Montana-Dakotas Regional Study
East Side (MAPP) Studies
Phase 1

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SUMMARY

Western Area Power Administration was directed to conduct a study pursuant to the following language in House Report 107-148, the Conference Report for the Supplemental Appropriation Act, 2001, Pub. L. 107-20:

"Non-reimbursable funding of $250,000 is provided to conduct a planning study of transmission expansion options and projected costs in Western's Upper Great Plains Region (UGPR). Existing Western transmission capacity is insufficient to support the development of known energy resources that could support new electric generation capacity in the Upper Great Plains Region. The directed study will require assumptions as to future generation locations. Western is directed to solicit suggestions from interested parties for the sites that should be studied as potential locations for new generation and to consult with such parties before conducting the study. Western is directed to produce an objective evaluation of options that may be used by all interested parties."

Additionally, House Report 107-258, the Conference Report for the Energy and Water Development Appropriations Act 2002, Public Law 107-66, states: "Within the amount appropriated, not less than $200,000 shall be provided for the Western Area Power Administration to conduct a technical analysis of the costs and feasibility of transmission expansion methods and technologies. These funds shall be non-reimbursable. Western shall publish a study by July 31, 2002 that contains a recommendation of the most cost-effective methods and technologies to enhance electricity transmission from lignite and wind energy. "

In order to fulfill the requirements of the above-referenced Congressional direction, Western conducted a public workshop on October 19, 2001, and also accepted written comments. Based on the Congressional directive and input from all interested parties, a detailed study scope was formulated. By using funds appropriated in Fiscal Year 2001, and some of Fiscal Year 2002, Western was able to expand the study scope.

The UGPR East Side studies were divided into two phases, Phase 1 (reported here) and Phase 2, and were conducted under contract with ABB Inc. A companion report by Peak Power Engineering Inc. summarizes results from UGPR West Side Studies (Montana Transmission Study). A second companion report (Transmission Enhancement Technology Report) by SSR Engineers, Inc. contains a review of the methods and technologies to enhance electricity transmission from lignite and wind energy that Western has considered through various research projects.

This report documents results for Phase 1 of the Western Area Power Administration Upper Great Plains Region "Montana - Dakotas Regional Transmission Study - East Side" (UGPR Transmission Study - East Side). The objective of this East Side portion of the study was to identify transmission reinforcements or other power system upgrades

necessary to accommodate a new 1000 MW generation development in North or South Dakota. Five different sites were studied:

Site 1 (Hettinger) - 500 MW coal and 500 MW of wind generation centered around Hettinger, ND, with power transfers to the Minneapolis/St. Paul, MN area (Twin Cities) and the Western Electricity Coordinating Council (WECC).
Site 2 (Jamestown) - 1000 MW of wind generation centered around Jamestown, ND, with power transfers to the Twin Cities.
Site 3 (Minot) - 1000 MW of wind generation centered around Minot, ND, with power transfers to the Twin Cities.
Site 4 (Ft. Thompson) - 1000 MW of wind generation centered around Ft. Thompson, SD, with power transfers to the Twin Cities.
Site 5 (Watertown) - 1000 MW of wind generation centered around Watertown, SD, with power transfers to the Twin Cities.

Because of the long distances between the new generation and the targeted Minnesota/St. Paul, MN area (Twin Cities) market, and because exports from North Dakota are already constrained by the NDEX (North Dakota Export) Interface (a stability-based limitation) dynamic performance and its impact on reliability was a key consideration in these studies. Other factors were also taken into account:

- Thermal performance - Contingency analyses were performed to assess the impact of the new generation and transmission upgrades on the loading of existing transmission following contingencies.
- Transmission losses - Incremental losses (i.e., those resulting from the new generation) were calculated under two assumptions: a) wind generation at full output, and b) wind generation at 1/3 of rated MW. This latter assumption recognizes the variability inherent to this type of generation.
- Impact on constrained interfaces - The impact of the alternatives on known constrained interfaces (flowgates) was assessed, since an alternative leading to excessive loading of flowgates could incur additional operational (i.e., generation restrictions) and/or capital (share of system upgrades) costs.
- Cost - Cost estimates (2001 dollars) were developed on the basis of the Mid-Continent Area Power Pool (MAPP) Transmission Plan Cost Estimator[1] (attached) and ABB's budgetary estimates.

A total of twenty one transmission alternatives were developed and evaluated for meeting MAPP transmission system performance criteria. The main attributes for these 21 alternatives are summarized in Table A. Hyperlinks in this table permit the reader to easily view the geographical maps showing existing and new lines. Various attributes (columns) in Table A are explained in the following paragraphs (in italic).

[1] Provided by Charles A. Tyson, MAPPCOR, May 9, 2001.

Taking the Watertown Site Case S5C1XXA as an example, clicking on the Case's name in Table A will bring a geographical map of the Northern MAPP System, where the new generation is identified with a "W" (for wind), or "C" (for a coal unit), and the new Watertown-Twin Cities 345 kV transmission upgrade in this alternative is highlighted in red (orange if it were 500 kV).

The entry on the third column in Table A indicates that this case's capital costs ($119 million) are the lowest among all alternatives. The fourth and fifth columns indicate that the reliability for this alternative is high since the case meets MAPP criteria without requiring that the new generation be tripped following critical contingencies. The alternative has a low thermal impact, meaning that it will not lead to a high number of overloads on existing transmission lines following contingencies.

Regarding losses, Table A indicates that under the high transfer conditions (typical of summer off-peak) studied, of the 1000 MW injected at the Watertown Station, 123 MW will be lost in transmission losses (in other words, only 877 MW will reach their intended Twin Cities destination). On the other hand, if the new wind generation were assumed at 1/3 of rated power (i.e., 333 MW in this alternative), the incremental losses drop from 12.3% to 2.7% (i.e., only 9 MW of the 333 MW will be consumed in losses).

One disadvantage Case S5C1XXA has is that 6.3% of the new generation (63 MW) would flow through the Cooper-South flowgate, and 5.2% would flow through the Ft. Calhoun-South flowgate, which could lead to operational restrictions or additional capital costs. The alternative also leads to an additional 42.3 MW flowing south on the Manitoba Hydro (MH) to US 500 kV line, which could also lead to operational restrictions under high MH exports conditions.

When evaluating the results from this report, it is important to keep in mind that this study is a high-level feasibility study. The most attractive alternatives need to be studied further to define sufficient detail to receive project approval and to determine whether projects are economically justifiable. This feasibility study should be viewed as a first step into the determination of the magnitude and type of network reinforcements that could be associated with new generation at each of the five sites studied, as well as providing guidance on the issues that are likely to be raised by such projects. Some of these preliminary conclusions are:

- Generation at the Ft. Thompson and (particularly) Watertown sites is likely to require less capital outlays for necessary transmission additions. It is also likely to have less of a thermal impact on existing transmission.
- On the other hand, the Ft. Thompson and Watertown sites are more likely to have a detrimental impact on flowgates in southern MAPP.
- The Jamestown and Minot sites are more likely than other sites to raise concerns regarding their potential interaction with the Manitoba Hydro system.
- Because of their proximity to the large amounts of existing thermal generation in the Bismarck, ND region, commonly referred to as the "Coalfields", and to Manitoba

Hydro's system, generation at the Jamestown and Minot sites is more prone to raise regional stability issues, and thus requires additional transmission paths to the Twin Cities.

- The main problems affecting the Ft. Thompson, Watertown, and (particularly) Hettinger Sites will likely be of a "local" nature (i.e., faults affecting lines in the vicinity of the site). These are problems that are usually resolved by reinforcing the connection from the site to the bulk transmission system. Also, special protection systems, such as generation tripping schemes, are usually more effective when applied to the resolution of local, rather than regional, problems.

These Phase 1 studies established requirements to serve Twin Cities markets with the new generation. A companion report summarizes results from Phase 2 of the UGPR Transmission Study - East Side, which investigates additional requirements if the new generation is delivered to Eastern Wisconsin and Iowa/Illinois markets instead of the Twin Cities.

Table A
Comparison of Alternatives

SITE	CASE	CAPITAL COSTS (M$)	RELIABILITY		THERMAL IMPACT	INCR. LOSSES (%)		IMPACT ON MAPP FLOWGATES (%)	INCR. MH>US 500 KV (D602F) FLOWS (MW)
			MEETS CRITERIA ?	GEN.TRIP REQUIRED ?		WIND GEN @ RATED	WIND GEN @ 1/3 RATED		
Hettinger	S1C1XXA	240	Yes	Yes (Coal)	High	25.0	19.5	5.0% on Grand Island-Lincoln Interface 5.5% on Cooper-South Interface	59.3
	S1C1XX2	229	Yes	No	High	24.2	19.2	5.7% on Grand Island-Lincoln Interface 6.1% on Cooper-South Interface	47.1
	S1C2XXX	261	Yes	No	High	23.5	18.2	5.4% on Grand Island-Lincoln Interface 5.9% on Cooper-South Interface	57.5
	S1C3XXA	255	Yes	No	High	11.0	0.5	None	17.9
	S1C4XXX	208	Yes	No	High	7.5	-3.5	None	19.0
	S1C5XX1	423	Yes	Yes (Coal)	High	2.8	-6.7	None	-6.5
	S1C5XXA	370	Yes	Yes (Coal)	High	2.9	-6.4	None	1.8
Jamestown	S2C3XX2	294	Marginally	No	Moderate	5.2	-29.2	7.4% on Ft. Calhoun-South Interface	69.9
	S2C4XX1	255	Marginally	No	Moderate	8.7	-17.0	None	68.7
	S2C4XX3	249	Yes	No	Moderate	12.8	-8.9	None	0.4
Minot	S3C2X1A	376	Marginally	No	Moderate	17.0	-1.8	None	65.5
	S3C3X2A	399	Yes	Yes (Wind)	Moderate	19.5	-0.2	None	37.7
	S3C3X3A	407	Yes	No	Moderate	18.7	0.1	None	38.1
	S3C3X4A	431	Yes	No	Moderate	19.0	-0.5	None	41.0
	S3C4X1A	410	Yes	No	Moderate	11.0	-6.8	7.5% on Cooper-South Interface 9.2% on Ft.Calhoun-South Interface	45.0

Table A
Comparison of Alternatives

SITE	CASE	CAPITAL COSTS (M$)	RELIABILITY		THERMAL IMPACT	INCR. LOSSES (%)		IMPACT ON MAPP FLOWGATES (%)	INCR. MH>US 500 KV (D602F) FLOWS (MW)
			MEETS CRITERIA ?	GEN.TRIP REQUIRED ?		WIND GEN @ RATED	WIND GEN @ 1/3 RATED		
Ft. Thompson	S4C1XXA	154	Yes	Yes (Wind)	Low	17.6	5.9	7.3% on Grand Island-Lincoln Interface 7.6% on Cooper-South Interface	42.3
	S4C2X1A	141	Marginally	No	Low	17.1	3.1	13.1% on Cooper-South Interface 11.1% on Ft.Calhoun-South Interface	32.7
	S4C4XXA	178	Yes	Yes (Wind)	Low	14.9	-1.0	13.7% on Cooper-South Interface 13.3% on Ft.Calhoun-South Interface	26.9
	S4C5XXA	219	Marginally	No	Low	11.7	-6.4	8.6% on Cooper-South Interface 7.6% on Ft.Calhoun-South Interface	16.0
Watertown	S5C1XXA	119	Yes	No	Low	12.3	2.7	6.3% on Cooper-South Interface 5.2% on Ft.Calhoun-South Interface	42.3
	S5C5XXX	130	Yes	No	Low	9.3	-6.5	8.0% on Cooper-South Interface 8.5% on Ft.Calhoun-South Interface	27.4

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9.6 CONSTRAINED INTERFACE IMPACT STUDIES
9.7 CAPITAL COSTS

1. INTRODUCTION

This report documents results for Phase 1 of the UGPR Transmission Study - East Side. The objective of this Phase 1 study was to identify transmission reinforcements or other power system upgrades necessary to accommodate a new 1000 MW generation development in North or South Dakota. This study should be considered a high-level feasibility study and does not include sufficient detail to receive project approval at the Regional, State, or local levels; nor does this study attempt to determine if a specific project is economically justifiable. Five different sites, for possible location of the new 1000 MW generation, were identified in the public process to be studied:

- Site 1 (Hettinger). 500 MW coal and 500 MW of wind generation centered around Hettinger, ND, with power transfers to the Twin Cities and the Western Electricity Coordinating Council (WECC).
- Site 2 (Jamestown). 1000 MW of wind generation centered around Jamestown, ND, with power transfers to the Twin Cities.
- Site 3 (Minot). 1000 MW of wind generation centered around Minot, ND, with power transfers to the Twin Cities.
- Site 4 (Ft. Thompson). 1000 MW of wind generation centered around Ft. Thompson, SD, with power transfers to the Twin Cities.
- Site 5 (Watertown). 1000 MW of wind generation centered around Watertown, SD, with power transfers to the Twin Cities.

The studies have been conducted on an approved Mid-Continent Area Power Pool (MAPP) power system model based on the "upe" series of cases developed in the North Dakota Transmission Improvement Planning Study (TIPS), modified to include the generation developments considered in these analyses.

The analyses were conducted with a single set of off-peak high-transfer conditions (with high simultaneous exports from North Dakota and Manitoba Hydro) that are critical due to limiting stability constraints. In subsequent studies, additional analyses should be conducted, for example, at peak load conditions. Additional issues/upgrades may be identified from those peak load studies.

It is also important to note that future system additions may affect the results from these studies. For example, since the start of these analyses, a new 200 MW HVdc tie at Rapid City, SD (scheduled to enter commercial operation in October 2003) gained approval from MAPP's Design Review Subcommittee (DRS). That converter was not modeled in these studies, and would likely impact some of the conclusions (mainly steady-state contingency results) in this report.

2. CONCLUSIONS AND RECOMMENDATIONS

This report documents results for Phase 1 of the UGPR Transmission Study - East Side. The objective of this study was to identify transmission reinforcements or other power system upgrades necessary to accommodate a new 1000 MW generation development in North or South Dakota. Five different sites, identified through public input and participation, were studied:

Site 1 (Hettinger) - 500 MW coal and 500 MW of wind generation centered around Hettinger, ND, with power transfers to the Twin Cities and the Western Electricity Coordinating Council (WECC).
Site 2 (Jamestown) - 1000 MW of wind generation centered around Jamestown, ND, with power transfers to the Twin Cities.
Site 3 (Minot) - 1000 MW of wind generation centered around Minot, ND, with power transfers to the Twin Cities.
Site 4 (Ft. Thompson) - 1000 MW of wind generation centered around Ft. Thompson, SD, with power transfers to the Twin Cities.
Site 5 (Watertown) - 1000 MW of wind generation centered around Watertown, SD, with power transfers to the Twin Cities.

For each of these five sites, several alternatives were developed, with the objective of not only finding least-cost solutions, but also of highlighting the trade-offs available between attributes. No preference is implied in the listings below. For example:

- Cost and reliability
- Transmission reinforcements vs FACTS (Flexible AC Transmission Systems) solutions such as Static Var Compensators (SVCs) and Series Compensation.
- Conventional induction generators vs wind generation with dynamic var capability.
- 345 kV and 500 kV transmission reinforcements.

Because of 1) the long distances between the new generation and the targeted markets, and because 2) exports from North Dakota are already constrained by the stability-based NDEX (North Dakota Export) Interface, dynamic performance was a key consideration in these studies, following both "regional" and "local" contingencies. Other factors were also taken into account:

- Thermal performance - Contingency analyses were performed to assess the impact of the new generation and transmission upgrades on the loading of existing transmission for post-contingency conditions.
- Transmission losses - Incremental losses (i.e., those resulting from the new generation) were calculated under two assumptions: a) wind generation at full output, and b) wind generation at 1/3 of rated MW. This latter assumption recognizes the variability inherent to the wind generation.

- Impact on constrained interfaces - The impact of the alternatives on known constrained interfaces (flowgates) was assessed, since an alternative leading to excessive loading of flowgates could incur additional operational (i.e., generation restrictions) and/or capital (share of system upgrades) costs.
- Cost - Cost estimates were developed on the basis of the MAPP Cost Estimator[2] and ABB's budgetary estimates.

2.1 Site 1 (Hettinger) Alternatives

Seven alternatives were developed for this site. The main features of these alternatives are summarized in Table 2.1. For a detailed listing of all upgrades (including transformers, etc.), in each alternative, refer to the respective report sections (shown in parenthesis in Table 2.1). Alternatives involving full or partial transfer of the output from the new generation to the Twin Cities include a new 345 kV or 500 kV path from the site to the Cities. Alternative S1C4XXX, where the bulk of the generation is exported to the WECC does not include new transmission to the Twin Cities, and, instead, includes a new 345 kV line from Hettinger to Miles City (where the export takes place).

Table 2.1
Main Features of Site 1 (Hettinger) Viable Alternatives

ALTERNATIVE	
Cases with 345 kV Upgrades: Hettinger-Belfield 345 kV + Hettinger-Ft. Thompson 345 kV + Ft. Thompson-Blue Lake 345 kV	S1C1XXA - With SVCs @ Wind Generator Terminals (Section 5.6.1)
	S1C1XX2 - With 50% Series compensation of Hettinger-Belfield 345 kV and Hettinger-Ft. Thompson 345 kV (Section 5.6.2)
	S1C2XXX - With Hettinger-Glenham 345 kV (Section 5.6.3)
Case with incremental 400 MW Exports to WECC	S1C3XXA - Hettinger-Belfield 345 kV + Hettinger-Ft. Thompson 345 kV+ Ft. Thompson-Blue Lake 345 kV + SVCs @ Wind Generator terminals (Section 5.6.4)
Case with incremental 750 MW Exports to WECC	S1C4XXX - Hettinger-Belfield 345 kV + Hettinger-Miles City 345 kV + Hettinger-Glenham 345 kV (Section 5.6.5)
Cases with new Hettinger-Glenham-Groton-Big Stone-Blue Lake 500 kV line	S1C5XX1 - With Hettinger-Belfield 345 kV + Hettinger-Ft. Thompson 345 kV (Section 5.6.6)
	S1C5XXA - With Hettinger-Belfield 345 kV + SVCs @ Wind Generator terminals (Section 5.6.7)

[2] Provided by Charles A. Tyson, MAPPCOR, May 9, 2001.

Because Hettinger is relatively distant from the 345 kV bulk transmission system the design of transmission alternatives was mainly driven by "local" concerns. These concerns included the stability performance following outage of new 345 and 500 kV links between the site's generation and the existing system.

2.2 Site 2 (Jamestown) Alternatives

Three alternatives (Table 2.2) were developed for this site. All alternatives include the upgrade of one of the two 230 kV circuits between Bismarck and Fargo to 345 kV, as well as a new 345 kV path from Fargo to the Twin Cities (part upgrade, part new transmission). Also all alternatives utilize the existing Center to Maple River 345 kV transmission by connecting it to the new transmission at the Coalfields, and at the Jamestown, and Maple River Substations. Consequently, there is ample connectivity available to the new generation, and local contingencies are not a major concern. This explains why, for example, none of the selected alternatives include the application of SVCs at wind generation terminals.

Instead, the main concern for this site is a regional one, in that the new generation, due to parallel flow effects, tends to bias the exports from Manitoba Hydro to the US by reducing flows on the Glenboro-Rugby and Letellier-Drayton 230 kV lines and increasing them on the Dorsey-Roseau 500 kV transmission. This is detrimental to such critical transmission in that it could lead to overloading of series capacitors on that line, depletion of reactive resources at Dorsey, and overall deterioration of the Manitoba Hydro-US dynamic performance.

Table 2.2
Main Features of Site 2 (Jamestown) Viable Alternatives

<table>
<tr><th colspan="3">ALTERNATIVE</th></tr>
<tr><td rowspan="3">Upgrade of Bismarck-Granite Falls 345 kV

+Granite Falls-Blue Lake 345 kV

+Bismarck-Leland Olds 345 kV

+Maple River-Moorhead 345 kV

+Center-Leland Olds 345 kV

+Jamestown (N)-Jamestown (S) 345 kV</td><td colspan="2">S2C3XX2 - With Antelope Valley-Split Rock 500 kV + Split Rock-Lakefield Junction 345 kV + 35% Series Compensation West of Jamestown (Section 6.3.1)</td></tr>
<tr><td rowspan="2">Maple River - Benton Co. 345 kV</td><td>S2C4XX1 - 35% Series Compensation West of Jamestown (Section 6.3.2)</td></tr>
<tr><td>S2C4XX3 - Letellier Phase Shifter + Prairie SVC (Section 6.3.3)</td></tr>
</table>

In order to mitigate these concerns, a second, additional path to the Twin Cities was included (Antelope Valley-Split Rock 500 kV + Split Rock-Lakefield Junction 345 kV or

Maple River-Benton County 345 kV), as well as series compensation or a phase shifter controlling flows on the Letellier to Drayton 230 kV line.

2.3 Site 3 (Minot) Alternatives

Five alternatives (Table 2.3) were developed for this site. As in the Site 2 case, all alternatives include two new transmission paths (345 kV or 500 kV) to the Twin Cities.

Table 2.3
Main Features of Site 3 (Minot) Viable Alternatives

<table>
<tr><th colspan="3">ALTERNATIVE</th></tr>
<tr><td rowspan="5">Minot-Harvey 345 kV + Minot-Leland Olds 345 kV.

+Harvey-Prairie-Maple River-Benton Co. 345 kV

+Center-Leland Olds 345 kV

+ Prairie SVC

+SVC at Wind Generation Terminals</td><td colspan="2">S3C2X1A - Upgrade of Fargo/Maple River-Granite Falls 345 kV + Granite Falls-Blue Lake 345 kV (Section 7.3.1)</td></tr>
<tr><td colspan="2">S3C4X1A - Antelope Valley-Split Rock 500 kV + Split Rock-Lakefield Junction 345 kV (Section 7.3.5)</td></tr>
<tr><td rowspan="3">Prairie-Duluth 345 kV</td><td>S3C3X2A (Section 7.3.2)</td></tr>
<tr><td>S3C3X3A - 35% Series Comp. Of Minot-Harvey-Prairie 345 kV (Section 7.3.3)</td></tr>
<tr><td>S3C3X4A - Harvey-Leland Olds 345 kV (Section 7.3.4)</td></tr>
</table>

The first path is common to all alternatives and it comprises a Minot-Harvey-Prairie-Maple River-Benton Co. 345 kV line to the Twin Cities. Also common to all alternatives are a new Minot-Leland Olds 345 kV line (to provide N-1 reliability to the Site), and a Center-Leland Olds 345 kV circuit (to take advantage of the Center to Maple River 345 kV line). The alternatives differ on the nature of the second path to the Twin Cities, which included one of the following three possibilities:

- Fargo/Maple River-Granite Falls-Blue Lake 345 kV (part upgrade, part new transmission)
- Antelope Valley-Split Rock 500 kV + Split Rock-Lakefield Junction 345 kV
- Prairie-Duluth 345 kV

The need for this second path to the Twin Cities stems from the proximity of the Site 3 to the Coalfields and to the Manitoba Hydro System. This tends to aggravate stability performance following regional (as opposed to local) contingencies. In some cases, performance following local contingencies is also a concern. One such contingency

(fault and outage of Minot-Leland Olds 345 kV) leads to the three options associated with the Prairie-Duluth 345 kV reinforcement.

2.4 Site 4 (Ft. Thompson) Alternatives

Four alternatives (Table 2.4) were developed for this site. Because the site is relatively far from the Coalfields and from the MH System, regional interactions are less of a concern, which explains why a single path to the Twin Cities (either Ft. Thompson-Granite Falls-Blue Lake 345 kV or Ft. Thompson-Huron-Split Rock-Lakefield Junction 345 kV) suffices.

Local contingencies are more of a concern in this case, particularly because the Leland Olds-Ft. Thompson-Grand Island 345 kV line is one of the major ties connecting the Coalfields to the MAPP system, and as such experiences significant southbound flows even without the new generation. Consequently, the site is vulnerable to the fault and outage of existing and new 345 kV lines connecting the Ft. Thompson station to the South and East. Two alternatives to this problem were explored: a) the tripping of the new generation soon (200 msec or less) after fault inception, and b) an additional Ft. Thompson-Sioux Falls 345 kV reinforcement, for a total of four (two new, two existing) 345 kV lines emanating from Ft. Thompson.

Another concern for this site is the lack of VAR support from nearby generation, which explains the use in all four cases of dynamic compensation in the form of SVCs.

Table 2.4
Main Features of Site 4 (Ft. Thompson) Viable Alternatives

ALTERNATIVE	
Ft. Thompson-Granite Falls 345 kV Upgrade + Granite Falls-Blue Lake 345 kV + SVC at Wind Generation Terminals	S4C1XXA (Section 8.4.1)
	S4C5XXA - Ft. Thompson-Sioux Falls 345 kV Upgrade + Split Rock-Lakefield Junction 345 kV (Section 8.4.4)
Ft. Thompson-Huron 345 kV Upgrade + Huron-Split Rock 345 kV +Split Rock-Lakefield Junction 345 kV + SVC at Wind Generation Terminals	S4C2X1A (Section 8.4.2)
	S4C4XXA - Ft. Thompson-Sioux Falls 345 kV Upgrade (Section 8.4.3)

2.5 Site 5 (Watertown) Alternatives

The two alternatives developed for this site are described in Table 2.5. Both alternatives include a path to the Twin Cities: a 345 kV line from Watertown to Granite Falls (an upgrade from the existing 230 kV line, if possible), and a new 345 kV line from Granite Falls to Blue Lake.

With this transmission in place, the remaining concern is for the dynamic performance of the new generation following fault and outage of 345 kV circuits connecting the Watertown Station to the south and east (i.e., same concerns as in the Ft. Thompson Site). Two solutions were examined: a) SVC application at wind generation terminals, and b) Upgrade of Watertown-Huron 345 kV + a new Huron-Split Rock 345 kV line.

Table 2.5
Main Features of Site 5 (Watertown) Viable Alternatives

ALTERNATIVE	
Watertown-Granite Falls 345 kV Upgrade	S5C1XXA - SVC at Wind Generation Terminals (Section 9.3.1)
+ Granite Falls-Blue Lake 345 kV	S5C5XXX - Watertown-Huron 345 kV Upgrade + Huron-Split Rock 345 kV (Section 9.3.2)

2.6 Attributes for Comparison

Alternatives are compared in Table 2.6 according to the following attributes:

Capital Costs. These include estimates of the cost of new and upgraded lines, substation costs, and compensation costs (SVCs and Series compensation). Not included are the costs of right of way (ROW), electrical equipment within wind farms, nor the costs of step-up transformers. Capital costs usually constitute an important gauge in selecting the preferred alternatives.

It is important however to recognize that there are several uncertainties in these cost estimates, particularly regarding line costs. For example, several of the alternatives include line upgrades from 230 kV to 345 kV. Their cost was assumed to be 62% of the cost of new 345 kV lines. Detailed line and tower analyses should be conducted to verify the feasibility of upgrades and their costs relative to those of new lines. Also, such an in-depth look at proposed upgrades might uncover situations where operational restrictions during upgrade construction might make such an upgrading infeasible, thus requiring separate new lines.

Another source of uncertainty is actual line lengths, which should be verified in light of environmental and topography constraints. Yet another uncertainty is the fact that

ROW costs are not included in these estimates, which could typically add between 10 to 15% to the capital costs, particularly for lines terminating in the Twin Cities.

Reliability. Although all alternatives should be considered acceptable if they meet criteria, some are more reliable than others. Alternatives labeled as meeting deterministic criteria exhibit larger margins to stability than alternatives labeled as marginal. Similarly, some alternatives require tripping of the new generation for outage of one or (at most) two of the bulk transmission circuits connecting the new generation. Such alternatives should be considered less reliable and might be unacceptable to the new plant owners.

Generation tripping schemes are widely used throughout the world particularly on hydro plants. They are also used (although more judiciously) to trip conventional steam units (including coal units in the MAPP system), and this is facilitated in the case of new units, since such potential tripping could then be designed into the plant and its controls.

There is less experience, however, with tripping schemes involving wind generation. Per informal discussions with wind developers, it appears that such tripping might not be a concern in terms of potential damage to the wind units themselves (which sometimes is a concern in the case of thermal generation). What remains to be seen, however, is the practicality of tripping hundreds of generators (typically rated between 1 and 2 MW each), all within 200 msec. or less from fault inception.

Thermal Impact. This column measures the potential overloading of existing and new equipment as a consequence of the new generation and its associated new transmission following single (N-1) contingencies (more in-depth analyses should consider multi-element contingencies, such as double circuit contingencies in Western's South Dakota 230 kV transmission system). In Table 2.6 this exposure to potential overloading was arbitrarily gauged in terms of "High", "Moderate" and "Low", with "High" meaning a higher exposure to increased costs due to upgrading of either lines or equipment. More detailed information on thermal performance is provided in Sections 5 through 9.

Here again, more in-depth analyses are warranted, in terms of the actual nature of the limitation and the cost of its upgrading. Also, when comparing the relative performances of different sites in Table 2.6, it is important to note that in the case of Sites 1 and 2 the wind generation was assumed dispersed into 5 and 10 locations, respectively, and that those units were modeled connected at lower voltage levels ranging from 115 kV to 230 kV. On the other hand, the new generation in Sites 3 through 5 was assumed concentrated at a single location, and connected to the 345 kV bulk transmission system. Connection at higher voltage levels will usually lead to less overloading.

Transmission Losses. Shown in Table 2.6 are the incremental losses in percentage of the new generation output for each of the selected alternatives. When evaluating these

results it is important to take into consideration the inherent variability of wind generation, which is the reason why two loss figures are provided in Table 2.6: one with wind generation at full capacity, and another with wind units operating at 1/3 of rated power. At this reduced dispatch level most cases (except Site 1, where half of the new generation was assumed to be coal-based, and thus was assumed to remain constant) display a dramatic reduction in losses (including an actual reduction in losses in many cases).

Another factor to consider is that these loss figures correspond to a snapshot of summer off-peak loading conditions. Considering that for "weak" alternatives, the present worth of cost of losses throughout the life of the project could well exceed the capital costs, a more comprehensive analysis of losses, including study of a variety of load levels, transmission loading and dispatch conditions throughout the year, is necessary. Such an analysis, however, is beyond the scope of these studies.

Impact on MAPP/Regional Flowgates. This column lists the impact alternatives could have on interfaces recognized as potentially constraining to the operation of the system. Such impacts are worth looking into since they could result in limitations on the operation of the new generation and/or a requirement to share in the costs of upgrading the limiting constraint. The calculated impacts presented throughout this report are based upon a Power Transfer Distribution Factor (PTDF) assumption. The definition of the flowgates and type of flowgate (PTDF or alternate Outage Transfer Distribution Factor - OTDF) should be confirmed in subsequent detailed studies as they can change and many flowgates are being converted to the OTDF type. The present "significant impact" threshold for a PTDF type flowgate is 5.0%. Therefore, if the impact is greater than 5.0% on a PTDF-type flowgate and insufficient Available Transfer Capability (ATC) remains to accommodate the impact of the 1000 MW transfer, mitigation will be required.

Impact on 500 kV MH to US, Dorsey-Roseau-Forbes(D602F) Flows. An increase in North to South flows on this transmission increases the likelihood of series capacitor overloading, reactive depletion, and/or instability along this critical link between the Manitoba Hydro and US Systems. Alternatives with higher impact on such flows are more likely to incur operational restrictions and/or additional capital costs for, for example, installation of phase shifters between the systems (such as in Case S2C4XX3).

Table 2.6
Comparison of Alternatives

CASE	CAPITAL COSTS (M$)	RELIABILITY		THERMAL IMPACT	INCR. LOSSES (%)		IMPACT ON MAPP FLOWGATES (%)	INCR. MH>US 500 KV (D602F) FLOWS (MW)
		MEETS CRITERIA ?	GEN.TRIP REQUIRED ?		WIND GEN @ RATED	WIND GEN @ 1/3 RATED		
S1C1XXA	240	Yes	Yes (Coal)	High	25.0	19.5	5.0% on Grand Island-Lincoln Interface 5.5% on Cooper-South Interface	59.3
S1C1XX2	229	Yes	No	High	24.2	19.2	5.7% on Grand Island-Lincoln Interface 6.1% on Cooper-South Interface	47.1
S1C2XXX	261	Yes	No	High	23.5	18.2	5.4% on Grand Island-Lincoln Interface 5.9% on Cooper-South Interface	57.5
S1C3XXA	255	Yes	No	High	11.0	0.5	None	17.9
S1C4XXX	208	Yes	No	High	7.5	-3.5	None	19.0
S1C5XX1	423	Yes	Yes (Coal)	High	2.8	-6.7	None	-6.5
S1C5XXA	370	Yes	Yes (Coal)	High	2.9	-6.4	None	1.8
S2C3XX2	294	Marginally	No	Moderate	5.2	-29.2	7.4% on Ft. Calhoun-South Interface	69.9
S2C4XX1	255	Marginally	No	Moderate	8.7	-17.0	None	68.7
S2C4XX3	249	Yes	No	Moderate	12.8	-8.9	None	0.4
S3C2X1A	376	Marginally	No	Moderate	17.0	-1.8	None	65.5
S3C3X2A	399	Yes	Yes (Wind)	Moderate	19.5	-0.2	None	37.7
S3C3X3A	407	Yes	No	Moderate	18.7	0.1	None	38.1
S3C3X4A	431	Yes	No	Moderate	19.0	-0.5	None	41.0
S3C4X1A	410	Yes	No	Moderate	11.0	-6.8	7.5% on Cooper-South Interface 9.2% on Ft.Calhoun-South Interface	45.0
S4C1XXA	154	Yes	Yes (Wind)	Low	17.6	5.9	7.3% on Grand Island-Lincoln Interface 7.6% on Cooper-South Interface	42.3
S4C2X1A	141	Marginally	No	Low	17.1	3.1	13.1% on Cooper-South Interface 11.1% on Ft.Calhoun-South Interface	32.7
S4C4XXA	178	Yes	Yes (Wind)	Low	14.9	-1.0	13.7% on Cooper-South Interface 13.3% on Ft.Calhoun-South Interface	26.9
S4C5XXA	219	Marginally	No	Low	11.7	-6.4	8.6% on Cooper-South Interface 7.6% on Ft.Calhoun-South Interface	16.0
S5C1XXA	119	Yes	No	Low	12.3	2.7	6.3% on Cooper-South Interface 5.2% on Ft.Calhoun-South Interface	42.3
S5C5XXX	130	Yes	No	Low	9.3	-6.5	8.0% on Cooper-South Interface 8.5% on Ft.Calhoun-South Interface	27.4

2.7 Comparison of Sites

When evaluating the results from this report, it is important to keep in mind that this study is a high-level feasibility study, without sufficient detail to receive project approval and without attempting to determine whether projects are economically justifiable. Instead, it should be viewed as a first step into the determination of the magnitude and type of network reinforcements that could be associated with new generation at each of the five sites studied, as well as providing guidance on the issues that are likely to be raised by such projects. Some of these preliminary conclusions are:

- Generation at the Ft. Thompson (Site #4) and (particularly) Watertown (Site #5) sites is likely to require less capital outlays than generation at the other three sites. It is also likely to have less of a thermal impact on existing transmission.
- On the other hand, the Ft. Thompson and Watertown sites are more likely to have a detrimental impact on flowgates in southern MAPP.
- The Jamestown (Site #2) and Minot (Site #3) sites are more likely than other sites to raise concerns regarding their potential interaction with the Manitoba Hydro system.
- Because of their proximity to the Coalfields and to Manitoba Hydro's system, generation at the Jamestown and Minot sites is more prone to raise regional stability issues, and thus requires additional transmission paths to the Twin Cities.
- The main problems affecting the Ft. Thompson, Watertown, and (particularly) Hettinger Sites will likely be of a "local" nature (i.e., faults affecting lines in the vicinity of the site). These are problems that are usually resolved by reinforcing the connection from the site to the bulk transmission system. Also, special protection systems, such as generation tripping schemes, are usually more effective when applied to the resolution of local, rather than regional, problems.

3. BASE CASE DEVELOPMENT

3.1 Introduction

The studies were conducted utilizing the Northern MAPP Operating Review Work Group (NMORWG) 2001 Study Package released on November 27, 2001. The base-case (i.e., without additional generation) was developed using Case "upe-sp04aa.gqdV4X4" as a starting point. This summer-peak 2004 case was developed by participants of the Red River Valley Sub-Regional Planning Group (RRV-SPG) for the TIPS Studies.

Because these studies are mainly concerned with investigating conditions with high transfer levels within the Northern MAPP region, summer off-peak conditions with maximum simultaneous transfers were developed by applying the "Setexports" IPLAN program in the package. The resulting case was named "upe-so04aa.ABBBASE", and is described in detail in Figure 3.1. Critical transfer indices in this case are:

- North Dakota Export Level (NDEX): 2080 MW
- Manitoba Hydro Export Level (MHEX): 2173 MW
  - Dorsey to Roseau 500 kV Flow: 1769 MW (line is 0.5% above its thermal limit)
  - Letellier to Drayton 230 kV Flow: 245.8 MW
  - Glenboro to Rugby 230 kV Flow: -3.4 MW
- Minnesota-Wisconsin Interface (MWSI): 1486 MW
  - Eau Claire to Arpin 345 kV Flow: 647 MW
  - Prairie Island to Byron 345 kV Flow: 839 MW
- Load Levels as % of 2004 Summer Peak:
  - North Dakota: 64.2%
  - NSP: 78.6%
  - Manitoba Hydro: 80.3%

The case includes the new Harvey-Glenboro 230kV line between North Dakota and Manitoba Hydro, and the MHEX south flow is increased to approximately 2175 MW.

Also included in the case is a model of the Arrowhead-Tripoli-Weston 345 kV line. This model includes a phase shifter controlling flows (to a 590-610 MW range) between the 230 kV and 345 kV busbars at Arrowhead. However, in these Phase 1 studies, this phase shifter was assumed disabled (i.e., with phase shift locked at 0 degrees), as was the case in the original "upe" case from the TIPS studies. Consequently, 345 kV flows from Arrowhead towards Tripoli/Weston are generally lower than the targeted 600 MW, 508 MW in this basecase.

The case includes the following upgrades, which are necessary in order to increase NDEX levels from 1950 MW to 2080 MW:

- New 2 x 20 Mvar Shunt Capacitors at Brookings 115 kV
- New 2 x 30 Mvar Shunt Capacitors at Groton 115 kV

- New 60 Mvar Shunt Capacitor at Watertown 230 kV
- New 2 x 40 Mvar Shunt Capacitors at Jamestown 115 kV
- Switching off the Ft. Thompson line reactor on Ft. Thompson-Grand Island 345 kV line

The case, however, does not include the potential Griggs-Steele 130 MW wind generation addition associated with the 130 MW NDEX increase; a conservative assumption for NDEX transfer analyses.

3.2 Base-Case Dynamic Performance

Dynamic studies of the base case were conducted utilizing the NMORWG 2001 Study Package together with the "mapp99-tips" snapshot. Also modeled in the studies was an implementation of a damping signal on the Watertown SVC as documented in the Griggs-Steele base model.

The upe-so04aa.ABBBASE case was subjected to a number of critical MAPP Contingencies. The contingencies are described in Table 3.1. Simulation results are summarized in Table 3.2 and detailed in Appendix 1.

The results suggest performance that is in line with MAPP Criteria, except for Contingency mqs (single line to ground fault with breaker failure at Sherco, tripping Sherco Unit #3), which exhibits a 35% relay margin at the Forbes end of the D602F 500 kV line. This is the same value indicated in the September 2000 Harvey-Glenboro Design Review Subcommittee (DRS) Study report, where mqs is highlighted as one of the most critical Twin Cities Contingencies

3.3 Base-Case Steady-State Performance

The upe-so04aa.ABBBASE case was also tested with load-flow contingency analysis. The analyses were conducted with the ACCC Activity in the PSS/E Program and tested N-1 contingencies throughout the MAPP System (Areas 1 through 39, 210 and 211). Results were then post-processed with the Screen ACCC IPLAN Program. Results from those analyses are summarized in Appendix 2 and constitute the baseline for thermal analyses with the new generation in place.

3.4 New Wind and Coal Generation - Base Case Development

1000 MW of new coal and/or wind generation (and new transmission) was added at the locations specified for each of the five sites. A "Gen-to-Gen" approach was employed for accommodating this new generation. Generation at the following Twin Cities units was reduced or turned off:

- Bus 1784 - Black Dog 115 kV Plant - 153.1 MW Net Generation
- Bus 1786 - High Bridge 115 kV - 153.1 MW Net
- Bus 1788 - Riverside 115 kV - 204.1 MW Net
- Bus 1783 - Black Dog 115 kV - 114.3 MW Net

Generation at the Twin Cities Sherco Plant (Buses 1681, 1682, and 1683, 2241.8 MW Net Generation) was then scaled down in order to restore swing bus generation levels to those in the ABBBASE case. The Setexports IPLAN program was then invoked, but solely for the purpose of restoring MWSI transfer levels to 1480 MW (i.e., NDEX transfer levels were allowed to increase when necessary to accommodate the new generation).

The development of transmission scenarios to accommodate the new generation required the definition of fault scenarios in addition to those already in the NMORWG 2001 Package. These new fault scenarios are described in Table 3.3.

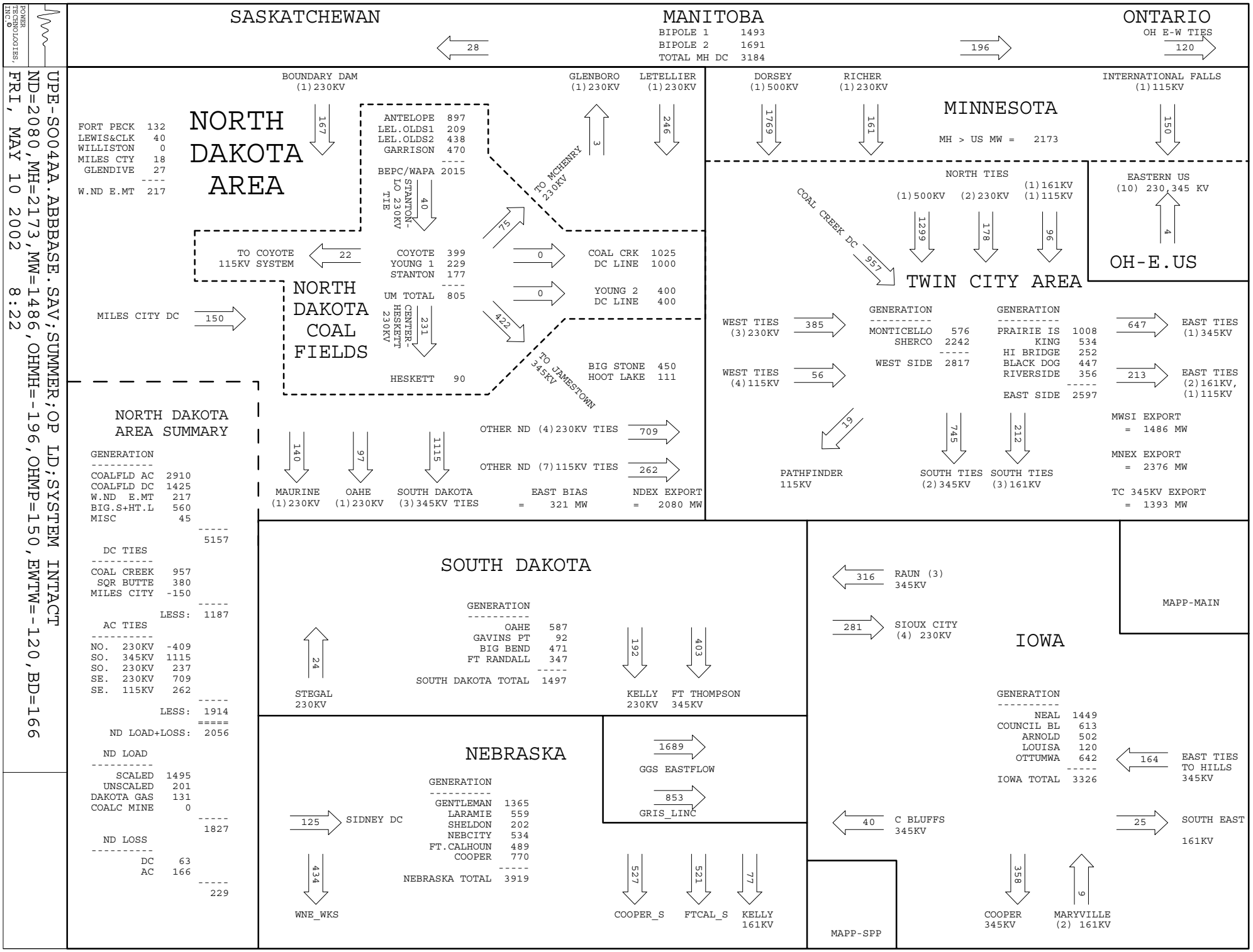


Figure 3.1 - ABBBASE Case (Without Future Coal or Wind Generation)

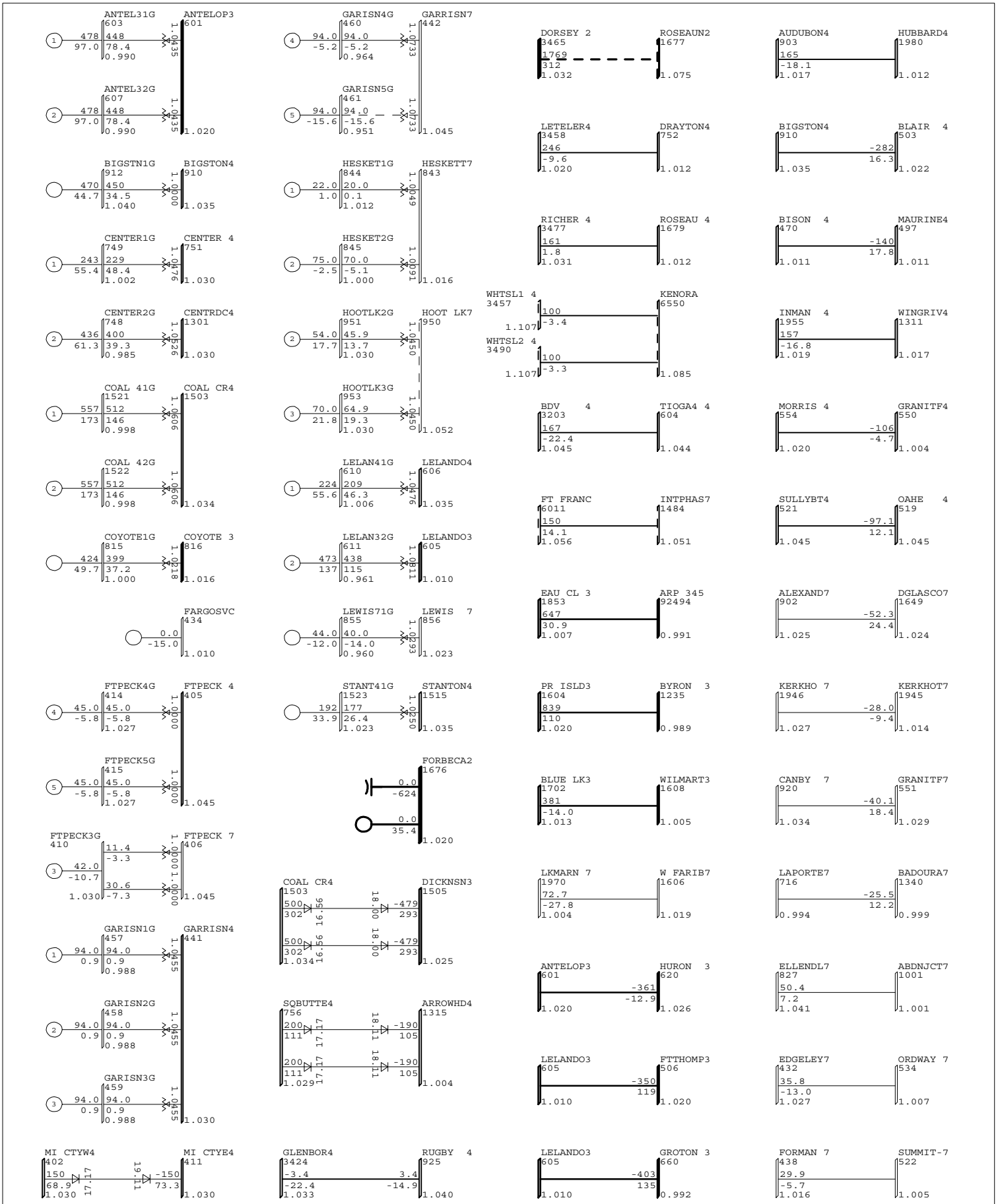
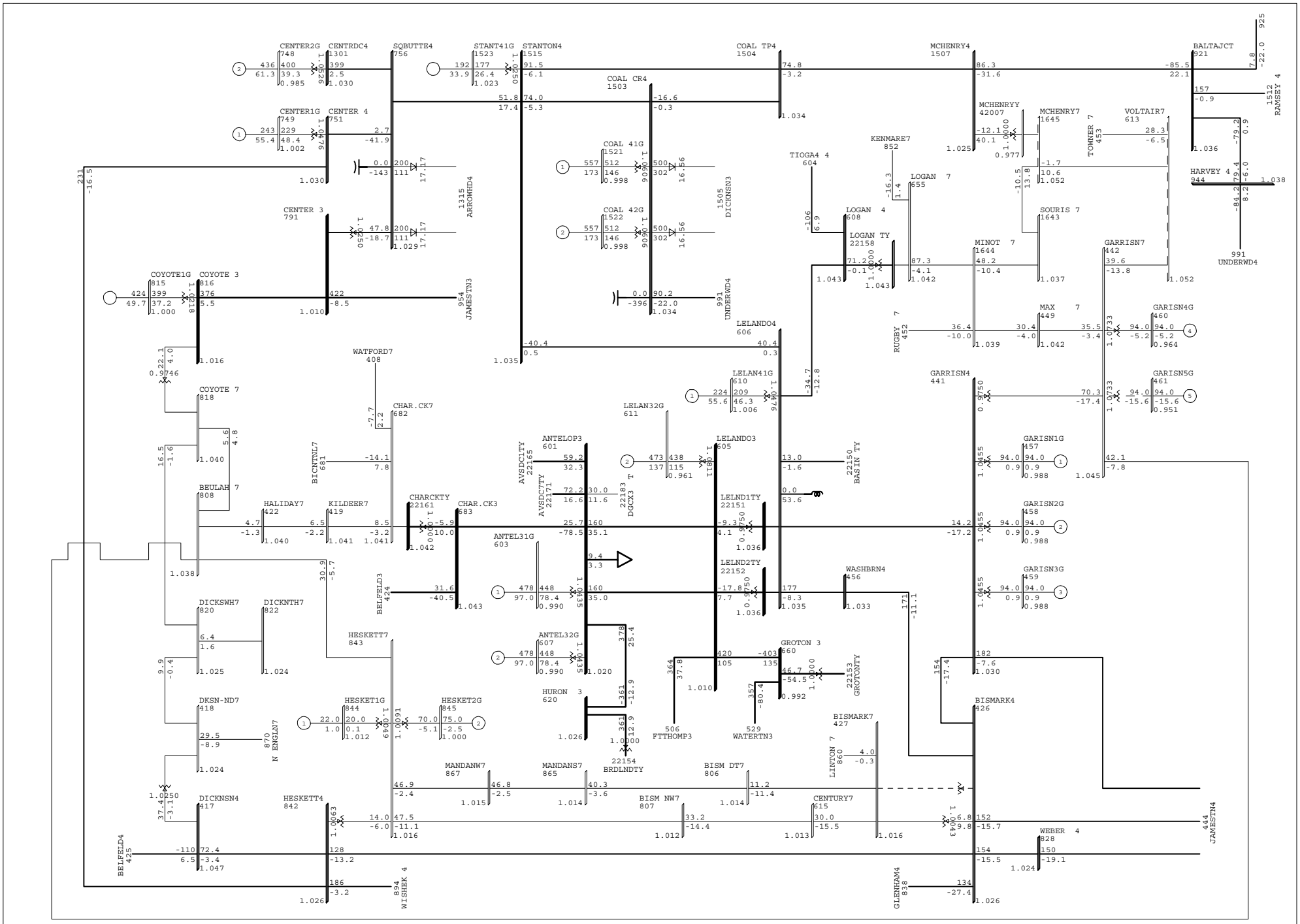


Figure 3.1 (Cont.)

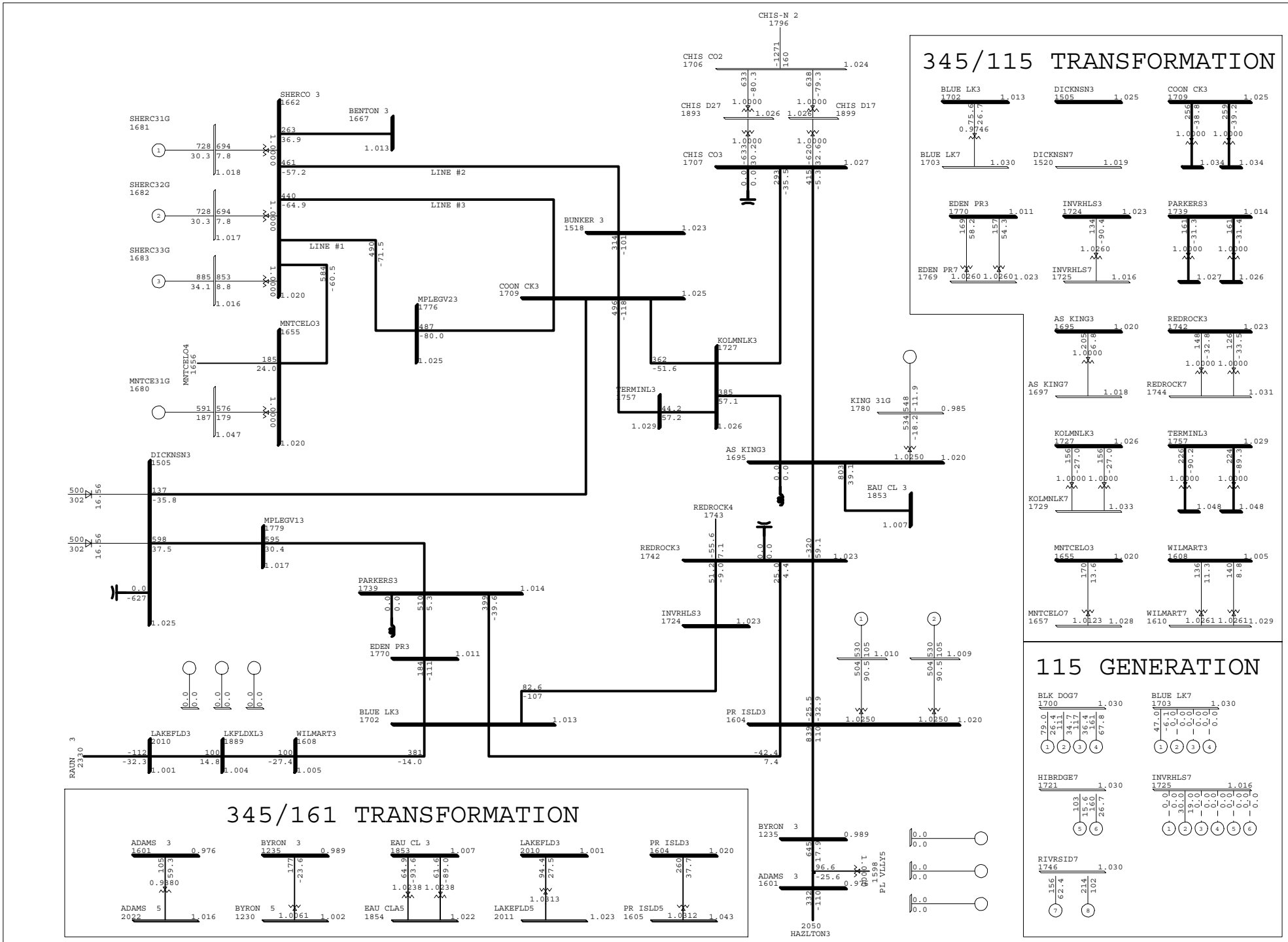


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
NORTH DAKOTA COAL FIELDS FRI, MAY 10 2002 8:22

100% RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≤345

BUS -VOLTAGE(PU)
BRANCH -MW/MVAR
EQUIPMENT -MW/MVAR

Figure 3.1 (Cont.)



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TWIN CITY 345 KV SYSTEMS FRI, MAY 10 2002 8:22

100% RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≤345

BUS -VOLTAGE(PU)
BRANCH -MW/MVAR
EQUIPMENT -MW/MVAR

Figure 3.1 (Cont.)

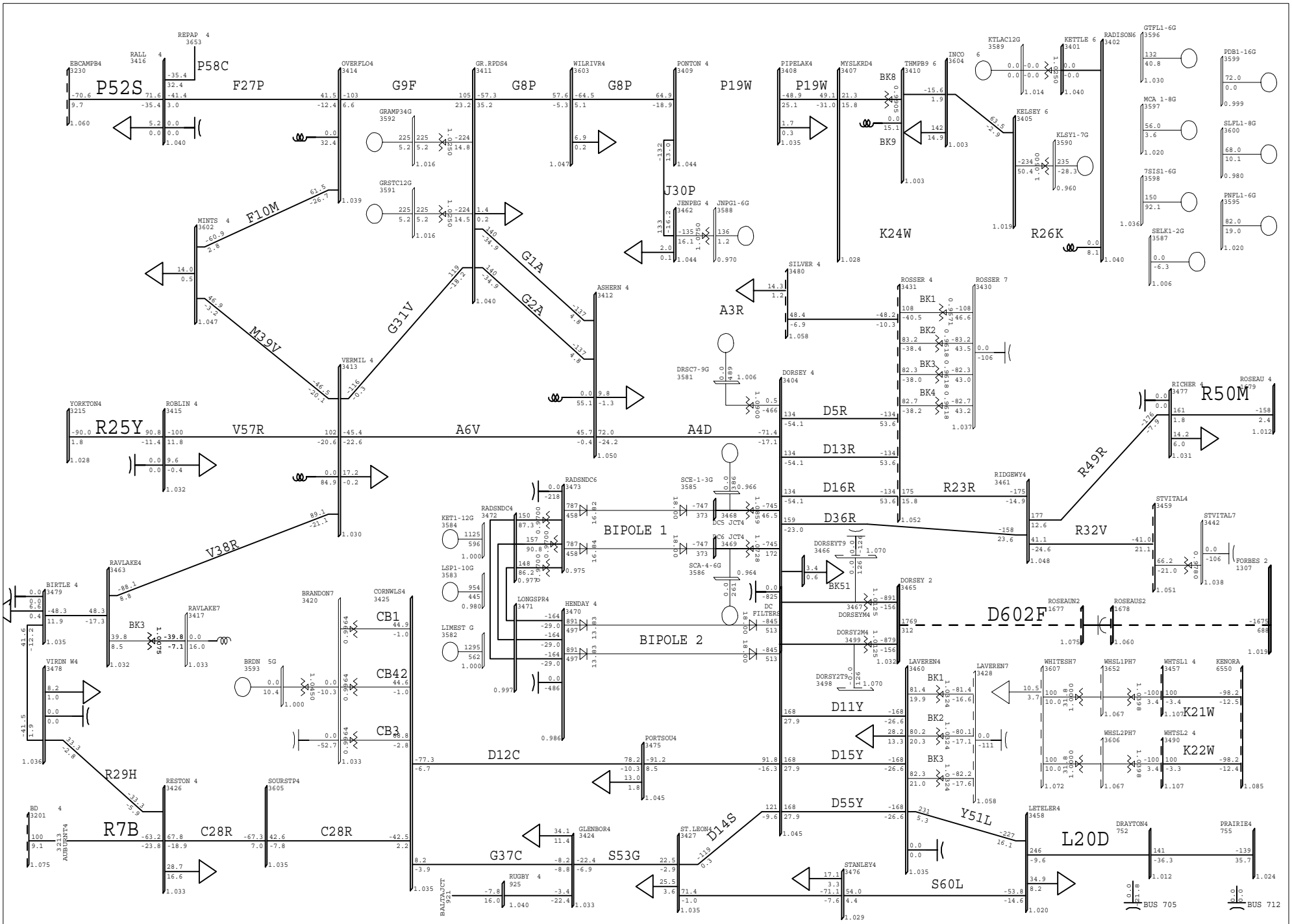


Figure 3.1 (Cont.)

4. MODELING OF NEW WIND AND COAL GENERATION

4.1 Wind Generation

Depending on the site, wind generation was modeled as either a single 1000 MW unit or 5/10 100 MW units. In all cases typical induction generators were assumed to simplify modeling and solution of the power-flow and stability cases. A typical loadflow model for a 1000 MW unit is included in Table 4.1. The 0.89 power factor unit draws 510 Mvars from the network. Those reactive requirements are mostly supplied locally by fixed capacitor banks at the terminals (370 Mvars) and at the high-voltage side of the step-up transformer (130 Mvars). The impedance of the equivalent step-up transformer (1.25% on a 100 MVA Base) also accounts for feeder reactances in the wind park itself. The net reactive requirements of the plant (including transformer reactive losses) at the high-voltage side are thus reduced to those of a power factor in the range of 0.98 to 0.99 (depending on system voltages).

Also included in Table 4.1 is the assumed dynamic model for the induction generator unit. For the purposes of these studies, mechanical power was assumed constant, and thus no governor was simulated.

In several instances throughout these studies, a SVC was modeled at wind generation terminals. This was intended to assess the impact on simulation results of availability of dynamic reactive sources at the wind farm. Other such sources are available, such as variable-frequency excitation of the induction generator rotor and connection of the generator through voltage source-type converters. In these studies, however, only the SVC solution was investigated.

The SVC was sized at approximately 60% of machine MVA rating (0 to +700 Mvars for a 1000 MW unit) [1], and was assumed in addition to the above-described fixed shunt compensation. In the loadflow the SVC was modeled as a switched shunt on continuous control (Mode 2) and with a voltage setpoint such that the SVC is generating near its lower range (i.e., close to 0 Mvars) in the steady-state. In dynamics the SVC was modeled utilizing the PSS/E CSSCS1 model with parameters designed to achieve a full excursion for a 1% reduction in voltage, and a 25 rad/sec voltage loop speed. See example in Table 4.2.

4.2 Coal Generation

Shown in Table 4.3 are the loadflow and dynamic models and parameters utilized to simulate a 500 MW (Net Generation) Coal Unit at the Hettinger Station in Site 1.

[1] "Application of Induction Generators in Power Systems" , F.P. de Mello et al., Paper 82 WM 157-6.

5. SITE 1 - HETTINGER

5.1 Introduction

The analysis for Site 1 considered a development with a 500 MW coal plant at Hettinger, ND, and five 100 MW wind plants in the vicinity of Hettinger, for a total of 1000 MW of new generation. This new generation is inside the NDEX interface. The sites considered for the wind generation plants were:

- Hettinger 230 kV (Bus 847)
- Marmarth 230 kV. Assumed connected at the midpoint of the Baker (Bus 804) - Bowman (Bus 810) 230 kV line.
- Bowman 230 kV (Bus 810)
- Belfield 230 kV (Bus 425)
- New England 115 kV (Bus 870)

The 500 MW coal unit was assumed connected to a new 345 kV substation at Hettinger. A 500 MVA transformer was assumed between the Hettinger 230 kV and 345 kV Stations. Powerflow parameters for these units, as well as for their connecting stations are detailed in Table 5.1.

Because the Northern MAPP system has significant stability constraints, the transmission alternatives were first designed and selected on the basis of dynamic simulation. Alternatives meeting dynamic criteria were then further investigated in terms of thermal performance and other criteria (such as losses and cost).

A roadmap for the stability studies discussed in Sections 5.2 through 5.5 is included in Figure 5.1. For the purpose of clarity, however, not all of the cases indicated in that figure are discussed in the sections that follow. "Selected" alternatives (i.e., alternatives that were subjected to more detailed thermal and other analyses, as well as costing) are highlighted in red in Figure 5.1.

5.2 Cases with 345 kV transmission upgrades

In these studies, the new generation was assumed serving the Twin Cities only (as opposed to also serving WECC loads in alternatives described later). Connection of the Hettinger station was assumed over 345 kV circuits to other MAPP stations of the same voltage level.

5.2.1 Case S1C1XXX

This case has the following upgrades

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- Hettinger – Ft Thompson 345 kV line (200 miles)
- Upgrade of one of two circuits from Ft Thompson – Granite Falls 230 kV (206 miles)

- One 500 MVA 345/230 kV transformer at Granite Falls
- Granite Falls – Blue Lake 345 kV line (100 miles)

Further details on these upgrades are provided in Table 5.2. The stability performance of the alternative is summarized in Table 5.3 and key cases are detailed in Appendix 3. The coal unit and some of the wind units become unstable for loss of any of the two 345 kV lines emanating from Hettinger (Contingencies av3 and au9). Tripping of the Hettinger Coal Unit within 200 msec does not render the scenarios stable (bu9 and bv3). Only after extensive generation tripping (the Hettinger Coal Unit, and the Bowman and Marmarth Wind Units, a total of 700 MW of generation) transient stability is regained (avd and ay3).

This alternative does not meet minimum reliability requirements.

5.2.2 Case S1C1XXA

This case has the following upgrades:

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- Hettinger – Ft Thompson 345 kV line (200 miles)
- Upgrade one of two circuits from Ft Thompson – Granite Falls 230 kV (206 miles)
- One 500 MVA 345/230 kV transformer at Granite Falls
- Granite Falls – Blue Lake (100 miles)
- SVCs at the wind generator terminals

That is, the case is the same as Case S1C1XXX above, but with 70 Mvar SVCs at the terminals of each of the five wind units (See Table 5.4).

The stability performance for this alternative is summarized in Table 5.5 and detailed in Appendix 4. Only the local contingencies were studied for this alternative, since the stability performance for the other contingencies in Case S1C1XXX was satisfactory. With this alternative the wind units remain stable if the 500 MW coal unit is tripped for loss of any of the two 345 kV lines emanating from Hettinger (Hettinger - Belfield and Hettinger - Ft Thompson). Significant transient voltage violations are observed if the coal unit is not tripped following those contingencies.

This alternative is acceptable, although not very reliable since the 500 MW coal unit must be tripped for loss of the Hettinger - Belfield and Hettinger - Ft Thompson 345 kV lines.

5.2.3 Case S1C1XX2

This case has the same upgrades as Case S1C1XXX:

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- Hettinger – Ft Thompson 345 kV line (200 miles)

- Upgrade one of two circuits from Ft Thompson – Granite Falls 230 kV (206 miles)
- One 500 MVA 345/230 kV transformer at Granite Falls
- Granite Falls – Blue Lake (100 miles)

Additionally, the following lines were 50% series compensated:
- Hettinger – Ft. Thompson
- Hettinger – Belfield
- Belfield – Charlie Creek
- Charlie Creek – Antelope Valley

Line parameters from Antelope Valley through Blue Lake are provided in Table 5.6. The stability performance of this alternative is summarized in Table 5.7 and detailed in Appendix 5. Only the contingencies with poor performance for the S1C1XXX case were investigated, since the only changes between the S1C1XX2 and the S1C1XXX cases was the line series compensations. With the line compensations, the system is marginally stable for the loss of the Hettinger - Ft Thompson line (au9).

This case can be considered a viable alternative but only marginally acceptable, noting the 40% Forbes relay margin for loss of the Hettinger-Ft Thompson line, as well as the violations of transient voltage criteria at the Bison, Maurine and Newell Stations.

5.2.4 Case S1C2XXX

This case had the following upgrades

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- Hettinger – Ft Thompson 345 kV line (200 miles)
- Upgrade one of two circuits from Ft Thompson – Granite Falls 230 kV (206 miles)
- One 500 MVA 345/230 kV transformer at Granite Falls
- Granite Falls – Blue Lake 345 kV line (100 miles)
- Hettinger - Glenham 345 kV line (113 miles)

The data for these upgrades are provided in Table 5.8. The Hettinger - Glenham line was added for stability purposes only, and taps into the Leland Olds - Ft Thompson line. No stepdown 345/230 kV transformer at Glenham was assumed. Table 5.9 summarizes the stability performance of this alternative. Simulation results are detailed in Appendix 6. The stability analysis considered only the contingencies with poor performance for case S1C1XXX, since the additional Hettinger - Glenham 345 kV line makes the system more stable. The system response to local contingencies is acceptable.

The alternative meets MAPP criteria.

5.3 Cases with moderate HVdc exports to the WECC at Miles City

The ABBBASE case includes a 150 MW import from the WECC into the MAPP system at the Miles City 230 kV HVdc Back-to-Back Converter Station. In these cases, those same converters are assumed to export to the WECC 150 MW (50 MW less than the Miles City 200 MW east-to-west capability due to modeling solution issues). A second converter, of the same characteristic as the existing one, is also assumed at the Miles City Station. This second converter is assumed to export 100 MW to the WECC. Thus, the net change in exports towards the WECC is of 400 MW, and the modeled new east-to-west capability is 50 MW.

5.3.1 Case S1C3XXX

This alternative had the following upgrades:

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- Hettinger – Ft Thompson 345 kV line (200 miles)
- Upgrade one of two circuits from Ft Thompson – Granite Falls 230 kV (206 miles)
- One 500 MVA 345/230 kV transformer at Granite Falls
- Granite Falls – Blue Lake 345 kV line (100 miles)

The parameters for these upgrades are provided in Table 5.10. The stability performance of this alternative is shown in Table 5.11. Selected results are detailed in Appendix 7. System performance is unacceptable for the local contingencies; loss of the Hettinger - Belfield (av3) and Hettinger - Ft Thompson (au9) 345 kV lines.

This alternative does not satisfy the MAPP criteria.

5.3.2 Case S1C3XXA

This alternative had the following upgrades:

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- Hettinger – Ft Thompson 345 kV line (200 miles)
- Upgrade one of two circuits from Ft Thompson – Granite Falls 230 kV (206 miles)
- One 500 MVA 345/230 kV transformer at Granite Falls
- Granite Falls – Blue Lake 345 kV line (100 miles)
- SVCs at the wind generator terminals

That is, the case is the same as Case S1C3XXX discussed above, but with 70 Mvar SVCs at the terminals of each of the five wind units.

The parameters for the line upgrades are those in Table 5.10. The stability performance of this alternative is shown in Table 5.12, and suggests that the system response to the local contingencies: loss of Hettinger - Belfield 345 kV (av3 - albeit with some transient

voltage violations at Bison and Maurine) and Hettinger - Ft Thompson 345 kV (au9) is acceptable. These latter results are included in Appendix 8.

This alternative meets criteria.

5.4 Cases with significant HVdc Exports at Miles City

Significant HVdc exports to the WECC are assumed in these cases. A new 345 kV Station is assumed at Miles City. A total of 450 MW HVdc exports to the WECC are assumed at this 345 kV Station. Commutation is assumed facilitated by a 150 MVA Synchronous Condenser (other technologies such as Capacitor-Coupled Converters [CCC] would likely be more competitive) The 345 kV Station is assumed connected to the existing Miles City 230 kV Station over a 500 MVA transformer. The existing 230 kV converter is assumed to also export 150 MW to the WECC (50 MW less than its 200 MW capability due to modeling solution issues). Thus, the net change in flows towards the WECC is 750 MW, and the modeled new east-to-west capability is 400 MW. This leads to a relatively low 2300 MW NDEX flow level (only slightly higher than the 2080 MW NDEX in the base case).

5.4.1 Case S1C4XXX

This alternative includes the following upgrades:

- Hettinger – Belfield 345 kV line (62 miles)
- Hettinger - Glenham 345 kV line (113 miles)
- Hettinger - Miles City 345 kV line (153 miles)

The parameters for these upgrades as well as those for the HVdc installations are provided in Table 5.13. Table 5.14 summarizes the stability performance of this alternative. Selected detailed simulation results may be found in Appendix 9.

The dynamic performance of this alternative meets criteria.

5.5 Cases with a Hettinger - Blue Lake 500 kV line

These cases considered a 500 kV line from Hettinger to Blue Lake, MN, via Glenham, Groton and Big Stone.

5.5.1 Case S1C5XXX

This alternative has the following upgrades:

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- New Hettinger - Glenham - Groton - Big Stone - Blue Lake 500 kV line (438 miles)
- Two 600 MVA 500/345 kV transformers at Hettinger.
- One 800 MVA 500/345 kV transformer at Glenham
- One 500 MVA 500/345 kV transformer at Groton
- One 500 MVA 500/230 kV transformer at Big Stone
- Two 600 MVA 500/345 kV transformers at Blue Lake

The parameters for these upgrades are provided in Table 5.15. The stability performance is summarized in Table 5.16. Selected simulation results are detailed in Appendix 10. This is not a viable alternative since the system is unstable for faults on the Hettinger end of the 500 kV line, even when tripping the 500 MW coal unit for this contingency (cb3).

5.5.2 Case S1C5XX1

This alternative had the following upgrades:

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- New Hettinger - Glenham - Groton - Big Stone - Blue Lake 500 kV line (438 miles)
- Two 600 MVA 500/345 kV transformers at Hettinger.
- One 800 MVA 500/345 kV transformer at Glenham
- One 500 MVA 500/345 kV transformer at Groton
- One 500 MVA 500/230 kV transformer at Big Stone
- Two 600 MVA 500/345 kV transformers at Blue Lake
- Hettinger - Ft Thompson 345 kV line (200 miles)

The case is the same as S1C5XXX above, but with the addition of a 345 kV line from Hettinger to Ft. Thompson. The parameters for these upgrades are provided in Table 5.17. Table 5.18 summarizes the stability performance of this alternative for loss of the 500 kV line. Detailed simulation results are included in Appendix 11. Upon fault and outage of the 500 kV line (cc3) the case is stable, although leading to transient voltage violations at Bison, Maurine, and Bowman, among others. If tripping of the 500 MW coal unit at Hettinger is assumed (cb3) only a minor voltage violation (0.69 pu) at Bowman remains.

This is a viable alternative but is marginally acceptable, because it requires the tripping of the 500 MW coal unit for loss of the Hettinger - Glenham 500 kV line.

5.5.3 Case S1C5XXA

This alternative includes the following upgrades:

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- New Hettinger - Glenham - Groton - Big Stone - Blue Lake 500 kV line (438 miles)
- Two 600 MVA 500/345 kV transformers at Hettinger.
- One 800 MVA 500/345 kV transformer at Glenham
- One 500 MVA 500/345 kV transformer at Groton
- One 500 MVA 500/230 kV transformer at Big Stone
- Two 600 MVA 500/345 kV transformers at Blue Lake
- SVCs added at the wind generator terminals

The case is the same as S1C5XXX above but with SVCs (5x70 Mvars) at the wind generator terminals. The line parameters for these upgrades are provided in Table 5.15. Table 5.19 summarizes the stability performance for loss of the 500 kV line. The simulation results are detailed in Appendix 12. As in Case S1C5XX1 (which includes a Hettinger-Ft. Thompson line instead of the SVCs) the system is transiently stable for the loss of this line (cc3), but it is necessary to trip the 500 MW coal unit in order to avoid excessive transient voltage excursions (cb3).

This is a viable alternative but is marginally acceptable, because it requires the tripping of the 500 MW coal unit for loss of the 500 kV line.

5.6 Conclusions from Dynamic Analyses of Site 1

Four distinct types of alternatives were examined for the Hettinger site:

- Cases with 345 kV transmission upgrades.
- Cases with moderate HVdc exports to the WECC at Miles City
- Cases with significant HVdc Exports at Miles City
- Cases with a new 500 kV line Hettinger - Blue Lake

Due to the significant distances between the new generation sites and the 345 kV MAPP bulk transmission system, the most critical contingencies involved the fault and outage of 345 kV or 500 kV lines connecting the Hettinger site to the MAPP system. For the same reason, several of the alternatives required dynamic (SVC-type) shunt compensation at wind generator terminals.

Compensating for the local shortcoming of this site is the fact that it is located south of the Antelope Valley/Leland Olds cluster of generation, and is somewhat removed from the Manitoba Hydro system. This makes this site (and others such as the Ft. Thompson and Watertown sites) more robust with regards to regional stability, displaying less of an interaction with other North Dakota and Manitoba Hydro generation.

<u>Cases with 345 kV transmission upgrades</u>

Three viable 345 kV transmission upgrade alternatives were developed. All three include a new Hettinger-Belfield 345 kV line and a new Hettinger-Ft. Thompson 345 kV line. They also include the upgrade to 345 kV of one of the two Ft. Thompson-Huron-Watertown-Granite Falls 230 kV circuits and a new 345 kV Ckt. from Granite Falls to Blue Lake. The three 345 kV-based alternatives were:

- Case S1C1XXA. In addition to the above reinforcements this alternative includes SVCs at generator terminals. S1C1XXA is not very reliable since the 500 MW coal unit must be tripped for loss of the Hettinger - Belfield and loss of the Hettinger - Ft. Thompson 345 kV lines.
- Case S1C1XX2 does not include SVCs at wind terminals, but, instead, assumes 50% series compensation of the new Hettinger-Ft. Thompson and Hettinger-Belfield 345 kV lines, as well as 50% series compensation of the existing Belfield-Charlie

Creek-Antelope Valley 345 kV line. No generator tripping is required in this alternative.

- Case S1C2XXX. The case is the same as S1C1XXA but without SVCs at Wind Generator terminals. Instead, the case includes a new 345 kV outlet from Hettinger to a 345 kV tap on the Leland Olds-Ft. Thompson 345 kV line, in the vicinity of the Glenham Station (but without connection to that station). Due to the third outlet, no generation tripping is required under this alternative.

Cases with moderate HVdc exports to the WECC at Miles City

The selected alternative is Case S1C3XXA which is similar to S1C1XXA above (i.e., Hettinger-Belfield 345 kV + Hettinger-Ft. Thompson-Granite Falls-Blue Lake 345 kV + SVCs at wind generator terminals) except that the case includes additional 400 MW exports to the WECC, including a new converter at the Miles City Station. As opposed to S1C1XXA, Case S1C3XXA does not require the tripping of generation following the fault and outage of Hettinger-Belfield 345 kV of Hettinger-Ft. Thompson 345 kV).

It is important to note that in this alternative (and especially in the alternatives below with high exports to the WECC) operating restrictions may limit the output from new generation whenever the assumed exports to the WECC are not feasible.

Cases with significant HVdc Exports at Miles City

These cases assumed additional 750 MW exports to the WECC at the Miles City Station, including 400 MW in new conversion capacity at a new Miles City 345 kV. The selected alternative (Case S1C4XXX) includes three new 345 kV lines emanating from the Hettinger Station: one to Miles City (to serve the additional exports to the WECC), one to the Belfield 345 kV station, and one to a tap on the Leland Olds-Ft. Thompson 345 kV line, in the vicinity of the Glenham Station (but without connection to that station). The latter two circuits are necessary to provide sufficient synchronizing power to the new generation.

It is important to note that Case S1C4XXX does not include (as the cases above do) a new circuit to the Twin Cities. This is because these alternatives assume the bulk of the power from the new generation is flowing to the WECC instead of towards the Twin Cities.

Cases with a new 500 kV Hettinger - Blue Lake line

One of the selected alternatives, Case S1C5XX1, includes, in addition to the Hettinger-Blue Lake 500 kV Ckt., a Hettinger-Belfield 345 kV line, and a Hettinger-Ft. Thompson 345 kV line. Not withstanding these reinforcements, the alternative requires tripping of the new 500 MW Coal Unit at Hettinger upon fault and outage of the Hettinger-Glenham 500 kV Ckt.

The other selected alternative, Case S1C5XXA includes SVCs at generator terminals instead of a new 345 kV line to Ft. Thompson. S1C5XXA also requires tripping of the Coal Unit upon fault and outage of Hettinger-Glenham 500 kV.

The need for tripping of the generation following the outage of the 500 kV line is a typical outcome of cases where one transmission link is much stronger than the others, making it the critical outage (and unstable) without resorting to special protection schemes (such as generation tripping).

The above alternatives are summarized in Table 5.20a and their associated reinforcements are listed in the sections below. Critical interface flows are listed in Table 5.20b. When reviewing these alternatives (and those from other sites) it is important to recognize that:

a) Line lengths are only approximate, since it was not within these studies' scope to consider terrain, right of way, and environmental concerns, among others.

b) Further, more in-depth, analyses should be conducted to verify whether or not some of the proposed 230 kV to 345 kV upgrades are feasible. For example, upgrading the Watertown to Granite Falls 230 kV circuit to 345 kV might require having the Watertown-Blair-Granite Falls 230 kV circuit out of service for an extended period of time (since they are both on the same double circuit towers). Since this latter line constitutes the main outlet for the Big Stone plant, this might be an expensive proposition. Thus, a separate, new 345 kV line might be required due to considerations other than cost or performance.

5.6.1 Case S1C1XXA

This case had the following upgrades:

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- Hettinger – Ft Thompson 345 kV line (200 miles)
- Upgrade one of two circuits from Ft Thompson – Granite Falls 230 kV (206 miles)
- One 500 MVA 345/230 kV transformer at Granite Falls
- Granite Falls – Blue Lake 345 kV line (100 miles)
- SVCs at the wind generator terminals

The above upgrades are highlighted in the Figure 5.2 map. In that map (and others elsewhere in this report), new (or upgraded) 345 kV lines are highlighted in red. New wind and coal generation sites are indicated with a "W" and "C", respectively. Wind generation sites furnished with SVCs are highlighted with a "W" in red.

5.6.2 Case S1C1XX2

This case includes the following upgrades:

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- Hettinger – Ft Thompson 345 kV line (200 miles)

- Upgrade one of two circuits from Ft Thompson – Granite Falls 230 kV (206 miles)
- One 500 MVA 345/230 kV transformer at Granite Falls
- Granite Falls – Blue Lake 345 kV line (100 miles)

Additionally, the following lines were 50% series compensated:
- Hettinger – Ft. Thompson
- Hettinger – Belfield
- Belfield – Charlie Creek
- Charlie Creek – Antelope Valley

The above upgrades are illustrated in Figure 5.3, where newly series-compensated lines are indicated with an "=" sign.

5.6.3 Case S1C2XXX

This case includes the following upgrades (See Figure 5.4):

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- Hettinger – Ft Thompson 345 kV line (200 miles)
- Upgrade one of two circuits from Ft Thompson – Granite Falls 230 kV (206 miles)
- One 500 MVA 345/230 kV transformer at Granite Falls
- Granite Falls – Blue Lake 345 kV line (100 miles)
- Hettinger - Glenham 345 kV line (113 miles)

5.6.4 Case S1C3XXA

This alternative has the following upgrades (See Figure 5.5):

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- Hettinger – Ft Thompson 345 kV line (200 miles)
- Upgrade one of two circuits from Ft Thompson – Granite Falls 230 kV (206 miles)
- One 500 MVA 345/230 kV transformer at Granite Falls
- Granite Falls – Blue Lake 345 kV line (100 miles)
- 400 MW additional exports to the WECC at Miles City, including an additional 50 MW converter capacity at that station.
- 70 Mvar SVCs at the wind generator terminals

5.6.5 Case S1C4XXX

This alternative includes the following upgrades (See Figure 5.6):

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- Hettinger - Glenham 345 kV line (113 miles)
- Hettinger - Miles City 345 kV line (153 miles)

- 750 MW additional exports to the WECC at Miles City, including new 400 MW converter capacity at that station.

5.6.6 Case S1C5XX1

This alternative has the following upgrades:

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- New Hettinger - Glenham - Groton - Big Stone - Blue Lake 500 kV line (438 miles)
- Two 600 MVA 500/345 kV transformers at Hettinger.
- One 800 MVA 500/345 kV transformer at Glenham
- One 500 MVA 500/345 kV transformer at Groton
- One 500 MVA 500/230 kV transformer at Big Stone
- Two 600 MVA 500/345 kV transformers at Blue Lake
- Hettinger - Ft Thompson 345 kV line (200 miles)

These upgrades are illustrated in Figure 5.7, where the new 500 kV reinforcement is highlighted in orange.

5.6.7 Case S1C5XXA

This alternative includes the following upgrades (See Figure 5.8):

- Hettinger – Belfield 345 kV line (62 miles)
- One 500 MVA 345/230 kV transformer at Hettinger
- New Hettinger - Glenham - Groton - Big Stone - Blue Lake 500 kV line (438 miles)
- Two 600 MVA 500/345 kV transformers at Hettinger.
- One 800 MVA 500/345 kV transformer at Glenham
- One 500 MVA 500/345 kV transformer at Groton
- One 500 MVA 500/230 kV transformer at Big Stone
- Two 600 MVA 500/345 kV transformers at Blue Lake
- SVCs added at the wind generator terminals

5.7 Thermal Analysis of Selected Alternatives

5.7.1 Introduction

Linearized (MUST - a program compatible with PSS/E that, among other things, performs dc loadflow-type analyses similar to those in PSS/E's TLTG Activity) and full AC contingency analyses (PSS/E Activity ACCC) were performed on the Scenario 1 cases selected from dynamic studies. N-1 Contingencies were investigated throughout the MAPP System. More in-depth analyses should consider multi-element contingencies, such as double circuit contingencies in Western's South Dakota 230 kV transmission system. MUST results for each of the selected alternatives are included in Table 5.21. The four right-most columns in MUST listings include the following ACCC results:

- Percent overload (Rate C - Emergency Rating) for the same contingency in Case ABBBASE (i.e., the base-case without the additional generation).
- Maximum percent overload under any contingency in Case ABBBASE.
- Percent overload in the case under consideration.
- Increase in % overloading with respect to Case ABBBASE.

Marked in red in Table 5.21 are contingencies that do not solve due to reactive deficiency (voltage instability). They are:

Alternative S1C1XX2:
- Ft. Thompson-Hettinger 345 kV
- Dickinson-New England 115 kV
- Hettinger 345/230 kV Transformer

Alternative S1C2XXX:
- Dickinson-New England 115 kV

Additional compensation (for example at Wind Generation terminals) would be required in these Alternatives in order to comply with MAPP Criteria.

On the basis of overload results in Table 5.21, Table 5.22 was prepared. Table 5.22 shows:

- Limiting Branch.
- Worst Contingency.
- Rates C (Emergency) and B (Conductor) for limiting branch.
- Post-Contingency loading as a % of Emergency Rating.
- In parenthesis, % change with respect to overloading in the base-case ABBBASE.

The right-most column in Table 5.22 shows:

- An "R" (re-conductor) if the branch loading is greater than both emergency and conductor ratings, and if the overload is either new or has been aggravated by the new generation and its transmission.
- A "U" (upgrade) if the branch loading exceeds the emergency, but not the conductor rating. It is therefore likely that the overload can be overcome by the relatively low cost replacement of equipment (current transformers, line wave traps, etc.) that is preventing the full use of conductor thermal capacity.
- None. If the overload is less than the maximum experienced under Case ABBBASE, the condition is deemed a pre-existing one, and no action is recommended.

5.7.2 Case S1C1XXA

This case includes the following upgrades:

- New Hettinger – Belfield 345 kV line
- New Hettinger – Ft. Thompson 345 kV line
- Upgrade Ft.Thompson – Granite Falls from 230 kV to 345 kV (one of the two circuits)
- New Granite Falls – Blue Lake 345 kV line
- 70 Mvar SVCs at the wind generator sites

The outage of the new Hettinger – Ft. Thompson 345 kV line leads to unacceptable overloads on the following facilities: a 129% overload on Maurine – Bison 230 kV line, 87% overload on Hettinger – Bison 230 kV line, 69% overload on New Underwood – Maurine 230 kV line, and a 51% overload on the Belfield – Charlie Creek 345 kV line based on their respective emergency ratings.

The following facilities in the vicinity of Site #1 generation were overloaded:

Loss of Dawson County – Medora 230 kV line
- Bowman – Hettinger 230 kV line - 43%
- Bowman – Marmarth 230 kV line – 3%

Loss of Bowman – Hettinger 230 kV line
- Dawson County – Medora 230 kV line – 12%
- Dawson County – Lewis 115 kV line - 31%
- Dawson County – Glendct 115 kV line - 18%
- Medora - Belfield 230 kV line - 9%

Loss of Hettinger – N.England 115 kV line
- Dickinson – N England 115 kV line – 59%

Loss of Dicknson – N.England 115 kV line
- Hettinger – N England 115 kV line – 41%

Loss of New Underwood – Maurine 230 kV line
- Newell – Rapid City 230 kV line – 29%

Loss of Ft. Thompson – Ft. Randall 230 kV line
- Ft. Randall – Lake Platte 230 kV line – 7%

An overload of about 7% was observed for loss of the 345/230 kV transformers at Maple River on the remaining transformer.

Overloads were also observed in facilities remote from the Site #1 generation. These facilities were already overloaded in the basecase without the new generation, but the new generation caused incremental overloads of up to 13%.

These facilities include Alexandria – Douglas 115 kV and Alexandria – Alexandria Switching Station 115 kV lines for the loss of Wing River – Inman 230 kV line; Ellendale – Aberdeen Jnct. 115 kV for the loss of Ellendale – Oakes 230 kV line; Martin – Vetal Tap for the loss of Maxwell – N.Platt; Mission – Vetal Tap 115 kV and Sidney – Ogalala 230 kV for the loss of Sidney – Keystone 345 kV line.

5.7.3 Case S1C1XX2

This case includes the following upgrades:

- New Hettinger – Belfield 345 kV line, with 50% series compensation
- New Hettinger – Ft. Thompson 345 kV line, with 50% series compensation
- Conversion of the existing Ft. Thompson – Granite Falls 230 kV line to 345 kV.
- New Granite Falls – Blue Lake 345 kV line
- 50% series compensation in Belfield-Charlie Creek 345 kV line
- 50% series compensation in Charlie Creek – Antelope Valley 345 kV line.

The outage of the new Hettinger – Ft. Thompson 345 kV line leads to the following severe overloads: 99% overload on Maurine – Bison 230 kV line, 65% overload on Hettinger – Bison 230 kV line, 44% overload in New Underwood – Maurine 230 kV line, 18% overload on Antelope-Charlie Creek 345 kV line, 81% overload on Belfield – Charlie Creek 345 kV line and a 6% overload on Antelope – Huron 345 kV line based on the respective emergency ratings (Rate C).

The following facilities in the vicinity of Site #1 generation were also overloaded:

Loss of Dawson County – Medora 230 kV line

- Bowman – Hettinger 230 kV line - 50%
- Bowman – Marmarth 230 kV line – 10%

Loss of Bowman – Hettinger 230 kV line

- Dawson County – Medora 230 kV line – 17%
- Dawson County – Lewis 115 kV line - 26%
- Dawson County – Glendct 115 kV line - 16%
- Medora - Belfield 230 kV line - 13%

Loss of Hettinger – New England 115 kV line

- Dicknson – New England 115 kV line – 44%

Loss of Dicknson – New England 115 kV line

- Hettinger – New England 115 kV line – 44%

Loss of New Underwood – Maurine 230 kV line

- Newell – Maurine 115 kV line – 8%

Loss of Ft. Thompson – Ft. Randall 230 kV line

- Ft. Thompson – Lake Platte 230 kV line – 12%
- Ft. Randall – Lake Platte 230 kV line – 4%

An overload of about 3% was observed on the 345/230 kV transformers at Maple River for the loss of the second transformer.

Overloads were observed on the facilities remote with respect to the Site #1 generation. These facilities were already overloaded in the basecase without the new generation, but the new generation facilities caused incremental overloads of up to 13%.

These facilities include Alexandria – Douglas 115 kV and Alexandria – Alexandria Switching Station 115 kV lines for the loss of Wing River – Inman 230 kV line; Martin – Vetal Tap 115 kV and Sidney – Ogalala 230 kV for the loss of Sidney – Keystone 345 kV line.

5.7.4 Case S1C2XXX

This case comprises the following upgrades:

- New Hettinger – Belfield 345 kV line
- New Hettinger – Ft. Thompson 345 kV line
- Upgrade Ft.Thompson – Granite Falls from 230 kV to 345 kV (one of the two circuits).
- New Granite Falls – Blue Lake 345 kV line
- New Hettinger – Glenham 345 kV line

The outage of the new Hettinger – Ft. Thompson 345 kV line leads to the following unacceptable overloads: a 69% overload on Maurine – Bison 230 kV line, 39% overload on Hettinger – Bison 230 kV line, 44% overload on New Underwood – Maurine 230 kV line based on their respective emergency ratings.

The following facilities in the vicinity of Site #1 generation were overloaded:

Loss of Dawson County – Medora 230 kV line

- Bowman – Hettinger 230 kV line - 49%
- Bowman – Marmarth 230 kV line – 11%

Loss of Bowman – Hettinger 230 kV line

- Dawson County – Medora 230 kV line – 13%
- Dawson County – Lewis 115 kV line - 29%
- Dawson County – Glendct 115 kV line - 16%
- Medora - Belfield 230 kV line - 11%

Loss of Hettinger – New England 115 kV line

- Dickinson – New England 115 kV line – 44%

Loss of Dickinson – New England 115 kV line
- Hettinger – New England 115 kV line – 44%

Loss of New Underwood – Maurine 230 kV line
- Newell – Maurine 115 kV line – 17%
- Newell – Rapid City 115 kV line – 9%

Loss of Leland Olds – Groton 345 kV line
- Ft. Thompson – Lake Platte 230 kV line – 11%
- Antelope – Huron 345 kV line – 1%

An overload of about 7% was observed on the 230 kV/345 kV transformers at Maple River for the loss of the second transformer.

Overloads were observed on the facilities which were remote with respect to the Site #1 generation. These facilities were already overloaded in the basecase without the new generation, but the new generation facilities caused incremental overloads of up to 21%.

These facilities include Alexandria– Douglas 115 kV and Alexandria – Alexandria Switching Station 115 kV lines for the loss of Wing River – Inman 230 kV line; Martin – Vetal Tap 115 kV for the loss of Ft. Thompson – Ft. Randal 230 kV line; Ellendale – Aberdeen Junction 115 kV for the loss of Ellendale – Oakes 230 kV line and Sidney – Ogalala 230 kV and Mission – Vetal Tp for the loss of Sidney – Keystone 345 kV line.

5.7.5 Case S1C3XXA

This case comprises the following upgrades:

- New Hettinger – Belfield 345 kV line
- New Hettinger – Ft. Thompson 345 kV line
- Additional 150 MW HVDC tie at Miles City
- 70 Mvar SVCs at the new wind generation sites

The outage of the new Hettinger – Ft. Thompson 345 kV line leads to the following severe overloads: an 80% overload on Maurine – Bison 230 kV line, 47% overload in Hettinger – Bison 230 kV line, and a 32% overload on the New Underwood – Maurine 230 kV line based on their respective emergency ratings.

The following facilities in the vicinity of Site #1 generation were overloaded:

Loss of Hettinger – New England 115 kV line
- Dicknson – New England 115 kV line – 40%

Loss of Dickinson – New England 115 kV line
- Hettinger – New England 115 kV line – 40%

Loss of New Underwood – Maurine 230 kV line
- Newell – Maurine 115 kV line – 10%

Loss of Dawson County – Miles City 230 kV line
- Miles City – Baker 230 kV line – 7%

Loss of Leland Olds – Groton 345 kV line
- Ft. Thompson – Lake Platte 230 kV line – 2%

Overloads were observed on facilities remote with respect to the Site #1 generation. These facilities were already overloaded in the base case without the new generation, but the new generation facilities caused incremental overloads of up to 8%.

These facilities include Alexand – Douglas 115 kV and Alexand – Alexss 115 kV lines for the loss of Wing River – Inman 230 kV line; Martin – Vetal Tap 115 kV and Mission – Vetal Tp for the loss of Maxwell – N.Platt 115 kV line; and Sidney – Ogalala 230 kV for the loss of Sidney – Keystone 345 kV line.

5.7.6 Case S1C4XXX

This case comprises the following upgrades:

- New Hettinger – Belfield 345 kV line
- New Hettinger – Glenham 345 kV line
- New Hettinger – Miles City 345 kV line
- New 400 MW HVDC ties at Miles City

The outage of Ft.Thompson - Glenham 345 kV line leads to the following severe overloads: 32% overload on Hettinger – Bison 230 kV line, 61% overload on Maurine – Bison 230 kV line and 18% overload on New Underwood – Maurine 230 kV line based on their respective emergency ratings.

The following facilities in the vicinity of Site #1 generation were overloaded:

Loss of Hettinger – N.England 115 kV line
- Dicknson – New England 115 kV line – 44%

Loss of Dickinson – N.England 115 kV line
- Hettinger – New England 115 kV line – 57%

Loss of Hettinger – Miles City 345 kV line
- Miles City – Baker 230 kV line – 54%
- Baker – Marmarth 230 kV line – 31%

Overloads were observed in facilities remote from the Site #1 generation. These facilities were already overloaded in the basecase without the new generation, but the new generation facilities caused incremental overloads of up to 11%.

These facilities include Alexandria – Douglas 115 kV and Alexandria – Alexandria Switching Station 115 kV lines for the loss of Wing River – Inman 230 kV line; Martin – Vetal Tap 115 kV for the loss of Maxwell – N.Platt 115 kV line; Sioux Cy – Plymoth 69 kV line for the loss of Sioux Cy – Plymoth 115 kV line, Sidney – Ogalala 230 kV for the loss of Sidney – Keystone 345 kV line, Huron-Woonsocket-Storla 115 kV following outage of Ft. Thompson-Storla 230 kV, and Bird Isl-HenryTr-Birch 69 kV upon outage of Minnesota Valley-RedFlSt-Franklin 115 kV.

5.7.7 Case S1C5XX1

This case comprises the following upgrades:

- New Hettinger - Belfield 345 kV line
- New Hettinger - Glenham - Groton - Big Stone - Blue Lake 500 kV line
- New Hettinger – Ft Thompson 345 kV line

The outage of the 345/230 kV transformer at Hettinger leads to a 46% overload on Maurine – Bison 230 kV line, a 21% overload on Hettinger – Bison 230 kV line and 4% overload on New Underwood – Maurine 230 kV line based on their respective emergency ratings.

The following facilities in the vicinity of Site #1 generation were overloaded:

Loss of Dawson County – Medora 230 kV line

- Bowman – Hettinger 230 kV line - 55%
- Bowman – Marmarth 230 kV line – 17%

Loss of Bowman – Hettinger 230 kV line

- Dawson County – Medora 230 kV line – 16%
- Dawson County – Lewis 115 kV line - 25%
- Dawson County – Glendct 115 kV line - 15%
- Medora - Belfield 230 kV line - 13%

Loss of Hettinger – N.England 115 kV line

- Dickinson – New England 115 kV line – 46%

Loss of Dicknson – New England 115 kV line

- Hettinger – New England 115 kV line – 44%

Loss of Groton – Bigstone 500 kV line

- Watertown – Groton 345 kV line – 4%

A 9% overload was observed on 500/345 kV transformer at Blue Lake for the loss of the second transformer, based on an 840 MVA emergency rating, thus suggesting that a slightly higher rating might be required.

5.7.8 Case S1C5XXA

This case includes the following upgrades:

- New Hettinger - Belfield 345 kV line
- New Hettinger - Glenham - Groton - Big Stone - Blue Lake 500 kV line
- SVCs at wind generator terminals

In the absence of the Hettinger-Ft. Thompson 345 kV reinforcement in Case S1C5XX1, the outage of the Hettinger-Glenham 500 kV Ckt. leads to the following severe overloads:

- Maurine - Bison 230 kV line - 113%
- Hettinger - Bison 230 kV line – 76%
- Belfield – Charlie Creek 345 kV line – 51%
- New Underwood – Maurine 230 kV line – 53%
- Dicknson – New England 115 kV line – 55%

Based on an 840 MVA emergency rating for the two new 500/345 kV transformers at Hettinger, a 5% overloading was observed on one of the transformers, for the loss of the second transformer. Thus suggesting the need for a somewhat larger emergency rating on those transformers.

The following facilities in the vicinity of Site #1 generation were also overloaded:

Loss of Dawson County – Medora 230 kV line

- Bowman – Hettinger 230 kV line - 54%
- Bowman – Marmarth 230 kV line – 13%

Loss of Bowman – Hettinger 230 kV line

- Dawson County – Medora 230 kV line – 17%
- Dawson County – Lewis 115 kV line - 24%
- Dawson County – Glendct 115 kV line - 16%
- Medora - Belfield 230 kV line - 14%

Loss of Hettinger – New England 115 kV line

- Dicknson – New England 115 kV line – 49%

Loss of Dicknson – New England 115 kV line

- Hettinger – New England 115 kV line – 41%

Loss of Groton – Bigstone 500 kV line

- Watertown – Groton 345 kV line – 10%

An 11% overload was observed in 500/345 kV transformer at Blue Lake for the loss of the second transformer, based on an 840 MVA emergency rating, thus suggesting the need for a somewhat larger emergency rating on those transformers.

5.7.9 Conclusions from Thermal Analyses

The thermal analyses of the selected Site 1 alternatives suggest that due to a combination of the long distances between the Hettinger Site and the MAPP 345 kV bulk transmission system, and the weak transmission to which some of the wind generation was assumed to be connected to, significant thermal violations on 230 kV and 115 kV branches should be expected following outages of existing and new branches. In some cases, these overloads can be addressed by removing constraints up to the full conductor ratings (cases marked "U" in Table 5.22). In several other cases, however, even conductor ratings are being exceeded (cases marked "R" in Table 5.22), thus suggesting that either reconductoring of existing circuits, or the construction of additional circuits, or the design of special protections systems to trip generation following certain contingencies, might be required.

5.8 Transmission Losses

Comparison of the transmission losses in each of the seven selected alternatives against those in Case ABBBASE with no additional generation leads to the results in Table 5.23 which shows, for each of the selected alternatives the increase in losses attributable to the new generation and its transmission to the Twin Cities. Such an increase is given in MW and as a % of the 1000 MW of new generation.

Table 5.23
Incremental Transmission Losses for Selected Alternatives

CASE	LOSSES (MW)	LOSSES (%)
S1C1XXA	250.3	25.0
S1C1XX2	242.3	24.2
S1C2XXX	234.5	23.5
S1C3XXA	109.7	11.0
S1C4XXX	75.2	7.5
S1C5XX1	27.6	2.8
S1C5XXA	28.5	2.9

The results suggest that alternatives with 345 kV reinforcements exhibit relatively large transmission losses (23.5% to 25%). MAPP losses for alternatives involving increased

exports to the WECC are moderate (7.5% to 11%). Losses for alternatives including a 500 kV transmission from Hettinger to the Twin Cities are low (2.8%-2.9%).

Taking into account that wind generation is likely to operate at a fraction of its nominal rating, and that losses are proportional to the square of currents, the loss analyses were repeated but with base cases where wind units were dispatched at 1/3 of their MW rating. Losses were thus recalculated and the results are summarized in Table 5.24, both in MW, and as a % of the total generation dispatch for the new units (667 MW in this case). The results suggest in all cases significant reductions in losses when compared against the cases with wind generation at full output (Table 5.23), and, in several cases, an actual loss reduction with respect to the base case without the additional generation.

Table 5.24
Incremental Transmission Losses for Selected Alternatives (Wind Generation dispatched at 1/3 of MW Rating)

CASE	LOSSES (MW)	LOSSES (%)
S1C1XXA	129.9	19.5
S1C1XX2	127.9	19.2
S1C2XXX	121.1	18.2
S1C3XXA	3.4	0.5
S1C4XXX	-23.2	-3.5
S1C5XX1	-44.4	-6.7
S1C5XXA	-42.6	-6.4

The above tables list incremental transmission losses for the system as a whole. Included in Appendix 33 is a listing of absolute losses (as well as of generation, loads, net interchange, etc.) for each of the selected alternatives discriminated by the areas defined in the loadflow cases.

5.9 Constrained Interface Impact Studies

5.9.1 Introduction

The purpose of these studies was to determine the impact the new generation and associated transmission would have on constrained interfaces throughout the MAPP System. The studies were conducted utilizing the IPLAN Program DFCALC to compare the selected alternatives against Case ABBBASE without the new generation.

DFCALC results comparing interface flows in these new cases against those in Case ABBBASE are summarized in Table 5.25.

5.9.2 Impact on NDEX Interface - North Dakota Losses

As expected, Alternatives S1C1XXA, S1C1XX2, S1C2XXX, S1C5XX1, and S1C5XXA which transfer the full output of the new generation to the Twin Cities display significant

increases in NDEX transfer levels. These values are listed in Table 5.26. Also included in Table 5.26 is the NDEX increase in % of the additional 1000 MW in generation. For cases not involving additional exports to the WECC, the difference between 100% and this latter number constitute the incremental losses incurred within the NDEX boundaries (as opposed to the incremental system losses listed in Table 5.23). These incremental losses are listed in the last column of Table 5.26.

The results in Table 5.26 suggest that alternatives with 345 kV reinforcements exhibit relatively high incremental NDEX losses (8.6% to 10.1%). Incremental NDEX losses for alternatives including a 500 kV transmission from Hettinger through the Twin Cities are significantly lower (3.3% to 4.5%). These are essentially the same observations made when evaluating incremental system losses in Section 5.8.

Table 5.26
Impact of Selected Alternatives on NDEX Flows (Base Level: 2080 MW)

CASE	NDEX		
	MW	% CHANGE	% LOSSES
S1C1XXA	2979.4	89.9	10.1
S1C1XX2	2987.0	90.7	9.3
S1C2XXX	2994.8	91.4	8.6
S1C3XXA	2642.3	56.2	N/A
S1C4XXX	2304.5	22.4	N/A
S1C5XX1	3047.4	96.7	3.3
S1C5XXA	3035.5	95.5	4.5

5.9.3 Impact on Other Interfaces

Other constrained interfaces displaying an impact above the MAPP DRS minimum threshold of 5% are:

Case S1C1XXA
- 5.0% Impact on Grand Island-Lincoln Interface
- 5.5% Impact on the Cooper-South Interface

Case S1C1XX2
- 5.7% Impact on Grand Island-Lincoln Interface
- 6.1% Impact on the Cooper-South Interface

Case S1C2XXX
- 5.4% Impact on Grand Island-Lincoln Interface
- 5.9% Impact on the Cooper-South Interface

Case S1C3XXA
- No Impacts

Case S1C4XXX
- No Impacts

Case S1C5XX1
- No Impacts

Case S1C5XXA
- No Impacts

In summary, cases relying on 345 kV reinforcements exhibit some (relatively mild) impacts on the Grand Island-Lincoln and on the Cooper-South Interfaces. Cases including increased exports to the WECC or a 500 kV connection with the Twin Cities exhibit no significant impacts on constrained interfaces.

5.9.4 Impact on MH-US 500 kV Transmission

Although none of the alternatives selected has a significant impact on the MHEX Interface, several of the alternatives lead to an increase in flows on the MH-US 500 kV transmission. This is suggested in Table 5.27, which shows in its second column the increase in flows from the Dorsey to the Roseau 500 kV Stations (D602F line) for each of the alternatives. Positive numbers in this column are indicative of potential interactions with the MH-US Interface both in terms of steady-state effects (capacitor overloading, for example) as well as dynamic effects (for example, exhaustion, following critical contingencies, of reactive resources in the vicinity of the Dorsey Station). The detrimental impact of higher D602F flows on 500 kV reactive performance is further confirmed in Columns 3 through 6 of Table 5.27, which, for each of the selected alternatives, show increases in a) 500 kV reactive losses, b) Dorsey Synchronous Condenser outputs, and c) Forbes SVC outputs with respect to the base case (ABBBASE).

Table 5.27
Impact of Selected Alternatives on Incremental D602F Flow and Incremental 500 kV Reactive Performance

CASE	CHANGE WITH RESPECT TO BASE CASE			
	D602F MW	500 KV MVAR LOSSES	DORSEY SC MVARS	FORBES SVC MVARS
S1C1XXA	59.3	126.8	54	17
S1C1XX2	47.1	99.4	39	12
S1C2XXX	57.5	122.7	54	16
S1C3XXA	17.9	34.1	0	2
S1C4XXX	19.0	38.3	1	3
S1C5XX1	-6.5	-18.6	-16	-6
S1C5XXA	1.8	-0.8	-4	-4

It is interesting to observe in Table 5.27 that increases in MW flows on the D602F 500 kV line lead to increases in 500 kV reactive losses that are about twice as large as the MW increases. Reactive deficiency problems along this transmission can not only lead to voltage profile concerns, and to concerns about the stability of the MH>US Interface, but also could impact the MH HVdc Inverter Station at Dorsey, which, as any conventional HVdc Station, is very much dependent on ample supplies of reactive power for its performance.

5.10 New Equipment (Capital) Costs

Costs were developed on the basis of the MAPP Cost Estimator and ABB's budgetary estimates. The results are summarized in Table 5.28. The table shows that, as expected, line costs are an important factor in all alternatives. In that regard, it is important to recognize that lines upgraded from 230 kV to 345 kV were assumed to cost 62% of new 345 kV lines of comparable length. It is also important to recognize that the line costs do not include ROW costs. For a more in-depth analysis of these calculations, please refer to the spreadsheets attached to this report.

Table 5.28
Capital Costs (2001 dollars, in millions)

CASE	LINES	STATIONS	SVCs	SERIES COMP.	TOTAL
S1C1XXA	188.81	24.72	26.55	-	$240.08
S1C1XX2	188.81	24.72	-	15.45	$228.98
S1C2XXX	232.32	28.82			$261.14
S1C3XXA	188.81	39.72 (*)	26.55		$255.08
S1C4XXX	126.28	82.17 (*)			$208.45
S1C5XX1	339.58	82.94			$422.52
S1C5XXA	262.58	81.04	26.55		$370.17

Note (*): Includes HVdc Converter Costs

The costs in Table 5.28 suggest that 345 kV alternatives are less expensive than their 500 kV counterparts. Alternatives assuming exports to the WECC (S1C3XXA, and S1C4XXX) include the estimated cost of a back-to-back conversion at the Miles City Station. They do not include, however, the potential ac reinforcement costs on the WECC side.

Figure 5.1
Road-Map for Case Development - Site 1 (Hettinger)

Cases with 345 kV Transmission Upgrades

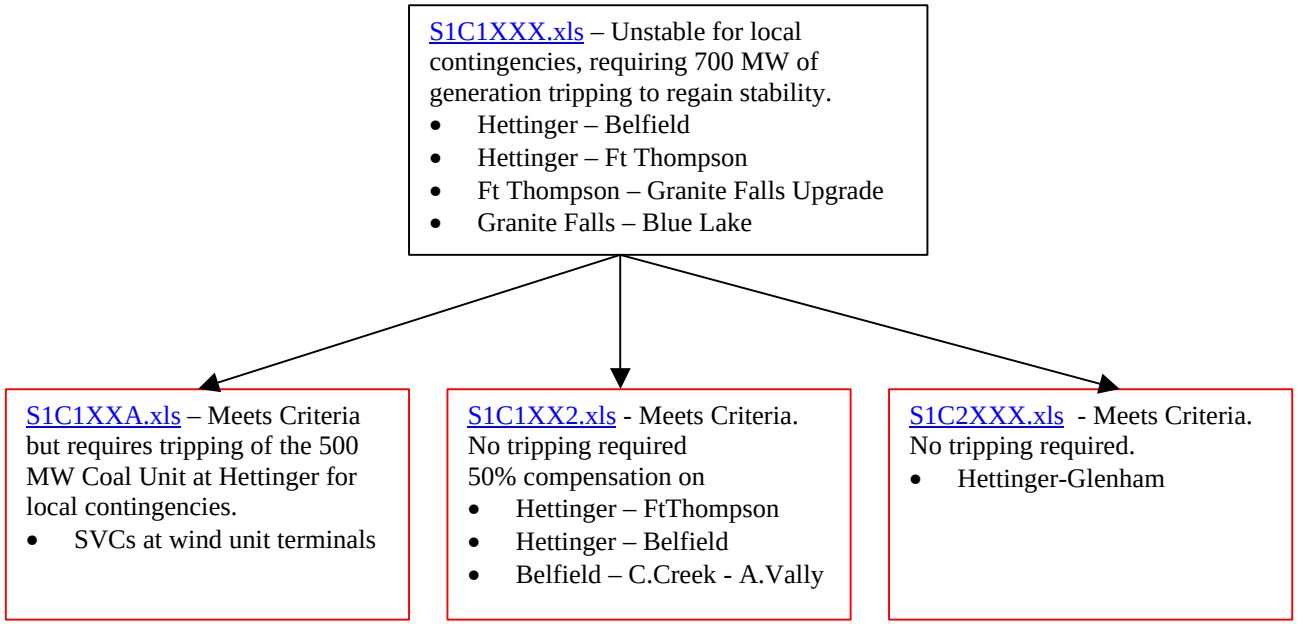


Figure 5.1 (Cont.)

"Low HVdc" Alternatives

S1C3XXX.xls – Unstable for loss of Hettinger-Ft. Thompson & Hettinger-Belfield.

- Hettinger – Belfield
- Hettinger – Ft Thompson
- Ft Thompson – Granite Falls Upgrade
- Granite Falls – Blue Lake
- Additional 150MV HVdc station at Miles City

↓

S1C3XXA.xls – Meets criteria. No tripping required.

- SVC at wind generator terminals

↓

S1C3X1A.xls – Meets criteria, but not discussed in the report since Ft. Thompson is the start of 345 kV line to Twin Cities

- Hettinger – Glenham instead of Hettinger – Ft Thompson

"High HVdc" Alternatives

S1C4XXX.xls – Meets criteria

- Hettinger – Belfield
- Hettinger – Glenham
- Hettinger – Miles City
- Additional 3x150MW HVdc at Miles City

↓

S1C4XX3.xls – meets criteria, but not discussed in the report since S1C4XXX also meets criteria.

- Huron – Split Rock
- Split Rock - Lakefield

Figure 5.1 (Cont.)

500 kV Line Alternatives

S1C5XXX.xls – Unstable for loss of 500 kV line even when tripping the 500 MW Hettinger Coal Unit.

- Hettinger - Belfield 345kV line
- Hettinger - Glenham - Groton - Big Stone - Blue Lake 500kV line

S1C5XX1.xls - Meets Criteria but requires tripping of the 500 MW Coal Unit at Hettinger for loss of the 500 kV line.

- Hettinger – Ft Thompson

S1C5XXA.xls - Meets Criteria but requires tripping of the 500 MW Coal Unit at Hettinger for loss of the 500 kV line.

- SVCs added at wind unit terminals

Case S1C1XXA

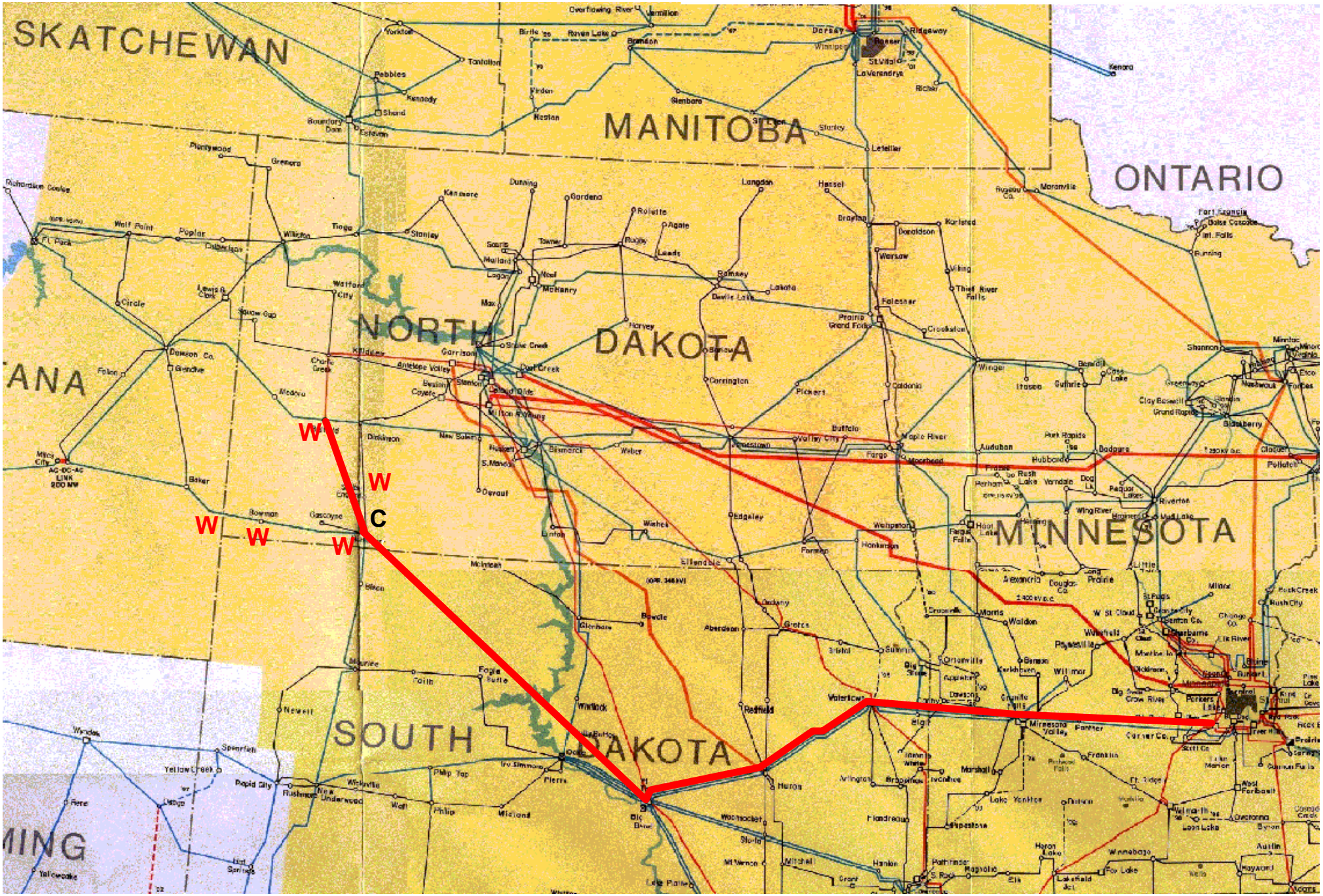


Figure 5.2 - Site 1 (Hettinger) Selected Alternative

Case S1C1XX2

Figure 5.3 - Site 1 (Hettinger) Selected Alternative

Case S1C2XXX

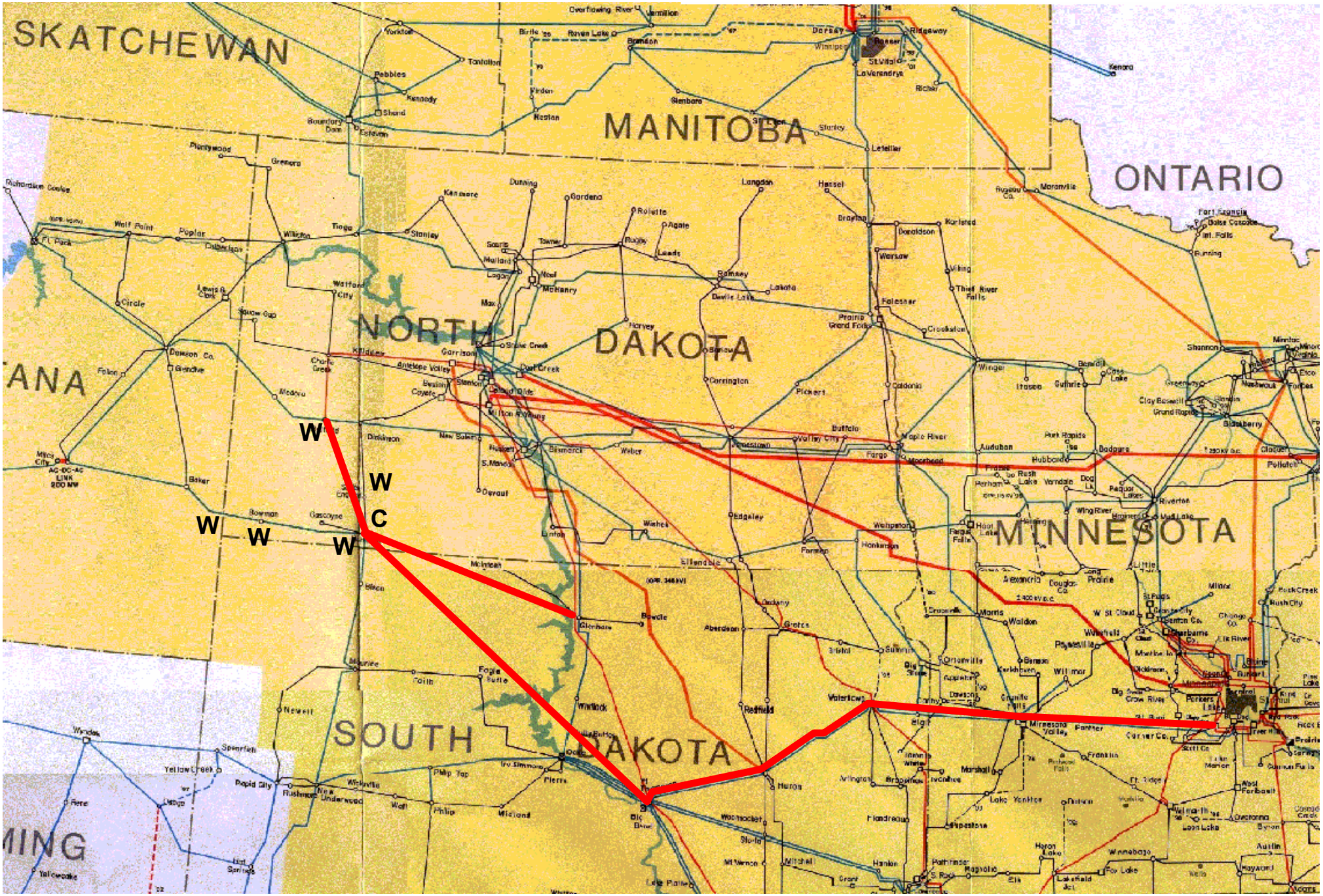


Figure 5.4 - Site 1 (Hettinger) Selected Alternative

Case S1C3XXA

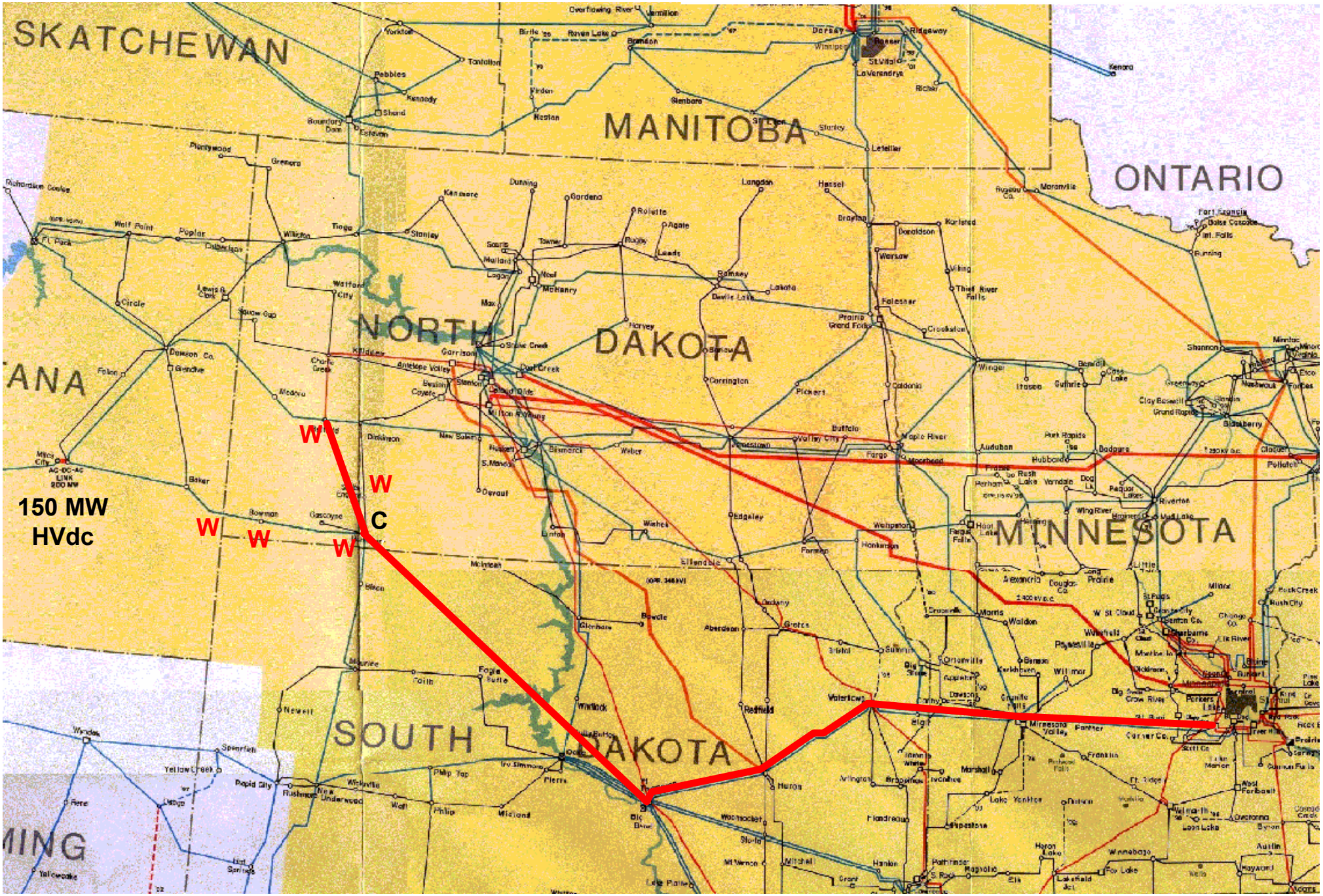


Figure 5.5 - Site 1 (Hettinger) Selected Alternative

Case S1C4XXX

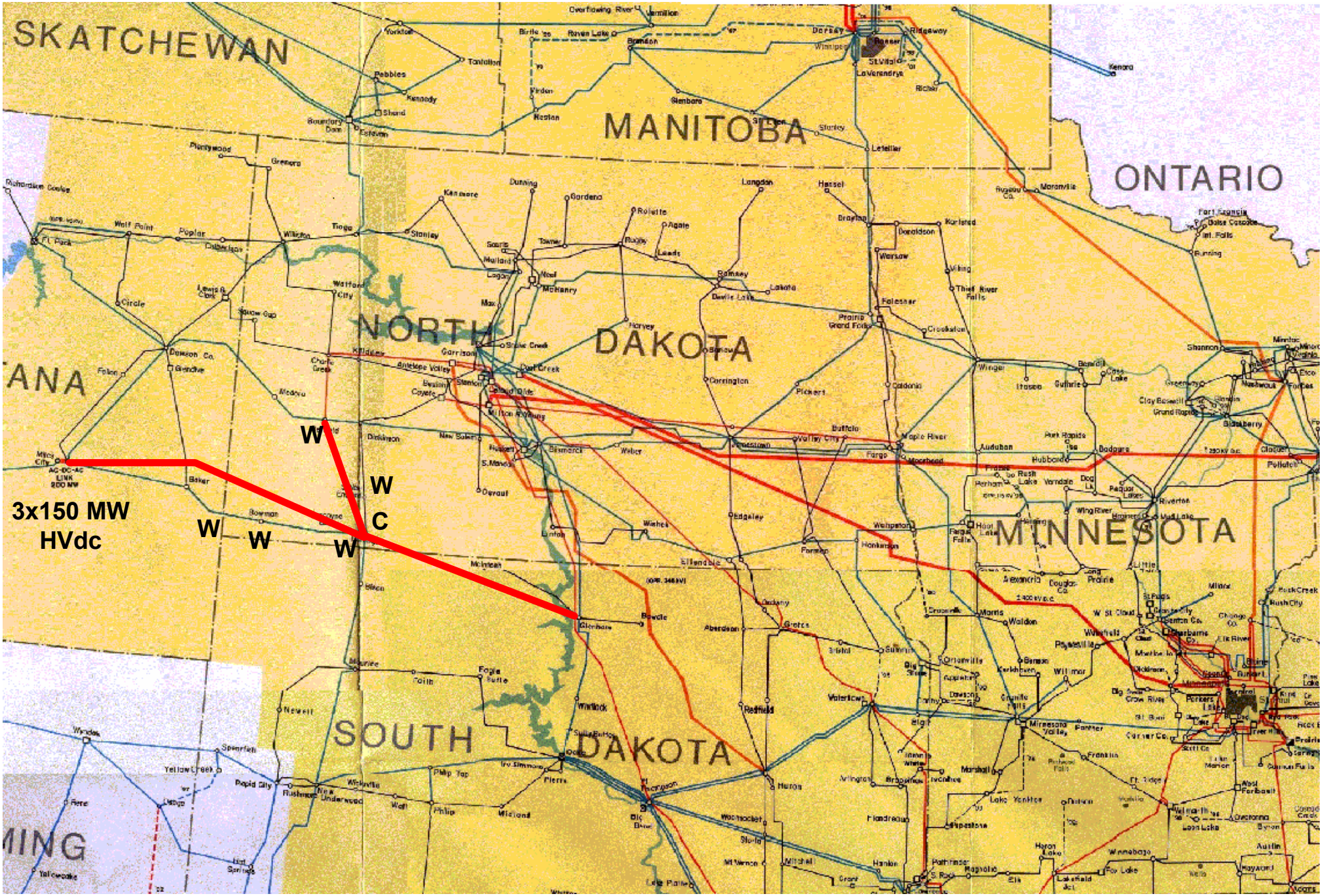


Figure 5.6 - Site 1 (Hettinger) Selected Alternative

Case S1C5XX1

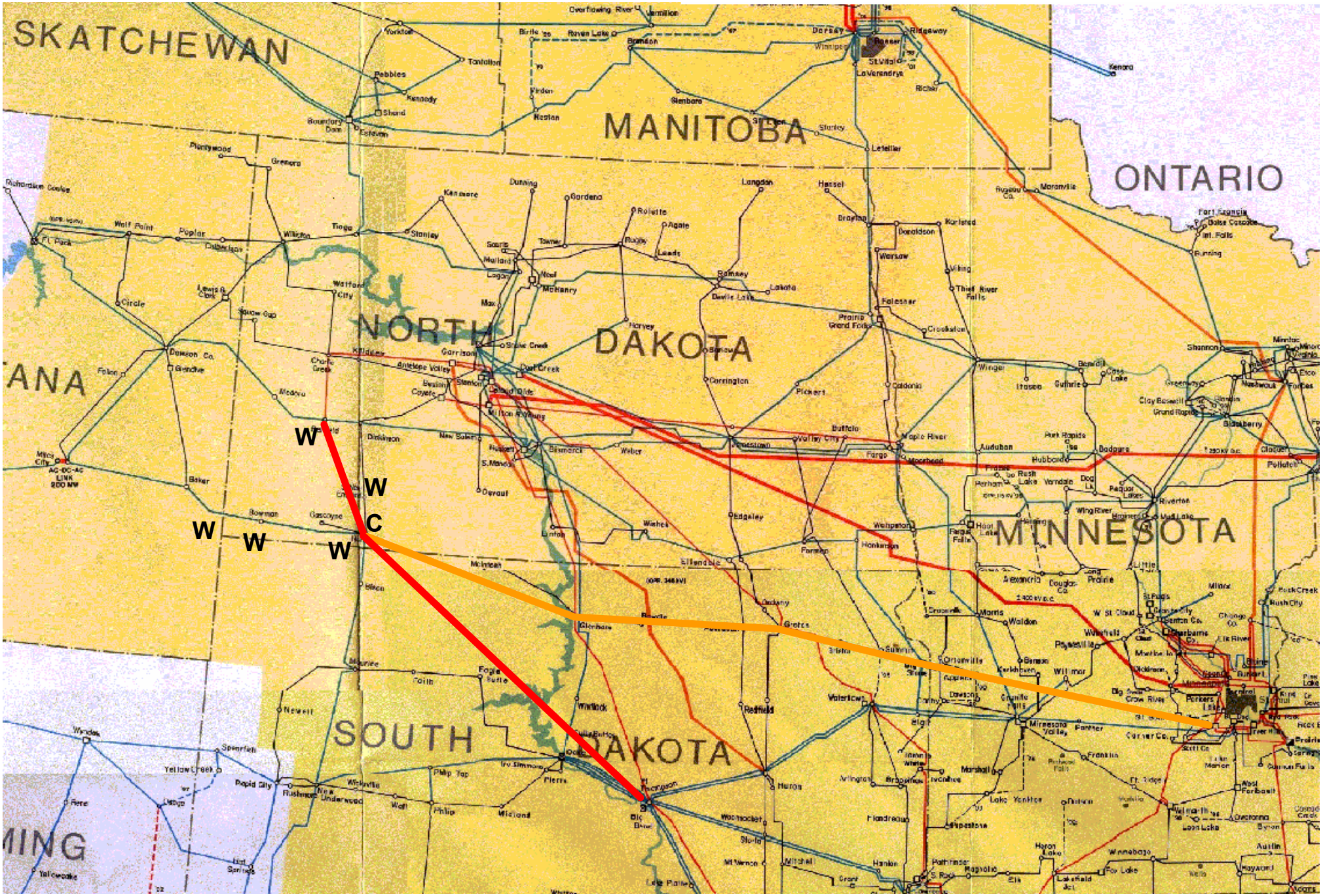


Figure 5.7 - Site 1 (Hettinger) Selected Alternative

Case S1C5XXA

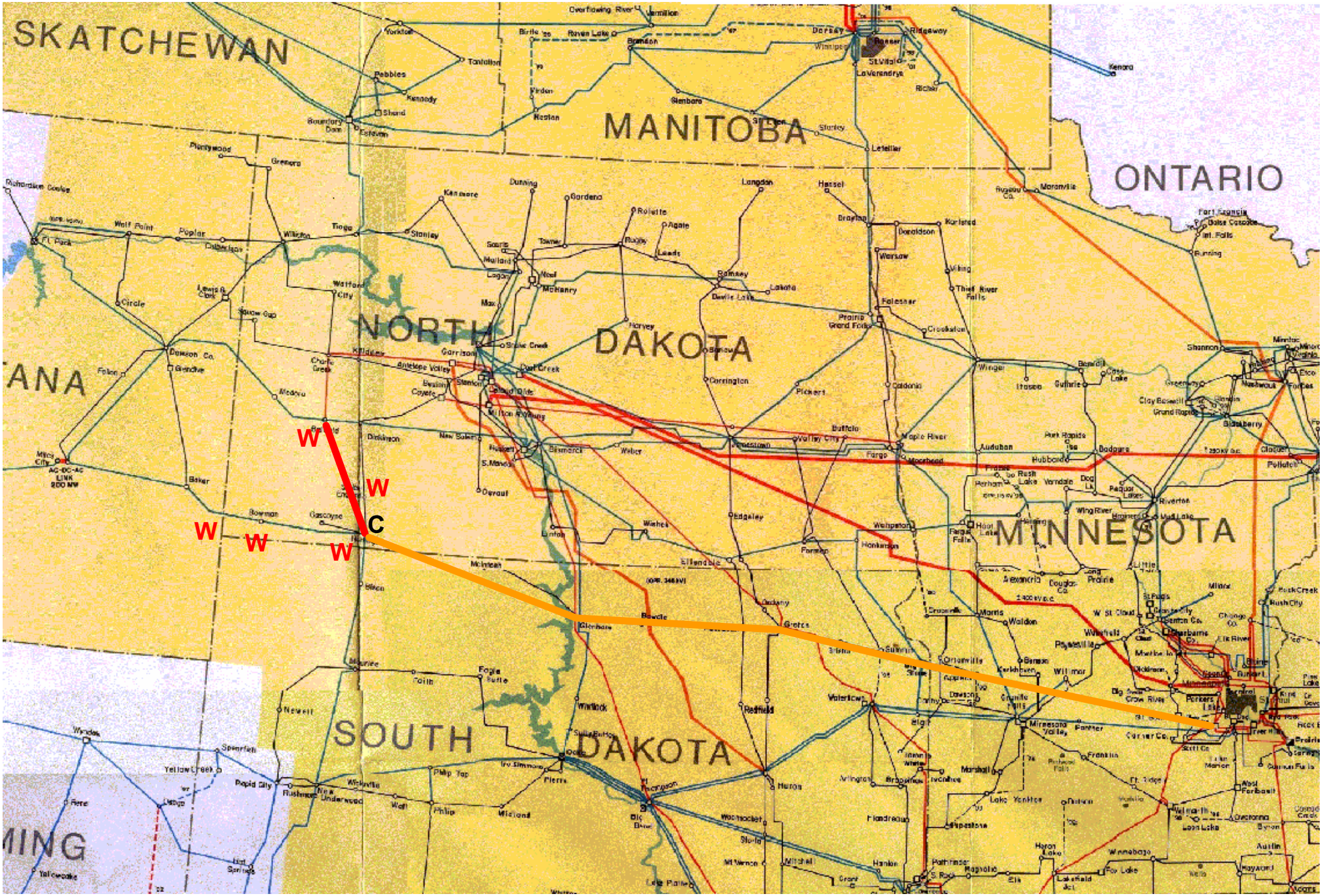


Figure 5.8 - Site 1 (Hettinger) Selected Alternative

6. SITE 2 - JAMESTOWN

6.1. Introduction

Site 2 considered ten 100 MW wind generation plants centered at Jamestown, ND, with power transfers to the Twin Cities. This new generation is inside the NDEX interface. The wind units were connected to the following substations:

- Pickert 230 kV (Bus 759)
- Jamestown 230 kV (Bus 444)
- Devils Lake 115 kV (Bus 431)
- Carrington 115 kV (Bus 428)
- Grand Forks 230 kV (Bus 437)
- Edgeley 115 kV (Bus 432)
- Valley City 115 kV (Bus 454)
- Wahpeton 230 kV (Bus 984)
- Langdon 115 kV (Bus 709)
- Hensel (for Cavalier Site) 115 kV (Bus 992)

Powerflow parameters for these units, as well as for their connecting stations are detailed in Table 6.1.

Because the Northern MAPP system has significant stability constraints, the transmission alternatives were first designed and selected on the basis of dynamic simulation. Alternatives meeting dynamic criteria were then further investigated in terms of thermal performance and other criteria (such as losses and cost).

6.2 Dynamic Analyses of Site 2 Alternatives

A roadmap for the stability studies is included in Figure 6.1. "Selected" alternatives (i.e., alternatives that were subjected to more detailed thermal and other analyses, as well as costing) are highlighted in red in Figure 6.1.

6.2.1 Case S2C1XXX

This case includes the following upgrades:

- Upgrade Bismarck – Granite Falls (350 miles)
- Granite Falls – Blue Lake 345 kV line (100 miles)
- Bismarck – Leland Olds 345 kV line (40 miles)
- Maple River – Moorhead 345 kV line (8 miles)
- Center (Milton Young) – Leland Olds 345 kV line (12 miles)
- Jamestown (N) – Jamestown (S) 345 kV line (5 miles)
- 500 MVA 345/230 kV transformers at Bismarck, Jamestown, Fargo and Granite Falls (total of 4 transformers)
- Two 67 MVA 345/115 kV transformers at Moorhead
- One 250 MVA 345/230 kV transformer at Morris

The line parameters for these upgrades can be found in Table 6.2. Table 6.3 summarizes the stability performance of this alternative. Selected simulation results are included in Appendix 13.

The concern with these results (and in most simulation results for Site 2) is the resulting dynamic excursions of the Manitoba Hydro System as measured by the Forbes relay margin. For example, Contingencies ag1 and ei2 lead to relay margins of 19% and 26%, respectively. More critical, however, is that the system is not stable for the loss of the Leland Olds - Ft Thompson line (ag3). This is not a viable alternative.

6.2.2 Case S2C3XXX

This case had the following upgrades:

- Upgrade Bismarck – Granite Falls (350 miles)
- Granite Falls – Blue Lake 345 kV line (100 miles)
- Bismarck – Leland Olds 345 kV line (40 miles)
- Maple River – Moorhead 345 kV line (8 miles)
- Center (Milton Young) – Leland Olds 345 kV line (12 miles)
- Jamestown (N) – Jamestown (S) 345 kV line (5 miles)
- 500 MVA 345/230 kV transformers at Bismarck, Jamestown, Fargo and Granite Falls (total of 4 transformers)
- Two 67 MVA 345/115 kV transformers at Moorhead
- One 250 MVA 345/230 kV transformer at Morris
- Antelope Valley - Split Rock 500 kV line (409 miles)
- Split Rock - Lakefield Junction 345 kV line (62 miles)
- 1200 MVA 500/345 kV transformers at Antelope Valley and Split Rock (total of 2 transformers)

That is, in addition to the upgrades in Case S2C1XXX above, the case includes and upgrade to 500 kV and extension to Split Rock of the Antelope Valley to Huron 345 kV line, as well as a new Split Rock to Lakefield Junction 345 kV line. The purpose of this upgrade is to divert more flows south of the Coal Fields, thus unloading the MH system.

The line parameters for these upgrades are provided in Table 6.4. Table 6.5 summarizes the stability performance of this alternative. Selected simulation results are detailed in Appendix 14. With the addition of the Antelope Valley - Split Rock 500 kV and Split Rock - Lakefield Junction 345 kV lines the system is stable for the loss of the Leland Olds - Ft Thompson line (Contingency ag3). However the Forbes relay margin is still a low 43% for this contingency.

In order to improve relay margins following ag3, Case S2C3XX2 adds series compensation to this alternative.

6.2.3 Case S2C3XX2

This case includes the following upgrades:

- Upgrade Bismarck – Granite Falls (350 miles)
- Granite Falls – Blue Lake 345 kV line (100 miles)
- Bismarck – Leland Olds 345 kV line (40 miles)
- Maple River – Moorhead 345 kV line (8 miles)
- Center (Milton Young) – Leland Olds 345 kV line (12 miles)
- Jamestown (N) – Jamestown (S) 345 kV line (5 miles)
- 500 MVA 345/230 kV transformers at Bismarck, Jamestown, Fargo and Granite Falls (total of 4 transformers)
- Two 67 MVA 345/115 kV transformers at Moorhead
- One 250 MVA 345/230 kV transformer at Morris
- Antelope Valley - Split Rock 500 kV line
- Split Rock - Lakefield Junction 345 kV line (62 miles)
- 1200 MVA 500/345 kV transformers at Antelope Valley and Split Rock (total of 2 transformers)

Additionally, the following 345 kV lines were 35% shunt compensated:

- Jamestown – Buffalo
- Buffalo – Maple River
- Fargo – Moorhead
- Moorhead – Morris
- Morris – Granite Falls
- Granite Falls – Blue Lake
- Jamestown - Fargo

The line parameters for this alternative are provided in Table 6.6. Table 6.7 summarizes its dynamic performance. . Detailed simulation results are included in Appendix 15.

Despite a slight violation of relay margin criteria at Forbes (49% vs. a 50% minimum) for Contingency ag3, this was considered a viable alternative.

6.2.4 Case S2C4XXX

This case is the same as S2C1XXX, but also includes a Maple River - Benton Co. 345 kV line added. The purpose of this upgrade is the same as that of the Antelope Valley-Split Rock 500 kV transmission in the previous two scenarios: to reduce parallel flows on the Manitoba Hydro System. The complete list of transmission upgrades for this alternative includes:

- Upgrade Bismarck – Granite Falls (350 miles)
- Granite Falls – Blue Lake 345 kV line (100 miles)

- Bismarck – Leland Olds 345 kV line (40 miles)
- Maple River – Moorhead 345 kV line (8 miles)
- Center (Milton Young) – Leland Olds 345 kV line (12 miles)
- Jamestown (N) – Jamestown (S) 345 kV line (5 miles)
- 500 MVA 345/230 kV transformers at Bismarck, Jamestown, Fargo and Granite Falls (total of 4 transformers)
- Two 67 MVA 345/115 kV transformers at Moorhead
- One 250 MVA 345/230 kV transformer at Morris
- Maple River - Benton Co. 345 kV line (180 miles)

The transmission parameters for this alternative are provided in Table 6.8. Table 6.9 summarizes the stability performance. Simulation results are detailed in Appendix 16. The Forbes relay margin for Contingencies ag1, ag3, and ei2 are 38%, 26%, and 47%, respectively.

This is not a viable alternative. Case S2C4XX1 further reinforces this alternative by adding series compensation to selected lines. Case S2C4XX2 adds a phase shifter at Letellier in an attempt to improve the stability performance by limiting power flowing from Drayton towards Letellier and through the MH>US 500 kV line.

6.2.5 Case S2C4XX1

This case is similar to S2C4XXX, but with series compensation added on selected lines.

The complete list of transmission upgrades includes:

- Upgrade Bismarck – Granite Falls (350 miles)
- Granite Falls – Blue Lake 345 kV line (100 miles)
- Bismarck – Leland Olds 345 kV line (40 miles)
- Maple River – Moorhead 345 kV line (8 miles)
- Center (Milton Young) – Leland Olds 345 kV line (12 miles)
- Jamestown (N) – Jamestown (S) 345 kV line (5 miles)
- 500 MVA 345/230 kV transformers at Bismarck, Jamestown, Fargo and Granite Falls (total of 4 transformers)
- Two 67 MVA 345/115 kV transformers at Moorhead
- One 250 MVA 345/230 kV transformer at Morris
- Maple River - Benton Co. 345 kV line (180 miles)

Additionally, the following 345 kV lines were 35% series compensated:

- Jamestown – Buffalo
- Buffalo – Maple River
- Fargo – Moorhead
- Moorhead – Morris
- Morris – Granite Falls
- Granite Falls – Blue Lake

- Jamestown - Fargo
- Maple River – Benton Co.

Parameters for these upgrades are provided in Table 6.10. Table 6.11 provides a summary of the stability performance for this alternative. Selected results are detailed in Appendix 17. The series compensation of the above lines increased the Forbes relay margin for the loss of the Leland Old - Ft Thompson line (ag3) from 26% in Case S2C4XXX to 46%. If this is deemed acceptable, this is a viable alternative.

6.2.6 Case S2C4XX2

This case is similar to case S2C4XXX, but with a phase shifter added at Letellier to limit the power flow from North Dakota to Twin Cities through the Dorsey - Forbes 500 kV line. The complete list of transmission upgrades for this alternative includes:

- Upgrade Bismarck – Granite Falls (350 miles)
- Granite Falls – Blue Lake 345 kV line (100 miles)
- Bismarck – Leland Olds 345 kV line (40 miles)
- Maple River – Moorhead 345 kV line (8 miles)
- Center (Milton Young) – Leland Olds 345 kV line (12 miles)
- Jamestown (N) – Jamestown (S) 345 kV line (5 miles)
- 500 MVA 345/230 kV transformers at Bismarck, Jamestown, Fargo and Granite Falls (total of 4 transformers)
- Two 67 MVA 345/115 kV transformers at Moorhead
- One 250 MVA 345/230 kV transformer at Morris
- Maple River - Benton Co. 345 kV line (180 miles)
- Phase shifter at Letellier controlling Letellier - Drayton power flow

The phase shifter parameters are provided in Table 6.12 and were designed to restore Dorsey to Roseau 500 kV flows to within continuous ratings. As shown in Table 6.12, the phase shifter forces a 320 MW flow from Letellier towards Drayton 230 kV (246 MW in the base case), leading to a 1770 MW flow from Dorsey to Roseau 500 kV (1769 MW in the base case). 85 MW are received at the Glenboro 230 kV Station from the Harvey/Rugby line (3.4 MW in the base case). (A second phase shifter on the Harvey-Glenboro transmission would likely allow for better balancing of MH to US flows, such an alternative should be investigated in a further, more detailed, stage of the studies).

Parameters for the other upgrades in this alternative are the same as in Case S2C4XXX, and may be found in Table 6.8. Table 6.13 summarizes the stability performance for this alternative. Detailed results may be found in Appendix 18.

The relay margins for this alternative meet the MAPP criteria (an indication that the phase shifter is effective in addressing MH>US dynamic problems), however, over-voltages were noted at the Prairie 230 kV bus near Grand Forks ND. This was caused by the on and off switching of the capacitor banks at Prairie. The capacitor bank switching logic would likely need to be adjusted to allow for this shift in power flow

patterns. Alternatively, Case S2C4XX3 investigates the replacement of those capacitor banks with an equally-sized SVC to eliminate this toggling problem.

6.2.7 Case S2C4XX3

This case is a variation of case S2C4XX2, but with the switched capacitor banks at Prairie replaced with an equal-sized SVC. The complete list of transmission upgrades for this alternative includes:

- Upgrade Bismarck – Granite Falls (350 miles)
- Granite Falls – Blue Lake 345 kV line (100 miles)
- Bismarck – Leland Olds 345 kV line (40 miles)
- Maple River – Moorhead 345 kV line (8 miles)
- Center (Milton Young) – Leland Olds 345 kV line (12 miles)
- Jamestown (N) – Jamestown (S) 345 kV line (5 miles)
- 500 MVA 345/230 kV transformers at Bismarck, Jamestown, Fargo and Granite Falls (total of 4 transformers)
- Two 67 MVA 345/115 kV transformers at Moorhead
- One 250 MVA 345/230 kV transformer at Morris
- Maple River - Benton Co. 345 kV line (180 miles)
- Phase shifter at Letellier controlling Letellier - Drayton power flow
- Prairie switched capacitors replaced with 480 Mvar SVC.

Parameters for these upgrades are provided in Tables 6.8 and 6.12. The loadflow model for the Prairie SVC is shown in Table 6.14. The stability performance of this alternative is summarized in Table 6.15 and detailed in Appendix 19.

With the Prairie switched capacitors replaced with an SVC, the voltage oscillations are eliminated. Forbes relay margins for Contingencies ag1, ag3, and ei2 are 76%, 58%, and 82%. Hence, this is a viable alternative.

6.3. Conclusions from Dynamic Analyses of Site 2

The base configuration studied for Site 2 was a 345 kV path from Bismarck - Moorhead - Granite Falls - Blue Lake. It was found that the main concern with that configuration was that of a significant increase in parallel flows through the Manitoba Hydro system. This in turn led to a deterioration of Manitoba Hydro>US dynamics, including instability following the fault and outage of the Leland Olds to Ft. Thompson 345 kV line (Contingency ag3). Two alternative strategies were examined to improve dynamic performance:

One was to "attract" flows away from the MH system by adding reinforcements and series compensation to North Dakota>Twin Cities transmission. The two selected alternatives were:

- Case S2C3XX2 includes series compensation east of Jamestown as well as a new Antelope Valley - Split Rock 500 kV line and a new Split Rock-Lakefield Junction 345 kV line.
- Case S2C4XX1 also includes series compensation east of Jamestown, but with a new Maple River - Benton Co. 345 kV line (also series compensated).

The other strategy was to both attract flows away from the MH system by adding a new Maple River - Benton Co. 345 kV line and to force flows away from MH by placing a phase shifter on the Drayton to Letellier 230 kV line:

- Case S2C4XX3 includes a new Maple River - Benton Co. 345 kV line combined with a Phase shifter at Letellier and switched capacitors at Prairie replaced with an SVC.

The above alternatives are summarized in Table 6.16a and their associated reinforcements are listed in the sections below. Critical interface flows are listed in Table 6.16b.

6.3.1 Case S2C3XX2

The transmission upgrades for this alternative were (See Figure 6.2):

- Upgrade Bismarck – Granite Falls (350 miles)
- Granite Falls – Blue Lake 345 kV line (100 miles)
- Bismarck – Leland Olds 345 kV line (40 miles)
- Maple River – Moorhead 345 kV line (8 miles)
- Center (Milton Young) – Leland Olds 345 kV line (12 miles)
- Jamestown (N) – Jamestown (N) 345 kV line (5 miles)
- 500 MVA 345/230 kV transformers at Bismarck, Jamestown, Fargo and Granite Falls (total of 4 transformers)
- Two 67 MVA 345/115 kV transformers at Moorhead
- One 250 MVA 345/230 kV transformer at Morris
- Antelope Valley - Split Rock 500 kV line (409 miles)
- Split Rock - Lakefield Junction 345 kV line (62 miles)
- 1200 MVA 500/345 kV transformers at Antelope Valley and Split Rock (total of 2 transformers)

Additionally, the following 345 kV lines were 35% series compensated:

- Jamestown – Buffalo
- Buffalo – Maple River
- Fargo – Moorhead
- Moorhead – Morris
- Morris – Granite Falls
- Granite Falls – Blue Lake
- Jamestown - Fargo

6.3.2 Case S2C4XX1

This alternative had the following transmission upgrades(See Figure 6.3):

- Upgrade Bismarck – Granite Falls 230 kV circuit to 345 kV (350 miles)
- Granite Falls – Blue Lake 345 kV line (100 miles)
- Bismarck – Leland Olds 345 kV line (40 miles)
- Maple River – Moorhead 345 kV line (8 miles)
- Center (Milton Young) – Leland Olds 345 kV line (12 miles)
- Jamestown (N) – Jamestown (S) 345 kV line (5 miles)
- 500 MVA 345/230 kV transformers at Bismarck, Jamestown, Fargo and Granite Falls (total of 4 transformers)
- Two 67 MVA 345/115 kV transformers at Moorhead
- One 250 MVA 345/230 kV transformer at Morris
- Maple River - Benton Co. 345 kV line (180 miles)

Additionally, the following 345 kV lines were 35% series compensated:

- Jamestown – Buffalo
- Buffalo – Maple River
- Fargo – Moorhead
- Moorhead – Morris
- Morris – Granite Falls
- Granite Falls – Blue Lake
- Jamestown - Fargo
- Maple River – Benton Co.

6.3.3 Case S2C4XX3

This alternative had the following transmission upgrades (See Figure 6.4):

- Upgrade Bismarck – Granite Falls 230 kV circuit to 345 kV (350 miles)
- Granite Falls – Blue Lake 345 kV line (100 miles)
- Bismarck – Leland Olds 345 kV line (40 miles)
- Maple River – Moorhead 345 kV line (8 miles)
- Center (Milton Young) – Leland Olds 345 kV line (12 miles)
- Jamestown (N) – Jamestown (S) 345 kV line (5 miles)
- 500 MVA 345/230 kV transformers at Bismarck, Jamestown, Fargo and Granite Falls (total of 4 transformers)
- Two 67 MVA 345/115 kV transformers at Moorhead
- One 250 MVA 345/230 kV transformer at Morris
- Maple River - Benton Co. 345 kV line (180 miles)
- Phase shifter at Letellier controlling Letellier - Drayton power flow
- Prairie switched capacitors replaced with a 480 Mvar SVC.

6.4 Thermal Analysis of Selected Alternatives

MUST results for each of the selected alternatives are included in Table 6.17. A summary of the results from thermal analyses is included in Table 6.18.

The following upgrades are common to all Site 2 cases:

- Bismarck – Granite Falls 230 kV line upgraded to 345 kV
- New Granite Falls – Blue Lake 345 kV line
- Bismarck – Leland Olds 345 kV line
- Maple River – Moorhead 345 kV line
- Milton Young (Center) – Leland Olds 345 kV line
- Jamestown (N) – Jamestown (S) 345 kV line section

6.4.1 Case S2C3XX2

This case includes the following upgrades in addition to those common to all of Site 2 Alternatives:

- Upgrade Antelope Valley – Split Rock to 500 kV
- New Split Rock – Lakefield Junction 345 kV line

Additionally, the case includes 35% series compensation on the following 345 kV lines.

- Jamestown – Buffalo
- Buffalo – Maple River
- Fargo – Moorhead
- Moorhead – Morris
- Morris – Granite Falls
- Granite Falls – Blue Lake
- Jamestown – Fargo

The majority of overloads observed are the result of overloads on paths parallel to outaged series-compensated 345 kV line sections east of Jamestown:

Loss of Jamestown – Fargo 345 kV line

- Buffalo - Jamestown 345 kV line – 24%
- Maple River – Buffalo 345 kV line – 24%

Loss of Moorhead – Fargo 345 kV line

- Fargo – Sheyenne 230 kV line – 11%

Loss of Morris – Granite Falls 345 kV line

- Morris – Waldon 115 kV line – 40%
- Benson – Waldon 115 kV line – 36%
- Benson – Kerkho 115 kV line – 20%
- Kerkho T – Kerkho 115 kV line – 16%

Loss of Moorhead – Morris 345 kV line
- GrantCo – Hootlake 115 kV line – 13%

Additionally,

Loss of Leland Olds – Groton 345 kV line
- Edgeley – Ordway 115 kV line – 11%

Also, the loss of Carrington – Jamestown 115 kV leads to an overload of 37% on the Devilse – Ramsey 115 kV line. Conversely, the loss of Devilse – Ramsey 115 kV line leads to an overload of 58% on Carington – Jamestown 115 kV line. A 12% overload is observed on the 115/69 kV transformer at Edgeley for the loss of Edgeley – Ordway 115 kV line.

6.4.2 Case S2C4XX1

This case includes the following upgrades in addition to those common to all of Site 2 Alternatives:

- New Maple River - Benton Co. 345 kV line

Additionally, this case includes 35% series compensation of the following 345 kV lines:

- Jamestown – Buffalo
- Buffalo – Maple River
- Fargo – Moorhead
- Moorhead – Morris
- Morris – Granite Falls
- Granite Falls – Blue Lake
- Jamestown Fargo
- Maple River – Benton Co.

As in the previous case, the majority of overloads observed are the result of overloads on paths parallel to outaged 345 kV line sections east of Jamestown:

Loss of Jamestown – Fargo 345 kV line
- Buffalo - Jamestown 345 kV line – 24%
- Maple River – Buffalo 345 kV line – 24%

Loss of Moorhead – Fargo 345 kV line
- Fargo – Sheyenne 230 kV line – 35%

Loss of Morris – Granite Falls 345 kV line
- Morris – Waldon 115 kV line – 23%
- Benson – Waldon 115 kV line – 19%
- Benson – Kerkho 115 kV line – 2%

Loss of Moorhead – Morris 345 kV line

- GrantCo – Hootlake 115 kV line – 2%

As expected, the new Maple River – Benton Co. 345 kV line reduces overloads caused by outage of 345 kV Ckts. south of Moorhead 345 kV.

Loss of Leland Olds – Groton 345 kV line

- Edgeley – Ordway 115 kV line – 11%

The loss of Carrington – Jamestown 115 kV line leads to an overload of 40% on Devilse – Ramsey 115 kV line, while the loss of Devilse – Ramsey 115 kV line leads to an overload of 62% on Carington – Jamestown 115 kV line. A 11% overload is observed on the 115/69 kV transformer at Edgeley for the loss of Edgeley – Ordway 115 kV line.

6.4.3 Case S2C4XX3

This case includes the following upgrades in addition to those common to all of Site 2 Alternatives:

- New Maple River - Benton 345 kV line
- Phase Shifter on the Drayton- Letellier 230 kV line

The following overloads were observed:

Loss of Moorhead – Fargo 345 kV line

- Fargo – Sheyenne 230 kV line – 38%

Loss of Morris – Granite Falls 345 kV line

- Benson – Waldon 115 kV line – 15%
- Morris – Waldon 115 kV line – 20%
- Benson – Kerkho 115 kV line – 6%
- Kerkhot – Kerkho 115 kV line – 2%

Loss of Moorhead – Morris 345 kV line

- GrantCo – Hootlake 115 kV line – 7%

Loss of Leland Olds – Groton 345 kV line

- Edgeley – Ordway 115 kV line – 25%

Loss of Drayton – Prairie 230 kV line

- Drayton – Donalds 115 kV line – 39%
- Warsaw – Donalds 115 kV line – 37%

The latter overloads are a consequence of the higher flows being forced by the new phase shifter controlling flows along the Drayton to Letellier 230 kV line.

The loss of Carrington – Jamestown 115 kV line leads to an overload of 36% on Devilse – Ramsey 115 kV line. Conversely, the loss of Devilse – Ramsey 115 kV line leads to an overload of 58% on Carington – Jamestown 115 kV line. A 12% overload was observed on Bagley – Winger 115 kV line for the loss of Winger – Wilton 230 kV line. An overload of 26% was observed on the 115/69 kV transformer at Edgeley for the loss of Edgeley – Ordway 115 kV line.

6.4.4 Conclusions from Thermal Analyses

The thermal analyses suggest that the main concern for Site 2 are the significant thermal violations on 230 kV and 115 kV branches parallel to outaged 345 kV sections. In some cases, these overloads can be addressed by removing constraints up to the full conductor ratings. In several other cases, however, conductor ratings are being exceeded, thus suggesting that either reconductoring of existing circuits, or the construction of additional circuits might be required.

6.5 Transmission Losses

Transmission losses for each of the three selected alternatives are compared in Table 6.19 against those in Case ABBBASE.

Table 6.19
Incremental Transmission Losses for Selected Alternatives

CASE	LOSSES (MW)	LOSSES (%)
S2C3XX2	51.9	5.2
S2C4XX1	86.6	8.7
S2C4XX3	127.8	12.8

The results indicate that alternative S2C3XX2 with a 500 kV transmission between Antelope Valley and Split Rock, and series compensation east of Jamestown exhibits the lowest losses (5.2%). Alternative S2C4XX1, with 345 kV reinforcements only, but with series compensation (which tends to "attract" flows towards higher voltage levels with less losses) exhibits an intermediate level of losses (8.7%). The "all 345 kV" option with no series compensation Alternative S2C4XX3 incurs the highest (although still reasonable) loss level of 12.8%.

As was the case in Site 1, the analyses were repeated but with base cases with the new wind generation dispatched at 1/3 of MW rating. The results are summarized in Table 6.20, in MW, and as a % of the dispatch of the new units (333.33 MW). In all cases, the much reduced generation levels, together with the transmission reinforcements, lead to significant reductions in transmission losses.

Table 6.20
Incremental Transmission Losses for Selected Alternatives (New Generation dispatched at 1/3 of MW Rating)

CASE	LOSSES (MW)	LOSSES (%)
S2C3XX2	-97.2	-29.2
S2C4XX1	-56.7	-17.0
S2C4XX3	-29.6	-8.9

The above tables list incremental transmission losses for the system as a whole. Included in Appendix 33 is a listing of absolute losses (as well as of generation, loads, net interchange, etc.) for each of the selected alternatives discriminated by the areas defined in the loadflow cases.

6.6 Constrained Interface Impact Studies

6.6.1 Introduction

DFCALC results comparing interface flows in the selected alternatives against those in Case ABBBASE are summarized in Table 6.21.

6.6.2 Impact on NDEX Interface - North Dakota Losses

Listed in Table 6.22 are NDEX transfer levels for the selected alternatives; its change with respect to the 2080 MW base level in % of the 1000 MW of new generation, and incremental NDEX losses, also in % on a 1000 MW base.

Table 6.22
Impact of Selected Alternatives on NDEX Flows (Base Level: 2080 MW)

CASE	NDEX		
	MW	% CHANGE	% LOSSES
S2C3XX2	3046.6	96.6	3.4
S2C4XX1	3015.5	93.5	6.5
S2C4XX3	2997.1	91.7	8.3

6.6.3 Impact on Other Interfaces

Other constrained interfaces exhibiting impacts above the 5% threshold are:

Case S2C3XX2

- 7.4% Impact on the Ft. Calhoun-South Interface

This is attributable to the upgrade to 500 kV, and extension to Split Rock of the Antelope Valley to Huron 345 kV transmission.

Case S2C4XX1

No Impacts

Case S2C4XX3
No Impacts

6.6.4 Impact on MH-US 500 kV Transmission

Results in Table 6.23 confirm that the impact on the MHUS 500 kV transmission is one of the main concerns for this site, since, even after the significant reinforcements and series compensation in Cases S2C3XX2 and S2C4XX1, substantial increases in active power flows and in reactive losses are incurred over that transmission. Only with the application of a phase shifter on the Drayton-Letellier 230 kV line are flows on the 500 kV transmission effectively controlled.

Table 6.23
Impact of Selected Alternatives on Incremental D602F Flow and on Incremental 500 kV Reactive Performance

CASE	CHANGE WITH RESPECT TO BASE CASE			
	D602F MW	500 KV MVAR LOSSES	DORSEY SC MVARS	FORBES SVC MVARS
S2C3XX2	69.9	123.1	49	12
S2C4XX1	68.7	122.9	56	9
S2C4XX3	0.4	-7.1	36	-7

6.7 Capital Costs

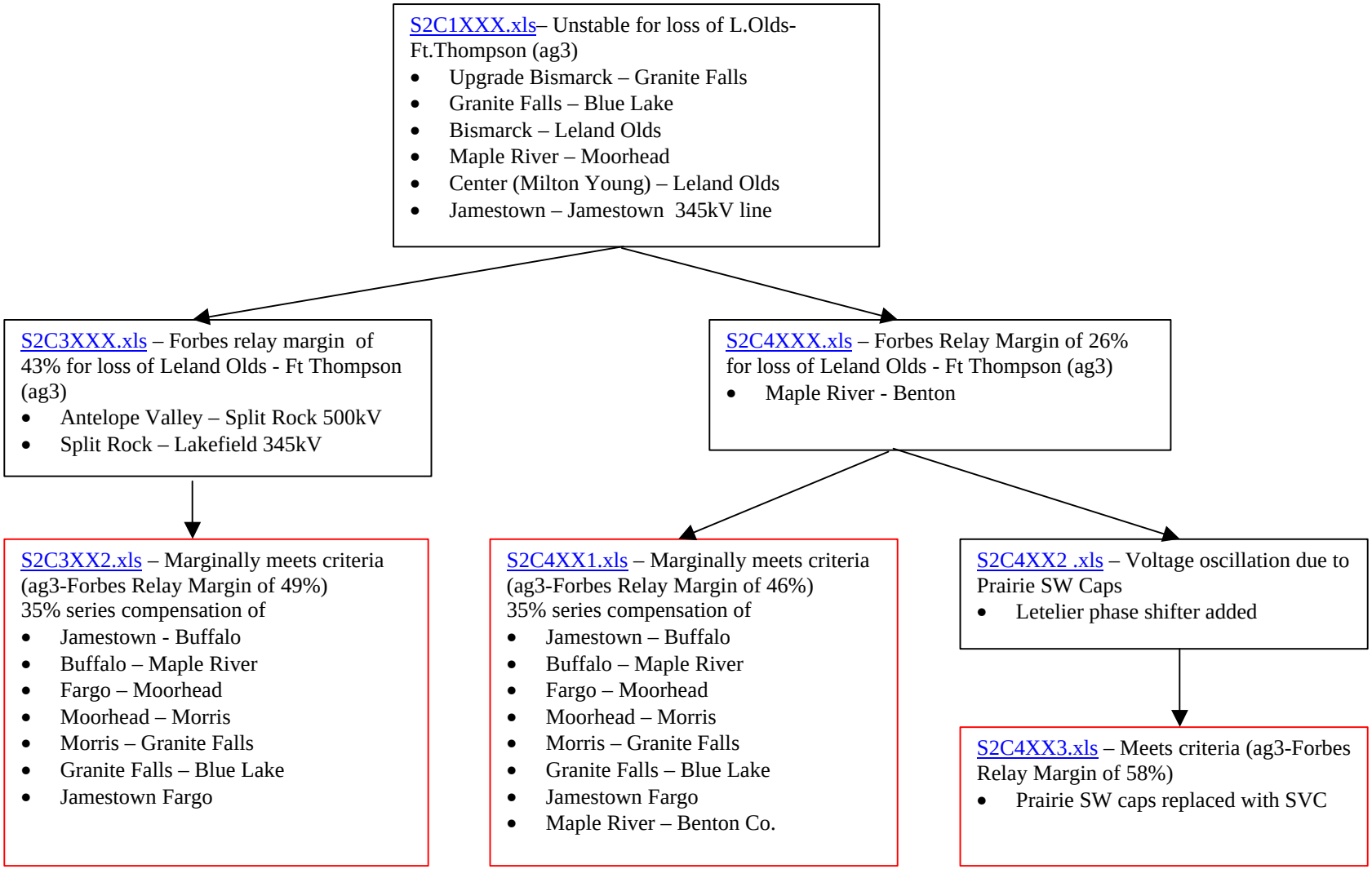
Costs were developed on the basis of the MAPP Cost Estimator and ABB's budgetary estimates. The results are summarized in Table 6.24.

Table 6.24
Capital Costs (2001 dollars, in millions)

CASE	LINES	STATIONS	SVCs	SERIES COMP.	TOTAL
S2C3XX2	192.85	83.57	-	17.48	$293.90
S2C4XX1	178.32	54.71	-	21.68	$254.71
S2C4XX3	178.32	58.22	12.9	-	$249.44

The costs in Table 6.24 suggest that Case S2C4XX3, which includes a Phase Shifter on the Drayton to Letellier line is the least expensive, even after assuming full replacement of the Prairie switched capacitor banks with an equally-sized SVC. The most expensive alternative, on the other hand, is Case S2C3XX2, which includes an Antelope Valley to Split Rock 500 kV transmission.

Figure 6.1
Road-Map for Case Development - Site 2 (Jamestown)



Case S2C3XX2

SKATCHEWAN
MANITOBA
ONTARIO
NORTH
DAKOTA
MINNESOTA
SOUTH
DAKOTA
ANA
MING
W
W
W

Case S2C4XX1

SKATCHEWAN
MANITOBA
ONTARIO
NORTH
DAKOTA
MINNESOTA
SOUTH
DAKOTA
ANA
MING
W
W
W

Case S2C4XX3

Figure 6.4 - Site 2 (Jamestown) Selected Alternative

7. SITE 3 - MINOT

7.1 Introduction

In this section a 1000 MW wind generation farm in the vicinity of Minot, ND was investigated. The wind farm was assumed connected to a new 345 kV Minot Station; station also including a 500 MVA 230/345 kV transformer to the Logan 230 kV Substation. This new generation is inside the NDEX interface. Power from the Minot plant was delivered to the Twin Cities.

7.2. Dynamic Analysis of Site 3 Alternatives

The base configuration studies for Site 3 included 345 kV lines from Minot to Leland Olds and Harvey, and a Harvey - Prairie - Maple River - Benton Co. 345 kV line. In order to take advantage of the Center to Maple River transmission, a Center to Leland Olds line was also included. The transmission alternatives developed were based on this base configuration.

A roadmap for the stability studies is included in Figure 7.1. For the purpose of clarity, however, not all of the cases indicated in that figure are discussed in the sections that follow. "Selected" alternatives (i.e., alternatives that were subjected to more detailed thermal and other analyses, as well as costing) are highlighted in red in Figure 7.1.

7.2.1 Case S3C1X1A - Base Configuration

This transmission alternative formed the basis for the final cases developed for Site 3. Since the wind generation plant is situated in an area with little local generation, a 700 Mvar SVC was placed at the generator terminals for reactive support.

As was observed for Site 2, the switched capacitors at Prairie caused voltage oscillations for increased transfer across the Prairie Station. It was therefore decided to replace the Prairie switched capacitors with an SVC (of the same range as that of the current capacitors) for the entire Site 3 analyses. Whether the fast, vernier-type control of an SVC is actually needed, or retuning of the current switched capacitor logic would suffice, is left for further, more detailed studies.

The list of the transmission upgrades for Case S3C1X1A includes:

- New Minot – Harvey 345 kV line (64 miles)
- New Minot – Leland Olds 345 kV line (67 miles)
- New Harvey – Prairie 345 kV line (125 miles)
- New Prairie – Maple River 345 kV line (68 miles)
- New Maple River – Benton 345 kV line (180 miles)
- New Center – Leland Olds 345 kV line (12 miles)
- 500 MVA 345/230 kV transformer connected to Logan 230 kV
- 500 MVA 345/230 kV transformer at Harvey
- 500 MVA 345/230 kV transformer at Prairie

- Switched capacitors at Prairie replaced with SVC
- 700 Mvar SVC at wind generator terminals

The parameters for these transmission upgrades are provided in Table 7.1. The stability performance of this alternative is provided in Table 7.2. Selected simulation results are included in Appendix 20. The case is in general stable, however it leads to 31%, 44%, and 47% relay margins at the Forbes station for Contingencies ag3, ei2, and ag1, respectively.

Additional reinforcements were investigated, leading to the alternatives described in the following subsections.

7.2.2 Case S3C2X1A

This alternative is similar to S3C1X1A in Section 7.2.1, but reinforced with an additional 345 kV path Maple River - Granite Falls - Blue Lake. The complete list of transmission upgrades is:

- New Minot – Harvey 345 kV line (64 miles)
- New Minot – Leland Olds 345 kV line (67 miles)
- New Harvey – Prairie 345 kV line (125 miles)
- New Prairie – Maple River 345 kV line (68 miles)
- New Maple River – Benton 345 kV line (180 miles)
- New Center – Leland Olds 345 kV line (12 miles)
- 500 MVA 345/230 kV transformer connected to Logan 230 kV
- 500 MVA 345/230 kV transformer at Harvey
- 500 MVA 345/230 kV transformer at Prairie
- Switched capacitors at Prairie replaced with SVC
- 700 Mvar SVC at wind generator terminal
- Upgrade existing 230 kV circuit from Maple River to Granite Falls to 345 kV (165 miles)
- New 345 kV Granite Falls - Blue Lake 345 kV line (100 miles)
- 250 MVA 345/230 kV transformers at Morris and Moorhead
- 500 MVA 345/230 kV transformer at Granite Falls

The parameters for these upgrades are provided in Table 7.3. Table 7.4 summarizes its stability performance. Simulation results are detailed in Appendix 21. The relay margin at Forbes for the loss of Leland Olds - Ft Thompson (ag3) was 49%; only slightly below the 50% minimum. System performance for the remaining contingencies was within MAPP Criteria.

This is a viable alternative for Site 3.

7.2.3 Case S3C3X2A

This case is similar to S3C1X1A in Section 7.2.1, but with an additional Prairie - Duluth 345 kV line. It is important to observe that the ABBBASE Base Case includes a Duluth

to Weston (Wisconsin) 345 kV circuit. The complete list of upgrades for this alternative includes:

- New Minot – Harvey 345 kV line (64 miles)
- New Minot – Leland Olds 345 kV line (67 miles)
- New Harvey – Prairie 345 kV line (125 miles)
- New Prairie – Maple River 345 kV line (68 miles)
- New Maple River – Benton 345 kV line (180 miles)
- New Center – Leland Olds 345 kV line (12 miles)
- 500 MVA 345/230 kV transformer connected to Logan 230 kV
- 500 MVA 345/230 kV transformer at Harvey
- 500 MVA 345/230 kV transformer at Prairie
- Switched capacitors at Prairie replaced with SVC
- 700 Mvar SVC at wind generator terminals
- New Prairie - Duluth (Arrowhead) 345 kV line (250 miles)

Table 7.5 provides the parameters for the Prairie-Duluth 345 kV transmission line. Parameters for the other reinforcements may be found in Table 7.1. The stability performance is summarized in Table 7.6. Key simulation results are detailed in Appendix 22. The wind generation plant at Minot is unstable for the loss of Minot – Leland Olds (Contingency cm3). One solution to this problem is to trip the unit for this contingency (Contingency ct3). If this is undesirable then further upgrades are necessary.

This is a viable alternative, but requires tripping of the Minot wind unit following the fault and outage of Minot-Leland Olds 345 kV.

Cases S3C3X3A and S3C3X4A are further variations of this alternative with series compensation along Minot – Harvey – Prairie, and a new Leland Olds – Prairie 345 kV line, respectively. Both alternatives are meant to improve the transient response of the wind generator following the fault and outage of Minot-Leland Olds 345 kV.

7.2.4 Case S3C3X3A

This is Case S3C1X2A with 35% series compensation along the Minot – Harvey – Prairie 345 kV line. The complete list of transmission upgrades includes:

- Minot – Harvey 345 kV line (64 miles)
- Minot – Leland Olds 345 kV line (67 miles)
- Harvey – Prairie 345 kV line (125 miles)
- Prairie – Maple River 345 kV line (68 miles)
- Maple River – Benton 345 kV line (180 miles)
- Center – Leland Olds 345 kV line (12 miles)
- 500 MVA 345/230 kV transformer connected to Logan 230 kV
- 500 MVA 345/230 kV transformer at Harvey
- 500 MVA 345/230 kV transformer at Prairie

- Switched capacitors at Prairie replaced with a 480 Mvar SVC
- 700 Mvar SVC at wind generator terminal
- Prairie - Duluth (Arrowhead) 345 kV line (250 miles)
- 35% series compensation along Minot – Harvey – Prairie

Table 7.5a provides the parameters for the Series-Compensated Minot-Harvey-Prairie. The stability performance for the fault and outage of Minot – Leland Olds (Contingency cm3) is summarized in Column 12 of Table 7.6 and detailed in Appendix 22. With the series compensation of Minot – Harvey – Prairie, the Minot wind generation remains stable following that critical contingency.

This is a viable alternative for Site 3.

7.2.5 Case S3C3X4A

This is Case S3C1X2A with a Harvey - Leland Olds 345 kV line added to improve dynamic performance following the fault and outage of the Minot – Leland Olds 345 kV line. The complete list of transmission upgrades includes:

- Minot – Harvey 345 kV line (64 miles)
- Minot – Leland Olds 345 kV line (67 miles)
- Harvey – Prairie 345 kV line (125 miles)
- Prairie – Maple River 345 kV line (68 miles)
- Maple River – Benton Co. 345 kV line (180 miles)
- Center – Leland Olds 345 kV line (12 miles)
- 500 MVA 345/230 kV transformer connected to Logan 230 kV
- 500 MVA 345/230 kV transformer at Harvey
- 500 MVA 345/230 kV transformer at Prairie
- Switched capacitors at Prairie replaced with a 480 Mvar SVC
- 700 Mvar SVC at wind generator terminal
- Prairie - Duluth (Arrowhead) 345 kV line (250 miles)
- Harvey – Leland Olds 345 kV (78 miles)

Table 7.5b provides the parameters for the Harvey-Leland Olds 345 kV Ckt. The stability performance for Contingency cm3 (fault and outage of Minot – Leland Olds) is summarized in Column 13 of Table 7.6 and detailed in Appendix 22. With inclusion of the Harvey – Leland Olds 345 kV line, the Minot wind generation is stable for the loss of Minot – Leland Olds.

This is a viable alternative for Site 3.

7.2.6 Case S3C4X1A

This alternative is similar to Case S3C1X1A in Section 7.2.1, but with an Antelope Valley - Split Rock 500 kV line and a Split Rock - Lakefield Junction 345 kV line. The complete list of transmission upgrades for this alternative includes:

- New Minot – Harvey 345 kV line (64 miles)
- New Minot – Leland Olds 345 kV line (67 miles)
- New Harvey – Prairie 345 kV line (125 miles)
- New Prairie – Maple River 345 kV line (68 miles)
- New Maple River – Benton 345 kV line (180 miles)
- New Center – Leland Olds 345 kV line (12 miles)
- 500 MVA 345/230 kV transformer connected to Logan 230 kV
- 500 MVA 345/230 kV transformer at Harvey
- 500 MVA 345/230 kV transformer at Prairie
- Switched capacitors at Prairie replaced with SVC
- SVC at wind generator terminal
- Antelope Valley - Split Rock 500 kV line (409 miles)
- Split Rock - Lakefield Junction 345 kV line (62 miles)
- 1200 MVA 500/345 kV transformers at Antelope Valley and Split Rock (total of 2 transformers)

The parameters for these transmission upgrades are provided in Table 7.7. The stability performance for this alternative is summarized in Table 7.8 and meets MAPP criteria. Selected simulation results are included in Appendix 23.

This is a viable alternative for Site 3.

7.3. Conclusions from Dynamic Analyses of Site 3

Five transmission alternatives satisfying the stability criteria were developed. They were all based on transfers from Minot to the Twin Cites via Leland Olds and via Harvey - Prairie - Maple River - Benton Co 345 kV, plus one of the following 5 alternatives:

- Maple River through Blue Lake 345 kV line - Case S3C2X1A
- Prairie - Duluth 345 kV line. Requires tripping of the Minot Wind unit upon fault and outage of Minot-Leland Olds 345 kV - Case S3C3X2A.
- Prairie - Duluth 345 kV line with 35% series compensation of Minot – Harvey - Prairie - Case S3C3X3A.
- Prairie – Duluth 345 kV and Harvey – Leland Olds 345 kV lines – Case S3C3X4A.
- Antelope Valley - Split Rock 500 kV line - Case S3C4X1A

In all cases a 700 Mvar SVC was included at the wind generator terminals for reactive support since the new wind generation is situated far from generation sources. Also, in all cases the switched capacitors at Prairie were replaced with an equivalent SVC, since their switching algorithm may need adjustments (or their replacement with an SVC) to allow for the increase in power transfer across eastern North Dakota.

The above alternatives are summarized in Table 7.9a and their associated reinforcements are listed in the sections below. Critical interface flows are listed in Table 7.9b.

7.3.1 Case S3C2X1A.

The transmission upgrades for this alternative were (See Figure 7.2):

- New Minot – Harvey 345 kV line (64 miles)
- New Minot – Leland Olds 345 kV line (67 miles)
- New Harvey – Prairie 345 kV line (125 miles)
- New Prairie – Maple River 345 kV line (68 miles)
- New Maple River – Benton 345 kV line (180 miles)
- New Center – Leland Olds 345 kV line (12 miles)
- 500 MVA 345/230 kV transformer connected to Logan 230 kV
- 500 MVA 345/230 kV transformer at Harvey
- 500 MVA 345/230 kV transformer at Prairie
- Switched capacitors at Prairie replace with SVC
- 700 Mvar SVC at wind generator terminal
- Upgrade existing 230 kV circuit from Fargo to Granite Falls to 345 kV (165 miles)
- New 345 kV Granite Falls - Blue Lake 345 kV line (100 miles)
- 250 MVA 345/230 kV transformers at Morris and Moorhead
- 500 MVA 345/230 kV transformer at Granite Falls

7.3.2 Case S3C3X2A.

The transmission upgrades for this alternative were (See Figure 7.3):

- Minot – Harvey 345 kV line (64 miles)
- Minot – Leland Olds 345 kV line (67 miles)
- Harvey – Prairie 345 kV line (125 miles)
- Prairie – Maple River 345 kV line (68 miles)
- Maple River – Benton 345 kV line (180 miles)
- Center – Leland Olds 345 kV line (12 miles)
- 500 MVA 345/230 kV transformer connected to Logan 230 kV
- 500 MVA 345/230 kV transformer at Harvey
- 500 MVA 345/230 kV transformer at Prairie
- Switched capacitors at Prairie replaced with a 480 Mvar SVC
- 700 Mvar SVC at wind generator terminal
- Prairie - Duluth (Arrowhead) 345 kV line (250 miles)

7.3.3 Case S3C3X3A.

The transmission upgrades for this alternative were (See Figure 7.4):

- Minot – Harvey 345 kV line (64 miles)
- Minot – Leland Olds 345 kV line (67 miles)
- Harvey – Prairie 345 kV line (125 miles)
- Prairie – Maple River 345 kV line (68 miles)
- Maple River – Benton 345 kV line (180 miles)
- Center – Leland Olds 345 kV line (12 miles)

- 500 MVA 345/230 kV transformer connected to Logan 230 kV
- 500 MVA 345/230 kV transformer at Harvey
- 500 MVA 345/230 kV transformer at Prairie
- Switched capacitors at Prairie replaced with a 480 Mvar SVC
- 700 Mvar SVC at wind generator terminal
- Prairie - Duluth (Arrowhead) 345 kV line (250 miles)
- 35% series compensation of Minot – Harvey – Prairie

7.3.4 Case S3C3X4A

The transmission upgrades for this alternative were (See Figure 7.5):

Minot – Harvey 345 kV line (64 miles)
Minot – Leland Olds 345 kV line (67 miles)
Harvey – Prairie 345 kV line (125 miles)
Prairie – Maple River 345 kV line (68 miles)
Maple River – Benton 345 kV line (180 miles)
Center – Leland Olds 345 kV line (12 miles)
500 MVA 345/230 kV transformer connected to Logan 230 kV
500 MVA 345/230 kV transformer at Harvey
500 MVA 345/230 kV transformer at Prairie
Switched capacitors at Prairie replaced with a 480 Mvar SVC
700 Mvar SVC at wind generator terminal
Prairie - Duluth (Arrowhead) 345 kV line (250 miles)
Harvey – Leland Olds 345 kV (78 miles)

7.3.5 Case S3C4X1A.

The transmission upgrades for this alternative were (See Figure 7.6):

- New Minot – Harvey 345 kV line (64 miles)
- New Minot – Leland Olds 345 kV line (67 miles)
- New Harvey – Prairie 345 kV line (125 miles)
- New Prairie – Maple River 345 kV line (68 miles)
- New Maple River – Benton 345 kV line (180 miles)
- New Center – Leland Olds 345 kV line (12 miles)
- 500 MVA 345/230 kV transformer connected to Logan 230 kV
- 500 MVA 345/230 kV transformer at Harvey
- 500 MVA 345/230 kV transformer at Prairie
- Switched capacitors at Prairie replaced with SVC
- SVC at wind generator terminal
- Antelope Valley - Split Rock 500 kV line (409 miles)
- Split Rock - Lakefield Junction 345 kV line (62 miles)
- 1200 MVA 500/345 kV transformers at Antelope Valley and Split Rock (total of 2 transformers)

7.4 Thermal Analysis of Selected Alternatives

MUST results for each of the selected alternatives are included in Table 7.10. A summary of the thermal analysis results is included in Table 7.11.

Upgrades common to all Site 3 alternatives are:

- Minot – Harvey 345 kV line
- Minot – Leland Olds 345 kV line
- Harvey – Prairie – Maple River – Benton 345 kV line
- Center – Leland Olds 345 kV
- SW caps at Prairie replaced with SVC
- SVCs at wind generator terminal

7.4.1 Case S3C2X1A

This case includes the following upgrades in addition to those common to all of Site 3 Alternatives:

- Upgrade Maple River to Granite Falls to 345 kV
- New Granite Falls to Blue Lake 345 kV line

The following overloads were observed:

Loss of Miles City – Baker 230 kV line
Baker – Glendive 115 kV line – 42%
Dawson County – Glendive 115 kV – 18%

Loss of Maple River – Moorhead 345 kV line
Fargo – Moorhead 230 kV line – 16%

Loss of Morris – Granite Falls 345 kV line
Morris – Waldon 115 kV – 11%
Benson – Waldon 115 kV – 6%

Loss of Baker – Bowman 230 kV line
Dickinson – N. England 115 kV line – 37%
Hettinger – N. England 115 kV line – 33%

The Huron – Woonsocket and Woonsocket – Storla 115 kV lines were overloaded by 42% and 27% respectively for the loss of Ft. Thompson – Storla 230 kV line. These lines were already overloaded by about 30% and 12% respectively in the base case without the new generation.

7.4.2 Case S3C3X2A

In addition to the upgrades common to all of Site 3, this alternative includes:

- Prairie – Duluth 345 kV line

The following overloads were observed:

Loss of Miles City – Baker 230 kV line
Baker – Glendive 115 kV line – 39%
Dawson County – Glendive 115 kV – 18%

Loss of Baker – Bowman 230 kV line
Dickinson – N. England 115 kV line – 29%
Hettinger – N. England 115 kV line – 35%

Loss of Leland Olds-Ft. Thompson 345 kV
Maurine – Bison 230 kV line – 4%

The Huron – Woonsocket and Woonsocket – Storla 115 kV lines were overloaded by 27% and 20% respectively for the loss of Ft. Thompson – Storla 230 kV line.

7.4.3 Case S3C3X3A

This alternative includes:

- Prairie – Duluth 345 kV line
- 35% series compensation of Minot – Harvey – Prairie 345 kV

The following overloads were observed:

Loss of Miles City – Baker 230 kV line
Baker – Glendive 115 kV line – 37%
Dawson County – Glendive 115 kV – 16%

Loss of Baker – Bowman 230 kV line
Dickinson – N. England 115 kV line – 34%
Hettinger – N. England 115 kV line – 31%

Loss of Minot – Harvey 345 kV line
Logan – Minot 115 kV line – 5%
Rugby – Minot 115 kV line – 8%

The Huron – Woonsocket and Woonsocket – Storla 115 kV lines were overloaded by 26% and 21% respectively for the loss of Ft. Thompson – Storla 230 kV line.

7.4.4 Case S3C3X4A

This alternative includes:

- Prairie – Duluth 345 kV line
- Leland Olds – Harvey 345 kV

The following overloads were observed:

Loss of Miles City – Baker 230 kV line
- Baker – Glendive 115 kV line – 42%
- Dawson County – Glendive 115 kV – 18%

Loss of Baker – Bowman 230 kV line
- Dickinson – N. England 115 kV line – 38%
- Hettinger – N. England 115 kV line – 34%

Loss of Fargo – Sheyenne 230 kV line
- Fargo – Maple 69 kV line – 3%

The Huron – Woonsocket and Woonsocket – Storla 115 kV lines were overloaded by 28% and 19% respectively for the loss of Ft. Thompson – Storla 230 kV line.

7.4.5 Case S3C4X1A

This alternative includes:

- Antelope Valley – Split Rock 500 kV
- Split Rock – Lakefield Junction 345 kV

The following overloads were observed:

Loss of Miles City – Baker 230 kV line
Baker – Glendive 115 kV line – 31%
Dawson County – Glendive 115 kV – 10%

Loss of Baker – Bowman 230 kV line
Dickinson – N. England 115 kV line – 27%
Hettinger – N. England 115 kV line – 23%

Loss of Antelope Valley – Split Rock 500 kV line
Maurine – Bison 230 kV line – 14%

7.4.6 Conclusions from Thermal Analyses

Relatively few, and fairly consistent overloads across all selected alternatives characterize Site 3. This is in large part attributable to the fact that the new generation was assumed concentrated at a single plant, with connection to a 345 kV Station (as opposed to the various wind farms connected at 230 kV and 115 kV assumed in Sites 1 and 2).

7.5 Transmission Losses

Transmission losses for each of the five selected alternatives are compared in Table 7.12 against those in Case ABBBASE.

Table 7.12
Incremental Transmission Losses for Selected Alternatives

CASE	LOSSES (MW)	LOSSES (%)
S3C2X1A	169.7	17.0
S3C3X2A	195.1	19.5
S3C3X3A	186.8	18.7
S3C3X4A	189.5	19.0
S3C4X1A	109.6	11.0

The results indicate that Alternative S3C4X1A with a 500 kV transmission between Antelope Valley and Split Rock exhibits the least transmission losses (a moderate 11%). The remaining four "345 kV only" alternatives display relatively large losses ranging from 17% to 19.5%. Of those four, Alternative S3C2X1A, which includes a 345 kV transmission from Maple River to Granite Falls to Blue Lake, exhibits less losses than the three S3C3 alternatives which, instead, include a 345 kV transmission to Arrowhead (Duluth).

The analyses were repeated but with base cases with the new wind generation dispatched at 1/3 of its MW rating. The results are summarized in Table 7.13, in MW, and as a % of the dispatch of the new units (333.33 MW). In all cases but one, the much reduced generation levels on the new wind generation, together with the transmission reinforcements, lead to reductions in transmission losses with respect to the base case.

Table 7.13
Incremental Transmission Losses for Selected Alternatives (New Generation dispatched at 1/3 of MW Rating)

CASE	LOSSES (MW)	LOSSES (%)
S3C2X1A	-18.3	-1.8
S3C3X2A	-1.7	-0.2
S3C3X3A	1.1	0.1
S3C3X4A	-4.7	-0.5
S3C4X1A	-68.0	-6.8

Also included in Appendix 33 is a listing of absolute losses (as well as of generation, loads, net interchange, etc.) for each of the selected alternatives discriminated by the areas defined in the loadflow cases.

7.6 Constrained Interface Impact Studies

7.6.1 Introduction

DFCALC results comparing interface flows in the selected alternatives against those in Case ABBBASE are summarized in Table 7.14.

7.6.2 Impact on NDEX Interface - North Dakota Losses

Listed in Table 7.15 are NDEX transfer levels for the selected alternatives; its change with respect to the 2080 MW base level in % of the 1000 MW of new generation, and incremental NDEX losses, also in % on a 1000 MW base.

Table 7.15
Impact of Selected Alternatives on NDEX Flows (Base Level: 2080 MW)

CASE	NDEX		
	MW	% CHANGE	% LOSSES
S3C2X1A	2971.7	89.1	10.9
S3C3X2A	2972.4	89.2	10.8
S3C3X3A	2977.1	89.7	10.3
S3C3X4A	2975.8	89.5	10.5
S3C4X1A	3017.0	93.7	6.3

As observed in Section 7.5 on system losses, Case S3C4X1A, which includes an Antelope Valley to Split Rock 500 kV transmission exhibits the least losses of all selected alternatives, and thus, the highest impact on NDEX transfer levels.

7.6.3 Impact on Other Interfaces

Other constrained interfaces exhibiting impacts above the 5% threshold are:

Case S3C2X1A
No Impacts

Case S3C3X2A
No Impacts

Case S3C3X3A
No Impacts

Case S3C3X4A
No Impacts

Case S3C4X1A
- 7.5% Impact on the Cooper-South Interface
- 9.2% Impact on the Ft. Calhoun-South Interface

These impacts are attributable to the upgrade to 500 kV, and extension to Split Rock, of the Antelope Valley to Huron 345 kV transmission in this alternative.

7.6.4 Impact on MH-US 500 kV Transmission

Results in Table 7.16 indicate a significant impact on the active and reactive performances of the MH>US 500 kV transmission, thus suggesting that a phase shifter (this time on the Harvey-Glenboro transmission) could be considered for this site too (as

was considered for the Jamestown Site in Section 6). However, regarding the impact of the alternatives on reactive performance, it is important to note that in three of the five alternatives (those starting with S3C3) the alternatives include connection to the Duluth area, which results in increased 500 kV MW flows south of the Forbes Station. This in turn increases overall reactive losses on the 500 kV transmission. Because of their location (at the receiving - Chisago, in the vicinity of the Twin Cities, - rather than at the sending - Dorsey - in the vicinity of a large inverter station - end of the transmission), their impact on performance might not be as severe as in other Sites/Alternatives.

Table 7.16
Impact of Selected Alternatives on D602F Flow and 500 kV Reactive Performance

CASE	CHANGE WITH RESPECT TO BASE CASE			
	D602F MW	500 KV MVAR LOSSES	DORSEY SC MVARS	FORBES SVC MVARS
S3C2X1A	65.5	123.6	69	12
S3C3X2A	37.7	118.5	42	6
S3C3X3A	38.1	121.9	43	10
S3C3X4A	41.0	124.6	49	10
S3C4X1A	45.0	79.6	33	6

7.7 Capital Costs

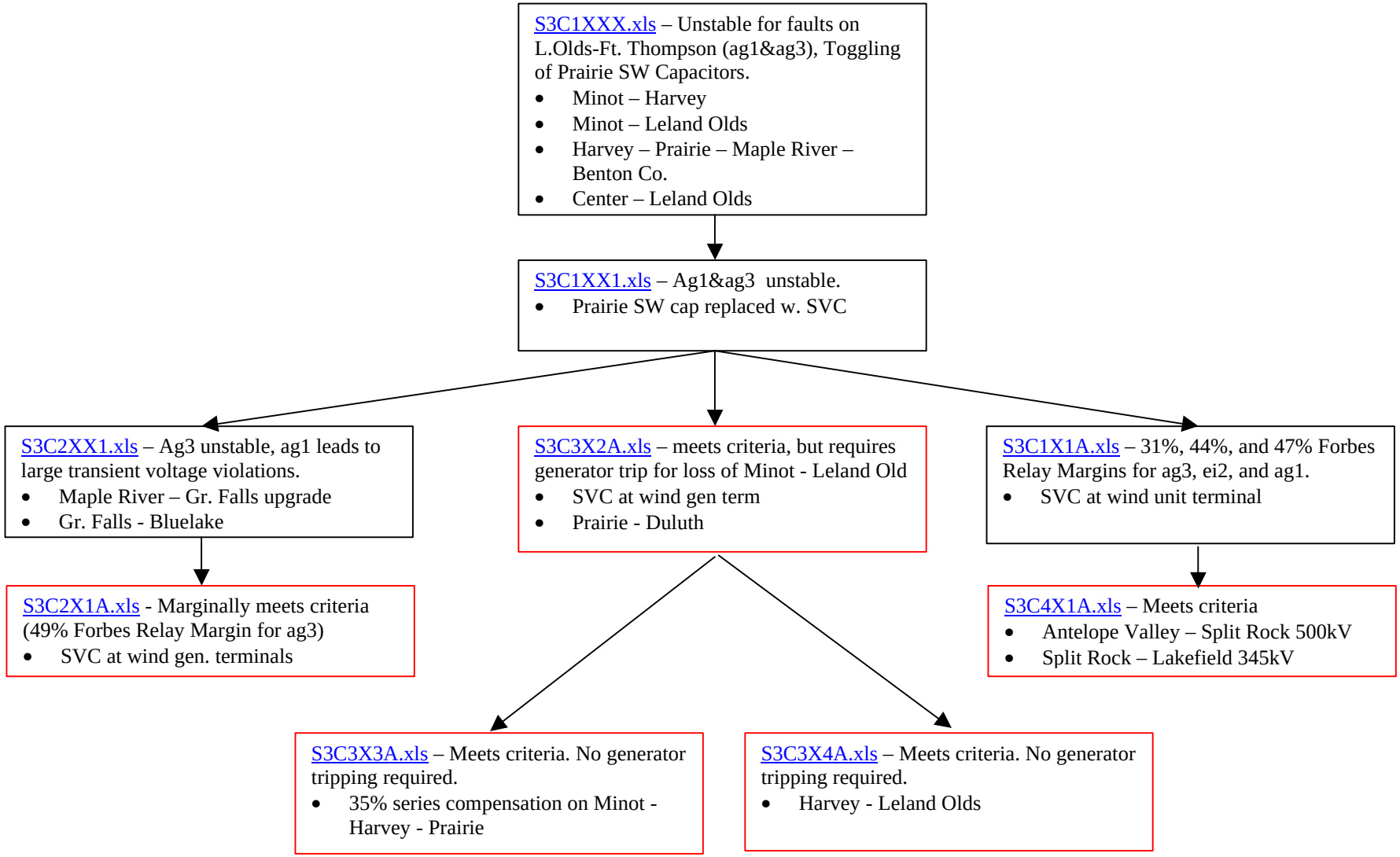
Costs were developed on the basis of the MAPP Cost Estimator and ABB's budgetary estimates. The results are summarized in Table 7.17. Even though wind generation was modeled as a single unit in the studies for this site, the SVC costs assume ten 70 Mvar installations. They also include the cost of replacing the Prairie switched capacitors with an equally-sized SVC.

Table 7.17
Capital Costs (2001 dollars, in millions)

CASE	LINES	STATIONS	SVCs	SERIES COMP.	TOTAL
S3C2X1A	258.61	51.00	66.00	-	$375.61
S3C3X2A	294.91	38.34	66.00	-	$399.25
S3C3X3A	294.91	38.34	66.00	7.28	$406.53
S3C3X4A	324.94	40.24	66.00	-	$431.18
S3C4X1A	282.48	61.00	66.00		$409.48

The results suggest that costs are in general higher than for other sites. The least-cost solution is S3C2X1A, which includes a Maple River-Granite Falls-Blue Lake 345 kV transmission.

Figure 7.1
Road-Map for Case Development - Site 3 (Minot)



Case S3C2X1A

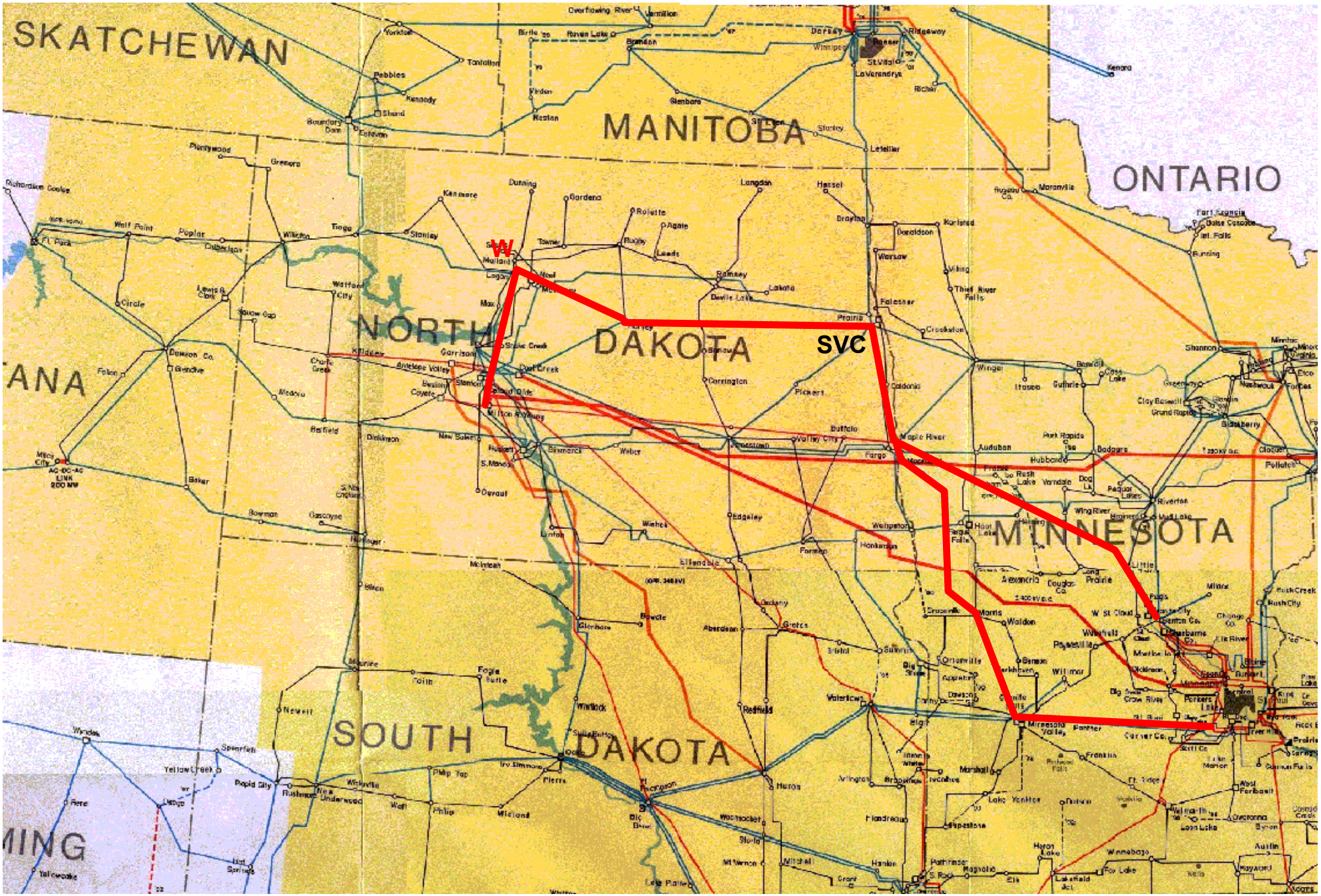


Figure 7.2 - Site 3 (Minot) Selected Alternative

Case S3C3X2A

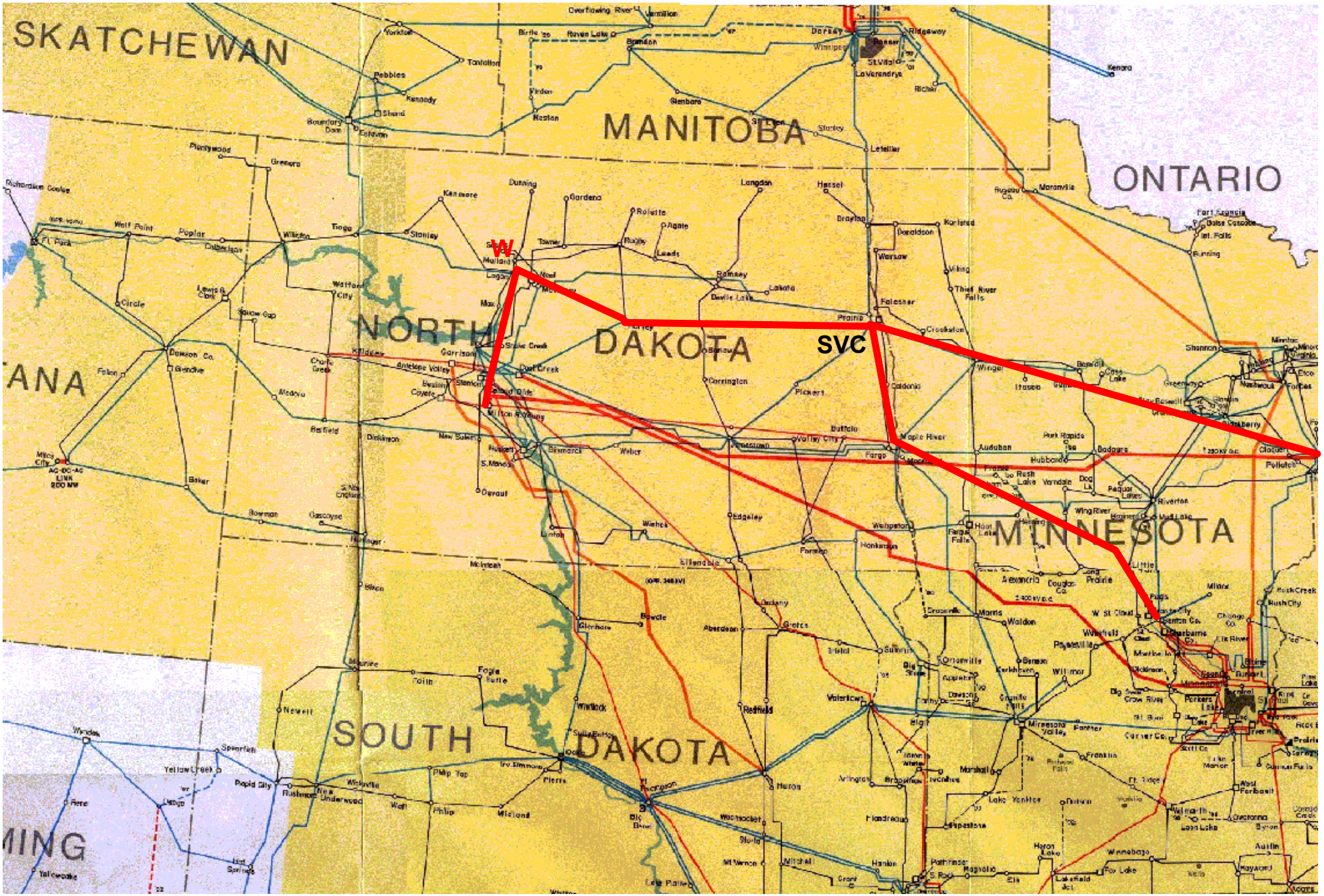


Figure 7.3 - Site 3 (Minot) Selected Alternative

Case S3C3X3A

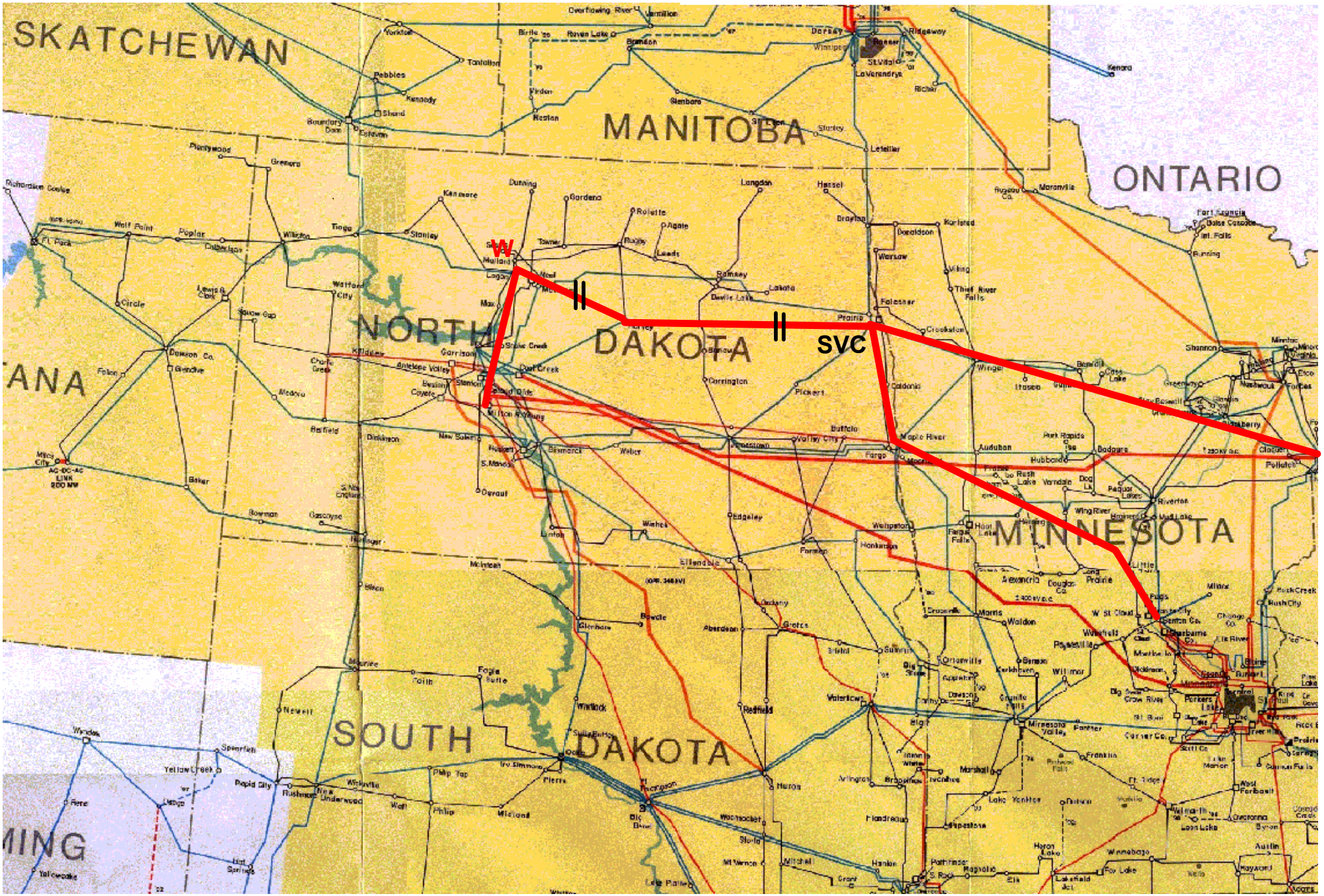


Figure 7.4 - Site 3 (Minot) Selected Alternative

Case S3C3X4A

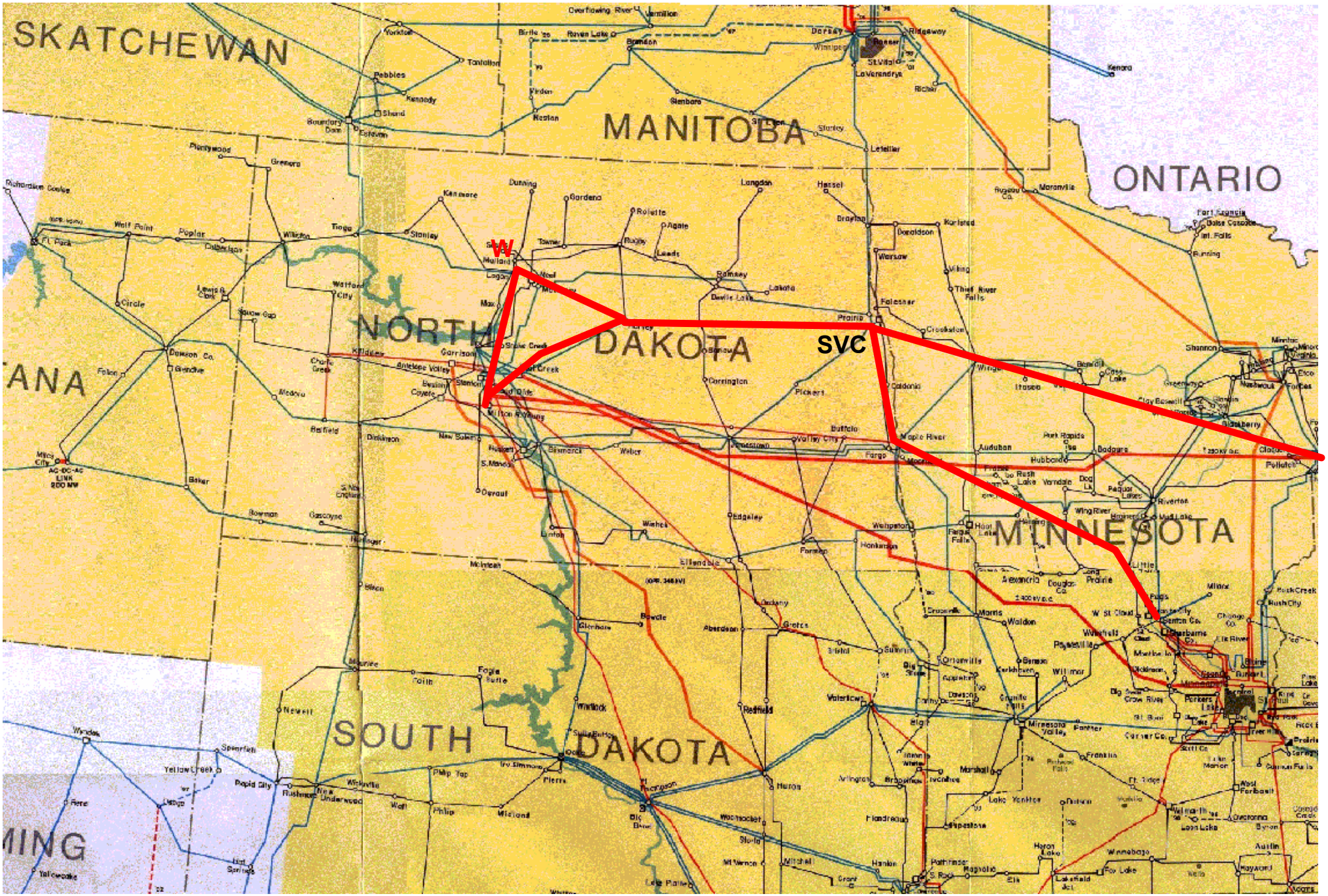


Figure 7.5 - Site 3 (Minot) Selected Alternative

Case S3C4X1A

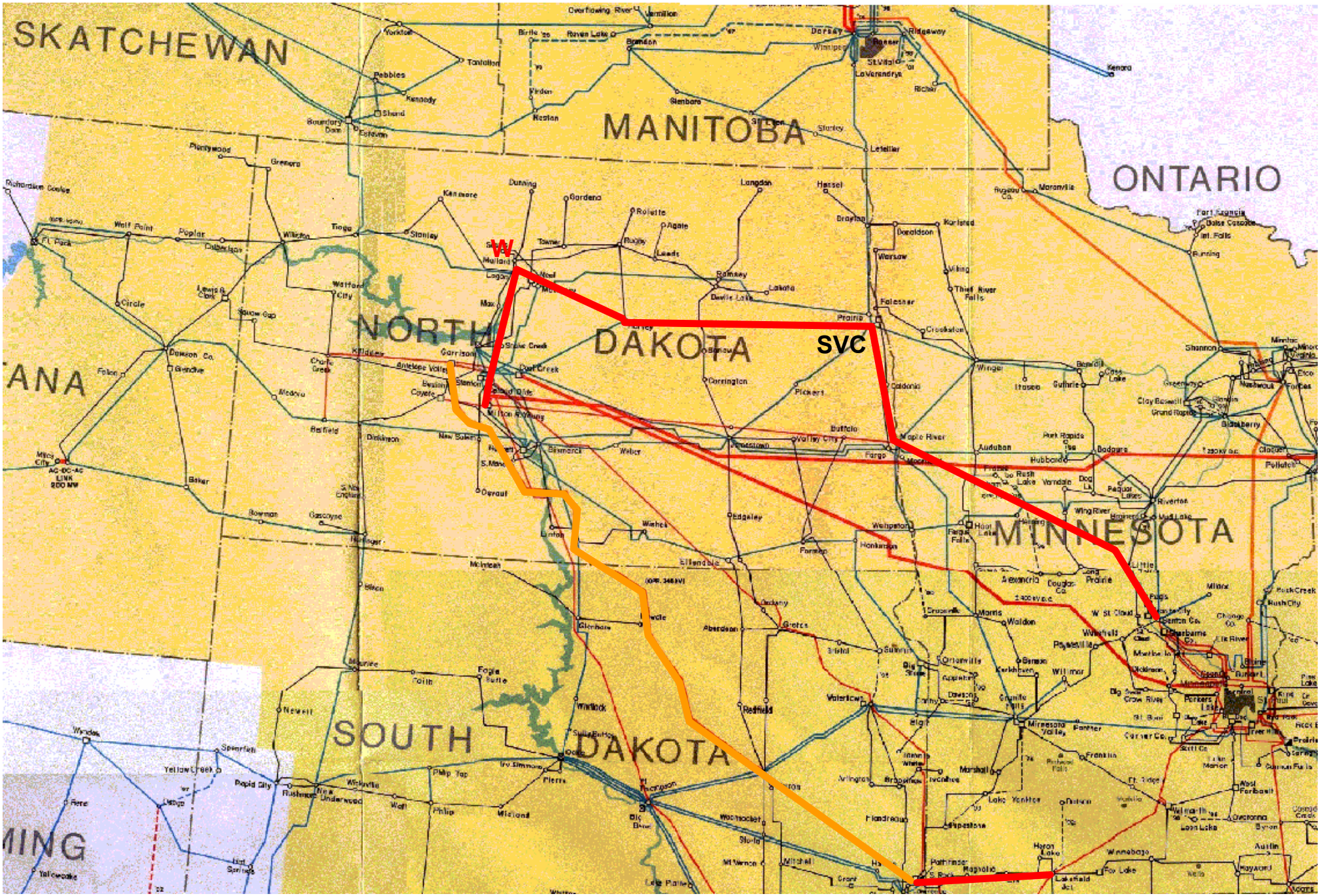


Figure 7.6 - Site 3 (Minot) Selected Alternative

8. SITE 4 - FT. THOMPSON

8.1 Introduction

This section considers a 1000 MW wind generation farm connected to the Ft Thompson, SD 345 kV Station (Bus 506) and with power transfers to the Twin Cities. The transmission reinforcements required to accommodate these transfers were first designed and selected on the basis of dynamic simulation. Alternatives meeting dynamic criteria were then further investigated in terms of thermal performance and other criteria (such as losses and cost).

A roadmap for the stability studies is included in Figure 8.1. "Selected" alternatives (i.e., alternatives that were subjected to more detailed thermal and other analyses, as well as costing) are highlighted in red in Figure 8.1.

8.2 Dynamic Analysis of Cases with Three 345 kV Lines Emanating from Ft. Thompson

These cases investigated the upgrade of one of two 230 kV circuits form Ft Thompson to Huron to 345 kV, either as part of a Ft Thompson - Huron - Granite Falls - Blue Lake 345 kV circuit, or of a Ft Thompson - Huron - Split Rock - Lakefield Junction 345 kV circuit for transfer capability to the Twin Cities.

8.2.1 Case S4C1XXX

This case includes the following transmission upgrades:

- Upgrade of one of the two 230 kV circuits from Ft Thompson through Granite Falls to 345 kV (206 miles).
- 500 MVA 345/230 kV transformer at Granite Falls
- New 345 kV circuit from Granite Falls to Blue Lake (100 miles)

Further details on these reinforcements are provided in Table 8.1. Stability results are shown in Table 8.2. Selected simulation results are included in Appendix 24. With this configuration, the new wind generation is unstable for the loss of any of the three 345 kV lines emanating from Ft Thompson (to Grand Island - ch3, Leland Olds - ci3, and Huron - cj3).

This is not a viable alternative.

8.2.2 Case S4C1XXA

This case has the following upgrades:

- Upgrade of one of the two 230 kV circuits from Ft Thompson through Granite Falls to 345 kV (206 miles)
- 500 MVA 345/230 kV transformer at Granite Falls
- New 345 kV circuit from Granite Falls to Blue Lake (100 miles)
- 700 Mvar SVC at the wind generator terminals

In other words; the case is the same as Case S4C1XXX in Section 8.2.1, but with a 700 Mvar SVC at the terminals of the wind unit (See Table 8.3).

Stability results are shown in Table 8.4 and detailed in Appendix 25. The wind generation is still unstable for the loss of the Huron line (contingency cj3), as illustrated in Figure 8.2, and the Forbes relay margin is low (24%) for the loss of the Grand Island line (contingency ch3). Tripping the wind unit for these two contingencies satisfies the stability criteria, as shown in contingencies cn3 and co3, respectively.

This case satisfies MAPP stability criteria provided the new wind generation is tripped for the loss of Ft Thompson - Huron and Ft Thompson - Grand Island 345 kV lines.

8.2.3 Case S4C2XX1

This case has the following 345 kV transmission upgrades:

- Upgrade one of the two Ft Thompson – Huron 230 kV circuits to 345 kV (62 miles)
- New Huron – Split Rock 345 kV line (110 miles)
- New Split Rock – Lakefield Junction 345 kV line (62 miles)

Parameters for these upgrades are shown in Table 8.5. The stability performance for this configuration is provided in Table 8.6 and Appendix 26, and is unacceptable for the local contingencies (loss of the 345 kV lines emanating from Ft Thompson to Leland Olds [ci3], Grand Island [ch3] and Huron [cj3]).

This is not a viable alternative.

8.2.4 Case S4C2X1A

This case has the following transmission upgrades:

- Upgrade one of the two Ft Thompson – Huron 230 kV circuits to 345 kV (62 miles)
- New Huron – Split Rock 345 kV line (110 miles)
- New Split Rock – Lakefield Junction 345 kV line (62 miles)
- SVC at wind generator terminals

In other words; the case is the same as Case S4C2XX1 in Section 8.2.3, but with a 700 Mvar SVC at the terminals of the wind unit (See Table 8.7).

The stability performance of this configuration is summarized in Table 8.8 and detailed in Appendix 27. With the SVC, the wind unit is stable for the local contingencies, however the relay margin for the loss of the Ft Thompson - Grand Island 345 kV line is 30%, which is unacceptable. If the wind unit is tripped after 12 cycles for this contingency (Contingency co3) the relay margin increases to 70%.

This is a viable alternative provided the wind generator is tripped for the loss of the Ft Thompson - Grand Island 345 kV line.

8.3 Dynamic Analysis of Cases with Four 345 kV lines Emanating from Ft Thompson

8.3.1 Case S4C5XXA

This case includes the following upgrades:

- Upgrade one of the two 230 kV circuits from Ft Thompson through Granite Falls to 345 kV (206 miles).
- 500 MVA 345/230 kV transformer at Granite Falls
- New 345 kV circuit from Granite Falls to Blue Lake (100 miles).
- Upgrade of one of the two 230 kV circuits between Ft Thompson - Sioux Falls (in the vicinity of Split Rock) to 345 kV (146 miles)
- New Split Rock - Lakefield Junction 345 kV circuit (62 miles)
- SVC at the wind generator terminals

Thus, this case is the same as S4C1XXA in Section 8.2.2, but with a 345 kV upgraded line between Ft. Thompson and Sioux Falls/Split Rock and a new 345 kV line between Split Rock and Lakefield Junction (See Table 8.9).

The stability performance of this configuration is summarized in Table 8.10. Selected simulation results are detailed in Appendix 28. The Forbes relay margin for the loss of Ft Thompson - Grand Island (ch3) and Ft Thompson - Split Rock 345 kV (ck3) lines is in both cases 44%. This is slightly less than the 50% required per MAPP criteria.

Nevertheless, this was assumed a viable alternative. The alternative does not require tripping the wind generator for local contingencies.

8.3.2 Case S4C4XXA

This case includes the following upgrades:

- Upgrade one of the two Ft Thompson – Huron 230 kV circuits to 345 kV (62 miles)
- New Huron – Split Rock 345 kV line (110 miles)
- New Split Rock – Lakefield Junction 345 kV line (62 miles)
- SVC at generator terminals
- Upgrade one of the two 230 kV circuits between Ft Thompson - Sioux Falls/Split Rock (146 miles).

This case is the same as S4C2X1A in Section 8.2.4, but with a 345 kV upgraded line between Ft. Thompson and Sioux Falls/Split Rock (See Table 8.11).

The stability performance of this configuration is summarized in Table 8.12 and Appendix 29. The lowest Forbes relay margin observed was 45% for loss of the Ft Thompson - Grand Island line (ch3).

This is a viable alternative that does not require the tripping of the wind generator for local contingencies (albeit with a Forbes relay margin violation for fault and outage of the Ft. Thompson-Grand Island 345 kV line).

8.4 Conclusions from Dynamic Analyses of Site 4

The dynamics of Site 4 alternatives is dominated by the impact of fault and outage of 345 kV lines emanating from the Site, particularly those with a southern and eastern direction, since that is the general direction of flows through Ft. Thompson, even without the additional generation. Because the site is relatively far from the Coal Fields and the Manitoba Hydro systems, regional contingencies (such as ag1, ag3, ei2, etc.) are less of a concern.

Two of the four selected alternatives require tripping of the new wind generation following the fault and outage of 345 kV lines to the South. They are:

- Case S4C1XXA, with a Ft. Thompson-Granite Falls-Blue Lake 345 kV circuit. Requires tripping of the wind generation for fault and outage of the 345 kV line to Grand Island.
- Case S4C2X1A, with a Ft. Thompson-Huron-Split Rock-Lakefield Junction 345 kV circuit. Requires tripping of the wind generation for fault and outage of the 345 kV lines to Grand Island and Huron, respectively.

The remaining two alternatives are the same as the above, but include the upgrade to 345 kV of one of the two Ft. Thompson to Sioux Falls 230 kV Ckts. With these reinforcements, system performance meets criteria (albeit marginally) following local contingencies, <u>without</u> resorting to generation tripping:

- Case S4C5XXA, with a Ft. Thompson-Granite Falls-Blue Lake 345 kV circuit + a Ft. Thompson-Sioux Falls 345 kV Ckt. and a Split Rock to Lakefield Junction 345 kV Ckt.
- Case S4C2X1A, with a Ft. Thompson-Huron-Split Rock-Lakefield Junction 345 kV circuit and a Ft. Thompson-Sioux Falls 345 kV Ckt.

In all cases a 700 Mvar SVC was included at the wind generator terminals for reactive support since the new wind generation is located far from generation sources.

The above alternatives are summarized in Table 8.13a and their associated reinforcements are listed in the sections below. Critical interface flows are listed in Table 8.13b.

8.4.1 Case S4C1XXA

Transmission upgrades were (See Figure 8.3):

- Upgrade of one of the two 230 kV circuits from Ft Thompson through Granite Falls to 345 kV (206 miles)
- 500 MVA 345/230 kV transformer at Granite Falls
- New 345 kV circuit from Granite Falls to Blue Lake (100 miles)
- 700 Mvar SVC at the wind generator terminals

8.4.2 Case S4C2X1A

This alternative includes the following transmission upgrades (See Figure 8.4):

- Upgrade one of the two Ft Thompson – Huron 230 kV circuits to 345 kV (62 miles)
- New Huron – Split Rock 345 kV line (110 miles)
- New Split Rock – Lakefield Junction 345 kV line (62 miles)
- SVC at wind generator terminals

8.4.3 Case S4C4XXA

Transmission upgrades were (See Figure 8.5):

- Upgrade one of the two Ft Thompson – Huron 230 kV circuits to 345 kV (62 miles)
- New Huron – Split Rock 345 kV line (110 miles)
- New Split Rock – Lakefield Junction 345 kV line (62 miles)
- SVC at generator terminals
- Upgrade one of the two 230 kV circuits between Ft Thompson - Sioux Falls (146 miles).

8.4.4 Case S4C5XXA

Transmission upgrades were (See Figure 8.6):

- Upgrade one of the two 230 kV circuits from Ft Thompson through Granite Falls to 345 kV (206 miles).
- 500 MVA 345/230 kV transformer at Granite Falls
- New 345 kV circuit from Granite Falls to Blue Lake (100 miles).
- Upgrade of one of the two 230 kV circuits between Ft Thompson - Sioux Falls to 345 kV (146 miles)
- New Split Rock - Lakefield Junction 345 kV circuit (62 miles)
- SVC at the wind generator terminals

8.5 Thermal Analysis of Selected Alternatives

MUST results for each of the selected alternatives are included in Table 8.14. A summary of the thermal analysis results is included in Table 8.15.

8.5.1 Case S4C1XXA

This case includes the following upgrades:

- Ft. Thompson – Granite Falls upgraded one of two circuits to 345 kV
- New Granite Falls – Blue Lake 345 kV line
- SVC at wind generation terminals for reactive support

The following overloads were observed:

Loss of Ft.Thompson – Ft. Randall 230 kV line.
Overloads the Ft. Thompson - Lake Platte 230 kV line by 17% and the Ft. Randall - Lake Platte 230 kV line by 9%. Conversely, the outage of Ft. Thompson - Lake Platte 230 kV line overloads the Ft.Thompson – Ft. Randall 230 kV line by 5%. The fact that these lines' conductor ratings (Rate "B") are 26% higher than their respective emergency ratings (Rate "C") suggests that these limitations can be overcome by the relatively low cost replacement of equipment (current transformers, line wave traps, etc.) that is preventing the full use of conductor thermal capacity.

Loss of Sioux City – Plymouth 161 kV.
Leads to a 43% overload of the underlying Sioux City – Plymouth 69 kV line. This latter line was overloaded by 26% in the base case for the same contingency.

8.5.2 Case S4C2X1A

This case includes the following upgrades:

- Upgrade of one of the two Ft Thompson – Huron 230 kV circuits to 345 kV
- New Huron – Split Rock 345 kV line
- New Split Rock – Lakefield Junction 345 kV line
- SVC at the wind generator terminal for reactive support

The following overloads were observed:

Loss of Ft.Thompson – Ft. Randall 230 kV
- Ft. Thompson – Lake Platte 230 kV - 7%
- Ft. Randall – Lake Platte 230 kV line - 4%

Loss of Raun – Leigh 345 kV
- Monona – Caroll 161 kV line - 11%

Loss of Sioux City – Denison 230 kV
- Neal – Monona 161 kV - 5%

8.5.3 Case S4C4XXA

This case includes the following upgrades:

- Upgrade of one of the two Ft Thompson – Huron 230 kV circuits to 345 kV
- New Huron – Split Rock 345 kV line
- New Split Rock – Lakefield Junction 345 kV line

- Upgrade of one of the two Ft Thompson – Sioux Falls 230 kV circuits to 345 kV
- SVC at the wind generator terminal for reactive support

The following overloads were observed:

Loss of Raun-Leigh 345 kV
- Monona – Caroll 161 kV - 12%

Loss of Sioux City-Denison 230 kV
- Monona – Neal 161 kV - 5%

8.5.4 Case S4C5XXA

This case includes the following upgrades:

- Ft. Thompson – Granite Falls upgraded one of two circuits to 345 kV
- New Granite Falls – Blue Lake 345 kV line
- Upgrade of one of the two Ft Thompson – Sioux Falls 230 kV circuits to 345 kV
- New Split Rock – Lakefield Junction 345 kV line
- SVC at wind generation terminals for reactive support

The following overloads were observed:

Loss of Ft.Thompson – Ft. Randall 230 kV line.
Ft. Thompson - Lake Platte 230 kV line - 11%.

8.5.5 Conclusions from Thermal Analyses

Relatively few overloads characterize Site 4, overloads that in most cases can be overcome by the relatively low cost replacement of equipment (current transformers, line wave traps, etc.) that is preventing the full use of conductor thermal capacity.

As in Site 3 (Minot) this is in part attributable to the fact that the new generation was assumed concentrated at a single plant, with connection to a 345 kV Station (as opposed to the various wind farms connected at 230 kV and 115 kV assumed in Sites 1 and 2). However, it is also the result of the fact that the Ft. Thompson Station is a well-established station, with a variety of 345 kV and 230 kV circuits connecting it to the rest of the MAPP system.

8.6 Transmission Losses

Transmission losses for each of the four selected alternatives are compared in Table 8.16 against those in Case ABBBASE.

Table 8.16
Incremental Transmission Losses for Selected Alternatives

CASE	LOSSES (MW)	LOSSES (%)
S4C1XXA	176.2	17.6
S4C2X1A	170.8	17.1
S4C4XXA	149.4	14.9
S4C5XXA	117.0	11.7

Of all selected alternatives, the one with the least losses (S4C5XXA - 11.7%) includes, in addition to a 345 kV transmission between Ft. Thompson and Blue Lake, a 345 kV line from Ft. Thompson to Split Rock (Sioux Falls) to Lakefield Junction. Higher losses (14.9%) are incurred in Alternative S4C4XXA, which instead of a 345 kV transmission between Ft. Thompson and Blue Lake, includes a 345 kV transmission from Ft. Thompson to Huron to Split Rock.

Eliminating the Ft. Thompson to Sioux Falls upgrade in the above two alternatives (as well as the Split Rock to Lakefield Junction 345 kV line in S4C5XXA) leads to Alternatives S4C1XXA and S4C2X1A, respectively, which incur losses of 17.6% and 17.1%, respectively.

The analyses were repeated but with base cases with the new wind generation dispatched at 1/3 of its MW rating. The results are summarized in Table 8.17, in MW, and as a % of the dispatch of the new units (333.33 MW). The much-reduced output levels on the new wind generation leads to significant reductions in losses. The two cases including a Ft. Thompson to Sioux Falls 345 kV line display reductions in transmission losses at this dispatch level.

Table 8.17
Incremental Transmission Losses for Selected Alternatives (New Generation dispatched at 1/3 of MW Rating)

CASE	LOSSES (MW)	LOSSES (%)
S4C1XXA	19.7	5.9
S4C2X1A	10.2	3.1
S4C4XXA	-3.3	-1.0
S4C5XXA	-21.4	-6.4

8.7 Constrained Interface Impact Studies

8.7.1 Introduction

DFCALC results comparing interface flows in the selected alternatives against those in Case ABBBASE are summarized in Table 8.18.

8.7.2 Impact on NDEX Interface

Listed in Table 8.19 are NDEX transfer levels for the selected alternatives and its change with respect to the 2080 MW base level in % of the 1000 MW of new generation. Because the Ft. Thompson Station is outside the NDEX Interface boundary, the Site's impact on that interface is negligible. Calculation of incremental NDEX losses is also not applicable.

Table 8.19
Impact of Selected Alternatives on NDEX Flow (Base Level: 2080 MW)

CASE	NDEX		
	MW	% CHANGE	% LOSSES
S4C1XXA	2067.2	-1.3	N/A
S4C2X1A	2074.3	-0.6	N/A
S4C4XXA	2075.7	-0.5	N/A
S4C5XXA	2075.2	-0.5	N/A

8.7.3 Impact on other Constrained Interfaces

Other constrained interfaces exhibiting impacts above the 5% threshold are:

Case S4C1XXA
- 7.3% Impact on the Grand Island-Lincoln Interface
- 7.6% Impact on the Cooper-South Interface

Case S4C2X1A
- 13.1% Impact on the Cooper-South Interface
- 11.1% Impact on the Ft. Calhoun-South Interface

Case S4C4XXA
- 13.7% Impact on the Cooper-South Interface
- 13.3% Impact on the Ft. Calhoun-South Interface

Case S4C5XXA
- 8.6% Impact on the Cooper-South Interface
- 7.6% Impact on the Ft. Calhoun-South Interface

The South Dakota location of this site makes it more prone to adverse interactions with the Grand Island-Lincoln, Copper-South, and Ft. Calhoun-South Flowgates.

8.7.4 Impact on MH-US 500 kV Transmission

Results in Table 8.20 suggest that adverse interactions between this site and the MH>US transmission are less of a concern than for other sites. Once again, location is the determinant factor.

Table 8.20
Impact of Selected Alternatives on D602F Flow and 500 kV Reactive Performance

CASE	CHANGE WITH RESPECT TO BASE CASE			
	D602F MW	500 KV MVAR LOSSES	DORSEY SC MVARS	FORBES SVC MVARS
S4C1XXA	42.3	90.5	39	7
S4C2X1A	32.7	68.4	27	3
S4C4XXA	26.9	54.4	16	5
S4C5XXA	16.0	30.1	0	2

8.8 Capital Costs

Costs were developed on the basis of the MAPP Cost Estimator and ABB's budgetary estimates. The results are summarized in Table 8.21. Even though wind generation was modeled as a single unit in the studies for this site, the SVC costs assume ten 70 Mvar installations.

Table 8.21
Capital Costs (2001 dollars, in millions)

CASE	LINES	STATIONS	SVCs	SERIES COMP.	TOTAL
S4C1XXA	87.94	13.15	53.10	-	$154.19
S4C2X1A	81.10	6.95	53.10	-	$141.15
S4C4XXA	116.14	8.85	53.10	-	$178.09
S4C5XXA	146.85	19.15	53.10	-	$219.10

The costs in Table 8.21 suggest that, as expected, Cases S4C1XXA and S4C2X1A, which are less reliable (since they require generation tripping following critical contingencies), are also the least expensive. The most expensive alternative is S4C5XXA, which includes a Ft. Thompson to Blue Lake 345 kV circuit, as well as the upgrade to 345 kV of one of two 230 kV circuits between Ft. Thompson and Sioux Falls, and a new Split Rock to Lakefield Junction 345 kV line.

Figure 8.1
Road-Map for Case Development - Site 4 (Ft. Thompson)

S4C1XXX.xls: Unstable for loss of 345 kV lines to G.Island (ch3), L.Olds (ci3), and Huron (cj3)

- Ft. Thompson – Granite Falls upgrade
- Granite Falls – Blue Lake

↓

S4C1XXA.xls: Meets criteria, but requires generation tripping for loss of Huron and Grand Island lines

- SVC at wind generator terminal

↓

S4C5XXA.xls: Meets criteria, but relay margin is 44% for loss of lines to Huron and Grand Island

- Ft Thompson – Sioux Falls upgrade
- Split Rock - Lakefield

S4C2XX1.xls: Unstable for loss of 345 kV lines to G.Island (ch3), L.Olds (ci3), and Huron (cj3)

- Ft Thompson – Huron
- Huron – Split Rock
- Split Rock – Lakefield

↓

S4C2X1A.xls: Meets criteria, but requires generation tripping for loss of the Grand Island line

- SVC at wind generator terminal

↓

S4C4XXA.xls: Meets criteria, but relay margin for loss of the Grand Island line is 45%

- Ft Thompson – Sioux Falls upgrade

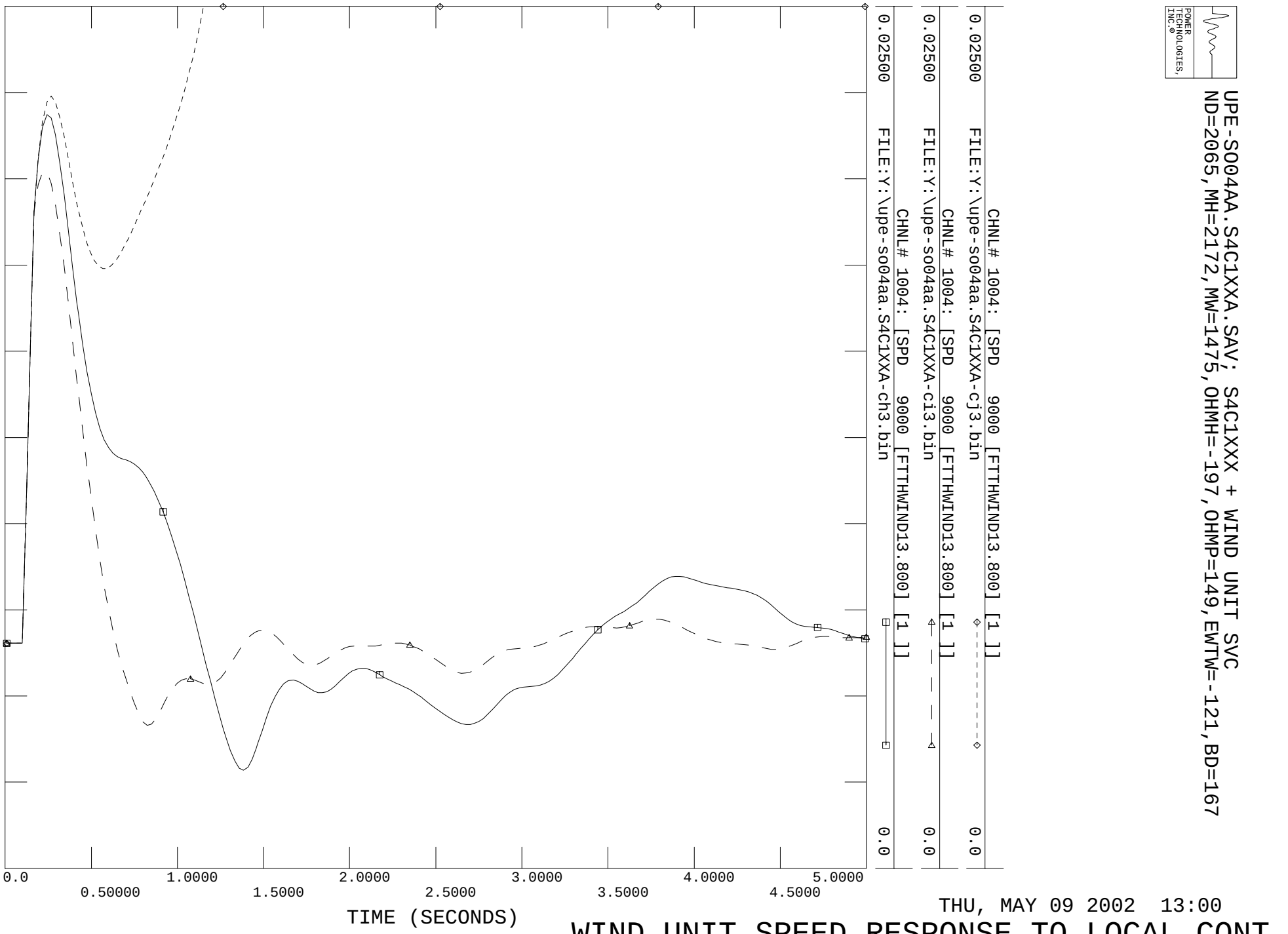


Figure 8.2 - Case S4C1XXA - Wind Unit Performance for Local Contingencies

Case S4C1XXA

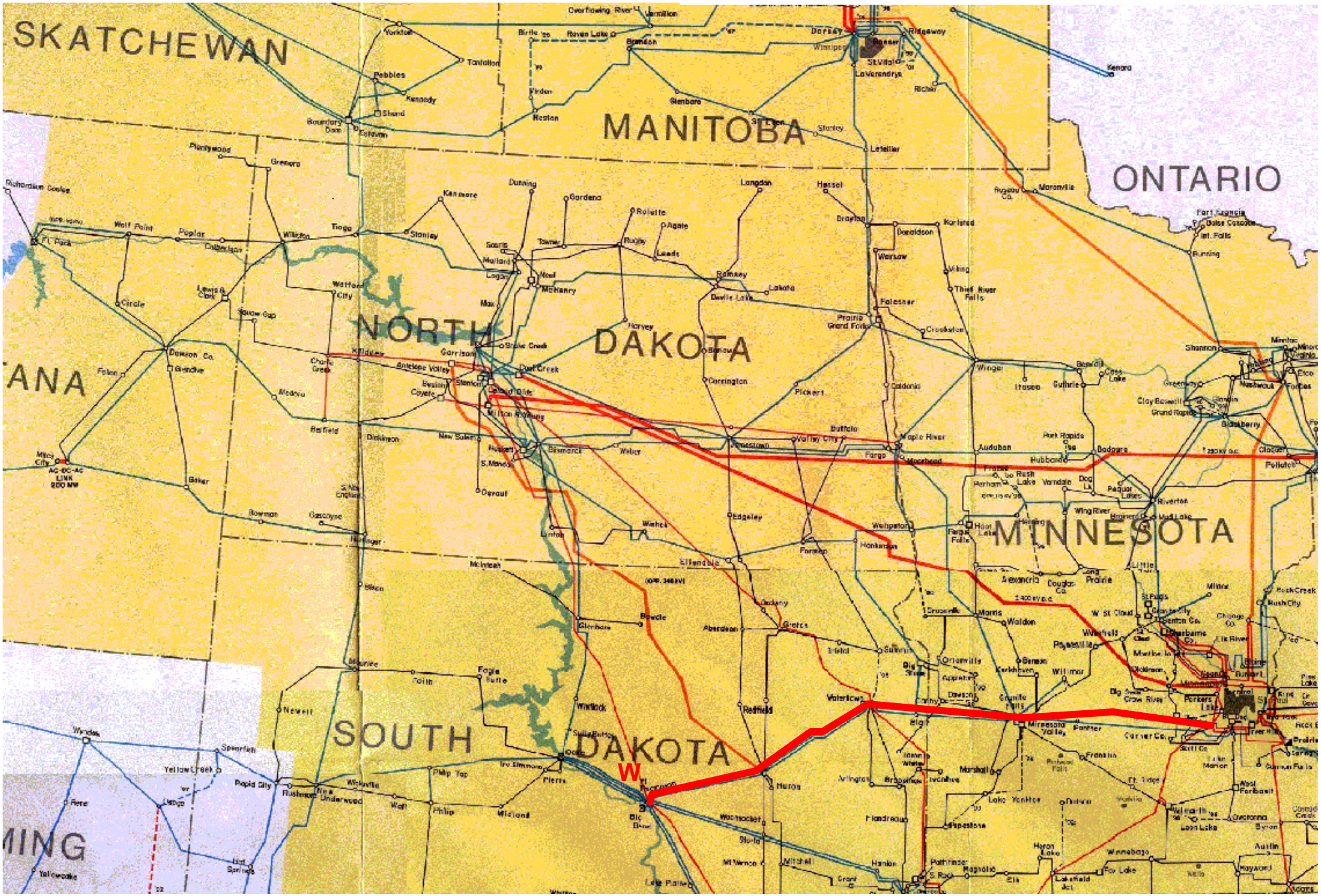


Figure 8.3 - Site 4 (Ft. Thompson) Selected Alternative

Case S4C2X1A

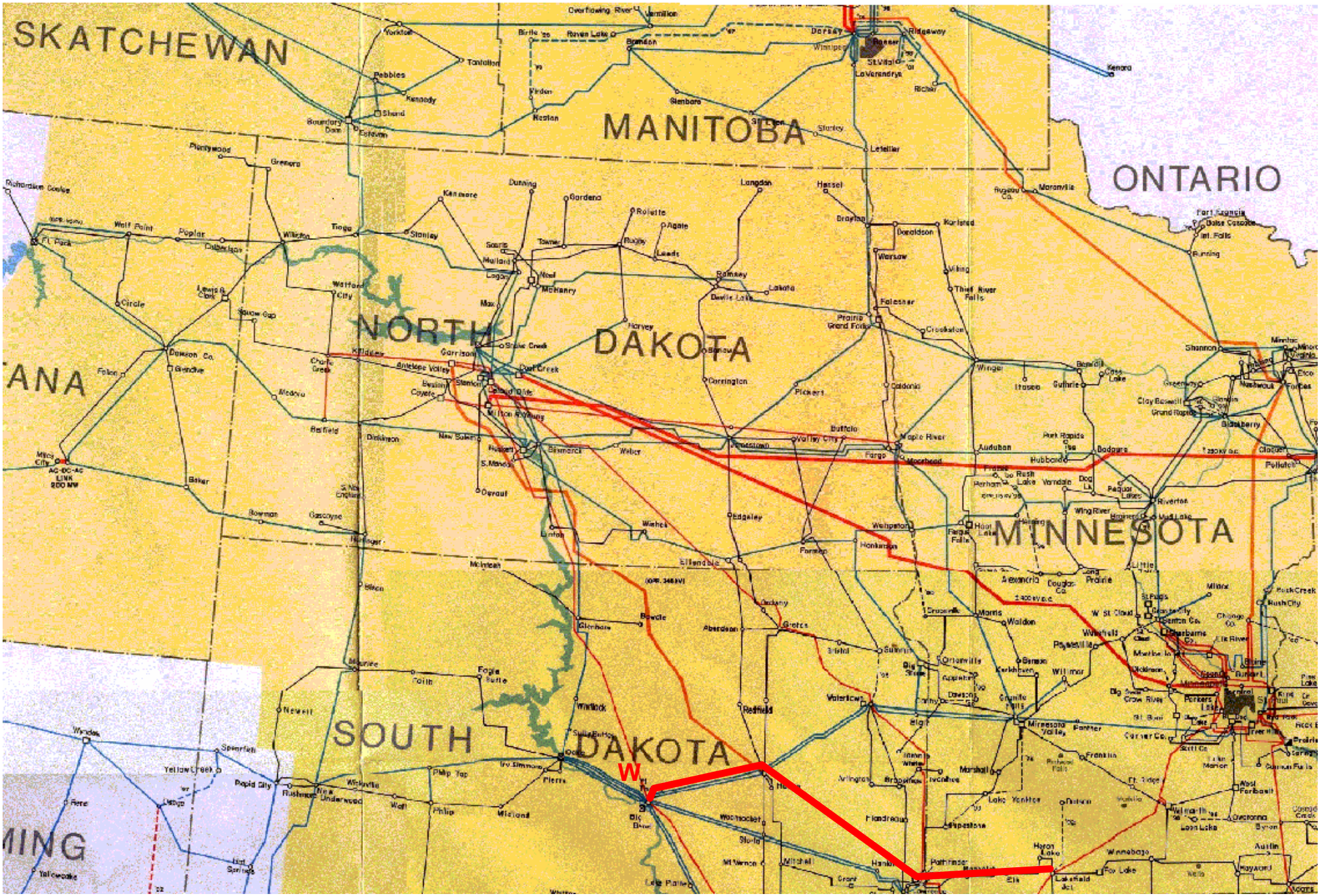


Figure 8.4 - Site 4 (Ft. Thompson) Selected Alternative

Case S4C4XXA

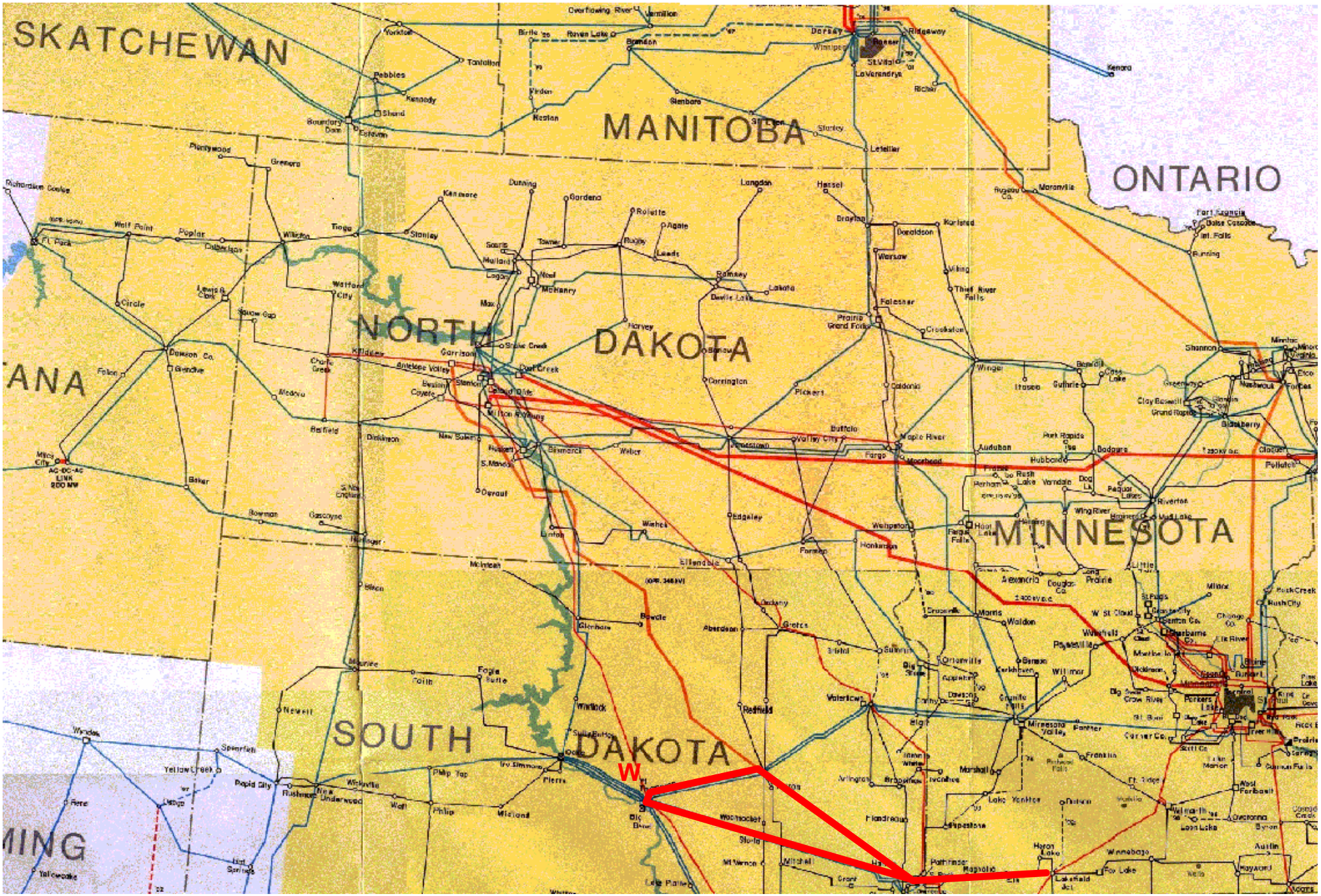


Figure 8.5 - Site 4 (Ft. Thompson) Selected Alternative

Case S4C5XXA

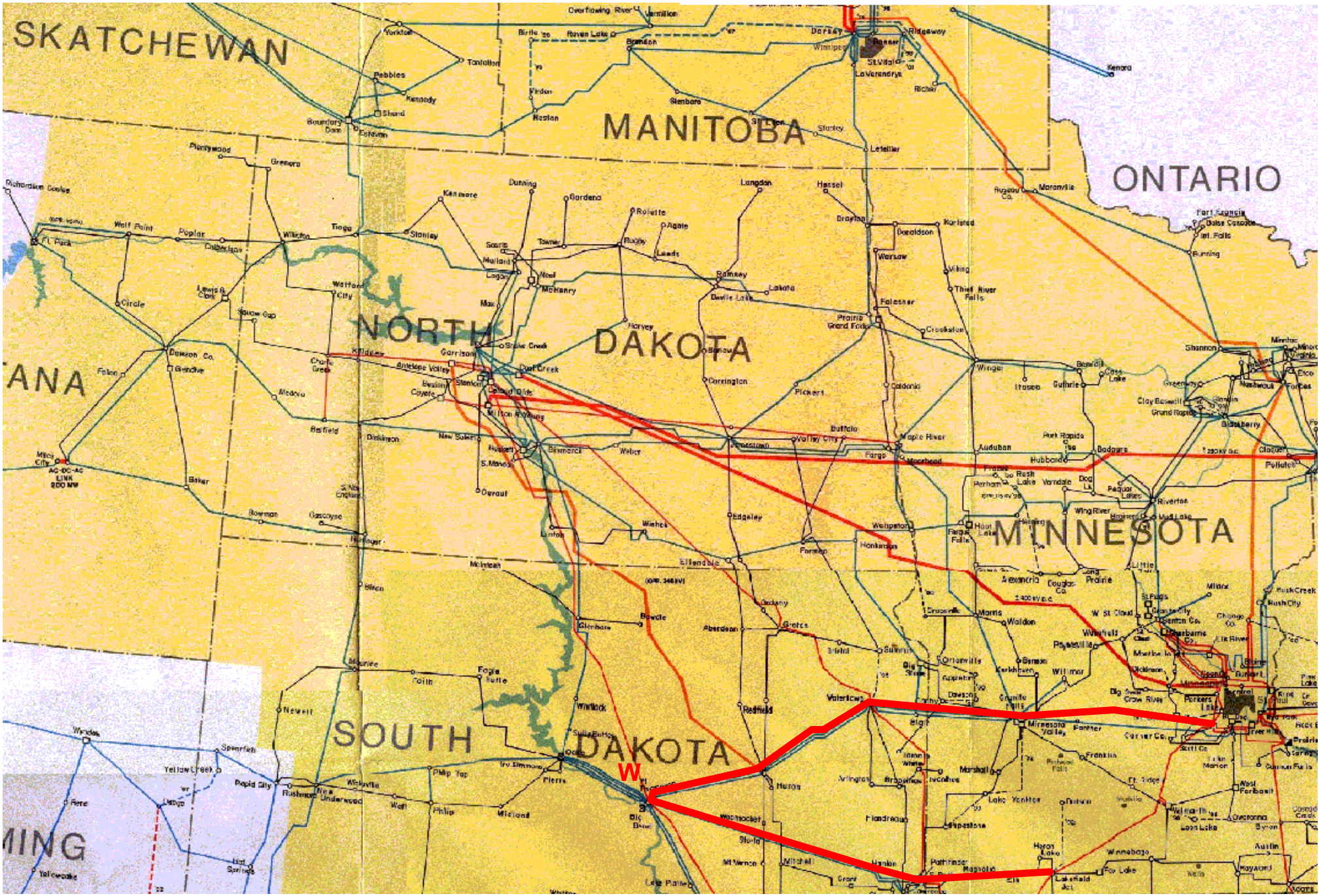


Figure 8.6 - Site 4 (Ft. Thompson) Selected Alternative

9. SITE 5 - WATERTOWN

9.1 Introduction

This section describes the analysis of a 1000 MW wind generation plant connected to the Watertown, ND 345 kV Station (Bus 529) with power transfers to the Twin Cities.

9.2 Dynamic Analyses of Site 5 Alternatives

The cases developed for Site 5 were all based on a base configuration which included an upgrade of Watertown - Granite Falls 230 kV (one of two circuits) to 345 kV and a new Granite Falls - Blue Lake 345 kV line.

A roadmap for the stability studies is included in Figure 9.1. For the purpose of clarity, however, not all of the cases indicated in that figure are discussed in the sections that follow. "Selected" alternatives (i.e., alternatives that were subjected to more detailed thermal and other analyses, as well as costing) are highlighted in red in Figure 9.1.

9.2.1 Case S5C1XXX - Base Configuration

The transmission upgrades for the base configuration were:

- Upgrade Watertown – Granite Falls (75 miles, one of two circuits) from 230 kV to 345 kV.
- New Granite Falls – Blue Lake 345 kV (100 miles)
- 500 MVA 345/230 kV transformer at Granite Falls.

The parameters for these transmission upgrades are provided in Table 9.1. Table 9.2 summarizes the stability performance of this base configuration. Selected simulation results are detailed in Appendix 30. The wind unit is unstable for loss of the Watertown - Granite Falls (Contingency cp3) and Watertown - White (Contingency cq3) 345 kV lines.

This alternative requires further local reinforcements. The subsequent cases investigate the benefit of an SVC at the generator terminals (Case S5C1XXA) versus an additional 345 kV outlet from Watertown (Case S5C5XXX).

9.2.2 Case S5C1XXA

This alternative is similar to Case S5C1XXX, but includes an SVC at the wind generator terminals. The transmission upgrades for this alternative include:

- Upgrade Watertown – Granite Falls (75 miles, one of two circuits) from 230 to 345 kV.
- New Granite Falls – Blue Lake 345 kV (100 miles)
- 500 MVA 345/230 kV transformer at Granite Falls
- 700 Mvar SVC installed at the generator terminals

The parameters for the SVC are provided in Table 9.3. Table 9.4 summarizes the stability performance for this alternative. Detailed results are included in Appendix 31. With the SVC at the generator terminals, the wind unit is stable for the local contingencies.

This is a viable alternative for Site 5.

9.2.3 Case S5C5XXX

This case is similar to Case S5C1XXX, but includes an upgrade from 230 kV to 345 kV of one of the Huron - Watertown 230 kV Ckts. and a new Huron - Split Rock 345 kV line. The complete list of transmission upgrades for this alternative is:

- Upgrade Watertown – Granite Falls (75 miles, one of two circuits) from 230 kV to 345 kV.
- New Granite Falls – Blue Lake 345 kV (100 miles)
- 500 MVA 345/230 kV transformer at Granite Falls
- Upgrade Huron - Watertown from 230 kV to 345 kV (71 miles)
- New Huron - Split Rock 345 kV line (110 miles)

The parameters for these transmission upgrades are provided in Table 9.5. The stability performance is summarized in Table 9.6 and detailed in Appendix 32. With the additional 345 kV outlet from Watertown, the wind unit is stable for local contingencies.

This is a viable alternative for Site 5.

9.3 Conclusions from Dynamic Analyses of Site 5

Assuming a base configuration with an upgrade of Watertown - Granite Falls 230 kV (one of two circuits) to 345 kV, and a new Granite Falls - Blue Lake 345 kV line, the only stability issues for this site are associated with the fault and outage of the 345 kV lines emanating from Watertown. These stability concerns can be overcome by either (1) adding an SVC at the wind generator terminals (Case S5C1XXA), or (2) adding a new 345 kV line towards Huron and a new 345 kV Ckt. from Huron to Split Rock 345 kV (Case S5C5XXX).

The above alternatives are summarized in Table 9.7a and their associated reinforcements are listed in the sections below. Critical interface flows are listed in Table 9.7b.

9.3.1 Case S5C1XXA.

The transmission upgrades for this alternative were (See Figure 9.2):

- Upgrade Watertown – Granite Falls (75 miles, one of two circuits) from 230 kV to 345 kV
- New Granite Falls – Blue Lake 345 kV (100 miles)

- 500 MVA 345/230 kV transformer at Granite Falls
- 700 Mvar SVC installed at wind generation terminals.

9.3.2. Case S5C5XXX

This alternative includes (See Figure 9.3):

- Upgrade Watertown – Granite Falls (75 miles, one of two circuits) from 230 kV to 345 kV.
- New Granite Falls – Blue Lake 345 kV (100 miles)
- 500 MVA 345/230 kV transformer at Granite Falls
- Upgrade Huron - Watertown from 230 kV to 345 kV (71 miles)
- New Huron - Split Rock 345 kV line (110 miles)

9.4 Thermal Analyses of Selected Alternatives

MUST results for each of the selected alternatives are included in Table 9.8. A summary of the thermal analysis results is included in Table 9.9.

Upgrades common to all Site 5 alternatives are:

- Upgrade Watertown – Granite Falls (one of two circuits) from 230 kV to 345 kV
- New Granite Falls – Blue Lake 345 kV line

9.4.1 Case S5C1XXA

In addition to upgrades common to all Site 5 Alternatives, this case includes:

- SVC at wind generation terminals for reactive support

The following overloads were observed:

Loss of White-Split Rock 345 kV

- Brookings-Flandreau 115 kV - 15%

Loss of Watertown-White 345 kV

- Brookings-Watertown 115 kV - 8%

Loss of Watertown-Granite Falls 345 kV

- Watertown-White 345 kV - 7%
- Blair-Granite Falls 230 kV - 16%

Loss of Granite Falls - Willmar 230 kV

- Willmar-Kerkhoven 115 kV - 21%

Minnesota Valley-Redwood Falls 115 kV

- HenryTR – BirdIsl 69 kV– 21%
- HenryTR – Birch 69 kV – 16%
- Franklin – Birch 69 kV – 13%

Overloads were also observed on facilities remote with respect to Site 5 generation. These facilities were already overloaded in the basecase without the new generation, but the new generation facilities increased the overload value by about 15%:

Loss of Wing River-Inman 230 kV
- Alexandria – Douglas Co. 115 kV - 21%
- Alexandria – Alexandria Switching Station 115 kV - 27%

9.4.2 Case S5C5XXX

In addition to upgrades common to all Site 5 Alternatives, this case includes:

- Upgrade Watertown – Huron (one of two circuits) from 230 kV to 345 kV
- New Huron – Split Rock 345 kV line

The following overloads were observed:

Loss of Watertown-Granite Falls 345 kV
- Blair-Granite Falls 230 kV - 10%

Loss of Ft. Thompson-Storla 230 kV
- Huron-Woonsocket 115 kV - 32%

Loss of Minnesota Valley-Redwood falls 115 kV
- HenryTR – BirdIsl 69 kV– 18%
- HenryTR – Birch 69 kV – 14%

Loss of Sioux City-Plymouth 115 kV
- Sioux City-Plymouth 69 kV - 48%

9.4.3 Case S5C3XXX

This Case is the same as S5C5XXX but it also includes:

- New Split Rock -Lakefield Junction 345 kV line

Although this reinforcement is not necessary for dynamics (See Figure 9.1), it significantly improves thermal performance. Results in Tables 9.8 and 9.9 suggest that with this upgrade in place there are essentially no thermal overloads of concern.

9.4.4 Conclusions from Thermal Analyses

Relatively few overloads characterize Site 5. This is in part attributable to the fact that the new generation was assumed concentrated at a single plant, with connection to a 345 kV Station (as opposed to the various wind farms connected at 230 kV and 115 kV assumed in Sites 1 and 2). Case S5C5XXX, which includes a Watertown-Huron-Split Rock 345 kV line leads to improved performance over Case S5C1XXA. This

performance is further improved if a new Split Rock to Lakefield Junction 345 kV line is assumed.

9.5 Transmission Losses

Transmission losses for the two selected alternatives are compared in Table 9.10 against those in Case ABBBASE.

Table 9.10
Incremental Transmission Losses for Selected Alternatives

CASE	LOSSES (MW)	LOSSES (%)
S5C1XXA	123.4	12.3
S5C5XXX	93.2	9.3

Because the Watertown Site is the closest to the Twin Cities of all sites studied, transmission losses are moderate even under these "all 345 kV" alternatives. As expected, Alternative S5C5XXX, which, in addition to the reinforcements in S5C1XXA, includes a Watertown to Huron to Split Rock 345 kV line, exhibits lower losses than in the latter alternative.

The analyses were repeated but with base cases with the new wind generation dispatched at 1/3 of its MW rating. The results are summarized in Table 9.11, in MW, and as a % of the dispatch of the new units (333.33 MW). The much reduced generation levels on the new wind generation leads to negligible incremental losses (and in Case S5C5XXX to an actual reduction in losses) with respect to the base case with no additional generation (Case ABBBASE).

Table 9.11
Incremental Transmission Losses for Selected Alternatives (New Generation dispatched at 1/3 of MW Rating)

CASE	LOSSES (MW)	LOSSES (%)
S5C1XXA	8.9	2.7
S5C5XXX	-21.7	-6.5

9.6 Constrained Interface Impact Studies

9.6.1 Introduction

DFCALC results comparing interface flows in the selected alternatives against those in Case ABBBASE are summarized in Table 9.12.

9.6.2 Impact on NDEX Interface

Listed in Table 9.13 are NDEX transfer levels for the selected alternatives and their change with respect to the 2080 MW base level in % of the 1000 MW of new generation. Because the Watertown Station is outside the NDEX Interface boundary,

the Site's impact on that interface is negligible. Calculation of incremental NDEX losses is also not applicable.

Table 9.13
Impact of Selected Alternatives on NDEX Flow (Base Level: 2080 MW)

CASE	NDEX		
	MW	% CHANGE	% LOSSES
S5C1XXA	2074.6	-0.3	N/A
S5C5XXX	2077.0	-0.2	N/A

9.6.3 Impact on other Constrained Interfaces

Other constrained interfaces exhibiting impacts above the 5% threshold are:

Case S5C1XXA

- 6.3% Impact on the Cooper-South Interface
- 5.2% Impact on the Ft. Calhoun-South Interface

Case S5C5XXX

- 8.0% Impact on the Cooper-South Interface
- 8.5% Impact on the Ft. Calhoun-South Interface

As was the case for the Ft. Thompson Site, the South Dakota location of the Watertown Site makes it more prone to adverse interactions with the Copper-South, and the Ft. Calhoun-South Flowgates.

9.6.4 Impact on MH-US 500 kV Transmission

Results in Table 9.14 suggest that adverse interactions between this site and the MH>US transmission are less of a concern than for other sites. Once again, location is the determinant factor.

Table 9.14
Impact of Selected Alternatives on D602F Flow and 500 kV Reactive Performance

CASE	CHANGE WITH RESPECT TO BASE CASE			
	D602F MW	500 KV MVAR LOSSES	DORSEY SC MVARS	FORBES SVC MVARS
S5C1XXA	42.3	77.1	33	5
S5C5XXX	27.4	43.2	11	0

9.7 Capital Costs

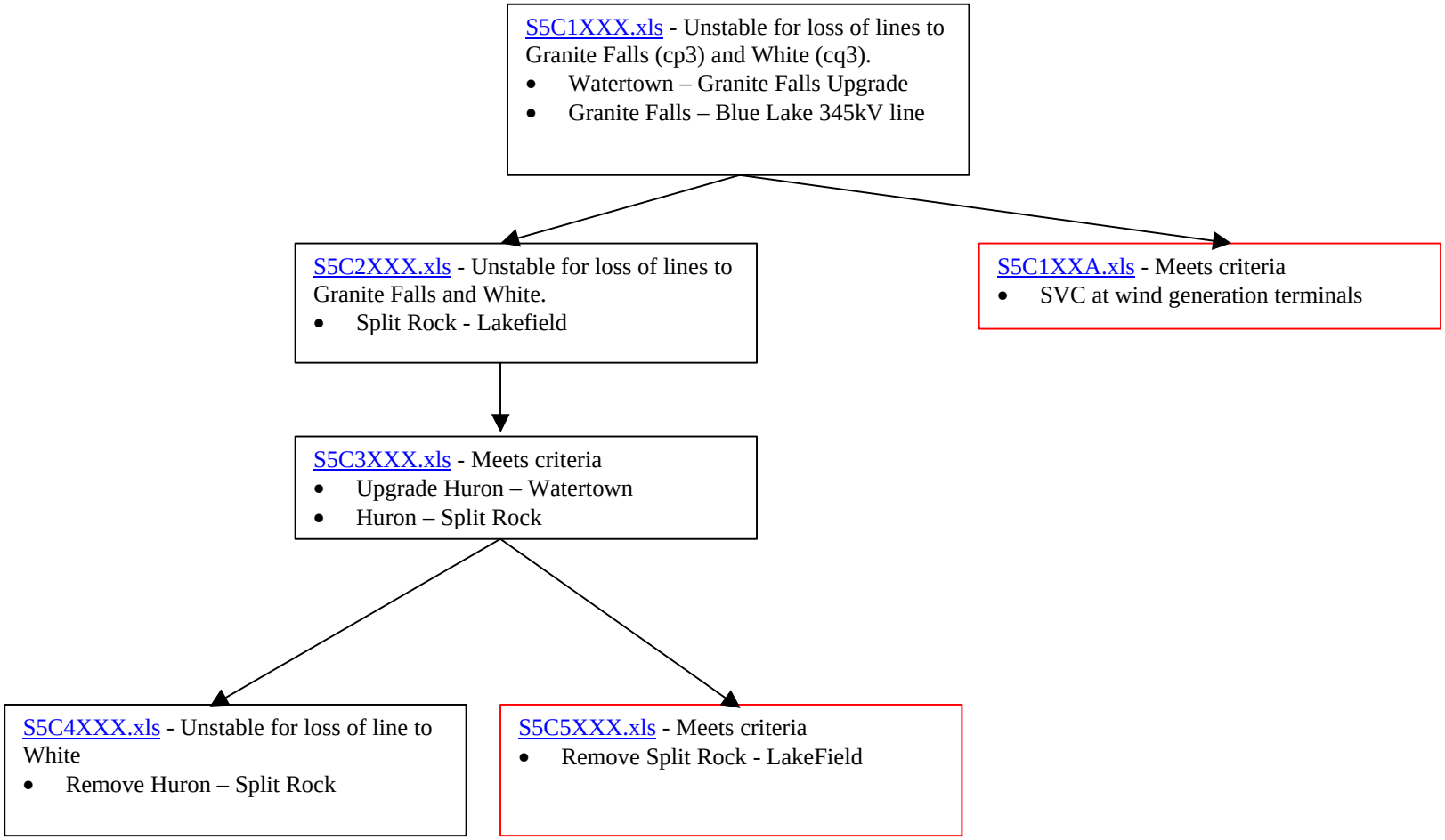
Costs were developed on the basis of the MAPP Cost Estimator and ABB's budgetary estimates. The results are summarized in Table 9.15. Even though wind generation was modeled as a single unit in the studies for this site, the SVC costs in Case S5C1XXA assume ten 70 Mvar installations.

Table 9.15
Capital Costs (2001 dollars, in millions)

CASE	LINES	STATIONS	SVCs	SERIES COMP.	TOTAL
S5C1XXA	56.50	9.35	53.10	-	$118.95
S5C5XXX	115.89	14.40	-	-	$130.29

Given the proximity of the Watertown Site to the Twin Cities, cost estimates are the lowest among the five sites studied. The results suggest that the alternative of adding SVCs at wind generation terminals (or other means of dynamic voltage regulation) (Case S5C1XXA) is a less expensive means of securing stability than the upgrading to 345 kV of one of two Watertown-Huron 230 kV circuits and the building of a new Huron to Split Rock 345 kV line (Case S5C5XXX).

Figure 9.1
Road-Map for Case Development - Site 5 (Watertown)



Case S5C1XXA

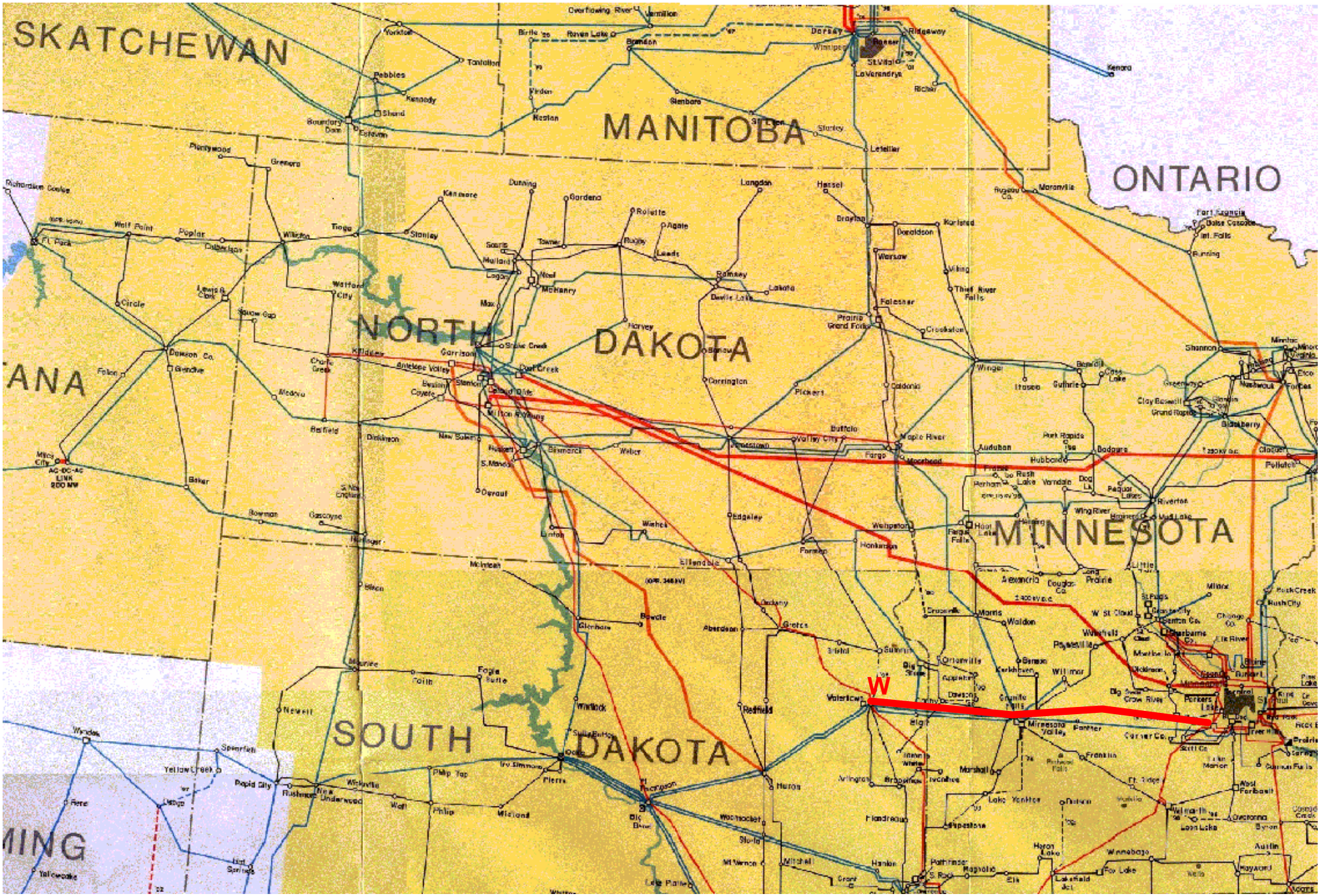


Figure 9.2 - Site 5 (Watertown) Selected Alternative

Case S5C5XXX

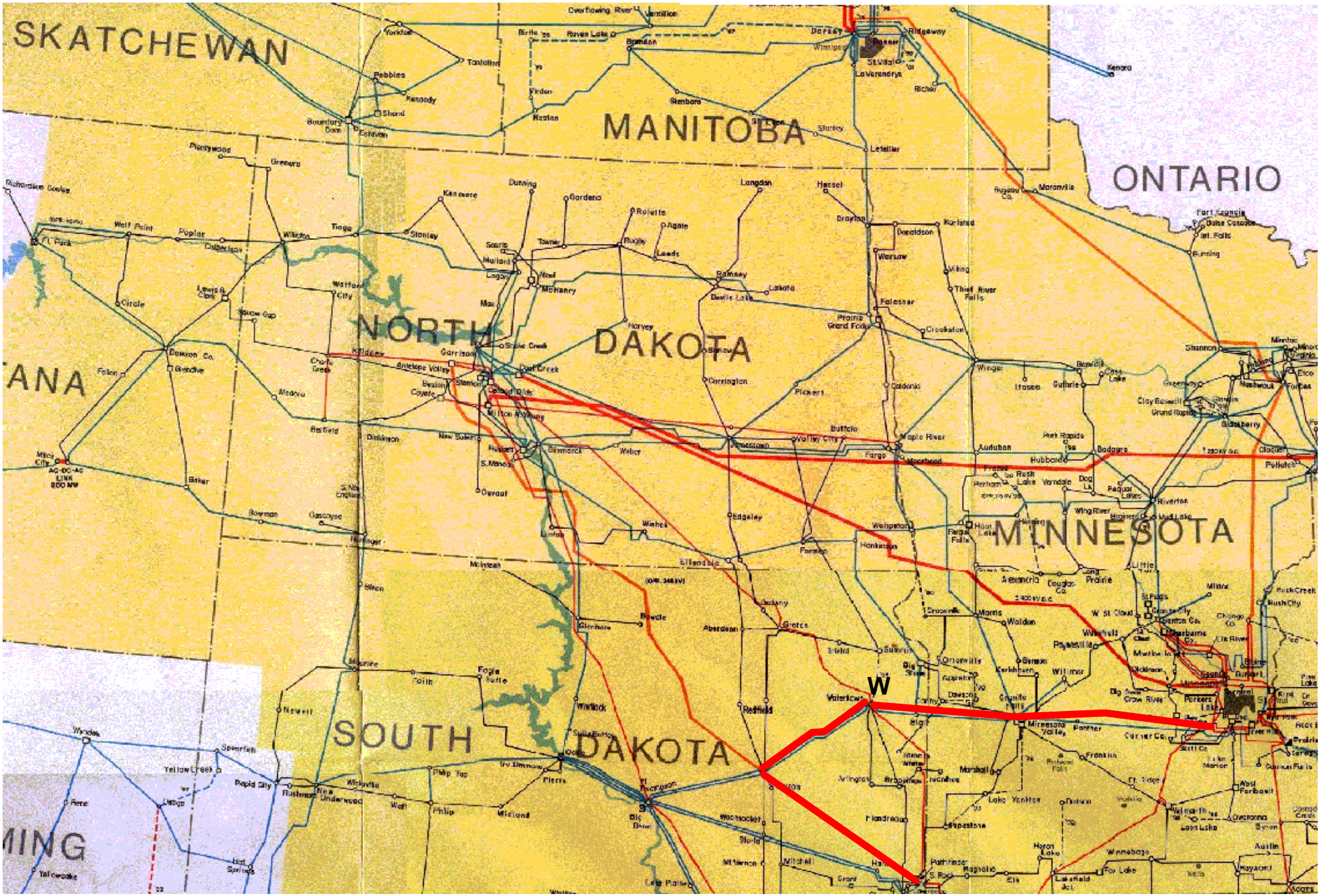


Figure 9.3 - Site 5 (Watertown) Selected Alternative

TABLES

Table 3.1
Base-Case Dynamic Testing Scenarios

FAULT	DESCRIPTION
ag1	Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line.
ag3	Three phase fault at Leland Olds on the Ft. Thompson 345 kV line.
ei2	CU DC Permanent Bipole Fault with tripping of both Coal Creek units.
eq1	Single line to ground fault with breaker fail at Coal Creek on pole 1 with cross-trip of Coal Creek unit #2.
nbz	4 Cycle 3 phase fault on the Chisago County to Forbes 500 kV line D601C at Chisago County.
mqs	Single line to ground fault with breaker fail at Sherco with 8N28 stuck. Trip Sherco generator 3.
pys	Single line to ground fault with breaker fail at Prairie Island with XXX stuck.
pyt	Trip of Prairie Island-Byron without a fault.

TABLE 3.2 - POWER FLOW AND STABILITY SUMMARY TABLE
Case ABBBASE - Base Case Performance

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.ABBBASE-ag1	upe-so04aa.ABBBASE-ag3	upe-so04aa.ABBBASE-ei2	upe-so04aa.ABBBASE-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 04 2002 11:43	APR 04 2002 12:00	APR 04 2002 12:16	APR 04 2002 12:31
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2080 / 320	2080 / 320	2080 / 320	2080 / 320
10	MHEX / L20D	2173 / 246	2173 / 246	2173 / 246	2173 / 246
11	ECL-ARP / PRI-BYN	646 / 837	646 / 837	646 / 837	646 / 837
12	TCEX / MNEX	1484 / 2829	1484 / 2829	1484 / 2829	1484 / 2829
13	D602F / F601C	1768 / 1298	1768 / 1298	1768 / 1298	1768 / 1298
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	161 / 150	161 / 150	161 / 150	161 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	264 / 28	264 / 28	264 / 28	264 / 28
19	Forbes SVC / MSC	34 / 600	34 / 600	34 / 600	34 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.033 / 1.045	1.033 / 1.045	1.033 / 1.045	1.033 / 1.045
22	Roseau 500/Forbes 500	1.060 / 1.019	1.060 / 1.019	1.060 / 1.019	1.060 / 1.019
23	Chisago 500/EauClaire 345	1.024 / 1.008	1.024 / 1.008	1.024 / 1.008	1.024 / 1.008
24	Int Falls 115/Badoura 115	1.048 / 0.999	1.048 / 0.999	1.048 / 0.999	1.048 / 0.999
25	Drayton 230/Groton 345	1.012 / 0.993	1.012 / 0.993	1.012 / 0.993	1.012 / 0.993
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	146% / 241%	146% / 241%	146% / 241%	146% / 241%
28	L20D at Prairie/Drayton	999% / 809%	999% / 809%	999% / 809%	999% / 809%
29	R50M/F3M	753% / 346%	753% / 346%	753% / 346%	753% / 346%
30	B10T	342%	342%	342%	342%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.97 | 1.02	0.97 | 1.01	0.97 | 1.04	0.98 | 1.03
33	Boise 115	1.02 | 1.07	1.02 | 1.08	1.01 | 1.08	1.03 | 1.07
34	Dorsey 230	1.02 | 1.06	1.02 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	1.00 | 1.03	0.98 | 1.03	1.00 | 1.03
36	Riverton 230	0.97 | 1.04	0.97 | 1.04	0.93 | 1.04	0.97 | 1.04
37	Coal Creek 230	0.97 | 1.11	0.96 | 1.11	1.03 | 1.12	0.97 | 1.14
38	Dickinson 345	0.97 | 1.06	0.97 | 1.05	1.03 | 1.06	1.03 | 1.08
39	Drayton 230	0.98 | 1.08	0.98 | 1.08	0.95 | 1.07	1.00 | 1.07
40	Groton 345	0.84 | 1.03	0.84 | 1.02	0.88 | 1.05	0.89 | 1.03
41	Tioga 230	1.00 | 1.08	1.00 | 1.08	1.02 | 1.07	1.02 | 1.07
42	Wahpeton 115	0.97 | 1.10	0.97 | 1.11	0.93 | 1.10	0.96 | 1.10
43	Watertown 345	0.94 | 1.05	0.94 | 1.05	0.93 | 1.06	0.95 | 1.05
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 73.44%	SHERC3 / 71.86%	KING 3 / -42.31%	SHERC3 / -89.32%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	346%	337%	495%	507%
55	K22W (max +dP @ t, d-ang)	7.9@(2.67489,-1.2)	9.1@(2.63322,-2.1)	54.2@(2.14991,-35.2)	32.4@(2.54156,-20.0)
56	K22W (max -dP @ t, d-ang)	18.5@(0.79997,5.5)	19.2@(1.99158,-1.3)	5.1@(0.59164,-0.2)	6.2@(0.32499,0.4)
57	K22W (max d-ang @ t, dP)	8.9@(1.13329,-6.3)	9.6@(1.09162,-7.8)	-148.9@(20.00792,25.1)	-81.9@(20.00792,14.3)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	90% / 159%	87% / 156%	63% / 120%	97% / 169%
61	L20D at Prairie/Drayton	999% / 627%	999% / 630%	811% / 585%	152% / 591%
62	R50M / F3M	600% / 271%	594% / 270%	551% / 238%	635% / 280%
63	B10T	192%	190%	132%	175%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 2 | 1)	(2 | 4 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 0)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (0 | 1 | 1)	(0 | 1 | 1) / (0 | 1 | 1)	(0 | 1 | 0) / (0 | 1 | 1)	(0 | 0 | 0) / (0 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 0) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)

TABLE 3.2 - POWER FLOW AND STABILITY SUMMARY TABLE
Case ABBBASE - Base Case Performance

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.ABBBASE-nbz	upe-so04aa.ABBBASE-mqs	upe-so04aa.ABBBASE-pys	upe-so04aa.ABBBASE-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 04 2002 12:45	APR 04 2002 13:03	APR 04 2002 13:19	APR 04 2002 13:33
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2080 / 320	2080 / 320	2080 / 320	2080 / 320
10	MHEX / L20D	2173 / 246	2173 / 246	2173 / 246	2173 / 246
11	ECL-ARP / PRI-BYN	646 / 837	646 / 837	646 / 837	646 / 837
12	TCEX / MNEX	1484 / 2829	1484 / 2829	1484 / 2829	1484 / 2829
13	D602F / F601C	1768 / 1298	1768 / 1298	1768 / 1298	1768 / 1298
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	161 / 150	161 / 150	161 / 150	161 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	264 / 28	264 / 28	264 / 28	264 / 28
19	Forbes SVC / MSC	34 / 600	34 / 600	34 / 600	34 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.033 / 1.045	1.033 / 1.045	1.033 / 1.045	1.033 / 1.045
22	Roseau 500/Forbes 500	1.060 / 1.019	1.060 / 1.019	1.060 / 1.019	1.060 / 1.019
23	Chisago 500/EauClaire 345	1.024 / 1.008	1.024 / 1.008	1.024 / 1.008	1.024 / 1.008
24	Int Falls 115/Badoura 115	1.048 / 0.999	1.048 / 0.999	1.048 / 0.999	1.048 / 0.999
25	Drayton 230/Groton 345	1.012 / 0.993	1.012 / 0.993	1.012 / 0.993	1.012 / 0.993
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	146% / 241%	146% / 241%	146% / 241%	146% / 241%
28	L20D at Prairie/Drayton	999% / 809%	999% / 809%	999% / 809%	999% / 809%
29	R50M/F3M	753% / 346%	753% / 346%	753% / 346%	753% / 346%
30	B10T	342%	342%	342%	342%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.09	0.96 | 1.05	0.97 | 1.00	0.98 | 1.00
33	Boise 115	0.98 | 1.09	0.99 | 1.09	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.14	1.00 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.05	0.98 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.93 | 1.06	0.95 | 1.03	1.01 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.97 | 1.09	0.97 | 1.07	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.99 | 1.08	0.96 | 1.09	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.97 | 1.07	0.97 | 1.06	0.99 | 1.03	1.00 | 1.02
40	Groton 345	0.88 | 1.04	0.93 | 1.02	0.96 | 0.99	0.98 | 0.99
41	Tioga 230	1.00 | 1.08	1.01 | 1.07	1.01 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.92 | 1.10	0.99 | 1.08	1.03 | 1.06	1.05 | 1.06
43	Watertown 345	0.94 | 1.05	0.97 | 1.03	1.00 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -21.02%	KING 3 / 0.19%	SHERC3 / 35.00%	KING 3 / 24.70%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	454%	174%	326%
55	K22W (max +dP @ t, d-ang)	143.4@(2.09991,-65.5)	69.9@(2.37490,-36.9)	0.4@(4.08316,5.9)	0.0@(0.10000,0.0)
56	K22W (max -dP @ t, d-ang)	98.3@(0.26666,10.7)	20.4@(0.34165,4.0)	30.4@(1.81659,17.7)	21.0@(2.09158,13.3)
57	K22W (max d-ang @ t, dP)	-268.3@(20.00792,48.1)	-134.1@(20.00792,23.1)	20.1@(20.00792,-15.0)	16.8@(20.00792,-11.7)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	35% / 83%	119% / 201%	146% / 241%
61	L20D at Prairie/Drayton	999% / 465%	999% / 626%	999% / 633%	999% / 702%
62	R50M / F3M	295% / 140%	476% / 210%	643% / 346%	714% / 346%
63	B10T	137%	136%	195%	259%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 1)	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (0 | 6 | 2)	(0 | 2 | 1) / (0 | 2 | 1)	(0 | 0 | 0) / (0 | 0 | 0)	(0 | 0 | 0) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(0 | 5 | 1) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

Table 3.3
Additional Testing for Scenarios with New Wind and Coal Generation

FAULT	DESCRIPTION
ab3	4 cycle 3 phase fault at Hettinger 345 kV. Clear the Hettinger - Glenham 345 kV line
au9	4 cycle 3 phase fault at Hettinger 345 kV. Clear the Hettinger - Ft. Thompson 345 kV line
av3	4 cycle 3 phase fault at Hettinger 345 kV. Clear the Hettinger - Belfield 345 kV line
av9	4 cycle 3 phase fault at Hettinger 500 kV on Hettinger-Glenham 500kV. Trip Hett. Coal unit 12 cyc after fault inception
avd	4 cycle 3 phase fault at Hettinger end of Hettinger - Belfield 345 kV line. Trip Hettinger Coal and Bowman/Marmarth Wind @ 12 cy
avj	4 cycle 3 phase fault @Hettinger 345 kV on Hettinger-M.Cty 345 kV. Trip Miles City 345 kV 12 cyc after fault inception
ay3	4 cycle 3 phase fault at Hettinger end of Hettinger- Ft.Thompson 345 kV line. Trip Hettinger Coal and Bowman/Marmarth Wind @ 12 cy
bu9	4 cycle 3 phase fault at Hettinger end of Hettinger - Ft.Thompson 345 kV line. Trip Hettinger Coal Unit @ 12 cy
bv3	4 cycle 3 phase fault at Hettinger end of Hettinger - Belfield 345 kV line. Trip of Hettinger 500 MW Coal Unit @ 12 cy
cb3	4 cycle 3 phase fault at Hettinger 500 kV on Hettinger-Glenham 500 kV. Trip Hettinger Coal unit 12 cycles after fault inception.
cc3	4 cycle 3 phase fault at Hettinger 500 kV on Hettinger-Glenham 500 kV. Trip Hettinger Glenham.
ce3	4 cycle 3 phase fault at Jamestown 345kV. clear the Jamestown - Fargo 345 kV line
cf3	4 cycle 3 phase fault at Jamestown 345kV. clear the Jamestown - Bismarck 345 kV line
cg1	4 cy slgf @ L.Olds 345 kV on Glenham line, lo brkr 2692 stk. clr @ 11 cy by tripping fltd line
cg3	4 cycle 3 phase fault at Leland Olds 345 kV. Clear the Leland Olds-Glenham 345 kV line
ch3	4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Grand Island 345 kV line
ci3	4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Leland Olds 345 kV line
cj3	4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Huron 345 kV line
ck3	4 cycle 3 phase fault at Ft Thompson 345kV. Clear the Ft Thompson – Split Rock 345 kV line

Table 3.3 (Cont.)

FAULT	DESCRIPTION
cl3	4 cycle 3 phase fault at Minot 345kV. Clear Minot – Harvey 345 kV line
cm3	4 cycle 3 phase fault at Minot 345kV. Clear Minot – Leland Olds 345 kV line
cn3 (cj3+unit trip)	4 cycle 3 phase fault at Ft Thompson 345 kV. Clear Ft.Thompson-Huron. Trip Wind unit after 12 cycles
co3(ch3+ unit trip)	4 cycle 3 phase fault at Ft Thompson 345 kV. Clear Ft.Thompson-Gr.Island and trip Wind unit after 12 cycles
cp3	4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-Gr. Falls 345 kV line
cq3	4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-White 345 kV line
cr3	4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-Huron 345 kV line
cs3	4 cycle 3 phase fault at Split Rock 345 kV. Clear the Split Rock – Sioux City 345 kV line
ct3	4 cycle 3 phase fault at Minot on Minot – Leland Olds 345 kV. Clear fault after 4 cycles. Trip Wind unit after 12 cycles

Table 4.1
Wind Generation Loadflow and Dynamic Models

```
DATA FOR BUS  9000 [FTTHWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 -2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 0.95346  97.55

 PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    1000.0  -510.0  -510.0  -510.0 1.02000                             100.00

 ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
 1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   506 FTTHOMP3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   506 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS   506 [FTTHOMP3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0   130.0 0.96290  89.86


                          ** CIMTR3 ** BUS   NAME   BSKV MACH   C O N S     S T A T E S     V A R S   I C O N
                                      9000 FTTHWIND 13.8  1   40049-40061   14932-14937    5417-5419     6387

                                       MBASE     Z S O R C E         X T R A N       GENTAP
                                      1120.0  0.00000+J 0.11060  0.00000+J 0.00000  1.00000

                                          T'    T''      H      X      X'      X''     XL
                                        1.122  0.000   2.30  2.9350  0.1106  0.0000  0.1000

                                        E1      S(E1)     E2      S(E2)         D    SYN-POW
                                      1.0000   0.0700   1.2000   0.2800       0.00    0.0000
```

Table 4.2
Dynamic Model for SVC at Wind Generator Terminals

```
*** CALL CSSCS1(  6389, 40062, 14938,  5421) ***

     BUS   NAME  BSKV   I C O N S      C O N S     S T A T E S     V A R S
    9000 FTTHWIND13.8   6389-6390    40062-40070   14938-14940    5421-5424

REMOTE BUS     K       T1      T2      T3      T4      T5    VMAX   VMIN   VOV
      0    70000.0   0.000   0.000   0.224   0.000   0.025    0.0    0.0  0.150
```

Table 4.3
Coal Generation Loadflow and Dynamic Models

```
DATA FOR BUS  9601 [HETTCOAL13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 -2    38.7    24.0    0.0    0.0     0.0     0.0     0.0     0.0 1.04564 127.41

 ID ST   PLOAD   QLOAD     I - L O A D     Y - L O A D  AREA  ZONE OWNER
 1   1    38.7    24.0     0.0     0.0     0.0     0.0     6    90     1

 PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
     538.7   234.7   234.7  -173.3 1.02000   847 [HETINGR4 230] 1.01508 100.00

 ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
 1  1  538.7  234.7  234.7 -173.3  584.0 0.0000 0.2250 0.0000 0.0000 1.0000  538.7    0.0   1 1.000

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  9847 HETINGR3 345  1   0.00040  0.02000  0.00000  1  T   550.0  550.0  550.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  9847 1  T 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

```
** GENROU ** BUS   NAME   BSKV MACH    C O N S     S T A T E S
             9601 HETTCOAL 13.8  1    40049-40062   14932-14937

      MBASE     Z S O R C E         X T R A N       GENTAP
      584.0  0.00000+J 0.22500  0.00000+J 0.00000  1.00000

T'D0 T''D0  T'Q0 T''Q0     H   DAMP   XD     XQ     X'D    X'Q   X''D    XL
3.68 0.031  0.51 0.057   1.95  0.00 1.8200 1.7600 0.2850 0.4855 0.2250 0.1600

                          S(1.0)  S(1.2)
                          0.1500  0.5300
```

Table 4.3 (Cont.)
Coal Generation Loadflow and Dynamic Models

** EXPIC1 **	BUS	NAME	BSKV	MACH	C O N S	S T A T E S
	9601	HETTCOAL	13.8	1	40128-40151	14968-14974

TR	KA	TA1	VR1	VR2	TA2	TA3	TA4
0.000	3.0	1.000	1.000	-0.870	0.010	0.000	0.000

VRMAX	VRMIN	KF	TF1	TF2	EFDMAX	EFDMIN
1.000	-0.870	0.000	1.000	0.000	8.350	-8.350

KE	TE	E1	SE(E1)	E2	SE(E2)	KP	KI	KC
0.000	0.000	1.000	0.000	1.100	0.000	6.680	0.000	0.190

** IEESGO **	BUS	NAME	BSKV	MACH	C O N S	S T A T E S	VAR
	9601	HETTCOAL	13.8	1	40152-40162	14975-14979	5432

T1	T2	T3	T4	T5	T6	K1	K2	K3	PMAX	PMIN
0.000	0.000	0.025	0.350	10.00	0.59	20.0	0.68	0.62	1.00	0.20

Table 5.1
Site 1 (Hettinger) - New Coal (1x500 MW) and Wind (5x100 MW) Generation

```
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165

DATA FOR BUS  9601 [HETTCOAL13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2    38.7    24.0    0.0    0.0     0.0     0.0     0.0     0.0 1.04564 127.41

ID ST   PLOAD   QLOAD     I - L O A D     Y - L O A D  AREA  ZONE OWNER
1   1    38.7    24.0     0.0     0.0     0.0     0.0     6    90     1

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    538.7   234.7   234.7  -173.3 1.02000   847 [HETINGR4 230] 1.01508 100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  538.7  234.7  234.7 -173.3  584.0 0.0000 0.2250 0.0000 0.0000 1.0000  538.7    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 9847 HETINGR3 345  1   0.00040  0.02000  0.00000  1  T   550.0  550.0  550.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9847 1  T 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  9847 [HETINGR3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02807 122.01

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  847 HETINGR4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 9601 HETTCOAL13.8  1   0.00040  0.02000  0.00000  1  F   550.0  550.0  550.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  847 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9601 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 5.1 (Cont.)

```
DATA FOR BUS  9112 [HETTWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.01490 129.47

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.02000                              100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  847 HETINGR4 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  847 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   847 [HETINGR4 230] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.01508 122.62

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  470 BISON  4 230  1   0.00710  0.05570  0.10610  1  T   216.1  216.1  216.1    0.0       1 1.000
  810 BOWMAN 4 230  1   0.00670  0.05380  0.10410  1  F   216.1  216.1  216.1    0.0       1 1.000
  848 HETINGR7 115  1   0.00350  0.14390  0.00000  1  T   100.0  100.0  125.0    0.0       1 1.000
 9112 HETTWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
 9847 HETINGR3 345  1   0.00000  0.01500  0.00000  1  T   500.0  600.0  700.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  848 HETINGR7 115  1    0.00000 -0.00025   0.00000 -0.00025     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  848 1  F 0.97560   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 9112 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9847 1  T 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  9113 [MARMWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.02619 139.58

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.02000                              100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  803 MARMARTH 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  803 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 5.1 (Cont.)

```
DATA FOR BUS   803 [MARMARTH 230] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.02475 132.88

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  804 BAKER  4 230  1   0.00510  0.04010  0.07700  1  F   216.1  216.1  216.1    0.0       1 1.000
  810 BOWMAN 4 230  1   0.00510  0.04010  0.07700  1  T   216.1  216.1  216.1    0.0       1 1.000
 9113 MARMWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9113 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  9114 [BOWMWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.01843 136.44

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  810 BOWMAN 4 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  810 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   810 [BOWMAN 4 230] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1    12.5     1.1    0.0    0.0     0.0     0.0     0.0    13.0 1.01810 129.64

ID ST   PLOAD   QLOAD     I - L O A D     Y - L O A D  AREA  ZONE OWNER
B1  1     8.2     0.0     0.0     0.0     0.0     0.0     6    90     1
M5  1     1.9     0.6     0.0     0.0     0.0     0.0     6    90     1
W1  1     2.4     0.5     0.0     0.0     0.0     0.0     6    90     1

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  803 MARMARTH 230  1   0.00510  0.04010  0.07700  1  F   216.1  216.1  216.1    0.0       1 1.000
  847 HETINGR4 230  1   0.00670  0.05380  0.10410  1  T   216.1  216.1  216.1    0.0       1 1.000
 9114 BOWMWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9114 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 5.1 (Cont.)

```
DATA FOR BUS  9115 [BELFWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.03366 128.87

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  425 BELFELD4 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  425 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   425 [BELFELD4 230] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.03116 122.26

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  413 MEDORA 4 230  1   0.00430  0.03430  0.06236  1  T   239.0  398.0  263.0    0.0       1 1.000
  417 DICKNSN4 230  1   0.00300  0.02390  0.04340  1  T   239.0  398.0  263.0    0.0       1 1.000
 9115 BELFWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
19042 BELFELDT 345  1   0.00010 -0.00700  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9115 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19042 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 5.1 (Cont.)

```
DATA FOR BUS  9116 [NEWEWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.02874 133.26

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  870 N ENGLN7 115  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  870 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   870 [N ENGLN7 115] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     2.5     0.5    0.0    0.0     0.0     0.0     0.0    13.0 1.02694 126.59

ID ST   PLOAD   QLOAD     I - L O A D     Y - L O A D  AREA  ZONE OWNER
B1  1     0.8     0.0     0.0     0.0     0.0     0.0     6    90     1
M5  1     1.4     0.5     0.0     0.0     0.0     0.0     6    90     1
W1  1     0.3     0.1     0.0     0.0     0.0     0.0     6    90     1

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  418 DKSN-ND7 115  1   0.03520  0.12370  0.01450  1  F    67.7   67.7   67.7    0.0       1 1.000
  848 HETINGR7 115  1   0.06780  0.23810  0.02800  1  F    67.7   67.7   67.7    0.0       1 1.000
 9116 NEWEWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9116 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 5.2
Belfield - Hettinger - Ft Thompson - Granite Falls - Blue Lake 345 kV (Case S1C1XXX)

```
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165

DATA FOR BUS  9847 [HETINGR3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02807 122.01

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  424 BELFELD3 345  1   0.00267  0.03850  0.41990  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  506 FTTHOMP3 345  1   0.00860  0.12434  1.35450  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  847 HETINGR4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 9601 HETTCOAL13.8  1   0.00040  0.02000  0.00000  1  F   550.0  550.0  550.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  847 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9601 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   506 [FTTHOMP3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98177  82.93

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  571 GR ISLD3 345  1   0.00940  0.11900  2.04340  1  T   720.0  880.0  792.0    0.0       1 1.000
  605 LELANDO3 345  1   0.01046  0.15170  1.65250  1  F   680.0 1159.0  748.0    0.0       1 1.000
  620 HURON  3 345  1   0.00245  0.02911  0.50537  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 9847 HETINGR3 345  1   0.00860  0.12434  1.35450  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
19143 FTTHMP1T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000
19146 FTTHMP2T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  605 LELANDO3 345  1    0.00000 -0.68000   0.00000 -0.50000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
19143 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
19146 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 5.2 (Cont.)

```
DATA FOR BUS   620 [HURON  3 345] RESIDING IN AREA   6, ZONE  11, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99325  78.20

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   506 FTTHOMP3 345  1   0.00245  0.02911  0.50537  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
   529 WATERTN3 345  1   0.00294  0.03499  0.60850  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
   601 ANTELOP3 345  1   0.01202  0.13530  2.76110  1  F   478.0 2270.0  526.0    0.0       1 1.000
 22154 BRDLNDTY 345  1   0.00013  0.03292  0.00000  1  F   400.0  400.0  480.0    0.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
   601 ANTELOP3 345  1    0.00000  0.00000   0.00000 -1.07000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 22154 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

 DATA FOR BUS   529 [WATERTN3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00896  66.73

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   537 WHITE  3 345  1   0.00190  0.02220  0.37340  1  F   720.0  880.0  792.0    0.0       1 1.000
   620 HURON  3 345  1   0.00294  0.03499  0.60850  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
   660 GROTON 3 345  1   0.00300  0.04530  0.46570  1  T   600.0 1159.0  660.0    0.0       1 1.000
 19076 WATERT1T 345  1  -0.00020 -0.00550  0.00000  1  F   400.0  400.0  500.0    0.0       1 1.000
 99550 GRANFLS3 345  1   0.00312  0.03671  0.64255  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 19076 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

 DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99993  57.20

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   529 WATERTN3 345  1   0.00312  0.03671  0.64255  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
   550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 5.3 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C1XXX

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S1C1XXX-ag1	upe-so04aa.S1C1XXX-ag3	upe-so04aa.S1C1XXX-ei2	upe-so04aa.S1C1XXX-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 09 2002 17:39	APR 09 2002 17:54	APR 09 2002 18:10	APR 09 2002 18:26
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3005 / 378	3005 / 378	3005 / 378	3005 / 378
10	MHEX / L20D	2174 / 216	2174 / 216	2174 / 216	2174 / 216
11	ECL-ARP / PRI-BYN	650 / 833	650 / 833	650 / 833	650 / 833
12	MWSI / MNEX	1483 / 2751	1483 / 2751	1483 / 2751	1483 / 2751
13	D602F / F601C	1827 / 1360	1827 / 1360	1827 / 1360	1827 / 1360
14	B10T / MH>SPC	166 / 98	166 / 98	166 / 98	166 / 98
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	172 / 150	172 / 150	172 / 150	172 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	210 / 118	210 / 118	210 / 118	210 / 118
19	Forbes SVC / MSC	51 / 600	51 / 600	51 / 600	51 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045
22	Roseau 500/Forbes 500	1.056 / 1.013	1.056 / 1.013	1.056 / 1.013	1.056 / 1.013
23	Chisago 500/EauClaire 345	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006
24	Int Falls 115/Badoura 115	1.051 / 0.992	1.051 / 0.992	1.051 / 0.992	1.051 / 0.992
25	Drayton 230/Groton 345	1.013 / 0.994	1.013 / 0.994	1.013 / 0.994	1.013 / 0.994
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	129% / 215%	129% / 215%	129% / 215%	129% / 215%
28	L20D at Prairie/Drayton	999% / 956%	999% / 956%	999% / 956%	999% / 956%
29	R50M/F3M	714% / 349%	714% / 349%	714% / 349%	714% / 349%
30	B10T	340%	340%	340%	340%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.97 | 1.02	0.97 | 1.02	0.96 | 1.06	0.97 | 1.05
33	Boise 115	1.02 | 1.07	1.02 | 1.08	1.01 | 1.08	1.03 | 1.08
34	Dorsey 230	1.02 | 1.06	1.02 | 1.05	0.99 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.02	1.00 | 1.02	0.97 | 1.03	0.99 | 1.03
36	Riverton 230	0.96 | 1.04	0.95 | 1.04	0.90 | 1.05	0.93 | 1.04
37	Coal Creek 230	0.95 | 1.11	0.96 | 1.11	1.00 | 1.14	0.96 | 1.12
38	Dickinson 345	0.96 | 1.06	0.96 | 1.06	1.01 | 1.07	1.02 | 1.09
39	Drayton 230	0.98 | 1.09	0.98 | 1.09	0.93 | 1.09	0.99 | 1.08
40	Groton 345	0.82 | 1.03	0.81 | 1.03	0.78 | 1.08	0.81 | 1.05
41	Tioga 230	0.99 | 1.07	0.99 | 1.06	0.99 | 1.07	1.00 | 1.06
42	Wahpeton 115	0.95 | 1.10	0.94 | 1.10	0.87 | 1.12	0.91 | 1.09
43	Watertown 345	0.90 | 1.05	0.89 | 1.05	0.82 | 1.08	0.86 | 1.06
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 66.95%	SHERC3 / 61.40%	SHERC3 / -31.19%	SHERC3 / -12.87%
53	Dorsey SUVP / UdHold			/ 19.532	
54	Forbes DC Red (DCAR)	289%	275%	506%	494%
55	K22W (max +dP @ t, d-ang)	12.7@(2.81655,-2.0)	16.2@(2.80822,-4.8)	66.4@(3.00821,-33.0)	45.4@(2.90821,-21.4)
56	K22W (max -dP @ t, d-ang)	20.2@(0.87497,6.8)	22.3@(0.85830,8.2)	8.1@(1.14995,-3.8)	8.1@(0.99996,-0.4)
57	K22W (max d-ang @ t, dP)	10.9@(1.22495,-8.8)	12.8@(1.21662,-10.7)	-145.4@(20.00792,20.3)	-81.7@(20.00792,15.8)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	68% / 128%	64% / 123%	49% / 95%	81% / 144%
61	L20D at Prairie/Drayton	999% / 718%	999% / 694%	572% / 564%	199% / 607%
62	R50M / F3M	550% / 265%	540% / 263%	507% / 218%	593% / 234%
63	B10T	199%	188%	105%	161%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 2 | 0)	(0 | 1 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 4 | 1) / (0 | 2 | 1)	(1 | 4 | 1) / (0 | 2 | 1)	(1 | 6 | 1) / (0 | 2 | 0)	(1 | 4 | 1) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 1 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 1) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 5 | 0) / (2 | 2 | 2)

TABLE 5.3 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C1XXX

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S1C1XXX-nbz	upe-so04aa.S1C1XXX-mqs	upe-so04aa.S1C1XXX-pys	upe-so04aa.S1C1XXX-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 09 2002 18:41	APR 09 2002 19:01	APR 09 2002 19:17	APR 09 2002 19:31
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3005 / 378	3005 / 378	3005 / 378	3005 / 378
10	MHEX / L20D	2174 / 216	2174 / 216	2174 / 216	2174 / 216
11	ECL-ARP / PRI-BYN	650 / 833	650 / 833	650 / 833	650 / 833
12	MWSI / MNEX	1483 / 2751	1483 / 2751	1483 / 2751	1483 / 2751
13	D602F / F601C	1827 / 1360	1827 / 1360	1827 / 1360	1827 / 1360
14	B10T / MH>SPC	166 / 98	166 / 98	166 / 98	166 / 98
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	172 / 150	172 / 150	172 / 150	172 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	210 / 118	210 / 118	210 / 118	210 / 118
19	Forbes SVC / MSC	51 / 600	51 / 600	51 / 600	51 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045
22	Roseau 500/Forbes 500	1.056 / 1.013	1.056 / 1.013	1.056 / 1.013	1.056 / 1.013
23	Chisago 500/EauClaire 345	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006
24	Int Falls 115/Badoura 115	1.051 / 0.992	1.051 / 0.992	1.051 / 0.992	1.051 / 0.992
25	Drayton 230/Groton 345	1.013 / 0.994	1.013 / 0.994	1.013 / 0.994	1.013 / 0.994
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	129% / 215%	129% / 215%	129% / 215%	129% / 215%
28	L20D at Prairie/Drayton	999% / 956%	999% / 956%	999% / 956%	999% / 956%
29	R50M/F3M	714% / 349%	714% / 349%	714% / 349%	714% / 349%
30	B10T	340%	340%	340%	340%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.11	0.96 | 1.05	0.96 | 1.01	0.98 | 1.00
33	Boise 115	0.97 | 1.08	1.00 | 1.08	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.15	1.00 | 1.07	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	0.97 | 1.04	1.00 | 1.03	1.01 | 1.02
36	Riverton 230	0.87 | 1.07	0.93 | 1.04	1.00 | 1.02	1.00 | 1.02
37	Coal Creek 230	0.95 | 1.11	0.98 | 1.09	1.00 | 1.06	1.02 | 1.04
38	Dickinson 345	0.96 | 1.10	0.96 | 1.10	1.00 | 1.04	1.01 | 1.03
39	Drayton 230	0.94 | 1.12	0.96 | 1.07	1.00 | 1.04	1.01 | 1.03
40	Groton 345	0.73 | 1.08	0.84 | 1.05	0.95 | 1.00	0.98 | 1.00
41	Tioga 230	0.97 | 1.07	1.00 | 1.07	1.01 | 1.05	1.03 | 1.04
42	Wahpeton 115	0.82 | 1.12	0.94 | 1.10	1.01 | 1.05	1.03 | 1.05
43	Watertown 345	0.78 | 1.08	0.88 | 1.06	0.97 | 1.01	0.99 | 1.01
44	**Dynamic Voltage Warnings**				
45		1638 [SHEYNNE7] 1.22	none	none	none
46		1639 [CASS CO7] 1.21			
47		761 [MODEROW7] 1.21			
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -45.74%	KING 3 / 13.92%	SHERC3 / 15.51%	KING 3 / 3.53%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	489%	173%	307%
55	K22W (max +dP @ t, d-ang)	154.4@(2.72489,-77.2)	71.3@(2.76655,-36.7)	4.9@(4.11649,3.9)	0.0@(0.00000,0.0)
56	K22W (max -dP @ t, d-ang)	102.6@(0.26666,11.1)	22.3@(0.33332,4.3)	31.2@(1.76659,21.8)	21.1@(2.13325,14.2)
57	K22W (max d-ang @ t, dP)	-271.8@(20.00792,53.5)	-117.3@(20.00792,21.2)	23.3@(1.47494,-24.0)	18.0@(20.00792,-10.7)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	35% / 79%	100% / 174%	125% / 207%
61	L20D at Prairie/Drayton	733% / 492%	999% / 596%	999% / 728%	999% / 846%
62	R50M / F3M	259% / 138%	452% / 229%	588% / 349%	669% / 349%
63	B10T	141%	106%	181%	275%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 2 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 8 | 1) / (0 | 2 | 0)	(1 | 4 | 1) / (0 | 1 | 1)	(1 | 1 | 1) / (0 | 1 | 1)	(1 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (1 | 6 | 0)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 5.3 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C1XXX

1	**Case No.**	9	10	11	12
2	**Case Name**	upe-so04aa.S1C1XXX-av3	upe-so04aa.S1C1XXX-au9	upe-so04aa.S1C1XXX-bv3	upe-so04aa.S1C1XXX-bu9
3	**Disturbance**	av3	au9	bv3	bu9
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 10 2002 8:17	APR 10 2002 8:25	APR 08 2002 10:26	APR 08 2002 10:45
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3005 / 378	3005 / 378	3002 / 377	3002 / 377
10	MHEX / L20D	2174 / 216	2174 / 216	2173 / 215	2173 / 215
11	ECL-ARP / PRI-BYN	650 / 833	650 / 833	647 / 830	647 / 830
12	MWSI / MNEX	1483 / 2751	1483 / 2751	1477 / 2742	1477 / 2742
13	D602F / F601C	1827 / 1360	1827 / 1360	1827 / 1361	1827 / 1361
14	B10T / MH>SPC	166 / 98	166 / 98	165 / 98	165 / 98
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	172 / 150	172 / 150	172 / 150	172 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	210 / 118	210 / 118	210 / 124	210 / 124
19	Forbes SVC / MSC	51 / 600	51 / 600	51 / 600	51 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045
22	Roseau 500/Forbes 500	1.056 / 1.013	1.056 / 1.013	1.056 / 1.013	1.056 / 1.013
23	Chisago 500/EauClaire 345	1.020 / 1.006	1.020 / 1.006	1.019 / 1.007	1.019 / 1.007
24	Int Falls 115/Badoura 115	1.051 / 0.992	1.051 / 0.992	1.051 / 0.992	1.051 / 0.992
25	Drayton 230/Groton 345	1.013 / 0.994	1.013 / 0.994	1.013 / 0.993	1.013 / 0.993
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	129% / 215%	129% / 215%	129% / 215%	129% / 215%
28	L20D at Prairie/Drayton	999% / 956%	999% / 956%	999% / 957%	999% / 957%
29	R50M/F3M	714% / 349%	714% / 349%	714% / 350%	714% / 350%
30	B10T	340%	340%	339%	339%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.99 | 1.05	0.95 | 1.07	1.01 | 1.03	1.00 | 1.04
33	Boise 115	1.03 | 1.07	1.01 | 1.05	1.04 | 1.06	1.04 | 1.06
34	Dorsey 230	1.02 | 1.06	0.99 | 1.05	1.04 | 1.05	1.03 | 1.05
35	Forbes 230	1.00 | 1.03	0.99 | 1.03	1.01 | 1.03	1.00 | 1.03
36	Riverton 230	0.98 | 1.05	0.94 | 1.08	1.00 | 1.03	0.98 | 1.03
37	Coal Creek 230	0.99 | 1.08	0.92 | 1.13	1.02 | 1.06	0.99 | 1.07
38	Dickinson 345	1.00 | 1.06	0.96 | 1.08	1.02 | 1.05	1.01 | 1.05
39	Drayton 230	0.97 | 1.05	0.94 | 1.11	1.00 | 1.03	0.97 | 1.05
40	Groton 345	0.88 | 1.07	0.74 | 1.15	0.96 | 1.02	0.93 | 1.02
41	Tioga 230	0.89 | 1.01	(1.60)0.74 | 1.07	1.00 | 1.04	0.96 | 1.03
42	Wahpeton 115	0.97 | 1.10	0.91 | 1.15	1.02 | 1.06	0.99 | 1.07
43	Watertown 345	0.91 | 1.08	0.85 | 1.14	0.98 | 1.03	0.98 | 1.04
44	**Dynamic Voltage Warnings**				
45		470 [BISON 4] 0.40	497 [MAURINE4] 0.48	810 [BOWMAN 4] 0.50	810 [BOWMAN 4] 0.60
46		497 [MAURINE4] 0.43	480 [MAURINE7] 0.52	803 [MARMARTH] 0.52	803 [MARMARTH] 0.61
47		480 [MAURINE7] 0.49	470 [BISON 4] 0.52	847 [HETINGR4] 0.56	804 [BAKER 4] 0.63
48		847 [HETINGR4] 0.51	9088 [MAURIN1T] 0.54	804 [BAKER 4] 0.57	470 [BISON 4] 0.64
49		9847 [HETINGR3] 0.53	483 [NEWELL 7] 0.56	9847 [HETINGR3] 0.58	847 [HETINGR4] 0.65
50		483 [NEWELL 7] 0.54	490 [RAPIDCY7] 0.61	850 [GASCOYN7] 0.61	805 [BAKER 7] 0.66
51		810 [BOWMAN 4] 0.54 +more	477 [ELSWRTH7] 0.62 +more	848 [HETINGR7] 0.61 +more	850 [GASCOYN7] 0.67 +more
52	Worst Case Angle Damping	/ %	/ %	/ %	/ %
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	507%	399%	507%	507%
55	K22W (max +dP @ t, d-ang)	48.6@(1.99992,-30.0)	61.4@(1.94992,-20.0)	34.8@(1.99992,-20.8)	34.2@(1.99992,-21.3)
56	K22W (max -dP @ t, d-ang)	4.6@(0.73330,0.7)	19.3@(1.12496,7.9)	0.4@(0.24999,0.0)	1.9@(0.59998,0.0)
57	K22W (max d-ang @ t, dP)	-30.0@(1.99992,48.6)	-23.6@(1.99992,59.7)	-20.8@(1.99992,34.8)	-21.3@(1.99992,34.2)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	84% / 155%	57% / 121%	101% / 177%	98% / 172%
61	L20D at Prairie/Drayton	999% / 500%	538% / 294%	999% / 733%	999% / 717%
62	R50M / F3M	627% / 230%	558% / 195%	660% / 274%	649% / 268%
63	B10T	58%	1.61660 sec	190%	177%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 3 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 3 | 2) / (0 | 1 | 1)	(1 | 5 | 1) / (0 | 2 | 1)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 3 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 2 | 1) / (2 | 2 | 2)	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 1 | 1) / (2 | 2 | 2)

TABLE 5.3 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C1XXX

1	**Case No.**	13	14
2	**Case Name**	upe-so04aa.S1C1XXX-avd	upe-so04aa.S1C1XXX-ay3
3	**Disturbance**	avd	ay3
4	**Prior Outage**	None	None
5	**Date/Time**	APR 09 2002 19:45	APR 09 2002 20:00
6	**Comments**		
7			
8	**Steady State Flows**		
9	NDEX / EAST BIAS	3005 / 378	3005 / 378
10	MHEX / L20D	2174 / 216	2174 / 216
11	ECL-ARP / PRI-BYN	650 / 833	650 / 833
12	MWSI / MNEX	1483 / 2751	1483 / 2751
13	D602F / F601C	1827 / 1360	1827 / 1360
14	B10T / MH>SPC	166 / 98	166 / 98
15	OH E-W / OH>MH	-119 / -196	-119 / -196
16	R50M / OH>MP	172 / 150	172 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	210 / 118	210 / 118
19	Forbes SVC / MSC	51 / 600	51 / 600
20	**Steady State Vltgs**		
21	Dorsey 500/Dorsey 230	1.029 / 1.045	1.029 / 1.045
22	Roseau 500/Forbes 500	1.056 / 1.013	1.056 / 1.013
23	Chisago 500/EauClaire 345	1.020 / 1.006	1.020 / 1.006
24	Int Falls 115/Badoura 115	1.051 / 0.992	1.051 / 0.992
25	Drayton 230/Groton 345	1.013 / 0.994	1.013 / 0.994
26	**SS OS Relay Margins**		
27	D602F at Forbes/Dorsey	129% / 215%	129% / 215%
28	L20D at Prairie/Drayton	999% / 956%	999% / 956%
29	R50M/F3M	714% / 349%	714% / 349%
30	B10T	340%	340%
31	**Min/MaxTransientVltg**		
32	Arrowhd 230	1.01 | 1.04	1.00 | 1.04
33	Boise 115	1.04 | 1.07	1.04 | 1.07
34	Dorsey 230	1.03 | 1.06	1.03 | 1.06
35	Forbes 230	1.01 | 1.03	1.01 | 1.03
36	Riverton 230	1.00 | 1.04	0.99 | 1.04
37	Coal Creek 230	1.02 | 1.08	1.00 | 1.09
38	Dickinson 345	1.02 | 1.06	1.01 | 1.06
39	Drayton 230	1.00 | 1.04	0.98 | 1.04
40	Groton 345	0.98 | 1.05	0.95 | 1.06
41	Tioga 230	1.01 | 1.06	0.99 | 1.06
42	Wahpeton 115	1.03 | 1.08	1.00 | 1.09
43	Watertown 345	1.01 | 1.06	0.99 | 1.06
44	**Dynamic Voltage Warnings**		
45		none	none
46			
47			
48			
49			
50			
51			
52	Worst Case Angle Damping	KING 3 / -41.06%	KING 3 / -40.44%
53	Dorsey SUVP / UdHold		
54	Forbes DC Red (DCAR)	507%	507%
55	K22W (max +dP @ t, d-ang)	54.1@(2.35824,-26.1)	52.4@(2.39990,-25.4)
56	K22W (max -dP @ t, d-ang)	0.3@(0.24999,0.0)	1.0@(0.54164,-0.1)
57	K22W (max d-ang @ t, dP)	-109.0@(20.00792,24.3)	-107.9@(20.00792,22.9)
58	**OS Rel Trip / Marg**		
59	MH - OH		
60	D602F at Forbes/Dorsey	103% / 180%	102% / 179%
61	L20D at Prairie/Drayton	999% / 648%	999% / 633%
62	R50M / F3M	673% / 259%	669% / 257%
63	B10T	143%	133%
64	**FSCAPS (SS/Unav/Final)**		
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 2 | 1) / (0 | 1 | 0)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

Table 5.4
70 Mvar SVCs at each of Five Wind Generator Terminals (Case S1C1XXA)

```
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165

DATA FOR BUS  9112 [HETTWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.01990 129.46

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 1.01990 1.01990     3.83  1:  70.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  847 HETINGR4 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  847 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  9113 [MARMWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.03120 139.52

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 1.03120 1.03120     1.79  1:  70.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  803 MARMARTH 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  803 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 5.4 (Cont.)

```
DATA FOR BUS  9114 [BOWMWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.02340 136.39

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 1.02340 1.02340     2.10  1:  70.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  810 BOWMAN 4 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  810 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  9115 [BELFWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.03870 128.83

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 1.03870 1.03870     2.70  1:  70.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  425 BELFELD4 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  425 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 5.4 (Cont.)

```
DATA FOR BUS  9116 [NEWEWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.03370 133.21

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 1.03370 1.03370     4.12  1:  70.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  870 N ENGLN7 115  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  870 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 5.5 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C1XXA

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S1C1XXA-av3	upe-so04aa.S1C1XXA-au9	upe-so04aa.S1C1XXA-bv3	upe-so04aa.S1C1XXA-bu9
3	**Disturbance**	av3	au9	bv3	bu9
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 22 2002 12:16	APR 22 2002 12:33	APR 22 2002 12:50	APR 22 2002 13:05
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3005 / 378	3005 / 378	3005 / 378	3005 / 378
10	MHEX / L20D	2174 / 216	2174 / 216	2174 / 216	2174 / 216
11	ECL-ARP / PRI-BYN	650 / 833	650 / 833	650 / 833	650 / 833
12	MWSI / MNEX	1483 / 2751	1483 / 2751	1483 / 2751	1483 / 2751
13	D602F / F601C	1827 / 1360	1827 / 1360	1827 / 1360	1827 / 1360
14	B10T / MH>SPC	166 / 98	166 / 98	166 / 98	166 / 98
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	172 / 150	172 / 150	172 / 150	172 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	210 / 119	210 / 119	210 / 119	210 / 119
19	Forbes SVC / MSC	51 / 600	51 / 600	51 / 600	51 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045
22	Roseau 500/Forbes 500	1.056 / 1.013	1.056 / 1.013	1.056 / 1.013	1.056 / 1.013
23	Chisago 500/EauClaire 345	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006
24	Int Falls 115/Badoura 115	1.051 / 0.992	1.051 / 0.992	1.051 / 0.992	1.051 / 0.992
25	Drayton 230/Groton 345	1.013 / 0.994	1.013 / 0.994	1.013 / 0.994	1.013 / 0.994
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	129% / 215%	129% / 215%	129% / 215%	129% / 215%
28	L20D at Prairie/Drayton	999% / 956%	999% / 956%	999% / 956%	999% / 956%
29	R50M/F3M	714% / 349%	714% / 349%	714% / 349%	714% / 349%
30	B10T	340%	340%	340%	340%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.99 | 1.02	0.97 | 1.02	1.00 | 1.03	1.00 | 1.03
33	Boise 115	1.03 | 1.07	1.02 | 1.07	1.04 | 1.07	1.04 | 1.07
34	Dorsey 230	1.03 | 1.06	1.02 | 1.05	1.03 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	0.99 | 1.02	1.01 | 1.03	1.01 | 1.03
36	Riverton 230	0.98 | 1.04	0.96 | 1.03	1.00 | 1.03	0.99 | 1.04
37	Coal Creek 230	1.00 | 1.10	0.95 | 1.10	1.02 | 1.07	1.00 | 1.09
38	Dickinson 345	0.99 | 1.06	0.96 | 1.06	1.02 | 1.05	1.00 | 1.06
39	Drayton 230	0.99 | 1.06	0.95 | 1.09	1.00 | 1.04	0.98 | 1.05
40	Groton 345	0.90 | 1.05	0.84 | 1.02	0.97 | 1.04	0.93 | 1.05
41	Tioga 230	1.00 | 1.06	0.96 | 1.05	1.01 | 1.05	0.99 | 1.06
42	Wahpeton 115	0.98 | 1.09	0.94 | 1.08	1.02 | 1.07	0.99 | 1.09
43	Watertown 345	0.92 | 1.05	0.91 | 1.04	0.99 | 1.05	0.98 | 1.05
44	**Dynamic Voltage Warnings**				
45		497 [MAURINE4] 0.57	497 [MAURINE4] 0.63	none	none
46		470 [BISON 4] 0.58	480 [MAURINE7] 0.64		
47		480 [MAURINE7] 0.60	483 [NEWELL 7] 0.65		
48		9088 [MAURIN1T] 0.62	9088 [MAURIN1T] 0.66		
49		483 [NEWELL 7] 0.63	490 [RAPIDCY7] 0.67		
50		490 [RAPIDCY7] 0.66	477 [ELSWRTH7] 0.68		
51		496 [RUSHMRE7] 0.66 +more	496 [RUSHMRE7] 0.68		
52	Worst Case Angle Damping	SHERC3 / 71.99%	SHERC3 / 52.41%	KING 3 / -33.75%	KING 3 / -31.69%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	324%	325%	507%	507%
55	K22W (max +dP @ t, d-ang)	16.7@(2.87488,-3.6)	10.5@(2.93321,-1.4)	39.3@(2.41657,-18.9)	38.3@(2.46656,-18.3)
56	K22W (max -dP @ t, d-ang)	13.2@(0.98330,4.5)	18.0@(0.94163,5.9)	0.6@(0.51665,0.0)	3.3@(0.58331,0.3)
57	K22W (max d-ang @ t, dP)	6.9@(1.27495,-4.0)	-15.0@(20.00792,-2.7)	-76.8@(20.00792,17.0)	-78.1@(20.00792,15.2)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	83% / 149%	69% / 129%	103% / 179%	98% / 171%
61	L20D at Prairie/Drayton	999% / 703%	999% / 742%	999% / 711%	999% / 682%
62	R50M / F3M	595% / 269%	552% / 268%	667% / 271%	650% / 264%
63	B10T	188%	231%	177%	164%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 2 | 1) / (0 | 1 | 1)	(1 | 8 | 2) / (0 | 2 | 1)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 2 | 1) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 1 | 0) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 1 | 0) / (2 | 2 | 2)

Table 5.6
50% Series Compensation of Antelope Valley-Ch. Creek-Hettinger-Ft. Thompson 345 kV (Case S1C1XX2)

```
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165

DATA FOR BUS   601 [ANTELOP3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     9.4     3.3    0.0    0.0     0.0     0.0     0.0     0.0 1.02000 113.45

ID ST   PLOAD   QLOAD     I - L O A D     Y - L O A D  AREA  ZONE OWNER
B1  1     8.6     2.8     0.0     0.0     0.0     0.0     6    90     1
W1  1     0.8     0.5     0.0     0.0     0.0     0.0     6    90     1

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  603 ANTEL31G24.0  1   0.00040  0.01800  0.00000  1  F   480.0  480.0  576.0    0.0       1 1.000
  605 LELANDO3 345  1   0.00123  0.01910  0.19730  1  F   717.0 1135.0  789.0    0.0       1 1.000
  605 LELANDO3 345  2   0.00124  0.01910  0.19730  1  F   717.0 1135.0  789.0    0.0       1 1.000
  607 ANTEL32G24.0  1   0.00040  0.01800  0.00000  1  F   480.0  480.0  576.0    0.0       1 1.000
  620 HURON  3 345  1   0.01202  0.13530  2.76110  1  T   478.0 2270.0  526.0    0.0       1 1.000
  683 CHAR.CK3 345  1   0.00281  0.02265  0.46610  1  T   359.0 1135.0  395.0    0.0       1 1.000
22165 AVSDC1TY 345  1   0.00000 -0.04230  0.00000  1  F   125.0  125.0  150.0    0.0       1 1.000
22171 AVSDC7TY 345  1  -0.00316 -0.11060  0.00000  1  F   125.0  125.0  150.0    0.0       1 1.000
22183 DGCX3  T      1   0.00008  0.03029  0.00000  1  F   250.0    0.0    0.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  620 HURON  3 345  1    0.00000 -1.07000   0.00000  0.00000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  603 1  F 1.04350   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
  607 1  F 1.04350   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22165 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22171 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22183 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS   683 [CHAR.CK3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.03263 113.67

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  424 BELFELD3 345  1   0.00170  0.01040  0.33587  1  T   239.0  880.0  263.0    0.0       1 1.000
  601 ANTELOP3 345  1   0.00281  0.02265  0.46610  1  F   359.0 1135.0  395.0    0.0       1 1.000
22161 CHARCKTY 345  1   0.00008  0.02019  0.00000  1  F   400.0  400.0  480.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
22161 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 5.6 (Cont.)

```
DATA FOR BUS   424 [BELFELD3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.03547 113.67

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  683 CHAR.CK3 345  1   0.00170  0.01040  0.33587  1  F   239.0  880.0  263.0    0.0       1 1.000
 9847 HETINGR3 345  1   0.00267  0.01925  0.41990  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
19042 BELFELDT 345  1   0.00010  0.03710  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
19042 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000


DATA FOR BUS  9847 [HETINGR3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.03278 112.42

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  424 BELFELD3 345  1   0.00267  0.01925  0.41990  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  506 FTTHOMP3 345  1   0.00860  0.06217  1.35450  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  847 HETINGR4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 9601 HETTCOAL13.8  1   0.00040  0.02000  0.00000  1  F   550.0  550.0  550.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  847 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9601 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS   506 [FTTHOMP3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98381  85.06

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  571 GR ISLD3 345  1   0.00940  0.11900  2.04340  1  T   720.0  880.0  792.0    0.0       1 1.000
  605 LELANDO3 345  1   0.01046  0.15170  1.65250  1  F   680.0 1159.0  748.0    0.0       1 1.000
  620 HURON  3 345  1   0.00245  0.02911  0.50537  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 9847 HETINGR3 345  1   0.00860  0.06217  1.35450  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
19143 FTTHMP1T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000
19146 FTTHMP2T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  605 LELANDO3 345  1    0.00000 -0.68000   0.00000 -0.50000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
19143 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
19146 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 5.6 (Cont.)

```
DATA FOR BUS   620 [HURON  3 345] RESIDING IN AREA   6, ZONE  11, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99652  79.14

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   506 FTTHOMP3 345  1   0.00245  0.02911  0.50537  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
   529 WATERTN3 345  1   0.00294  0.03499  0.60850  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
   601 ANTELOP3 345  1   0.01202  0.13530  2.76110  1  F   478.0 2270.0  526.0    0.0       1 1.000
 22154 BRDLNDTY 345  1   0.00013  0.03292  0.00000  1  F   400.0  400.0  480.0    0.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
   601 ANTELOP3 345  1    0.00000  0.00000   0.00000 -1.07000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 22154 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000


 DATA FOR BUS   529 [WATERTN3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01039  67.12

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   537 WHITE  3 345  1   0.00190  0.02220  0.37340  1  F   720.0  880.0  792.0    0.0       1 1.000
   620 HURON  3 345  1   0.00294  0.03499  0.60850  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
   660 GROTON 3 345  1   0.00300  0.04530  0.46570  1  T   600.0 1159.0  660.0    0.0       1 1.000
 19076 WATERT1T 345  1  -0.00020 -0.00550  0.00000  1  F   400.0  400.0  500.0    0.0       1 1.000
 99550 GRANFLS3 345  1   0.00312  0.03671  0.64255  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 19076 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000


 DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00076  57.37

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   529 WATERTN3 345  1   0.00312  0.03671  0.64255  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
   550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 5.7 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C1XX2

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S1C1XX2-ei2	upe-so04aa.S1C1XX2-mqs	upe-so04aa.S1C1XX2-av3	upe-so04aa.S1C1XX2-au9
3	**Disturbance**	ei2	mqs	av3	au9
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 09 2002 20:16	APR 09 2002 20:31	APR 09 2002 20:47	APR 09 2002 21:03
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3037 / 371	3037 / 371	3037 / 371	3037 / 371
10	MHEX / L20D	2174 / 221	2174 / 221	2174 / 221	2174 / 221
11	ECL-ARP / PRI-BYN	650 / 831	650 / 831	650 / 831	650 / 831
12	MWSI / MNEX	1481 / 2739	1481 / 2739	1481 / 2739	1481 / 2739
13	D602F / F601C	1815 / 1349	1815 / 1349	1815 / 1349	1815 / 1349
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	171 / 150	171 / 150	171 / 150	171 / 150
17	Dorsey BP1 / BP2	1492 / 1690	1492 / 1690	1492 / 1690	1492 / 1690
18	Dorsey Reserve / Wtrtn SVC	225 / 106	225 / 106	225 / 106	225 / 106
19	Forbes SVC / MSC	46 / 600	46 / 600	46 / 600	46 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045
22	Roseau 500/Forbes 500	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015
23	Chisago 500/EauClaire 345	1.021 / 1.006	1.021 / 1.006	1.021 / 1.006	1.021 / 1.006
24	Int Falls 115/Badoura 115	1.052 / 0.997	1.052 / 0.997	1.052 / 0.997	1.052 / 0.997
25	Drayton 230/Groton 345	1.014 / 1.000	1.014 / 1.000	1.014 / 1.000	1.014 / 1.000
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	133% / 220%	133% / 220%	133% / 220%	133% / 220%
28	L20D at Prairie/Drayton	999% / 930%	999% / 930%	999% / 930%	999% / 930%
29	R50M/F3M	726% / 351%	726% / 351%	726% / 351%	726% / 351%
30	B10T	340%	340%	340%	340%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.97 | 1.05	0.96 | 1.05	0.99 | 1.02	0.95 | 1.03
33	Boise 115	1.01 | 1.08	1.00 | 1.08	1.03 | 1.06	1.01 | 1.09
34	Dorsey 230	1.02 | 1.06	1.00 | 1.06	1.03 | 1.05	1.00 | 1.06
35	Forbes 230	0.97 | 1.03	0.98 | 1.04	1.00 | 1.02	0.99 | 1.03
36	Riverton 230	0.92 | 1.05	0.94 | 1.04	0.98 | 1.04	0.93 | 1.03
37	Coal Creek 230	1.01 | 1.13	0.98 | 1.08	0.99 | 1.09	0.92 | 1.11
38	Dickinson 345	1.01 | 1.07	0.96 | 1.09	0.99 | 1.05	0.95 | 1.06
39	Drayton 230	0.94 | 1.08	0.96 | 1.05	0.98 | 1.05	0.94 | 1.09
40	Groton 345	0.82 | 1.07	0.87 | 1.05	0.91 | 1.04	0.72 | 1.00
41	Tioga 230	1.00 | 1.07	1.00 | 1.07	1.00 | 1.06	0.93 | 1.06
42	Wahpeton 115	0.89 | 1.12	0.95 | 1.10	0.99 | 1.08	0.89 | 1.08
43	Watertown 345	0.85 | 1.07	0.89 | 1.05	0.93 | 1.04	0.82 | 1.04
44	**Dynamic Voltage Warnings**				
45		none	none	none	497 [MAURINE4] 0.64
46					480 [MAURINE7] 0.66
47					483 [NEWELL 7] 0.67
48					470 [BISON 4] 0.68
49					9088 [MAURIN1T] 0.68
50					
51					
52	Worst Case Angle Damping	SHERC3 / -39.60%	KING 3 / 10.84%	SHERC3 / 66.96%	SHERC3 / 41.81%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	504%	484%	347%	267%
55	K22W (max +dP @ t, d-ang)	63.2@(2.94988,-31.9)	70.6@(2.72489,-36.1)	11.9@(2.72489,-3.7)	35.3@(3.26653,-11.4)
56	K22W (max -dP @ t, d-ang)	4.8@(0.47498,0.3)	22.0@(0.33332,4.2)	12.0@(0.84163,3.8)	35.8@(1.25828,17.4)
57	K22W (max d-ang @ t, dP)	-148.3@(20.00792,27.3)	-118.9@(20.00792,22.4)	6.1@(1.15829,-3.4)	23.3@(1.62493,-24.7)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	55% / 106%	41% / 88%	92% / 163%	40% / 92%
61	L20D at Prairie/Drayton	618% / 593%	999% / 599%	999% / 760%	791% / 554%
62	R50M / F3M	527% / 222%	470% / 231%	619% / 286%	477% / 254%
63	B10T	126%	111%	225%	138%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 3 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 5 | 1) / (0 | 2 | 0)	(1 | 3 | 2) / (0 | 1 | 1)	(1 | 2 | 1) / (0 | 1 | 1)	(1 | 6 | 2) / (0 | 2 | 2)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 0) / (1 | 2 | 0)
69	Shey 115 / Split Rock 115	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 1 | 0) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)

Table 5.8
Belfield - Hettinger - Ft Thompson through Blue Lake 345 kV + Hettinger - Glenham 345 kV (Case S1C2XXX)

```
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166

DATA FOR BUS  9847 [HETINGR3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.03417 115.03

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  424 BELFELD3 345  1   0.00267  0.03850  0.41990  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  506 FTTHOMP3 345  1   0.00860  0.12434  1.35450  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  847 HETINGR4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 9601 HETTCOAL13.8  1   0.00040  0.02000  0.00000  1  F   550.0  550.0  550.0    0.0       1 1.000
 9838 GLENHAM3 345  1   0.00490  0.07030  0.76530  1  F   680.0 1159.0  748.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  847 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9601 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  9838 [GLENHAM3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00763 103.86

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00471  0.06826  0.74362  1  T   680.0 1159.0  748.0    0.0       1 1.000
  605 LELANDO3 345  1   0.00575  0.08344  0.90888  1  F   680.0 1159.0  748.0    0.0       1 1.000
 9847 HETINGR3 345  1   0.00490  0.07030  0.76530  1  T   680.0 1159.0  748.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  506 FTTHOMP3 345  1    0.00000  0.00000   0.00000 -0.68000     1
  605 LELANDO3 345  1    0.00000  0.00000   0.00000 -0.50000     1
```

Table 5.8 (Cont.)

```
DATA FOR BUS   506 [FTTHOMP3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98936  83.85

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  571 GR ISLD3 345  1   0.00940  0.11900  2.04340  1  T   720.0  880.0  792.0    0.0       1 1.000
  620 HURON  3 345  1   0.00245  0.02911  0.50537  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 9838 GLENHAM3 345  1   0.00471  0.06826  0.74362  1  F   680.0 1159.0  748.0    0.0       1 1.000
 9847 HETINGR3 345  1   0.00860  0.12434  1.35450  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
19143 FTTHMP1T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000
19146 FTTHMP2T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
 9838 GLENHAM3 345  1    0.00000 -0.68000   0.00000  0.00000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
19143 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
19146 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DATA FOR BUS   620 [HURON  3 345] RESIDING IN AREA   6, ZONE  11, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99721  78.77

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00245  0.02911  0.50537  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  529 WATERTN3 345  1   0.00294  0.03499  0.60850  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  601 ANTELOP3 345  1   0.01202  0.13530  2.76110  1  F   478.0 2270.0  526.0    0.0       1 1.000
22154 BRDLNDTY 345  1   0.00013  0.03292  0.00000  1  F   400.0  400.0  480.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  601 ANTELOP3 345  1    0.00000  0.00000   0.00000 -1.07000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
22154 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DATA FOR BUS   529 [WATERTN3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00951  67.09

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  537 WHITE  3 345  1   0.00190  0.02220  0.37340  1  F   720.0  880.0  792.0    0.0       1 1.000
  620 HURON  3 345  1   0.00294  0.03499  0.60850  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  660 GROTON 3 345  1   0.00300  0.04530  0.46570  1  T   600.0 1159.0  660.0    0.0       1 1.000
19076 WATERT1T 345  1  -0.00020 -0.00550  0.00000  1  F   400.0  400.0  500.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00312  0.03671  0.64255  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
19076 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 5.8 (Cont.)

```
DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99951  57.39

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  529 WATERTN3 345  1   0.00312  0.03671  0.64255  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 5.9 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C2XXX

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S1C2XXX-ei2	upe-so04aa.S1C2XXX-mqs	upe-so04aa.S1C2XXX-av3	upe-so04aa.S1C2XXX-au9
3	**Disturbance**	ei2	mqs	av3	au9
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 09 2002 21:21	APR 09 2002 21:37	APR 09 2002 21:52	APR 09 2002 22:08
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3011 / 375	3011 / 375	3011 / 375	3011 / 375
10	MHEX / L20D	2174 / 216	2174 / 216	2174 / 216	2174 / 216
11	ECL-ARP / PRI-BYN	650 / 831	650 / 831	650 / 831	650 / 831
12	MWSI / MNEX	1482 / 2742	1482 / 2742	1482 / 2742	1482 / 2742
13	D602F / F601C	1826 / 1358	1826 / 1358	1826 / 1358	1826 / 1358
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	172 / 150	172 / 150	172 / 150	172 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	210 / 112	210 / 112	210 / 112	210 / 112
19	Forbes SVC / MSC	50 / 600	50 / 600	50 / 600	50 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045
22	Roseau 500/Forbes 500	1.056 / 1.013	1.056 / 1.013	1.056 / 1.013	1.056 / 1.013
23	Chisago 500/EauClaire 345	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006
24	Int Falls 115/Badoura 115	1.051 / 0.988	1.051 / 0.988	1.051 / 0.988	1.051 / 0.988
25	Drayton 230/Groton 345	1.011 / 0.994	1.011 / 0.994	1.011 / 0.994	1.011 / 0.994
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	130% / 215%	130% / 215%	130% / 215%	130% / 215%
28	L20D at Prairie/Drayton	999% / 950%	999% / 950%	999% / 950%	999% / 950%
29	R50M/F3M	716% / 350%	716% / 350%	716% / 350%	716% / 350%
30	B10T	340%	340%	340%	340%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.97 | 1.05	0.96 | 1.05	0.99 | 1.02	0.97 | 1.02
33	Boise 115	1.01 | 1.08	1.00 | 1.08	1.03 | 1.06	1.02 | 1.07
34	Dorsey 230	1.01 | 1.06	1.00 | 1.07	1.03 | 1.05	1.02 | 1.05
35	Forbes 230	0.97 | 1.03	0.98 | 1.04	1.00 | 1.02	1.00 | 1.02
36	Riverton 230	0.90 | 1.05	0.93 | 1.04	0.97 | 1.04	0.96 | 1.03
37	Coal Creek 230	0.99 | 1.14	0.98 | 1.09	0.98 | 1.10	0.95 | 1.10
38	Dickinson 345	1.01 | 1.07	0.96 | 1.09	0.99 | 1.05	0.96 | 1.06
39	Drayton 230	0.93 | 1.09	0.97 | 1.05	0.98 | 1.06	0.96 | 1.08
40	Groton 345	0.79 | 1.08	0.86 | 1.05	0.89 | 1.04	0.84 | 1.03
41	Tioga 230	1.00 | 1.07	1.00 | 1.07	1.00 | 1.06	0.97 | 1.06
42	Wahpeton 115	0.88 | 1.12	0.95 | 1.10	0.97 | 1.09	0.94 | 1.09
43	Watertown 345	0.83 | 1.08	0.89 | 1.05	0.93 | 1.04	0.90 | 1.04
44	**Dynamic Voltage Warnings**				
45		1638 [SHEYNNE7] 1.21	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / -33.12%	KING 3 / 10.90%	SHERC3 / 63.33%	SHERC3 / 63.99%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	505%	483%	338%	304%
55	K22W (max +dP @ t, d-ang)	65.5@(2.99154,-32.6)	71.8@(2.73322,-36.9)	14.3@(2.74155,-4.6)	14.0@(2.91654,-4.0)
56	K22W (max -dP @ t, d-ang)	6.3@(1.14162,-4.4)	22.2@(0.35832,4.8)	12.5@(0.84163,4.0)	18.4@(0.95830,7.1)
57	K22W (max d-ang @ t, dP)	-146.0@(20.00792,23.0)	-119.7@(20.00792,22.7)	6.4@(1.15829,-3.7)	10.7@(1.29995,-9.8)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	51% / 98%	37% / 83%	89% / 158%	71% / 133%
61	L20D at Prairie/Drayton	580% / 573%	999% / 606%	999% / 763%	999% / 713%
62	R50M / F3M	511% / 220%	458% / 230%	609% / 283%	560% / 269%
63	B10T	112%	112%	214%	206%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 1 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 6 | 1) / (0 | 2 | 0)	(1 | 3 | 2) / (0 | 1 | 1)	(1 | 2 | 1) / (0 | 1 | 1)	(1 | 4 | 1) / (0 | 2 | 1)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 5 | 1) / (2 | 2 | 2)	(0 | 2 | 1) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)

TABLE 5.9 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C2XXX

1	**Case No.**	5
2	**Case Name**	upe-so04aa.S1C2XXX-ab3
3	**Disturbance**	ab3
4	**Prior Outage**	None
5	**Date/Time**	APR 09 2002 22:25
6	**Comments**	
7		
8	**Steady State Flows**	
9	NDEX / EAST BIAS	3011 / 375
10	MHEX / L20D	2174 / 216
11	ECL-ARP / PRI-BYN	650 / 831
12	MWSI / MNEX	1482 / 2742
13	D602F / F601C	1826 / 1358
14	B10T / MH>SPC	166 / 99
15	OH E-W / OH>MH	-119 / -196
16	R50M / OH>MP	172 / 150
17	Dorsey BP1 / BP2	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	210 / 112
19	Forbes SVC / MSC	50 / 600
20	**Steady State Vltgs**	
21	Dorsey 500/Dorsey 230	1.029 / 1.045
22	Roseau 500/Forbes 500	1.056 / 1.013
23	Chisago 500/EauClaire 345	1.020 / 1.006
24	Int Falls 115/Badoura 115	1.051 / 0.988
25	Drayton 230/Groton 345	1.011 / 0.994
26	**SS OS Relay Margins**	
27	D602F at Forbes/Dorsey	130% / 215%
28	L20D at Prairie/Drayton	999% / 950%
29	R50M/F3M	716% / 350%
30	B10T	340%
31	**Min/MaxTransientVltg**	
32	Arrowhd 230	0.98 | 1.02
33	Boise 115	1.03 | 1.07
34	Dorsey 230	1.03 | 1.05
35	Forbes 230	1.00 | 1.02
36	Riverton 230	0.97 | 1.04
37	Coal Creek 230	0.98 | 1.10
38	Dickinson 345	0.98 | 1.05
39	Drayton 230	0.97 | 1.07
40	Groton 345	0.89 | 1.03
41	Tioga 230	0.98 | 1.06
42	Wahpeton 115	0.97 | 1.09
43	Watertown 345	0.93 | 1.04
44	**Dynamic Voltage Warnings**	
45		none
46		
47		
48		
49		
50		
51		
52	Worst Case Angle Damping	SHERC3 / 66.04%
53	Dorsey SUVP / UdHold	
54	Forbes DC Red (DCAR)	332%
55	K22W (max +dP @ t, d-ang)	13.1@(2.81655,-3.7)
56	K22W (max -dP @ t, d-ang)	13.1@(0.89163,4.5)
57	K22W (max d-ang @ t, dP)	6.9@(1.21662,-4.8)
58	**OS Rel Trip / Marg**	
59	MH - OH	
60	D602F at Forbes/Dorsey	87% / 156%
61	L20D at Prairie/Drayton	999% / 753%
62	R50M / F3M	606% / 283%
63	B10T	215%
64	**FSCAPS (SS/Unav/Final)**	
65	Balta 230	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 3 | 1) / (0 | 1 | 0)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 3 | 1) / (2 | 2 | 2)

Table 5.10
Belfield - Hettinger - Ft Thompson through Blue Lake 345 kV + 400 MW HVdc Exports to WSCC (Case S1C3XXX)

```
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
 ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163

 DATA FOR BUS   411 [MI CTYE4 230] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.03000  99.32

 MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
  2 1.03000 1.03000   125.61  9:  15.00 5:  15.00 2:   8.00

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   403 DAWSONC4 230  1   0.01340  0.10780  0.19690  1  T   239.0  440.0  263.0    0.0       1 1.000
   804 BAKER  4 230  1   0.01430  0.11380  0.21640  1  F   160.0  322.0  176.0    0.0       1 1.000
 19036 MICTYE1T 230  1   0.00110  0.09050  0.00000  1  F   100.0  100.0  125.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 19036 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

 DC# X--- RECTIFIER --X X--- INVERTER ---X  MDC RDC-OHMS RCOMP-OHMS DELTI
  11   411 MI CTYE4 230   402 MI CTYW4 230   1    0.000    0.000   0.0000

    SETVAL  VSCHED  DCVMIN  VCMODE DC-AMPS    VDCR    VDCI   VCOMP  METER
     150.0    80.9     0.0     0.0  1854.1    80.9    80.9    80.9   INV

  ALPHA AFLMN ALFMX   PACR   QACR NBR EBASER    RCR     XCR    XCCCR  X--MEASURING BUS-X
  17.17 15.59 19.59  150.0   68.9  1   230.0   0.000   2.456   0.000

   TRR    TAPR   TAPMXR  TAPMNR   TSTPR X--TAPPED SIDE---X X-UNTAPPED SIDE--X ID
 0.2969 1.06457 1.12900 0.94100 0.00587

 DC# X--- RECTIFIER --X X--- INVERTER ---X  MDC RDC-OHMS RCOMP-OHMS DELTI
  14   411 MI CTYE4 230   402 MI CTYW4 230   1    0.000    0.000   0.0000

    SETVAL  VSCHED  DCVMIN  VCMODE DC-AMPS    VDCR    VDCI   VCOMP  METER
     100.0    80.9     0.0     0.0  1236.1    80.9    80.9    80.9   INV

  ALPHA AFLMN ALFMX   PACR   QACR NBR EBASER    RCR     XCR    XCCCR  X--MEASURING BUS-X
  19.20 15.59 19.59  100.0   44.8  1   230.0   0.000   2.456   0.000

   TRR    TAPR   TAPMXR  TAPMNR   TSTPR X--TAPPED SIDE---X X-UNTAPPED SIDE--X ID
 0.2969 1.07044 1.12900 0.94100 0.00587
```

Table 5.10 (Cont.)

```
DATA FOR BUS   424 [BELFELD3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.04049 107.64

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   683 CHAR.CK3 345  1   0.00170  0.02080  0.33587  1  F   239.0  880.0  263.0    0.0       1 1.000
  9847 HETINGR3 345  1   0.00267  0.03850  0.41990  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
 19042 BELFELDT 345  1   0.00010  0.03710  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 19042 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

 DATA FOR BUS  9847 [HETINGR3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02426 108.23

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   424 BELFELD3 345  1   0.00267  0.03850  0.41990  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
   506 FTTHOMP3 345  1   0.00860  0.12434  1.35450  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
   847 HETINGR4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  9601 HETTCOAL13.8  1   0.00040  0.02000  0.00000  1  F   550.0  550.0  550.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   847 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
  9601 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

 DATA FOR BUS   506 [FTTHOMP3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00811  76.78

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   571 GR ISLD3 345  1   0.00940  0.11900  2.04340  1  T   720.0  880.0  792.0    0.0       1 1.000
   605 LELANDO3 345  1   0.01046  0.15170  1.65250  1  F   680.0 1159.0  748.0    0.0       1 1.000
   620 HURON  3 345  1   0.00245  0.02911  0.50537  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  9847 HETINGR3 345  1   0.00860  0.12434  1.35450  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
 19143 FTTHMP1T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000
 19146 FTTHMP2T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
   605 LELANDO3 345  1    0.00000 -0.68000   0.00000 -0.50000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 19143 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 19146 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 5.10 (Cont.)

```
DATA FOR BUS   620 [HURON  3 345] RESIDING IN AREA   6, ZONE  11, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01373  72.81

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   506 FTTHOMP3 345  1   0.00245  0.02911  0.50537  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
   529 WATERTN3 345  1   0.00294  0.03499  0.60850  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
   601 ANTELOP3 345  1   0.01202  0.13530  2.76110  1  F   478.0 2270.0  526.0    0.0       1 1.000
 22154 BRDLNDTY 345  1   0.00013  0.03292  0.00000  1  F   400.0  400.0  480.0    0.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
   601 ANTELOP3 345  1    0.00000  0.00000   0.00000 -1.07000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 22154 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

 DATA FOR BUS   529 [WATERTN3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01828  62.69

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   537 WHITE  3 345  1   0.00190  0.02220  0.37340  1  F   720.0  880.0  792.0    0.0       1 1.000
   620 HURON  3 345  1   0.00294  0.03499  0.60850  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
   660 GROTON 3 345  1   0.00300  0.04530  0.46570  1  T   600.0 1159.0  660.0    0.0       1 1.000
 19076 WATERT1T 345  1  -0.00020 -0.00550  0.00000  1  F   400.0  400.0  500.0    0.0       1 1.000
 99550 GRANFLS3 345  1   0.00312  0.03671  0.64255  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 19076 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

 DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00693  54.36

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   529 WATERTN3 345  1   0.00312  0.03671  0.64255  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
   550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 5.11 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C3XXX

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S1C3XXX-ag1	upe-so04aa.S1C3XXX-ag3	upe-so04aa.S1C3XXX-ei2	upe-so04aa.S1C3XXX-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 10 2002 11:23	APR 10 2002 11:45	APR 10 2002 12:08	APR 10 2002 12:36
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2659 / 337	2659 / 337	2659 / 337	2659 / 337
10	MHEX / L20D	2173 / 235	2173 / 235	2173 / 235	2173 / 235
11	ECL-ARP / PRI-BYN	646 / 834	646 / 834	646 / 834	646 / 834
12	MWSI / MNEX	1481 / 2791	1481 / 2791	1481 / 2791	1481 / 2791
13	D602F / F601C	1786 / 1319	1786 / 1319	1786 / 1319	1786 / 1319
14	B10T / MH>SPC	164 / 97	164 / 97	164 / 97	164 / 97
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	167 / 150	167 / 150	167 / 150	167 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	265 / 26	265 / 26	265 / 26	265 / 26
19	Forbes SVC / MSC	38 / 600	38 / 600	38 / 600	38 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.020	1.059 / 1.020	1.059 / 1.020	1.059 / 1.020
23	Chisago 500/EauClaire 345	1.024 / 1.007	1.024 / 1.007	1.024 / 1.007	1.024 / 1.007
24	Int Falls 115/Badoura 115	1.052 / 1.002	1.052 / 1.002	1.052 / 1.002	1.052 / 1.002
25	Drayton 230/Groton 345	1.011 / 1.008	1.011 / 1.008	1.011 / 1.008	1.011 / 1.008
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	142% / 235%	142% / 235%	142% / 235%	142% / 235%
28	L20D at Prairie/Drayton	999% / 857%	999% / 857%	999% / 857%	999% / 857%
29	R50M/F3M	755% / 350%	755% / 350%	755% / 350%	755% / 350%
30	B10T	336%	336%	336%	336%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.02	0.98 | 1.02	0.98 | 1.05	0.99 | 1.04
33	Boise 115	1.03 | 1.06	1.02 | 1.06	1.02 | 1.07	1.03 | 1.07
34	Dorsey 230	1.02 | 1.06	1.02 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	1.00 | 1.03	0.98 | 1.04	1.00 | 1.03
36	Riverton 230	0.98 | 1.04	0.98 | 1.04	0.94 | 1.05	0.96 | 1.04
37	Coal Creek 230	0.96 | 1.11	0.96 | 1.10	1.02 | 1.12	0.97 | 1.13
38	Dickinson 345	0.97 | 1.06	0.97 | 1.06	1.02 | 1.06	1.03 | 1.08
39	Drayton 230	0.98 | 1.07	0.99 | 1.08	0.94 | 1.07	1.00 | 1.07
40	Groton 345	0.88 | 1.04	0.88 | 1.04	0.87 | 1.07	0.89 | 1.05
41	Tioga 230	0.99 | 1.05	0.99 | 1.05	1.00 | 1.05	1.00 | 1.04
42	Wahpeton 115	0.98 | 1.10	0.98 | 1.10	0.92 | 1.10	0.95 | 1.09
43	Watertown 345	0.94 | 1.05	0.94 | 1.05	0.90 | 1.07	0.93 | 1.05
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 65.07%	SHERC3 / 63.69%	SHERC3 / -53.06%	SHERC3 / -61.52%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	314%	305%	500%	507%
55	K22W (max +dP @ t, d-ang)	9.4@(2.70822,-1.6)	11.6@(2.69155,-3.0)	57.4@(2.89988,-30.9)	39.0@(2.72489,-20.5)
56	K22W (max -dP @ t, d-ang)	17.2@(0.84997,5.9)	18.3@(0.82497,7.0)	4.5@(0.48331,0.1)	5.8@(0.32499,0.4)
57	K22W (max d-ang @ t, dP)	9.0@(1.17495,-5.8)	10.2@(1.14162,-8.2)	-149.7@(20.00792,27.1)	-84.5@(20.00792,16.9)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	88% / 157%	84% / 152%	66% / 124%	97% / 169%
61	L20D at Prairie/Drayton	999% / 684%	999% / 688%	733% / 598%	167% / 598%
62	R50M / F3M	606% / 278%	597% / 276%	567% / 224%	646% / 258%
63	B10T	224%	216%	144%	194%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 3 | 1) / (0 | 1 | 0)	(1 | 3 | 1) / (0 | 2 | 1)	(1 | 4 | 1) / (0 | 1 | 0)	(1 | 3 | 1) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 3 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)

TABLE 5.11 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C3XXX

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S1C3XXX-nbz	upe-so04aa.S1C3XXX-mqs	upe-so04aa.S1C3XXX-pys	upe-so04aa.S1C3XXX-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 10 2002 13:00	APR 10 2002 16:56	APR 10 2002 14:05	APR 10 2002 14:27
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2659 / 337	2659 / 337	2659 / 337	2659 / 337
10	MHEX / L20D	2173 / 235	2173 / 235	2173 / 235	2173 / 235
11	ECL-ARP / PRI-BYN	646 / 834	646 / 834	646 / 834	646 / 834
12	MWSI / MNEX	1481 / 2791	1481 / 2791	1481 / 2791	1481 / 2791
13	D602F / F601C	1786 / 1319	1786 / 1319	1786 / 1319	1786 / 1319
14	B10T / MH>SPC	164 / 97	164 / 97	164 / 97	164 / 97
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	167 / 150	167 / 150	167 / 150	167 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	265 / 26	265 / 26	265 / 26	265 / 26
19	Forbes SVC / MSC	38 / 600	38 / 600	38 / 600	38 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.020	1.059 / 1.020	1.059 / 1.020	1.059 / 1.020
23	Chisago 500/EauClaire 345	1.024 / 1.007	1.024 / 1.007	1.024 / 1.007	1.024 / 1.007
24	Int Falls 115/Badoura 115	1.052 / 1.002	1.052 / 1.002	1.052 / 1.002	1.052 / 1.002
25	Drayton 230/Groton 345	1.011 / 1.008	1.011 / 1.008	1.011 / 1.008	1.011 / 1.008
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	142% / 235%	142% / 235%	142% / 235%	142% / 235%
28	L20D at Prairie/Drayton	999% / 857%	999% / 857%	999% / 857%	999% / 857%
29	R50M/F3M	755% / 350%	755% / 350%	755% / 350%	755% / 350%
30	B10T	336%	336%	336%	336%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.10	0.96 | 1.06	0.97 | 1.01	0.99 | 1.01
33	Boise 115	0.97 | 1.08	1.00 | 1.08	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.14	1.00 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	0.98 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.92 | 1.07	0.95 | 1.05	1.01 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.96 | 1.09	0.97 | 1.08	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.97 | 1.09	0.95 | 1.09	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.96 | 1.08	0.96 | 1.05	0.99 | 1.03	1.00 | 1.02
40	Groton 345	0.84 | 1.07	0.91 | 1.05	0.98 | 1.01	1.00 | 1.01
41	Tioga 230	0.98 | 1.06	0.99 | 1.05	1.00 | 1.03	1.02 | 1.03
42	Wahpeton 115	0.90 | 1.11	0.97 | 1.10	1.03 | 1.05	1.04 | 1.05
43	Watertown 345	0.88 | 1.07	0.94 | 1.05	1.00 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -34.22%	KING 3 / 5.46%	SHERC3 / 26.84%	KING 3 / 15.82%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	467%	187%	325%
55	K22W (max +dP @ t, d-ang)	143.0@(2.10825,-66.1)	75.2@(2.65822,-38.6)	1.2@(4.09983,5.4)	0.0@(-0.01667,0.0)
56	K22W (max -dP @ t, d-ang)	99.4@(0.26666,10.8)	21.9@(0.34165,4.4)	30.8@(1.75826,19.3)	20.6@(2.11658,13.4)
57	K22W (max d-ang @ t, dP)	-268.8@(20.00792,49.8)	-136.0@(20.00792,25.7)	21.9@(20.00792,-15.9)	17.4@(20.00792,-11.7)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	37% / 86%	118% / 200%	138% / 228%
61	L20D at Prairie/Drayton	999% / 470%	999% / 589%	999% / 679%	999% / 759%
62	R50M / F3M	296% / 139%	468% / 212%	647% / 350%	708% / 350%
63	B10T	153%	115%	-354%	59%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 4 | 1) / (0 | 2 | 1)	(1 | 3 | 2) / (0 | 1 | 1)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (1 | 6 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 5.11 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C3XXX

1	**Case No.**	9	10
2	**Case Name**	upe-so04aa.S1C3XXX-av3	upe-so04aa.S1C3XXX-au9
3	**Disturbance**	av3	au9
4	**Prior Outage**	None	None
5	**Date/Time**	APR 10 2002 14:45	APR 10 2002 15:09
6	**Comments**		
7			
8	**Steady State Flows**		
9	NDEX / EAST BIAS	2659 / 337	2659 / 337
10	MHEX / L20D	2173 / 235	2173 / 235
11	ECL-ARP / PRI-BYN	646 / 834	646 / 834
12	MWSI / MNEX	1481 / 2791	1481 / 2791
13	D602F / F601C	1786 / 1319	1786 / 1319
14	B10T / MH>SPC	164 / 97	164 / 97
15	OH E-W / OH>MH	-119 / -196	-119 / -196
16	R50M / OH>MP	167 / 150	167 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	265 / 26	265 / 26
19	Forbes SVC / MSC	38 / 600	38 / 600
20	**Steady State Vltgs**		
21	Dorsey 500/Dorsey 230	1.032 / 1.045	1.032 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.020	1.059 / 1.020
23	Chisago 500/EauClaire 345	1.024 / 1.007	1.024 / 1.007
24	Int Falls 115/Badoura 115	1.052 / 1.002	1.052 / 1.002
25	Drayton 230/Groton 345	1.011 / 1.008	1.011 / 1.008
26	**SS OS Relay Margins**		
27	D602F at Forbes/Dorsey	142% / 235%	142% / 235%
28	L20D at Prairie/Drayton	999% / 857%	999% / 857%
29	R50M/F3M	755% / 350%	755% / 350%
30	B10T	336%	336%
31	**Min/MaxTransientVltg**		
32	Arrowhd 230	1.00 | 1.11	0.97 | 1.02
33	Boise 115	1.03 | 1.07	1.02 | 1.07
34	Dorsey 230	1.02 | 1.06	1.02 | 1.05
35	Forbes 230	1.01 | 1.10	1.00 | 1.03
36	Riverton 230	0.98 | 1.38(1.07)	0.97 | 1.04
37	Coal Creek 230	0.99 | 1.34(1.07)	0.95 | 1.10
38	Dickinson 345	0.99 | 1.17	0.96 | 1.06
39	Drayton 230	0.95 | 1.47(1.07)	0.96 | 1.08
40	Groton 345	0.75 | 3.09(1.07)	0.86 | 1.03
41	Tioga 230	(1.05)0.77 | 4.34(1.07)	0.95 | 1.05
42	Wahpeton 115	0.94 | 1.99(1.07)	0.95 | 1.09
43	Watertown 345	0.78 | 2.98(1.07)	0.92 | 1.05
44	**Dynamic Voltage Warnings**		
45		4702 [AITKIN 7] 9.56	497 [MAURINE4] 0.60
46		4701 [KIMBRLY7] 8.58	470 [BISON 4] 0.61
47		4700 [MCGREGR7] 7.68	480 [MAURINE7] 0.63
48		4631 [HILLCTY7] 6.72	9088 [MAURIN1T] 0.64
49		4992 [SHAKOPE7] 5.05	483 [NEWELL 7] 0.65
50		4825 [PLYMTH 7] 4.81	810 [BOWMAN 4] 0.68
51		4801 [BASS LK7] 4.68 +more	03 [MARMARTH] 0.68 +mor
52	Worst Case Angle Damping	SHERC3 / -71.64%	SHERC3 / 52.45%
53	Dorsey SUVP / UdHold		
54	Forbes DC Red (DCAR)	432%	276%
55	K22W (max +dP @ t, d-ang)	49.6@(6.74979,-47.5)	15.5@(3.04154,-5.7)
56	K22W (max -dP @ t, d-ang)	10.1@(0.86663,3.1)	23.3@(1.08329,10.2)
57	K22W (max d-ang @ t, dP)	-72.0@(10.47473,34.1)	14.8@(1.44161,-13.9)
58	**OS Rel Trip / Marg**		
59	MH - OH		
60	D602F at Forbes/Dorsey	87% / 158%	72% / 137%
61	L20D at Prairie/Drayton	999% / 551%	999% / 634%
62	R50M / F3M	623% / 251%	564% / 268%
63	B10T	112%	197%
64	**FSCAPS (SS/Unav/Final)**		
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 8 | 2) / (0 | 1 | 1)	(1 | 4 | 1) / (0 | 2 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)

TABLE 5.12 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C3XXA

1	**Case No.**	1	2
2	**Case Name**	upe-so04aa.S1C3XXA-av3	upe-so04aa.S1C3XXA-au9
3	**Disturbance**	av3	au9
4	**Prior Outage**	None	None
5	**Date/Time**	APR 21 2002 10:24	APR 21 2002 10:49
6	**Comments**		
7			
8	**Steady State Flows**		
9	NDEX / EAST BIAS	2659 / 337	2659 / 337
10	MHEX / L20D	2173 / 235	2173 / 235
11	ECL-ARP / PRI-BYN	646 / 834	646 / 834
12	MWSI / MNEX	1481 / 2791	1481 / 2791
13	D602F / F601C	1786 / 1319	1786 / 1319
14	B10T / MH>SPC	164 / 97	164 / 97
15	OH E-W / OH>MH	-119 / -196	-119 / -196
16	R50M / OH>MP	167 / 150	167 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	264 / 27	264 / 27
19	Forbes SVC / MSC	36 / 600	36 / 600
20	**Steady State Vltgs**		
21	Dorsey 500/Dorsey 230	1.032 / 1.045	1.032 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.019	1.059 / 1.019
23	Chisago 500/EauClaire 345	1.023 / 1.007	1.023 / 1.007
24	Int Falls 115/Badoura 115	1.052 / 1.002	1.052 / 1.002
25	Drayton 230/Groton 345	1.011 / 1.008	1.011 / 1.008
26	**SS OS Relay Margins**		
27	D602F at Forbes/Dorsey	142% / 235%	142% / 235%
28	L20D at Prairie/Drayton	999% / 856%	999% / 856%
29	R50M/F3M	755% / 350%	755% / 350%
30	B10T	336%	336%
31	**Min/MaxTransientVltg**		
32	Arrowhd 230	1.00 | 1.02	0.99 | 1.02
33	Boise 115	1.03 | 1.06	1.03 | 1.06
34	Dorsey 230	1.03 | 1.05	1.03 | 1.05
35	Forbes 230	1.01 | 1.03	1.01 | 1.03
36	Riverton 230	1.00 | 1.03	0.98 | 1.03
37	Coal Creek 230	1.01 | 1.08	0.97 | 1.09
38	Dickinson 345	1.00 | 1.05	0.98 | 1.05
39	Drayton 230	0.99 | 1.02	0.97 | 1.04
40	Groton 345	0.95 | 1.03	0.91 | 1.02
41	Tioga 230	1.01 | 1.04	0.99 | 1.04
42	Wahpeton 115	1.01 | 1.06	0.98 | 1.08
43	Watertown 345	0.96 | 1.04	0.96 | 1.04
44	**Dynamic Voltage Warnings**		
45		470 [BISON 4] 0.67	none
46		497 [MAURINE4] 0.68	
47			
48			
49			
50			
51			
52	Worst Case Angle Damping	SHERC3 / 66.96%	SHERC3 / 60.27%
53	Dorsey SUVP / UdHold		
54	Forbes DC Red (DCAR)	359%	355%
55	K22W (max +dP @ t, d-ang)	10.3@(2.76655,-2.7)	7.5@(2.76655,-2.3)
56	K22W (max -dP @ t, d-ang)	11.9@(0.89163,4.1)	15.1@(0.85830,4.9)
57	K22W (max d-ang @ t, dP)	6.6@(1.21662,-3.6)	7.7@(1.19995,-5.5)
58	**OS Rel Trip / Marg**		
59	MH - OH		
60	D602F at Forbes/Dorsey	103% / 178%	94% / 166%
61	L20D at Prairie/Drayton	999% / 708%	999% / 726%
62	R50M / F3M	648% / 292%	622% / 288%
63	B10T	239%	262%
64	**FSCAPS (SS/Unav/Final)**		
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 8 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)

Table 5.13
Belfield - Hettinger - Ft Thompson 345 kV + 750 MW HVdc Exports to WSCC (Case S1C4XXX)

```
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166

DATA FOR BUS   424 [BELFELD3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.03778 104.58

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  683 CHAR.CK3 345  1   0.00170  0.02080  0.33587  1  F   239.0  880.0  263.0    0.0       1 1.000
 9847 HETINGR3 345  1   0.00267  0.03850  0.41990  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
19042 BELFELDT 345  1   0.00010  0.03710  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
19042 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DATA FOR BUS  9847 [HETINGR3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02000 103.55

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  424 BELFELD3 345  1   0.00267  0.03850  0.41990  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  847 HETINGR4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 9411 MI CITY3 345  1   0.00658  0.09510  1.03600  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 9601 HETTCOAL13.8  1   0.00040  0.02000  0.00000  1  F   550.0  550.0  550.0    0.0       1 1.000
 9838 GLENHAM3 345  1   0.00490  0.07030  0.76530  1  F     0.0    0.0    0.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  847 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9601 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  9838 [GLENHAM3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01158  94.08

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00471  0.06826  0.74362  1  T   680.0 1159.0  748.0    0.0       1 1.000
  605 LELANDO3 345  1   0.00575  0.08344  0.90888  1  F   680.0 1159.0  748.0    0.0       1 1.000
 9847 HETINGR3 345  1   0.00490  0.07030  0.76530  1  T     0.0    0.0    0.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  506 FTTHOMP3 345  1    0.00000  0.00000   0.00000 -0.68000     1
  605 LELANDO3 345  1    0.00000  0.00000   0.00000 -0.50000     1
```

Table 5.13 (Cont.)

```
DATA FOR BUS   411 [MI CTYE4 230] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.03000  90.63

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 1.03000 1.03000   112.90  9:  15.00 1:   8.00

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  403 DAWSONC4 230  1   0.01340  0.10780  0.19690  1  T   239.0  440.0  263.0    0.0       1 1.000
  804 BAKER  4 230  1   0.01430  0.11380  0.21640  1  F   160.0  322.0  176.0    0.0       1 1.000
 9411 MI CITY3 345  1   0.00000  0.01500  0.00000  1  T   500.0  600.0  700.0    0.0       1 1.000
19036 MICTYE1T 230  1   0.00110  0.09050  0.00000  1  F   100.0  100.0  125.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9411 1  T 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19036 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DC# X--- RECTIFIER --X X--- INVERTER ---X  MDC RDC-OHMS RCOMP-OHMS DELTI
 11   411 MI CTYE4 230   402 MI CTYW4 230   1    0.000    0.000   0.0000

   SETVAL  VSCHED  DCVMIN  VCMODE DC-AMPS    VDCR    VDCI   VCOMP  METER
    150.0    80.9     0.0     0.0  1854.1    80.9    80.9    80.9   INV

 ALPHA AFLMN ALFMX   PACR   QACR NBR EBASER    RCR     XCR    XCCCR  X--MEASURING BUS-X
 16.14 15.59 19.59  150.0   66.6  1   230.0   0.000   2.456   0.000

  TRR    TAPR   TAPMXR  TAPMNR   TSTPR X--TAPPED SIDE---X X-UNTAPPED SIDE--X ID
0.2969 1.07030 1.12900 0.94100 0.00587

DATA FOR BUS  9411 [MI CITY3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 2     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.03000  89.17

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 0 1.03000 1.03000   105.00  9:  15.00 9:  15.00 3:  15.00 3:   8.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
      0.0   100.0   150.0  -150.0 1.03000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1    0.0  100.0  150.0 -150.0  150.0 0.0000 0.1700 0.0000 0.1200 1.0000 9999.0-9999.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  411 MI CTYE4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 9847 HETINGR3 345  1   0.00658  0.09510  1.03600  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  411 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 5.13 (Cont.)

```
DC# X--- RECTIFIER --X X--- INVERTER ---X  MDC RDC-OHMS RCOMP-OHMS DELTI
  14  9411 MI CITY3 345   402 MI CTYW4 230   1    0.000    0.000   0.0000

    SETVAL  VSCHED  DCVMIN  VCMODE DC-AMPS    VDCR    VDCI   VCOMP  METER
     150.0    80.9     0.0     0.0  1854.1    80.9    80.9    80.9   INV

  ALPHA AFLMN ALFMX   PACR   QACR NBR EBASER    RCR     XCR    XCCCR  X--MEASURING BUS-X
  16.14 15.59 19.59  150.0   66.6  1   345.0   0.000   2.456   0.000

   TRR    TAPR   TAPMXR  TAPMNR   TSTPR X--TAPPED SIDE---X X-UNTAPPED SIDE--X ID
 0.1979 1.07030 1.12900 0.94100 0.00587

 DC# X--- RECTIFIER --X X--- INVERTER ---X  MDC RDC-OHMS RCOMP-OHMS DELTI
  15  9411 MI CITY3 345   402 MI CTYW4 230   1    0.000    0.000   0.0000

    SETVAL  VSCHED  DCVMIN  VCMODE DC-AMPS    VDCR    VDCI   VCOMP  METER
     150.0    80.9     0.0     0.0  1854.1    80.9    80.9    80.9   INV

  ALPHA AFLMN ALFMX   PACR   QACR NBR EBASER    RCR     XCR    XCCCR  X--MEASURING BUS-X
  16.14 15.59 19.59  150.0   66.6  1   345.0   0.000   2.456   0.000

   TRR    TAPR   TAPMXR  TAPMNR   TSTPR X--TAPPED SIDE---X X-UNTAPPED SIDE--X ID
 0.1979 1.07030 1.12900 0.94100 0.00587

 DC# X--- RECTIFIER --X X--- INVERTER ---X  MDC RDC-OHMS RCOMP-OHMS DELTI
  16  9411 MI CITY3 345   402 MI CTYW4 230   1    0.000    0.000   0.0000

    SETVAL  VSCHED  DCVMIN  VCMODE DC-AMPS    VDCR    VDCI   VCOMP  METER
     150.0    80.9     0.0     0.0  1854.1    80.9    80.9    80.9   INV

  ALPHA AFLMN ALFMX   PACR   QACR NBR EBASER    RCR     XCR    XCCCR  X--MEASURING BUS-X
  16.14 15.59 19.59  150.0   66.6  1   345.0   0.000   2.456   0.000

   TRR    TAPR   TAPMXR  TAPMNR   TSTPR X--TAPPED SIDE---X X-UNTAPPED SIDE--X ID
 0.1979 1.07030 1.12900 0.94100 0.00587
```

TABLE 5.14 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C4XXX

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S1C4XXX-cg1	upe-so04aa.S1C4XXX-cg3	upe-so04aa.S1C4XXX-ei2	upe-so04aa.S1C4XXX-eq1
3	**Disturbance**	cg1	cg3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 21 2002 11:52	APR 21 2002 12:14	APR 21 2002 12:49	APR 21 2002 13:22
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2305 / 342	2305 / 342	2305 / 342	2305 / 342
10	MHEX / L20D	2171 / 233	2171 / 233	2171 / 233	2171 / 233
11	ECL-ARP / PRI-BYN	642 / 823	642 / 823	642 / 823	642 / 823
12	MWSI / MNEX	1465 / 2740	1465 / 2740	1465 / 2740	1465 / 2740
13	D602F / F601C	1787 / 1322	1787 / 1322	1787 / 1322	1787 / 1322
14	B10T / MH>SPC	165 / 98	165 / 98	165 / 98	165 / 98
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	168 / 150	168 / 150	168 / 150	168 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	263 / 28	263 / 28	263 / 28	263 / 28
19	Forbes SVC / MSC	37 / 600	37 / 600	37 / 600	37 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.019	1.059 / 1.019	1.059 / 1.019	1.059 / 1.019
23	Chisago 500/EauClaire 345	1.023 / 1.008	1.023 / 1.008	1.023 / 1.008	1.023 / 1.008
24	Int Falls 115/Badoura 115	1.048 / 0.994	1.048 / 0.994	1.048 / 0.994	1.048 / 0.994
25	Drayton 230/Groton 345	1.013 / 1.009	1.013 / 1.009	1.013 / 1.009	1.013 / 1.009
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	141% / 234%	141% / 234%	141% / 234%	141% / 234%
28	L20D at Prairie/Drayton	999% / 871%	999% / 871%	999% / 871%	999% / 871%
29	R50M/F3M	755% / 345%	755% / 345%	755% / 345%	755% / 345%
30	B10T	333%	333%	333%	333%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	1.00 | 1.01	0.98 | 1.02	0.98 | 1.05	0.99 | 1.04
33	Boise 115	1.04 | 1.05	1.02 | 1.06	1.01 | 1.07	1.03 | 1.07
34	Dorsey 230	1.04 | 1.05	1.03 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.01 | 1.02	1.00 | 1.03	0.98 | 1.03	1.00 | 1.03
36	Riverton 230	1.00 | 1.01	0.98 | 1.04	0.93 | 1.04	0.96 | 1.03
37	Coal Creek 230	1.01 | 1.05	0.97 | 1.10	1.03 | 1.11	0.97 | 1.12
38	Dickinson 345	1.01 | 1.03	0.98 | 1.05	1.03 | 1.06	1.03 | 1.08
39	Drayton 230	1.00 | 1.02	0.99 | 1.07	0.95 | 1.07	1.00 | 1.07
40	Groton 345	0.97 | 1.01	0.89 | 1.04	0.89 | 1.06	0.91 | 1.04
41	Tioga 230	1.02 | 1.03	0.99 | 1.04	1.00 | 1.05	1.01 | 1.04
42	Wahpeton 115	1.02 | 1.05	0.98 | 1.09	0.92 | 1.10	0.96 | 1.08
43	Watertown 345	1.00 | 1.03	0.95 | 1.05	0.93 | 1.06	0.95 | 1.05
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 68.43%	SHERC3 / 65.74%	KING 3 / -45.46%	SHERC3 / -82.20%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	444%	311%	499%	507%
55	K22W (max +dP @ t, d-ang)	2.1@(2.64156,-0.5)	12.5@(2.67489,-3.1)	58.1@(2.13325,-35.3)	36.3@(2.74988,-20.0)
56	K22W (max -dP @ t, d-ang)	6.6@(0.73330,2.1)	16.5@(0.79164,6.2)	4.0@(0.49165,0.1)	5.6@(0.32499,0.3)
57	K22W (max d-ang @ t, dP)	3.5@(1.07496,-2.7)	9.2@(1.10829,-6.6)	-149.1@(20.00792,26.7)	-85.1@(20.00792,17.0)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	121% / 204%	91% / 162%	58% / 112%	93% / 163%
61	L20D at Prairie/Drayton	999% / 818%	999% / 702%	728% / 639%	173% / 616%
62	R50M / F3M	697% / 320%	618% / 280%	548% / 229%	640% / 261%
63	B10T	300%	213%	152%	203%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 3 | 2) / (0 | 2 | 1)	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 3 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 3) / (2 | 2 | 2)

TABLE 5.14 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C4XXX

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S1C4XXX-nbz	upe-so04aa.S1C4XXX-mqs	upe-so04aa.S1C4XXX-pys	upe-so04aa.S1C4XXX-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 21 2002 13:52	APR 21 2002 14:31	APR 21 2002 15:04	APR 21 2002 15:27
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2305 / 342	2305 / 342	2305 / 342	2305 / 342
10	MHEX / L20D	2171 / 233	2171 / 233	2171 / 233	2171 / 233
11	ECL-ARP / PRI-BYN	642 / 823	642 / 823	642 / 823	642 / 823
12	MWSI / MNEX	1465 / 2740	1465 / 2740	1465 / 2740	1465 / 2740
13	D602F / F601C	1787 / 1322	1787 / 1322	1787 / 1322	1787 / 1322
14	B10T / MH>SPC	165 / 98	165 / 98	165 / 98	165 / 98
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	168 / 150	168 / 150	168 / 150	168 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	263 / 28	263 / 28	263 / 28	263 / 28
19	Forbes SVC / MSC	37 / 600	37 / 600	37 / 600	37 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.019	1.059 / 1.019	1.059 / 1.019	1.059 / 1.019
23	Chisago 500/EauClaire 345	1.023 / 1.008	1.023 / 1.008	1.023 / 1.008	1.023 / 1.008
24	Int Falls 115/Badoura 115	1.048 / 0.994	1.048 / 0.994	1.048 / 0.994	1.048 / 0.994
25	Drayton 230/Groton 345	1.013 / 1.009	1.013 / 1.009	1.013 / 1.009	1.013 / 1.009
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	141% / 234%	141% / 234%	141% / 234%	141% / 234%
28	L20D at Prairie/Drayton	999% / 871%	999% / 871%	999% / 871%	999% / 871%
29	R50M/F3M	755% / 345%	755% / 345%	755% / 345%	755% / 345%
30	B10T	333%	333%	333%	333%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.09	0.97 | 1.06	0.97 | 1.01	0.99 | 1.01
33	Boise 115	0.96 | 1.08	0.99 | 1.07	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.15	0.99 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.05	0.98 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.92 | 1.05	0.94 | 1.03	1.01 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.97 | 1.09	0.98 | 1.08	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.98 | 1.09	0.95 | 1.10	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.97 | 1.08	0.96 | 1.05	1.00 | 1.04	1.01 | 1.02
40	Groton 345	0.89 | 1.06	0.94 | 1.03	0.98 | 1.01	1.00 | 1.01
41	Tioga 230	0.99 | 1.06	0.99 | 1.05	1.00 | 1.03	1.02 | 1.03
42	Wahpeton 115	0.91 | 1.10	0.97 | 1.09	1.03 | 1.06	1.04 | 1.05
43	Watertown 345	0.93 | 1.06	0.97 | 1.04	1.00 | 1.02	1.02 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -26.26%	KING 3 / 3.23%	SHERC3 / 33.26%	KING 3 / 23.04%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	459%	170%	323%
55	K22W (max +dP @ t, d-ang)	134.2@(2.10825,-63.6)	69.7@(2.30824,-36.9)	0.4@(0.11666,0.2)	0.0@(-0.01667,0.0)
56	K22W (max -dP @ t, d-ang)	99.5@(0.26666,10.8)	21.2@(0.34165,4.2)	29.6@(1.78326,18.0)	20.1@(2.06658,13.1)
57	K22W (max d-ang @ t, dP)	-269.3@(20.00792,48.6)	-134.9@(20.00792,24.8)	20.1@(20.00792,-14.5)	16.8@(20.00792,-11.3)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	27% / 71%	118% / 199%	141% / 234%
61	L20D at Prairie/Drayton	999% / 483%	999% / 652%	999% / 678%	999% / 756%
62	R50M / F3M	278% / 126%	450% / 197%	651% / 345%	720% / 345%
63	B10T	172%	137%	52%	-340%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 1)	(2 | 4 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (1 | 5 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 1) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 5.14 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C4XXX

1	**Case No.**	9	10	11
2	**Case Name**	upe-so04aa.S1C4XXX-ab3	upe-so04aa.S1C4XXX-av3	upe-so04aa.S1C4XXX-avj
3	**Disturbance**	ab3	av3	avj
4	**Prior Outage**	None	None	None
5	**Date/Time**	APR 21 2002 16:28	APR 21 2002 15:46	APR 21 2002 11:31
6	**Comments**			
7				
8	**Steady State Flows**			
9	NDEX / EAST BIAS	2305 / 342	2305 / 342	2305 / 342
10	MHEX / L20D	2171 / 233	2171 / 233	2171 / 233
11	ECL-ARP / PRI-BYN	642 / 823	642 / 823	642 / 823
12	MWSI / MNEX	1465 / 2740	1465 / 2740	1465 / 2740
13	D602F / F601C	1787 / 1322	1787 / 1322	1787 / 1322
14	B10T / MH>SPC	165 / 98	165 / 98	165 / 98
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	168 / 150	168 / 150	168 / 150
17	Dorsey BP1 / BP2	1492 / 1689	1492 / 1689	1492 / 1689
18	Dorsey Reserve / Wtrtn SVC	263 / 28	263 / 28	263 / 28
19	Forbes SVC / MSC	37 / 600	37 / 600	37 / 600
20	**Steady State Vltgs**			
21	Dorsey 500/Dorsey 230	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.019	1.059 / 1.019	1.059 / 1.019
23	Chisago 500/EauClaire 345	1.023 / 1.008	1.023 / 1.008	1.023 / 1.008
24	Int Falls 115/Badoura 115	1.048 / 0.994	1.048 / 0.994	1.048 / 0.994
25	Drayton 230/Groton 345	1.013 / 1.009	1.013 / 1.009	1.013 / 1.009
26	**SS OS Relay Margins**			
27	D602F at Forbes/Dorsey	141% / 234%	141% / 234%	141% / 234%
28	L20D at Prairie/Drayton	999% / 871%	999% / 871%	999% / 871%
29	R50M/F3M	755% / 345%	755% / 345%	755% / 345%
30	B10T	333%	333%	333%
31	**Min/MaxTransientVltg**			
32	Arrowhd 230	0.98 | 1.02	0.99 | 1.03	0.96 | 1.02
33	Boise 115	1.02 | 1.06	1.02 | 1.06	1.01 | 1.06
34	Dorsey 230	1.03 | 1.05	1.03 | 1.05	1.01 | 1.06
35	Forbes 230	1.00 | 1.03	1.00 | 1.03	0.99 | 1.02
36	Riverton 230	0.97 | 1.03	0.98 | 1.03	0.96 | 1.02
37	Coal Creek 230	0.97 | 1.10	0.98 | 1.10	0.96 | 1.10
38	Dickinson 345	0.98 | 1.05	0.99 | 1.05	0.97 | 1.04
39	Drayton 230	0.98 | 1.06	0.99 | 1.06	0.97 | 1.07
40	Groton 345	0.92 | 1.04	0.92 | 1.04	0.87 | 1.01
41	Tioga 230	0.98 | 1.05	1.00 | 1.05	0.98 | 1.05
42	Wahpeton 115	0.98 | 1.09	0.99 | 1.09	0.96 | 1.08
43	Watertown 345	0.96 | 1.04	0.96 | 1.05	0.91 | 1.03
44	**Dynamic Voltage Warnings**			
45		none	470 [BISON 4] 0.68	none
46				
47				
48				
49				
50				
51				
52	Worst Case Angle Damping	SHERC3 / 62.69%	SHERC3 / 62.70%	ANTEL3 / -13.93%
53	Dorsey SUVP / UdHold			
54	Forbes DC Red (DCAR)	294%	284%	139%
55	K22W (max +dP @ t, d-ang)	12.7@(2.87488,-3.5)	15.9@(2.89155,-4.8)	1.3@(0.14166,0.0)
56	K22W (max -dP @ t, d-ang)	19.0@(0.90830,6.9)	18.1@(0.92496,7.1)	40.1@(2.38323,13.1)
57	K22W (max d-ang @ t, dP)	10.9@(1.26662,-7.2)	10.9@(1.27495,-6.9)	65.7@(20.00792,-17.5)
58	**OS Rel Trip / Marg**			
59	MH - OH			
60	D602F at Forbes/Dorsey	88% / 157%	89% / 158%	58% / 114%
61	L20D at Prairie/Drayton	999% / 688%	999% / 681%	999% / 705%
62	R50M / F3M	607% / 279%	610% / 278%	511% / 281%
63	B10T	213%	206%	247%
64	**FSCAPS (SS/Unav/Final)**			
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 1 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 4 | 2) / (0 | 2 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 2 | 1) / (2 | 2 | 2)	(0 | 2 | 1) / (2 | 2 | 2)	(0 | 4 | 3) / (2 | 2 | 2)

Table 5.15
Belfield - Hettinger 345 kV + Hettinger-Blue Lake 500 kV (Case S1C5XXX)

```
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166

DATA FOR BUS  9847 [HETINGR3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02000  96.40

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  424 BELFELD3 345  1   0.00267  0.03850  0.41990  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  847 HETINGR4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 9601 HETTCOAL13.8  1   0.00040  0.02000  0.00000  1  F   550.0  550.0  550.0    0.0       1 1.000
99847 HETINGR2 500  1   0.00012  0.00940  0.00000  1  T   600.0  720.0  840.0    0.0       1 1.000
99847 HETINGR2 500  2   0.00012  0.00940  0.00000  1  T   600.0  720.0  840.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  847 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9601 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
99847 1  T 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
99847 2  T 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99847 [HETINGR2 500] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02089  94.04

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 9847 HETINGR3 345  1   0.00012  0.00940  0.00000  1  F   600.0  720.0  840.0    0.0       1 1.000
 9847 HETINGR3 345  2   0.00012  0.00940  0.00000  1  F   600.0  720.0  840.0    0.0       1 1.000
99838 GLENHAM2 500  1   0.00110  0.02430  2.18090  1  F  3290.0 3290.0 3290.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9847 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9847 2  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99838 [GLENHAM2 500] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01921  81.75

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 9838 GLENHAM3 345  1   0.00009  0.00705  0.00000  1  F   800.0  960.0 1120.0    0.0       1 1.000
99660 GROTON 2 500  1   0.00100  0.02190  1.96860  1  F  3290.0 3290.0 3290.0    0.0       1 1.000
99847 HETINGR2 500  1   0.00110  0.02430  2.18090  1  T  3290.0 3290.0 3290.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9838 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 5.15 (Cont.)

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DATA FOR BUS 99660 [GROTON 2 500] RESIDING IN AREA   6, ZONE  11, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01770  69.99

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  660 GROTON 3 345  1   0.00014  0.01128  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
99838 GLENHAM2 500  1   0.00100  0.02190  1.96860  1  T  3290.0 3290.0 3290.0    0.0       1 1.000
99910 BIGSTON2 500  1   0.00070  0.01570  1.40890  1  F  3290.0 3290.0 3290.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  660 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS 99910 [BIGSTON2 500] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02278  62.51

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  910 BIGSTON4 230  1   0.00052  0.02592  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
91702 BLUE LK2 500  1   0.00140  0.03220  2.89500  1  F  3290.0 3290.0 3290.0    0.0       1 1.000
99660 GROTON 2 500  1   0.00070  0.01570  1.40890  1  T  3290.0 3290.0 3290.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  910 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS 91702 [BLUE LK2 500] RESIDING IN AREA  23, ZONE 323, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01352  44.69

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 1702 BLUE LK3 345  1   0.00012  0.00940  0.00000  1  F   600.0  720.0  840.0    0.0       1 1.000
 1702 BLUE LK3 345  2   0.00012  0.00940  0.00000  1  F   600.0  720.0  840.0    0.0       1 1.000
99910 BIGSTON2 500  1   0.00140  0.03220  2.89500  1  T  3290.0 3290.0 3290.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 1702 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 1702 2  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 5.16 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C5XXX

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S1C5XXX-cg1	upe-so04aa.S1C5XXX-cg3	upe-so04aa.S1C5XXX-ei2	upe-so04aa.S1C5XXX-eq1
3	**Disturbance**	cg1	cg3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 11 2002 17:35	APR 11 2002 17:47	APR 11 2002 18:03	APR 11 2002 18:18
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2928 / 317	2928 / 317	2928 / 317	2928 / 317
10	MHEX / L20D	2171 / 245	2171 / 245	2171 / 245	2171 / 245
11	ECL-ARP / PRI-BYN	640 / 836	640 / 836	640 / 836	640 / 836
12	MWSI / MNEX	1476 / 2868	1476 / 2868	1476 / 2868	1476 / 2868
13	D602F / F601C	1770 / 1297	1770 / 1297	1770 / 1297	1770 / 1297
14	B10T / MH>SPC	167 / 100	167 / 100	167 / 100	167 / 100
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	161 / 150	161 / 150	161 / 150	161 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	268 / -9	268 / -9	268 / -9	268 / -9
19	Forbes SVC / MSC	30 / 600	30 / 600	30 / 600	30 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.033 / 1.045	1.033 / 1.045	1.033 / 1.045	1.033 / 1.045
22	Roseau 500/Forbes 500	1.060 / 1.021	1.060 / 1.021	1.060 / 1.021	1.060 / 1.021
23	Chisago 500/EauClaire 345	1.025 / 1.022	1.025 / 1.022	1.025 / 1.022	1.025 / 1.022
24	Int Falls 115/Badoura 115	1.049 / 0.999	1.049 / 0.999	1.049 / 0.999	1.049 / 0.999
25	Drayton 230/Groton 345	1.011 / 1.012	1.011 / 1.012	1.011 / 1.012	1.011 / 1.012
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	146% / 242%	146% / 242%	146% / 242%	146% / 242%
28	L20D at Prairie/Drayton	999% / 811%	999% / 811%	999% / 811%	999% / 811%
29	R50M/F3M	753% / 345%	753% / 345%	753% / 345%	753% / 345%
30	B10T	338%	338%	338%	338%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	1.00 | 1.02	0.98 | 1.03	0.98 | 1.05	0.99 | 1.04
33	Boise 115	1.04 | 1.05	1.02 | 1.08	1.02 | 1.08	1.03 | 1.07
34	Dorsey 230	1.04 | 1.05	1.02 | 1.06	1.03 | 1.06	1.03 | 1.06
35	Forbes 230	1.01 | 1.02	1.00 | 1.03	0.98 | 1.04	1.00 | 1.03
36	Riverton 230	1.00 | 1.02	0.97 | 1.04	0.94 | 1.05	0.96 | 1.04
37	Coal Creek 230	1.00 | 1.06	0.96 | 1.11	1.02 | 1.12	0.96 | 1.14
38	Dickinson 345	1.00 | 1.04	0.97 | 1.07	1.01 | 1.07	1.01 | 1.09
39	Drayton 230	0.99 | 1.01	0.98 | 1.07	0.95 | 1.07	1.00 | 1.07
40	Groton 345	0.98 | 1.02	0.91 | 1.06	0.87 | 1.08	0.89 | 1.06
41	Tioga 230	1.03 | 1.05	1.00 | 1.07	1.01 | 1.07	1.02 | 1.06
42	Wahpeton 115	1.01 | 1.05	0.97 | 1.10	0.93 | 1.11	0.95 | 1.10
43	Watertown 345	1.00 | 1.03	0.96 | 1.05	0.93 | 1.07	0.95 | 1.06
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 57.95%	SHERC3 / 65.13%	KING 3 / -60.30%	SHERC3 / -42.98%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	444%	312%	501%	507%
55	K22W (max +dP @ t, d-ang)	2.0@(0.14166,0.0)	11.4@(2.61656,-3.9)	56.0@(2.80822,-30.8)	37.3@(2.60822,-19.2)
56	K22W (max -dP @ t, d-ang)	7.8@(0.79164,2.5)	16.3@(0.79164,5.9)	5.5@(0.59998,-0.1)	6.1@(0.32499,0.4)
57	K22W (max d-ang @ t, dP)	3.9@(1.14162,-3.9)	8.4@(1.08329,-6.9)	-147.7@(20.00792,25.5)	-77.6@(20.00792,15.4)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	120% / 203%	89% / 159%	78% / 140%	104% / 181%
61	L20D at Prairie/Drayton	999% / 773%	999% / 652%	826% / 580%	153% / 582%
62	R50M / F3M	678% / 315%	597% / 267%	582% / 235%	652% / 257%
63	B10T	320%	212%	138%	179%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 3 | 2) / (0 | 2 | 1)	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (0 | 0 | 0)	(0 | 1 | 1) / (0 | 1 | 1)	(0 | 1 | 0) / (0 | 1 | 1)	(0 | 0 | 0) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 0) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)

TABLE 5.16 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C5XXX

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S1C5XXX-nbz	upe-so04aa.S1C5XXX-mqs	upe-so04aa.S1C5XXX-pys	upe-so04aa.S1C5XXX-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 11 2002 18:32	APR 11 2002 18:50	APR 11 2002 19:05	APR 11 2002 19:19
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2928 / 317	2928 / 317	2928 / 317	2928 / 317
10	MHEX / L20D	2171 / 245	2171 / 245	2171 / 245	2171 / 245
11	ECL-ARP / PRI-BYN	640 / 836	640 / 836	640 / 836	640 / 836
12	MWSI / MNEX	1476 / 2868	1476 / 2868	1476 / 2868	1476 / 2868
13	D602F / F601C	1770 / 1297	1770 / 1297	1770 / 1297	1770 / 1297
14	B10T / MH>SPC	167 / 100	167 / 100	167 / 100	167 / 100
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	161 / 150	161 / 150	161 / 150	161 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	268 / -9	268 / -9	268 / -9	268 / -9
19	Forbes SVC / MSC	30 / 600	30 / 600	30 / 600	30 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.033 / 1.045	1.033 / 1.045	1.033 / 1.045	1.033 / 1.045
22	Roseau 500/Forbes 500	1.060 / 1.021	1.060 / 1.021	1.060 / 1.021	1.060 / 1.021
23	Chisago 500/EauClaire 345	1.025 / 1.022	1.025 / 1.022	1.025 / 1.022	1.025 / 1.022
24	Int Falls 115/Badoura 115	1.049 / 0.999	1.049 / 0.999	1.049 / 0.999	1.049 / 0.999
25	Drayton 230/Groton 345	1.011 / 1.012	1.011 / 1.012	1.011 / 1.012	1.011 / 1.012
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	146% / 242%	146% / 242%	146% / 242%	146% / 242%
28	L20D at Prairie/Drayton	999% / 811%	999% / 811%	999% / 811%	999% / 811%
29	R50M/F3M	753% / 345%	753% / 345%	753% / 345%	753% / 345%
30	B10T	338%	338%	338%	338%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.10	0.97 | 1.06	0.98 | 1.01	0.99 | 1.01
33	Boise 115	0.98 | 1.08	1.01 | 1.09	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.14	1.02 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	1.00 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.91 | 1.07	0.96 | 1.04	1.01 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.95 | 1.09	0.97 | 1.07	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.96 | 1.09	0.96 | 1.08	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.95 | 1.08	0.98 | 1.05	0.99 | 1.03	1.00 | 1.02
40	Groton 345	0.83 | 1.09	0.92 | 1.05	0.99 | 1.02	1.01 | 1.03
41	Tioga 230	0.99 | 1.08	1.01 | 1.07	1.02 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.89 | 1.13	0.98 | 1.09	1.02 | 1.06	1.04 | 1.06
43	Watertown 345	0.91 | 1.09	0.97 | 1.05	1.00 | 1.03	1.01 | 1.03
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -32.53%	KING 3 / 9.69%	ANTEL3 / 32.64%	KING 3 / 21.83%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	466%	189%	348%
55	K22W (max +dP @ t, d-ang)	143.6@(2.11658,-67.9)	62.0@(2.66656,-32.0)	0.5@(0.11666,0.2)	0.0@(-0.00833,0.0)
56	K22W (max -dP @ t, d-ang)	98.5@(0.26666,10.7)	21.5@(0.33332,4.0)	30.7@(1.79159,18.8)	18.9@(2.15824,11.7)
57	K22W (max d-ang @ t, dP)	-260.5@(20.00792,48.4)	-107.9@(20.00792,18.8)	24.7@(20.00792,-15.3)	15.9@(20.00792,-11.2)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	63% / 124%	120% / 202%	143% / 236%
61	L20D at Prairie/Drayton	999% / 455%	999% / 560%	999% / 643%	999% / 734%
62	R50M / F3M	316% / 160%	531% / 244%	641% / 345%	711% / 345%
63	B10T	133%	118%	193%	277%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 1) / (0 | 0 | 0)	(4 | 4 | 2) / (0 | 3 | 3)	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 2 | 0)	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (0 | 5 | 2)	(0 | 1 | 0) / (0 | 1 | 1)	(0 | 0 | 0) / (0 | 0 | 0)	(0 | 0 | 0) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 3 | 1) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 5.16 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C5XXX

1	**Case No.**	9	10
2	**Case Name**	upe-so04aa.S1C5XXX-av3	upe-so04aa.S1C5XXX-cb3
3	**Disturbance**	av3	cb3
4	**Prior Outage**	None	None
5	**Date/Time**	APR 11 2002 19:32	APR 11 2002 19:48
6	**Comments**		
7			
8	**Steady State Flows**		
9	NDEX / EAST BIAS	2928 / 317	2928 / 317
10	MHEX / L20D	2171 / 245	2171 / 245
11	ECL-ARP / PRI-BYN	640 / 836	640 / 836
12	MWSI / MNEX	1476 / 2868	1476 / 2868
13	D602F / F601C	1770 / 1297	1770 / 1297
14	B10T / MH>SPC	167 / 100	167 / 100
15	OH E-W / OH>MH	-120 / -197	-120 / -197
16	R50M / OH>MP	161 / 150	161 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	268 / -9	268 / -9
19	Forbes SVC / MSC	30 / 600	30 / 600
20	**Steady State Vltgs**		
21	Dorsey 500/Dorsey 230	1.033 / 1.045	1.033 / 1.045
22	Roseau 500/Forbes 500	1.060 / 1.021	1.060 / 1.021
23	Chisago 500/EauClaire 345	1.025 / 1.022	1.025 / 1.022
24	Int Falls 115/Badoura 115	1.049 / 0.999	1.049 / 0.999
25	Drayton 230/Groton 345	1.011 / 1.012	1.011 / 1.012
26	**SS OS Relay Margins**		
27	D602F at Forbes/Dorsey	146% / 242%	146% / 242%
28	L20D at Prairie/Drayton	999% / 811%	999% / 811%
29	R50M/F3M	753% / 345%	753% / 345%
30	B10T	338%	338%
31	**Min/MaxTransientVltg**		
32	Arrowhd 230	1.00 | 1.03	0.99 | 1.06
33	Boise 115	1.03 | 1.07	1.03 | 1.07
34	Dorsey 230	1.03 | 1.05	1.03 | 1.05
35	Forbes 230	1.01 | 1.03	1.00 | 1.05
36	Riverton 230	0.98 | 1.04	0.98 | 1.19(8.37)
37	Coal Creek 230	0.98 | 1.09	0.96 | 1.10
38	Dickinson 345	0.98 | 1.06	0.99 | 1.09
39	Drayton 230	0.98 | 1.05	0.95 | 1.20
40	Groton 345	0.90 | 1.07	0.94 | 1.64(8.37)
41	Tioga 230	1.01 | 1.06	0.84 | 2.36(8.37)
42	Wahpeton 115	0.98 | 1.10	0.97 | 1.51(8.37)
43	Watertown 345	0.96 | 1.05	0.99 | 1.51(8.37)
44	**Dynamic Voltage Warnings**		
45		none	none
46			
47			
48			
49			
50			
51			
52	Worst Case Angle Damping	SHERC3 / 65.59%	SHERC3 / 65.59%
53	Dorsey SUVP / UdHold		
54	Forbes DC Red (DCAR)	341%	507%
55	K22W (max +dP @ t, d-ang)	11.7@(2.63322,-5.0)	55.4@(2.66656,-29.8)
56	K22W (max -dP @ t, d-ang)	12.3@(0.79164,4.1)	3.8@(0.64997,0.4)
57	K22W (max d-ang @ t, dP)	6.3@(1.08329,-4.3)	-54.1@(7.14145,33.6)
58	**OS Rel Trip / Marg**		
59	MH - OH		
60	D602F at Forbes/Dorsey	101% / 176%	97% / 174%
61	L20D at Prairie/Drayton	999% / 667%	999% / 578%
62	R50M / F3M	632% / 278%	647% / 246%
63	B10T	223%	165%
64	**FSCAPS (SS/Unav/Final)**		
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 4 | 3) / (0 | 2 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (0 | 1 | 1)	(0 | 0 | 0) / (0 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 2 | 1) / (2 | 2 | 2)	(0 | 3 | 2) / (2 | 2 | 2)

Table 5.17
Hettinger-Blue Lake 500 kV + Belfield - Hettinger & Ft. Thompson-Hettinger 345 kV (Case S1C5XX1)

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UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167

DATA FOR BUS  9847 [HETINGR3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02000  92.28

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  424 BELFELD3 345  1   0.00267  0.03850  0.41990  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  506 FTTHOMP3 345  1   0.00860  0.12434  1.35450  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  847 HETINGR4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 9601 HETTCOAL13.8  1   0.00040  0.02000  0.00000  1  F   550.0  550.0  550.0    0.0       1 1.000
99847 HETINGR2 500  1   0.00012  0.00940  0.00000  1  T   600.0  720.0  840.0    0.0       1 1.000
99847 HETINGR2 500  2   0.00012  0.00940  0.00000  1  T   600.0  720.0  840.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  847 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9601 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
99847 1  T 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
99847 2  T 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99847 [HETINGR2 500] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02405  90.36

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 9847 HETINGR3 345  1   0.00012  0.00940  0.00000  1  F   600.0  720.0  840.0    0.0       1 1.000
 9847 HETINGR3 345  2   0.00012  0.00940  0.00000  1  F   600.0  720.0  840.0    0.0       1 1.000
99838 GLENHAM2 500  1   0.00110  0.02430  2.18090  1  F  3290.0 3290.0 3290.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9847 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9847 2  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99838 [GLENHAM2 500] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.03038  80.48

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 9838 GLENHAM3 345  1   0.00009  0.00705  0.00000  1  F   800.0  960.0 1120.0    0.0       1 1.000
99660 GROTON 2 500  1   0.00100  0.02190  1.96860  1  F  3290.0 3290.0 3290.0    0.0       1 1.000
99847 HETINGR2 500  1   0.00110  0.02430  2.18090  1  T  3290.0 3290.0 3290.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9838 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
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Table 5.17 (Cont.)

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DATA FOR BUS 99660 [GROTON 2 500] RESIDING IN AREA   6, ZONE  11, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02635  69.63

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  660 GROTON 3 345  1   0.00014  0.01128  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
99838 GLENHAM2 500  1   0.00100  0.02190  1.96860  1  T  3290.0 3290.0 3290.0    0.0       1 1.000
99910 BIGSTON2 500  1   0.00070  0.01570  1.40890  1  F  3290.0 3290.0 3290.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  660 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS 99910 [BIGSTON2 500] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02845  62.52

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  910 BIGSTON4 230  1   0.00052  0.02592  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
91702 BLUE LK2 500  1   0.00140  0.03220  2.89500  1  F  3290.0 3290.0 3290.0    0.0       1 1.000
99660 GROTON 2 500  1   0.00070  0.01570  1.40890  1  T  3290.0 3290.0 3290.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  910 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS 91702 [BLUE LK2 500] RESIDING IN AREA  23, ZONE 323, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01564  45.19

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 1702 BLUE LK3 345  1   0.00012  0.00940  0.00000  1  F   600.0  720.0  840.0    0.0       1 1.000
 1702 BLUE LK3 345  2   0.00012  0.00940  0.00000  1  F   600.0  720.0  840.0    0.0       1 1.000
99910 BIGSTON2 500  1   0.00140  0.03220  2.89500  1  T  3290.0 3290.0 3290.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 1702 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 1702 2  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 5.18 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C5XX1

1	**Case No.**	1	2
2	**Case Name**	upe-so04aa.S1C5XX1-cc3	upe-so04aa.S1C5XX1-cb3
3	**Disturbance**	cc3	cb3
4	**Prior Outage**	None	None
5	**Date/Time**	APR 17 2002 16:17	APR 17 2002 17:02
6	**Comments**		
7			
8	**Steady State Flows**		
9	NDEX / EAST BIAS	2934 / 312	2934 / 312
10	MHEX / L20D	2170 / 248	2170 / 248
11	ECL-ARP / PRI-BYN	643 / 838	643 / 838
12	MWSI / MNEX	1482 / 2867	1482 / 2867
13	D602F / F601C	1762 / 1288	1762 / 1288
14	B10T / MH>SPC	167 / 100	167 / 100
15	OH E-W / OH>MH	-121 / -198	-121 / -198
16	R50M / OH>MP	160 / 149	160 / 149
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	280 / -25	280 / -25
19	Forbes SVC / MSC	28 / 600	28 / 600
20	**Steady State Vltgs**		
21	Dorsey 500/Dorsey 230	1.033 / 1.045	1.033 / 1.045
22	Roseau 500/Forbes 500	1.060 / 1.022	1.060 / 1.022
23	Chisago 500/EauClaire 345	1.026 / 1.022	1.026 / 1.022
24	Int Falls 115/Badoura 115	1.050 / 1.001	1.050 / 1.001
25	Drayton 230/Groton 345	1.012 / 1.019	1.012 / 1.019
26	**SS OS Relay Margins**		
27	D602F at Forbes/Dorsey	149% / 246%	149% / 246%
28	L20D at Prairie/Drayton	999% / 800%	999% / 800%
29	R50M/F3M	760% / 349%	760% / 349%
30	B10T	339%	339%
31	**Min/MaxTransientVltg**		
32	Arrowhd 230	0.98 | 1.03	1.00 | 1.04
33	Boise 115	1.02 | 1.08	1.03 | 1.06
34	Dorsey 230	1.02 | 1.05	1.03 | 1.05
35	Forbes 230	1.00 | 1.03	1.01 | 1.03
36	Riverton 230	0.96 | 1.03	0.99 | 1.04
37	Coal Creek 230	0.95 | 1.09	0.98 | 1.09
38	Dickinson 345	0.96 | 1.05	1.00 | 1.06
39	Drayton 230	0.95 | 1.07	0.97 | 1.04
40	Groton 345	0.89 | 1.03	0.95 | 1.06
41	Tioga 230	0.95 | 1.06	0.98 | 1.06
42	Wahpeton 115	0.95 | 1.08	0.99 | 1.09
43	Watertown 345	0.94 | 1.04	0.99 | 1.06
44	**Dynamic Voltage Warnings**		
45		470 [BISON 4] 0.63	810 [BOWMAN 4] 0.69
46		497 [MAURINE4] 0.65	
47		810 [BOWMAN 4] 0.65	
48		847 [HETINGR4] 0.66	
49		803 [MARMARTH] 0.66	
50		480 [MAURINE7] 0.68	
51		804 [BAKER 4] 0.68 +more	
52	Worst Case Angle Damping	SHERC3 / 53.85%	KING 3 / -26.00%
53	Dorsey SUVP / UdHold		
54	Forbes DC Red (DCAR)	309%	497%
55	K22W (max +dP @ t, d-ang)	19.2@(2.94154,-10.6)	38.9@(2.52489,-20.4)
56	K22W (max -dP @ t, d-ang)	19.6@(0.96663,7.1)	4.4@(0.57498,0.7)
57	K22W (max d-ang @ t, dP)	11.2@(1.33328,-11.3)	-76.3@(20.00792,14.8)
58	**OS Rel Trip / Marg**		
59	MH - OH		
60	D602F at Forbes/Dorsey	83% / 153%	105% / 185%
61	L20D at Prairie/Drayton	999% / 627%	999% / 614%
62	R50M / F3M	586% / 268%	662% / 262%
63	B10T	219%	186%
64	**FSCAPS (SS/Unav/Final)**		
65	Balta 230	(0 | 1 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 4 | 2) / (0 | 2 | 1)	(2 | 3 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 1 | 1) / (0 | 1 | 1)	(0 | 0 | 0) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(0 | 4 | 3) / (2 | 2 | 2)	(0 | 2 | 1) / (2 | 2 | 2)

TABLE 5.19 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 1 (Hettinger) - Case S1C5XXA

1	**Case No.**	1	2
2	**Case Name**	upe-so04aa.S1C5XXA-cb3	upe-so04aa.S1C5XXA-cc3
3	**Disturbance**	cb3	cc3
4	**Prior Outage**	None	None
5	**Date/Time**	APR 18 2002 17:12	APR 18 2002 17:27
6	**Comments**		
7			
8	**Steady State Flows**		
9	NDEX / EAST BIAS	2928 / 317	2928 / 317
10	MHEX / L20D	2171 / 245	2171 / 245
11	ECL-ARP / PRI-BYN	640 / 837	640 / 837
12	MWSI / MNEX	1477 / 2868	1477 / 2868
13	D602F / F601C	1770 / 1297	1770 / 1297
14	B10T / MH>SPC	167 / 100	167 / 100
15	OH E-W / OH>MH	-120 / -197	-120 / -197
16	R50M / OH>MP	161 / 150	161 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	268 / -9	268 / -9
19	Forbes SVC / MSC	30 / 600	30 / 600
20	**Steady State Vltgs**		
21	Dorsey 500/Dorsey 230	1.033 / 1.045	1.033 / 1.045
22	Roseau 500/Forbes 500	1.060 / 1.021	1.060 / 1.021
23	Chisago 500/EauClaire 345	1.025 / 1.022	1.025 / 1.022
24	Int Falls 115/Badoura 115	1.049 / 0.999	1.049 / 0.999
25	Drayton 230/Groton 345	1.011 / 1.012	1.011 / 1.012
26	**SS OS Relay Margins**		
27	D602F at Forbes/Dorsey	146% / 242%	146% / 242%
28	L20D at Prairie/Drayton	999% / 811%	999% / 811%
29	R50M/F3M	753% / 345%	753% / 345%
30	B10T	338%	338%
31	**Min/MaxTransientVltg**		
32	Arrowhd 230	1.00 | 1.04	0.96 | 1.03
33	Boise 115	1.03 | 1.08	1.00 | 1.09
34	Dorsey 230	1.03 | 1.06	1.00 | 1.06
35	Forbes 230	1.01 | 1.04	0.99 | 1.04
36	Riverton 230	0.98 | 1.05	0.94 | 1.04
37	Coal Creek 230	0.98 | 1.09	0.92 | 1.12
38	Dickinson 345	0.99 | 1.07	0.95 | 1.07
39	Drayton 230	0.96 | 1.05	0.93 | 1.10
40	Groton 345	0.95 | 1.07	0.81 | 1.06
41	Tioga 230	0.99 | 1.06	0.91 | 1.06
42	Wahpeton 115	0.98 | 1.10	0.91 | 1.10
43	Watertown 345	0.99 | 1.06	0.89 | 1.06
44	**Dynamic Voltage Warnings**		
45		none	497 [MAURINE4] 0.55
46			480 [MAURINE7] 0.57
47			9088 [MAURIN1T] 0.58
48			483 [NEWELL 7] 0.59
49			470 [BISON 4] 0.62
50			490 [RAPIDCY7] 0.63
51			477 [ELSWRTH7] 0.64 +more
52	Worst Case Angle Damping	KING 3 / -23.20%	SHERC3 / 57.88%
53	Dorsey SUVP / UdHold		
54	Forbes DC Red (DCAR)	499%	270%
55	K22W (max +dP @ t, d-ang)	34.8@(2.50823,-18.1)	28.0@(3.09987,-6.7)
56	K22W (max -dP @ t, d-ang)	4.5@(0.59164,0.5)	31.6@(1.14995,12.4)
57	K22W (max d-ang @ t, dP)	-78.3@(20.00792,11.7)	17.5@(1.47494,-18.1)
58	**OS Rel Trip / Marg**		
59	MH - OH		
60	D602F at Forbes/Dorsey	100% / 176%	55% / 113%
61	L20D at Prairie/Drayton	999% / 592%	999% / 488%
62	R50M / F3M	649% / 250%	524% / 243%
63	B10T	175%	136%
64	**FSCAPS (SS/Unav/Final)**		
65	Balta 230	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 3) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 4 | 2) / (0 | 1 | 1)	(2 | 7 | 2) / (0 | 2 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (0 | 1 | 1)	(0 | 1 | 0) / (0 | 1 | 0)
69	Shey 115 / Split Rock 115	(0 | 2 | 1) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)

Table 5.20a
Summary of Site 1 (Hettinger) Selected Alternatives

ALTERNATIVE		MEETS CRITERIA ?	REQUIRES GENERATION TRIPPING ?
Cases with 345 kV Upgrades Hettinger-Belfield 345 kV + Hettinger-Ft. Thompson 345 kV+ Ft. Thompson-Blue Lake 345 kV	S1C1XXA - With SVCs @ Wind Generator Terminals	Yes	Yes
	S1C1XX2 - With 50% Series compensation of Hettinger-Belfield 345 kV and Hettinger-Ft. Thompson 345 kV	Yes	No
	S1C2XXX - With Hettinger-Glenham 345 kV	Yes	No
Case with incremental 400 MW Exports to WECC	S1C3XXA - Hettinger-Belfield 345 kV + Hettinger-Ft. Thompson 345 kV+ Ft. Thompson-Blue Lake 345 kV + SVCs @ Wind Generator terminals	Yes	No
Case with incremental 750MW Exports to WECC	S1C4XXX - Hettinger-Belfield 345 kV + Hettinger-Miles City 345 kV + Hettinger-Glenham 345 kV	Yes	No
Cases with new Hettinger-Glenham-Groton-Big Stone-Blue Lake 500 kV line	S1C5XX1 - With Hettinger-Belfield 345 kV + Hettinger-Ft. Thompson 345 kV	Yes	Yes
	S1C5XXA - With Hettinger-Belfield 345 kV + SVCs @ Wind Generator terminals	Yes	Yes

Table 5.20b
Interface Flows for Site 1 (Hettinger) Selected Alternatives

ALTERNATIVE	MHEX	G82R	LD20	D602F	R50M	NDEX	MWSI	PI-BYN	EAU-ARP
S1C1XXA	2174.5	-42.3	215.6	1828.7	172.6	2979.4	1485.5	834.2	651.3
S1C1XX2	2174.5	-33.8	220.7	1816.5	171.1	2987.0	1483.8	832.3	651.5
S1C2XXX	2174.1	-41.1	215.9	1826.9	172.4	2994.8	1484.2	832.9	651.4
S1C3XXA	2173.9	-16.1	234.6	1787.3	168.1	2642.3	1483.7	836.0	647.7
S1C4XXX	2172.0	-17.1	232.5	1788.4	168.2	2304.5	1467.5	824.2	643.3
S1C5XX1	2170.0	-1.5	247.8	1762.9	160.8	3047.4	1484.5	839.6	644.8
S1C5XXA	2171.2	-6.3	244.8	1771.2	161.4	3035.5	1479.3	838.1	641.2

Table 5.21
MUST Results Case S1C1XXA

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FCITC Single Study

  *** MUST 4.01.07 ***  TUE, APR 23 2002  12:36 ***
      UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
      ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE1      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total 35495 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC BASE ACCC  Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final  CNT% MAX% S1C1XXA  %
     4  -1880.1 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1973.2 -1732.0 -0.12830         -0.12169 -1828.7 -1599.9  111  111  116      5
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     662
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.65387  0.01010   221.0   202.0
    14  -1369.6 L:  515 HURON  7 115   528 WOONSKT7 115 1         105.4    88.0  0.01274          0.00243    41.2    37.9  119  119  120      1
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25126  0.04104   255.6   199.4
    20  -1210.1 L:  911 BIGSTON7 115   948 HIWY12 7 115 1         189.3   176.0  0.01100          0.01060   104.8    92.0  104  104  108(N/C) 4
                C:  503 BLAIR  4 230   910 BIGSTON4 230 1     310
                  Open   503 BLAIR  4 230   910 BIGSTON4 230 1                          -0.29688 -0.00138  -284.7  -283.0
    26  -1100.5 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          83.0    65.8  0.01563          0.00608    46.2    39.5  120  120   123     3
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.22908  0.04168   160.9   115.0
    54   -955.9 L:  497 MAURINE4 230   470 BISON  4 230 1        -382.6  -176.0 -0.21612         -0.14373  -255.1  -117.7 N/A  NONE  229     NEW
                C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                  Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                           0.24315 -0.29772  -524.4  -239.8
    62   -941.2 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         386.4   352.0  0.03657          0.01284   143.6   131.6  101   101   111   10
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     582
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.59702  0.03976   406.6   369.2
   159   -839.0 L:  497 MAURINE4 230   470 BISON  4 230 1        -296.6  -176.0 -0.14373         -0.14373  -255.1  -134.5  NONE NONE  169    NEW
                C:  618 LARAM31G24.0   631 LARAMIE3 345 1     567
                  Open   618 LARAM31G24.0   631 LARAMIE3 345 1                           0.07434  0.00000  -558.5  -558.5
   401   -807.3 L:  847 HETINGR4 230   470 BISON  4 230 1         390.6   216.1  0.21612          0.14373   263.1   147.0  N/A  NONE  187    NEW
                C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                  Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                          -0.24315 -0.29772  -524.4  -284.1
  2612   -794.4 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1828.7 -1732.0 -0.12169
                  Base Case
  5309   -791.3 L:  528 WOONSKT7 115   623 STORLA 7 115 1          98.1    88.0  0.01274          0.00243    33.9    31.9  112  112   113      1
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25126  0.04104   255.6   223.1
  5849   -705.4 L:  479 MARTIN 7 115   653 VETALTP7 115 1          74.2    66.0  0.01164          0.01184    62.6    54.2  101  101   114    13
                C:10181 MAXWELL7 115 10204 N.PLATT7 115 1    3347
                  Open 10181 MAXWELL7 115 10204 N.PLATT7 115 1                          -0.10673  0.00184  -109.0  -110.3
  5869   -666.9 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         311.2   216.1  0.14253          0.12295   230.0   148.1  NONE  NONE   143    NEW
                C:  403 DAWSONC4 230   413 MEDORA 4 230 1     110
                  Open   403 DAWSONC4 230   413 MEDORA 4 230 1                           0.57483  0.03407   141.1   118.4
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Table 5.21 (Cont.)
MUST Results Case S1C1XXA

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 5870   -661.5 L:  497 MAURINE4 230   470 BISON  4 230 1        -255.1  -160.0 -0.14373                                  NONE  NONE   151    NEW
                Base Case
 5903   -606.9 L:  484 NUNDRWD4 230   497 MAURINE4 230 1        -273.2  -176.0 -0.16021         -0.10747  -180.3  -115.1  N/A  101  169    NEW
               C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                          0.17713 -0.29772  -524.4  -343.7
11771   -493.0 L:  827 ELLENDL7 115  1001 ABDNJCT7 115 1          95.3    88.0  0.01488          0.00093    50.2    49.7  103   103   112    9
               C:  826 ELLENDL4 230   994 OAKES  4 230 1     709
                Open   826 ELLENDL4 230   994 OAKES  4 230 1                          0.32546  0.04288   138.8   117.7
11776   -489.8 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          51.0    44.0  0.01438          0.00849    44.2    40.1  107   138   118   11
               C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     966
                Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                          0.06020  0.09786   113.0    65.1
11798   -474.9 L:  480 MAURINE7 115   483 NEWELL 7 115 1          86.9    66.0  0.04407          0.01589    39.6    32.1   92    92   136   44
               C:  484 NUNDRWD4 230   497 MAURINE4 230 1     272
                Open   484 NUNDRWD4 230   497 MAURINE4 230 1                         -0.26229 -0.10747  -180.3  -129.3
11802   -460.2 L:  507 FTTHOMP4 230   516 LAKPLAT4 230 1         343.2   316.0  0.05904          0.04335   253.4   233.5   94    94   110   16
               C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     324
                Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                          0.35529  0.04417   252.6   232.2
11812   -436.2 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1785.1  1732.0  0.12169
                Base Case
11813   -436.2 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1785.1 -1732.0 -0.12169
                Base Case
11817   -422.5 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -121.0  -106.0 -0.03557         -0.02014   -80.7   -72.2  115   115   126    11
               C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     953
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          0.21851 -0.07065  -184.4  -154.6
11840   -392.7 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -83.1   -77.0 -0.01563         -0.00608   -46.3   -43.9  112  112   116    4
               C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                Open   550 GRANITF4 230  1516 WILLMAR4 230 1                         -0.22908  0.04168   160.9   144.5
11851   -377.9 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          47.9    44.0  0.01027          0.00849    44.2    41.0  105   138   110   5
               C: 1312 RIVERTN4 230  1317 MUDLAKE4 230 1     954
                Open  1312 RIVERTN4 230  1317 MUDLAKE4 230 1                          0.01916  0.09277   189.9   154.8   98   98 102(N/C) 4
11858   -368.7 L:  948 HIWY12 7 115   970 ORTONVL7 115 1         180.1   176.0  0.01100          0.01060    95.5    91.6
               C:  503 BLAIR  4 230   910 BIGSTON4 230 1     310
                Open   503 BLAIR  4 230   910 BIGSTON4 230 1                         -0.29688 -0.00138  -284.7  -284.1
11870   -359.6 L:  404 DAWSONC7 115   856 LEWIS  7 115 1          80.6    61.6  0.05275          0.02746    33.2    23.4  NONE  NONE  131   NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                Open   810 BOWMAN 4 230   847 HETINGR4 230 1                          0.20567  0.12295   230.0   185.8
11878   -355.6 L:  483 NEWELL 7 115   490 RAPIDCY7 115 1          81.7    66.0  0.04407          0.01589    34.4    28.7  NONE  NONE  129   NEW
               C:  484 NUNDRWD4 230   497 MAURINE4 230 1     272
                Open   484 NUNDRWD4 230   497 MAURINE4 230 1                         -0.26229 -0.10747  -180.3  -142.1
17440   -324.5 L:  403 DAWSONC4 230   413 MEDORA 4 230 1         302.0   263.0  0.12002          0.03407   141.1   130.1  NONE  NONE  112   NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                Open   810 BOWMAN 4 230   847 HETINGR4 230 1                          0.69908  0.12295   230.0   190.1
17500   -323.1 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1        -104.4   -67.7 -0.11387         -0.09771   -76.0   -44.4  N/A  123  159    NEW
               C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                          0.05425 -0.29772  -524.4  -428.2
17668   -296.1 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.00229   -21.3   -20.6  NONE  119  141   NEW
               C:  418 DKSN-ND7 115   870 N ENGLN7 115 1     140
                Open   418 DKSN-ND7 115   870 N ENGLN7 115 1                          1.00000 -0.09771   -76.0   -47.1
17677   -291.8 L:  792 MAPLE R3 345 79824 MAPLER1Y 345 1         444.7   420.0  0.08468          0.04426   232.5   219.6  96  96  107  11
               C:  754 MAPLE R4 230 79825 MAPLER2Y 345 1     671
                Open   754 MAPLE R4 230 79825 MAPLER2Y 345 1                         -0.91305 -0.04426  -232.4  -219.5  96  96  107  11
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Table 5.21 (Cont.)
MUST Results Case S1C1XXA

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17680   -291.7 L:  754 MAPLE R4 230 79825 MAPLER2Y 345 1        -444.7  -420.0 -0.08468         -0.04426  -232.4  -219.5
               C:  792 MAPLE R3 345 79824 MAPLER1Y 345 1     689
                 Open   792 MAPLE R3 345 79824 MAPLER1Y 345 1                          -0.91305  0.04426   232.5   219.6
17686   -289.8 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          98.3    88.0  0.03557          0.02014    58.0    52.2  106    NONE  119  13
               C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     953
                 Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.21851 -0.07065  -184.4  -163.9
17719   -272.2 L:  424 BELFELD3 345   683 CHAR.CK3 345 1         385.1   263.0  0.44831          0.30325   129.6    47.0  N/A  NONE  151  NEW
               C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                 Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                          -0.48720 -0.29772  -524.4  -443.4
17729   -264.8 L:  810 BOWMAN 4 230   803 MARMARTH 230 1        -227.4  -216.1 -0.04253         -0.02295  -146.3  -140.2  N/A  N/A  103
               C:  403 DAWSONC4 230   413 MEDORA 4 230 1     110
                 Open   403 DAWSONC4 230   413 MEDORA 4 230 1                          -0.57483  0.03407   141.1   132.1
17745   -248.1 L:  413 MEDORA 4 230   425 BELFELD4 230 1         292.8   263.0  0.12002          0.03407   132.0   123.5  NONE  NONE   109   NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                           0.69908  0.12295   230.0   199.5
17777   -202.9 L:  482 MISSION7 115   653 VETALTP7 115 1         -68.6   -66.0 -0.01300         -0.01184   -56.7   -54.3  93    98   112    19
               C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     582
                 Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                          -0.02943  0.03976   406.6   398.6
17780   -198.0 L:  404 DAWSONC7 115   832 GLENDCT7 115 1         -78.9   -67.7 -0.05681         -0.02224   -14.2    -9.8  NONE  108  118   NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                          -0.28117  0.12295   230.0   205.7
17799   -167.8 L:  880 STANLEY7 115   885 TIOGA4 7 115 1         -64.2   -61.6 -0.01571         -0.00967   -32.3   -30.6  120    120   140  20
               C:  604 TIOGA4 4 230   608 LOGAN  4 230 1     549
                 Open   604 TIOGA4 4 230   608 LOGAN  4 230 1                          -0.25858  0.02337   123.6   119.7
17812   -158.5 L:  601 ANTELOP3 345   620 HURON  3 345 1         541.3   526.0  0.09630          0.07849   445.2   432.7   90     90   111  21
               C:  605 LELANDO3 345   660 GROTON 3 345 1     552
                 Open   605 LELANDO3 345   660 GROTON 3 345 1                           0.21683  0.08213   443.2   430.2
21493   -113.2 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         230.0   216.1  0.12295
                 Base Case
23750    -93.4 L:  509 FTRANDL4 230   516 LAKPLAT4 230 1        -321.5  -316.0 -0.05904         -0.04335  -231.8  -227.7   90     90   107  17
               C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     324
                 Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                          -0.35529  0.04417   252.6   248.4
26213    -85.3 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1         -76.0   -67.7 -0.09771
                 Base Case
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Table 5.21 (Cont.)
MUST Results Case S1C1XX2

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FCITC Single Study

  *** MUST 4.01.07 ***  TUE, APR 23 2002  11:55 ***
      UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
      ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE1      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total 23913 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX%  S1C1XX2   %
     2   -2345.3 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1934.3 -1732.0 -0.08626         -0.11863 -1816.5 -1538.3 111   111   112(N/C)   1
                C:  752 DRAYTON4 230  3458 LETELER4 230 1     658
                  Open   752 DRAYTON4 230  3458 LETELER4 230 1                           0.53384  0.06063  -220.7  -362.9
     5  -1823.6 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1960.1 -1732.0 -0.12505         -0.11863 -1816.5 -1600.1   111   111  113(N/C)   2
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     662
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.65337  0.00983   219.7   201.8
    10  -1361.3 L:  515 HURON  7 115   528 WOONSKT7 115 1         106.2    88.0  0.01335          0.00266    40.0    36.4   119   119   121       2
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25129  0.04252   263.2   205.4
    11  -1359.0 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1893.2 -1732.0 -0.11863         -0.11863 -1816.5 -1655.3
                C: 3202 BDX    4 230  3203 BDV    4 230 1    2683
                  Open  3202 BDX    4 230  3203 BDV    4 230 1                          -0.46247  0.00000   165.9   165.9
    21  -1101.4 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          83.1    65.8  0.01569          0.00601    45.9    39.3   120   120   126       6
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.22908  0.04227   162.1   115.5
    22  -1080.1 L:  911 BIGSTON7 115   948 HIWY12 7 115 1         187.2   176.0  0.01034          0.01085   105.3    93.6    104   104  101      -3
                C:  503 BLAIR  4 230   910 BIGSTON4 230 1     310
                  Open   503 BLAIR  4 230   910 BIGSTON4 230 1                          -0.29673  0.00173  -275.8  -277.7
    27  -1023.9 L:  497 MAURINE4 230   470 BISON  4 230 1        -351.3  -176.0 -0.17126         -0.10185  -204.7  -100.4   N/A  NONE  199(N/C)  NEW
                C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                  Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                           0.18980 -0.36570  -772.8  -398.4
    34   -946.6 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         380.4   352.0  0.03003          0.01053   141.5   131.6   101   101  108(N/C)    7
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     582
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.59640  0.03270   400.6   369.6
    80   -823.8 L:  847 HETINGR4 230   470 BISON  4 230 1         357.2   216.1  0.17126          0.10185   210.5   126.6   N/A  NONE   165(N/C) NEW
                C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                  Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                          -0.18980 -0.36570  -772.8  -471.5
    91   -813.1 L:  528 WOONSKT7 115   623 STORLA 7 115 1          98.9    88.0  0.01335          0.00266    32.7    30.5    112   112   113       1
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25129  0.04252   263.2   228.7
  5755   -689.2 L:  479 MARTIN 7 115   653 VETALTP7 115 1          73.2    66.0  0.01045          0.00950    61.5    55.0  98    101   111   NEW
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     582
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.02919  0.03270   400.6   378.0
  5775   -683.8 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         322.4   216.1  0.15547          0.13896   242.9   147.9  NONE  NONE  150   NEW
                C:  403 DAWSONC4 230   413 MEDORA 4 230 1     110
                  Open   403 DAWSONC4 230   413 MEDORA 4 230 1                           0.58027  0.02845   137.0   117.5
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Table 5.21 (Cont.)
MUST Results Case S1C1XX2

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 5858   -604.2 L:  484 NUNDRWD4 230   497 MAURINE4 230 1        -253.0  -176.0 -0.12738         -0.07688  -146.2   -99.8  N/A   101   144   NEW
               C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                 Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                           0.13809 -0.36570  -772.8  -551.8
 5861   -594.0 L:  507 FTTHOMP4 230   516 LAKPLAT4 230 1         352.6   316.0  0.06170          0.04532   260.6   233.6   94    94   112    18
               C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     324
                 Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                           0.35469  0.04618   259.6   232.2
 5868   -568.1 L:  497 MAURINE4 230   470 BISON  4 230 1        -271.2  -176.0 -0.16750         -0.10185  -204.7  -146.8  N/A   NONE  154   NEW
               C:  847 HETINGR4 230  9847 HETINGR3 345 1     724
                 Open   847 HETINGR4 230  9847 HETINGR3 345 1                          -0.43370  0.15139   153.3    67.3
 5897   -463.4 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          50.6    44.0  0.01414          0.00834    44.0    40.1  109  138   117     8
               C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     966
                 Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                           0.06017  0.09641   108.9    64.2
 5914   -413.7 L:  810 BOWMAN 4 230   803 MARMARTH 230 1        -239.1  -216.1 -0.05547         -0.03896  -159.6  -143.5  N/A  N/A   110
               C:  403 DAWSONC4 230   413 MEDORA 4 230 1     110
                 Open   403 DAWSONC4 230   413 MEDORA 4 230 1                          -0.58027  0.02845   137.0   125.2
 5915   -396.2 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -83.2   -77.0 -0.01569         -0.00601   -46.1   -43.7  112  112   108    -4
               C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                 Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.22908  0.04227   162.1   145.3
 5918   -390.6 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -119.7  -106.0 -0.03502         -0.01981   -80.0   -72.2  115   100   124     9
               C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     953
                 Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.21845 -0.06963  -181.7  -154.5
 5919   -384.0 L:  424 BELFELD3 345   683 CHAR.CK3 345 1         477.2   263.0  0.55778          0.33398     4.2  -124.0   N/A  NONE  181(N/C) NEW
               C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                 Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                          -0.61197 -0.36570  -772.8  -632.4
 5941   -350.8 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1773.6  1732.0  0.11863
                 Base Case
 5942   -350.8 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1773.6 -1732.0 -0.11863
                 Base Case
 5945   -347.1 L:  403 DAWSONC4 230   413 MEDORA 4 230 1         306.5   263.0  0.12543          0.02845   137.0   127.1  NONE  NONE  117(N/C)  NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                           0.69786  0.13896   242.9   194.7
 5958   -326.3 L:  404 DAWSONC7 115   856 LEWIS  7 115 1          77.8    61.6  0.04961          0.02088    27.6    20.7  NONE  NONE  126 (N/C) NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                           0.20671  0.13896   242.9   197.6
 6032   -296.0 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.01428   -32.5   -28.3  NONE   119  144(N/C)  NEW
               C:  418 DKSN-ND7 115   870 N ENGLN7 115 1     140
                 Open   418 DKSN-ND7 115   870 N ENGLN7 115 1                           1.00000 -0.08572   -64.8   -39.4
 6033   -296.0 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.08572   -64.8   -39.4  NONE   123  144(N/C)  NEW
               C:  848 HETINGR7 115   870 N ENGLN7 115 1     726
                 Open   848 HETINGR7 115   870 N ENGLN7 115 1                           1.00000 -0.01428   -32.5   -28.3
11608   -275.1 L:  413 MEDORA 4 230   425 BELFELD4 230 1         297.5   263.0  0.12543          0.02845   128.0   120.1  NONE  NONE  113(N/C)  NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                           0.69786  0.13896   242.9   204.7
11719   -261.5 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1         -98.9   -67.7 -0.11940         -0.08572   -64.8   -42.4  NONE   123  146(N/C)  NEW
               C:  847 HETINGR4 230  9847 HETINGR3 345 1     724
                 Open   847 HETINGR4 230  9847 HETINGR3 345 1                          -0.22246  0.15139   153.3   113.7
11732   -257.0 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          97.0    88.0  0.03502          0.01981    57.3    52.2  106   106   117    11
               C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     953
                 Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.21845 -0.06963  -181.7  -163.8
11748   -249.4 L:  479 MARTIN 7 115   653 VETALTP7 115 1          68.7    66.0  0.01077          0.00950    61.5    59.1   93   101   104    11
               C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     324
                 Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                           0.02763  0.04618   259.6   248.1
11781   -232.6 L:  509 FTRANDL4 230   516 LAKPLAT4 230 1        -330.4  -316.0 -0.06170         -0.04532  -238.3  -227.7   94   94   104    10
               C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     324
                 Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                          -0.35469  0.04618   259.6   248.9
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Table 5.21 (Cont.)
MUST Results Case S1C1XX2

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11818   -216.8 L:  601 ANTELOP3 345   620 HURON  3 345 1         558.1   526.0  0.14824          0.07820   410.1   393.2  N/A  NONE 106(N/C)   NEW
               C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                 Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                          -0.19152 -0.36570  -772.8  -693.5
15039   -193.0 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         242.9   216.1  0.13896
                 Base Case
16991   -192.9 L:  404 DAWSONC7 115   832 GLENDCT7 115 1         -78.6   -67.7 -0.05665         -0.01757   -10.3    -6.9  NONE  108  116(N/C)   NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                          -0.28122  0.13896   242.9   216.1
17710   -164.2 L:  480 MAURINE7 115   483 NEWELL 7 115 1          71.1    66.0  0.03077          0.01140    34.2    32.3   92   92   108(N/C)   16
               C:  484 NUNDRWD4 230   497 MAURINE4 230 1     272
                 Open   484 NUNDRWD4 230   497 MAURINE4 230 1                          -0.25190 -0.07688  -146.2  -133.6
17715   -159.2 L:  827 ELLENDL7 115  1001 ABDNJCT7 115 1          90.0    88.0  0.01228         -0.00089    46.5    46.7   98   98   102(N/C)    4
               C:  826 ELLENDL4 230   994 OAKES  4 230 1     709
                 Open   826 ELLENDL4 230   994 OAKES  4 230 1                           0.32497  0.04053   133.7   127.2
17725   -154.2 L:  792 MAPLE R3 345 79824 MAPLER1Y 345 1         432.2   420.0  0.07903          0.04132   226.0   219.6   96   96   103(N/C)    7
               C:  792 MAPLE R3 345 79825 MAPLER2Y 345 1     690
                 Open   792 MAPLE R3 345 79825 MAPLER2Y 345 1                           0.91289  0.04132   225.9   219.5
17728   -154.1 L:  792 MAPLE R3 345 79825 MAPLER2Y 345 1         432.2   420.0  0.07903          0.04132   225.9   219.5   96   96   103(N/C)    7
               C:  792 MAPLE R3 345 79824 MAPLER1Y 345 1     689
                 Open   792 MAPLE R3 345 79824 MAPLER1Y 345 1                           0.91289  0.04132   226.0   219.6
17749   -145.7 L:  482 MISSION7 115   653 VETALTP7 115 1         -67.5   -66.0 -0.01045         -0.00950   -55.8   -54.4   91    98   102    11
               C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     582
                 Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                          -0.02919  0.03270   400.6   395.8
17753   -133.7 L:  601 ANTELOP3 345   683 CHAR.CK3 345 1        -465.3  -395.0 -0.52564         -0.31695   -24.3    18.1  NONE  NONE  118   NEW
               C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                 Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                           0.57065 -0.36570  -772.8  -723.9
17773    -97.5 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1917.2  1905.0  0.12505          0.11863  1773.6  1762.1
               C:  753 RUNNING4 230  1327 SHANNON4 230 1     662
                 Open   753 RUNNING4 230  1327 SHANNON4 230 1                           0.65337  0.00983   219.7   218.8
17795    -43.0 L:  915 ELBOWLK7 115   940 GRANTCO7 115 1        -106.0  -105.0 -0.02364         -0.01328   -70.5   -69.9  100  100  102     2
               C:  934 FERGSFL4 230  1940 HENNING4 230 1     792
                 Open   934 FERGSFL4 230  1940 HENNING4 230 1                          -0.16243  0.06378   218.6   215.9
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Table 5.21 (Cont.)
MUST Results Case S1C2XXX

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FCITC Single Study

  *** MUST 4.01.07 ***  TUE, APR 23 2002  13:10 ***
      UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
      ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE1      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total 29573 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE  ACCC  Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final  CNT%  MAX% S1C2XX2   %
     2  -2406.8 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1942.1 -1732.0 -0.08728         -0.11995 -1826.9 -1538.2  111  111   112      1
                C:  752 DRAYTON4 230  3458 LETELER4 230 1     659
                  Open   752 DRAYTON4 230  3458 LETELER4 230 1                           0.53332  0.06126  -215.9  -363.4
     4  -1892.2 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1971.3 -1732.0 -0.12646         -0.11995 -1826.9 -1599.9  111  111   116     5
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     663
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.65382  0.00995   220.8   202.0
    13  -1393.6 L:  515 HURON  7 115   528 WOONSKT7 115 1         106.3    88.0  0.01310          0.00254    41.1    37.6  119  119  121    2
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25125  0.04203   259.3   200.7
    20  -1205.3 L:  911 BIGSTON7 115   948 HIWY12 7 115 1         188.8   176.0  0.01060          0.01075   105.4    92.4  104   104  107(N/C)   3
                C:  503 BLAIR  4 230   910 BIGSTON4 230 1     310
                  Open   503 BLAIR  4 230   910 BIGSTON4 230 1                          -0.29686  0.00050  -281.0  -281.6
    25  -1110.8 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          83.2    65.8  0.01567          0.00604    46.1    39.4  120   120   123     3
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.22908  0.04204   162.0   115.3
   169   -831.9 L:  528 WOONSKT7 115   623 STORLA 7 115 1          98.9    88.0  0.01310          0.00254    33.8    31.6  112  112   113    1
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25125  0.04203   259.3   224.3
  2546   -791.2 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1826.9 -1732.0 -0.11995
                  Base Case
  5787   -756.6 L:  497 MAURINE4 230   470 BISON  4 230 1        -288.1  -176.0 -0.14812         -0.11440  -220.6  -134.1  N/A  NONE  169   NEW
                C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                  Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                           0.15509 -0.21742  -434.8  -270.3
  5845   -701.6 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         322.4   216.1  0.15142          0.13425   244.4   150.2  NONE  NONE  149  NEW
                C:  403 DAWSONC4 230   413 MEDORA 4 230 1     110
                  Open   403 DAWSONC4 230   413 MEDORA 4 230 1                           0.57651  0.02978   135.3   114.4
  5866   -663.6 L:  479 MARTIN 7 115   653 VETALTP7 115 1          73.4    66.0  0.01122          0.01020    61.7    54.9  93     101  114    21
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     583
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.02926  0.03481   402.2   379.1
  5899   -539.4 L:  507 FTTHOMP4 230   516 LAKPLAT4 230 1         348.8   316.0  0.06082          0.04465   257.6   233.5   94   94  111    17
                C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     324
                  Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                           0.35523  0.04551   256.7   232.1
  5904   -530.0 L:  497 MAURINE4 230   470 BISON  4 230 1        -220.6  -160.0 -0.11440
                  Base Case
  5905   -529.3 L:  847 HETINGR4 230   470 BISON  4 230 1         294.5   216.1  0.14812          0.11440   227.1   166.5  N/A  NONE  139   NEW
                C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                  Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                          -0.15509 -0.21742  -434.8  -319.7
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Table 5.21 (Cont.)
MUST Results Case S1C2XXX

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 5924   -471.8 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          50.7    44.0  0.01424          0.00840    44.0    40.0  107   138   115     8
               C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     967
                 Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                                0.06020  0.09700   111.6    65.8
 5937   -445.8 L:  810 BOWMAN 4 230   803 MARMARTH 230 1        -239.0  -216.1 -0.05142         -0.03425  -161.0  -145.8  N/A  N/A   111   NEW
               C:  403 DAWSONC4 230   413 MEDORA 4 230 1     110
                 Open   403 DAWSONC4 230   413 MEDORA 4 230 1                               -0.57651  0.02978   135.3   122.0
 5951   -428.7 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1783.4 -1732.0 -0.11995
                 Base Case
 5952   -428.7 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1783.4  1732.0  0.11995
                 Base Case
 5990   -408.1 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -120.4  -106.0 -0.03525         -0.01994   -80.3   -72.2  115    100   126    11
               C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     954
                 Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                                0.21851 -0.07004  -183.5  -154.9
 6004   -404.6 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -83.3   -77.0 -0.01567         -0.00604   -46.2   -43.8  112  112   116    4
               C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                 Open   550 GRANITF4 230  1516 WILLMAR4 230 1                               -0.22908  0.04204   162.0   145.0
 6120   -396.1 L:  827 ELLENDL7 115  1001 ABDNJCT7 115 1          93.2    88.0  0.01322         -0.00025    48.5    48.6  103     98   109    6
               C:  826 ELLENDL4 230   994 OAKES  4 230 1     710
                 Open   826 ELLENDL4 230   994 OAKES  4 230 1                                0.32537  0.04140   137.4   121.0
11764   -345.1 L:  403 DAWSONC4 230   413 MEDORA 4 230 1         305.6   263.0  0.12332          0.02978   135.3   125.0  NONE  NONE   113   NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     701
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                                0.69678  0.13425   244.4   198.0
11789   -331.2 L:  948 HIWY12 7 115   970 ORTONVL7 115 1         179.5   176.0  0.01060          0.01075    96.1    92.5   98   98  102(N/C)   4
               C:  503 BLAIR  4 230   910 BIGSTON4 230 1     310
                 Open   503 BLAIR  4 230   910 BIGSTON4 230 1                               -0.29686  0.00050  -281.0  -281.1
11798   -325.3 L:  404 DAWSONC7 115   856 LEWIS  7 115 1          78.1    61.6  0.05086          0.02307    27.5    20.0  NONE  NONE  129   NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     701
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                                0.20699  0.13425   244.4   200.7
11824   -296.0 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.01084   -32.8   -29.6  NONE  119  144(N/C) NEW
               C:  418 DKSN-ND7 115   870 N ENGLN7 115 1     140
                 Open   418 DKSN-ND7 115   870 N ENGLN7 115 1                                1.00000 -0.08916   -64.5   -38.1
11825   -296.0 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.08916   -64.5   -38.1  NONE  119   144  NEW
               C:  848 HETINGR7 115   870 N ENGLN7 115 1     727
                 Open   848 HETINGR7 115   870 N ENGLN7 115 1                                1.00000 -0.01084   -32.8   -29.6
11832   -284.1 L:  480 MAURINE7 115   483 NEWELL 7 115 1          75.9    66.0  0.03469          0.01275    35.7    32.1   92   92   117    25
               C:  484 NUNDRWD4 230   497 MAURINE4 230 1     272
                 Open   484 NUNDRWD4 230   497 MAURINE4 230 1                               -0.25506 -0.08605  -157.3  -132.8
11838   -274.5 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          97.7    88.0  0.03525          0.01994    57.6    52.1  106  106   119    13
               C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     954
                 Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                               -0.21851 -0.07004  -183.5  -164.3
11841   -272.4 L:  413 MEDORA 4 230   425 BELFELD4 230 1         296.6   263.0  0.12332          0.02978   126.3   118.2  NONE  NONE  111   NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     701
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                                0.69678  0.13425   244.4   207.8
11867   -241.6 L:  479 MARTIN 7 115   653 VETALTP7 115 1          68.8    66.0  0.01146          0.01020    61.7    59.2   93  101  107    14
               C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     324
                 Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                                0.02762  0.04551   256.7   245.7
12160   -211.6 L:  792 MAPLE R3 345 79824 MAPLER1Y 345 1         437.1   420.0  0.08101          0.04235   228.6   219.6   96   96  105     9
               C:  792 MAPLE R3 345 79825 MAPLER2Y 345 1     691
                 Open   792 MAPLE R3 345 79825 MAPLER2Y 345 1                                0.91302  0.04235   228.5   219.5
12176   -211.5 L:  792 MAPLE R3 345 79825 MAPLER2Y 345 1         437.1   420.0  0.08101          0.04235   228.5   219.5   96   96  105     9
               C:  792 MAPLE R3 345 79824 MAPLER1Y 345 1     690
                 Open   792 MAPLE R3 345 79824 MAPLER1Y 345 1                                0.91302  0.04235   228.6   219.6
15511   -210.4 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         244.4   216.1  0.13425
                 Base Case
```

Table 5.21 (Cont.)
MUST Results Case S1C2XXX

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17727   -192.3 L:  404 DAWSONC7 115   832 GLENDCT7 115 1         -78.6   -67.7 -0.05671         -0.01896    -9.8    -6.2  NONE  108   116   8
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     701
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                          -0.28124  0.13425   244.4   218.6
17755   -180.3 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1927.8  1905.0  0.12646          0.11995  1783.4  1761.8   98   98  102     4
               C:  753 RUNNING4 230  1327 SHANNON4 230 1     663
                 Open   753 RUNNING4 230  1327 SHANNON4 230 1                           0.65382  0.00995   220.8   219.0
17758   -178.9 L:  509 FTRANDL4 230   516 LAKPLAT4 230 1        -326.9  -316.0 -0.06082         -0.04465  -235.7  -227.7   90  90  108    18
               C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     324
                 Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                          -0.35523  0.04551   256.7   248.5
17788   -164.4 L:  479 MARTIN 7 115   653 VETALTP7 115 1          61.7    60.0  0.01020
                 Base Case
17803   -152.7 L:  482 MISSION7 115   653 VETALTP7 115 1         -67.7   -66.0 -0.01122         -0.01020   -55.9   -54.4   94  98  109    15
               C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     583
                 Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                          -0.02926  0.03481   402.2   396.9 NONE NONE 109    NEW
17807   -139.9 L:  483 NEWELL 7 115   490 RAPIDCY7 115 1          70.9    66.0  0.03469          0.01275    30.7    29.0
               C:  484 NUNDRWD4 230   497 MAURINE4 230 1     272
                 Open   484 NUNDRWD4 230   497 MAURINE4 230 1                          -0.25506 -0.08605  -157.3  -145.2 NONE NONE 101    NEW
23544    -82.6 L:  601 ANTELOP3 345   620 HURON  3 345 1         533.6   526.0  0.09207          0.07387   437.7   431.6
               C:  605 LELANDO3 345   660 GROTON 3 345 1     552
                 Open   605 LELANDO3 345   660 GROTON 3 345 1                           0.21703  0.08389   442.1   435.1
23611    -63.3 L:  915 ELBOWLK7 115   940 GRANTCO7 115 1        -106.5  -105.0 -0.02371         -0.01329   -70.7   -69.9  96    96   104    8
               C:  934 FERGSFL4 230  1940 HENNING4 230 1     793
                 Open   934 FERGSFL4 230  1940 HENNING4 230 1                          -0.16245  0.06415   220.2   216.2
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Table 5.21 (Cont.)
MUST Results Case S1C3XXA

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FCITC Single Study

  *** MUST 4.01.07 ***  TUE, APR 23 2002  13:46 ***
      UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
      ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE1      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total 23560 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX%  S1C3XXA   %
     4  -1536.5 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1929.1 -1732.0 -0.12829         -0.12169 -1787.3 -1600.3   111   111   112       1
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     662
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.65348  0.01010   217.0   201.5
    17   -928.8 L:  515 HURON  7 115   528 WOONSKT7 115 1          99.8    88.0  0.01274          0.00243    38.8    36.6   119   119   112    -7
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25126  0.04104   242.9   204.7
    20   -849.6 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          79.1    65.8  0.01563          0.00608    44.5    39.3   120   120   119    -1
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.22908  0.04168   151.1   115.7
    50   -633.7 L:  497 MAURINE4 230   470 BISON  4 230 1        -313.0  -176.0 -0.21611         -0.14373  -205.9  -114.9  N/A  NONE 180    NEW
                C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                  Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                           0.24312 -0.29772  -440.1  -251.5
    98   -545.9 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         372.0   352.0  0.03657          0.01284   138.3   131.3   101  101   106   5
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     582
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.59702  0.03976   391.4   369.7
   287   -475.5 L:  479 MARTIN 7 115   653 VETALTP7 115 1          71.5    66.0  0.01164          0.01184    59.9    54.2  101   101   109    8
                C:10181 MAXWELL7 115 10204 N.PLATT7 115 1    3347
                  Open 10181 MAXWELL7 115 10204 N.PLATT7 115 1                          -0.10673  0.00184  -109.4  -110.3
   291   -475.3 L:  847 HETINGR4 230   470 BISON  4 230 1         318.8   216.1  0.21611          0.14373   211.8   143.5  N/A  NONE   147   NEW
                C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                  Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                          -0.24312 -0.29772  -440.1  -298.6
  2640   -454.4 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1787.3 -1732.0 -0.12169
                  Base Case
  5775   -424.3 L:  411 MI CTYE4 230   804 BAKER  4 230 1        -187.0  -176.0 -0.02588         -0.05481  -113.4   -90.2  NONE  NONE  107   NEW
                C:  403 DAWSONC4 230   411 MI CTYE4 230 1     109
                  Open   403 DAWSONC4 230   411 MI CTYE4 230 1                          -0.64219 -0.04505   114.5   133.6
  5795   -413.1 L:  479 MARTIN 7 115   653 VETALTP7 115 1          71.4    66.0  0.01300          0.01184    59.9    55.0   98  101  108   10
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     582
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.02943  0.03976   391.4   375.0
  5852   -359.7 L:  528 WOONSKT7 115   623 STORLA 7 115 1          92.6    88.0  0.01274          0.00243    31.6    30.7  112  112   104    -8
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25126  0.04104   242.9   228.1
  5879   -297.4 L:  484 NUNDRWD4 230   497 MAURINE4 230 1        -223.6  -176.0 -0.16020         -0.10747  -145.7  -113.7  N/A   101   132    NEW
                C:  506 FTTHOMP3 345  9847 HETINGR3 345 1     321
                  Open   506 FTTHOMP3 345  9847 HETINGR3 345 1                           0.17711 -0.29772  -440.1  -351.6
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Table 5.21 (Cont.)
MUST Results Case S1C3XXA

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 5880   -296.1 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.00229   -27.9   -27.2  NONE  119   140    NEW
               C:  418 DKSN-ND7 115   870 N ENGLN7 115 1     140
                 Open   418 DKSN-ND7 115   870 N ENGLN7 115 1                           1.00000 -0.09771   -69.4   -40.5
 5881   -296.1 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.09771   -69.4   -40.5  NONE  119   140    NEW
               C:  848 HETINGR7 115   870 N ENGLN7 115 1     726
                 Open   848 HETINGR7 115   870 N ENGLN7 115 1                           1.00000 -0.00229   -27.9   -27.2
 5923   -242.2 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          47.5    44.0  0.01438          0.00849    42.4    40.3  107   138   111    4
               C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     966
                 Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                           0.06020  0.09786    85.2    61.5
11756   -165.0 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -111.9  -106.0 -0.03557         -0.02014   -76.1   -72.7  115   100   116     1
               C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     953
                 Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.21851 -0.07065  -163.9  -152.2
 11758   -163.8 L:  507 FTTHOMP4 230   516 LAKPLAT4 230 1         325.7   316.0  0.05904          0.04335   240.5   233.4   94   94   102     8
               C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     324
                 Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                           0.35529  0.04417   239.6   232.4
 11787   -141.1 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -79.2   -77.0 -0.01563         -0.00608   -44.6   -43.7  112  112   111    -1
               C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                 Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.22908  0.04168   151.1   145.2
 11788   -141.0 L:  480 MAURINE7 115   483 NEWELL 7 115 1          72.2    66.0  0.04407          0.01589    34.0    31.8   92   92   110    18
               C:  484 NUNDRWD4 230   497 MAURINE4 230 1     272
                 Open   484 NUNDRWD4 230   497 MAURINE4 230 1                          -0.26229 -0.10747  -145.7  -130.5
 11799   -131.7 L:  847 HETINGR4 230   470 BISON  4 230 1         233.4   216.1  0.13113          0.14373   211.8   192.9  NONE  NONE  107   NEW
               C:  635 STEGALL3 345 22157 STEGALTY 345 1     586
                 Open   635 STEGALL3 345 22157 STEGALTY 345 1                           0.23685 -0.05322    91.0    98.0
 11810   -116.0 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1746.1  1732.0  0.12169
                 Base Case
 11811   -116.0 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1746.1 -1732.0 -0.12169
                 Base Case
 11836    -71.2 L:  827 ELLENDL7 115  1001 ABDNJCT7 115 1          89.1    88.0  0.01488          0.00093    48.5    48.4   98   98   101     3
               C:  826 ELLENDL4 230   994 OAKES  4 230 1     709
                 Open   826 ELLENDL4 230   994 OAKES  4 230 1                           0.32545  0.04288   124.7   121.7
 11868    -38.5 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          89.4    88.0  0.03557          0.02014    53.6    52.8   106    106   107   1
               C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     953
                 Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.21851 -0.07065  -163.9  -161.2
 11909    -30.0 L:  483 NEWELL 7 115   490 RAPIDCY7 115 1          67.3    66.0  0.04407          0.01589    29.1    28.6   NONE  NONE   103  NEW
               C:  484 NUNDRWD4 230   497 MAURINE4 230 1     272
                 Open   484 NUNDRWD4 230   497 MAURINE4 230 1                          -0.26229 -0.10747  -145.7  -142.    98   98   105     7
 17722     -9.1 L:  482 MISSION7 115   653 VETALTP7 115 1         -66.1   -66.0 -0.01164         -0.01184   -54.4   -54.3
               C:10181 MAXWELL7 115 10204 N.PLATT7 115 1    3347
                 Open 10181 MAXWELL7 115 10204 N.PLATT7 115 1                           0.10673  0.00184  -109.4  -109.4
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Table 5.21 (Cont.)
MUST Results Case S1C4XXX

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FCITC Single Study

  *** MUST 4.01.07 ***  TUE, APR 30 2002  10:18 ***
      UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
      ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE1      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total 11939 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX%  S1C4XXX   %
     2  -1779.4 L:  411 MI CTYE4 230   804 BAKER  4 230 1        -270.3  -176.0 -0.05301         -0.05289  -142.4   -48.3   N/A  NONE   154(N/C) NEW
                C: 9847 HETINGR3 345  9411 MI CITY3 345 1    3063
                  Open  9847 HETINGR3 345  9411 MI CITY3 345 1                          -0.46550  0.00025   274.8   274.3
     4  -1463.6 L:  574 SIOUXCY869.0  2338 PLYMOTH869.0 1          66.3    50.0  0.01116          0.00176    12.1     9.5   126  126   131      5
                C:  566 SIOUXCY5 161  2337 PLYMOTH5 161 1     488
                  Open   566 SIOUXCY5 161  2337 PLYMOTH5 161 1                           0.27967  0.03363   194.1   144.9
     5  -1281.4 L:  515 HURON  7 115   528 WOONSKT7 115 1         110.8    88.0  0.01778          0.00692    51.7    42.8   119  119   124      5
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25401  0.04276   232.6   177.8
     6  -1280.6 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1931.4 -1732.0 -0.15571         -0.14787 -1788.4 -1599.0   111  111   113      2
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     662
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.65798  0.01191   217.4   202.1
    13   -903.5 L:  804 BAKER  4 230   803 MARMARTH 230 1        -283.4  -216.1 -0.07450         -0.07438  -153.1   -85.9  N/A  N/A   131(N/C)   NEW
                C: 9847 HETINGR3 345  9411 MI CITY3 345 1    3063
                  Open  9847 HETINGR3 345  9411 MI CITY3 345 1                          -0.47451  0.00025   274.8   274.5   120  120   124      4
    14   -883.2 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          83.1    65.8  0.01953          0.00707    44.2    38.0
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.23785  0.05241   163.3   117.0
    20   -841.8 L:  528 WOONSKT7 115   623 STORLA 7 115 1         103.0    88.0  0.01778          0.00692    43.9    38.1  112  112   116      4
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25401  0.04276   232.6   196.6
    59   -525.0 L:46502 HENRYTR869.0 46553 BIRDISL869.0 1         -47.0   -40.7 -0.01196         -0.00383   -15.9   -13.9  107  107  118    11
                C: 1246 REDFLST7 115  1653 MINVALY7 115 1     894
                  Open  1246 REDFLST7 115  1653 MINVALY7 115 1                           0.32096 -0.02533   -96.9   -83.6
    69   -506.4 L:  497 MAURINE4 230   470 BISON  4 230 1        -274.2  -176.0 -0.19398         -0.15011  -186.2  -110.2  N/A  NONE  161     NEW
                C:  506 FTTHOMP3 345  9838 GLENHAM3 345 1     320
                  Open   506 FTTHOMP3 345  9838 GLENHAM3 345 1                           0.18603 -0.23584  -473.2  -353.8
   238   -406.1 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         368.2   352.0  0.03988          0.01398   136.8   131.2  101   101   105      4
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     582
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.59723  0.04337   387.4   369.8
  2593   -381.3 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1788.4 -1732.0 -0.14787
                  Base Case
  5796   -349.3 L:  479 MARTIN 7 115   653 VETALTP7 115 1          70.3    66.0  0.01239          0.01265    58.7    54.2  101  101    107      6
                C:10181 MAXWELL7 115 10204 N.PLATT7 115 1    3350
                  Open 10181 MAXWELL7 115 10204 N.PLATT7 115 1                          -0.10674  0.00245  -109.4  -110.3
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Table 5.21 (Cont.)
MUST Results Case S1C4XXX

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5811   -338.2 L:  411 MI CTYE4 230   804 BAKER  4 230 1        -189.5  -176.0 -0.03992         -0.05289  -142.4  -124.5  NONE  NONE  108    NEW
              C:  403 DAWSONC4 230   411 MI CTYE4 230 1     109
                Open   403 DAWSONC4 230   411 MI CTYE4 230 1                          -0.29685 -0.04369   158.6   173.4
5835   -326.5 L:  847 HETINGR4 230   470 BISON  4 230 1         279.5   216.1  0.19398          0.15011   191.4   142.4  N/A  NONE  132    NEW
              C:  506 FTTHOMP3 345  9838 GLENHAM3 345 1     320
                Open   506 FTTHOMP3 345  9838 GLENHAM3 345 1                          -0.18603 -0.23584  -473.2  -396.2
5851   -316.4 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -83.2   -77.0 -0.01953         -0.00707   -44.3   -42.1  112   112   116     4
              C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.23785  0.05241   163.3   146.7
5857   -296.0 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.00365   -35.0   -33.9  NONE  119   157    NEW
              C:  418 DKSN-ND7 115   870 N ENGLN7 115 1     141
                Open   418 DKSN-ND7 115   870 N ENGLN7 115 1                           1.00000 -0.09635   -62.3   -33.8
5858   -296.0 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.09635   -62.3   -33.8  NONE  123   144    NEW
              C:  848 HETINGR7 115   870 N ENGLN7 115 1     726
                Open   848 HETINGR7 115   870 N ENGLN7 115 1                           1.00000 -0.00365   -35.0   -33.9
5878   -260.1 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          48.1    44.0  0.01585          0.00968    42.7    40.2  107  138   112     5
              C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     966
                Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                           0.06138  0.10055    88.8    62.6
5882   -247.7 L:  497 MAURINE4 230   470 BISON  4 230 1        -214.9  -176.0 -0.15697         -0.15011  -186.2  -149.0  94   94   126    32
              C:  601 ANTELOP3 345   620 HURON  3 345 1     543
                Open   601 ANTELOP3 345   620 HURON  3 345 1                          -0.07975  0.08611   359.8   338.5
5906   -198.3 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -114.2  -106.0 -0.04119         -0.02295   -76.9   -72.4  115    100   118     3
              C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     953
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.22248 -0.08202  -167.4  -151.2
5907   -197.9 L:46502 HENRYTR869.0 46608 BIRCH R869.0 1          43.1    40.7  0.01196          0.00383    13.6    12.9  NONE  NONE  106    NEW
              C: 1246 REDFLST7 115  1650 FRANKLN7 115 1     893
                Open  1246 REDFLST7 115  1650 FRANKLN7 115 1                           0.32096  0.02533    91.7    86.7
5912   -182.9 L:46563 FRANKLN869.0 46608 BIRCH R869.0 1         -42.9   -40.7 -0.01196         -0.00383   -11.8   -11.1  NONE  NONE   110   NEW
              C: 1246 REDFLST7 115  1653 MINVALY7 115 1     894
                Open  1246 REDFLST7 115  1653 MINVALY7 115 1                           0.32096 -0.02533   -96.9   -92.3
5941   -133.8 L:  484 NUNDRWD4 230   497 MAURINE4 230 1        -195.3  -176.0 -0.14428         -0.11253  -131.6  -116.5  N/A   101   118    NEW
              C:  506 FTTHOMP3 345  9838 GLENHAM3 345 1     320
                Open   506 FTTHOMP3 345  9838 GLENHAM3 345 1                           0.13466 -0.23584  -473.2  -441.7
5963   -102.4 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1747.1  1732.0  0.14787
                Base Case
5964   -102.4 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1747.1 -1732.0 -0.14787
                Base Case
5991    -88.2 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          91.6    88.0  0.04119          0.02295    54.4    52.4  106    106    110   4
              C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     953
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.22248 -0.08202  -167.4  -160.2
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Table 5.21 (Cont.)
MUST Results Case S1C5XX1

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FCITC Single Study

  *** MUST 4.01.07 ***  MON, APR 22 2002  12:02 ***
      UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
      ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE1      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total 11855 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX%  S1C5XX1   %
     2  -2477.7 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1896.8 -1732.0 -0.06649         -0.09226 -1762.9 -1534.3   111   111   110(N/C-MUST)
                C:  752 DRAYTON4 230  3458 LETELER4 230 1     659
                  Open   752 DRAYTON4 230  3458 LETELER4 230 1                           0.54013  0.04771  -247.8  -366.1
     4  -1715.9 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1898.9 -1732.0 -0.09724         -0.09226 -1762.9 -1604.6   111   111   110(N/C-MUST)
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     663
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.64883  0.00767   209.6   196.4
     5  -1665.9 L:  515 HURON  7 115   528 WOONSKT7 115 1         105.5    88.0  0.01048          0.00293    47.6    42.7   119   119   117      -2
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25387  0.02972   228.0   178.5
     6  -1386.2 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1866.1 -1732.0 -0.09674         -0.09226 -1762.9 -1635.0   111   109   109       0
                C: 3461 RIDGEWY4 230  3477 RICHER 4 230 1    2944
                  Open  3461 RIDGEWY4 230  3477 RICHER 4 230 1                          -0.58357  0.00767   176.9   166.2
    17   -939.9 L:  528 WOONSKT7 115   623 STORLA 7 115 1          97.8    88.0  0.01048          0.00293    40.0    37.2   112   112   110       -2
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     334
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25387  0.02972   228.0   200.1
    18   -925.7 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          78.9    65.8  0.01415          0.00481    42.9    38.4   120   120   119       -1
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.23372  0.03998   154.1   117.1
    25   -753.7 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         336.0   216.1  0.15900          0.14421   262.8   154.1   NONE   NONE   155    NEW
                C:  403 DAWSONC4 230   413 MEDORA 4 230 1     110
                  Open   403 DAWSONC4 230   413 MEDORA 4 230 1                           0.57743  0.02562   126.7   107.4
    34   -647.4 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          50.5    44.0  0.01007          0.00686    41.7    37.3   N/A   138   115(N/C) NEW
                C:99910 BIGSTON2 500 91702 BLUE LK2 500 1    5824
                  Open 99910 BIGSTON2 500 91702 BLUE LK2 500 1                           0.00906  0.35399   972.4   743.2
    39   -631.4 L:  810 BOWMAN 4 230   803 MARMARTH 230 1        -253.4  -216.1 -0.05900         -0.04421  -180.2  -152.3   NONE  NONE   117(N/C) NEW
                C:  403 DAWSONC4 230   413 MEDORA 4 230 1     110
                  Open   403 DAWSONC4 230   413 MEDORA 4 230 1                          -0.57743  0.02562   126.7   110.6
    46   -605.4 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -74.1   -67.7 -0.01058         -0.01910   -49.5   -37.9    N/A  119   109    NEW
                C:  424 BELFELD3 345  9847 HETINGR3 345 1     153
                  Open   424 BELFELD3 345  9847 HETINGR3 345 1                          -0.08979 -0.09488   274.0   331.5
    62   -546.5 L:  810 BOWMAN 4 230   803 MARMARTH 230 1        -248.4  -216.1 -0.05900         -0.04421  -180.2  -156.0   N/A  N/A   115
                C:  413 MEDORA 4 230   425 BELFELD4 230 1     133
                  Open   413 MEDORA 4 230   425 BELFELD4 230 1                          -0.57743  0.02562   118.1   104.1
    76   -500.3 L:  497 MAURINE4 230   470 BISON  4 230 1        -256.9  -176.0 -0.16166         -0.08095  -145.6  -105.0   N/A   NONE  146(N/C) NEW
                C:  847 HETINGR4 230  9847 HETINGR3 345 1     725
                  Open   847 HETINGR4 230  9847 HETINGR3 345 1                          -0.44258  0.18235   251.6   160.3
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Table 5.21 (Cont.)
MUST Results Case S1C5XX1

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   81   -484.2 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         291.5   216.1  0.15564          0.14421   262.8   193.0   NONE  NONE   137     NEW
               C:  425 BELFELD4 230 19042 BELFELDT 345 1     156
                 Open   425 BELFELD4 230 19042 BELFELDT 345 1                           0.17658  0.06471   162.5   131.2
  266   -369.0 L:  403 DAWSONC4 230   413 MEDORA 4 230 1         309.5   263.0  0.12589          0.02562   126.7   117.3   NONE  NONE   116    NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     701
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                           0.69533  0.14421   262.8   209.6
 2941   -334.8 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1762.9 -1732.0 -0.09226
                 Base Case
 9238   -323.5 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         262.8   216.1  0.14421                                  NONE  NONE  123      NEW
                 Base Case
11664   -300.1 L:  413 MEDORA 4 230   425 BELFELD4 230 1         300.8   263.0  0.12589          0.02562   118.1   110.4   NONE  NONE  113      NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     701
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                           0.69533  0.14421   262.8   219.5
11677   -296.0 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.01910   -49.5   -43.8   NONE   119  144(N/C) NEW
               C:  418 DKSN-ND7 115   870 N ENGLN7 115 1     140
                 Open   418 DKSN-ND7 115   870 N ENGLN7 115 1                           1.00000 -0.08090   -47.8   -23.9
11678   -296.0 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.08090   -47.8   -23.9   NONE   123  146      NEW
               C:  848 HETINGR7 115   870 N ENGLN7 115 1     727
                 Open   848 HETINGR7 115   870 N ENGLN7 115 1                           1.00000 -0.01910   -49.5   -43.8
11685   -293.2 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1        -103.1   -67.7 -0.12102         -0.08090   -47.8   -24.1   NONE   123  133      NEW
               C:  847 HETINGR4 230  9847 HETINGR3 345 1     725
                 Open   847 HETINGR4 230  9847 HETINGR3 345 1                          -0.21996  0.18235   251.6   198.1
11720   -278.4 L:  404 DAWSONC7 115   856 LEWIS  7 115 1          75.3    61.6  0.04945          0.01949    20.8    15.3   NONE  NONE  125      NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     701
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                           0.20776  0.14421   262.8   222.6
11721   -277.8 L:  847 HETINGR4 230   470 BISON  4 230 1         261.0   216.1  0.16166          0.08095   149.7   127.2   N/A   NONE  121(N/C) NEW
               C:  847 HETINGR4 230  9847 HETINGR3 345 1     725
                 Open   847 HETINGR4 230  9847 HETINGR3 345 1                           0.44258  0.18235   251.6   200.9
11768   -238.1 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         357.5   352.0  0.02311          0.00811   133.1   131.1   101  NONE   102(N/C) 1
               C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     582
                 Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.59576  0.02518   376.7   370.8
11779   -226.2 L:  847 HETINGR4 230   470 BISON  4 230 1         247.8   216.1  0.13990          0.08095   149.7   131.4   N/A  NONE  115(N/C) NEW
               C:99847 HETINGR2 500 99838 GLENHAM2 500 1    5827
                 Open 99847 HETINGR2 500 99838 GLENHAM2 500 1                           0.13165  0.44775   744.9   643.7
11787   -218.0 L: 1702 BLUE LK3 345 91702 BLUE LK2 500 1        -913.5  -840.0 -0.33697         -0.17700  -479.8  -441.2   N/A  NONE  109     NEW
               C: 1702 BLUE LK3 345 91702 BLUE LK2 500 2    1441
                 Open  1702 BLUE LK3 345 91702 BLUE LK2 500 2                           0.90382 -0.17700  -479.8  -441.2
11801   -186.8 L:  404 DAWSONC7 115   832 GLENDCT7 115 1         -78.2   -67.7 -0.05664         -0.01608    -4.3    -1.3   NONE   108   115    NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     701
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                          -0.28128  0.14421   262.8   235.8
11810   -142.6 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -79.0   -77.0 -0.01415         -0.00481   -43.0   -42.3   112    112   110     -2
               C:  550 GRANITF4 230  1516 WILLMAR4 230 1     440
                 Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.23372  0.03998   154.1   148.4
11812   -133.6 L:  529 WATERTN3 345   660 GROTON 3 345 1        -685.1  -660.0 -0.18783         -0.06118  -389.1  -381.0   N/A   NONE   104(N/C) NEW
               C:99660 GROTON 2 500 99910 BIGSTON2 500 1    5826
                 Open 99660 GROTON 2 500 99910 BIGSTON2 500 1                          -0.35561  0.35612   832.2   784.6
11827    -61.6 L:  484 NUNDRWD4 230   497 MAURINE4 230 1        -183.4  -176.0 -0.12002         -0.06097  -101.9   -98.2   N/A   NONE   104(N/C) NEW
               C:  847 HETINGR4 230  9847 HETINGR3 345 1     725
                 Open   847 HETINGR4 230  9847 HETINGR3 345 1                          -0.32383  0.18235   251.6   240.3
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Table 5.21 (Cont.)
MUST Results Case S1C5XXA

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FCITC Single Study

  *** MUST 4.01.07 ***  MON, APR 22 2002  11:35 ***
      UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
      ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE1      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total 17718 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX%  S1C5XX1   %
     4  -1749.2 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1908.2 -1732.0 -0.10073         -0.09556 -1771.2 -1604.1  111   111    111       0
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     662
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.64901  0.00797   211.0   197.1
     5  -1590.4 L:  515 HURON  7 115   528 WOONSKT7 115 1         105.5    88.0  0.01098          0.00504    50.8    42.8  119   119    117      -2
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     333
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25369  0.02340   215.4   178.2
    17   -943.0 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          79.2    65.8  0.01418          0.00488    43.1    38.5  120   120   119     -1
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     439
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.23372  0.03979   154.5   117.0
    18   -935.1 L:  497 MAURINE4 230   470 BISON  4 230 1        -375.0  -176.0 -0.21277         -0.09771  -177.7   -86.3  N/A   NONE  213    NEW
                C:99847 HETINGR2 500 99838 GLENHAM2 500 1    5826
                  Open 99847 HETINGR2 500 99838 GLENHAM2 500 1                          -0.21582  0.53311   914.2   415.7
    22   -882.7 L:  528 WOONSKT7 115   623 STORLA 7 115 1          97.7    88.0  0.01098          0.00504    43.0    38.6  112   112   111     -1
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     333
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25369  0.02340   215.4   194.8
    30   -770.0 L:  847 HETINGR4 230   470 BISON  4 230 1         380.0   216.1  0.21277          0.09771   182.7   107.4  N/A  NONE   176     NEW
                C:99847 HETINGR2 500 99838 GLENHAM2 500 1    5826
                  Open 99847 HETINGR2 500 99838 GLENHAM2 500 1                           0.21582  0.53311   914.2   503.7
    32   -736.7 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         331.4   216.1  0.15642          0.14088   256.6   152.8  NONE  NONE  154     NEW
                C:  403 DAWSONC4 230   413 MEDORA 4 230 1     110
                  Open   403 DAWSONC4 230   413 MEDORA 4 230 1                           0.57709  0.02693   129.6   109.7
    36   -704.4 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         326.3   216.1  0.15642          0.14088   256.6   157.4  NONE  NONE  152     NEW
                C:  413 MEDORA 4 230   425 BELFELD4 230 1     133
                  Open   413 MEDORA 4 230   425 BELFELD4 230 1                           0.57709  0.02693   120.8   101.8
    46   -675.0 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          51.0    44.0  0.01034          0.00701    41.9    37.2   N/A  138   116     NEW
                C:99910 BIGSTON2 500 91702 BLUE LK2 500 1    5823
                  Open 99910 BIGSTON2 500 91702 BLUE LK2 500 1                           0.00913  0.36498   991.4   745.0
    71   -591.0 L:  484 NUNDRWD4 230   497 MAURINE4 230 1        -269.0  -176.0 -0.15739         -0.07309  -124.4   -81.3   N/A  NONE  153     NEW
                C:99847 HETINGR2 500 99838 GLENHAM2 500 1    5826
                  Open 99847 HETINGR2 500 99838 GLENHAM2 500 1                          -0.15813  0.53311   914.2   599.2
    75   -574.1 L:  810 BOWMAN 4 230   803 MARMARTH 230 1        -248.5  -216.1 -0.05642         -0.04088  -173.7  -150.3  NONE  NONE  113    NEW
                C:  403 DAWSONC4 230   413 MEDORA 4 230 1     110
                  Open   403 DAWSONC4 230   413 MEDORA 4 230 1                          -0.57709  0.02693   129.6   114.1
  2805   -410.7 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1771.2 -1732.0 -0.09556
                  Base Case
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Table 5.21 (Cont.)
MUST Results Case S1C5XXA

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 5827   -361.0 L:  403 DAWSONC4 230   413 MEDORA 4 230 1         308.1   263.0  0.12496          0.02693   129.6   119.8  NONE  NONE   117(N/C)  NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                             0.69585  0.14088   256.6   205.7
 5858   -329.7 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1        -105.2   -67.7 -0.11382         -0.08358   -53.3   -25.8  N/A  123    155      NEW
               C:99847 HETINGR2 500 99838 GLENHAM2 500 1    5826
                 Open 99847 HETINGR2 500 99838 GLENHAM2 500 1                            -0.05672  0.53311   914.2   738.4
 5865   -324.5 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         360.1   352.0  0.02502          0.00878   134.0   131.1   101  NONE   102(N/C)    1
               C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     581
                 Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                             0.59593  0.02724   379.5   370.7
 5888   -314.3 L:  529 WATERTN3 345   660 GROTON 3 345 1        -726.0  -660.0 -0.21003         -0.07498  -413.3  -389.8  N/A  NONE  110(N/C)  NEW
               C:99660 GROTON 2 500 99910 BIGSTON2 500 1    5825
                 Open 99660 GROTON 2 500 99910 BIGSTON2 500 1                            -0.36281  0.37223   861.9   744.8
 5935   -297.9 L:  424 BELFELD3 345   683 CHAR.CK3 345 1         398.0   263.0  0.45327          0.18324   -65.0  -119.6   N/A  NONE  151(N/C)   NEW
               C:99847 HETINGR2 500 99838 GLENHAM2 500 1    5826
                 Open 99847 HETINGR2 500 99838 GLENHAM2 500 1                             0.50652  0.53311   914.2   755.4
 5943   -296.1 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.08358   -53.3   -28.6   NONE  123   141      NEW
               C:  848 HETINGR7 115   870 N ENGLN7 115 1     726
                 Open   848 HETINGR7 115   870 N ENGLN7 115 1                             1.00000 -0.01642   -43.9   -39.1
 5944   -296.1 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -97.3   -67.7 -0.10000         -0.01642   -43.9   -39.1   NONE  119   141      NEW
               C:  418 DKSN-ND7 115   870 N ENGLN7 115 1     140
                 Open   418 DKSN-ND7 115   870 N ENGLN7 115 1                             1.00000 -0.08358   -53.3   -28.6
 5946   -295.9 L:  404 DAWSONC7 115   856 LEWIS  7 115 1          76.4    61.6  0.04997          0.02074    23.1    17.0   NONE  NONE  124      NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                             0.20747  0.14088   256.6   214.9
 6024   -290.8 L:  413 MEDORA 4 230   425 BELFELD4 230 1         299.3   263.0  0.12496          0.02693   120.8   113.0   NONE  NONE   114    NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                             0.69585  0.14088   256.6   215.6
 9033   -287.3 L:  810 BOWMAN 4 230   847 HETINGR4 230 1         256.6   216.1  0.14088
                 Base Case
11768   -265.8 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1         -99.3   -67.7 -0.11912         -0.08358   -53.3   -31.1   N/A   123    149    NEW
               C:  847 HETINGR4 230  9847 HETINGR3 345 1     724
                 Open   847 HETINGR4 230  9847 HETINGR3 345 1                            -0.22272  0.15959   206.5   164.1
11775   -262.2 L: 1702 BLUE LK3 345 91702 BLUE LK2 500 1        -931.1  -840.0 -0.34748         -0.18249  -489.0  -441.2   N/A   NONE   111    NEW
               C: 1702 BLUE LK3 345 91702 BLUE LK2 500 2    1440
                 Open  1702 BLUE LK3 345 91702 BLUE LK2 500 2                             0.90410 -0.18249  -489.0  -441.2
11823   -190.7 L:  404 DAWSONC7 115   832 GLENDCT7 115 1         -78.5   -67.7 -0.05667         -0.01704    -6.3    -3.0  NONE  108  116    NEW
               C:  810 BOWMAN 4 230   847 HETINGR4 230 1     700
                 Open   810 BOWMAN 4 230   847 HETINGR4 230 1                            -0.28127  0.14088   256.6   229.7
11828   -180.7 L:  497 MAURINE4 230   470 BISON  4 230 1        -177.7  -160.0 -0.09771
                 Base Case
11834   -161.9 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -79.3   -77.0 -0.01418         -0.00488   -43.2   -42.4   112   112   111     -1
               C:  550 GRANITF4 230  1516 WILLMAR4 230 1     439
                 Open   550 GRANITF4 230  1516 WILLMAR4 230 1                            -0.23372  0.03979   154.5   148.0
11842   -147.7 L:  479 MARTIN 7 115   653 VETALTP7 115 1          68.2    66.0  0.01484          0.00792    56.3    55.1   N/A  101   103     NEW
               C:99847 HETINGR2 500 99838 GLENHAM2 500 1    5826
                 Open 99847 HETINGR2 500 99838 GLENHAM2 500 1                             0.01299  0.53311   914.2   835.5
11854   -114.3 L:  484 NUNDRWD4 230   497 MAURINE4 230 1        -190.2  -176.0 -0.12388         -0.07309  -124.4  -116.1  N/A   101   114     NEW
               C:  847 HETINGR4 230  9847 HETINGR3 345 1     724
                 Open   847 HETINGR4 230  9847 HETINGR3 345 1                            -0.31830  0.15959   206.5   188.2
11877    -77.1 L: 9847 HETINGR3 345 99847 HETINGR2 500 2         879.5   840.0  0.51289          0.26656   457.1   436.6 N/A  N/A    105    NEW
               C: 9847 HETINGR3 345 99847 HETINGR2 500 1    3066
                 Open  9847 HETINGR3 345 99847 HETINGR2 500 1                             0.92413  0.26656   457.1   436.6
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Table 5.22
Summary of Contingency Analysis Results
Case S1C1XXA

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	116(+5)	U
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	120 (+1)	U
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	111(+10)	U
810	BOWMAN	230	847	HETINGR4	230	403	DAWSONC	230	413	MEDORA	230	216.1	216.1	143(NEW)	R
911	BIGSTON	115	948	HIWY	115	503	BLAIR	230	910	BIGSTON	230	176	160	108(+4)	R
810	BOWMAN	230	803	MARMARTH	230	403	DAWSONC	230	413	MEDORA	230	216.1	216.1	103 (NEW)	R
848	HETINGR	115	870	N ENGLN	115	418	DKSN-ND7	115	870	N ENGLN7	115	67.7	67.7	141(NEW)	R
497	MAURINE	230	470	BISON	230	506	FTTHOMP3	345	9847	HETINGR3	345	176	440	229(NEW)	U
847	HETINGR4	230	470	BISON	230	506	FTTHOMP3	345	9847	HETINGR3	345	216.1	216.1	187(N/A)	R
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	118(+11)	NONE PRE-EXISTING MAX 138%
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	113(+1)	U
601	ANTELOPE	345	620	HURON	345	605	LELANDO	345	660	GROTON	345	526	2270	103(+13)	U
880	STANLEY	115	885	TIOGA	115	604	TIOGA	230	608	LOGAN	230	61.6	61.6	140(+20)	R
403	DAWSONC	230	413	MEDORA	230	810	BOWMAN	230	847	HETINGR4	230	263	398	112 (NEW)	U
902	ALEXAND	115	1649	DGLAS	115	1311	WINGRIV	230	1955	INMAN	230	106	96	119(+13)	R
418	DKSN-ND7	115	870	N ENGLN7	115	848	HETINGR	115	870	N ENGLN	115	67.7	67.7	159(NEW)	R
403	DAWSONC	115	856	LEWIS	115	810	BOWMAN	230	847	HETINGR4	230	61.6	61.6	131(NEW)	R
403	DAWSONC	115	832	GLENDCT7	115	810	BOWMAN	230	847	HETINGR4	230	67.7	67.7	118(NEW)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	116(+4)	U
484	NUNDRWD4	230	497	MAURINE4	230	506	FTTHOMP	345	9847	HETINGR3	345	176	440	169(NEW)	U
1517	WILLMAR7	115	1519	WILMAR8	69	550	GRANITF4	230	1516	WILLMAR4	230	65.8	84	123(+3)	U
424	BELFELD 3	345	683	CHAR. CK3	345	506	FTTHOMP3	345	9847	HETINGR3	345	263	880	151(NEW)	U
479	MARTIN	115	653	VETALTP	115	10181	MAXWELL	115	10204	N.PLATT	115	66	128	114(+13)	U
827	ELLENDL	115	1001	ABDNJCT	115	826	ELLENDL	230	994	OAKES	230	88	128	112(+9)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	106	96	126(+11)	R

Table 5.22 (Cont.)
Summary of Contingency Analysis Results
Case S1C1XXA

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
482	MISSION	115	653	VETALTP	115	633	SIDNEY	345	10166	KEYSTONE	345	66	128	112(+19)	U
483	NEWELL	115	490	RAPIDCY	115	484	NUNDRWD	230	497	MAURINE	230	66	143	129(NEW)	U
509	FTRANDL	230	516	LAKPLAT	230	507	FTTHOMP	230	509	FTRANDL	230	316	398	107(+17)	U
480	MAURINE	115	483	NEWELL	115	484	NUNDRWD	230	497	MAURINE	230	66	143	136(+44)	U
507	FTTHOMP	230	516	LAKPLAT	230	507	FTTHOMP	230	509	FTRANDL	230	316	398	110(+16)	U
792	MAPLE R3	345	79825	MAPLER1Y	345	792	MAPLE R3	345	79824	MAPLER2Y	345	420	336	107(+11)	R
948	HIWY	115	970	ORTONVL	115	503	BLAIR	230	910	BIGSTON	230	176	160	102(+4)	R
792	MAPLE R3	345	79824	MAPLER2Y	345	792	MAPLE R3	345	79825	MAPLER1Y	345	420	336	107(+11)	R
413	MEDORA	230	425	BELFELD	230	810	BOWMAN	230	847	HETINGR4	230	263	398	109(NEW)	U

Table 5.22 (Cont.)
Summary of Contingency Analysis Results
Case S1C1XX2

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	113(+2)	U
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	121 (+2)	U
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	108(+7)	U
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	113(+1)	U
810	BOWMAN	230	847	HETINGR4	230	403	DAWSONC	230	413	MEDORA	230	216.1	216.1	150(NEW)	R
507	FTTHOMP	230	516	LAKPLAT	230	507	FTTHOMP	230	509	FTRANDL	230	316	398	112(18)	U
509	FTRANDL	230	516	LAKPLAT	230	507	FTTHOMP	230	509	FTRANDL	230	316	398	104(+10)	U
810	BOWMAN	230	803	MARMARTH	230	403	DAWSONC	230	413	MEDORA	230	216.1	216.1	110 (NEW)	R
848	HETINGR	115	870	N ENGLN	115	418	DKSN-ND7	115	870	N ENGLN7	115	67.7	67.7	144(NEW)	R
497	MAURINE	230	470	BISON	230	506	FTTHOMP3	345	9847	HETINGR3	345	176	440	199(NEW)	U
847	HETINGR4	230	470	BISON	230	506	FTTHOMP3	345	9847	HETINGR3	345	216.1	216.1	165(N/A)	R
403	DAWSONC	230	413	MEDORA	230	810	BOWMAN	230	847	HETINGR4	230	263	398	117 (NEW)	U
418	DKSN-ND7	115	870	N ENGLN7	115	848	HETINGR	115	870	N ENGLN	115	67.7	67.7	144(NEW)	R
403	DAWSONC	115	856	LEWIS	115	810	BOWMAN	230	847	HETINGR4	230	61.6	61.6	126(NEW)	R
403	DAWSONC	115	832	GLENDCT7	115	810	BOWMAN	230	847	HETINGR4	230	67.7	67.7	116(NEW)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	108(-4)	NONE
484	NUNDRWD4	230	497	MAURINE4	230	506	FTTHOMP	345	9847	HETINGR3	345	176	440	144(NEW)	U
1517	WILLMAR7	115	1519	WILMAR8	69	550	GRANITF4	230	1516	WILLMAR4	230	65.8	84	126(+6)	U
424	BELFELD 3	345	683	CHAR. CK3	345	506	FTTHOMP3	345	9847	HETINGR3	345	263	880	181(NEW)	U
479	MARTIN	115	653	VETALTP	115	633	SIDNEY	345	10166	KEYSTONE	345	66	128	111(+13)	U
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	117(+11)	R
902	ALEXAND	115	87901	ALEXXS	115	1311	WINGRIV	230	1955	INMAN	230	106	96	124(+9)	R
413	MEDORA	230	425	BELFELD	230	810	BOWMAN	230	847	HETINGR4	230	263	398	113(NEW)	U
915	ELBOWLK	115	940	GRANTCO	115	934	FERGSFL	230	1940	HENNING	230	105	96	102(+2)	R
601	ANTELOP	345	620	HURON	345	506	FTTHOMP	345	9847	HURON	345	526	2270	106(NEW)	U

Table 5.22 (Cont.)
Summary of Contingency Analysis Results
Case S1C1XX2

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
792	MAPLE R3	345	79825	MAPLER1Y	345	792	MAPLE R3	345	79824	MAPLER2Y	345	420	336	103(+7)	R
792	MAPLE R3	345	79824	MAPLER2Y	345	792	MAPLE R3	345	79825	MAPLER1Y	345	420	336	103(+7)	R
480	MAURINE	115	483	NEWELL	115	484	NUNDRWD	230	497	MAURINE	230	66	143	108(+16)	U
601	ANTELOP3	345	683	CHAR.CK3	345	506	FTTHOMP3	345	9847	HETINGR3	345	395	1135	118(NEW)	U

Table 5.22 (Cont.)
Summary of Contingency Analysis Results
Case S1C2XXX

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	116(+5)	U
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	121 (+2)	U
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	113(+1)	U
911	BIGSTON	115	948	HIWY	115	503	BLAIR	230	910	BIGSTON	230	176	160	107(+3)	R
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	110(+9)	U
810	BOWMAN	230	847	HETINGR4	230	403	DAWSONC	230	413	MEDORA	230	216.1	216.1	149(NEW)	R
810	BOWMAN	230	803	MARMARTH	230	403	DAWSONC	230	413	MEDORA	230	216.1	216.1	111 (NEW)	R
848	HETINGR	115	870	N ENGLN	115	418	DKSN-ND7	115	870	N ENGLN7	115	67.7	67.7	144(NEW)	R
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	115(+8)	NONE PRE-EXISTING MAX 138%
497	MAURINE	230	470	BISON	230	506	FTTHOMP3	345	9847	HETINGR3	345	176	440	169(NEW)	U
915	ELBOWLK	115	940	GRANTCO	115	934	FERGSFL	230	1940	HENNING	230	105	96	104(+8)	R
507	FTTHOMP	230	516	LAKPLAT	230	605	LELENA\DO	345	660	GROTON	345	316	398	111(17)	U
847	HETINGR4	230	470	BISON	230	506	FTTHOMP3	345	9847	HETINGR3	345	216.1	216.1	139(NEW)	R
403	DAWSONC	230	413	MEDORA	230	810	BOWMAN	230	847	HETINGR4	230	263	398	113 (NEW)	U
418	DKSN-ND7	115	870	N ENGLN7	115	848	HETINGR	115	870	N ENGLN	115	67.7	67.7	144(NEW)	R
403	DAWSONC	115	856	LEWIS	115	810	BOWMAN	230	847	HETINGR4	230	61.6	61.6	129(NEW)	R
403	DAWSONC	115	832	GLENDCT7	115	810	BOWMAN	230	847	HETINGR4	230	67.7	67.7	116(NEW)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	116(+4)	U
827	ELLENDL	115	1001	ABDNJCT	115	826	ELLENDL	230	994	OAKES	230	88	128	109(+6)	U
484	NUNDRWD4	230	497	MAURINE4	230	506	FTTHOMP	345	9847	HETINGR3	345	176	440	144(NEW)	U
1517	WILLMAR7	115	1519	WILMAR8	69	550	GRANITF4	230	1516	WILLMAR4	230	65.8	84	123(+3)	U
479	MARTIN	115	653	VETALTP	115	507	FTTHOMP	230	509	FTRANDL	230	66	128	114(+21)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	126(+11)	R
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	119(+13)	R
483	NEWELL	115	480	MAURINE	115	484	NUNDRWD	230	497	MAURINE	230	66	143	117(25)	U

Table 5.22 (Cont.)
Summary of Contingency Analysis Results
Case S1C2XXX

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
413	MEDORA	230	425	BELFELD	230	810	BOWMAN	230	847	HETINGR4	230	263	398	111(NEW)	U
948	HIWY	115	970	ORTONVL	115	503	BLAIR	230	910	BIGSTON	230	176	160	102(+4)	R
792	MAPLE R3	345	79825	MAPLER1Y	345	792	MAPLE R3	345	79824	MAPLER2Y	345	420	336	105(+9)	R
792	MAPLE R3	345	79824	MAPLER2Y	345	792	MAPLE R3	345	79825	MAPLER1Y	345	420	336	105(+9)	R
1677	ROSEAUN	500	1678	ROSEAUS	500	753	RUNNING	230	1327	SHANNON	230	1905	1732	102(+4)	R
482	MISSION	115	653	VETALTP	115	633	SIDNEY	345	10166	KEYSTONE	345	66	128	109(+15)	U
509	FTRANDL	230	516	LAKPLAT	230	507	FTTHOMP	230	509	FTRANDL	230	316	398	108(+18)	U
601	ANTELOP	345	620	HURON	345	605	LELANDO	345	660	GROTON	345	526	2270	101(NEW)	U
483	NEWELL	115	490	RAPIDCY	115	484	NUNDRWD	230	497	MAURINE	230	66	143	109(NEW)	U

Table 5.22 (Cont.)
Summary of Contingency Analysis Results
Case S1C3XXA

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	112(+1)	U
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	112 (-7)	NONE
1517	WILMAR	115	1519	WILMAR	69	550	GRANITF4	230	1516	WILLMAR4	230	65.8	84	119(-1)	NONE
911	BIGSTON	115	948	HIWY	115	503	BLAIR	230	910	BIGSTON	230	176	160	107(+3)	R
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	106(+5)	U
848	HETINGR	115	870	N ENGLN	115	418	DKSN-ND7	115	870	N ENGLN7	115	67.7	67.7	140(NEW)	R
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	111(+4)	NONE PRE-EXISTING MAX 138%
497	MAURINE	230	470	BISON	230	506	FTTHOMP3	345	9847	HETINGR3	345	176	440	180(NEW)	U
507	FTTHOMP	230	516	LAKPLAT	230	605	LELENA\DO	345	660	GROTON	345	316	398	102(8)	U
847	HETINGR4	230	470	BISON	230	506	FTTHOMP3	345	9847	HETINGR3	345	216.1	216.1	147(NEW)	R
411	MI CTY	230	804	BAKER	230	403	DAWSON	230	411	MI CTY	230	176	322	107(NEW)	U
418	DKSN-ND7	115	870	N ENGLN7	115	848	HETINGR	115	870	N ENGLN	115	67.7	67.7	140(NEW)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	111(-1)	NONE
484	NUNDRWD4	230	497	MAURINE4	230	506	FTTHOMP	345	9847	HETINGR3	345	176	440	132(NEW)	U
479	MARTIN	115	653	VETALTP	115	10181	MAXWELL	115	10204	N.PLATT	115	66	128	109(+8)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	116(+1)	R
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	107(+1)	U
482	MISSION	115	653	VETALTP	115	10181	MAXWELL	15	10204	N. PLATT	115	66	128	105(+7)	U
483	NEWELL	115	480	MAURINE	115	484	NUNDRWD	230	497	MAURINE	230	66	143	110(18)	U

Table 5.22 (Cont.)
Summary of Contingency Analysis Results
Case S1C3XXA

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	112(+1)	U
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	112 (-7)	NONE
1517	WILMAR	115	1519	WILMAR	69	550	GRANITF4	230	1516	WILLMAR4	230	65.8	84	119(-1)	NONE
911	BIGSTON	115	948	HIWY	115	503	BLAIR	230	910	BIGSTON	230	176	160	107(+3)	R
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	106(+5)	U
848	HETINGR	115	870	N ENGLN	115	418	DKSN-ND7	115	870	N ENGLN7	115	67.7	67.7	140(NEW)	R
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	111(+4)	NONE PRE-EXISTING MAX 138%
497	MAURINE	230	470	BISON	230	506	FTTHOMP3	345	9847	HETINGR3	345	176	440	180(NEW)	U
507	FTTHOMP	230	516	LAKPLAT	230	605	LELENA\DO	345	660	GROTON	345	316	398	102(8)	U
847	HETINGR4	230	470	BISON	230	506	FTTHOMP3	345	9847	HETINGR3	345	216.1	216.1	147(NEW)	R
411	MI CTY	230	804	BAKER	230	403	DAWSON	230	411	MI CTY	230	176	322	107(NEW)	U
418	DKSN-ND7	115	870	N ENGLN7	115	848	HETINGR	115	870	N ENGLN	115	67.7	67.7	140(NEW)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	111(-1)	NONE
484	NUNDRWD4	230	497	MAURINE4	230	506	FTTHOMP	345	9847	HETINGR3	345	176	440	132(NEW)	U
479	MARTIN	115	653	VETALTP	115	10181	MAXWELL	115	10204	N.PLATT	115	66	128	109(+8)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	116(+1)	R
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	107(+1)	U
482	MISSION	115	653	VETALTP	115	10181	MAXWELL	15	10204	N. PLATT	115	66	128	105(+7)	U
483	NEWELL	115	480	MAURINE	115	484	NUNDRWD	230	497	MAURINE	230	66	143	110(18)	U

Table 5.22 (Cont.)
Summary of Contingency Analysis Results
Case S1C4XXX

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	113(+2)	U
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	124 (+5)	U
804	BAKER	230	803	MARMARTH	230	9847	HETINGR3	345	9411	MI CTY	345	216.1	216.1	131(NEW)	R
528	WOONSTK	115	623	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	116(+4)	U
46502	HENRYTR	69	46553	BIRDISL	69	1246	REDFLST	115	1653	MINVALY	115	40.7	37	118(+11)	R
46563	FRANKLIN	69	46608	BIRCH	69	1246	REDFLST	115	1653	MINVALY	115	40.7	37	110(NEW)	R
46502	HENRYTR	69	46608	BIRCH	69	1246	REDFLST	115	1650	FRANKLIN	115	40.7	37	106(+2)	R
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	105(+4)	U
848	HETINGR	115	870	N ENGLN	115	418	DKSN-ND7	115	870	N ENGLN7	115	67.7	67.7	157(NEW)	R
497	MAURINE	230	470	BISON	230	506	FTTHOMP3	345	9838	GLENHAM	345	176	440	161(NEW)	U
847	HETINGR4	230	470	BISON	230	506	FTTHOMP3	345	9838	GLENHAM	345	216.1	216.1	132(NEW)	R
411	MI CTY	230	804	BAKER	230	9847	HETINGR3	345	9411	MI CTY	345	176	322	154(N/A)	U
418	DKSN-ND7	115	870	N ENGLN7	115	848	HETINGR	115	870	N ENGLN	115	67.7	67.7	144(NEW)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	116(+4)	U
484	NUNDRWD4	230	497	MAURINE4	230	506	FTTHOMP	345	9838	GLENHAM	345	176	440	118(N/A)	U
479	MARTIN	115	653	VETALTP	115	10181	MAXWELL	115	10204	N.PLATT	115	66	128	107(+6)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	118(+3)	R
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	110(+4)	U
1517	WILLMAR7	115	1519	WILMAR8	69	550	GRANITF4	230	1516	WILLMAR4	230	65.8	84	124(+4)	U
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	112(+5)	NONE PRE-EXISTING MAX 138%
574	SIOUXCY	69	2338	PLYMOTH	69	566	SIOUXCY	161	2337	PLYMOTH	161	50	64	131(+5)	R

Table 5.22 (Cont.)
Summary of Contingency Analysis Results
Case S1C5XX1

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	752	DRAYTON4	230	3458	LETELER4	230	1732	2094	110(-1)	NONE
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	117 (-2)	NONE
810	BOWMAN	230	847	HETINGR4	230	403	DAWSONC	230	413	MEDORA	230	216.1	216.1	155(NEW)	R
1353	RIVERTN	115	44250	RIVTON	69	99910	BIGSTON	500	91702	BLUE LK	500	44	56	115(NEW)	NONE (PRE-EXISTING MAX 138%)
810	BOWMAN	230	803	MARMARTH	230	403	DAWSONC	230	413	MEDORA	230	216.1	216.1	117 (NEW)	
848	HETINGR	115	870	N ENGLN	115	418	DKSN-ND7	115	870	N ENGLN7	115	67.7	67.7	144(NEW)	R
847	HETINGR4	230	470	BISON	230	847	HETINGR4	230	9847	HETINGR3	345	216.1	216.1	121(NEW)	R
497	MAURINE	230	470	BISON	230	847	HETINGR4	230	9847	HETINGR3	345	176	440	146(NEW)	U
403	DAWSONC	230	413	MEDORA	230	810	BOWMAN	230	847	HETINGR4	230	263	398	116 (NEW)	U
413	MEDORA	230	425	BELFELD	230	810	BOWMAN	230	847	HETINGR4	230	263	398	113(NEW)	U
418	DKSN-ND7	115	870	N ENGLN7	115	848	HETINGR	115	870	N ENGLN	115	67.7	67.7	146(NEW)	R
403	DAWSONC	115	856	LEWIS	115	810	BOWMAN	230	847	HETINGR4	230	61.6	61.6	125(NEW)	R
1702	BLUE LK3	345	91702	BLUE LK2	500	1702	BLUE LK3	345	91702	BLUE LK2	500	840	720	109(N/A)	PROPOSED FACILITY
403	DAWSONC	115	832	GLENDCT7	115	810	BOWMAN	230	847	HETINGR4	230	67.7	67.7	115(NEW)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	110(-2)	NONE
529	WATERTN3	345	660	GROTON3	345	99960	GRONTN2	500	99910	BIGSTON2	500	660	1159	104(NEW)	U
484	NUNDRWD4	230	497	MAURINE4	230	847	HETINGR4	230	9847	HETINGR3	345	176	440	104(NEW)	U
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	110(-2)	NONE
1517	WILLMAR7	115	1519	WILMAR8	69	550	GRANITF4	230	1516	WILLMAR4	230	65.8	84	119(-1)	NONE

Table 5.22 (Cont.)
Summary of Contingency Analysis Results
Case S1C5XXA

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	752	DRAYTON4	230	3458	LETELER4	230	1732	2094	110(-1)	NONE
808	BEULAH	115	843	HESKETT7	115	791	CENTER	345	816	COYOTE	345	88	88	132(3)	R
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	117 (-2)	NONE
810	BOWMAN	230	847	HETINGR4	230	403	DAWSONC	230	413	MEDORA	230	216.1	216.1	154(NEW)	R
1353	RIVERTN	115	44250	RIVTON	69	99910	BIGSTON	500	91702	BLUE LK	500	44	56	116(NEW)	NONE (PRE-EXISTING MAX 138%)
810	BOWMAN	230	803	MARMARTH	230	403	DAWSONC	230	413	MEDORA	230	216.1	216.1	113 (NEW)	
848	HETINGR	115	870	N ENGLN	115	418	DKSN-ND7	115	870	N ENGLN7	115	67.7	67.7	141(NEW)	R
497	MAURINE	230	470	BISON	230	99847	HETINGR2	500	99838	GLENHAM2	500	176	440	213(NEW)	U
847	HETINGR4	230	470	BISON	230	99847	HETINGR2	500	99838	GLENHAM2	500	216.1	216.1	176(NEW)	R
403	DAWSONC	230	413	MEDORA	230	810	BOWMAN	230	847	HETINGR4	230	263	398	117 (NEW)	U
413	MEDORA	230	425	BELFELD	230	810	BOWMAN	230	847	HETINGR4	230	263	398	114(NEW)	U
418	DKSN-ND7	115	870	N ENGLN7	115	99847	HETINGR2	500	99838	GLENHAM2	500	67.7	67.7	155(NEW)	R
403	DAWSONC	115	856	LEWIS	115	810	BOWMAN	230	847	HETINGR4	230	61.6	61.6	124(NEW)	R
1702	BLUE LK3	345	91702	BLUE LK2	500	1702	BLUE LK3	345	91702	BLUE LK2	500	840	720	111(NEW)	PROPOSED FACILITY
403	DAWSONC	115	832	GLENDCT7	115	810	BOWMAN	230	847	HETINGR4	230	67.7	67.7	116(NEW)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	111(-1)	NONE
529	WATERTN3	345	660	GROTON3	345	99960	GRONTN2	500	99910	BIGSTON2	500	660	1159	110(NEW)	U
484	NUNDRWD4	230	497	MAURINE4	230	99847	HETINGR4	500	99838	GLENHAM	500	176	440	153(NEW)	U
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	111(-1)	NONE
1517	WILLMAR7	115	1519	WILMAR8	69	550	GRANITF4	230	1516	WILLMAR4	230	65.8	84	119(-1)	NONE
424	BELFELD 3	345	683	CHAR. CK3	345	99847	HETINGR2	500	99838	GLENHAM2	500	263	880	151(N/A)	U
9847	HETINGR3	345	99847	HETINGR2	500	9847	HETINGR3	345	99847	HETINGR2	500	840	720	105(N/A)	PROPOSED FACILITY

Table 5.25
Constrained Interface Impact Analyses - Case S1C1XXA

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   332.2 DIFF:    -5.1%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   443.2 DIFF:     9.9%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   445.2 DIFF:    23.3%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   284.7 DIFF:     1.0%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   130.9 DIFF:    23.4%
99554 --------  - 99550 GRANFLS3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   193.4 DIFF:    17.5%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    90.8 DIFF:    -6.5%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   185.9 DIFF:    18.7%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   255.1 DIFF:    82.4%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    35.8 DIFF:    40.6%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    58.0 DIFF:    11.0%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    51.6 DIFF:     2.3%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    38.1 DIFF:     6.6%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    30.0 DIFF:     0.4%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    46.4 DIFF:    15.9%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    32.1 DIFF:    13.5%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -215.6 DIFF:   -12.3%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  HETINGR3  - 0506  FTTHOMP3   BASE:     0.0 CHNG:   499.3 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    42.3 DIFF:   999.0%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  2979.4 DIFF:    43.2%
                                                 DIFF:   899.1   DF:    89.9%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   172.6 DIFF:     7.0%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1828.7 DIFF:     3.4%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   215.6 DIFF:   -12.3%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -42.3 DIFF:   999.0%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2174.5 DIFF:     0.1%
                                                 DIFF:     1.4   DF:     0.1%
*******************************************************************************
```

Table 5.25 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -169.2 DIFF:     6.9%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1785.1 DIFF:     3.2%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -212.0 DIFF:   -12.1%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    42.7 DIFF:   999.0%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2123.6 DIFF:    -0.1%
                                                 DIFF:     1.6   DF:     0.2%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   157.3 DIFF:     2.0%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   157.8 DIFF:     2.0%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   162.3 DIFF:     2.0%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   359.6 DIFF:     0.6%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   432.2 DIFF:     0.7%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   462.5 DIFF:     6.5%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1731.7 DIFF:     2.5%
                                                 DIFF:    42.3   DF:     4.2%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   462.5 DIFF:     6.5%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   462.5 DIFF:     6.5%
                                                 DIFF:    28.1   DF:     2.8%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   267.1 DIFF:     5.2%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   110.6 DIFF:    -1.3%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   525.2 DIFF:     7.9%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   902.8 DIFF:     5.9%
                                                 DIFF:    50.3   DF:     5.0%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   315.3 DIFF:    11.4%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   266.6 DIFF:     9.3%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   581.8 DIFF:    10.4%
                                                 DIFF:    54.9   DF:     5.5%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   151.1 DIFF:     5.6%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   300.8 DIFF:     6.3%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    98.4 DIFF:     3.6%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   550.4 DIFF:     5.6%
                                                 DIFF:    29.4   DF:     2.9%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   651.3 DIFF:     0.6%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   651.3 DIFF:     0.6%
                                                 DIFF:     3.8   DF:     0.4%
*******************************************************************************
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Table 5.25 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   834.2 DIFF:    -0.5%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   834.2 DIFF:    -0.5%
                                                 DIFF:    -4.4   DF:    -0.4%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   801.5 DIFF:    -0.2%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   834.2 DIFF:    -0.5%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   357.7 DIFF:    -6.1%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   169.1 DIFF:    -0.8%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   109.1 DIFF:    -1.8%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    61.9 DIFF:   -14.8%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2333.6 DIFF:    -1.8%
                                                 DIFF:   -42.9   DF:    -4.3%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   651.3 DIFF:     0.6%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   834.2 DIFF:    -0.5%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1485.5 DIFF:     0.0%
                                                 DIFF:    -0.6   DF:    -0.1%
*******************************************************************************

2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -79.0 DIFF:     3.8%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -79.0 DIFF:     3.8%
                                                 DIFF:    -2.9   DF:    -0.3%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   484.6 DIFF:    -1.9%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   617.6 DIFF:    -0.9%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1102.2 DIFF:    -1.3%
                                                 DIFF:   -14.9   DF:    -1.5%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    61.9 DIFF:   -14.8%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    61.9 DIFF:   -14.8%
                                                 DIFF:   -10.7   DF:    -1.1%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    62.4 DIFF:    -1.8%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.1 DIFF:    -1.0%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -69.5 DIFF:    -1.5%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -96.2 DIFF:    -0.9%
                                                 DIFF:     0.8   DF:     0.1%
*******************************************************************************
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Table 5.25 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -62.1 DIFF:    -1.8%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    89.9 DIFF:    -1.0%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    70.6 DIFF:    -1.5%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    98.3 DIFF:    -0.9%
                                                DIFF:    -0.9   DF:    -0.1%
*******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -79.9 DIFF:   111.4%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -79.9 DIFF:   111.4%
                                                DIFF:   -42.1   DF:    -4.2%
*******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    99.1 DIFF:    -1.1%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    99.1 DIFF:    -1.1%
                                                DIFF:    -1.1   DF:    -0.1%
*******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   354.3 DIFF:    -1.2%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   354.3 DIFF:    -1.2%
                                                DIFF:    -4.2   DF:    -0.4%
*******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   206.2 DIFF:    -8.8%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    65.0 DIFF:   -19.1%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   271.1 DIFF:   -11.5%
                                                DIFF:   -35.2   DF:    -3.5%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   462.5 DIFF:     6.5%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   462.5 DIFF:     6.5%
                                                DIFF:    28.1   DF:     2.8%
*******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -42.3 DIFF:   999.0%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -42.3 DIFF:   999.0%
                                                DIFF:   -38.9   DF:    -3.9%
*******************************************************************************
```

Table 5.25 (Cont.)
Constrained Interface Impact Analyses - Case S1C1XX2

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   289.7 DIFF:   -17.3%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   424.1 DIFF:     5.1%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   410.1 DIFF:    13.6%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   275.8 DIFF:    -2.1%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   124.4 DIFF:    17.3%
99554 --------  - 99550 GRANFLS3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   189.2 DIFF:    15.0%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    72.7 DIFF:   -25.1%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   183.1 DIFF:    17.0%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   204.7 DIFF:    46.3%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    34.3 DIFF:    34.4%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    57.3 DIFF:     9.7%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    47.7 DIFF:    -5.3%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    34.2 DIFF:    -4.5%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    27.0 DIFF:    -9.8%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    45.7 DIFF:    14.2%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    31.2 DIFF:    10.2%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -220.7 DIFF:   -10.2%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  HETINGR3  - 0506  FTTHOMP3   BASE:     0.0 CHNG:   722.6 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    33.8 DIFF:   883.7%

SUBTOTALS FOR: NDEX               BASE:  2080.3 CHNG:  2987.0 DIFF:    43.6%
                                                DIFF:   906.7   DF:    90.7%
*******************************************************************************


3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   171.1 DIFF:     6.1%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1816.5 DIFF:     2.7%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   220.7 DIFF:   -10.2%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -33.8 DIFF:   883.7%

SUBTOTALS FOR: MHEX_S             BASE:  2173.1 CHNG:  2174.5 DIFF:     0.1%
                                                DIFF:     1.4   DF:     0.1%
*******************************************************************************
```

Table 5.25 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -167.8 DIFF:     6.0%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1773.6 DIFF:     2.6%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -217.0 DIFF:   -10.0%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    34.1 DIFF:   889.7%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2124.3 DIFF:     0.0%
                                                 DIFF:     0.9   DF:     0.1%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   156.6 DIFF:     1.5%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   157.1 DIFF:     1.5%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   161.6 DIFF:     1.5%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   356.3 DIFF:    -0.4%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   428.2 DIFF:    -0.2%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   463.5 DIFF:     6.7%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1723.4 DIFF:     2.0%
                                                 DIFF:    34.1   DF:     3.4%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   463.5 DIFF:     6.7%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   463.5 DIFF:     6.7%
                                                 DIFF:    29.1   DF:     2.9%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   268.1 DIFF:     5.6%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   110.3 DIFF:    -1.5%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   531.0 DIFF:     9.1%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   909.4 DIFF:     6.7%
                                                 DIFF:    56.8   DF:     5.7%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   318.9 DIFF:    12.7%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   269.1 DIFF:    10.3%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   587.9 DIFF:    11.6%
                                                 DIFF:    61.0   DF:     6.1%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   151.7 DIFF:     6.1%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   302.6 DIFF:     6.9%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    98.8 DIFF:     4.0%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   553.1 DIFF:     6.2%
                                                 DIFF:    32.1   DF:     3.2%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   651.5 DIFF:     0.6%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   651.5 DIFF:     0.6%
                                                 DIFF:     4.0   DF:     0.4%
*******************************************************************************
```

Table 5.25 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   832.3 DIFF:    -0.8%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   832.3 DIFF:    -0.8%
                                                 DIFF:    -6.3   DF:    -0.6%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   801.2 DIFF:    -0.2%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   832.3 DIFF:    -0.8%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   352.7 DIFF:    -7.4%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   169.2 DIFF:    -0.7%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   109.3 DIFF:    -1.6%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    61.8 DIFF:   -15.0%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2326.5 DIFF:    -2.1%
                                                 DIFF:   -50.0   DF:    -5.0%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   651.5 DIFF:     0.6%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   832.3 DIFF:    -0.8%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1483.8 DIFF:    -0.2%
                                                 DIFF:    -2.3   DF:    -0.2%
*******************************************************************************

2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -78.6 DIFF:     3.2%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -78.6 DIFF:     3.2%
                                                 DIFF:    -2.4   DF:    -0.2%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   483.5 DIFF:    -2.1%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   617.0 DIFF:    -1.0%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1100.5 DIFF:    -1.5%
                                                 DIFF:   -16.7   DF:    -1.7%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    61.8 DIFF:   -15.0%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    61.8 DIFF:   -15.0%
                                                 DIFF:   -10.9   DF:    -1.1%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    62.6 DIFF:    -1.5%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.3 DIFF:    -0.8%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -69.8 DIFF:    -1.1%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -96.5 DIFF:    -0.6%
                                                 DIFF:     0.5   DF:     0.1%
*******************************************************************************
```

Table 5.25 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -62.2 DIFF:    -1.5%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.1 DIFF:    -0.8%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    70.8 DIFF:    -1.1%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    98.7 DIFF:    -0.6%
                                                DIFF:    -0.6   DF:    -0.1%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -84.2 DIFF:   122.8%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -84.2 DIFF:   122.8%
                                                DIFF:   -46.4   DF:    -4.6%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    99.4 DIFF:    -0.8%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    99.4 DIFF:    -0.8%
                                                DIFF:    -0.8   DF:    -0.1%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   354.1 DIFF:    -1.2%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   354.1 DIFF:    -1.2%
                                                DIFF:    -4.4   DF:    -0.4%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   204.4 DIFF:    -9.6%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    63.6 DIFF:   -20.8%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   268.0 DIFF:   -12.5%
                                                DIFF:   -38.4   DF:    -3.8%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   463.5 DIFF:     6.7%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   463.5 DIFF:     6.7%
                                                DIFF:    29.1   DF:     2.9%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -33.8 DIFF:   883.7%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -33.8 DIFF:   883.7%
                                                DIFF:   -30.4   DF:    -3.0%
******************************************************************************
```

Table 5.25 (Cont.)
Constrained Interface Impact Analyses - Case S1C2XXX

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:     0.0 DIFF:  -100.0%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   442.1 DIFF:     9.6%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   437.7 DIFF:    21.2%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   281.0 DIFF:    -0.3%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   127.9 DIFF:    20.6%
99554 --------  - 99550 GRANFLS3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   190.9 DIFF:    16.0%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    87.3 DIFF:   -10.1%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   184.9 DIFF:    18.2%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   220.6 DIFF:    57.7%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    35.1 DIFF:    37.6%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    57.6 DIFF:    10.2%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    49.8 DIFF:    -1.1%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    36.5 DIFF:     2.1%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    28.8 DIFF:    -3.7%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    46.3 DIFF:    15.5%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    31.6 DIFF:    11.8%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -215.9 DIFF:   -12.2%
9838  GLENHAM3  - 0506  FTTHOMP3   BASE:     0.0 CHNG:   493.2 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  HETINGR3  - 0506  FTTHOMP3   BASE:     0.0 CHNG:   418.3 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    41.1 DIFF:   999.0%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  2994.8 DIFF:    44.0%
                                                 DIFF:   914.4   DF:    91.4%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   172.4 DIFF:     6.9%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1826.9 DIFF:     3.3%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   215.9 DIFF:   -12.2%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -41.1 DIFF:   999.0%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2174.1 DIFF:     0.0%
                                                 DIFF:     1.1   DF:     0.1%
*******************************************************************************
```

Table 5.25 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -169.1 DIFF:     6.8%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1783.4 DIFF:     3.1%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -212.4 DIFF:   -12.0%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    41.5 DIFF:   999.0%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2123.3 DIFF:    -0.1%
                                                 DIFF:     1.9   DF:     0.2%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   156.8 DIFF:     1.6%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   157.3 DIFF:     1.6%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   161.8 DIFF:     1.6%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   357.4 DIFF:     0.0%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   429.5 DIFF:     0.1%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   462.8 DIFF:     6.5%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1725.5 DIFF:     2.1%
                                                 DIFF:    36.2   DF:     3.6%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   462.8 DIFF:     6.5%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   462.8 DIFF:     6.5%
                                                 DIFF:    28.3   DF:     2.8%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   267.5 DIFF:     5.4%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   110.3 DIFF:    -1.5%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   528.9 DIFF:     8.7%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   906.7 DIFF:     6.4%
                                                 DIFF:    54.2   DF:     5.4%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   317.7 DIFF:    12.3%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   268.2 DIFF:     9.9%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   585.9 DIFF:    11.2%
                                                 DIFF:    59.0   DF:     5.9%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   151.6 DIFF:     6.0%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   302.1 DIFF:     6.8%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    98.7 DIFF:     3.9%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   552.4 DIFF:     6.0%
                                                 DIFF:    31.4   DF:     3.1%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   651.4 DIFF:     0.6%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   651.4 DIFF:     0.6%
                                                 DIFF:     3.9   DF:     0.4%
*******************************************************************************
```

Table 5.25 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   832.9 DIFF:    -0.7%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   832.9 DIFF:    -0.7%
                                                 DIFF:    -5.8   DF:    -0.6%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   801.2 DIFF:    -0.2%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   832.9 DIFF:    -0.7%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   354.1 DIFF:    -7.0%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   169.1 DIFF:    -0.8%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   109.2 DIFF:    -1.7%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    61.8 DIFF:   -14.9%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2328.3 DIFF:    -2.0%
                                                 DIFF:   -48.1   DF:    -4.8%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   651.4 DIFF:     0.6%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   832.9 DIFF:    -0.7%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1484.2 DIFF:    -0.1%
                                                 DIFF:    -1.9   DF:    -0.2%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -78.7 DIFF:     3.4%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -78.7 DIFF:     3.4%
                                                 DIFF:    -2.6   DF:    -0.3%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   483.9 DIFF:    -2.1%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   617.2 DIFF:    -0.9%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1101.0 DIFF:    -1.4%
                                                 DIFF:   -16.1   DF:    -1.6%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    61.8 DIFF:   -14.9%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    61.8 DIFF:   -14.9%
                                                 DIFF:   -10.8   DF:    -1.1%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    62.2 DIFF:    -2.1%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.2 DIFF:    -0.9%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -69.7 DIFF:    -1.3%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -96.7 DIFF:    -0.4%
                                                 DIFF:     0.4   DF:     0.0%
*******************************************************************************
```

Table 5.25 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -61.9 DIFF:    -2.1%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.0 DIFF:    -0.9%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    70.7 DIFF:    -1.3%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    98.8 DIFF:    -0.4%
                                                DIFF:    -0.4   DF:     0.0%
*******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -82.9 DIFF:   119.3%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -82.9 DIFF:   119.3%
                                                DIFF:   -45.1   DF:    -4.5%
*******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    99.3 DIFF:    -0.9%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    99.3 DIFF:    -0.9%
                                                DIFF:    -0.9   DF:    -0.1%
*******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   354.2 DIFF:    -1.2%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   354.2 DIFF:    -1.2%
                                                DIFF:    -4.4   DF:    -0.4%
*******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   204.9 DIFF:    -9.4%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    64.0 DIFF:   -20.3%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   268.9 DIFF:   -12.2%
                                                DIFF:   -37.4   DF:    -3.7%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   462.8 DIFF:     6.5%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   462.8 DIFF:     6.5%
                                                DIFF:    28.3   DF:     2.8%
*******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -41.1 DIFF:   999.0%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -41.1 DIFF:   999.0%
                                                DIFF:   -37.7   DF:    -3.8%
*******************************************************************************
```

Table 5.25 (Cont.)
Constrained Interface Impact Analyses - Case S1C3XXA

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   315.9 DIFF:    -9.8%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   413.2 DIFF:     2.4%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   415.9 DIFF:    15.2%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   279.7 DIFF:    -0.7%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   118.8 DIFF:    12.0%
99554 --------  - 99550 GRANFLS3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   172.7 DIFF:     5.0%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    81.6 DIFF:   -16.0%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   165.0 DIFF:     5.4%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   205.9 DIFF:    47.2%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    29.5 DIFF:    15.8%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    53.6 DIFF:     2.5%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    49.8 DIFF:    -1.2%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    33.9 DIFF:    -5.1%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    28.2 DIFF:    -5.5%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    43.7 DIFF:     9.1%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    30.0 DIFF:     6.2%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -234.6 DIFF:    -4.5%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  HETINGR3  - 0506  FTTHOMP3   BASE:     0.0 CHNG:   423.3 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    16.1 DIFF:   368.9%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  2642.3 DIFF:    27.0%
                                                 DIFF:   562.0   DF:    56.2%
******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   168.1 DIFF:     4.2%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1787.3 DIFF:     1.0%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   234.6 DIFF:    -4.5%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -16.1 DIFF:   368.9%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2173.9 DIFF:     0.0%
                                                 DIFF:     0.8   DF:     0.1%
******************************************************************************
```

Table 5.25 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -164.9 DIFF:     4.2%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1746.1 DIFF:     1.0%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -230.4 DIFF:    -4.5%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    16.2 DIFF:   369.8%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2125.3 DIFF:     0.0%
                                                 DIFF:    -0.1   DF:     0.0%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   156.2 DIFF:     1.3%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   156.7 DIFF:     1.3%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   161.2 DIFF:     1.3%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   357.8 DIFF:     0.1%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   429.8 DIFF:     0.2%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   449.9 DIFF:     3.5%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1711.6 DIFF:     1.3%
                                                 DIFF:    22.3   DF:     2.2%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   449.9 DIFF:     3.5%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   449.9 DIFF:     3.5%
                                                 DIFF:    15.4   DF:     1.5%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   258.3 DIFF:     1.8%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   111.6 DIFF:    -0.4%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   508.8 DIFF:     4.5%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   878.7 DIFF:     3.1%
                                                 DIFF:    26.1   DF:     2.6%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   299.2 DIFF:     5.7%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   255.4 DIFF:     4.7%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   554.5 DIFF:     5.2%
                                                 DIFF:    27.6   DF:     2.8%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   146.3 DIFF:     2.3%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   291.3 DIFF:     3.0%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    96.6 DIFF:     1.7%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   534.2 DIFF:     2.5%
                                                 DIFF:    13.2   DF:     1.3%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   647.7 DIFF:     0.0%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   647.7 DIFF:     0.0%
                                                 DIFF:     0.2   DF:     0.0%
*******************************************************************************
```

Table 5.25 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   836.0 DIFF:    -0.3%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   836.0 DIFF:    -0.3%
                                                 DIFF:    -2.7   DF:    -0.3%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   800.1 DIFF:    -0.3%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   836.0 DIFF:    -0.3%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   377.9 DIFF:    -0.8%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   169.2 DIFF:    -0.7%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   108.3 DIFF:    -2.5%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    62.0 DIFF:   -14.6%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2353.4 DIFF:    -1.0%
                                                 DIFF:   -23.0   DF:    -2.3%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   647.7 DIFF:     0.0%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   836.0 DIFF:    -0.3%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1483.7 DIFF:    -0.2%
                                                 DIFF:    -2.5   DF:    -0.2%
*******************************************************************************

2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -76.0 DIFF:    -0.2%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -76.0 DIFF:    -0.2%
                                                 DIFF:     0.1   DF:     0.0%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   489.5 DIFF:    -0.9%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   620.7 DIFF:    -0.4%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1110.2 DIFF:    -0.6%
                                                 DIFF:    -6.9   DF:    -0.7%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    62.0 DIFF:   -14.6%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    62.0 DIFF:   -14.6%
                                                 DIFF:   -10.6   DF:    -1.1%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    64.4 DIFF:     1.3%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.2 DIFF:    -1.0%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -69.8 DIFF:    -1.1%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -94.6 DIFF:    -2.5%
                                                 DIFF:     2.5   DF:     0.2%
*******************************************************************************
```

Table 5.25 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -64.0 DIFF:     1.3%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    89.9 DIFF:    -1.0%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    70.8 DIFF:    -1.1%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    96.7 DIFF:    -2.5%
                                                DIFF:    -2.5   DF:    -0.3%
*******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -60.8 DIFF:    60.9%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -60.8 DIFF:    60.9%
                                                DIFF:   -23.0   DF:    -2.3%
*******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    99.9 DIFF:    -0.3%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    99.9 DIFF:    -0.3%
                                                DIFF:    -0.3   DF:     0.0%
*******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   356.5 DIFF:    -0.6%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   356.5 DIFF:    -0.6%
                                                DIFF:    -2.0   DF:    -0.2%
*******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   215.2 DIFF:    -4.8%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    71.8 DIFF:   -10.6%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   287.0 DIFF:    -6.3%
                                                DIFF:   -19.4   DF:    -1.9%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   449.9 DIFF:     3.5%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   449.9 DIFF:     3.5%
                                                DIFF:    15.4   DF:     1.5%
*******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -16.1 DIFF:   368.9%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -16.1 DIFF:   368.9%
                                                DIFF:   -12.7   DF:    -1.3%
*******************************************************************************
```

Table 5.25 (Cont.)
Constrained Interface Impact Analyses - Case S1C4XXX

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:     0.0 DIFF:  -100.0%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   421.2 DIFF:     4.4%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   359.8 DIFF:    -0.4%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   277.8 DIFF:    -1.4%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   107.5 DIFF:     1.4%
99554 --------  - 99550 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   174.6 DIFF:     6.1%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    87.0 DIFF:   -10.5%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   168.6 DIFF:     7.7%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   186.2 DIFF:    33.1%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    28.2 DIFF:    10.5%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    54.4 DIFF:     4.1%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    48.5 DIFF:    -3.7%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    34.0 DIFF:    -5.0%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    28.7 DIFF:    -4.0%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    41.4 DIFF:     3.4%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    28.9 DIFF:     2.0%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -232.5 DIFF:    -5.4%
9838  GLENHAM3  - 0506  FTTHOMP3   BASE:     0.0 CHNG:   473.2 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  HETINGR3  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    17.1 DIFF:   397.9%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  2304.5 DIFF:    10.8%
                                                 DIFF:   224.2   DF:    22.4%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   168.2 DIFF:     4.3%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1788.4 DIFF:     1.1%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   232.5 DIFF:    -5.4%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -17.1 DIFF:   397.9%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2172.0 DIFF:     0.0%
                                                 DIFF:    -1.1   DF:    -0.1%
*******************************************************************************
```

Table 5.25 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -165.1 DIFF:     4.3%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1747.1 DIFF:     1.0%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -228.4 DIFF:    -5.3%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    17.2 DIFF:   399.0%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2123.4 DIFF:    -0.1%
                                                 DIFF:     1.8   DF:     0.2%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   155.7 DIFF:     0.9%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   156.2 DIFF:     0.9%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   160.7 DIFF:     0.9%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   358.0 DIFF:     0.1%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   429.9 DIFF:     0.2%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   445.9 DIFF:     2.6%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1706.4 DIFF:     1.0%
                                                 DIFF:    17.1   DF:     1.7%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   445.9 DIFF:     2.6%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   445.9 DIFF:     2.6%
                                                 DIFF:    11.5   DF:     1.1%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   258.8 DIFF:     2.0%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   111.9 DIFF:     0.0%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   505.2 DIFF:     3.8%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   875.8 DIFF:     2.7%
                                                 DIFF:    23.3   DF:     2.3%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   293.9 DIFF:     3.9%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   251.8 DIFF:     3.2%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   545.8 DIFF:     3.6%
                                                 DIFF:    18.8   DF:     1.9%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   144.5 DIFF:     1.0%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   288.6 DIFF:     2.0%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    96.1 DIFF:     1.2%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   529.2 DIFF:     1.6%
                                                 DIFF:     8.2   DF:     0.8%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   643.3 DIFF:    -0.6%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   643.3 DIFF:    -0.6%
                                                 DIFF:    -4.2   DF:    -0.4%
*******************************************************************************
```

Table 5.25 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   824.2 DIFF:    -1.7%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   824.2 DIFF:    -1.7%
                                                 DIFF:   -14.5   DF:    -1.4%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   796.5 DIFF:    -0.8%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   824.2 DIFF:    -1.7%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   352.8 DIFF:    -7.4%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   169.1 DIFF:    -0.8%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   109.7 DIFF:    -1.2%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    68.1 DIFF:    -6.2%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2320.5 DIFF:    -2.4%
                                                 DIFF:   -56.0   DF:    -5.6%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   643.3 DIFF:    -0.6%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   824.2 DIFF:    -1.7%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1467.5 DIFF:    -1.3%
                                                 DIFF:   -18.7   DF:    -1.9%
*******************************************************************************

2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -69.4 DIFF:    -8.8%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -69.4 DIFF:    -8.8%
                                                 DIFF:     6.7   DF:     0.7%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   491.3 DIFF:    -0.6%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   622.0 DIFF:    -0.2%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1113.2 DIFF:    -0.4%
                                                 DIFF:    -3.9   DF:    -0.4%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    68.1 DIFF:    -6.2%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    68.1 DIFF:    -6.2%
                                                 DIFF:    -4.5   DF:    -0.5%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    63.7 DIFF:     0.3%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.4 DIFF:    -0.7%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.0 DIFF:    -0.9%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -95.7 DIFF:    -1.4%
                                                 DIFF:     1.4   DF:     0.1%
*******************************************************************************
```

Table 5.25 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -63.4 DIFF:     0.3%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.2 DIFF:    -0.7%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.0 DIFF:    -0.9%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    97.8 DIFF:    -1.4%
                                                DIFF:    -1.4   DF:    -0.1%
*******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -56.4 DIFF:    49.1%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -56.4 DIFF:    49.1%
                                                DIFF:   -18.6   DF:    -1.9%
*******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:   101.6 DIFF:     1.4%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:   101.6 DIFF:     1.4%
                                                DIFF:     1.4   DF:     0.1%
*******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   358.3 DIFF:    -0.1%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   358.3 DIFF:    -0.1%
                                                DIFF:    -0.2   DF:     0.0%
*******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   218.6 DIFF:    -3.3%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    74.2 DIFF:    -7.5%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   292.8 DIFF:    -4.4%
                                                DIFF:   -13.5   DF:    -1.4%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   445.9 DIFF:     2.6%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   445.9 DIFF:     2.6%
                                                DIFF:    11.5   DF:     1.1%
*******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -17.1 DIFF:   397.9%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -17.1 DIFF:   397.9%
                                                DIFF:   -13.7   DF:    -1.4%
*******************************************************************************
```

Table 5.25 (Cont.)
Constrained Interface Impact Analyses - Case S1C5XX1

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:     0.0 DIFF:  -100.0%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   382.4 DIFF:    -5.2%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   334.5 DIFF:    -7.3%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   194.4 DIFF:   -31.0%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   100.0 DIFF:    -5.7%
99554 --------  - 99550 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   162.4 DIFF:    -1.3%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    75.6 DIFF:   -22.1%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   150.2 DIFF:    -4.0%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   145.6 DIFF:     4.1%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    25.1 DIFF:    -1.6%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    50.9 DIFF:    -2.6%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    42.0 DIFF:   -16.6%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    28.4 DIFF:   -20.6%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    23.8 DIFF:   -20.3%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    31.6 DIFF:   -21.2%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    26.2 DIFF:    -7.2%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -247.8 DIFF:     0.8%
9838  GLENHAM3  - 0506  FTTHOMP3   BASE:     0.0 CHNG:   216.2 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 GLENHAM2  - 99660 GROTON 2   BASE:     0.0 CHNG:   904.0 DIFF:   999.0%
99910 BIGSTON2  - 99660 GROTON 2   BASE:     0.0 CHNG:  -832.2 DIFF:   999.0%
99910 BIGSTON2  - 91702 BLUE LK2   BASE:     0.0 CHNG:   959.6 DIFF:   999.0%
9847  HETINGR3  - 0506  FTTHOMP3   BASE:     0.0 CHNG:   272.8 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:     1.5 DIFF:   -55.3%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  3047.4 DIFF:    46.5%
                                                 DIFF:   967.0   DF:    96.7%
******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   160.8 DIFF:    -0.3%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1762.9 DIFF:    -0.4%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   247.8 DIFF:     0.8%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:    -1.5 DIFF:   -55.3%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2170.0 DIFF:    -0.1%
                                                 DIFF:    -3.1   DF:    -0.3%
******************************************************************************
```

Table 5.25 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -157.9 DIFF:    -0.3%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1723.1 DIFF:    -0.4%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -243.1 DIFF:     0.8%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:     1.5 DIFF:   -55.3%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2122.5 DIFF:    -0.1%
                                                 DIFF:     2.7   DF:     0.3%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   154.3 DIFF:     0.1%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   154.8 DIFF:     0.1%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   159.3 DIFF:     0.1%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   356.7 DIFF:    -0.3%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   428.1 DIFF:    -0.2%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   439.1 DIFF:     1.1%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1692.2 DIFF:     0.2%
                                                 DIFF:     2.9   DF:     0.3%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   439.1 DIFF:     1.1%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   439.1 DIFF:     1.1%
                                                 DIFF:     4.7   DF:     0.5%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   257.8 DIFF:     1.6%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   113.8 DIFF:     1.6%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   498.8 DIFF:     2.5%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   870.4 DIFF:     2.1%
                                                 DIFF:    17.9   DF:     1.8%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   289.4 DIFF:     2.3%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   248.5 DIFF:     1.9%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   537.9 DIFF:     2.1%
                                                 DIFF:    11.0   DF:     1.1%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   143.0 DIFF:    -0.1%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   285.0 DIFF:     0.7%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    95.4 DIFF:     0.4%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   523.4 DIFF:     0.5%
                                                 DIFF:     2.4   DF:     0.2%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   644.8 DIFF:    -0.4%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   644.8 DIFF:    -0.4%
                                                 DIFF:    -2.6   DF:    -0.3%
*******************************************************************************
```

Table 5.25 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   839.6 DIFF:     0.1%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   839.6 DIFF:     0.1%
                                                 DIFF:     1.0   DF:     0.1%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   798.4 DIFF:    -0.5%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   839.6 DIFF:     0.1%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   418.2 DIFF:     9.8%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   167.4 DIFF:    -1.8%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   109.0 DIFF:    -1.9%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    59.2 DIFF:   -18.5%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2391.8 DIFF:     0.6%
                                                 DIFF:    15.4   DF:     1.5%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   644.8 DIFF:    -0.4%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   839.6 DIFF:     0.1%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1484.5 DIFF:    -0.1%
                                                 DIFF:    -1.7   DF:    -0.2%
*******************************************************************************

2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -73.4 DIFF:    -3.6%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -73.4 DIFF:    -3.6%
                                                 DIFF:     2.7   DF:     0.3%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   492.0 DIFF:    -0.4%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   621.7 DIFF:    -0.2%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1113.7 DIFF:    -0.3%
                                                 DIFF:    -3.4   DF:    -0.3%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    59.2 DIFF:   -18.5%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    59.2 DIFF:   -18.5%
                                                 DIFF:   -13.5   DF:    -1.3%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    63.2 DIFF:    -0.5%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -90.3 DIFF:     0.3%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.8 DIFF:     0.3%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -97.8 DIFF:     0.8%
                                                 DIFF:    -0.8   DF:    -0.1%
*******************************************************************************
```

Table 5.25 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -62.8 DIFF:    -0.5%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    91.0 DIFF:     0.3%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.8 DIFF:     0.3%

SUBTOTALS FOR: MH_SPC_W           BASE:    99.2 CHNG:   100.0 DIFF:     0.8%
                                               DIFF:     0.8   DF:     0.1%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -45.7 DIFF:    21.0%

SUBTOTALS FOR: MNTZUMA_W          BASE:   -37.8 CHNG:   -45.7 DIFF:    21.0%
                                               DIFF:    -7.9   DF:    -0.8%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:   101.7 DIFF:     1.5%

SUBTOTALS FOR: NI_WUMS            BASE:   100.2 CHNG:   101.7 DIFF:     1.5%
                                               DIFF:     1.5   DF:     0.1%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   358.3 DIFF:    -0.1%

SUBTOTALS FOR: QUAD-ROCKC         BASE:   358.5 CHNG:   358.3 DIFF:    -0.1%
                                               DIFF:    -0.2   DF:     0.0%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   223.2 DIFF:    -1.3%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    77.9 DIFF:    -2.9%

SUBTOTALS FOR: QUADCITY_W         BASE:   306.4 CHNG:   301.1 DIFF:    -1.7%
                                               DIFF:    -5.2   DF:    -0.5%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   439.1 DIFF:     1.1%

SUBTOTALS FOR: WNE_WKS            BASE:   434.5 CHNG:   439.1 DIFF:     1.1%
                                               DIFF:     4.7   DF:     0.5%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:    -1.5 DIFF:   -55.3%

SUBTOTALS FOR: G82R-INFO-         BASE:    -3.4 CHNG:    -1.5 DIFF:   -55.3%
                                               DIFF:     1.9   DF:     0.2%
******************************************************************************
```

Table 5.25 (Cont.)
Constrained Interface Impact Analyses - Case S1C5XXA

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:     0.0 DIFF:  -100.0%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   388.8 DIFF:    -3.6%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   355.4 DIFF:    -1.6%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   204.6 DIFF:   -27.4%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   103.6 DIFF:    -2.3%
99554 --------  - 99550 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   165.2 DIFF:     0.4%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    92.6 DIFF:    -4.6%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   152.8 DIFF:    -2.4%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   177.7 DIFF:    27.0%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    26.0 DIFF:     1.8%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    51.6 DIFF:    -1.2%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    43.4 DIFF:   -13.8%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    29.5 DIFF:   -17.5%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    25.1 DIFF:   -16.1%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    32.7 DIFF:   -18.5%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    26.9 DIFF:    -4.8%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -244.8 DIFF:    -0.4%
9838  GLENHAM3  - 0506  FTTHOMP3   BASE:     0.0 CHNG:   323.3 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 GLENHAM2  - 99660 GROTON 2   BASE:     0.0 CHNG:   958.8 DIFF:   999.0%
99910 BIGSTON2  - 99660 GROTON 2   BASE:     0.0 CHNG:  -861.9 DIFF:   999.0%
99910 BIGSTON2  - 91702 BLUE LK2   BASE:     0.0 CHNG:   978.0 DIFF:   999.0%
9847  HETINGR3  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:     6.3 DIFF:    82.0%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  3035.5 DIFF:    45.9%
                                                 DIFF:   955.2   DF:    95.5%
******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   161.4 DIFF:     0.1%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1771.2 DIFF:     0.1%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   244.8 DIFF:    -0.4%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:    -6.3 DIFF:    82.0%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2171.2 DIFF:    -0.1%
                                                 DIFF:    -1.9   DF:    -0.2%
******************************************************************************
```

Table 5.25 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -158.4 DIFF:     0.1%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1731.0 DIFF:     0.1%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -240.2 DIFF:    -0.4%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:     6.3 DIFF:    82.0%

SUBTOTALS FOR: MHEX_N             BASE: -2125.2 CHNG: -2123.3 DIFF:    -0.1%
                                                DIFF:     1.9   DF:     0.2%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   154.8 DIFF:     0.3%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   155.3 DIFF:     0.3%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   159.7 DIFF:     0.3%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   359.7 DIFF:     0.6%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   431.7 DIFF:     0.6%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   435.0 DIFF:     0.1%

SUBTOTALS FOR: GGS                BASE:  1689.3 CHNG:  1696.1 DIFF:     0.4%
                                                DIFF:     6.8   DF:     0.7%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   435.0 DIFF:     0.1%

SUBTOTALS FOR: WNE_WKS            BASE:   434.5 CHNG:   435.0 DIFF:     0.1%
                                                DIFF:     0.5   DF:     0.1%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   254.0 DIFF:     0.1%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   113.0 DIFF:     0.9%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   485.8 DIFF:    -0.2%

SUBTOTALS FOR: GRIS_LNC           BASE:   852.5 CHNG:   852.7 DIFF:     0.0%
                                                DIFF:     0.2   DF:     0.0%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   281.5 DIFF:    -0.5%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   243.0 DIFF:    -0.4%

SUBTOTALS FOR: COOPER_S           BASE:   526.9 CHNG:   524.6 DIFF:    -0.4%
                                                DIFF:    -2.3   DF:    -0.2%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   142.5 DIFF:    -0.4%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   282.3 DIFF:    -0.2%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    94.9 DIFF:    -0.1%

SUBTOTALS FOR: FTCAL_S            BASE:   521.0 CHNG:   519.7 DIFF:    -0.2%
                                                DIFF:    -1.3   DF:    -0.1%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   641.2 DIFF:    -1.0%

SUBTOTALS FOR: ECL-ARP            BASE:   647.5 CHNG:   641.2 DIFF:    -1.0%
                                                DIFF:    -6.3   DF:    -0.6%
*******************************************************************************
```

Table 5.25 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   838.1 DIFF:    -0.1%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   838.1 DIFF:    -0.1%
                                                 DIFF:    -0.6   DF:    -0.1%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   795.4 DIFF:    -0.9%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   838.1 DIFF:    -0.1%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   422.2 DIFF:    10.9%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   166.8 DIFF:    -2.1%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   108.3 DIFF:    -2.5%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    58.8 DIFF:   -19.1%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2389.6 DIFF:     0.6%
                                                 DIFF:    13.2   DF:     1.3%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   641.2 DIFF:    -1.0%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   838.1 DIFF:    -0.1%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1479.3 DIFF:    -0.5%
                                                 DIFF:    -6.8   DF:    -0.7%
*******************************************************************************

2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -70.8 DIFF:    -7.0%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -70.8 DIFF:    -7.0%
                                                 DIFF:     5.4   DF:     0.5%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   494.5 DIFF:     0.1%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   623.3 DIFF:     0.0%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1117.8 DIFF:     0.1%
                                                 DIFF:     0.6   DF:     0.1%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    58.8 DIFF:   -19.1%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    58.8 DIFF:   -19.1%
                                                 DIFF:   -13.9   DF:    -1.4%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    63.0 DIFF:    -0.9%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -90.2 DIFF:     0.2%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.7 DIFF:     0.2%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -97.9 DIFF:     0.9%
                                                 DIFF:    -0.8   DF:    -0.1%
*******************************************************************************
```

Table 5.25 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -62.6 DIFF:    -0.9%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    91.0 DIFF:     0.2%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.7 DIFF:     0.2%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:   100.1 DIFF:     0.8%
                                                DIFF:     0.8   DF:     0.1%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -37.8 DIFF:    -0.1%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -37.8 DIFF:    -0.1%
                                                DIFF:     0.0   DF:     0.0%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:   102.6 DIFF:     2.4%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:   102.6 DIFF:     2.4%
                                                DIFF:     2.4   DF:     0.2%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   359.5 DIFF:     0.3%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   359.5 DIFF:     0.3%
                                                DIFF:     1.0   DF:     0.1%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   227.2 DIFF:     0.5%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    80.9 DIFF:     0.8%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   308.1 DIFF:     0.6%
                                                DIFF:     1.7   DF:     0.2%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   435.0 DIFF:     0.1%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   435.0 DIFF:     0.1%
                                                DIFF:     0.5   DF:     0.1%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:    -6.3 DIFF:    82.0%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:    -6.3 DIFF:    82.0%
                                                DIFF:    -2.8   DF:    -0.3%
******************************************************************************
```

Table 6.1
Site 2 (Jamestown) - New Wind (10x100 MW) Generation

```
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168

DATA FOR BUS  9759 [PICKWIND13.8] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.02083 103.54

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.00000                              100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  759 PICKERT4 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  759 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   759 [PICKERT4 230] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.02016  96.77

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  437 GRNDFKS4 230  1   0.00910  0.06730  0.15170  1  F   319.0  440.0  351.0    0.0       1 1.000
  444 JAMESTN4 230  1   0.01140  0.08380  0.18880  1  F   319.0  440.0  351.0    0.0       1 1.000
  462 PICWIND4 230  1   0.00190  0.01370  0.03090  1  T   319.0  440.0  351.0    0.0       1 1.000
 9759 PICKWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
79809 PICKERTY 230  1   0.00300  0.22580  0.00000  1  T    60.0   60.0   75.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9759 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
79809 1  F 1.02600   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 6.1 (Cont.)

```
DATA FOR BUS  9444 [JAMEWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.01495 103.55

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.00000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  444 JAMESTN4 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  444 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   444 [JAMESTN4 230] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.01512  96.71

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  426 BISMARK4 230  1   0.01850  0.15220  0.27120  0  T   318.0  440.0  350.0    0.0       1 1.000
  435 FARGO  4 230  1   0.01570  0.12610  0.23330  1  T   318.0  440.0  350.0    0.0       1 1.000
  435 FARGO  4 230  2   0.01600  0.12890  0.23600  0  F   318.0  440.0  350.0    0.0       1 1.000
  441 GARRISN4 230  1   0.02570  0.20850  0.38700  1  T   318.0  440.0  350.0    0.0       1 1.000
  445 JAMESTN7 115  1   0.00250  0.07260  0.00000  1  F   100.0  100.0  125.0    0.0       1 1.000
  759 PICKERT4 230  1   0.01140  0.08380  0.18880  1  T   319.0  440.0  351.0    0.0       1 1.000
  828 WEBER  4 230  1   0.01130  0.09100  0.16590  1  F   318.0  440.0  350.0    0.0       1 1.000
 9444 JAMEWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
19020 JAMEST1T 230  1   0.00050  0.10130  0.00000  1  F   117.0  117.0  146.0    0.0       1 1.000
99444 JAMESTN3 345  1   0.00000  0.01500  0.00000  1  T   500.0  600.0  700.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  445 1  F 1.00430   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 9444 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19020 1  F 1.00430   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
99444 1  T 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.1 (Cont.)

```
DATA FOR BUS  9431 [DEVIWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.04774 119.82

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.00000                              100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  431 DEVILSL7 115  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  431 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   431 [DEVILSL7 115] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.04328 113.38

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 1 1.02500 1.02500     0.00  1:  22.50

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  423 BARLOW 7 115  1   0.07240  0.23540  0.02970  1  T    80.0  128.0   88.0    0.0       1 1.000
  447 LEEDS  7 115  1   0.05670  0.18400  0.02300  1  F   120.0  128.0  132.0    0.0       1 1.000
  448 LAKOTA 7 115  1   0.04670  0.15190  0.01910  1  F    48.0  128.0   60.0    0.0       1 1.000
  947 DEVIL J7 115  1   0.00020  0.00070  0.00009  1  F   120.0  144.0  132.0    0.0       1 1.000
 9431 DEVIWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
19544 DEVILSL941.6  1   0.02730  0.50940  0.00000  1  F    20.0   20.0   25.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9431 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19544 1  T 0.97550 -30.0 1 -19544 1.1005 0.9005 1.0250 0.9850 0.00625

DATA FOR BUS  9428 [CARRWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.04892 118.64

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.00000                              100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  428 CARNGTN7 115  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  428 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.1 (Cont.)

```
DATA FOR BUS   428 [CARNGTN7 115] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.04429 112.20

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  423 BARLOW 7 115  1   0.02140  0.06980  0.00880  1  T    80.0  128.0   88.0    0.0       1 1.000
  445 JAMESTN7 115  1   0.08640  0.28140  0.03540  1  F    80.0  128.0   88.0    0.0       1 1.000
 9428 CARRWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
19546 CARNGTN941.6  1   0.01360  0.34790  0.00000  1  F    42.0   42.0   53.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9428 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19546 1  T 0.98330 -30.0 1 -19546 1.0929 0.9025 1.0400 1.0000 0.00595

DATA FOR BUS  9437 [GRNDWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.01842 100.37

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.00000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  437 GRNDFKS4 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  437 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   437 [GRNDFKS4 230] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.01809  93.56

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  755 PRAIRIE4 230  1   0.00130  0.00927  0.01934  1  F   434.0  566.0  436.0    0.0       1 1.000
  759 PICKERT4 230  1   0.00910  0.06730  0.15170  1  T   319.0  440.0  351.0    0.0       1 1.000
 9437 GRNDWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
19000 GRNDFKST 230  1   0.00000  0.02390  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9437 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19000 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 6.1 (Cont.)

```
DATA FOR BUS  9432 [EDGEWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.04953 100.01

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.00000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  432 EDGELEY7 115  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  432 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   432 [EDGELEY7 115] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.04482  93.58

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  433 EDGELEY869.0  1   0.01190  0.16630  0.00000  1  F    20.0   20.0   25.0    0.0       1 1.000
  445 JAMESTN7 115  1   0.06690  0.21750  0.02720  1  F   120.0  128.0  128.0    0.0       1 1.000
  534 ORDWAY 7 115  1   0.13990  0.21450  0.02630  1  F   116.0  116.0  116.0    0.0       1 1.000
 9432 EDGEWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
19549 EDGELEY941.6  1   0.05340  0.90580  0.00000  1  F    13.0   13.0   16.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  433 1  F 1.00430   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 9432 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19549 1  T 0.97550 -30.0 1 -19549 1.1005 0.9005 1.0250 0.9850 0.00625

DATA FOR BUS  9454 [VALLWIND13.8] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.00455 105.50

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.00000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  454 VALLEYC7 115  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  454 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.1 (Cont.)

```
 DATA FOR BUS   454 [VALLEYC7 115] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.00624  98.52

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
  1 1.02500 1.02500     0.00  1:  15.00

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   438 FORMAN 7 115  1   0.09220  0.35610  0.04600  1  T    80.0  204.0   88.0    0.0       1 1.000
   445 JAMESTN7 115  1   0.06320  0.20590  0.02560  1  T    80.0  128.0   88.0    0.0       1 1.000
  9454 VALLWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
 19013 VALLEYC869.0  1   0.00730  0.11980  0.00000  1  F    50.0   50.0   63.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  9454 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 19013 1  T 0.98323   0.0 1 -19013 1.0952 0.8962 1.0200 0.9800 0.00622

 DATA FOR BUS  9984 [WHAPWIND13.8] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 -2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.01067  83.42

 PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
     100.0   -51.0   -51.0   -51.0 1.00000                             100.00

 ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
 1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   984 WAHPETN4 230  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   984 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

 DATA FOR BUS   984 [WAHPETN4 230] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.01146  76.52


 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   754 MAPLE R4 230  1   0.01320  0.07990  0.15187  1  F   265.0  265.0  292.0    0.0       1 1.000
   934 FERGSFL4 230  1   0.00710  0.04010  0.08722  1  T   320.0  398.0  352.0    0.0       1 1.000
   942 HANKSON4 230  1   0.00630  0.03560  0.07796  1  T   320.0  398.0  352.0    0.0       1 1.000
  9984 WHAPWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
 79829 WAHPET1Y 230  1   0.00100  0.09020  0.00000  1  T   140.0  140.0  175.0    0.0       1 1.000
 79987 WAHPET2Y 230  1   0.00100  0.09020  0.00000  1  T   140.0  140.0  175.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  9984 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 79829 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 79987 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 6.1 (Cont.)

```
DATA FOR BUS  9709 [LANGWIND13.8] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.18179 131.26

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.00000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  709 LANGDON7 115  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  709 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   709 [LANGDON7 115] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.16010 126.14


X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  962 LOMA JT7 115  1   0.03060  0.06320  0.00731  1  T    96.0   96.0  106.0    0.0       1 1.000
 9709 LANGWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
29832 LANGDONT 115  1   0.00000  0.12825  0.00000  1  F    50.0   50.0   57.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9709 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
29832 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DATA FOR BUS  9992 [CAVAWIND13.8] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0    37.0 1.05605 109.87

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    100.0   -51.0   -51.0   -51.0 1.00000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1  100.0  -51.0  -51.0  -51.0  112.0 0.0000 0.1106 0.0000 0.0000 1.0000  100.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  992 HENSEL 7 115  1   0.00240  0.12500  0.00000  1  T   150.0  150.0  150.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  992 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.1 (Cont.)

```
DATA FOR BUS   992 [HENSEL 7 115] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0    13.0 1.05044 103.52

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  705 DRAYTON7 115  1   0.03640  0.12860  0.01622  1  F    74.0   74.0   81.0    0.0       1 1.000
 9992 CAVAWIND13.8  1   0.00240  0.12500  0.00000  1  F   150.0  150.0  150.0    0.0       1 1.000
79851 HENSEL Y 115  1  -0.00150  0.19060  0.00000  1  T    55.0   55.0   69.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9992 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
79851 1  F 1.02500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
ENTER UP TO 20 BUS NUMBERS
```

Table 6.2
Bismark - Granite Falls - Blue Lake 345 kV (Case S2C1XXX)

```
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168

DATA FOR BUS   605 [LELANDO3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01000 108.44

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.01046  0.15170  1.65250  1  T   680.0 1159.0  748.0    0.0       1 1.000
  601 ANTELOP3 345  1   0.00123  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
  601 ANTELOP3 345  2   0.00124  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
  611 LELAN32G20.0  1   0.00050  0.02770  0.00000  1  F   495.0  495.0  594.0    0.0       1 1.000
  660 GROTON 3 345  1   0.00914  0.13380  1.43530  1  T   717.0 1159.0  789.0    0.0       1 1.000
  791 CENTER 3 345  1   0.00052  0.00746  0.08127  1  T   680.0 1159.0  748.0    0.0       1 1.000
22151 LELND1TY 345  1  -0.00042  0.00095  0.00000  1  F   250.0  250.0  300.0    0.0       1 1.000
22152 LELND2TY 345  1   0.00032  0.00144  0.00000  1  F   500.0  500.0  600.0    0.0       1 1.000
99426 BISMARK3 345  1   0.00172  0.02487  0.27090  1  T   680.0 1159.0  748.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  506 FTTHOMP3 345  1    0.00000 -0.50000   0.00000 -0.68000     1
  660 GROTON 3 345  1    0.00000 -0.68000   0.00000  0.00000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  611 1  F 1.08110   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22151 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22152 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DATA FOR BUS 99426 [BISMARK3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01827 104.50

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  426 BISMARK4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  605 LELANDO3 345  1   0.00172  0.02487  0.27090  1  F   680.0 1159.0  748.0    0.0       1 1.000
99444 JAMESTN3 345  1   0.00410  0.05030  0.81519  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  426 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.2 (Cont.)

```
DATA FOR BUS 99444 [JAMESTN3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01066  95.15

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  444 JAMESTN4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  954 JAMESTN3 345  1   0.00022  0.00311  0.03386  1  T   680.0 1159.0  748.0    0.0       1 1.000
99426 BISMARK3 345  1   0.00410  0.05030  0.81519  1  T   800.0  900.0  999.0    0.0       1 1.000
99435 FARGO  3 345  1   0.00353  0.04321  0.69831  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  444 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99435 [FARGO  3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99643  83.83

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  435 FARGO  4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
99444 JAMESTN3 345  1   0.00353  0.04321  0.69831  1  T   800.0  900.0  999.0    0.0       1 1.000
99553 MOORHED3 345  1   0.00048  0.00545  0.08705  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  435 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS 99553 [MOORHED3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98948  82.77

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  587 MOORHED7 115  1   0.00590  0.14500  0.00000  1  F    67.0   67.0   84.0    0.0       1 1.000
  587 MOORHED7 115  2   0.00590  0.14500  0.00000  1  F    67.0   67.0   84.0    0.0       1 1.000
  792 MAPLE R3 345  1   0.00034  0.00497  0.05418  1  T   680.0 1159.0  748.0    0.0       1 1.000
99435 FARGO  3 345  1   0.00048  0.00545  0.08705  1  T   800.0  900.0  999.0    0.0       1 1.000
99554 MORRIS 3 345  1   0.00427  0.04827  0.77768  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  587 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
  587 2  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.2 (Cont.)

```
DATA FOR BUS 99554 [MORRIS 3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98486  66.98

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   555 MORRIS 7 115  1   0.00000  0.03000  0.00000  1  F   250.0  300.0  350.0    0.0       1 1.000
 99550 GRANFLS3 345  1   0.00276  0.03102  0.49710  1  F   800.0  900.0  999.0    0.0       1 1.000
 99553 MOORHED3 345  1   0.00427  0.04827  0.77768  1  T   800.0  900.0  999.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   555 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


 DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98871  57.74

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 99554 MORRIS 3 345  1   0.00276  0.03102  0.49710  1  T   800.0  900.0  999.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 6.3 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C1XXX

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S2C1XXX-ag1	upe-so04aa.S2C1XXX-ag3	upe-so04aa.S2C1XXX-ei2	upe-so04aa.S2C1XXX-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 15 2002 16:53	APR 15 2002 17:10	APR 15 2002 17:39	APR 15 2002 17:54
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3024 / 419	3024 / 419	3024 / 419	3024 / 419
10	MHEX / L20D	2174 / 122	2174 / 122	2174 / 122	2174 / 122
11	ECL-ARP / PRI-BYN	643 / 833	643 / 833	643 / 833	643 / 833
12	MWSI / MNEX	1476 / 2775	1476 / 2775	1476 / 2775	1476 / 2775
13	D602F / F601C	1916 / 1438	1916 / 1438	1916 / 1438	1916 / 1438
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	181 / 150	181 / 150	181 / 150	181 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	84 / 70	84 / 70	84 / 70	84 / 70
19	Forbes SVC / MSC	49 / 600	49 / 600	49 / 600	49 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045
22	Roseau 500/Forbes 500	1.057 / 1.002	1.057 / 1.002	1.057 / 1.002	1.057 / 1.002
23	Chisago 500/EauClaire 345	1.015 / 1.007	1.015 / 1.007	1.015 / 1.007	1.015 / 1.007
24	Int Falls 115/Badoura 115	1.047 / 0.973	1.047 / 0.973	1.047 / 0.973	1.047 / 0.973
25	Drayton 230/Groton 345	1.022 / 0.999	1.022 / 0.999	1.022 / 0.999	1.022 / 0.999
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	107% / 178%	107% / 178%	107% / 178%	107% / 178%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	638% / 345%	638% / 345%	638% / 345%	638% / 345%
30	B10T	336%	336%	336%	336%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.94 | 1.03	0.91 | 1.17(2.96)	0.96 | 1.05	0.97 | 1.04
33	Boise 115	1.00 | 1.09	0.91 | 1.09	1.00 | 1.08	1.02 | 1.08
34	Dorsey 230	0.98 | 1.06	0.97 | 1.36(1.67)	0.98 | 1.06	0.98 | 1.06
35	Forbes 230	0.97 | 1.02	0.94 | 1.16(1.59)	0.95 | 1.03	0.98 | 1.03
36	Riverton 230	0.89 | 1.02	0.84 | 1.12	0.87 | 1.04	0.92 | 1.03
37	Coal Creek 230	0.94 | 1.11	0.93 | 1.14	1.01 | 1.13	0.97 | 1.13
38	Dickinson 345	0.94 | 1.06	0.93 | 1.14	1.00 | 1.07	1.01 | 1.09
39	Drayton 230	0.97 | 1.08	0.92 | 1.15	0.94 | 1.09	0.99 | 1.08
40	Groton 345	0.75 | 1.01	(0.79)0.64 | 1.15	0.83 | 1.06	0.86 | 1.04
41	Tioga 230	0.99 | 1.07	0.96 | 1.11	1.01 | 1.08	1.02 | 1.07
42	Wahpeton 115	0.85 | 1.07	(0.69)0.76 | 1.17	0.86 | 1.11	0.91 | 1.09
43	Watertown 345	0.84 | 1.04	0.76 | 1.14	0.89 | 1.07	0.92 | 1.05
44	**Dynamic Voltage Warnings**				
45		none	534 [ORDWAY 7] 0.66	709 [LANGDON7] 1.22	none
46			847 [HETINGR4] 0.66	9832 [LANGDONT] 1.21	
47			810 [BOWMAN 4] 0.66		
48			9871 [FORMAN Y] 0.67		
49			848 [HETINGR7] 0.67		
50			850 [GASCOYN7] 0.67		
51			470 [BISON 4] 0.67 +more		
52	Worst Case Angle Damping	SHERC3 / 49.82%	KING 3 / 13.07%	KING 3 / -36.55%	SHERC3 / -36.83%
53	Dorsey SUVP / UdHold	/ 1.574	/ 0.175	/ 15.291	/ 15.399
54	Forbes DC Red (DCAR)	201%	-14%	507%	507%
55	K22W (max +dP @ t, d-ang)	30.5@(20.00792,-21.0)	310.3@(3.27486,-112.7)	69.3@(17.09130,-144.2)	57.1@(19.23293,-96.5)
56	K22W (max -dP @ t, d-ang)	34.9@(0.91663,13.9)	121.2@(1.64160,38.7)	13.3@(0.78330,1.1)	8.3@(0.70831,0.7)
57	K22W (max d-ang @ t, dP)	-21.0@(20.00792,30.5)	-348.2@(20.00792,197.5)	-165.0@(20.00792,51.6)	-97.9@(19.81625,51.1)
58	**OS Rel Trip / Marg**				
59	MH - OH		3.27486 sec		
60	D602F at Forbes/Dorsey	19% / 59%	1.56660 sec / 1.56660 sec	26% / 58%	57% / 107%
61	L20D at Prairie/Drayton	666% / -899%	205% / -956%	609% / 932%	299% / 999%
62	R50M / F3M	427% / 243%	133% / 59%	443% / 221%	513% / 264%
63	B10T	149%	127%	111%	170%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 2 | 0)	(0 | 3 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 4 | 3) / (0 | 0 | 0)	(3 | 4 | 0) / (0 | 2 | 2)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 7 | 2) / (0 | 2 | 1)	(2 |12 | 2) / (0 | 2 | 0)	(2 | 7 | 2) / (0 | 2 | 0)	(2 | 6 | 2) / (0 | 1 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 1) / (1 | 3 | 1)	(0 | 2 | 0) / (1 | 6 | 0)	(0 | 1 | 0) / (1 | 4 | 2)	(0 | 1 | 0) / (1 | 2 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 4) / (2 | 2 | 2)	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)

TABLE 6.3 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C1XXX

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S2C1XXX-nbz	upe-so04aa.S2C1XXX-mqs	upe-so04aa.S2C1XXX-pys	upe-so04aa.S2C1XXX-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 15 2002 18:09	APR 15 2002 18:28	APR 15 2002 18:44	APR 15 2002 18:59
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3024 / 419	3024 / 419	3024 / 419	3024 / 419
10	MHEX / L20D	2174 / 122	2174 / 122	2174 / 122	2174 / 122
11	ECL-ARP / PRI-BYN	643 / 833	643 / 833	643 / 833	643 / 833
12	MWSI / MNEX	1476 / 2775	1476 / 2775	1476 / 2775	1476 / 2775
13	D602F / F601C	1916 / 1438	1916 / 1438	1916 / 1438	1916 / 1438
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	181 / 150	181 / 150	181 / 150	181 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	84 / 70	84 / 70	84 / 70	84 / 70
19	Forbes SVC / MSC	49 / 600	49 / 600	49 / 600	49 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045	1.029 / 1.045
22	Roseau 500/Forbes 500	1.057 / 1.002	1.057 / 1.002	1.057 / 1.002	1.057 / 1.002
23	Chisago 500/EauClaire 345	1.015 / 1.007	1.015 / 1.007	1.015 / 1.007	1.015 / 1.007
24	Int Falls 115/Badoura 115	1.047 / 0.973	1.047 / 0.973	1.047 / 0.973	1.047 / 0.973
25	Drayton 230/Groton 345	1.022 / 0.999	1.022 / 0.999	1.022 / 0.999	1.022 / 0.999
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	107% / 178%	107% / 178%	107% / 178%	107% / 178%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	638% / 345%	638% / 345%	638% / 345%	638% / 345%
30	B10T	336%	336%	336%	336%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.11	0.96 | 1.06	0.96 | 1.01	0.98 | 1.00
33	Boise 115	0.96 | 1.09	1.00 | 1.08	1.02 | 1.07	1.04 | 1.06
34	Dorsey 230	1.05 | 1.18	0.98 | 1.06	0.98 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.07	0.96 | 1.03	0.99 | 1.03	1.00 | 1.01
36	Riverton 230	0.84 | 1.05	0.91 | 1.02	0.99 | 1.01	0.99 | 1.01
37	Coal Creek 230	0.96 | 1.10	0.98 | 1.07	1.00 | 1.06	1.02 | 1.04
38	Dickinson 345	0.98 | 1.10	0.97 | 1.09	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.96 | 1.10	0.98 | 1.06	0.99 | 1.03	1.02 | 1.04
40	Groton 345	0.81 | 1.07	0.89 | 1.03	0.95 | 1.00	0.98 | 1.00
41	Tioga 230	0.99 | 1.08	1.00 | 1.07	1.01 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.81 | 1.10	0.94 | 1.08	1.01 | 1.05	1.03 | 1.05
43	Watertown 345	0.87 | 1.07	0.93 | 1.05	0.98 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	709 [LANGDON7] 1.21	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -51.47%	KING 3 / 13.75%	SHERC3 / 28.73%	KING 3 / 14.03%
53	Dorsey SUVP / UdHold	/ 0.133	/ 15.449	/ 16.124	
54	Forbes DC Red (DCAR)	507%	490%	127%	304%
55	K22W (max +dP @ t, d-ang)	152.6@(2.16658,-72.4)	72.4@(2.73322,-36.1)	3.3@(4.09983,4.4)	0.0@(0.04167,0.0)
56	K22W (max -dP @ t, d-ang)	108.4@(0.26666,11.5)	23.1@(0.35832,4.8)	32.4@(1.80826,20.2)	20.7@(2.15824,13.1)
57	K22W (max d-ang @ t, dP)	-289.7@(20.00792,56.1)	-129.5@(20.00792,55.0)	22.2@(16.23298,-19.2)	16.7@(20.00792,-10.8)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	14% / 50%	82% / 142%	106% / 176%
61	L20D at Prairie/Drayton	746% / 304%	999% / 922%	999% / 999%	999% / 999%
62	R50M / F3M	209% / 125%	407% / 226%	539% / 345%	605% / 345%
63	B10T	144%	102%	196%	268%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 9 | 3) / (0 | 2 | 0)	(2 | 4 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (1 | 6 | 1)	(0 | 2 | 1) / (1 | 3 | 1)	(0 | 1 | 1) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 1) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

Table 6.4
Bismark - Granite Falls - Blue Lake 345 kV + Antelope Valley-Split Rock 500 kV (Case S2C3XXX)

```
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164

DATA FOR BUS   605 [LELANDO3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01000  99.14

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.01046  0.15170  1.65250  1  T   680.0 1159.0  748.0    0.0       1 1.000
  601 ANTELOP3 345  1   0.00123  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
  601 ANTELOP3 345  2   0.00124  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
  611 LELAN32G20.0  1   0.00050  0.02770  0.00000  1  F   495.0  495.0  594.0    0.0       1 1.000
  660 GROTON 3 345  1   0.00914  0.13380  1.43530  1  T   717.0 1159.0  789.0    0.0       1 1.000
  791 CENTER 3 345  1   0.00052  0.00746  0.08127  1  T   680.0 1159.0  748.0    0.0       1 1.000
22151 LELND1TY 345  1  -0.00042  0.00095  0.00000  1  F   250.0  250.0  300.0    0.0       1 1.000
22152 LELND2TY 345  1   0.00032  0.00144  0.00000  1  F   500.0  500.0  600.0    0.0       1 1.000
99426 BISMARK3 345  1   0.00172  0.02487  0.27090  1  T   680.0 1159.0  748.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  506 FTTHOMP3 345  1    0.00000 -0.50000   0.00000 -0.68000     1
  660 GROTON 3 345  1    0.00000 -0.68000   0.00000  0.00000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  611 1  F 1.08110   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22151 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22152 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DATA FOR BUS 99426 [BISMARK3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02472  96.25

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  426 BISMARK4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  605 LELANDO3 345  1   0.00172  0.02487  0.27090  1  F   680.0 1159.0  748.0    0.0       1 1.000
99444 JAMESTN3 345  1   0.00410  0.05030  0.81519  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  426 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.4 (Cont.)

```
DATA FOR BUS 99444 [JAMESTN3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02519  88.71

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  444 JAMESTN4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  954 JAMESTN3 345  1   0.00022  0.00311  0.03386  1  T   680.0 1159.0  748.0    0.0       1 1.000
99426 BISMARK3 345  1   0.00410  0.05030  0.81519  1  T   800.0  900.0  999.0    0.0       1 1.000
99435 FARGO  3 345  1   0.00353  0.04321  0.69831  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  444 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99435 [FARGO  3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01315  79.05

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  435 FARGO  4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
99444 JAMESTN3 345  1   0.00353  0.04321  0.69831  1  T   800.0  900.0  999.0    0.0       1 1.000
99553 MOORHED3 345  1   0.00048  0.00545  0.08705  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  435 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99553 [MOORHED3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00655  78.14

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  587 MOORHED7 115  1   0.00590  0.14500  0.00000  1  F    67.0   67.0   84.0    0.0       1 1.000
  587 MOORHED7 115  2   0.00590  0.14500  0.00000  1  F    67.0   67.0   84.0    0.0       1 1.000
  792 MAPLE R3 345  1   0.00034  0.00497  0.05418  1  T   680.0 1159.0  748.0    0.0       1 1.000
99435 FARGO  3 345  1   0.00048  0.00545  0.08705  1  T   800.0  900.0  999.0    0.0       1 1.000
99554 MORRIS 3 345  1   0.00427  0.04827  0.77768  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  587 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
  587 2  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.4 (Cont.)

```
 DATA FOR BUS 99554 [MORRIS 3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00703  64.83

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   555 MORRIS 7 115  1   0.00000  0.03000  0.00000  1  F   250.0  300.0  350.0    0.0       1 1.000
 99550 GRANFLS3 345  1   0.00276  0.03102  0.49710  1  F   800.0  900.0  999.0    0.0       1 1.000
 99553 MOORHED3 345  1   0.00427  0.04827  0.77768  1  T   800.0  900.0  999.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   555 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00596  57.07

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 99554 MORRIS 3 345  1   0.00276  0.03102  0.49710  1  T   800.0  900.0  999.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

 DATA FOR BUS  6601 [AVALL T1 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01361  98.54

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   601 ANTELOP3 345  1   0.00003  0.00120  0.00000  1  F  1200.0 1200.0 1440.0    0.0       1 1.000
  5601 A.VALLEY 500  1   0.00003  0.00350  0.00000  1  T  1200.0 1200.0 1440.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   601 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
  5601 1  T 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.4 (Cont.)

```
 DATA FOR BUS  5601 [A.VALLEY 500] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00587  97.00

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  5634 SPL ROCK 500  1   0.00390  0.08811  7.93300  1  F  3290.0 3290.0 3290.0    0.0       1 1.000
  6601 AVALL T1 345  1   0.00003  0.00350  0.00000  1  F  1200.0 1200.0 1440.0    0.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  5634 SPL ROCK 500  1    0.00000 -3.50000   0.00000 -3.50000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  6601 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

 DATA FOR BUS  5634 [SPL ROCK 500] RESIDING IN AREA  23, ZONE 353, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01288  55.15

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  5601 A.VALLEY 500  1   0.00390  0.08811  7.93300  1  T  3290.0 3290.0 3290.0    0.0       1 1.000
  6634 SPL.RKT1 345  1   0.00003  0.00350  0.00000  1  F  1200.0 1200.0 1440.0    0.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  5601 A.VALLEY 500  1    0.00000 -3.50000   0.00000 -3.50000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  6634 1  F 1.02500   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  6634 [SPL.RKT1 345] RESIDING IN AREA  23, ZONE 353, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99853  53.61

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  1634 SPLT RK3 345  1   0.00003  0.00120  0.00000  1  F  1200.0 1200.0 1440.0    0.0       1 1.000
  5634 SPL ROCK 500  1   0.00003  0.00350  0.00000  1  T  1200.0 1200.0 1440.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  1634 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
  5634 1  T 1.02500   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.4 (Cont.)

DATA FOR BUS 1634 [SPLT RK3 345] RESIDING IN AREA 23, ZONE 353, OWNER 1:

CODE	PLOAD	QLOAD	I - L O A D	Y - L O A D	G-SHUNT	B-SHUNT	VOLTAGE	ANGLE
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00210	53.08

X-------TO-------X	CKT	LINE R	LINE X	CHARGING	ST	MET	RATE-A	RATE-B	RATE-C	LENGTH	ZI	OWN1	FRAC1	OWN2	FRAC2	OWN3	FRAC3	OWN4	FRAC4
1684 SPLTRKY11.00	1	0.00031	0.03588	0.00000	1	F	450.0	450.0	585.0	0.0		1	1.000						
1686 SPLTRKY21.00	1	0.00031	0.03588	0.00000	1	F	450.0	450.0	585.0	0.0		1	1.000						
2010 LAKEFLD3 345	1	0.00139	0.03168	0.64641	1	F	2270.0	2270.0	2270.0	0.0		1	1.000						
6634 SPL.RKT1 345	1	0.00003	0.00120	0.00000	1	T	1200.0	1200.0	1440.0	0.0		1	1.000						
45641 SPLTRTA3 345	1	0.00020	0.00250	0.04329	1	T	717.0	1308.0	789.0	0.0		1	1.000						
45646 SPLTRTB3 345	1	0.00020	0.00250	0.04329	1	T	717.0	1308.0	789.0	0.0		1	1.000						

TO	CKT	TP	RATIO	ANGLE	RG	CONT	RMAX	RMIN	VMAX	VMIN	TSTP	CR	CX	TAB	NOMINAL R,X
1684	1	F	1.02600	0.0	1	0	1.5000	0.5100	1.5000	0.5100	0.00625				
1686	1	F	1.02600	0.0	1	0	1.5000	0.5100	1.5000	0.5100	0.00625				
6634	1	T	1.00000	0.0	1	0	1.5000	0.5100	1.5000	0.5100	0.00625				

TABLE 6.5 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C3XXX

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S2C3XXX-ag1	upe-so04aa.S2C3XXX-ag3	upe-so04aa.S2C3XXX-ei2	upe-so04aa.S2C3XXX-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 23 2002 11:19	APR 23 2002 11:36	APR 23 2002 11:53	APR 23 2002 12:08
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3084 / 374	3084 / 374	3084 / 374	3084 / 374
10	MHEX / L20D	2168 / 149	2168 / 149	2168 / 149	2168 / 149
11	ECL-ARP / PRI-BYN	652 / 821	652 / 821	652 / 821	652 / 821
12	MWSI / MNEX	1474 / 2409	1474 / 2409	1474 / 2409	1474 / 2409
13	D602F / F601C	1856 / 1375	1856 / 1375	1856 / 1375	1856 / 1375
14	B10T / MH>SPC	164 / 97	164 / 97	164 / 97	164 / 97
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	174 / 150	174 / 150	174 / 150	174 / 150
17	Dorsey BP1 / BP2	1488 / 1685	1488 / 1685	1488 / 1685	1488 / 1685
18	Dorsey Reserve / Wtrtn SVC	205 / -21	205 / -21	205 / -21	205 / -21
19	Forbes SVC / MSC	53 / 600	53 / 600	53 / 600	53 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.034 / 1.045	1.034 / 1.045	1.034 / 1.045	1.034 / 1.045
22	Roseau 500/Forbes 500	1.061 / 1.014	1.061 / 1.014	1.061 / 1.014	1.061 / 1.014
23	Chisago 500/EauClaire 345	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006
24	Int Falls 115/Badoura 115	1.050 / 0.997	1.050 / 0.997	1.050 / 0.997	1.050 / 0.997
25	Drayton 230/Groton 345	1.030 / 1.016	1.030 / 1.016	1.030 / 1.016	1.030 / 1.016
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	126% / 208%	126% / 208%	126% / 208%	126% / 208%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	697% / 348%	697% / 348%	697% / 348%	697% / 348%
30	B10T	337%	337%	337%	337%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.03	0.95 | 1.03	0.98 | 1.06	0.99 | 1.04
33	Boise 115	1.01 | 1.07	1.01 | 1.09	1.01 | 1.08	1.03 | 1.07
34	Dorsey 230	1.01 | 1.06	1.00 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	0.99 | 1.03	0.99 | 1.03	0.98 | 1.04	0.99 | 1.03
36	Riverton 230	0.94 | 1.04	0.92 | 1.03	0.92 | 1.04	0.95 | 1.04
37	Coal Creek 230	0.95 | 1.11	0.94 | 1.11	1.04 | 1.12	0.97 | 1.13
38	Dickinson 345	0.95 | 1.06	0.95 | 1.07	1.02 | 1.06	1.02 | 1.09
39	Drayton 230	0.99 | 1.09	0.97 | 1.10	0.96 | 1.07	1.00 | 1.07
40	Groton 345	0.85 | 1.05	0.81 | 1.03	0.91 | 1.07	0.92 | 1.05
41	Tioga 230	0.98 | 1.05	0.97 | 1.05	1.00 | 1.05	1.01 | 1.05
42	Wahpeton 115	0.93 | 1.10	0.89 | 1.09	0.93 | 1.10	0.96 | 1.10
43	Watertown 345	0.92 | 1.05	0.89 | 1.05	0.95 | 1.06	0.96 | 1.05
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 63.44%	SHERC3 / 57.76%	KING 3 / -58.74%	SHERC3 / -57.56%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	242%	195%	507%	507%
55	K22W (max +dP @ t, d-ang)	12.7@(2.70822,-4.1)	22.3@(2.74155,-8.5)	60.3@(2.46656,-33.7)	36.0@(2.52489,-20.0)
56	K22W (max -dP @ t, d-ang)	26.5@(0.81663,9.4)	32.2@(0.80830,11.6)	4.9@(0.59998,0.2)	5.0@(0.34165,0.3)
57	K22W (max d-ang @ t, dP)	14.4@(1.17495,-10.9)	18.4@(1.19995,-15.2)	-153.0@(20.00792,28.4)	-81.7@(20.00792,15.2)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	57% / 110%	43% / 92%	53% / 102%	80% / 142%
61	L20D at Prairie/Drayton	999% / 888%	820% / 865%	862% / 943%	284% / 999%
62	R50M / F3M	509% / 258%	480% / 249%	514% / 230%	582% / 260%
63	B10T	165%	151%	140%	182%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 2 | 0)	(0 | 0 | 0)	(0 | 1 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 6 | 2) / (0 | 1 | 0)	(2 | 7 | 2) / (0 | 2 | 0)	(2 | 5 | 2) / (0 | 0 | 0)	(2 | 4 | 2) / (0 | 1 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 1) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 2 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 1) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 4 | 0) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)

TABLE 6.5 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C3XXX

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S2C3XXX-nbz	upe-so04aa.S2C3XXX-mqs	upe-so04aa.S2C3XXX-pys	upe-so04aa.S2C3XXX-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 23 2002 12:22	APR 23 2002 12:41	APR 23 2002 12:55	APR 23 2002 13:09
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3084 / 374	3084 / 374	3084 / 374	3084 / 374
10	MHEX / L20D	2168 / 149	2168 / 149	2168 / 149	2168 / 149
11	ECL-ARP / PRI-BYN	652 / 821	652 / 821	652 / 821	652 / 821
12	MWSI / MNEX	1474 / 2409	1474 / 2409	1474 / 2409	1474 / 2409
13	D602F / F601C	1856 / 1375	1856 / 1375	1856 / 1375	1856 / 1375
14	B10T / MH>SPC	164 / 97	164 / 97	164 / 97	164 / 97
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	174 / 150	174 / 150	174 / 150	174 / 150
17	Dorsey BP1 / BP2	1488 / 1685	1488 / 1685	1488 / 1685	1488 / 1685
18	Dorsey Reserve / Wtrtn SVC	205 / -21	205 / -21	205 / -21	205 / -21
19	Forbes SVC / MSC	53 / 600	53 / 600	53 / 600	53 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.034 / 1.045	1.034 / 1.045	1.034 / 1.045	1.034 / 1.045
22	Roseau 500/Forbes 500	1.061 / 1.014	1.061 / 1.014	1.061 / 1.014	1.061 / 1.014
23	Chisago 500/EauClaire 345	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006	1.020 / 1.006
24	Int Falls 115/Badoura 115	1.050 / 0.997	1.050 / 0.997	1.050 / 0.997	1.050 / 0.997
25	Drayton 230/Groton 345	1.030 / 1.016	1.030 / 1.016	1.030 / 1.016	1.030 / 1.016
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	126% / 208%	126% / 208%	126% / 208%	126% / 208%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	697% / 348%	697% / 348%	697% / 348%	697% / 348%
30	B10T	337%	337%	337%	337%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.11	0.97 | 1.06	0.98 | 1.01	0.99 | 1.01
33	Boise 115	0.98 | 1.08	1.01 | 1.08	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.16	1.01 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.95 | 1.06	0.99 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.90 | 1.05	0.95 | 1.02	1.00 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.96 | 1.09	0.98 | 1.06	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.98 | 1.08	0.98 | 1.08	1.01 | 1.04	1.01 | 1.03
39	Drayton 230	0.99 | 1.08	0.97 | 1.06	1.01 | 1.04	1.02 | 1.04
40	Groton 345	0.90 | 1.07	0.95 | 1.04	0.99 | 1.02	1.01 | 1.02
41	Tioga 230	0.98 | 1.06	0.99 | 1.05	1.00 | 1.03	1.02 | 1.03
42	Wahpeton 115	0.90 | 1.10	0.98 | 1.08	1.04 | 1.06	1.05 | 1.07
43	Watertown 345	0.93 | 1.07	0.98 | 1.04	1.01 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -32.08%	KING 3 / 2.20%	ANTEL3 / 40.52%	KING 3 / 20.18%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	466%	159%	325%
55	K22W (max +dP @ t, d-ang)	151.0@(2.10825,-68.2)	63.3@(2.61656,-32.7)	0.6@(0.11666,0.2)	0.0@(0.00000,0.0)
56	K22W (max -dP @ t, d-ang)	102.8@(0.26666,11.0)	20.9@(0.33332,4.0)	29.9@(1.78326,17.5)	19.9@(2.12491,12.5)
57	K22W (max d-ang @ t, dP)	-280.1@(20.00792,51.1)	-112.7@(20.00792,20.5)	19.7@(20.00792,-14.2)	16.5@(20.00792,-11.1)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	39% / 88%	101% / 173%	124% / 205%
61	L20D at Prairie/Drayton	999% / 606%	999% / 936%	999% / 999%	999% / 999%
62	R50M / F3M	264% / 137%	469% / 231%	597% / 348%	660% / 348%
63	B10T	133%	123%	200%	268%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 3) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 3 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (1 | 6 | 2)	(0 | 1 | 1) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 3 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 6.5 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C3XXX

1	**Case No.**	9	10
2	**Case Name**	upe-so04aa.S2C3XXX-ce3	upe-so04aa.S2C3XXX-cf3
3	**Disturbance**	ce3	cf3
4	**Prior Outage**	None	None
5	**Date/Time**	APR 23 2002 13:23	APR 23 2002 13:36
6	**Comments**		
7			
8	**Steady State Flows**		
9	NDEX / EAST BIAS	3084 / 374	3084 / 374
10	MHEX / L20D	2168 / 149	2168 / 149
11	ECL-ARP / PRI-BYN	652 / 821	652 / 821
12	MWSI / MNEX	1474 / 2409	1474 / 2409
13	D602F / F601C	1856 / 1375	1856 / 1375
14	B10T / MH>SPC	164 / 97	164 / 97
15	OH E-W / OH>MH	-119 / -196	-119 / -196
16	R50M / OH>MP	174 / 150	174 / 150
17	Dorsey BP1 / BP2	1488 / 1685	1488 / 1685
18	Dorsey Reserve / Wtrtn SVC	205 / -21	205 / -21
19	Forbes SVC / MSC	53 / 600	53 / 600
20	**Steady State Vltgs**		
21	Dorsey 500/Dorsey 230	1.034 / 1.045	1.034 / 1.045
22	Roseau 500/Forbes 500	1.061 / 1.014	1.061 / 1.014
23	Chisago 500/EauClaire 345	1.020 / 1.006	1.020 / 1.006
24	Int Falls 115/Badoura 115	1.050 / 0.997	1.050 / 0.997
25	Drayton 230/Groton 345	1.030 / 1.016	1.030 / 1.016
26	**SS OS Relay Margins**		
27	D602F at Forbes/Dorsey	126% / 208%	126% / 208%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%
29	R50M/F3M	697% / 348%	697% / 348%
30	B10T	337%	337%
31	**Min/MaxTransientVltg**		
32	Arrowhd 230	1.00 | 1.02	1.00 | 1.02
33	Boise 115	1.03 | 1.06	1.04 | 1.06
34	Dorsey 230	1.03 | 1.05	1.03 | 1.05
35	Forbes 230	1.00 | 1.02	1.01 | 1.02
36	Riverton 230	0.99 | 1.03	0.99 | 1.03
37	Coal Creek 230	0.99 | 1.08	0.99 | 1.08
38	Dickinson 345	0.99 | 1.05	0.99 | 1.05
39	Drayton 230	1.01 | 1.07	1.01 | 1.07
40	Groton 345	0.96 | 1.03	0.96 | 1.03
41	Tioga 230	1.01 | 1.04	1.01 | 1.04
42	Wahpeton 115	1.00 | 1.08	1.01 | 1.09
43	Watertown 345	0.99 | 1.04	0.99 | 1.03
44	**Dynamic Voltage Warnings**		
45		none	none
46			
47			
48			
49			
50			
51			
52	Worst Case Angle Damping	SHERC3 / 57.35%	SHERC3 / 55.53%
53	Dorsey SUVP / UdHold		
54	Forbes DC Red (DCAR)	367%	363%
55	K22W (max +dP @ t, d-ang)	5.6@(2.64156,-2.2)	5.3@(0.13333,0.1)
56	K22W (max -dP @ t, d-ang)	8.5@(0.54998,2.5)	8.0@(0.29999,1.0)
57	K22W (max d-ang @ t, dP)	4.7@(0.99996,-5.1)	4.6@(0.99996,-4.9)
58	**OS Rel Trip / Marg**		
59	MH - OH		
60	D602F at Forbes/Dorsey	93% / 162%	106% / 182%
61	L20D at Prairie/Drayton	999% / 999%	999% / 999%
62	R50M / F3M	603% / 303%	640% / 327%
63	B10T	276%	280%
64	**FSCAPS (SS/Unav/Final)**		
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 2 | 1) / (2 | 2 | 2)

Table 6.6
Bismark - Blue Lake 345 kV + A. Valley-S. Rock 500 kV + 35% Series Comp. East of Jamestown (Case S2C3XX2)

```
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166

DATA FOR BUS   605 [LELANDO3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01005  95.56

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.01046  0.15170  1.65250  1  T   680.0 1159.0  748.0    0.0       1 1.000
  601 ANTELOP3 345  1   0.00123  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
  601 ANTELOP3 345  2   0.00124  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
  611 LELAN32G20.0  1   0.00050  0.02770  0.00000  1  F   495.0  495.0  594.0    0.0       1 1.000
  660 GROTON 3 345  1   0.00914  0.13380  1.43530  1  T   717.0 1159.0  789.0    0.0       1 1.000
  791 CENTER 3 345  1   0.00052  0.00746  0.08127  1  T   680.0 1159.0  748.0    0.0       1 1.000
22151 LELND1TY 345  1  -0.00042  0.00095  0.00000  1  F   250.0  250.0  300.0    0.0       1 1.000
22152 LELND2TY 345  1   0.00032  0.00144  0.00000  1  F   500.0  500.0  600.0    0.0       1 1.000
99426 BISMARK3 345  1   0.00172  0.02487  0.27090  1  T   680.0 1159.0  748.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  506 FTTHOMP3 345  1    0.00000 -0.50000   0.00000 -0.68000     1
  660 GROTON 3 345  1    0.00000 -0.68000   0.00000  0.00000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  611 1  F 1.08110   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22151 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22152 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DATA FOR BUS 99426 [BISMARK3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02226  92.35

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  426 BISMARK4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  605 LELANDO3 345  1   0.00172  0.02487  0.27090  1  F   680.0 1159.0  748.0    0.0       1 1.000
99444 JAMESTN3 345  1   0.00410  0.05030  0.81519  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  426 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.6 (Cont.)

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DATA FOR BUS 99444 [JAMESTN3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01845  83.54

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  444 JAMESTN4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  954 JAMESTN3 345  1   0.00022  0.00311  0.03386  1  T   680.0 1159.0  748.0    0.0       1 1.000
99426 BISMARK3 345  1   0.00410  0.05030  0.81519  1  T   800.0  900.0  999.0    0.0       1 1.000
99435 FARGO  3 345  1   0.00353  0.02809  0.69831  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  444 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99435 [FARGO  3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00596  75.80

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  435 FARGO  4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
99444 JAMESTN3 345  1   0.00353  0.02809  0.69831  1  T   800.0  900.0  999.0    0.0       1 1.000
99553 MOORHED3 345  1   0.00048  0.00354  0.08705  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  435 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99553 [MOORHED3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00128  75.01

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  587 MOORHED7 115  1   0.00590  0.14500  0.00000  1  F    67.0   67.0   84.0    0.0       1 1.000
  587 MOORHED7 115  2   0.00590  0.14500  0.00000  1  F    67.0   67.0   84.0    0.0       1 1.000
  792 MAPLE R3 345  1   0.00034  0.00497  0.05418  1  T   680.0 1159.0  748.0    0.0       1 1.000
99435 FARGO  3 345  1   0.00048  0.00354  0.08705  1  T   800.0  900.0  999.0    0.0       1 1.000
99554 MORRIS 3 345  1   0.00427  0.03138  0.77768  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  587 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
  587 2  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.6 (Cont.)

```
DATA FOR BUS 99554 [MORRIS 3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99854  63.19

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  555 MORRIS 7 115  1   0.00000  0.03000  0.00000  1  F   250.0  300.0  350.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00276  0.02016  0.49710  1  F   800.0  900.0  999.0    0.0       1 1.000
99553 MOORHED3 345  1   0.00427  0.03138  0.77768  1  T   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  555 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99911  56.15

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 1702 BLUE LK3 345  1   0.00430  0.04083  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
99554 MORRIS 3 345  1   0.00276  0.02016  0.49710  1  T   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  6601 [AVALL T1 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01661  95.12

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  601 ANTELOP3 345  1   0.00003  0.00120  0.00000  1  F  1200.0 1200.0 1440.0    0.0       1 1.000
 5601 A.VALLEY 500  1   0.00003  0.00350  0.00000  1  T  1200.0 1200.0 1440.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  601 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 5601 1  T 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  5601 [A.VALLEY 500] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00980  93.64

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 5634 SPL ROCK 500  1   0.00390  0.08811  7.93300  1  F  3290.0 3290.0 3290.0    0.0       1 1.000
 6601 AVALL T1 345  1   0.00003  0.00350  0.00000  1  F  1200.0 1200.0 1440.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
 5634 SPL ROCK 500  1    0.00000 -3.50000   0.00000 -3.50000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 6601 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.6 (Cont.)

```
DATA FOR BUS  5634 [SPL ROCK 500] RESIDING IN AREA  23, ZONE 353, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01834  53.78

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 5601 A.VALLEY 500  1   0.00390  0.08811  7.93300  1  T  3290.0 3290.0 3290.0    0.0       1 1.000
 6634 SPL.RKT1 345  1   0.00003  0.00350  0.00000  1  F  1200.0 1200.0 1440.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
 5601 A.VALLEY 500  1    0.00000 -3.50000   0.00000 -3.50000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 6634 1  F 1.02500   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 6.7 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C3XX2

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S2C3XX2-ag1	upe-so04aa.S2C3XX2-ag3	upe-so04aa.S2C3XX2-ei2	upe-so04aa.S2C3XX2-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 24 2002 17:02	APR 24 2002 17:18	APR 24 2002 17:35	APR 24 2002 17:50
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3080 / 348	3080 / 348	3080 / 348	3080 / 348
10	MHEX / L20D	2174 / 163	2174 / 163	2174 / 163	2174 / 163
11	ECL-ARP / PRI-BYN	652 / 827	652 / 827	652 / 827	652 / 827
12	MWSI / MNEX	1480 / 2466	1480 / 2466	1480 / 2466	1480 / 2466
13	D602F / F601C	1838 / 1353	1838 / 1353	1838 / 1353	1838 / 1353
14	B10T / MH>SPC	167 / 99	167 / 99	167 / 99	167 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	173 / 150	173 / 150	173 / 150	173 / 150
17	Dorsey BP1 / BP2	1492 / 1690	1492 / 1690	1492 / 1690	1492 / 1690
18	Dorsey Reserve / Wtrtn SVC	215 / 50	215 / 50	215 / 50	215 / 50
19	Forbes SVC / MSC	46 / 600	46 / 600	46 / 600	46 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045
22	Roseau 500/Forbes 500	1.063 / 1.017	1.063 / 1.017	1.063 / 1.017	1.063 / 1.017
23	Chisago 500/EauClaire 345	1.022 / 1.007	1.022 / 1.007	1.022 / 1.007	1.022 / 1.007
24	Int Falls 115/Badoura 115	1.049 / 0.992	1.049 / 0.992	1.049 / 0.992	1.049 / 0.992
25	Drayton 230/Groton 345	1.021 / 1.021	1.021 / 1.021	1.021 / 1.021	1.021 / 1.021
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	131% / 217%	131% / 217%	131% / 217%	131% / 217%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	713% / 346%	713% / 346%	713% / 346%	713% / 346%
30	B10T	342%	342%	342%	342%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.97 | 1.03	0.96 | 1.04	0.99 | 1.06	0.99 | 1.05
33	Boise 115	1.01 | 1.07	1.01 | 1.08	1.02 | 1.07	1.03 | 1.06
34	Dorsey 230	1.01 | 1.06	1.01 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	0.99 | 1.03	0.98 | 1.04	1.00 | 1.03
36	Riverton 230	0.94 | 1.04	0.92 | 1.03	0.93 | 1.04	0.96 | 1.04
37	Coal Creek 230	0.95 | 1.11	0.94 | 1.10	1.04 | 1.12	0.97 | 1.13
38	Dickinson 345	0.95 | 1.07	0.94 | 1.06	1.01 | 1.06	1.02 | 1.09
39	Drayton 230	0.99 | 1.09	0.97 | 1.09	0.96 | 1.07	1.00 | 1.07
40	Groton 345	0.86 | 1.05	0.83 | 1.04	0.92 | 1.07	0.93 | 1.06
41	Tioga 230	1.00 | 1.07	0.99 | 1.07	1.02 | 1.07	1.02 | 1.07
42	Wahpeton 115	0.93 | 1.10	0.89 | 1.09	0.93 | 1.10	0.96 | 1.10
43	Watertown 345	0.92 | 1.06	0.89 | 1.05	0.94 | 1.06	0.96 | 1.05
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 62.77%	SHERC3 / 56.25%	KING 3 / -60.00%	SHERC3 / -52.51%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	232%	189%	506%	507%
55	K22W (max +dP @ t, d-ang)	14.1@(2.68322,-4.5)	22.1@(2.73322,-9.1)	59.7@(2.55823,-33.8)	36.6@(2.49990,-20.4)
56	K22W (max -dP @ t, d-ang)	25.1@(0.79164,8.8)	30.8@(0.79164,11.0)	4.5@(0.54998,0.1)	5.3@(0.34165,0.4)
57	K22W (max d-ang @ t, dP)	13.8@(1.14995,-10.1)	17.7@(1.18329,-13.6)	-155.9@(20.00792,29.2)	-83.2@(20.00792,15.7)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	62% / 118%	49% / 101%	61% / 115%	87% / 153%
61	L20D at Prairie/Drayton	999% / 810%	999% / 843%	999% / 868%	262% / 971%
62	R50M / F3M	525% / 255%	496% / 247%	539% / 231%	603% / 258%
63	B10T	173%	162%	147%	186%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 2 | 0)	(0 | 0 | 0)	(0 | 1 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 6 | 2) / (0 | 1 | 0)	(2 | 7 | 2) / (0 | 2 | 0)	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 5 | 2) / (0 | 1 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 1) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 1 | 1)	(0 | 1 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 5 | 4) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)

TABLE 6.7 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C3XX2

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S2C3XX2-nbz	upe-so04aa.S2C3XX2-mqs	upe-so04aa.S2C3XX2-pys	upe-so04aa.S2C3XX2-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 24 2002 18:03	APR 24 2002 18:22	APR 24 2002 18:36	APR 24 2002 18:50
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3080 / 348	3080 / 348	3080 / 348	3080 / 348
10	MHEX / L20D	2174 / 163	2174 / 163	2174 / 163	2174 / 163
11	ECL-ARP / PRI-BYN	652 / 827	652 / 827	652 / 827	652 / 827
12	MWSI / MNEX	1480 / 2466	1480 / 2466	1480 / 2466	1480 / 2466
13	D602F / F601C	1838 / 1353	1838 / 1353	1838 / 1353	1838 / 1353
14	B10T / MH>SPC	167 / 99	167 / 99	167 / 99	167 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	173 / 150	173 / 150	173 / 150	173 / 150
17	Dorsey BP1 / BP2	1492 / 1690	1492 / 1690	1492 / 1690	1492 / 1690
18	Dorsey Reserve / Wtrtn SVC	215 / 50	215 / 50	215 / 50	215 / 50
19	Forbes SVC / MSC	46 / 600	46 / 600	46 / 600	46 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045
22	Roseau 500/Forbes 500	1.063 / 1.017	1.063 / 1.017	1.063 / 1.017	1.063 / 1.017
23	Chisago 500/EauClaire 345	1.022 / 1.007	1.022 / 1.007	1.022 / 1.007	1.022 / 1.007
24	Int Falls 115/Badoura 115	1.049 / 0.992	1.049 / 0.992	1.049 / 0.992	1.049 / 0.992
25	Drayton 230/Groton 345	1.021 / 1.021	1.021 / 1.021	1.021 / 1.021	1.021 / 1.021
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	131% / 217%	131% / 217%	131% / 217%	131% / 217%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	713% / 346%	713% / 346%	713% / 346%	713% / 346%
30	B10T	342%	342%	342%	342%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.11	0.98 | 1.06	0.98 | 1.02	1.00 | 1.01
33	Boise 115	0.98 | 1.07	1.01 | 1.08	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.05 | 1.16	1.01 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.95 | 1.07	0.99 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.91 | 1.06	0.95 | 1.03	1.00 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.96 | 1.08	0.98 | 1.06	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.97 | 1.08	0.98 | 1.08	1.01 | 1.04	1.01 | 1.03
39	Drayton 230	0.98 | 1.08	0.98 | 1.06	1.00 | 1.04	1.01 | 1.03
40	Groton 345	0.90 | 1.07	0.95 | 1.04	0.98 | 1.02	1.01 | 1.02
41	Tioga 230	1.00 | 1.08	1.01 | 1.07	1.02 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.90 | 1.10	0.99 | 1.08	1.03 | 1.06	1.05 | 1.06
43	Watertown 345	0.93 | 1.07	0.97 | 1.04	1.00 | 1.03	1.02 | 1.03
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -31.00%	KING 3 / 5.15%	ANTEL3 / 40.79%	KING 3 / 21.32%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	457%	165%	330%
55	K22W (max +dP @ t, d-ang)	155.1@(2.10825,-68.7)	64.5@(2.60822,-32.1)	0.7@(0.11666,0.2)	0.0@(0.00833,0.0)
56	K22W (max -dP @ t, d-ang)	101.3@(0.26666,10.9)	21.0@(0.33332,4.0)	30.5@(1.78326,18.1)	20.1@(2.12491,12.6)
57	K22W (max d-ang @ t, dP)	-280.0@(20.00792,52.5)	-108.9@(20.00792,20.5)	20.5@(20.00792,-14.6)	16.9@(20.00792,-11.3)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	45% / 97%	104% / 178%	129% / 213%
61	L20D at Prairie/Drayton	999% / 548%	999% / 835%	999% / 999%	999% / 999%
62	R50M / F3M	285% / 142%	486% / 228%	605% / 346%	673% / 346%
63	B10T	127%	121%	200%	273%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 6 | 2) / (0 | 1 | 0)	(2 | 3 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (1 | 6 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 4 | 3) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 6.7 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C3XX2

1	**Case No.**	9	10	11
2	**Case Name**	upe-so04aa.S2C3XX2-ce3	upe-so04aa.S2C3XX2-cf3	upe-so04aa.S2C3XX2-eb3
3	**Disturbance**	ce3	cf3	eb3
4	**Prior Outage**	None	None	None
5	**Date/Time**	APR 24 2002 19:04	APR 24 2002 19:17	JUN 07 2002 21:09
6	**Comments**			
7				
8	**Steady State Flows**			
9	NDEX / EAST BIAS	3080 / 348	3080 / 348	3080 / 348
10	MHEX / L20D	2174 / 163	2174 / 163	2174 / 163
11	ECL-ARP / PRI-BYN	652 / 827	652 / 827	652 / 827
12	MWSI / MNEX	1480 / 2466	1480 / 2466	1480 / 2466
13	D602F / F601C	1838 / 1353	1838 / 1353	1838 / 1353
14	B10T / MH>SPC	167 / 99	167 / 99	167 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	173 / 150	173 / 150	173 / 150
17	Dorsey BP1 / BP2	1492 / 1690	1492 / 1690	1492 / 1690
18	Dorsey Reserve / Wtrtn SVC	215 / 50	215 / 50	215 / 50
19	Forbes SVC / MSC	46 / 600	46 / 600	46 / 600
20	**Steady State Vltgs**			
21	Dorsey 500/Dorsey 230	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045
22	Roseau 500/Forbes 500	1.063 / 1.017	1.063 / 1.017	1.063 / 1.017
23	Chisago 500/EauClaire 345	1.022 / 1.007	1.022 / 1.007	1.022 / 1.007
24	Int Falls 115/Badoura 115	1.049 / 0.992	1.049 / 0.992	1.049 / 0.992
25	Drayton 230/Groton 345	1.021 / 1.021	1.021 / 1.021	1.021 / 1.021
26	**SS OS Relay Margins**			
27	D602F at Forbes/Dorsey	131% / 217%	131% / 217%	131% / 217%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	713% / 346%	713% / 346%	713% / 346%
30	B10T	342%	342%	342%
31	**Min/MaxTransientVltg**			
32	Arrowhd 230	1.00 | 1.03	1.00 | 1.03	0.97 | 1.03
33	Boise 115	1.03 | 1.05	1.03 | 1.06	1.02 | 1.07
34	Dorsey 230	1.03 | 1.05	1.03 | 1.05	1.02 | 1.06
35	Forbes 230	1.01 | 1.02	1.01 | 1.02	1.00 | 1.03
36	Riverton 230	0.98 | 1.03	0.98 | 1.03	0.95 | 1.04
37	Coal Creek 230	0.98 | 1.08	0.98 | 1.08	0.95 | 1.10
38	Dickinson 345	0.99 | 1.05	0.99 | 1.05	0.96 | 1.07
39	Drayton 230	1.00 | 1.07	1.00 | 1.06	0.98 | 1.09
40	Groton 345	0.95 | 1.04	0.95 | 1.04	0.87 | 1.05
41	Tioga 230	1.03 | 1.05	1.03 | 1.05	1.00 | 1.07
42	Wahpeton 115	0.99 | 1.08	1.00 | 1.08	0.94 | 1.10
43	Watertown 345	0.98 | 1.05	0.98 | 1.05	0.92 | 1.05
44	**Dynamic Voltage Warnings**			
45		none	none	none
46				
47				
48				
49				
50				
51				
52	Worst Case Angle Damping	SHERC3 / 52.83%	SHERC3 / 51.43%	SHERC3 / 60.53%
53	Dorsey SUVP / UdHold			
54	Forbes DC Red (DCAR)	348%	346%	245%
55	K22W (max +dP @ t, d-ang)	8.5@(2.66656,-3.5)	9.6@(2.67489,-3.8)	17.6@(2.67489,-6.1)
56	K22W (max -dP @ t, d-ang)	9.7@(0.54998,2.9)	8.7@(0.29999,1.1)	20.3@(0.74997,6.2)
57	K22W (max d-ang @ t, dP)	5.6@(1.00829,-5.9)	5.3@(1.01663,-5.8)	10.7@(1.12496,-9.1)
58	**OS Rel Trip / Marg**			
59	MH - OH			
60	D602F at Forbes/Dorsey	95% / 165%	99% / 170%	73% / 135%
61	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 874%
62	R50M / F3M	610% / 297%	620% / 301%	564% / 268%
63	B10T	274%	283%	215%
64	**FSCAPS (SS/Unav/Final)**			
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 1 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 3) / (0 | 1 | 0)	(2 | 5 | 3) / (0 | 1 | 1)	(2 | 6 | 2) / (0 | 2 | 0)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 3 | 3) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 5 | 3) / (2 | 2 | 2)

Table 6.8
Bismark - Blue Lake 345 kV + Maple River - Benton Co. 345 kV (Case S2C4XXX)

```
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168

DATA FOR BUS   605 [LELANDO3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01000 102.77

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.01046  0.15170  1.65250  1  T   680.0 1159.0  748.0    0.0       1 1.000
  601 ANTELOP3 345  1   0.00123  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
  601 ANTELOP3 345  2   0.00124  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
  611 LELAN32G20.0  1   0.00050  0.02770  0.00000  1  F   495.0  495.0  594.0    0.0       1 1.000
  660 GROTON 3 345  1   0.00914  0.13380  1.43530  1  T   717.0 1159.0  789.0    0.0       1 1.000
  791 CENTER 3 345  1   0.00052  0.00746  0.08127  1  T   680.0 1159.0  748.0    0.0       1 1.000
22151 LELND1TY 345  1  -0.00042  0.00095  0.00000  1  F   250.0  250.0  300.0    0.0       1 1.000
22152 LELND2TY 345  1   0.00032  0.00144  0.00000  1  F   500.0  500.0  600.0    0.0       1 1.000
99426 BISMARK3 345  1   0.00172  0.02487  0.27090  1  T   680.0 1159.0  748.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  506 FTTHOMP3 345  1    0.00000 -0.50000   0.00000 -0.68000     1
  660 GROTON 3 345  1    0.00000 -0.68000   0.00000  0.00000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  611 1  F 1.08110   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22151 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22152 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DATA FOR BUS 99426 [BISMARK3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01682  98.53

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  426 BISMARK4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  605 LELANDO3 345  1   0.00172  0.02487  0.27090  1  F   680.0 1159.0  748.0    0.0       1 1.000
99444 JAMESTN3 345  1   0.00410  0.05030  0.81519  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  426 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.8 (Cont.)

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DATA FOR BUS 99444 [JAMESTN3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00695  88.05

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  444 JAMESTN4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  954 JAMESTN3 345  1   0.00022  0.00311  0.03386  1  T   680.0 1159.0  748.0    0.0       1 1.000
99426 BISMARK3 345  1   0.00410  0.05030  0.81519  1  T   800.0  900.0  999.0    0.0       1 1.000
99435 FARGO  3 345  1   0.00353  0.04321  0.69831  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  444 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99435 [FARGO  3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99947  75.69

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  435 FARGO  4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
99444 JAMESTN3 345  1   0.00353  0.04321  0.69831  1  T   800.0  900.0  999.0    0.0       1 1.000
99553 MOORHED3 345  1   0.00048  0.00545  0.08705  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  435 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99553 [MOORHED3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99384  74.43

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  587 MOORHED7 115  1   0.00590  0.14500  0.00000  1  F    67.0   67.0   84.0    0.0       1 1.000
  587 MOORHED7 115  2   0.00590  0.14500  0.00000  1  F    67.0   67.0   84.0    0.0       1 1.000
  792 MAPLE R3 345  1   0.00034  0.00497  0.05418  1  T   680.0 1159.0  748.0    0.0       1 1.000
99435 FARGO  3 345  1   0.00048  0.00545  0.08705  1  T   800.0  900.0  999.0    0.0       1 1.000
99554 MORRIS 3 345  1   0.00427  0.04827  0.77768  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  587 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
  587 2  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.8 (Cont.)

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DATA FOR BUS 99554 [MORRIS 3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00127  61.89

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  555 MORRIS 7 115  1   0.00000  0.03000  0.00000  1  F   250.0  300.0  350.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00276  0.03102  0.49710  1  F   800.0  900.0  999.0    0.0       1 1.000
99553 MOORHED3 345  1   0.00427  0.04827  0.77768  1  T   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  555 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00176  54.51

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
99554 MORRIS 3 345  1   0.00276  0.03102  0.49710  1  T   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   792 [MAPLE R3 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98793  74.62


X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  916 BUFFALO3 345  1   0.00120  0.01630  0.29051  1  F   720.0 1560.0  792.0    0.0       1 1.000
 1667 BENTON 3 345  1   0.00774  0.11191  1.21905  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
79824 MAPLER1Y 345  1   0.00020  0.01970  0.00000  1  F   336.0  336.0  420.0    0.0       1 1.000
79825 MAPLER2Y 345  1   0.00020  0.01970  0.00000  1  T   336.0  336.0  420.0    0.0       1 1.000
99553 MOORHED3 345  1   0.00034  0.00497  0.05418  1  F   680.0 1159.0  748.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
79824 1  F 0.97390   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
79825 1  F 0.97390   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

TABLE 6.9 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C4XXX

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S2C4XXX-ag1	upe-so04aa.S2C4XXX-ag3	upe-so04aa.S2C4XXX-ei2	upe-so04aa.S2C4XXX-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 23 2002 17:37	APR 23 2002 17:53	APR 23 2002 18:10	APR 23 2002 18:26
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3038 / 349	3038 / 349	3038 / 349	3038 / 349
10	MHEX / L20D	2173 / 153	2173 / 153	2173 / 153	2173 / 153
11	ECL-ARP / PRI-BYN	641 / 836	641 / 836	641 / 836	641 / 836
12	MWSI / MNEX	1477 / 2812	1477 / 2812	1477 / 2812	1477 / 2812
13	D602F / F601C	1871 / 1389	1871 / 1389	1871 / 1389	1871 / 1389
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	177 / 150	177 / 150	177 / 150	177 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	133 / 19	133 / 19	133 / 19	133 / 19
19	Forbes SVC / MSC	12 / 600	12 / 600	12 / 600	12 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.004	1.059 / 1.004	1.059 / 1.004	1.059 / 1.004
23	Chisago 500/EauClaire 345	1.015 / 1.008	1.015 / 1.008	1.015 / 1.008	1.015 / 1.008
24	Int Falls 115/Badoura 115	1.047 / 0.992	1.047 / 0.992	1.047 / 0.992	1.047 / 0.992
25	Drayton 230/Groton 345	1.015 / 1.006	1.015 / 1.006	1.015 / 1.006	1.015 / 1.006
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	119% / 196%	119% / 196%	119% / 196%	119% / 196%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	674% / 343%	674% / 343%	674% / 343%	674% / 343%
30	B10T	337%	337%	337%	337%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.03	0.94 | 1.04	0.98 | 1.05	0.98 | 1.04
33	Boise 115	1.00 | 1.08	1.00 | 1.09	1.01 | 1.08	1.03 | 1.07
34	Dorsey 230	1.00 | 1.06	0.99 | 1.07	0.97 | 1.06	0.98 | 1.06
35	Forbes 230	0.98 | 1.03	0.97 | 1.03	0.97 | 1.03	0.98 | 1.03
36	Riverton 230	0.92 | 1.04	0.89 | 1.04	0.91 | 1.05	0.94 | 1.05
37	Coal Creek 230	0.94 | 1.12	0.93 | 1.11	1.02 | 1.13	0.97 | 1.13
38	Dickinson 345	0.94 | 1.07	0.93 | 1.07	1.01 | 1.07	1.01 | 1.09
39	Drayton 230	0.97 | 1.09	0.94 | 1.08	0.94 | 1.09	0.98 | 1.08
40	Groton 345	0.79 | 1.03	0.74 | 1.02	0.88 | 1.07	0.89 | 1.05
41	Tioga 230	0.99 | 1.07	0.97 | 1.08	1.01 | 1.08	1.02 | 1.07
42	Wahpeton 115	0.89 | 1.10	0.84 | 1.08	0.90 | 1.11	0.94 | 1.10
43	Watertown 345	0.89 | 1.05	0.84 | 1.04	0.93 | 1.07	0.94 | 1.05
44	**Dynamic Voltage Warnings**				
45		none	709 [LANGDON7] 1.21	9832 [LANGDONT] 1.22	none
46				709 [LANGDON7] 1.22	
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 56.03%	SHERC3 / 53.46%	SHERC3 / -50.08%	SHERC3 / -43.71%
53	Dorsey SUVP / UdHold		/ 0.175	/ 15.599	/ 16.083
54	Forbes DC Red (DCAR)	195%	155%	507%	507%
55	K22W (max +dP @ t, d-ang)	20.5@(2.75822,-7.0)	33.1@(2.85821,-13.7)	69.0@(19.39959,-159.5)	38.1@(2.54989,-20.8)
56	K22W (max -dP @ t, d-ang)	30.4@(0.86663,11.3)	38.6@(0.88330,15.3)	8.1@(0.65831,0.3)	5.1@(0.40832,0.4)
57	K22W (max d-ang @ t, dP)	16.7@(1.20829,-11.8)	23.5@(1.28328,-17.8)	-162.7@(20.00792,61.8)	-79.1@(20.00792,11.3)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	38% / 83%	26% / 70%	47% / 91%	75% / 131%
61	L20D at Prairie/Drayton	827% / 761%	637% / 358%	720% / 833%	290% / 965%
62	R50M / F3M	457% / 239%	450% / 235%	492% / 225%	560% / 250%
63	B10T	154%	125%	123%	171%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 2 | 0)	(0 | 3 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 4 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 8 | 3) / (0 | 2 | 0)	(2 | 8 | 2) / (0 | 2 | 1)	(2 | 7 | 2) / (0 | 2 | 0)	(2 | 6 | 2) / (0 | 1 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 1) / (1 | 2 | 1)	(0 | 2 | 1) / (1 | 2 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 1 | 1) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 5 | 4) / (2 | 2 | 2)	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 5 | 1) / (2 | 2 | 2)

TABLE 6.9 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C4XXX

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S2C4XXX-nbz	upe-so04aa.S2C4XXX-mqs	upe-so04aa.S2C4XXX-pys	upe-so04aa.S2C4XXX-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 23 2002 18:40	APR 23 2002 18:59	APR 23 2002 19:14	APR 23 2002 19:28
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3038 / 349	3038 / 349	3038 / 349	3038 / 349
10	MHEX / L20D	2173 / 153	2173 / 153	2173 / 153	2173 / 153
11	ECL-ARP / PRI-BYN	641 / 836	641 / 836	641 / 836	641 / 836
12	MWSI / MNEX	1477 / 2812	1477 / 2812	1477 / 2812	1477 / 2812
13	D602F / F601C	1871 / 1389	1871 / 1389	1871 / 1389	1871 / 1389
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	177 / 150	177 / 150	177 / 150	177 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	133 / 19	133 / 19	133 / 19	133 / 19
19	Forbes SVC / MSC	12 / 600	12 / 600	12 / 600	12 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.004	1.059 / 1.004	1.059 / 1.004	1.059 / 1.004
23	Chisago 500/EauClaire 345	1.015 / 1.008	1.015 / 1.008	1.015 / 1.008	1.015 / 1.008
24	Int Falls 115/Badoura 115	1.047 / 0.992	1.047 / 0.992	1.047 / 0.992	1.047 / 0.992
25	Drayton 230/Groton 345	1.015 / 1.006	1.015 / 1.006	1.015 / 1.006	1.015 / 1.006
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	119% / 196%	119% / 196%	119% / 196%	119% / 196%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	674% / 343%	674% / 343%	674% / 343%	674% / 343%
30	B10T	337%	337%	337%	337%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.11	0.97 | 1.06	0.97 | 1.01	0.99 | 1.01
33	Boise 115	0.97 | 1.08	1.00 | 1.09	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.05 | 1.16	0.98 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.95 | 1.07	0.98 | 1.03	0.99 | 1.03	1.00 | 1.01
36	Riverton 230	0.89 | 1.07	0.94 | 1.04	1.00 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.96 | 1.10	0.98 | 1.07	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.97 | 1.09	0.97 | 1.09	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.96 | 1.10	0.97 | 1.07	1.00 | 1.03	1.01 | 1.03
40	Groton 345	0.85 | 1.08	0.90 | 1.04	0.97 | 1.01	0.99 | 1.01
41	Tioga 230	0.99 | 1.08	1.00 | 1.07	1.01 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.86 | 1.12	0.96 | 1.10	1.02 | 1.05	1.04 | 1.06
43	Watertown 345	0.91 | 1.08	0.94 | 1.05	1.00 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		9832 [LANGDONT] 1.21	9832 [LANGDONT] 1.21	none	none
46		709 [LANGDON7] 1.21	709 [LANGDON7] 1.21		
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -39.85%	KING 3 / 9.48%	ANTEL3 / 36.71%	KING 3 / 18.65%
53	Dorsey SUVP / UdHold	/ 0.133	/ 15.858		
54	Forbes DC Red (DCAR)	507%	500%	147%	319%
55	K22W (max +dP @ t, d-ang)	161.3@(2.11658,-72.2)	70.9@(2.67489,-34.2)	1.0@(4.09150,5.1)	0.0@(-0.01667,0.0)
56	K22W (max -dP @ t, d-ang)	104.8@(0.26666,11.1)	22.1@(0.34999,4.5)	31.3@(1.78326,18.9)	20.5@(2.15824,12.8)
57	K22W (max d-ang @ t, dP)	-283.8@(20.00792,53.9)	-108.8@(20.00792,17.6)	20.5@(1.33328,-15.3)	16.4@(20.00792,-11.2)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	32% / 76%	93% / 159%	117% / 191%
61	L20D at Prairie/Drayton	832% / 507%	999% / 774%	999% / 999%	999% / 999%
62	R50M / F3M	253% / 135%	449% / 235%	570% / 343%	635% / 343%
63	B10T	130%	102%	199%	271%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 8 | 2) / (0 | 2 | 0)	(2 | 5 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (1 | 6 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 5 | 3) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 6.9 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C4XXX

1	**Case No.**	9	10
2	**Case Name**	upe-so04aa.S2C4XXX-ce3	upe-so04aa.S2C4XXX-cf3
3	**Disturbance**	ce3	cf3
4	**Prior Outage**	None	None
5	**Date/Time**	APR 23 2002 19:41	APR 23 2002 19:55
6	**Comments**		
7			
8	**Steady State Flows**		
9	NDEX / EAST BIAS	3038 / 349	3038 / 349
10	MHEX / L20D	2173 / 153	2173 / 153
11	ECL-ARP / PRI-BYN	641 / 836	641 / 836
12	MWSI / MNEX	1477 / 2812	1477 / 2812
13	D602F / F601C	1871 / 1389	1871 / 1389
14	B10T / MH>SPC	168 / 101	168 / 101
15	OH E-W / OH>MH	-120 / -197	-120 / -197
16	R50M / OH>MP	177 / 150	177 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	133 / 19	133 / 19
19	Forbes SVC / MSC	12 / 600	12 / 600
20	**Steady State Vltgs**		
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.004	1.059 / 1.004
23	Chisago 500/EauClaire 345	1.015 / 1.008	1.015 / 1.008
24	Int Falls 115/Badoura 115	1.047 / 0.992	1.047 / 0.992
25	Drayton 230/Groton 345	1.015 / 1.006	1.015 / 1.006
26	**SS OS Relay Margins**		
27	D602F at Forbes/Dorsey	119% / 196%	119% / 196%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%
29	R50M/F3M	674% / 343%	674% / 343%
30	B10T	337%	337%
31	**Min/MaxTransientVltg**		
32	Arrowhd 230	0.99 | 1.02	0.99 | 1.02
33	Boise 115	1.03 | 1.05	1.03 | 1.06
34	Dorsey 230	1.03 | 1.05	1.03 | 1.05
35	Forbes 230	1.00 | 1.02	1.00 | 1.02
36	Riverton 230	0.97 | 1.03	0.98 | 1.04
37	Coal Creek 230	0.97 | 1.09	0.97 | 1.08
38	Dickinson 345	0.97 | 1.05	0.97 | 1.05
39	Drayton 230	0.99 | 1.08	1.00 | 1.08
40	Groton 345	0.92 | 1.02	0.92 | 1.03
41	Tioga 230	1.03 | 1.06	1.02 | 1.06
42	Wahpeton 115	0.97 | 1.08	0.98 | 1.08
43	Watertown 345	0.97 | 1.04	0.97 | 1.04
44	**Dynamic Voltage Warnings**		
45		none	none
46			
47			
48			
49			
50			
51			
52	Worst Case Angle Damping	SHERC3 / 51.94%	SHERC3 / 54.25%
53	Dorsey SUVP / UdHold		
54	Forbes DC Red (DCAR)	328%	322%
55	K22W (max +dP @ t, d-ang)	10.0@(2.66656,-4.2)	10.7@(2.65822,-4.1)
56	K22W (max -dP @ t, d-ang)	10.5@(0.58331,3.2)	9.1@(0.53331,2.6)
57	K22W (max d-ang @ t, dP)	6.2@(1.04163,-7.6)	5.6@(1.03329,-6.6)
58	**OS Rel Trip / Marg**		
59	MH - OH		
60	D602F at Forbes/Dorsey	77% / 137%	82% / 143%
61	L20D at Prairie/Drayton	999% / 999%	999% / 999%
62	R50M / F3M	558% / 284%	569% / 287%
63	B10T	261%	265%
64	**FSCAPS (SS/Unav/Final)**		
65	Balta 230	(0 | 1 | 0)	(0 | 1 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 6 | 3) / (0 | 1 | 1)	(2 | 6 | 3) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 3 | 3) / (2 | 2 | 2)	(0 | 3 | 2) / (2 | 2 | 2)

Table 6.10
Bismark - Blue Lake 345 kV + Maple River - Benton Co. 345 kV + 355 Series Comp. East of Jamestown (Case S2C4XX1)

```
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168

DATA FOR BUS   605 [LELANDO3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01000  97.34

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.01046  0.15170  1.65250  1  T   680.0 1159.0  748.0    0.0       1 1.000
  601 ANTELOP3 345  1   0.00123  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
  601 ANTELOP3 345  2   0.00124  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
  611 LELAN32G20.0  1   0.00050  0.02770  0.00000  1  F   495.0  495.0  594.0    0.0       1 1.000
  660 GROTON 3 345  1   0.00914  0.13380  1.43530  1  T   717.0 1159.0  789.0    0.0       1 1.000
  791 CENTER 3 345  1   0.00052  0.00746  0.08127  1  T   680.0 1159.0  748.0    0.0       1 1.000
22151 LELND1TY 345  1  -0.00042  0.00095  0.00000  1  F   250.0  250.0  300.0    0.0       1 1.000
22152 LELND2TY 345  1   0.00032  0.00144  0.00000  1  F   500.0  500.0  600.0    0.0       1 1.000
99426 BISMARK3 345  1   0.00172  0.02487  0.27090  1  T   680.0 1159.0  748.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  506 FTTHOMP3 345  1    0.00000 -0.50000   0.00000 -0.68000     1
  660 GROTON 3 345  1    0.00000 -0.68000   0.00000  0.00000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  611 1  F 1.08110   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22151 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
22152 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DATA FOR BUS 99426 [BISMARK3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01672  92.69

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  426 BISMARK4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  605 LELANDO3 345  1   0.00172  0.02487  0.27090  1  F   680.0 1159.0  748.0    0.0       1 1.000
99444 JAMESTN3 345  1   0.00410  0.05030  0.81519  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  426 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.10 (Cont.)

```
DATA FOR BUS 99444 [JAMESTN3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01033  80.64

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  444 JAMESTN4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
  954 JAMESTN3 345  1   0.00022  0.00311  0.03386  1  T   680.0 1159.0  748.0    0.0       1 1.000
99426 BISMARK3 345  1   0.00410  0.05030  0.81519  1  T   800.0  900.0  999.0    0.0       1 1.000
99435 FARGO  3 345  1   0.00353  0.02809  0.69831  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  444 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99435 [FARGO  3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00425  71.04

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  435 FARGO  4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
99444 JAMESTN3 345  1   0.00353  0.02809  0.69831  1  T   800.0  900.0  999.0    0.0       1 1.000
99553 MOORHED3 345  1   0.00048  0.00354  0.08705  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  435 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99553 [MOORHED3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00015  70.01

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  587 MOORHED7 115  1   0.00590  0.14500  0.00000  1  F    67.0   67.0   84.0    0.0       1 1.000
  587 MOORHED7 115  2   0.00590  0.14500  0.00000  1  F    67.0   67.0   84.0    0.0       1 1.000
  792 MAPLE R3 345  1   0.00034  0.00497  0.05418  1  T   680.0 1159.0  748.0    0.0       1 1.000
99435 FARGO  3 345  1   0.00048  0.00354  0.08705  1  T   800.0  900.0  999.0    0.0       1 1.000
99554 MORRIS 3 345  1   0.00427  0.03138  0.77768  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  587 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
  587 2  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 6.10 (Cont.)

```
DATA FOR BUS 99554 [MORRIS 3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00172  59.47

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  555 MORRIS 7 115  1   0.00000  0.03000  0.00000  1  F   250.0  300.0  350.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00276  0.02016  0.49710  1  F   800.0  900.0  999.0    0.0       1 1.000
99553 MOORHED3 345  1   0.00427  0.03138  0.77768  1  T   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  555 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00130  53.13

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 1702 BLUE LK3 345  1   0.00430  0.04083  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
99554 MORRIS 3 345  1   0.00276  0.02016  0.49710  1  T   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   792 [MAPLE R3 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99460  70.25

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  916 BUFFALO3 345  1   0.00120  0.01060  0.29051  1  T   720.0 1560.0  792.0    0.0       1 1.000
 1667 BENTON 3 345  1   0.00774  0.07274  1.21905  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
79824 MAPLER1Y 345  1   0.00020  0.01970  0.00000  1  F   336.0  336.0  420.0    0.0       1 1.000
79825 MAPLER2Y 345  1   0.00020  0.01970  0.00000  1  T   336.0  336.0  420.0    0.0       1 1.000
99553 MOORHED3 345  1   0.00034  0.00497  0.05418  1  F   680.0 1159.0  748.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
79824 1  F 0.97390   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
79825 1  F 0.97390   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

TABLE 6.11 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C4XX1

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S2C4XX1-ag1	upe-so04aa.S2C4XX1-ag3	upe-so04aa.S2C4XX1-ei2	upe-so04aa.S2C4XX1-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 23 2002 20:09	APR 23 2002 20:25	APR 23 2002 20:42	APR 23 2002 20:57
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3039 / 310	3039 / 310	3039 / 310	3039 / 310
10	MHEX / L20D	2172 / 174	2172 / 174	2172 / 174	2172 / 174
11	ECL-ARP / PRI-BYN	641 / 844	641 / 844	641 / 844	641 / 844
12	MWSI / MNEX	1485 / 2868	1485 / 2868	1485 / 2868	1485 / 2868
13	D602F / F601C	1837 / 1355	1837 / 1355	1837 / 1355	1837 / 1355
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	172 / 150	172 / 150	172 / 150	172 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	208 / -15	208 / -15	208 / -15	208 / -15
19	Forbes SVC / MSC	43 / 600	43 / 600	43 / 600	43 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045
22	Roseau 500/Forbes 500	1.063 / 1.016	1.063 / 1.016	1.063 / 1.016	1.063 / 1.016
23	Chisago 500/EauClaire 345	1.021 / 1.008	1.021 / 1.008	1.021 / 1.008	1.021 / 1.008
24	Int Falls 115/Badoura 115	1.052 / 1.004	1.052 / 1.004	1.052 / 1.004	1.052 / 1.004
25	Drayton 230/Groton 345	1.016 / 1.015	1.016 / 1.015	1.016 / 1.015	1.016 / 1.015
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	131% / 217%	131% / 217%	131% / 217%	131% / 217%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	714% / 349%	714% / 349%	714% / 349%	714% / 349%
30	B10T	337%	337%	337%	337%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.97 | 1.03	0.95 | 1.04	0.99 | 1.06	0.99 | 1.05
33	Boise 115	1.01 | 1.08	1.01 | 1.09	1.02 | 1.07	1.03 | 1.07
34	Dorsey 230	1.01 | 1.06	1.00 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	0.99 | 1.03	0.99 | 1.04	0.98 | 1.04	1.00 | 1.04
36	Riverton 230	0.94 | 1.05	0.92 | 1.05	0.94 | 1.05	0.96 | 1.05
37	Coal Creek 230	0.94 | 1.12	0.93 | 1.11	1.04 | 1.12	0.97 | 1.14
38	Dickinson 345	0.94 | 1.07	0.93 | 1.07	1.01 | 1.07	1.01 | 1.09
39	Drayton 230	0.97 | 1.10	0.96 | 1.10	0.95 | 1.07	0.99 | 1.07
40	Groton 345	0.84 | 1.05	0.81 | 1.04	0.92 | 1.07	0.92 | 1.06
41	Tioga 230	1.00 | 1.07	0.98 | 1.08	1.02 | 1.07	1.02 | 1.07
42	Wahpeton 115	0.93 | 1.11	0.89 | 1.10	0.94 | 1.11	0.97 | 1.11
43	Watertown 345	0.92 | 1.06	0.89 | 1.05	0.96 | 1.07	0.97 | 1.06
44	**Dynamic Voltage Warnings**				
45		none	none	709 [LANGDON7] 1.21	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 63.50%	SHERC3 / 56.89%	KING 3 / -56.62%	SHERC3 / -40.51%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	215%	169%	507%	507%
55	K22W (max +dP @ t, d-ang)	14.7@(2.66656,-4.4)	24.2@(2.69989,-8.1)	58.1@(2.54989,-32.5)	38.5@(2.46656,-20.8)
56	K22W (max -dP @ t, d-ang)	25.6@(0.80830,8.9)	31.6@(0.80830,11.3)	4.1@(0.52498,0.0)	4.7@(0.33332,0.3)
57	K22W (max d-ang @ t, dP)	13.6@(1.14162,-8.9)	17.6@(1.16662,-12.2)	-148.9@(20.00792,27.5)	-82.2@(20.00792,15.7)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	59% / 115%	46% / 97%	66% / 121%	90% / 156%
61	L20D at Prairie/Drayton	999% / 781%	809% / 726%	873% / 783%	269% / 878%
62	R50M / F3M	518% / 251%	490% / 240%	551% / 228%	608% / 256%
63	B10T	160%	144%	136%	175%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 2 | 0)	(0 | 0 | 0)	(0 | 1 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 8 | 3) / (0 | 2 | 0)	(2 | 8 | 3) / (0 | 2 | 0)	(2 | 6 | 2) / (0 | 1 | 0)	(2 | 5 | 2) / (0 | 2 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 1) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 1) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 4 | 0) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)

TABLE 6.11 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C4XX1

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S2C4XX1-nbz	upe-so04aa.S2C4XX1-mqs	upe-so04aa.S2C4XX1-pys	upe-so04aa.S2C4XX1-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 23 2002 21:10	APR 23 2002 21:29	APR 23 2002 21:44	APR 23 2002 21:57
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3039 / 310	3039 / 310	3039 / 310	3039 / 310
10	MHEX / L20D	2172 / 174	2172 / 174	2172 / 174	2172 / 174
11	ECL-ARP / PRI-BYN	641 / 844	641 / 844	641 / 844	641 / 844
12	MWSI / MNEX	1485 / 2868	1485 / 2868	1485 / 2868	1485 / 2868
13	D602F / F601C	1837 / 1355	1837 / 1355	1837 / 1355	1837 / 1355
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	172 / 150	172 / 150	172 / 150	172 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	208 / -15	208 / -15	208 / -15	208 / -15
19	Forbes SVC / MSC	43 / 600	43 / 600	43 / 600	43 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045
22	Roseau 500/Forbes 500	1.063 / 1.016	1.063 / 1.016	1.063 / 1.016	1.063 / 1.016
23	Chisago 500/EauClaire 345	1.021 / 1.008	1.021 / 1.008	1.021 / 1.008	1.021 / 1.008
24	Int Falls 115/Badoura 115	1.052 / 1.004	1.052 / 1.004	1.052 / 1.004	1.052 / 1.004
25	Drayton 230/Groton 345	1.016 / 1.015	1.016 / 1.015	1.016 / 1.015	1.016 / 1.015
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	131% / 217%	131% / 217%	131% / 217%	131% / 217%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	714% / 349%	714% / 349%	714% / 349%	714% / 349%
30	B10T	337%	337%	337%	337%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.11	0.97 | 1.06	0.98 | 1.01	1.00 | 1.01
33	Boise 115	0.99 | 1.07	1.01 | 1.09	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.05 | 1.16	1.01 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.95 | 1.07	0.99 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.92 | 1.07	0.96 | 1.05	1.01 | 1.02	1.01 | 1.03
37	Coal Creek 230	0.95 | 1.09	0.98 | 1.07	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.96 | 1.09	0.97 | 1.08	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.96 | 1.08	0.98 | 1.06	1.00 | 1.03	1.01 | 1.03
40	Groton 345	0.89 | 1.08	0.93 | 1.05	0.99 | 1.01	1.00 | 1.02
41	Tioga 230	0.99 | 1.08	1.00 | 1.07	1.02 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.91 | 1.11	0.97 | 1.10	1.04 | 1.06	1.05 | 1.07
43	Watertown 345	0.94 | 1.08	0.96 | 1.05	1.01 | 1.02	1.02 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	709 [LANGDON7] 1.21	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -32.90%	KING 3 / 5.86%	ANTEL3 / 35.84%	KING 3 / 18.82%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	494%	168%	328%
55	K22W (max +dP @ t, d-ang)	162.0@(2.10825,-70.6)	68.2@(2.62489,-33.1)	0.7@(0.11666,0.2)	0.0@(0.09166,0.0)
56	K22W (max -dP @ t, d-ang)	101.4@(0.26666,10.9)	22.2@(0.34165,4.3)	31.3@(1.77493,18.5)	20.9@(2.15824,13.1)
57	K22W (max d-ang @ t, dP)	-277.6@(20.00792,53.4)	-109.8@(20.00792,20.6)	20.8@(20.00792,-14.9)	17.0@(20.00792,-11.7)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	44% / 96%	105% / 179%	127% / 210%
61	L20D at Prairie/Drayton	999% / 499%	999% / 722%	999% / 975%	999% / 999%
62	R50M / F3M	300% / 149%	487% / 235%	607% / 349%	668% / 349%
63	B10T	118%	103%	202%	273%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 7 | 2) / (0 | 2 | 0)	(2 | 4 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (1 | 6 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 0) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 6.11 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C4XX1

1	**Case No.**	9	10	11
2	**Case Name**	upe-so04aa.S2C4XX1-ce3	upe-so04aa.S2C4XX1-cf3	upe-so04aa.S2C4XX1-eb3
3	**Disturbance**	ce3	cf3	eb3
4	**Prior Outage**	None	None	None
5	**Date/Time**	APR 23 2002 22:10	APR 23 2002 22:24	JUN 07 2002 21:32
6	**Comments**			
7				
8	**Steady State Flows**			
9	NDEX / EAST BIAS	3039 / 310	3039 / 310	3039 / 310
10	MHEX / L20D	2172 / 174	2172 / 174	2172 / 174
11	ECL-ARP / PRI-BYN	641 / 844	641 / 844	641 / 844
12	MWSI / MNEX	1485 / 2868	1485 / 2868	1485 / 2868
13	D602F / F601C	1837 / 1355	1837 / 1355	1837 / 1355
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	172 / 150	172 / 150	172 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	208 / -15	208 / -15	208 / -15
19	Forbes SVC / MSC	43 / 600	43 / 600	43 / 600
20	**Steady State Vltgs**			
21	Dorsey 500/Dorsey 230	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045
22	Roseau 500/Forbes 500	1.063 / 1.016	1.063 / 1.016	1.063 / 1.016
23	Chisago 500/EauClaire 345	1.021 / 1.008	1.021 / 1.008	1.021 / 1.008
24	Int Falls 115/Badoura 115	1.052 / 1.004	1.052 / 1.004	1.052 / 1.004
25	Drayton 230/Groton 345	1.016 / 1.015	1.016 / 1.015	1.016 / 1.015
26	**SS OS Relay Margins**			
27	D602F at Forbes/Dorsey	131% / 217%	131% / 217%	131% / 217%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	714% / 349%	714% / 349%	714% / 349%
30	B10T	337%	337%	337%
31	**Min/MaxTransientVltg**			
32	Arrowhd 230	1.00 | 1.03	1.00 | 1.03	0.97 | 1.03
33	Boise 115	1.03 | 1.06	1.03 | 1.06	1.02 | 1.07
34	Dorsey 230	1.03 | 1.05	1.03 | 1.05	1.01 | 1.06
35	Forbes 230	1.01 | 1.03	1.01 | 1.03	1.00 | 1.03
36	Riverton 230	0.98 | 1.04	0.99 | 1.04	0.96 | 1.05
37	Coal Creek 230	0.98 | 1.09	0.97 | 1.09	0.95 | 1.11
38	Dickinson 345	0.98 | 1.05	0.98 | 1.05	0.95 | 1.07
39	Drayton 230	0.99 | 1.07	0.99 | 1.07	0.98 | 1.09
40	Groton 345	0.94 | 1.03	0.94 | 1.03	0.85 | 1.04
41	Tioga 230	1.03 | 1.06	1.02 | 1.06	0.99 | 1.07
42	Wahpeton 115	0.99 | 1.08	0.99 | 1.09	0.94 | 1.10
43	Watertown 345	0.98 | 1.04	0.98 | 1.04	0.91 | 1.05
44	**Dynamic Voltage Warnings**			
45		none	none	none
46				
47				
48				
49				
50				
51				
52	Worst Case Angle Damping	SHERC3 / 53.47%	SHERC3 / 54.12%	SHERC3 / 58.13%
53	Dorsey SUVP / UdHold			
54	Forbes DC Red (DCAR)	333%	327%	237%
55	K22W (max +dP @ t, d-ang)	9.8@(2.64989,-4.1)	10.2@(2.64156,-4.0)	18.5@(2.69155,-6.6)
56	K22W (max -dP @ t, d-ang)	10.4@(0.58331,3.4)	9.4@(0.74164,4.4)	22.0@(0.79997,6.7)
57	K22W (max d-ang @ t, dP)	6.2@(1.02496,-7.3)	5.8@(1.02496,-6.6)	11.0@(1.14995,-9.8)
58	**OS Rel Trip / Marg**			
59	MH - OH			
60	D602F at Forbes/Dorsey	88% / 155%	91% / 160%	67% / 126%
61	L20D at Prairie/Drayton	999% / 999%	999% / 943%	999% / 760%
62	R50M / F3M	592% / 289%	601% / 292%	548% / 259%
63	B10T	261%	269%	200%
64	**FSCAPS (SS/Unav/Final)**			
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 6 | 3) / (0 | 2 | 1)	(2 | 5 | 3) / (0 | 2 | 1)	(2 | 8 | 3) / (0 | 2 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 3 | 3) / (2 | 2 | 2)	(0 | 3 | 2) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)

Table 6.12
Letellier Phase Shifter (Case S2C4XX2)

```
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168

DATA FOR BUS  3458 [LETELER4 230] RESIDING IN AREA  20, ZONE 992, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1    34.9     8.2    0.0    0.0     0.0     0.0     0.0     0.0 0.97090 115.46

ID ST   PLOAD   QLOAD     I - L O A D     Y - L O A D  AREA  ZONE OWNER
M8  1    34.9     8.2     0.0     0.0     0.0     0.0    20   992     1

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  752 DRAYTON4 230  1   0.00800  0.05680  0.11085  1  F   430.0  430.0  430.0    0.0       1 1.000
 9458 LETLRPHS      1   0.00123  0.03945  0.00000  1  F   400.0  400.0  570.0    1.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9458 1  F 1.00000  37.1 1      0   70.0  -70.0 -350.0 -360.0 0.00000                 2 0.00150 0.04825

IMPEDANCE CORRECTION TABLE  2 IS A FUNCTION OF TRANSFORMER PHASE SHIFT ANGLE
ENTRY 1      2      3      4      5      6      7
AN  -70.0  -43.0  -32.0    0.0   32.0   43.0   70.0
*F 1.0000 0.7800 0.8500 0.5000 0.8500 0.7800 1.0000



BUS  3458 LETELER4 230 AREA CKT    MW     MVAR     MVA  %I 0.9709PU 115.46 3458
                       20                                 223.31KV
 TO LOAD-PQ                       34.9     8.2    35.9
 TO   752 DRAYTON4 230  14  1    319.5   -17.6   319.9  77
 TO  9458 LETLRPHS      20  1   -354.4     9.4   354.5  91 1.0000LK  37.09RG

BUS  3465 DORSEY 2 500 AREA CKT    MW     MVAR     MVA  %I 1.0391PU  94.62 3465
                       20                                 519.56KV
 TO  1677 ROSEAUN2 500  23  1   1770.0   306.9  1796.4 100
 TO  3467 DORSEYM4 230  20  1   -890.8  -153.5   904.0  72 1.0188RG
 TO  3499 DORSY2M4 230  20  1   -879.2  -153.3   892.4  72 1.0188RG

BUS  3424 GLENBOR4 230 AREA CKT    MW     MVAR     MVA  %I 1.0225PU  93.87 3424
                       20                                 235.18KV
 TO LOAD-PQ                       34.1    11.4    36.0
 TO SWITCHED SHUNT                 0.0    26.1    26.1
 TO   925 RUGBY  4 230  14  1    -85.1    -9.5    85.7  21
 TO  3425 CORNWLS4 230  20  1     21.9   -25.6    33.7  13
 TO  3427 ST.LEON4 230  20  1     29.1    -2.5    29.2  10
```

TABLE 6.13 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C4XX2

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S2C4XX2-ag1	upe-so04aa.S2C4XX2-ag3	upe-so04aa.S2C4XX2-ei2	upe-so04aa.S2C4XX2-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 24 2002 19:31	APR 24 2002 19:50	APR 24 2002 20:10	APR 24 2002 20:24
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3013 / 368	3013 / 368	3013 / 368	3013 / 368
10	MHEX / L20D	2170 / 322	2170 / 322	2170 / 322	2170 / 322
11	ECL-ARP / PRI-BYN	638 / 830	638 / 830	638 / 830	638 / 830
12	MWSI / MNEX	1468 / 2787	1468 / 2787	1468 / 2787	1468 / 2787
13	D602F / F601C	1768 / 1326	1768 / 1326	1768 / 1326	1768 / 1326
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	163 / 150	163 / 150	163 / 150	163 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	229 / 28	229 / 28	229 / 28	229 / 28
19	Forbes SVC / MSC	25 / 600	25 / 600	25 / 600	25 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.039 / 1.045	1.039 / 1.045	1.039 / 1.045	1.039 / 1.045
22	Roseau 500/Forbes 500	1.067 / 1.024	1.067 / 1.024	1.067 / 1.024	1.067 / 1.024
23	Chisago 500/EauClaire 345	1.026 / 1.009	1.026 / 1.009	1.026 / 1.009	1.026 / 1.009
24	Int Falls 115/Badoura 115	1.054 / 0.988	1.054 / 0.988	1.054 / 0.988	1.054 / 0.988
25	Drayton 230/Groton 345	0.999 / 1.005	0.999 / 1.005	0.999 / 1.005	0.999 / 1.005
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	152% / 248%	152% / 248%	152% / 248%	152% / 248%
28	L20D at Prairie/Drayton	999% / 525%	999% / 525%	999% / 525%	999% / 525%
29	R50M/F3M	794% / 353%	794% / 353%	794% / 353%	794% / 353%
30	B10T	344%	344%	344%	344%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.07	0.96 | 1.07	0.99 | 1.06	0.99 | 1.05
33	Boise 115	1.03 | 1.09	1.02 | 1.09	1.02 | 1.07	1.03 | 1.07
34	Dorsey 230	1.01 | 1.09	1.01 | 1.09	1.03 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.06	0.99 | 1.06	0.99 | 1.04	1.00 | 1.04
36	Riverton 230	0.92 | 1.11	0.89 | 1.10	0.91 | 1.05	0.94 | 1.04
37	Coal Creek 230	0.94 | 1.15	0.93 | 1.15	1.03 | 1.13	0.96 | 1.13
38	Dickinson 345	0.94 | 1.09	0.94 | 1.09	1.01 | 1.07	1.01 | 1.09
39	Drayton 230	0.96 | 1.49(2.13)	0.94 | 1.49(2.23)	0.93 | 1.07	0.97 | 1.07
40	Groton 345	0.79 | 1.09	0.75 | 1.08	0.87 | 1.07	0.88 | 1.05
41	Tioga 230	0.99 | 1.10	0.97 | 1.10	1.01 | 1.08	1.02 | 1.07
42	Wahpeton 115	0.88 | 1.19(1.13)	0.84 | 1.18	0.90 | 1.11	0.93 | 1.10
43	Watertown 345	0.88 | 1.09	0.85 | 1.08	0.92 | 1.07	0.94 | 1.05
44	**Dynamic Voltage Warnings**				
45		712 [PRAIRIE7] 1.46	712 [PRAIRIE7] 1.43	none	none
46		1647 [NORDIC 7] 1.46	1647 [NORDIC 7] 1.42		
47		755 [PRAIRIE4] 1.33	755 [PRAIRIE4] 1.30		
48		9000 [GRNDFKST] 1.29	437 [GRNDFKS4] 1.26		
49		706 [FALCONR7] 1.29	443 [GRNDFKS7] 1.26		
50		443 [GRNDFKS7] 1.29	706 [FALCONR7] 1.25		
51		437 [GRNDFKS4] 1.29 +more	000 [GRNDFKST] 1.25 +mor		
52	Worst Case Angle Damping	SHERC3 / 40.23%	SHERC3 / 43.01%	KING 3 / -54.33%	SHERC3 / -42.25%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	180%	146%	507%	507%
55	K22W (max +dP @ t, d-ang)	72.4@(2.60822,-25.9)	80.2@(2.67489,-27.3)	59.3@(2.75822,-32.6)	38.5@(2.59156,-20.9)
56	K22W (max -dP @ t, d-ang)	21.8@(0.64997,5.1)	28.6@(0.79164,9.9)	4.7@(0.53331,0.0)	4.6@(0.33332,0.3)
57	K22W (max d-ang @ t, dP)	-56.9@(20.00792,22.6)	-59.5@(20.00792,22.4)	-147.8@(20.00792,27.1)	-81.6@(20.00792,15.6)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	102% / 181%	90% / 165%	76% / 137%	105% / 178%
61	L20D at Prairie/Drayton	518% / 179%	418% / 183%	459% / 358%	307% / 403%
62	R50M / F3M	682% / 256%	657% / 242%	598% / 225%	668% / 257%
63	B10T	117%	101%	132%	181%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 2 | 0)	(0 | 3 | 0)	(0 | 0 | 0)	(0 | 1 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(3 | 9 |12) / (0 | 2 | 0)	(3 | 9 |19) / (0 | 2 | 0)	(3 | 8 | 3) / (0 | 1 | 0)	(3 | 7 | 3) / (0 | 2 | 0)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 0)	(0 | 0 | 0) / (1 | 1 | 0)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(1 | 5 | 0) / (2 | 2 | 2)	(1 | 5 | 0) / (2 | 2 | 2)	(1 | 5 | 1) / (2 | 2 | 2)	(1 | 5 | 2) / (2 | 2 | 2)

TABLE 6.13 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C4XX2

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S2C4XX2-nbz	upe-so04aa.S2C4XX2-mqs	upe-so04aa.S2C4XX2-pys	upe-so04aa.S2C4XX2-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 24 2002 20:38	APR 24 2002 20:59	APR 24 2002 21:14	APR 24 2002 21:27
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3013 / 368	3013 / 368	3013 / 368	3013 / 368
10	MHEX / L20D	2170 / 322	2170 / 322	2170 / 322	2170 / 322
11	ECL-ARP / PRI-BYN	638 / 830	638 / 830	638 / 830	638 / 830
12	MWSI / MNEX	1468 / 2787	1468 / 2787	1468 / 2787	1468 / 2787
13	D602F / F601C	1768 / 1326	1768 / 1326	1768 / 1326	1768 / 1326
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	163 / 150	163 / 150	163 / 150	163 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	229 / 28	229 / 28	229 / 28	229 / 28
19	Forbes SVC / MSC	25 / 600	25 / 600	25 / 600	25 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.039 / 1.045	1.039 / 1.045	1.039 / 1.045	1.039 / 1.045
22	Roseau 500/Forbes 500	1.067 / 1.024	1.067 / 1.024	1.067 / 1.024	1.067 / 1.024
23	Chisago 500/EauClaire 345	1.026 / 1.009	1.026 / 1.009	1.026 / 1.009	1.026 / 1.009
24	Int Falls 115/Badoura 115	1.054 / 0.988	1.054 / 0.988	1.054 / 0.988	1.054 / 0.988
25	Drayton 230/Groton 345	0.999 / 1.005	0.999 / 1.005	0.999 / 1.005	0.999 / 1.005
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	152% / 248%	152% / 248%	152% / 248%	152% / 248%
28	L20D at Prairie/Drayton	999% / 525%	999% / 525%	999% / 525%	999% / 525%
29	R50M/F3M	794% / 353%	794% / 353%	794% / 353%	794% / 353%
30	B10T	344%	344%	344%	344%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.13	0.98 | 1.07	0.98 | 1.02	1.00 | 1.02
33	Boise 115	0.97 | 1.08	1.01 | 1.08	1.03 | 1.07	1.05 | 1.06
34	Dorsey 230	1.04 | 1.14	1.01 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.09	0.99 | 1.05	1.01 | 1.04	1.02 | 1.03
36	Riverton 230	0.88 | 1.14	0.93 | 1.04	1.00 | 1.02	1.00 | 1.02
37	Coal Creek 230	0.95 | 1.12	0.98 | 1.08	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.95 | 1.11	0.97 | 1.09	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.94 | 1.61(2.38)	0.96 | 1.05	0.97 | 1.03	0.99 | 1.02
40	Groton 345	0.85 | 1.13	0.89 | 1.04	0.97 | 1.00	0.99 | 1.01
41	Tioga 230	0.99 | 1.10	1.01 | 1.07	1.01 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.87 | 1.21(1.58)	0.94 | 1.09	1.02 | 1.05	1.04 | 1.06
43	Watertown 345	0.90 | 1.12	0.94 | 1.05	0.99 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		712 [PRAIRIE7] 1.44	none	none	none
46		1647 [NORDIC 7] 1.43			
47		755 [PRAIRIE4] 1.30			
48		443 [GRNDFKS7] 1.27			
49		437 [GRNDFKS4] 1.27			
50		706 [FALCONR7] 1.27			
51		000 [GRNDFKST] 1.26 +mor			
52	Worst Case Angle Damping	KING 3 / -46.14%	KING 3 / 8.12%	SHERC3 / 37.01%	KING 3 / 15.59%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	507%	190%	339%
55	K22W (max +dP @ t, d-ang)	236.8@(2.18324,-91.1)	69.8@(2.69989,-32.9)	1.0@(4.08316,5.1)	0.0@(-0.00833,0.0)
56	K22W (max -dP @ t, d-ang)	99.5@(0.27499,11.2)	21.5@(0.33332,4.0)	31.4@(1.77493,18.8)	20.3@(2.14991,12.7)
57	K22W (max d-ang @ t, dP)	-331.4@(20.00792,106.5)	-106.7@(20.00792,21.4)	20.3@(1.32495,-15.4)	16.1@(20.00792,-11.1)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	60% / 119%	122% / 205%	148% / 242%
61	L20D at Prairie/Drayton	432% / 226%	618% / 345%	805% / 443%	999% / 483%
62	R50M / F3M	346% / 151%	542% / 247%	670% / 353%	744% / 353%
63	B10T	94%	109%	201%	277%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(3 | 9 |12) / (0 | 1 | 0)	(3 | 6 | 3) / (0 | 1 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (1 | 4 | 0)	(0 | 1 | 0) / (1 | 1 | 0)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(1 | 5 | 0) / (2 | 2 | 2)	(1 | 5 | 3) / (2 | 2 | 2)	(1 | 1 | 1) / (2 | 2 | 2)	(1 | 1 | 1) / (2 | 2 | 2)

Table 6.14
Prairie SVC (Case S2C4XX3)

```
DATA FOR BUS  1620 [PRASWCP7 115] RESIDING IN AREA  14, ZONE  74, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02873  91.28

 MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
  2 1.02873 1.02873   120.00  9:  40.00 3:  40.00                       755 PRAIRIE4 230

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   712 PRAIRIE7 115  1   0.00000  0.01080  0.00000  1  T   596.0  596.0  596.0    0.0       1 1.000
```

TABLE 6.15 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C4XX3

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S2C4XX3-ag1	upe-so04aa.S2C4XX3-ag3	upe-so04aa.S2C4XX3-ei2	upe-so04aa.S2C4XX3-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 29 2002 18:11	APR 29 2002 18:28	APR 29 2002 18:46	APR 29 2002 19:00
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3014 / 367	3014 / 367	3014 / 367	3014 / 367
10	MHEX / L20D	2170 / 321	2170 / 321	2170 / 321	2170 / 321
11	ECL-ARP / PRI-BYN	638 / 830	638 / 830	638 / 830	638 / 830
12	MWSI / MNEX	1468 / 2787	1468 / 2787	1468 / 2787	1468 / 2787
13	D602F / F601C	1769 / 1326	1769 / 1326	1769 / 1326	1769 / 1326
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	163 / 150	163 / 150	163 / 150	163 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	228 / 29	228 / 29	228 / 29	228 / 29
19	Forbes SVC / MSC	27 / 600	27 / 600	27 / 600	27 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.039 / 1.045	1.039 / 1.045	1.039 / 1.045	1.039 / 1.045
22	Roseau 500/Forbes 500	1.067 / 1.024	1.067 / 1.024	1.067 / 1.024	1.067 / 1.024
23	Chisago 500/EauClaire 345	1.026 / 1.009	1.026 / 1.009	1.026 / 1.009	1.026 / 1.009
24	Int Falls 115/Badoura 115	1.054 / 0.988	1.054 / 0.988	1.054 / 0.988	1.054 / 0.988
25	Drayton 230/Groton 345	0.997 / 1.005	0.997 / 1.005	0.997 / 1.005	0.997 / 1.005
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	151% / 248%	151% / 248%	151% / 248%	151% / 248%
28	L20D at Prairie/Drayton	999% / 526%	999% / 526%	999% / 526%	999% / 526%
29	R50M/F3M	793% / 352%	793% / 352%	793% / 352%	793% / 352%
30	B10T	343%	343%	343%	343%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.97 | 1.03	0.96 | 1.04	0.99 | 1.06	0.99 | 1.05
33	Boise 115	1.02 | 1.07	1.01 | 1.08	1.02 | 1.07	1.04 | 1.07
34	Dorsey 230	1.01 | 1.05	1.00 | 1.06	1.03 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	1.00 | 1.04	0.99 | 1.04	1.00 | 1.04
36	Riverton 230	0.93 | 1.03	0.91 | 1.03	0.92 | 1.04	0.95 | 1.04
37	Coal Creek 230	0.94 | 1.11	0.94 | 1.11	1.04 | 1.12	0.97 | 1.12
38	Dickinson 345	0.95 | 1.06	0.93 | 1.06	1.01 | 1.07	1.02 | 1.09
39	Drayton 230	0.97 | 1.02	0.96 | 1.02	0.97 | 1.02	0.98 | 1.01
40	Groton 345	0.81 | 1.03	0.77 | 1.01	0.89 | 1.06	0.90 | 1.04
41	Tioga 230	0.99 | 1.07	0.98 | 1.07	1.02 | 1.07	1.02 | 1.06
42	Wahpeton 115	0.91 | 1.08	0.87 | 1.07	0.92 | 1.10	0.95 | 1.09
43	Watertown 345	0.90 | 1.05	0.86 | 1.04	0.93 | 1.06	0.95 | 1.05
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 59.90%	SHERC3 / 54.72%	KING 3 / -61.79%	SHERC3 / -58.13%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	260%	220%	507%	507%
55	K22W (max +dP @ t, d-ang)	14.4@(2.73322,-5.0)	25.3@(2.79155,-9.5)	58.2@(2.76655,-32.3)	37.3@(2.58323,-20.5)
56	K22W (max -dP @ t, d-ang)	26.9@(0.85830,9.3)	33.5@(0.85830,11.9)	3.0@(0.47498,-0.2)	2.2@(0.31665,-0.1)
57	K22W (max d-ang @ t, dP)	14.6@(1.20829,-10.4)	19.5@(1.24162,-15.2)	-150.5@(20.00792,28.3)	-83.3@(20.00792,16.2)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	76% / 140%	58% / 116%	82% / 145%	108% / 185%
61	L20D at Prairie/Drayton	543% / 398%	417% / 371%	465% / 375%	340% / 421%
62	R50M / F3M	580% / 261%	535% / 248%	617% / 227%	682% / 260%
63	B10T	181%	162%	147%	196%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 2 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(0 | 1 | 1) / (0 | 0 | 0)	(0 | 1 | 1) / (0 | 1 | 1)	(0 | 0 | 0) / (0 | 0 | 0)	(0 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 1 | 1) / (1 | 5 | 4)	(1 | 1 | 0) / (1 | 5 | 5)	(1 | 1 | 1) / (1 | 5 | 3)	(1 | 1 | 1) / (1 | 5 | 3)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

TABLE 6.15 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C4XX3

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S2C4XX3-nbz	upe-so04aa.S2C4XX3-mqs	upe-so04aa.S2C4XX3-pys	upe-so04aa.S2C4XX3-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 29 2002 19:16	APR 29 2002 19:34	APR 29 2002 19:50	APR 29 2002 20:04
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3014 / 367	3014 / 367	3014 / 367	3014 / 367
10	MHEX / L20D	2170 / 321	2170 / 321	2170 / 321	2170 / 321
11	ECL-ARP / PRI-BYN	638 / 830	638 / 830	638 / 830	638 / 830
12	MWSI / MNEX	1468 / 2787	1468 / 2787	1468 / 2787	1468 / 2787
13	D602F / F601C	1769 / 1326	1769 / 1326	1769 / 1326	1769 / 1326
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	163 / 150	163 / 150	163 / 150	163 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	228 / 29	228 / 29	228 / 29	228 / 29
19	Forbes SVC / MSC	27 / 600	27 / 600	27 / 600	27 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.039 / 1.045	1.039 / 1.045	1.039 / 1.045	1.039 / 1.045
22	Roseau 500/Forbes 500	1.067 / 1.024	1.067 / 1.024	1.067 / 1.024	1.067 / 1.024
23	Chisago 500/EauClaire 345	1.026 / 1.009	1.026 / 1.009	1.026 / 1.009	1.026 / 1.009
24	Int Falls 115/Badoura 115	1.054 / 0.988	1.054 / 0.988	1.054 / 0.988	1.054 / 0.988
25	Drayton 230/Groton 345	0.997 / 1.005	0.997 / 1.005	0.997 / 1.005	0.997 / 1.005
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	151% / 248%	151% / 248%	151% / 248%	151% / 248%
28	L20D at Prairie/Drayton	999% / 526%	999% / 526%	999% / 526%	999% / 526%
29	R50M/F3M	793% / 352%	793% / 352%	793% / 352%	793% / 352%
30	B10T	343%	343%	343%	343%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.11	0.98 | 1.06	0.98 | 1.02	1.00 | 1.02
33	Boise 115	0.97 | 1.07	1.01 | 1.08	1.03 | 1.07	1.05 | 1.06
34	Dorsey 230	1.04 | 1.14	1.01 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	1.00 | 1.04	1.01 | 1.04	1.02 | 1.03
36	Riverton 230	0.89 | 1.05	0.94 | 1.03	1.00 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.96 | 1.08	0.98 | 1.07	1.00 | 1.06	1.02 | 1.04
38	Dickinson 345	0.96 | 1.08	0.98 | 1.08	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.98 | 1.06	0.97 | 1.01	0.98 | 1.02	0.99 | 1.00
40	Groton 345	0.86 | 1.06	0.91 | 1.03	0.97 | 1.00	0.99 | 1.01
41	Tioga 230	1.00 | 1.08	1.01 | 1.07	1.02 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.88 | 1.09	0.97 | 1.08	1.03 | 1.05	1.04 | 1.06
43	Watertown 345	0.91 | 1.06	0.95 | 1.05	0.99 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -38.35%	KING 3 / 2.01%	SHERC3 / 37.83%	KING 3 / 21.35%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	494%	192%	338%
55	K22W (max +dP @ t, d-ang)	145.7@(2.12491,-65.9)	65.6@(2.64989,-31.6)	0.8@(0.11666,0.2)	0.0@(0.00000,0.0)
56	K22W (max -dP @ t, d-ang)	98.7@(0.26666,10.7)	20.6@(0.33332,3.8)	30.8@(1.76659,18.6)	20.5@(2.14158,12.8)
57	K22W (max d-ang @ t, dP)	-264.2@(20.00792,52.9)	-108.5@(20.00792,22.2)	20.2@(1.30828,-14.4)	16.5@(20.00792,-11.6)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	61% / 122%	123% / 207%	147% / 241%
61	L20D at Prairie/Drayton	533% / 368%	639% / 367%	810% / 442%	999% / 483%
62	R50M / F3M	327% / 145%	550% / 243%	674% / 352%	741% / 352%
63	B10T	141%	117%	199%	274%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(0 | 0 | 0) / (0 | 2 | 0)	(0 | 0 | 0) / (0 | 1 | 0)	(0 | 0 | 0) / (0 | 0 | 0)	(0 | 0 | 0) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 5 | 1) / (1 | 5 | 2)	(1 | 1 | 0) / (1 | 5 | 4)	(1 | 1 | 1) / (1 | 1 | 1)	(1 | 1 | 1) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

TABLE 6.15 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 2 (Jamestown) - Case S2C4XX3

1	**Case No.**	9	10	11
2	**Case Name**	upe-so04aa.S2C4XX3-ce3	upe-so04aa.S2C4XX3-cf3	upe-so04aa.S2C4XX3-eb3
3	**Disturbance**	ce3	cf3	eb3
4	**Prior Outage**	None	None	None
5	**Date/Time**	APR 29 2002 20:17	APR 29 2002 20:30	JUN 07 2002 22:02
6	**Comments**			
7				
8	**Steady State Flows**			
9	NDEX / EAST BIAS	3014 / 367	3014 / 367	3014 / 367
10	MHEX / L20D	2170 / 321	2170 / 321	2170 / 321
11	ECL-ARP / PRI-BYN	638 / 830	638 / 830	638 / 830
12	MWSI / MNEX	1468 / 2787	1468 / 2787	1468 / 2787
13	D602F / F601C	1769 / 1326	1769 / 1326	1769 / 1326
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	163 / 150	163 / 150	163 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	228 / 29	228 / 29	228 / 29
19	Forbes SVC / MSC	27 / 600	27 / 600	27 / 600
20	**Steady State Vltgs**			
21	Dorsey 500/Dorsey 230	1.039 / 1.045	1.039 / 1.045	1.039 / 1.045
22	Roseau 500/Forbes 500	1.067 / 1.024	1.067 / 1.024	1.067 / 1.024
23	Chisago 500/EauClaire 345	1.026 / 1.009	1.026 / 1.009	1.026 / 1.009
24	Int Falls 115/Badoura 115	1.054 / 0.988	1.054 / 0.988	1.054 / 0.988
25	Drayton 230/Groton 345	0.997 / 1.005	0.997 / 1.005	0.997 / 1.005
26	**SS OS Relay Margins**			
27	D602F at Forbes/Dorsey	151% / 248%	151% / 248%	151% / 248%
28	L20D at Prairie/Drayton	999% / 526%	999% / 526%	999% / 526%
29	R50M/F3M	793% / 352%	793% / 352%	793% / 352%
30	B10T	343%	343%	343%
31	**Min/MaxTransientVltg**			
32	Arrowhd 230	1.00 | 1.03	1.00 | 1.03	0.98 | 1.04
33	Boise 115	1.04 | 1.06	1.04 | 1.06	1.02 | 1.07
34	Dorsey 230	1.03 | 1.05	1.03 | 1.05	1.02 | 1.06
35	Forbes 230	1.01 | 1.03	1.02 | 1.03	1.00 | 1.04
36	Riverton 230	0.98 | 1.02	0.99 | 1.02	0.95 | 1.04
37	Coal Creek 230	0.98 | 1.07	0.98 | 1.07	0.94 | 1.11
38	Dickinson 345	0.98 | 1.05	0.99 | 1.04	0.96 | 1.07
39	Drayton 230	0.98 | 1.01	0.98 | 1.00	0.96 | 1.02
40	Groton 345	0.93 | 1.01	0.93 | 1.02	0.83 | 1.03
41	Tioga 230	1.03 | 1.05	1.03 | 1.05	0.99 | 1.07
42	Wahpeton 115	0.99 | 1.06	1.00 | 1.06	0.93 | 1.08
43	Watertown 345	0.97 | 1.03	0.98 | 1.03	0.90 | 1.05
44	**Dynamic Voltage Warnings**			
45		none	none	none
46				
47				
48				
49				
50				
51				
52	Worst Case Angle Damping	SHERC3 / 54.31%	SHERC3 / 54.67%	SHERC3 / 56.73%
53	Dorsey SUVP / UdHold			
54	Forbes DC Red (DCAR)	375%	373%	266%
55	K22W (max +dP @ t, d-ang)	7.8@(2.64156,-3.4)	7.9@(2.64989,-3.1)	19.0@(2.70822,-7.3)
56	K22W (max -dP @ t, d-ang)	10.2@(0.81663,4.1)	9.6@(0.83330,4.0)	22.4@(0.84163,6.7)
57	K22W (max d-ang @ t, dP)	5.3@(1.05829,-6.2)	5.1@(1.05829,-5.6)	11.3@(1.18329,-9.0)
58	**OS Rel Trip / Marg**			
59	MH - OH			
60	D602F at Forbes/Dorsey	112% / 191%	116% / 197%	86% / 154%
61	L20D at Prairie/Drayton	999% / 466%	999% / 450%	532% / 376%
62	R50M / F3M	678% / 301%	689% / 306%	618% / 267%
63	B10T	291%	296%	216%
64	**FSCAPS (SS/Unav/Final)**			
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 1 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(0 | 0 | 0) / (0 | 0 | 0)	(0 | 0 | 0) / (0 | 0 | 0)	(0 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 1 | 1) / (1 | 4 | 4)	(1 | 1 | 1) / (1 | 3 | 3)	(1 | 1 | 1) / (1 | 5 | 4)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

Table 6.16a
Summary of Site 2 (Jamestown) Selected Alternatives

<table>
<tr><th colspan="3">ALTERNATIVE</th><th>MEETS CRITERIA ?</th><th>REQUIRES GENERATION TRIPPING ?</th></tr>
<tr><td rowspan="3">Upgrade of Bismarck-Granite Falls 345 kV+Granite Falls-Blue Lake 345 kV

+Bismarck-Leland Olds 345 kV

+Maple River-Moorhead 345 kV

+Center-Leland Olds 345 kV

+Jamestown-Jamestown 345 kV</td><td colspan="2">S2C3XX2 - With Antelope Valley-Split Rock 500 kV + Split Rock-Lakefield Jnct. 345 kV + 35% Series Compensation West of Jamestown.</td><td>Marginally</td><td>No</td></tr>
<tr><td rowspan="2">Maple River - Benton Co. 345 kV</td><td>S2C4XX1 - 35% Series Compensation West of Jamestown.</td><td>Marginally</td><td>No</td></tr>
<tr><td>S2C4XX3 - Letellier Phase Shifter + Prairie SVC</td><td>Yes</td><td>No</td></tr>
</table>

Table 6.16b
Interface Flows for Site 2 (Jamestown) Selected Alternatives

ALTERNATIVE	MHEX	G82R	LD20	D602F	R50M	NDEX	MWSI	PI-BYN	EAU-ARP
S2C3XX2	2174.4	-1.1	162.9	1839.3	173.3	3046.6	1482.5	828.8	653.7
S2C4XX1	2172.4	-12.4	173.7	1838.1	172.9	3015.5	1488.0	845.1	642.8
S2C4XX3	2170.1	-83.9	320.7	1769.8	163.6	2997.1	1470.5	831.0	639.5

Table 6.17
MUST Results Case S2C3XX2

```
FCITC Single Study

  *** MUST 4.01.07 ***  THU, MAY 02 2002  11:29 ***
      UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
      ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE2      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total 29631 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX%  S2C3XX2   %
     2  -1253.6 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1983.1 -1732.0 -0.20029         -0.18965 -1839.3 -1601.6   111   111   116      5
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     664
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.64798  0.01643   221.9   201.3
     3  -1242.3 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          80.3    65.8  0.01170          0.00591    45.8    38.5   120   120   120       0
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     441
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.22807  0.02536   151.2   119.7
    20   -840.2 L:  555 MORRIS 7 115  1911 WALDON 7 115 1         107.4    80.0  0.03266          0.01007    47.4    39.0   N/A   NONE   140    NEW
                C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5826
                  Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                           0.09998  0.22588   600.1   410.3
    21   -827.1 L:  970 ORTONVL7 115  1935 GRACEVT7 115 1         114.9   105.0  0.01191          0.00191    39.9    38.3   105   105   102      -3
                C:  503 BLAIR  4 230   910 BIGSTON4 230 1     314
                  Open   503 BLAIR  4 230   910 BIGSTON4 230 1                          -0.23806 -0.04202  -315.0  -280.2
    35   -720.7 L: 1905 BENSON 7 115  1911 WALDON 7 115 1        -103.5   -80.0 -0.03266         -0.01007   -43.5   -36.3   N/A   NONE   136    NEW
                C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5826
                  Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                          -0.09998  0.22588   600.1   437.3
   166   -591.0 L:  911 BIGSTON7 115   948 HIWY12 7 115 1         188.0   176.0  0.02031          0.00734    90.8    86.5  104   104   102      -2
                C:  503 BLAIR  4 230   910 BIGSTON4 230 1     314
                  Open   503 BLAIR  4 230   910 BIGSTON4 230 1                          -0.30865 -0.04202  -315.0  -290.1
   182   -587.3 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1          73.6    67.7  0.01016          0.00659    24.6    20.7  123   123   110      -13
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     696
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                           0.37899  0.00942   129.3   123.8
  2923   -565.9 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1839.3 -1732.0 -0.18965
                  Base Case
  5866   -494.7 L: 1905 BENSON 7 115  1946 KERKHO 7 115 1          96.2    80.0  0.03266          0.01007    36.2    31.2  N/A   NONE   120      NEW
                C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5826
                  Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                           0.09998  0.22588   600.1   488.4
  5882   -453.4 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          49.0    44.0  0.01104          0.00890    43.3    39.3  N/A   138   111      NEW
                C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5826
                  Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                           0.00946  0.22588   600.1   497.7
  5884   -448.5 L:  940 GRANTCO7 115   950 HOOT LK7 115 1        -121.9  -105.0 -0.03758         -0.01651   -61.6   -54.2  N/A   NONE   113      NEW
                C:99553 MOORHED3 345 99554 MORRIS 3 345 1    5827
                  Open 99553 MOORHED3 345 99554 MORRIS 3 345 1                          -0.09253  0.22770   650.9   548.8
  5898   -401.6 L: 1945 KERKHOT7 115  1946 KERKHO 7 115 1         -93.1   -80.0 -0.03266         -0.01007   -33.1   -29.1  N/A   NONE   116     NEW
                C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5826
                  Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                          -0.09998  0.22588   600.1   509.4
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Table 6.17 (Cont.)
MUST Results Case S2C3XX2

```
 5908   -381.5 L:  977 RAMSEY 7 115 42012 RAMSEY Y1.00 1         181.4   105.0  0.20021          0.13939   117.0    63.8  NONE  NONE   172     NEW
              C:  428 CARNGTN7 115   445 JAMESTN7 115 1     165
                Open   428 CARNGTN7 115   445 JAMESTN7 115 1                          0.68236  0.08913    94.4    60.4
 5915   -360.4 L:  435 FARGO  4 230  1637 SHEYNNE4 230 1         427.3   391.0  0.10062          0.03524   212.2   199.4  N/A   NONE  111     NEW
              C:99553 MOORHED3 345 99435 FARGO  3 345 1    5825
                Open 99553 MOORHED3 345 99435 FARGO  3 345 1                         -0.53556 -0.12206  -401.7  -357.7
 5919   -357.3 L:  428 CARNGTN7 115   445 JAMESTN7 115 1         138.7    88.0  0.14197          0.08913    94.4    62.5  NONE  NONE  158     NEW
              C:  976 DEVILSE7 115   977 RAMSEY 7 115 1     831
                Open   976 DEVILSE7 115   977 RAMSEY 7 115 1                          0.37908  0.13939   117.0    67.2
 5925   -340.7 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -71.1   -67.7 -0.01016         -0.00659   -22.1   -19.9   119   119   107     -12
              C:  804 BAKER  4 230   810 BOWMAN 4 230 1     696
                Open   804 BAKER  4 230   810 BOWMAN 4 230 1                         -0.37899  0.00942   129.3   126.1
 5927   -336.0 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1795.7  1732.0  0.18965
                Base Case
 5928   -336.0 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1795.7 -1732.0 -0.18965
                Base Case
 5930   -296.3 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -80.5   -77.0 -0.01170         -0.00591   -46.0   -44.2   112   112   112       0
              C:  550 GRANITF4 230  1516 WILLMAR4 230 1     441
                Open   550 GRANITF4 230  1516 WILLMAR4 230 1                         -0.22807  0.02536   151.2   143.7
 5934   -272.3 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -116.1  -106.0 -0.03693         -0.02093   -79.0   -73.3   115   115   121       6
              C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     954
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          0.20986 -0.07627  -176.7  -155.9
 5936   -246.6 L:  976 DEVILSE7 115   977 RAMSEY 7 115 1         181.4   132.0  0.20021          0.13939   117.0    82.6  NONE  NONE   137(N/C)  NEW
              C:  428 CARNGTN7 115   445 JAMESTN7 115 1     165
                Open   428 CARNGTN7 115   445 JAMESTN7 115 1                          0.68236  0.08913    94.4    72.4
 5939   -236.6 L:  977 RAMSEY 7 115 42012 RAMSEY Y1.00 1         117.0    84.0  0.13939
                Base Case
 5940   -231.1 L: 1512 RAMSEY 4 230 42012 RAMSEY Y1.00 1        -116.2   -84.0 -0.13939
                Base Case
 5948   -197.2 L:  432 EDGELEY7 115   433 EDGELEY869.0 1          28.6    25.0  0.01848          0.00833    15.0    13.4  NONE  NONE  112     NEW
              C:  432 EDGELEY7 115   534 ORDWAY 7 115 1     179
                Open   432 EDGELEY7 115   534 ORDWAY 7 115 1                          0.14210  0.07138    95.8    81.7
 5951   -187.8 L:  705 DRAYTON7 115   992 HENSEL 7 115 1         -99.8   -81.0 -0.10000         -0.10000   -83.8   -65.0  NONE  NONE   116     NEW
              C:  992 HENSEL 7 115 79851 HENSEL Y 115 1     850
                Open   992 HENSEL 7 115 79851 HENSEL Y 115 1                         -1.00000  0.00000    16.0    16.0
 5952   -183.6 L:  432 EDGELEY7 115   534 ORDWAY 7 115 1         129.6   116.0  0.07415          0.07138    95.8    82.7  NONE  NONE   111     NEW
              C:  605 LELANDO3 345   660 GROTON 3 345 1     552
                Open   605 LELANDO3 345   660 GROTON 3 345 1                          0.10047  0.02762   336.7   331.6
 5954   -172.2 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1939.5  1905.0  0.20029          0.18965  1795.7  1763.1    98    98   102       4
              C:  753 RUNNING4 230  1327 SHANNON4 230 1     664
                Open   753 RUNNING4 230  1327 SHANNON4 230 1                          0.64798  0.01643   221.9   219.1
 5955   -161.4 L:  428 CARNGTN7 115   445 JAMESTN7 115 1          94.4    80.0  0.08913
                Base Case
 5960   -146.5 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          93.4    88.0  0.03693          0.02093    56.3    53.3  106   106   113     7
              C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     954
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                         -0.20986 -0.07627  -176.7  -165.5
 6034    -98.0 L:  705 DRAYTON7 115   992 HENSEL 7 115 1         -83.8   -74.0 -0.10000
                Base Case
 6124    -89.1 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1          68.6    67.7  0.01016          0.00659    24.6    24.0  115   123   102    -13
              C:  810 BOWMAN 4 230   847 HETINGR4 230 1     702
                Open   810 BOWMAN 4 230   847 HETINGR4 230 1                          0.37899  0.00942   116.0   115.2
29597    -23.7 L:  432 EDGELEY7 115   534 ORDWAY 7 115 1         117.9   116.0  0.07910          0.07138    95.8    94.1  N/A   NONE   102   NEW
              C:99553 MOORHED3 345 99554 MORRIS 3 345 1    5827
                Open 99553 MOORHED3 345 99554 MORRIS 3 345 1                          0.03392  0.22770   650.9   645.5
```

Table 6.17 (Cont.)
MUST Results Case S2C4XX1

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FCITC Single Study

  *** MUST 4.01.07 ***  THU, MAY 02 2002  11:59 ***
      UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
      ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE2      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total 29612 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final    CNT%  MAX% S2C4XX1   %
     2  -1358.4 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1980.9 -1732.0 -0.18324         -0.17352 -1838.1 -1602.4   111   111   102     -9
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     666
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.64419  0.01509   221.7   201.2
    11  -1004.2 L:  970 ORTONVL7 115  1935 GRACEVT7 115 1         117.5   105.0  0.01242          0.00430    45.3    41.0  105   105   105    0
                C:  503 BLAIR  4 230   910 BIGSTON4 230 1     314
                  Open   503 BLAIR  4 230   910 BIGSTON4 230 1                          -0.23802 -0.03413  -303.3  -269.0
    13   -997.8 L:  916 BUFFALO3 345   954 JAMESTN3 345 1        -990.0  -792.0 -0.19849         -0.12594  -632.0  -506.4  N/A   NONE   124   NEW
                C:99444 JAMESTN3 345 99435 FARGO  3 345 1    5823
                  Open 99444 JAMESTN3 345 99435 FARGO  3 345 1                          -0.59504  0.12192   601.7   480.0
    15   -972.0 L:  435 FARGO  4 230  1637 SHEYNNE4 230 1         509.0   391.0  0.12145          0.03628   232.2   196.9  N/A   NONE   135   NEW
                C:99553 MOORHED3 345 99435 FARGO  3 345 1    5824
                  Open 99553 MOORHED3 345 99435 FARGO  3 345 1                          -0.53475 -0.15927  -517.7  -362.9
    16   -941.9 L:  792 MAPLE R3 345   916 BUFFALO3 345 1        -979.0  -792.0 -0.19849         -0.12594  -620.9  -502.3  N/A   NONE   124   NEW
                C:99444 JAMESTN3 345 99435 FARGO  3 345 1    5823
                  Open 99444 JAMESTN3 345 99435 FARGO  3 345 1                          -0.59504  0.12192   601.7   486.8
    60   -720.9 L:  911 BIGSTON7 115   948 HIWY12 7 115 1         190.1   176.0  0.01953          0.00901    96.6    90.1  104   104    102   -2
                C:  503 BLAIR  4 230   910 BIGSTON4 230 1     314
                  Open   503 BLAIR  4 230   910 BIGSTON4 230 1                          -0.30828 -0.03413  -303.3  -278.7
   306   -624.1 L:  555 MORRIS 7 115  1911 WALDON 7 115 1          94.2    80.0  0.02273          0.00755    45.4    40.7   N/A  NONE   123     NEW
                C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5825
                  Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                           0.08963  0.16934   544.3   438.6
  3009   -611.6 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1838.1 -1732.0 -0.17352
                  Base Case
  5863   -545.3 L:  555 MORRIS 7 115  1935 GRACEVT7 115 1        -111.8  -105.0 -0.01242         -0.00430   -39.6   -37.2    96   96   102      6
                C:  503 BLAIR  4 230   910 BIGSTON4 230 1     314
                  Open   503 BLAIR  4 230   910 BIGSTON4 230 1                           0.23802 -0.03413  -303.3  -284.7
  5889   -454.5 L: 1905 BENSON 7 115  1911 WALDON 7 115 1         -90.3   -80.0 -0.02273         -0.00755   -41.5   -38.1   N/A  NONE   119     NEW
                C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5825
                  Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                          -0.08963  0.16934   544.3   467.3
  5905   -395.2 L:  977 RAMSEY 7 115 42012 RAMSEY Y1.00 1         184.4   105.0  0.20096          0.13916   117.4    62.4   NONE  NONE  175     NEW
                C:  428 CARNGTN7 115   445 JAMESTN7 115 1     165
                  Open   428 CARNGTN7 115   445 JAMESTN7 115 1                           0.68224  0.09059    98.3    62.5
  5907   -391.4 L: 1512 RAMSEY 4 230 42012 RAMSEY Y1.00 1        -183.7  -105.0 -0.20096         -0.13916  -116.6   -62.1   NONE  NONE  175     NEW
                C:  428 CARNGTN7 115   445 JAMESTN7 115 1     165
                  Open   428 CARNGTN7 115   445 JAMESTN7 115 1                          -0.68224  0.09059    98.3    62.8
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Table 6.17 (Cont.)
MUST Results Case S2C4XX1

```
 5913   -382.2 L:  428 CARNGTN7 115   445 JAMESTN7 115 1         142.8    88.0  0.14335          0.09059    98.3    63.7   NONE  NONE  162(N/C)  NEW
              C:  976 DEVILSE7 115   977 RAMSEY 7 115 1     834
                Open   976 DEVILSE7 115   977 RAMSEY 7 115 1                           0.37914  0.13916   117.4    64.2
 5918   -360.6 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1794.6  1732.0  0.17352
                Base Case
 5919   -360.5 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1794.6 -1732.0 -0.17352
                Base Case
 5927   -260.8 L:  976 DEVILSE7 115   977 RAMSEY 7 115 1         184.4   132.0  0.20096          0.13916   117.4    81.1  NONE  NONE  140(N/C) NEW
              C:  428 CARNGTN7 115   445 JAMESTN7 115 1     165
                Open   428 CARNGTN7 115   445 JAMESTN7 115 1                           0.68224  0.09059    98.3    74.7
 5932   -239.7 L:  977 RAMSEY 7 115 42012 RAMSEY Y1.00 1         117.4    84.0  0.13916
                Base Case
 5933   -234.2 L: 1512 RAMSEY 4 230 42012 RAMSEY Y1.00 1        -116.6   -84.0 -0.13916
                Base Case
 5937   -202.0 L:  428 CARNGTN7 115   445 JAMESTN7 115 1          98.3    80.0  0.09059
                Base Case
 5939   -194.2 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          46.1    44.0  0.01057          0.00700    42.3    40.9   107  138    108      1
              C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     970
                Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                           0.05449  0.06557    69.5    56.7
 5941   -190.1 L:  432 EDGELEY7 115   433 EDGELEY869.0 1          28.4    25.0  0.01788          0.00827    15.4    13.8  NONE  NONE   111      NEW
              C:  432 EDGELEY7 115   534 ORDWAY 7 115 1     179
                Open   432 EDGELEY7 115   534 ORDWAY 7 115 1                           0.14191  0.06774    91.6    78.7
 5942   -187.8 L:  705 DRAYTON7 115   992 HENSEL 7 115 1         -99.8   -81.0 -0.10000         -0.10000   -83.8   -65.0  NONE  NONE   117      NEW
              C:  992 HENSEL 7 115 79851 HENSEL Y 115 1     853
                Open   992 HENSEL 7 115 79851 HENSEL Y 115 1                          -1.00000  0.00000    16.0    16.0
 5943   -185.5 L:  432 EDGELEY7 115   534 ORDWAY 7 115 1         129.0   116.0  0.07029          0.06774    91.6    79.0  NONE  NONE   111(N/C) NEW
              C:  605 LELANDO3 345   660 GROTON 3 345 1     553
                Open   605 LELANDO3 345   660 GROTON 3 345 1                           0.10203  0.02499   367.4   362.7
 5955   -153.8 L:  940 GRANTCO7 115   950 HOOT LK7 115 1        -109.4  -105.0 -0.02875         -0.01534   -62.1   -59.7  N/A   NONE   102    NEW
              C:99553 MOORHED3 345 99554 MORRIS 3 345 1    5826
                Open 99553 MOORHED3 345 99554 MORRIS 3 345 1                          -0.08165  0.16418   579.8   554.5
 5978   -132.6 L: 1905 BENSON 7 115  1946 KERKHO 7 115 1          83.0    80.0  0.02273          0.00755    34.2    33.2   N/A   NONE   102   NEW
              C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5825
                Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                           0.08963  0.16934   544.3   521.8
11875    -97.9 L:  705 DRAYTON7 115   992 HENSEL 7 115 1         -83.8   -74.0 -0.10000
                Base Case
23662    -59.6 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -107.7  -106.0 -0.02861         -0.01614   -74.9   -74.0  115   115   102   -13
              C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     957
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.20411 -0.06109  -160.7  -157.0
23670    -35.6 L:  916 BUFFALO3 345   954 JAMESTN3 345 1        -798.3  -792.0 -0.17709         -0.12594  -632.0  -627.5  NONE   NONE  125   NEW
              C:99553 MOORHED3 345 99435 FARGO  3 345 1    5824
                Open 99553 MOORHED3 345 99435 FARGO  3 345 1                           0.32115 -0.15927  -517.7  -512.1  NONE   NONE  101   NEW
29592    -13.1 L:  423 BARLOW 7 115   428 CARNGTN7 115 1         -89.3   -88.0 -0.10000         -0.00941     9.0     9.1
              C:  428 CARNGTN7 115   445 JAMESTN7 115 1     165
                Open   428 CARNGTN7 115   445 JAMESTN7 115 1                          -1.00000  0.09059    98.3    97.1
29594    -10.3 L:  720 SWEETWA7 115   976 DEVILSE7 115 1          81.0    80.0  0.10000
                Base Case
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Table 6.17 (Cont.)
MUST Results Case S2C4XX3

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FCITC Single Study

 *** MUST 4.01.07 ***  THU, MAY 02 2002  12:33 ***
     UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
     ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
Subsys.File C:\WapaStudies-Seshu\mapp.sys
Monit.File  C:\WapaStudies-Seshu\mapp.mon
Contin.File C:\WapaStudies-Seshu\mapp.con
Exclud.File C:\WapaStudies-Seshu\excldcont.exc

Study transfer. From WAPASITE2      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


 Violations report ordered by transfer capability. Total 35547 violations


    N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX% S2C4XX3   %
    1  -2398.0 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1965.3 -1732.0 -0.09729         -0.09729 -1769.8 -1536.5  NONE   111   113     NEW
                C: 3458 LETELER4 230  9458 LETLRPHS     1    2942
                  Open  3458 LETELER4 230  9458 LETLRPHS     1                           0.54975  0.00000  -355.6  -355.6
    3  -1780.9 L:  515 HURON  7 115   528 WOONSKT7 115 1         109.8    88.0  0.01225          0.00891    54.4    38.5   119   119   122      3
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     337
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25340  0.01321   218.7   195.2
    5  -1521.9 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1          86.2    67.7  0.01215          0.00780    32.2    20.3   123   123   128      5
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     699
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                           0.37997  0.01145   142.1   124.6
    9  -1315.8 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -83.7   -67.7 -0.01215         -0.00780   -29.7   -19.4   119   119   124      5
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     699
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                          -0.37997  0.01145   142.1   127.0
   10  -1311.0 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          80.8    65.8  0.01148          0.00588    46.0    38.3   120   120   120      0
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     442
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.22892  0.02448   152.1   120.0
   16  -1131.4 L:  528 WOONSKT7 115   623 STORLA 7 115 1         101.9    88.0  0.01225          0.00891    46.4    36.4   112  112   115      3
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     337
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25340  0.01321   218.7   203.8
   17  -1125.3 L:  970 ORTONVL7 115  1935 GRACEVT7 115 1         119.6   105.0  0.01301          0.00320    44.7    41.1   105  105   107      2
                C:  503 BLAIR  4 230   910 BIGSTON4 230 1     314
                  Open   503 BLAIR  4 230   910 BIGSTON4 230 1                          -0.23604 -0.04156  -317.4  -270.7
   21  -1086.8 L:  705 DRAYTON7 115   930 DONALDS7 115 1         238.0   171.0  0.06167          0.03486   131.1    93.3    81    81  139(N/C) 58
                C:  752 DRAYTON4 230   755 PRAIRIE4 230 1     661
                  Open   752 DRAYTON4 230   755 PRAIRIE4 230 1                           0.41154  0.06514   259.7   188.9
   22  -1061.9 L:  435 FARGO  4 230  1637 SHEYNNE4 230 1         533.8   391.0  0.13445          0.05010   275.7   222.5   N/A  NONE  138     NEW
                C:99553 MOORHED3 345 99435 FARGO  3 345 1    5825
                  Open 99553 MOORHED3 345 99435 FARGO  3 345 1                          -0.61564 -0.13701  -419.2  -273.7
   24   -926.7 L:  714 WARSAW 7 115   930 DONALDS7 115 1        -124.1   -90.4 -0.03633         -0.01782   -50.3   -33.8    69    69  137      68
                C:  752 DRAYTON4 230   755 PRAIRIE4 230 1     661
                  Open   752 DRAYTON4 230   755 PRAIRIE4 230 1                          -0.28406  0.06514   259.7   199.3
   25   -903.2 L:  911 BIGSTON7 115   948 HIWY12 7 115 1         195.7   176.0  0.02181          0.00902    98.1    89.9   104   104  106      2
                C:  503 BLAIR  4 230   910 BIGSTON4 230 1     314
                  Open   503 BLAIR  4 230   910 BIGSTON4 230 1                          -0.30758 -0.04156  -317.4  -279.9
   32   -771.7 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         360.6   352.0  0.01120          0.00388   133.4   130.5   101   101  102      1
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     585
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.60111  0.01219   378.0   368.6
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Table 6.17 (Cont.)
MUST Results Case S2C4XX3

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   38   -690.6 L:  555 MORRIS 7 115  1935 GRACEVT7 115 1        -114.0  -105.0 -0.01301         -0.00320   -39.1   -36.9   96    96     104     8
               C:  503 BLAIR  4 230   910 BIGSTON4 230 1     314
                 Open   503 BLAIR  4 230   910 BIGSTON4 230 1                           0.23604 -0.04156  -317.4  -288.7
   69   -609.8 L:  555 MORRIS 7 115  1911 WALDON 7 115 1          96.2    80.0  0.02652          0.01025    49.6    43.4 N/A  NONE  120(N/C)  NEW
               C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5826
                 Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                           0.10816  0.15044   430.3   338.6
  146   -460.9 L: 1905 BENSON 7 115  1911 WALDON 7 115 1         -92.2   -80.0 -0.02652         -0.01025   -45.7   -41.0   N/A   NONE 115(N/C)  NEW
               C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5826
                 Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                          -0.10816  0.15044   430.3   361.0
  187   -437.4 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          49.0    44.0  0.01153          0.00914    44.2    40.2 N/A   138   111    -27
               C:  792 MAPLE R3 345  1667 BENTON 3 345 1     694
                 Open   792 MAPLE R3 345  1667 BENTON 3 345 1                           0.01269  0.18898   378.3   295.6
 1316   -389.6 L:  977 RAMSEY 7 115 42012 RAMSEY Y1.00 1         180.7   105.0  0.19438          0.13256   115.2    63.6 NONE  NONE  172    NEW
               C:  428 CARNGTN7 115   445 JAMESTN7 115 1     165
                 Open   428 CARNGTN7 115   445 JAMESTN7 115 1                           0.68200  0.09065    96.0    60.7
 2776   -388.6 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1769.8 -1732.0 -0.09729
                 Base Case
 5731   -372.7 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -120.1  -106.0 -0.03779         -0.02131   -81.2   -73.2   115   115   125    10
               C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     957
                 Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.20756 -0.07940  -187.6  -158.0
 5744   -370.3 L:  432 EDGELEY7 115   534 ORDWAY 7 115 1         144.4   116.0  0.07662          0.07286   103.4    76.4    70     70  125    55
               C:  605 LELANDO3 345   660 GROTON 3 345 1     553
                 Open   605 LELANDO3 345   660 GROTON 3 345 1                           0.10450  0.03594   392.3   379.0
 5764   -367.2 L:  428 CARNGTN7 115   445 JAMESTN7 115 1         139.7    88.0  0.14091          0.09065    96.0    62.8   NONE  NONE  158    NEW
               C:  976 DEVILSE7 115   977 RAMSEY 7 115 1     834
                 Open   976 DEVILSE7 115   977 RAMSEY 7 115 1                           0.37913  0.13256   115.3    66.6
 5810   -347.0 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -81.0   -77.0 -0.01148         -0.00588   -46.2   -44.1   112   112   112     0
               C:  550 GRANITF4 230  1516 WILLMAR4 230 1     442
                 Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.22892  0.02448   152.1   143.6
 5832   -337.3 L:  432 EDGELEY7 115   433 EDGELEY869.0 1          31.4    25.0  0.01910          0.00872    16.7    13.8 NONE NONE 126(N/C) NEW
               C:  432 EDGELEY7 115   534 ORDWAY 7 115 1     179
                 Open   432 EDGELEY7 115   534 ORDWAY 7 115 1                           0.14238  0.07286   103.4    78.8
 5852   -310.6 L:  906 BAGLEY 7 115   990 WINGER 7 115 1        -113.6  -105.0 -0.02761         -0.01376   -54.1   -49.8    93    93   112    19
               C:  758 WINGER 4 230   986 WILTON 4 230 1     685
                 Open   758 WINGER 4 230   986 WILTON 4 230 1                          -0.52665  0.02629   112.9   104.7
 5893   -250.8 L:  976 DEVILSE7 115   977 RAMSEY 7 115 1         180.8   132.0  0.19438          0.13256   115.3    82.0   NONE  NONE   136   NEW
               C:  428 CARNGTN7 115   445 JAMESTN7 115 1     165
                 Open   428 CARNGTN7 115   445 JAMESTN7 115 1                           0.68200  0.09065    96.0    73.3
 5895   -246.9 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          97.3    88.0  0.03779          0.02131    58.4    53.1   106    106   118     8
               C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     957
                 Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.20756 -0.07940  -187.6  -168.0
 5897   -235.7 L:  977 RAMSEY 7 115 42012 RAMSEY Y1.00 1         115.2    84.0  0.13256
                 Base Case
 5898   -230.2 L: 1512 RAMSEY 4 230 42012 RAMSEY Y1.00 1        -114.5   -84.0 -0.13256
                 Base Case
 5905   -215.4 L:  940 GRANTCO7 115   950 HOOT LK7 115 1        -112.1  -105.0 -0.03282         -0.01812   -66.2   -62.3   N/A  NONE   107(N/C) NEW
               C:99553 MOORHED3 345 99554 MORRIS 3 345 1    5827
                 Open 99553 MOORHED3 345 99554 MORRIS 3 345 1                          -0.09861  0.14915   465.6   433.5
 5908   -211.6 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1925.6  1905.0  0.09729          0.09729  1730.1  1709.5   N/A  98    101(N/C)  3
               C: 3458 LETELER4 230  9458 LETLRPHS     1    2942
                 Open  3458 LETELER4 230  9458 LETLRPHS     1                          -0.54975  0.00000  -355.6  -355.6
 5920   -187.8 L:  705 DRAYTON7 115   992 HENSEL 7 115 1         -99.8   -81.0 -0.10000         -0.10000   -83.8   -65.0   NONE  NONE   116    NEW
               C:  992 HENSEL 7 115 79851 HENSEL Y 115 1     853
                 Open   992 HENSEL 7 115 79851 HENSEL Y 115 1                          -1.00000  0.00000    16.0    16.0
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Table 6.17 (Cont.)
MUST Results Case S2C4XX3

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 5921   -180.3 L: 1905 BENSON 7 115  1946 KERKHO 7 115 1          84.8    80.0  0.02652          0.01025    38.2    36.4   N/A   NONE   106    NEW
               C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5826
                 Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                           0.10816  0.15044   430.3   403.2
 5922   -176.9 L:  428 CARNGTN7 115   445 JAMESTN7 115 1          96.0    80.0  0.09065
                 Base Case
 5971   -112.4 L:  551 GRANITF7 115   920 CANBY  7 115 1        -107.4  -105.0 -0.02153         -0.01357   -46.7   -45.1   95   95  105    10
               C:  503 BLAIR  4 230   910 BIGSTON4 230 1     314
                 Open   503 BLAIR  4 230   910 BIGSTON4 230 1                           0.19144 -0.04156  -317.4  -312.8   N/A NONE 102   NEW
23604    -63.3 L: 1945 KERKHOT7 115  1946 KERKHO 7 115 1         -81.7   -80.0 -0.02652         -0.01025   -35.1   -34.5
               C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5826
                 Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                          -0.10816  0.15044   430.3   420.8
23624    -59.3 L:  720 SWEETWA7 115   976 DEVILSE7 115 1          85.9    80.0  0.10000
                 Base Case
```

Table 6.18
Summary of Contingency Analysis Results
Case S2C3XX2

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	116(+5)	U
916	BUFFALO	345	954	JAMESTN	345	99444	JAMESTN	345	99435	FARGO	345	792	1560	124(NEW)	U
970	ORTONVL	115	1935	GRACEVT	115	503	BLAIR	230	910	BIGSTON	230	105	96	102(-3)	NONE
555	MORRIS	115	1911	WALDON	115	99554	MORRIS	345	99550	GRANFLS	345	80	149	140 (NEW)	U
435	FARGO	230	1637	SHEYNNE4	230	99553	MOORHED	345	99435	FARGO	345	391	391	111(NEW)	R
792	MAPLE	345	916	BUFFALO	345	99444	JAMESTN	345	99435	FARGO	345	792	1560	124(NEW)	U
555	MORRIS	115	1935	GRACEVT	115	503	BLAIR	230	910	BIGSTON	230	105	96	102(+6)	R
1905	BENSON	115	1911	WALDON	115	99554	MORRIS	345	99550	GRANFLS	345	80	149	136(NEW)	U
911	BIGSTON	115	948	HIWY	115	503	BLAIR	230	910	BIGSTON	230	176	160	102(-2)	NONE
1353	RIVERTN	115	44250	RIVTON	69	99554	MORRIS	345	99550	GRANFLS	345	44	56	111(-27)	NONE
418	DKSN-ND7	115	870	N ENGLN7	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	110(-13)	NONE
848	HETINGR	115	870	N ENGLN	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	107(-12)	NONE
428	CARNGTN	115	445	JAMESTN	115	976	DEVILSE	115	977	RAMSEY	115	88	128	158(NEW)	R
976	DEVILSE	115	977	RAMSEY	115	428	CARNGTN	115	445	JAMESTN	115	132	142	137(NEW)	R
705	DRAYTON	115	992	HENSEL	115	992	HENSEL	115	79851	HELSEL Y	115	81	74	116(NEW)	R
976	DEVILSE	115	977	RAMSEY	115	428	CARNGTN	115	445	JAMESTN	115	132	142	130(NEW)	R
432	EDGELEY	115	433	EDGELEY8	69	432	EDGELEY	115	534	ORDWAY	115	25	20	112(NEW)	R
940	GRANTCO	115	950	HOOTLK	115	99553	MOORHED	345	99554	MORRIS	345	105	96	113(NEW)	R
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	121(+6)	R
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	113(+7)	U
1905	BENSON	115	1946	KERKHO	115	99554	MORRIS	345	99550	GRANFLS	345	80	149	120(NEW)	U
1517	WILMAR	115	1946	KERKHO	115	550	GRANIT4	230	1516	WILMAR	230	77	100	112(0)	NONE
432	EDGELEY	115	534	ORDWAY	115	605	LELANDO	345	660	GROTON	345	116	116	111(NEW)	R
1945	KERKHOT	115	1946	KERKHO	115	99554	MORRIS	345	99550	GRANFLS	345	80	102	116(NEW)	U
977	RAMSEY	115	42012	RAMSEY Y	1	428	CARNGTN	115	445	JAMESTN	115	105	84	172(NEW)	R
1677	ROSEAUN2	500	1678	ROSEAUS	500	753	RUNNING	230	1327	SHANNON	230	1905	1732	102(4)	R

Table 6.18 (Cont.)
Summary of Contingency Analysis Results
Case S2C4XX1

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	3458	LETELER4	230	9458	LETTLRPHS	230	1732	2094	102(-9)	NONE
916	BUFFALO	345	954	JAMESTN	345	99444	JAMESTN	345	99435	FARGO	345	792	1560	124(NEW)	U
970	ORTONVL	115	1935	GRACEVT	115	503	BLAIR	230	910	BIGSTON	230	105	96	105(0)	NONE
555	MORRIS	115	1911	WALDON	115	99554	MORRIS	345	99550	GRANFLS	345	80	149	123 (NEW)	U
435	FARGO	230	1637	SHEYNNE4	230	99553	MOORHED	345	99435	FARGO	345	391	391	135(N/A)	R
792	MAPLE	345	916	BUFFALO	345	99444	JAMESTN	345	99435	FARGO	345	792	1560	124(NEW)	U
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	108(+1)	NONE
															PRE-EXISTING MAX 138%
555	MORRIS	115	1935	GRACEVT	115	503	BLAIR	230	910	BIGSTON	230	105	96	102(+6)	R
1905	BENSON	115	1911	WALDON	115	99554	MORRIS	345	99550	GRANFLS	345	80	149	119(NEW)	U
428	CARNGTN	115	445	JAMESTN	115	976	DEVILSE	115	977	RAMSEY	115	88	128	162(NEW)	R
432	EDGELEY	115	433	EDGELEY8	69	432	EDGELEY	115	534	ORDWAY	115	25	20	111(NEW)	RT
705	DRAYTON	115	992	HENSEL	115	992	HENSEL	115	79851	HELSEL Y	115	81	74	117(NEW)	R
976	DEVILSE	115	977	RAMSEY	115	428	CARNGTN	115	445	JAMESTN	115	132	142	140(NEW)	R
432	EDGELEY	115	534	ORDWAY	115	605	LELANDO	345	660	GROTON	345	116	116	111(NEW)	R
940	GRANTCO	115	950	HOOTLK	115	99553	MOORHED	345	99554	MORRIS	345	105	96	102(NEW)	R
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	102(-13)	NONE
977	RAMSEY	115	42012	RAMSEY Y	1	428	CARNGTN	115	445	JAMESTN	115	105	84	175(NEW)	R
1512	RAMSEY	230	42012	RAMSEY Y	1	428	CARNGTN	115	445	JAMESTN	115	105	84	175(NEW)	R
1905	BENSON	115	1946	KERKHO	115	99554	MORRIS	345	99550	GRANFLS	345	80	149	102(NEW)	U

Table 6.18 (Cont.)
Summary of Contingency Analysis Results
Case S2C4XX3

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	3458	LETELER4	230	9458	LETTLRPHS	230	1732	2094	113(+2)	U
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	122 (+3)	U
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	102(+1)	U
1353	RIVERTN	115	44250	RIVTON	69	792	MAPLE R3	345	1667	BENTON	345	44	56	111(NEW)	NONE (PRE-EXISTING MAX 138%
435	FARGO	230	1637	SHEYNNE4	230	99553	MOORHED	345	99435	FARGO	345	391	391	138(NEW)	R
528	WOONSTK	115	623	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	115(+3)	U
1905	BENSON	115	1911	WALDON	115	99554	MORRIS	345	99550	GRANFLS	345	80	149	115(NEW)	U
970	ORTONVL	115	1935	GRACEVT	115	503	BLAIR	230	910	BIGSTON	230	105	96	107(+2)	R
705	DRAYTON	115	930	DONALDS	115	752	DRAYTON	230	755	PRAIRIE	230	171	199	139(+58)	R
714	WARSAW	115	930	DONALDS	115	752	DRAYTON	230	755	PRAIRIE	230	90.4	82.2	137(+68)	R
911	BIGSTON	115	948	HIWY	115	503	BLAIR	230	910	BIGSTON	230	176	160	106(+2)	R
555	MORRIS	115	1935	GRACEVT	115	503	BLAIR	230	910	BIGSTON	230	105	96	104(+8)	R
432	EDGELEY	115	433	EDGELEY8	69	432	EDGELEY	115	534	ORDWAY	115	25	20	126(NEW)	R
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	110(+4)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	125(+10)	R
432	EDGELEY	115	534	ORDWAY	115	605	LELANDO	345	660	GROTON	345	116	116	125(NEW)	R
428	CARNGTN	115	445	JAMESTN	115	976	DEVILSE	115	977	RAMSEY	115	88	128	158(NEW)	R
906	BAGLEY	115	990	WINGER	115	758	WINGER	230	986	WILTON	230	105	96	112(+19)	R
976	DEVILSE	115	977	RAMSEY	115	428	CARNGTN	115	445	JAMESTN	115	132	142	136(NEW)	R
977	RAMSEY	115	42012	RAMSEY Y	1	428	CARNGTN	115	445	JAMESTN	115	105	84	172(NEW)	R
940	GRANTCO	115	950	HOOTLK	115	99553	MOORHED	345	99554	MORRIS	345	105	96	107(NEW)	R
1905	BENSON	115	1946	KERKHO	115	99554	MORRIS	345	99550	GRANFLS	345	80	149	106(NEW)	U
555	MORRIS	115	1911	WALDON	115	99554	MORRIS	345	99550	GRANFLS	345	80	149	120(NEW)	U
848	HETINGR	115	870	N ENGLN	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	124(+5)	R
418	DKSN-ND7	115	870	N ENGLN7	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	128(+5)	R

Table 6.18 (Cont.)
Summary of Contingency Analysis Results
Case S2C4XX3

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	116(0)	NONE
1677	ROSEAUN2	500	1678	ROSEAUS	500	3458	LETELER	230	9458	LETLRPHS	230	1905	1732	101(+3)	R
551	GRANITF	115	920	CANBY	115	503	BLAIR	230	910	BIGSTON	230	105	96	105(+10)	R
1945	KERKHOT	115	1946	KERKHO	115	99554	MORRIS	345	99550	GRANFLS	345	80	102	102(NEW)	U

Table 6.21
Constrained Interface Impact Analyses - Case S2C3XX2

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   299.5 DIFF:   -14.5%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   336.7 DIFF:   -16.6%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:     0.0 DIFF:  -100.0%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   315.0 DIFF:    11.8%
0554  --------  - 0550  GRANITF4   BASE:   106.1 CHNG:     0.0 DIFF:  -100.0%
99554 MORRIS 3  - 99550 GRANFLS3   BASE:     0.0 CHNG:   590.1 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   170.6 DIFF:     3.7%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    94.7 DIFF:    -2.5%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   178.0 DIFF:    13.7%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   125.4 DIFF:   -10.3%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    36.3 DIFF:    42.6%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    56.3 DIFF:     7.8%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    58.5 DIFF:    16.0%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    95.8 DIFF:   167.8%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    42.2 DIFF:    41.4%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    42.0 DIFF:     4.7%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    33.1 DIFF:    17.0%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -162.9 DIFF:   -33.7%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  A.VALLEY  - 5634  SPL ROCK   BASE:     0.0 CHNG:   734.2 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:     1.1 DIFF:   -67.5%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  3046.6 DIFF:    46.4%
                                                 DIFF:   966.2   DF:    96.6%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   173.3 DIFF:     7.4%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1839.3 DIFF:     4.0%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   162.9 DIFF:   -33.7%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:    -1.1 DIFF:   -67.5%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2174.4 DIFF:     0.1%
                                                 DIFF:     1.4   DF:     0.1%
*******************************************************************************
```

Table 6.21 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -169.9 DIFF:     7.3%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1795.7 DIFF:     3.9%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -160.9 DIFF:   -33.3%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:     1.1 DIFF:   -67.4%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2125.4 DIFF:     0.0%
                                                 DIFF:    -0.2   DF:     0.0%
******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   152.9 DIFF:    -0.9%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   153.4 DIFF:    -0.9%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   157.8 DIFF:    -0.9%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   352.9 DIFF:    -1.3%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   423.4 DIFF:    -1.3%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   436.3 DIFF:     0.4%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1676.6 DIFF:    -0.8%
                                                 DIFF:   -12.7   DF:    -1.3%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   436.3 DIFF:     0.4%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   436.3 DIFF:     0.4%
                                                 DIFF:     1.8   DF:     0.2%
******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   242.6 DIFF:    -4.4%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   100.6 DIFF:   -10.1%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   466.4 DIFF:    -4.2%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   809.6 DIFF:    -5.0%
                                                 DIFF:   -42.9   DF:    -4.3%
******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   310.6 DIFF:     9.8%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   262.7 DIFF:     7.7%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   573.2 DIFF:     8.8%
                                                 DIFF:    46.3   DF:     4.6%
******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   175.5 DIFF:    22.7%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   317.9 DIFF:    12.4%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:   101.3 DIFF:     6.6%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   594.7 DIFF:    14.2%
                                                 DIFF:    73.7   DF:     7.4%
******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   653.7 DIFF:     1.0%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   653.7 DIFF:     1.0%
                                                 DIFF:     6.2   DF:     0.6%
******************************************************************************
```

Table 6.21 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   828.8 DIFF:    -1.2%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   828.8 DIFF:    -1.2%
                                                 DIFF:    -9.9   DF:    -1.0%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   800.2 DIFF:    -0.3%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   828.8 DIFF:    -1.2%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   222.1 DIFF:   -41.7%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   168.4 DIFF:    -1.2%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   110.4 DIFF:    -0.6%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    57.6 DIFF:   -20.7%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2187.4 DIFF:    -8.0%
                                                 DIFF:  -189.0   DF:   -18.9%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   653.7 DIFF:     1.0%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   828.8 DIFF:    -1.2%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1482.5 DIFF:    -0.2%
                                                 DIFF:    -3.6   DF:    -0.4%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -93.7 DIFF:    23.2%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -93.7 DIFF:    23.2%
                                                 DIFF:   -17.6   DF:    -1.8%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   485.0 DIFF:    -1.8%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   616.7 DIFF:    -1.0%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1101.7 DIFF:    -1.4%
                                                 DIFF:   -15.4   DF:    -1.5%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    57.6 DIFF:   -20.7%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    57.6 DIFF:   -20.7%
                                                 DIFF:   -15.1   DF:    -1.5%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    62.8 DIFF:    -1.2%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.8 DIFF:    -0.3%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.2 DIFF:    -0.5%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -97.3 DIFF:     0.2%
                                                 DIFF:    -0.2   DF:     0.0%
*******************************************************************************
```

Table 6.21 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -62.4 DIFF:    -1.2%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.6 DIFF:    -0.3%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.3 DIFF:    -0.5%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    99.4 DIFF:     0.2%
                                                DIFF:     0.2   DF:     0.0%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -72.7 DIFF:    92.2%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -72.7 DIFF:    92.2%
                                                DIFF:   -34.9   DF:    -3.5%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    96.7 DIFF:    -3.4%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    96.7 DIFF:    -3.4%
                                                DIFF:    -3.5   DF:    -0.3%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   351.9 DIFF:    -1.8%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   351.9 DIFF:    -1.8%
                                                DIFF:    -6.6   DF:    -0.7%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   207.1 DIFF:    -8.4%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    66.2 DIFF:   -17.5%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   273.3 DIFF:   -10.8%
                                                DIFF:   -33.1   DF:    -3.3%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   436.3 DIFF:     0.4%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   436.3 DIFF:     0.4%
                                                DIFF:     1.8   DF:     0.2%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:    -1.1 DIFF:   -67.5%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:    -1.1 DIFF:   -67.5%
                                                DIFF:     2.3   DF:     0.2%
******************************************************************************
```

Table 6.21 (Cont.)
Constrained Interface Impact Analyses - Case S2C4XX1

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   317.9 DIFF:    -9.2%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   367.4 DIFF:    -8.9%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   333.4 DIFF:    -7.6%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   303.3 DIFF:     7.6%
0554  --------  - 0550  GRANITF4   BASE:   106.1 CHNG:     0.0 DIFF:  -100.0%
99554 MORRIS 3  - 99550 GRANFLS3   BASE:     0.0 CHNG:   536.1 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   149.5 DIFF:    -9.1%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    97.4 DIFF:     0.3%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   161.7 DIFF:     3.3%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   134.8 DIFF:    -3.6%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    34.3 DIFF:    34.5%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    52.5 DIFF:     0.4%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    55.0 DIFF:     9.1%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    91.6 DIFF:   156.0%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    40.4 DIFF:    35.0%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    43.0 DIFF:     7.3%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    31.2 DIFF:    10.4%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -173.7 DIFF:   -29.3%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:   427.6 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    12.4 DIFF:   259.8%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  3015.5 DIFF:    45.0%
                                                 DIFF:   935.2   DF:    93.5%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   172.9 DIFF:     7.2%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1838.1 DIFF:     3.9%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   173.7 DIFF:   -29.3%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -12.4 DIFF:   259.8%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2172.4 DIFF:     0.0%
                                                 DIFF:    -0.7   DF:    -0.1%
*******************************************************************************
```

Table 6.21 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -169.5 DIFF:     7.1%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1794.6 DIFF:     3.8%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -171.5 DIFF:   -28.9%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    12.4 DIFF:   260.1%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2123.1 DIFF:    -0.1%
                                                 DIFF:     2.1   DF:     0.2%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   154.2 DIFF:     0.0%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   154.7 DIFF:     0.0%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   159.1 DIFF:     0.0%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   357.2 DIFF:    -0.1%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   428.6 DIFF:    -0.1%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   431.8 DIFF:    -0.6%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1685.5 DIFF:    -0.2%
                                                 DIFF:    -3.8   DF:    -0.4%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   431.8 DIFF:    -0.6%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   431.8 DIFF:    -0.6%
                                                 DIFF:    -2.7   DF:    -0.3%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   250.1 DIFF:    -1.5%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   112.1 DIFF:     0.1%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   480.7 DIFF:    -1.2%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   842.9 DIFF:    -1.1%
                                                 DIFF:    -9.7   DF:    -1.0%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   279.7 DIFF:    -1.1%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   241.7 DIFF:    -0.9%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   521.4 DIFF:    -1.0%
                                                 DIFF:    -5.5   DF:    -0.6%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   143.4 DIFF:     0.2%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   282.0 DIFF:    -0.3%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    94.8 DIFF:    -0.2%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   520.1 DIFF:    -0.2%
                                                 DIFF:    -0.8   DF:    -0.1%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   642.8 DIFF:    -0.7%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   642.8 DIFF:    -0.7%
                                                 DIFF:    -4.6   DF:    -0.5%
*******************************************************************************
```

Table 6.21 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   845.1 DIFF:     0.8%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   845.1 DIFF:     0.8%
                                                 DIFF:     6.5   DF:     0.6%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   796.2 DIFF:    -0.8%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   845.1 DIFF:     0.8%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   411.0 DIFF:     7.9%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   168.0 DIFF:    -1.4%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   107.8 DIFF:    -3.0%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    65.4 DIFF:   -10.0%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2393.5 DIFF:     0.7%
                                                 DIFF:    17.0   DF:     1.7%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   642.8 DIFF:    -0.7%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   845.1 DIFF:     0.8%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1488.0 DIFF:     0.1%
                                                 DIFF:     1.8   DF:     0.2%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -77.5 DIFF:     1.8%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -77.5 DIFF:     1.8%
                                                 DIFF:    -1.4   DF:    -0.1%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   495.0 DIFF:     0.2%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   623.7 DIFF:     0.1%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1118.7 DIFF:     0.1%
                                                 DIFF:     1.6   DF:     0.2%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    65.4 DIFF:   -10.0%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    65.4 DIFF:   -10.0%
                                                 DIFF:    -7.3   DF:    -0.7%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    61.6 DIFF:    -3.0%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -90.1 DIFF:     0.0%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.4 DIFF:    -0.2%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -98.9 DIFF:     1.9%
                                                 DIFF:    -1.8   DF:    -0.2%
*******************************************************************************
```

Table 6.21 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -61.3 DIFF:    -3.0%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.8 DIFF:     0.0%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.4 DIFF:    -0.2%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:   101.0 DIFF:     1.8%
                                                DIFF:     1.8   DF:     0.2%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -33.7 DIFF:   -10.9%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -33.7 DIFF:   -10.9%
                                                DIFF:     4.1   DF:     0.4%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    99.1 DIFF:    -1.1%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    99.1 DIFF:    -1.1%
                                                DIFF:    -1.1   DF:    -0.1%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   358.5 DIFF:     0.0%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   358.5 DIFF:     0.0%
                                                DIFF:    -0.1   DF:     0.0%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   227.7 DIFF:     0.7%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    81.4 DIFF:     1.5%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   309.1 DIFF:     0.9%
                                                DIFF:     2.7   DF:     0.3%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   431.8 DIFF:    -0.6%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   431.8 DIFF:    -0.6%
                                                DIFF:    -2.7   DF:    -0.3%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -12.4 DIFF:   259.8%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -12.4 DIFF:   259.8%
                                                DIFF:    -8.9   DF:    -0.9%
******************************************************************************
```

Table 6.21 (Cont.)
Constrained Interface Impact Analyses - Case S2C4XX3

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   346.8 DIFF:    -1.0%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   392.3 DIFF:    -2.8%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   358.1 DIFF:    -0.8%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   317.4 DIFF:    12.7%
0554  --------  - 0550  GRANITF4   BASE:   106.1 CHNG:     0.0 DIFF:  -100.0%
99554 MORRIS 3  - 99550 GRANFLS3   BASE:     0.0 CHNG:   425.2 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   179.3 DIFF:     9.0%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:   118.0 DIFF:    21.5%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   189.1 DIFF:    20.8%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   144.4 DIFF:     3.2%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    49.3 DIFF:    93.5%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    58.4 DIFF:    11.7%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    59.1 DIFF:    17.2%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:   103.4 DIFF:   189.1%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    44.5 DIFF:    48.9%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    46.7 DIFF:    16.4%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    35.1 DIFF:    24.2%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -320.7 DIFF:    30.4%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:   366.9 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    83.9 DIFF:   999.0%

SUBTOTALS FOR: NDEX               BASE:  2080.3 CHNG:  2997.1 DIFF:    44.1%
                                                DIFF:   916.8   DF:    91.7%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   163.6 DIFF:     1.4%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1769.8 DIFF:     0.0%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   320.7 DIFF:    30.4%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -83.9 DIFF:   999.0%

SUBTOTALS FOR: MHEX_S             BASE:  2173.1 CHNG:  2170.1 DIFF:    -0.1%
                                                DIFF:    -2.9   DF:    -0.3%
*******************************************************************************
```

Table 6.21 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -160.6 DIFF:     1.4%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1730.1 DIFF:     0.1%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -312.2 DIFF:    29.4%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    85.5 DIFF:   999.0%

SUBTOTALS FOR: MHEX_N             BASE: -2125.2 CHNG: -2117.3 DIFF:    -0.4%
                                                DIFF:     7.9   DF:     0.8%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   154.4 DIFF:     0.1%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   154.9 DIFF:     0.1%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   159.3 DIFF:     0.1%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   357.7 DIFF:     0.0%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   429.3 DIFF:     0.0%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   438.0 DIFF:     0.8%

SUBTOTALS FOR: GGS                BASE:  1689.3 CHNG:  1693.7 DIFF:     0.3%
                                                DIFF:     4.4   DF:     0.4%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   438.0 DIFF:     0.8%

SUBTOTALS FOR: WNE_WKS            BASE:   434.5 CHNG:   438.0 DIFF:     0.8%
                                                DIFF:     3.6   DF:     0.4%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   255.7 DIFF:     0.8%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   111.3 DIFF:    -0.6%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   493.0 DIFF:     1.3%

SUBTOTALS FOR: GRIS_LNC           BASE:   852.5 CHNG:   860.0 DIFF:     0.9%
                                                DIFF:     7.5   DF:     0.8%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   288.3 DIFF:     1.9%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   247.8 DIFF:     1.6%

SUBTOTALS FOR: COOPER_S           BASE:   526.9 CHNG:   536.1 DIFF:     1.7%
                                                DIFF:     9.2   DF:     0.9%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   145.4 DIFF:     1.6%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   287.1 DIFF:     1.5%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    95.8 DIFF:     0.8%

SUBTOTALS FOR: FTCAL_S            BASE:   521.0 CHNG:   528.3 DIFF:     1.4%
                                                DIFF:     7.3   DF:     0.7%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   639.5 DIFF:    -1.2%

SUBTOTALS FOR: ECL-ARP            BASE:   647.5 CHNG:   639.5 DIFF:    -1.2%
                                                DIFF:    -8.0   DF:    -0.8%
*******************************************************************************
```

Table 6.21 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   831.0 DIFF:    -0.9%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   831.0 DIFF:    -0.9%
                                                 DIFF:    -7.7   DF:    -0.8%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   791.5 DIFF:    -1.4%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   831.0 DIFF:    -0.9%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   381.0 DIFF:     0.0%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   167.5 DIFF:    -1.7%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   107.7 DIFF:    -3.1%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    64.7 DIFF:   -11.0%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2343.4 DIFF:    -1.4%
                                                 DIFF:   -33.0   DF:    -3.3%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   639.5 DIFF:    -1.2%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   831.0 DIFF:    -0.9%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1470.5 DIFF:    -1.1%
                                                 DIFF:   -15.7   DF:    -1.6%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -71.4 DIFF:    -6.2%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -71.4 DIFF:    -6.2%
                                                 DIFF:     4.7   DF:     0.5%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   492.7 DIFF:    -0.3%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   622.5 DIFF:    -0.1%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1115.2 DIFF:    -0.2%
                                                 DIFF:    -1.9   DF:    -0.2%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    64.7 DIFF:   -11.0%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    64.7 DIFF:   -11.0%
                                                 DIFF:    -8.0   DF:    -0.8%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    61.6 DIFF:    -3.0%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.1 DIFF:    -1.1%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -69.5 DIFF:    -1.6%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -96.9 DIFF:    -0.1%
                                                 DIFF:     0.1   DF:     0.0%
*******************************************************************************
```

Table 6.21 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -61.3 DIFF:    -3.0%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    89.8 DIFF:    -1.1%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    70.5 DIFF:    -1.6%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    99.0 DIFF:    -0.2%
                                                DIFF:    -0.2   DF:     0.0%
*******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -47.3 DIFF:    25.2%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -47.3 DIFF:    25.2%
                                                DIFF:    -9.5   DF:    -1.0%
*******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:   101.2 DIFF:     1.0%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:   101.2 DIFF:     1.0%
                                                DIFF:     1.0   DF:     0.1%
*******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   358.7 DIFF:     0.1%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   358.7 DIFF:     0.1%
                                                DIFF:     0.2   DF:     0.0%
*******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   222.7 DIFF:    -1.5%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    77.5 DIFF:    -3.5%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   300.1 DIFF:    -2.0%
                                                DIFF:    -6.2   DF:    -0.6%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   438.0 DIFF:     0.8%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   438.0 DIFF:     0.8%
                                                DIFF:     3.6   DF:     0.4%
*******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -83.9 DIFF:   999.0%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -83.9 DIFF:   999.0%
                                                DIFF:   -80.5   DF:    -8.0%
*******************************************************************************
```

Table 7.1
Minot-Leland Olds-Harvey-Prairie-Maple River-Benton Co. 345 kV (Case S3C1X1A)

```
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164

DATA FOR BUS  9000 [MINOWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 0.98040 130.87

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 0.98040 0.98040   111.40  1: 700.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
   1000.0  -510.0  -510.0  -510.0 1.00000                              100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
91644 MINOT  3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
91644 1  T 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 91644 [MINOT  3 345] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0   130.0 1.01207 123.48

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  605 LELANDO3 345  1   0.00288  0.04165  0.45376  1  F   680.0 1159.0  748.0    0.0       1 1.000
  608 LOGAN  4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 9000 MINOWIND13.8  1   0.00024  0.01250  0.00000  1  F  1500.0 1500.0 1500.0    0.0       1 1.000
99944 HARVEY 5 345  1   0.00275  0.03979  0.43344  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  608 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9000 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 7.1 (Cont.)

```
DATA FOR BUS   605 [LELANDO3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00802 115.91

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   506 FTTHOMP3 345  1   0.01046  0.15170  1.65250  1  T   680.0 1159.0  748.0    0.0       1 1.000
   601 ANTELOP3 345  1   0.00123  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
   601 ANTELOP3 345  2   0.00124  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
   611 LELAN32G20.0  1   0.00050  0.02770  0.00000  1  F   495.0  495.0  594.0    0.0       1 1.000
   660 GROTON 3 345  1   0.00914  0.13380  1.43530  1  T   717.0 1159.0  789.0    0.0       1 1.000
   791 CENTER 3 345  1   0.00052  0.00746  0.08127  1  T   680.0 1159.0  748.0    0.0       1 1.000
 22151 LELND1TY 345  1  -0.00042  0.00095  0.00000  1  F   250.0  250.0  300.0    0.0       1 1.000
 22152 LELND2TY 345  1   0.00032  0.00144  0.00000  1  F   500.0  500.0  600.0    0.0       1 1.000
 91644 MINOT  3 345  1   0.00288  0.04165  0.45376  1  T   680.0 1159.0  748.0    0.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
   506 FTTHOMP3 345  1    0.00000 -0.50000   0.00000 -0.68000     1
   660 GROTON 3 345  1    0.00000 -0.68000   0.00000  0.00000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   611 1  F 1.08110   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 22151 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 22152 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

 DATA FOR BUS 99944 [HARVEY 5 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00352 111.14

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   944 HARVEY 4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 91644 MINOT  3 345  1   0.00275  0.03979  0.43344  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
 99755 PRAIRIE5 345  1   0.00538  0.07771  0.84660  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   944 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

 DATA FOR BUS 99755 [PRAIRIE5 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99860  90.24

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   755 PRAIRIE4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
   792 MAPLE R3 345  1   0.00292  0.04228  0.46050  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 99944 HARVEY 5 345  1   0.00538  0.07771  0.84660  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   755 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 7.1 (Cont.)

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 DATA FOR BUS  1620 [PRASWCP7 115] RESIDING IN AREA  14, ZONE  74, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02228  88.04

 MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
  2 1.01080 1.01080   120.00  9:  40.00 3:  40.00                       755 PRAIRIE4 230

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   712 PRAIRIE7 115  1   0.00000  0.01080  0.00000  1  T   596.0  596.0  596.0    0.0       1 1.000

DATA FOR BUS   792 [MAPLE R3 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.96768  82.62

 ID ST   PLOAD   QLOAD     I - L O A D     Y - L O A D  AREA  ZONE OWNER
 99  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 B1  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 C4  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 M3  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 M5  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 MB  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 MC  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 MI  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 N2  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 N3  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 O4  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 S5  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 U2  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 W1  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   916 BUFFALO3 345  1   0.00120  0.01630  0.29051  1  F   720.0 1560.0  792.0    0.0       1 1.000
  1667 BENTON 3 345  1   0.00774  0.11191  1.21905  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 79824 MAPLER1Y 345  1   0.00020  0.01970  0.00000  1  F   336.0  336.0  420.0    0.0       1 1.000
 79825 MAPLER2Y 345  1   0.00020  0.01970  0.00000  1  T   336.0  336.0  420.0    0.0       1 1.000
 99755 PRAIRIE5 345  1   0.00292  0.04228  0.46050  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 79824 1  F 0.97390   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 79825 1  F 0.97390   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

TABLE 7.2 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C1X1A

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S3C1X1A-ag1	upe-so04aa.S3C1X1A-ag3	upe-so04aa.S3C1X1A-ei2	upe-so04aa.S3C1X1A-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 01 2002 11:04	MAY 01 2002 11:07	MAY 01 2002 11:10	MAY 01 2002 11:13
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2980 / 374	2980 / 374	2980 / 374	2980 / 374
10	MHEX / L20D	2175 / 185	2175 / 185	2175 / 185	2175 / 185
11	ECL-ARP / PRI-BYN	647 / 828	647 / 828	647 / 828	647 / 828
12	MWSI / MNEX	1475 / 2726	1475 / 2726	1475 / 2726	1475 / 2726
13	D602F / F601C	1872 / 1407	1872 / 1407	1872 / 1407	1872 / 1407
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	176 / 150	176 / 150	176 / 150	176 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	124 / 95	124 / 95	124 / 95	124 / 95
19	Forbes SVC / MSC	15 / 600	15 / 600	15 / 600	15 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.004	1.059 / 1.004	1.059 / 1.004	1.059 / 1.004
23	Chisago 500/EauClaire 345	1.017 / 1.006	1.017 / 1.006	1.017 / 1.006	1.017 / 1.006
24	Int Falls 115/Badoura 115	1.047 / 0.987	1.047 / 0.987	1.047 / 0.987	1.047 / 0.987
25	Drayton 230/Groton 345	1.017 / 0.992	1.017 / 0.992	1.017 / 0.992	1.017 / 0.992
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	119% / 195%	119% / 195%	119% / 195%	119% / 195%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	677% / 345%	677% / 345%	677% / 345%	677% / 345%
30	B10T	334%	334%	334%	334%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.01	0.94 | 1.01	0.97 | 1.04	0.98 | 1.03
33	Boise 115	1.01 | 1.08	1.00 | 1.08	1.01 | 1.07	1.03 | 1.06
34	Dorsey 230	1.01 | 1.05	1.00 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	0.98 | 1.02	0.98 | 1.02	0.96 | 1.02	0.98 | 1.02
36	Riverton 230	0.94 | 1.02	0.93 | 1.02	0.91 | 1.05	0.95 | 1.03
37	Coal Creek 230	0.95 | 1.11	0.94 | 1.11	1.01 | 1.11	0.98 | 1.12
38	Dickinson 345	0.95 | 1.06	0.94 | 1.06	1.01 | 1.07	1.02 | 1.08
39	Drayton 230	0.99 | 1.04	0.98 | 1.03	0.99 | 1.03	1.00 | 1.03
40	Groton 345	0.79 | 1.01	0.75 | 1.00	0.84 | 1.05	0.87 | 1.03
41	Tioga 230	1.00 | 1.04	1.00 | 1.04	1.01 | 1.04	1.01 | 1.04
42	Wahpeton 115	0.92 | 1.07	0.90 | 1.07	0.90 | 1.10	0.94 | 1.07
43	Watertown 345	0.89 | 1.04	0.86 | 1.03	0.90 | 1.06	0.93 | 1.04
44	**Dynamic Voltage Warnings**				
45		none	847 [HETINGR4] 0.69	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	/ %	/ %	/ %	/ %
53	Dorsey SUVP / UdHold		/ 0.158		
54	Forbes DC Red (DCAR)	283%	252%	507%	507%
55	K22W (max +dP @ t, d-ang)	3.4@(0.12499,-0.1)	10.2@(0.15833,-0.2)	54.1@(1.99992,-34.0)	32.0@(1.87492,-20.4)
56	K22W (max -dP @ t, d-ang)	27.9@(0.84997,9.4)	32.8@(0.83330,12.0)	6.6@(0.69997,-0.4)	2.0@(0.62498,-0.9)
57	K22W (max d-ang @ t, dP)	14.8@(1.19995,-9.9)	18.6@(1.20829,-13.7)	-34.0@(1.99992,54.1)	-22.0@(1.99992,31.8)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	47% / 95%	31% / 75%	44% / 86%	75% / 133%
61	L20D at Prairie/Drayton	632% / 767%	557% / 699%	653% / 677%	496% / 851%
62	R50M / F3M	481% / 251%	451% / 239%	490% / 233%	570% / 253%
63	B10T	169%	146%	109%	183%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 2 | 0)	(0 | 3 | 0)	(0 | 1 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 1 | 1) / (0 | 1 | 1)	(1 | 2 | 2) / (0 | 2 | 1)	(1 | 1 | 1) / (0 | 1 | 1)	(1 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 2 | 2) / (0 | 5 | 4)	(1 | 2 | 1) / (0 | 5 | 5)	(1 | 2 | 2) / (0 | 5 | 2)	(1 | 1 | 1) / (0 | 4 | 3)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

TABLE 7.2 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C1X1A

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S3C1X1A-nbz	upe-so04aa.S3C1X1A-mqs	upe-so04aa.S3C1X1A-pys	upe-so04aa.S3C1X1A-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 01 2002 11:16	MAY 01 2002 11:19	MAY 01 2002 11:22	MAY 01 2002 11:24
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2980 / 374	2980 / 374	2980 / 374	2980 / 374
10	MHEX / L20D	2175 / 185	2175 / 185	2175 / 185	2175 / 185
11	ECL-ARP / PRI-BYN	647 / 828	647 / 828	647 / 828	647 / 828
12	MWSI / MNEX	1475 / 2726	1475 / 2726	1475 / 2726	1475 / 2726
13	D602F / F601C	1872 / 1407	1872 / 1407	1872 / 1407	1872 / 1407
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	176 / 150	176 / 150	176 / 150	176 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	124 / 95	124 / 95	124 / 95	124 / 95
19	Forbes SVC / MSC	15 / 600	15 / 600	15 / 600	15 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.004	1.059 / 1.004	1.059 / 1.004	1.059 / 1.004
23	Chisago 500/EauClaire 345	1.017 / 1.006	1.017 / 1.006	1.017 / 1.006	1.017 / 1.006
24	Int Falls 115/Badoura 115	1.047 / 0.987	1.047 / 0.987	1.047 / 0.987	1.047 / 0.987
25	Drayton 230/Groton 345	1.017 / 0.992	1.017 / 0.992	1.017 / 0.992	1.017 / 0.992
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	119% / 195%	119% / 195%	119% / 195%	119% / 195%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%	999% / 999%	999% / 999%
29	R50M/F3M	677% / 345%	677% / 345%	677% / 345%	677% / 345%
30	B10T	334%	334%	334%	334%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.10	0.95 | 1.05	0.95 | 0.99	0.97 | 1.00
33	Boise 115	0.97 | 1.08	0.99 | 1.08	1.02 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.16	1.00 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	0.96 | 1.02	0.99 | 1.03	1.00 | 1.01
36	Riverton 230	0.89 | 1.06	0.92 | 1.03	1.00 | 1.01	1.00 | 1.01
37	Coal Creek 230	0.96 | 1.09	0.98 | 1.07	1.01 | 1.06	1.02 | 1.04
38	Dickinson 345	0.97 | 1.09	0.97 | 1.09	1.00 | 1.02	1.00 | 1.03
39	Drayton 230	0.98 | 1.05	1.00 | 1.03	1.01 | 1.03	1.01 | 1.02
40	Groton 345	0.83 | 1.06	0.88 | 1.02	0.94 | 0.97	0.97 | 0.99
41	Tioga 230	1.00 | 1.05	0.99 | 1.04	1.01 | 1.04	1.02 | 1.04
42	Wahpeton 115	0.87 | 1.10	0.95 | 1.07	1.02 | 1.04	1.03 | 1.05
43	Watertown 345	0.89 | 1.07	0.92 | 1.04	0.97 | 1.00	1.00 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	/ %	/ %	/ %	/ %
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	507%	147%	291%
55	K22W (max +dP @ t, d-ang)	147.4@(1.99992,-68.8)	41.2@(1.99992,-28.3)	0.7@(0.11666,0.2)	0.0@(0.04167,0.0)
56	K22W (max -dP @ t, d-ang)	103.6@(0.26666,11.1)	22.9@(0.33332,4.4)	34.0@(1.78326,21.9)	20.8@(1.99992,14.2)
57	K22W (max d-ang @ t, dP)	-68.8@(1.99992,147.4)	-28.3@(1.99992,41.2)	22.9@(1.44161,-22.0)	14.2@(1.94159,-20.5)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	21% / 59%	95% / 160%	112% / 185%
61	L20D at Prairie/Drayton	681% / 486%	835% / 691%	999% / 879%	999% / 999%
62	R50M / F3M	249% / 135%	430% / 226%	574% / 345%	626% / 345%
63	B10T	120%	92%	193%	265%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 2 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 2 | 2) / (0 | 1 | 0)	(1 | 1 | 1) / (0 | 2 | 1)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 6 | 2) / (0 | 5 | 2)	(1 | 3 | 2) / (0 | 5 | 4)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

TABLE 7.2 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C1X1A

1	**Case No.**	9	10
2	**Case Name**	upe-so04aa.S3C1X1A-cl3	upe-so04aa.S3C1X1A-cm3
3	**Disturbance**	cl3	cm3
4	**Prior Outage**	None	None
5	**Date/Time**	MAY 01 2002 11:27	MAY 01 2002 11:29
6	**Comments**		
7			
8	**Steady State Flows**		
9	NDEX / EAST BIAS	2980 / 374	2980 / 374
10	MHEX / L20D	2175 / 185	2175 / 185
11	ECL-ARP / PRI-BYN	647 / 828	647 / 828
12	MWSI / MNEX	1475 / 2726	1475 / 2726
13	D602F / F601C	1872 / 1407	1872 / 1407
14	B10T / MH>SPC	166 / 99	166 / 99
15	OH E-W / OH>MH	-120 / -197	-120 / -197
16	R50M / OH>MP	176 / 150	176 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	124 / 95	124 / 95
19	Forbes SVC / MSC	15 / 600	15 / 600
20	**Steady State Vltgs**		
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.004	1.059 / 1.004
23	Chisago 500/EauClaire 345	1.017 / 1.006	1.017 / 1.006
24	Int Falls 115/Badoura 115	1.047 / 0.987	1.047 / 0.987
25	Drayton 230/Groton 345	1.017 / 0.992	1.017 / 0.992
26	**SS OS Relay Margins**		
27	D602F at Forbes/Dorsey	119% / 195%	119% / 195%
28	L20D at Prairie/Drayton	999% / 999%	999% / 999%
29	R50M/F3M	677% / 345%	677% / 345%
30	B10T	334%	334%
31	**Min/MaxTransientVltg**		
32	Arrowhd 230	0.97 | 1.01	0.99 | 1.01
33	Boise 115	1.02 | 1.06	1.04 | 1.05
34	Dorsey 230	1.02 | 1.06	1.04 | 1.05
35	Forbes 230	0.99 | 1.01	1.00 | 1.01
36	Riverton 230	0.97 | 1.04	0.99 | 1.01
37	Coal Creek 230	0.95 | 1.11	0.98 | 1.07
38	Dickinson 345	0.97 | 1.06	1.00 | 1.04
39	Drayton 230	0.99 | 1.05	1.00 | 1.03
40	Groton 345	0.85 | 1.03	0.95 | 1.02
41	Tioga 230	0.90 | 1.05	0.86 | 1.05
42	Wahpeton 115	0.97 | 1.10	1.00 | 1.05
43	Watertown 345	0.92 | 1.05	0.99 | 1.03
44	**Dynamic Voltage Warnings**		
45		none	1644 [MINOT 3] 0.63
46			
47			
48			
49			
50			
51			
52	Worst Case Angle Damping	/ %	/ %
53	Dorsey SUVP / UdHold		
54	Forbes DC Red (DCAR)	292%	456%
55	K22W (max +dP @ t, d-ang)	9.5@(1.67493,3.2)	9.5@(0.15833,-0.3)
56	K22W (max -dP @ t, d-ang)	17.8@(0.96663,3.0)	6.6@(0.87497,1.5)
57	K22W (max d-ang @ t, dP)	7.4@(1.33328,-1.1)	2.3@(1.19162,-4.6)
58	**OS Rel Trip / Marg**		
59	MH - OH		
60	D602F at Forbes/Dorsey	76% / 136%	95% / 161%
61	L20D at Prairie/Drayton	999% / 728%	999% / 927%
62	R50M / F3M	570% / 266%	608% / 316%
63	B10T	274%	243%
64	**FSCAPS (SS/Unav/Final)**		
65	Balta 230	(0 | 2 | 0)	(0 | 3 | 1)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 1 | 0) / (0 | 0 | 0)	(1 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 1 | 1) / (0 | 4 | 2)	(1 | 1 | 1) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

Table 7.3
Minot-Leland Olds-Harvey-Prairie-Maple River-Benton Co. + Maple River-Blue Lake 345 kV (Case S3C2X1A)

```
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164

DATA FOR BUS  9000 [MINOWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 0.98040 125.82

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 0.98040 0.98040   110.83  1: 700.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
   1000.0  -510.0  -510.0  -510.0 1.00000                              100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
91644 MINOT  3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
91644 1  T 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 91644 [MINOT  3 345] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0   130.0 1.01214 118.43

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  605 LELANDO3 345  1   0.00288  0.04165  0.45376  1  F   680.0 1159.0  748.0    0.0       1 1.000
  608 LOGAN  4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 9000 MINOWIND13.8  1   0.00024  0.01250  0.00000  1  F  1500.0 1500.0 1500.0    0.0       1 1.000
99944 HARVEY 5 345  1   0.00275  0.03979  0.43344  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  608 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9000 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 7.3 (Cont.)

```
DATA FOR BUS   605 [LELANDO3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00920 111.00

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   506 FTTHOMP3 345  1   0.01046  0.15170  1.65250  1  T   680.0 1159.0  748.0    0.0       1 1.000
   601 ANTELOP3 345  1   0.00123  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
   601 ANTELOP3 345  2   0.00124  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
   611 LELAN32G20.0  1   0.00050  0.02770  0.00000  1  F   495.0  495.0  594.0    0.0       1 1.000
   660 GROTON 3 345  1   0.00914  0.13380  1.43530  1  T   717.0 1159.0  789.0    0.0       1 1.000
   791 CENTER 3 345  1   0.00052  0.00746  0.08127  1  T   680.0 1159.0  748.0    0.0       1 1.000
 22151 LELND1TY 345  1  -0.00042  0.00095  0.00000  1  F   250.0  250.0  300.0    0.0       1 1.000
 22152 LELND2TY 345  1   0.00032  0.00144  0.00000  1  F   500.0  500.0  600.0    0.0       1 1.000
 91644 MINOT  3 345  1   0.00288  0.04165  0.45376  1  T   680.0 1159.0  748.0    0.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
   506 FTTHOMP3 345  1    0.00000 -0.50000   0.00000 -0.68000     1
   660 GROTON 3 345  1    0.00000 -0.68000   0.00000  0.00000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   611 1  F 1.08110   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 22151 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 22152 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

 DATA FOR BUS 99944 [HARVEY 5 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00289 105.89

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   944 HARVEY 4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 91644 MINOT  3 345  1   0.00275  0.03979  0.43344  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
 99755 PRAIRIE5 345  1   0.00538  0.07771  0.84660  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   944 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


 DATA FOR BUS 99755 [PRAIRIE5 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00282  84.15

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   755 PRAIRIE4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
   792 MAPLE R3 345  1   0.00292  0.04228  0.46050  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 99944 HARVEY 5 345  1   0.00538  0.07771  0.84660  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   755 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 7.3 (Cont.)

```
DATA FOR BUS  1620 [PRASWCP7 115] RESIDING IN AREA  14, ZONE  74, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02504  82.32

 MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
  2 1.01080 1.01080   120.00  9:  40.00 3:  40.00                       755 PRAIRIE4 230

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   712 PRAIRIE7 115  1   0.00000  0.01080  0.00000  1  T   596.0  596.0  596.0    0.0       1 1.000

 DATA FOR BUS   792 [MAPLE R3 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98347  75.14

 ID ST   PLOAD   QLOAD     I - L O A D     Y - L O A D  AREA  ZONE OWNER
 99  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 B1  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 C4  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 M3  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 M5  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 MB  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 MC  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 MI  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 N2  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 N3  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 O4  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 S5  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 U2  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
 W1  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   916 BUFFALO3 345  1   0.00120  0.01630  0.29051  1  F   720.0 1560.0  792.0    0.0       1 1.000
  1667 BENTON 3 345  1   0.00774  0.11191  1.21905  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 79824 MAPLER1Y 345  1   0.00020  0.01970  0.00000  1  F   336.0  336.0  420.0    0.0       1 1.000
 79825 MAPLER2Y 345  1   0.00020  0.01970  0.00000  1  T   336.0  336.0  420.0    0.0       1 1.000
 99553 MOORHED3 345  1   0.00047  0.00684  0.07450  1  F   680.0 1159.0  748.0    0.0       1 1.000
 99755 PRAIRIE5 345  1   0.00292  0.04228  0.46050  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 79824 1  F 0.97390   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 79825 1  F 0.97390   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 7.3 (Cont.)

```
DATA FOR BUS 99553 [MOORHED3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98961  73.60

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  553 MOORHED4 230  1   0.00000  0.03000  0.00000  1  F   250.0  300.0  350.0    0.0       1 1.000
  792 MAPLE R3 345  1   0.00047  0.00684  0.07450  1  T   680.0 1159.0  748.0    0.0       1 1.000
99554 MORRIS 3 345  1   0.00427  0.04827  0.77768  1  F   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  553 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS 99554 [MORRIS 3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00196  61.76

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  555 MORRIS 7 115  1   0.00000  0.03000  0.00000  1  F   250.0  300.0  350.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00276  0.03102  0.49710  1  F   800.0  900.0  999.0    0.0       1 1.000
99553 MOORHED3 345  1   0.00427  0.04827  0.77768  1  T   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  555 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00213  54.87

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
99554 MORRIS 3 345  1   0.00276  0.03102  0.49710  1  T   800.0  900.0  999.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 7.3 (Cont.)

```
DATA FOR BUS  1702 [BLUE LK3 345] RESIDING IN AREA  23, ZONE 323, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01198  42.30

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  1604 PR ISLD3 345  1   0.00260  0.02620  0.43798  1  T  1165.0 1165.0 1281.0    0.0       1 1.000
  1608 WILMART3 345  1   0.00300  0.02780  0.45145  1  T  1195.0 1165.0 1281.0    0.0       1 1.000
  1703 BLUE LK7 115  1   0.00080  0.03720  0.00000  1  F   336.0  336.0  436.0    0.0       1 1.000
  1724 INVRHLS3 345  1   0.00120  0.01130  0.18892  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
  1739 PARKERS3 345  1   0.00080  0.00740  0.12471  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
  1770 EDEN PR3 345  1   0.00030  0.00270  0.04662  1  F  1165.0 1114.0 1225.0    0.0       1 1.000
 99550 GRANFLS3 345  1   0.00430  0.06282  0.67725  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  1703 1  F 0.97460   0.0 0      0 1.5000 0.5100 1.5000 0.5100 0.00000
```

TABLE 7.4 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C2X1A

Case No.	1	2	3	4
Case Name	upe-so04aa.S3C2X1A-ag1	upe-so04aa.S3C2X1A-ag3	upe-so04aa.S3C2X1A-ei2	upe-so04aa.S3C2X1A-eq1
Disturbance	ag1	ag3	ei2	eq1
Prior Outage	None	None	None	None
Date/Time	APR 30 2002 17:19	APR 30 2002 17:36	MAY 01 2002 16:26	APR 30 2002 17:53
Comments				
Steady State Flows				
NDEX / EAST BIAS	2985 / 331	2985 / 331	2985 / 331	2985 / 331
MHEX / L20D	2176 / 214	2176 / 214	2176 / 214	2176 / 214
ECL-ARP / PRI-BYN	645 / 837	645 / 837	645 / 837	645 / 837
MWSI / MNEX	1483 / 2806	1483 / 2806	1483 / 2806	1483 / 2806
D602F / F601C	1834 / 1361	1834 / 1361	1834 / 1361	1834 / 1361
B10T / MH>SPC	165 / 98	165 / 98	165 / 98	165 / 98
OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
R50M / OH>MP	172 / 151	172 / 151	172 / 151	172 / 151
Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
Dorsey Reserve / Wtrtn SVC	195 / 61	195 / 61	195 / 61	195 / 61
Forbes SVC / MSC	46 / 600	46 / 600	46 / 600	46 / 600
Steady State Vltgs				
Dorsey 500/Dorsey 230	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045
Roseau 500/Forbes 500	1.063 / 1.015	1.063 / 1.015	1.063 / 1.015	1.063 / 1.015
Chisago 500/EauClaire 345	1.020 / 1.007	1.020 / 1.007	1.020 / 1.007	1.020 / 1.007
Int Falls 115/Badoura 115	1.051 / 1.002	1.051 / 1.002	1.051 / 1.002	1.051 / 1.002
Drayton 230/Groton 345	1.016 / 0.998	1.016 / 0.998	1.016 / 0.998	1.016 / 0.998
SS OS Relay Margins				
D602F at Forbes/Dorsey	132% / 217%	132% / 217%	132% / 217%	132% / 217%
L20D at Prairie/Drayton	999% / 972%	999% / 972%	999% / 972%	999% / 972%
R50M/F3M	718% / 348%	718% / 348%	718% / 348%	718% / 348%
B10T	337%	337%	337%	337%
Min/MaxTransientVltg				
Arrowhd 230	0.97 | 1.02	0.96 | 1.03	0.98 | 1.05	0.98 | 1.04
Boise 115	1.01 | 1.07	1.01 | 1.08	1.02 | 1.07	1.03 | 1.07
Dorsey 230	1.01 | 1.06	1.00 | 1.06	1.02 | 1.06	1.03 | 1.06
Forbes 230	1.00 | 1.03	0.99 | 1.03	0.98 | 1.04	1.00 | 1.03
Riverton 230	0.96 | 1.04	0.95 | 1.04	0.94 | 1.05	0.97 | 1.04
Coal Creek 230	0.95 | 1.11	0.94 | 1.11	1.02 | 1.11	0.98 | 1.12
Dickinson 345	0.95 | 1.06	0.95 | 1.06	1.01 | 1.07	1.02 | 1.08
Drayton 230	0.99 | 1.04	0.98 | 1.04	0.99 | 1.03	1.00 | 1.03
Groton 345	0.82 | 1.03	0.79 | 1.02	0.87 | 1.06	0.89 | 1.03
Tioga 230	1.01 | 1.05	1.00 | 1.05	1.01 | 1.05	1.01 | 1.05
Wahpeton 115	0.95 | 1.09	0.93 | 1.09	0.93 | 1.10	0.96 | 1.08
Watertown 345	0.91 | 1.05	0.89 | 1.04	0.92 | 1.06	0.94 | 1.05
Dynamic Voltage Warnings				
	none	none	none	none
Worst Case Angle Damping	SHERC3 / 61.23%	SHERC3 / 54.93%	SHERC3 / -57.11%	SHERC3 / -57.23%
Dorsey SUVP / UdHold		/ 0.166		
Forbes DC Red (DCAR)	285%	246%	507%	507%
K22W (max +dP @ t, d-ang)	10.9@(2.64989,-3.2)	17.9@(2.67489,-7.6)	59.4@(2.73322,-32.7)	39.2@(2.55823,-21.5)
K22W (max -dP @ t, d-ang)	25.2@(0.82497,7.9)	29.9@(0.81663,10.6)	2.2@(0.45831,-0.2)	1.5@(0.29999,-0.1)
K22W (max d-ang @ t, dP)	12.5@(1.14995,-8.1)	16.2@(1.15829,-11.4)	-151.2@(20.00792,28.2)	-85.6@(20.00792,17.6)
OS Rel Trip / Marg				
MH - OH				
D602F at Forbes/Dorsey	63% / 120%	49% / 101%	63% / 118%	92% / 159%
L20D at Prairie/Drayton	804% / 671%	671% / 614%	753% / 606%	999% / 737%
R50M / F3M	532% / 255%	495% / 242%	547% / 222%	620% / 256%
B10T	-273%	150%	119%	187%
FSCAPS (SS/Unav/Final)				
Balta 230	(0 | 3 | 0)	(0 | 3 | 0)	(0 | 1 | 0)	(0 | 0 | 0)
Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
Prairie 115 / Ramsey 230	(1 | 1 | 1) / (0 | 1 | 1)	(1 | 2 | 2) / (0 | 1 | 1)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
Roseau 230 / Running 230	(1 | 1 | 1) / (0 | 5 | 3)	(1 | 1 | 1) / (0 | 5 | 4)	(1 | 1 | 1) / (0 | 4 | 2)	(1 | 1 | 1) / (0 | 3 | 3)
Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

TABLE 7.4 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C2X1A

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S3C2X1A-nbz	upe-so04aa.S3C2X1A-mqs	upe-so04aa.S3C2X1A-pys	upe-so04aa.S3C2X1A-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 01 2002 16:08	APR 30 2002 18:07	APR 30 2002 18:22	APR 30 2002 18:36
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2985 / 331	2985 / 331	2985 / 331	2985 / 331
10	MHEX / L20D	2176 / 214	2176 / 214	2176 / 214	2176 / 214
11	ECL-ARP / PRI-BYN	645 / 837	645 / 837	645 / 837	645 / 837
12	MWSI / MNEX	1483 / 2806	1483 / 2806	1483 / 2806	1483 / 2806
13	D602F / F601C	1834 / 1361	1834 / 1361	1834 / 1361	1834 / 1361
14	B10T / MH>SPC	165 / 98	165 / 98	165 / 98	165 / 98
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	172 / 151	172 / 151	172 / 151	172 / 151
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	195 / 61	195 / 61	195 / 61	195 / 61
19	Forbes SVC / MSC	46 / 600	46 / 600	46 / 600	46 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045	1.035 / 1.045
22	Roseau 500/Forbes 500	1.063 / 1.015	1.063 / 1.015	1.063 / 1.015	1.063 / 1.015
23	Chisago 500/EauClaire 345	1.020 / 1.007	1.020 / 1.007	1.020 / 1.007	1.020 / 1.007
24	Int Falls 115/Badoura 115	1.051 / 1.002	1.051 / 1.002	1.051 / 1.002	1.051 / 1.002
25	Drayton 230/Groton 345	1.016 / 0.998	1.016 / 0.998	1.016 / 0.998	1.016 / 0.998
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	132% / 217%	132% / 217%	132% / 217%	132% / 217%
28	L20D at Prairie/Drayton	999% / 972%	999% / 972%	999% / 972%	999% / 972%
29	R50M/F3M	718% / 348%	718% / 348%	718% / 348%	718% / 348%
30	B10T	337%	337%	337%	337%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.10	0.96 | 1.06	0.96 | 1.01	0.98 | 1.00
33	Boise 115	0.99 | 1.07	1.01 | 1.09	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.15	1.01 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.95 | 1.06	0.98 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.92 | 1.07	0.96 | 1.04	1.01 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.97 | 1.09	0.98 | 1.07	1.01 | 1.06	1.02 | 1.04
38	Dickinson 345	0.97 | 1.09	0.96 | 1.08	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.98 | 1.06	0.99 | 1.03	1.00 | 1.03	1.01 | 1.02
40	Groton 345	0.85 | 1.07	0.90 | 1.03	0.96 | 1.00	0.98 | 1.00
41	Tioga 230	1.00 | 1.06	0.99 | 1.05	1.01 | 1.04	1.02 | 1.04
42	Wahpeton 115	0.90 | 1.11	0.97 | 1.09	1.03 | 1.05	1.04 | 1.06
43	Watertown 345	0.91 | 1.07	0.94 | 1.05	0.99 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -33.94%	KING 3 / 6.05%	SHERC3 / 23.93%	KING 3 / 15.71%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	486%	174%	317%
55	K22W (max +dP @ t, d-ang)	154.2@(2.09991,-69.7)	72.0@(2.63322,-35.1)	1.2@(4.07483,5.3)	0.0@(-0.01667,0.0)
56	K22W (max -dP @ t, d-ang)	99.8@(0.26666,10.8)	21.9@(0.33332,4.1)	32.5@(1.76659,20.4)	21.7@(2.17491,13.5)
57	K22W (max d-ang @ t, dP)	-279.2@(20.00792,53.6)	-122.7@(20.00792,23.1)	22.7@(20.00792,-16.2)	17.9@(20.00792,-12.1)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	41% / 90%	107% / 180%	127% / 210%
61	L20D at Prairie/Drayton	719% / 454%	999% / 579%	999% / 761%	999% / 858%
62	R50M / F3M	300% / 150%	479% / 229%	611% / 348%	670% / 348%
63	B10T	117%	90%	195%	267%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 2 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 2 | 2) / (0 | 1 | 0)	(1 | 1 | 1) / (0 | 1 | 0)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 6 | 2) / (0 | 5 | 1)	(1 | 2 | 1) / (0 | 5 | 3)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

TABLE 7.4 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C2X1A

1	**Case No.**	9	10
2	**Case Name**	upe-so04aa.S3C2X1A-cl3	upe-so04aa.S3C2X1A-cm3
3	**Disturbance**	cl3	cm3
4	**Prior Outage**	None	None
5	**Date/Time**	APR 30 2002 18:49	APR 30 2002 19:05
6	**Comments**		
7			
8	**Steady State Flows**		
9	NDEX / EAST BIAS	2985 / 331	2985 / 331
10	MHEX / L20D	2176 / 214	2176 / 214
11	ECL-ARP / PRI-BYN	645 / 837	645 / 837
12	MWSI / MNEX	1483 / 2806	1483 / 2806
13	D602F / F601C	1834 / 1361	1834 / 1361
14	B10T / MH>SPC	165 / 98	165 / 98
15	OH E-W / OH>MH	-119 / -196	-119 / -196
16	R50M / OH>MP	172 / 151	172 / 151
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	195 / 61	195 / 61
19	Forbes SVC / MSC	46 / 600	46 / 600
20	**Steady State Vltgs**		
21	Dorsey 500/Dorsey 230	1.035 / 1.045	1.035 / 1.045
22	Roseau 500/Forbes 500	1.063 / 1.015	1.063 / 1.015
23	Chisago 500/EauClaire 345	1.020 / 1.007	1.020 / 1.007
24	Int Falls 115/Badoura 115	1.051 / 1.002	1.051 / 1.002
25	Drayton 230/Groton 345	1.016 / 0.998	1.016 / 0.998
26	**SS OS Relay Margins**		
27	D602F at Forbes/Dorsey	132% / 217%	132% / 217%
28	L20D at Prairie/Drayton	999% / 972%	999% / 972%
29	R50M/F3M	718% / 348%	718% / 348%
30	B10T	337%	337%
31	**Min/MaxTransientVltg**		
32	Arrowhd 230	0.98 | 1.02	1.00 | 1.01
33	Boise 115	1.03 | 1.07	1.04 | 1.05
34	Dorsey 230	1.02 | 1.06	1.04 | 1.05
35	Forbes 230	1.00 | 1.03	1.01 | 1.02
36	Riverton 230	0.98 | 1.05	1.00 | 1.02
37	Coal Creek 230	0.95 | 1.11	0.98 | 1.07
38	Dickinson 345	0.97 | 1.06	1.00 | 1.04
39	Drayton 230	0.99 | 1.04	1.00 | 1.03
40	Groton 345	0.87 | 1.03	0.96 | 1.02
41	Tioga 230	0.90 | 1.05	0.86 | 1.05
42	Wahpeton 115	0.98 | 1.10	1.01 | 1.06
43	Watertown 345	0.93 | 1.05	1.00 | 1.04
44	**Dynamic Voltage Warnings**		
45		none	1644 [MINOT 3] 0.63
46			
47			
48			
49			
50			
51			
52	Worst Case Angle Damping	SHERC3 / 61.59%	SHERC3 / 59.49%
53	Dorsey SUVP / UdHold		
54	Forbes DC Red (DCAR)	304%	455%
55	K22W (max +dP @ t, d-ang)	17.2@(2.84988,-5.0)	8.5@(0.14999,-0.3)
56	K22W (max -dP @ t, d-ang)	16.8@(0.94996,2.4)	6.5@(0.84997,1.2)
57	K22W (max d-ang @ t, dP)	6.7@(1.31661,-0.8)	2.1@(1.18329,-4.0)
58	**OS Rel Trip / Marg**		
59	MH - OH		
60	D602F at Forbes/Dorsey	90% / 158%	107% / 182%
61	L20D at Prairie/Drayton	999% / 647%	999% / 792%
62	R50M / F3M	613% / 270%	648% / 319%
63	B10T	288%	245%
64	**FSCAPS (SS/Unav/Final)**		
65	Balta 230	(0 | 3 | 0)	(0 | 3 | 1)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 1 | 1) / (0 | 3 | 2)	(1 | 1 | 1) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

Table 7.5
Prairie - Duluth (Arrowhead) 345 kV (Case S3C3X2A)

```
 UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
 ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165

 DATA FOR BUS 99755 [PRAIRIE5 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99401  83.21

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   755 PRAIRIE4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
   792 MAPLE R3 345  1   0.00292  0.04228  0.46050  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  1318 ARROWHD3 345  1   0.01075  0.15542  1.69313  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 99944 HARVEY 5 345  1   0.00538  0.07771  0.84660  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   755 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 7.5a
35% Series Compensation of Minot-Harvey-Prairie 345 kV (Case S3C3X3A)

```
UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
 ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164

 DATA FOR BUS 99944 [HARVEY 5 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99811 105.36

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   944 HARVEY 4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 91644 MINOT  3 345  1   0.00275  0.02586  0.43344  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
 99755 PRAIRIE5 345  1   0.00538  0.05050  0.84660  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   944 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 7.5b
With Leland Olds-Harvey 345 kV (Case S3C3X4A)

```
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167

DATA FOR BUS 99944 [HARVEY 5 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00431 108.49

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  605 LELANDO3 345  1   0.00335  0.04849  0.52825  1  F   680.0 1159.0  748.0    0.0       1 1.000
  944 HARVEY 4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
91644 MINOT  3 345  1   0.00275  0.03979  0.43344  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
99755 PRAIRIE5 345  1   0.00538  0.07771  0.84660  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  944 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 7.6 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C3X2A

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S3C3X2A-ag1	upe-so04aa.S3C3X2A-ag3	upe-so04aa.S3C3X2A-ei2	upe-so04aa.S3C3X2A-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 13 2002 17:33	MAY 13 2002 17:50	MAY 13 2002 18:08	MAY 13 2002 18:23
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2668 / 318	2668 / 318	2668 / 318	2668 / 318
10	MHEX / L20D	2174 / 238	2174 / 238	2174 / 238	2174 / 238
11	ECL-ARP / PRI-BYN	630 / 845	630 / 845	630 / 845	630 / 845
12	MWSI / MNEX	1475 / 2783	1475 / 2783	1475 / 2783	1475 / 2783
13	D602F / F601C	1806 / 1473	1806 / 1473	1806 / 1473	1806 / 1473
14	B10T / MH>SPC	165 / 98	165 / 98	165 / 98	165 / 98
15	OH E-W / OH>MH	-120 / -196	-120 / -196	-120 / -196	-120 / -196
16	R50M / OH>MP	166 / 149	166 / 149	166 / 149	166 / 149
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	222 / 64	222 / 64	222 / 64	222 / 64
19	Forbes SVC / MSC	40 / 600	40 / 600	40 / 600	40 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018
23	Chisago 500/EauClaire 345	1.022 / 1.005	1.022 / 1.005	1.022 / 1.005	1.022 / 1.005
24	Int Falls 115/Badoura 115	1.049 / 1.003	1.049 / 1.003	1.049 / 1.003	1.049 / 1.003
25	Drayton 230/Groton 345	1.006 / 0.998	1.006 / 0.998	1.006 / 0.998	1.006 / 0.998
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	140% / 229%	140% / 229%	140% / 229%	140% / 229%
28	L20D at Prairie/Drayton	999% / 833%	999% / 833%	999% / 833%	999% / 833%
29	R50M/F3M	772% / 349%	772% / 349%	772% / 349%	772% / 349%
30	B10T	337%	337%	337%	337%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.02	0.95 | 1.03	0.96 | 1.05	0.98 | 1.04
33	Boise 115	1.01 | 1.06	1.01 | 1.07	1.02 | 1.07	1.03 | 1.06
34	Dorsey 230	1.01 | 1.06	1.01 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	0.99 | 1.03	0.98 | 1.04	1.00 | 1.04
36	Riverton 230	0.96 | 1.04	0.95 | 1.04	0.94 | 1.05	0.97 | 1.04
37	Coal Creek 230	0.95 | 1.11	0.95 | 1.11	1.01 | 1.11	0.98 | 1.12
38	Dickinson 345	0.95 | 1.06	0.95 | 1.06	1.02 | 1.07	1.02 | 1.08
39	Drayton 230	0.98 | 1.03	0.97 | 1.03	0.97 | 1.02	0.99 | 1.02
40	Groton 345	0.82 | 1.03	0.79 | 1.02	0.87 | 1.06	0.89 | 1.03
41	Tioga 230	1.00 | 1.05	0.99 | 1.05	1.01 | 1.05	1.01 | 1.05
42	Wahpeton 115	0.95 | 1.10	0.92 | 1.09	0.93 | 1.10	0.97 | 1.08
43	Watertown 345	0.91 | 1.05	0.89 | 1.04	0.92 | 1.06	0.94 | 1.04
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 61.46%	SHERC3 / 55.26%	KING 3 / -57.70%	SHERC3 / -61.85%
53	Dorsey SUVP / UdHold		/ 0.158		
54	Forbes DC Red (DCAR)	281%	246%	507%	507%
55	K22W (max +dP @ t, d-ang)	11.3@(2.65822,-2.6)	21.1@(2.68322,-6.8)	59.6@(2.72489,-33.2)	39.1@(2.56656,-21.6)
56	K22W (max -dP @ t, d-ang)	25.1@(0.82497,8.1)	30.0@(0.81663,10.9)	1.7@(0.45831,-0.2)	1.4@(0.29999,-0.2)
57	K22W (max d-ang @ t, dP)	12.8@(1.14995,-7.7)	16.7@(1.15829,-11.6)	-152.4@(20.00792,28.7)	-85.9@(20.00792,17.6)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	71% / 131%	56% / 112%	71% / 128%	100% / 170%
61	L20D at Prairie/Drayton	829% / 581%	682% / 541%	796% / 548%	999% / 648%
62	R50M / F3M	578% / 258%	537% / 245%	598% / 222%	673% / 257%
63	B10T	-256%	147%	118%	187%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 3 | 0)	(0 | 3 | 1)	(0 | 1 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 2 | 2) / (0 | 0 | 0)	(1 | 2 | 2) / (0 | 1 | 1)	(1 | 2 | 2) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 1 | 1) / (0 | 5 | 3)	(1 | 1 | 0) / (0 | 5 | 3)	(1 | 1 | 1) / (0 | 4 | 2)	(1 | 1 | 1) / (0 | 3 | 3)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

TABLE 7.6 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C3X2A

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S3C3X2A-nbz	upe-so04aa.S3C3X2A-mqs	upe-so04aa.S3C3X2A-pys	upe-so04aa.S3C3X2A-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 13 2002 18:37	MAY 13 2002 18:55	MAY 13 2002 19:10	MAY 13 2002 19:25
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2668 / 318	2668 / 318	2668 / 318	2668 / 318
10	MHEX / L20D	2174 / 238	2174 / 238	2174 / 238	2174 / 238
11	ECL-ARP / PRI-BYN	630 / 845	630 / 845	630 / 845	630 / 845
12	MWSI / MNEX	1475 / 2783	1475 / 2783	1475 / 2783	1475 / 2783
13	D602F / F601C	1806 / 1473	1806 / 1473	1806 / 1473	1806 / 1473
14	B10T / MH>SPC	165 / 98	165 / 98	165 / 98	165 / 98
15	OH E-W / OH>MH	-120 / -196	-120 / -196	-120 / -196	-120 / -196
16	R50M / OH>MP	166 / 149	166 / 149	166 / 149	166 / 149
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	222 / 64	222 / 64	222 / 64	222 / 64
19	Forbes SVC / MSC	40 / 600	40 / 600	40 / 600	40 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018
23	Chisago 500/EauClaire 345	1.022 / 1.005	1.022 / 1.005	1.022 / 1.005	1.022 / 1.005
24	Int Falls 115/Badoura 115	1.049 / 1.003	1.049 / 1.003	1.049 / 1.003	1.049 / 1.003
25	Drayton 230/Groton 345	1.006 / 0.998	1.006 / 0.998	1.006 / 0.998	1.006 / 0.998
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	140% / 229%	140% / 229%	140% / 229%	140% / 229%
28	L20D at Prairie/Drayton	999% / 833%	999% / 833%	999% / 833%	999% / 833%
29	R50M/F3M	772% / 349%	772% / 349%	772% / 349%	772% / 349%
30	B10T	337%	337%	337%	337%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.92 | 1.09	0.96 | 1.06	0.97 | 1.01	0.99 | 1.01
33	Boise 115	0.98 | 1.07	1.01 | 1.08	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.15	1.01 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	0.99 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.92 | 1.07	0.96 | 1.04	1.01 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.97 | 1.09	0.98 | 1.07	1.01 | 1.06	1.02 | 1.04
38	Dickinson 345	0.97 | 1.09	0.96 | 1.09	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.97 | 1.06	0.99 | 1.02	0.99 | 1.02	1.00 | 1.01
40	Groton 345	0.87 | 1.06	0.90 | 1.03	0.95 | 1.00	0.98 | 1.00
41	Tioga 230	1.00 | 1.06	0.99 | 1.06	1.01 | 1.04	1.02 | 1.04
42	Wahpeton 115	0.91 | 1.10	0.98 | 1.08	1.03 | 1.05	1.04 | 1.05
43	Watertown 345	0.92 | 1.07	0.94 | 1.04	0.99 | 1.02	1.00 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -38.03%	KING 3 / 4.48%	SHERC3 / 22.94%	KING 3 / 23.81%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	506%	162%	298%
55	K22W (max +dP @ t, d-ang)	152.8@(2.10825,-68.2)	71.6@(2.60822,-35.7)	2.0@(4.08316,5.0)	0.0@(-0.00833,0.0)
56	K22W (max -dP @ t, d-ang)	97.9@(0.26666,10.8)	21.9@(0.32499,4.1)	33.4@(1.76659,21.4)	21.3@(2.14991,13.7)
57	K22W (max d-ang @ t, dP)	-274.2@(20.00792,57.2)	-123.7@(20.00792,23.8)	24.5@(20.00792,-16.9)	14.2@(1.89992,-20.3)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	47% / 99%	117% / 196%	132% / 218%
61	L20D at Prairie/Drayton	789% / 409%	999% / 535%	999% / 663%	999% / 734%
62	R50M / F3M	365% / 154%	525% / 231%	663% / 349%	713% / 349%
63	B10T	108%	94%	193%	264%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 2 | 0)	(0 | 1 | 1)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 2 | 2) / (0 | 1 | 0)	(1 | 1 | 1) / (0 | 1 | 0)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 4 | 1) / (0 | 5 | 1)	(1 | 2 | 1) / (0 | 4 | 3)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

TABLE 7.6 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C3X2A

1	**Case No.**	9	10	11	12
2	**Case Name**	upe-so04aa.S3C3X2A-cl3	upe-so04aa.S3C3X2A-cm3	upe-so04aa.S3C3X2A-ct3	*upe-so04aa.S3C3X3A-cm3*
3	**Disturbance**	cl3	cm3	ct3	cm3
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 13 2002 19:39	MAY 13 2002 16:51	MAY 14 2002 9:06	MAY 13 2002 19:54
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2668 / 318	2668 / 318	2668 / 318	2658 / 319
10	MHEX / L20D	2174 / 238	2174 / 238	2174 / 238	2171 / 224
11	ECL-ARP / PRI-BYN	630 / 845	630 / 845	630 / 845	629 / 846
12	MWSI / MNEX	1475 / 2783	1475 / 2783	1475 / 2783	1476 / 2794
13	D602F / F601C	1806 / 1473	1806 / 1473	1806 / 1473	1806 / 1478
14	B10T / MH>SPC	165 / 98	165 / 98	165 / 98	168 / 101
15	OH E-W / OH>MH	-120 / -196	-120 / -196	-120 / -196	-120 / -196
16	R50M / OH>MP	166 / 149	166 / 149	166 / 149	165 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	222 / 64	222 / 64	222 / 64	226 / 35
19	Forbes SVC / MSC	40 / 600	40 / 600	40 / 600	40 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018
23	Chisago 500/EauClaire 345	1.022 / 1.005	1.022 / 1.005	1.022 / 1.005	1.021 / 1.006
24	Int Falls 115/Badoura 115	1.049 / 1.003	1.049 / 1.003	1.049 / 1.003	1.049 / 1.003
25	Drayton 230/Groton 345	1.006 / 0.998	1.006 / 0.998	1.006 / 0.998	1.008 / 1.002
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	140% / 229%	140% / 229%	140% / 229%	140% / 229%
28	L20D at Prairie/Drayton	999% / 833%	999% / 833%	999% / 833%	999% / 901%
29	R50M/F3M	772% / 349%	772% / 349%	772% / 349%	774% / 347%
30	B10T	337%	337%	337%	329%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.03	(8.83)0.53 | 3.80(8.86)	1.02 | 1.08	1.00 | 1.02
33	Boise 115	1.03 | 1.06	0.96 | 1.61(8.86)	1.04 | 1.08	1.04 | 1.05
34	Dorsey 230	1.02 | 1.06	0.76 | 2.75(8.86)	1.03 | 1.07	1.04 | 1.05
35	Forbes 230	1.00 | 1.03	(8.83)0.76 | 2.48(8.86)	1.02 | 1.05	1.01 | 1.02
36	Riverton 230	0.98 | 1.05	(8.78)0.52 | 4.38(8.86)	1.02 | 1.07	1.00 | 1.03
37	Coal Creek 230	0.95 | 1.11	(8.78)0.23 | 8.21(8.86)	1.02 | 1.11	0.98 | 1.08
38	Dickinson 345	0.97 | 1.06	0.82 | 1.78(8.86)	1.02 | 1.07	0.99 | 1.04
39	Drayton 230	0.98 | 1.03	(8.78)0.55 | ****	1.00 | 1.07	0.99 | 1.03
40	Groton 345	0.86 | 1.03	(8.78)0.51 | 4.61(8.86)	1.00 | 1.10	0.96 | 1.02
41	Tioga 230	0.90 | 1.05	(8.27)0.19 | ****	1.01 | 1.09	0.92 | 1.05
42	Wahpeton 115	0.97 | 1.10	(8.78)0.22 | 6.86(8.86)	1.05 | 1.13	1.01 | 1.06
43	Watertown 345	0.93 | 1.05	(8.83)0.60 | 3.30(8.86)	1.02 | 1.09	1.00 | 1.03
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 60.93%	/ %	KING 3 / -36.30%	SHERC3 / 57.84%
53	Dorsey SUVP / UdHold				/ 0.158
54	Forbes DC Red (DCAR)	294%	496%	507%	422%
55	K22W (max +dP @ t, d-ang)	18.5@(2.86655,-5.8)	82.6@(8.09143,-67.7)	90.0@(2.14991,-39.0)	9.8@(0.14166,-0.3)
56	K22W (max -dP @ t, d-ang)	17.6@(0.95830,2.5)	5.7@(0.79997,0.8)	2.5@(0.24999,0.0)	10.8@(0.80830,2.6)
57	K22W (max d-ang @ t, dP)	6.9@(1.31661,-1.4)	-70.0@(8.76642,61.4)	-154.2@(20.00792,44.9)	4.1@(1.09996,-3.6)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	95% / 166%	73% / 153%	128% / 212%	116% / 194%
61	L20D at Prairie/Drayton	999% / 564%	-344% / -275%	999% / 480%	999% / 788%
62	R50M / F3M	653% / 268%	653% / 196%	731% / 243%	705% / 314%
63	B10T	285%	-365%	68%	250%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 3 | 0)	(0 | 3 | 0)	(0 | 0 | 0)	(0 | 3 | 1)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 2 | 0) / (0 | 0 | 0)	(1 | 1 | 0) / (0 | 0 | 0)	(1 | 2 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 1 | 1) / (0 | 3 | 2)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 0) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

TABLE 7.6 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C3X2A

1	**Case No.**	13
2	**Case Name**	*upe-so04aa.S3C3X4A-cm3*
3	**Disturbance**	cm3
4	**Prior Outage**	None
5	**Date/Time**	MAY 13 2002 20:08
6	**Comments**	
7		
8	**Steady State Flows**	
9	NDEX / EAST BIAS	2666 / 318
10	MHEX / L20D	2172 / 236
11	ECL-ARP / PRI-BYN	629 / 844
12	MWSI / MNEX	1474 / 2784
13	D602F / F601C	1809 / 1475
14	B10T / MH>SPC	167 / 100
15	OH E-W / OH>MH	-121 / -197
16	R50M / OH>MP	166 / 149
17	Dorsey BP1 / BP2	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	220 / 44
19	Forbes SVC / MSC	40 / 600
20	**Steady State Vltgs**	
21	Dorsey 500/Dorsey 230	1.036 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.018
23	Chisago 500/EauClaire 345	1.022 / 1.007
24	Int Falls 115/Badoura 115	1.049 / 1.004
25	Drayton 230/Groton 345	1.007 / 1.000
26	**SS OS Relay Margins**	
27	D602F at Forbes/Dorsey	139% / 228%
28	L20D at Prairie/Drayton	999% / 840%
29	R50M/F3M	769% / 348%
30	B10T	333%
31	**Min/MaxTransientVltg**	
32	Arrowhd 230	1.00 | 1.02
33	Boise 115	1.04 | 1.05
34	Dorsey 230	1.04 | 1.05
35	Forbes 230	1.01 | 1.02
36	Riverton 230	1.00 | 1.02
37	Coal Creek 230	0.98 | 1.08
38	Dickinson 345	1.00 | 1.04
39	Drayton 230	1.00 | 1.02
40	Groton 345	0.95 | 1.02
41	Tioga 230	0.90 | 1.05
42	Wahpeton 115	1.01 | 1.06
43	Watertown 345	0.99 | 1.03
44	**Dynamic Voltage Warnings**	
45		none
46		
47		
48		
49		
50		
51		
52	Worst Case Angle Damping	SHERC3 / 56.43%
53	Dorsey SUVP / UdHold	
54	Forbes DC Red (DCAR)	438%
55	K22W (max +dP @ t, d-ang)	7.9@(0.13333,-0.3)
56	K22W (max -dP @ t, d-ang)	10.6@(0.89163,2.6)
57	K22W (max d-ang @ t, dP)	4.0@(1.17495,-3.8)
58	**OS Rel Trip / Marg**	
59	MH - OH	
60	D602F at Forbes/Dorsey	117% / 196%
61	L20D at Prairie/Drayton	999% / 735%
62	R50M / F3M	709% / 317%
63	B10T	263%
64	**FSCAPS (SS/Unav/Final)**	
65	Balta 230	(0 | 3 | 1)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 1 | 1) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)

Table 7.7
Minot-Leland Olds-Harvey-Prairie-Maple River-Benton Co. + Antelope Valley-Split Rock 500 kV + Split Rock-Lakefield Junction 345 kV (Case S3C4X1A)

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UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164

DATA FOR BUS  9000 [MINOWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 0.98040 122.90

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 0.98040 0.98040    87.12  1: 700.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
   1000.0  -510.0  -510.0  -510.0 1.00000                              100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
91644 MINOT  3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
91644 1  T 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS 91644 [MINOT  3 345] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0   130.0 1.01508 115.53

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  605 LELANDO3 345  1   0.00288  0.04165  0.45376  1  F   680.0 1159.0  748.0    0.0       1 1.000
  608 LOGAN  4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 9000 MINOWIND13.8  1   0.00024  0.01250  0.00000  1  F  1500.0 1500.0 1500.0    0.0       1 1.000
99944 HARVEY 5 345  1   0.00275  0.03979  0.43344  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  608 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 9000 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 7.7 (Cont.)

```
DATA FOR BUS   605 [LELANDO3 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01000 106.91

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   506 FTTHOMP3 345  1   0.01046  0.15170  1.65250  1  T   680.0 1159.0  748.0    0.0       1 1.000
   601 ANTELOP3 345  1   0.00123  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
   601 ANTELOP3 345  2   0.00124  0.01910  0.19730  1  T   717.0 1135.0  789.0    0.0       1 1.000
   611 LELAN32G20.0  1   0.00050  0.02770  0.00000  1  F   495.0  495.0  594.0    0.0       1 1.000
   660 GROTON 3 345  1   0.00914  0.13380  1.43530  1  T   717.0 1159.0  789.0    0.0       1 1.000
   791 CENTER 3 345  1   0.00052  0.00746  0.08127  1  T   680.0 1159.0  748.0    0.0       1 1.000
 22151 LELND1TY 345  1  -0.00042  0.00095  0.00000  1  F   250.0  250.0  300.0    0.0       1 1.000
 22152 LELND2TY 345  1   0.00032  0.00144  0.00000  1  F   500.0  500.0  600.0    0.0       1 1.000
 91644 MINOT  3 345  1   0.00288  0.04165  0.45376  1  T   680.0 1159.0  748.0    0.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
   506 FTTHOMP3 345  1    0.00000 -0.50000   0.00000 -0.68000     1
   660 GROTON 3 345  1    0.00000 -0.68000   0.00000  0.00000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   611 1  F 1.08110   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 22151 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
 22152 1  F 0.97500   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

 DATA FOR BUS 99944 [HARVEY 5 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01584 104.49

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   944 HARVEY 4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 91644 MINOT  3 345  1   0.00275  0.03979  0.43344  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
 99755 PRAIRIE5 345  1   0.00538  0.07771  0.84660  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   944 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

 DATA FOR BUS 99755 [PRAIRIE5 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01686  86.09

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   755 PRAIRIE4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
   792 MAPLE R3 345  1   0.00292  0.04228  0.46050  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 99944 HARVEY 5 345  1   0.00538  0.07771  0.84660  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   755 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 7.7 (Cont.)

```
DATA FOR BUS  1620 [PRASWCP7 115] RESIDING IN AREA  14, ZONE  74, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.03740  84.12

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 1.01080 1.01080   120.00  9:  40.00 3:  40.00                       755 PRAIRIE4 230

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  712 PRAIRIE7 115  1   0.00000  0.01080  0.00000  1  T   596.0  596.0  596.0    0.0       1 1.000

DATA FOR BUS   792 [MAPLE R3 345] RESIDING IN AREA  14, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98875  79.26

ID ST   PLOAD   QLOAD     I - L O A D     Y - L O A D  AREA  ZONE OWNER
99  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
B1  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
C4  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
M3  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
M5  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
MB  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
MC  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
MI  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
N2  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
N3  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
O4  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
S5  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
U2  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1
W1  1     0.0     0.0     0.0     0.0     0.0     0.0    14    90     1

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  916 BUFFALO3 345  1   0.00120  0.01630  0.29051  1  F   720.0 1560.0  792.0    0.0       1 1.000
 1667 BENTON 3 345  1   0.00774  0.11191  1.21905  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
79824 MAPLER1Y 345  1   0.00020  0.01970  0.00000  1  F   336.0  336.0  420.0    0.0       1 1.000
79825 MAPLER2Y 345  1   0.00020  0.01970  0.00000  1  T   336.0  336.0  420.0    0.0       1 1.000
99755 PRAIRIE5 345  1   0.00292  0.04228  0.46050  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
79824 1  F 0.97390   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
79825 1  F 0.97390   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 7.7 (Cont.)

```
DATA FOR BUS  6601 [AVALL T1 345] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00634 105.86

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  601 ANTELOP3 345  1   0.00003  0.00120  0.00000  1  F  1200.0 1200.0 1440.0    0.0       1 1.000
 5601 A.VALLEY 500  1   0.00003  0.00350  0.00000  1  T  1200.0 1200.0 1440.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  601 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 5601 1  T 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS  5601 [A.VALLEY 500] RESIDING IN AREA   6, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99628 104.18

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 5634 SPL ROCK 500  1   0.00390  0.08811  7.93300  1  F  3290.0 3290.0 3290.0    0.0       1 1.000
 6601 AVALL T1 345  1   0.00003  0.00350  0.00000  1  F  1200.0 1200.0 1440.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
 5634 SPL ROCK 500  1    0.00000 -3.50000   0.00000 -3.50000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 6601 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  5634 [SPL ROCK 500] RESIDING IN AREA  23, ZONE 353, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00115  57.47

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 5601 A.VALLEY 500  1   0.00390  0.08811  7.93300  1  T  3290.0 3290.0 3290.0    0.0       1 1.000
 6634 SPL.RKT1 345  1   0.00003  0.00350  0.00000  1  F  1200.0 1200.0 1440.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
 5601 A.VALLEY 500  1    0.00000 -3.50000   0.00000 -3.50000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 6634 1  F 1.02500   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 7.7 (Cont.)

```
 DATA FOR BUS  6634 [SPL.RKT1 345] RESIDING IN AREA  23, ZONE 353, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98946  55.79

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  1634 SPLT RK3 345  1   0.00003  0.00120  0.00000  1  F  1200.0 1200.0 1440.0    0.0       1 1.000
  5634 SPL ROCK 500  1   0.00003  0.00350  0.00000  1  T  1200.0 1200.0 1440.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  1634 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
  5634 1  T 1.02500   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS  2010 [LAKEFLD3 345] RESIDING IN AREA  31, ZONE  25, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99902  45.41

 MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
  1 1.04000 1.02000     0.00  3: -25.00

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  1634 SPLT RK3 345  1   0.00139  0.03168  0.64641  1  T  2270.0 2270.0 2270.0    0.0       1 1.000
  1889 LKFLDXL3 345  1   0.00100  0.00960  0.15547  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
  2011 LAKEFLD5 161  1   0.00000  0.03400  0.00000  1  T   250.0  250.0  312.0    1.0       1 1.000
  2011 LAKEFLD5 161  2   0.00000  0.02736  0.00000  1  T   336.0  420.0  336.0    0.0       1 1.000
  2330 RAUN   3 345  1   0.00590  0.05830  0.93020  1  F   720.0  720.0  792.0    1.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  2330 RAUN   3 345  1    0.00000 -0.50000   0.00000  0.00000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  2011 1  T 1.03130   0.0 1  -2011 1.0500 0.9500 1.0350 1.0170 0.00313
  2011 2  T 1.03130   0.0 1  -2011 1.0500 0.9500 1.0350 1.0170 0.00313
```

TABLE 7.8 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C4X1A

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S3C4X1A-ag1	upe-so04aa.S3C4X1A-ag3	upe-so04aa.S3C4X1A-ei2	upe-so04aa.S3C4X1A-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 10 2002 4:19	MAY 10 2002 4:34	MAY 10 2002 4:50	MAY 10 2002 5:05
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3059 / 330	3059 / 330	3059 / 330	3059 / 330
10	MHEX / L20D	2172 / 213	2172 / 213	2172 / 213	2172 / 213
11	ECL-ARP / PRI-BYN	659 / 820	659 / 820	659 / 820	659 / 820
12	MWSI / MNEX	1479 / 2356	1479 / 2356	1479 / 2356	1479 / 2356
13	D602F / F601C	1813 / 1344	1813 / 1344	1813 / 1344	1813 / 1344
14	B10T / MH>SPC	167 / 100	167 / 100	167 / 100	167 / 100
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	169 / 150	169 / 150	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	231 / -3	231 / -3	231 / -3	231 / -3
19	Forbes SVC / MSC	40 / 600	40 / 600	40 / 600	40 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.017	1.064 / 1.017	1.064 / 1.017	1.064 / 1.017
23	Chisago 500/EauClaire 345	1.022 / 1.005	1.022 / 1.005	1.022 / 1.005	1.022 / 1.005
24	Int Falls 115/Badoura 115	1.052 / 1.003	1.052 / 1.003	1.052 / 1.003	1.052 / 1.003
25	Drayton 230/Groton 345	1.023 / 1.011	1.023 / 1.011	1.023 / 1.011	1.023 / 1.011
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	138% / 226%	138% / 226%	138% / 226%	138% / 226%
28	L20D at Prairie/Drayton	999% / 991%	999% / 991%	999% / 991%	999% / 991%
29	R50M/F3M	738% / 351%	738% / 351%	738% / 351%	738% / 351%
30	B10T	333%	333%	333%	333%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.97 | 1.02	0.96 | 1.02	0.98 | 1.05	0.99 | 1.04
33	Boise 115	1.02 | 1.06	1.01 | 1.07	1.02 | 1.07	1.04 | 1.07
34	Dorsey 230	1.02 | 1.05	1.01 | 1.05	1.03 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	1.00 | 1.03	0.98 | 1.04	1.00 | 1.03
36	Riverton 230	0.97 | 1.03	0.96 | 1.03	0.95 | 1.04	0.98 | 1.03
37	Coal Creek 230	0.95 | 1.10	0.95 | 1.10	1.03 | 1.10	0.98 | 1.12
38	Dickinson 345	0.96 | 1.06	0.95 | 1.06	1.02 | 1.06	1.02 | 1.08
39	Drayton 230	1.00 | 1.04	0.99 | 1.04	1.00 | 1.04	1.01 | 1.03
40	Groton 345	0.87 | 1.03	0.85 | 1.03	0.92 | 1.05	0.93 | 1.04
41	Tioga 230	1.01 | 1.05	1.01 | 1.05	1.02 | 1.05	1.02 | 1.05
42	Wahpeton 115	0.97 | 1.08	0.96 | 1.08	0.96 | 1.09	0.98 | 1.07
43	Watertown 345	0.94 | 1.04	0.93 | 1.04	0.95 | 1.05	0.97 | 1.04
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 62.47%	SHERC3 / 57.73%	KING 3 / -61.72%	SHERC3 / -59.40%
53	Dorsey SUVP / UdHold		/ 0.166		
54	Forbes DC Red (DCAR)	302%	275%	507%	507%
55	K22W (max +dP @ t, d-ang)	8.1@(2.61656,-2.3)	11.0@(2.63322,-4.0)	57.9@(2.59989,-33.4)	36.2@(2.48323,-20.6)
56	K22W (max -dP @ t, d-ang)	23.0@(0.79997,7.4)	27.0@(0.79164,10.0)	2.2@(0.49998,-0.4)	2.0@(0.29999,-0.1)
57	K22W (max d-ang @ t, dP)	11.8@(1.13329,-7.4)	14.9@(1.12496,-10.7)	-156.4@(20.00792,29.4)	-83.5@(20.00792,16.6)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	73% / 134%	64% / 122%	70% / 128%	98% / 168%
61	L20D at Prairie/Drayton	999% / 727%	999% / 688%	999% / 665%	999% / 788%
62	R50M / F3M	560% / 265%	535% / 260%	572% / 231%	640% / 265%
63	B10T	189%	170%	136%	194%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 2 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 1 | 1)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 1 | 1) / (0 | 3 | 2)	(1 | 1 | 1) / (0 | 2 | 2)	(1 | 1 | 1) / (0 | 3 | 2)	(1 | 1 | 1) / (0 | 1 | 1)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

TABLE 7.8 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C4X1A

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S3C4X1A-nbz	upe-so04aa.S3C4X1A-mqs	upe-so04aa.S3C4X1A-pys	upe-so04aa.S3C4X1A-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 10 2002 5:19	MAY 10 2002 5:37	MAY 10 2002 5:52	MAY 10 2002 6:06
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	3059 / 330	3059 / 330	3059 / 330	3059 / 330
10	MHEX / L20D	2172 / 213	2172 / 213	2172 / 213	2172 / 213
11	ECL-ARP / PRI-BYN	659 / 820	659 / 820	659 / 820	659 / 820
12	MWSI / MNEX	1479 / 2356	1479 / 2356	1479 / 2356	1479 / 2356
13	D602F / F601C	1813 / 1344	1813 / 1344	1813 / 1344	1813 / 1344
14	B10T / MH>SPC	167 / 100	167 / 100	167 / 100	167 / 100
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	169 / 150	169 / 150	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	231 / -3	231 / -3	231 / -3	231 / -3
19	Forbes SVC / MSC	40 / 600	40 / 600	40 / 600	40 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.017	1.064 / 1.017	1.064 / 1.017	1.064 / 1.017
23	Chisago 500/EauClaire 345	1.022 / 1.005	1.022 / 1.005	1.022 / 1.005	1.022 / 1.005
24	Int Falls 115/Badoura 115	1.052 / 1.003	1.052 / 1.003	1.052 / 1.003	1.052 / 1.003
25	Drayton 230/Groton 345	1.023 / 1.011	1.023 / 1.011	1.023 / 1.011	1.023 / 1.011
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	138% / 226%	138% / 226%	138% / 226%	138% / 226%
28	L20D at Prairie/Drayton	999% / 991%	999% / 991%	999% / 991%	999% / 991%
29	R50M/F3M	738% / 351%	738% / 351%	738% / 351%	738% / 351%
30	B10T	333%	333%	333%	333%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.10	0.97 | 1.05	0.97 | 1.00	0.99 | 1.00
33	Boise 115	0.97 | 1.07	1.01 | 1.08	1.03 | 1.07	1.05 | 1.06
34	Dorsey 230	1.04 | 1.15	1.01 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.95 | 1.06	0.99 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.94 | 1.05	0.96 | 1.03	1.01 | 1.03	1.02 | 1.03
37	Coal Creek 230	0.97 | 1.07	0.98 | 1.06	1.01 | 1.06	1.02 | 1.04
38	Dickinson 345	0.97 | 1.08	0.97 | 1.08	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	1.02 | 1.05	1.01 | 1.03	1.01 | 1.04	1.02 | 1.03
40	Groton 345	0.91 | 1.06	0.94 | 1.03	0.98 | 1.01	1.00 | 1.01
41	Tioga 230	1.00 | 1.06	1.00 | 1.05	1.01 | 1.04	1.03 | 1.04
42	Wahpeton 115	0.95 | 1.09	0.99 | 1.06	1.04 | 1.06	1.05 | 1.06
43	Watertown 345	0.95 | 1.05	0.97 | 1.04	1.00 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -29.86%	KING 3 / 0.34%	SHERC3 / 29.23%	KING 3 / 18.09%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	478%	175%	323%
55	K22W (max +dP @ t, d-ang)	148.5@(2.09158,-66.4)	67.1@(2.59989,-33.5)	0.8@(0.11666,0.2)	0.0@(0.00000,0.0)
56	K22W (max -dP @ t, d-ang)	98.1@(0.26666,10.6)	21.5@(0.33332,4.0)	30.9@(1.75826,18.8)	20.8@(2.14991,13.1)
57	K22W (max d-ang @ t, dP)	-278.3@(20.00792,52.3)	-120.9@(20.00792,22.3)	21.8@(20.00792,-15.1)	17.8@(20.00792,-11.6)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	44% / 95%	114% / 192%	136% / 222%
61	L20D at Prairie/Drayton	894% / 481%	999% / 661%	999% / 777%	999% / 867%
62	R50M / F3M	305% / 142%	492% / 226%	633% / 351%	695% / 351%
63	B10T	122%	110%	194%	263%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 1 | 1) / (0 | 2 | 0)	(1 | 1 | 1) / (0 | 1 | 0)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 5 | 2) / (0 | 5 | 3)	(1 | 2 | 1) / (0 | 1 | 1)	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

TABLE 7.8 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 3 (Minot) - Case S3C4X1A

1	**Case No.**	9	10
2	**Case Name**	upe-so04aa.S3C4X1A-cl3	upe-so04aa.S3C4X1A-cm3
3	**Disturbance**	cl3	cm3
4	**Prior Outage**	None	None
5	**Date/Time**	MAY 10 2002 6:19	MAY 10 2002 6:33
6	**Comments**		
7			
8	**Steady State Flows**		
9	NDEX / EAST BIAS	3059 / 330	3059 / 330
10	MHEX / L20D	2172 / 213	2172 / 213
11	ECL-ARP / PRI-BYN	659 / 820	659 / 820
12	MWSI / MNEX	1479 / 2356	1479 / 2356
13	D602F / F601C	1813 / 1344	1813 / 1344
14	B10T / MH>SPC	167 / 100	167 / 100
15	OH E-W / OH>MH	-120 / -197	-120 / -197
16	R50M / OH>MP	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	231 / -3	231 / -3
19	Forbes SVC / MSC	40 / 600	40 / 600
20	**Steady State Vltgs**		
21	Dorsey 500/Dorsey 230	1.036 / 1.045	1.036 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.017	1.064 / 1.017
23	Chisago 500/EauClaire 345	1.022 / 1.005	1.022 / 1.005
24	Int Falls 115/Badoura 115	1.052 / 1.003	1.052 / 1.003
25	Drayton 230/Groton 345	1.023 / 1.011	1.023 / 1.011
26	**SS OS Relay Margins**		
27	D602F at Forbes/Dorsey	138% / 226%	138% / 226%
28	L20D at Prairie/Drayton	999% / 991%	999% / 991%
29	R50M/F3M	738% / 351%	738% / 351%
30	B10T	333%	333%
31	**Min/MaxTransientVltg**		
32	Arrowhd 230	0.99 | 1.02	1.00 | 1.01
33	Boise 115	1.04 | 1.06	1.05 | 1.05
34	Dorsey 230	1.03 | 1.05	1.04 | 1.05
35	Forbes 230	1.01 | 1.03	1.01 | 1.02
36	Riverton 230	0.99 | 1.03	1.01 | 1.02
37	Coal Creek 230	0.97 | 1.10	0.99 | 1.07
38	Dickinson 345	0.97 | 1.05	1.00 | 1.03
39	Drayton 230	1.01 | 1.04	1.01 | 1.03
40	Groton 345	0.92 | 1.03	0.98 | 1.02
41	Tioga 230	0.91 | 1.04	0.88 | 1.05
42	Wahpeton 115	1.01 | 1.08	1.03 | 1.06
43	Watertown 345	0.97 | 1.04	1.00 | 1.03
44	**Dynamic Voltage Warnings**		
45		none	1644 [MINOT 3] 0.68
46			
47			
48			
49			
50			
51			
52	Worst Case Angle Damping	SHERC3 / 62.42%	SHERC3 / 39.36%
53	Dorsey SUVP / UdHold		
54	Forbes DC Red (DCAR)	347%	479%
55	K22W (max +dP @ t, d-ang)	11.8@(2.79988,-3.8)	8.0@(0.14166,-0.2)
56	K22W (max -dP @ t, d-ang)	14.2@(0.90830,1.8)	8.7@(0.94996,2.5)
57	K22W (max d-ang @ t, dP)	5.3@(1.27495,-0.4)	3.4@(1.23328,-4.5)
58	**OS Rel Trip / Marg**		
59	MH - OH		
60	D602F at Forbes/Dorsey	106% / 182%	119% / 201%
61	L20D at Prairie/Drayton	999% / 722%	999% / 889%
62	R50M / F3M	658% / 291%	686% / 331%
63	B10T	317%	137%
64	**FSCAPS (SS/Unav/Final)**		
65	Balta 230	(0 | 1 | 0)	(0 | 3 | 1)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(1 | 1 | 1) / (0 | 0 | 0)	(1 | 1 | 1) / (0 | 0 | 0)
69	Shey 115 / Split Rock 115	(2 | 2 | 2) / (| 0 |)	(2 | 2 | 2) / (| 0 |)

Table 7.9a
Summary of Site 3 (Minot) Selected Alternatives

ALTERNATIVE			MEETS CRITERIA ?	REQUIRES GENERATION TRIPPING ?
Minot-Harvey 345 kV + Minot-Leland Olds 345 kV. +Harvey-Prairie-Maple River-Benton Co. 345 kV +Center-Leland Olds 345 kV + Prairie SVC +SVC at Wind Generation Terminals	S3C2X1A - Upgrade of Fargo/Maple River-Granite Falls 345 kV+Granite Falls-Blue Lake 345 kV		Marginally	No
	S3C4X1A - Antelope Valley-S.Rock 500 kV + S. Rock-Lakefield Jnct. 345 kV		Yes	No
	Prairie-Duluth 345 kV	S3C3X2A	Yes	Yes
		S3C3X3A - 35% Series Comp. of Minot-Harvey-Prairie 345 kV	Yes	No
		S3C3X4A - Harvey-Leland Olds 345 kV	Yes	No

Table 7.9b
Interface Flows for Site 3 (Minot) Selected Alternatives

ALTERNATIVE	MHEX	G82R	LD20	D602F	R50M	NDEX	MWSI	PI-BYN	EAU-ARP
S3C2X1A	2176.1	-44.8	213.9	1834.9	172.2	2971.7	1485.2	838.8	646.4
S3C3X2A	2174.4	-36.6	237.7	1807.1	166.2	2972.4	1477.4	846.0	631.5
S3C3X3A	2172.0	-25.7	224.2	1807.5	165.9	2977.1	1478.9	847.8	631.1
S3C3X4A	2172.8	-40.7	236.5	1810.4	166.6	2975.8	1476.4	845.7	630.7
S3C4X1A	2172.9	-24.2	213.0	1814.4	169.7	3017.0	1481.2	820.9	660.3

Table 7.10
MUST Results Case S3C2X1A

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FCITC Single Study

  *** MUST 4.01.07 ***  TUE, MAY 07 2002  11:43 ***
      UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
      ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE3      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5951 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX% S3C2X1A   %
     1  -2264.8 L:  805 BAKER  7 115   832 GLENDCT7 115 1         -96.0   -67.7 -0.01251         -0.00585   -31.9   -18.7   129   129   142(N/C)  13
                C:  411 MI CTYE4 230   804 BAKER  4 230 1     129
                  Open   411 MI CTYE4 230   804 BAKER  4 230 1                          -0.47202  0.01409   135.7   103.8
     3  -1725.0 L:  515 HURON  7 115   528 WOONSKT7 115 1         112.0    88.0  0.01391          0.00864    54.9    40.0   119   119   127(N/C)   8
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     331
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25340  0.02078   225.2   189.3
     4  -1530.4 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1976.1 -1732.0 -0.15948         -0.15130 -1834.9 -1603.3   111   111   114(N/C)   3
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     661
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.63834  0.01283   221.2   201.6
     5  -1363.8 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1          92.5    67.7  0.01821          0.01063    35.7    21.2   123   123   137(N/C)  14
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     695
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                           0.37989  0.01995   149.6   122.4
    11  -1232.2 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          79.2    65.8  0.01089          0.00506    45.2    39.0   120   120    119    -1
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     436
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.22891  0.02549   148.6   117.2
    12  -1226.3 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -90.0   -67.7 -0.01821         -0.01063   -33.2   -20.1   119   119    133    14
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     695
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                          -0.37989  0.01995   149.6   125.1
    16  -1150.1 L:  528 WOONSKT7 115   623 STORLA 7 115 1         104.0    88.0  0.01391          0.00864    46.9    37.0   112   112    118     6
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     331
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25340  0.02078   225.2   201.3
    21   -990.9 L:  404 DAWSONC7 115   832 GLENDCT7 115 1          80.1    67.7  0.01251          0.00585    16.0    10.2   108   108    118    10
                C:  411 MI CTYE4 230   804 BAKER  4 230 1     129
                  Open   411 MI CTYE4 230   804 BAKER  4 230 1                           0.47202  0.01409   135.7   121.7
    33   -887.7 L:  911 BIGSTON7 115   948 HIWY12 7 115 1         187.0   176.0  0.01236          0.00868    98.0    90.3   104  104   101   -3
                C:  503 BLAIR  4 230   910 BIGSTON4 230 1     308
                  Open   503 BLAIR  4 230   910 BIGSTON4 230 1                          -0.30771 -0.01195  -289.1  -278.4
    43   -855.4 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         364.8   352.0  0.01492          0.00518   135.0   130.5   101   101   104  3
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     581
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.60112  0.01621   382.3   368.4
  2612   -680.0 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1834.9 -1732.0 -0.15130
                  Base Case
  5888   -483.9 L:  435 FARGO  4 230   553 MOORHED4 230 1         305.4   263.0  0.08760          0.02470    59.9    47.9   N/A  NONE   116      NEW
                C:  792 MAPLE R3 345 99553 MOORHED3 345 1     692
                  Open   792 MAPLE R3 345 99553 MOORHED3 345 1                           0.65755  0.09566   373.4   327.1
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Table 7.10 (Cont.)
MUST Results Case S3C2X1A

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5892   -475.7 L:  827 ELLENDL7 115  1001 ABDNJCT7 115 1          96.0    88.0  0.01680          0.00386    50.9    49.1   101   101   109      8
              C:  826 ELLENDL4 230   994 OAKES  4 230 1     709
                Open   826 ELLENDL4 230   994 OAKES  4 230 1                          0.32546  0.03974   138.6   119.7
5901   -439.6 L:  555 MORRIS 7 115  1911 WALDON 7 115 1          88.9    80.0  0.02028          0.00741    46.5    43.2   N/A   NONE  111(N/C) NEW
              C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5817
                Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                          0.10958  0.11737   387.1   335.5
5907   -392.9 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1791.4 -1732.0 -0.15130
                Base Case
5908   -392.9 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1791.4  1732.0  0.15130
                Base Case
5915   -349.1 L:19010 FARGO  869.0 29400 MAPLE R869.0 1          48.5    45.0  0.01004          0.00213    16.5    15.7  NONE  NONE  108      NEW
              C:  435 FARGO  4 230  1637 SHEYNNE4 230 1     186
                Open   435 FARGO  4 230  1637 SHEYNNE4 230 1                          0.11827  0.06689   270.9   247.5
5919   -327.5 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          47.5    44.0  0.01073          0.00701    43.2    40.9   109   138  111      2
              C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     964
                Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                          0.05582  0.06670    78.1    56.2
5923   -248.3 L: 1905 BENSON 7 115  1911 WALDON 7 115 1         -85.0   -80.0 -0.02028         -0.00741   -42.6   -40.8   N/A  NONE  106      NEW
              C:99554 MORRIS 3 345 99550 GRANFLS3 345 1    5817
                Open 99554 MORRIS 3 345 99550 GRANFLS3 345 1                         -0.10958  0.11737   387.1   358.0
5927   -216.2 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -79.4   -77.0 -0.01089         -0.00506   -45.3   -44.2   112   112   111     -1
              C:  550 GRANITF4 230  1516 WILLMAR4 230 1     436
                Open   550 GRANITF4 230  1516 WILLMAR4 230 1                         -0.22891  0.02549   148.6   143.1
5930   -167.4 L:  497 MAURINE4 230   470 BISON  4 230 1        -182.3  -176.0 -0.03788         -0.03058  -154.5  -149.4   N/A  NONE   104(N/C) NEW
              C:  506 FTTHOMP3 345   605 LELANDO3 345 1     317
                Open   506 FTTHOMP3 345   605 LELANDO3 345 1                          0.07176 -0.10174  -387.7  -370.6
5932   -126.2 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -109.5  -106.0 -0.02747         -0.01606   -76.1   -74.1   115   115   114     -1
              C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     951
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          0.20723 -0.05504  -161.1  -154.1
5940    -36.3 L:  480 MAURINE7 115   483 NEWELL 7 115 1          66.4    66.0  0.01198          0.00363    28.6    28.5   92    92    101     9
              C:  484 NUNDRWD4 230   497 MAURINE4 230 1     270
                Open   484 NUNDRWD4 230   497 MAURINE4 230 1                         -0.34655 -0.02409  -109.1  -108.2
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Table 7.10 (Cont.)
MUST Results Case S3C3X2A

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FCITC Single Study

  *** MUST 4.01.07 ***  TUE, MAY 14 2002  11:20 ***
      UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
      ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE3      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5940 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX% S3C3X2A   %
     1  -2313.5 L:  805 BAKER  7 115   832 GLENDCT7 115 1         -96.3   -67.7 -0.01237         -0.00579   -32.1   -18.7   129   129   139      10
                C:  411 MI CTYE4 230   804 BAKER  4 230 1     129
                  Open   411 MI CTYE4 230   804 BAKER  4 230 1                           -0.47202  0.01394   136.0   103.8
     3  -1784.3 L:  515 HURON  7 115   528 WOONSKT7 115 1         113.8    88.0  0.01443          0.00923    56.7    40.2   119   119   127       8
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     331
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                            0.25336  0.02055   225.2   188.5
     5  -1411.0 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1          93.1    67.7  0.01801          0.01052    36.1    21.2   123   123   129       6
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     694
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                            0.37988  0.01973   150.0   122.2
     6  -1382.2 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1941.7 -1732.0 -0.15168         -0.14475 -1807.1 -1607.0   111   111   113       2
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     661
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                           -0.62719  0.01106   214.5   199.2
     7  -1272.0 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -90.6   -67.7 -0.01801         -0.01052   -33.6   -20.2   119   119   135      16
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     694
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                           -0.37988  0.01973   150.0   124.9
     8  -1223.5 L:  528 WOONSKT7 115   623 STORLA 7 115 1         105.7    88.0  0.01443          0.00923    48.6    37.3   112   112   120       8
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     331
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                            0.25336  0.02055   225.2   200.1
    11  -1165.8 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          81.5    65.8  0.01343          0.00528    44.3    38.1   120   120   116      -4
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     437
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                            0.23617  0.03449   157.5   117.2   108   108   118      10
    18  -1025.6 L:  404 DAWSONC7 115   832 GLENDCT7 115 1          80.3    67.7  0.01237          0.00579    16.1    10.2
                C:  411 MI CTYE4 230   804 BAKER  4 230 1     129
                  Open   411 MI CTYE4 230   804 BAKER  4 230 1                            0.47202  0.01394   136.0   121.7
    23   -960.9 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         366.5   352.0  0.01504          0.00522   135.6   130.6   101   101   104       3
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     581
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                            0.60113  0.01634   384.1   368.4
  2662   -518.9 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1807.1 -1732.0 -0.14475
                  Base Case
  5834   -467.0 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          49.5    44.0  0.01176          0.00755    44.0    40.5   107   138   115       8
                C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     963
                  Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                            0.05672  0.07435    96.9    62.1
  5840   -461.5 L:  827 ELLENDL7 115  1001 ABDNJCT7 115 1          95.4    88.0  0.01608          0.00372    51.7    49.9   103   103   111       8
                C:  826 ELLENDL4 230   994 OAKES  4 230 1     708
                  Open   826 ELLENDL4 230   994 OAKES  4 230 1                            0.32572  0.03794   134.4   116.9
```

Table 7.10 (Cont.)
MUST Results Case S3C3X2A

```
5887   -341.1 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -81.6   -77.0 -0.01343         -0.00528   -44.4   -42.6   114   114   116     2
              C:  550 GRANITF4 230  1516 WILLMAR4 230 1     437
                Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.23617  0.03449   157.5   145.7
5900   -275.0 L:  497 MAURINE4 230   470 BISON  4 230 1        -184.3  -176.0 -0.03025         -0.03025  -155.3  -147.0 NONE  NONE  104(N/C) NEW
              C:  618 LARAM31G24.0   631 LARAMIE3 345 1     566
                Open   618 LARAM31G24.0   631 LARAMIE3 345 1                           0.05196  0.00000  -558.5  -558.5
5908   -229.9 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1765.3  1732.0  0.14475
                Base Case
5909   -229.8 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1765.3 -1732.0 -0.14475
                Base Case
5915   -192.8 L:  497 MAURINE4 230   470 BISON  4 230 1        -183.2  -176.0 -0.03746         -0.03025  -155.3  -149.5  NONE  NONE  104    NEW
              C:  506 FTTHOMP3 345   605 LELANDO3 345 1     317
                Open   506 FTTHOMP3 345   605 LELANDO3 345 1                           0.07182 -0.10042  -388.8  -369.4
5916   -164.2 L:19010 FARGO  869.0 29400 MAPLE R869.0 1          47.0    45.0  0.01204          0.00133    12.5    12.3  NONE  NONE  104    NEW
              C:  435 FARGO  4 230  1637 SHEYNNE4 230 1     186
                Open   435 FARGO  4 230  1637 SHEYNNE4 230 1                           0.20921  0.05118   164.9   156.4
5922    -83.7 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -108.4  -106.0 -0.02861         -0.01674   -75.7   -74.3   115   115   112    -2
              C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     950
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.21109 -0.05620  -154.7  -149.9
5928    -70.1 L:  480 MAURINE7 115   483 NEWELL 7 115 1          66.8    66.0  0.01187          0.00360    28.8    28.5    92    92   102    10
              C:  484 NUNDRWD4 230   497 MAURINE4 230 1     270
                Open   484 NUNDRWD4 230   497 MAURINE4 230 1                          -0.34654 -0.02388  -109.9  -108.2
5935     -6.0 L:  655 LOGAN  7 115  1644 MINOT  7 115 1         215.8   215.0  0.13170          0.07626   121.1   120.6   NONE  NONE  104    NEW
              C:91644 MINOT  3 345 99944 HARVEY 5 345 1    5815
                Open 91644 MINOT  3 345 99944 HARVEY 5 345 1                           0.16417  0.33770   576.9   574.8
```

Table 7.10 (Cont.)
MUST Results Case S3C3X3A

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FCITC Single Study

  *** MUST 4.01.07 ***  TUE, MAY 14 2002  11:35 ***
      UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
      ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE3      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5936 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX% S3C3X3A   %
     1  -2314.3 L:  805 BAKER  7 115   832 GLENDCT7 115 1         -94.7   -67.7 -0.01167         -0.00545   -31.3   -18.7   129   129   137    8
                C:  411 MI CTYE4 230   804 BAKER  4 230 1     129
                  Open   411 MI CTYE4 230   804 BAKER  4 230 1                          -0.47196  0.01316   134.2   103.8
     3  -1773.0 L:  515 HURON  7 115   528 WOONSKT7 115 1         112.6    88.0  0.01387          0.00892    56.0    40.2   119   119   126    7
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     331
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25333  0.01956   223.2   188.5
     6  -1359.9 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1          91.0    67.7  0.01716          0.01009    34.9    21.2    123   123   134    11
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     694
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                           0.37975  0.01862   147.6   122.3
     7  -1213.9 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -88.5   -67.7 -0.01716         -0.01009   -32.4   -20.2    119   119  131     12
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     694
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                          -0.37975  0.01862   147.6   125.0
     8  -1192.3 L:  528 WOONSKT7 115   623 STORLA 7 115 1         104.5    88.0  0.01387          0.00892    48.0    37.4    112   112  118      6
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     331
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25333  0.01956   223.2   199.9
     9  -1190.1 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          81.4    65.8  0.01315          0.00527    44.5    38.2    120   120   121     1
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     437
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.23615  0.03338   156.5   116.8
    21   -948.7 L:  404 DAWSONC7 115   832 GLENDCT7 115 1          78.7    67.7  0.01167          0.00545    15.4    10.2   108   108   116     8
                C:  411 MI CTYE4 230   804 BAKER  4 230 1     129
                  Open   411 MI CTYE4 230   804 BAKER  4 230 1                           0.47196  0.01316   134.2   121.7
    23   -891.4 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         364.8   352.0  0.01438          0.00499   135.0   130.5   101   101   104    3
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     581
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.60111  0.01562   382.4   368.4
  2975   -516.0 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1807.5 -1732.0 -0.14638
                  Base Case
  5803   -487.9 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          49.8    44.0  0.01188          0.00761    44.2    40.5   107   138   111     4
                C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     963
                  Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                           0.05672  0.07519    98.8    62.1
  5868   -394.0 L:  827 ELLENDL7 115  1001 ABDNJCT7 115 1          94.1    88.0  0.01541          0.00410    52.4    50.8   103   103   107(N/C) 4
                C:  826 ELLENDL4 230   994 OAKES  4 230 1     708
                  Open   826 ELLENDL4 230   994 OAKES  4 230 1                           0.32551  0.03476   128.1   114.4
  5886   -347.9 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -81.6   -77.0 -0.01315         -0.00527   -44.6   -42.8   112   112   114     2
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     437
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.23615  0.03338   156.5   144.9
  5907   -230.0 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1765.7 -1732.0 -0.14638
                  Base Case
```

Table 7.10 (Cont.)
MUST Results Case S3C3X3A

```
5908   -230.0 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1765.7  1732.0  0.14638
                Base Case
5914   -179.5 L:  497 MAURINE4 230   470 BISON  4 230 1        -181.2  -176.0 -0.02871         -0.02871  -152.1  -146.9  NONE  NONE  103  NEW
              C:  618 LARAM31G24.0   631 LARAMIE3 345 1     566
                Open   618 LARAM31G24.0   631 LARAMIE3 345 1                          0.05207  0.00000  -558.5  -558.5
5920    -92.2 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -108.6  -106.0 -0.02849         -0.01676   -76.0   -74.5   115   115   113     -2
              C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     950
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          0.21109 -0.05559  -154.4  -149.3
5926    -30.1 L:  452 RUGBY  7 115  1644 MINOT  7 115 1         -89.5   -88.0 -0.04962         -0.02127   -39.4   -38.7  NONE  NONE   108    NEW
              C:91644 MINOT  3 345 99944 HARVEY 5 345 1    5815
                Open 91644 MINOT  3 345 99944 HARVEY 5 345 1                         -0.06935  0.40880   722.6   710.3
5928    -15.8 L:  655 LOGAN  7 115  1644 MINOT  7 115 1         217.1   215.0  0.13146          0.06613   101.6   100.6   NONE  NONE  105    NEW
              C:91644 MINOT  3 345 99944 HARVEY 5 345 1    5815
                Open 91644 MINOT  3 345 99944 HARVEY 5 345 1                          0.15979  0.40880   722.6   716.1
```

Table 7.10 (Cont.)
MUST Results Case S3C3X4A

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FCITC Single Study

  *** MUST 4.01.07 ***  TUE, MAY 14 2002  12:07 ***
      UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
      ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE3      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5939 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX% S3C3X4A   %
     1  -2270.3 L:  805 BAKER  7 115   832 GLENDCT7 115 1         -95.9   -67.7 -0.01245         -0.00582   -31.9   -18.7   129   129   142(N/C) 13
                C:  411 MI CTYE4 230   804 BAKER  4 230 1     129
                  Open   411 MI CTYE4 230   804 BAKER  4 230 1                           -0.47200  0.01404   135.6   103.7
     3  -1726.3 L:  515 HURON  7 115   528 WOONSKT7 115 1         113.2    88.0  0.01460          0.00933    56.3    40.2   119   119   128(N/C) 9
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     331
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                            0.25331  0.02081   224.5   188.5
     5  -1423.7 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1945.1 -1732.0 -0.14970         -0.14288 -1810.4 -1607.0   111   111   112     1
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     662
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                           -0.62677  0.01088   215.0   199.5
     6  -1362.3 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1          92.4    67.7  0.01817          0.01063    35.6    21.2   123   123   138    15
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     695
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                            0.37982  0.01986   149.5   122.4
     8  -1224.5 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -89.9   -67.7 -0.01817         -0.01063   -33.1   -20.1   119   119   134    15
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     695
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                           -0.37982  0.01986   149.5   125.2
    10  -1173.4 L:  528 WOONSKT7 115   623 STORLA 7 115 1         105.1    88.0  0.01460          0.00933    48.3    37.3   112   112   119     7
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     331
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                            0.25331  0.02081   224.5   200.0
    11  -1172.8 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          81.6    65.8  0.01351          0.00529    44.4    38.2   120   120   122     2
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     437
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                            0.23614  0.03481   157.6   116.7
    21   -990.3 L:  404 DAWSONC7 115   832 GLENDCT7 115 1          80.0    67.7  0.01245          0.00582    16.0    10.2   108   108   118    10
                C:  411 MI CTYE4 230   804 BAKER  4 230 1     129
                  Open   411 MI CTYE4 230   804 BAKER  4 230 1                            0.47200  0.01404   135.6   121.7
    24   -910.3 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         365.8   352.0  0.01519          0.00527   135.4   130.6   101   101   104     3
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     582
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                            0.60111  0.01650   383.4   368.4
  2816   -548.6 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1810.4 -1732.0 -0.14288
                  Base Case
  5855   -474.0 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          49.6    44.0  0.01174          0.00754    44.1    40.5   107   138   116     9
                C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     964
                  Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                            0.05672  0.07415    97.1    62.0
  5862   -449.9 L:  827 ELLENDL7 115  1001 ABDNJCT7 115 1          95.2    88.0  0.01611          0.00354    52.0    50.4   103   103   110     7
                C:  826 ELLENDL4 230   994 OAKES  4 230 1     709
                  Open   826 ELLENDL4 230   994 OAKES  4 230 1                            0.32570  0.03857   132.8   115.5
```

Table 7.10 (Cont.)
MUST Results Case S3C3X4A

```
5890   -353.2 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -81.8   -77.0 -0.01351         -0.00529   -44.6   -42.7   112   112   114     2
              C:  550 GRANITF4 230  1516 WILLMAR4 230 1     437
                Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.23614  0.03481   157.6   145.3
5907   -254.5 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1768.4  1732.0  0.14288
                Base Case
5908   -254.5 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1768.4 -1732.0 -0.14288
                Base Case
5909   -245.1 L:  497 MAURINE4 230   470 BISON  4 230 1        -183.5  -176.0 -0.03049         -0.03049  -154.4  -146.9  NONE  NONE  104  NEW
              C:  618 LARAM31G24.0   631 LARAMIE3 345 1     567
                Open   618 LARAM31G24.0   631 LARAMIE3 345 1                           0.05205  0.00000  -558.5  -558.5
5924    -83.8 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -108.4  -106.0 -0.02867         -0.01676   -75.8   -74.4   115   115   112    -3
              C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     951
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.21108 -0.05643  -154.4  -149.6
5925    -83.7 L:19010 FARGO  869.0 29400 MAPLE R869.0 1          46.0    45.0  0.01231          0.00134    12.3    12.2  NONE  NONE  103  NEW
              C:  435 FARGO  4 230  1637 SHEYNNE4 230 1     186
                Open   435 FARGO  4 230  1637 SHEYNNE4 230 1                           0.20907  0.05246   161.3   156.9
5928    -39.9 L:  480 MAURINE7 115   483 NEWELL 7 115 1          66.5    66.0  0.01197          0.00363    28.7    28.5    92    92   102    10
              C:  484 NUNDRWD4 230   497 MAURINE4 230 1     270
                Open   484 NUNDRWD4 230   497 MAURINE4 230 1                          -0.34651 -0.02407  -109.1  -108.2
```

Table 7.10 (Cont.)
MUST Results Case S3C4X1A

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FCITC Single Study

  *** MUST 4.01.07 ***  THU, MAY 09 2002   9:21 ***
      UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
      ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE3      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5928 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX% S3C4X1A   %
     1  -1998.2 L:  805 BAKER  7 115   832 GLENDCT7 115 1         -90.6   -67.7 -0.01149         -0.00539   -29.4   -18.7   129   129   131      2
                C:  411 MI CTYE4 230   804 BAKER  4 230 1     129
                  Open   411 MI CTYE4 230   804 BAKER  4 230 1                           -0.47177  0.01292   129.7   103.8
     2  -1764.3 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1929.8 -1732.0 -0.11213         -0.15215 -1814.4 -1545.9   111   111   111(N/C) 0
                C:  752 DRAYTON4 230  3458 LETELER4 230 1     655
                  Open   752 DRAYTON4 230  3458 LETELER4 230 1                            0.54216  0.07381  -213.0  -343.2
     6  -1151.8 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          80.9    65.8  0.01307          0.00529    44.6    38.5   120   120   121     1
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     436
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                            0.23584  0.03301   153.8   115.8
    13  -1017.4 L:  418 DKSN-ND7 115   870 N ENGLN7 115 1          84.7    67.7  0.01677          0.00982    31.0    21.0   123   123   127     4
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     692
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                            0.37918  0.01831   141.7   123.0
    22   -868.0 L:  848 HETINGR7 115   870 N ENGLN7 115 1         -82.2   -67.7 -0.01677         -0.00982   -28.5   -20.0   119   119   123      4
                C:  804 BAKER  4 230   810 BOWMAN 4 230 1     692
                  Open   804 BAKER  4 230   810 BOWMAN 4 230 1                           -0.37918  0.01831   141.7   125.8
    91   -611.3 L:  404 DAWSONC7 115   832 GLENDCT7 115 1          74.7    67.7  0.01149          0.00539    13.5    10.2   108   108   110       2
                C:  411 MI CTYE4 230   804 BAKER  4 230 1     129
                  Open   411 MI CTYE4 230   804 BAKER  4 230 1                            0.47177  0.01292   129.7   121.8
  2653   -541.3 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1814.4 -1732.0 -0.15215
                  Base Case
  5885   -346.9 L:  497 MAURINE4 230   470 BISON  4 230 1        -189.1  -176.0 -0.03765         -0.02813  -142.9  -133.2   N/A  NONE   114    NEW
                C:  601 ANTELOP3 345  6601 AVALL T1 345 1     540
                  Open   601 ANTELOP3 345  6601 AVALL T1 345 1                           -0.05504  0.17289   838.1   778.1
  5897   -305.0 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -81.0   -77.0 -0.01307         -0.00529   -44.7   -43.1   112   112   113      1
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     436
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           -0.23584  0.03301   153.8   143.8
  5901   -292.6 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          47.3    44.0  0.01130          0.00738    43.1    40.9   109   138   108     -1
                C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     961
                  Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                            0.05649  0.06948    74.3    54.0
  5902   -289.3 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         355.7   352.0  0.01289          0.00447   131.7   130.4   101   101   101      0
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     579
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                            0.60083  0.01402   372.9   368.8
  5906   -274.5 L:  827 ELLENDL7 115  1001 ABDNJCT7 115 1          92.5    88.0  0.01624          0.00508    54.4    53.0   101   101   105(N/C) 4
                C:  826 ELLENDL4 230   994 OAKES  4 230 1     706
                  Open   826 ELLENDL4 230   994 OAKES  4 230 1                            0.32518  0.03430   117.0   107.6
  5912   -263.7 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1772.1  1732.0  0.15215
                  Base Case
```

Table 7.10 (Cont.)
MUST Results Case S3C4X1A

```
5913   -263.7 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1772.1 -1732.0 -0.15215
                Base Case
5918   -189.7 L:  827 ELLENDL7 115  1001 ABDNJCT7 115 1          91.1    88.0  0.01624          0.00508    54.4    53.5   98     98   105     6
               C:  938 FORMAN 4 230   994 OAKES  4 230 1     793
                Open   938 FORMAN 4 230   994 OAKES  4 230 1                          -0.32518 -0.03430  -112.7  -106.2
5921   -123.3 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -109.6  -106.0 -0.02919         -0.01685   -75.6   -73.5   115   115   103     -12
               C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     948
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.21232 -0.05812  -160.2  -153.1
```

Table 7.11
Summary of Contingency Analysis Results
Case S3C2X1A

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	114(+3)	U
805	BAKER	115	832	GLENDCT	115	411	MI CTY	230	804	BAKER	230	67.7	67.7	142(+13)	R
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	127 (+8)	U
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	118(+6)	U
403	DAWSONC	115	832	GLENDCT7	115	411	MI CTY	230	804	BAKER	230	67.7	67.7	118(+10)	R
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	104(+3)	U
435	FARGO	230	553	MOORHED	230	792	MAPLE R3	345	99553	MOORHED	345	263	398	116(NEW)	U
827	ELLENDL	115	1001	ABDNJCT	115	826	ELLENDL	230	994	OAKES	230	88	128	109(+8)	U
497	MAURINE	230	470	BISON	230	506	FTTHOMP3	345	605	LELANDO	345	176	440	104(NEW)	U
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	111(-2)	NONE
418	DKSN-ND7	115	870	N ENGLN7	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	137(+14)	R
848	HETINGR	115	870	N ENGLN	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	133(+14)	R
555	MORRIS	115	1911	WALDON	115	99554	MORRIS	345	99550	GRANFLS	345	80	149	111(NEW)	U
19010	FARGO	69	29400	MAPLE	69	435	FARGO	230	1637	SHEYNNE	230	45	41	108(NEW)	R
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	111(-1)	NONE
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	114(-1)	NONE
1905	BENSON	115	1911	WALDON	115	99554	MORRIS	345	99550	GRANFLS	345	80	149	106(NEW)	U
1517	WILMAR	115	1946	KERKHO	115	550	GRANIT4	230	1516	WILMAR	230	77	100	112(0)	NONE

Table 7.11 (Cont.)
Summary of Contingency Analysis Results
Case S3C3X2A

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	113(+2)	U
805	BAKER	115	832	GLENDCT	115	411	MI CTY	230	804	BAKER	230	67.7	67.7	139(+10)	R
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	127 (+8)	U
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	120(+8)	U
403	DAWSONC	115	832	GLENDCT7	115	411	MI CTY	230	804	BAKER	230	67.7	67.7	118(+10)	R
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	104(3)	U
827	ELLENDL	115	1001	ABDNJCT	115	826	ELLENDL	230	994	OAKES	230	88	128	111(+8)	U
497	MAURINE	230	470	BISON	230	506	FTTHOMP3	345	605	LELANDO	345	176	440	104(NEW)	U
480	MAURINE	115	483	NEWELL	115	484	NW UNDRWD	230	497	MAURINE	230	66	143	102(NEW)	U
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	115(+8)	NONE PRE-EXISTING MAX 138%
418	DKSN-ND7	115	870	N ENGLN7	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	129(+6)	R
848	HETINGR	115	870	N ENGLN	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	135(+16)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	116(+2)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	112(-3)	NONE
655	LOGAN	115	1644	MINOT	115	91644	MINOT	345	99944	HARVEY	345	215	282	104(N/A)	U
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	116(-4)	NONE
19010	FARGO	69	29400	MAPLE	69	435	FARGO	230	1637	SHEYNNE	230	45	41	104(NEW)	R

Table 7.11 (Cont.)
Summary of Contingency Analysis Results
Case S3C3X3A

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	112(+1)	U
805	BAKER	115	832	GLENDCT	115	411	MI CTY	230	804	BAKER	230	67.7	67.7	137(+8)	R
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	126 (+7)	U
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	121(+9)	U
403	DAWSONC	115	832	GLENDCT7	115	411	MI CTY	230	804	BAKER	230	67.7	67.7	116(+8)	R
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	104(+3)	U
827	ELLENDL	115	1001	ABDNJCT	115	826	ELLENDL	230	994	OAKES	230	88	128	107(+4)	U
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	111(+4)	NONE PRE-EXISTING MAX 138%
418	DKSN-ND7	115	870	N ENGLN7	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	134(+11)	R
848	HETINGR	115	870	N ENGLN	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	131(+12)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	114(+2)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	113(-2)	NONE
655	LOGAN	115	1644	MINOT	115	91644	MINOT	345	99944	HARVEY	345	215	282	105(NEW)	U
452	RUGBY	115	1644	MINOT	115	91644	MINOT	345	99944	HARVEY	345	88	143	108(NEW)	U
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	116(-4)	NONE
497	MAURINE	230	470	BISON	230	618	LARAM	24	631	LARAM	345	176	440	103(NEW)	U

Table 7.11 (Cont.)
Summary of Contingency Analysis Results
Case S3C3X4A

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	112(+1)	U
805	BAKER	115	832	GLENDCT	115	411	MI CTY	230	804	BAKER	230	67.7	67.7	142(+13)	R
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	128 (+9)	U
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	119(+7)	U
403	DAWSONC	115	832	GLENDCT7	115	411	MI CTY	230	804	BAKER	230	67.7	67.7	118(+10)	R
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	104(+3)	U
827	ELLENDL	115	1001	ABDNJCT	115	826	ELLENDL	230	994	OAKES	230	88	128	110(+7)	U
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	116(+9)	NONE PRE-EXISTING MAX 138%
418	DKSN-ND7	115	870	N ENGLN7	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	138(+15)	R
848	HETINGR	115	870	N ENGLN	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	134(+15)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	114(+2)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	113(-2)	NONE
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	122(+2)	U
497	MAURINE	230	470	BISON	230	618	LARAM	24	631	LARAM	345	176	440	104(NEW)	U
19010	FARGO	69	29400	MAPLE	69	435	FARGO	230	1637	SHEYNNE	230	45	41	103(NEW)	R

Table 7.11 (Cont.)
Summary of Contingency Analysis
Case S3C4X1A

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	752	DRAYTON	230	3458	LETELER	230	1732	2094	111(0)	NONE
805	BAKER	115	832	GLENDCT	115	411	MI CTY	230	804	BAKER	230	67.7	67.7	131(+2)	R
403	DAWSONC	115	832	GLENDCT7	115	411	MI CTY	230	804	BAKER	230	67.7	67.7	110(+2)	R
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	101(0)	NONE
827	ELLENDL	115	1001	ABDNJCT	115	826	ELLENDL	230	994	OAKES	230	88	128	105(+4)	U
497	MAURINE	230	470	BISON	230	5601	A.VALLEY	500	5634	SPL ROCK	500	176	440	114(NEW)	U
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	108(-1)	NONE
418	DKSN-ND7	115	870	N ENGLN7	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	127(+4)	R
848	HETINGR	115	870	N ENGLN	115	804	BAKER	230	810	BOWMAN	230	67.7	67.7	123(+4)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	113(+1)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	103(-12)	NONE
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	121(1)	U

Table 7.14
Constrained Interface Impact Analyses - Case S3C2X1A

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   387.7 DIFF:    10.7%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   451.3 DIFF:    11.9%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   397.1 DIFF:    10.0%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   289.1 DIFF:     2.6%
0554  --------  - 0550  GRANITF4   BASE:   106.1 CHNG:     0.0 DIFF:  -100.0%
99554 MORRIS 3  - 99550 GRANFLS3   BASE:     0.0 CHNG:   383.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   169.8 DIFF:     3.2%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:   119.8 DIFF:    23.3%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   162.1 DIFF:     3.6%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   154.5 DIFF:    10.5%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    34.6 DIFF:    35.6%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    53.6 DIFF:     2.5%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    52.3 DIFF:     3.9%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    41.3 DIFF:    15.5%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    31.6 DIFF:     5.6%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    44.3 DIFF:    10.4%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    32.2 DIFF:    14.0%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -213.9 DIFF:   -13.0%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:   336.5 DIFF:   999.0%
99755 PRAIRIE5  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    44.8 DIFF:   999.0%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  2971.7 DIFF:    42.8%
                                                 DIFF:   891.4   DF:    89.1%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   172.2 DIFF:     6.7%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1834.9 DIFF:     3.7%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   213.9 DIFF:   -13.0%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -44.8 DIFF:   999.0%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2176.1 DIFF:     0.1%
                                                 DIFF:     3.0   DF:     0.3%
*******************************************************************************
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Table 7.14 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -168.8 DIFF:     6.6%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1791.4 DIFF:     3.6%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -210.4 DIFF:   -12.8%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    45.3 DIFF:   999.0%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2125.3 DIFF:     0.0%
                                                 DIFF:    -0.1   DF:     0.0%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   154.9 DIFF:     0.4%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   155.4 DIFF:     0.4%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   159.8 DIFF:     0.4%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   357.3 DIFF:    -0.1%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   429.0 DIFF:     0.0%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   443.1 DIFF:     2.0%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1699.4 DIFF:     0.6%
                                                 DIFF:    10.1   DF:     1.0%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   443.1 DIFF:     2.0%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   443.1 DIFF:     2.0%
                                                 DIFF:     8.6   DF:     0.9%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   257.7 DIFF:     1.5%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   110.8 DIFF:    -1.0%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   499.1 DIFF:     2.5%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   867.6 DIFF:     1.8%
                                                 DIFF:    15.1   DF:     1.5%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   295.5 DIFF:     4.4%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   252.7 DIFF:     3.6%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   548.2 DIFF:     4.0%
                                                 DIFF:    21.3   DF:     2.1%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   147.1 DIFF:     2.9%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   290.3 DIFF:     2.6%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    96.3 DIFF:     1.4%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   533.8 DIFF:     2.5%
                                                 DIFF:    12.8   DF:     1.3%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   646.4 DIFF:    -0.2%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   646.4 DIFF:    -0.2%
                                                 DIFF:    -1.1   DF:    -0.1%
*******************************************************************************
```

Table 7.14 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   838.8 DIFF:     0.0%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   838.8 DIFF:     0.0%
                                                 DIFF:     0.1   DF:     0.0%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   799.9 DIFF:    -0.4%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   838.8 DIFF:     0.0%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   385.4 DIFF:     1.2%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   168.6 DIFF:    -1.1%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   106.9 DIFF:    -3.7%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    61.3 DIFF:   -15.7%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2360.9 DIFF:    -0.7%
                                                 DIFF:   -15.5   DF:    -1.6%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -76.7 DIFF:     0.8%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -76.7 DIFF:     0.8%
                                                 DIFF:    -0.6   DF:    -0.1%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   490.1 DIFF:    -0.8%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   620.5 DIFF:    -0.4%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1110.6 DIFF:    -0.6%
                                                 DIFF:    -6.6   DF:    -0.7%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    61.3 DIFF:   -15.7%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    61.3 DIFF:   -15.7%
                                                 DIFF:   -11.4   DF:    -1.1%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    62.3 DIFF:    -1.9%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.1 DIFF:    -1.1%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -69.5 DIFF:    -1.5%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -96.2 DIFF:    -0.9%
                                                 DIFF:     0.9   DF:     0.1%
*******************************************************************************

3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -62.0 DIFF:    -1.9%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    89.8 DIFF:    -1.1%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    70.5 DIFF:    -1.5%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    98.3 DIFF:    -0.9%
                                                 DIFF:    -0.9   DF:    -0.1%
*******************************************************************************
```

Table 7.14 (Cont.)

```
2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -52.9 DIFF:    39.9%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -52.9 DIFF:    39.9%
                                                 DIFF:   -15.1   DF:    -1.5%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    99.5 DIFF:    -0.7%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    99.5 DIFF:    -0.7%
                                                 DIFF:    -0.7   DF:    -0.1%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   357.1 DIFF:    -0.4%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   357.1 DIFF:    -0.4%
                                                 DIFF:    -1.4   DF:    -0.1%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   219.6 DIFF:    -2.9%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    75.3 DIFF:    -6.2%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   294.9 DIFF:    -3.7%
                                                 DIFF:   -11.5   DF:    -1.1%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   443.1 DIFF:     2.0%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   443.1 DIFF:     2.0%
                                                 DIFF:     8.6   DF:     0.9%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -44.8 DIFF:   999.0%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -44.8 DIFF:   999.0%
                                                 DIFF:   -41.4   DF:    -4.1%
******************************************************************************


1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   646.4 DIFF:    -0.2%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   838.8 DIFF:     0.0%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1485.2 DIFF:    -0.1%
                                                 DIFF:    -1.0   DF:    -0.1%
******************************************************************************
```

Table 7.14 (Cont.)
Constrained Interface Impact Analyses - Case S3C3X2A

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   388.8 DIFF:    11.0%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   448.9 DIFF:    11.3%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   396.0 DIFF:     9.7%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   286.5 DIFF:     1.7%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   112.7 DIFF:     6.3%
99554 --------  - 99550 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   163.4 DIFF:    -0.7%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:   120.3 DIFF:    23.8%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   155.6 DIFF:    -0.6%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   155.3 DIFF:    11.0%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    28.5 DIFF:    11.8%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    53.3 DIFF:     1.9%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    53.1 DIFF:     5.5%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    38.0 DIFF:     6.3%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    31.6 DIFF:     5.7%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    42.3 DIFF:     5.6%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    30.0 DIFF:     6.0%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -237.7 DIFF:    -3.3%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:   353.6 DIFF:   999.0%
99755 PRAIRIE5  - 1318  ARROWHD3   BASE:     0.0 CHNG:   315.6 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    36.6 DIFF:   962.6%

SUBTOTALS FOR: NDEX               BASE:  2080.3 CHNG:  2972.4 DIFF:    42.9%
                                                DIFF:   892.1   DF:    89.2%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   166.2 DIFF:     3.0%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1807.1 DIFF:     2.1%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   237.7 DIFF:    -3.3%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -36.6 DIFF:   962.6%

SUBTOTALS FOR: MHEX_S             BASE:  2173.1 CHNG:  2174.4 DIFF:     0.1%
                                                DIFF:     1.4   DF:     0.1%
*******************************************************************************
```

Table 7.14 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -163.1 DIFF:     3.0%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1765.3 DIFF:     2.1%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -233.4 DIFF:    -3.2%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    36.9 DIFF:   970.0%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2124.8 DIFF:     0.0%
                                                 DIFF:     0.4   DF:     0.0%
******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   154.8 DIFF:     0.3%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   155.3 DIFF:     0.3%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   159.7 DIFF:     0.3%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   356.7 DIFF:    -0.2%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   428.2 DIFF:    -0.2%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   447.0 DIFF:     2.9%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1701.7 DIFF:     0.7%
                                                 DIFF:    12.4   DF:     1.2%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   447.0 DIFF:     2.9%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   447.0 DIFF:     2.9%
                                                 DIFF:    12.5   DF:     1.3%
******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   259.2 DIFF:     2.1%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   109.1 DIFF:    -2.6%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   503.0 DIFF:     3.3%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   871.3 DIFF:     2.2%
                                                 DIFF:    18.8   DF:     1.9%
******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   304.7 DIFF:     7.7%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   259.0 DIFF:     6.1%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   563.6 DIFF:     7.0%
                                                 DIFF:    36.7   DF:     3.7%
******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   151.2 DIFF:     5.7%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   295.7 DIFF:     4.5%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    97.4 DIFF:     2.5%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   544.2 DIFF:     4.5%
                                                 DIFF:    23.2   DF:     2.3%
******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   631.5 DIFF:    -2.5%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   631.5 DIFF:    -2.5%
                                                 DIFF:   -16.0   DF:    -1.6%
******************************************************************************
```

Table 7.14 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   846.0 DIFF:     0.9%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   846.0 DIFF:     0.9%
                                                 DIFF:     7.3   DF:     0.7%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   794.2 DIFF:    -1.1%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   846.0 DIFF:     0.9%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   371.2 DIFF:    -2.5%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   168.5 DIFF:    -1.1%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   105.1 DIFF:    -5.4%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    64.2 DIFF:   -11.7%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2349.3 DIFF:    -1.1%
                                                 DIFF:   -27.2   DF:    -2.7%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   631.5 DIFF:    -2.5%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   846.0 DIFF:     0.9%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1477.4 DIFF:    -0.6%
                                                 DIFF:    -8.7   DF:    -0.9%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -87.0 DIFF:    14.3%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -87.0 DIFF:    14.3%
                                                 DIFF:   -10.9   DF:    -1.1%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   487.1 DIFF:    -1.4%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   618.3 DIFF:    -0.8%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1105.4 DIFF:    -1.1%
                                                 DIFF:   -11.7   DF:    -1.2%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    64.2 DIFF:   -11.7%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    64.2 DIFF:   -11.7%
                                                 DIFF:    -8.5   DF:    -0.8%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    62.8 DIFF:    -1.1%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.3 DIFF:    -0.9%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -69.8 DIFF:    -1.1%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -96.2 DIFF:    -0.9%
                                                 DIFF:     0.8   DF:     0.1%
*******************************************************************************
```

Table 7.14 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -62.5 DIFF:    -1.1%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.0 DIFF:    -0.9%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    70.8 DIFF:    -1.2%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    98.4 DIFF:    -0.9%
                                                DIFF:    -0.9   DF:    -0.1%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -58.7 DIFF:    55.1%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -58.7 DIFF:    55.1%
                                                DIFF:   -20.8   DF:    -2.1%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    85.5 DIFF:   -14.7%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    85.5 DIFF:   -14.7%
                                                DIFF:   -14.7   DF:    -1.5%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   353.3 DIFF:    -1.4%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   353.3 DIFF:    -1.4%
                                                DIFF:    -5.2   DF:    -0.5%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   216.6 DIFF:    -4.2%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    73.4 DIFF:    -8.5%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   290.0 DIFF:    -5.3%
                                                DIFF:   -16.4   DF:    -1.6%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   447.0 DIFF:     2.9%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   447.0 DIFF:     2.9%
                                                DIFF:    12.5   DF:     1.3%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -36.6 DIFF:   962.6%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -36.6 DIFF:   962.6%
                                                DIFF:   -33.1   DF:    -3.3%
******************************************************************************
```

Table 7.14 (Cont.)
Constrained Interface Impact Analyses - Case S3C3X3A

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   379.1 DIFF:     8.3%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   438.0 DIFF:     8.6%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   386.7 DIFF:     7.1%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   291.0 DIFF:     3.3%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   117.4 DIFF:    10.7%
99554 --------  - 99550 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   164.9 DIFF:     0.2%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:   117.1 DIFF:    20.6%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   155.4 DIFF:    -0.7%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   152.1 DIFF:     8.7%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    30.8 DIFF:    20.8%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    53.6 DIFF:     2.5%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    53.9 DIFF:     7.0%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    39.9 DIFF:    11.6%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    32.7 DIFF:     9.3%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    42.0 DIFF:     4.9%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    30.5 DIFF:     7.7%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -224.2 DIFF:    -8.8%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:   360.5 DIFF:   999.0%
99755 PRAIRIE5  - 1318  ARROWHD3   BASE:     0.0 CHNG:   330.1 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    25.7 DIFF:   646.9%

SUBTOTALS FOR: NDEX               BASE:  2080.3 CHNG:  2977.1 DIFF:    43.1%
                                                DIFF:   896.7   DF:    89.7%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   165.9 DIFF:     2.9%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1807.5 DIFF:     2.2%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   224.2 DIFF:    -8.8%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -25.7 DIFF:   646.9%

SUBTOTALS FOR: MHEX_S             BASE:  2173.1 CHNG:  2172.0 DIFF:    -0.1%
                                                DIFF:    -1.1   DF:    -0.1%
*******************************************************************************
```

Table 7.14 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -162.9 DIFF:     2.9%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1765.7 DIFF:     2.1%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -220.3 DIFF:    -8.6%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    25.8 DIFF:   650.0%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2123.0 DIFF:    -0.1%
                                                 DIFF:     2.2   DF:     0.2%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   154.7 DIFF:     0.3%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   155.2 DIFF:     0.3%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   159.6 DIFF:     0.3%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   356.5 DIFF:    -0.3%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   428.0 DIFF:    -0.3%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   445.5 DIFF:     2.5%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1699.5 DIFF:     0.6%
                                                 DIFF:    10.2   DF:     1.0%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   445.5 DIFF:     2.5%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   445.5 DIFF:     2.5%
                                                 DIFF:    11.0   DF:     1.1%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   258.0 DIFF:     1.6%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   109.1 DIFF:    -2.5%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   500.5 DIFF:     2.8%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   867.6 DIFF:     1.8%
                                                 DIFF:    15.1   DF:     1.5%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   303.1 DIFF:     7.1%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   257.8 DIFF:     5.7%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   560.9 DIFF:     6.5%
                                                 DIFF:    34.0   DF:     3.4%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   150.8 DIFF:     5.4%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   294.6 DIFF:     4.1%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    97.2 DIFF:     2.3%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   542.6 DIFF:     4.1%
                                                 DIFF:    21.6   DF:     2.2%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   631.1 DIFF:    -2.5%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   631.1 DIFF:    -2.5%
                                                 DIFF:   -16.4   DF:    -1.6%
*******************************************************************************
```

Table 7.14 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   847.8 DIFF:     1.1%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   847.8 DIFF:     1.1%
                                                 DIFF:     9.1   DF:     0.9%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   794.3 DIFF:    -1.1%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   847.8 DIFF:     1.1%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   375.4 DIFF:    -1.4%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   168.3 DIFF:    -1.2%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   104.9 DIFF:    -5.6%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    64.4 DIFF:   -11.4%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2355.1 DIFF:    -0.9%
                                                 DIFF:   -21.4   DF:    -2.1%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   631.1 DIFF:    -2.5%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   847.8 DIFF:     1.1%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1478.9 DIFF:    -0.5%
                                                 DIFF:    -7.3   DF:    -0.7%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -88.2 DIFF:    15.8%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -88.2 DIFF:    15.8%
                                                 DIFF:   -12.0   DF:    -1.2%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   487.5 DIFF:    -1.3%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   618.5 DIFF:    -0.7%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1106.0 DIFF:    -1.0%
                                                 DIFF:   -11.2   DF:    -1.1%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    64.4 DIFF:   -11.4%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    64.4 DIFF:   -11.4%
                                                 DIFF:    -8.3   DF:    -0.8%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    61.6 DIFF:    -3.0%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -90.0 DIFF:     0.0%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.4 DIFF:    -0.2%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -98.8 DIFF:     1.8%
                                                 DIFF:    -1.7   DF:    -0.2%
*******************************************************************************
```

Table 7.14 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -61.3 DIFF:    -3.0%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.8 DIFF:     0.0%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.5 DIFF:    -0.2%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:   101.0 DIFF:     1.7%
                                                DIFF:     1.7   DF:     0.2%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -55.7 DIFF:    47.4%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -55.7 DIFF:    47.4%
                                                DIFF:   -17.9   DF:    -1.8%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    83.6 DIFF:   -16.5%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    83.6 DIFF:   -16.5%
                                                DIFF:   -16.5   DF:    -1.7%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   353.2 DIFF:    -1.5%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   353.2 DIFF:    -1.5%
                                                DIFF:    -5.3   DF:    -0.5%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   217.9 DIFF:    -3.6%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    74.5 DIFF:    -7.1%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   292.5 DIFF:    -4.5%
                                                DIFF:   -13.9   DF:    -1.4%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   445.5 DIFF:     2.5%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   445.5 DIFF:     2.5%
                                                DIFF:    11.0   DF:     1.1%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -25.7 DIFF:   646.9%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -25.7 DIFF:   646.9%
                                                DIFF:   -22.3   DF:    -2.2%
******************************************************************************
```

Table 7.14 (Cont.)
Constrained Interface Impact Analyses - Case S3C3X4A

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   384.7 DIFF:     9.9%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   444.6 DIFF:    10.2%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   392.2 DIFF:     8.6%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   288.3 DIFF:     2.3%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   114.7 DIFF:     8.1%
99554 --------  - 99550 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   163.6 DIFF:    -0.6%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:   119.6 DIFF:    23.1%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   155.3 DIFF:    -0.8%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   154.4 DIFF:    10.4%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    29.1 DIFF:    14.4%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    53.3 DIFF:     2.1%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    53.5 DIFF:     6.2%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    38.8 DIFF:     8.6%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    32.0 DIFF:     7.0%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    42.0 DIFF:     4.9%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    30.1 DIFF:     6.4%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -236.5 DIFF:    -3.8%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:   354.8 DIFF:   999.0%
99755 PRAIRIE5  - 1318  ARROWHD3   BASE:     0.0 CHNG:   320.5 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    40.7 DIFF:   999.0%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  2975.8 DIFF:    43.0%
                                                 DIFF:   895.5   DF:    89.5%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   166.6 DIFF:     3.3%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1810.4 DIFF:     2.3%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   236.5 DIFF:    -3.8%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -40.7 DIFF:   999.0%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2172.8 DIFF:     0.0%
                                                 DIFF:    -0.3   DF:     0.0%
*******************************************************************************
```

Table 7.14 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -163.5 DIFF:     3.2%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1768.4 DIFF:     2.3%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -232.2 DIFF:    -3.7%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    41.1 DIFF:   999.0%

SUBTOTALS FOR: MHEX_N             BASE: -2125.2 CHNG: -2123.0 DIFF:    -0.1%
                                                DIFF:     2.2   DF:     0.2%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   154.7 DIFF:     0.3%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   155.2 DIFF:     0.3%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   159.7 DIFF:     0.3%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   356.7 DIFF:    -0.3%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   428.2 DIFF:    -0.2%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   446.3 DIFF:     2.7%

SUBTOTALS FOR: GGS                BASE:  1689.3 CHNG:  1700.8 DIFF:     0.7%
                                                DIFF:    11.5   DF:     1.2%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   446.3 DIFF:     2.7%

SUBTOTALS FOR: WNE_WKS            BASE:   434.5 CHNG:   446.3 DIFF:     2.7%
                                                DIFF:    11.9   DF:     1.2%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   258.7 DIFF:     1.9%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   109.2 DIFF:    -2.5%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   502.0 DIFF:     3.1%

SUBTOTALS FOR: GRIS_LNC           BASE:   852.5 CHNG:   869.8 DIFF:     2.0%
                                                DIFF:    17.3   DF:     1.7%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   303.8 DIFF:     7.4%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   258.4 DIFF:     5.9%

SUBTOTALS FOR: COOPER_S           BASE:   526.9 CHNG:   562.2 DIFF:     6.7%
                                                DIFF:    35.3   DF:     3.5%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   150.9 DIFF:     5.5%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   295.1 DIFF:     4.3%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    97.2 DIFF:     2.4%

SUBTOTALS FOR: FTCAL_S            BASE:   521.0 CHNG:   543.2 DIFF:     4.3%
                                                DIFF:    22.2   DF:     2.2%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   630.7 DIFF:    -2.6%

SUBTOTALS FOR: ECL-ARP            BASE:   647.5 CHNG:   630.7 DIFF:    -2.6%
                                                DIFF:   -16.8   DF:    -1.7%
*******************************************************************************
```

Table 7.14 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   845.7 DIFF:     0.8%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   845.7 DIFF:     0.8%
                                                 DIFF:     7.1   DF:     0.7%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   793.7 DIFF:    -1.1%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   845.7 DIFF:     0.8%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   372.3 DIFF:    -2.3%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   168.3 DIFF:    -1.2%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   104.9 DIFF:    -5.5%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    64.2 DIFF:   -11.7%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2349.2 DIFF:    -1.1%
                                                 DIFF:   -27.3   DF:    -2.7%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   630.7 DIFF:    -2.6%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   845.7 DIFF:     0.8%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1476.4 DIFF:    -0.7%
                                                 DIFF:    -9.7   DF:    -1.0%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -87.0 DIFF:    14.3%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -87.0 DIFF:    14.3%
                                                 DIFF:   -10.9   DF:    -1.1%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   487.3 DIFF:    -1.4%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   618.4 DIFF:    -0.7%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1105.7 DIFF:    -1.0%
                                                 DIFF:   -11.4   DF:    -1.1%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    64.2 DIFF:   -11.7%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    64.2 DIFF:   -11.7%
                                                 DIFF:    -8.5   DF:    -0.8%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    61.9 DIFF:    -2.6%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.6 DIFF:    -0.5%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.0 DIFF:    -0.9%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -97.6 DIFF:     0.6%
                                                 DIFF:    -0.5   DF:    -0.1%
*******************************************************************************
```

Table 7.14 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -61.6 DIFF:    -2.6%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.3 DIFF:    -0.5%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.0 DIFF:    -0.9%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    99.7 DIFF:     0.5%
                                                DIFF:     0.5   DF:     0.0%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -57.1 DIFF:    51.0%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -57.1 DIFF:    51.0%
                                                DIFF:   -19.3   DF:    -1.9%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    84.1 DIFF:   -16.0%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    84.1 DIFF:   -16.0%
                                                DIFF:   -16.1   DF:    -1.6%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   353.4 DIFF:    -1.4%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   353.4 DIFF:    -1.4%
                                                DIFF:    -5.2   DF:    -0.5%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   217.5 DIFF:    -3.8%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    74.2 DIFF:    -7.5%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   291.7 DIFF:    -4.8%
                                                DIFF:   -14.6   DF:    -1.5%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   446.3 DIFF:     2.7%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   446.3 DIFF:     2.7%
                                                DIFF:    11.9   DF:     1.2%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -40.7 DIFF:   999.0%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -40.7 DIFF:   999.0%
                                                DIFF:   -37.2   DF:    -3.7%
******************************************************************************
```

Table 7.14 (Cont.)
Constrained Interface Impact Analyses - Case S3C4X1A

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   362.4 DIFF:     3.5%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   410.1 DIFF:     1.6%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:     0.0 DIFF:  -100.0%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   289.9 DIFF:     2.9%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   113.0 DIFF:     6.5%
99554 --------  - 99550 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   170.2 DIFF:     3.4%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:   111.9 DIFF:    15.2%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   161.3 DIFF:     3.0%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   142.9 DIFF:     2.2%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    32.9 DIFF:    28.9%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    53.1 DIFF:     1.6%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    56.1 DIFF:    11.3%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    40.6 DIFF:    13.5%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    31.9 DIFF:     6.7%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    40.0 DIFF:    -0.1%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    29.0 DIFF:     2.4%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -213.0 DIFF:   -13.4%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  A.VALLEY  - 5634  SPL ROCK   BASE:     0.0 CHNG:   806.4 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:   354.2 DIFF:   999.0%
99755 PRAIRIE5  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    24.2 DIFF:   604.0%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  3017.0 DIFF:    45.0%
                                                 DIFF:   936.7   DF:    93.7%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   169.7 DIFF:     5.2%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1814.4 DIFF:     2.5%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   213.0 DIFF:   -13.4%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -24.2 DIFF:   604.0%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2172.9 DIFF:     0.0%
                                                 DIFF:    -0.2   DF:     0.0%
*******************************************************************************
```

Table 7.14 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -166.5 DIFF:     5.2%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1772.1 DIFF:     2.5%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -209.5 DIFF:   -13.1%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    24.4 DIFF:   606.7%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2123.8 DIFF:    -0.1%
                                                 DIFF:     1.4   DF:     0.1%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   153.3 DIFF:    -0.6%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   153.8 DIFF:    -0.6%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   158.2 DIFF:    -0.6%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   352.4 DIFF:    -1.4%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   423.0 DIFF:    -1.4%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   446.3 DIFF:     2.7%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1686.9 DIFF:    -0.1%
                                                 DIFF:    -2.4   DF:    -0.2%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   446.3 DIFF:     2.7%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   446.3 DIFF:     2.7%
                                                 DIFF:    11.9   DF:     1.2%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   248.2 DIFF:    -2.2%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:    98.5 DIFF:   -12.0%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   481.3 DIFF:    -1.1%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   828.0 DIFF:    -2.9%
                                                 DIFF:   -24.5   DF:    -2.5%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   327.4 DIFF:    15.7%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   274.3 DIFF:    12.4%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   601.7 DIFF:    14.2%
                                                 DIFF:    74.8   DF:     7.5%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   181.5 DIFF:    26.9%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   328.1 DIFF:    16.0%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:   103.2 DIFF:     8.7%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   612.8 DIFF:    17.6%
                                                 DIFF:    91.8   DF:     9.2%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   660.3 DIFF:     2.0%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   660.3 DIFF:     2.0%
                                                 DIFF:    12.8   DF:     1.3%
*******************************************************************************
```

Table 7.14 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   820.9 DIFF:    -2.1%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   820.9 DIFF:    -2.1%
                                                 DIFF:   -17.7   DF:    -1.8%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   809.8 DIFF:     0.9%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   820.9 DIFF:    -2.1%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   169.7 DIFF:   -55.4%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   170.0 DIFF:    -0.2%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   108.5 DIFF:    -2.3%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    53.9 DIFF:   -25.8%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2132.9 DIFF:   -10.2%
                                                 DIFF:  -243.5   DF:   -24.4%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   660.3 DIFF:     2.0%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   820.9 DIFF:    -2.1%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1481.2 DIFF:    -0.3%
                                                 DIFF:    -4.9   DF:    -0.5%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -93.9 DIFF:    23.3%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -93.9 DIFF:    23.3%
                                                 DIFF:   -17.7   DF:    -1.8%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   479.3 DIFF:    -3.0%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   612.5 DIFF:    -1.7%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1091.9 DIFF:    -2.3%
                                                 DIFF:   -25.2   DF:    -2.5%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    53.9 DIFF:   -25.8%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    53.9 DIFF:   -25.8%
                                                 DIFF:   -18.7   DF:    -1.9%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    62.2 DIFF:    -2.1%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.7 DIFF:    -0.3%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.1 DIFF:    -0.6%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -97.7 DIFF:     0.6%
                                                 DIFF:    -0.6   DF:    -0.1%
*******************************************************************************
```

Table 7.14 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -61.9 DIFF:    -2.1%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.5 DIFF:    -0.3%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.2 DIFF:    -0.6%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    99.8 DIFF:     0.6%
                                                DIFF:     0.6   DF:     0.1%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -90.2 DIFF:   138.6%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -90.2 DIFF:   138.6%
                                                DIFF:   -52.4   DF:    -5.2%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    95.7 DIFF:    -4.5%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    95.7 DIFF:    -4.5%
                                                DIFF:    -4.5   DF:    -0.5%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   350.4 DIFF:    -2.3%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   350.4 DIFF:    -2.3%
                                                DIFF:    -8.1   DF:    -0.8%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   200.7 DIFF:   -11.2%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    61.5 DIFF:   -23.4%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   262.2 DIFF:   -14.4%
                                                DIFF:   -44.2   DF:    -4.4%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   446.3 DIFF:     2.7%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   446.3 DIFF:     2.7%
                                                DIFF:    11.9   DF:     1.2%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -24.2 DIFF:   604.0%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -24.2 DIFF:   604.0%
                                                DIFF:   -20.8   DF:    -2.1%
******************************************************************************
```

Table 8.1
Ft Thompson - Blue Lake 345 kV (Case S4C1XXX)

```
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167

DATA FOR BUS  9000 [FTTHWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 0.95346  97.55

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
   1000.0  -510.0  -510.0  -510.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  506 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS   506 [FTTHOMP3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0   130.0 0.96290  89.86

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  571 GR ISLD3 345  1   0.00940  0.11900  2.04340  1  T   720.0  880.0  792.0    0.0       1 1.000
  605 LELANDO3 345  1   0.01046  0.15170  1.65250  1  F   680.0 1159.0  748.0    0.0       1 1.000
  620 HURON  3 345  1   0.00245  0.02911  0.50537  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 9000 FTTHWIND13.8  1   0.00024  0.01250  0.00000  1  F  1500.0 1500.0 1500.0    0.0       1 1.000
19143 FTTHMP1T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000
19146 FTTHMP2T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  605 LELANDO3 345  1    0.00000 -0.68000   0.00000 -0.50000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9000 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19143 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
19146 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 8.1 (Cont.)

```
DATA FOR BUS   620 [HURON  3 345] RESIDING IN AREA   6, ZONE  11, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98281  82.17

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00245  0.02911  0.50537  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  529 WATERTN3 345  1   0.00294  0.03499  0.60850  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  601 ANTELOP3 345  1   0.01202  0.13530  2.76110  1  F   478.0 2270.0  526.0    0.0       1 1.000
22154 BRDLNDTY 345  1   0.00013  0.03292  0.00000  1  F   400.0  400.0  480.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  601 ANTELOP3 345  1    0.00000  0.00000   0.00000 -1.07000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
22154 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000


DATA FOR BUS   529 [WATERTN3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00218  68.90

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  537 WHITE  3 345  1   0.00190  0.02220  0.37340  1  F   720.0  880.0  792.0    0.0       1 1.000
  620 HURON  3 345  1   0.00294  0.03499  0.60850  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  660 GROTON 3 345  1   0.00300  0.04530  0.46570  1  T   600.0 1159.0  660.0    0.0       1 1.000
19076 WATERT1T 345  1  -0.00020 -0.00550  0.00000  1  F   400.0  400.0  500.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00312  0.03671  0.64255  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
19076 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000


DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99370  58.47

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  529 WATERTN3 345  1   0.00312  0.03671  0.64255  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 8.1 (Cont.)

```
DATA FOR BUS  1702 [BLUE LK3 345] RESIDING IN AREA  23, ZONE 323, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01192  43.13

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 1604 PR ISLD3 345  1   0.00260  0.02620  0.43798  1  T  1165.0 1165.0 1281.0    0.0       1 1.000
 1608 WILMART3 345  1   0.00300  0.02780  0.45145  1  T  1195.0 1165.0 1281.0    0.0       1 1.000
 1703 BLUE LK7 115  1   0.00080  0.03720  0.00000  1  F   336.0  336.0  436.0    0.0       1 1.000
 1724 INVRHLS3 345  1   0.00120  0.01130  0.18892  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
 1739 PARKERS3 345  1   0.00080  0.00740  0.12471  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
 1770 EDEN PR3 345  1   0.00030  0.00270  0.04662  1  F  1165.0 1114.0 1225.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00430  0.06282  0.67725  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 1703 1  F 0.97460   0.0 0      0 1.5000 0.5100 1.5000 0.5100 0.00000
```

TABLE 8.2 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C1XXX

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S4C1XXX-ag1	upe-so04aa.S4C1XXX-ag3	upe-so04aa.S4C1XXX-ei2	upe-so04aa.S4C1XXX-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 24 2002 14:58	APR 24 2002 15:01	APR 24 2002 15:04	APR 24 2002 15:07
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2066 / 370	2066 / 370	2066 / 370	2066 / 370
10	MHEX / L20D	2172 / 220	2172 / 220	2172 / 220	2172 / 220
11	ECL-ARP / PRI-BYN	647 / 825	647 / 825	647 / 825	647 / 825
12	MWSI / MNEX	1473 / 2709	1473 / 2709	1473 / 2709	1473 / 2709
13	D602F / F601C	1814 / 1349	1814 / 1349	1814 / 1349	1814 / 1349
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-121 / -197	-121 / -197	-121 / -197	-121 / -197
16	R50M / OH>MP	171 / 149	171 / 149	171 / 149	171 / 149
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	222 / 123	222 / 123	222 / 123	222 / 123
19	Forbes SVC / MSC	46 / 600	46 / 600	46 / 600	46 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045
22	Roseau 500/Forbes 500	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015
23	Chisago 500/EauClaire 345	1.021 / 1.007	1.021 / 1.007	1.021 / 1.007	1.021 / 1.007
24	Int Falls 115/Badoura 115	1.052 / 0.991	1.052 / 0.991	1.052 / 0.991	1.052 / 0.991
25	Drayton 230/Groton 345	1.013 / 0.998	1.013 / 0.998	1.013 / 0.998	1.013 / 0.998
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	133% / 221%	133% / 221%	133% / 221%	133% / 221%
28	L20D at Prairie/Drayton	999% / 935%	999% / 935%	999% / 935%	999% / 935%
29	R50M/F3M	726% / 999%	726% / 999%	726% / 999%	726% / 999%
30	B10T	336%	336%	336%	336%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.02	0.98 | 1.02	0.97 | 1.05	0.98 | 1.05
33	Boise 115	1.03 | 1.06	1.03 | 1.06	1.01 | 1.07	1.03 | 1.06
34	Dorsey 230	1.03 | 1.06	1.02 | 1.06	1.02 | 1.05	1.03 | 1.05
35	Forbes 230	1.00 | 1.02	1.00 | 1.02	0.97 | 1.03	0.99 | 1.03
36	Riverton 230	0.97 | 1.04	0.97 | 1.04	0.91 | 1.04	0.94 | 1.03
37	Coal Creek 230	0.96 | 1.11	0.96 | 1.11	1.01 | 1.12	0.96 | 1.13
38	Dickinson 345	0.97 | 1.06	0.97 | 1.06	1.01 | 1.06	1.02 | 1.08
39	Drayton 230	0.98 | 1.09	0.98 | 1.09	0.94 | 1.09	1.00 | 1.08
40	Groton 345	0.87 | 1.04	0.86 | 1.03	0.82 | 1.03	0.85 | 1.02
41	Tioga 230	1.00 | 1.07	1.00 | 1.07	1.01 | 1.05	1.02 | 1.06
42	Wahpeton 115	0.97 | 1.10	0.97 | 1.10	0.89 | 1.10	0.93 | 1.08
43	Watertown 345	0.93 | 1.03	0.92 | 1.03	0.84 | 1.03	0.88 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	/ %	/ %	/ %	/ %
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	335%	316%	505%	507%
55	K22W (max +dP @ t, d-ang)	2.1@(0.14166,-0.1)	5.6@(0.14166,-0.1)	54.0@(1.99992,-30.5)	34.9@(1.99992,-21.1)
56	K22W (max -dP @ t, d-ang)	15.3@(0.79164,4.5)	16.6@(0.78330,5.8)	5.3@(0.55831,0.4)	5.6@(0.32499,0.4)
57	K22W (max d-ang @ t, dP)	7.3@(1.10829,-5.3)	8.7@(1.09996,-6.6)	-30.5@(1.99992,54.0)	-21.1@(1.99992,34.9)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	87% / 153%	83% / 149%	56% / 106%	87% / 153%
61	L20D at Prairie/Drayton	999% / 713%	999% / 753%	606% / 699%	186% / 614%
62	R50M / F3M	596% / 284%	588% / 284%	528% / 239%	613% / 265%
63	B10T	218%	222%	177%	227%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 3) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 0)	(2 | 6 | 2) / (0 | 2 | 1)	(2 | 5 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 2 | 2)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)	(0 | 5 | 1) / (2 | 2 | 2)	(0 | 5 | 3) / (2 | 2 | 2)

TABLE 8.2 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C1XXX

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S4C1XXX-nbz	upe-so04aa.S4C1XXX-mqs	upe-so04aa.S4C1XXX-pys	upe-so04aa.S4C1XXX-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 24 2002 15:09	APR 24 2002 15:13	APR 24 2002 15:16	APR 24 2002 15:18
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2066 / 370	2066 / 370	2066 / 370	2066 / 370
10	MHEX / L20D	2172 / 220	2172 / 220	2172 / 220	2172 / 220
11	ECL-ARP / PRI-BYN	647 / 825	647 / 825	647 / 825	647 / 825
12	MWSI / MNEX	1473 / 2709	1473 / 2709	1473 / 2709	1473 / 2709
13	D602F / F601C	1814 / 1349	1814 / 1349	1814 / 1349	1814 / 1349
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-121 / -197	-121 / -197	-121 / -197	-121 / -197
16	R50M / OH>MP	171 / 149	171 / 149	171 / 149	171 / 149
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	222 / 123	222 / 123	222 / 123	222 / 123
19	Forbes SVC / MSC	46 / 600	46 / 600	46 / 600	46 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045
22	Roseau 500/Forbes 500	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015
23	Chisago 500/EauClaire 345	1.021 / 1.007	1.021 / 1.007	1.021 / 1.007	1.021 / 1.007
24	Int Falls 115/Badoura 115	1.052 / 0.991	1.052 / 0.991	1.052 / 0.991	1.052 / 0.991
25	Drayton 230/Groton 345	1.013 / 0.998	1.013 / 0.998	1.013 / 0.998	1.013 / 0.998
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	133% / 221%	133% / 221%	133% / 221%	133% / 221%
28	L20D at Prairie/Drayton	999% / 935%	999% / 935%	999% / 935%	999% / 935%
29	R50M/F3M	726% / 999%	726% / 999%	726% / 999%	726% / 999%
30	B10T	336%	336%	336%	336%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.10	0.96 | 1.06	0.96 | 1.00	0.98 | 1.00
33	Boise 115	0.98 | 1.08	1.00 | 1.07	1.03 | 1.07	1.05 | 1.06
34	Dorsey 230	1.04 | 1.15	1.00 | 1.05	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	0.98 | 1.03	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.89 | 1.05	0.94 | 1.03	1.00 | 1.01	1.00 | 1.02
37	Coal Creek 230	0.96 | 1.09	0.98 | 1.07	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.97 | 1.09	0.96 | 1.09	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.95 | 1.09	0.98 | 1.05	1.00 | 1.04	1.01 | 1.03
40	Groton 345	0.78 | 1.04	0.86 | 1.02	0.96 | 0.99	0.98 | 1.00
41	Tioga 230	0.99 | 1.07	1.02 | 1.06	1.02 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.86 | 1.08	0.96 | 1.08	1.01 | 1.04	1.03 | 1.05
43	Watertown 345	0.79 | 1.04	0.88 | 1.03	0.96 | 0.99	0.99 | 1.01
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	/ %	/ %	/ %	/ %
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	479%	176%	312%
55	K22W (max +dP @ t, d-ang)	123.0@(1.99992,-55.4)	42.9@(1.99992,-25.3)	0.4@(0.10833,0.2)	0.0@(0.02500,0.0)
56	K22W (max -dP @ t, d-ang)	101.6@(0.26666,11.0)	22.1@(0.33332,4.2)	33.5@(1.73326,23.1)	21.4@(1.99992,14.3)
57	K22W (max d-ang @ t, dP)	-55.4@(1.99992,123.0)	-25.3@(1.99992,42.9)	23.4@(1.60827,-31.8)	14.3@(1.99992,-21.4)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	38% / 85%	110% / 189%	131% / 216%
61	L20D at Prairie/Drayton	999% / 495%	999% / 697%	999% / 747%	999% / 840%
62	R50M / F3M	274% / 143%	465% / 229%	610% / 999%	683% / 999%
63	B10T	244%	159%	198%	280%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 2 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 6 | 2) / (0 | 2 | 1)	(2 | 8 | 3) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (1 | 5 | 2)	(0 | 1 | 1) / (1 | 2 | 2)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 5 | 3) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 8.2 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C1XXX

1	**Case No.**	9	10	11
2	**Case Name**	upe-so04aa.S4C1XXX-ch3	upe-so04aa.S4C1XXX-ci3	upe-so04aa.S4C1XXX-cj3
3	**Disturbance**	ch3	ci3	cj3
4	**Prior Outage**	None	None	None
5	**Date/Time**	APR 30 2002 9:39	APR 30 2002 9:42	APR 30 2002 9:44
6	**Comments**			
7				
8	**Steady State Flows**			
9	NDEX / EAST BIAS	2066 / 370	2066 / 370	2066 / 370
10	MHEX / L20D	2172 / 220	2172 / 220	2172 / 220
11	ECL-ARP / PRI-BYN	647 / 825	647 / 825	647 / 825
12	MWSI / MNEX	1473 / 2709	1473 / 2709	1473 / 2709
13	D602F / F601C	1814 / 1349	1814 / 1349	1814 / 1349
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-121 / -197	-121 / -197	-121 / -197
16	R50M / OH>MP	171 / 149	171 / 149	171 / 149
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	222 / 123	222 / 123	222 / 123
19	Forbes SVC / MSC	46 / 600	46 / 600	46 / 600
20	**Steady State Vltgs**			
21	Dorsey 500/Dorsey 230	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045
22	Roseau 500/Forbes 500	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015
23	Chisago 500/EauClaire 345	1.021 / 1.007	1.021 / 1.007	1.021 / 1.007
24	Int Falls 115/Badoura 115	1.052 / 0.991	1.052 / 0.991	1.052 / 0.991
25	Drayton 230/Groton 345	1.013 / 0.998	1.013 / 0.998	1.013 / 0.998
26	**SS OS Relay Margins**			
27	D602F at Forbes/Dorsey	133% / 221%	133% / 221%	133% / 221%
28	L20D at Prairie/Drayton	999% / 935%	999% / 935%	999% / 935%
29	R50M/F3M	726% / 999%	726% / 999%	726% / 999%
30	B10T	336%	336%	336%
31	**Min/MaxTransientVltg**			
32	Arrowhd 230	0.88 | 0.98	0.96 | 1.00	0.97 | 1.01
33	Boise 115	1.01 | 1.05	1.00 | 1.06	1.00 | 1.05
34	Dorsey 230	0.99 | 1.06	1.01 | 1.05	1.00 | 1.05
35	Forbes 230	0.93 | 1.00	0.98 | 1.00	0.97 | 1.00
36	Riverton 230	0.81 | 0.95	0.95 | 0.99	0.96 | 0.99
37	Coal Creek 230	0.90 | 0.97	0.97 | 1.06	0.97 | 1.05
38	Dickinson 345	0.90 | 0.96	0.96 | 1.02	0.97 | 1.03
39	Drayton 230	0.89 | 1.21(1.01)	0.97 | 1.03	0.97 | 1.02
40	Groton 345	(1.16)0.28 | 0.79	0.78 | 0.83	0.75 | 0.85
41	Tioga 230	0.87 | 1.02	1.00 | 1.04	0.98 | 1.01
42	Wahpeton 115	(1.16)0.65 | 0.94	0.95 | 1.00	0.95 | 1.01
43	Watertown 345	(1.09)0.45 | 0.78	0.79 | 0.83	0.80 | 0.90
44	**Dynamic Voltage Warnings**			
45		470 [BISON 4] 0.24	506 [FTTHOMP3] 0.58	506 [FTTHOMP3] 0.51
46		432 [EDGELEY7] 0.43	622 [STORLA 4] 0.69	507 [FTTHOMP4] 0.62
47		438 [FORMAN 7] 0.49	507 [FTTHOMP4] 0.69	516 [LAKPLAT4] 0.63
48		454 [VALLEYC7] 0.51	620 [HURON 3] 0.69	622 [STORLA 4] 0.63
49		445 [JAMESTN7] 0.54		9146 [FTTHMP2T] 0.64
50		444 [JAMESTN4] 0.55		540 [BIGBND14] 0.65
51		435 [FARGO 4] 0.61 +more		9143 [FTTHMP1T] 0.65 +more
52	Worst Case Angle Damping	/ %	/ %	/ %
53	Dorsey SUVP / UdHold			
54	Forbes DC Red (DCAR)	443%	269%	390%
55	K22W (max +dP @ t, d-ang)	1.6@(0.12499,0.0)	1.6@(0.12499,0.0)	1.6@(0.12499,0.0)
56	K22W (max -dP @ t, d-ang)	48.0@(1.03329,19.2)	29.3@(1.04996,14.3)	23.8@(1.14162,11.7)
57	K22W (max d-ang @ t, dP)	21.7@(1.09162,-45.5)	21.8@(1.51661,-21.0)	16.0@(1.49994,-16.4)
58	**OS Rel Trip / Marg**			
59	MH - OH			
60	D602F at Forbes/Dorsey	102% / 164%	40% / 86%	28% / 69%
61	L20D at Prairie/Drayton	433% / 854%	999% / 707%	999% / 608%
62	R50M / F3M	593% / 999%	474% / 272%	457% / 235%
63	B10T	336%	238%	175%
64	**FSCAPS (SS/Unav/Final)**			
65	Balta 230	(0 | 3 | 3)	(0 | 1 | 1)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 9 |12) / (0 | 2 | 2)	(2 | 8 | 3) / (0 | 2 | 2)	(2 | 8 | 4) / (0 | 2 | 2)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 2 | 2)	(0 | 2 | 2) / (1 | 3 | 3)
69	Shey 115 / Split Rock 115	(0 | 5 | 5) / (2 | 2 | 2)	(0 | 5 | 5) / (2 | 2 | 2)	(0 | 5 | 5) / (2 | 2 | 2)

Table 8.3
700 Mvar SVC @ Wind Generator Terminals (Case S4C1XXA)

```
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
 ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167

 DATA FOR BUS  9000 [FTTHWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 -2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 1.00000  95.70

 MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
  2 1.00000 1.00000   210.74  1: 700.00

 PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
    1000.0  -510.0  -510.0  -510.0 1.02000                             100.00

 ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
 1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   506 FTTHOMP3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
   506 1  T 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 8.4 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C1XXA

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S4C1XXA-ag1	upe-so04aa.S4C1XXA-ag3	upe-so04aa.S4C1XXA-ei2	upe-so04aa.S4C1XXA-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 29 2002 23:30	APR 29 2002 23:45	APR 30 2002 0:01	APR 30 2002 0:17
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2067 / 367	2067 / 367	2067 / 367	2067 / 367
10	MHEX / L20D	2174 / 223	2174 / 223	2174 / 223	2174 / 223
11	ECL-ARP / PRI-BYN	647 / 824	647 / 824	647 / 824	647 / 824
12	MWSI / MNEX	1472 / 2700	1472 / 2700	1472 / 2700	1472 / 2700
13	D602F / F601C	1810 / 1345	1810 / 1345	1810 / 1345	1810 / 1345
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	170 / 150	170 / 150	170 / 150	170 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	225 / 79	225 / 79	225 / 79	225 / 79
19	Forbes SVC / MSC	41 / 600	41 / 600	41 / 600	41 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045
22	Roseau 500/Forbes 500	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015
23	Chisago 500/EauClaire 345	1.021 / 1.007	1.021 / 1.007	1.021 / 1.007	1.021 / 1.007
24	Int Falls 115/Badoura 115	1.052 / 0.993	1.052 / 0.993	1.052 / 0.993	1.052 / 0.993
25	Drayton 230/Groton 345	1.014 / 1.005	1.014 / 1.005	1.014 / 1.005	1.014 / 1.005
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	134% / 222%	134% / 222%	134% / 222%	134% / 222%
28	L20D at Prairie/Drayton	999% / 921%	999% / 921%	999% / 921%	999% / 921%
29	R50M/F3M	730% / 350%	730% / 350%	730% / 350%	730% / 350%
30	B10T	343%	343%	343%	343%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.02	0.98 | 1.02	0.98 | 1.04	0.98 | 1.04
33	Boise 115	1.03 | 1.07	1.03 | 1.06	1.02 | 1.08	1.03 | 1.07
34	Dorsey 230	1.03 | 1.06	1.03 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.02	1.00 | 1.02	0.98 | 1.03	0.99 | 1.03
36	Riverton 230	0.97 | 1.04	0.97 | 1.04	0.92 | 1.04	0.95 | 1.04
37	Coal Creek 230	0.97 | 1.11	0.97 | 1.11	1.02 | 1.12	0.96 | 1.14
38	Dickinson 345	0.97 | 1.06	0.97 | 1.06	1.02 | 1.06	1.02 | 1.08
39	Drayton 230	0.98 | 1.08	0.98 | 1.07	0.94 | 1.08	1.00 | 1.07
40	Groton 345	0.89 | 1.05	0.89 | 1.04	0.87 | 1.05	0.89 | 1.04
41	Tioga 230	1.00 | 1.07	1.00 | 1.07	1.02 | 1.07	1.02 | 1.06
42	Wahpeton 115	0.98 | 1.10	0.98 | 1.10	0.91 | 1.10	0.94 | 1.09
43	Watertown 345	0.96 | 1.05	0.96 | 1.04	0.90 | 1.04	0.93 | 1.04
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 67.91%	SHERC3 / 64.45%	KING 3 / -58.17%	SHERC3 / -62.61%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	357%	345%	504%	507%
55	K22W (max +dP @ t, d-ang)	7.2@(2.59989,-0.8)	7.9@(2.57489,-1.2)	57.4@(2.81655,-31.4)	36.7@(2.62489,-20.4)
56	K22W (max -dP @ t, d-ang)	13.9@(0.78330,3.9)	14.8@(0.75830,5.0)	4.9@(0.48331,0.3)	5.6@(0.32499,0.3)
57	K22W (max d-ang @ t, dP)	6.2@(1.07496,-4.5)	7.3@(1.04996,-5.6)	-150.6@(20.00792,27.2)	-83.7@(20.00792,16.7)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	89% / 157%	86% / 153%	59% / 111%	89% / 156%
61	L20D at Prairie/Drayton	999% / 712%	999% / 739%	637% / 657%	185% / 622%
62	R50M / F3M	606% / 280%	598% / 280%	540% / 231%	620% / 266%
63	B10T	213%	218%	140%	187%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 4 | 2) / (0 | 2 | 1)	(2 | 3 | 2) / (0 | 2 | 1)	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 3 | 1) / (2 | 2 | 2)	(0 | 3 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)

TABLE 8.4 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C1XXA

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S4C1XXA-nbz	upe-so04aa.S4C1XXA-mqs	upe-so04aa.S4C1XXA-pys	upe-so04aa.S4C1XXA-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 30 2002 0:30	APR 30 2002 0:49	APR 30 2002 1:04	APR 30 2002 1:18
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2067 / 367	2067 / 367	2067 / 367	2067 / 367
10	MHEX / L20D	2174 / 223	2174 / 223	2174 / 223	2174 / 223
11	ECL-ARP / PRI-BYN	647 / 824	647 / 824	647 / 824	647 / 824
12	MWSI / MNEX	1472 / 2700	1472 / 2700	1472 / 2700	1472 / 2700
13	D602F / F601C	1810 / 1345	1810 / 1345	1810 / 1345	1810 / 1345
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	170 / 150	170 / 150	170 / 150	170 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	225 / 79	225 / 79	225 / 79	225 / 79
19	Forbes SVC / MSC	41 / 600	41 / 600	41 / 600	41 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045
22	Roseau 500/Forbes 500	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015
23	Chisago 500/EauClaire 345	1.021 / 1.007	1.021 / 1.007	1.021 / 1.007	1.021 / 1.007
24	Int Falls 115/Badoura 115	1.052 / 0.993	1.052 / 0.993	1.052 / 0.993	1.052 / 0.993
25	Drayton 230/Groton 345	1.014 / 1.005	1.014 / 1.005	1.014 / 1.005	1.014 / 1.005
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	134% / 222%	134% / 222%	134% / 222%	134% / 222%
28	L20D at Prairie/Drayton	999% / 921%	999% / 921%	999% / 921%	999% / 921%
29	R50M/F3M	730% / 350%	730% / 350%	730% / 350%	730% / 350%
30	B10T	343%	343%	343%	343%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.10	0.96 | 1.05	0.97 | 1.01	0.99 | 1.00
33	Boise 115	0.98 | 1.08	1.00 | 1.08	1.03 | 1.07	1.05 | 1.06
34	Dorsey 230	1.04 | 1.15	1.00 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	0.98 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.90 | 1.06	0.95 | 1.03	1.00 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.96 | 1.09	0.98 | 1.07	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.97 | 1.08	0.97 | 1.09	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.96 | 1.08	0.96 | 1.05	1.00 | 1.03	1.01 | 1.03
40	Groton 345	0.86 | 1.04	0.92 | 1.03	0.98 | 1.01	1.00 | 1.01
41	Tioga 230	1.00 | 1.08	1.01 | 1.07	1.02 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.89 | 1.10	0.98 | 1.08	1.02 | 1.05	1.04 | 1.05
43	Watertown 345	0.88 | 1.04	0.94 | 1.04	0.99 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -33.91%	KING 3 / 3.34%	SHERC3 / 33.49%	KING 3 / 19.53%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	468%	174%	323%
55	K22W (max +dP @ t, d-ang)	150.1@(2.10825,-67.2)	69.0@(2.64989,-35.2)	0.4@(4.09983,5.4)	0.0@(-0.01667,0.0)
56	K22W (max -dP @ t, d-ang)	101.3@(0.26666,11.0)	21.9@(0.33332,4.2)	30.6@(1.74993,19.2)	20.1@(2.12491,12.9)
57	K22W (max d-ang @ t, dP)	-277.7@(20.00792,53.1)	-124.1@(20.00792,23.9)	21.0@(20.00792,-14.7)	16.9@(20.00792,-11.2)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	38% / 86%	110% / 188%	132% / 218%
61	L20D at Prairie/Drayton	886% / 495%	999% / 652%	999% / 733%	999% / 817%
62	R50M / F3M	287% / 143%	470% / 221%	625% / 350%	689% / 350%
63	B10T	147%	132%	201%	275%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 2 | 1)	(2 | 8 | 3) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (1 | 6 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 8.4 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C1XXA

1	**Case No.**	9	10	11	12
2	**Case Name**	upe-so04aa.S4C1XXA-ch3	upe-so04aa.S4C1XXA-ci3	upe-so04aa.S4C1XXA-cj3	upe-so04aa.S4C1XXA-cn3
3	**Disturbance**	ch3	ci3	cj3	cn3
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 30 2002 1:31	APR 30 2002 1:48	APR 30 2002 2:02	MAY 02 2002 10:50
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2067 / 367	2067 / 367	2067 / 367	2067 / 367
10	MHEX / L20D	2174 / 223	2174 / 223	2174 / 223	2174 / 223
11	ECL-ARP / PRI-BYN	647 / 824	647 / 824	647 / 824	647 / 824
12	MWSI / MNEX	1472 / 2700	1472 / 2700	1472 / 2700	1472 / 2700
13	D602F / F601C	1810 / 1345	1810 / 1345	1810 / 1345	1810 / 1345
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	170 / 150	170 / 150	170 / 150	170 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	225 / 79	225 / 79	225 / 79	225 / 79
19	Forbes SVC / MSC	41 / 600	41 / 600	41 / 600	41 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045
22	Roseau 500/Forbes 500	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015	1.057 / 1.015
23	Chisago 500/EauClaire 345	1.021 / 1.007	1.021 / 1.007	1.021 / 1.007	1.021 / 1.007
24	Int Falls 115/Badoura 115	1.052 / 0.993	1.052 / 0.993	1.052 / 0.993	1.052 / 0.993
25	Drayton 230/Groton 345	1.014 / 1.005	1.014 / 1.005	1.014 / 1.005	1.014 / 1.005
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	134% / 222%	134% / 222%	134% / 222%	134% / 222%
28	L20D at Prairie/Drayton	999% / 921%	999% / 921%	999% / 921%	999% / 921%
29	R50M/F3M	730% / 350%	730% / 350%	730% / 350%	730% / 350%
30	B10T	343%	343%	343%	343%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.94 | 1.07	0.98 | 1.03	0.88 | ****	1.00 | 1.05
33	Boise 115	0.99 | 1.10	1.01 | 1.07	1.01 | ****	1.02 | 1.08
34	Dorsey 230	0.98 | 1.08	1.01 | 1.05	0.97 | ****	1.02 | 1.07
35	Forbes 230	0.97 | 1.05	0.99 | 1.03	0.92 | ****	1.01 | 1.04
36	Riverton 230	0.94 | 1.04	0.96 | 1.03	0.75 |	0.99 | 1.04
37	Coal Creek 230	0.97 | 1.09	0.97 | 1.09	(1.58)0.54 |	0.99 | 1.08
38	Dickinson 345	0.95 | 1.07	0.97 | 1.05	0.88 | ****	1.00 | 1.06
39	Drayton 230	0.98 | 1.07	0.98 | 1.05	(1.58)0.44 |	0.99 | 1.05
40	Groton 345	0.81 | 1.02	0.87 | 1.01	(9.84)0.64 |	0.93 | 1.07
41	Tioga 230	0.98 | 1.07	1.02 | 1.06	(1.58)0.17 |	0.99 | 1.07
42	Wahpeton 115	0.94 | 1.07	0.96 | 1.07	(1.58)0.63 |	0.99 | 1.09
43	Watertown 345	0.79 | 1.02	0.88 | 1.04	(9.84)0.73 |	0.97 | 1.07
44	**Dynamic Voltage Warnings**				
45		0263 [SPENCER7] 0.68	none	none	none
46		482 [MISSION7] 0.69			
47		494 [WINNER 7] 0.69			
48		495 [WITTEN 7] 0.69			
49		478 [GREGORY7] 0.69			
50					
51					
52	Worst Case Angle Damping	SHERC3 / 42.28%	SHERC3 / 59.22%	ANTEL3 / -12.51%	KING 3 / -31.47%
53	Dorsey SUVP / UdHold	/ 1.566			
54	Forbes DC Red (DCAR)	70%	238%	213%	502%
55	K22W (max +dP @ t, d-ang)	83.6@(3.04154,-26.5)	17.9@(2.78322,-6.2)	63.9@(8.52476,-53.6)	76.4@(2.45823,-34.9)
56	K22W (max -dP @ t, d-ang)	43.8@(1.09162,23.2)	22.7@(0.89163,9.4)	30.5@(1.15829,15.8)	4.2@(0.52498,0.9)
57	K22W (max d-ang @ t, dP)	-48.4@(20.00792,20.9)	14.1@(1.23328,-9.5)	-65.6@(11.58305,36.4)	-153.7@(20.00792,29.8)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	24% / 69%	59% / 116%	44% / 93%	80% / 150%
61	L20D at Prairie/Drayton	759% / 565%	999% / 670%	-133% / -504%	999% / 486%
62	R50M / F3M	438% / 237%	525% / 254%	479% / 251%	623% / 218%
63	B10T	106%	199%	-239%	90%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 4 | 2) / (0 | 1 | 1)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 3 | 2) / (0 | 2 | 2)	(2 | 8 | 3) / (0 | 1 | 1)	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (1 | 3 | 0)	(0 | 1 | 1) / (1 | 1 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 3) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 3 | 3) / (2 | 2 | 2)	(0 | 1 | 0) / (2 | 2 | 2)

TABLE 8.4 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C1XXA

1	**Case No.**	13
2	**Case Name**	upe-so04aa.S4C1XXA-co3
3	**Disturbance**	co3
4	**Prior Outage**	None
5	**Date/Time**	MAY 03 2002 11:47
6	**Comments**	
7		
8	**Steady State Flows**	
9	NDEX / EAST BIAS	2067 / 367
10	MHEX / L20D	2174 / 223
11	ECL-ARP / PRI-BYN	647 / 824
12	MWSI / MNEX	1472 / 2700
13	D602F / F601C	1810 / 1345
14	B10T / MH>SPC	166 / 99
15	OH E-W / OH>MH	-119 / -196
16	R50M / OH>MP	170 / 150
17	Dorsey BP1 / BP2	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	225 / 79
19	Forbes SVC / MSC	41 / 600
20	**Steady State Vltgs**	
21	Dorsey 500/Dorsey 230	1.030 / 1.045
22	Roseau 500/Forbes 500	1.057 / 1.015
23	Chisago 500/EauClaire 345	1.021 / 1.007
24	Int Falls 115/Badoura 115	1.052 / 0.993
25	Drayton 230/Groton 345	1.014 / 1.005
26	**SS OS Relay Margins**	
27	D602F at Forbes/Dorsey	134% / 222%
28	L20D at Prairie/Drayton	999% / 921%
29	R50M/F3M	730% / 350%
30	B10T	343%
31	**Min/MaxTransientVltg**	
32	Arrowhd 230	0.99 | 1.05
33	Boise 115	1.01 | 1.09
34	Dorsey 230	1.01 | 1.06
35	Forbes 230	1.00 | 1.04
36	Riverton 230	0.98 | 1.04
37	Coal Creek 230	0.99 | 1.08
38	Dickinson 345	0.99 | 1.06
39	Drayton 230	0.99 | 1.05
40	Groton 345	0.92 | 1.06
41	Tioga 230	1.00 | 1.07
42	Wahpeton 115	0.99 | 1.08
43	Watertown 345	0.94 | 1.07
44	**Dynamic Voltage Warnings**	
45		none
46		
47		
48		
49		
50		
51		
52	Worst Case Angle Damping	SHERC3 / -19.04%
53	Dorsey SUVP / UdHold	
54	Forbes DC Red (DCAR)	440%
55	K22W (max +dP @ t, d-ang)	73.8@(2.52489,-33.2)
56	K22W (max -dP @ t, d-ang)	9.3@(0.61664,2.5)
57	K22W (max d-ang @ t, dP)	-152.5@(20.00792,24.7)
58	**OS Rel Trip / Marg**	
59	MH - OH	
60	D602F at Forbes/Dorsey	65% / 128%
61	L20D at Prairie/Drayton	999% / 496%
62	R50M / F3M	573% / 212%
63	B10T	95%
64	**FSCAPS (SS/Unav/Final)**	
65	Balta 230	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 2 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 1 | 1) / (2 | 2 | 2)

Table 8.5
Ft-Thompson-Huron-Split Rock-Lakefield Jnctn. 345 kV (Case S4C2XX1)

```
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167

DATA FOR BUS  9000 [FTTHWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 0.95961  97.18

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
   1000.0  -510.0  -510.0  -510.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  506 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS   506 [FTTHOMP3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0   130.0 0.96809  89.58

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  571 GR ISLD3 345  1   0.00940  0.11900  2.04340  1  T   720.0  880.0  792.0    0.0       1 1.000
  605 LELANDO3 345  1   0.01046  0.15170  1.65250  1  F   680.0 1159.0  748.0    0.0       1 1.000
  620 HURON  3 345  1   0.00245  0.02911  0.50537  1  F   680.0 1159.0  748.0    0.0       1 1.000
 9000 FTTHWIND13.8  1   0.00024  0.01250  0.00000  1  F  1500.0 1500.0 1500.0    0.0       1 1.000
19143 FTTHMP1T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000
19146 FTTHMP2T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  605 LELANDO3 345  1    0.00000 -0.68000   0.00000 -0.50000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9000 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19143 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
19146 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 8.5 (Cont.)

```
DATA FOR BUS   620 [HURON  3 345] RESIDING IN AREA   6, ZONE  11, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.97154  80.48

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   506 FTTHOMP3 345  1   0.00245  0.02911  0.50537  1  T   680.0 1159.0  748.0    0.0       1 1.000
   601 ANTELOP3 345  1   0.01202  0.13530  2.76110  1  F   478.0 2270.0  526.0    0.0       1 1.000
  1634 SPLT RK3 345  1   0.00220  0.04983  1.01574  1  F  2270.0 2270.0 2270.0    0.0       1 1.000
 22154 BRDLNDTY 345  1   0.00013  0.03292  0.00000  1  F   400.0  400.0  480.0    0.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
   601 ANTELOP3 345  1    0.00000  0.00000   0.00000 -1.07000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 22154 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000


 DATA FOR BUS  1634 [SPLT RK3 345] RESIDING IN AREA  23, ZONE 353, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00097  58.46

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
   620 HURON  3 345  1   0.00220  0.04983  1.01574  1  T  2270.0 2270.0 2270.0    0.0       1 1.000
  1684 SPLTRKY11.00  1   0.00031  0.03588  0.00000  1  F   450.0  450.0  585.0    0.0       1 1.000
  1686 SPLTRKY21.00  1   0.00031  0.03588  0.00000  1  F   450.0  450.0  585.0    0.0       1 1.000
  2010 LAKEFLD3 345  1   0.00139  0.03168  0.64641  1  F  2270.0 2270.0 2270.0    0.0       1 1.000
 45641 SPLTRTA3 345  1   0.00020  0.00250  0.04329  1  T   717.0 1308.0  789.0    0.0       1 1.000
 45646 SPLTRTB3 345  1   0.00020  0.00250  0.04329  1  T   717.0 1308.0  789.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  1684 1  F 1.02600   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
  1686 1  F 1.02600   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 8.5 (Cont.)

```
DATA FOR BUS  2010 [LAKEFLD3 345] RESIDING IN AREA  31, ZONE  25, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00015  47.86

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 1 1.04000 1.02000     0.00  3: -25.00

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 1634 SPLT RK3 345  1   0.00139  0.03168  0.64641  1  T  2270.0 2270.0 2270.0    0.0       1 1.000
 1889 LKFLDXL3 345  1   0.00100  0.00960  0.15547  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
 2011 LAKEFLD5 161  1   0.00000  0.03400  0.00000  1  T   250.0  250.0  312.0    1.0       1 1.000
 2011 LAKEFLD5 161  2   0.00000  0.02736  0.00000  1  T   336.0  420.0  336.0    0.0       1 1.000
 2330 RAUN   3 345  1   0.00590  0.05830  0.93020  1  F   720.0  720.0  792.0    1.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
 2330 RAUN   3 345  1    0.00000 -0.50000   0.00000  0.00000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 2011 1  T 1.02817   0.0 1  -2011 1.0500 0.9500 1.0350 1.0170 0.00313
 2011 2  T 1.02817   0.0 1  -2011 1.0500 0.9500 1.0350 1.0170 0.00313
```

TABLE 8.6 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C2XX1

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S4C2XX1-ag1	upe-so04aa.S4C2XX1-ag3	upe-so04aa.S4C2XX1-ei2	upe-so04aa.S4C2XX1-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 26 2002 17:56	APR 26 2002 18:12	APR 26 2002 18:28	APR 26 2002 18:43
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2070 / 364	2070 / 364	2070 / 364	2070 / 364
10	MHEX / L20D	2172 / 222	2172 / 222	2172 / 222	2172 / 222
11	ECL-ARP / PRI-BYN	663 / 807	663 / 807	663 / 807	663 / 807
12	MWSI / MNEX	1470 / 2226	1470 / 2226	1470 / 2226	1470 / 2226
13	D602F / F601C	1806 / 1337	1806 / 1337	1806 / 1337	1806 / 1337
14	B10T / MH>SPC	167 / 99	167 / 99	167 / 99	167 / 99
15	OH E-W / OH>MH	-122 / -197	-122 / -197	-122 / -197	-122 / -197
16	R50M / OH>MP	170 / 148	170 / 148	170 / 148	170 / 148
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	232 / 107	232 / 107	232 / 107	232 / 107
19	Forbes SVC / MSC	44 / 600	44 / 600	44 / 600	44 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045
22	Roseau 500/Forbes 500	1.058 / 1.016	1.058 / 1.016	1.058 / 1.016	1.058 / 1.016
23	Chisago 500/EauClaire 345	1.022 / 1.004	1.022 / 1.004	1.022 / 1.004	1.022 / 1.004
24	Int Falls 115/Badoura 115	1.050 / 0.988	1.050 / 0.988	1.050 / 0.988	1.050 / 0.988
25	Drayton 230/Groton 345	1.012 / 0.987	1.012 / 0.987	1.012 / 0.987	1.012 / 0.987
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	136% / 225%	136% / 225%	136% / 225%	136% / 225%
28	L20D at Prairie/Drayton	999% / 917%	999% / 917%	999% / 917%	999% / 917%
29	R50M/F3M	731% / 999%	731% / 999%	731% / 999%	731% / 999%
30	B10T	340%	340%	340%	340%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.02	0.97 | 1.02	0.97 | 1.05	0.98 | 1.04
33	Boise 115	1.03 | 1.06	1.02 | 1.06	1.01 | 1.07	1.03 | 1.06
34	Dorsey 230	1.03 | 1.06	1.03 | 1.05	1.02 | 1.06	1.03 | 1.05
35	Forbes 230	1.00 | 1.02	1.00 | 1.02	0.98 | 1.03	0.99 | 1.03
36	Riverton 230	0.97 | 1.04	0.97 | 1.04	0.91 | 1.04	0.95 | 1.03
37	Coal Creek 230	0.97 | 1.11	0.97 | 1.11	1.02 | 1.12	0.96 | 1.13
38	Dickinson 345	0.97 | 1.06	0.97 | 1.06	1.02 | 1.06	1.03 | 1.08
39	Drayton 230	0.98 | 1.08	0.98 | 1.08	0.94 | 1.09	1.00 | 1.08
40	Groton 345	0.86 | 1.03	0.86 | 1.02	0.84 | 1.03	0.86 | 1.01
41	Tioga 230	1.00 | 1.07	1.00 | 1.07	1.01 | 1.07	1.02 | 1.06
42	Wahpeton 115	0.97 | 1.11	0.97 | 1.10	0.90 | 1.10	0.93 | 1.08
43	Watertown 345	0.94 | 1.05	0.93 | 1.04	0.89 | 1.04	0.91 | 1.03
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 55.98%	SHERC3 / 56.51%	SHERC3 / -59.56%	SHERC3 / -66.46%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	339%	323%	502%	507%
55	K22W (max +dP @ t, d-ang)	8.4@(2.64156,-2.1)	8.5@(2.62489,-2.4)	62.3@(2.96654,-33.6)	39.4@(2.80822,-22.5)
56	K22W (max -dP @ t, d-ang)	15.4@(0.79164,4.7)	16.5@(0.77497,5.9)	4.7@(0.47498,0.2)	5.7@(0.32499,0.4)
57	K22W (max d-ang @ t, dP)	7.5@(1.10829,-4.8)	8.8@(1.09162,-6.7)	-152.5@(20.00792,27.8)	-87.1@(20.00792,17.4)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	88% / 156%	85% / 152%	53% / 104%	87% / 154%
61	L20D at Prairie/Drayton	999% / 700%	999% / 739%	635% / 704%	184% / 606%
62	R50M / F3M	601% / 285%	591% / 284%	524% / 234%	615% / 269%
63	B10T	216%	220%	173%	221%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 8 | 3) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 0)	(2 | 6 | 2) / (0 | 2 | 1)	(2 | 5 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)	(0 | 5 | 1) / (2 | 2 | 2)	(0 | 5 | 3) / (2 | 2 | 2)

TABLE 8.6 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C2XX1

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S4C2XX1-nbz	upe-so04aa.S4C2XX1-mqs	upe-so04aa.S4C2XX1-pys	upe-so04aa.S4C2XX1-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 26 2002 18:57	APR 26 2002 19:16	APR 26 2002 19:31	APR 26 2002 19:45
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2070 / 364	2070 / 364	2070 / 364	2070 / 364
10	MHEX / L20D	2172 / 222	2172 / 222	2172 / 222	2172 / 222
11	ECL-ARP / PRI-BYN	663 / 807	663 / 807	663 / 807	663 / 807
12	MWSI / MNEX	1470 / 2226	1470 / 2226	1470 / 2226	1470 / 2226
13	D602F / F601C	1806 / 1337	1806 / 1337	1806 / 1337	1806 / 1337
14	B10T / MH>SPC	167 / 99	167 / 99	167 / 99	167 / 99
15	OH E-W / OH>MH	-122 / -197	-122 / -197	-122 / -197	-122 / -197
16	R50M / OH>MP	170 / 148	170 / 148	170 / 148	170 / 148
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	232 / 107	232 / 107	232 / 107	232 / 107
19	Forbes SVC / MSC	44 / 600	44 / 600	44 / 600	44 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045
22	Roseau 500/Forbes 500	1.058 / 1.016	1.058 / 1.016	1.058 / 1.016	1.058 / 1.016
23	Chisago 500/EauClaire 345	1.022 / 1.004	1.022 / 1.004	1.022 / 1.004	1.022 / 1.004
24	Int Falls 115/Badoura 115	1.050 / 0.988	1.050 / 0.988	1.050 / 0.988	1.050 / 0.988
25	Drayton 230/Groton 345	1.012 / 0.987	1.012 / 0.987	1.012 / 0.987	1.012 / 0.987
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	136% / 225%	136% / 225%	136% / 225%	136% / 225%
28	L20D at Prairie/Drayton	999% / 917%	999% / 917%	999% / 917%	999% / 917%
29	R50M/F3M	731% / 999%	731% / 999%	731% / 999%	731% / 999%
30	B10T	340%	340%	340%	340%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.10	0.96 | 1.05	0.96 | 1.01	0.98 | 1.00
33	Boise 115	0.97 | 1.08	1.00 | 1.07	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.14	1.00 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.05	0.98 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.89 | 1.04	0.94 | 1.03	1.00 | 1.02	1.00 | 1.02
37	Coal Creek 230	0.96 | 1.09	0.98 | 1.08	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.98 | 1.09	0.97 | 1.09	1.00 | 1.04	1.01 | 1.03
39	Drayton 230	0.95 | 1.09	0.97 | 1.06	1.00 | 1.04	1.00 | 1.02
40	Groton 345	0.82 | 1.02	0.88 | 1.01	0.94 | 0.99	0.97 | 0.99
41	Tioga 230	1.00 | 1.07	1.02 | 1.07	1.02 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.88 | 1.09	0.96 | 1.09	1.01 | 1.05	1.04 | 1.05
43	Watertown 345	0.86 | 1.04	0.92 | 1.04	0.98 | 1.02	1.00 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -47.45%	KING 3 / 5.95%	SHERC3 / 19.82%	KING 3 / 2.04%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	467%	165%	311%
55	K22W (max +dP @ t, d-ang)	134.8@(2.10825,-61.9)	68.6@(2.68322,-37.6)	5.4@(4.08316,3.1)	0.0@(-0.01667,0.0)
56	K22W (max -dP @ t, d-ang)	100.9@(0.26666,11.0)	22.1@(0.33332,4.2)	33.1@(1.74160,22.4)	21.2@(2.10825,14.2)
57	K22W (max d-ang @ t, dP)	-279.7@(20.00792,52.7)	-122.5@(20.00792,23.0)	24.2@(16.13298,-21.1)	18.4@(16.72463,-14.4)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	37% / 84%	116% / 195%	135% / 224%
61	L20D at Prairie/Drayton	999% / 487%	999% / 712%	999% / 727%	999% / 811%
62	R50M / F3M	271% / 138%	464% / 222%	631% / 999%	696% / 999%
63	B10T	211%	161%	200%	277%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 6 | 2) / (0 | 2 | 1)	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (1 | 6 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 3) / (2 | 2 | 2)	(0 | 5 | 3) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 8.6 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C2XX1

1	**Case No.**	9	10	11
2	**Case Name**	upe-so04aa.S4C2XX1-ch3	upe-so04aa.S4C2XX1-ci3	upe-so04aa.S4C2XX1-cj3
3	**Disturbance**	ch3	ci3	cj3
4	**Prior Outage**	None	None	None
5	**Date/Time**	APR 30 2002 9:56	APR 30 2002 9:59	APR 30 2002 10:01
6	**Comments**			
7				
8	**Steady State Flows**			
9	NDEX / EAST BIAS	2070 / 364	2070 / 364	2070 / 364
10	MHEX / L20D	2172 / 222	2172 / 222	2172 / 222
11	ECL-ARP / PRI-BYN	663 / 807	663 / 807	663 / 807
12	MWSI / MNEX	1470 / 2226	1470 / 2226	1470 / 2226
13	D602F / F601C	1806 / 1337	1806 / 1337	1806 / 1337
14	B10T / MH>SPC	167 / 99	167 / 99	167 / 99
15	OH E-W / OH>MH	-122 / -197	-122 / -197	-122 / -197
16	R50M / OH>MP	170 / 148	170 / 148	170 / 148
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	232 / 107	232 / 107	232 / 107
19	Forbes SVC / MSC	44 / 600	44 / 600	44 / 600
20	**Steady State Vltgs**			
21	Dorsey 500/Dorsey 230	1.030 / 1.045	1.030 / 1.045	1.030 / 1.045
22	Roseau 500/Forbes 500	1.058 / 1.016	1.058 / 1.016	1.058 / 1.016
23	Chisago 500/EauClaire 345	1.022 / 1.004	1.022 / 1.004	1.022 / 1.004
24	Int Falls 115/Badoura 115	1.050 / 0.988	1.050 / 0.988	1.050 / 0.988
25	Drayton 230/Groton 345	1.012 / 0.987	1.012 / 0.987	1.012 / 0.987
26	**SS OS Relay Margins**			
27	D602F at Forbes/Dorsey	136% / 225%	136% / 225%	136% / 225%
28	L20D at Prairie/Drayton	999% / 917%	999% / 917%	999% / 917%
29	R50M/F3M	731% / 999%	731% / 999%	731% / 999%
30	B10T	340%	340%	340%
31	**Min/MaxTransientVltg**			
32	Arrowhd 230	0.88 | 0.98	0.96 | 1.00	0.97 | 1.01
33	Boise 115	1.00 | 1.05	1.01 | 1.05	1.00 | 1.05
34	Dorsey 230	1.01 | 1.05	1.02 | 1.05	1.00 | 1.05
35	Forbes 230	0.93 | 1.00	0.99 | 1.01	0.98 | 1.00
36	Riverton 230	0.84 | 0.96	0.96 | 1.00	0.96 | 1.00
37	Coal Creek 230	0.91 | 0.98	0.97 | 1.06	0.97 | 1.05
38	Dickinson 345	0.92 | 0.97	0.97 | 1.02	0.97 | 1.04
39	Drayton 230	0.91 | 1.16	0.97 | 1.03	0.97 | 1.01
40	Groton 345	(1.31)0.32 | 0.82	0.79 | 0.85	0.76 | 0.84
41	Tioga 230	0.88 | 1.02	1.01 | 1.05	0.99 | 1.02
42	Wahpeton 115	(1.31)0.72 | 0.96	0.96 | 1.02	0.95 | 1.01
43	Watertown 345	(1.20)0.50 | 0.84	0.85 | 0.89	0.81 | 0.91
44	**Dynamic Voltage Warnings**			
45		480 [MAURINE7] 0.07	506 [FTTHOMP3] 0.61	506 [FTTHOMP3] 0.51
46		477 [ELSWRTH7] 0.08		507 [FTTHOMP4] 0.63
47		476 [EAGLEBT7] 0.16		516 [LAKPLAT4] 0.64
48		481 [MIDLAND7] 0.18		622 [STORLA 4] 0.64
49		470 [BISON 4] 0.22		9143 [FTTHMP1T] 0.65
50		479 [MARTIN 7] 0.32		9146 [FTTHMP2T] 0.65
51		432 [EDGELEY7] 0.50 +more		540 [BIGBND14] 0.65 +more
52	Worst Case Angle Damping	/ %	/ %	/ %
53	Dorsey SUVP / UdHold			
54	Forbes DC Red (DCAR)	334%	249%	351%
55	K22W (max +dP @ t, d-ang)	1.3@(0.12499,0.0)	1.3@(0.12499,0.0)	1.3@(0.12499,0.0)
56	K22W (max -dP @ t, d-ang)	49.1@(1.20829,26.1)	28.3@(1.98325,16.6)	25.9@(1.17495,13.6)
57	K22W (max d-ang @ t, dP)	26.1@(1.20829,-49.1)	21.3@(1.54994,-21.7)	17.9@(1.52494,-17.7)
58	**OS Rel Trip / Marg**			
59	MH - OH			
60	D602F at Forbes/Dorsey	82% / 138%	56% / 110%	33% / 79%
61	L20D at Prairie/Drayton	475% / 917%	999% / 776%	999% / 611%
62	R50M / F3M	540% / 999%	502% / 292%	466% / 241%
63	B10T	340%	304%	179%
64	**FSCAPS (SS/Unav/Final)**			
65	Balta 230	(0 | 3 | 3)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 4 | 4) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 |12 |18) / (0 | 2 | 2)	(2 | 4 | 4) / (0 | 1 | 1)	(2 | 8 | 3) / (0 | 2 | 2)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 1 | 1)	(0 | 2 | 2) / (1 | 2 | 2)
69	Shey 115 / Split Rock 115	(0 | 5 | 5) / (2 | 2 | 2)	(0 | 5 | 5) / (2 | 2 | 2)	(0 | 5 | 5) / (2 | 2 | 2)

Table 8.7
700 Mvar SVC @ Wind Generator Terminals (Case S4C2X1A)

```
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167

DATA FOR BUS  9000 [FTTHWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 1.00000  95.56

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 1.00000 1.00000   207.83  1: 700.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
   1000.0  -510.0  -510.0  -510.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  506 1  T 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 8.8 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C2X1A

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S4C2X1A-ag1	upe-so04aa.S4C2X1A-ag3	upe-so04aa.S4C2X1A-ei2	upe-so04aa.S4C2X1A-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 29 2002 20:44	APR 29 2002 21:00	APR 29 2002 21:16	APR 29 2002 21:31
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2074 / 361	2074 / 361	2074 / 361	2074 / 361
10	MHEX / L20D	2170 / 224	2170 / 224	2170 / 224	2170 / 224
11	ECL-ARP / PRI-BYN	663 / 804	663 / 804	663 / 804	663 / 804
12	MWSI / MNEX	1468 / 2214	1468 / 2214	1468 / 2214	1468 / 2214
13	D602F / F601C	1801 / 1333	1801 / 1333	1801 / 1333	1801 / 1333
14	B10T / MH>SPC	169 / 102	169 / 102	169 / 102	169 / 102
15	OH E-W / OH>MH	-122 / -197	-122 / -197	-122 / -197	-122 / -197
16	R50M / OH>MP	170 / 148	170 / 148	170 / 148	170 / 148
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	237 / 50	237 / 50	237 / 50	237 / 50
19	Forbes SVC / MSC	37 / 600	37 / 600	37 / 600	37 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.058 / 1.016	1.058 / 1.016	1.058 / 1.016	1.058 / 1.016
23	Chisago 500/EauClaire 345	1.022 / 1.004	1.022 / 1.004	1.022 / 1.004	1.022 / 1.004
24	Int Falls 115/Badoura 115	1.051 / 0.989	1.051 / 0.989	1.051 / 0.989	1.051 / 0.989
25	Drayton 230/Groton 345	1.012 / 0.991	1.012 / 0.991	1.012 / 0.991	1.012 / 0.991
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	137% / 227%	137% / 227%	137% / 227%	137% / 227%
28	L20D at Prairie/Drayton	999% / 909%	999% / 909%	999% / 909%	999% / 909%
29	R50M/F3M	735% / 999%	735% / 999%	735% / 999%	735% / 999%
30	B10T	333%	333%	333%	333%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.02	0.98 | 1.02	0.98 | 1.04	0.98 | 1.04
33	Boise 115	1.03 | 1.06	1.03 | 1.06	1.01 | 1.07	1.03 | 1.06
34	Dorsey 230	1.03 | 1.06	1.03 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	1.00 | 1.02	0.98 | 1.03	1.00 | 1.03
36	Riverton 230	0.98 | 1.04	0.97 | 1.04	0.92 | 1.04	0.95 | 1.04
37	Coal Creek 230	0.97 | 1.11	0.97 | 1.10	1.02 | 1.12	0.96 | 1.14
38	Dickinson 345	0.98 | 1.06	0.98 | 1.06	1.02 | 1.06	1.03 | 1.08
39	Drayton 230	0.98 | 1.07	0.99 | 1.08	0.94 | 1.08	0.99 | 1.07
40	Groton 345	0.88 | 1.03	0.87 | 1.02	0.88 | 1.03	0.89 | 1.02
41	Tioga 230	1.00 | 1.07	1.00 | 1.07	1.02 | 1.07	1.02 | 1.07
42	Wahpeton 115	0.98 | 1.10	0.98 | 1.10	0.91 | 1.10	0.94 | 1.09
43	Watertown 345	0.96 | 1.05	0.96 | 1.05	0.93 | 1.04	0.95 | 1.04
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 67.98%	SHERC3 / 65.95%	KING 3 / -56.82%	SHERC3 / -73.89%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	363%	351%	502%	507%
55	K22W (max +dP @ t, d-ang)	7.8@(2.59989,-1.2)	8.8@(2.56656,-1.6)	56.7@(2.30824,-35.0)	36.0@(2.59989,-20.8)
56	K22W (max -dP @ t, d-ang)	14.0@(0.76664,3.9)	14.3@(0.72497,4.6)	4.6@(0.45831,0.2)	5.7@(0.32499,0.3)
57	K22W (max d-ang @ t, dP)	6.3@(1.06663,-4.3)	7.2@(1.04163,-5.7)	-150.9@(20.00792,26.9)	-85.2@(20.00792,17.0)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	91% / 161%	88% / 156%	57% / 110%	90% / 157%
61	L20D at Prairie/Drayton	999% / 702%	999% / 726%	657% / 674%	183% / 614%
62	R50M / F3M	610% / 284%	603% / 282%	537% / 235%	621% / 273%
63	B10T	206%	204%	141%	182%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 2) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 2 | 1)	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 4 | 2) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)

TABLE 8.8 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C2X1A

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S4C2X1A-nbz	upe-so04aa.S4C2X1A-mqs	upe-so04aa.S4C2X1A-pys	upe-so04aa.S4C2X1A-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 29 2002 21:45	APR 29 2002 22:03	APR 29 2002 22:18	APR 29 2002 22:32
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2074 / 361	2074 / 361	2074 / 361	2074 / 361
10	MHEX / L20D	2170 / 224	2170 / 224	2170 / 224	2170 / 224
11	ECL-ARP / PRI-BYN	663 / 804	663 / 804	663 / 804	663 / 804
12	MWSI / MNEX	1468 / 2214	1468 / 2214	1468 / 2214	1468 / 2214
13	D602F / F601C	1801 / 1333	1801 / 1333	1801 / 1333	1801 / 1333
14	B10T / MH>SPC	169 / 102	169 / 102	169 / 102	169 / 102
15	OH E-W / OH>MH	-122 / -197	-122 / -197	-122 / -197	-122 / -197
16	R50M / OH>MP	170 / 148	170 / 148	170 / 148	170 / 148
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	237 / 50	237 / 50	237 / 50	237 / 50
19	Forbes SVC / MSC	37 / 600	37 / 600	37 / 600	37 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.058 / 1.016	1.058 / 1.016	1.058 / 1.016	1.058 / 1.016
23	Chisago 500/EauClaire 345	1.022 / 1.004	1.022 / 1.004	1.022 / 1.004	1.022 / 1.004
24	Int Falls 115/Badoura 115	1.051 / 0.989	1.051 / 0.989	1.051 / 0.989	1.051 / 0.989
25	Drayton 230/Groton 345	1.012 / 0.991	1.012 / 0.991	1.012 / 0.991	1.012 / 0.991
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	137% / 227%	137% / 227%	137% / 227%	137% / 227%
28	L20D at Prairie/Drayton	999% / 909%	999% / 909%	999% / 909%	999% / 909%
29	R50M/F3M	735% / 999%	735% / 999%	735% / 999%	735% / 999%
30	B10T	333%	333%	333%	333%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.09	0.97 | 1.05	0.97 | 1.00	0.99 | 1.00
33	Boise 115	0.97 | 1.08	1.00 | 1.08	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.14	1.00 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.05	0.98 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.90 | 1.05	0.95 | 1.02	1.00 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.97 | 1.08	0.98 | 1.07	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.98 | 1.08	0.97 | 1.09	1.00 | 1.04	1.01 | 1.03
39	Drayton 230	0.96 | 1.07	0.97 | 1.05	0.99 | 1.03	1.01 | 1.02
40	Groton 345	0.87 | 1.03	0.93 | 1.00	0.96 | 0.99	0.98 | 0.99
41	Tioga 230	1.00 | 1.08	1.01 | 1.07	1.01 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.90 | 1.09	0.98 | 1.07	1.02 | 1.05	1.04 | 1.05
43	Watertown 345	0.92 | 1.04	0.97 | 1.03	1.00 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -31.92%	KING 3 / 1.50%	SHERC3 / 36.35%	KING 3 / 21.80%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	458%	165%	324%
55	K22W (max +dP @ t, d-ang)	143.0@(2.10825,-66.2)	65.0@(2.61656,-34.5)	0.5@(0.11666,0.2)	0.0@(0.00000,0.0)
56	K22W (max -dP @ t, d-ang)	100.5@(0.26666,10.9)	21.9@(0.33332,4.2)	30.0@(1.75826,18.4)	19.5@(2.09158,12.8)
57	K22W (max d-ang @ t, dP)	-276.8@(20.00792,50.9)	-122.4@(20.00792,23.3)	20.5@(20.00792,-14.1)	16.8@(20.00792,-10.8)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	37% / 86%	113% / 192%	137% / 227%
61	L20D at Prairie/Drayton	892% / 488%	999% / 700%	999% / 717%	999% / 796%
62	R50M / F3M	275% / 131%	468% / 217%	631% / 999%	702% / 999%
63	B10T	146%	143%	195%	263%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 1)	(2 | 8 | 3) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (1 | 5 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 3 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 8.8 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C2X1A

1	**Case No.**	9	10	11	12
2	**Case Name**	upe-so04aa.S4C2X1A-ci3	upe-so04aa.S4C2X1A-ch3	upe-so04aa.S4C2X1A-cj3	upe-so04aa.S4C2X1A-co3
3	**Disturbance**	ci3	ch3	cj3	co3
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	APR 29 2002 23:01	APR 29 2002 22:46	APR 29 2002 23:15	MAY 02 2002 11:07
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2074 / 361	2074 / 361	2074 / 361	2074 / 361
10	MHEX / L20D	2170 / 224	2170 / 224	2170 / 224	2170 / 224
11	ECL-ARP / PRI-BYN	663 / 804	663 / 804	663 / 804	663 / 804
12	MWSI / MNEX	1468 / 2214	1468 / 2214	1468 / 2214	1468 / 2214
13	D602F / F601C	1801 / 1333	1801 / 1333	1801 / 1333	1801 / 1333
14	B10T / MH>SPC	169 / 102	169 / 102	169 / 102	169 / 102
15	OH E-W / OH>MH	-122 / -197	-122 / -197	-122 / -197	-122 / -197
16	R50M / OH>MP	170 / 148	170 / 148	170 / 148	170 / 148
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	237 / 50	237 / 50	237 / 50	237 / 50
19	Forbes SVC / MSC	37 / 600	37 / 600	37 / 600	37 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.058 / 1.016	1.058 / 1.016	1.058 / 1.016	1.058 / 1.016
23	Chisago 500/EauClaire 345	1.022 / 1.004	1.022 / 1.004	1.022 / 1.004	1.022 / 1.004
24	Int Falls 115/Badoura 115	1.051 / 0.989	1.051 / 0.989	1.051 / 0.989	1.051 / 0.989
25	Drayton 230/Groton 345	1.012 / 0.991	1.012 / 0.991	1.012 / 0.991	1.012 / 0.991
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	137% / 227%	137% / 227%	137% / 227%	137% / 227%
28	L20D at Prairie/Drayton	999% / 909%	999% / 909%	999% / 909%	999% / 909%
29	R50M/F3M	735% / 999%	735% / 999%	735% / 999%	735% / 999%
30	B10T	333%	333%	333%	333%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.02	0.95 | 1.03	0.97 | 1.03	0.99 | 1.05
33	Boise 115	1.01 | 1.06	0.99 | 1.09	1.01 | 1.08	1.01 | 1.08
34	Dorsey 230	1.02 | 1.05	0.98 | 1.06	1.01 | 1.06	1.01 | 1.06
35	Forbes 230	0.99 | 1.03	0.98 | 1.03	1.00 | 1.03	1.00 | 1.04
36	Riverton 230	0.97 | 1.02	0.96 | 1.03	0.97 | 1.03	0.98 | 1.04
37	Coal Creek 230	0.98 | 1.08	0.97 | 1.09	0.98 | 1.08	0.99 | 1.08
38	Dickinson 345	0.98 | 1.05	0.97 | 1.05	0.98 | 1.05	0.99 | 1.06
39	Drayton 230	0.98 | 1.04	0.97 | 1.06	0.97 | 1.05	0.98 | 1.05
40	Groton 345	0.88 | 0.99	0.84 | 1.00	0.85 | 1.00	0.92 | 1.04
41	Tioga 230	1.02 | 1.06	1.00 | 1.07	1.00 | 1.06	1.00 | 1.07
42	Wahpeton 115	0.97 | 1.06	0.96 | 1.07	0.97 | 1.06	0.99 | 1.08
43	Watertown 345	0.91 | 1.04	0.85 | 1.02	0.88 | 1.04	0.96 | 1.05
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 59.78%	SHERC3 / 49.58%	SHERC3 / 54.46%	SHERC3 / -20.42%
53	Dorsey SUVP / UdHold		/ 1.649		
54	Forbes DC Red (DCAR)	258%	103%	183%	446%
55	K22W (max +dP @ t, d-ang)	15.9@(2.79155,-5.1)	28.1@(3.07487,-9.8)	40.2@(3.19987,-11.2)	70.5@(2.53323,-32.6)
56	K22W (max -dP @ t, d-ang)	21.1@(0.87497,8.7)	38.1@(1.04996,19.2)	27.9@(1.10829,14.0)	8.7@(0.60831,2.3)
57	K22W (max d-ang @ t, dP)	13.3@(1.22495,-9.0)	29.1@(1.47494,-19.5)	20.2@(1.49994,-16.6)	-152.7@(20.00792,24.3)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	66% / 125%	30% / 77%	54% / 111%	70% / 135%
61	L20D at Prairie/Drayton	999% / 691%	999% / 554%	999% / 576%	999% / 504%
62	R50M / F3M	542% / 263%	444% / 241%	509% / 256%	585% / 218%
63	B10T	206%	124%	136%	98%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 3) / (0 | 0 | 0)	(3 | 4 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 8 | 3) / (0 | 1 | 1)	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 8 | 3) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 2 | 1) / (1 | 2 | 1)	(0 | 1 | 0) / (1 | 1 | 0)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 4 | 3) / (2 | 2 | 2)	(0 | 3 | 3) / (2 | 2 | 2)	(0 | 1 | 1) / (2 | 2 | 2)

Table 8.9
Ft Thompson - Blue Lake 345 kV + Ft Thompson-Split Rock-Lakefield Jnctn. + 700 Mvar SVC (Case S4C5XXA)

```
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167

DATA FOR BUS  9000 [FTTHWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 1.00000  88.51

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 1.00000 1.00000   177.00  1: 700.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
   1000.0  -510.0  -510.0  -510.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  506 1  T 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS   506 [FTTHOMP3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0   130.0 1.02082  81.34

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  571 GR ISLD3 345  1   0.00940  0.11900  2.04340  1  T   720.0  880.0  792.0    0.0       1 1.000
  605 LELANDO3 345  1   0.01046  0.15170  1.65250  1  F   680.0 1159.0  748.0    0.0       1 1.000
  620 HURON  3 345  1   0.00245  0.02911  0.50537  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 1634 SPLT RK3 345  1   0.00580  0.07509  1.11000  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 9000 FTTHWIND13.8  1   0.00024  0.01250  0.00000  1  F  1500.0 1500.0 1500.0    0.0       1 1.000
19143 FTTHMP1T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000
19146 FTTHMP2T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  605 LELANDO3 345  1    0.00000 -0.68000   0.00000 -0.50000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9000 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19143 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
19146 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 8.9 (Cont.)

```
DATA FOR BUS   620 [HURON  3 345] RESIDING IN AREA   6, ZONE  11, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02085  77.26

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00245  0.02911  0.50537  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  529 WATERTN3 345  1   0.00294  0.03499  0.60850  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  601 ANTELOP3 345  1   0.01202  0.13530  2.76110  1  F   478.0 2270.0  526.0    0.0       1 1.000
22154 BRDLNDTY 345  1   0.00013  0.03292  0.00000  1  F   400.0  400.0  480.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  601 ANTELOP3 345  1    0.00000  0.00000   0.00000 -1.07000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
22154 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000


DATA FOR BUS   529 [WATERTN3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01925  67.13

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  537 WHITE  3 345  1   0.00190  0.02220  0.37340  1  F   720.0  880.0  792.0    0.0       1 1.000
  620 HURON  3 345  1   0.00294  0.03499  0.60850  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  660 GROTON 3 345  1   0.00300  0.04530  0.46570  1  T   600.0 1159.0  660.0    0.0       1 1.000
19076 WATERT1T 345  1  -0.00020 -0.00550  0.00000  1  F   400.0  400.0  500.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00312  0.03671  0.64255  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
19076 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000


DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00770  58.51

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  529 WATERTN3 345  1   0.00312  0.03671  0.64255  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 8.9 (Cont.)

```
DATA FOR BUS  1702 [BLUE LK3 345] RESIDING IN AREA  23, ZONE 323, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01516  45.74

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  1604 PR ISLD3 345  1   0.00260  0.02620  0.43798  1  T  1165.0 1165.0 1281.0    0.0       1 1.000
  1608 WILMART3 345  1   0.00300  0.02780  0.45145  1  T  1195.0 1165.0 1281.0    0.0       1 1.000
  1703 BLUE LK7 115  1   0.00080  0.03720  0.00000  1  F   336.0  336.0  436.0    0.0       1 1.000
  1724 INVRHLS3 345  1   0.00120  0.01130  0.18892  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
  1739 PARKERS3 345  1   0.00080  0.00740  0.12471  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
  1770 EDEN PR3 345  1   0.00030  0.00270  0.04662  1  F  1165.0 1114.0 1225.0    0.0       1 1.000
 99550 GRANFLS3 345  1   0.00430  0.06282  0.67725  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  1703 1  F 0.97460   0.0 0      0 1.5000 0.5100 1.5000 0.5100 0.00000


 DATA FOR BUS  1634 [SPLT RK3 345] RESIDING IN AREA  23, ZONE 353, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01443  54.12

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
    506 FTTHOMP3 345  1   0.00580  0.07509  1.11000  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  1684 SPLTRKY11.00  1   0.00031  0.03588  0.00000  1  F   450.0  450.0  585.0    0.0       1 1.000
  1686 SPLTRKY21.00  1   0.00031  0.03588  0.00000  1  F   450.0  450.0  585.0    0.0       1 1.000
  2010 LAKEFLD3 345  1   0.00139  0.03168  0.64641  1  F  2270.0 2270.0 2270.0    0.0       1 1.000
 45641 SPLTRTA3 345  1   0.00020  0.00250  0.04329  1  T   717.0 1308.0  789.0    0.0       1 1.000
 45646 SPLTRTB3 345  1   0.00020  0.00250  0.04329  1  T   717.0 1308.0  789.0    0.0       1 1.000

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  1684 1  F 1.02600   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
  1686 1  F 1.02600   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 8.9 (Cont.)

```
DATA FOR BUS  2010 [LAKEFLD3 345] RESIDING IN AREA  31, ZONE  25, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00907  45.25

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 1 1.04000 1.02000     0.00  3: -25.00

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 1634 SPLT RK3 345  1   0.00139  0.03168  0.64641  1  T  2270.0 2270.0 2270.0    0.0       1 1.000
 1889 LKFLDXL3 345  1   0.00100  0.00960  0.15547  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
 2011 LAKEFLD5 161  1   0.00000  0.03400  0.00000  1  T   250.0  250.0  312.0    1.0       1 1.000
 2011 LAKEFLD5 161  2   0.00000  0.02736  0.00000  1  T   336.0  420.0  336.0    0.0       1 1.000
 2330 RAUN   3 345  1   0.00590  0.05830  0.93020  1  F   720.0  720.0  792.0    1.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
 2330 RAUN   3 345  1    0.00000 -0.50000   0.00000  0.00000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 2011 1  T 1.03130   0.0 1  -2011 1.0500 0.9500 1.0350 1.0170 0.00313
 2011 2  T 1.03130   0.0 1  -2011 1.0500 0.9500 1.0350 1.0170 0.00313
```

TABLE 8.10 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C5XXA

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S4C5XXA-ag1	upe-so04aa.S4C5XXA-ag3	upe-so04aa.S4C5XXA-ei2	upe-so04aa.S4C5XXA-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 09 2002 19:14	MAY 09 2002 19:31	MAY 09 2002 19:47	MAY 09 2002 20:02
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2075 / 341	2075 / 341	2075 / 341	2075 / 341
10	MHEX / L20D	2174 / 236	2174 / 236	2174 / 236	2174 / 236
11	ECL-ARP / PRI-BYN	659 / 824	659 / 824	659 / 824	659 / 824
12	MWSI / MNEX	1484 / 2417	1484 / 2417	1484 / 2417	1484 / 2417
13	D602F / F601C	1784 / 1315	1784 / 1315	1784 / 1315	1784 / 1315
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-118 / -195	-118 / -195	-118 / -195	-118 / -195
16	R50M / OH>MP	167 / 150	167 / 150	167 / 150	167 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	264 / 15	264 / 15	264 / 15	264 / 15
19	Forbes SVC / MSC	36 / 600	36 / 600	36 / 600	36 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.019	1.059 / 1.019	1.059 / 1.019	1.059 / 1.019
23	Chisago 500/EauClaire 345	1.023 / 1.005	1.023 / 1.005	1.023 / 1.005	1.023 / 1.005
24	Int Falls 115/Badoura 115	1.051 / 1.002	1.051 / 1.002	1.051 / 1.002	1.051 / 1.002
25	Drayton 230/Groton 345	1.016 / 1.012	1.016 / 1.012	1.016 / 1.012	1.016 / 1.012
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	142% / 235%	142% / 235%	142% / 235%	142% / 235%
28	L20D at Prairie/Drayton	999% / 859%	999% / 859%	999% / 859%	999% / 859%
29	R50M/F3M	756% / 349%	756% / 349%	756% / 349%	756% / 349%
30	B10T	344%	344%	344%	344%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.02	0.98 | 1.02	0.98 | 1.05	0.98 | 1.04
33	Boise 115	1.03 | 1.06	1.03 | 1.06	1.02 | 1.07	1.03 | 1.07
34	Dorsey 230	1.03 | 1.06	1.03 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	1.00 | 1.03	0.98 | 1.04	1.00 | 1.04
36	Riverton 230	0.98 | 1.05	0.98 | 1.04	0.94 | 1.04	0.97 | 1.05
37	Coal Creek 230	0.97 | 1.11	0.97 | 1.11	1.02 | 1.12	0.96 | 1.15
38	Dickinson 345	0.97 | 1.06	0.98 | 1.06	1.02 | 1.06	1.03 | 1.08
39	Drayton 230	0.98 | 1.08	0.99 | 1.07	0.95 | 1.07	1.00 | 1.07
40	Groton 345	0.90 | 1.05	0.90 | 1.04	0.90 | 1.06	0.92 | 1.05
41	Tioga 230	1.00 | 1.07	1.00 | 1.07	1.02 | 1.07	1.02 | 1.07
42	Wahpeton 115	0.98 | 1.11	0.98 | 1.10	0.93 | 1.11	0.96 | 1.11
43	Watertown 345	0.97 | 1.05	0.97 | 1.05	0.94 | 1.05	0.96 | 1.05
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 70.52%	SHERC3 / 68.47%	KING 3 / -65.01%	SHERC3 / -54.71%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	364%	353%	500%	507%
55	K22W (max +dP @ t, d-ang)	6.3@(2.59156,-0.6)	7.0@(2.55823,-0.9)	54.3@(2.70822,-31.5)	36.9@(2.50823,-20.5)
56	K22W (max -dP @ t, d-ang)	14.3@(0.76664,3.9)	15.1@(0.72497,4.7)	4.7@(0.49165,0.2)	5.9@(0.32499,0.4)
57	K22W (max d-ang @ t, dP)	6.4@(1.07496,-4.8)	7.4@(1.04163,-6.4)	-153.7@(20.00792,28.3)	-83.9@(20.00792,16.7)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	94% / 165%	91% / 161%	69% / 127%	99% / 171%
61	L20D at Prairie/Drayton	999% / 688%	999% / 695%	747% / 617%	169% / 612%
62	R50M / F3M	622% / 279%	613% / 278%	572% / 234%	650% / 265%
63	B10T	215%	217%	134%	173%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 3 | 2) / (0 | 2 | 0)	(2 | 4 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 3 | 1) / (2 | 2 | 2)	(0 | 4 | 0) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)

TABLE 8.10 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C5XXA

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S4C5XXA-nbz	upe-so04aa.S4C5XXA-mqs	upe-so04aa.S4C5XXA-pys	upe-so04aa.S4C5XXA-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 09 2002 20:16	MAY 09 2002 20:34	MAY 09 2002 20:49	MAY 09 2002 21:03
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2075 / 341	2075 / 341	2075 / 341	2075 / 341
10	MHEX / L20D	2174 / 236	2174 / 236	2174 / 236	2174 / 236
11	ECL-ARP / PRI-BYN	659 / 824	659 / 824	659 / 824	659 / 824
12	MWSI / MNEX	1484 / 2417	1484 / 2417	1484 / 2417	1484 / 2417
13	D602F / F601C	1784 / 1315	1784 / 1315	1784 / 1315	1784 / 1315
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-118 / -195	-118 / -195	-118 / -195	-118 / -195
16	R50M / OH>MP	167 / 150	167 / 150	167 / 150	167 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	264 / 15	264 / 15	264 / 15	264 / 15
19	Forbes SVC / MSC	36 / 600	36 / 600	36 / 600	36 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.019	1.059 / 1.019	1.059 / 1.019	1.059 / 1.019
23	Chisago 500/EauClaire 345	1.023 / 1.005	1.023 / 1.005	1.023 / 1.005	1.023 / 1.005
24	Int Falls 115/Badoura 115	1.051 / 1.002	1.051 / 1.002	1.051 / 1.002	1.051 / 1.002
25	Drayton 230/Groton 345	1.016 / 1.012	1.016 / 1.012	1.016 / 1.012	1.016 / 1.012
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	142% / 235%	142% / 235%	142% / 235%	142% / 235%
28	L20D at Prairie/Drayton	999% / 859%	999% / 859%	999% / 859%	999% / 859%
29	R50M/F3M	756% / 349%	756% / 349%	756% / 349%	756% / 349%
30	B10T	344%	344%	344%	344%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.10	0.97 | 1.05	0.97 | 1.01	0.99 | 1.01
33	Boise 115	0.97 | 1.08	1.00 | 1.08	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.04 | 1.14	1.00 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	0.99 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.92 | 1.06	0.96 | 1.03	1.01 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.96 | 1.08	0.98 | 1.07	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.98 | 1.07	0.97 | 1.08	1.01 | 1.04	1.01 | 1.03
39	Drayton 230	0.96 | 1.08	0.97 | 1.06	1.00 | 1.04	1.01 | 1.03
40	Groton 345	0.89 | 1.05	0.95 | 1.03	0.99 | 1.02	1.00 | 1.02
41	Tioga 230	1.00 | 1.08	1.01 | 1.07	1.02 | 1.05	1.04 | 1.05
42	Wahpeton 115	0.91 | 1.10	0.99 | 1.08	1.03 | 1.06	1.05 | 1.06
43	Watertown 345	0.92 | 1.04	0.97 | 1.04	1.01 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -27.82%	KING 3 / 1.06%	ANTEL3 / 37.60%	KING 3 / 21.00%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	459%	185%	334%
55	K22W (max +dP @ t, d-ang)	148.8@(2.10825,-66.5)	67.9@(2.60822,-34.4)	0.5@(0.10833,0.2)	0.0@(0.00833,0.0)
56	K22W (max -dP @ t, d-ang)	99.3@(0.26666,10.8)	21.6@(0.33332,4.1)	29.8@(1.74993,17.9)	19.9@(2.12491,12.6)
57	K22W (max d-ang @ t, dP)	-272.4@(20.00792,53.9)	-122.6@(20.00792,23.3)	19.9@(20.00792,-14.2)	16.5@(20.00792,-11.1)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	46% / 99%	118% / 200%	140% / 231%
61	L20D at Prairie/Drayton	999% / 480%	999% / 626%	999% / 696%	999% / 766%
62	R50M / F3M	301% / 140%	495% / 219%	648% / 349%	713% / 349%
63	B10T	127%	131%	208%	275%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 1)	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 1 | 0) / (1 | 4 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 8.10 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C5XXA

1	**Case No.**	9	10	11	12
2	**Case Name**	upe-so04aa.S4C5XXA-ch3	upe-so04aa.S4C5XXA-ci3	upe-so04aa.S4C5XXA-cj3	upe-so04aa.S4C5XXA-ck3
3	**Disturbance**	ch3	ci3	cj3	ck3
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 09 2002 21:16	MAY 09 2002 21:31	MAY 09 2002 21:45	MAY 09 2002 21:58
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2075 / 341	2075 / 341	2075 / 341	2075 / 341
10	MHEX / L20D	2174 / 236	2174 / 236	2174 / 236	2174 / 236
11	ECL-ARP / PRI-BYN	659 / 824	659 / 824	659 / 824	659 / 824
12	MWSI / MNEX	1484 / 2417	1484 / 2417	1484 / 2417	1484 / 2417
13	D602F / F601C	1784 / 1315	1784 / 1315	1784 / 1315	1784 / 1315
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-118 / -195	-118 / -195	-118 / -195	-118 / -195
16	R50M / OH>MP	167 / 150	167 / 150	167 / 150	167 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	264 / 15	264 / 15	264 / 15	264 / 15
19	Forbes SVC / MSC	36 / 600	36 / 600	36 / 600	36 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045	1.032 / 1.045
22	Roseau 500/Forbes 500	1.059 / 1.019	1.059 / 1.019	1.059 / 1.019	1.059 / 1.019
23	Chisago 500/EauClaire 345	1.023 / 1.005	1.023 / 1.005	1.023 / 1.005	1.023 / 1.005
24	Int Falls 115/Badoura 115	1.051 / 1.002	1.051 / 1.002	1.051 / 1.002	1.051 / 1.002
25	Drayton 230/Groton 345	1.016 / 1.012	1.016 / 1.012	1.016 / 1.012	1.016 / 1.012
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	142% / 235%	142% / 235%	142% / 235%	142% / 235%
28	L20D at Prairie/Drayton	999% / 859%	999% / 859%	999% / 859%	999% / 859%
29	R50M/F3M	756% / 349%	756% / 349%	756% / 349%	756% / 349%
30	B10T	344%	344%	344%	344%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.03	0.98 | 1.02	0.98 | 1.03	0.96 | 1.03
33	Boise 115	1.00 | 1.08	1.01 | 1.06	1.02 | 1.07	1.00 | 1.08
34	Dorsey 230	1.00 | 1.06	1.02 | 1.06	1.02 | 1.05	1.00 | 1.06
35	Forbes 230	0.99 | 1.03	1.00 | 1.03	1.00 | 1.03	0.99 | 1.03
36	Riverton 230	0.97 | 1.03	0.97 | 1.03	0.98 | 1.03	0.96 | 1.03
37	Coal Creek 230	0.98 | 1.09	0.98 | 1.09	0.98 | 1.08	0.97 | 1.09
38	Dickinson 345	0.96 | 1.05	0.97 | 1.05	0.98 | 1.05	0.96 | 1.06
39	Drayton 230	0.97 | 1.04	0.99 | 1.05	0.99 | 1.04	0.97 | 1.05
40	Groton 345	0.88 | 1.02	0.90 | 1.01	0.90 | 1.03	0.84 | 1.02
41	Tioga 230	1.01 | 1.07	1.02 | 1.06	1.02 | 1.06	1.01 | 1.07
42	Wahpeton 115	0.97 | 1.07	0.98 | 1.07	0.98 | 1.07	0.95 | 1.08
43	Watertown 345	0.87 | 1.03	0.91 | 1.04	0.92 | 1.04	0.84 | 1.03
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 52.58%	SHERC3 / 59.90%	SHERC3 / 58.73%	MNTCE3 / 55.43%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	130%	267%	231%	160%
55	K22W (max +dP @ t, d-ang)	18.3@(2.84155,-5.0)	14.8@(2.69989,-5.1)	20.9@(2.82488,-6.7)	25.0@(2.92488,-7.9)
56	K22W (max -dP @ t, d-ang)	32.5@(0.91663,14.4)	21.4@(0.84163,8.8)	20.5@(0.88330,8.4)	31.0@(0.96663,13.7)
57	K22W (max d-ang @ t, dP)	22.9@(1.31661,-13.8)	13.1@(1.17495,-8.9)	13.0@(1.24162,-8.4)	20.5@(1.34161,-14.4)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	44% / 96%	69% / 130%	76% / 141%	44% / 96%
61	L20D at Prairie/Drayton	999% / 590%	999% / 657%	999% / 635%	999% / 576%
62	R50M / F3M	479% / 241%	552% / 256%	575% / 263%	484% / 237%
63	B10T	164%	210%	197%	160%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 4 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 2 | 2) / (0 | 1 | 1)	(2 | 3 | 3) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 1 | 1)	(2 | 3 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 1 | 1) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 2 | 1)
69	Shey 115 / Split Rock 115	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 1 | 1) / (2 | 2 | 2)	(0 | 3 | 2) / (2 | 2 | 2)

Table 8.11
Ft. Thompson-Huron-Split Rock-Lakefield Jnctn. + Ft. Thompson-S.Rock + 700 Mvar SVC (Case S4C4XXA)

```
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167

DATA FOR BUS  9000 [FTTHWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 1.00000  91.34

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 1.00000 1.00000   169.32  1: 700.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
   1000.0  -510.0  -510.0  -510.0 1.02000                              100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  506 1  T 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS   506 [FTTHOMP3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0   130.0 1.02179  84.18

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  571 GR ISLD3 345  1   0.00940  0.11900  2.04340  1  T   720.0  880.0  792.0    0.0       1 1.000
  605 LELANDO3 345  1   0.01046  0.15170  1.65250  1  F   680.0 1159.0  748.0    0.0       1 1.000
  620 HURON  3 345  1   0.00245  0.02911  0.50537  1  F   680.0 1159.0  748.0    0.0       1 1.000
 1634 SPLT RK3 345  1   0.00580  0.07509  1.11000  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
 9000 FTTHWIND13.8  1   0.00024  0.01250  0.00000  1  F  1500.0 1500.0 1500.0    0.0       1 1.000
19143 FTTHMP1T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000
19146 FTTHMP2T 345  1   0.00010  0.03040  0.00000  1  F   250.0  250.0  313.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  605 LELANDO3 345  1    0.00000 -0.68000   0.00000 -0.50000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9000 1  F 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19143 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
19146 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000
```

Table 8.11 (Cont.)

```
DATA FOR BUS   620 [HURON  3 345] RESIDING IN AREA   6, ZONE  11, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01235  78.63

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00245  0.02911  0.50537  1  T   680.0 1159.0  748.0    0.0       1 1.000
  601 ANTELOP3 345  1   0.01202  0.13530  2.76110  1  F   478.0 2270.0  526.0    0.0       1 1.000
 1634 SPLT RK3 345  1   0.00220  0.04983  1.01574  1  F  2270.0 2270.0 2270.0    0.0       1 1.000
22154 BRDLNDTY 345  1   0.00013  0.03292  0.00000  1  F   400.0  400.0  480.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  601 ANTELOP3 345  1    0.00000  0.00000   0.00000 -1.07000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
22154 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000


DATA FOR BUS  1634 [SPLT RK3 345] RESIDING IN AREA  23, ZONE 353, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01305  61.42

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  506 FTTHOMP3 345  1   0.00580  0.07509  1.11000  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  620 HURON  3 345  1   0.00220  0.04983  1.01574  1  T  2270.0 2270.0 2270.0    0.0       1 1.000
 1684 SPLTRKY11.00  1   0.00031  0.03588  0.00000  1  F   450.0  450.0  585.0    0.0       1 1.000
 1686 SPLTRKY21.00  1   0.00031  0.03588  0.00000  1  F   450.0  450.0  585.0    0.0       1 1.000
 2010 LAKEFLD3 345  1   0.00139  0.03168  0.64641  1  F  2270.0 2270.0 2270.0    0.0       1 1.000
45641 SPLTRTA3 345  1   0.00020  0.00250  0.04329  1  T   717.0 1308.0  789.0    0.0       1 1.000
45646 SPLTRTB3 345  1   0.00020  0.00250  0.04329  1  T   717.0 1308.0  789.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 1684 1  F 1.02600   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 1686 1  F 1.02600   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 8.11 (Cont.)

```
DATA FOR BUS  2010 [LAKEFLD3 345] RESIDING IN AREA  31, ZONE  25, OWNER   1:

 CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
  1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.00416  49.82

 MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
  1 1.04000 1.02000     0.00  3: -25.00

 X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  1634 SPLT RK3 345  1   0.00139  0.03168  0.64641  1  T  2270.0 2270.0 2270.0    0.0       1 1.000
  1889 LKFLDXL3 345  1   0.00100  0.00960  0.15547  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
  2011 LAKEFLD5 161  1   0.00000  0.03400  0.00000  1  T   250.0  250.0  312.0    1.0       1 1.000
  2011 LAKEFLD5 161  2   0.00000  0.02736  0.00000  1  T   336.0  420.0  336.0    0.0       1 1.000
  2330 RAUN   3 345  1   0.00590  0.05830  0.93020  1  F   720.0  720.0  792.0    1.0       1 1.000

 X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  2330 RAUN   3 345  1    0.00000 -0.50000   0.00000  0.00000     1

   TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  2011 1  T 1.02817   0.0 1  -2011 1.0500 0.9500 1.0350 1.0170 0.00313
  2011 2  T 1.02817   0.0 1  -2011 1.0500 0.9500 1.0350 1.0170 0.00313
```

TABLE 8.12 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C4XXA

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S4C4XXA-ag1	upe-so04aa.S4C4XXA-ag3	upe-so04aa.S4C4XXA-ei2	upe-so04aa.S4C4XXA-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 09 2002 22:25	MAY 09 2002 22:41	MAY 09 2002 22:57	MAY 09 2002 23:12
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2076 / 355	2076 / 355	2076 / 355	2076 / 355
10	MHEX / L20D	2174 / 229	2174 / 229	2174 / 229	2174 / 229
11	ECL-ARP / PRI-BYN	667 / 807	667 / 807	667 / 807	667 / 807
12	MWSI / MNEX	1474 / 2178	1474 / 2178	1474 / 2178	1474 / 2178
13	D602F / F601C	1795 / 1326	1795 / 1326	1795 / 1326	1795 / 1326
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -195	-119 / -195	-119 / -195	-119 / -195
16	R50M / OH>MP	169 / 150	169 / 150	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	248 / 7	248 / 7	248 / 7	248 / 7
19	Forbes SVC / MSC	39 / 600	39 / 600	39 / 600	39 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.058 / 1.017	1.058 / 1.017	1.058 / 1.017	1.058 / 1.017
23	Chisago 500/EauClaire 345	1.023 / 1.004	1.023 / 1.004	1.023 / 1.004	1.023 / 1.004
24	Int Falls 115/Badoura 115	1.050 / 0.993	1.050 / 0.993	1.050 / 0.993	1.050 / 0.993
25	Drayton 230/Groton 345	1.013 / 0.996	1.013 / 0.996	1.013 / 0.996	1.013 / 0.996
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	139% / 230%	139% / 230%	139% / 230%	139% / 230%
28	L20D at Prairie/Drayton	999% / 888%	999% / 888%	999% / 888%	999% / 888%
29	R50M/F3M	745% / 348%	745% / 348%	745% / 348%	745% / 348%
30	B10T	344%	344%	344%	344%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.02	0.98 | 1.02	0.98 | 1.05	0.98 | 1.04
33	Boise 115	1.03 | 1.06	1.03 | 1.06	1.01 | 1.06	1.03 | 1.06
34	Dorsey 230	1.03 | 1.06	1.03 | 1.06	1.02 | 1.06	1.03 | 1.05
35	Forbes 230	1.00 | 1.03	1.00 | 1.03	0.98 | 1.03	1.00 | 1.03
36	Riverton 230	0.98 | 1.04	0.98 | 1.04	0.93 | 1.04	0.96 | 1.04
37	Coal Creek 230	0.97 | 1.11	0.97 | 1.10	1.03 | 1.12	0.97 | 1.14
38	Dickinson 345	0.98 | 1.06	0.98 | 1.06	1.03 | 1.06	1.03 | 1.08
39	Drayton 230	0.98 | 1.07	0.99 | 1.07	0.95 | 1.07	1.00 | 1.07
40	Groton 345	0.88 | 1.03	0.88 | 1.03	0.90 | 1.04	0.91 | 1.03
41	Tioga 230	1.00 | 1.07	1.00 | 1.07	1.02 | 1.07	1.03 | 1.07
42	Wahpeton 115	0.98 | 1.10	0.98 | 1.10	0.93 | 1.10	0.96 | 1.10
43	Watertown 345	0.97 | 1.05	0.97 | 1.05	0.95 | 1.05	0.97 | 1.04
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 68.74%	SHERC3 / 68.98%	KING 3 / -60.24%	SHERC3 / -73.47%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	366%	355%	501%	507%
55	K22W (max +dP @ t, d-ang)	7.2@(2.59156,-0.9)	7.9@(2.55823,-1.2)	55.7@(2.21657,-34.7)	35.2@(2.53323,-20.4)
56	K22W (max -dP @ t, d-ang)	14.3@(0.75830,3.9)	15.0@(0.71664,4.6)	4.5@(0.48331,0.1)	5.7@(0.32499,0.3)
57	K22W (max d-ang @ t, dP)	6.4@(1.07496,-4.4)	7.4@(1.04163,-5.9)	-155.5@(20.00792,28.4)	-83.9@(20.00792,16.6)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	92% / 162%	89% / 158%	60% / 115%	92% / 162%
61	L20D at Prairie/Drayton	999% / 699%	999% / 715%	707% / 655%	178% / 618%
62	R50M / F3M	615% / 279%	607% / 278%	551% / 233%	633% / 270%
63	B10T	214%	213%	141%	181%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 3) / (0 | 1 | 0)	(2 | 3 | 2) / (0 | 2 | 1)	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 3 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)

TABLE 8.12 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C4XXA

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S4C4XXA-nbz	upe-so04aa.S4C4XXA-mqs	upe-so04aa.S4C4XXA-pys	upe-so04aa.S4C4XXA-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 09 2002 23:26	MAY 09 2002 23:44	MAY 09 2002 23:59	MAY 10 2002 0:13
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2076 / 355	2076 / 355	2076 / 355	2076 / 355
10	MHEX / L20D	2174 / 229	2174 / 229	2174 / 229	2174 / 229
11	ECL-ARP / PRI-BYN	667 / 807	667 / 807	667 / 807	667 / 807
12	MWSI / MNEX	1474 / 2178	1474 / 2178	1474 / 2178	1474 / 2178
13	D602F / F601C	1795 / 1326	1795 / 1326	1795 / 1326	1795 / 1326
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -195	-119 / -195	-119 / -195	-119 / -195
16	R50M / OH>MP	169 / 150	169 / 150	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	248 / 7	248 / 7	248 / 7	248 / 7
19	Forbes SVC / MSC	39 / 600	39 / 600	39 / 600	39 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.058 / 1.017	1.058 / 1.017	1.058 / 1.017	1.058 / 1.017
23	Chisago 500/EauClaire 345	1.023 / 1.004	1.023 / 1.004	1.023 / 1.004	1.023 / 1.004
24	Int Falls 115/Badoura 115	1.050 / 0.993	1.050 / 0.993	1.050 / 0.993	1.050 / 0.993
25	Drayton 230/Groton 345	1.013 / 0.996	1.013 / 0.996	1.013 / 0.996	1.013 / 0.996
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	139% / 230%	139% / 230%	139% / 230%	139% / 230%
28	L20D at Prairie/Drayton	999% / 888%	999% / 888%	999% / 888%	999% / 888%
29	R50M/F3M	745% / 348%	745% / 348%	745% / 348%	745% / 348%
30	B10T	344%	344%	344%	344%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.09	0.96 | 1.05	0.97 | 1.00	0.99 | 1.00
33	Boise 115	0.97 | 1.08	1.00 | 1.08	1.03 | 1.07	1.05 | 1.06
34	Dorsey 230	1.04 | 1.14	1.00 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.05	0.99 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.91 | 1.05	0.95 | 1.02	1.01 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.97 | 1.08	0.98 | 1.07	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.98 | 1.08	0.97 | 1.09	1.01 | 1.04	1.01 | 1.03
39	Drayton 230	0.96 | 1.07	0.96 | 1.05	1.00 | 1.04	1.01 | 1.02
40	Groton 345	0.89 | 1.03	0.95 | 1.01	0.97 | 1.00	0.99 | 1.00
41	Tioga 230	1.00 | 1.08	1.01 | 1.07	1.02 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.91 | 1.09	0.99 | 1.06	1.03 | 1.06	1.04 | 1.05
43	Watertown 345	0.94 | 1.04	0.99 | 1.03	1.01 | 1.02	1.02 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -28.74%	KING 3 / 1.08%	ANTEL3 / 38.00%	KING 3 / 22.29%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	456%	168%	326%
55	K22W (max +dP @ t, d-ang)	144.0@(2.09991,-65.7)	65.2@(2.59989,-34.2)	0.5@(0.11666,0.2)	0.0@(0.08333,0.0)
56	K22W (max -dP @ t, d-ang)	100.0@(0.26666,10.8)	21.8@(0.34165,4.3)	30.0@(1.75826,17.8)	19.7@(2.09158,12.7)
57	K22W (max d-ang @ t, dP)	-277.4@(20.00792,51.9)	-122.6@(20.00792,23.4)	20.2@(20.00792,-14.0)	16.7@(20.00792,-10.9)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	38% / 87%	115% / 195%	139% / 230%
61	L20D at Prairie/Drayton	935% / 487%	999% / 689%	999% / 707%	999% / 779%
62	R50M / F3M	285% / 130%	473% / 212%	640% / 348%	711% / 348%
63	B10T	143%	146%	204%	270%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 3 | 1) / (0 | 0 | 0)	(3 | 4 | 2) / (0 | 3 | 3)	(3 | 4 | 4) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 1)	(2 | 8 | 3) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (1 | 5 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 3) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 8.12 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 4 (Ft. Thompson) - Case S4C4XXA

1	**Case No.**	9	10	11	12
2	**Case Name**	upe-so04aa.S4C4XXA-ch3	upe-so04aa.S4C4XXA-ci3	upe-so04aa.S4C4XXA-cj3	upe-so04aa.S4C4XXA-ck3
3	**Disturbance**	ch3	ci3	cj3	ck3
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 10 2002 0:27	MAY 10 2002 0:41	MAY 10 2002 0:55	MAY 10 2002 1:09
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2076 / 355	2076 / 355	2076 / 355	2076 / 355
10	MHEX / L20D	2174 / 229	2174 / 229	2174 / 229	2174 / 229
11	ECL-ARP / PRI-BYN	667 / 807	667 / 807	667 / 807	667 / 807
12	MWSI / MNEX	1474 / 2178	1474 / 2178	1474 / 2178	1474 / 2178
13	D602F / F601C	1795 / 1326	1795 / 1326	1795 / 1326	1795 / 1326
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -195	-119 / -195	-119 / -195	-119 / -195
16	R50M / OH>MP	169 / 150	169 / 150	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	248 / 7	248 / 7	248 / 7	248 / 7
19	Forbes SVC / MSC	39 / 600	39 / 600	39 / 600	39 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045	1.031 / 1.045
22	Roseau 500/Forbes 500	1.058 / 1.017	1.058 / 1.017	1.058 / 1.017	1.058 / 1.017
23	Chisago 500/EauClaire 345	1.023 / 1.004	1.023 / 1.004	1.023 / 1.004	1.023 / 1.004
24	Int Falls 115/Badoura 115	1.050 / 0.993	1.050 / 0.993	1.050 / 0.993	1.050 / 0.993
25	Drayton 230/Groton 345	1.013 / 0.996	1.013 / 0.996	1.013 / 0.996	1.013 / 0.996
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	139% / 230%	139% / 230%	139% / 230%	139% / 230%
28	L20D at Prairie/Drayton	999% / 888%	999% / 888%	999% / 888%	999% / 888%
29	R50M/F3M	745% / 348%	745% / 348%	745% / 348%	745% / 348%
30	B10T	344%	344%	344%	344%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.96 | 1.03	0.98 | 1.02	0.98 | 1.03	0.97 | 1.03
33	Boise 115	1.00 | 1.08	1.01 | 1.06	1.02 | 1.07	1.01 | 1.08
34	Dorsey 230	1.00 | 1.06	1.02 | 1.06	1.02 | 1.06	1.01 | 1.06
35	Forbes 230	0.99 | 1.03	1.00 | 1.03	1.00 | 1.03	0.99 | 1.03
36	Riverton 230	0.96 | 1.03	0.97 | 1.03	0.97 | 1.03	0.96 | 1.03
37	Coal Creek 230	0.98 | 1.09	0.98 | 1.08	0.98 | 1.09	0.98 | 1.09
38	Dickinson 345	0.97 | 1.05	0.98 | 1.05	0.98 | 1.05	0.98 | 1.06
39	Drayton 230	0.98 | 1.05	0.99 | 1.04	0.99 | 1.05	0.98 | 1.05
40	Groton 345	0.88 | 1.00	0.89 | 1.00	0.89 | 1.01	0.86 | 1.00
41	Tioga 230	1.01 | 1.07	1.02 | 1.06	1.02 | 1.06	1.02 | 1.06
42	Wahpeton 115	0.97 | 1.07	0.98 | 1.07	0.98 | 1.08	0.96 | 1.08
43	Watertown 345	0.89 | 1.03	0.93 | 1.04	0.92 | 1.04	0.89 | 1.04
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 54.02%	SHERC3 / 60.99%	SHERC3 / 58.83%	SHERC3 / 57.78%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	138%	270%	235%	190%
55	K22W (max +dP @ t, d-ang)	20.0@(2.86655,-5.6)	14.6@(2.74155,-4.7)	21.1@(2.83321,-6.5)	23.9@(2.90821,-8.2)
56	K22W (max -dP @ t, d-ang)	31.1@(0.93330,13.9)	20.7@(0.84997,8.5)	19.5@(0.89163,8.2)	26.0@(0.94163,11.2)
57	K22W (max d-ang @ t, dP)	21.8@(1.33328,-13.4)	12.7@(1.18329,-8.9)	12.5@(1.24162,-8.2)	16.7@(1.29995,-11.6)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	45% / 96%	68% / 128%	75% / 139%	55% / 111%
61	L20D at Prairie/Drayton	999% / 618%	999% / 687%	999% / 659%	999% / 627%
62	R50M / F3M	482% / 243%	550% / 259%	574% / 265%	516% / 247%
63	B10T	168%	215%	200%	180%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(3 | 4 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 3 | 3) / (0 | 0 | 0)	(3 | 4 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 3 | 3) / (0 | 1 | 1)	(2 | 3 | 3) / (0 | 1 | 1)	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 3 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 1 | 1) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)

Table 8.13a
Summary of Site 4 (Ft. Thompson) Selected Alternatives

ALTERNATIVE		MEETS CRITERIA ?	REQUIRES GENERATION TRIPPING ?
Ft. Thompson-Granite Falls 345 kV Upgrade + Granite Falls-Blue Lake 345 kV + SVC at Wind Generation Terminals	S4C1XXA	Yes	Yes
	S4C5XXA - Ft. Thompson-Sioux Falls 345 kV Upgrade + Split Rock-Lakefield 345 kV	Marginally	No
Ft. Thompson-Huron 345 kV Upgrade + Huron-Split Rock 345 kV +Split Rock-Lakefield 345 kV + SVC at Wind Generation Terminals	S4C2X1A	Yes	Yes
	S4C4XXA - Ft. Thompson-Sioux Falls 345 kV Upgrade	Marginally	No

Table 8.13b
Interface Flows for Site 4 (Ft. Thompson) Selected Alternatives

ALTERNATIVE	MHEX	G82R	LD20	D602F	R50M	NDEX	MWSI	PI-BYN	EAU-ARP
S4C1XXA	2175.0	-29,9	222.6	1811.7	170.6	2067.2	1474.4	825.5	648.9
S4C2X1A	2170.7	-26.0	224.1	1802.1	170.5	2074.3	1470.3	805.8	664.5
S4C4XXA	2174.9	-19.4	228.9	1796.3	169.1	2075.7	1476.7	808.3	668.4
S4C5XXA	2174.7	-14.5	236.0	1785.4	167.9	2075.2	1486.2	825.7	660.5

Table 8.14
MUST Results Case S4C1XXA

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FCITC Single Study

  *** MUST 4.01.07 ***  FRI, MAY 10 2002  11:17 ***
      UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
      ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE4      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5927 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX% S4C1XXA   %
     2  -2484.7 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1955.2 -1732.0 -0.08984         -0.08556 -1811.7 -1599.1   111  111    113      2
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     660
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                           -0.65438  0.00653   219.4   203.2
     6  -1944.4 L:  574 SIOUXCY869.0  2338 PLYMOTH869.0 1          71.4    50.0  0.01102          0.00169    12.7     9.4   126  126    143     17
                C:  566 SIOUXCY5 161  2337 PLYMOTH5 161 1     487
                  Open   566 SIOUXCY5 161  2337 PLYMOTH5 161 1                            0.27948  0.03336   210.1   145.3
    15  -1506.0 L:  515 HURON  7 115   528 WOONSKT7 115 1         108.6    88.0  0.01369         -0.00218    39.6    42.8   119  119    123      4
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     332
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                            0.25124  0.06317   274.9   179.8
    17  -1470.0 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         372.9   352.0  0.01424          0.00490   138.1   130.9   101  101    106      5
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     580
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                            0.60125  0.01554   390.6   367.7
    29  -1280.1 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          83.9    65.8  0.01410          0.00500    45.9    39.5   120  120    124      4
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                            0.22908  0.03973   165.8   115.0
   207   -973.8 L:  528 WOONSKT7 115   623 STORLA 7 115 1         101.3    88.0  0.01369         -0.00218    32.3    34.4   112  112    115      3
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     332
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                            0.25124  0.06317   274.9   213.4
  2904   -931.0 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1811.7 -1732.0 -0.08556
                  Base Case
  5860   -652.8 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          50.6    44.0  0.01010          0.00622    44.2    40.2   107  138    118     11
                C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     958
                  Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                            0.06026  0.06440   105.6    63.5
  5867   -615.8 L:  507 FTTHOMP4 230   516 LAKPLAT4 230 1         369.5   316.0  0.08688          0.06374   272.7   233.5    94   94    117     23
                C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     322
                  Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                            0.35629  0.06496   271.6   231.6
  5883   -498.5 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -119.3  -106.0 -0.02671         -0.01486   -79.7   -72.3   115  115    113     -2
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     945
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                            0.21864 -0.05419  -181.0  -154.0
  5884   -495.6 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -84.0   -77.0 -0.01410         -0.00500   -46.0   -43.5   112  112    117      5
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           -0.22908  0.03973   165.8   146.1
  5888   -433.0 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1769.1 -1732.0 -0.08556
                  Base Case
  5889   -433.0 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1769.1  1732.0  0.08556
                  Base Case
```

Table 8.14 (Cont.)
MUST Results Case S4C1XXA

```
5891   -349.1 L:  509 FTRANDL4 230   516 LAKPLAT4 230 1        -346.3  -316.0 -0.08688         -0.06374  -249.6  -227.3   90    90    109     19
              C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     322
                Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                          -0.35629  0.06496   271.6   248.9
5895   -323.5 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          96.6    88.0  0.02671          0.01486    57.1    52.3  106   106    110      4
              C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     945
                Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.21864 -0.05419  -181.0  -163.5
5902   -204.2 L:  507 FTTHOMP4 230   516 LAKPLAT4 230 1         332.7   316.0  0.08168          0.06374   272.7   259.7  NONE   94    105   NEW
              C:  506 FTTHOMP3 345   571 GR ISLD3 345 1     316
                Open   506 FTTHOMP3 345   571 GR ISLD3 345 1                           0.11801  0.15204   507.8   476.8
5903   -203.9 L:  507 FTTHOMP4 230   509 FTRANDL4 230 1         369.9   352.0  0.08795          0.06496   271.6   258.3  NONE  NONE  105    NEW
              C:  507 FTTHOMP4 230   516 LAKPLAT4 230 1     324
                Open   507 FTTHOMP4 230   516 LAKPLAT4 230 1                           0.36064  0.06374   272.7   259.8
5909    -87.8 L: 2337 PLYMOTH5 161  2348 LIT SX 5 161 1         164.6   163.0  0.01820          0.01536   126.4   125.1   94     94  101     7
              C: 2330 RAUN   3 345  2367 LEHIGH 3 345 1    2060
                Open  2330 RAUN   3 345  2367 LEHIGH 3 345 1                           0.07307  0.03888   522.1   518.7
5913    -35.3 L:  503 BLAIR  4 230   550 GRANITF4 230 1         430.3   425.0  0.14970          0.07164   268.9   266.4  N/A  NONE  101    NEW
              C:  529 WATERTN3 345 99550 GRANFLS3 345 1     414
                Open   529 WATERTN3 345 99550 GRANFLS3 345 1                           0.32530  0.23997   496.1   487.6
```

Table 8.14 (Cont.)
MUST Results Case S4C2X1A

```
FCITC Single Study

  *** MUST 4.01.07 ***  FRI, MAY 10 2002  11:40 ***
      UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
      ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE4      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5918 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX% S4C2X1A   %
     2  -2217.2 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1944.7 -1732.0 -0.09595         -0.09141 -1802.1 -1599.4   111   111   114     3
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     660
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.65642  0.00691   217.3   202.0
    15  -1263.7 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         369.2   352.0  0.01358          0.00466   136.6   130.7   101   101   105     4
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     580
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.60103  0.01484   386.9   368.2
    18  -1252.2 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          86.4    65.8  0.01648          0.00539    45.5    38.7   120   120   127     7
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.23702  0.04677   172.7   114.2
    20  -1224.2 L: 2351 MONONA 5 161  2355 CARROLL5 161 1         147.1   134.0  0.01066          0.00867   123.7   113.1    99    99   111    12
                C: 2330 RAUN   3 345  2367 LEHIGH 3 345 1    2060
                  Open  2330 RAUN   3 345  2367 LEHIGH 3 345 1                           0.04200  0.04753   555.8   497.6
    41  -1022.0 L: 2329 NEAL 4 5 161  2351 MONONA 5 161 1         173.5   163.0  0.01028          0.00818   147.3   138.9    95    95   105    10
                C:  565 SIOUXCY4 230   567 DENISON4 230 1     479
                  Open   565 SIOUXCY4 230   567 DENISON4 230 1                           0.13800  0.01521   190.2   174.7
  2854   -766.6 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1802.1 -1732.0 -0.09141
                  Base Case
  5851   -580.5 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -86.6   -77.0 -0.01648         -0.00539   -45.6   -42.5   112   112   120     8
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.23702  0.04677   172.7   145.6
  5853   -560.7 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          50.2    44.0  0.01098          0.00674    43.9    40.1   107   138   117    10
                C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     958
                  Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                           0.06097  0.06954   102.2    63.2
  5881   -413.3 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -118.0  -106.0 -0.02895         -0.01601   -78.5   -71.9   115   115   111    -4
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     945
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.22107 -0.05854  -178.6  -154.4
  5891   -306.5 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1760.0  1732.0  0.09141
                  Base Case
  5892   -306.5 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1760.0 -1732.0 -0.09141
                  Base Case
  5893   -297.3 L:  507 FTTHOMP4 230   516 LAKPLAT4 230 1         340.7   316.0  0.08293          0.06115   252.7   234.5    94    94   107     7
                C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     322
                  Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                           0.34946  0.06232   251.7   233.2
  5895   -253.8 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          95.3    88.0  0.02895          0.01601    55.9    51.8   106   106   108     2
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     945
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.22107 -0.05854  -178.6  -163.7
```

Table 8.14 (Cont.)
MUST Results Case S4C2X1A

```
5906   -132.6 L:46521 SACRDHT869.0 46522 RENVILL869.0 1          42.6    40.7  0.01436          0.00562    20.9    20.2    94    94   102     8
              C: 1985 PANTHER4 230 46605 MNVLTAP4 230 1    1752
                Open  1985 PANTHER4 230 46605 MNVLTAP4 230 1                          -0.09725 -0.08983  -222.9  -211.0
5909    -43.4 L:  509 FTRANDL4 230   516 LAKPLAT4 230 1        -319.6  -316.0 -0.08293         -0.06115  -231.6  -229.0   90   90   104    14
              C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     322
                Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                          -0.34946  0.06232   251.7   249.0
```

Table 8.14 (Cont.)
MUST Results Case S4C4XXA

```
FCITC Single Study

  *** MUST 4.01.07 ***  FRI, MAY 10 2002  11:54 ***
      UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
      ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE4      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5920 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX% S4C4XXA   %
     2  -2246.4 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1939.2 -1732.0 -0.09225         -0.08791 -1796.3 -1598.8   111   111   114      3
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     660
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.65620  0.00662   217.9   203.0
    14  -1299.0 L: 2351 MONONA 5 161  2355 CARROLL5 161 1         148.5   134.0  0.01113          0.00903   124.8   113.1    99    99   112     13
                C: 2330 RAUN   3 345  2367 LEHIGH 3 345 1    2060
                  Open  2330 RAUN   3 345  2367 LEHIGH 3 345 1                           0.04197  0.04998   563.1   498.2
    16  -1246.7 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          86.2    65.8  0.01633          0.00531    45.3    38.7   120   120   127      7
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.23702  0.04647   172.2   114.3
    26  -1139.2 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         366.0   352.0  0.01225          0.00419   135.4   130.6   101   101   104     3
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     580
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.60101  0.01340   383.6   368.4
    27  -1121.3 L: 2329 NEAL 4 5 161  2351 MONONA 5 161 1         175.1   163.0  0.01076          0.00859   148.5   138.9    95    95   106     11
                C:  565 SIOUXCY4 230   567 DENISON4 230 1     479
                  Open   565 SIOUXCY4 230   567 DENISON4 230 1                           0.13799  0.01574   192.5   174.8
  2717   -731.2 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1796.3 -1732.0 -0.08791
                  Base Case
  5840   -589.1 L:  563 SPENCER5 161  2597 TRIBOJI5 161 1        -169.5  -162.0 -0.01265          0.01008  -149.7  -155.6  NONE  NONE   106     NEW
                C: 1889 LKFLDXL3 345  2010 LAKEFLD3 345 1    1706
                  Open  1889 LKFLDXL3 345  2010 LAKEFLD3 345 1                           0.08413 -0.27017  -235.2   -76.0
  5847   -568.7 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1          -86.3   -77.0 -0.01633         -0.00531   -45.5   -42.5   112   112   120      8
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.23702  0.04647   172.2   145.8
  5855   -536.3 L: 1353 RIVERTN7 115 44250 RIVTON 869.0 1          49.7    44.0  0.01069          0.00656    43.7    40.2   107   138   113       6
                C: 1317 MUDLAKE4 230  1508 BENTON 4 230 1     958
                  Open  1317 MUDLAKE4 230  1508 BENTON 4 230 1                           0.06094  0.06777    98.8    62.4
  5877   -380.4 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -116.7  -106.0 -0.02822         -0.01559   -77.9   -71.9   115   115   110(N/C) -5
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     945
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.22103 -0.05714  -175.9  -154.2
  5896   -256.8 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1754.6  1732.0  0.08791
                  Base Case
  5897   -256.8 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1754.6 -1732.0 -0.08791
                  Base Case
  5899   -218.1 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          94.2    88.0  0.02822          0.01559    55.3    51.9  106   106   107   1
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     945
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.22103 -0.05714  -175.9  -163.5
```

Table 8.14 (Cont.)
MUST Results Case S4C4XXA

```
5904   -116.7 L:46521 SACRDHT869.0 46522 RENVILL869.0 1          42.4    40.7  0.01421          0.00557    20.9    20.2  NONE  NONE  101  NEW
              C: 1985 PANTHER4 230 46605 MNVLTAP4 230 1    1752
                Open  1985 PANTHER4 230 46605 MNVLTAP4 230 1                         -0.09724 -0.08885  -221.0  -210.7
```

Table 8.14 (Cont.)
MUST Results Case S4C5XXA

```
FCITC Single Study

  *** MUST 4.01.07 ***  FRI, MAY 10 2002  12:11 ***
      UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
      ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE4      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5900 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF              Init   Final   CNT%  MAX% S4C5XXA   %
     2  -2443.4 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1927.2 -1732.0 -0.07987         -0.07610 -1785.4 -1599.5   111   111   113      2
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     660
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.65323  0.00577   217.0   202.9
    12  -1548.3 L:  515 HURON  7 115   528 WOONSKT7 115 1         105.5    88.0  0.01129         -0.00264    39.1    43.2   119   119   118     -1
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     332
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25258  0.05516   262.8   177.4
    24  -1147.7 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          80.6    65.8  0.01288          0.00458    44.8    39.5   120   120   120     0
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.22875  0.03631   156.4   114.8
    27  -1120.1 L:  634 SIDNEY 4 230 10218 OGALALA4 230 1         364.9   352.0  0.01148          0.00394   135.1   130.7   101   101   104    3
                C:  633 SIDNEY 3 345 10166 KEYSTON3 345 1     580
                  Open   633 SIDNEY 3 345 10166 KEYSTON3 345 1                           0.60109  0.01254   382.3   368.2
    65   -905.7 L:  528 WOONSKT7 115   623 STORLA 7 115 1          98.2    88.0  0.01129         -0.00264    31.8    34.2   112   112   110    -2
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     332
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25258  0.05516   262.8   212.8
  2641   -701.7 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1785.4 -1732.0 -0.07610
                  Base Case
  5870   -301.1 L:  507 FTTHOMP4 230   516 LAKPLAT4 230 1         337.4   316.0  0.07120          0.05235   249.6   233.8    94    94   105     11
                C:  507 FTTHOMP4 230   509 FTRANDL4 230 1     323
                  Open   507 FTTHOMP4 230   509 FTRANDL4 230 1                           0.35322  0.05335   248.7   232.6
  5874   -298.0 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -113.2  -106.0 -0.02402         -0.01339   -76.7   -72.7   115   115   107     -8
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     945
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.21796 -0.04877  -167.2  -152.6
  5875   -288.2 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -80.7   -77.0 -0.01288         -0.00458   -44.9   -43.6   112   112   113      1
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.22875  0.03631   156.4   146.0
  5886   -162.0 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1744.3  1732.0  0.07610
                  Base Case
  5887   -162.0 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1744.3 -1732.0 -0.07610
                  Base Case
  5890   -109.8 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          90.6    88.0  0.02402          0.01339    54.2    52.7   106   106   103     -3
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     945
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.21796 -0.04877  -167.2  -161.8
```

Table 8.15
Summary of Contingency Analysis Results
Case S4C1XXA

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	113(+2)	U
574	SIOUXCY	69	2338	PLYMOTH	69	566	SIOUXCY	161	2337	PLYMOTH	161	50	64	143(+17)	R
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	123 (+4)	U
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	115(+3)	U
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	106(+5)	U
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	118(+11)	NONE PRE-EXISTING MAX 138%
507	FTTHOMP	230	516	LAKPLAT	230	507	FTTHOMP	230	509	FTRANDL	230	316	398	117(+23)	U
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	110(+4)	U
507	FTTHOMP	230	509	FTRANDL	230	507	FTTHOMP	230	516	LAKPLAT	230	352	478	105(NEW)	U
509	FTRANDL	230	516	LAKPLAT	230	507	FTTHOMP	230	509	FTRANDL	230	316	398	109(+19)	U
507	FTTHOMP	230	516	LAKPLAT	230	506	FTTHOMP	345	571	GR ISLD	345	316	398	105(NEW)	U
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	117(+5)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	113(-2)	NONE
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	124(+4)	U
2337	PLYMOTH	161	2348	LIT SX	161	2330	RAUN	345	2367	LEHIGH	345	163	163	101(+7)	R
503	BLAIR	230	550	GRANITF	230	529	WATERTN	345	99550	GRANFLS	345	425	425	101(NEW)	R

Table 8.15 (Cont.)
Summary of Contingency Analysis Results
Case S4C2X1A

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
2351	MONONA	161	2355	CAROLL	161	2330	RAUN	345	2367	LEHIGH	345	134	134	111(+12)	R
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	114(+3)	U
2329	NEAL	161	2351	MONONA	161	565	SIOUXCY	230	567	DENISON	230	163	163	105(+10)	R
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	105(+4)	U
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	117(+10)	NONE PRE-EXISTING MAX 138%
507	FTTHOMP	230	516	LAKPLAT	230	507	FTTHOMP	230	509	FTRANDL	230	316	398	107(+13)	U
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	108(+2)	U
46521	SACRDHT	69	46522	RENVILL	69	1985	PANTHER	230	46605	MNVLTAP	230	40.7	37	102(+8)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	120(+8)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	111(-4)	NONE
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	127(+7)	U
509	FTRANDL	230	516	LAKPLAT	230	507	FTTHOMP	230	509	FTRANDL	230	316	398	104(+14)	U

Table 8.15 (Cont.)
Summary of Contingency Analysis Results
Case S4C4XXA

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	114(+3)	U
2351	MONONA	161	2355	CAROLL	161	2330	RAUN	345	2367	LEHIGH	345	134	134	112(+13)	R
2329	NEAL	161	2351	MONONA	161	565	SIOUXCY	230	567	DENISON	230	163	163	106(+11)	R
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	104(+3)	U
1353	RIVERTN	115	44250	RIVTON	69	1317	MUDLAKE	230	1508	BENTON	230	44	56	113(+6)	NONE PRE-EXISTING MAX 138%
563	SPENCER	161	2597	TRIBOJI	161	1889	LKFLDXL	345	2010	LAKEFLD	345	162	225	106(NEW)	U
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	107(+1)	U
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	110(-5)	NONE
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	127(+7)	U
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	120(+8)	U
46521	SACRDHT	69	4652	RENVILL	69	1985	PANTHER	230	46605	MNVLTAP	230	40.7	37	101(NEW)	R

Table 8.15 (Cont.)
Summary of Contingency Analysis Results
Case S4C5XXA

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	113(+2)	U
634	SIDNEY	230	10218	OGALALA	230	633	SIDNEY	345	10166	KEYSTONE	345	352	402	104(+3)	U
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	110(-2)	NONE
507	FTTHOMP	230	516	LAKPLAT	230	507	FTTHOMP	230	509	FTRANDL	230	316	398	105(+11)	U
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	113(+1)	U
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	103(-3)	NONE
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	107(-8)	NONE
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	120(0)	NONE

Table 8.18
Constrained Interface Impact Analyses - Case S4C1XXA

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   260.6 DIFF:   -25.6%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   411.2 DIFF:     1.9%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   386.8 DIFF:     7.1%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   266.0 DIFF:    -5.6%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   118.1 DIFF:    11.3%
99554 --------  - 99550 GRANFLS3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   185.3 DIFF:    12.6%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    57.8 DIFF:   -40.5%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   182.4 DIFF:    16.6%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   128.9 DIFF:    -7.9%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    33.2 DIFF:    30.4%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    57.1 DIFF:     9.2%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    43.5 DIFF:   -13.7%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    29.1 DIFF:   -18.7%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    23.9 DIFF:   -20.0%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    45.7 DIFF:    14.0%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    30.3 DIFF:     7.2%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -222.6 DIFF:    -9.4%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    29.9 DIFF:   768.2%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  2067.2 DIFF:    -0.6%
                                                 DIFF:   -13.2   DF:    -1.3%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   170.6 DIFF:     5.7%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1811.7 DIFF:     2.4%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   222.6 DIFF:    -9.4%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -29.9 DIFF:   768.2%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2175.0 DIFF:     0.1%
                                                 DIFF:     1.9   DF:     0.2%
*******************************************************************************
```

Table 8.18 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -167.3 DIFF:     5.7%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1769.1 DIFF:     2.3%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -218.8 DIFF:    -9.3%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    30.1 DIFF:   772.6%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2125.1 DIFF:     0.0%
                                                 DIFF:     0.1   DF:     0.0%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   155.2 DIFF:     0.6%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   155.7 DIFF:     0.6%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   160.2 DIFF:     0.6%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   350.5 DIFF:    -2.0%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   421.2 DIFF:    -1.8%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   466.8 DIFF:     7.4%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1709.6 DIFF:     1.2%
                                                 DIFF:    20.3   DF:     2.0%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   466.8 DIFF:     7.4%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   466.8 DIFF:     7.4%
                                                 DIFF:    32.3   DF:     3.2%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   269.9 DIFF:     6.4%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   110.5 DIFF:    -1.3%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   545.5 DIFF:    12.1%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   925.8 DIFF:     8.6%
                                                 DIFF:    73.3   DF:     7.3%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   327.8 DIFF:    15.8%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   275.1 DIFF:    12.8%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   602.9 DIFF:    14.4%
                                                 DIFF:    76.0   DF:     7.6%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   153.0 DIFF:     6.9%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   306.1 DIFF:     8.2%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:    99.5 DIFF:     4.8%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   558.6 DIFF:     7.2%
                                                 DIFF:    37.6   DF:     3.8%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   648.9 DIFF:     0.2%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   648.9 DIFF:     0.2%
                                                 DIFF:     1.4   DF:     0.1%
*******************************************************************************
```

Table 8.18 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   825.5 DIFF:    -1.6%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   825.5 DIFF:    -1.6%
                                                 DIFF:   -13.2   DF:    -1.3%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   798.5 DIFF:    -0.5%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   825.5 DIFF:    -1.6%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   340.7 DIFF:   -10.6%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   168.5 DIFF:    -1.1%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   108.5 DIFF:    -2.3%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    60.0 DIFF:   -17.5%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2301.7 DIFF:    -3.1%
                                                 DIFF:   -74.8   DF:    -7.5%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   648.9 DIFF:     0.2%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   825.5 DIFF:    -1.6%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1474.4 DIFF:    -0.8%
                                                 DIFF:   -11.8   DF:    -1.2%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -75.3 DIFF:    -1.0%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -75.3 DIFF:    -1.0%
                                                 DIFF:     0.8   DF:     0.1%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   480.2 DIFF:    -2.8%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   614.2 DIFF:    -1.4%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1094.4 DIFF:    -2.0%
                                                 DIFF:   -22.7   DF:    -2.3%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    60.0 DIFF:   -17.5%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    60.0 DIFF:   -17.5%
                                                 DIFF:   -12.7   DF:    -1.3%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    62.7 DIFF:    -1.3%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.4 DIFF:    -0.7%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -69.9 DIFF:    -1.0%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -96.6 DIFF:    -0.5%
                                                 DIFF:     0.5   DF:     0.0%
*******************************************************************************
```

Table 8.18 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -62.3 DIFF:    -1.3%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.2 DIFF:    -0.7%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    70.9 DIFF:    -1.0%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    98.7 DIFF:    -0.5%
                                                DIFF:    -0.5   DF:    -0.1%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -91.7 DIFF:   142.6%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -91.7 DIFF:   142.6%
                                                DIFF:   -53.9   DF:    -5.4%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:   100.8 DIFF:     0.6%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:   100.8 DIFF:     0.6%
                                                DIFF:     0.6   DF:     0.1%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   354.4 DIFF:    -1.2%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   354.4 DIFF:    -1.2%
                                                DIFF:    -4.1   DF:    -0.4%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   203.0 DIFF:   -10.2%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    62.7 DIFF:   -21.9%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   265.7 DIFF:   -13.3%
                                                DIFF:   -40.7   DF:    -4.1%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   466.8 DIFF:     7.4%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   466.8 DIFF:     7.4%
                                                DIFF:    32.3   DF:     3.2%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -29.9 DIFF:   768.2%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -29.9 DIFF:   768.2%
                                                DIFF:   -26.4   DF:    -2.6%
******************************************************************************
```

Table 8.18 (Cont.)
Constrained Interface Impact Analyses - Case S4C2X1A

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   268.8 DIFF:   -23.2%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   407.8 DIFF:     1.1%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   405.0 DIFF:    12.2%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   272.0 DIFF:    -3.5%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   105.0 DIFF:    -1.1%
99554 --------  - 99550 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   182.6 DIFF:    11.0%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    61.5 DIFF:   -36.7%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   180.0 DIFF:    15.0%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   128.7 DIFF:    -8.0%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    30.0 DIFF:    17.8%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    55.9 DIFF:     6.9%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    48.0 DIFF:    -4.7%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    32.4 DIFF:    -9.3%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    26.3 DIFF:   -12.1%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    40.7 DIFF:     1.7%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    27.8 DIFF:    -1.9%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -224.1 DIFF:    -8.8%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    26.0 DIFF:   654.4%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  2074.3 DIFF:    -0.3%
                                                 DIFF:    -6.1   DF:    -0.6%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   170.5 DIFF:     5.7%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1802.1 DIFF:     1.8%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   224.1 DIFF:    -8.8%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -26.0 DIFF:   654.4%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2170.7 DIFF:    -0.1%
                                                 DIFF:    -2.4   DF:    -0.2%
*******************************************************************************
```

Table 8.18 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -167.2 DIFF:     5.6%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1760.0 DIFF:     1.8%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -220.3 DIFF:    -8.7%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    26.1 DIFF:   657.6%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2121.4 DIFF:    -0.2%
                                                 DIFF:     3.8   DF:     0.4%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   154.0 DIFF:    -0.2%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   154.4 DIFF:    -0.2%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   158.9 DIFF:    -0.2%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   347.8 DIFF:    -2.7%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   417.8 DIFF:    -2.6%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   471.4 DIFF:     8.5%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1704.2 DIFF:     0.9%
                                                 DIFF:    14.9   DF:     1.5%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   471.4 DIFF:     8.5%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   471.4 DIFF:     8.5%
                                                 DIFF:    36.9   DF:     3.7%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   266.6 DIFF:     5.1%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   100.3 DIFF:   -10.4%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   534.5 DIFF:     9.8%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   901.5 DIFF:     5.7%
                                                 DIFF:    48.9   DF:     4.9%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   360.5 DIFF:    27.4%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   297.5 DIFF:    21.9%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   658.0 DIFF:    24.9%
                                                 DIFF:   131.1   DF:    13.1%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   184.3 DIFF:    28.8%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   342.0 DIFF:    20.9%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:   106.0 DIFF:    11.6%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   632.3 DIFF:    21.4%
                                                 DIFF:   111.3   DF:    11.1%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   664.5 DIFF:     2.6%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   664.5 DIFF:     2.6%
                                                 DIFF:    17.1   DF:     1.7%
*******************************************************************************
```

Table 8.18 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   805.8 DIFF:    -3.9%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   805.8 DIFF:    -3.9%
                                                 DIFF:   -32.9   DF:    -3.3%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   809.5 DIFF:     0.8%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   805.8 DIFF:    -3.9%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   105.3 DIFF:   -72.3%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   170.4 DIFF:     0.0%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   110.8 DIFF:    -0.3%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    53.4 DIFF:   -26.5%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2055.1 DIFF:   -13.5%
                                                 DIFF:  -321.3   DF:   -32.1%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   664.5 DIFF:     2.6%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   805.8 DIFF:    -3.9%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1470.3 DIFF:    -1.1%
                                                 DIFF:   -15.8   DF:    -1.6%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -93.6 DIFF:    22.9%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -93.6 DIFF:    22.9%
                                                 DIFF:   -17.5   DF:    -1.7%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   470.0 DIFF:    -4.9%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   607.3 DIFF:    -2.5%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1077.3 DIFF:    -3.6%
                                                 DIFF:   -39.9   DF:    -4.0%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    53.4 DIFF:   -26.5%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    53.4 DIFF:   -26.5%
                                                 DIFF:   -19.2   DF:    -1.9%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    61.2 DIFF:    -3.7%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -90.2 DIFF:     0.2%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.6 DIFF:     0.0%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -99.5 DIFF:     2.6%
                                                 DIFF:    -2.5   DF:    -0.2%
*******************************************************************************
```

Table 8.18 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -60.9 DIFF:    -3.6%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    91.0 DIFF:     0.2%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.6 DIFF:     0.0%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:   101.7 DIFF:     2.5%
                                                DIFF:     2.5   DF:     0.2%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:  -131.9 DIFF:   248.9%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:  -131.9 DIFF:   248.9%
                                                DIFF:   -94.1   DF:    -9.4%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    96.7 DIFF:    -3.5%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    96.7 DIFF:    -3.5%
                                                DIFF:    -3.5   DF:    -0.4%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   347.2 DIFF:    -3.2%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   347.2 DIFF:    -3.2%
                                                DIFF:   -11.3   DF:    -1.1%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   181.7 DIFF:   -19.6%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    46.8 DIFF:   -41.7%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   228.4 DIFF:   -25.4%
                                                DIFF:   -77.9   DF:    -7.8%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   471.4 DIFF:     8.5%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   471.4 DIFF:     8.5%
                                                DIFF:    36.9   DF:     3.7%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -26.0 DIFF:   654.4%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -26.0 DIFF:   654.4%
                                                DIFF:   -22.5   DF:    -2.3%
******************************************************************************
```

Table 8.18 (Cont.)
Constrained Interface Impact Analyses - Case S4C4XXA

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   300.5 DIFF:   -14.2%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   394.2 DIFF:    -2.3%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   410.7 DIFF:    13.8%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   268.2 DIFF:    -4.8%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   101.6 DIFF:    -4.3%
99554 --------  - 99550 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   179.4 DIFF:     9.1%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    68.4 DIFF:   -29.6%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   177.2 DIFF:    13.2%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   129.9 DIFF:    -7.1%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    29.1 DIFF:    14.2%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    55.3 DIFF:     5.8%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    47.4 DIFF:    -5.9%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    31.0 DIFF:   -13.3%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    24.9 DIFF:   -16.6%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    40.1 DIFF:     0.2%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    27.1 DIFF:    -4.1%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -228.9 DIFF:    -6.9%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    19.4 DIFF:   465.2%

SUBTOTALS FOR: NDEX               BASE:  2080.3 CHNG:  2075.7 DIFF:    -0.2%
                                                DIFF:    -4.6   DF:    -0.5%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   169.1 DIFF:     4.9%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1796.3 DIFF:     1.5%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   228.9 DIFF:    -6.9%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -19.4 DIFF:   465.2%

SUBTOTALS FOR: MHEX_S             BASE:  2173.1 CHNG:  2174.9 DIFF:     0.1%
                                                DIFF:     1.8   DF:     0.2%
*******************************************************************************
```

Table 8.18 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -165.9 DIFF:     4.8%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1754.6 DIFF:     1.5%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -224.9 DIFF:    -6.7%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    19.5 DIFF:   466.7%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2125.9 DIFF:     0.0%
                                                 DIFF:    -0.7   DF:    -0.1%
******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   153.4 DIFF:    -0.6%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   153.9 DIFF:    -0.6%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   158.3 DIFF:    -0.6%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   348.5 DIFF:    -2.5%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   418.6 DIFF:    -2.5%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   467.4 DIFF:     7.6%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1700.1 DIFF:     0.6%
                                                 DIFF:    10.8   DF:     1.1%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   467.4 DIFF:     7.6%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   467.4 DIFF:     7.6%
                                                 DIFF:    33.0   DF:     3.3%
******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   259.6 DIFF:     2.3%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:    94.3 DIFF:   -15.8%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   517.1 DIFF:     6.2%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   871.1 DIFF:     2.2%
                                                 DIFF:    18.5   DF:     1.9%
******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   364.0 DIFF:    28.7%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   299.7 DIFF:    22.9%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   663.8 DIFF:    26.0%
                                                 DIFF:   136.8   DF:    13.7%
******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   195.1 DIFF:    36.3%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   351.7 DIFF:    24.3%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:   107.7 DIFF:    13.4%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   654.4 DIFF:    25.6%
                                                 DIFF:   133.5   DF:    13.3%
******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   668.4 DIFF:     3.2%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   668.4 DIFF:     3.2%
                                                 DIFF:    20.9   DF:     2.1%
******************************************************************************
```

Table 8.18 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   808.3 DIFF:    -3.6%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   808.3 DIFF:    -3.6%
                                                 DIFF:   -30.4   DF:    -3.0%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   812.7 DIFF:     1.2%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   808.3 DIFF:    -3.6%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:    84.7 DIFF:   -77.8%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   170.8 DIFF:     0.2%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   111.4 DIFF:     0.2%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    52.7 DIFF:   -27.5%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2040.6 DIFF:   -14.1%
                                                 DIFF:  -335.9   DF:   -33.6%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   668.4 DIFF:     3.2%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   808.3 DIFF:    -3.6%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1476.7 DIFF:    -0.6%
                                                 DIFF:    -9.5   DF:    -0.9%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -98.8 DIFF:    29.8%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -98.8 DIFF:    29.8%
                                                 DIFF:   -22.6   DF:    -2.3%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   468.6 DIFF:    -5.2%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   606.0 DIFF:    -2.7%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1074.6 DIFF:    -3.8%
                                                 DIFF:   -42.5   DF:    -4.3%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    52.7 DIFF:   -27.5%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    52.7 DIFF:   -27.5%
                                                 DIFF:   -20.0   DF:    -2.0%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    63.2 DIFF:    -0.6%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.6 DIFF:    -0.5%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.1 DIFF:    -0.7%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -96.5 DIFF:    -0.6%
                                                 DIFF:     0.6   DF:     0.1%
*******************************************************************************
```

Table 8.18 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -62.8 DIFF:    -0.6%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.3 DIFF:    -0.5%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.1 DIFF:    -0.7%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    98.7 DIFF:    -0.6%
                                                DIFF:    -0.6   DF:    -0.1%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:  -135.9 DIFF:   259.4%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:  -135.9 DIFF:   259.4%
                                                DIFF:   -98.1   DF:    -9.8%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    95.3 DIFF:    -4.8%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    95.3 DIFF:    -4.8%
                                                DIFF:    -4.9   DF:    -0.5%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   345.8 DIFF:    -3.6%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   345.8 DIFF:    -3.6%
                                                DIFF:   -12.8   DF:    -1.3%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   179.2 DIFF:   -20.7%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    45.1 DIFF:   -43.9%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   224.3 DIFF:   -26.8%
                                                DIFF:   -82.1   DF:    -8.2%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   467.4 DIFF:     7.6%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   467.4 DIFF:     7.6%
                                                DIFF:    33.0   DF:     3.3%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -19.4 DIFF:   465.2%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -19.4 DIFF:   465.2%
                                                DIFF:   -16.0   DF:    -1.6%
******************************************************************************
```

Table 8.18 (Cont.)
Constrained Interface Impact Analyses - Case S4C5XXA

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   303.3 DIFF:   -13.4%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   402.7 DIFF:    -0.2%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   401.8 DIFF:    11.3%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   272.0 DIFF:    -3.4%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   113.6 DIFF:     7.1%
99554 --------  - 99550 GRANFLS3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   173.6 DIFF:     5.5%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    70.1 DIFF:   -27.8%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   168.3 DIFF:     7.6%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   130.6 DIFF:    -6.7%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    30.0 DIFF:    17.8%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    54.2 DIFF:     3.7%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    46.8 DIFF:    -7.2%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    31.4 DIFF:   -12.3%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    25.9 DIFF:   -13.2%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    43.1 DIFF:     7.6%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    29.1 DIFF:     2.8%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -236.0 DIFF:    -4.0%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    14.5 DIFF:   322.3%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  2075.2 DIFF:    -0.2%
                                                 DIFF:    -5.1   DF:    -0.5%
******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   167.9 DIFF:     4.1%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1785.4 DIFF:     0.9%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   236.0 DIFF:    -4.0%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -14.5 DIFF:   322.3%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2174.7 DIFF:     0.1%
                                                 DIFF:     1.7   DF:     0.2%
******************************************************************************
```

Table 8.18 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -164.7 DIFF:     4.0%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1744.3 DIFF:     0.9%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -231.7 DIFF:    -3.9%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    14.6 DIFF:   323.0%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2126.2 DIFF:     0.0%
                                                 DIFF:    -1.0   DF:    -0.1%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   154.3 DIFF:     0.0%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   154.8 DIFF:     0.0%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   159.2 DIFF:     0.0%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   350.7 DIFF:    -1.9%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   421.3 DIFF:    -1.8%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   458.6 DIFF:     5.6%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1698.8 DIFF:     0.6%
                                                 DIFF:     9.5   DF:     1.0%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   458.6 DIFF:     5.6%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   458.6 DIFF:     5.6%
                                                 DIFF:    24.2   DF:     2.4%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   255.6 DIFF:     0.7%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   103.5 DIFF:    -7.6%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   511.9 DIFF:     5.2%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   871.0 DIFF:     2.2%
                                                 DIFF:    18.5   DF:     1.9%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   334.0 DIFF:    18.1%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   279.1 DIFF:    14.4%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   613.1 DIFF:    16.4%
                                                 DIFF:    86.2   DF:     8.6%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   172.2 DIFF:    20.4%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   322.6 DIFF:    14.0%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:   102.3 DIFF:     7.7%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   597.1 DIFF:    14.6%
                                                 DIFF:    76.1   DF:     7.6%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   660.5 DIFF:     2.0%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   660.5 DIFF:     2.0%
                                                 DIFF:    13.1   DF:     1.3%
*******************************************************************************
```

Table 8.18 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   825.7 DIFF:    -1.5%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   825.7 DIFF:    -1.5%
                                                 DIFF:   -13.0   DF:    -1.3%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   807.4 DIFF:     0.6%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   825.7 DIFF:    -1.5%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   198.3 DIFF:   -47.9%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   169.8 DIFF:    -0.4%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   110.3 DIFF:    -0.7%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    53.9 DIFF:   -25.8%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2165.5 DIFF:    -8.9%
                                                 DIFF:  -211.0   DF:   -21.1%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   660.5 DIFF:     2.0%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   825.7 DIFF:    -1.5%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1486.2 DIFF:     0.0%
                                                 DIFF:     0.1   DF:     0.0%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -95.2 DIFF:    25.1%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -95.2 DIFF:    25.1%
                                                 DIFF:   -19.1   DF:    -1.9%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   477.4 DIFF:    -3.4%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   611.5 DIFF:    -1.9%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1088.9 DIFF:    -2.5%
                                                 DIFF:   -28.2   DF:    -2.8%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    53.9 DIFF:   -25.8%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    53.9 DIFF:   -25.8%
                                                 DIFF:   -18.7   DF:    -1.9%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    63.3 DIFF:    -0.3%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.7 DIFF:    -0.4%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.2 DIFF:    -0.5%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -96.6 DIFF:    -0.5%
                                                 DIFF:     0.5   DF:     0.0%
*******************************************************************************
```

Table 8.18 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -63.0 DIFF:    -0.3%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.5 DIFF:    -0.4%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.3 DIFF:    -0.5%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    98.7 DIFF:    -0.5%
                                                DIFF:    -0.5   DF:    -0.1%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -96.2 DIFF:   154.5%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -96.2 DIFF:   154.5%
                                                DIFF:   -58.4   DF:    -5.8%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    96.5 DIFF:    -3.7%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    96.5 DIFF:    -3.7%
                                                DIFF:    -3.7   DF:    -0.4%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   349.8 DIFF:    -2.4%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   349.8 DIFF:    -2.4%
                                                DIFF:    -8.7   DF:    -0.9%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   197.3 DIFF:   -12.7%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    58.9 DIFF:   -26.7%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   256.1 DIFF:   -16.4%
                                                DIFF:   -50.2   DF:    -5.0%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   458.6 DIFF:     5.6%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   458.6 DIFF:     5.6%
                                                DIFF:    24.2   DF:     2.4%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -14.5 DIFF:   322.3%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -14.5 DIFF:   322.3%
                                                DIFF:   -11.1   DF:    -1.1%
******************************************************************************
```

Table 9.1
Watertown-Granite Falls-Blue Lake 345 kV (Case S5C1XXX)

```
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167

DATA FOR BUS  9000 [WATRWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 0.99734  81.37

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
   1000.0  -510.0  -510.0  -510.0 1.02000                              100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  529 WATERTN3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  529 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625

DATA FOR BUS   529 [WATERTN3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0   130.0 1.00008  74.30

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  537 WHITE  3 345  1   0.00190  0.02220  0.37340  1  F   720.0  880.0  792.0    0.0       1 1.000
  660 GROTON 3 345  1   0.00300  0.04530  0.46570  1  T   600.0 1159.0  660.0    0.0       1 1.000
 9000 WATRWIND13.8  1   0.00024  0.01250  0.00000  1  F  1500.0 1500.0 1500.0    0.0       1 1.000
19076 WATERT1T 345  1  -0.00020 -0.00550  0.00000  1  F   400.0  400.0  500.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00312  0.03671  0.64255  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9000 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19076 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.98569  61.58

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  529 WATERTN3 345  1   0.00312  0.03671  0.64255  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 9.1 (Cont.)

```
DATA FOR BUS  1702 [BLUE LK3 345] RESIDING IN AREA  23, ZONE 323, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01023  43.83

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 1604 PR ISLD3 345  1   0.00260  0.02620  0.43798  1  T  1165.0 1165.0 1281.0    0.0       1 1.000
 1608 WILMART3 345  1   0.00300  0.02780  0.45145  1  T  1195.0 1165.0 1281.0    0.0       1 1.000
 1703 BLUE LK7 115  1   0.00080  0.03720  0.00000  1  F   336.0  336.0  436.0    0.0       1 1.000
 1724 INVRHLS3 345  1   0.00120  0.01130  0.18892  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
 1739 PARKERS3 345  1   0.00080  0.00740  0.12471  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
 1770 EDEN PR3 345  1   0.00030  0.00270  0.04662  1  F  1165.0 1114.0 1225.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00430  0.06282  0.67725  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 1703 1  F 0.97460   0.0 0      0 1.5000 0.5100 1.5000 0.5100 0.00000
```

TABLE 9.2 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 5 (Watertown) - Case S5C1XXX

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S5C1XXX-ag1	upe-so04aa.S5C1XXX-ag3	upe-so04aa.S5C1XXX-ei2	upe-so04aa.S5C1XXX-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 02 2002 17:12	MAY 02 2002 17:29	MAY 02 2002 17:45	MAY 02 2002 18:00
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2073 / 377	2073 / 377	2073 / 377	2073 / 377
10	MHEX / L20D	2172 / 219	2172 / 219	2172 / 219	2172 / 219
11	ECL-ARP / PRI-BYN	652 / 829	652 / 829	652 / 829	652 / 829
12	MWSI / MNEX	1482 / 2732	1482 / 2732	1482 / 2732	1482 / 2732
13	D602F / F601C	1812 / 1351	1812 / 1351	1812 / 1351	1812 / 1351
14	B10T / MH>SPC	167 / 100	167 / 100	167 / 100	167 / 100
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	169 / 150	169 / 150	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	227 / 124	227 / 124	227 / 124	227 / 124
19	Forbes SVC / MSC	40 / 600	40 / 600	40 / 600	40 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018
23	Chisago 500/EauClaire 345	1.022 / 1.019	1.022 / 1.019	1.022 / 1.019	1.022 / 1.019
24	Int Falls 115/Badoura 115	1.053 / 0.995	1.053 / 0.995	1.053 / 0.995	1.053 / 0.995
25	Drayton 230/Groton 345	1.017 / 0.992	1.017 / 0.992	1.017 / 0.992	1.017 / 0.992
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	138% / 227%	138% / 227%	138% / 227%	138% / 227%
28	L20D at Prairie/Drayton	999% / 946%	999% / 946%	999% / 946%	999% / 946%
29	R50M/F3M	742% / 350%	742% / 350%	742% / 350%	742% / 350%
30	B10T	338%	338%	338%	338%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.97 | 1.02	0.97 | 1.02	0.98 | 1.05	0.98 | 1.04
33	Boise 115	1.02 | 1.06	1.02 | 1.06	1.02 | 1.08	1.03 | 1.07
34	Dorsey 230	1.02 | 1.06	1.02 | 1.05	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.02	1.00 | 1.02	0.98 | 1.04	1.00 | 1.03
36	Riverton 230	0.97 | 1.04	0.96 | 1.03	0.92 | 1.04	0.95 | 1.04
37	Coal Creek 230	0.96 | 1.11	0.96 | 1.11	1.02 | 1.12	0.96 | 1.14
38	Dickinson 345	0.97 | 1.05	0.96 | 1.05	1.01 | 1.06	1.02 | 1.08
39	Drayton 230	0.98 | 1.08	0.99 | 1.08	0.94 | 1.08	0.99 | 1.08
40	Groton 345	0.86 | 1.01	0.85 | 1.00	0.85 | 1.02	0.87 | 1.01
41	Tioga 230	1.00 | 1.07	1.00 | 1.07	1.01 | 1.07	1.02 | 1.06
42	Wahpeton 115	0.97 | 1.09	0.96 | 1.09	0.90 | 1.10	0.93 | 1.08
43	Watertown 345	0.91 | 1.01	0.90 | 1.01	0.87 | 1.02	0.90 | 1.01
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 59.86%	SHERC3 / 57.82%	KING 3 / -55.23%	SHERC3 / -49.80%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	334%	320%	504%	507%
55	K22W (max +dP @ t, d-ang)	6.2@(2.68322,-0.3)	7.0@(2.66656,-1.2)	59.8@(2.87488,-32.3)	37.9@(2.66656,-20.8)
56	K22W (max -dP @ t, d-ang)	18.5@(0.82497,5.8)	19.9@(0.80830,7.2)	4.9@(0.52498,0.3)	5.7@(0.32499,0.4)
57	K22W (max d-ang @ t, dP)	9.3@(1.15829,-6.6)	10.7@(1.14162,-8.1)	-150.0@(20.00792,27.0)	-80.3@(20.00792,16.1)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	83% / 148%	79% / 143%	60% / 113%	91% / 158%
61	L20D at Prairie/Drayton	999% / 734%	999% / 766%	637% / 675%	187% / 637%
62	R50M / F3M	588% / 277%	578% / 277%	544% / 231%	626% / 265%
63	B10T	217%	219%	149%	193%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 3) / (0 | 1 | 0)	(2 | 3 | 2) / (0 | 2 | 1)	(2 | 5 | 2) / (0 | 2 | 0)	(2 | 4 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 4 | 2) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)

TABLE 9.2 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 5 (Watertown) - Case S5C1XXX

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S5C1XXX-nbz	upe-so04aa.S5C1XXX-mqs	upe-so04aa.S5C1XXX-pys	upe-so04aa.S5C1XXX-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 02 2002 18:15	MAY 02 2002 18:33	MAY 02 2002 18:48	MAY 02 2002 19:03
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2073 / 377	2073 / 377	2073 / 377	2073 / 377
10	MHEX / L20D	2172 / 219	2172 / 219	2172 / 219	2172 / 219
11	ECL-ARP / PRI-BYN	652 / 829	652 / 829	652 / 829	652 / 829
12	MWSI / MNEX	1482 / 2732	1482 / 2732	1482 / 2732	1482 / 2732
13	D602F / F601C	1812 / 1351	1812 / 1351	1812 / 1351	1812 / 1351
14	B10T / MH>SPC	167 / 100	167 / 100	167 / 100	167 / 100
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	169 / 150	169 / 150	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	227 / 124	227 / 124	227 / 124	227 / 124
19	Forbes SVC / MSC	40 / 600	40 / 600	40 / 600	40 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018
23	Chisago 500/EauClaire 345	1.022 / 1.019	1.022 / 1.019	1.022 / 1.019	1.022 / 1.019
24	Int Falls 115/Badoura 115	1.053 / 0.995	1.053 / 0.995	1.053 / 0.995	1.053 / 0.995
25	Drayton 230/Groton 345	1.017 / 0.992	1.017 / 0.992	1.017 / 0.992	1.017 / 0.992
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	138% / 227%	138% / 227%	138% / 227%	138% / 227%
28	L20D at Prairie/Drayton	999% / 946%	999% / 946%	999% / 946%	999% / 946%
29	R50M/F3M	742% / 350%	742% / 350%	742% / 350%	742% / 350%
30	B10T	338%	338%	338%	338%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.09	0.96 | 1.05	0.96 | 1.01	0.99 | 1.01
33	Boise 115	0.97 | 1.08	1.01 | 1.08	1.03 | 1.07	1.05 | 1.06
34	Dorsey 230	1.04 | 1.15	1.01 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	0.98 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.89 | 1.05	0.94 | 1.03	1.00 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.95 | 1.09	0.97 | 1.07	1.00 | 1.06	1.02 | 1.04
38	Dickinson 345	0.97 | 1.08	0.96 | 1.08	0.99 | 1.03	1.01 | 1.03
39	Drayton 230	0.95 | 1.09	0.98 | 1.06	1.00 | 1.04	1.01 | 1.03
40	Groton 345	0.82 | 1.03	0.89 | 1.01	0.95 | 1.00	0.98 | 1.00
41	Tioga 230	1.00 | 1.08	1.01 | 1.07	1.02 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.87 | 1.09	0.97 | 1.09	1.01 | 1.05	1.04 | 1.05
43	Watertown 345	0.83 | 1.02	0.89 | 1.02	0.96 | 1.01	0.98 | 1.00
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -41.51%	KING 3 / 10.80%	ANTEL3 / 12.24%	KING 3 / 1.17%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	484%	175%	315%
55	K22W (max +dP @ t, d-ang)	137.0@(2.11658,-63.9)	69.6@(2.69155,-35.6)	4.8@(4.13316,4.5)	0.0@(0.05000,0.0)
56	K22W (max -dP @ t, d-ang)	101.4@(0.26666,11.0)	22.0@(0.33332,4.2)	34.9@(1.79159,24.0)	21.3@(2.15824,13.9)
57	K22W (max d-ang @ t, dP)	-272.2@(20.00792,52.5)	-117.4@(20.00792,22.2)	29.7@(16.11631,-23.0)	17.9@(20.00792,-10.5)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	47% / 98%	116% / 196%	135% / 222%
61	L20D at Prairie/Drayton	999% / 504%	999% / 659%	999% / 740%	999% / 841%
62	R50M / F3M	287% / 140%	490% / 234%	624% / 350%	697% / 350%
63	B10T	167%	133%	196%	274%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 1) / (0 | 0 | 0)	(4 | 4 | 2) / (0 | 3 | 3)	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 6 | 2) / (0 | 1 | 1)	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (1 | 5 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 4 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 9.2 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 5 (Watertown) - Case S5C1XXX

1	**Case No.**	9	10	11
2	**Case Name**	upe-so04aa.S5C1XXX-bq3	upe-so04aa.S5C1XXX-cp3	upe-so04aa.S5C1XXX-cq3
3	**Disturbance**	bq3	cp3	cq3
4	**Prior Outage**	None	None	None
5	**Date/Time**	MAY 02 2002 19:16	MAY 02 2002 12:37	MAY 02 2002 12:40
6	**Comments**			
7				
8	**Steady State Flows**			
9	NDEX / EAST BIAS	2073 / 377	2073 / 377	2073 / 377
10	MHEX / L20D	2172 / 219	2172 / 219	2172 / 219
11	ECL-ARP / PRI-BYN	652 / 829	652 / 829	652 / 829
12	MWSI / MNEX	1482 / 2732	1482 / 2732	1482 / 2732
13	D602F / F601C	1812 / 1351	1812 / 1351	1812 / 1351
14	B10T / MH>SPC	167 / 100	167 / 100	167 / 100
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	169 / 150	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	227 / 124	227 / 124	227 / 124
19	Forbes SVC / MSC	40 / 600	40 / 600	40 / 600
20	**Steady State Vltgs**			
21	Dorsey 500/Dorsey 230	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018
23	Chisago 500/EauClaire 345	1.022 / 1.019	1.022 / 1.019	1.022 / 1.019
24	Int Falls 115/Badoura 115	1.053 / 0.995	1.053 / 0.995	1.053 / 0.995
25	Drayton 230/Groton 345	1.017 / 0.992	1.017 / 0.992	1.017 / 0.992
26	**SS OS Relay Margins**			
27	D602F at Forbes/Dorsey	138% / 227%	138% / 227%	138% / 227%
28	L20D at Prairie/Drayton	999% / 946%	999% / 946%	999% / 946%
29	R50M/F3M	742% / 350%	742% / 350%	742% / 350%
30	B10T	338%	338%	338%
31	**Min/MaxTransientVltg**			
32	Arrowhd 230	0.98 | 1.03	0.97 | 1.01	0.94 | 1.03
33	Boise 115	1.02 | 1.06	1.00 | 1.05	0.99 | 1.07
34	Dorsey 230	1.03 | 1.05	1.01 | 1.05	0.98 | 1.06
35	Forbes 230	1.00 | 1.03	0.99 | 1.01	0.95 | 1.03
36	Riverton 230	0.96 | 1.02	0.95 | 0.98	0.93 | 0.99
37	Coal Creek 230	0.98 | 1.06	0.97 | 1.05	0.97 | 1.04
38	Dickinson 345	0.96 | 1.04	0.97 | 1.03	0.94 | 1.04
39	Drayton 230	1.00 | 1.03	0.97 | 1.02	0.95 | 1.03
40	Groton 345	0.95 | 1.02	(1.86)0.60 | 0.77	(1.77)0.58 | 0.76
41	Tioga 230	1.02 | 1.06	1.01 | 1.04	0.99 | 1.03
42	Wahpeton 115	0.97 | 1.05	0.92 | 0.97	0.91 | 0.96
43	Watertown 345	(0.42)0.74 | 1.01	(1.83)0.45 |	(1.63)0.44 |
44	**Dynamic Voltage Warnings**			
45		none	9076 [WATERT1T] 0.59	9076 [WATERT1T] 0.56
46			529 [WATERTN3] 0.62	529 [WATERTN3] 0.59
47			537 [WHITE 3] 0.65	530 [WATERTN4] 0.68
48			538 [WHITE 7] 0.67	500 [ARLNGTN7] 0.69
49			9187 [WHITE T] 0.68	9550 [GRANFLS3] 0.69
50			9189 [IVANHOE7] 0.68	
51				
52	Worst Case Angle Damping	SHERC3 / 41.61%	/ %	/ %
53	Dorsey SUVP / UdHold			/ 1.633
54	Forbes DC Red (DCAR)	257%	329%	237%
55	K22W (max +dP @ t, d-ang)	17.2@(3.05820,-7.4)	2.2@(0.11666,0.1)	6.8@(1.99992,11.1)
56	K22W (max -dP @ t, d-ang)	22.2@(0.94163,11.0)	27.3@(1.09996,12.7)	34.3@(1.03329,19.1)
57	K22W (max d-ang @ t, dP)	15.8@(1.33328,-13.7)	18.0@(1.49994,-18.5)	27.9@(1.54994,-26.8)
58	**OS Rel Trip / Marg**			
59	MH - OH			
60	D602F at Forbes/Dorsey	75% / 138%	40% / 87%	20% / 56%
61	L20D at Prairie/Drayton	999% / 760%	999% / 713%	999% / 656%
62	R50M / F3M	566% / 291%	480% / 250%	429% / 250%
63	B10T	221%	230%	168%
64	**FSCAPS (SS/Unav/Final)**			
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 3 | 3)
67	Prairie 115 / Ramsey 230	(2 | 2 | 2) / (0 | 1 | 1)	(2 | 8 | 3) / (0 | 2 | 2)	(2 | 8 | 4) / (0 | 2 | 2)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 1 | 1) / (1 | 2 | 2)	(0 | 2 | 2) / (1 | 3 | 3)
69	Shey 115 / Split Rock 115	(0 | 3 | 3) / (2 | 2 | 2)	(0 | 5 | 5) / (2 | 2 | 2)	(0 | 5 | 5) / (2 | 2 | 2)

Table 9.3
Watertown-Granite Falls-Blue Lake 345 kV + 700 Mvar SVC @ Wind Terminals (Case S5C1XXA)

```
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167

DATA FOR BUS  9000 [WATRWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 0.99730  81.26

MOD  VHI     VLO      SHUNT  X-------X X-------X X-------X X-------X X---- REMOTE ----X
 2 0.99730 0.99730   175.28  1: 700.00

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
   1000.0  -510.0  -510.0  -510.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  529 WATERTN3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  529 1  T 1.02000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 9.4 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 5 (Watertown) - Case S5C1XXA

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S5C1XXA-ag1	upe-so04aa.S5C1XXA-ag3	upe-so04aa.S5C1XXA-ei2	upe-so04aa.S5C1XXA-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 03 2002 1:23	MAY 03 2002 1:39	MAY 03 2002 1:55	MAY 03 2002 2:11
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2075 / 375	2075 / 375	2075 / 375	2075 / 375
10	MHEX / L20D	2172 / 219	2172 / 219	2172 / 219	2172 / 219
11	ECL-ARP / PRI-BYN	653 / 829	653 / 829	653 / 829	653 / 829
12	MWSI / MNEX	1483 / 2734	1483 / 2734	1483 / 2734	1483 / 2734
13	D602F / F601C	1811 / 1349	1811 / 1349	1811 / 1349	1811 / 1349
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	169 / 150	169 / 150	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	231 / 10	231 / 10	231 / 10	231 / 10
19	Forbes SVC / MSC	39 / 600	39 / 600	39 / 600	39 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018
23	Chisago 500/EauClaire 345	1.022 / 1.019	1.022 / 1.019	1.022 / 1.019	1.022 / 1.019
24	Int Falls 115/Badoura 115	1.050 / 0.996	1.050 / 0.996	1.050 / 0.996	1.050 / 0.996
25	Drayton 230/Groton 345	1.017 / 1.002	1.017 / 1.002	1.017 / 1.002	1.017 / 1.002
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	138% / 227%	138% / 227%	138% / 227%	138% / 227%
28	L20D at Prairie/Drayton	999% / 944%	999% / 944%	999% / 944%	999% / 944%
29	R50M/F3M	744% / 347%	744% / 347%	744% / 347%	744% / 347%
30	B10T	337%	337%	337%	337%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.02	0.98 | 1.02	0.98 | 1.05	0.98 | 1.04
33	Boise 115	1.02 | 1.06	1.02 | 1.06	1.02 | 1.07	1.03 | 1.07
34	Dorsey 230	1.02 | 1.06	1.02 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	1.00 | 1.03	0.98 | 1.04	1.00 | 1.03
36	Riverton 230	0.97 | 1.04	0.97 | 1.04	0.93 | 1.04	0.96 | 1.04
37	Coal Creek 230	0.97 | 1.11	0.97 | 1.11	1.02 | 1.12	0.96 | 1.15
38	Dickinson 345	0.97 | 1.05	0.97 | 1.05	1.02 | 1.06	1.02 | 1.08
39	Drayton 230	0.98 | 1.08	0.99 | 1.08	0.95 | 1.08	1.00 | 1.08
40	Groton 345	0.90 | 1.03	0.90 | 1.02	0.92 | 1.04	0.93 | 1.03
41	Tioga 230	1.00 | 1.08	1.00 | 1.07	1.02 | 1.07	1.02 | 1.07
42	Wahpeton 115	0.98 | 1.10	0.98 | 1.10	0.92 | 1.10	0.95 | 1.10
43	Watertown 345	0.99 | 1.03	0.99 | 1.03	0.98 | 1.03	0.99 | 1.03
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 70.22%	SHERC3 / 68.08%	KING 3 / -57.06%	SHERC3 / -61.64%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	363%	349%	503%	507%
55	K22W (max +dP @ t, d-ang)	6.9@(2.61656,-0.6)	8.2@(2.57489,-1.2)	54.0@(2.31657,-34.0)	35.3@(2.54989,-19.3)
56	K22W (max -dP @ t, d-ang)	16.1@(0.77497,4.3)	16.5@(0.74997,5.3)	4.7@(0.46665,0.2)	5.6@(0.32499,0.3)
57	K22W (max d-ang @ t, dP)	7.3@(1.09996,-5.3)	8.2@(1.05829,-6.6)	-150.6@(20.00792,27.4)	-79.1@(20.00792,15.7)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	87% / 154%	84% / 150%	63% / 118%	93% / 162%
61	L20D at Prairie/Drayton	999% / 739%	999% / 746%	649% / 657%	188% / 645%
62	R50M / F3M	603% / 273%	595% / 272%	555% / 233%	633% / 264%
63	B10T	203%	200%	127%	170%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 1 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 3 | 2) / (0 | 2 | 1)	(2 | 5 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 4 | 2) / (2 | 2 | 2)	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)

TABLE 9.4 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 5 (Watertown) - Case S5C1XXA

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S5C1XXA-nbz	upe-so04aa.S5C1XXA-mqs	upe-so04aa.S5C1XXA-pys	upe-so04aa.S5C1XXA-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 03 2002 2:25	MAY 03 2002 2:43	MAY 03 2002 2:58	MAY 03 2002 3:12
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2075 / 375	2075 / 375	2075 / 375	2075 / 375
10	MHEX / L20D	2172 / 219	2172 / 219	2172 / 219	2172 / 219
11	ECL-ARP / PRI-BYN	653 / 829	653 / 829	653 / 829	653 / 829
12	MWSI / MNEX	1483 / 2734	1483 / 2734	1483 / 2734	1483 / 2734
13	D602F / F601C	1811 / 1349	1811 / 1349	1811 / 1349	1811 / 1349
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	169 / 150	169 / 150	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	231 / 10	231 / 10	231 / 10	231 / 10
19	Forbes SVC / MSC	39 / 600	39 / 600	39 / 600	39 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018
23	Chisago 500/EauClaire 345	1.022 / 1.019	1.022 / 1.019	1.022 / 1.019	1.022 / 1.019
24	Int Falls 115/Badoura 115	1.050 / 0.996	1.050 / 0.996	1.050 / 0.996	1.050 / 0.996
25	Drayton 230/Groton 345	1.017 / 1.002	1.017 / 1.002	1.017 / 1.002	1.017 / 1.002
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	138% / 227%	138% / 227%	138% / 227%	138% / 227%
28	L20D at Prairie/Drayton	999% / 944%	999% / 944%	999% / 944%	999% / 944%
29	R50M/F3M	744% / 347%	744% / 347%	744% / 347%	744% / 347%
30	B10T	337%	337%	337%	337%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.10	0.97 | 1.05	0.97 | 1.01	0.99 | 1.01
33	Boise 115	0.97 | 1.08	1.00 | 1.08	1.03 | 1.07	1.04 | 1.06
34	Dorsey 230	1.05 | 1.15	1.00 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	0.99 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.91 | 1.05	0.96 | 1.03	1.00 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.96 | 1.08	0.98 | 1.07	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.98 | 1.07	0.97 | 1.08	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.96 | 1.08	0.97 | 1.04	1.00 | 1.04	1.01 | 1.03
40	Groton 345	0.91 | 1.04	0.95 | 1.02	0.98 | 1.01	1.00 | 1.01
41	Tioga 230	1.00 | 1.08	1.01 | 1.07	1.02 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.90 | 1.09	0.99 | 1.07	1.02 | 1.05	1.04 | 1.05
43	Watertown 345	0.97 | 1.03	0.99 | 1.03	1.01 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -29.69%	KING 3 / 4.13%	ANTEL3 / 19.95%	KING 3 / 16.48%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	468%	175%	321%
55	K22W (max +dP @ t, d-ang)	151.5@(2.10825,-67.2)	67.0@(2.64156,-34.0)	0.9@(4.12483,6.0)	0.0@(0.00000,0.0)
56	K22W (max -dP @ t, d-ang)	101.1@(0.26666,11.0)	21.7@(0.33332,4.1)	32.7@(1.77493,21.1)	20.6@(2.14158,13.3)
57	K22W (max d-ang @ t, dP)	-277.4@(20.00792,53.2)	-122.4@(20.00792,23.3)	27.4@(20.00792,-16.2)	17.4@(20.00792,-11.5)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	44% / 95%	119% / 198%	136% / 223%
61	L20D at Prairie/Drayton	868% / 507%	999% / 673%	999% / 751%	999% / 835%
62	R50M / F3M	289% / 135%	487% / 221%	646% / 347%	700% / 347%
63	B10T	127%	129%	201%	268%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 2) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 3 | 3)	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (1 | 5 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 3 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 9.4 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 5 (Watertown) - Case S5C1XXA

1	**Case No.**	9	10	11
2	**Case Name**	upe-so04aa.S5C1XXA-bq3	upe-so04aa.S5C1XXA-cp3	upe-so04aa.S5C1XXA-cq3
3	**Disturbance**	bq3	cp3	cq3
4	**Prior Outage**	None	None	None
5	**Date/Time**	MAY 03 2002 3:26	MAY 03 2002 3:39	MAY 03 2002 3:53
6	**Comments**			
7				
8	**Steady State Flows**			
9	NDEX / EAST BIAS	2075 / 375	2075 / 375	2075 / 375
10	MHEX / L20D	2172 / 219	2172 / 219	2172 / 219
11	ECL-ARP / PRI-BYN	653 / 829	653 / 829	653 / 829
12	MWSI / MNEX	1483 / 2734	1483 / 2734	1483 / 2734
13	D602F / F601C	1811 / 1349	1811 / 1349	1811 / 1349
14	B10T / MH>SPC	168 / 101	168 / 101	168 / 101
15	OH E-W / OH>MH	-120 / -197	-120 / -197	-120 / -197
16	R50M / OH>MP	169 / 150	169 / 150	169 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	231 / 10	231 / 10	231 / 10
19	Forbes SVC / MSC	39 / 600	39 / 600	39 / 600
20	**Steady State Vltgs**			
21	Dorsey 500/Dorsey 230	1.036 / 1.045	1.036 / 1.045	1.036 / 1.045
22	Roseau 500/Forbes 500	1.064 / 1.018	1.064 / 1.018	1.064 / 1.018
23	Chisago 500/EauClaire 345	1.022 / 1.019	1.022 / 1.019	1.022 / 1.019
24	Int Falls 115/Badoura 115	1.050 / 0.996	1.050 / 0.996	1.050 / 0.996
25	Drayton 230/Groton 345	1.017 / 1.002	1.017 / 1.002	1.017 / 1.002
26	**SS OS Relay Margins**			
27	D602F at Forbes/Dorsey	138% / 227%	138% / 227%	138% / 227%
28	L20D at Prairie/Drayton	999% / 944%	999% / 944%	999% / 944%
29	R50M/F3M	744% / 347%	744% / 347%	744% / 347%
30	B10T	337%	337%	337%
31	**Min/MaxTransientVltg**			
32	Arrowhd 230	0.99 | 1.02	0.99 | 1.03	0.97 | 1.03
33	Boise 115	1.03 | 1.06	1.02 | 1.06	1.01 | 1.06
34	Dorsey 230	1.03 | 1.05	1.02 | 1.05	1.02 | 1.06
35	Forbes 230	1.00 | 1.02	1.00 | 1.02	0.99 | 1.02
36	Riverton 230	0.98 | 1.01	0.96 | 1.02	0.96 | 1.02
37	Coal Creek 230	0.99 | 1.06	0.98 | 1.07	0.98 | 1.07
38	Dickinson 345	0.98 | 1.04	0.97 | 1.04	0.95 | 1.04
39	Drayton 230	1.00 | 1.02	0.99 | 1.03	0.99 | 1.03
40	Groton 345	0.98 | 1.01	0.89 | 1.02	0.88 | 1.02
41	Tioga 230	1.03 | 1.05	1.03 | 1.06	1.01 | 1.05
42	Wahpeton 115	0.99 | 1.04	0.96 | 1.05	0.96 | 1.05
43	Watertown 345	0.89 | 1.02	0.83 | 1.03	0.83 | 1.02
44	**Dynamic Voltage Warnings**			
45		none	none	none
46				
47				
48				
49				
50				
51				
52	Worst Case Angle Damping	SHERC3 / 51.36%	SHERC3 / 51.29%	SHERC3 / 46.79%
53	Dorsey SUVP / UdHold			
54	Forbes DC Red (DCAR)	326%	311%	213%
55	K22W (max +dP @ t, d-ang)	6.5@(2.75822,-2.3)	16.6@(2.90821,-6.7)	7.6@(2.85821,-2.4)
56	K22W (max -dP @ t, d-ang)	16.1@(0.83330,7.3)	17.9@(0.92496,7.4)	26.1@(0.85830,12.2)
57	K22W (max d-ang @ t, dP)	10.4@(1.17495,-8.9)	10.5@(1.25828,-9.9)	19.1@(1.27495,-13.1)
58	**OS Rel Trip / Marg**			
59	MH - OH			
60	D602F at Forbes/Dorsey	90% / 158%	77% / 140%	72% / 132%
61	L20D at Prairie/Drayton	999% / 818%	999% / 794%	999% / 749%
62	R50M / F3M	605% / 295%	578% / 274%	550% / 284%
63	B10T	256%	248%	200%
64	**FSCAPS (SS/Unav/Final)**			
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 1 | 1) / (2 | 2 | 2)	(0 | 3 | 3) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)

Table 9.5
Watertown-Granite Falls-Blue Lake 345 kV + Watertown-Huron-Split Rock 345 kV (Case S5C5XXX)

```
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166

DATA FOR BUS  9000 [WATRWIND13.8] RESIDING IN AREA  22, ZONE  90, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
-2     0.0     0.0    0.0    0.0     0.0     0.0     0.0   370.0 1.01473  80.76

PLNT PGEN    QGEN    QMAX    QMIN  VSCHED X-    REMOTE BUS     VOLTAGE  Q PCT-X
   1000.0  -510.0  -510.0  -510.0 1.02000                             100.00

ID ST  PGEN   QGEN   QMAX   QMIN  MBASE  Z S O R C E    X T R A N   GENTAP   PMAX   PMIN OW1 FRAC1 OW2 FRAC2 OW3 FRAC3 OW4 FRAC4
1  1 1000.0 -510.0 -510.0 -510.0 1120.0 0.0000 0.1106 0.0000 0.0000 1.0000 1000.0    0.0   1 1.000

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  529 WATERTN3 345  1   0.00024  0.01250  0.00000  1  T  1500.0 1500.0 1500.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  529 1  T 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625


DATA FOR BUS   529 [WATERTN3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0   130.0 1.01493  73.91

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  537 WHITE  3 345  1   0.00190  0.02220  0.37340  1  F   720.0  880.0  792.0    0.0       1 1.000
  620 HURON  3 345  1   0.00294  0.03499  0.60850  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  660 GROTON 3 345  1   0.00300  0.04530  0.46570  1  T   600.0 1159.0  660.0    0.0       1 1.000
 9000 WATRWIND13.8  1   0.00024  0.01250  0.00000  1  F  1500.0 1500.0 1500.0    0.0       1 1.000
19076 WATERT1T 345  1  -0.00020 -0.00550  0.00000  1  F   400.0  400.0  500.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00312  0.03671  0.64255  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 9000 1  F 0.98000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
19076 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000


DATA FOR BUS 99550 [GRANFLS3 345] RESIDING IN AREA   6, ZONE 502, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 0.99444  61.54

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  529 WATERTN3 345  1   0.00312  0.03671  0.64255  1  T  1159.0 1159.0 1159.0    0.0       1 1.000
  550 GRANITF4 230  1   0.00000  0.01500  0.00000  1  F   500.0  600.0  700.0    0.0       1 1.000
 1702 BLUE LK3 345  1   0.00430  0.06282  0.67725  1  F  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
  550 1  F 1.00000   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

Table 9.5 (Cont.)

```
DATA FOR BUS  1702 [BLUE LK3 345] RESIDING IN AREA  23, ZONE 323, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01143  44.34

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
 1604 PR ISLD3 345  1   0.00260  0.02620  0.43798  1  T  1165.0 1165.0 1281.0    0.0       1 1.000
 1608 WILMART3 345  1   0.00300  0.02780  0.45145  1  T  1195.0 1165.0 1281.0    0.0       1 1.000
 1703 BLUE LK7 115  1   0.00080  0.03720  0.00000  1  F   336.0  336.0  436.0    0.0       1 1.000
 1724 INVRHLS3 345  1   0.00120  0.01130  0.18892  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
 1739 PARKERS3 345  1   0.00080  0.00740  0.12471  1  F  1165.0 1165.0 1281.0    0.0       1 1.000
 1770 EDEN PR3 345  1   0.00030  0.00270  0.04662  1  F  1165.0 1114.0 1225.0    0.0       1 1.000
99550 GRANFLS3 345  1   0.00430  0.06282  0.67725  1  T  1159.0 1159.0 1159.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 1703 1  F 0.97460   0.0 0      0 1.5000 0.5100 1.5000 0.5100 0.00000

DATA FOR BUS   620 [HURON  3 345] RESIDING IN AREA   6, ZONE  11, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.02035  73.49

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  529 WATERTN3 345  1   0.00294  0.03499  0.60850  1  F  1159.0 1159.0 1159.0    0.0       1 1.000
  601 ANTELOP3 345  1   0.01202  0.13530  2.76110  1  F   478.0 2270.0  526.0    0.0       1 1.000
 1634 SPLT RK3 345  1   0.00220  0.04983  1.01574  1  F  2270.0 2270.0 2270.0    0.0       1 1.000
22154 BRDLNDTY 345  1   0.00013  0.03292  0.00000  1  F   400.0  400.0  480.0    0.0       1 1.000

X-------TO-------X CKT    LINE G,B (FROM)     LINE G,B (TO)   STATUS
  601 ANTELOP3 345  1    0.00000  0.00000   0.00000 -1.07000     1

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
22154 1  F 1.00000   0.0 0      0 1.5000 0.5000 1.5000 0.5000 0.00000

DATA FOR BUS  1634 [SPLT RK3 345] RESIDING IN AREA  23, ZONE 353, OWNER   1:

CODE PLOAD   QLOAD   I - L O A D     Y - L O A D G-SHUNT B-SHUNT VOLTAGE  ANGLE
 1     0.0     0.0    0.0    0.0     0.0     0.0     0.0     0.0 1.01896  60.58

X-------TO-------X CKT   LINE R   LINE X CHARGING ST MET RATE-A RATE-B RATE-C LENGTH ZI OWN1 FRAC1 OWN2 FRAC2 OWN3 FRAC3 OWN4 FRAC4
  620 HURON  3 345  1   0.00220  0.04983  1.01574  1  T  2270.0 2270.0 2270.0    0.0       1 1.000
 1684 SPLTRKY11.00  1   0.00031  0.03588  0.00000  1  F   450.0  450.0  585.0    0.0       1 1.000
 1686 SPLTRKY21.00  1   0.00031  0.03588  0.00000  1  F   450.0  450.0  585.0    0.0       1 1.000
45641 SPLTRTA3 345  1   0.00020  0.00250  0.04329  1  T   717.0 1308.0  789.0    0.0       1 1.000
45646 SPLTRTB3 345  1   0.00020  0.00250  0.04329  1  T   717.0 1308.0  789.0    0.0       1 1.000

  TO CKT TP RATIO  ANGLE RG  CONT   RMAX   RMIN   VMAX   VMIN   TSTP     CR      CX  TAB   NOMINAL R,X
 1684 1  F 1.02600   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
 1686 1  F 1.02600   0.0 1      0 1.5000 0.5100 1.5000 0.5100 0.00625
```

TABLE 9.6 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 5 (Watertown) - Case S5C5XXX

1	**Case No.**	1	2	3	4
2	**Case Name**	upe-so04aa.S5C5XXX-ag1	upe-so04aa.S5C5XXX-ag3	upe-so04aa.S5C5XXX-ei2	upe-so04aa.S5C5XXX-eq1
3	**Disturbance**	ag1	ag3	ei2	eq1
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 08 2002 17:15	MAY 08 2002 17:32	MAY 08 2002 17:48	MAY 08 2002 18:03
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2077 / 363	2077 / 363	2077 / 363	2077 / 363
10	MHEX / L20D	2174 / 228	2174 / 228	2174 / 228	2174 / 228
11	ECL-ARP / PRI-BYN	653 / 822	653 / 822	653 / 822	653 / 822
12	MWSI / MNEX	1476 / 2678	1476 / 2678	1476 / 2678	1476 / 2678
13	D602F / F601C	1796 / 1334	1796 / 1334	1796 / 1334	1796 / 1334
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	167 / 150	167 / 150	167 / 150	167 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	253 / 22	253 / 22	253 / 22	253 / 22
19	Forbes SVC / MSC	34 / 600	34 / 600	34 / 600	34 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045
22	Roseau 500/Forbes 500	1.065 / 1.020	1.065 / 1.020	1.065 / 1.020	1.065 / 1.020
23	Chisago 500/EauClaire 345	1.024 / 1.019	1.024 / 1.019	1.024 / 1.019	1.024 / 1.019
24	Int Falls 115/Badoura 115	1.052 / 1.002	1.052 / 1.002	1.052 / 1.002	1.052 / 1.002
25	Drayton 230/Groton 345	1.019 / 1.005	1.019 / 1.005	1.019 / 1.005	1.019 / 1.005
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	143% / 235%	143% / 235%	143% / 235%	143% / 235%
28	L20D at Prairie/Drayton	999% / 905%	999% / 905%	999% / 905%	999% / 905%
29	R50M/F3M	758% / 349%	758% / 349%	758% / 349%	758% / 349%
30	B10T	342%	342%	342%	342%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.02	0.98 | 1.02	0.98 | 1.05	0.99 | 1.04
33	Boise 115	1.03 | 1.06	1.02 | 1.06	1.02 | 1.06	1.03 | 1.07
34	Dorsey 230	1.02 | 1.05	1.02 | 1.06	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	1.00 | 1.03	0.98 | 1.04	1.00 | 1.03
36	Riverton 230	0.98 | 1.04	0.97 | 1.04	0.93 | 1.04	0.96 | 1.04
37	Coal Creek 230	0.96 | 1.11	0.96 | 1.10	1.03 | 1.12	0.96 | 1.14
38	Dickinson 345	0.97 | 1.06	0.97 | 1.06	1.02 | 1.06	1.02 | 1.08
39	Drayton 230	0.99 | 1.07	0.98 | 1.08	0.95 | 1.07	1.01 | 1.08
40	Groton 345	0.89 | 1.03	0.88 | 1.03	0.89 | 1.04	0.91 | 1.03
41	Tioga 230	1.01 | 1.07	1.00 | 1.07	1.02 | 1.07	1.02 | 1.07
42	Wahpeton 115	0.98 | 1.10	0.98 | 1.10	0.93 | 1.10	0.96 | 1.10
43	Watertown 345	0.94 | 1.03	0.94 | 1.03	0.92 | 1.04	0.94 | 1.03
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 64.81%	SHERC3 / 63.87%	KING 3 / -63.78%	SHERC3 / -62.37%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	343%	333%	502%	507%
55	K22W (max +dP @ t, d-ang)	5.4@(2.64156,-0.4)	7.3@(2.61656,-1.5)	54.8@(2.86655,-31.0)	34.7@(2.56656,-19.6)
56	K22W (max -dP @ t, d-ang)	16.8@(0.80830,5.2)	17.5@(0.78330,6.3)	4.6@(0.49998,0.2)	5.8@(0.32499,0.4)
57	K22W (max d-ang @ t, dP)	8.4@(1.13329,-5.9)	9.4@(1.09996,-7.5)	-150.4@(20.00792,27.4)	-79.1@(20.00792,15.5)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	90% / 158%	87% / 154%	67% / 124%	99% / 170%
61	L20D at Prairie/Drayton	999% / 731%	999% / 737%	727% / 663%	178% / 647%
62	R50M / F3M	609% / 279%	601% / 277%	568% / 236%	650% / 269%
63	B10T	230%	222%	150%	190%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 1 | 0)	(0 | 0 | 0)	(0 | 2 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 4 | 2) / (0 | 1 | 0)	(2 | 3 | 2) / (0 | 2 | 1)	(2 | 4 | 2) / (0 | 1 | 0)	(2 | 4 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 2 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)	(0 | 4 | 1) / (2 | 2 | 2)

TABLE 9.6 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 5 (Watertown) - Case S5C5XXX

1	**Case No.**	5	6	7	8
2	**Case Name**	upe-so04aa.S5C5XXX-nbz	upe-so04aa.S5C5XXX-mqs	upe-so04aa.S5C5XXX-pys	upe-so04aa.S5C5XXX-pyt
3	**Disturbance**	nbz	mqs	pys	pyt
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 08 2002 18:17	MAY 08 2002 18:35	MAY 08 2002 18:50	MAY 08 2002 19:04
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2077 / 363	2077 / 363	2077 / 363	2077 / 363
10	MHEX / L20D	2174 / 228	2174 / 228	2174 / 228	2174 / 228
11	ECL-ARP / PRI-BYN	653 / 822	653 / 822	653 / 822	653 / 822
12	MWSI / MNEX	1476 / 2678	1476 / 2678	1476 / 2678	1476 / 2678
13	D602F / F601C	1796 / 1334	1796 / 1334	1796 / 1334	1796 / 1334
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	167 / 150	167 / 150	167 / 150	167 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	253 / 22	253 / 22	253 / 22	253 / 22
19	Forbes SVC / MSC	34 / 600	34 / 600	34 / 600	34 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045
22	Roseau 500/Forbes 500	1.065 / 1.020	1.065 / 1.020	1.065 / 1.020	1.065 / 1.020
23	Chisago 500/EauClaire 345	1.024 / 1.019	1.024 / 1.019	1.024 / 1.019	1.024 / 1.019
24	Int Falls 115/Badoura 115	1.052 / 1.002	1.052 / 1.002	1.052 / 1.002	1.052 / 1.002
25	Drayton 230/Groton 345	1.019 / 1.005	1.019 / 1.005	1.019 / 1.005	1.019 / 1.005
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	143% / 235%	143% / 235%	143% / 235%	143% / 235%
28	L20D at Prairie/Drayton	999% / 905%	999% / 905%	999% / 905%	999% / 905%
29	R50M/F3M	758% / 349%	758% / 349%	758% / 349%	758% / 349%
30	B10T	342%	342%	342%	342%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.95 | 1.09	0.96 | 1.05	0.97 | 1.01	0.99 | 1.01
33	Boise 115	0.97 | 1.08	1.01 | 1.08	1.03 | 1.07	1.05 | 1.06
34	Dorsey 230	1.05 | 1.15	1.01 | 1.06	1.03 | 1.06	1.04 | 1.05
35	Forbes 230	0.94 | 1.06	0.99 | 1.04	1.00 | 1.04	1.01 | 1.02
36	Riverton 230	0.91 | 1.05	0.95 | 1.03	1.01 | 1.02	1.01 | 1.02
37	Coal Creek 230	0.96 | 1.08	0.97 | 1.07	1.00 | 1.07	1.02 | 1.04
38	Dickinson 345	0.97 | 1.08	0.96 | 1.08	1.00 | 1.03	1.01 | 1.03
39	Drayton 230	0.97 | 1.08	0.97 | 1.06	1.00 | 1.04	1.01 | 1.03
40	Groton 345	0.87 | 1.04	0.93 | 1.02	0.98 | 1.01	1.00 | 1.01
41	Tioga 230	1.00 | 1.08	1.01 | 1.07	1.02 | 1.05	1.03 | 1.05
42	Wahpeton 115	0.90 | 1.09	0.98 | 1.08	1.03 | 1.06	1.04 | 1.06
43	Watertown 345	0.89 | 1.04	0.94 | 1.04	1.00 | 1.02	1.01 | 1.02
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	KING 3 / -35.03%	KING 3 / 5.11%	ANTEL3 / 22.18%	KING 3 / 14.86%
53	Dorsey SUVP / UdHold	/ 0.133			
54	Forbes DC Red (DCAR)	507%	475%	182%	326%
55	K22W (max +dP @ t, d-ang)	141.2@(2.10825,-64.3)	67.0@(2.65822,-34.2)	1.3@(4.11649,5.8)	0.0@(0.08333,0.0)
56	K22W (max -dP @ t, d-ang)	100.0@(0.26666,10.9)	21.5@(0.33332,4.1)	32.5@(1.76659,21.1)	20.3@(2.13325,13.1)
57	K22W (max d-ang @ t, dP)	-274.1@(20.00792,51.9)	-117.9@(20.00792,22.2)	27.4@(20.00792,-16.2)	17.4@(20.00792,-11.3)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	0.16666 sec / 0.16666 sec	51% / 105%	123% / 205%	141% / 231%
61	L20D at Prairie/Drayton	999% / 502%	999% / 653%	999% / 722%	999% / 805%
62	R50M / F3M	298% / 141%	506% / 230%	658% / 349%	715% / 349%
63	B10T	154%	137%	203%	275%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 2) / (0 | 0 | 0)	(4 | 4 | 2) / (0 | 3 | 3)	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 5 | 2) / (0 | 1 | 1)	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 2 | 0) / (1 | 5 | 2)	(0 | 1 | 0) / (1 | 2 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 5 | 2) / (2 | 2 | 2)	(0 | 3 | 2) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)	(0 | 0 | 0) / (2 | 2 | 2)

TABLE 9.6 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 5 (Watertown) - Case S5C5XXX

1	**Case No.**	9	10	11	12
2	**Case Name**	upe-so04aa.S5C5XXX-bq3	upe-so04aa.S5C5XXX-cp3	upe-so04aa.S5C5XXX-cq3	upe-so04aa.S5C5XXX-cr3
3	**Disturbance**	bq3	cp3	cq3	cr3
4	**Prior Outage**	None	None	None	None
5	**Date/Time**	MAY 08 2002 19:18	MAY 08 2002 19:32	MAY 08 2002 19:46	MAY 08 2002 20:00
6	**Comments**				
7					
8	**Steady State Flows**				
9	NDEX / EAST BIAS	2077 / 363	2077 / 363	2077 / 363	2077 / 363
10	MHEX / L20D	2174 / 228	2174 / 228	2174 / 228	2174 / 228
11	ECL-ARP / PRI-BYN	653 / 822	653 / 822	653 / 822	653 / 822
12	MWSI / MNEX	1476 / 2678	1476 / 2678	1476 / 2678	1476 / 2678
13	D602F / F601C	1796 / 1334	1796 / 1334	1796 / 1334	1796 / 1334
14	B10T / MH>SPC	166 / 99	166 / 99	166 / 99	166 / 99
15	OH E-W / OH>MH	-119 / -196	-119 / -196	-119 / -196	-119 / -196
16	R50M / OH>MP	167 / 150	167 / 150	167 / 150	167 / 150
17	Dorsey BP1 / BP2	1493 / 1690	1493 / 1690	1493 / 1690	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	253 / 22	253 / 22	253 / 22	253 / 22
19	Forbes SVC / MSC	34 / 600	34 / 600	34 / 600	34 / 600
20	**Steady State Vltgs**				
21	Dorsey 500/Dorsey 230	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045	1.037 / 1.045
22	Roseau 500/Forbes 500	1.065 / 1.020	1.065 / 1.020	1.065 / 1.020	1.065 / 1.020
23	Chisago 500/EauClaire 345	1.024 / 1.019	1.024 / 1.019	1.024 / 1.019	1.024 / 1.019
24	Int Falls 115/Badoura 115	1.052 / 1.002	1.052 / 1.002	1.052 / 1.002	1.052 / 1.002
25	Drayton 230/Groton 345	1.019 / 1.005	1.019 / 1.005	1.019 / 1.005	1.019 / 1.005
26	**SS OS Relay Margins**				
27	D602F at Forbes/Dorsey	143% / 235%	143% / 235%	143% / 235%	143% / 235%
28	L20D at Prairie/Drayton	999% / 905%	999% / 905%	999% / 905%	999% / 905%
29	R50M/F3M	758% / 349%	758% / 349%	758% / 349%	758% / 349%
30	B10T	342%	342%	342%	342%
31	**Min/MaxTransientVltg**				
32	Arrowhd 230	0.98 | 1.03	0.98 | 1.04	0.97 | 1.04	0.98 | 1.03
33	Boise 115	1.02 | 1.06	1.02 | 1.07	1.02 | 1.06	1.02 | 1.06
34	Dorsey 230	1.02 | 1.06	1.02 | 1.05	1.02 | 1.06	1.03 | 1.06
35	Forbes 230	1.00 | 1.03	1.00 | 1.03	1.00 | 1.03	1.01 | 1.03
36	Riverton 230	0.97 | 1.02	0.96 | 1.03	0.96 | 1.03	0.97 | 1.03
37	Coal Creek 230	0.98 | 1.07	0.97 | 1.08	0.98 | 1.07	0.98 | 1.07
38	Dickinson 345	0.96 | 1.04	0.97 | 1.05	0.95 | 1.04	0.96 | 1.04
39	Drayton 230	1.00 | 1.03	0.98 | 1.05	1.00 | 1.04	1.00 | 1.04
40	Groton 345	0.94 | 1.02	0.81 | 1.04	0.82 | 1.02	0.83 | 1.02
41	Tioga 230	1.02 | 1.06	1.02 | 1.06	1.02 | 1.06	1.02 | 1.06
42	Wahpeton 115	0.97 | 1.06	0.94 | 1.07	0.96 | 1.07	0.97 | 1.07
43	Watertown 345	0.79 | 1.01	(0.47)0.74 | 1.04	0.75 | 1.02	0.76 | 1.03
44	**Dynamic Voltage Warnings**				
45		none	none	none	none
46					
47					
48					
49					
50					
51					
52	Worst Case Angle Damping	SHERC3 / 47.22%	KING 3 / 46.77%	SHERC3 / 41.80%	SHERC3 / 44.59%
53	Dorsey SUVP / UdHold				
54	Forbes DC Red (DCAR)	252%	253%	214%	236%
55	K22W (max +dP @ t, d-ang)	14.1@(2.88321,-5.4)	28.1@(3.12487,-11.2)	20.3@(3.07487,-8.4)	20.5@(2.93321,-8.0)
56	K22W (max -dP @ t, d-ang)	21.6@(0.87497,9.9)	25.4@(1.02496,11.4)	26.2@(0.91663,12.9)	21.3@(0.88330,10.1)
57	K22W (max d-ang @ t, dP)	14.7@(1.24995,-11.7)	16.2@(1.39994,-15.4)	19.0@(1.31661,-14.7)	14.9@(1.25828,-11.1)
58	**OS Rel Trip / Marg**				
59	MH - OH				
60	D602F at Forbes/Dorsey	81% / 147%	67% / 128%	76% / 141%	86% / 155%
61	L20D at Prairie/Drayton	999% / 730%	999% / 695%	999% / 688%	999% / 706%
62	R50M / F3M	584% / 286%	550% / 268%	568% / 289%	599% / 291%
63	B10T	225%	209%	188%	203%
64	**FSCAPS (SS/Unav/Final)**				
65	Balta 230	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 3) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)	(4 | 4 | 4) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 2 | 2) / (0 | 0 | 0)	(2 | 3 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 1 | 1)	(2 | 2 | 2) / (0 | 1 | 1)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 2 | 2) / (2 | 2 | 2)	(0 | 4 | 4) / (2 | 2 | 2)	(0 | 3 | 3) / (2 | 2 | 2)	(0 | 2 | 2) / (2 | 2 | 2)

TABLE 9.6 - POWER FLOW AND STABILITY SUMMARY TABLE
Site 5 (Watertown) - Case S5C5XXX

1	**Case No.**	13
2	**Case Name**	upe-so04aa.S5C5XXX-cs3
3	**Disturbance**	cs3
4	**Prior Outage**	None
5	**Date/Time**	MAY 08 2002 20:14
6	**Comments**	
7		
8	**Steady State Flows**	
9	NDEX / EAST BIAS	2077 / 363
10	MHEX / L20D	2174 / 228
11	ECL-ARP / PRI-BYN	653 / 822
12	MWSI / MNEX	1476 / 2678
13	D602F / F601C	1796 / 1334
14	B10T / MH>SPC	166 / 99
15	OH E-W / OH>MH	-119 / -196
16	R50M / OH>MP	167 / 150
17	Dorsey BP1 / BP2	1493 / 1690
18	Dorsey Reserve / Wtrtn SVC	253 / 22
19	Forbes SVC / MSC	34 / 600
20	**Steady State Vltgs**	
21	Dorsey 500/Dorsey 230	1.037 / 1.045
22	Roseau 500/Forbes 500	1.065 / 1.020
23	Chisago 500/EauClaire 345	1.024 / 1.019
24	Int Falls 115/Badoura 115	1.052 / 1.002
25	Drayton 230/Groton 345	1.019 / 1.005
26	**SS OS Relay Margins**	
27	D602F at Forbes/Dorsey	143% / 235%
28	L20D at Prairie/Drayton	999% / 905%
29	R50M/F3M	758% / 349%
30	B10T	342%
31	**Min/MaxTransientVltg**	
32	Arrowhd 230	0.99 | 1.02
33	Boise 115	1.03 | 1.06
34	Dorsey 230	1.03 | 1.05
35	Forbes 230	1.01 | 1.02
36	Riverton 230	1.00 | 1.01
37	Coal Creek 230	1.01 | 1.04
38	Dickinson 345	0.99 | 1.03
39	Drayton 230	1.00 | 1.02
40	Groton 345	0.98 | 1.01
41	Tioga 230	1.03 | 1.05
42	Wahpeton 115	1.02 | 1.04
43	Watertown 345	0.97 | 1.02
44	**Dynamic Voltage Warnings**	
45		none
46		
47		
48		
49		
50		
51		
52	Worst Case Angle Damping	ANTEL3 / 38.15%
53	Dorsey SUVP / UdHold	
54	Forbes DC Red (DCAR)	340%
55	K22W (max +dP @ t, d-ang)	2.5@(3.94150,1.6)
56	K22W (max -dP @ t, d-ang)	19.9@(1.97492,8.9)
57	K22W (max d-ang @ t, dP)	13.0@(1.33328,-11.8)
58	**OS Rel Trip / Marg**	
59	MH - OH	
60	D602F at Forbes/Dorsey	103% / 177%
61	L20D at Prairie/Drayton	999% / 830%
62	R50M / F3M	634% / 324%
63	B10T	265%
64	**FSCAPS (SS/Unav/Final)**	
65	Balta 230	(0 | 0 | 0)
66	Eau Cl 345 / Park Lk 115	(4 | 4 | 4) / (0 | 0 | 0)
67	Prairie 115 / Ramsey 230	(2 | 2 | 2) / (0 | 0 | 0)
68	Roseau 230 / Running 230	(0 | 0 | 0) / (1 | 1 | 1)
69	Shey 115 / Split Rock 115	(0 | 0 | 0) / (2 | 2 | 2)

Table 9.7a
Summary of Site 5 (Watertown) Selected Alternatives

ALTERNATIVE		MEETS CRITERIA ?	REQUIRES GENERATION TRIPPING ?
Watertown-Granite Falls 345 kV Upgrade + Granite Falls-Blue Lake 345 kV	S5C1XXA - SVC at Wind Generation Terminals	Yes	No
	S5C5XXX - Watertown-Huron 345 kV Upgrade + Huron-Split Rock 345 kV	Yes	No

Table 9.7b
Interface Flows for Site 5 (Watertown) Selected Alternatives

ALTERNATIVE	MHEX	G82R	LD20	D602F	R50M	NDEX	MWSI	PI-BYN	EAU-ARP
S5C1XXA	2172.1	-28.7	219.4	1812.1	169.3	2074.6	1485.3	830.8	654.5
S5C5XXX	2174.1	-18.0	227.6	1796.8	167.7	2077.0	1478.9	823.8	655.1

Table 9.8
MUST Results Case S5C1XXA

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FCITC Single Study

  *** MUST 4.01.07 ***  SUN, MAY 12 2002  16:21 ***
      UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
      ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE5      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5934 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX% S5C1XXA   %
     2  -2910.7 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1955.1 -1732.0 -0.07666         -0.07314 -1812.1 -1599.2   111   111    115      4
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     660
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.65490  0.00538   218.4   202.7
     3  -2772.2 L:  515 HURON  7 115   528 WOONSKT7 115 1         118.2    88.0  0.01089          0.01161    63.4    31.2   119   119    132     13
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     331
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25397 -0.00282   215.8   223.6
    11  -2126.2 L:  574 SIOUXCY869.0  2338 PLYMOTH869.0 1          71.3    50.0  0.01000          0.00173    12.9     9.3   126   126    142     16
                C:  566 SIOUXCY5 161  2337 PLYMOTH5 161 1     487
                  Open   566 SIOUXCY5 161  2337 PLYMOTH5 161 1                           0.27947  0.02961   208.7   145.8
    14  -1994.3 L:  528 WOONSKT7 115   623 STORLA 7 115 1         109.7    88.0  0.01089          0.01161    54.9    31.8   112   112   124     12
                C:  507 FTTHOMP4 230   622 STORLA 4 230 1     331
                  Open   507 FTTHOMP4 230   622 STORLA 4 230 1                           0.25397 -0.00282   215.8   221.4
    15  -1919.5 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1851.1 -1732.0 -0.06207         -0.07314 -1812.1 -1671.7
   108  -1219.6 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          87.1    65.8  0.01743          0.00479    46.2    40.3   120   120   128      8
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.22919  0.05518   178.4   111.1
  2806  -1095.4 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1812.1 -1732.0 -0.07314
                  Base Case
  5866   -706.1 L:46502 HENRYTR869.0 46553 BIRDISL869.0 1         -48.6   -40.7 -0.01124         -0.00372   -16.4   -13.8   107   107   121     14
                C: 1246 REDFLST7 115  1653 MINVALY7 115 1     886
                  Open  1246 REDFLST7 115  1653 MINVALY7 115 1                           0.31190 -0.02411  -103.2   -86.2
  5881   -594.8 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -122.2  -106.0 -0.02722         -0.01482   -81.0   -72.2   115   115   127     12
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     945
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.21869 -0.05669  -188.1  -154.4
  5882   -585.3 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -87.2   -77.0 -0.01743         -0.00479   -46.3   -43.5   112   112   121      9
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.22919  0.05518   178.4   146.1
  5887   -519.8 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1770.0  1732.0  0.07314
                  Base Case
  5888   -519.7 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1770.0 -1732.0 -0.07314
                  Base Case
  5889   -506.5 L:46502 HENRYTR869.0 46608 BIRCH R869.0 1          46.4    40.7  0.01124          0.00372    14.2    12.3   108   108   116      8
                C: 1246 REDFLST7 115  1653 MINVALY7 115 1     886
                  Open  1246 REDFLST7 115  1653 MINVALY7 115 1                          -0.31190 -0.02411  -103.2   -91.0
  5891   -421.0 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          99.5    88.0  0.02722          0.01482    58.3    52.1   106   106   121     15
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     945
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.21869 -0.05669  -188.1  -164.3
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Table 9.8 (Cont.)
MUST Results Case S5C1XXA

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5893   -390.0 L:  504 BROOKNG7 115   505 FLANDRU7 115 1         151.2   132.0  0.04914          0.01870    66.1    58.8   93     93   115   22
              C: 1634 SPLT RK3 345 45641 SPLTRTA3 345 1    1308
                Open  1634 SPLT RK3 345 45641 SPLTRTA3 345 1                          -0.13959 -0.21808  -609.6  -524.5
5894   -389.9 L:  504 BROOKNG7 115   505 FLANDRU7 115 1         151.2   132.0  0.04914          0.01870    66.1    58.8    93    93   115   22
              C:  537 WHITE  3 345 45641 SPLTRTA3 345 1     430
                Open   537 WHITE  3 345 45641 SPLTRTA3 345 1                           0.13959  0.21808   609.6   524.5
5899   -340.6 L:46563 FRANKLN869.0 46608 BIRCH R869.0 1         -44.5   -40.7 -0.01124         -0.00372   -12.3   -11.1   112   112   113    1
              C: 1246 REDFLST7 115  1653 MINVALY7 115 1     886
                Open  1246 REDFLST7 115  1653 MINVALY7 115 1                           0.31190 -0.02411  -103.2   -95.0
5902   -321.8 L:  504 BROOKNG7 115   531 WATERTN7 115 1        -142.9  -132.0 -0.03392         -0.00523   -58.5   -56.8   NONE  NONE  108   NEW
              C:  529 WATERTN3 345   537 WHITE  3 345 1     410
                Open   529 WATERTN3 345   537 WHITE  3 345 1                          -0.12630  0.22714   668.8   595.7
5903   -317.6 L:  503 BLAIR  4 230   550 GRANITF4 230 1         493.2   425.0  0.21477          0.08370   290.9   264.3   N/A   NONE  116   NEW
              C:  529 WATERTN3 345 99550 GRANFLS3 345 1     414
                Open   529 WATERTN3 345 99550 GRANFLS3 345 1                           0.33655  0.38945   601.3   477.6
5909   -231.0 L:  915 ELBOWLK7 115   940 GRANTCO7 115 1        -110.1  -105.0 -0.02220         -0.01373   -73.5   -70.3   100   100   104     4
              C:  934 FERGSFL4 230  1940 HENNING4 230 1     784
                Open   934 FERGSFL4 230  1940 HENNING4 230 1                          -0.16250  0.05215   225.3   213.3
5911   -195.9 L:46563 FRANKLN869.0 46608 BIRCH R869.0 1         -42.9   -40.7 -0.01124         -0.00372   -12.3   -11.6    98    98   113    15
              C: 1246 REDFLST7 115  1650 FRANKLN7 115 1     885
                Open  1246 REDFLST7 115  1650 FRANKLN7 115 1                          -0.31190  0.02411    98.0    93.3   N/A  NONE   107    NEW
5914   -165.6 L:  529 WATERTN3 345   537 WHITE  3 345 1         848.9   792.0  0.34384          0.22714   668.8   631.1
              C:  529 WATERTN3 345 99550 GRANFLS3 345 1     414
                Open   529 WATERTN3 345 99550 GRANFLS3 345 1                           0.29965  0.38945   601.3   536.8
5915   -161.0 L:  530 WATERTN4 230 19081 WATERT3T 230 1         131.1   125.0  0.03764          0.01190    55.3    53.4  NONE   NONE  105(N/C) NEW
              C:  529 WATERTN3 345   537 WHITE  3 345 1     410
                Open   529 WATERTN3 345   537 WHITE  3 345 1                           0.11332  0.22714   668.8   632.2
5920   -119.7 L: 1005 MITCHEL7 115  1006 TRIPP  7 115 1          67.4    66.0  0.01130          0.00655    54.1    53.3   94     94  102(N/C)  8
              C: 1634 SPLT RK3 345 45641 SPLTRTA3 345 1    1308
                Open  1634 SPLT RK3 345 45641 SPLTRTA3 345 1                          -0.02178 -0.21808  -609.6  -583.5
5922   -113.3 L:46521 SACRDHT869.0 46522 RENVILL869.0 1          42.4    40.7  0.01504          0.00621    22.0    21.3    94    94   102    8
              C: 1985 PANTHER4 230 46605 MNVLTAP4 230 1    1752
                Open  1985 PANTHER4 230 46605 MNVLTAP4 230 1                          -0.08706 -0.10141  -234.5  -223.0
5923   -104.8 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1913.0  1905.0  0.07666          0.07314  1770.0  1762.4    98    98   101    3
              C:  753 RUNNING4 230  1327 SHANNON4 230 1     660
                Open   753 RUNNING4 230  1327 SHANNON4 230 1                           0.65490  0.00538   218.4   217.8
5927    -43.8 L:  530 WATERTN4 230 19078 WATERT2T 230 1         126.6   125.0  0.03667          0.01159    52.8    52.3  NONE  NONE  101(N/C) NEW
              C:  529 WATERTN3 345   537 WHITE  3 345 1     410
                Open   529 WATERTN3 345   537 WHITE  3 345 1                           0.11041  0.22714   668.8   658.8
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Table 9.8 (Cont.)
MUST Results Case S5C5XXX

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FCITC Single Study

  *** MUST 4.01.07 ***  SUN, MAY 12 2002  17:03 ***
      UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
      ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE5      To TWIN CITIES GENERATION      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5914 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF             Init   Final   CNT%  MAX% S5C5XXX   %
     2  -2650.2 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1938.6 -1732.0 -0.07795         -0.07436 -1796.8 -1599.7   111   111   113      2
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     661
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.65409  0.00549   216.8   202.2
     3  -2365.0 L:  574 SIOUXCY869.0  2338 PLYMOTH869.0 1          74.7    50.0  0.01045          0.00180    13.5     9.3   126   126   148     22
                C:  566 SIOUXCY5 161  2337 PLYMOTH5 161 1     487
                  Open   566 SIOUXCY5 161  2337 PLYMOTH5 161 1                           0.27942  0.03097   219.0   145.7
    38  -1199.6 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          86.3    65.8  0.01706          0.00486    45.8    39.9   120   120   127      7
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.22911  0.05325   176.8   112.9
  2895   -871.5 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1796.8 -1732.0 -0.07436
                  Base Case
  5850   -619.9 L:46502 HENRYTR869.0 46553 BIRDISL869.0 1         -47.3   -40.7 -0.01070         -0.00345   -15.7   -13.5   107   107   118      11
                C: 1246 REDFLST7 115  1653 MINVALY7 115 1     887
                  Open  1246 REDFLST7 115  1653 MINVALY7 115 1                           0.31175 -0.02324  -101.5   -87.1
  5859   -551.0 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -86.4   -77.0 -0.01706         -0.00486   -45.9   -43.2   112   112   120       8
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.22911  0.05325   176.8   147.4
  5867   -488.4 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -119.3  -106.0 -0.02716         -0.01483   -79.6   -72.3   115   115   112(N/C) -3
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     946
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.21849 -0.05642  -181.7  -154.1
  5878   -411.9 L:46502 HENRYTR869.0 46608 BIRCH R869.0 1          45.1    40.7  0.01070          0.00345    13.5    12.0   108   108   114      6
                C: 1246 REDFLST7 115  1653 MINVALY7 115 1     887
                  Open  1246 REDFLST7 115  1653 MINVALY7 115 1                          -0.31175 -0.02324  -101.5   -91.9
  5885   -346.1 L: 2337 PLYMOTH5 161  2348 LIT SX 5 161 1         168.6   163.0  0.01621          0.01329   129.5   124.9    94    94   103      9
                C: 2330 RAUN   3 345  2367 LEHIGH 3 345 1    2061
                  Open  2330 RAUN   3 345  2367 LEHIGH 3 345 1                           0.07274  0.04008   537.0   523.1
  5887   -317.1 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          96.6    88.0  0.02716          0.01483    56.9    52.2   106   106   109(N/C)  3
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     946
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.21849 -0.05642  -181.7  -163.8
  5888   -317.1 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1755.6  1732.0  0.07436
                  Base Case
  5889   -317.1 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1755.6 -1732.0 -0.07436
                  Base Case
  5893   -238.6 L:46563 FRANKLN869.0 46608 BIRCH R869.0 1         -43.3   -40.7 -0.01070         -0.00345   -11.6   -10.8   112   112   110      -2
                C: 1246 REDFLST7 115  1653 MINVALY7 115 1     887
                  Open  1246 REDFLST7 115  1653 MINVALY7 115 1                           0.31175 -0.02324  -101.5   -96.0
```

Table 9.8 (Cont.)
MUST Results Case S5C5XXX

```
5897   -214.3 L:  503 BLAIR  4 230   550 GRANITF4 230 1         468.8   425.0  0.20455          0.08490   274.5   256.3   N/A  NONE   110      NEW
              C:  529 WATERTN3 345 99550 GRANFLS3 345 1     414
                Open   529 WATERTN3 345 99550 GRANFLS3 345 1                          0.32666  0.36628   595.0   516.5
5903   -146.0 L:  915 ELBOWLK7 115   940 GRANTCO7 115 1        -108.2  -105.0 -0.02190         -0.01346   -72.6   -70.7   100   100   103     3
              C:  934 FERGSFL4 230  1940 HENNING4 230 1     785
                Open   934 FERGSFL4 230  1940 HENNING4 230 1                         -0.16241  0.05195   219.0   211.4
5906   -119.7 L: 1632 SPLT RK7 115  1635 SPLT RK5 161 1         192.5   187.0  0.04574          0.03506   147.5   143.3   NONE  NONE  103    NEW
              C: 1634 SPLT RK3 345 45646 SPLTRTB3 345 1    1310
                Open  1634 SPLT RK3 345 45646 SPLTRTB3 345 1                          0.07285  0.14666   618.0   600.4
5912    -80.8 L:46521 SACRDHT869.0 46522 RENVILL869.0 1          41.9    40.7  0.01468          0.00611    21.9    21.4  NONE  NONE  101     NEW
              C: 1985 PANTHER4 230 46605 MNVLTAP4 230 1    1753
                Open  1985 PANTHER4 230 46605 MNVLTAP4 230 1                         -0.08696 -0.09859  -230.3  -222.3
5913    -67.6 L:  915 ELBOWLK7 115   940 GRANTCO7 115 1        -106.5  -105.0 -0.02190         -0.01346   -72.6   -71.7    95    95  101(N/C)  6
              C: 1940 HENNING4 230  1955 INMAN  4 230 1    1734
                Open  1940 HENNING4 230  1955 INMAN  4 230 1                         -0.16241  0.05195   208.5   205.0
```

Table 9.8 (Cont.)
MUST Results Case S5C3XXX

```
FCITC Single Study

  *** MUST 4.01.07 ***  SUN, MAY 12 2002  16:42 ***
      UPE-SO04AA.S5C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
      ND=2080,MH=2171,MW=1475,OHMH=-197,OHMP=150,EWTW=-120,BD=167
 Subsys.File C:\WapaStudies-Seshu\mapp.sys
 Monit.File  C:\WapaStudies-Seshu\mapp.mon
 Contin.File C:\WapaStudies-Seshu\mapp.con
 Exclud.File C:\WapaStudies-Seshu\excldcont.exc

 Study transfer. From WAPASITE5      To WAPALOAD      . Transfer level -     50.0 MW


  Violations report ordered by transfer capability. Total  5891 violations


     N    FCITC L: Limiting constraint                          PreShift    MW       TDF             PTDF =Base Case Flow= ACCC  BASE   ACCC    Delta
                C: Contingency description                   Ncon   Flow  Rating             LODF              Init   Final   CNT%  MAX% S5C3XXX   %
     2  -2621.1 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1918.8 -1732.0 -0.07129         -0.06802 -1778.4 -1600.2   111   111   112      1
                C:  753 RUNNING4 230  1327 SHANNON4 230 1     661
                  Open   753 RUNNING4 230  1327 SHANNON4 230 1                          -0.65312  0.00500   215.0   201.9
    27  -1105.7 L: 1517 WILLMAR7 115  1519 WILLMAR869.0 1          83.3    65.8  0.01578          0.00445    45.0    40.1   120   120   123      3
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                           0.22873  0.04956   167.3   112.5
  2841   -682.7 L: 1677 ROSEAUN2 500  3465 DORSEY 2 500 1       -1778.4 -1732.0 -0.06802
                  Base Case
  5850   -404.4 L: 1517 WILLMAR7 115  1945 KERKHOT7 115 1         -83.4   -77.0 -0.01578         -0.00445   -45.1   -43.3   112   112   115      3
                C:  550 GRANITF4 230  1516 WILLMAR4 230 1     438
                  Open   550 GRANITF4 230  1516 WILLMAR4 230 1                          -0.22873  0.04956   167.3   147.3
  5860   -326.7 L:  902 ALEXAND7 115 87901 ALEXSS   115 1        -114.2  -106.0 -0.02502         -0.01368   -77.2   -72.7   115   115   114     -1
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     946
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                           0.21779 -0.05205  -169.7  -152.7
  5881   -145.5 L:  902 ALEXAND7 115  1649 DGLASCO7 115 1          91.6    88.0  0.02502          0.01368    54.7    52.7   106   106   104     -2
                C: 1311 WINGRIV4 230  1955 INMAN  4 230 1     946
                  Open  1311 WINGRIV4 230  1955 INMAN  4 230 1                          -0.21779 -0.05205  -169.7  -162.2
  5884    -91.8 L: 1307 FORBES 2 500  1678 ROSEAUS2 500 1       -1738.2 -1732.0 -0.06802
                  Base Case
  5885    -91.8 L: 1677 ROSEAUN2 500  1678 ROSEAUS2 500 1        1738.2  1732.0  0.06802
                  Base Case
  5888    -28.0 L:  529 WATERTN3 345   537 WHITE  3 345 1         798.9   792.0  0.24558          0.20715   577.0   571.2   N/A   NONE  100     NEW
                C:  620 HURON  3 345  1634 SPLT RK3 345 1     566
                  Open   620 HURON  3 345  1634 SPLT RK3 345 1                           0.40997  0.09371   541.2   538.5
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Table 9.9
Summary of Contingency Analysis Results
Case S5C1XXA

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	115(+4)	NONE
515	HURON	115	528	WOONSKT	115	507	FTTHOMP	230	622	STORLA	230	88	128	132 (+13)	U
574	SIOUXCY	69	2338	PLYMOTH	69	566	SIOUXCY	161	2337	PLYMOTH	161	50	64	142(+16)	R
528	WOONSKT	115	622	STORLA	115	507	FTTHOMP	230	622	STORLA	230	88	128	124(+12)	U
46502	HENRYTR	69	46553	BIRDISL	69	1246	REDFLST	115	1653	MINVALY	115	40.7	37	121(+14)	R
46502	HENRYTR	69	46608	BIRCH	69	1246	REDFLST	115	1653	MINVALY	115	40.7	37	116(+8)	R
46563	FRANKLIN	69	46608	BIRCH	69	1246	REDFLST	115	1653	MINVALY	115	40.7	37	113(+15)	R
504	BROOKNG	115	505	FLANDRU	115	537	WHITE	345	45641	SPLTRT	345	132	128	115(+22)	R
504	BROOKNG	115	531	WATERTN	115	529	WATERTN	345	537	WHITE	345	132	160	108(NEW)	U
503	BLAIR	230	550	GRANIT	230	529	WATERTN	345	99550	GRANFLS	345	425	425	116(NEW)	R
915	ELBOWLK	115	940	GRANTCO	115	934	FERGSFL	230	1940	HENNING	230	105	96	104(+4)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	121(+9)	U
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	121(+15)	R
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	127(+12)	R
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	128(+8)	U
529	WATERTN	345	537	WHITE	345	529	WATERTN	345	99550	GRANFLS	345	792	880	107(NEW)	U
530	WATERTN	230	19081	WATERT3T	230	529	WATERTN	345	537	WHITE	345	125	100	105(NEW)	RT
1677	ROSEAUN2	500	1678	ROSEAUS2	500	753	RUNNING	230	1327	SHANNON	230	1905	1732	101(+3)	R
1005	MITCHEL	115	1006	TRIPP	115	1634	SPLT RK3	345	45641	SPLTRTA3	345	66	70	102(+8)	U
530	WATERTN	230	19078	WATERT2T	230	529	WATERTN	345	537	WHITE	345	125	100	101(NEW)	RT

Table 9.9 (Cont.)
Summary of Contingency Analysis Results
Case S5C5XXX

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	113(+2)	U
574	SIOUXCY	69	2338	PLYMOTH	69	566	SIOUXCY	161	2337	PLYMOTH	161	50	64	148(+22)	R
1632	SPLT RK	115	1635	SPLT RK	161	1634	SPLT RK	345	45646	SPLTRTB	345	187	187	103(NEW)	U
46502	HENRYTR	69	46553	BIRDISL	69	1246	REDFLST	115	1653	MINVALY	115	40.7	37	118(+11)	R
46502	HENRYTR	69	46608	BIRCH	69	1246	REDFLST	115	1653	MINVALY	115	40.7	37	114(+6)	R
46563	FRANKLIN	69	46608	BIRCH	69	1246	REDFLST	115	1653	MINVALY	115	40.7	37	110(-2)	R
503	BLAIR	230	550	GRANIT	230	529	WATERTN	345	99550	GRANFLS	345	425	425	110(NEW)	R
915	ELBOWLK	115	940	GRANTCO	115	934	FERGSFL	230	1940	HENNING	230	105	96	103(+3)	R
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	120(+8)	U
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	108(+3)	R
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	112(-3)	R
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	127(+7)	U
46521	SACRDHT	69	4652	RENVILL	69	1985	PANTHER	230	46605	MNVLTAP	230	40.7	37	101(NEW)	R
915	ELBOWLK	115	940	GRANTCO	115	1940	HENNING	230	1955	INMAN	230	105	96	101(+6)	R

Table 9.9 (Cont.)
Summary of Contingency Analysis Results
Case S5C3XXX

LIMITING CONSTRAINT						CONTINGENCY						RATE C	RATE B	%LOADING ON RATEC	RECOMMENDATION
F BUS			T BUS			F BUS			T BUS						
#	NAME	KV	#	NAME	KV	#	NAME	KV	#	NAME	KV				
1677	ROSEAUN2	500	3465	DORSEY 2	500	753	RUNNING	230	1327	SHANNON	230	1732	2094	112(+1)	U
1517	WILLMAR7	115	1945	KERKHOT7	115	550	GRANITF4	230	1516	WILLMAR4	230	77	100	115(+3)	U
902	ALEXAND	115	1649	DOUGLAS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	104(-2)	NONE
902	ALEXAND	115	87901	ALEXSS	115	1311	WINGRIV	230	1955	INMAN	230	88	96	108(-7)	NONE
1517	WILMAR	115	1519	WILMAR	69	550	GRANIT4	230	1516	WILMAR	230	65.8	84	123(+3)	U

Table 9.12
Constrained Interface Impact Analyses - Case S5C1XXA

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   350.7 DIFF:     0.1%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   366.5 DIFF:    -9.2%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   346.6 DIFF:    -4.0%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   238.3 DIFF:   -15.4%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:   105.6 DIFF:    -0.4%
99554 --------  - 99550 GRANFLS3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   187.0 DIFF:    13.7%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    94.5 DIFF:    -2.7%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   189.6 DIFF:    21.2%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   142.2 DIFF:     1.7%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    33.1 DIFF:    29.8%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    58.3 DIFF:    11.6%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    38.5 DIFF:   -23.6%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    21.5 DIFF:   -40.0%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    16.7 DIFF:   -44.2%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    46.7 DIFF:    16.5%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    29.4 DIFF:     4.1%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -219.4 DIFF:   -10.8%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    28.7 DIFF:   735.1%

SUBTOTALS FOR: NDEX                BASE:  2080.3 CHNG:  2074.6 DIFF:    -0.3%
                                                 DIFF:    -5.7   DF:    -0.6%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   169.3 DIFF:     5.0%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1812.1 DIFF:     2.4%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   219.4 DIFF:   -10.8%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -28.7 DIFF:   735.1%

SUBTOTALS FOR: MHEX_S              BASE:  2173.1 CHNG:  2172.1 DIFF:     0.0%
                                                 DIFF:    -1.0   DF:    -0.1%
*******************************************************************************
```

Table 9.12 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -166.1 DIFF:     4.9%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1770.0 DIFF:     2.4%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -215.7 DIFF:   -10.6%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    28.9 DIFF:   739.0%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2122.9 DIFF:    -0.1%
                                                 DIFF:     2.3   DF:     0.2%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   154.2 DIFF:    -0.1%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   154.6 DIFF:    -0.1%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   159.1 DIFF:    -0.1%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   354.3 DIFF:    -0.9%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   425.4 DIFF:    -0.9%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   453.5 DIFF:     4.4%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1701.0 DIFF:     0.7%
                                                 DIFF:    11.7   DF:     1.2%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   453.5 DIFF:     4.4%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   453.5 DIFF:     4.4%
                                                 DIFF:    19.1   DF:     1.9%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   260.0 DIFF:     2.4%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:   103.0 DIFF:    -8.0%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   509.1 DIFF:     4.6%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   872.1 DIFF:     2.3%
                                                 DIFF:    19.5   DF:     2.0%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   320.0 DIFF:    13.1%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   269.5 DIFF:    10.5%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   589.6 DIFF:    11.9%
                                                 DIFF:    62.7   DF:     6.3%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   162.2 DIFF:    13.4%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   310.5 DIFF:     9.7%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:   100.2 DIFF:     5.5%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   572.8 DIFF:     9.9%
                                                 DIFF:    51.8   DF:     5.2%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   654.5 DIFF:     1.1%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   654.5 DIFF:     1.1%
                                                 DIFF:     7.0   DF:     0.7%
*******************************************************************************
```

Table 9.12 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   830.8 DIFF:    -0.9%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   830.8 DIFF:    -0.9%
                                                 DIFF:    -7.9   DF:    -0.8%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   807.8 DIFF:     0.6%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   830.8 DIFF:    -0.9%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   350.2 DIFF:    -8.1%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   168.5 DIFF:    -1.2%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   108.4 DIFF:    -2.4%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    59.9 DIFF:   -17.5%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2325.6 DIFF:    -2.1%
                                                 DIFF:   -50.9   DF:    -5.1%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   654.5 DIFF:     1.1%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   830.8 DIFF:    -0.9%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1485.3 DIFF:    -0.1%
                                                 DIFF:    -0.9   DF:    -0.1%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -78.4 DIFF:     3.1%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -78.4 DIFF:     3.1%
                                                 DIFF:    -2.3   DF:    -0.2%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   482.1 DIFF:    -2.4%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   614.8 DIFF:    -1.3%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1096.9 DIFF:    -1.8%
                                                 DIFF:   -20.2   DF:    -2.0%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    59.9 DIFF:   -17.5%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    59.9 DIFF:   -17.5%
                                                 DIFF:   -12.7   DF:    -1.3%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    61.6 DIFF:    -3.1%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.9 DIFF:    -0.1%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.3 DIFF:    -0.4%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -98.7 DIFF:     1.7%
                                                 DIFF:    -1.6   DF:    -0.2%
*******************************************************************************
```

Table 9.12 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -61.2 DIFF:    -3.1%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.7 DIFF:    -0.1%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.3 DIFF:    -0.4%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:   100.8 DIFF:     1.6%
                                                DIFF:     1.6   DF:     0.2%
*****************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -81.9 DIFF:   116.7%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -81.9 DIFF:   116.7%
                                                DIFF:   -44.1   DF:    -4.4%
*****************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    97.8 DIFF:    -2.4%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    97.8 DIFF:    -2.4%
                                                DIFF:    -2.4   DF:    -0.2%
*****************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   354.3 DIFF:    -1.2%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   354.3 DIFF:    -1.2%
                                                DIFF:    -4.2   DF:    -0.4%
*****************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   207.4 DIFF:    -8.3%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    66.3 DIFF:   -17.4%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   273.7 DIFF:   -10.7%
                                                DIFF:   -32.7   DF:    -3.3%
*****************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   453.5 DIFF:     4.4%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   453.5 DIFF:     4.4%
                                                DIFF:    19.1   DF:     1.9%
*****************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -28.7 DIFF:   735.1%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -28.7 DIFF:   735.1%
                                                DIFF:   -25.3   DF:    -2.5%
*****************************************************************************
```

Table 9.12 (Cont.)
Constrained Interface Impact Analyses - Case S5C5XXX

```
***** BASE CASE:
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166


***** CHNG CASE:
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166


***** BASE TRANSACTION AMOUNT FOR DF CALCULATION:  1000.000


0605  LELANDO3  - 0506  FTTHOMP3   BASE:   350.2 CHNG:   342.0 DIFF:    -2.3%
0605  LELANDO3  - 0660  GROTON 3   BASE:   403.4 CHNG:   344.5 DIFF:   -14.6%
0601  ANTELOP3  - 0620  HURON  3   BASE:   361.1 CHNG:   431.1 DIFF:    19.4%
0910  BIGSTON4  - 0503  BLAIR  4   BASE:   281.8 CHNG:   238.0 DIFF:   -15.5%
0554  MORRIS 4  - 0550  GRANITF4   BASE:   106.1 CHNG:    98.9 DIFF:    -6.8%
99554 --------  - 99550 GRANFLS3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0903  AUDUBON4  - 1980  HUBBARD4   BASE:   164.5 CHNG:   180.7 DIFF:     9.8%
0521  SULLYBT4  - 0519  OAHE   4   BASE:    97.1 CHNG:    92.6 DIFF:    -4.7%
1955  INMAN  4  - 1311  WINGRIV4   BASE:   156.5 CHNG:   183.1 DIFF:    17.0%
0470  BISON  4  - 0497  MAURINE4   BASE:   139.9 CHNG:   137.7 DIFF:    -1.5%
0716  LAPORTE7  - 1340  BADOURA7   BASE:    25.5 CHNG:    31.2 DIFF:    22.5%
0902  ALEXAND7  - 1649  DGLASCO7   BASE:    52.3 CHNG:    56.9 DIFF:     8.9%
0827  ELLENDL7  - 1001  ABDNJCT7   BASE:    50.4 CHNG:    40.8 DIFF:   -19.1%
0432  EDGELEY7  - 0534  ORDWAY 7   BASE:    35.8 CHNG:    21.1 DIFF:   -41.0%
0438  FORMAN 7  - 0522  SUMMIT-7   BASE:    29.9 CHNG:    15.8 DIFF:   -47.1%
0920  CANBY  7  - 0551  GRANITF7   BASE:    40.1 CHNG:    44.3 DIFF:    10.7%
1946  KERKHO 7  - 1945  KERKHOT7   BASE:    28.3 CHNG:    28.0 DIFF:    -1.1%
0752  DRAYTON4  - 3458  LETELER4   BASE:  -245.8 CHNG:  -227.6 DIFF:    -7.4%
9838  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
5601  --------  - 5634  --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99838 --------  - 99660 --------   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
9847  --------  - 0506  FTTHOMP3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0792  MAPLE R3  - 1667  BENTON 3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
99755 --------  - 1318  ARROWHD3   BASE:     0.0 CHNG:     0.0 DIFF:   999.0%
0925  RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    18.0 DIFF:   422.5%

SUBTOTALS FOR: NDEX               BASE:  2080.3 CHNG:  2077.0 DIFF:    -0.2%
                                                DIFF:    -3.3   DF:    -0.3%
*******************************************************************************

3477  RICHER 4  - 1679  ROSEAU 4   BASE:   161.3 CHNG:   167.7 DIFF:     4.0%
3465  DORSEY 2  - 1677  ROSEAUN2   BASE:  1769.4 CHNG:  1796.8 DIFF:     1.5%
3458  LETELER4  - 752   DRAYTON4   BASE:   245.8 CHNG:   227.6 DIFF:    -7.4%
3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -18.0 DIFF:   422.5%

SUBTOTALS FOR: MHEX_S             BASE:  2173.1 CHNG:  2174.1 DIFF:     0.0%
                                                DIFF:     1.0   DF:     0.1%
*******************************************************************************
```

Table 9.12 (Cont.)

```
1679  ROSEAU 4  - 3477  RICHER 4   BASE:  -158.3 CHNG:  -164.5 DIFF:     3.9%
1677  ROSEAUN2  - 3465  DORSEY 2   BASE: -1729.1 CHNG: -1755.6 DIFF:     1.5%
752   DRAYTON4  - 3458  LETELER4   BASE:  -241.2 CHNG:  -223.7 DIFF:    -7.3%
925   RUGBY  4  - 3424  GLENBOR4   BASE:     3.4 CHNG:    18.0 DIFF:   423.7%

SUBTOTALS FOR: MHEX_N              BASE: -2125.2 CHNG: -2125.7 DIFF:     0.0%
                                                 DIFF:    -0.5   DF:    -0.1%
*******************************************************************************

10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.3 CHNG:   153.2 DIFF:    -0.7%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   154.7 CHNG:   153.7 DIFF:    -0.7%
10103 GENTLMN4  - 10203 N.PLATT4   BASE:   159.2 CHNG:   158.1 DIFF:    -0.7%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   357.6 CHNG:   352.3 DIFF:    -1.5%
10102 GENTLMN3  - 10282 SWEET W3   BASE:   429.1 CHNG:   422.9 DIFF:    -1.4%
10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   452.1 DIFF:     4.1%

SUBTOTALS FOR: GGS                 BASE:  1689.3 CHNG:  1692.4 DIFF:     0.2%
                                                 DIFF:     3.1   DF:     0.3%
*******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   452.1 DIFF:     4.1%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   452.1 DIFF:     4.1%
                                                 DIFF:    17.6   DF:     1.8%
*******************************************************************************

10229 PAULINE3  - 10194 MOORE  3   BASE:   253.8 CHNG:   254.0 DIFF:     0.1%
10118 GR ISLD4  - 10055 COLMB.W4   BASE:   112.0 CHNG:    95.4 DIFF:   -14.8%
571   GR ISLD3  - 10186 MCCOOL 3   BASE:   486.8 CHNG:   496.9 DIFF:     2.1%

SUBTOTALS FOR: GRIS_LNC            BASE:   852.5 CHNG:   846.4 DIFF:    -0.7%
                                                 DIFF:    -6.2   DF:    -0.6%
*******************************************************************************

10065 COOPER 3  - 91002 ST JOE 3   BASE:   282.9 CHNG:   330.2 DIFF:    16.7%
10065 COOPER 3  - 86022 FAIRPT 7   BASE:   244.0 CHNG:   276.3 DIFF:    13.3%

SUBTOTALS FOR: COOPER_S            BASE:   526.9 CHNG:   606.5 DIFF:    15.1%
                                                 DIFF:    79.6   DF:     8.0%
*******************************************************************************

13451 S3451  3  - 13454 S3454  3   BASE:   143.1 CHNG:   177.1 DIFF:    23.8%
13451 S3451  3  - 13459 S3459  3   BASE:   282.9 CHNG:   326.2 DIFF:    15.3%
13251 S1251  5  - 13297 S1297  5   BASE:    95.0 CHNG:   103.0 DIFF:     8.5%

SUBTOTALS FOR: FTCAL_S             BASE:   521.0 CHNG:   606.3 DIFF:    16.4%
                                                 DIFF:    85.3   DF:     8.5%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   655.1 DIFF:     1.2%

SUBTOTALS FOR: ECL-ARP             BASE:   647.5 CHNG:   655.1 DIFF:     1.2%
                                                 DIFF:     7.6   DF:     0.8%
*******************************************************************************
```

Table 9.12 (Cont.)

```
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   823.8 DIFF:    -1.8%

SUBTOTALS FOR: PRI-BYN             BASE:   838.6 CHNG:   823.8 DIFF:    -1.8%
                                                 DIFF:   -14.8   DF:    -1.5%
*******************************************************************************

1695  AS KING3  - 1853  EAU CL 3   BASE:   802.7 CHNG:   807.3 DIFF:     0.6%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   823.8 DIFF:    -1.8%
1702  BLUE LK3  - 1608  WILMART3   BASE:   380.9 CHNG:   327.0 DIFF:   -14.2%
1697  AS KING7  - 1878  WIL R T7   BASE:   170.4 CHNG:   168.4 DIFF:    -1.2%
1744  REDROCK7  - 57266 GLENMONT   BASE:   111.1 CHNG:   108.6 DIFF:    -2.2%
1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    58.7 DIFF:   -19.2%

SUBTOTALS FOR: OLD_MNEX            BASE:  2376.4 CHNG:  2293.9 DIFF:    -3.5%
                                                 DIFF:   -82.6   DF:    -8.3%
*******************************************************************************

1853  EAU CL 3  - 92494 ARP 345    BASE:   647.5 CHNG:   655.1 DIFF:     1.2%
1604  PR ISLD3  - 1235  BYRON  3   BASE:   838.6 CHNG:   823.8 DIFF:    -1.8%

SUBTOTALS FOR: MWSI                BASE:  1486.1 CHNG:  1478.9 DIFF:    -0.5%
                                                 DIFF:    -7.2   DF:    -0.7%
*******************************************************************************
2549  ARNOLD 3  - 2050  HAZLTON3   BASE:   -76.1 CHNG:   -77.8 DIFF:     2.1%

SUBTOTALS FOR: ARN-HAZLTN          BASE:   -76.1 CHNG:   -77.8 DIFF:     2.1%
                                                 DIFF:    -1.6   DF:    -0.2%
*******************************************************************************

80021 LACYGNE7  - 80012 W.GRDNR7   BASE:   494.1 CHNG:   478.7 DIFF:    -3.1%
80021 LACYGNE7  - 80014 STILWEL7   BASE:   623.1 CHNG:   612.3 DIFF:    -1.7%

SUBTOTALS FOR: LACYGNE_N           BASE:  1117.1 CHNG:  1090.9 DIFF:    -2.3%
                                                 DIFF:   -26.2   DF:    -2.6%
*******************************************************************************

1970  LKMARN 7  - 1606  W FARIB7   BASE:    72.7 CHNG:    58.7 DIFF:   -19.2%

SUBTOTALS FOR: LKM-WFB             BASE:    72.7 CHNG:    58.7 DIFF:   -19.2%
                                                 DIFF:   -14.0   DF:    -1.4%
*******************************************************************************

3213  AUBURNT4  - 3426  RESTON 4   BASE:    63.6 CHNG:    62.9 DIFF:    -1.1%
3215  YORKTON4  - 3415  ROBLIN 4   BASE:   -90.0 CHNG:   -89.8 DIFF:    -0.3%
3230  EBCAMPB4  - 3416  RALL   4   BASE:   -70.6 CHNG:   -70.2 DIFF:    -0.5%

SUBTOTALS FOR: MH_SPC_E            BASE:   -97.1 CHNG:   -97.1 DIFF:     0.0%
                                                 DIFF:     0.0   DF:     0.0%
*******************************************************************************
```

Table 9.12 (Cont.)

```
3426  RESTON 4  - 3213  AUBURNT4   BASE:   -63.2 CHNG:   -62.5 DIFF:    -1.1%
3415  ROBLIN 4  - 3215  YORKTON4   BASE:    90.8 CHNG:    90.5 DIFF:    -0.3%
3416  RALL   4  - 3230  EBCAMPB4   BASE:    71.6 CHNG:    71.2 DIFF:    -0.5%

SUBTOTALS FOR: MH_SPC_W            BASE:    99.2 CHNG:    99.2 DIFF:     0.0%
                                                DIFF:     0.0   DF:     0.0%
******************************************************************************

2455  MNTZUMA3  - 2412  BONDRNT3   BASE:   -37.8 CHNG:   -95.9 DIFF:   153.5%

SUBTOTALS FOR: MNTZUMA_W           BASE:   -37.8 CHNG:   -95.9 DIFF:   153.5%
                                                DIFF:   -58.1   DF:    -5.8%
******************************************************************************

34147 WEMPL; B  - 92085 PAD 345    BASE:   100.2 CHNG:    98.5 DIFF:    -1.7%

SUBTOTALS FOR: NI_WUMS             BASE:   100.2 CHNG:    98.5 DIFF:    -1.7%
                                                DIFF:    -1.7   DF:    -0.2%
******************************************************************************

34133 QUAD ;    - 2082  ROCK CK3   BASE:   358.5 CHNG:   353.5 DIFF:    -1.4%

SUBTOTALS FOR: QUAD-ROCKC          BASE:   358.5 CHNG:   353.5 DIFF:    -1.4%
                                                DIFF:    -5.1   DF:    -0.5%
******************************************************************************

34133 QUAD ;    - 2202  SUB 91 3   BASE:   226.1 CHNG:   202.1 DIFF:   -10.6%
60000 CORDOVA   - 2204  E MOLIN3   BASE:    80.3 CHNG:    62.3 DIFF:   -22.4%

SUBTOTALS FOR: QUADCITY_W          BASE:   306.4 CHNG:   264.4 DIFF:   -13.7%
                                                DIFF:   -42.0   DF:    -4.2%
******************************************************************************

10102 GENTLMN3  - 10238 REDWILO3   BASE:   434.5 CHNG:   452.1 DIFF:     4.1%

SUBTOTALS FOR: WNE_WKS             BASE:   434.5 CHNG:   452.1 DIFF:     4.1%
                                                DIFF:    17.6   DF:     1.8%
******************************************************************************

3424  GLENBOR4  - 925   RUGBY  4   BASE:    -3.4 CHNG:   -18.0 DIFF:   422.5%

SUBTOTALS FOR: G82R-INFO-          BASE:    -3.4 CHNG:   -18.0 DIFF:   422.5%
                                                DIFF:   -14.5   DF:    -1.5%
******************************************************************************
```

APPENDIX 1

SCREENING OF MAPP CONTINGENCIES

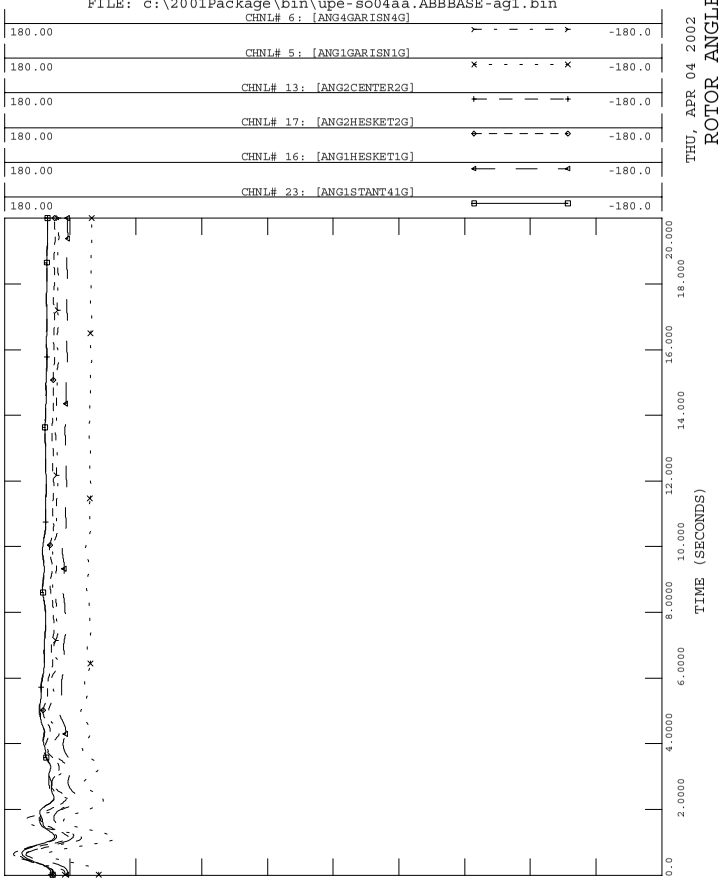
WITH DYNAMIC SIMULATION

ABBBASE Case (Without Future Coal or Wind Generation)

CONTINGENCY AG1

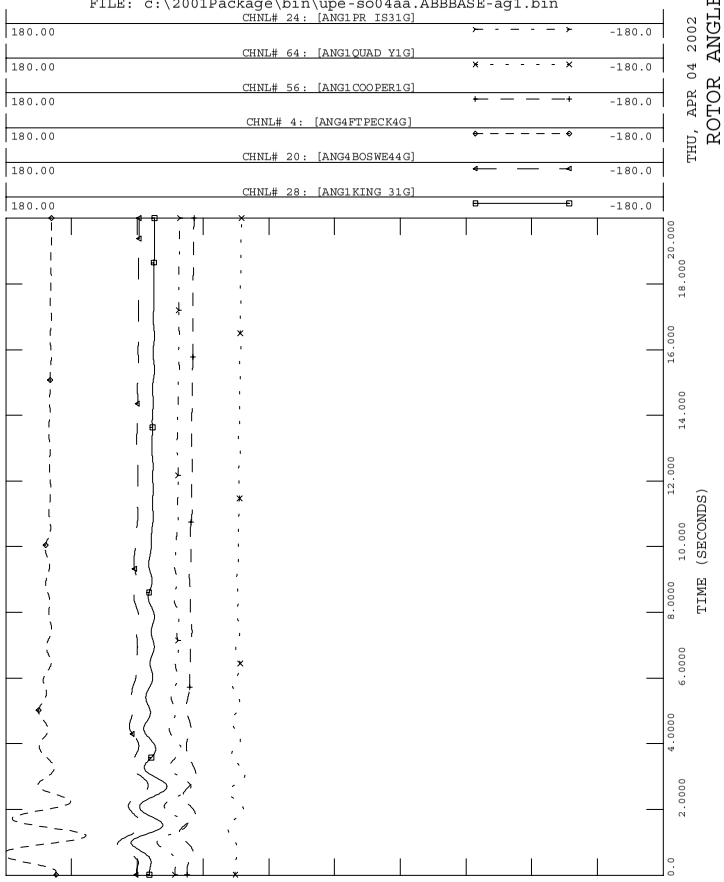
Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin



THU, APR 04 2002 11:59
ROTOR ANGLES 2

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin



THU, APR 04 2002 11:59
ROTOR ANGLES 4

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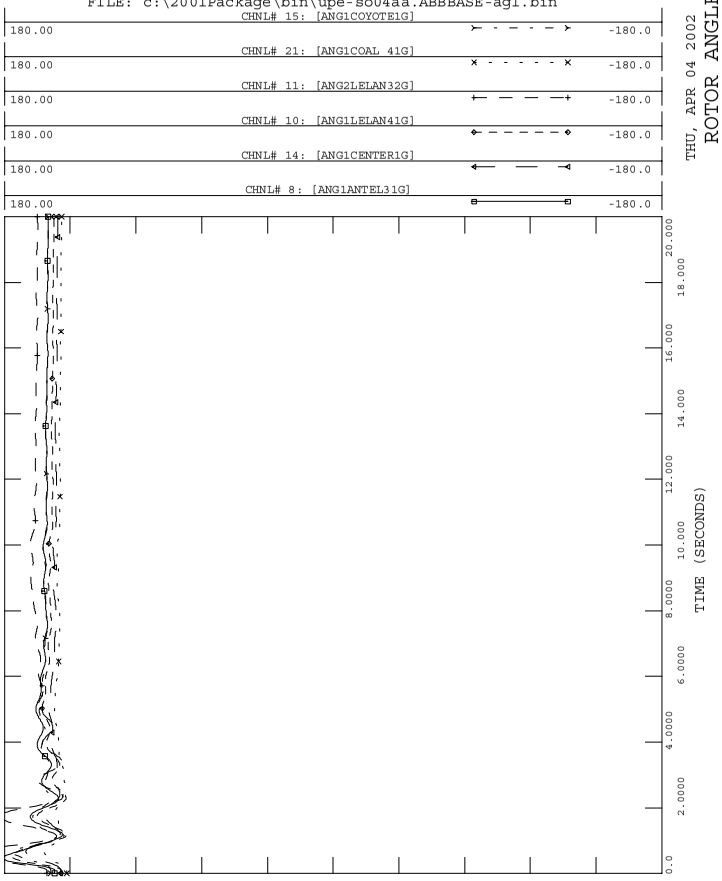
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin



THU, APR 04 2002 11:59
ROTOR ANGLES 1

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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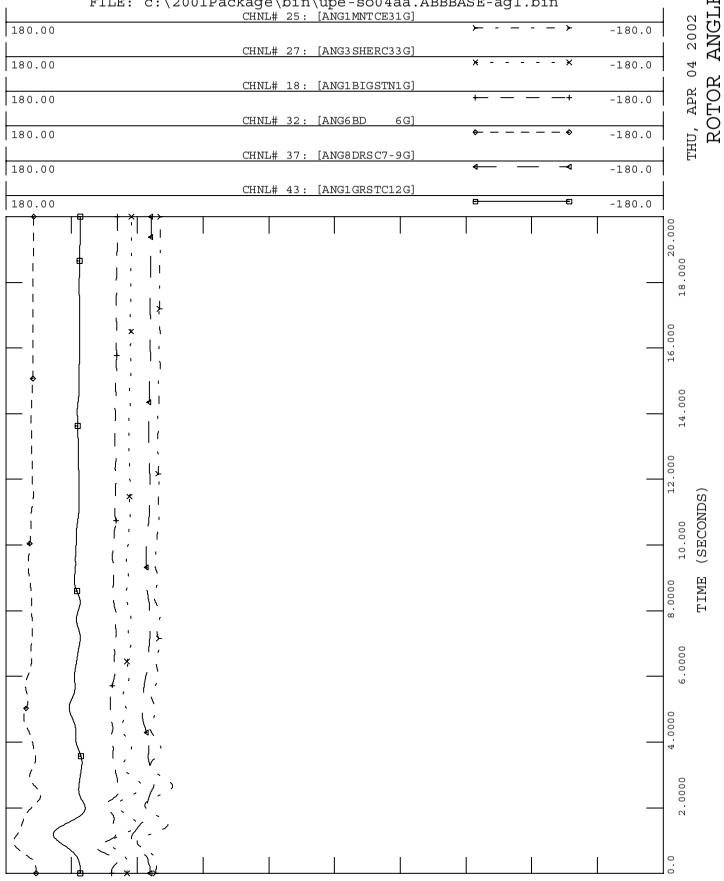
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin



THU, APR 04 2002 11:59
ROTOR ANGLES 3

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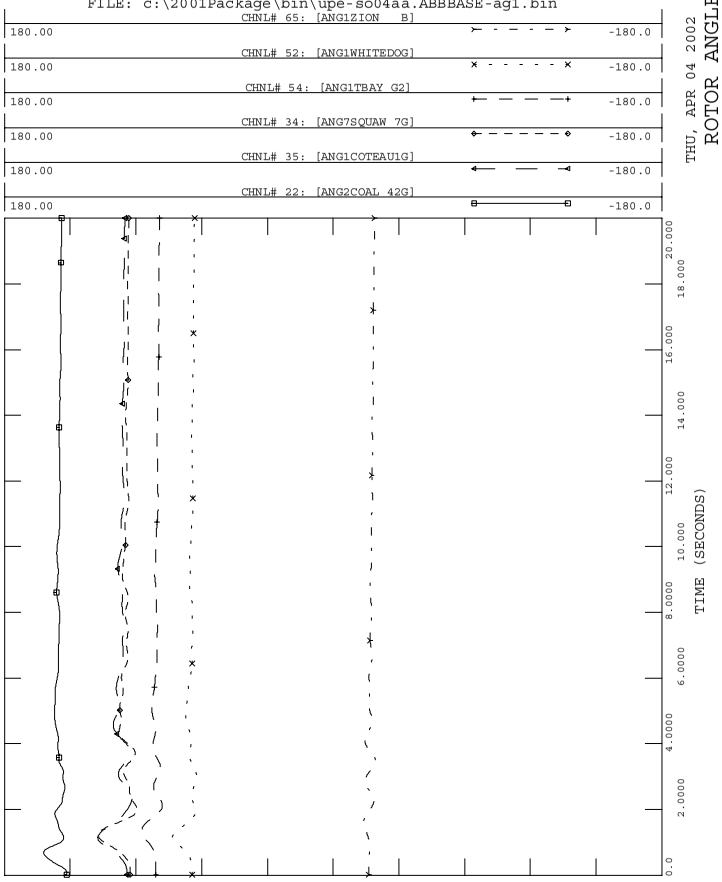
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin



THU, APR 04 2002 11:59
ROTOR ANGLES 6

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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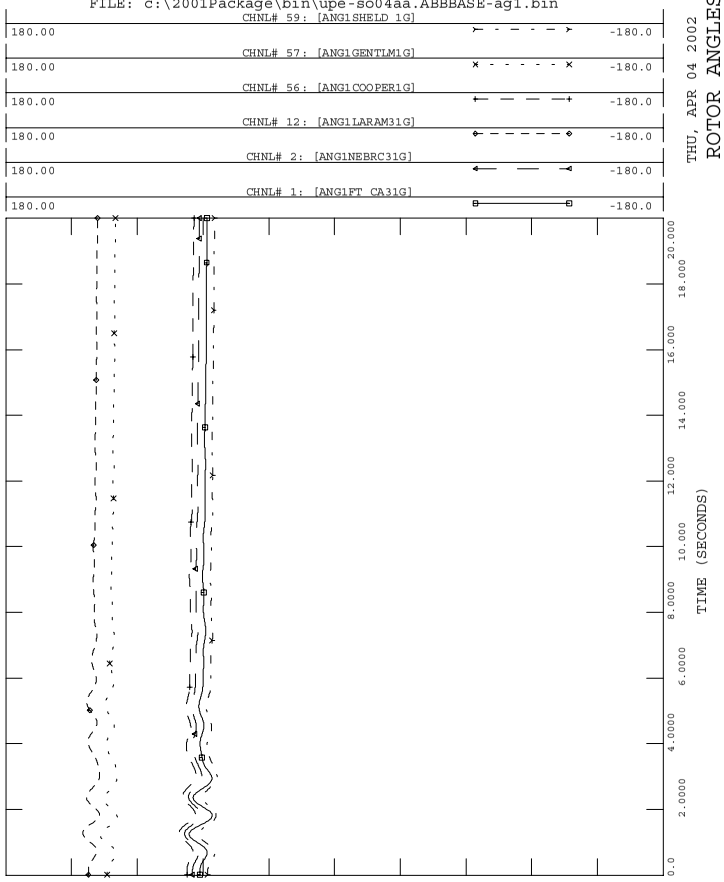
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin



THU, APR 04 2002 11:59
ROTOR ANGLES NB

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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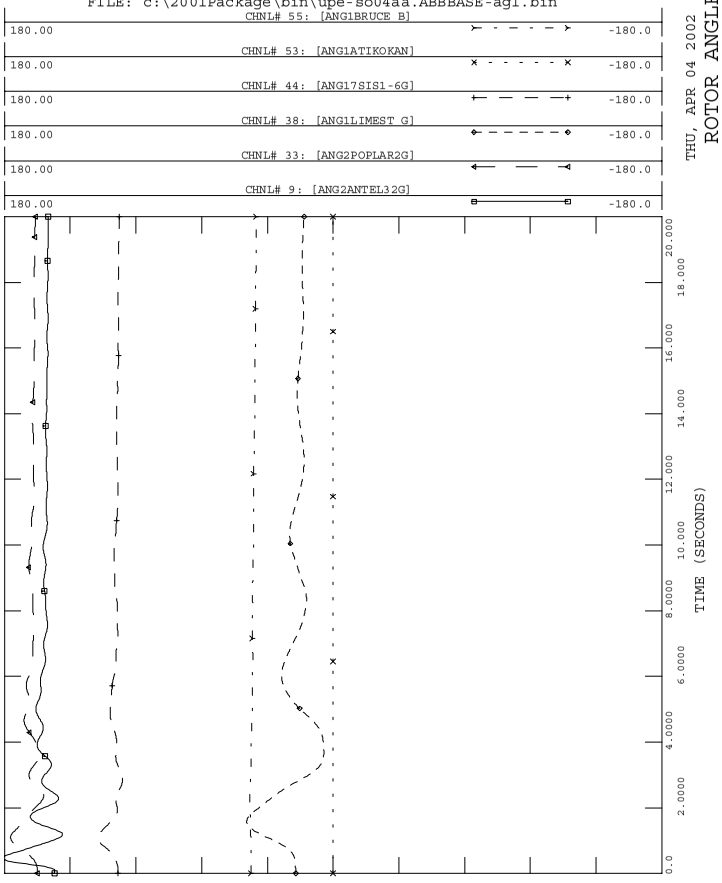
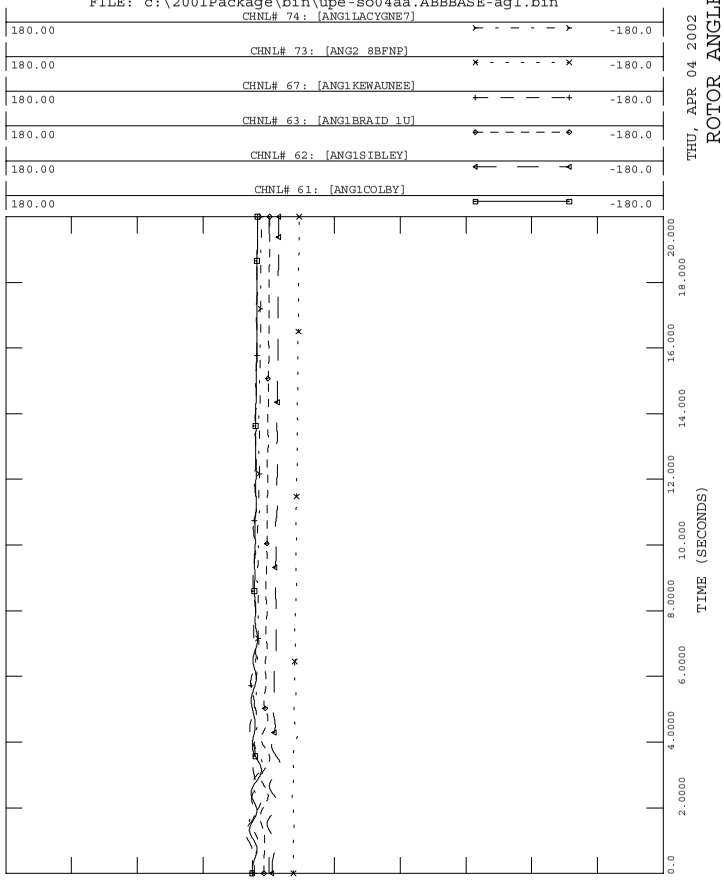


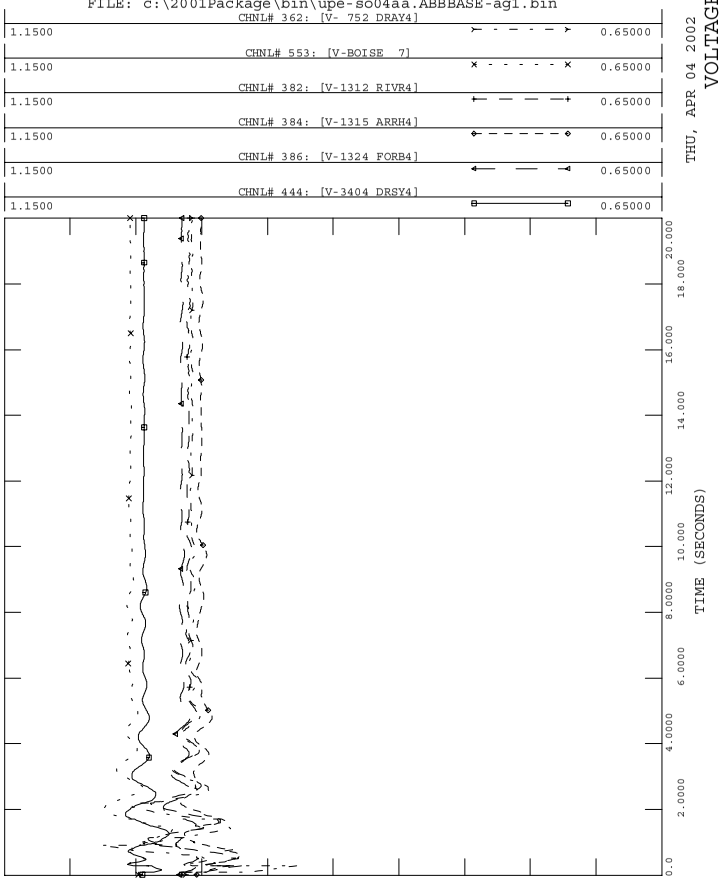
THU, APR 04 2002 11:59
ROTOR ANGLES 5

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin



THU, APR 04 2002 11:59
ROTOR ANGLES 7

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin



THU, APR 04 2002 11:59
VOLTAGES 1

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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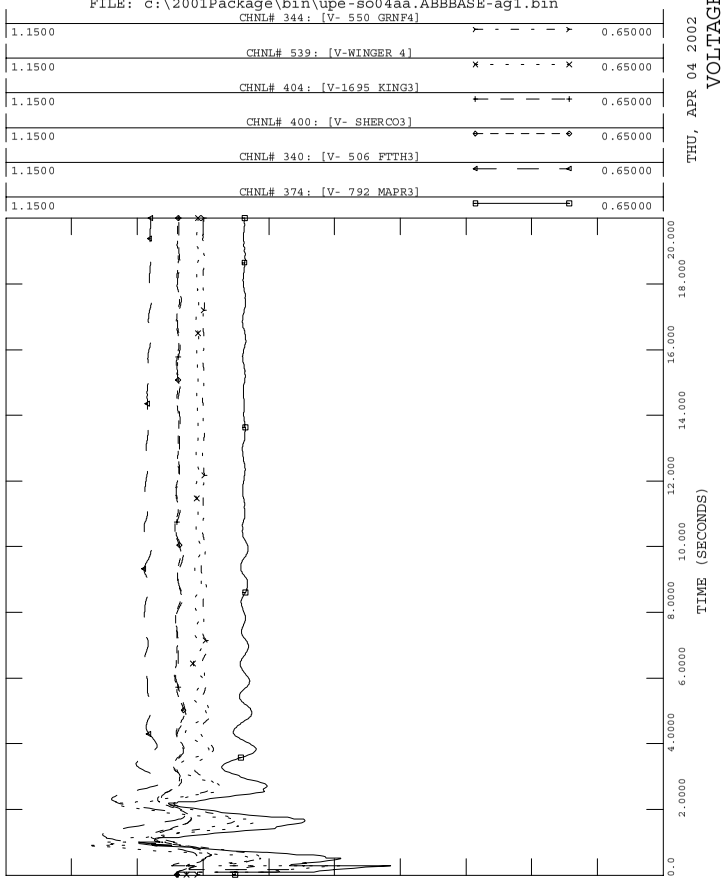

THU, APR 04 2002 11:59
VOLTAGES 3

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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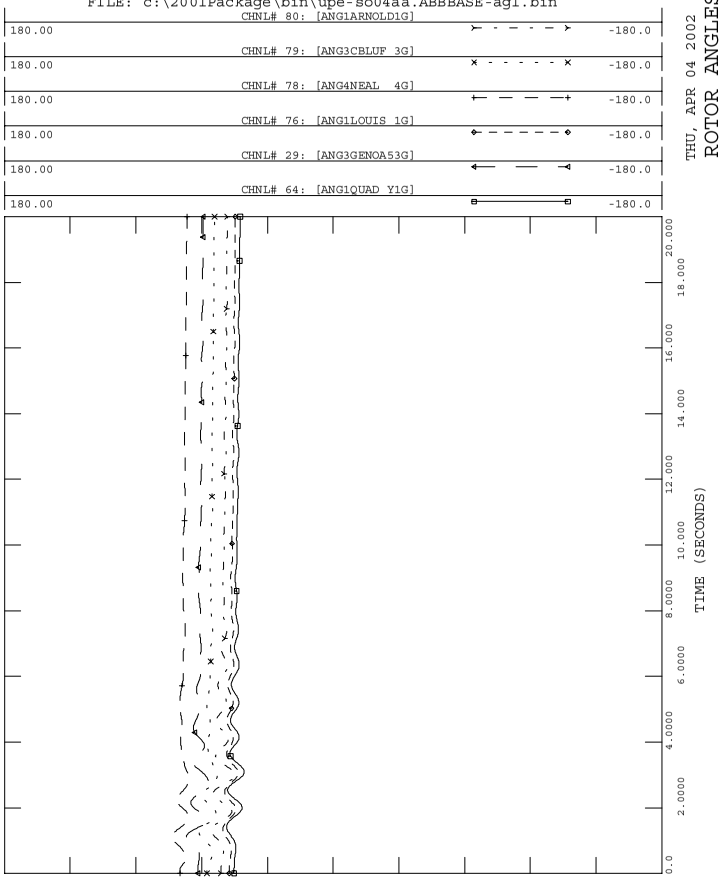

THU, APR 04 2002 11:59
ROTOR ANGLES IA

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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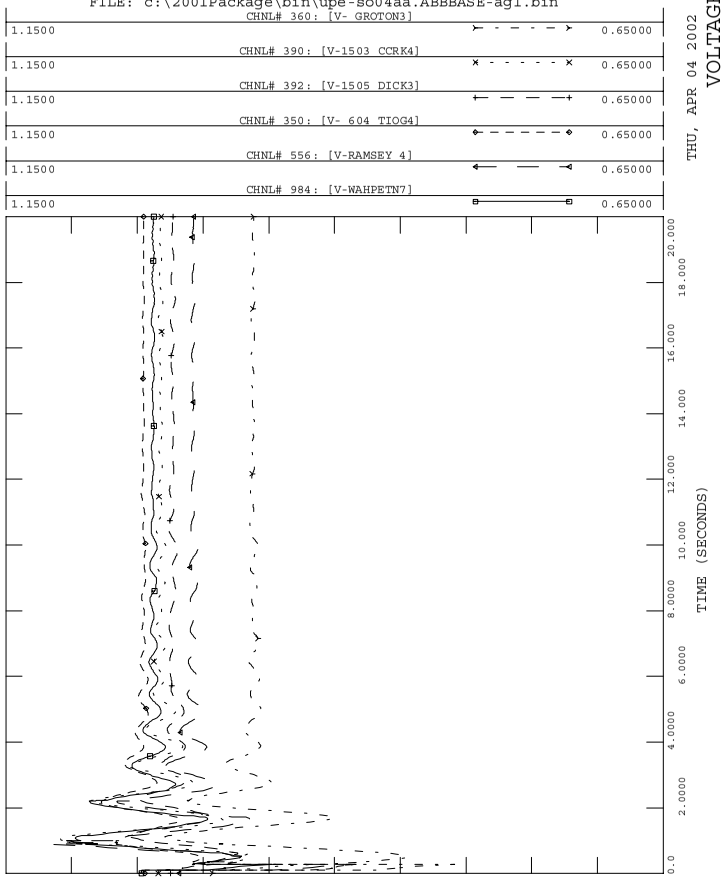

THU, APR 04 2002 11:59
VOLTAGES 2

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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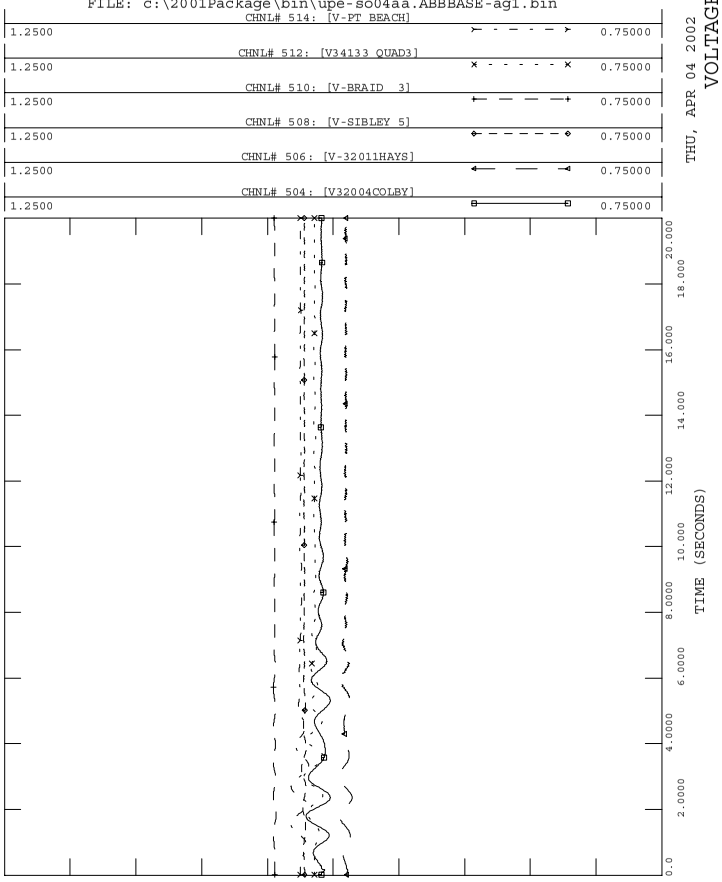
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59
VOLTAGES 5



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

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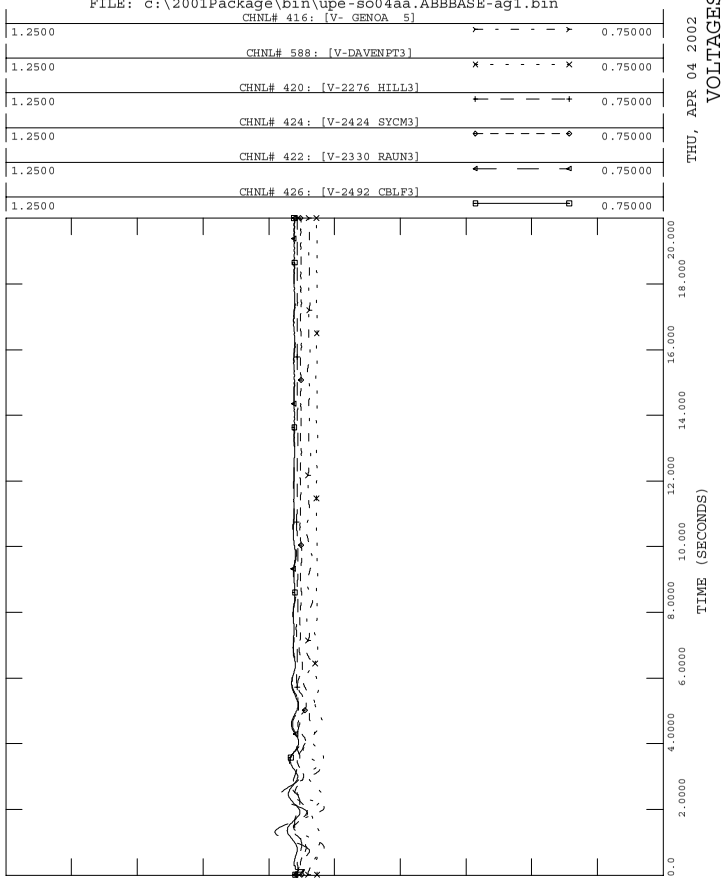
VOLTAGES IA



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ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
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CLR @ 11 CY BY TRIPPING FLTD LINE
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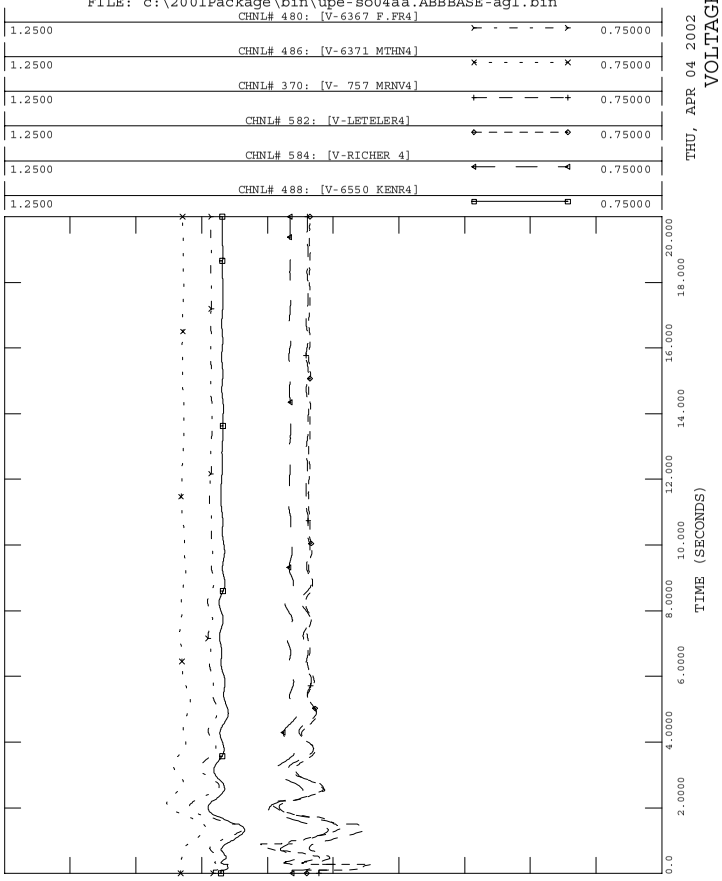
THU, APR 04 2002 11:59
VOLTAGES 4



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CLR @ 11 CY BY TRIPPING FLTD LINE
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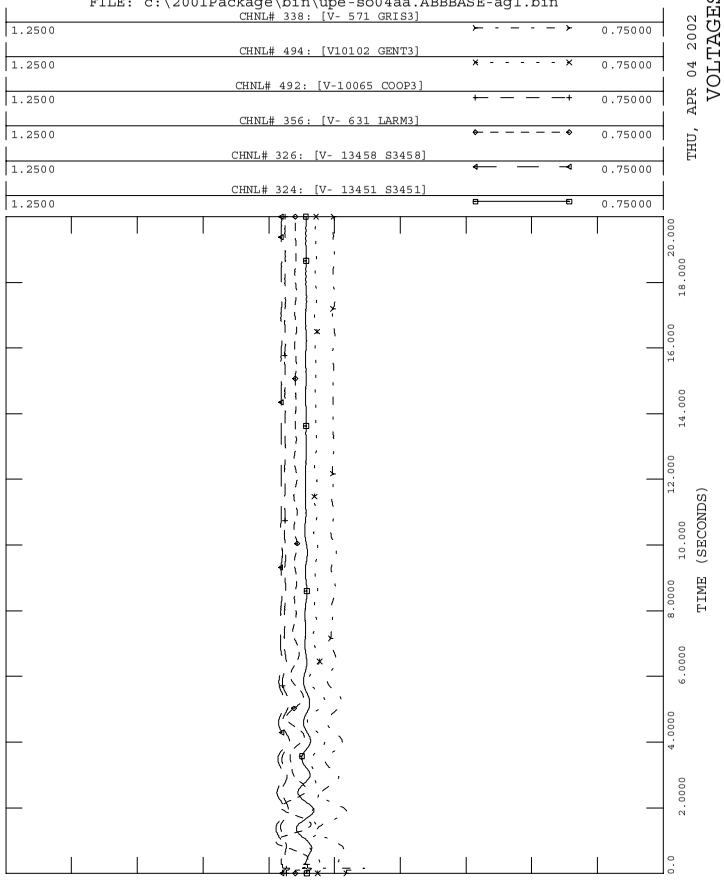
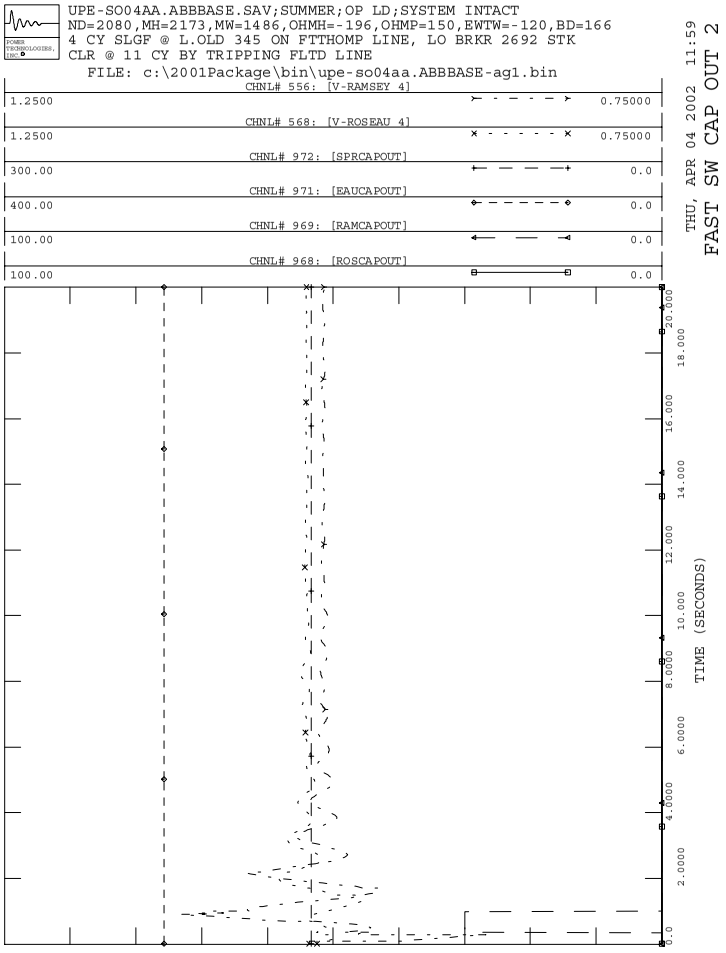
THU, APR 04 2002 11:59
VOLTAGES NB

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CLR @ 11 CY BY TRIPPING FLTD LINE
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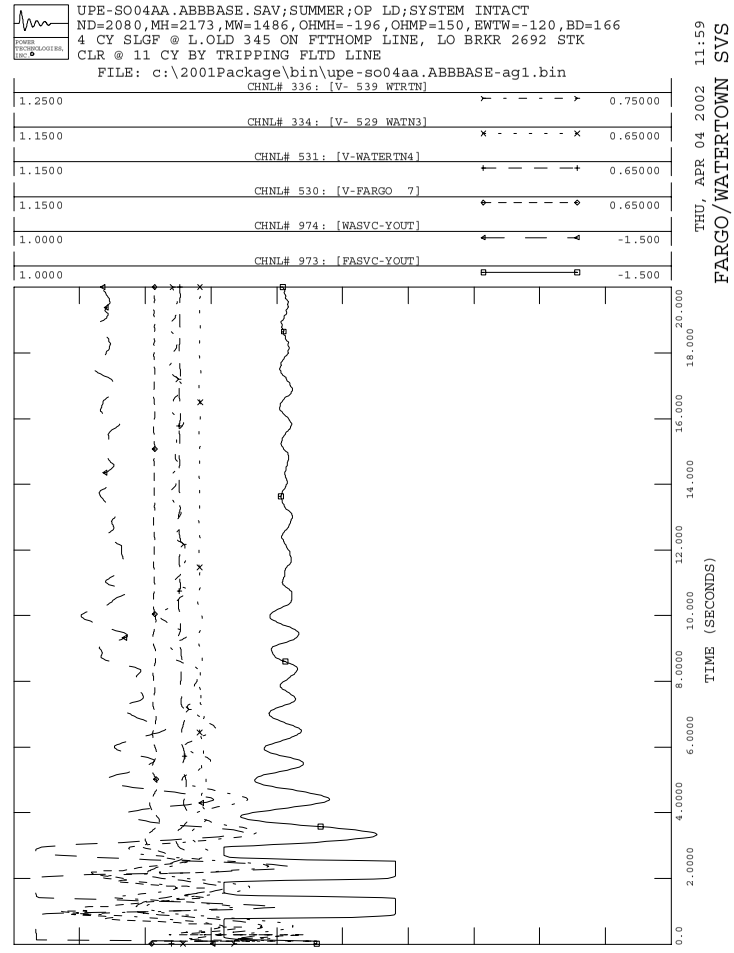
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
THU, APR 04 2002 11:59
FAST SW CAP OUT 2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ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
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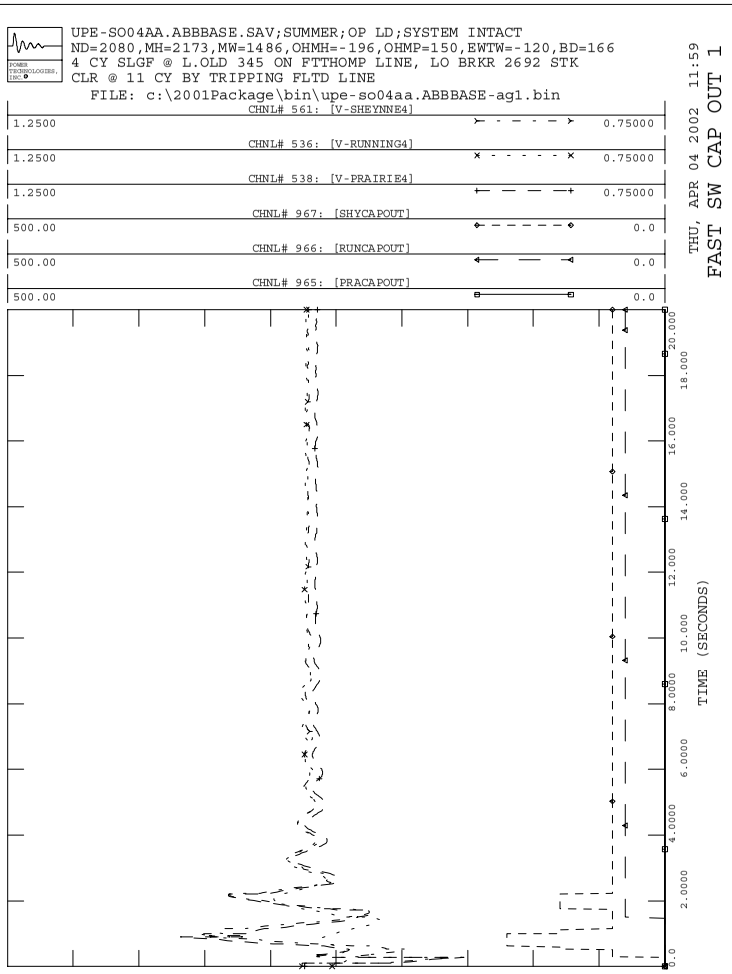
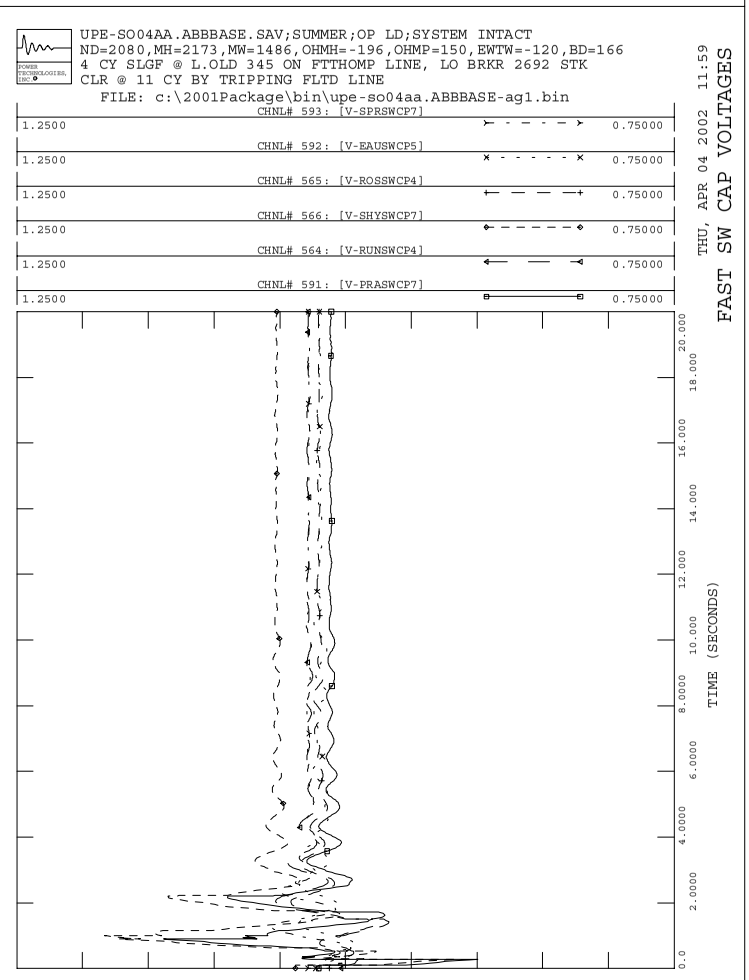
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
THU, APR 04 2002 11:59
FARGO/WATERTOWN SVS

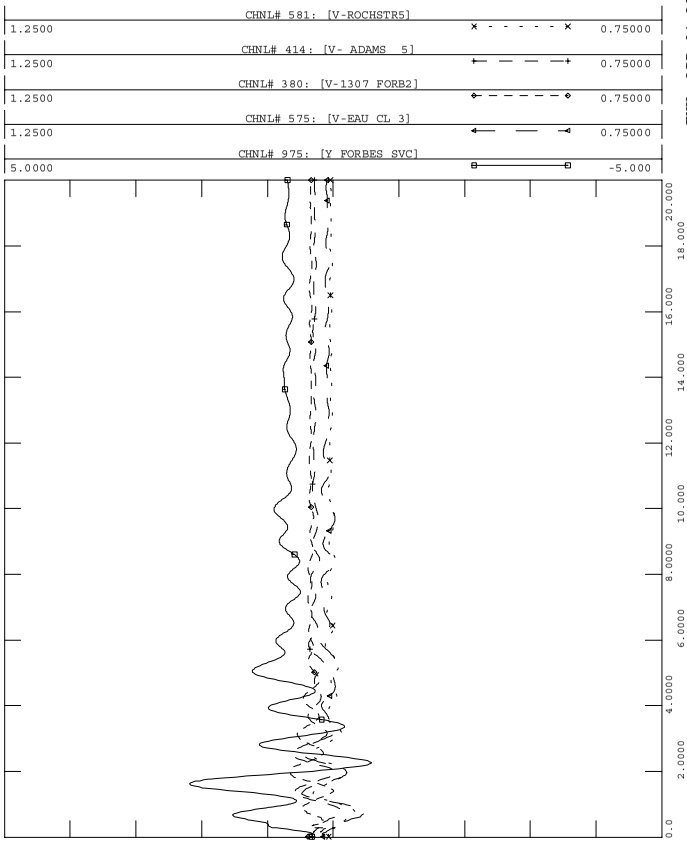

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
THU, APR 04 2002 11:59
FAST SW CAP OUT 1


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
THU, APR 04 2002 11:59
FAST SW CAP VOLTAGES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59

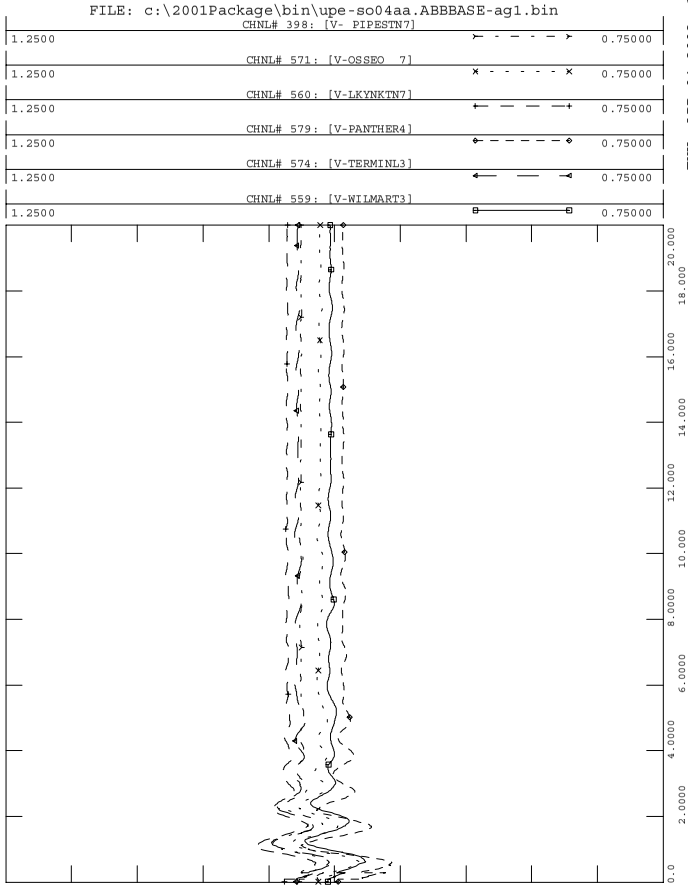
SVC & WISCONSIN VOLT



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59

TC VOLTAGES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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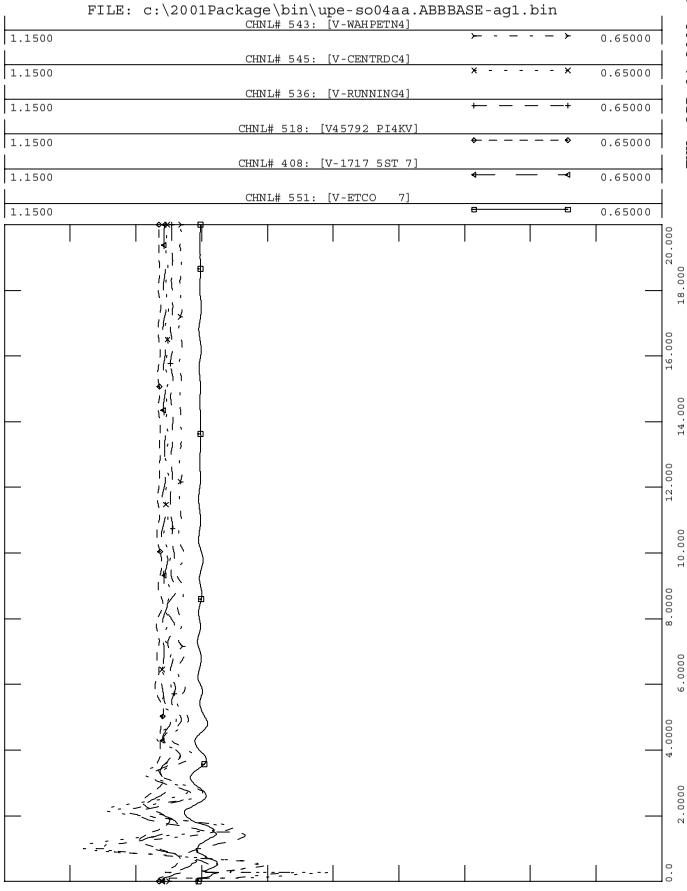
THU, APR 04 2002 11:59

VOLTAGES 6



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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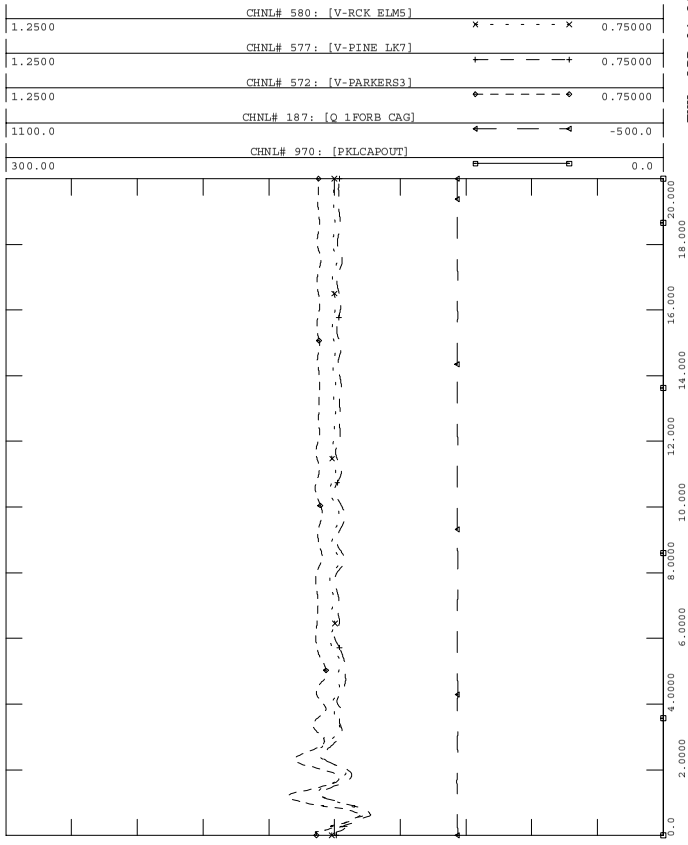
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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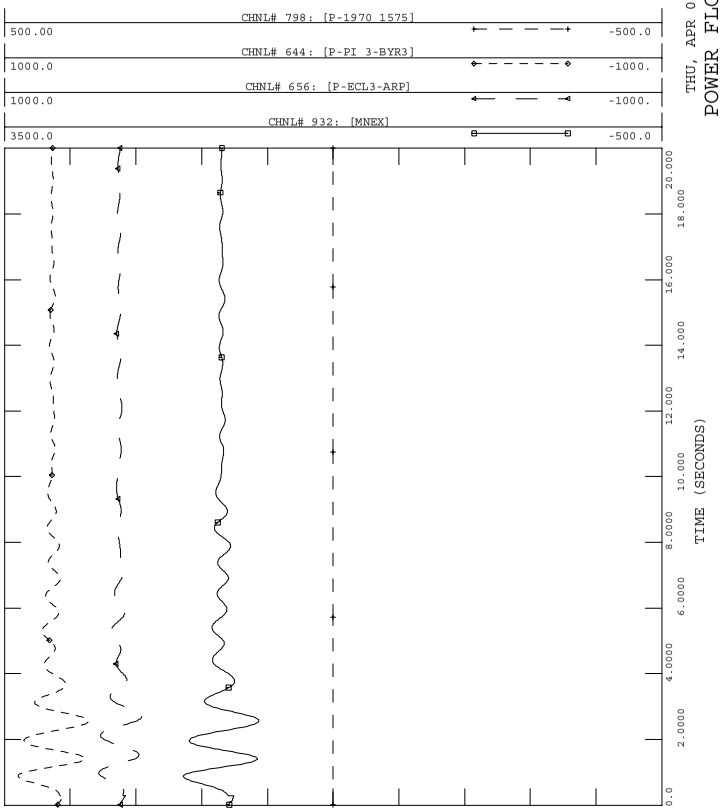
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59

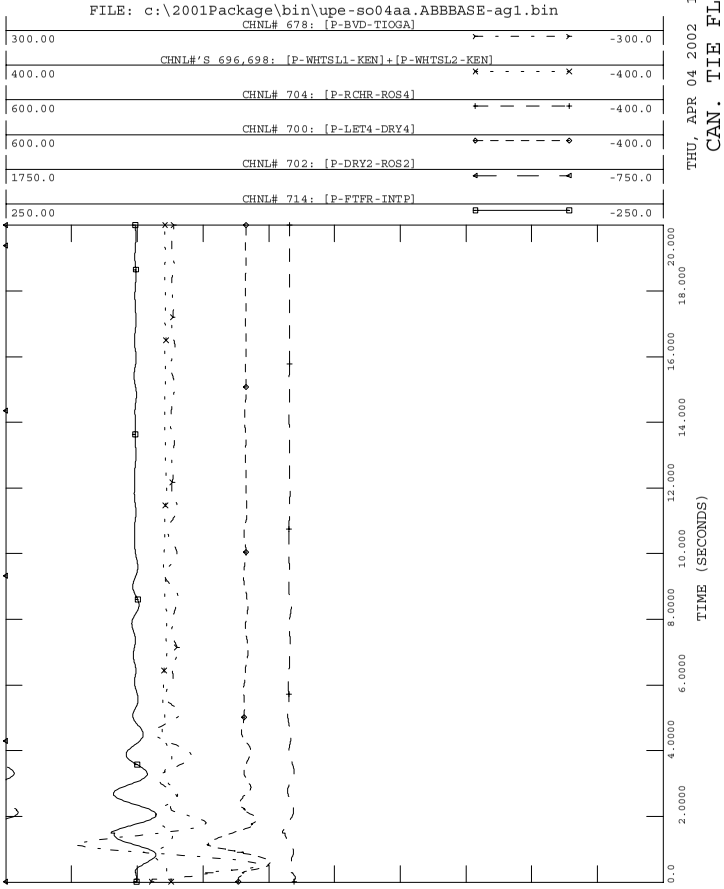
POWER FLOW SUMS 2



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59

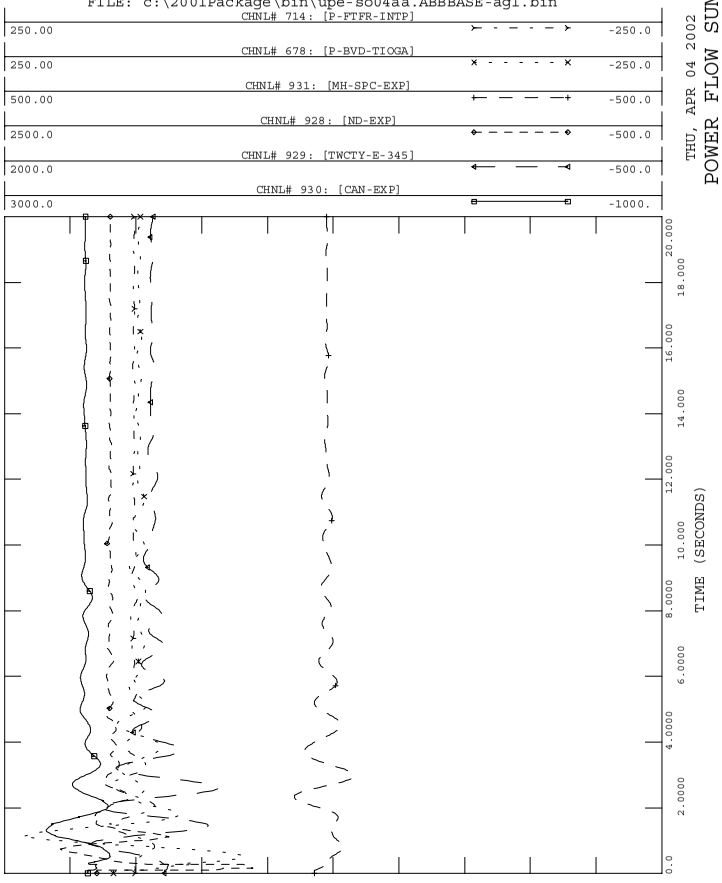
CAN. TIE FLOWS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59

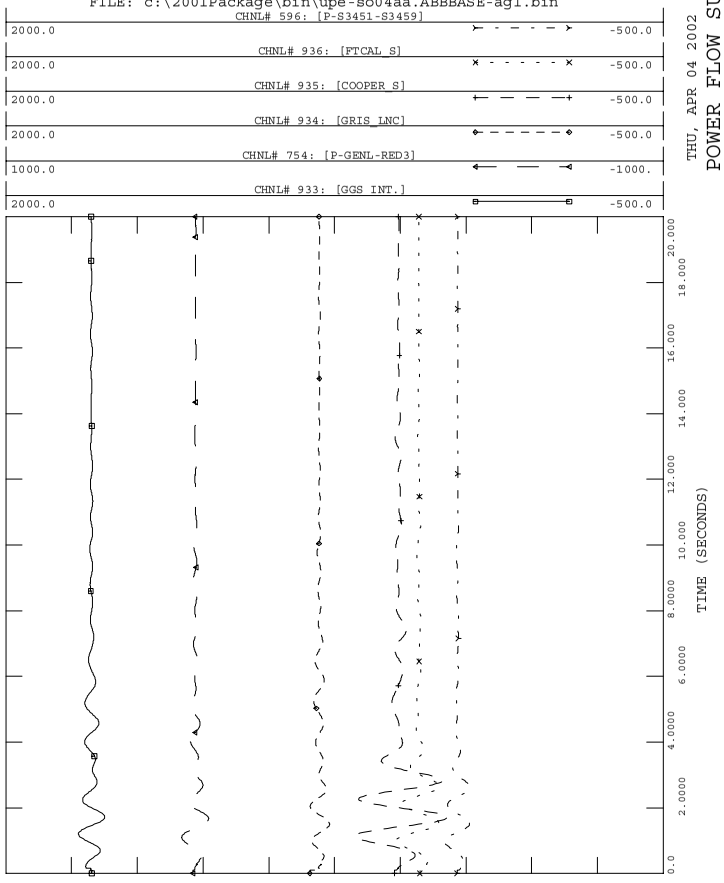
POWER FLOW SUMS 1



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59

POWER FLOW SUM 3



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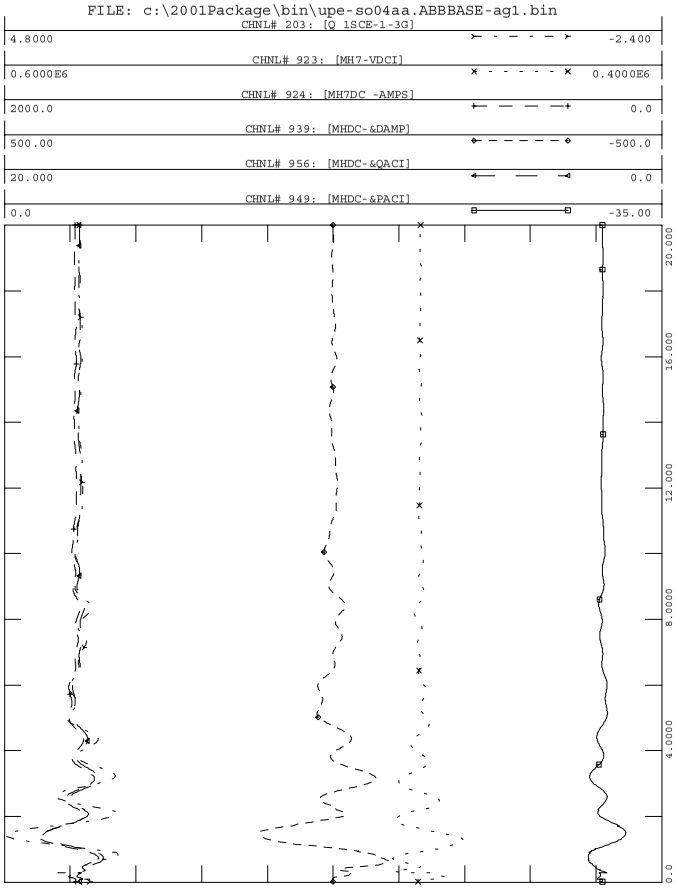
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59
MH DC PARAMETERS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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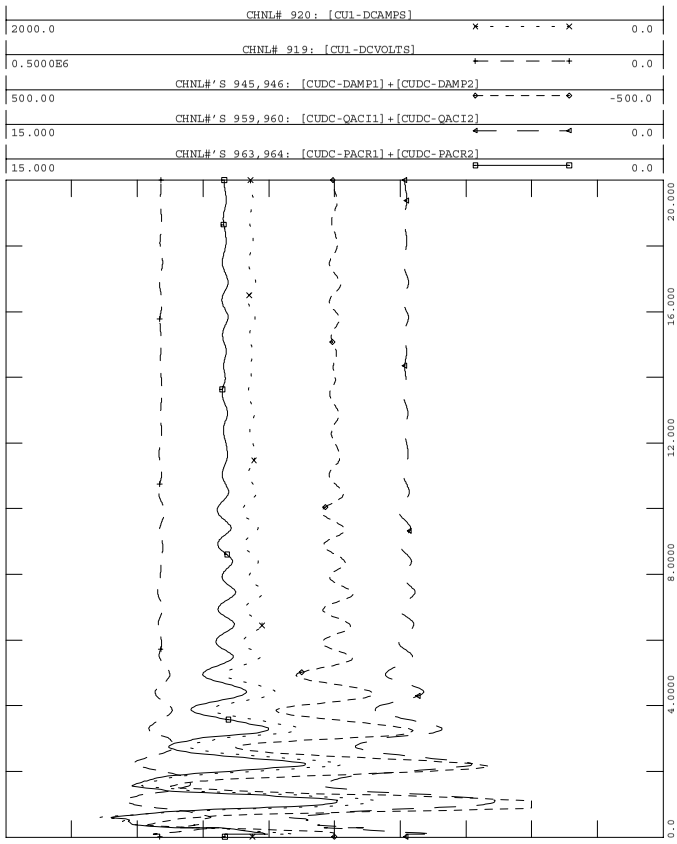
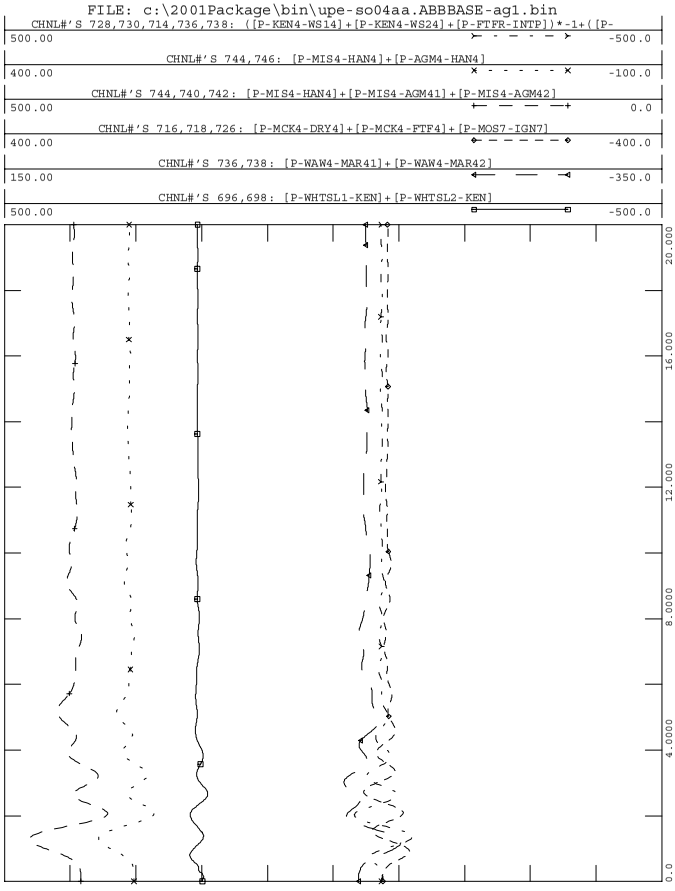
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59
CU DC #1



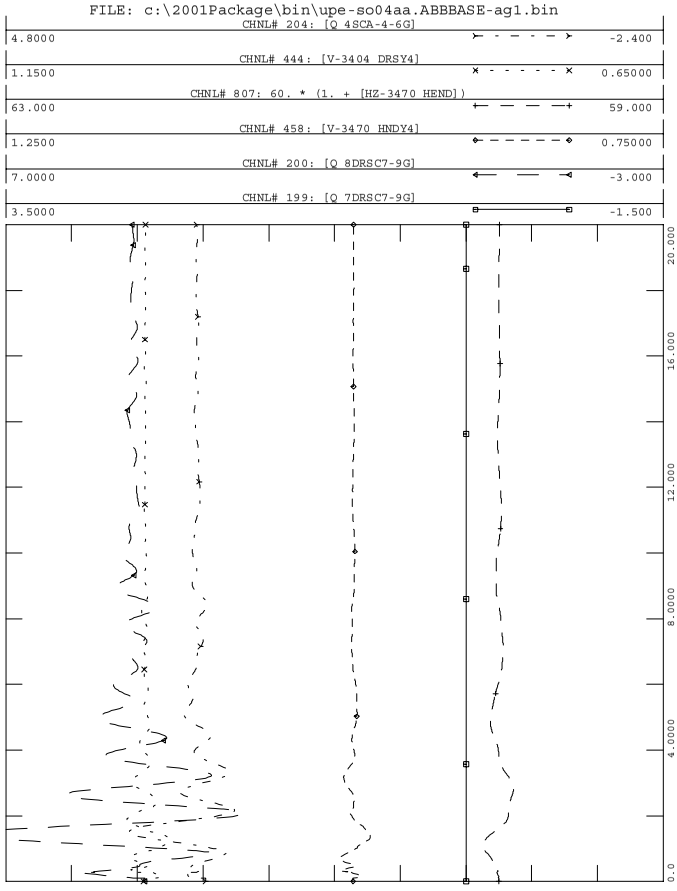
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59
OH TIE FLOWS

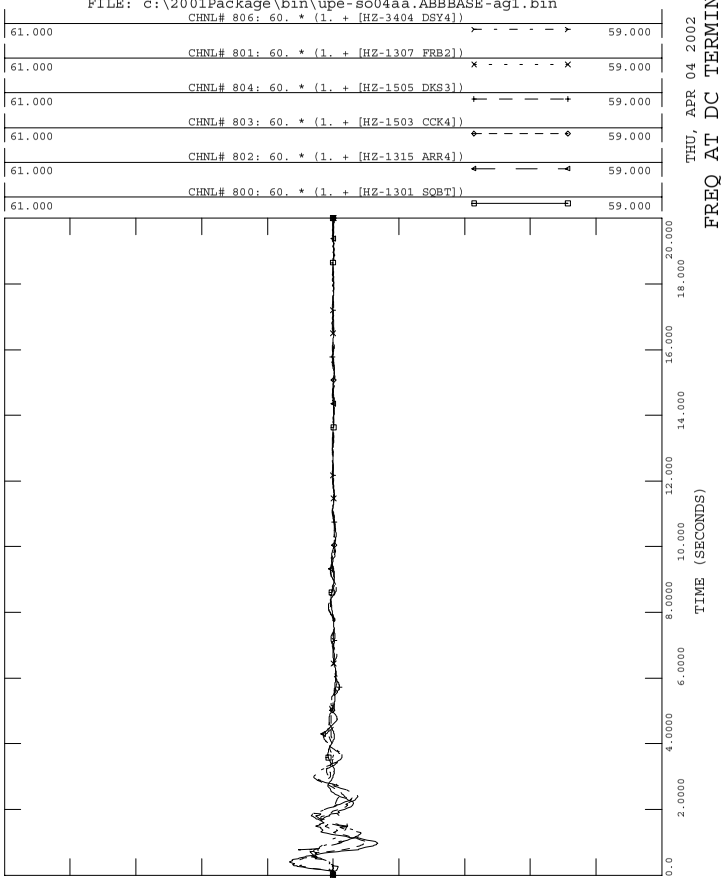


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

THU, APR 04 2002 11:59
MH DC PARAMETERS

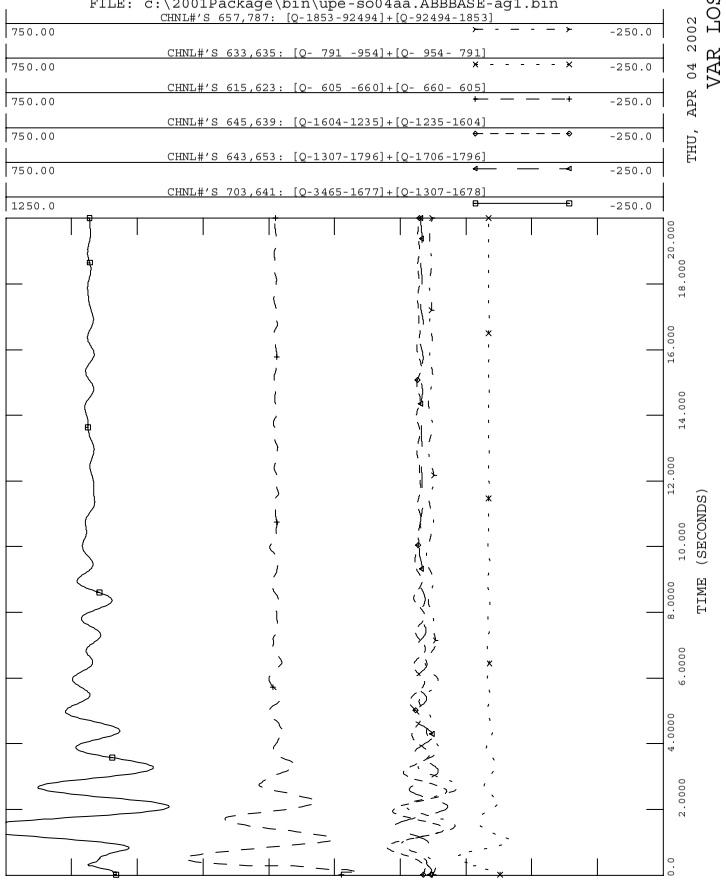


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin



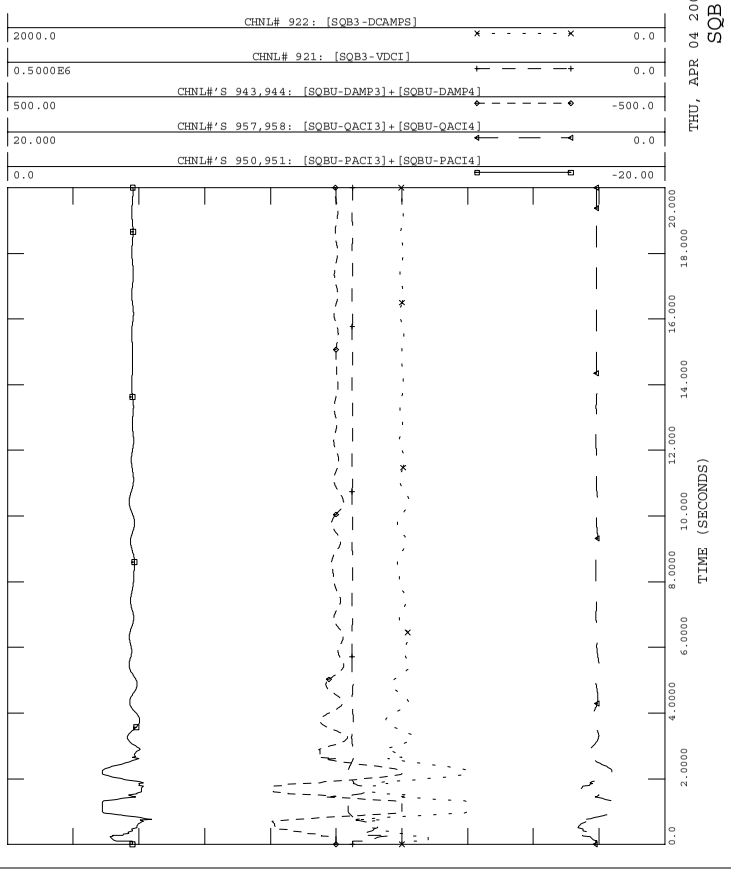
THU, APR 04 2002 11:59
FREQ AT DC TERMINALS

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin



THU, APR 04 2002 11:59
VAR LOSSES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin



THU, APR 04 2002 11:59
SQB DC #3

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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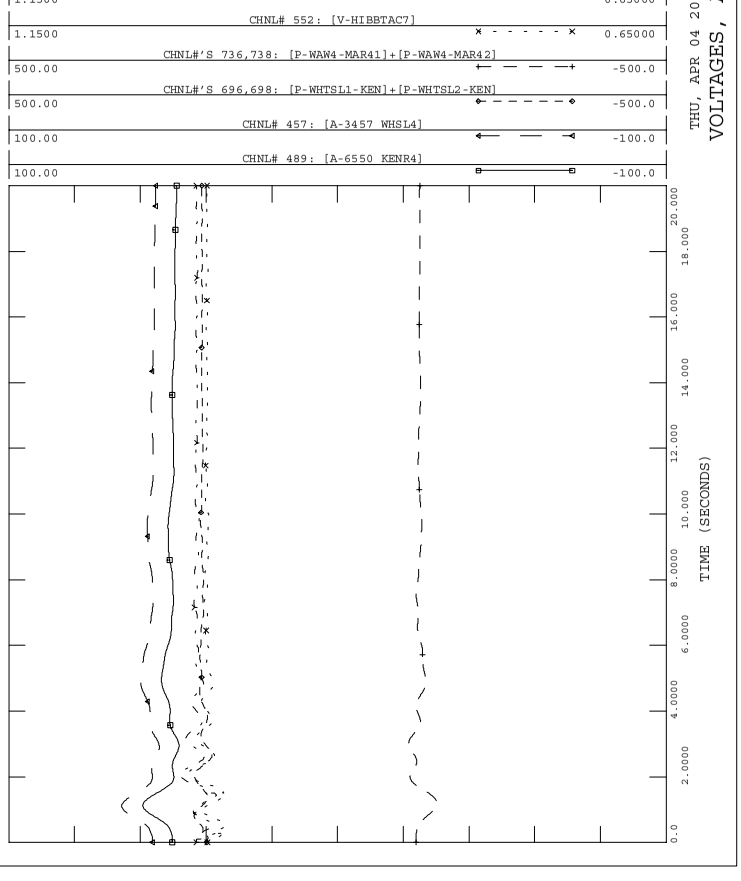
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

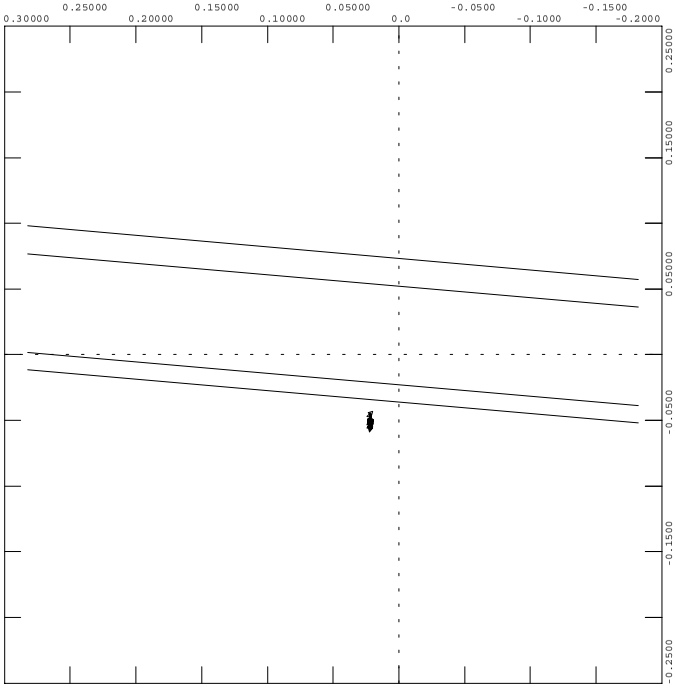


THU, APR 04 2002 11:59
VOLTAGES, ANGLES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, APR 04 2002 11:59
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

RELAY: RELAYG
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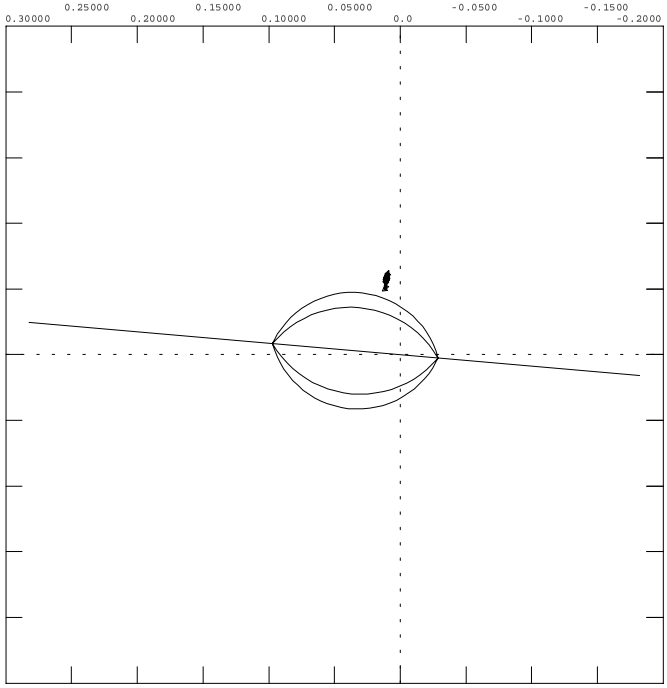
CHNL# 856: [X-DSY2-ROS2]



THU, APR 04 2002 11:59
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

RELAY: RELAYG
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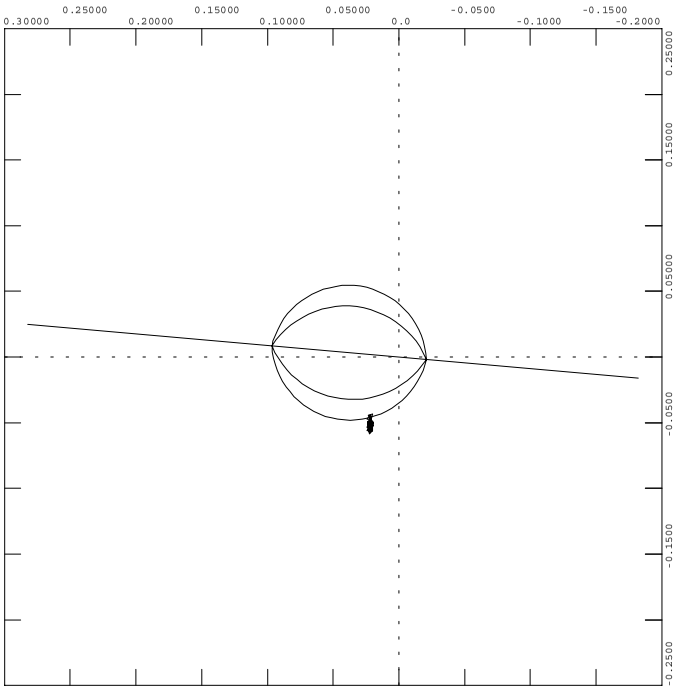
CHNL# 824: [X-FRB2-ROS2]

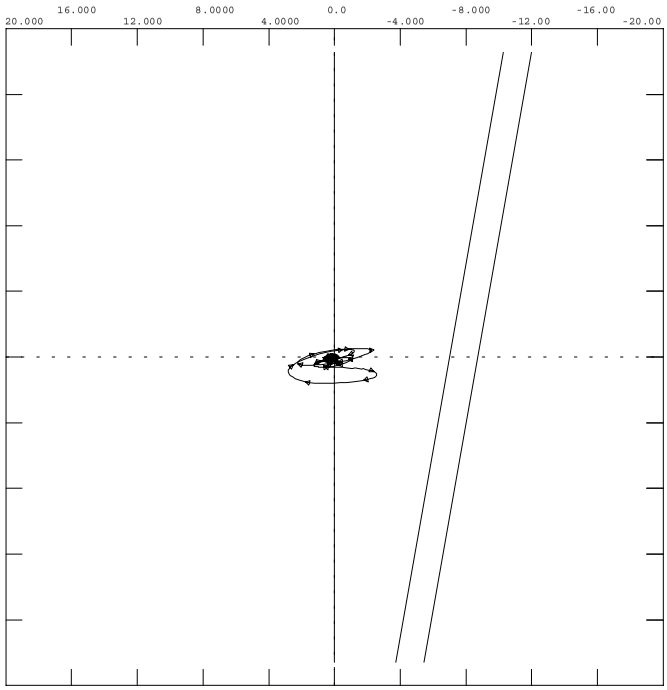


THU, APR 04 2002 11:59
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]



THU, APR 04 2002 11:59
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

RELAY: SLINOS
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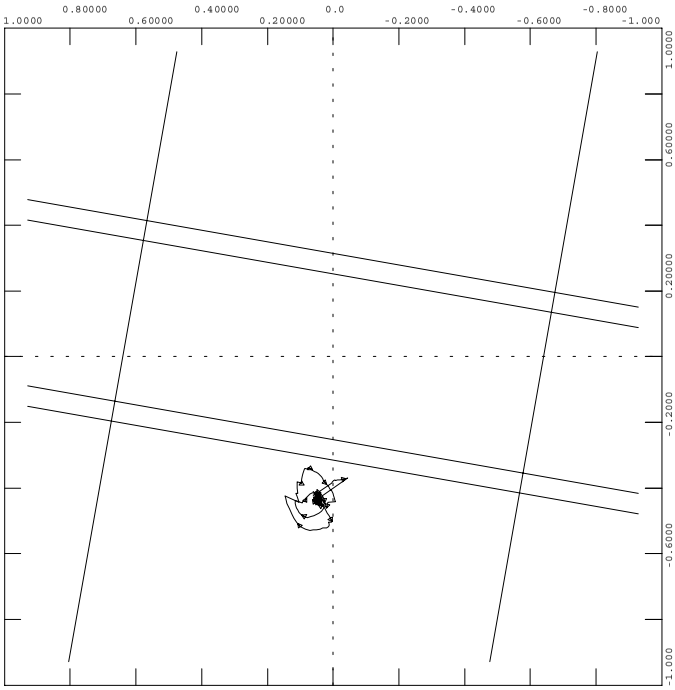
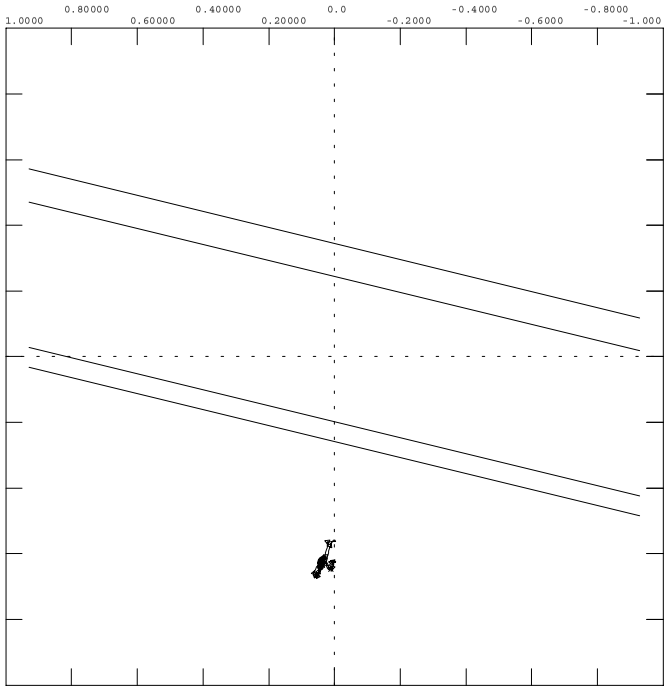
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

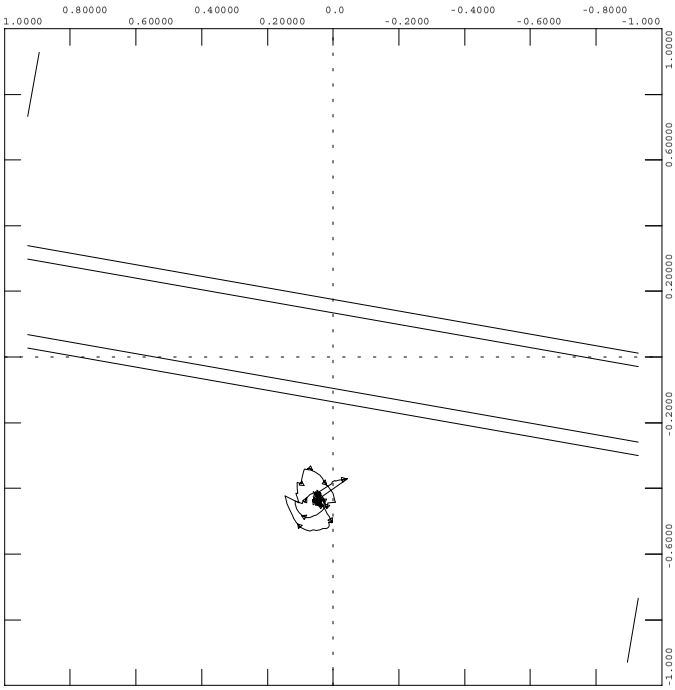
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

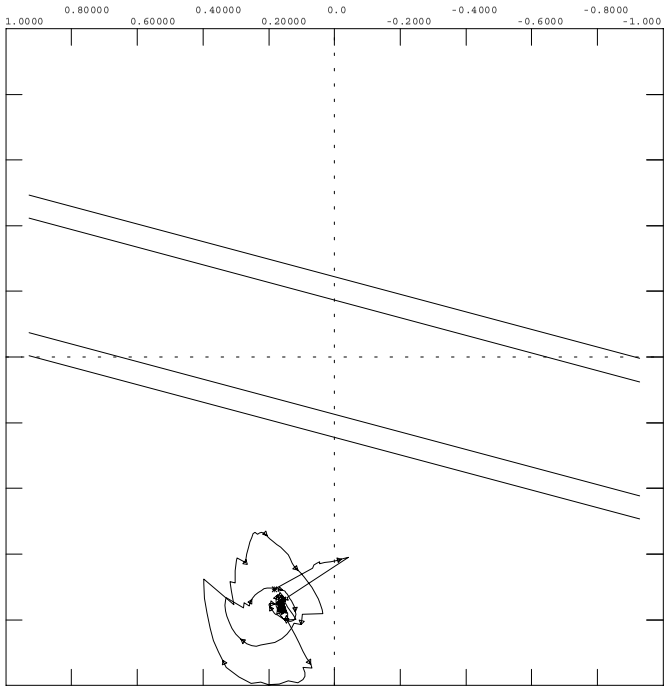
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

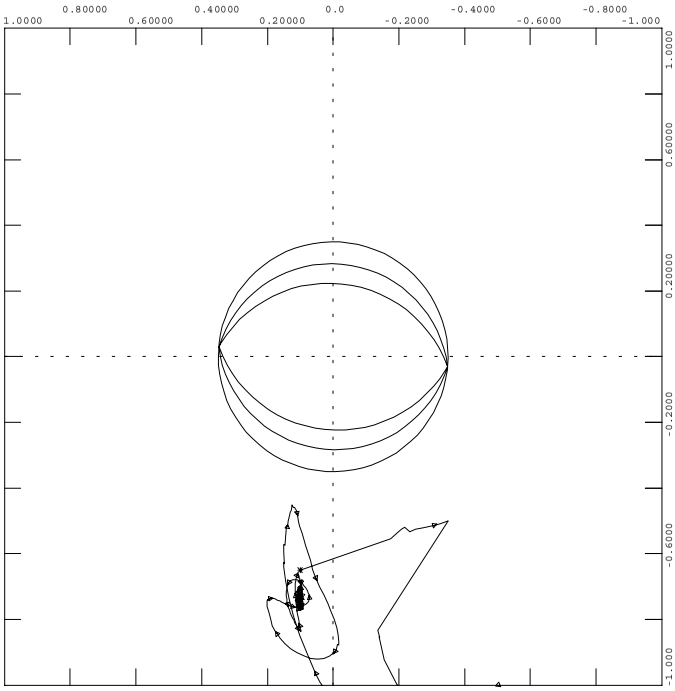
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

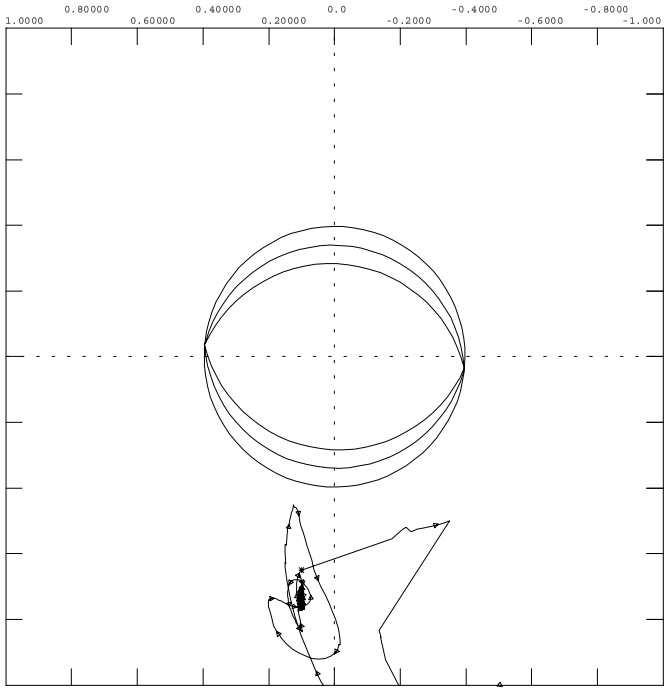


THU, APR 04 2002 11:59
TIOGA-B.DAM-SOUTH (266)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

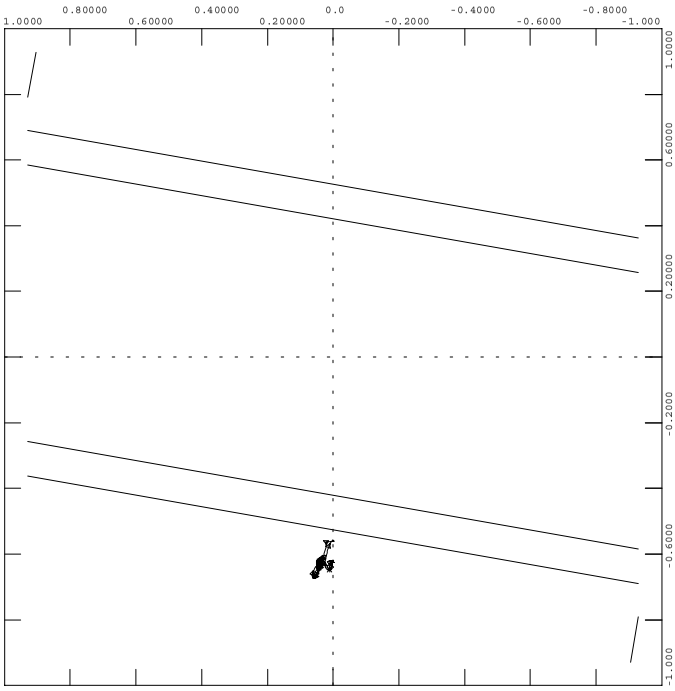


THU, APR 04 2002 11:59
TIOGA-B.DAM-EMRG (267)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

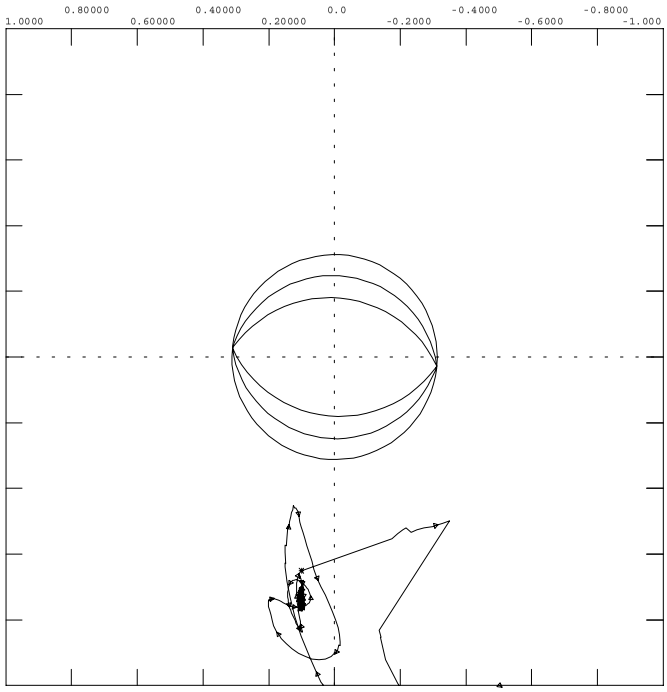


THU, APR 04 2002 11:59
R50M-MORANVILLE-EMRG (777

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

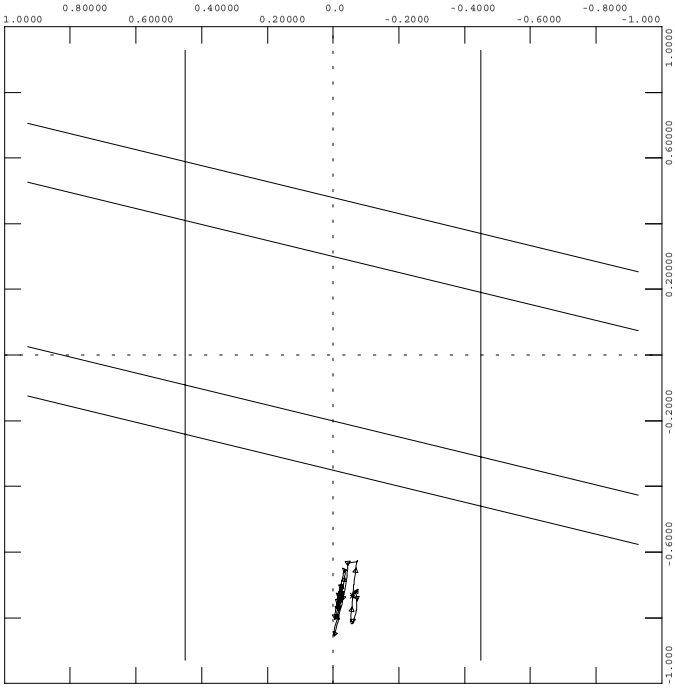


THU, APR 04 2002 11:59
TIOGA-B.DAM-NORTH (268)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



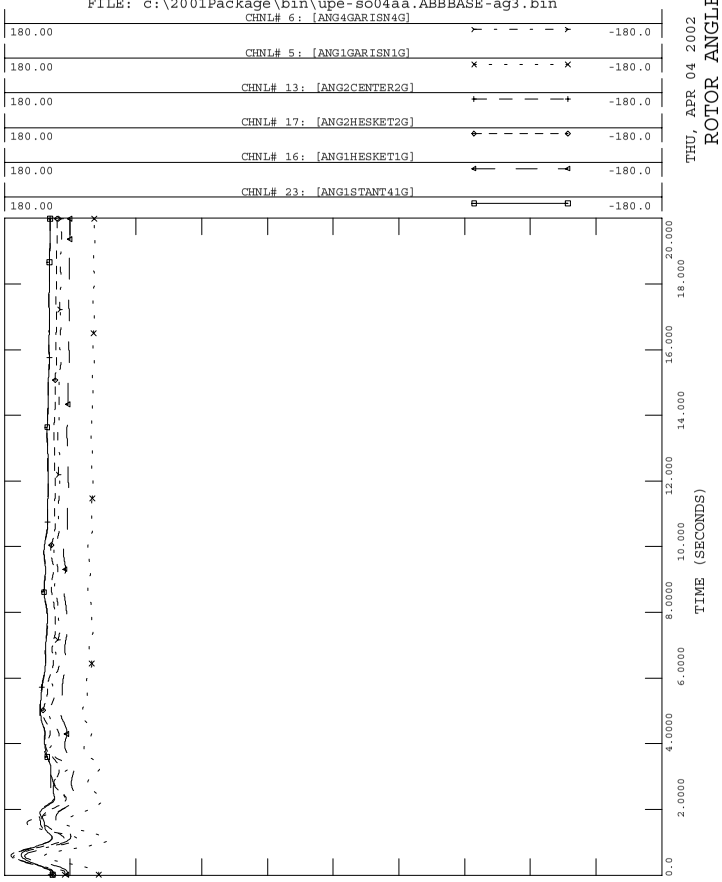
THU, APR 04 2002 11:59
MP-OH I.FALLS (779)

CONTINGENCY AG3

Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

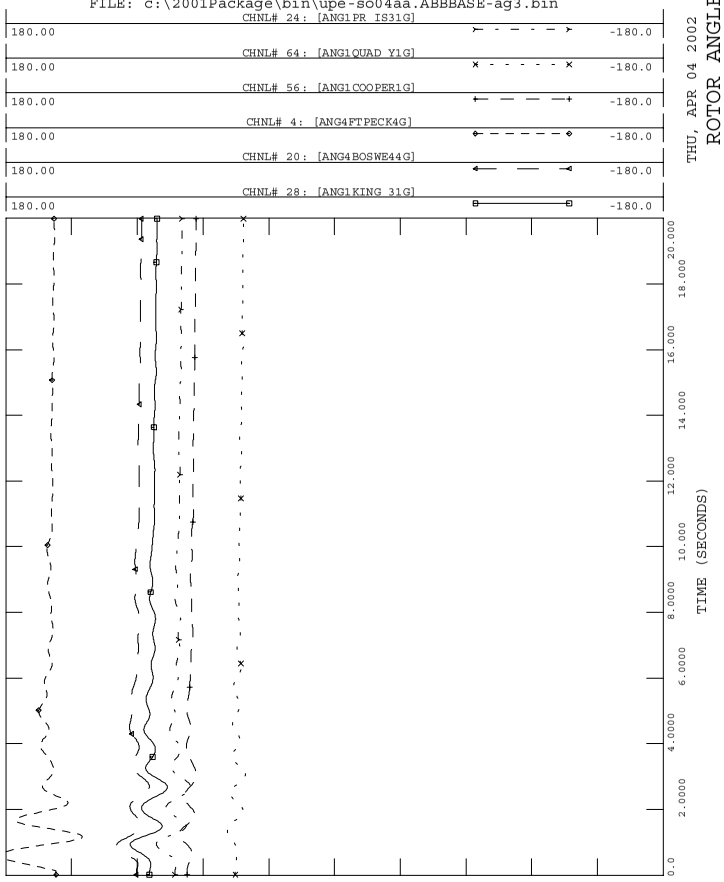
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:15
ROTOR ANGLES 2



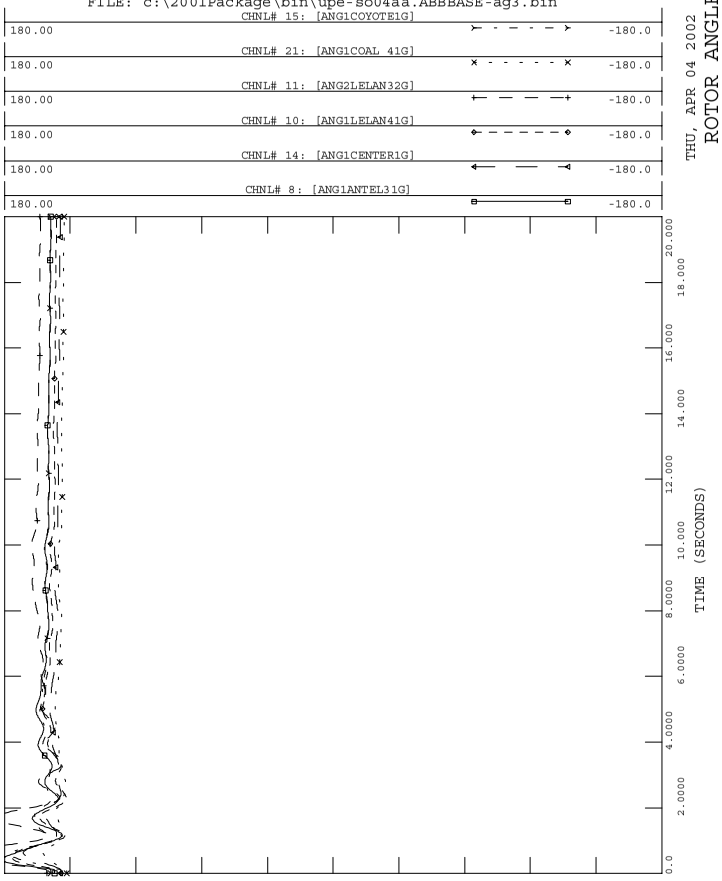
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:15
ROTOR ANGLES 4



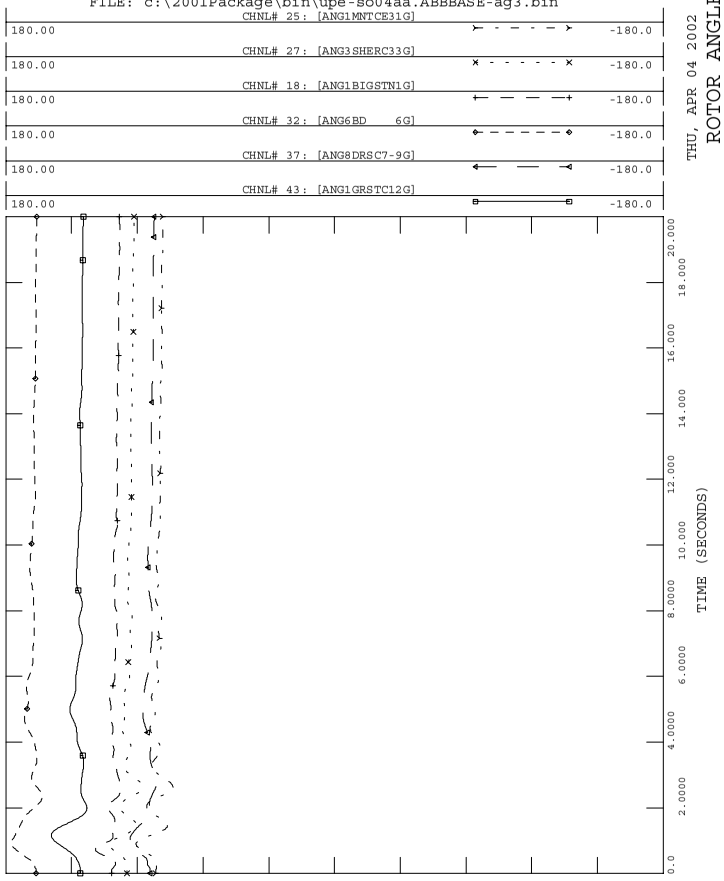
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

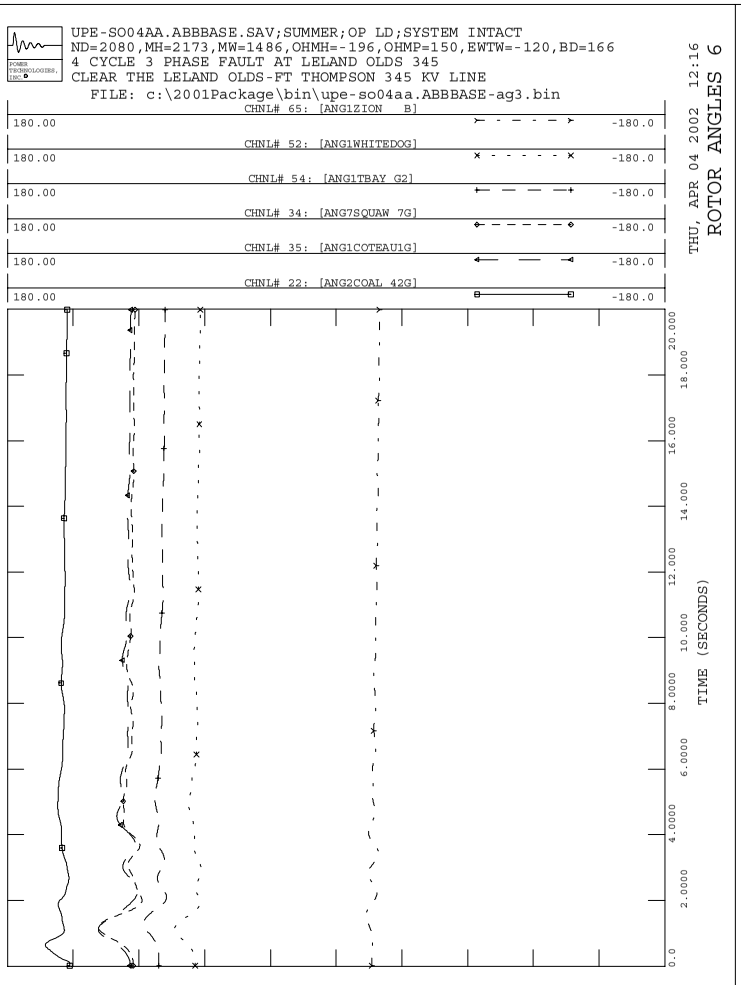
THU, APR 04 2002 12:15
ROTOR ANGLES 1

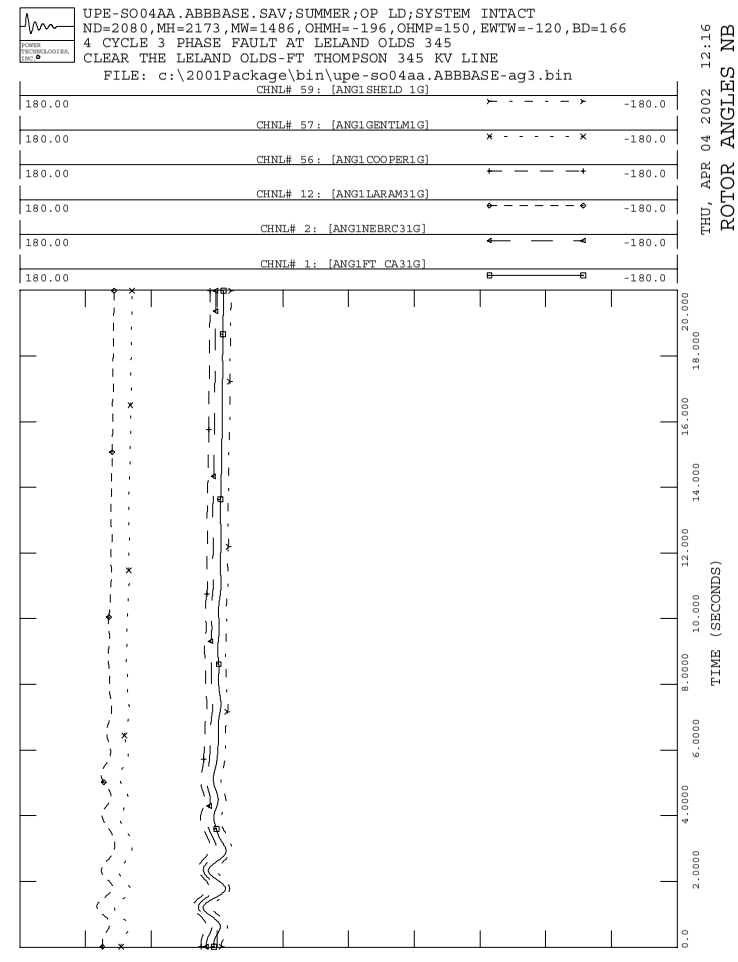


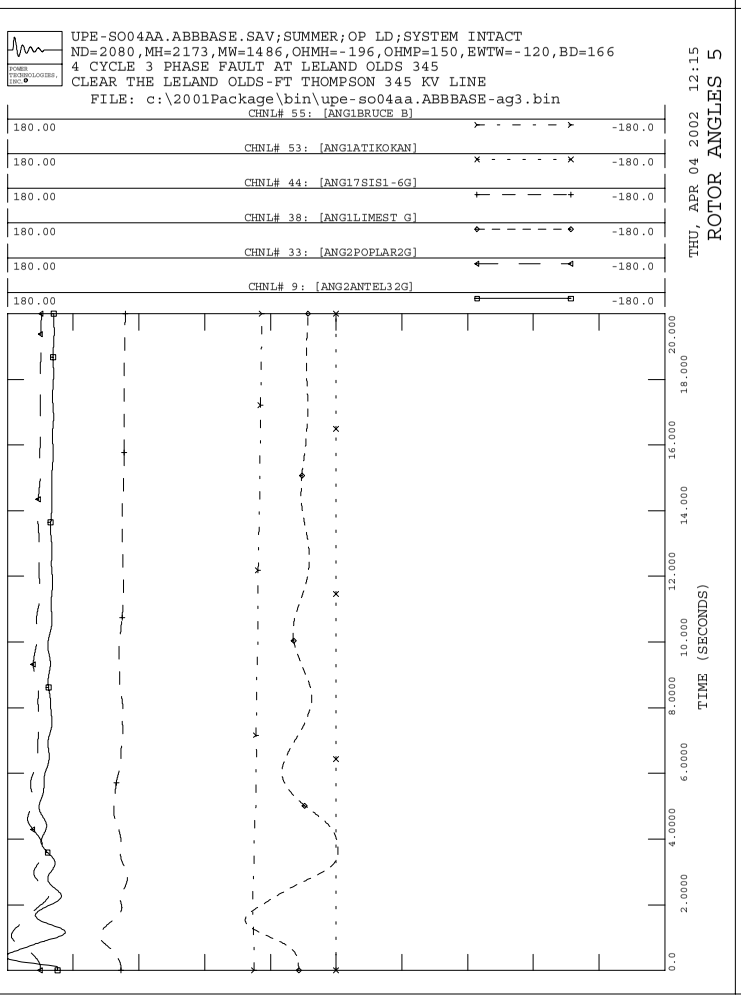
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

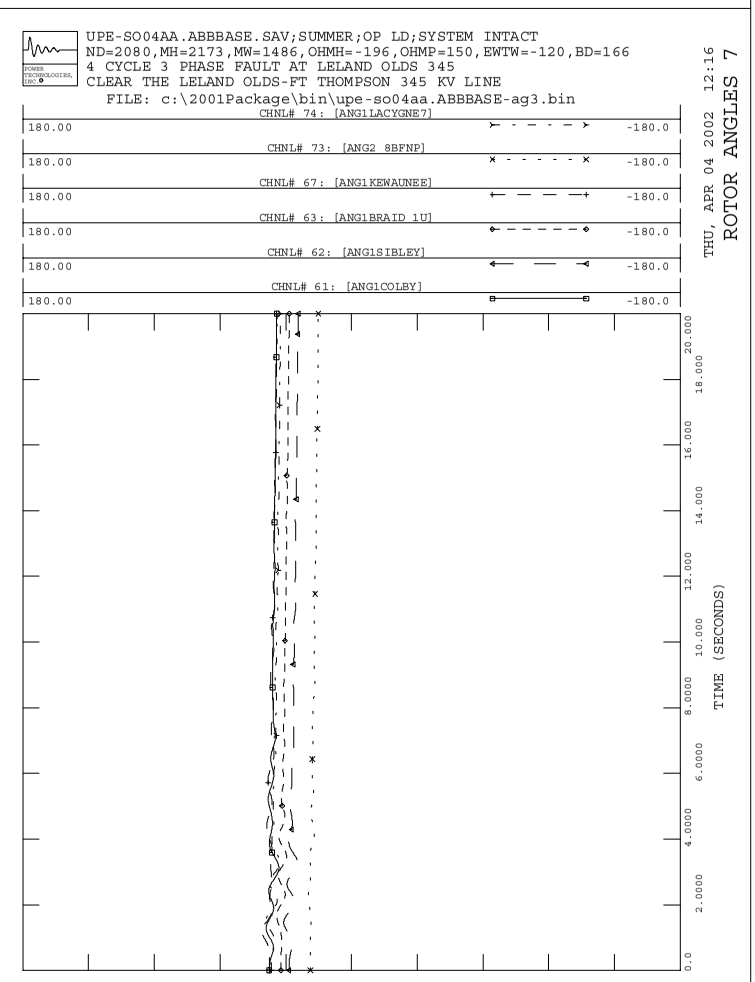
THU, APR 04 2002 12:15
ROTOR ANGLES 3



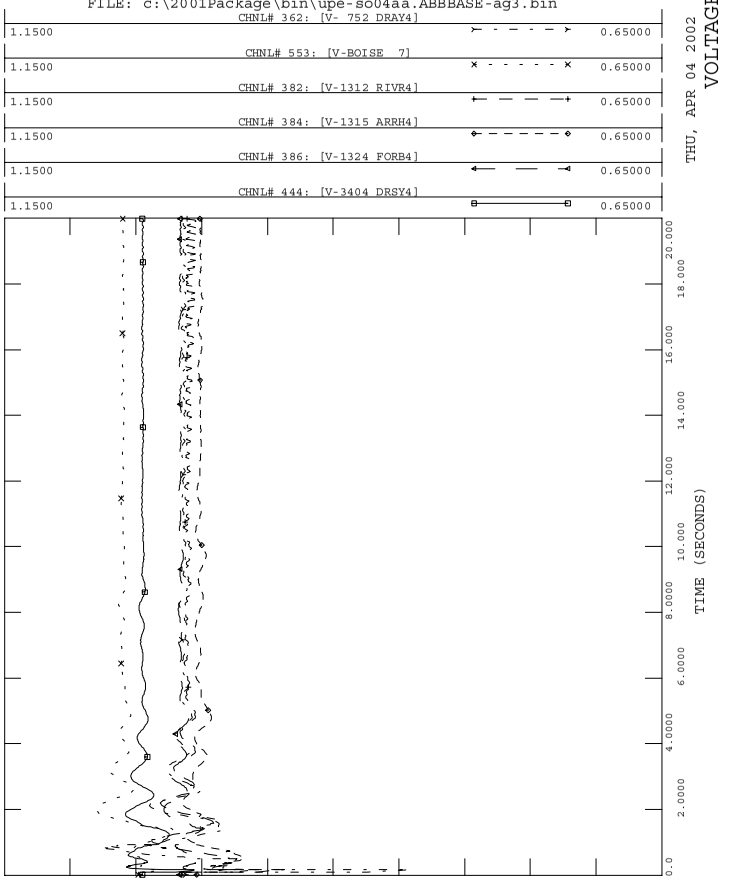

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
THU, APR 04 2002 12:16
ROTOR ANGLES 6
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
THU, APR 04 2002 12:16
ROTOR ANGLES NB
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
THU, APR 04 2002 12:15
ROTOR ANGLES 5
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

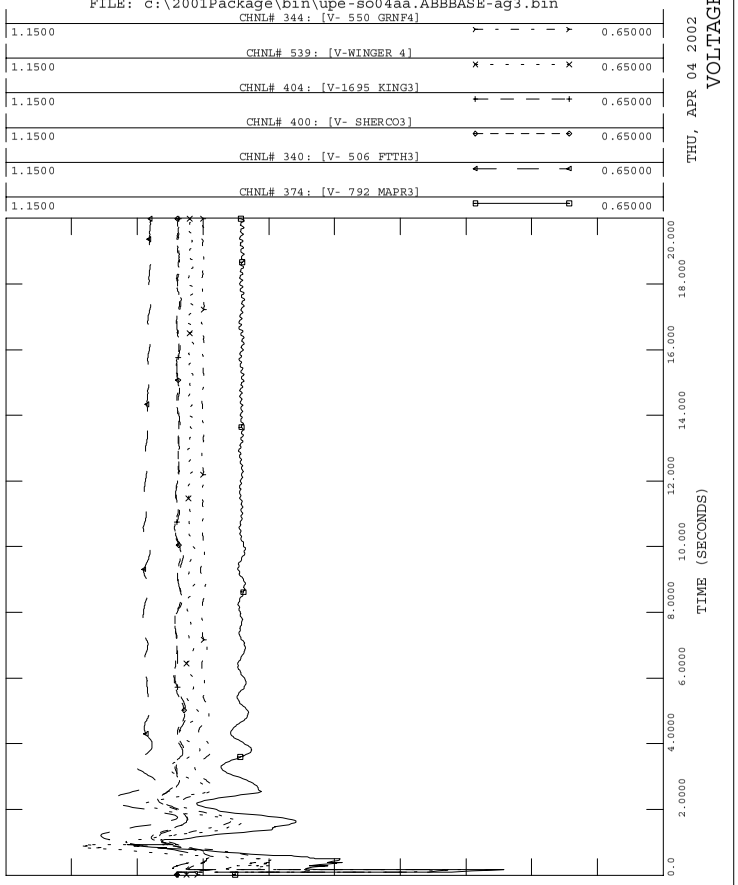

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
THU, APR 04 2002 12:16
ROTOR ANGLES 7
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin



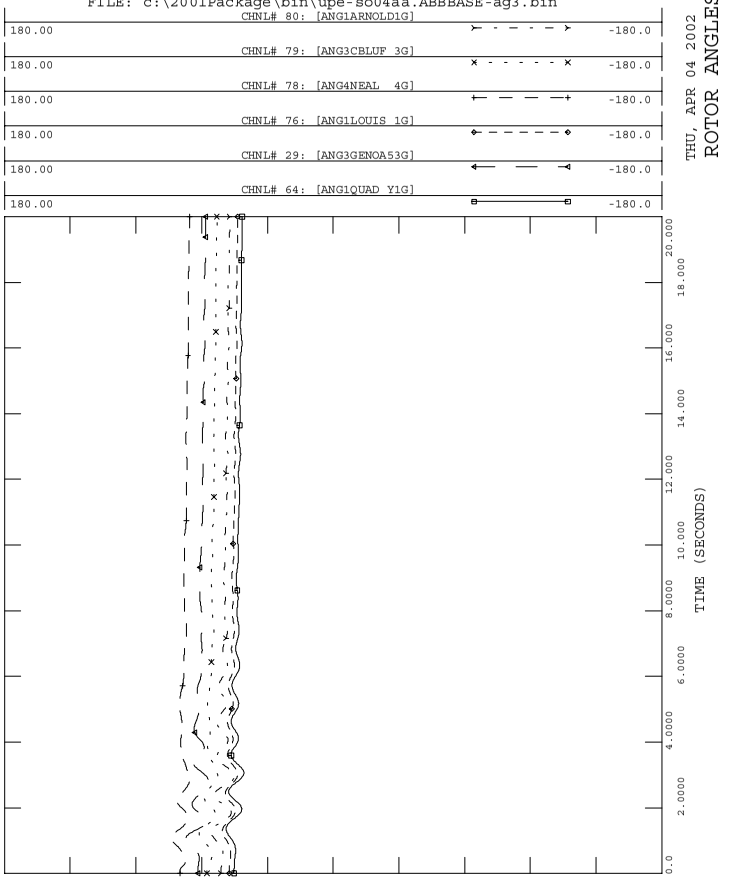
THU, APR 04 2002 12:16
VOLTAGES 1

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin



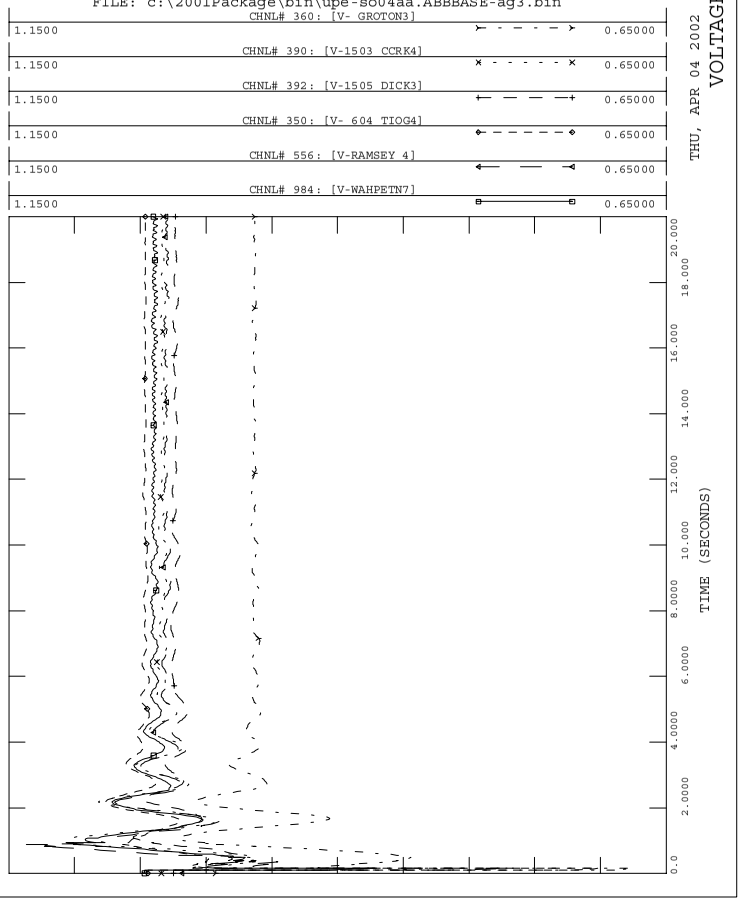
THU, APR 04 2002 12:16
VOLTAGES 3

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin



THU, APR 04 2002 12:16
ROTOR ANGLES IA

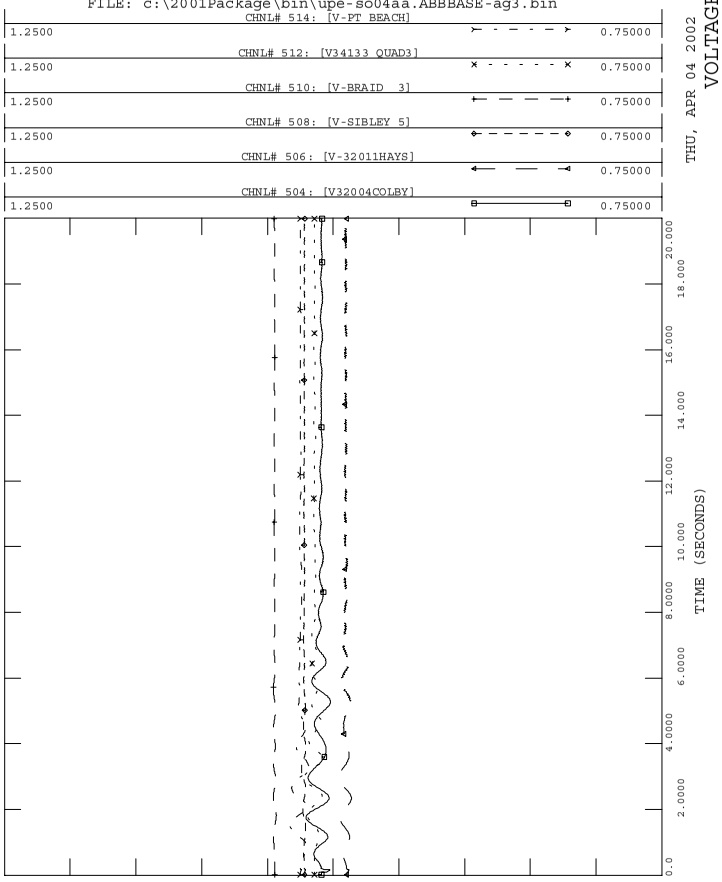
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin



THU, APR 04 2002 12:16
VOLTAGES 2

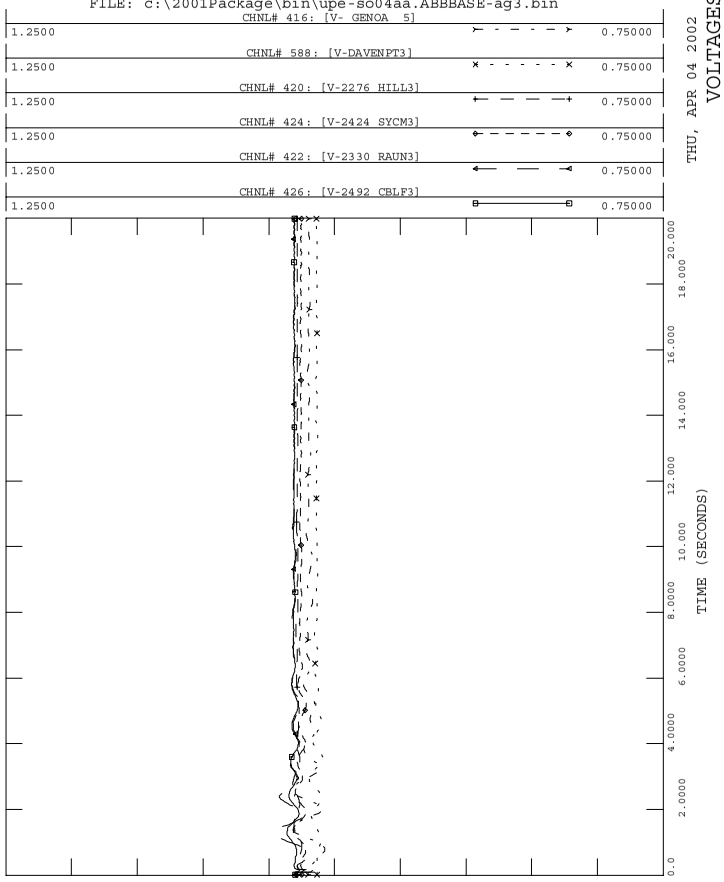
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16
VOLTAGES 5



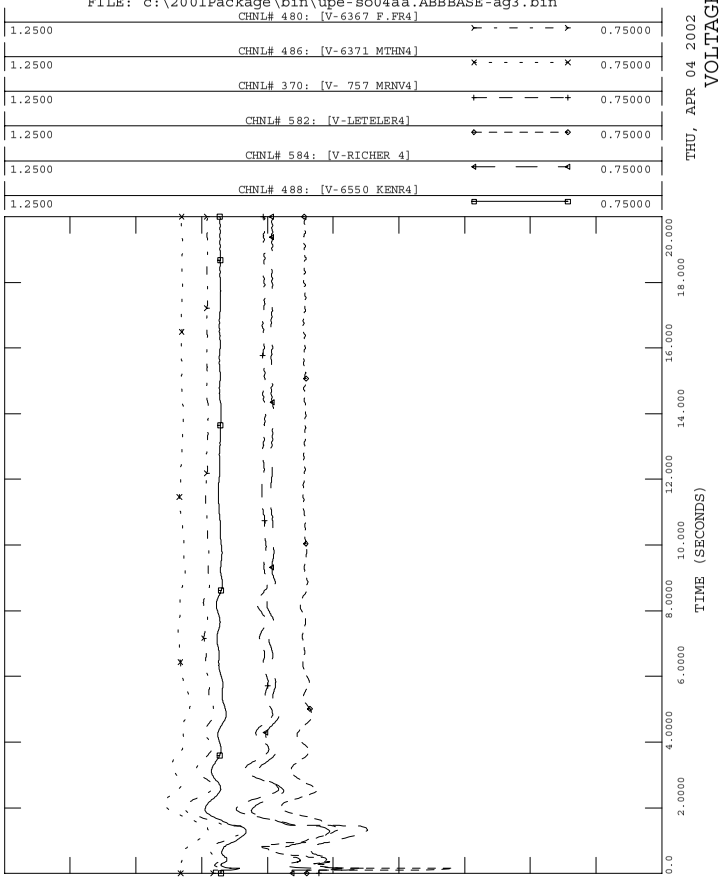
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16
VOLTAGES IA



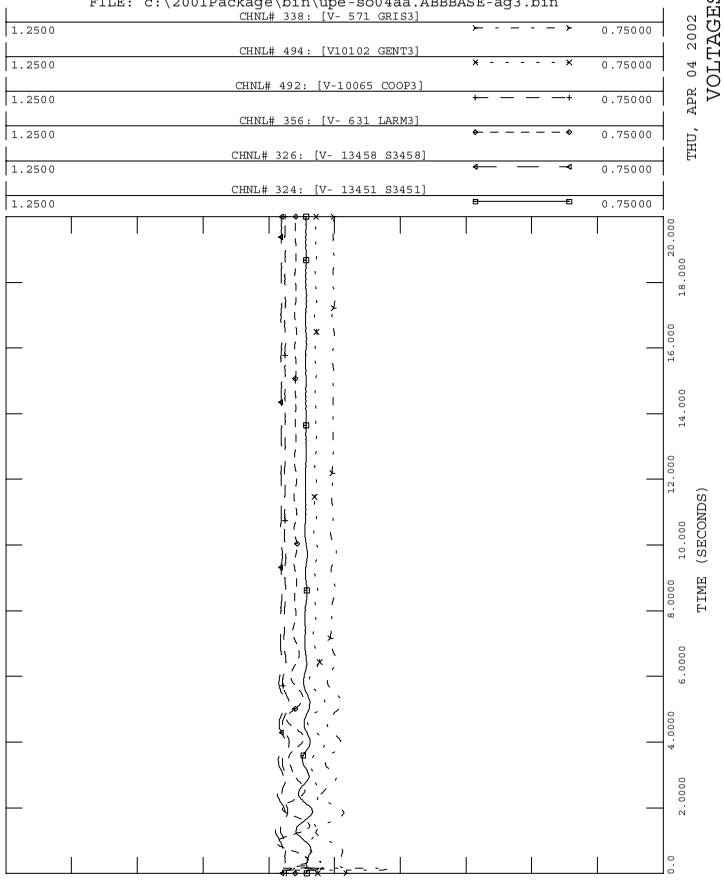
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16
VOLTAGES 4



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

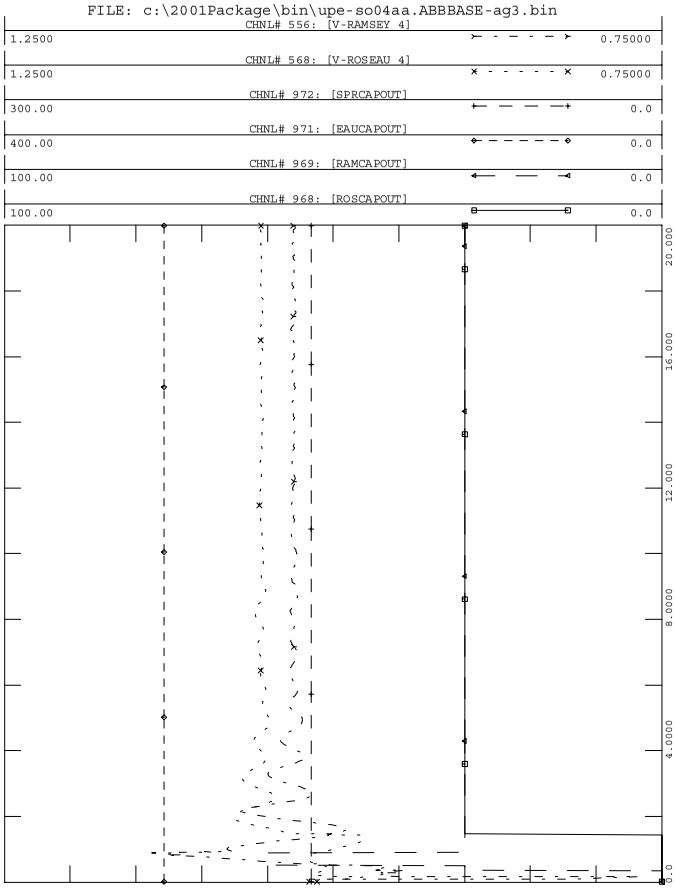
THU, APR 04 2002 12:16
VOLTAGES NB



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16

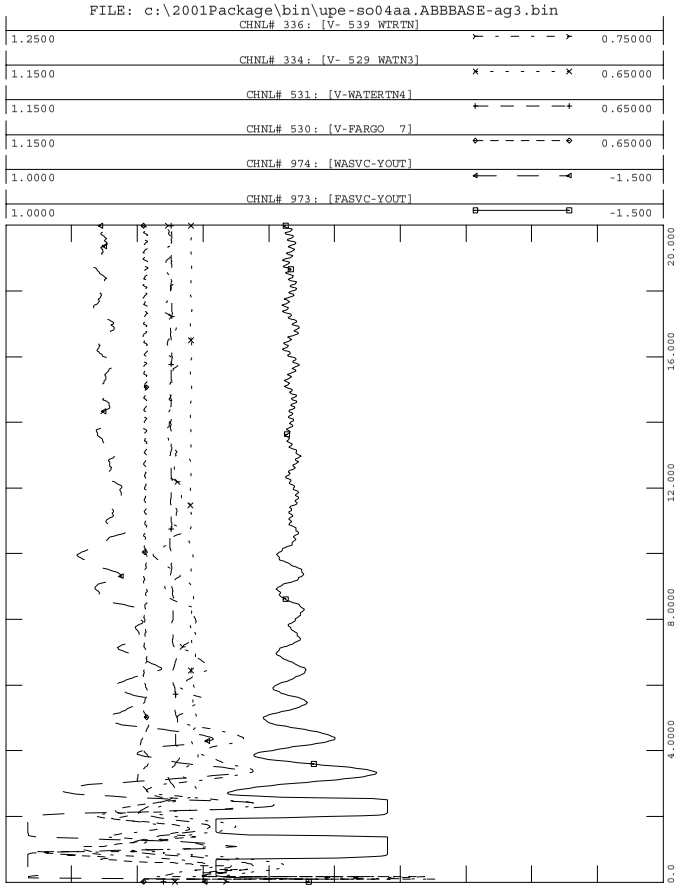
FAST SW CAP OUT 2



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16

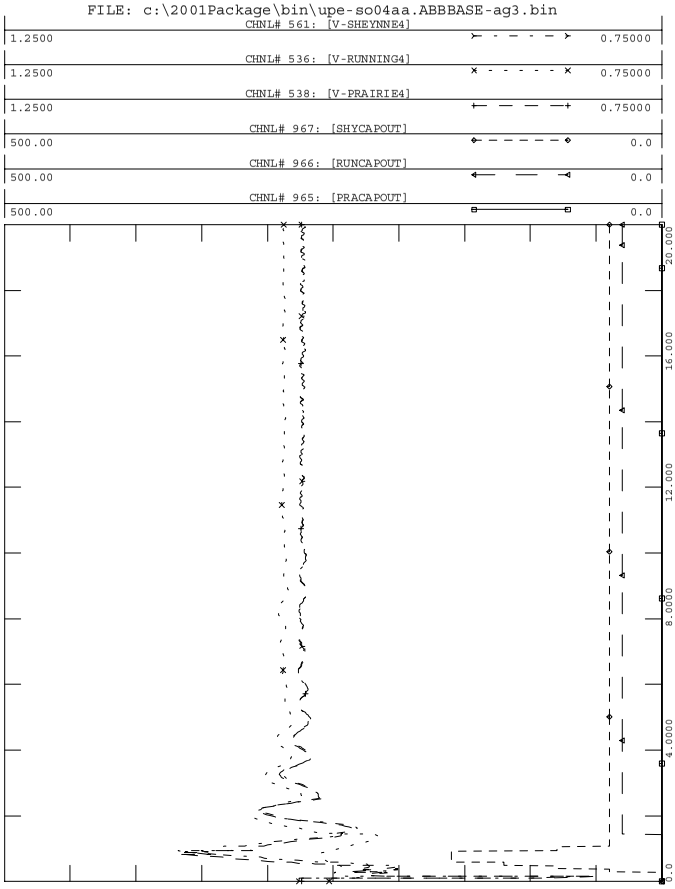
FARGO/WATERTOWN SVS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16

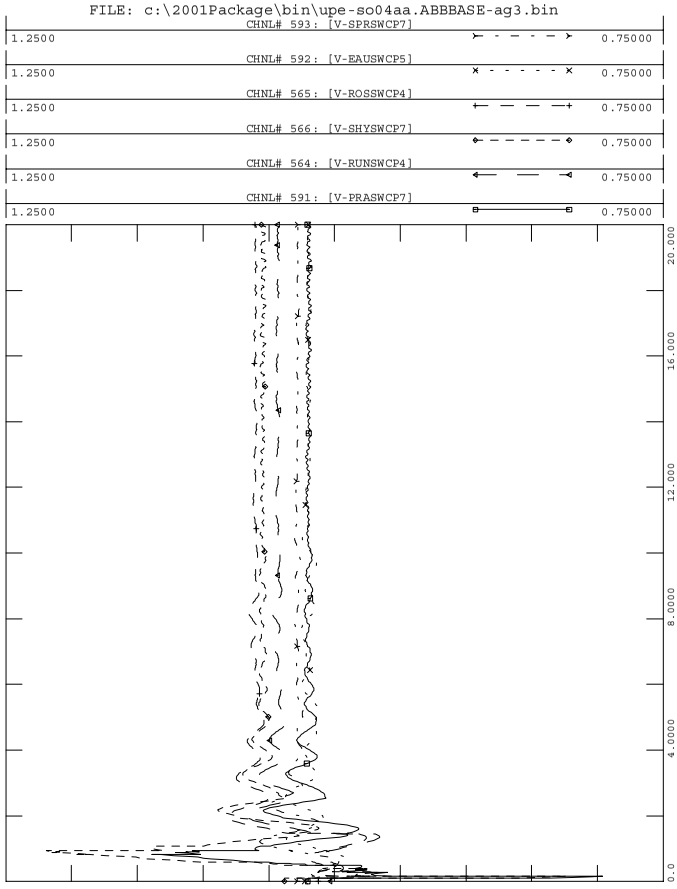
FAST SW CAP OUT 1



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16

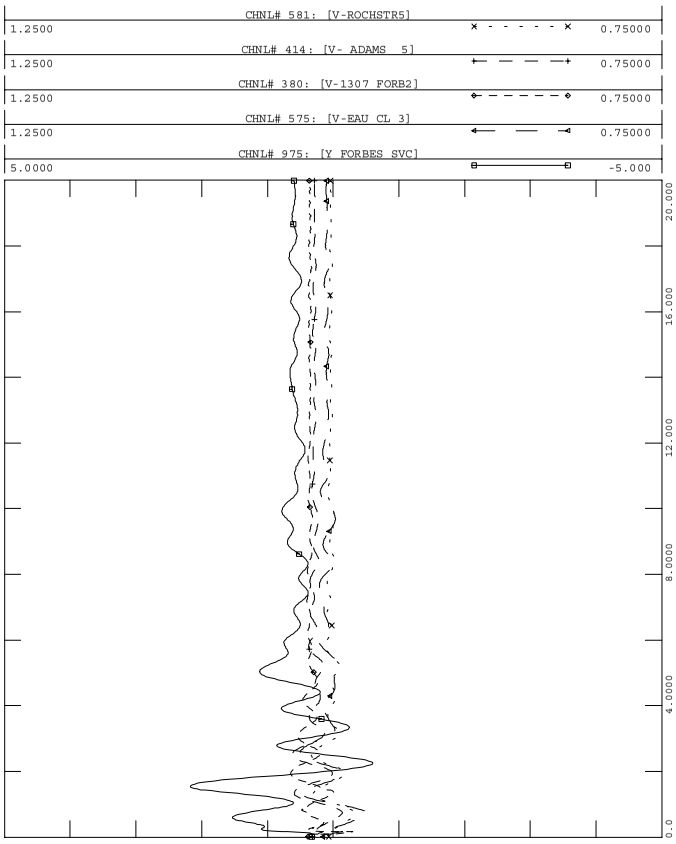
FAST SW CAP VOLTAGES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16

SVC & WISCONSIN VOLT



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

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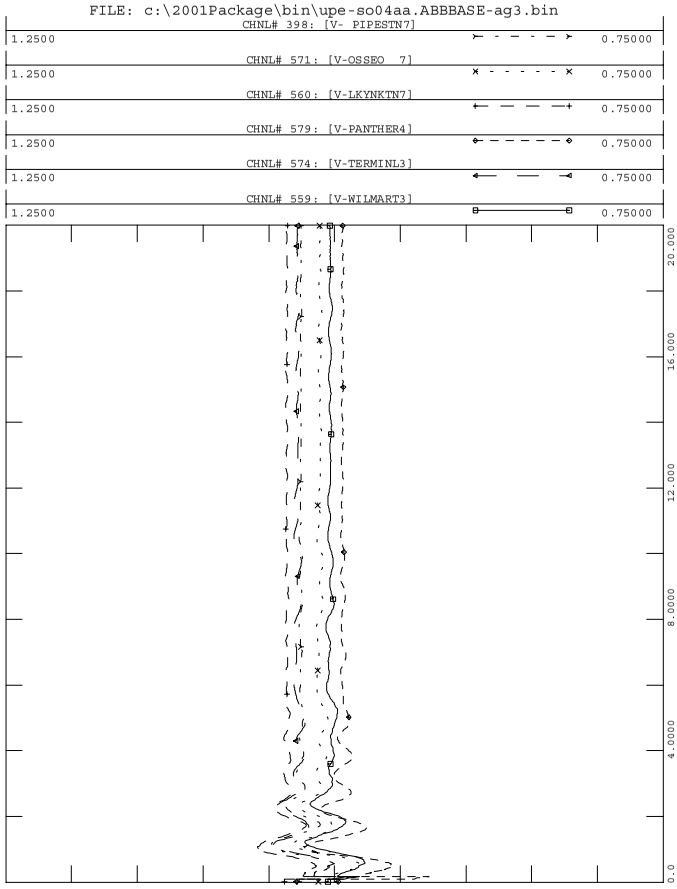
TC VOLTAGES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

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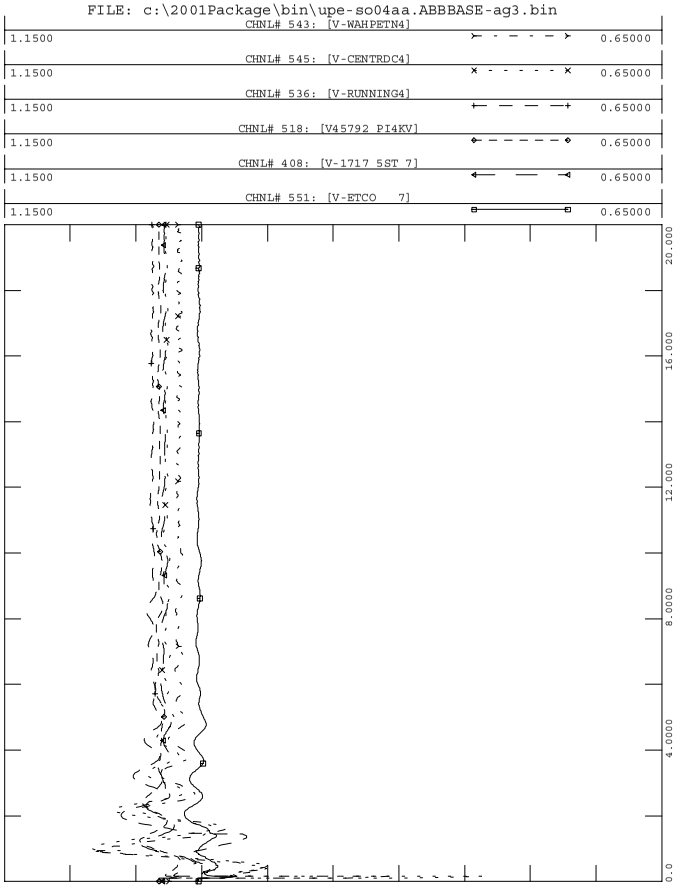
VOLTAGES 6



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

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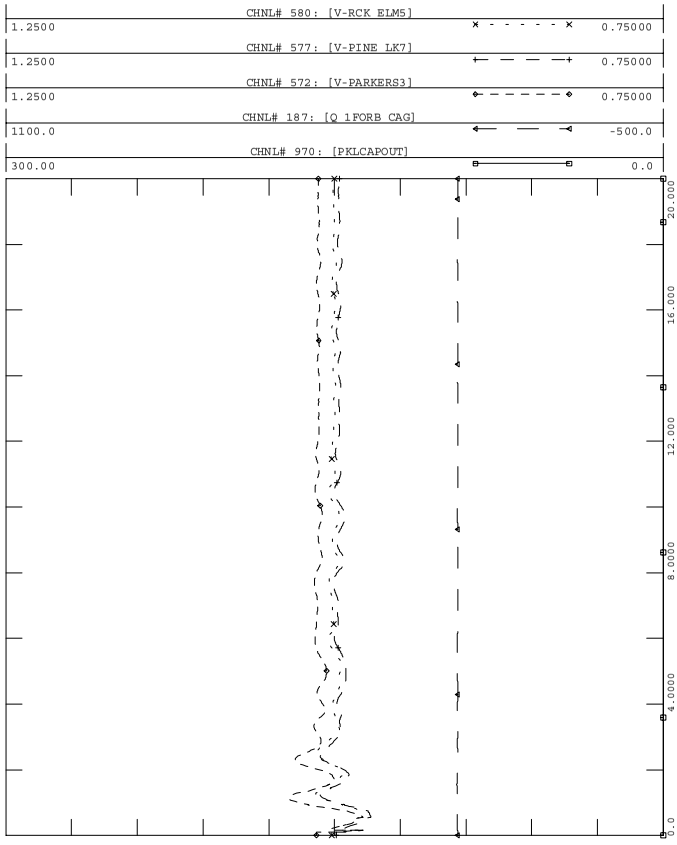
FORBES SVS OUT & VOLTAGES



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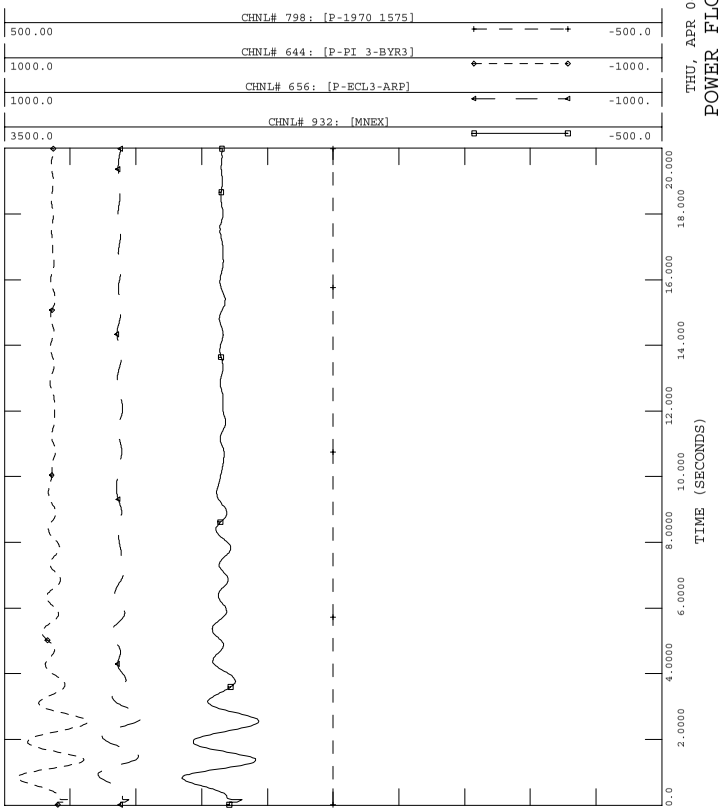
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16
POWER FLOW SUMS 2



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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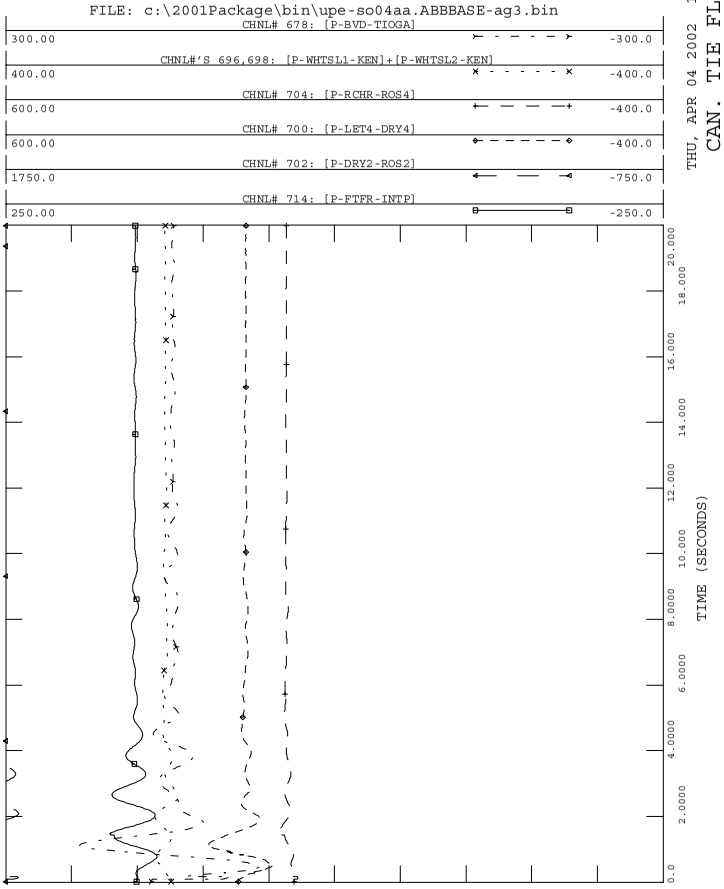
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16
CAN. TIE FLOWS



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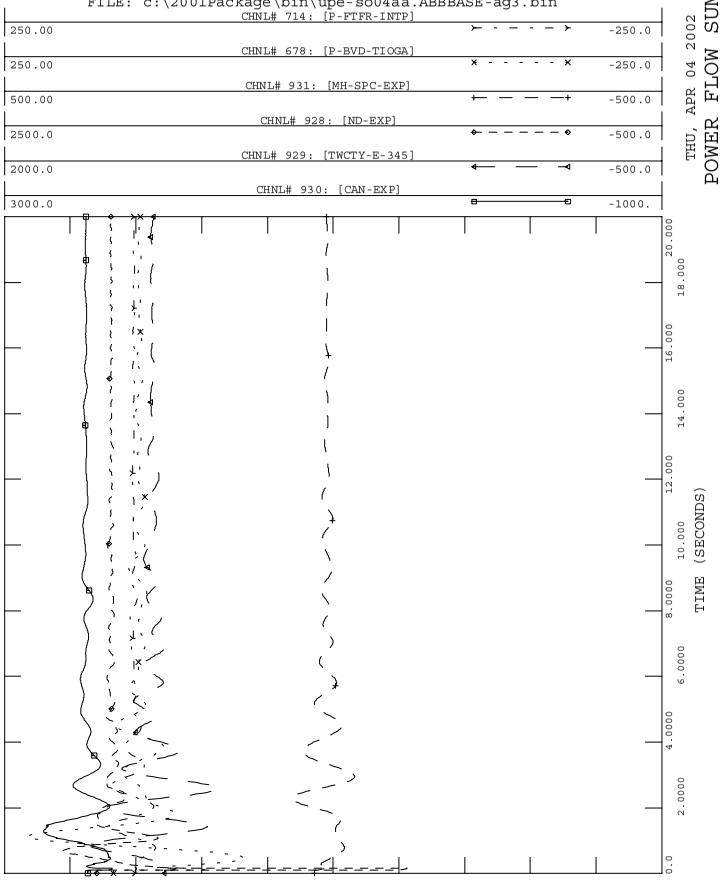
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16
POWER FLOW SUMS 1



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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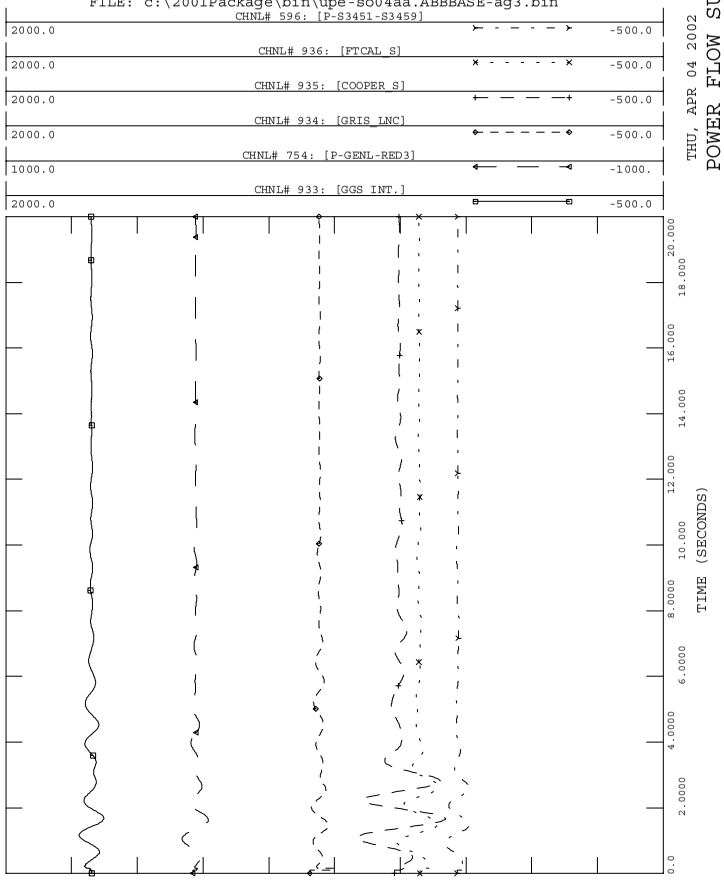
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16
POWER FLOW SUM 3



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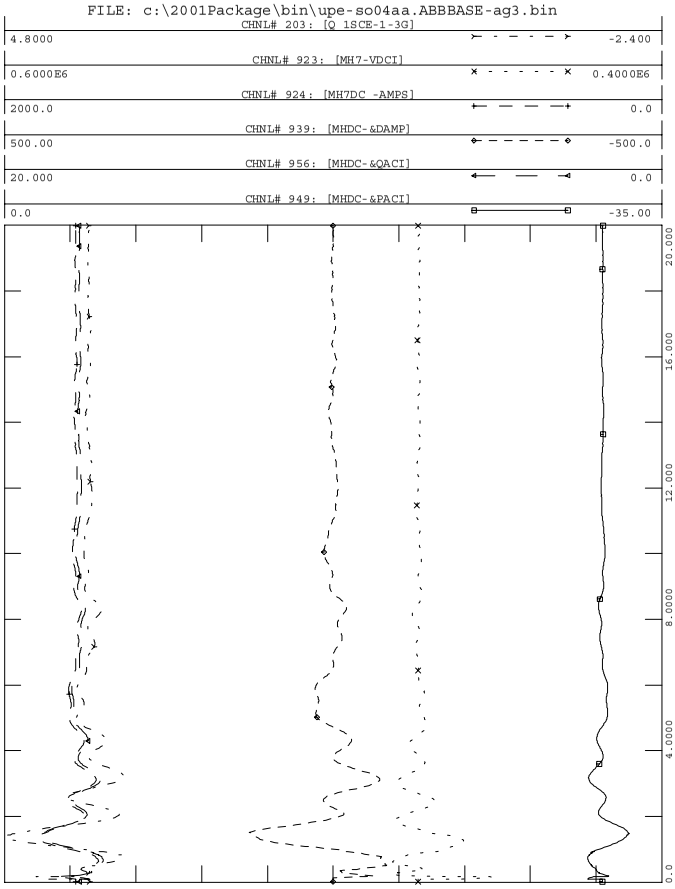
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16
MH DC PARAMETERS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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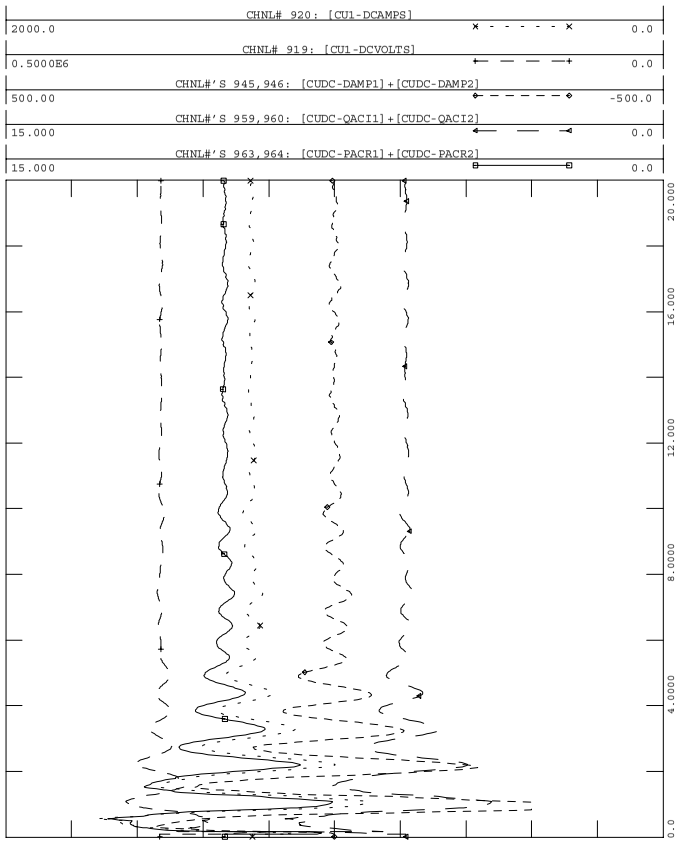
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16
CU DC #1



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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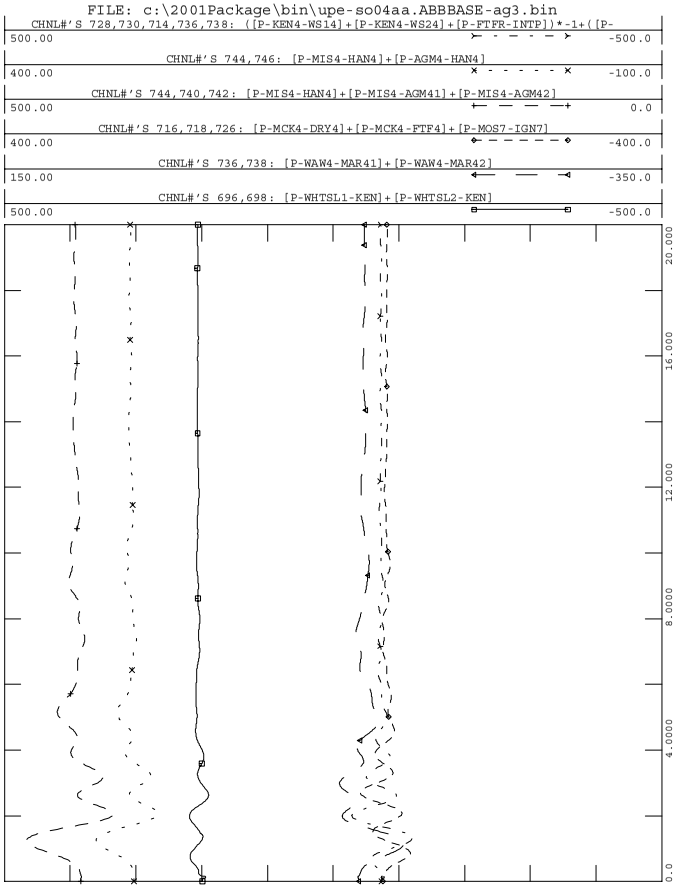
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16
OH TIE FLOWS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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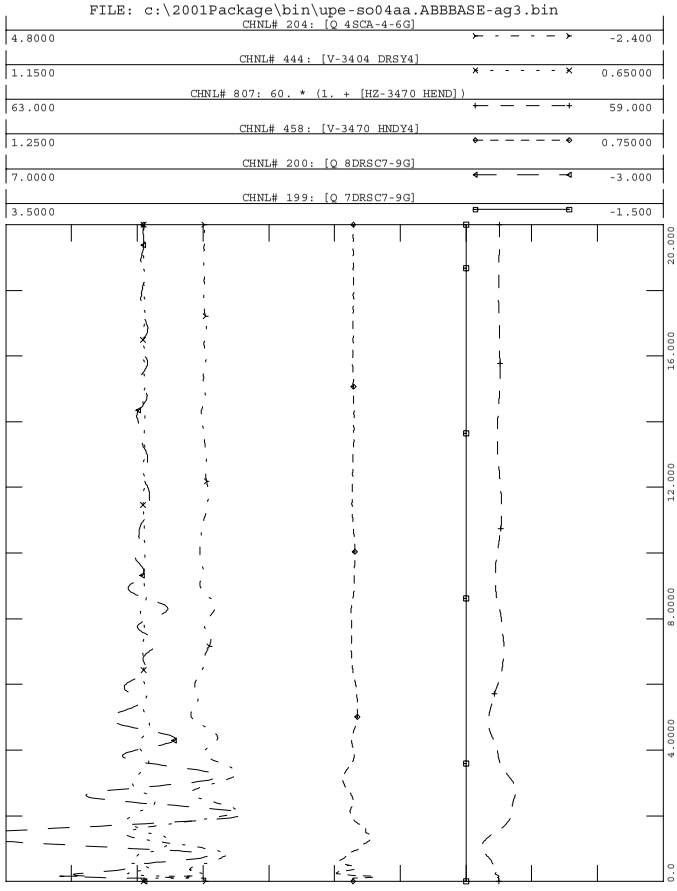
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16
MH DC PARAMETERS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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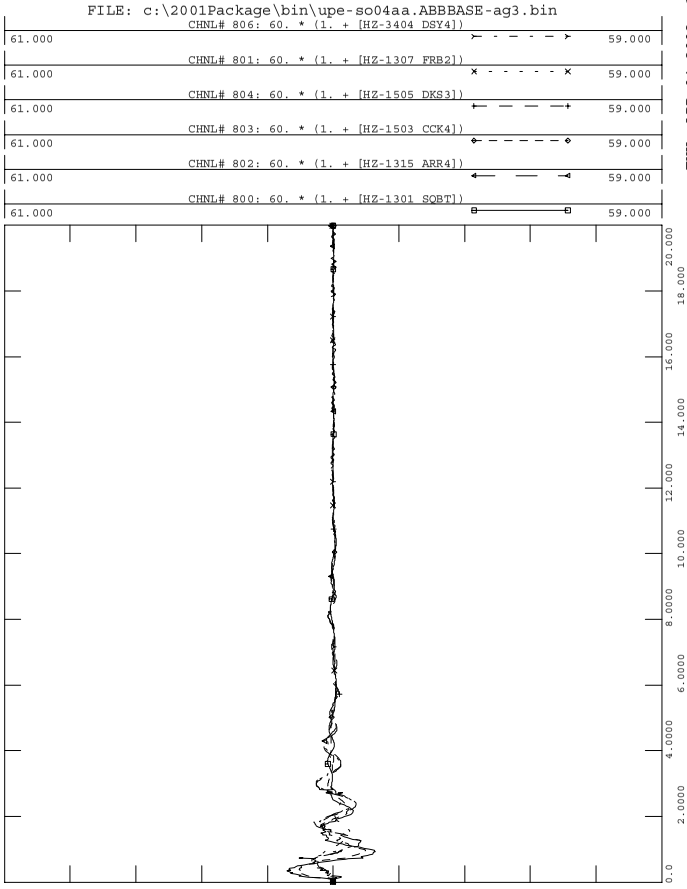
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16

FREQ AT DC TERMINALS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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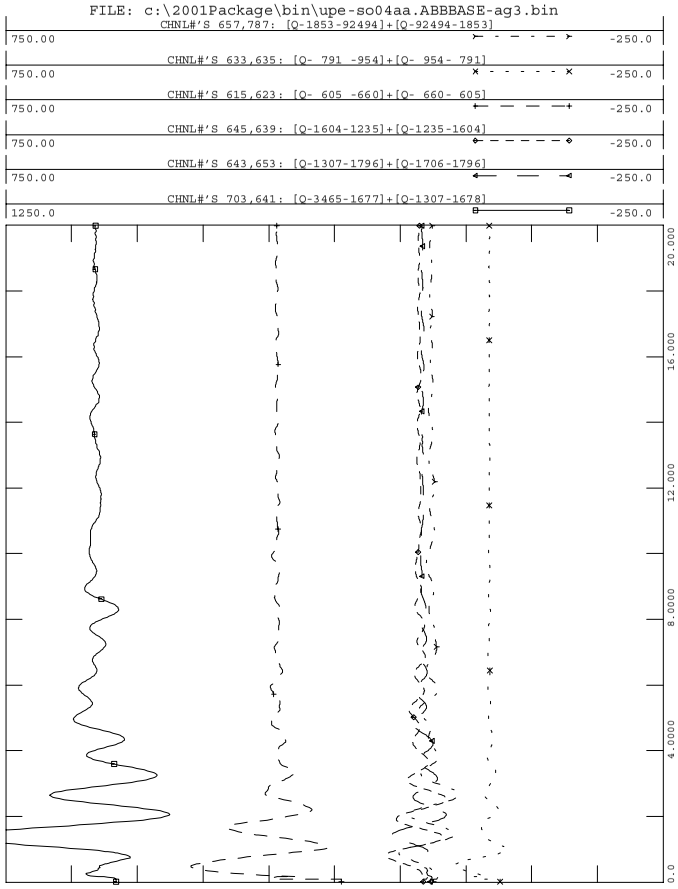
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16

VAR LOSSES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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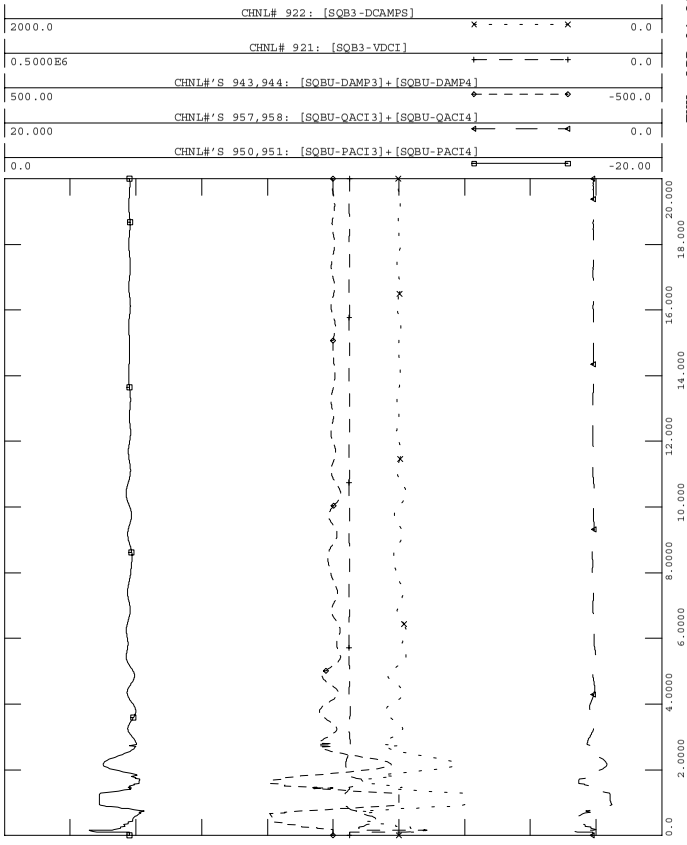
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16

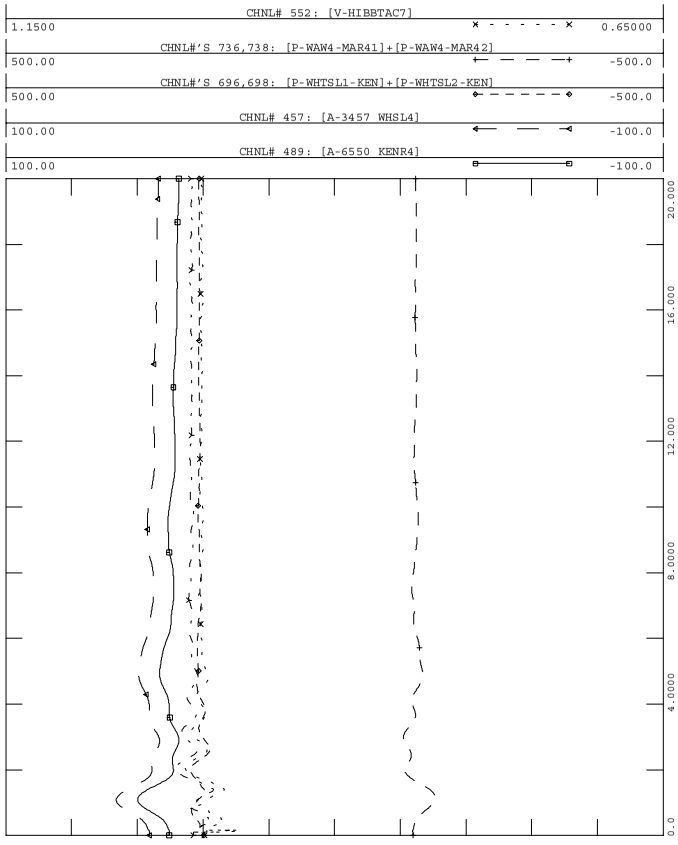
SQB DC #3



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

THU, APR 04 2002 12:16

VOLTAGES, ANGLES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

RELAY: SLINOS
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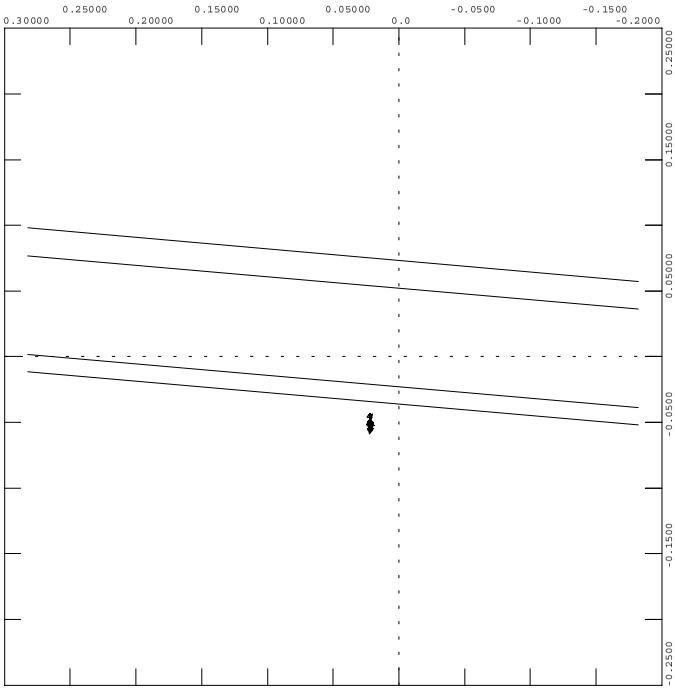
CHNL# 824: [X-FRB2-ROS2]



THU, APR 04 2002 12:16
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

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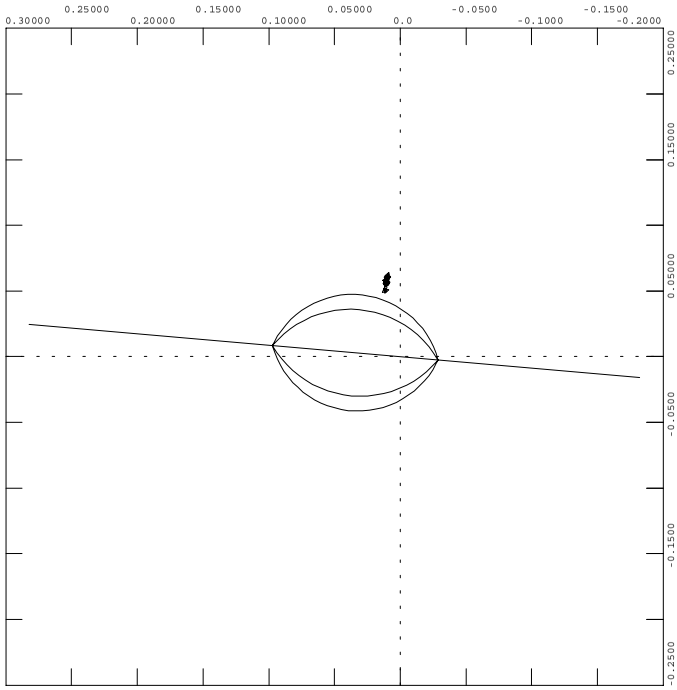

THU, APR 04 2002 12:16
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

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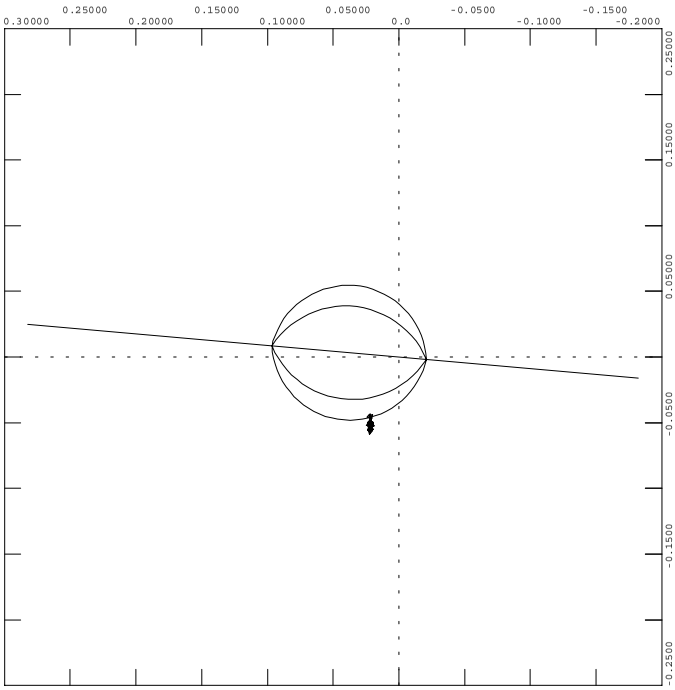

THU, APR 04 2002 12:16
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

RELAY: SLINOS
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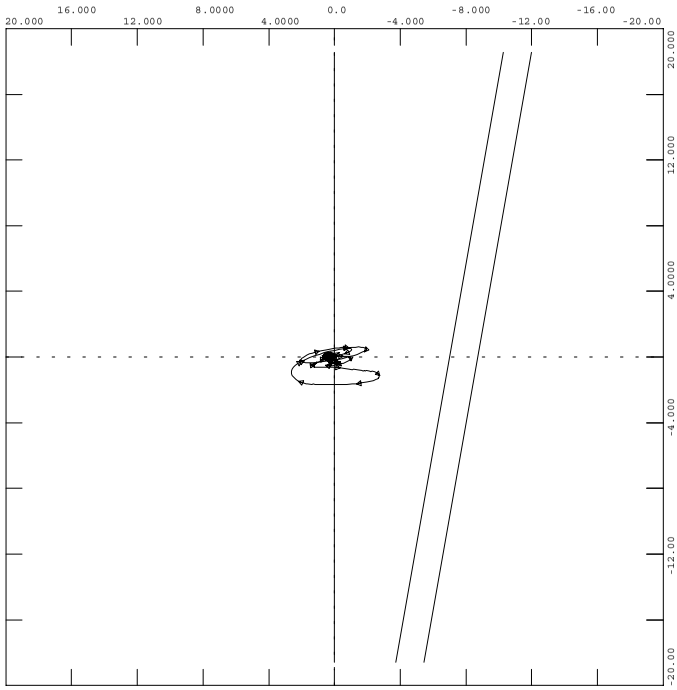
CHNL# 977: [DCAR-B]

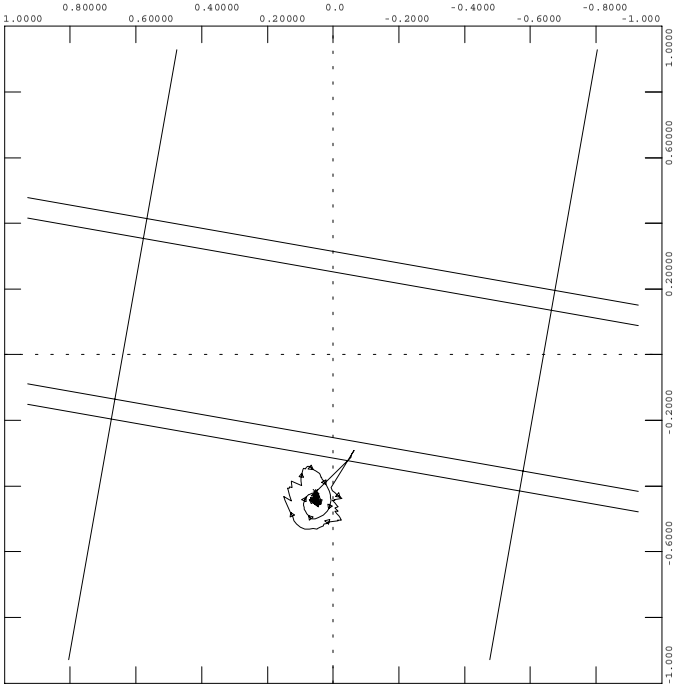


THU, APR 04 2002 12:16
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

RELAY: SLINOS
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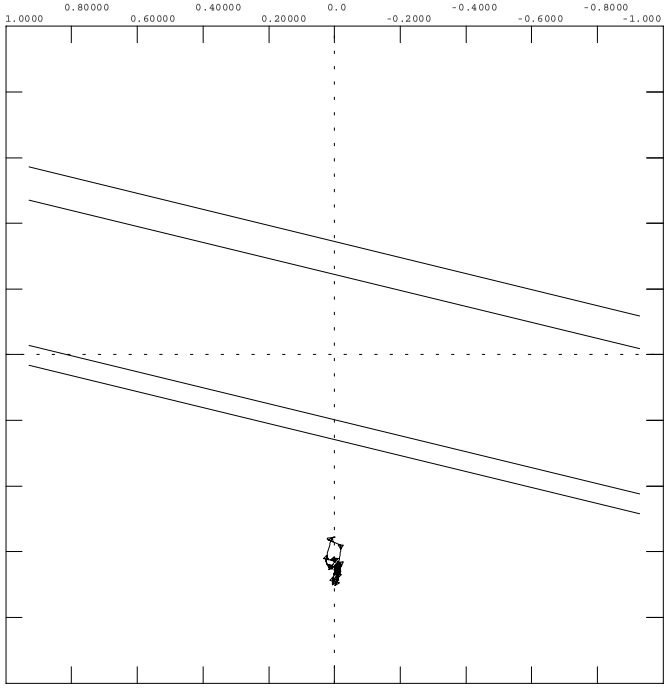

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

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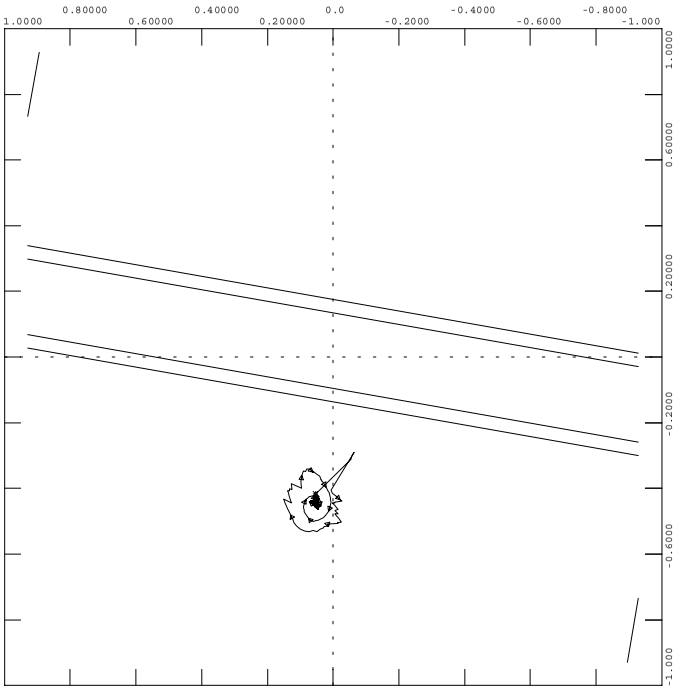
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

RELAY: SLINOS
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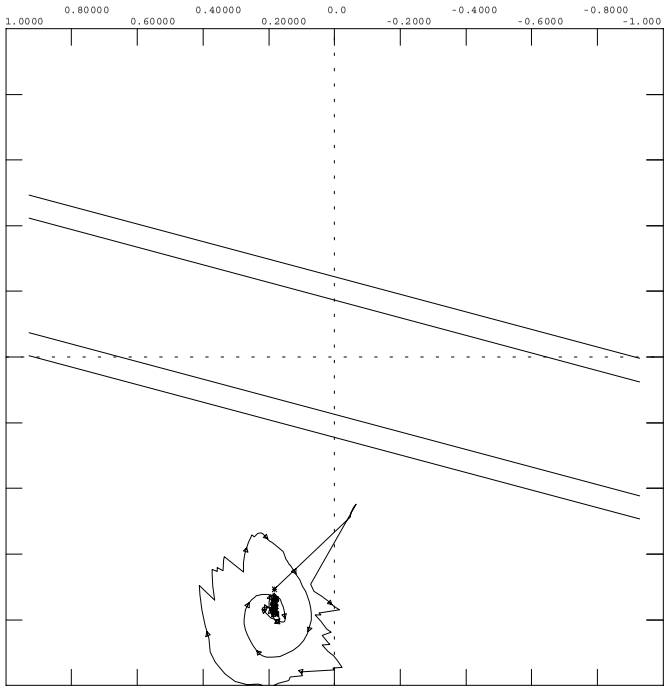
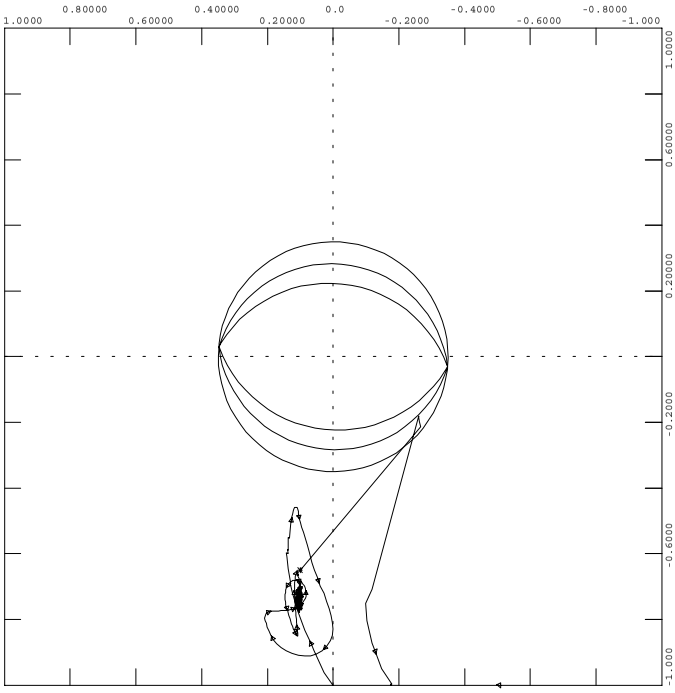
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

RELAY: SLLP
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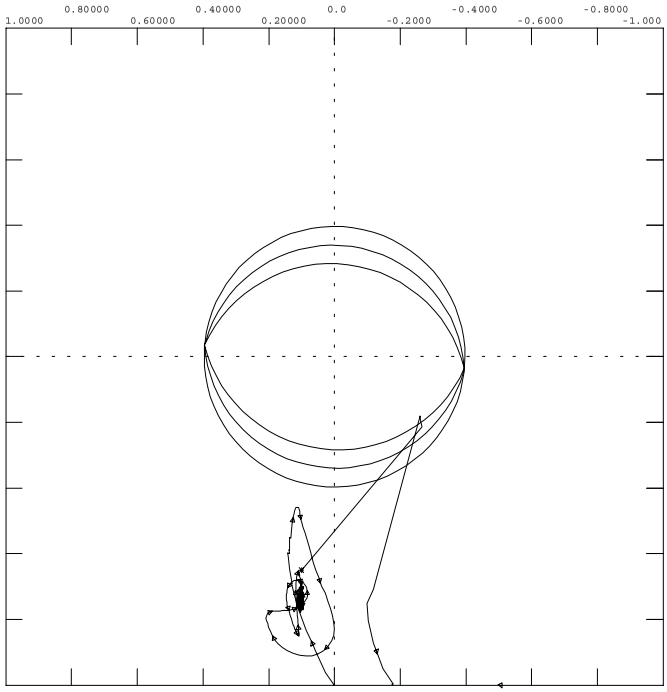
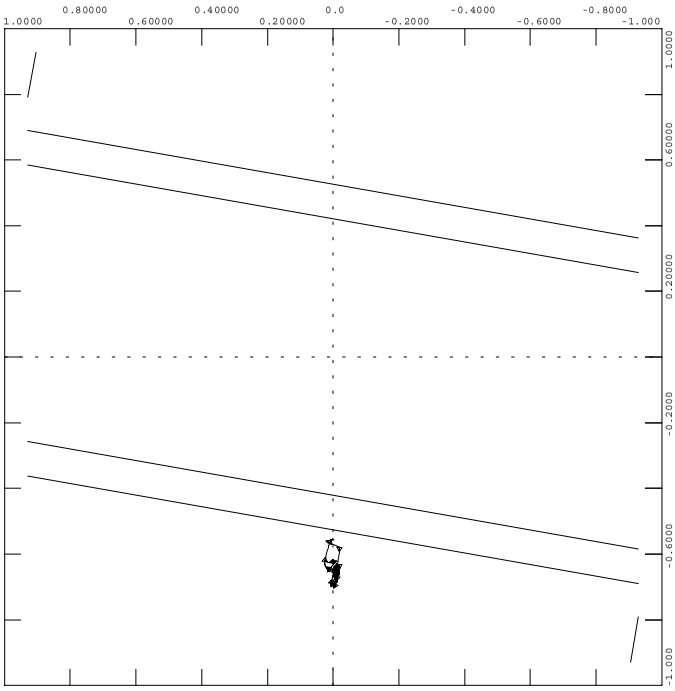
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

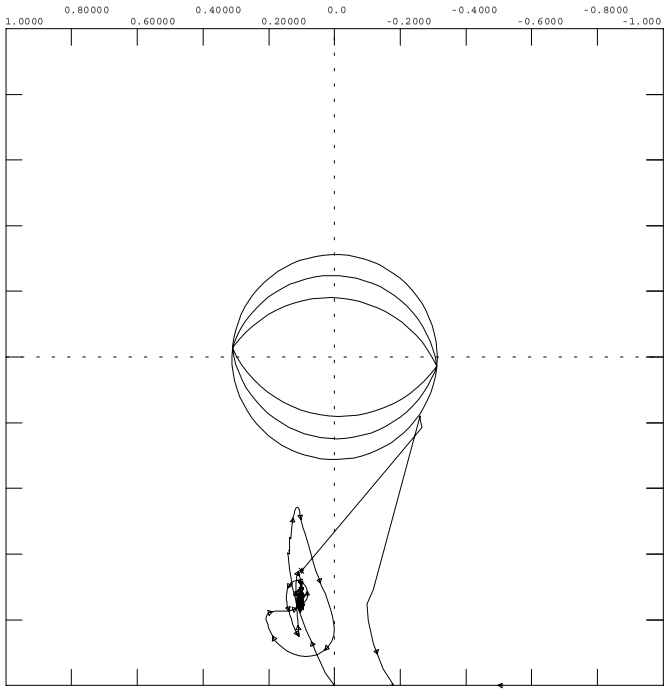
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

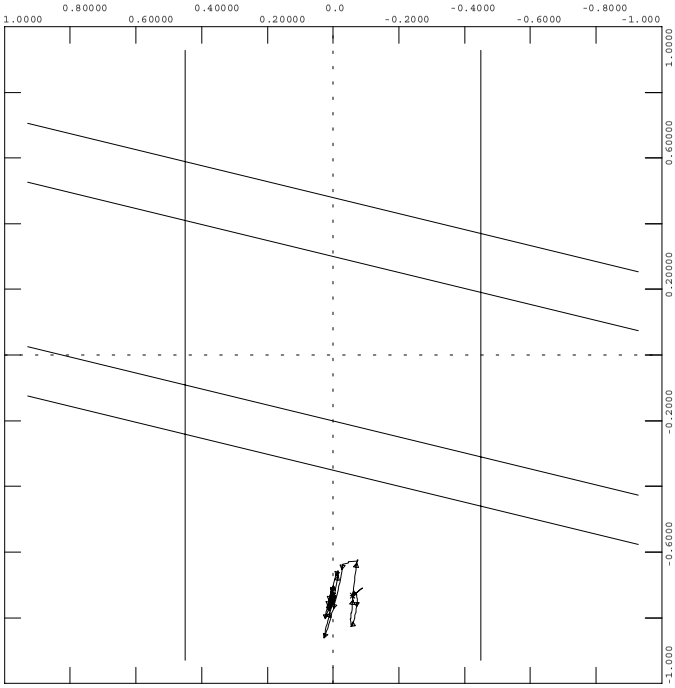
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



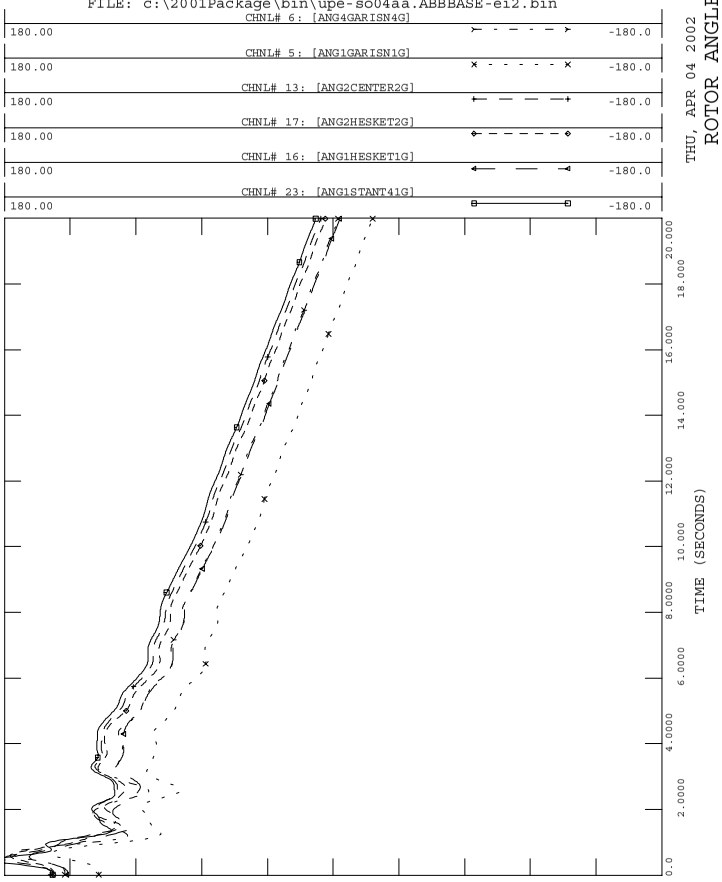
THU, APR 04 2002 12:16
MP-OH I.FALLS (779)
CHNL# 847: [R-1484 6011]

CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

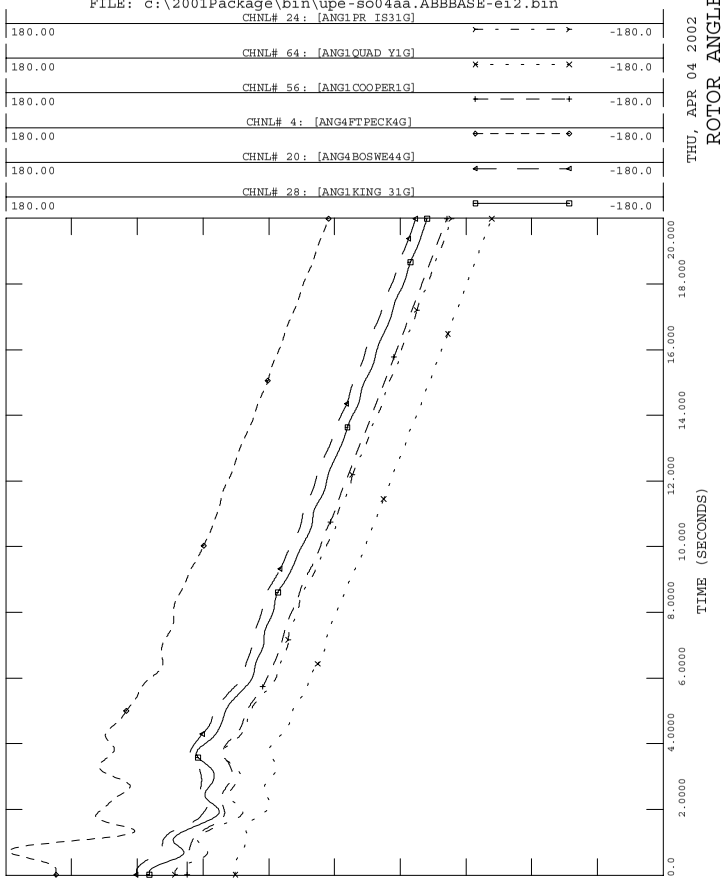
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

THU, APR 04 2002 12:31
ROTOR ANGLES 2



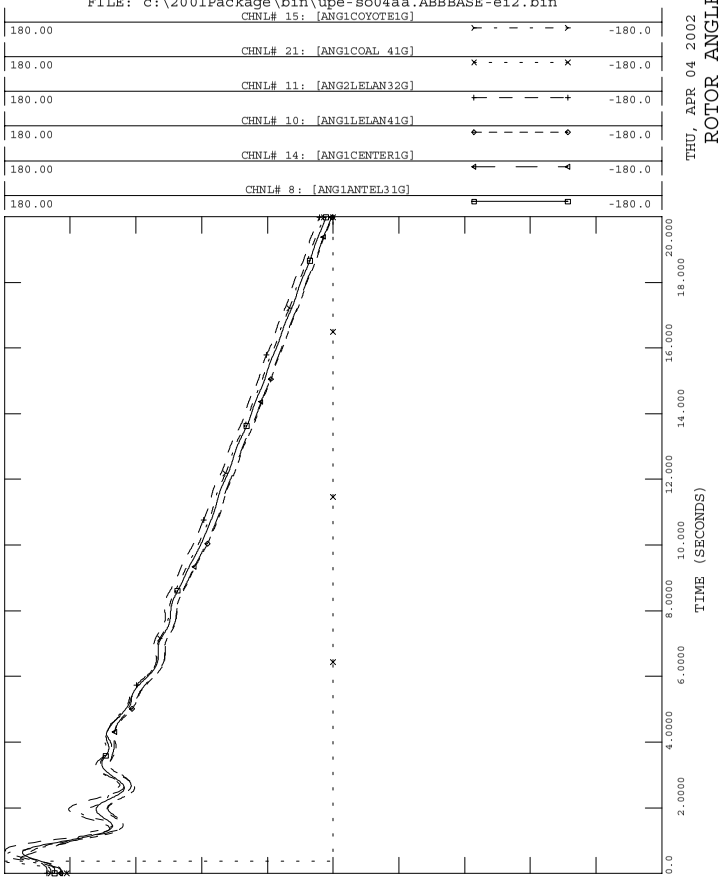
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

THU, APR 04 2002 12:31
ROTOR ANGLES 4



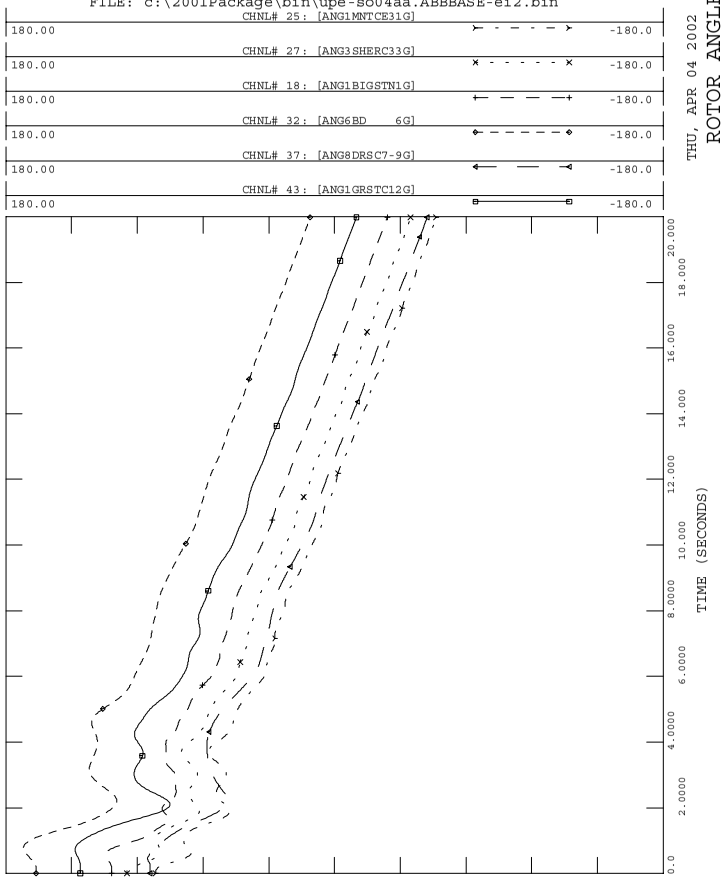
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

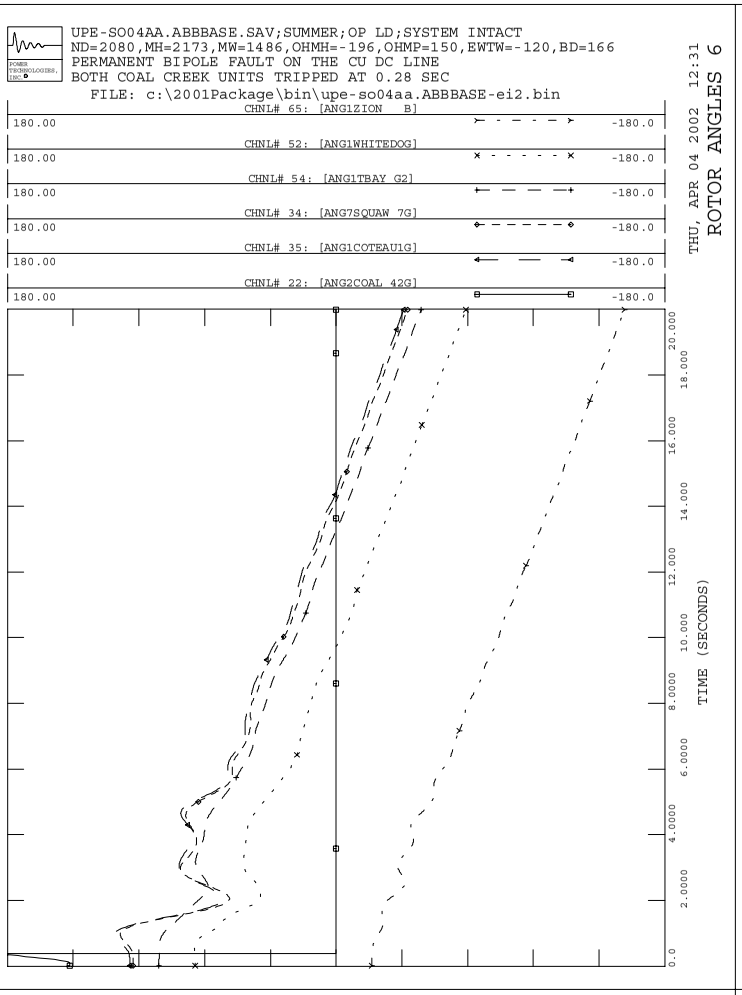
THU, APR 04 2002 12:31
ROTOR ANGLES 1

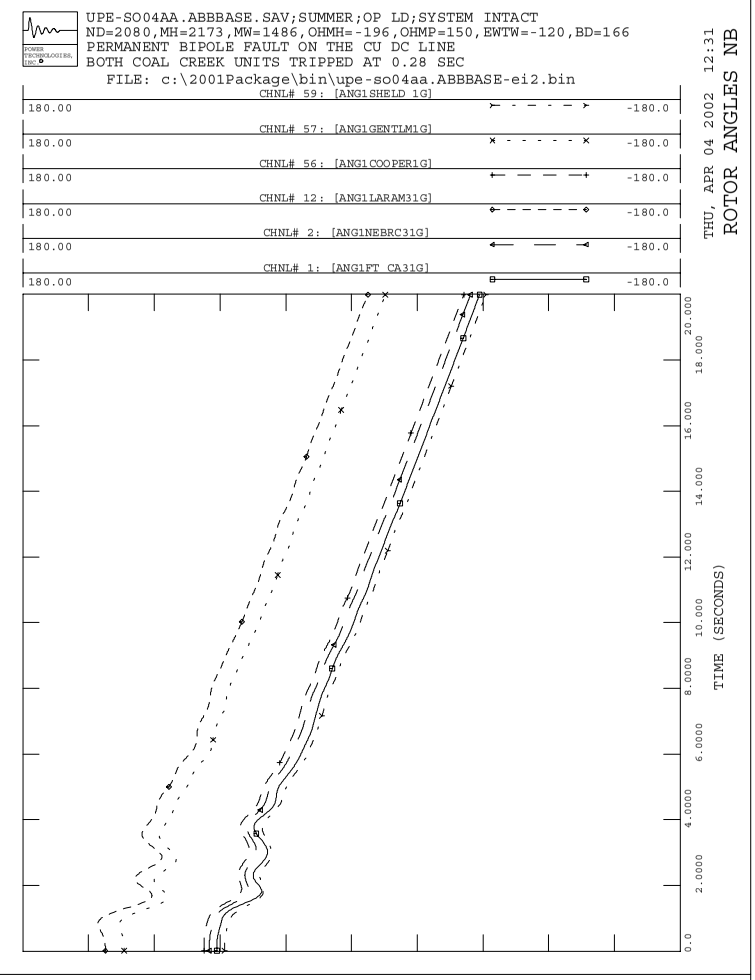


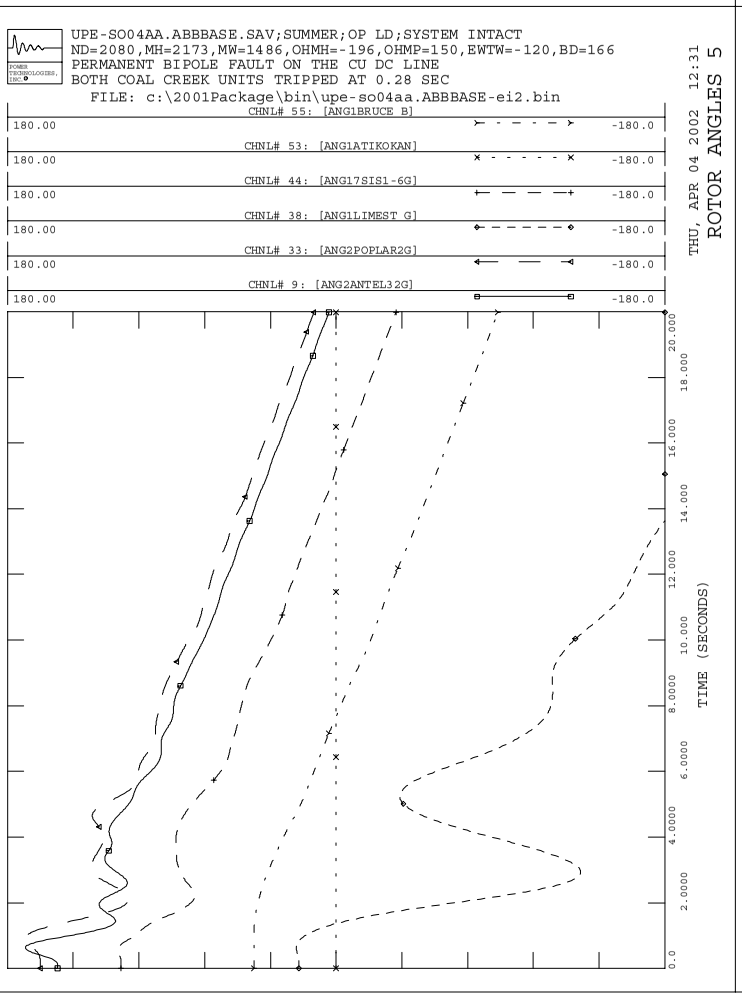
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

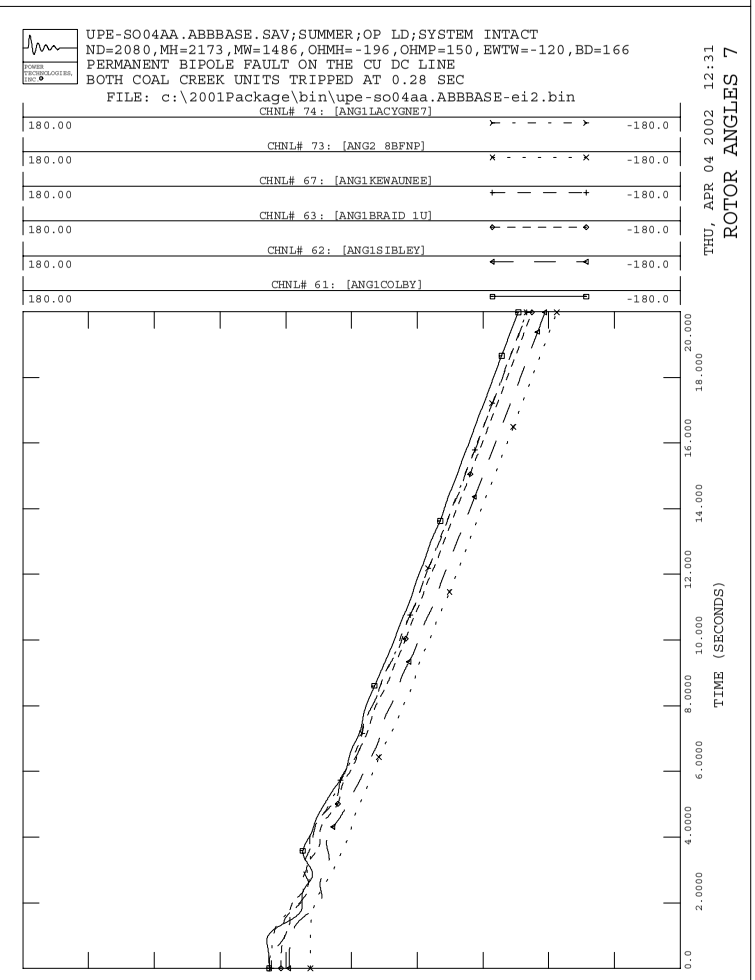
THU, APR 04 2002 12:31
ROTOR ANGLES 3



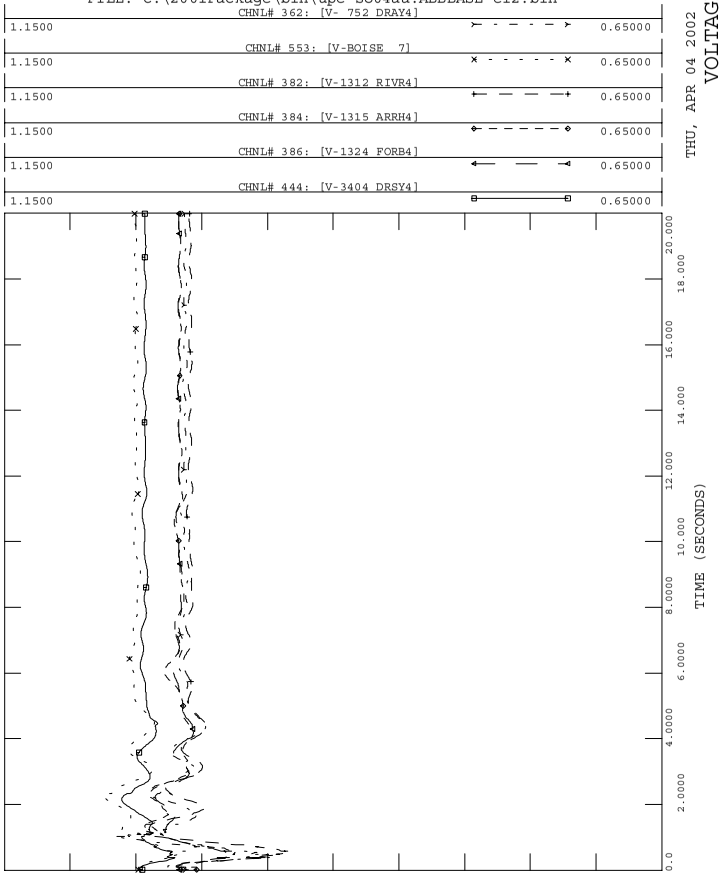

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 12:31
ROTOR ANGLES 6


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 12:31
ROTOR ANGLES NB


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 12:31
ROTOR ANGLES 5

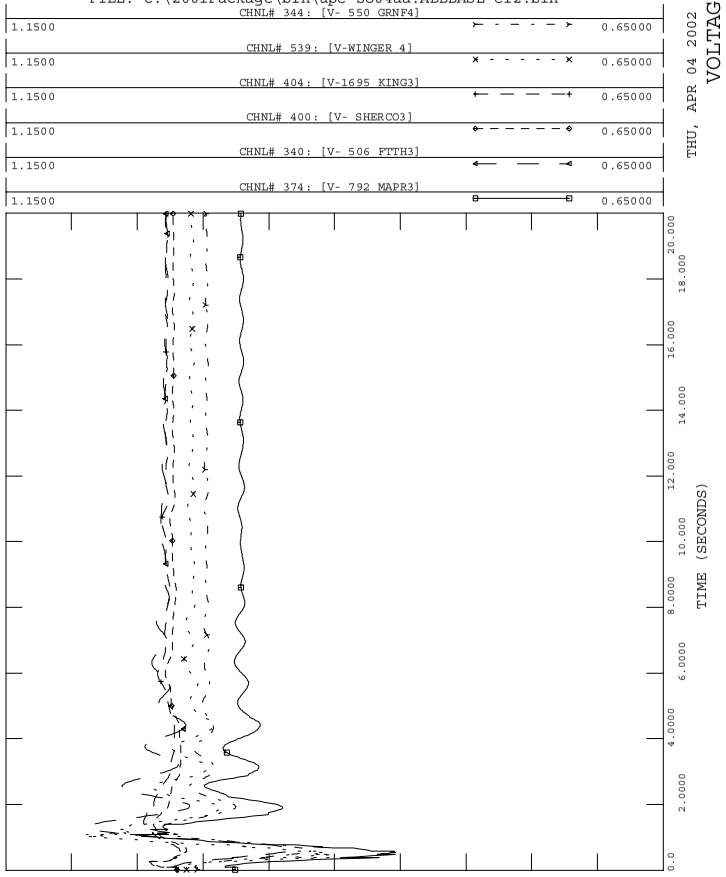

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 12:31
ROTOR ANGLES 7

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin



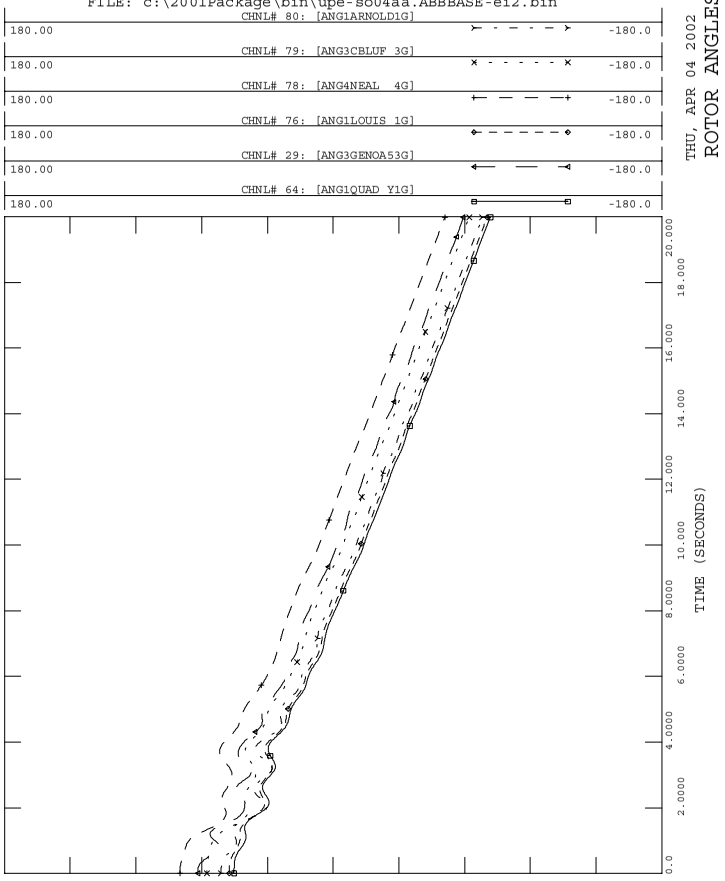
THU, APR 04 2002 12:31
VOLTAGES 1

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin



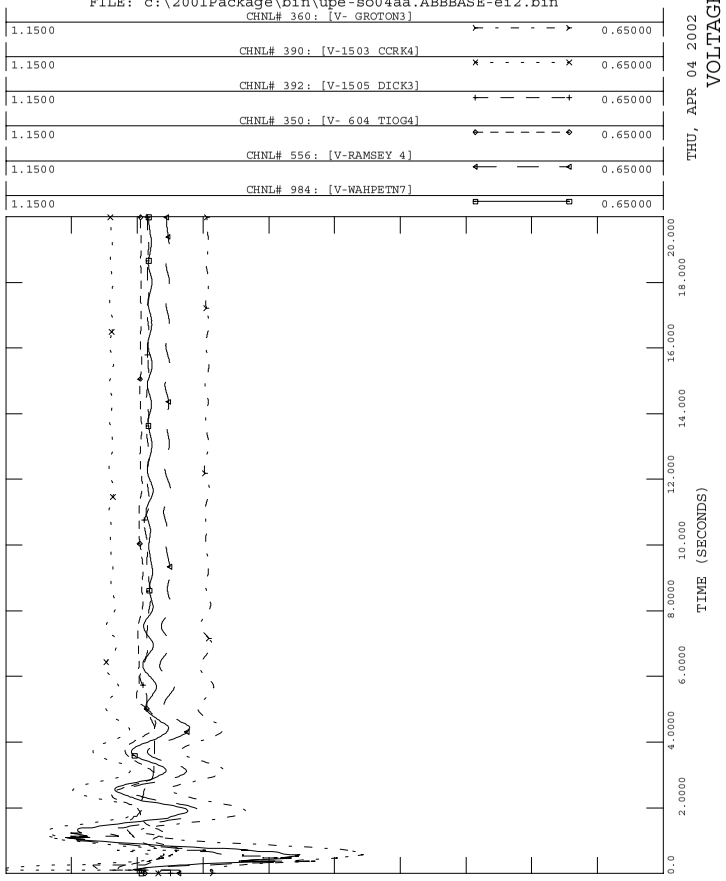
THU, APR 04 2002 12:31
VOLTAGES 3

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin



THU, APR 04 2002 12:31
ROTOR ANGLES IA

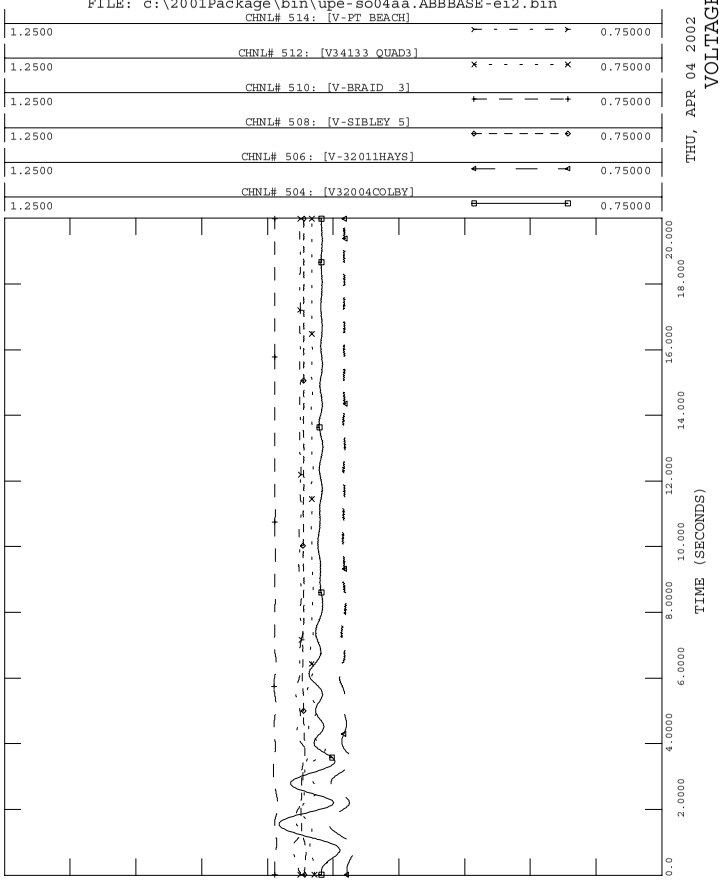
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin



THU, APR 04 2002 12:31
VOLTAGES 2

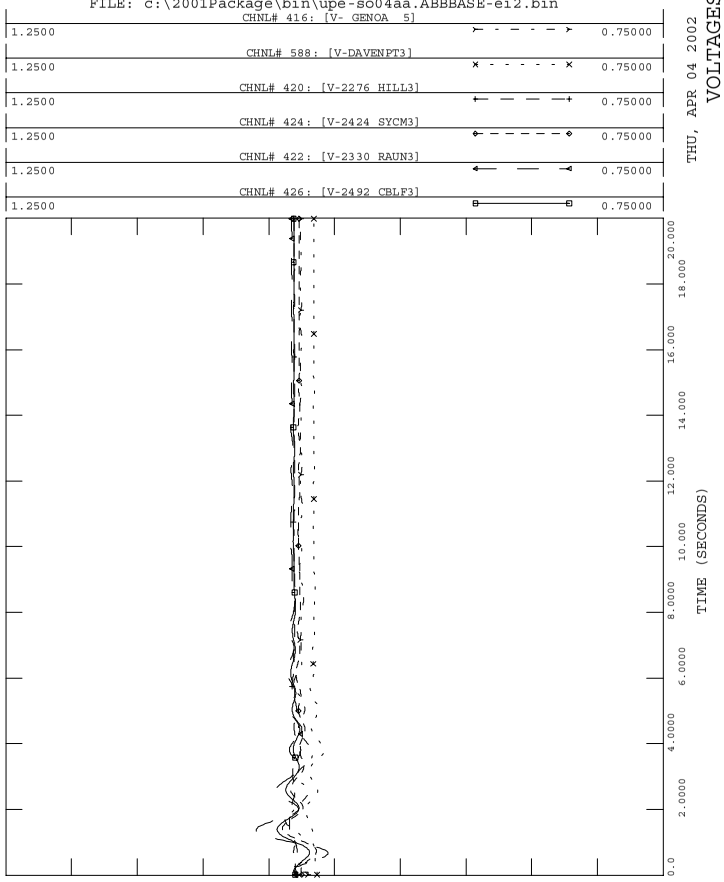
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

THU, APR 04 2002 12:31
VOLTAGES 5



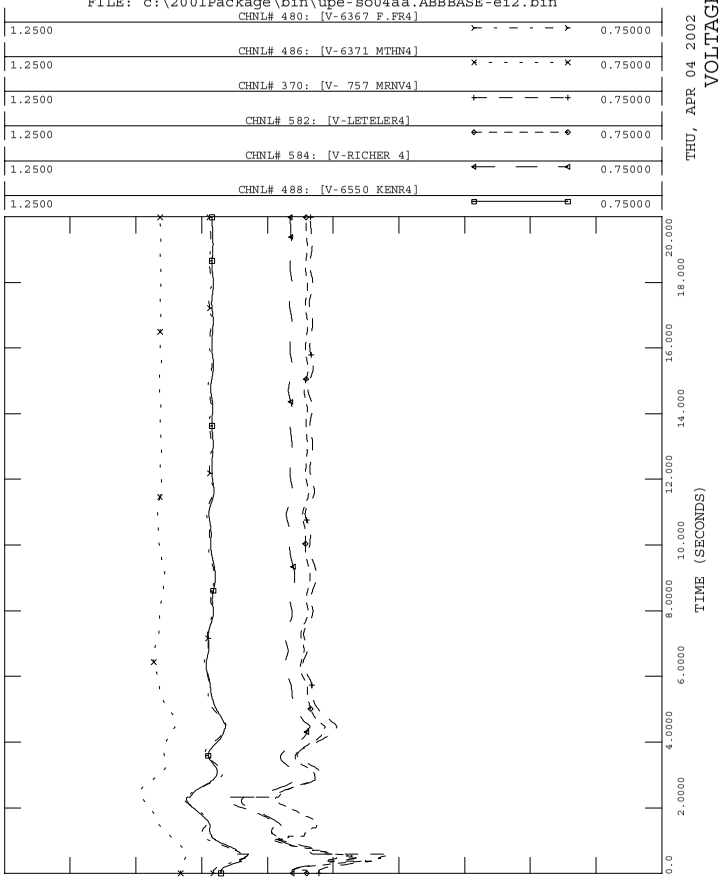
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

THU, APR 04 2002 12:31
VOLTAGES IA



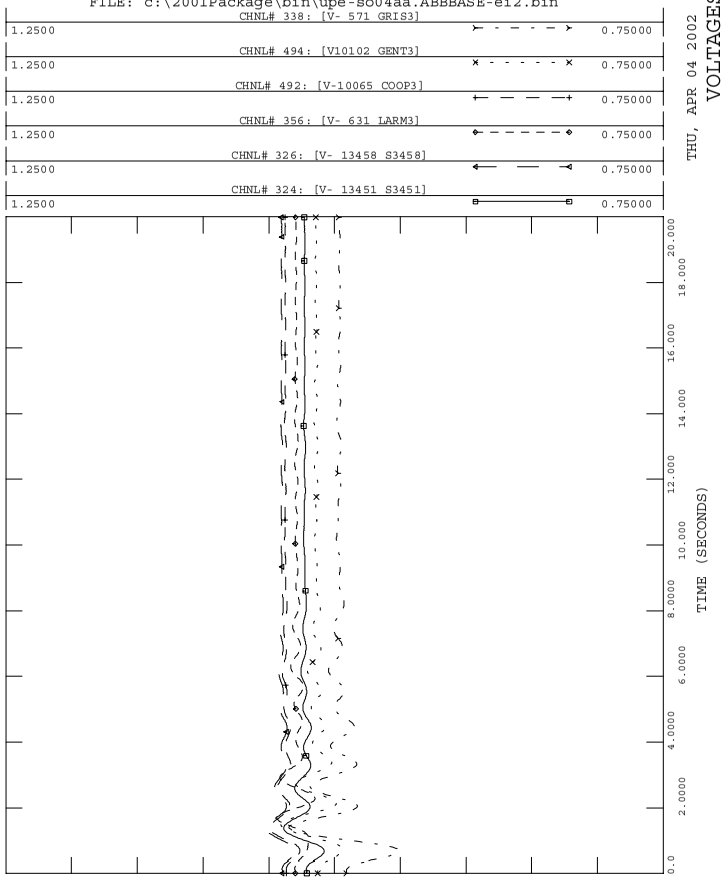
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

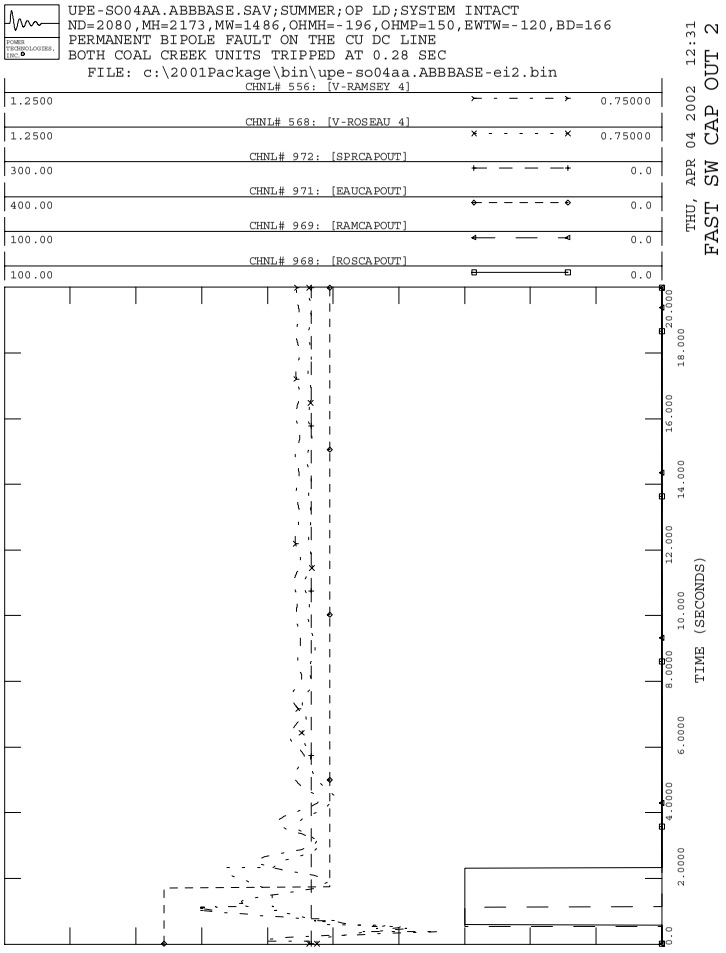
THU, APR 04 2002 12:31
VOLTAGES 4

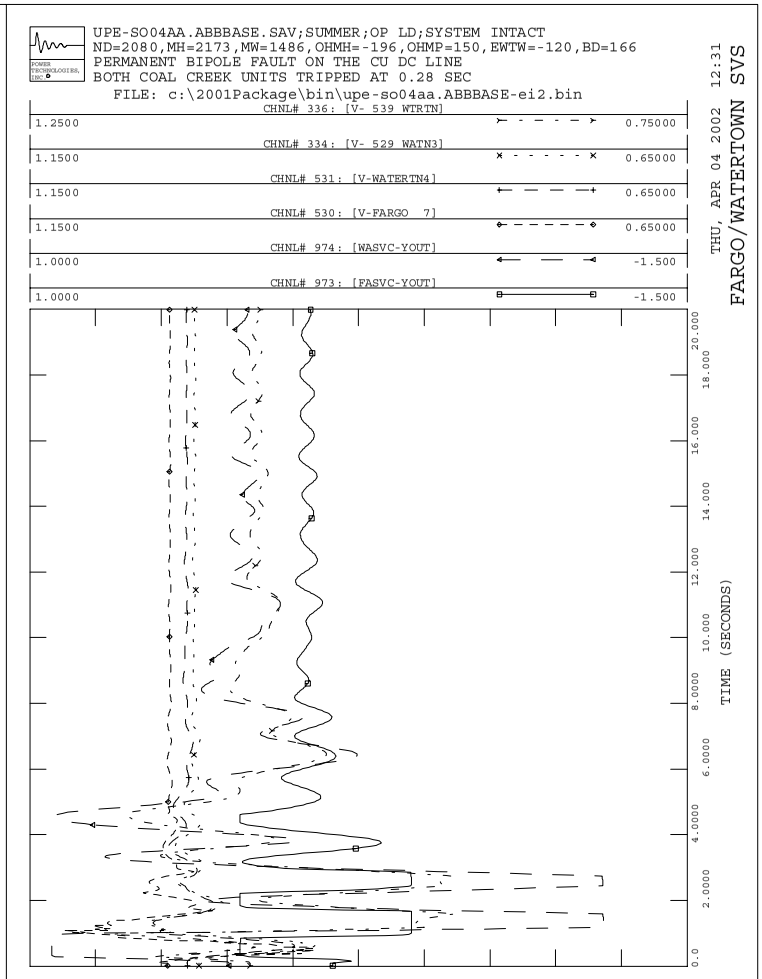


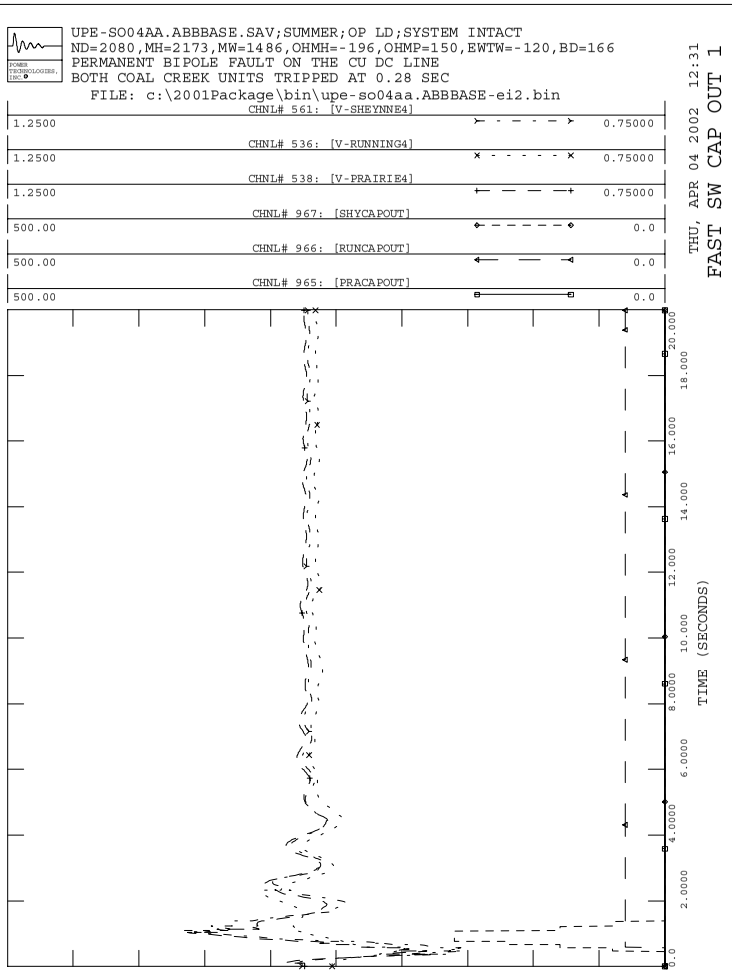
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

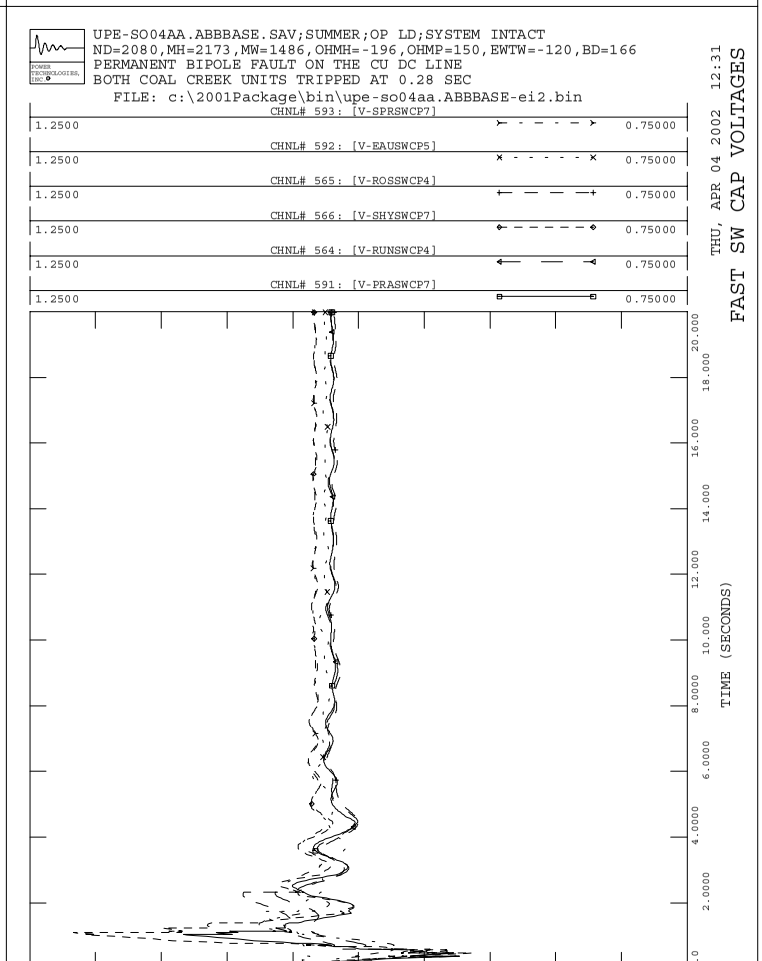
THU, APR 04 2002 12:31
VOLTAGES NB



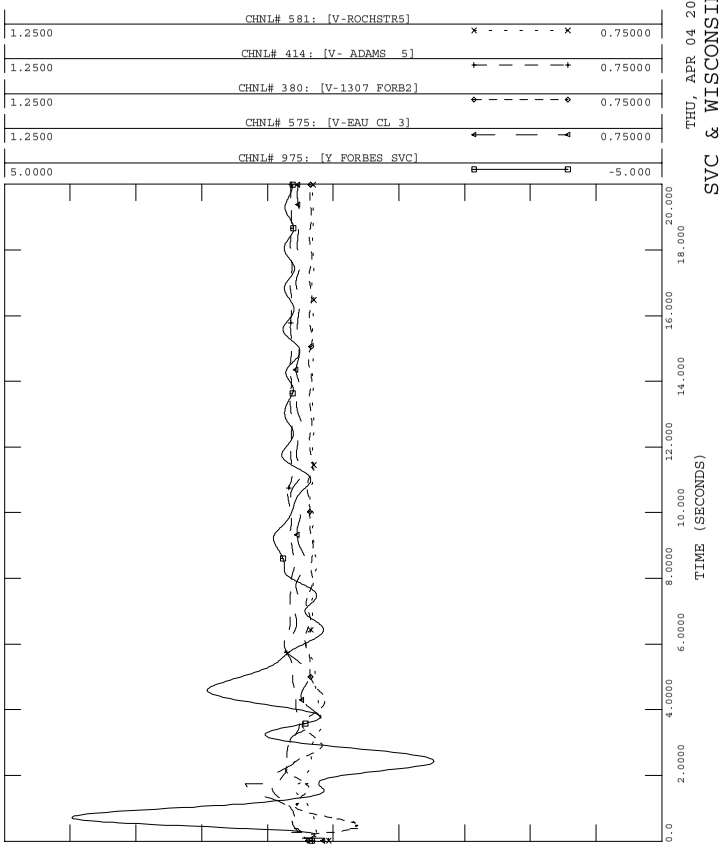

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
THU, APR 04 2002 12:31
FAST SW CAP OUT 2


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
THU, APR 04 2002 12:31
FARGO/WATERTOWN SVS


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
THU, APR 04 2002 12:31
FAST SW CAP OUT 1

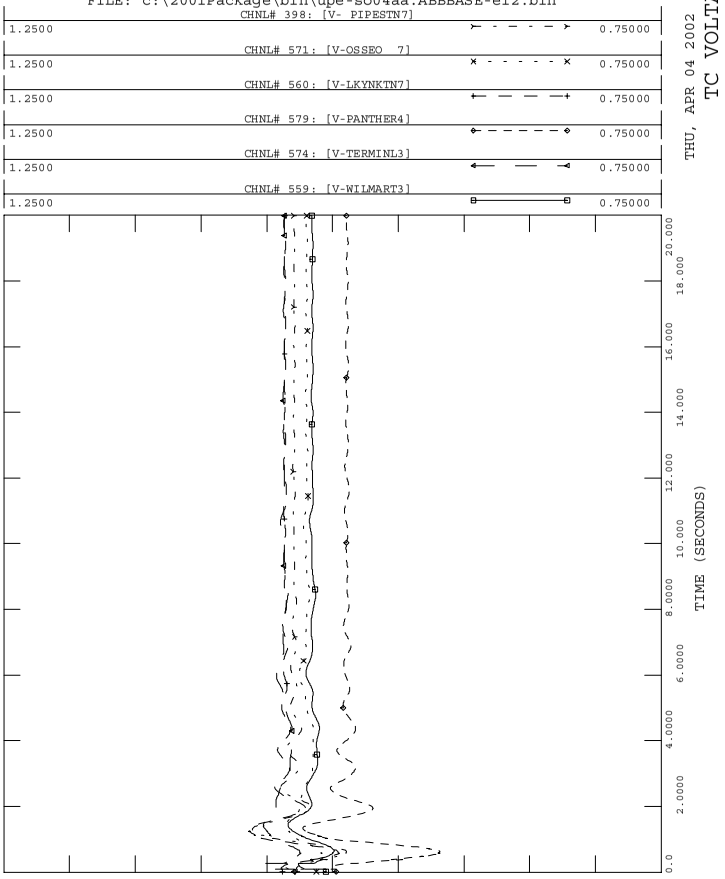

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
THU, APR 04 2002 12:31
FAST SW CAP VOLTAGES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin



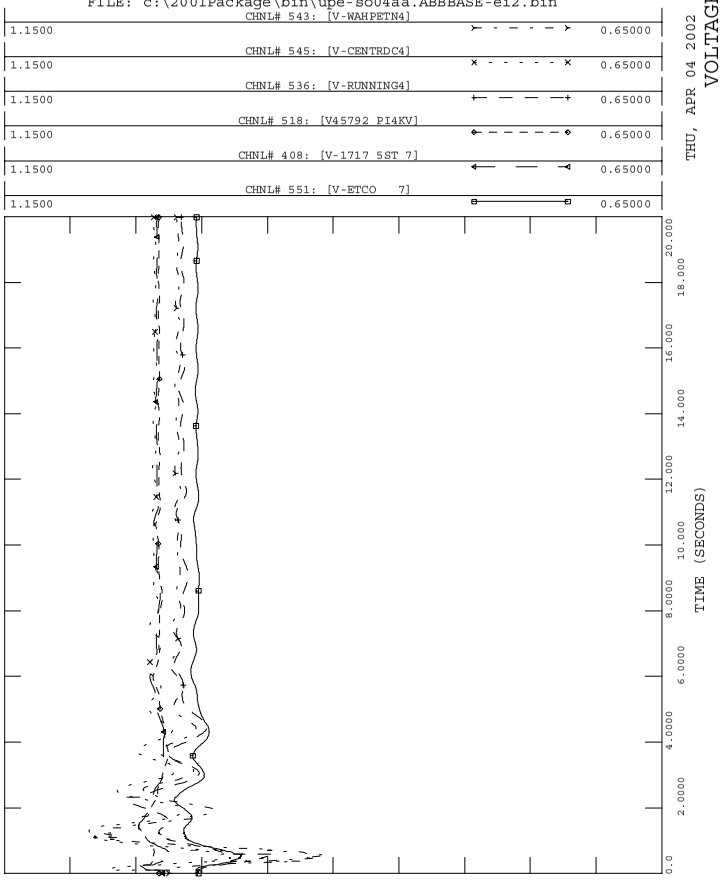
THU, APR 04 2002 12:31
SVC & WISCONSIN VOLT

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin



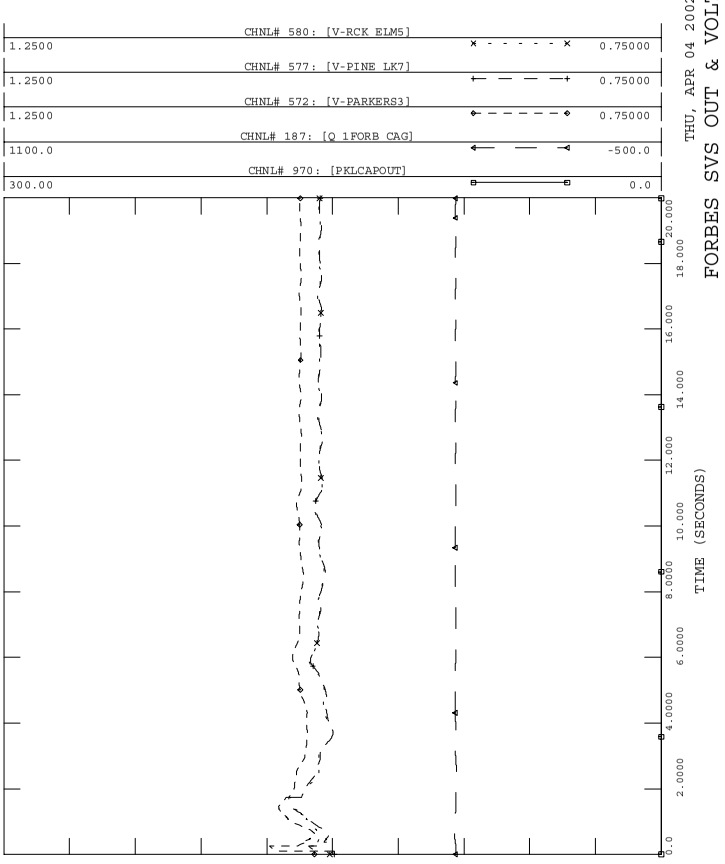
THU, APR 04 2002 12:31
TC VOLTAGES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin



THU, APR 04 2002 12:31
VOLTAGES 6

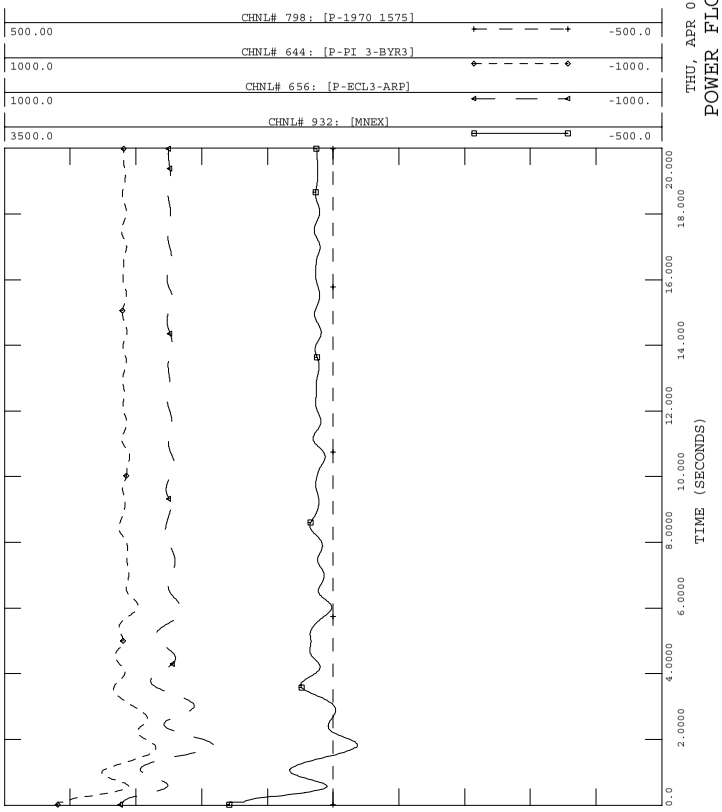
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin



THU, APR 04 2002 12:31
FORBES SVS OUT & VOLTAGES

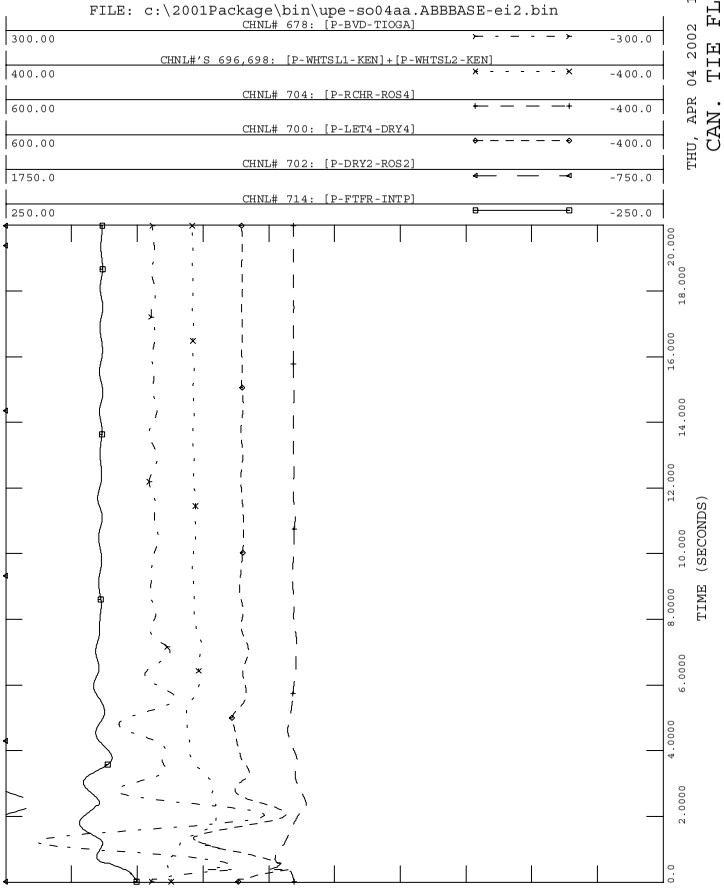
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

THU, APR 04 2002 12:31
POWER FLOW SUMS 2



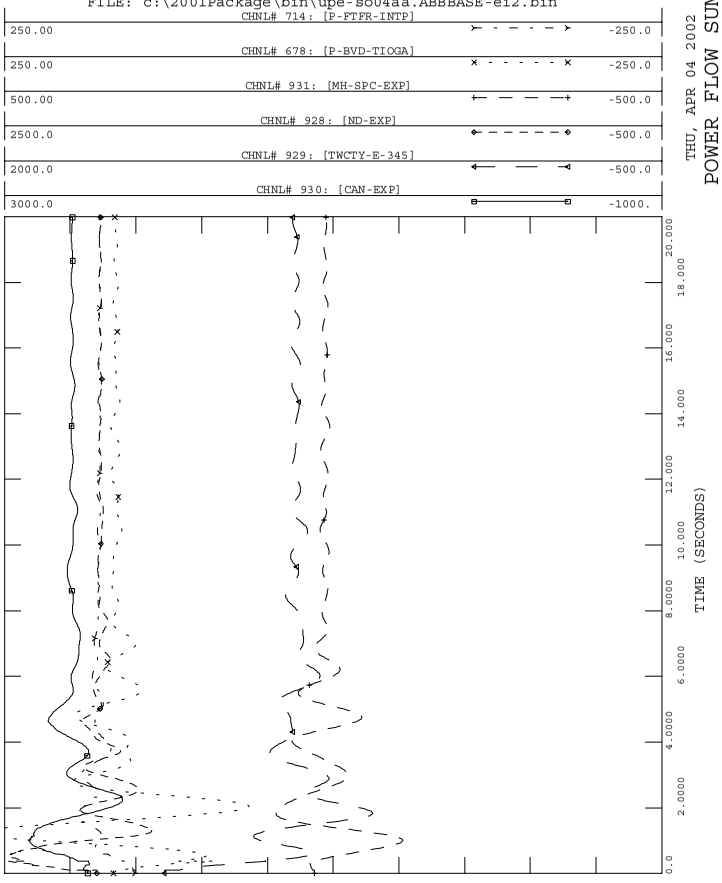
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

THU, APR 04 2002 12:31
CAN. TIE FLOWS



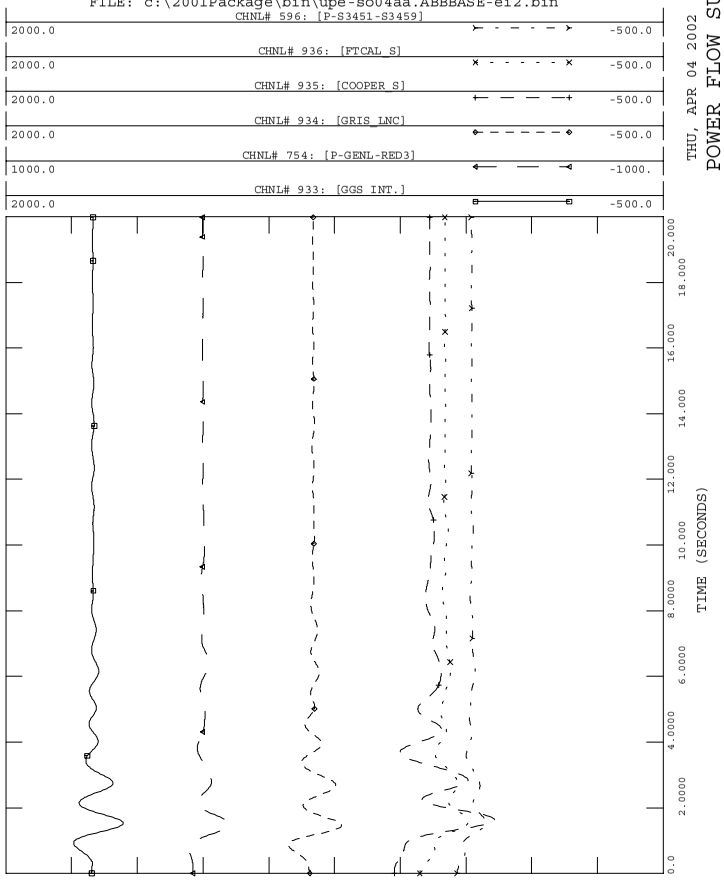
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

THU, APR 04 2002 12:31
POWER FLOW SUMS 1



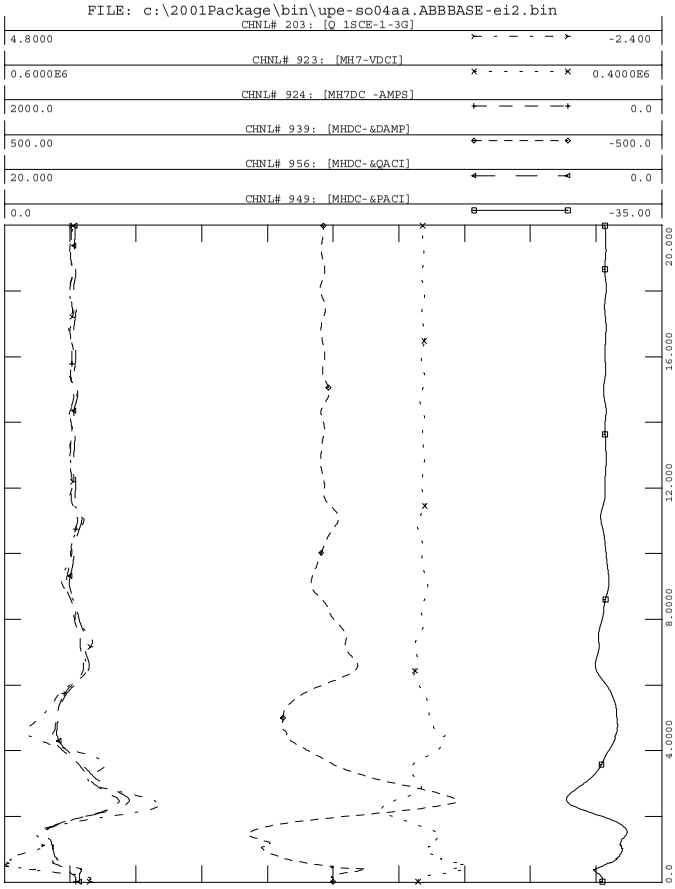
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

THU, APR 04 2002 12:31
POWER FLOW SUM 3



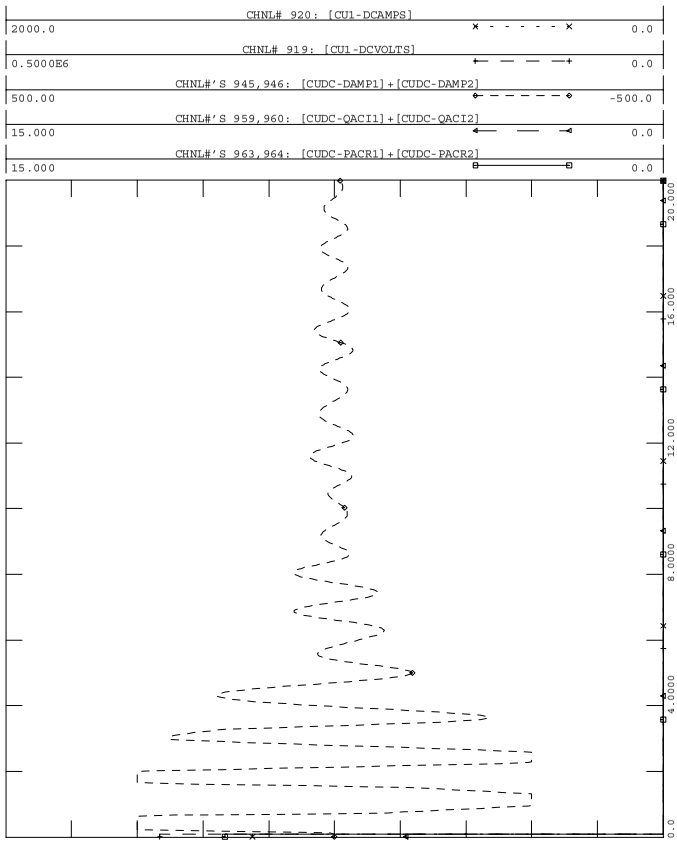
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

THU, APR 04 2002 12:31
MH DC PARAMETERS



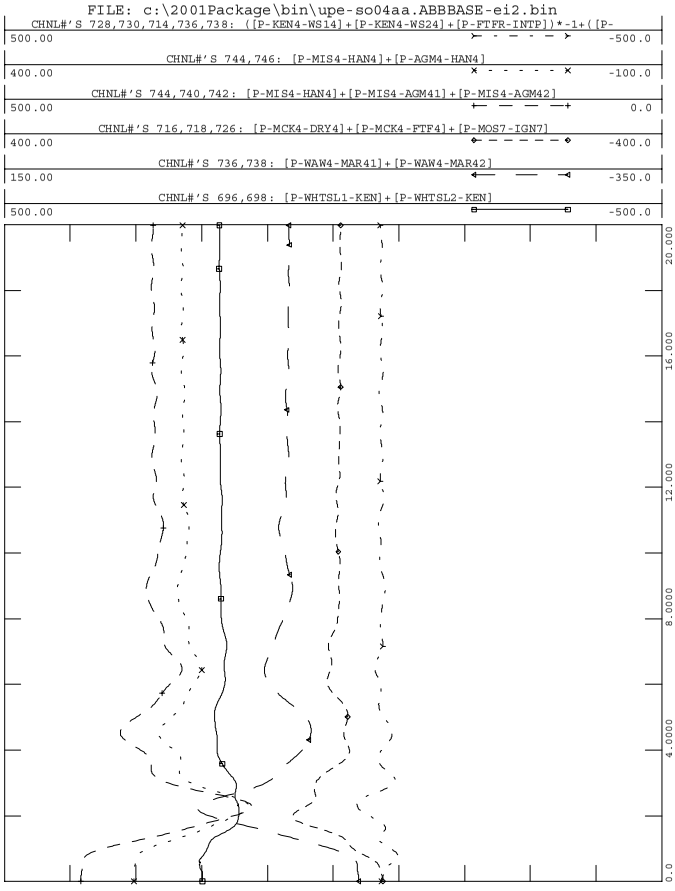
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

THU, APR 04 2002 12:31
CU DC #1



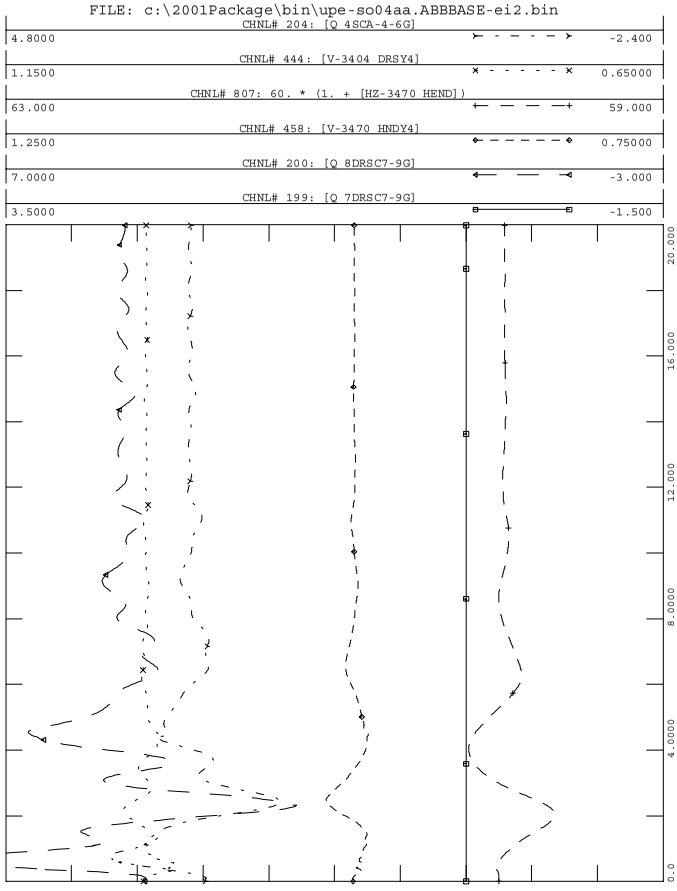
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

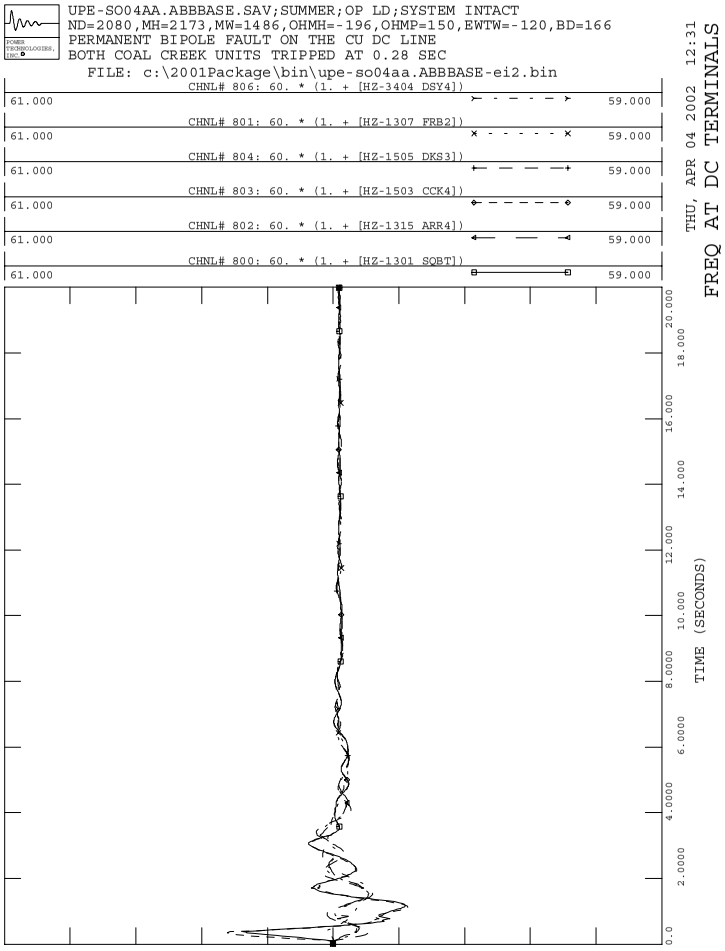
THU, APR 04 2002 12:31
OH TIE FLOWS

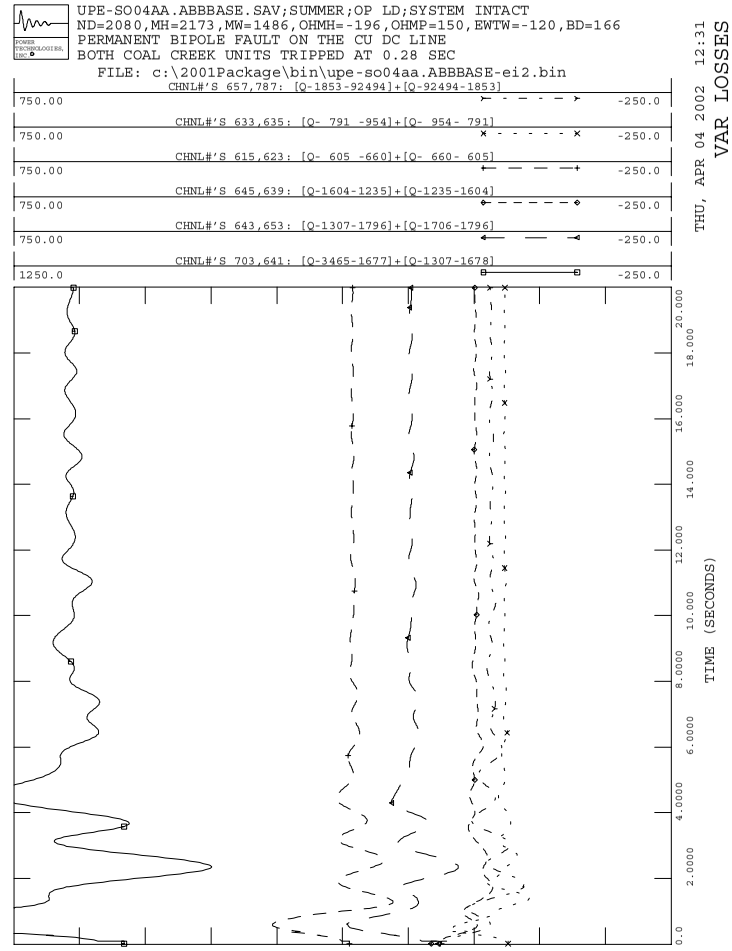


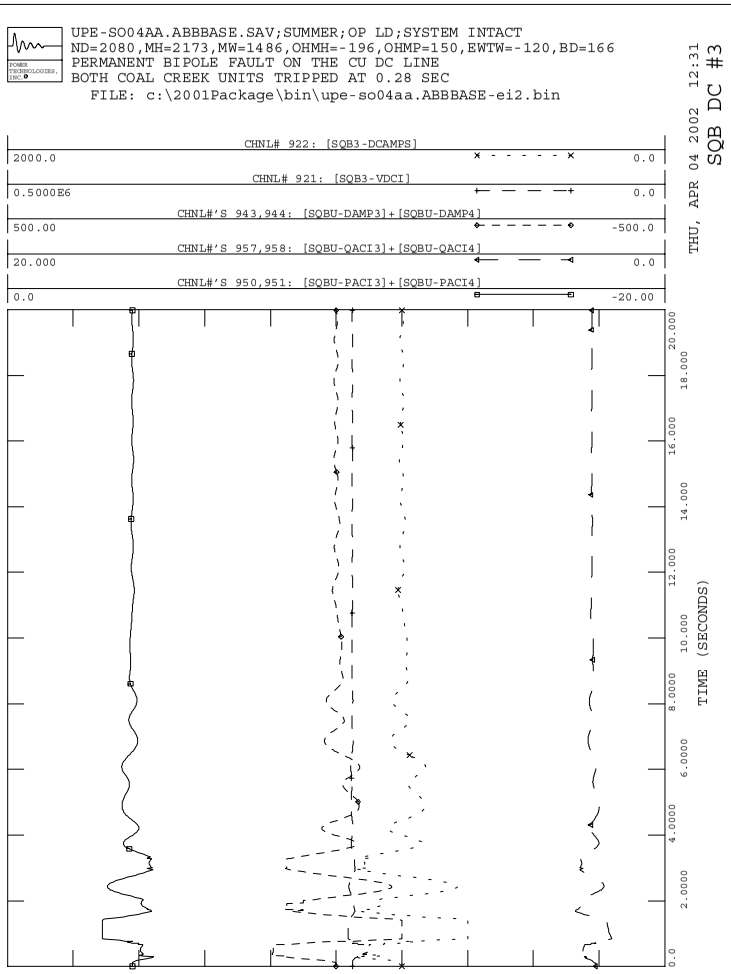
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

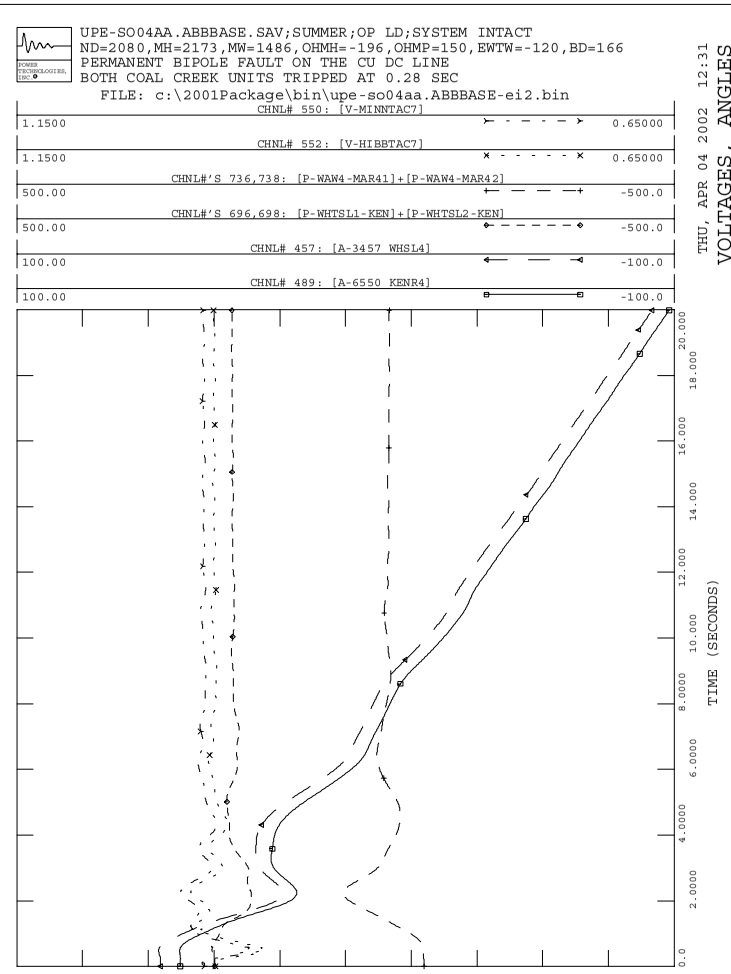
THU, APR 04 2002 12:31
MH DC PARAMETERS




UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
THU, APR 04 2002 12:31
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
THU, APR 04 2002 12:31
VAR LOSSES
TIME (SECONDS)

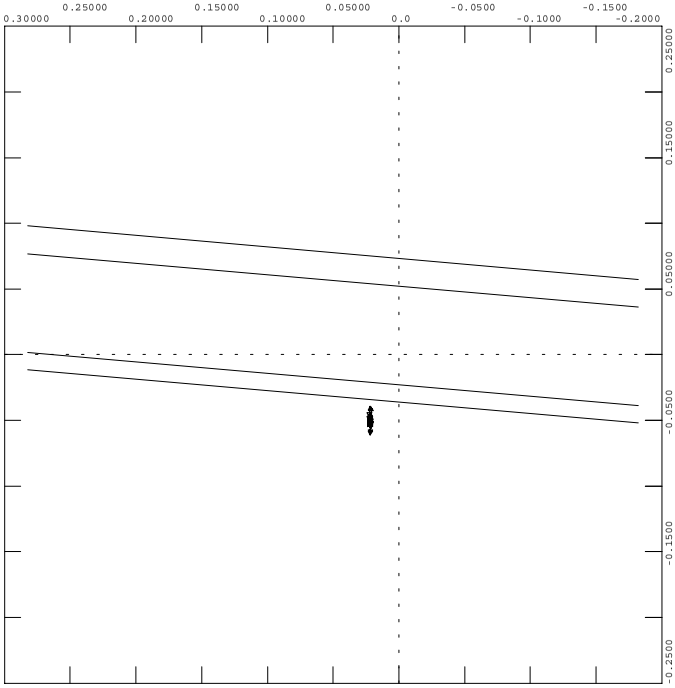

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
THU, APR 04 2002 12:31
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
THU, APR 04 2002 12:31
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

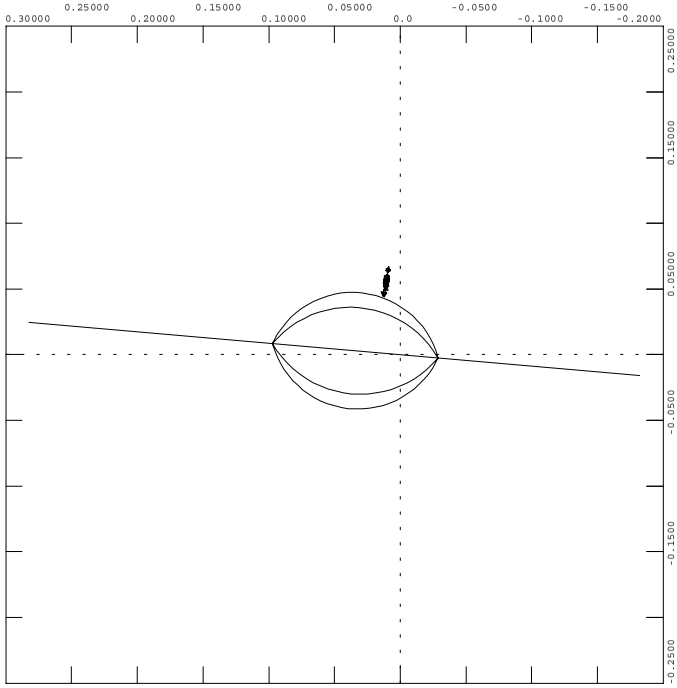


THU, APR 04 2002 12:31
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

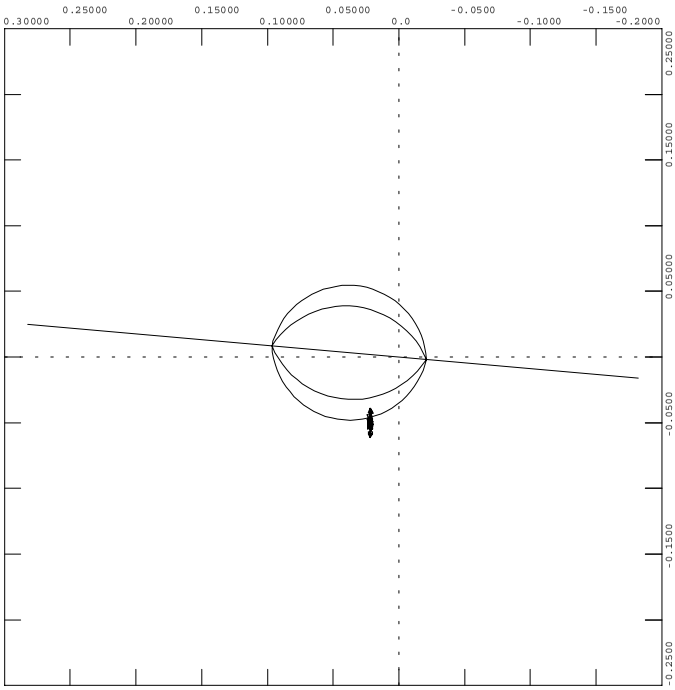


THU, APR 04 2002 12:31
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

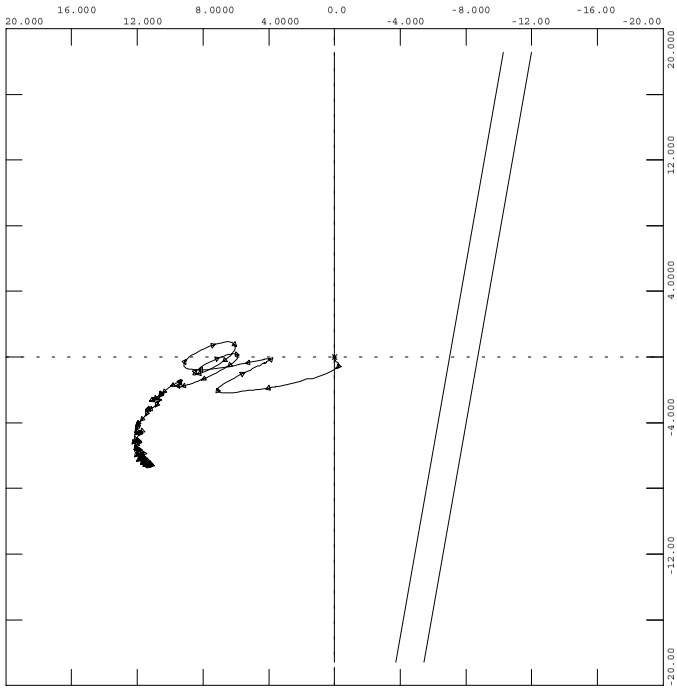


THU, APR 04 2002 12:31
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

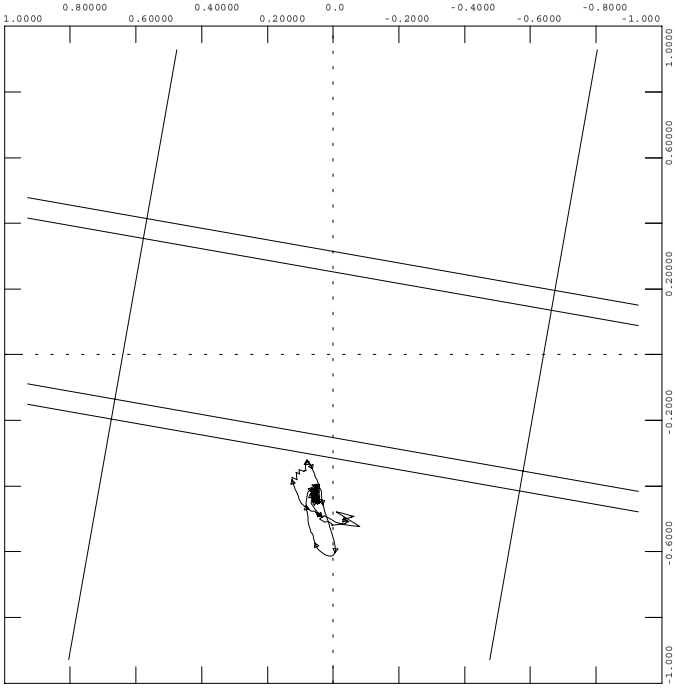


THU, APR 04 2002 12:31
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

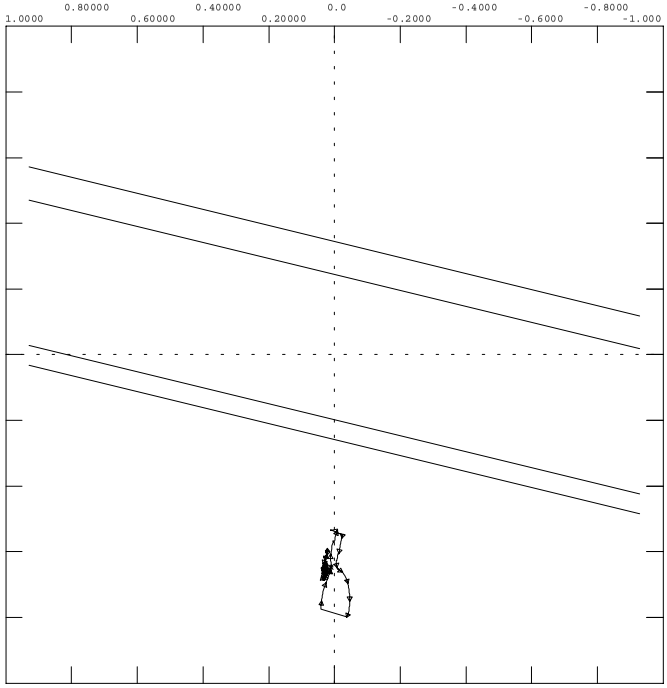


THU, APR 04 2002 12:31
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

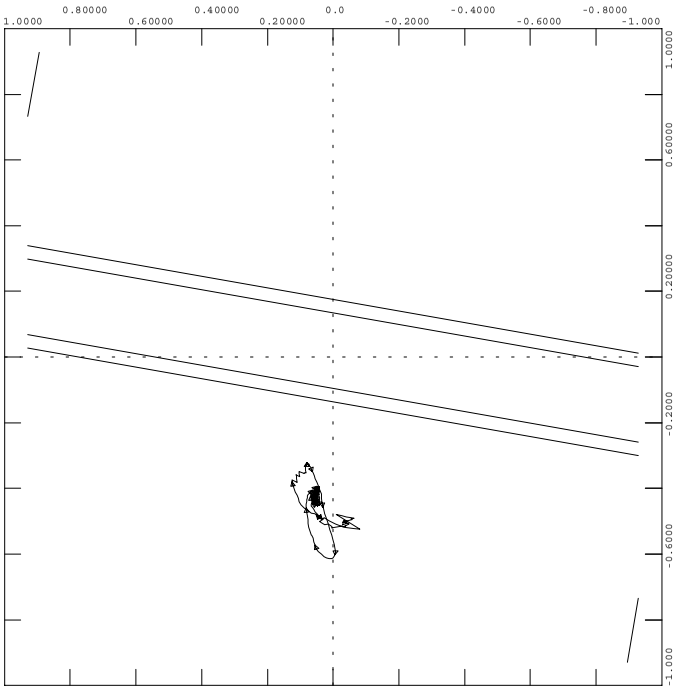


THU, APR 04 2002 12:31
R50M AT MORANVILLE (520)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

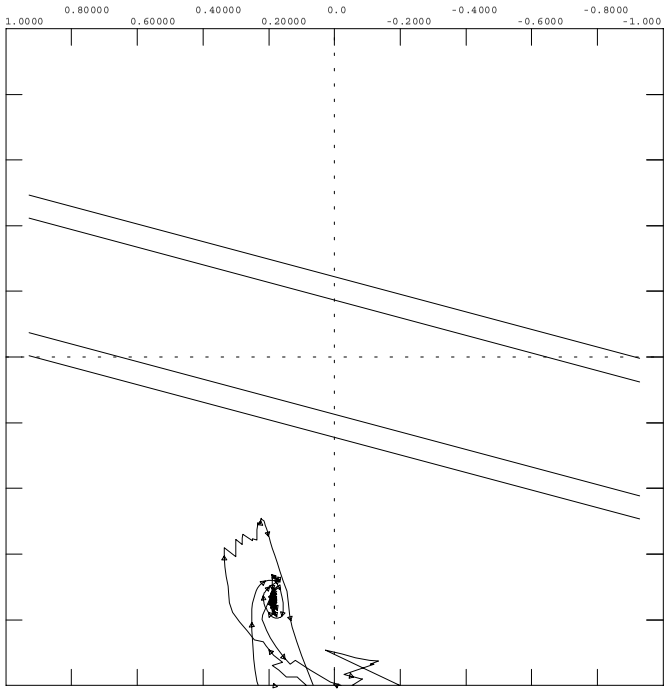


THU, APR 04 2002 12:31
L20D AT DRAYTON (506)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

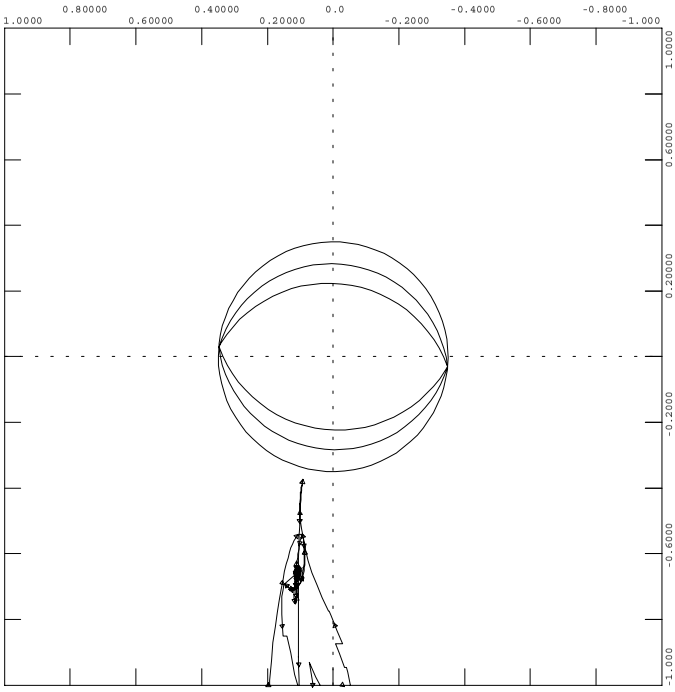


THU, APR 04 2002 12:31
L20D-PRAIRIE (510)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

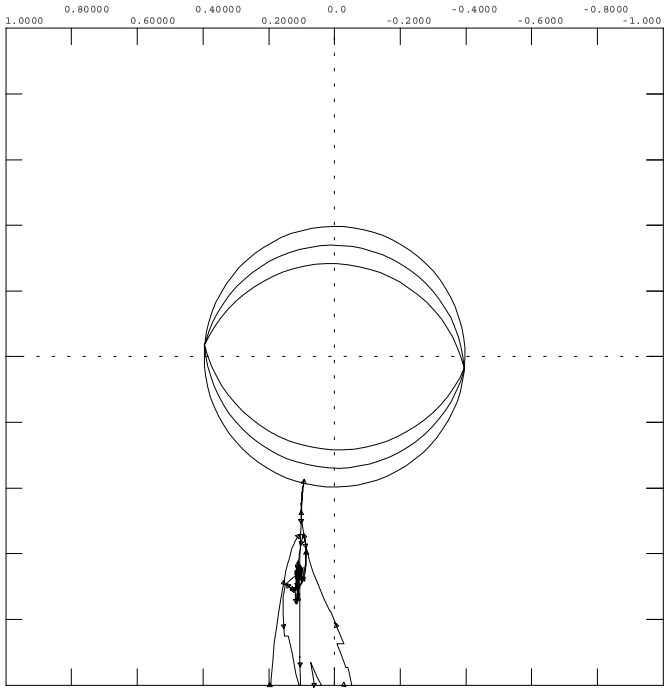
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

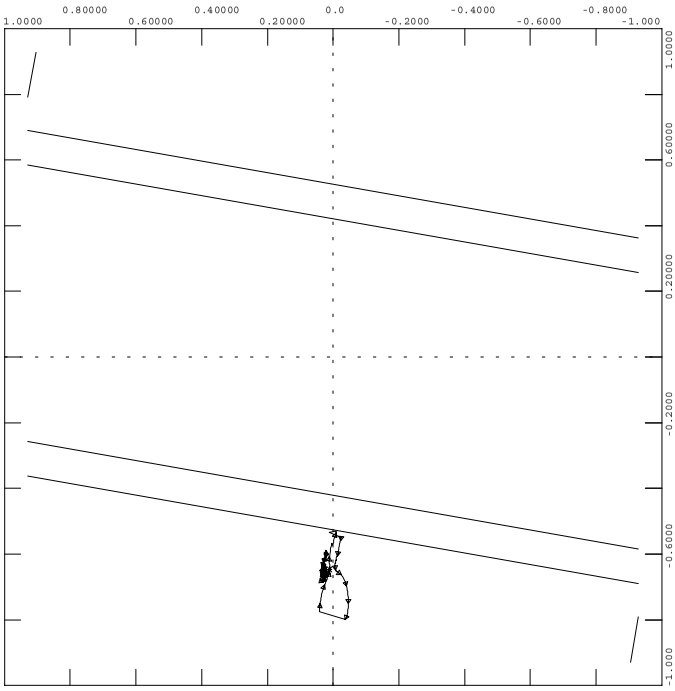
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

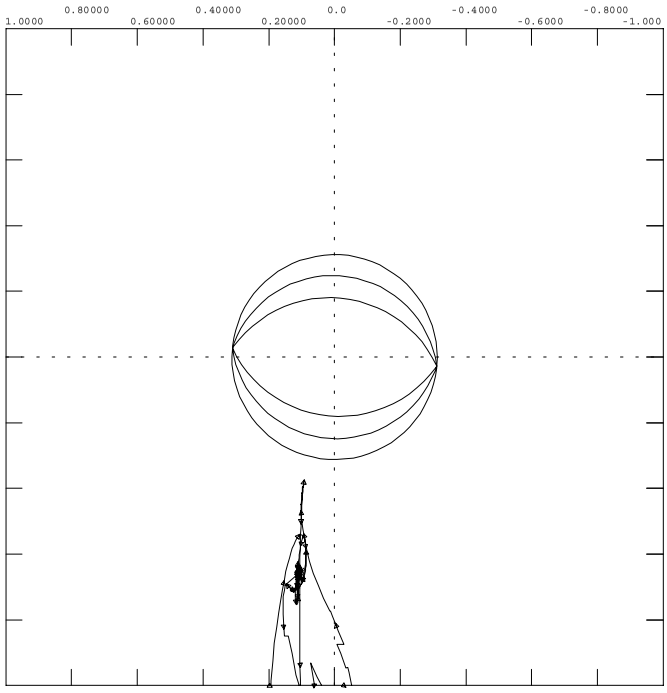
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

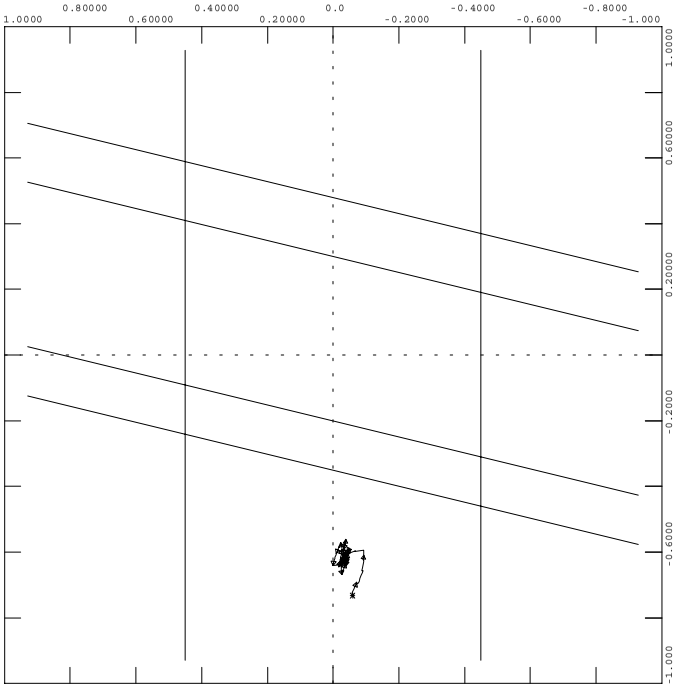
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

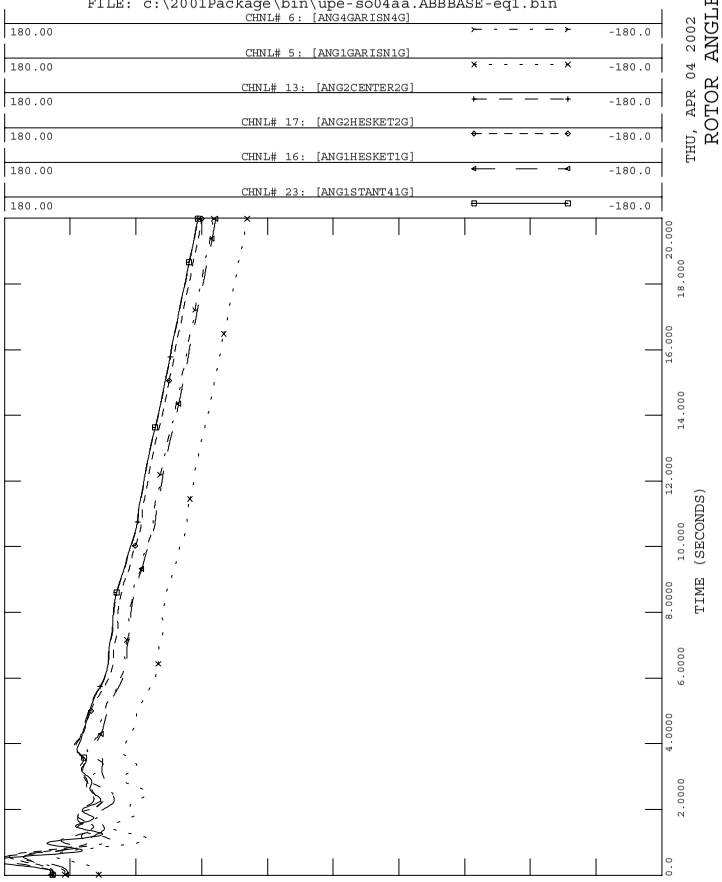


THU, APR 04 2002 12:31
MP-OH I.FALLS (779)

CONTINGENCY EQ1

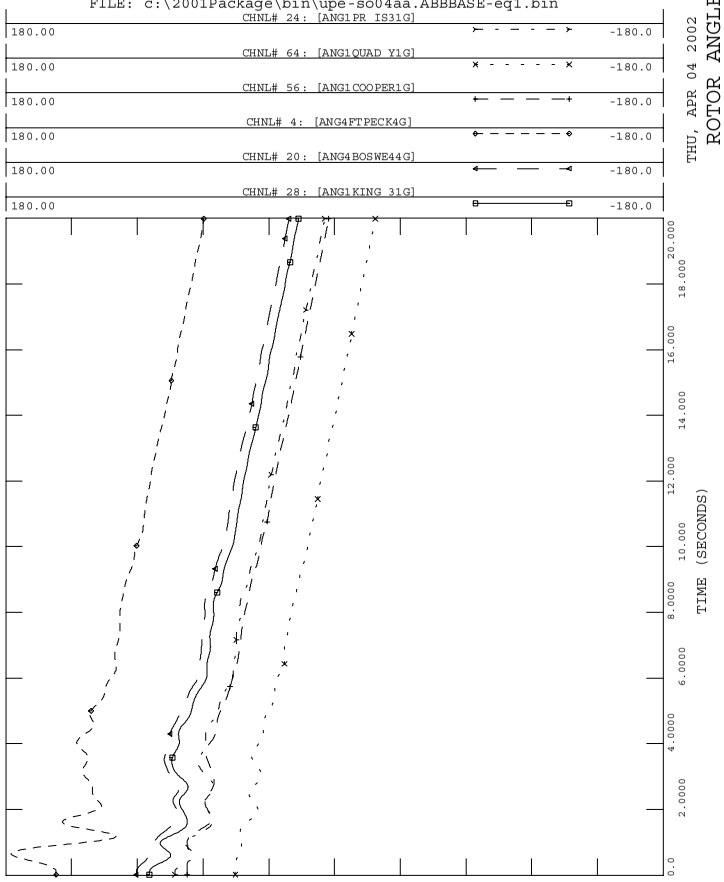
Single line to ground fault with breaker fail at Coal Creek on pole 1 with cross-trip of Coal Creek unit #2

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin



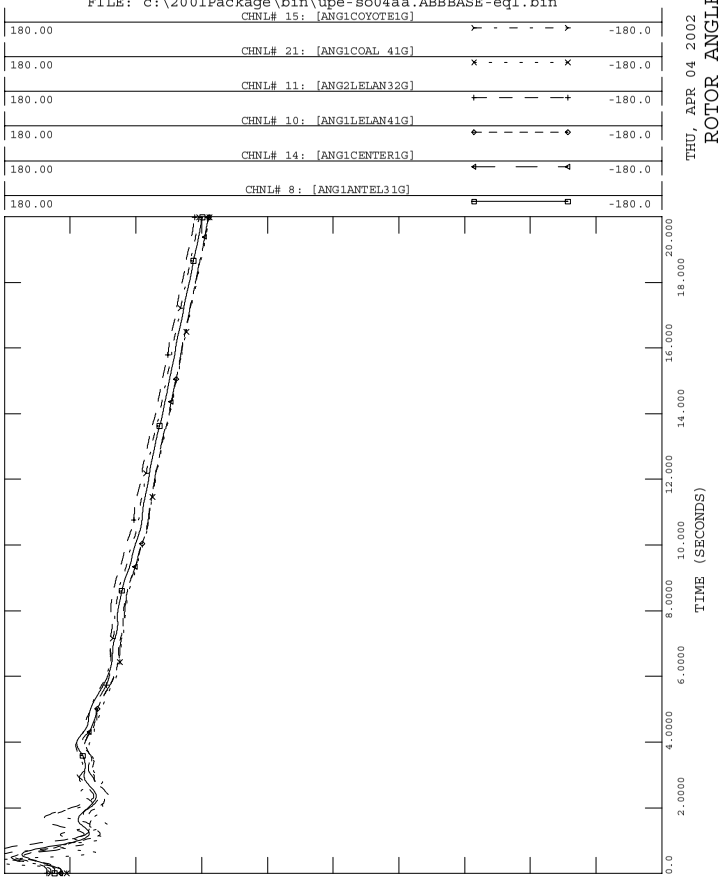
THU, APR 04 2002 12:44
ROTOR ANGLES 2

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin



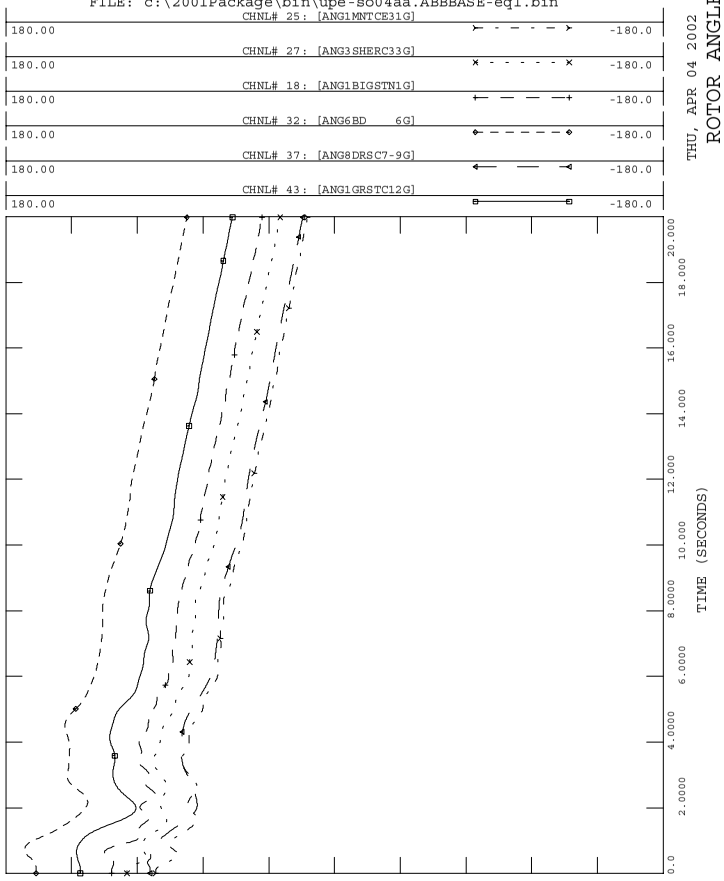
THU, APR 04 2002 12:44
ROTOR ANGLES 4

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

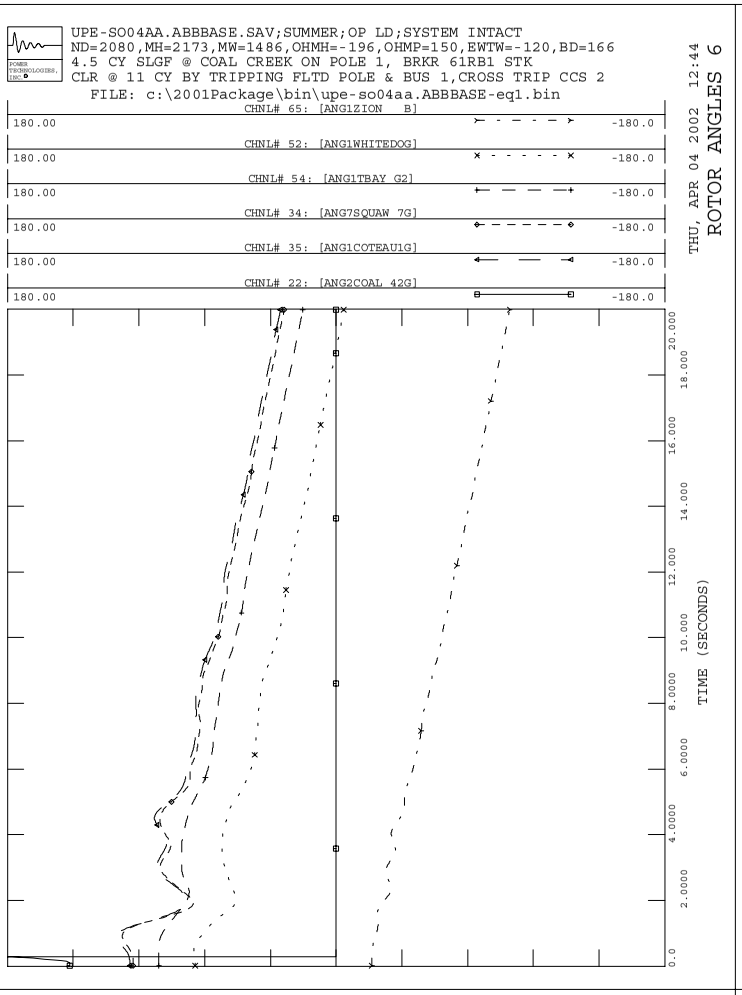


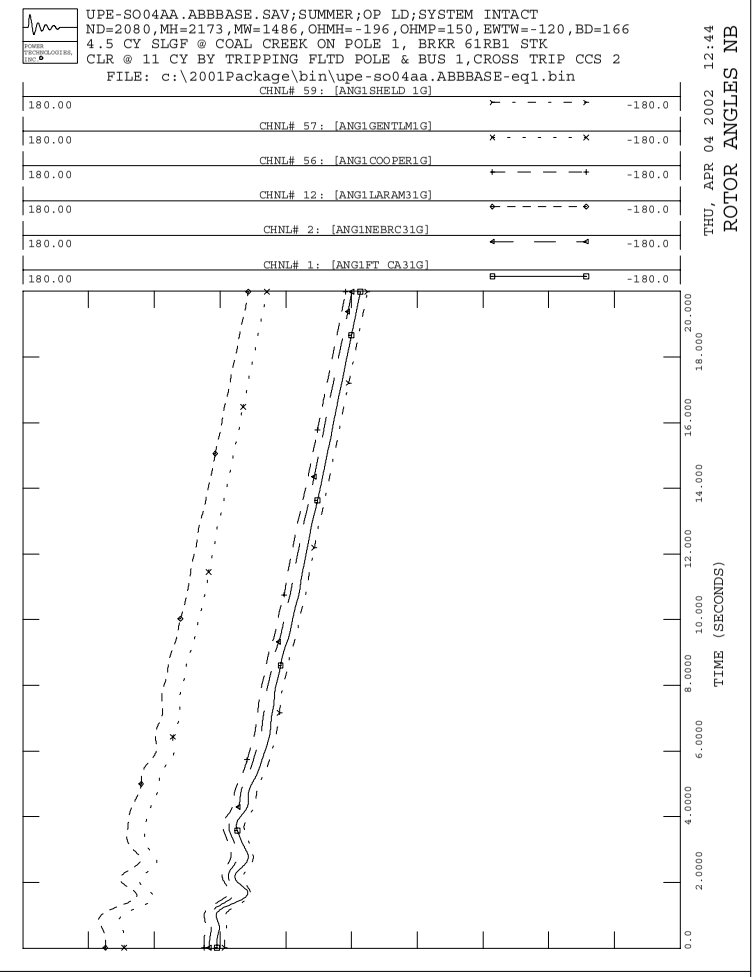
THU, APR 04 2002 12:44
ROTOR ANGLES 1

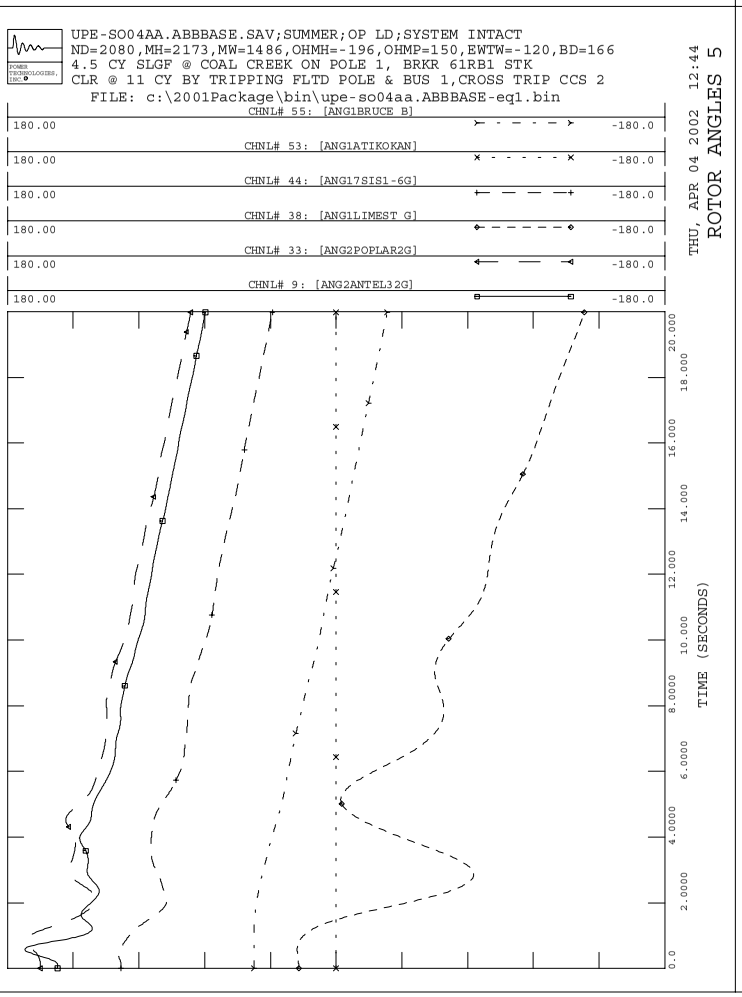
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

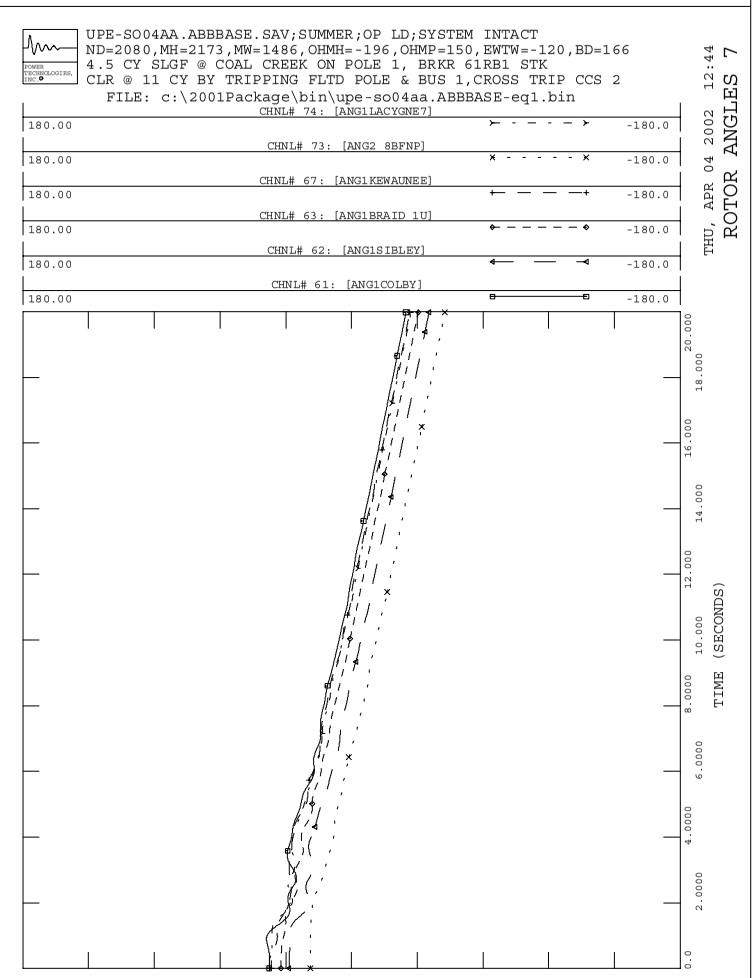


THU, APR 04 2002 12:44
ROTOR ANGLES 3


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 12:44
ROTOR ANGLES 6

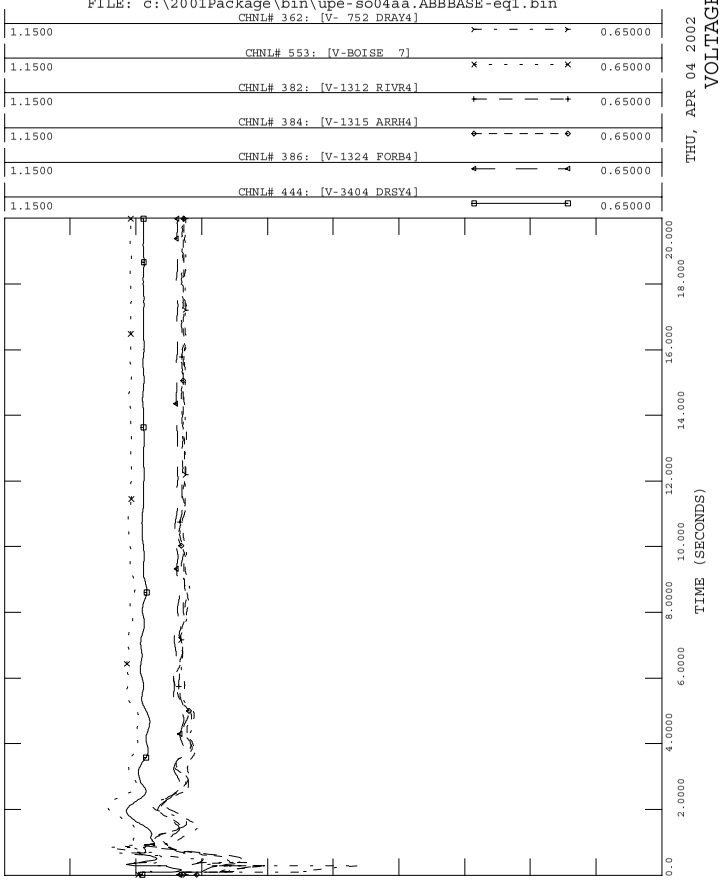

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 12:44
ROTOR ANGLES NB


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 12:44
ROTOR ANGLES 5


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 12:44
ROTOR ANGLES 7

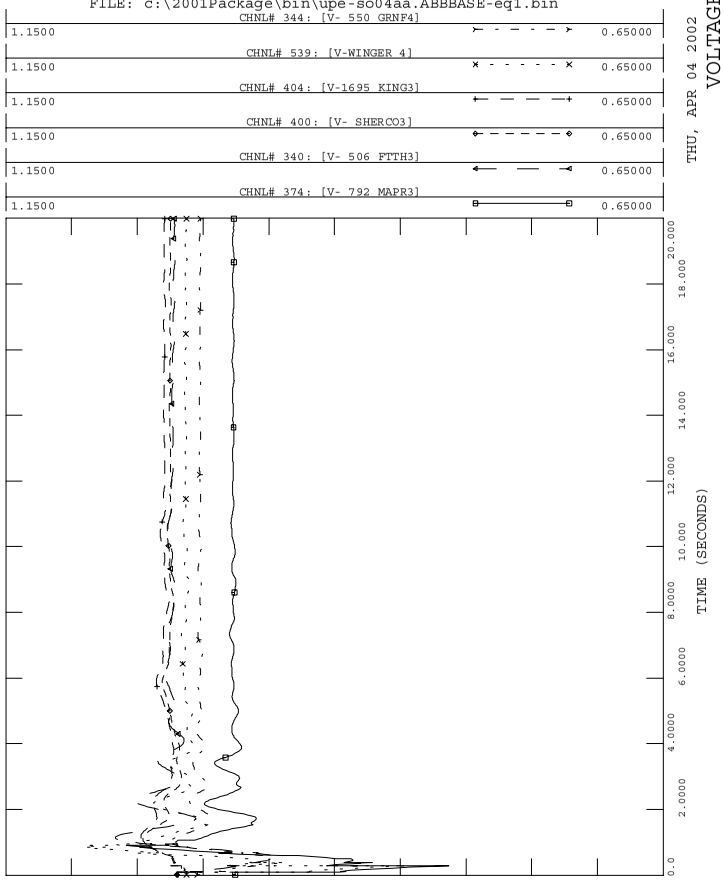
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

THU, APR 04 2002 12:44
VOLTAGES 1



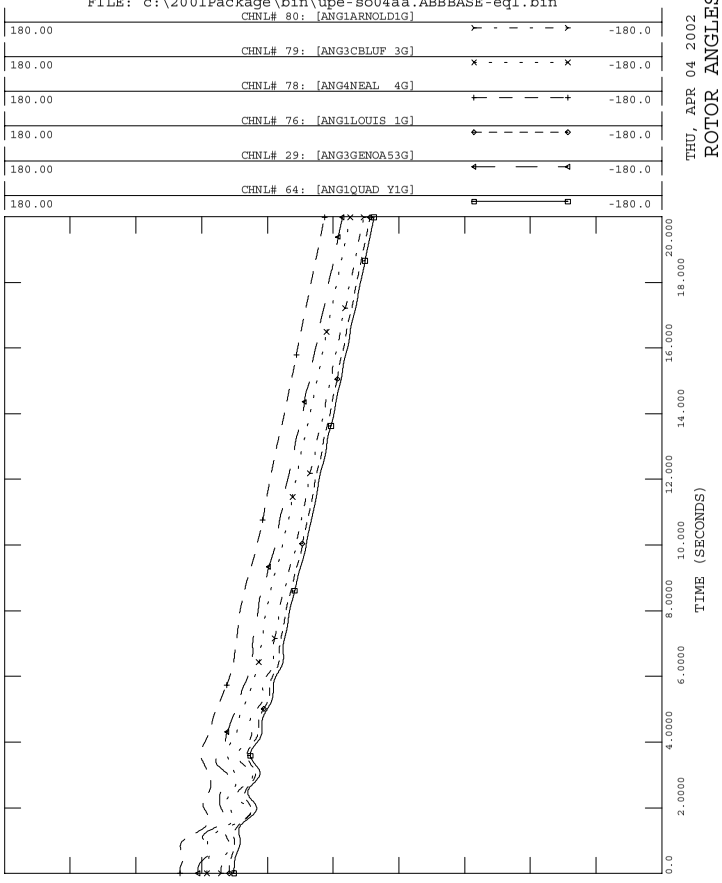
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

THU, APR 04 2002 12:44
VOLTAGES 3



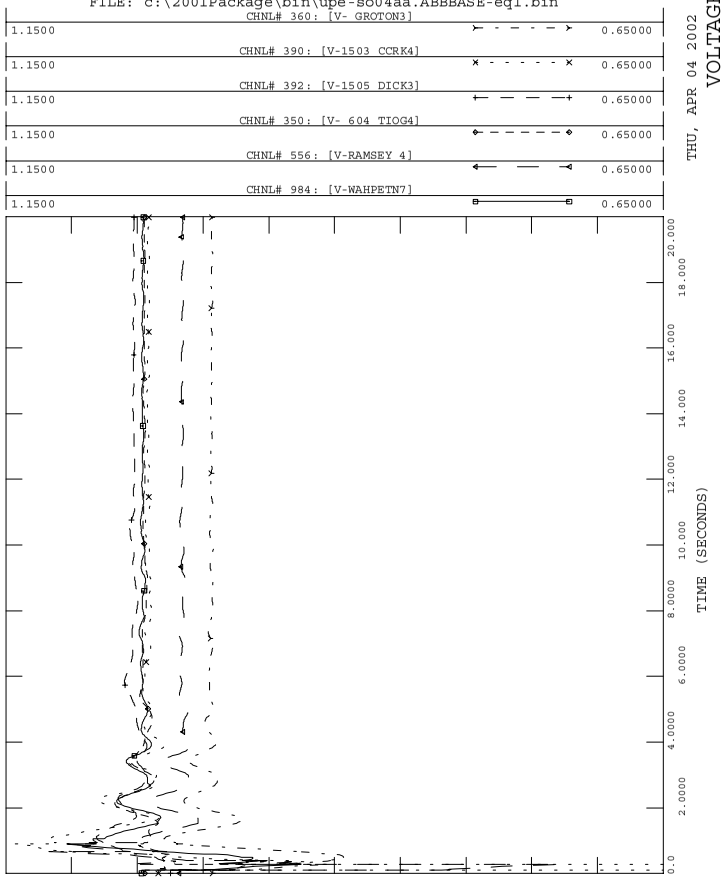
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

THU, APR 04 2002 12:44
ROTOR ANGLES IA



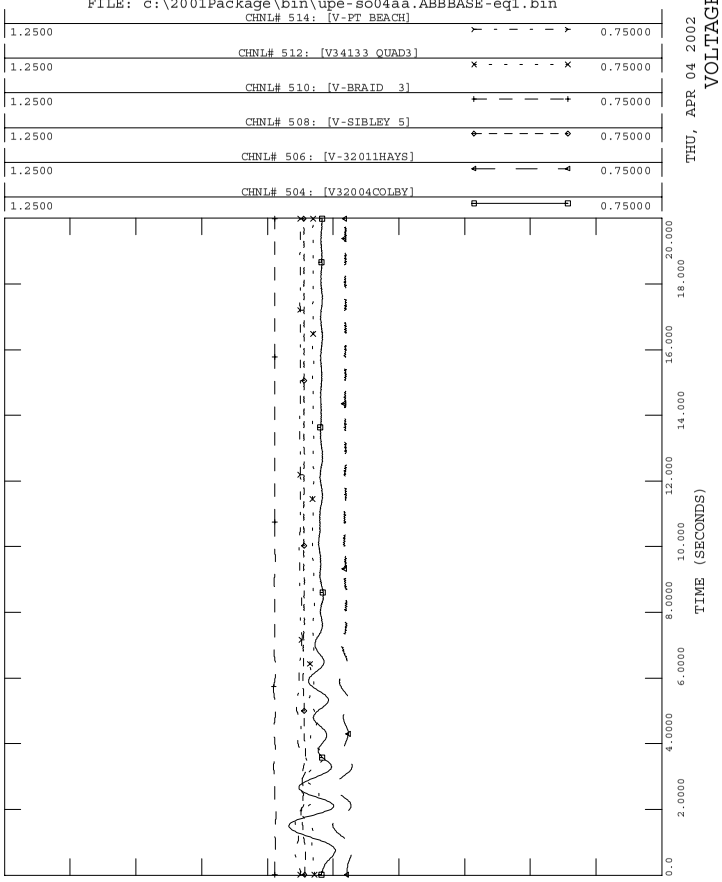
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

THU, APR 04 2002 12:44
VOLTAGES 2



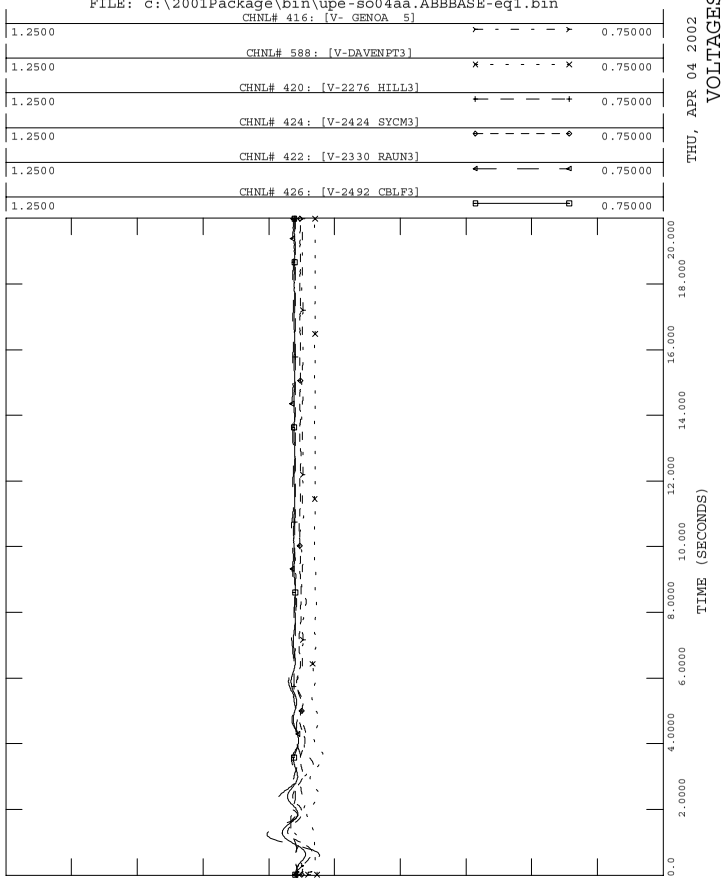
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

THU, APR 04 2002 12:44
VOLTAGES 5



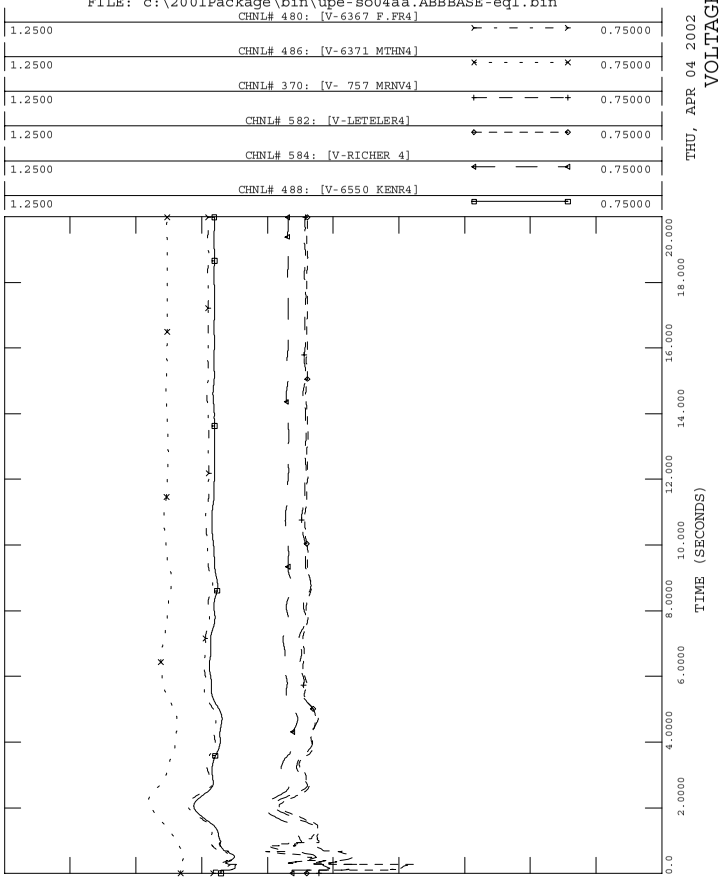
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

THU, APR 04 2002 12:44
VOLTAGES IA



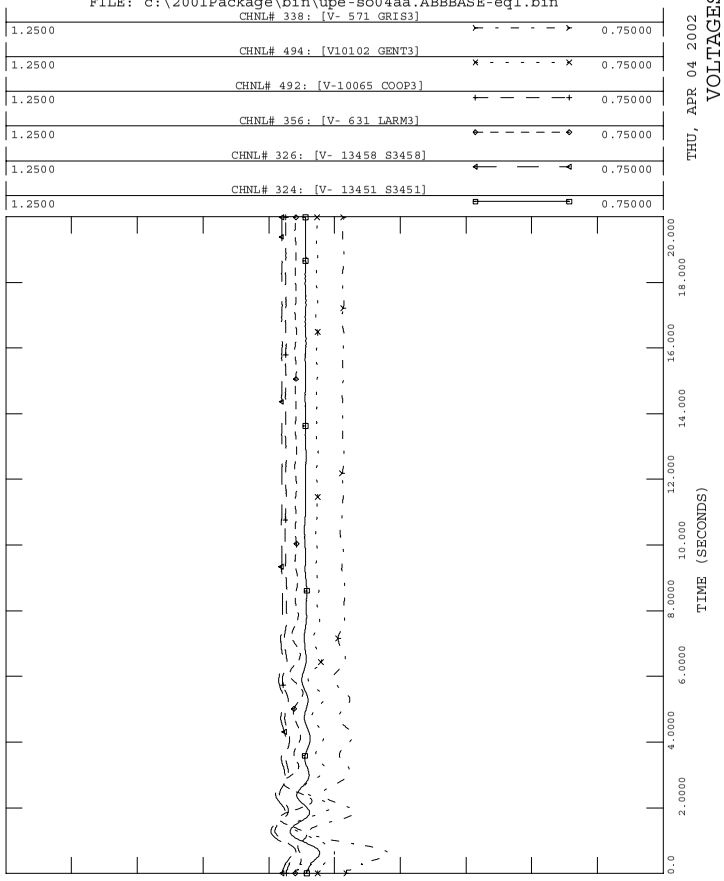
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

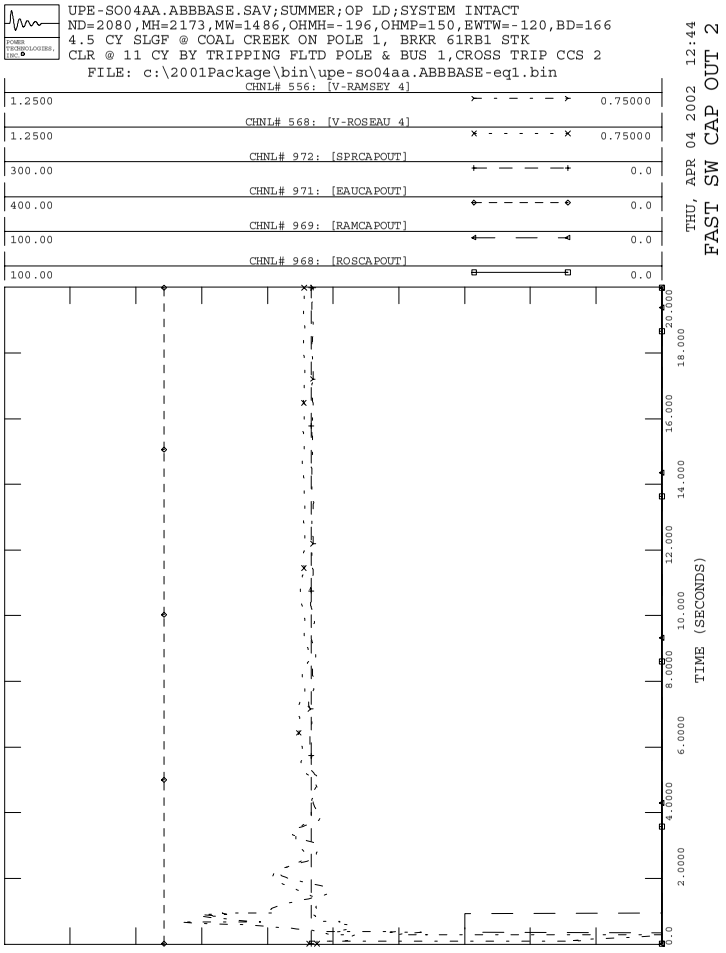
THU, APR 04 2002 12:44
VOLTAGES 4

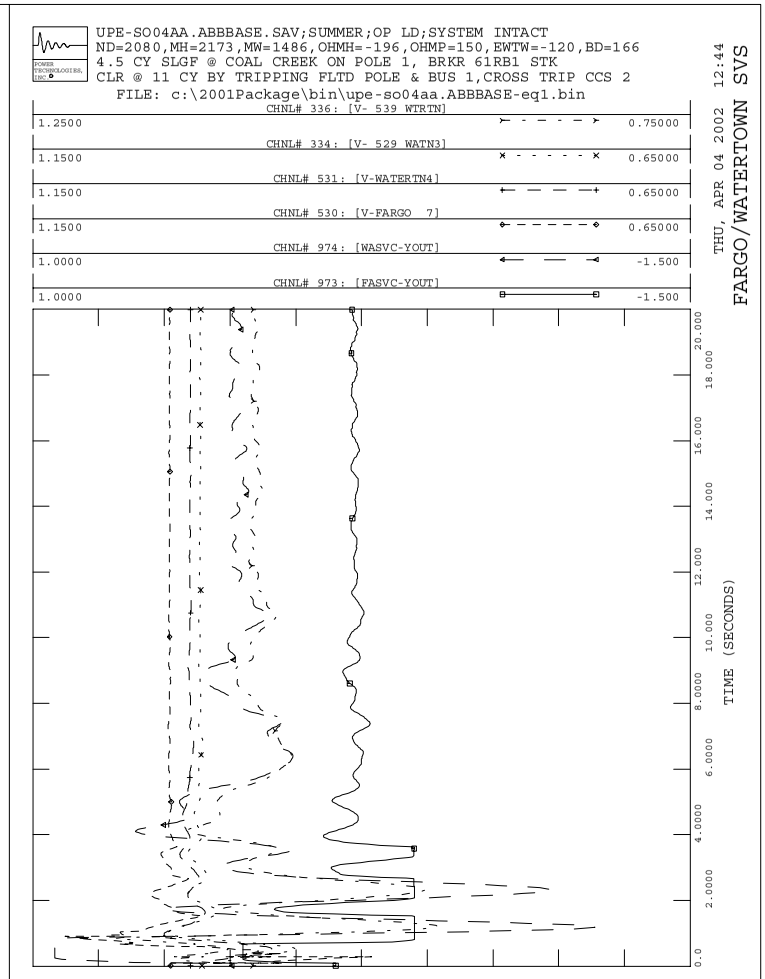


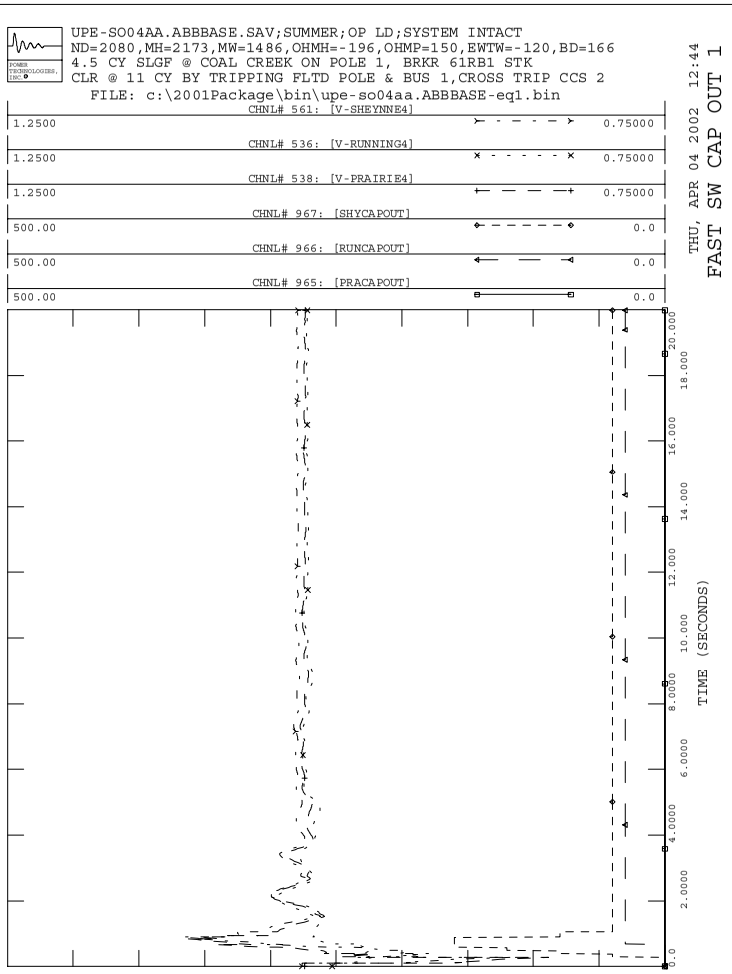
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

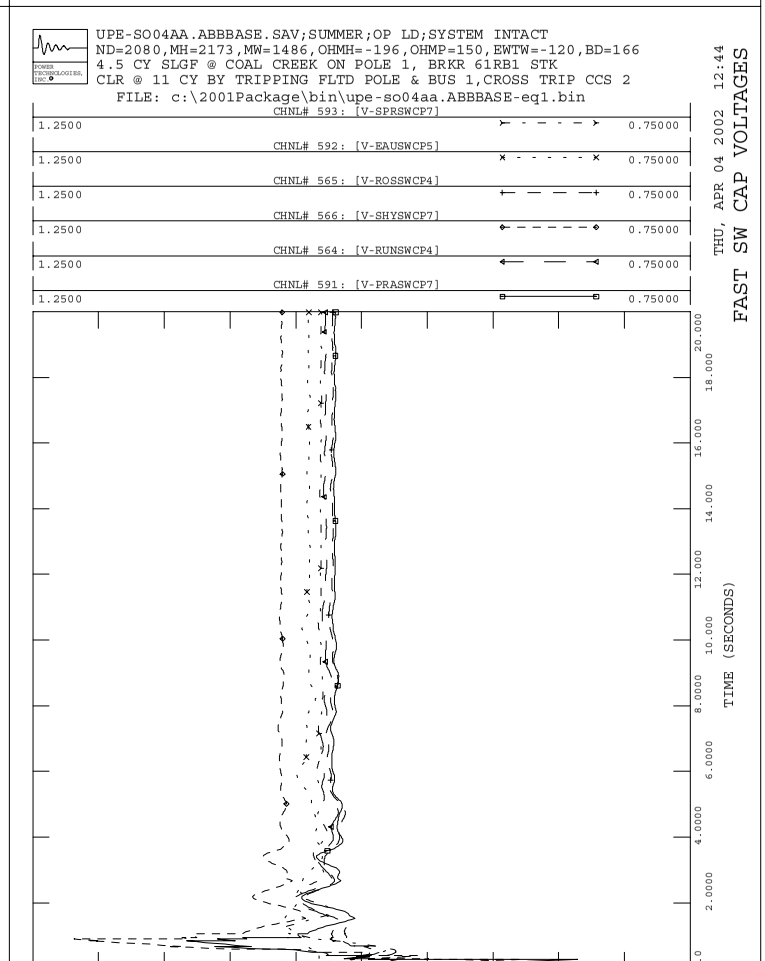
THU, APR 04 2002 12:44
VOLTAGES NB




UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
THU, APR 04 2002 12:44
FAST SW CAP OUT 2


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
THU, APR 04 2002 12:44
FARGO/WATERTOWN SVS

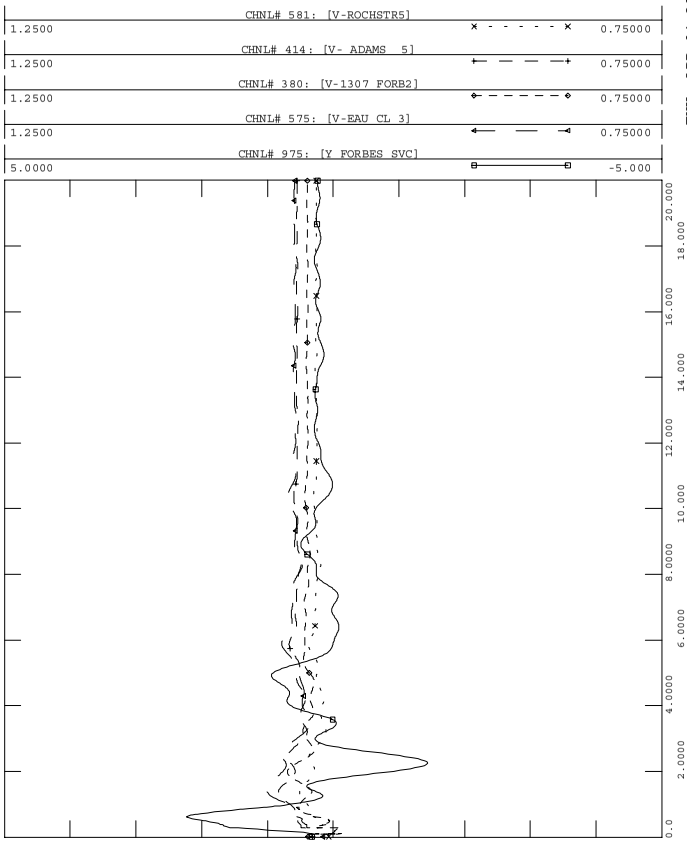

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
THU, APR 04 2002 12:44
FAST SW CAP OUT 1


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
THU, APR 04 2002 12:44
FAST SW CAP VOLTAGES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

THU, APR 04 2002 12:44

SVC & WISCONSIN VOLT



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
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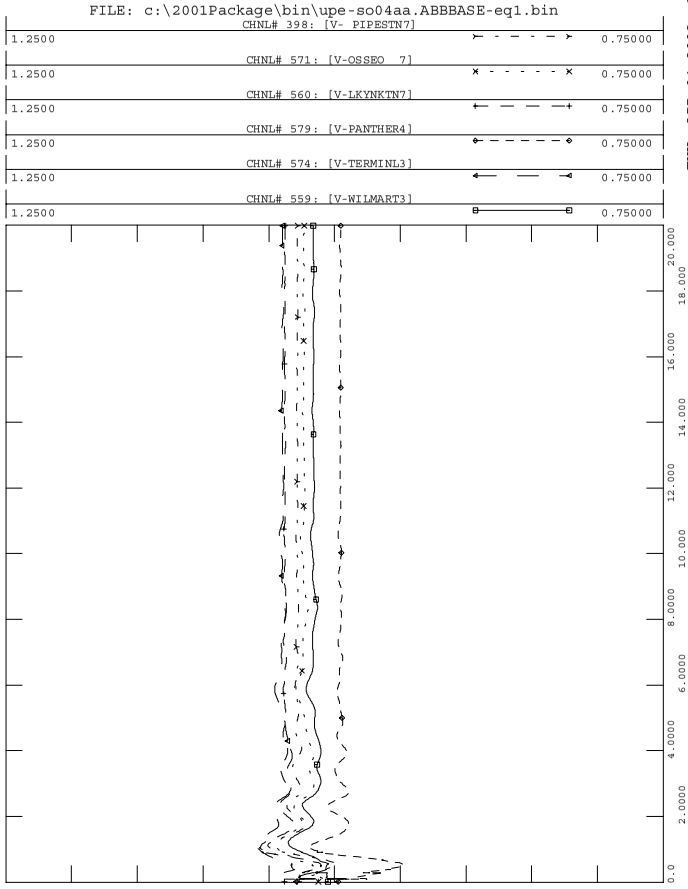
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

THU, APR 04 2002 12:44

TC VOLTAGES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
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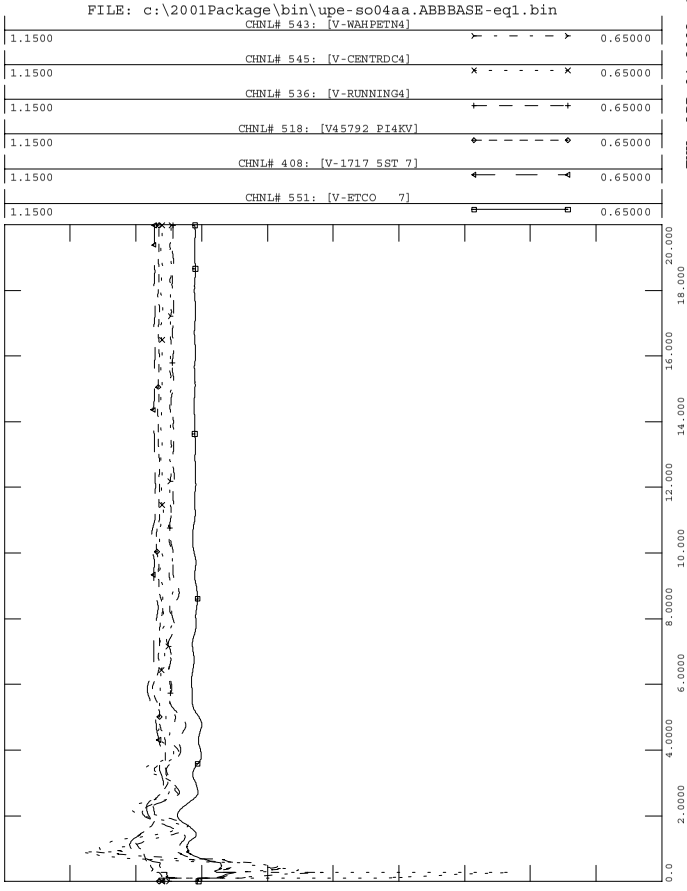
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

THU, APR 04 2002 12:44

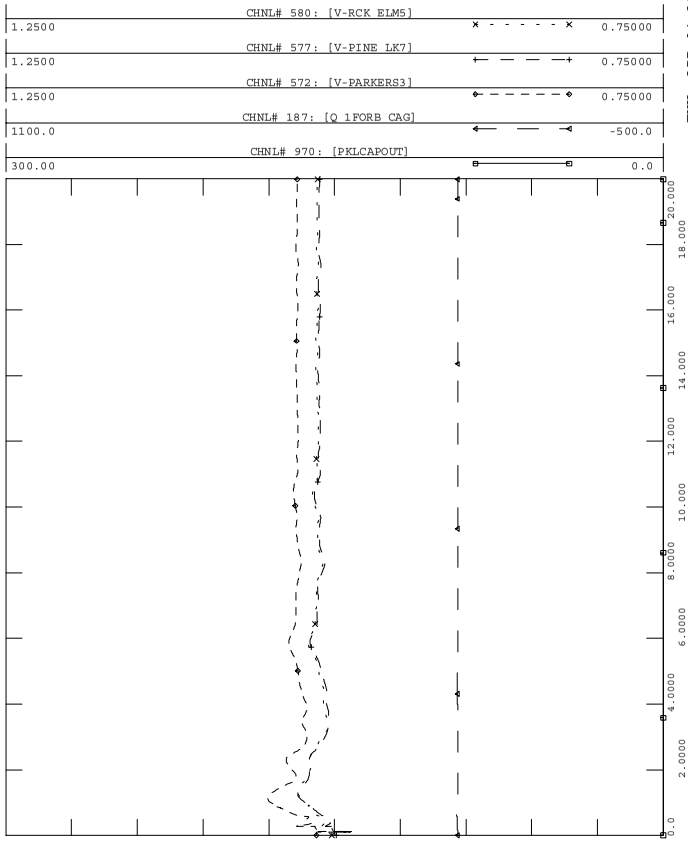
VOLTAGES 6



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

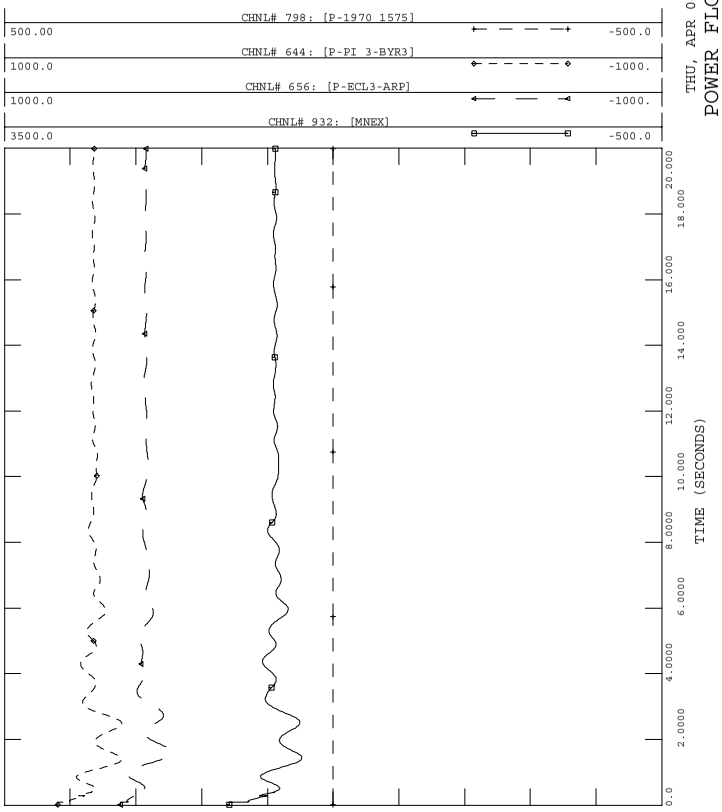
THU, APR 04 2002 12:44

FORBES SVS OUT & VOLTAGES



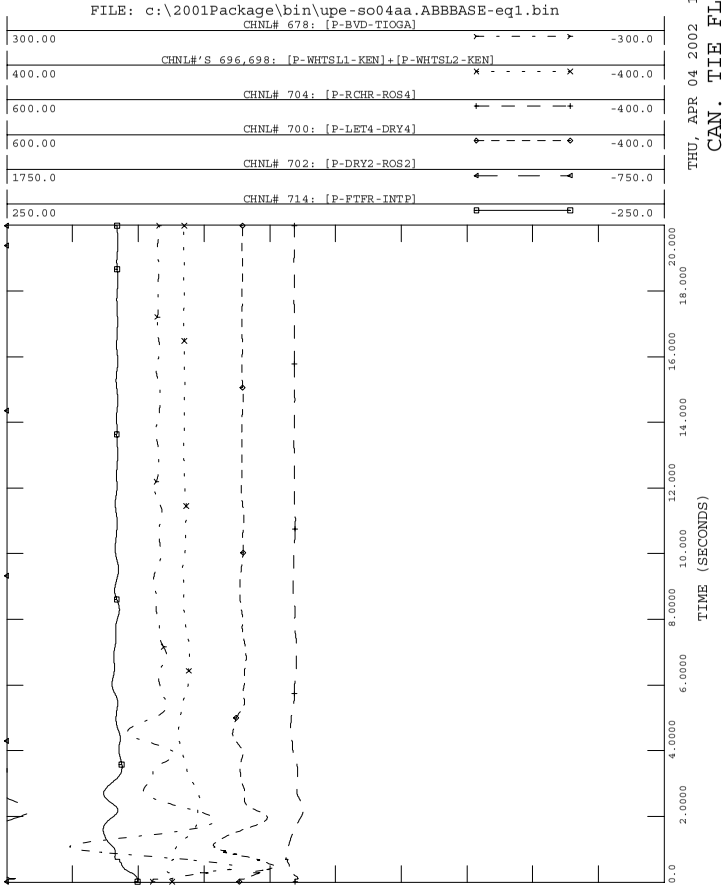
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

THU, APR 04 2002 12:44
POWER FLOW SUMS 2



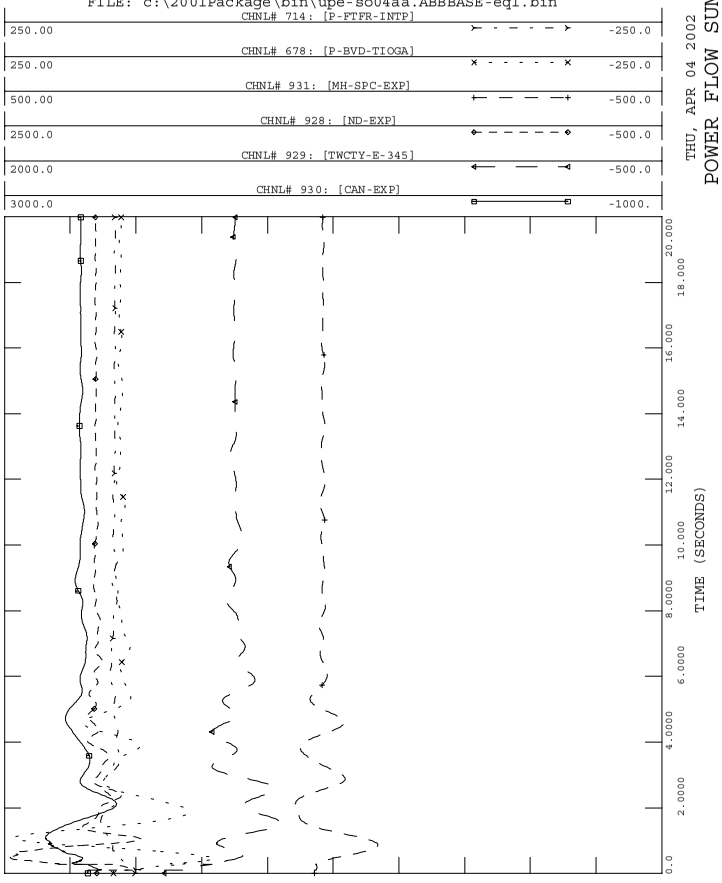
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

THU, APR 04 2002 12:44
CAN. TIE FLOWS



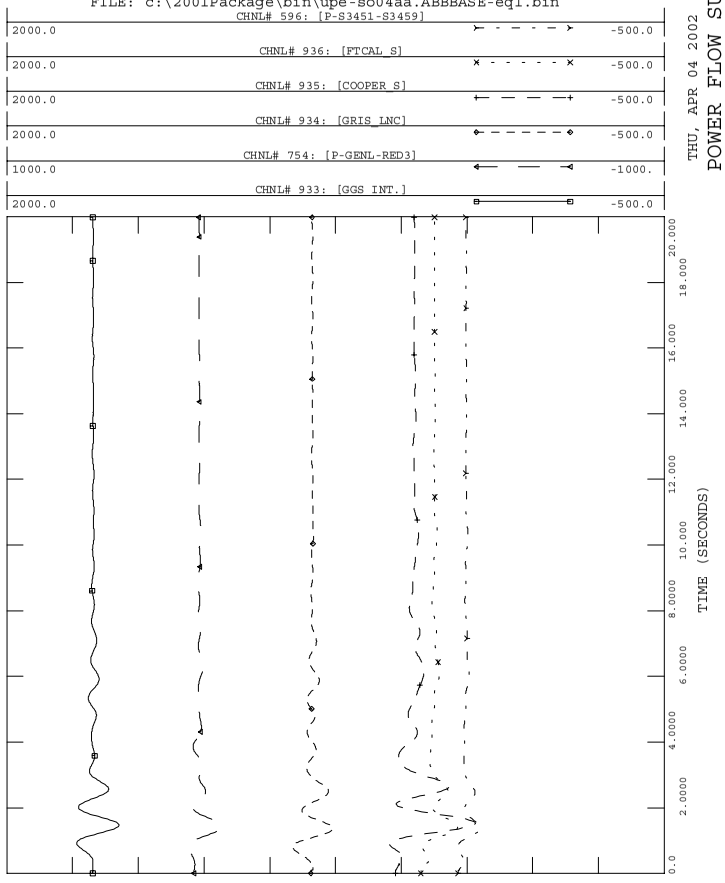
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

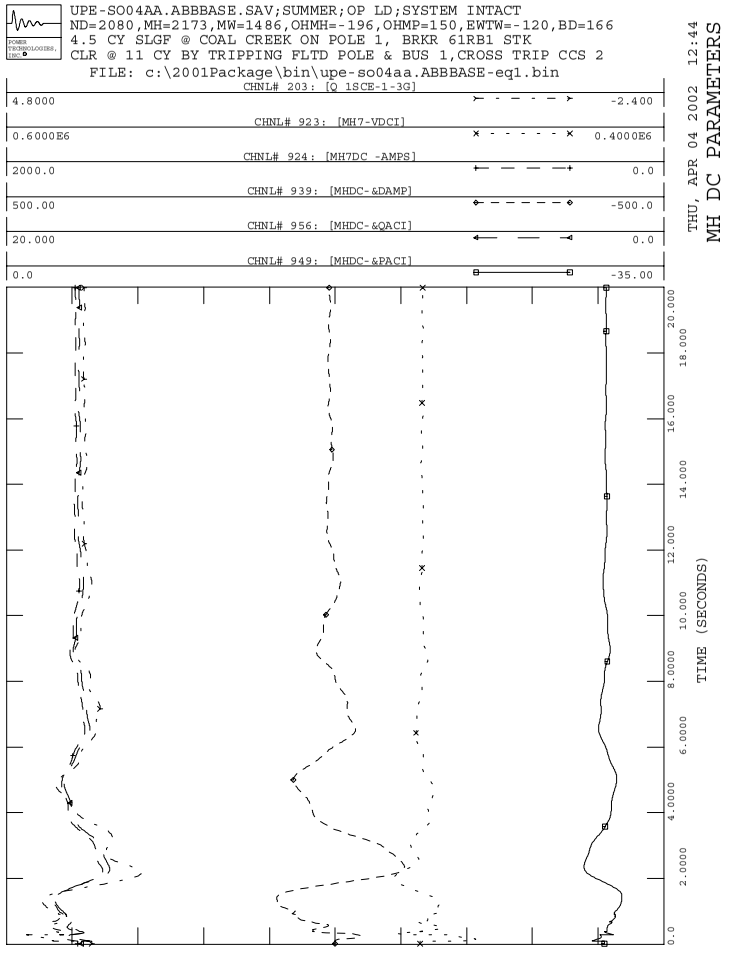
THU, APR 04 2002 12:44
POWER FLOW SUMS 1

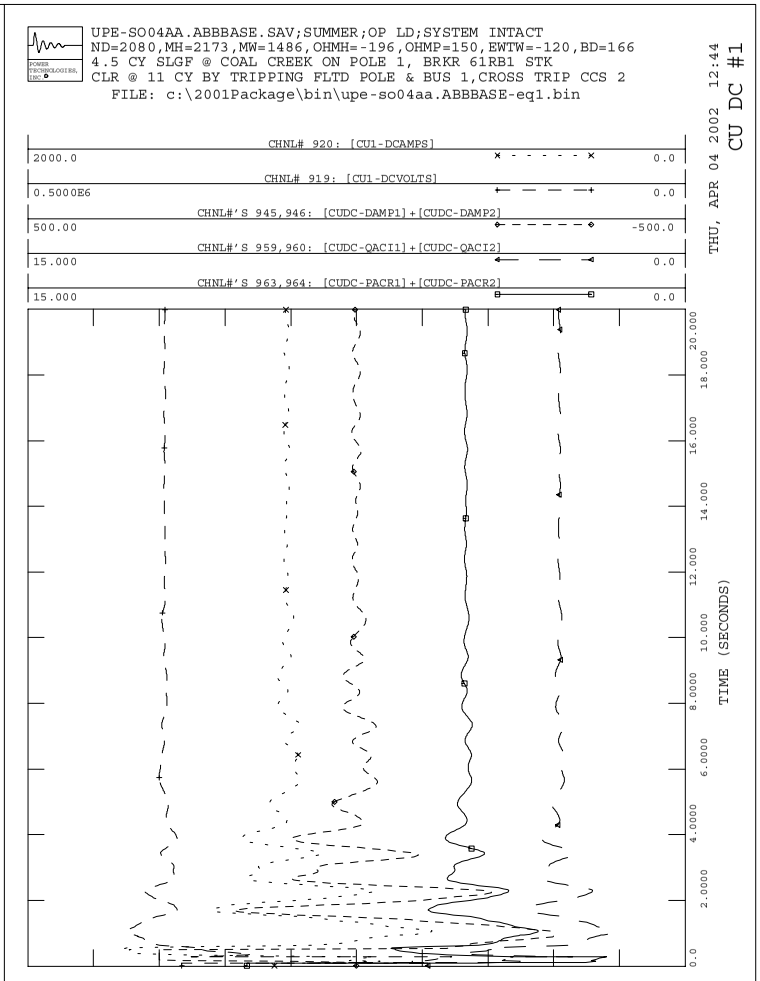


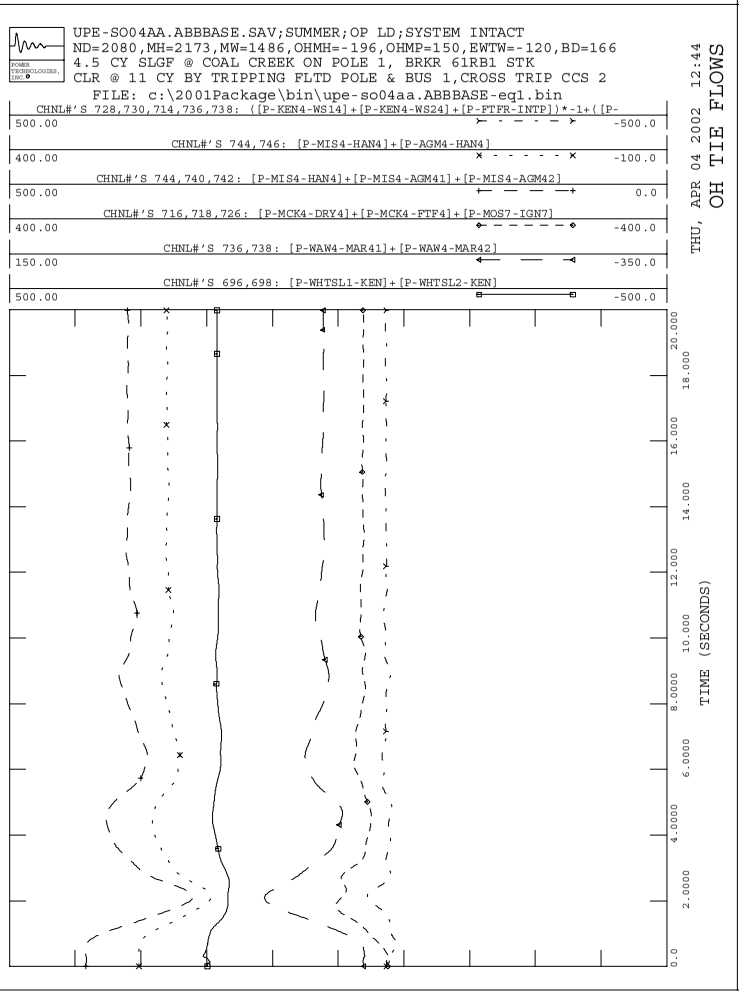
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

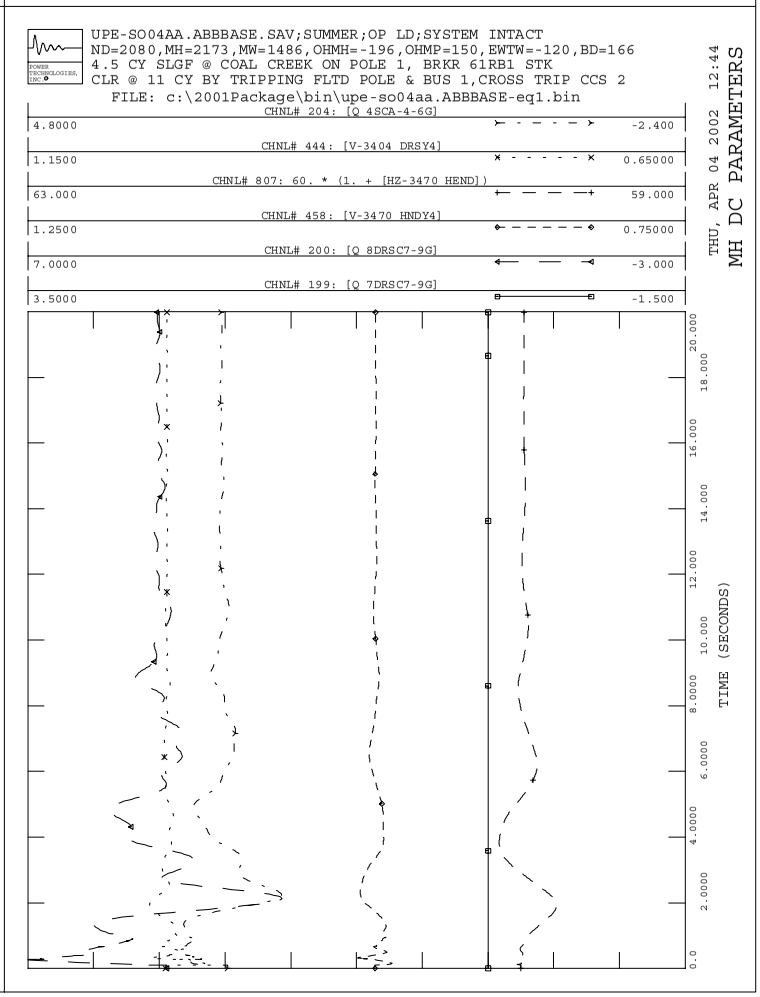
THU, APR 04 2002 12:44
POWER FLOW SUM 3

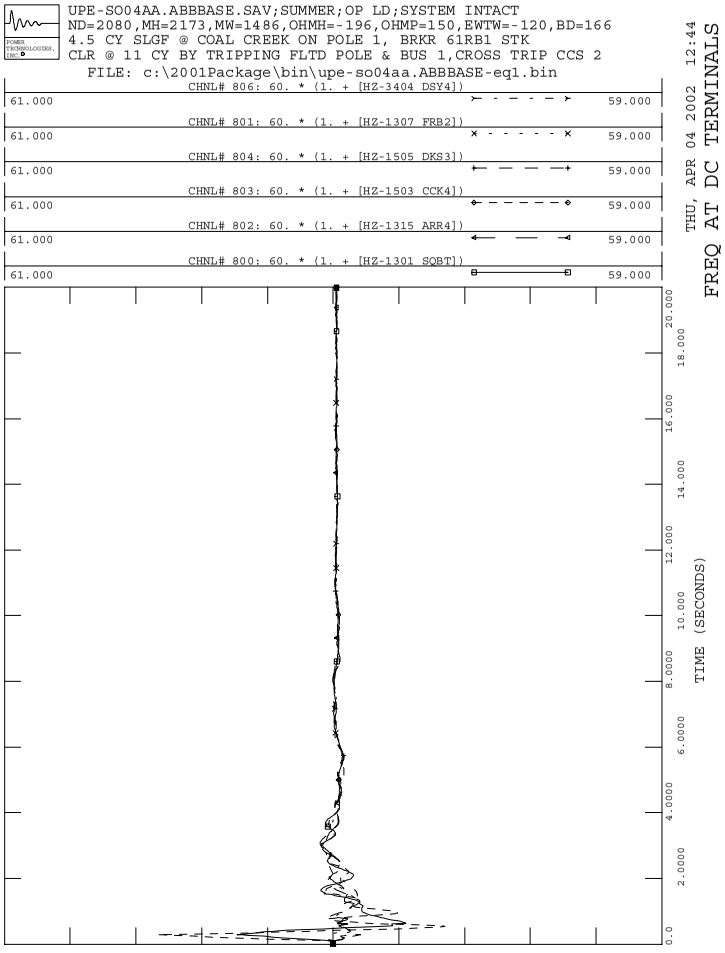


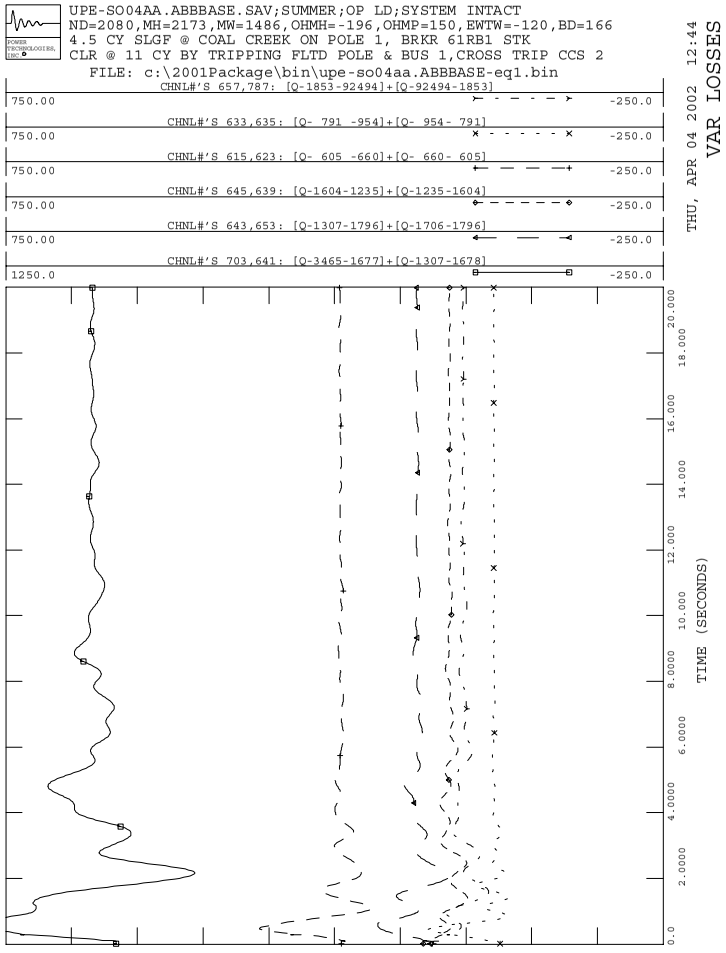

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TIME (SECONDS)
THU, APR 04 2002 12:44
MH DC PARAMETERS

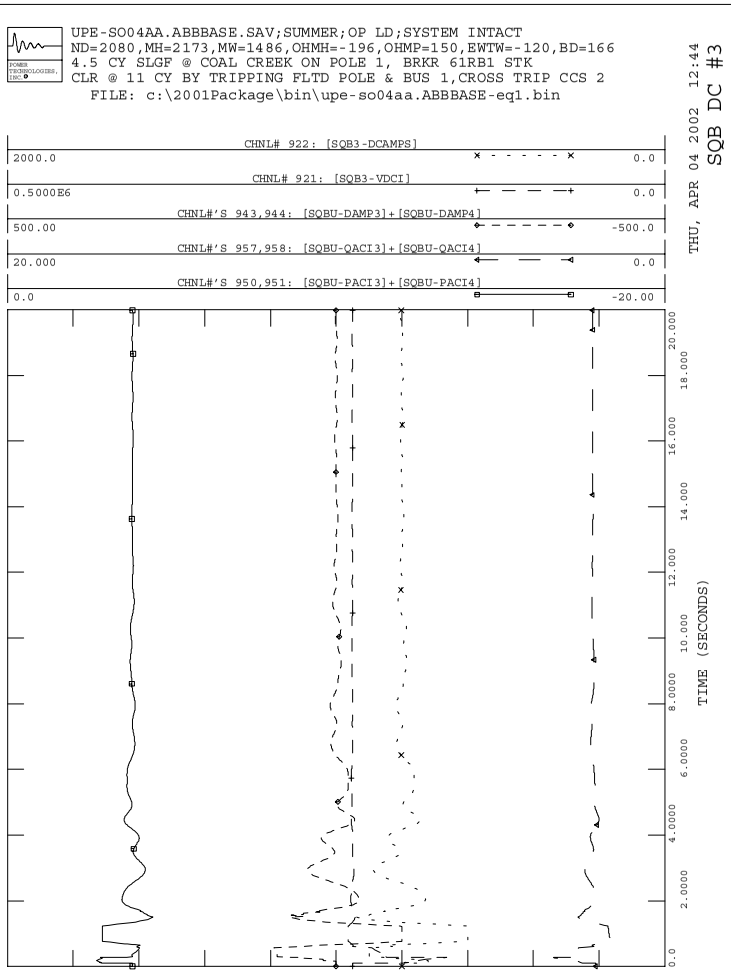

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TIME (SECONDS)
THU, APR 04 2002 12:44
CU DC #1

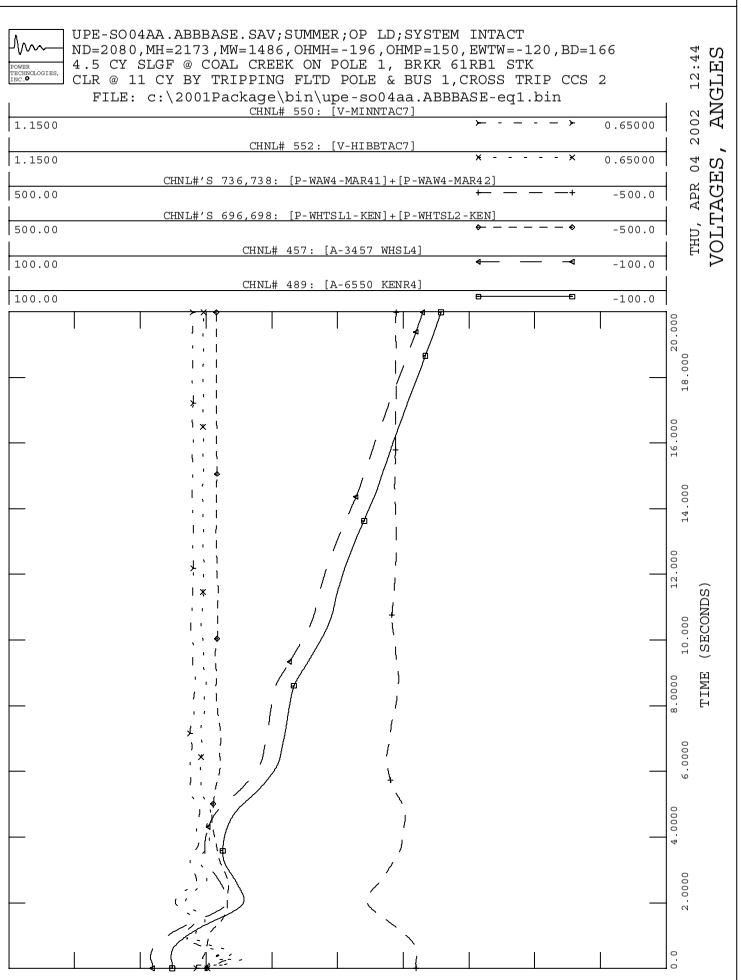

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TIME (SECONDS)
THU, APR 04 2002 12:44
OH TIE FLOWS


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TIME (SECONDS)
THU, APR 04 2002 12:44
MH DC PARAMETERS


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
THU, APR 04 2002 12:44
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
THU, APR 04 2002 12:44
VAR LOSSES
TIME (SECONDS)

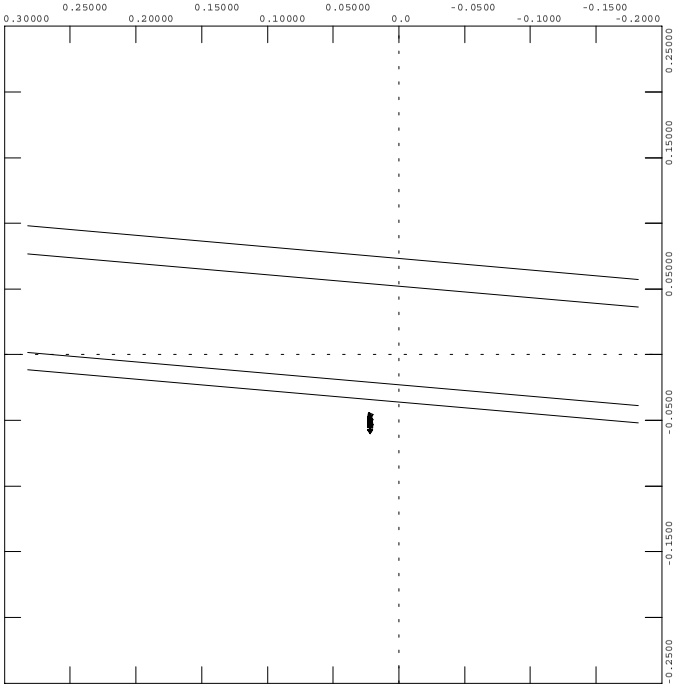

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
THU, APR 04 2002 12:44
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
THU, APR 04 2002 12:44
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

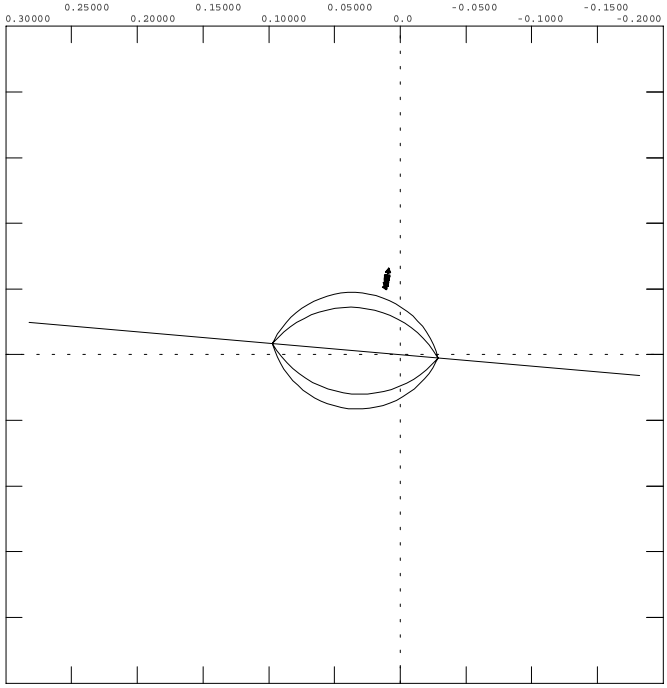


THU, APR 04 2002 12:44
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

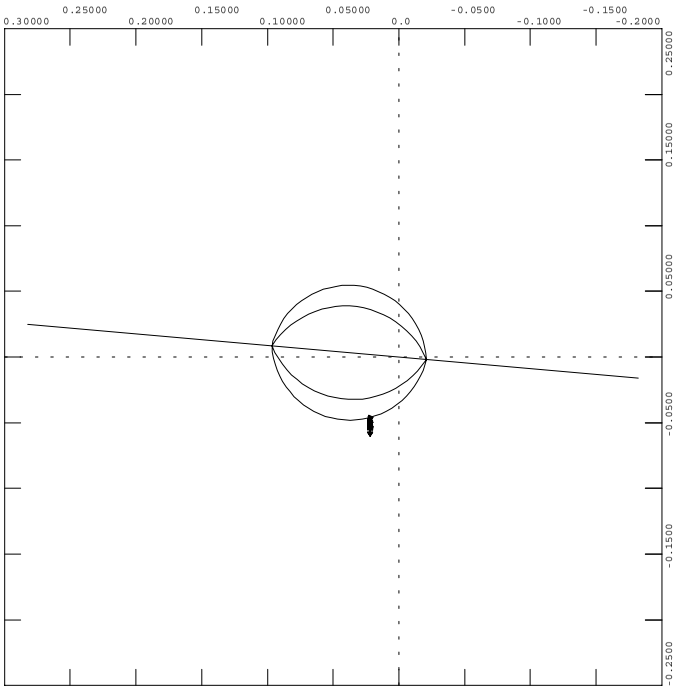


THU, APR 04 2002 12:44
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

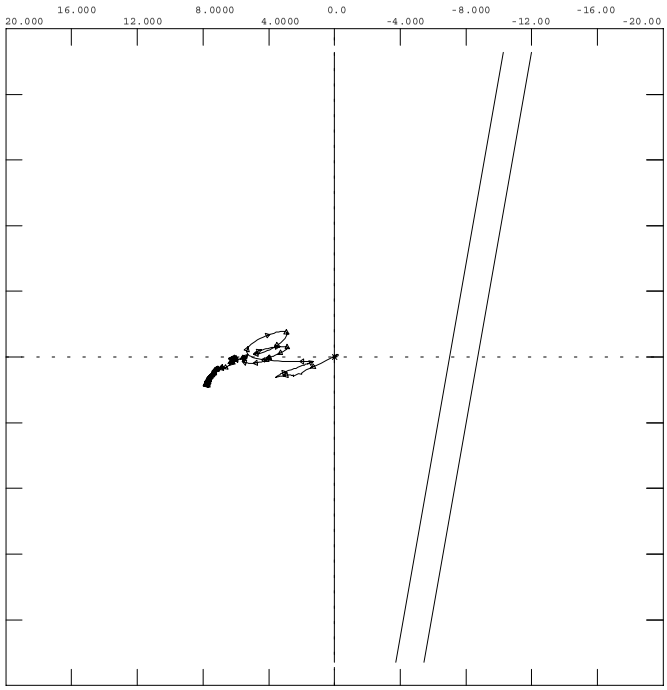


THU, APR 04 2002 12:44
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

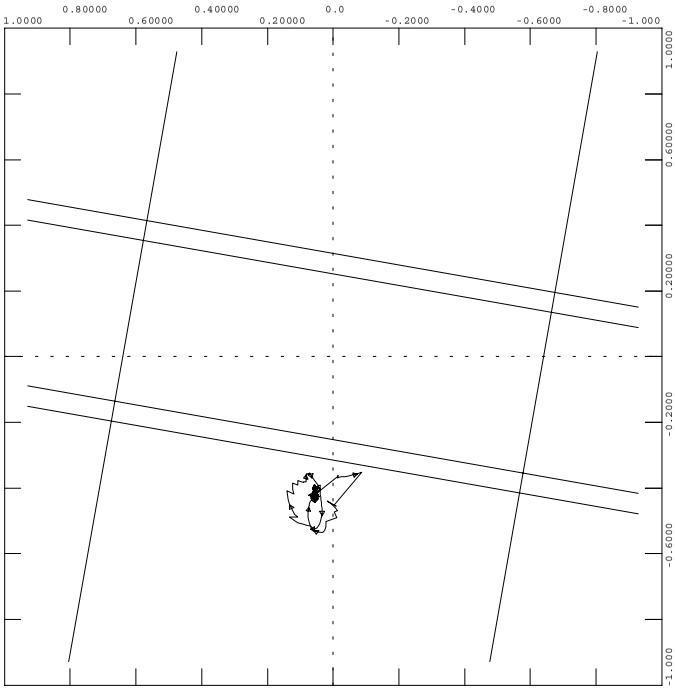


THU, APR 04 2002 12:44
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

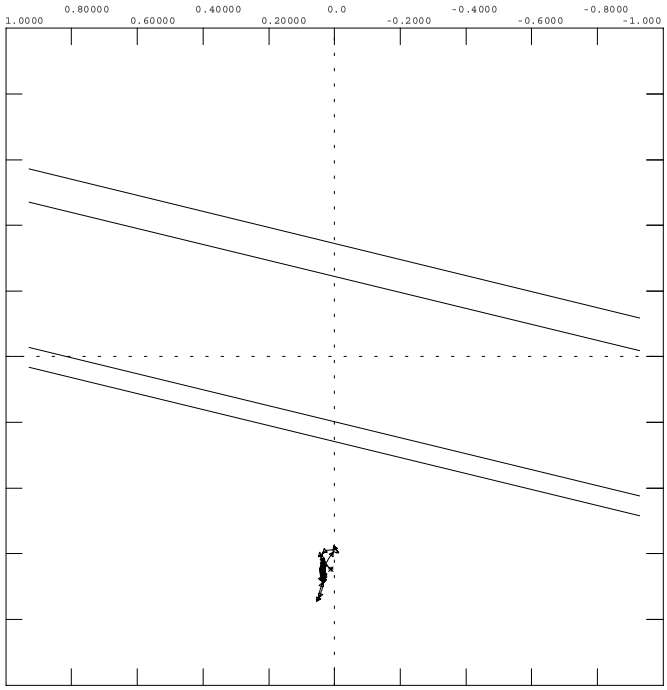
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

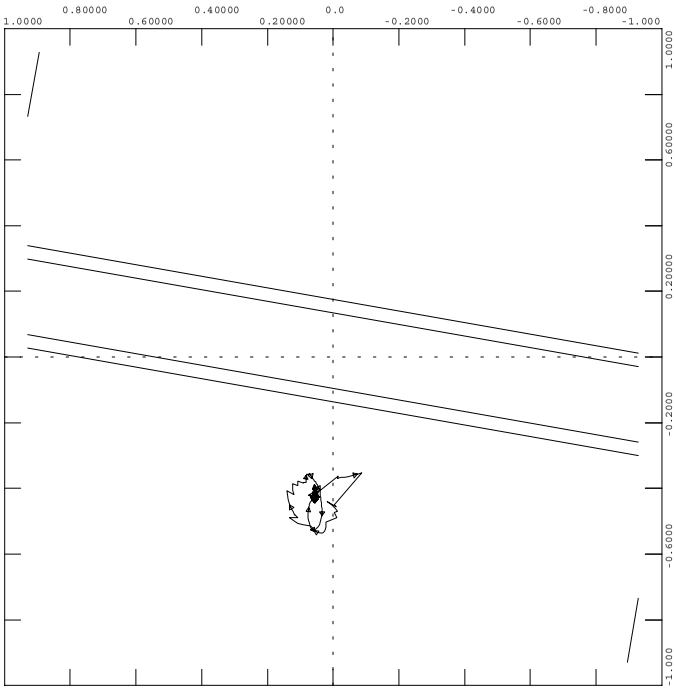
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

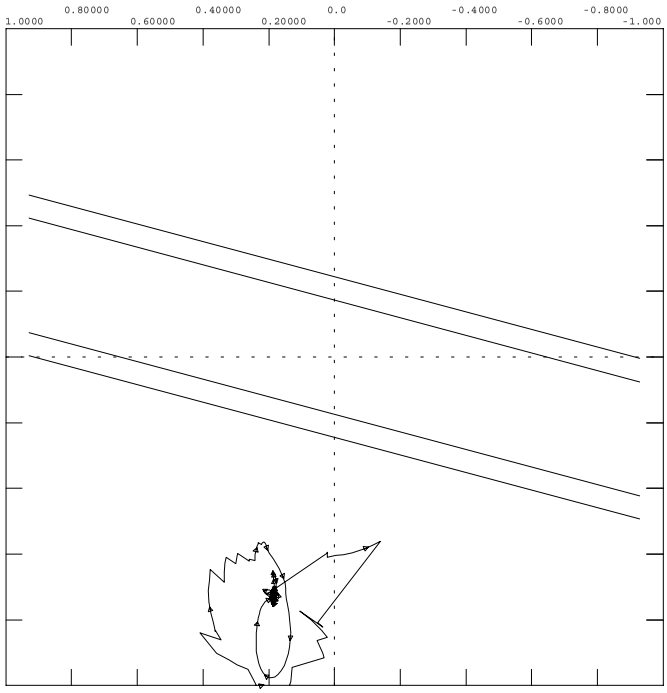
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

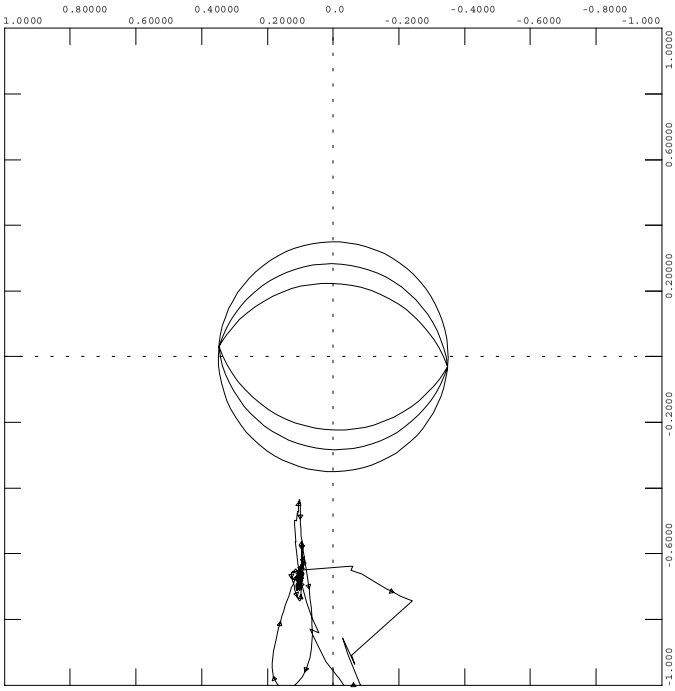
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

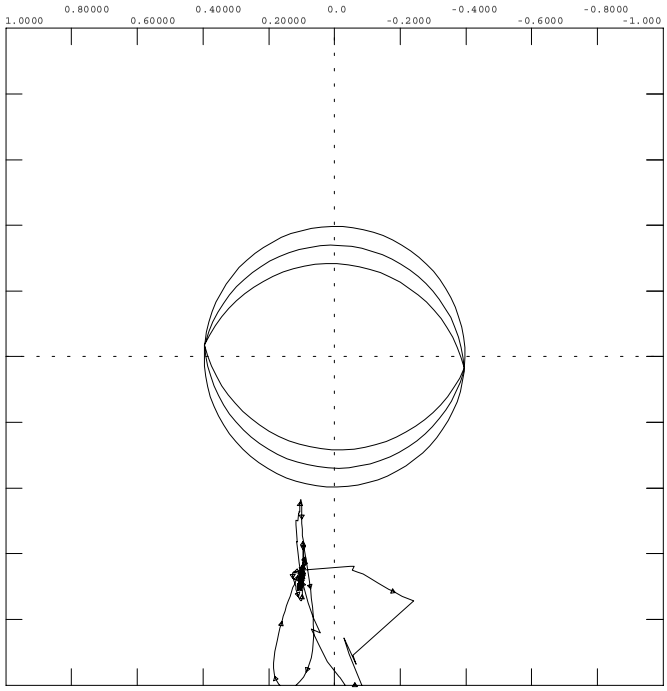
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

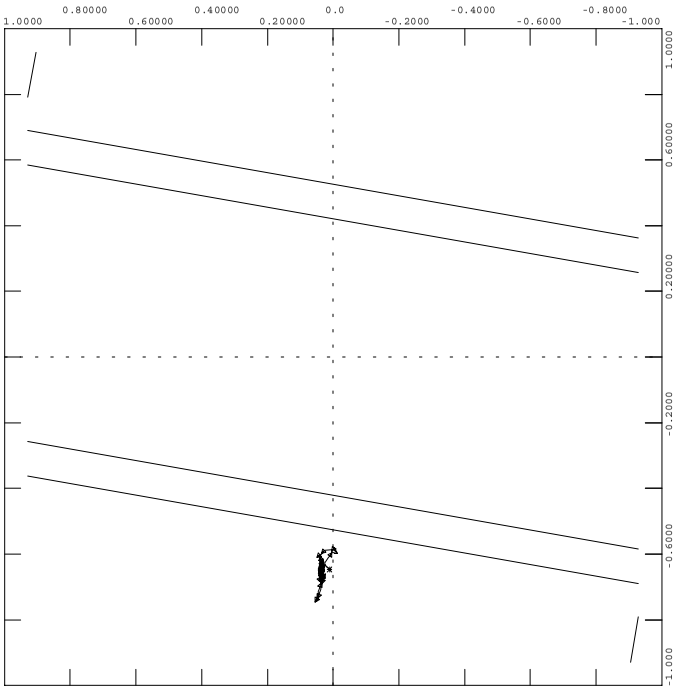
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

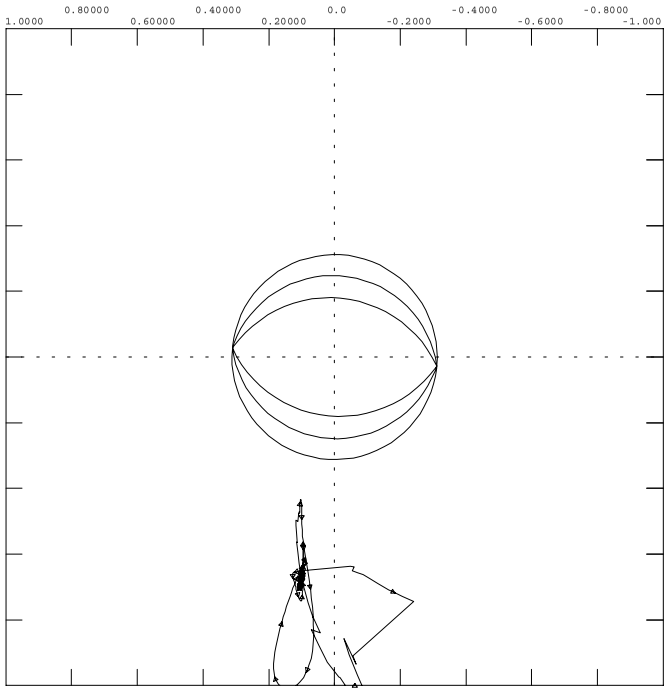
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

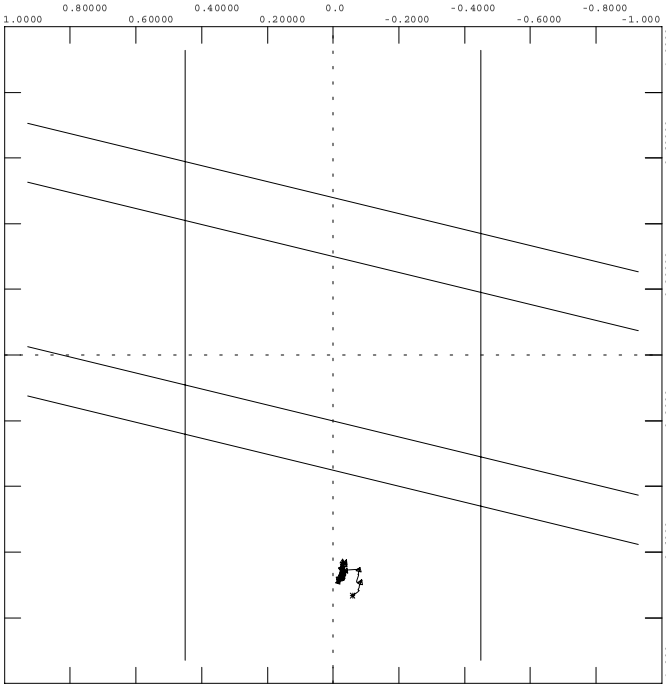
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4.5 CY SLGF @ COAL CREEK ON POLE 1, BRKR 61RB1 STK
CLR @ 11 CY BY TRIPPING FLTD POLE & BUS 1,CROSS TRIP CCS 2

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-eq1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

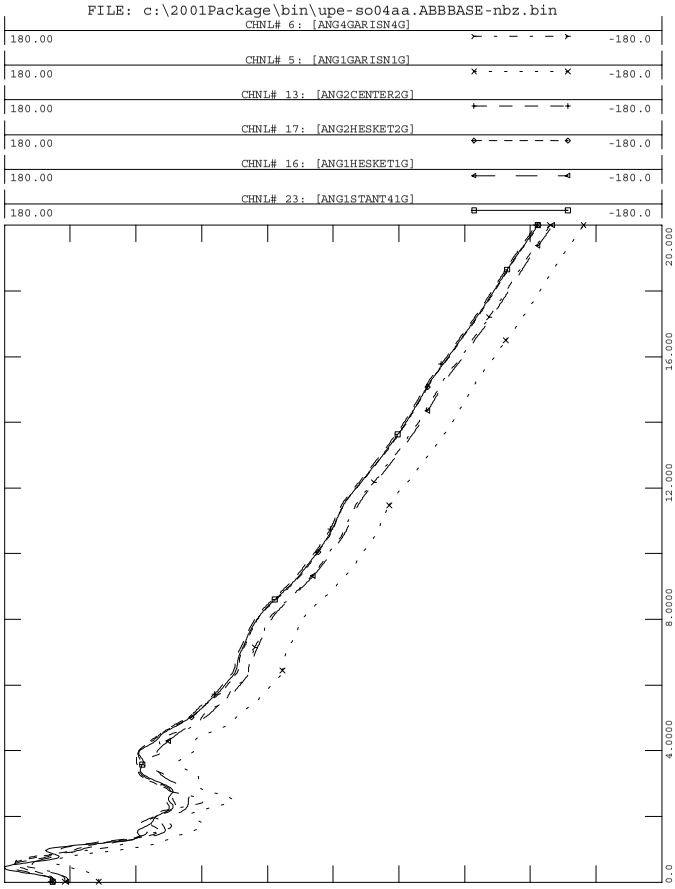


THU, APR 04 2002 12:44
MP-OH I.FALLS (779)

CONTINGENCY NBZ

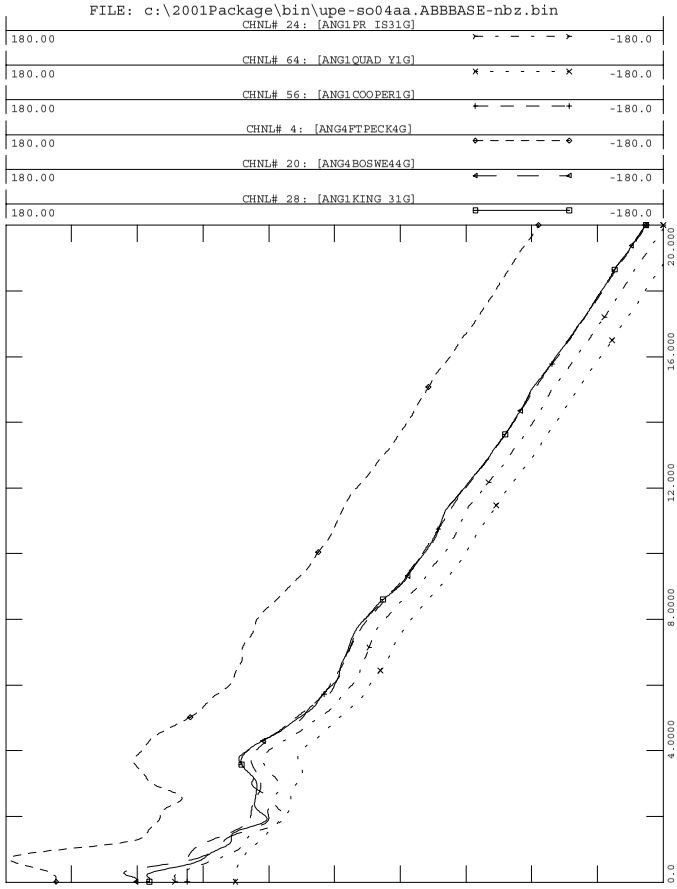
Three-phase fault at Chisago on Chisago County-Forbes 500 kV line

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin



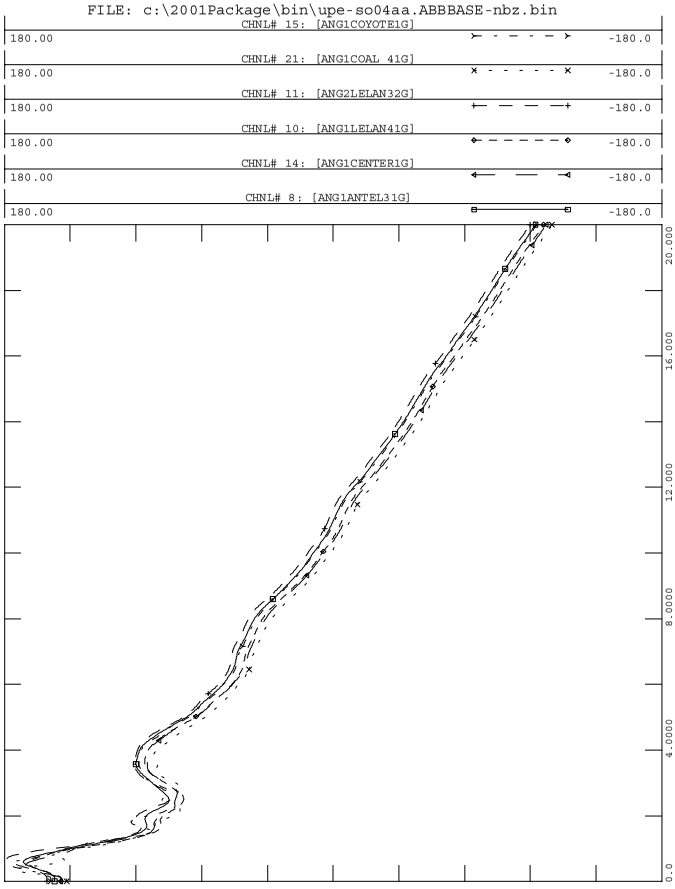
THU, APR 04 2002 13:03
ROTOR ANGLES 2

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin



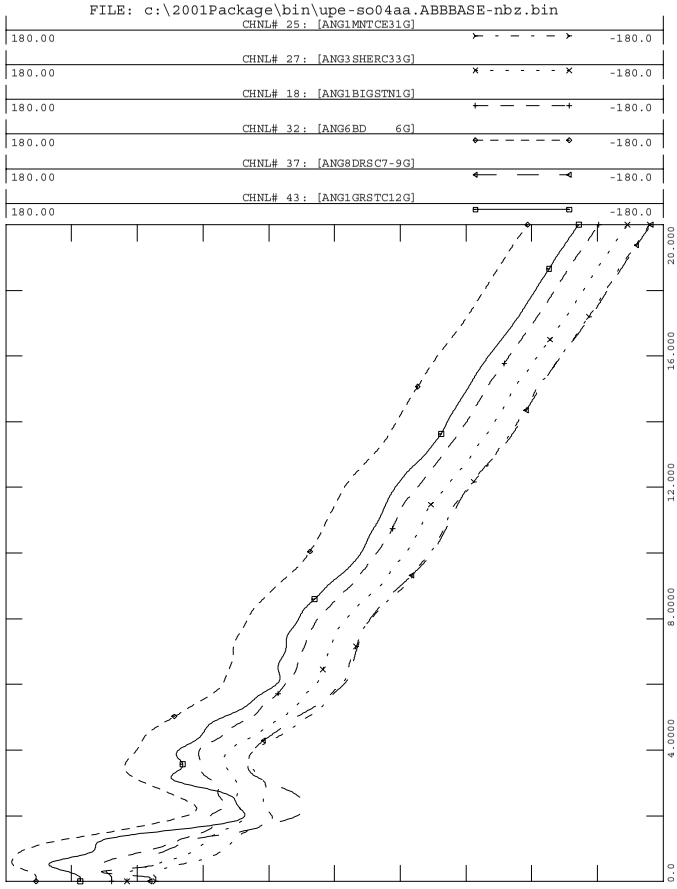
THU, APR 04 2002 13:03
ROTOR ANGLES 4

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

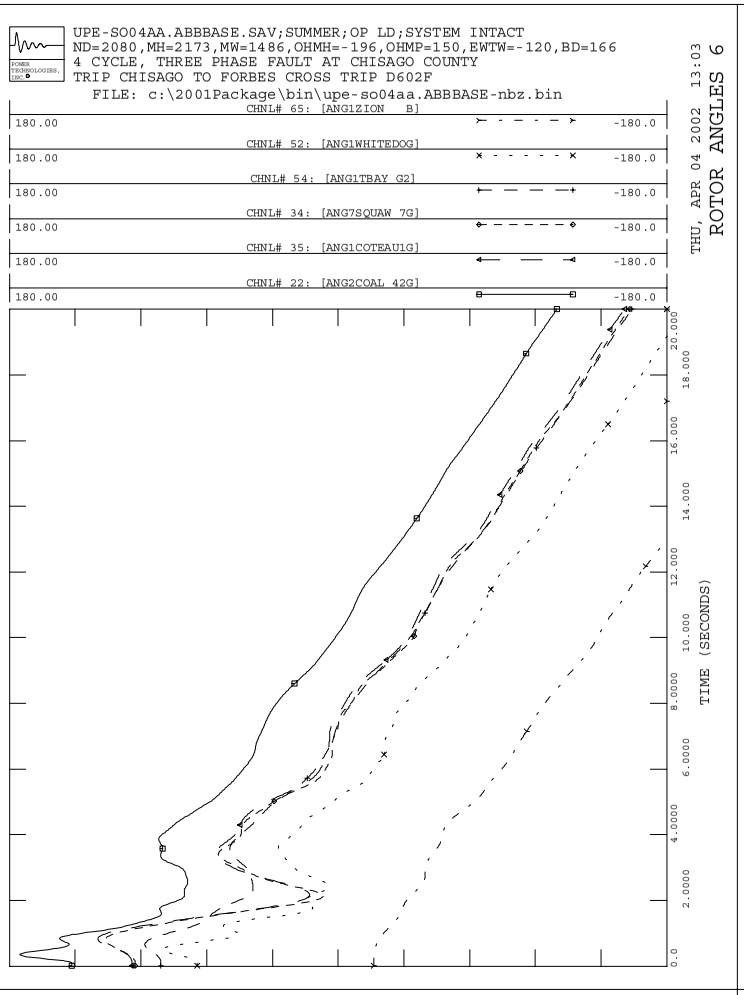


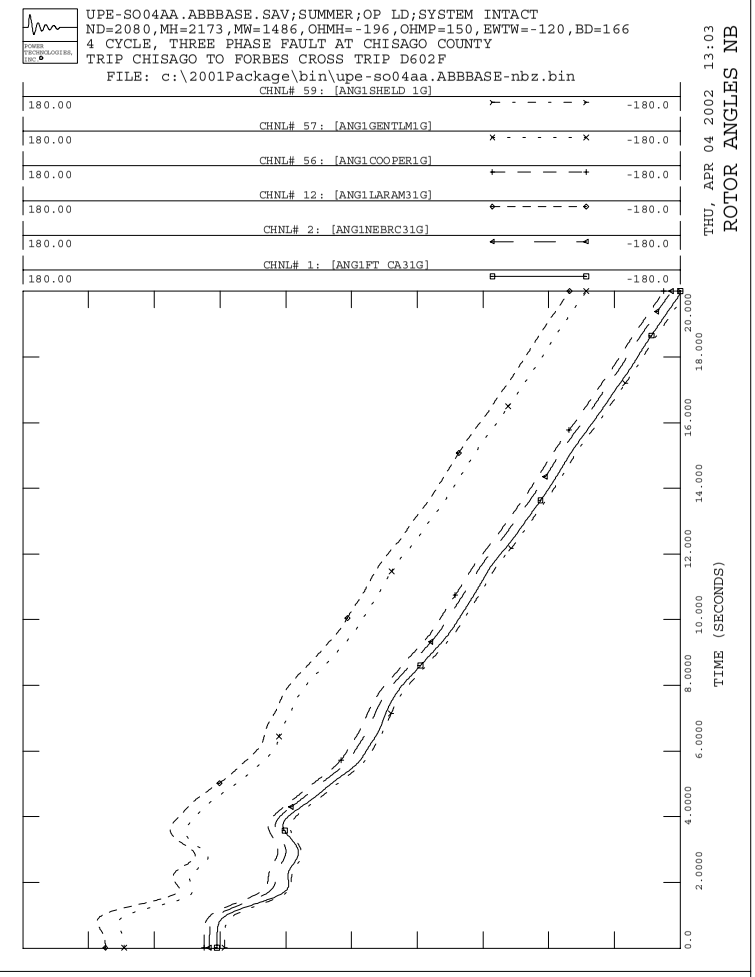
THU, APR 04 2002 13:03
ROTOR ANGLES 1

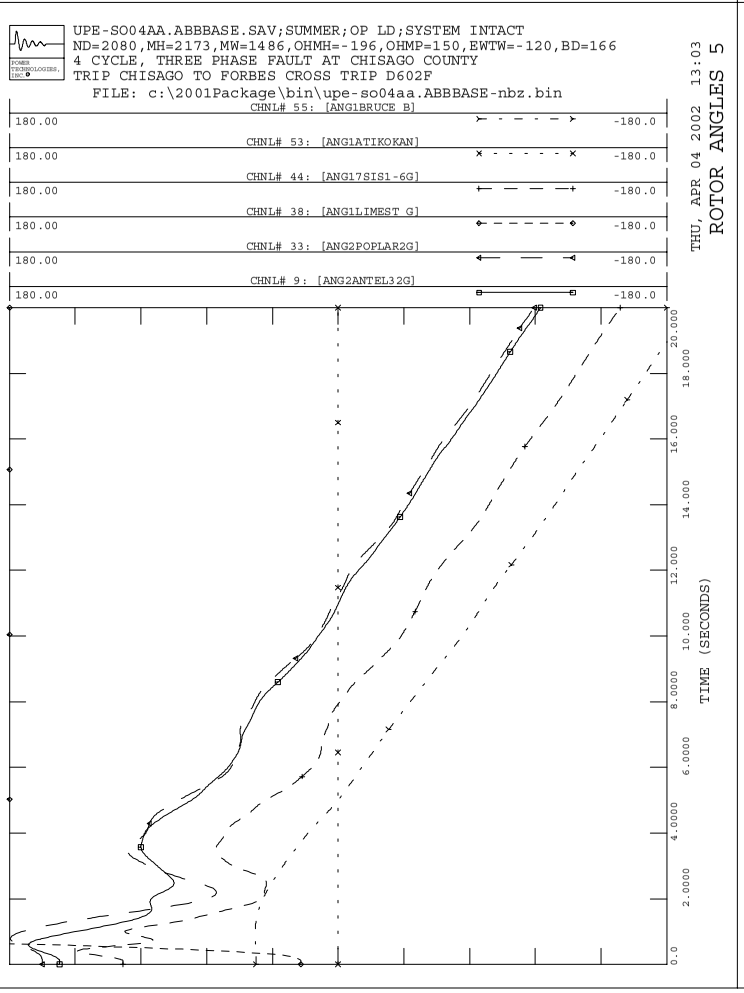
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

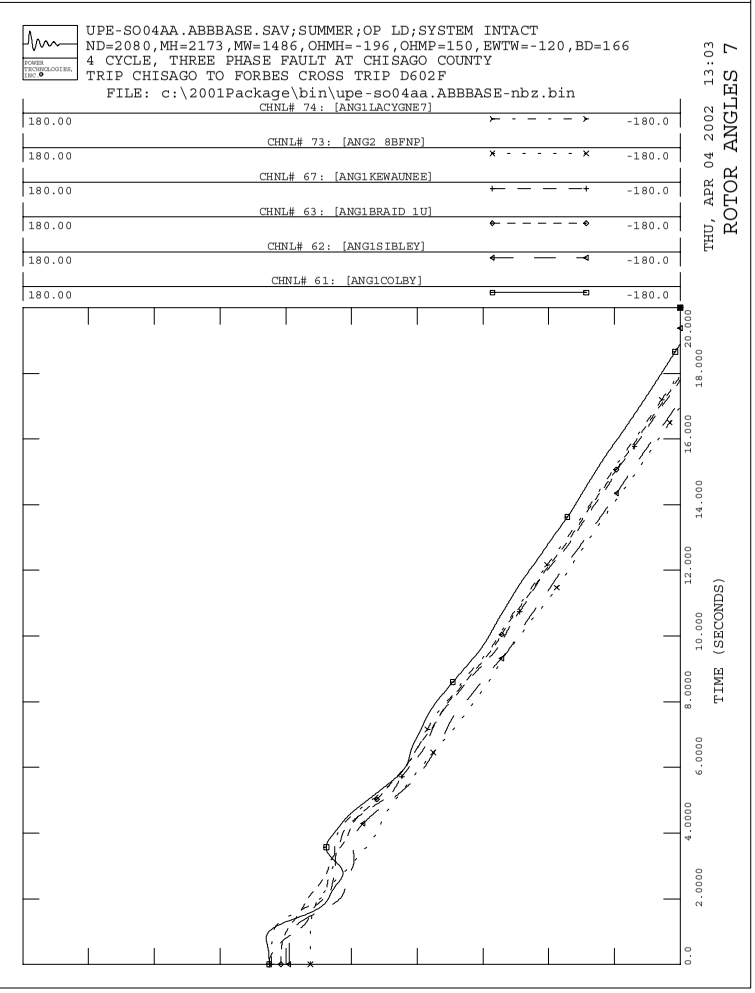


THU, APR 04 2002 13:03
ROTOR ANGLES 3


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:03
ROTOR ANGLES 6

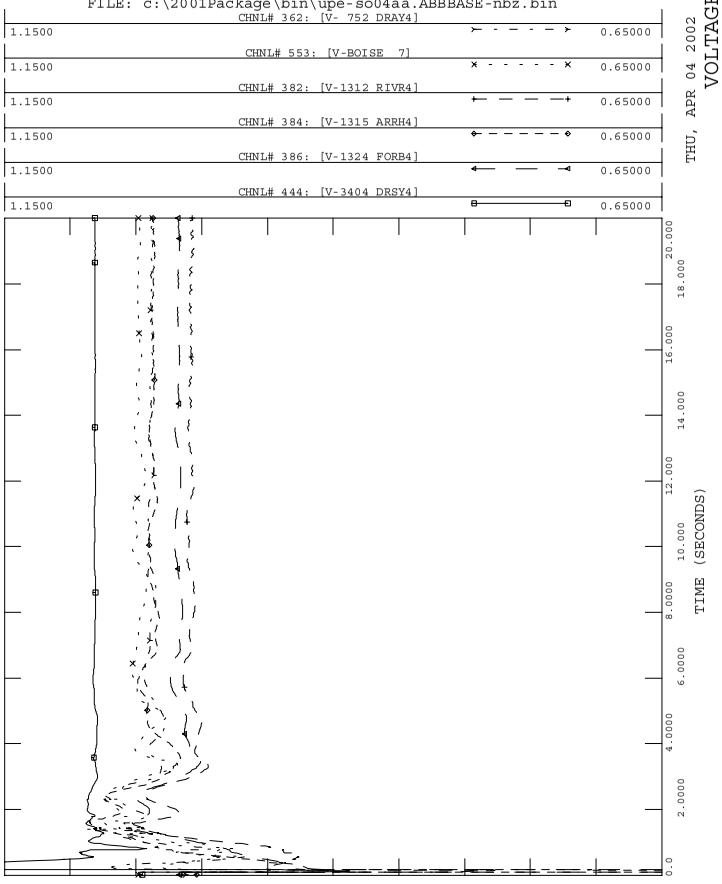

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:03
ROTOR ANGLES NB


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:03
ROTOR ANGLES 5


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:03
ROTOR ANGLES 7

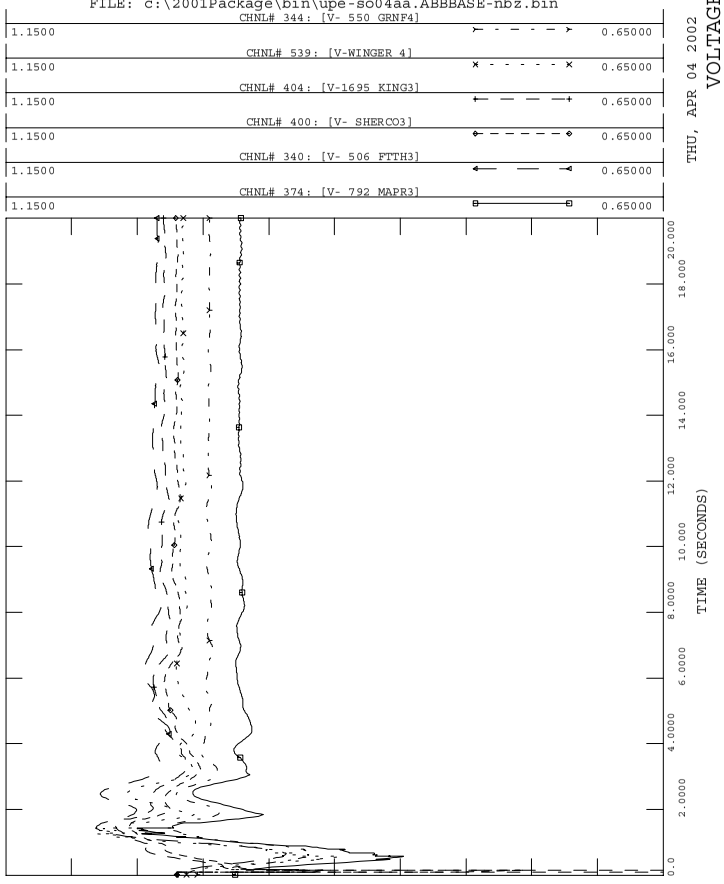
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03
VOLTAGES 1



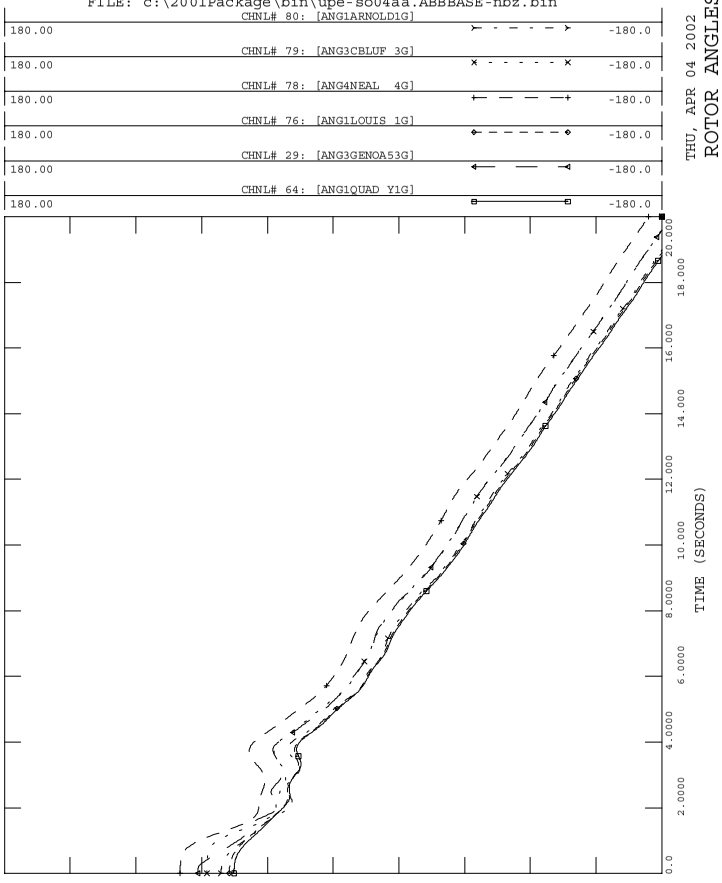
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03
VOLTAGES 3



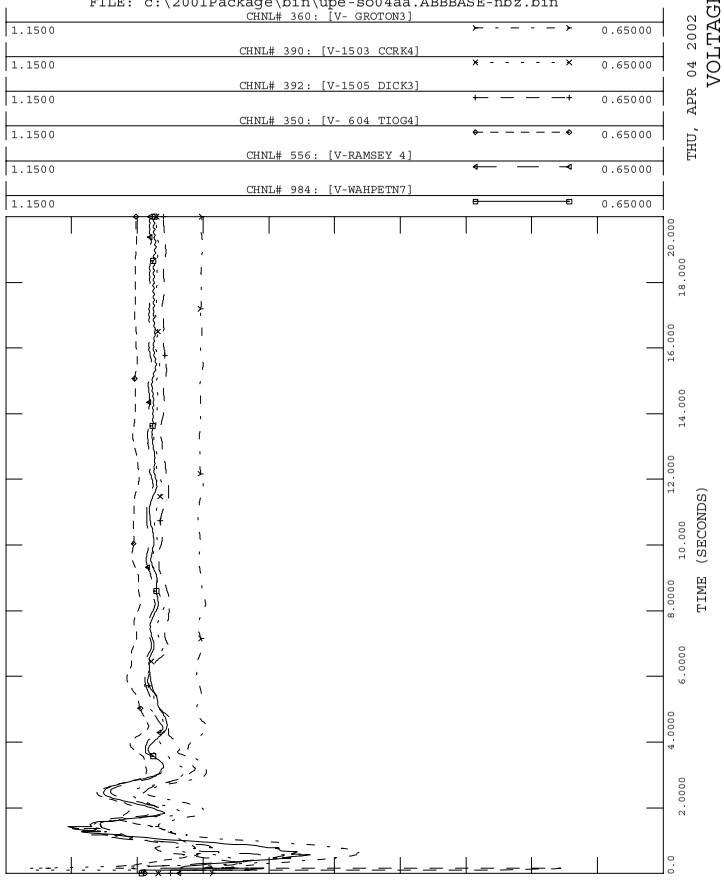
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03
ROTOR ANGLES IA

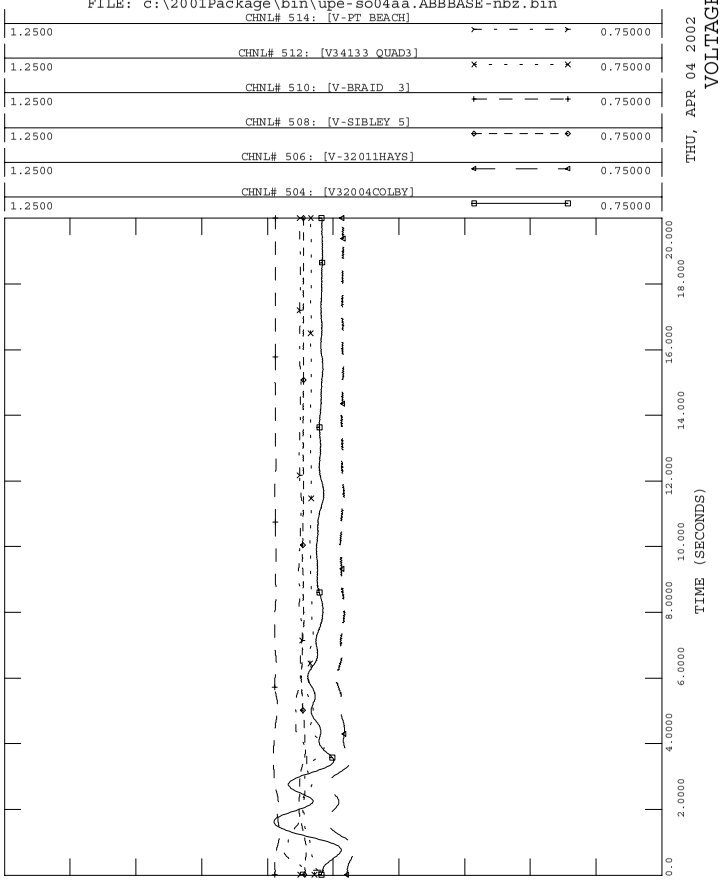


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03
VOLTAGES 2

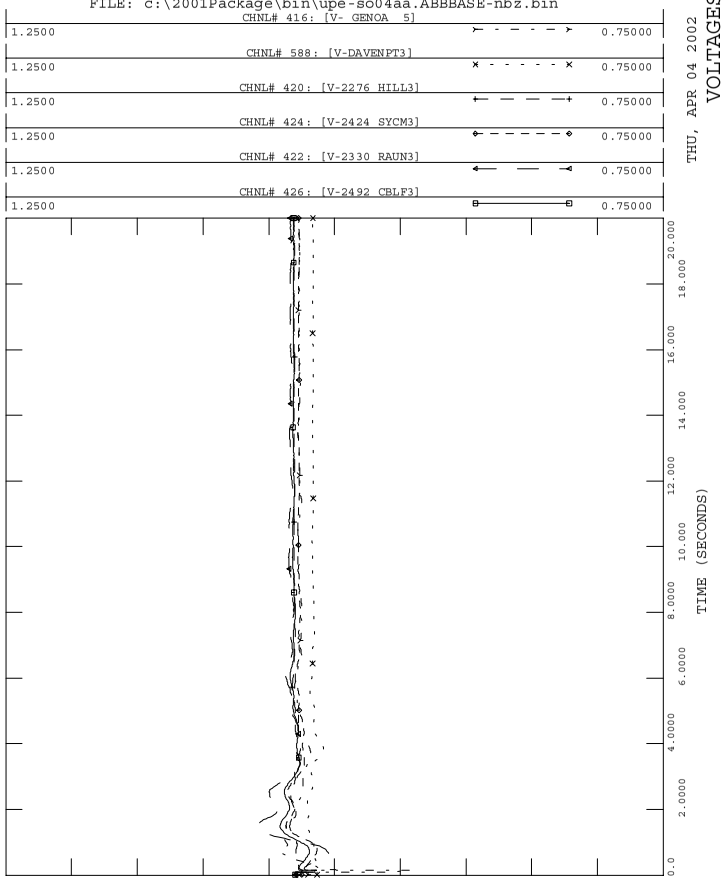


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin



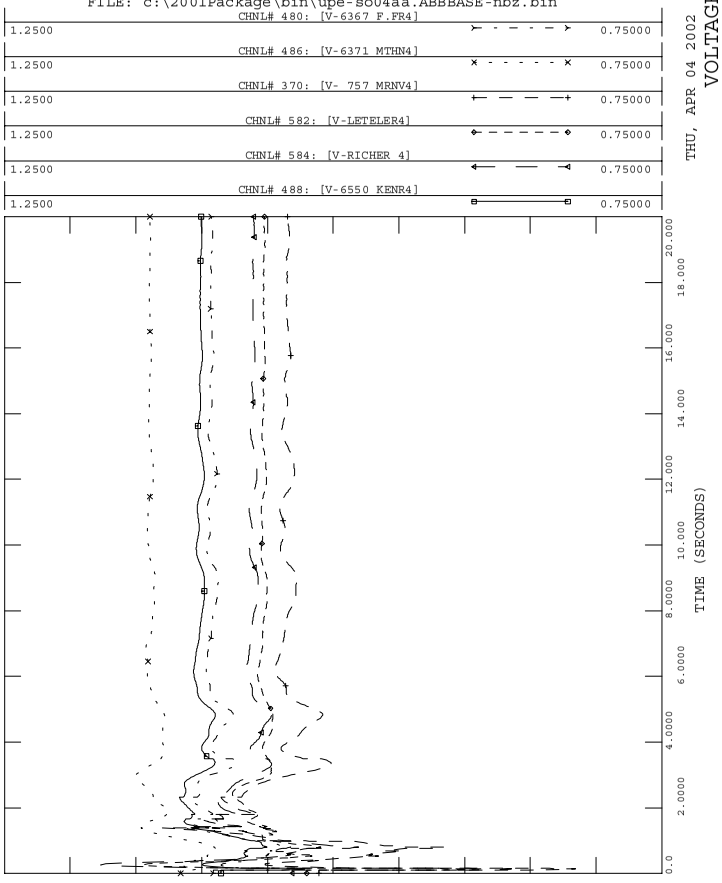
THU, APR 04 2002 13:03
VOLTAGES 5

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin



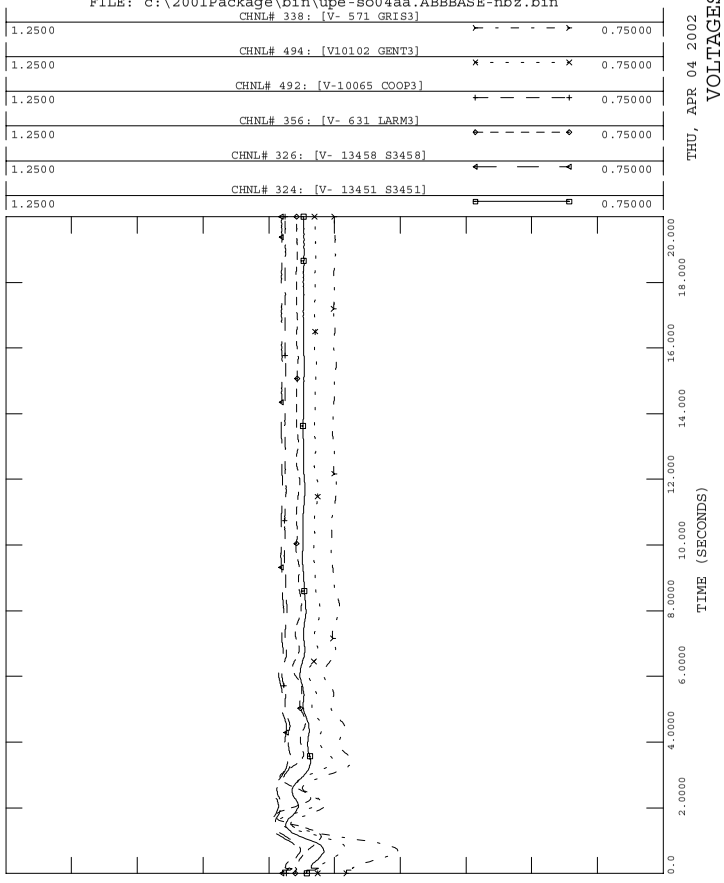
THU, APR 04 2002 13:03
VOLTAGES IA

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

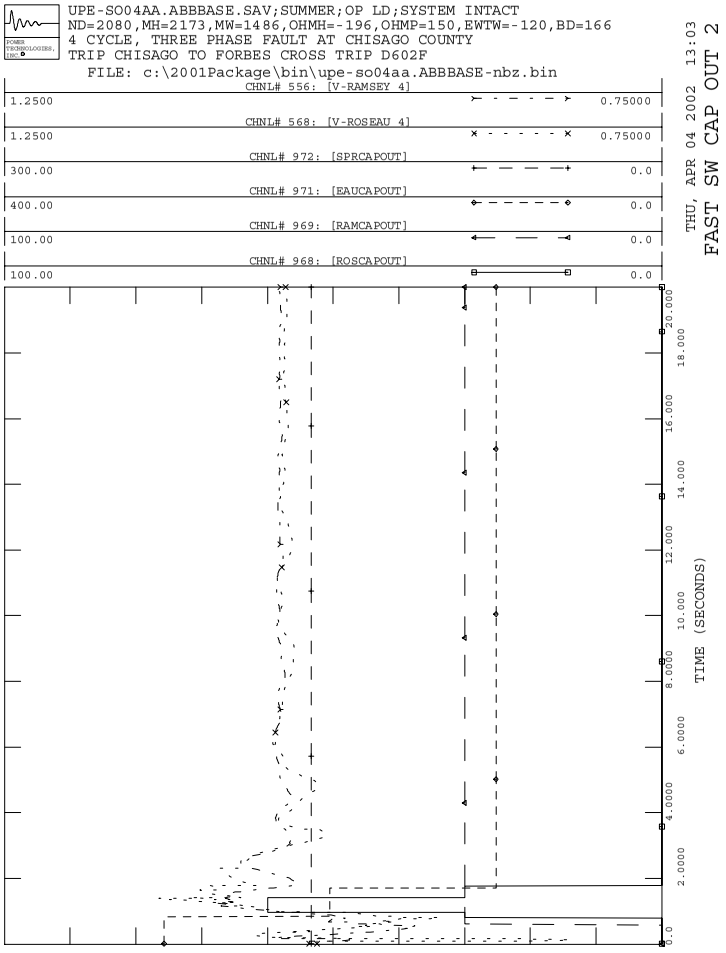


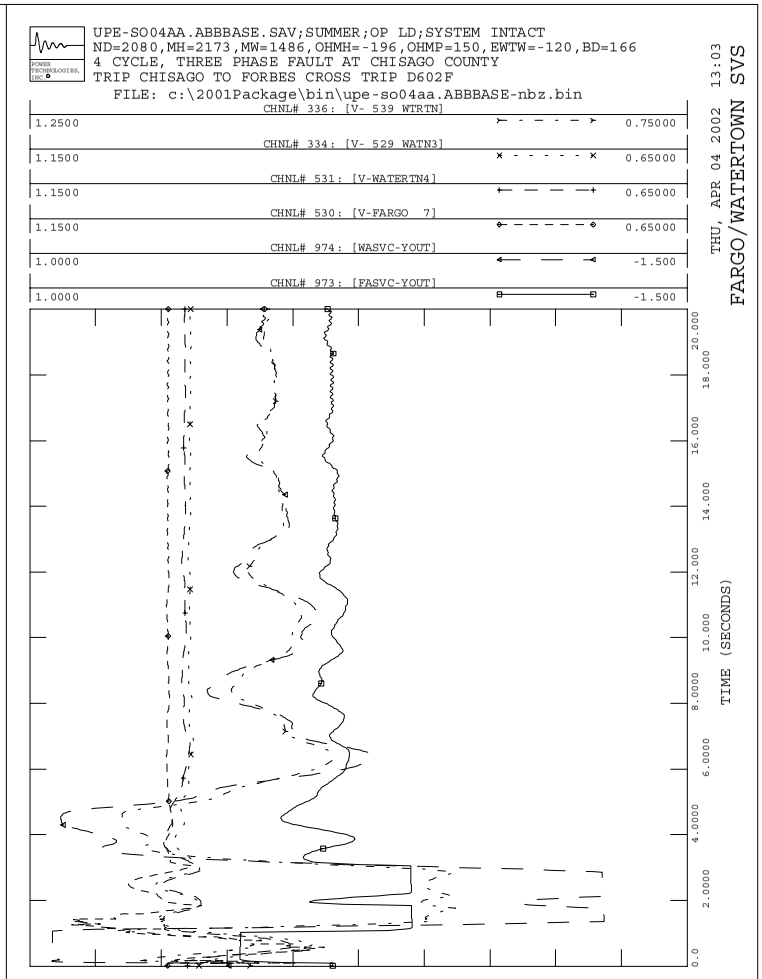
THU, APR 04 2002 13:03
VOLTAGES 4

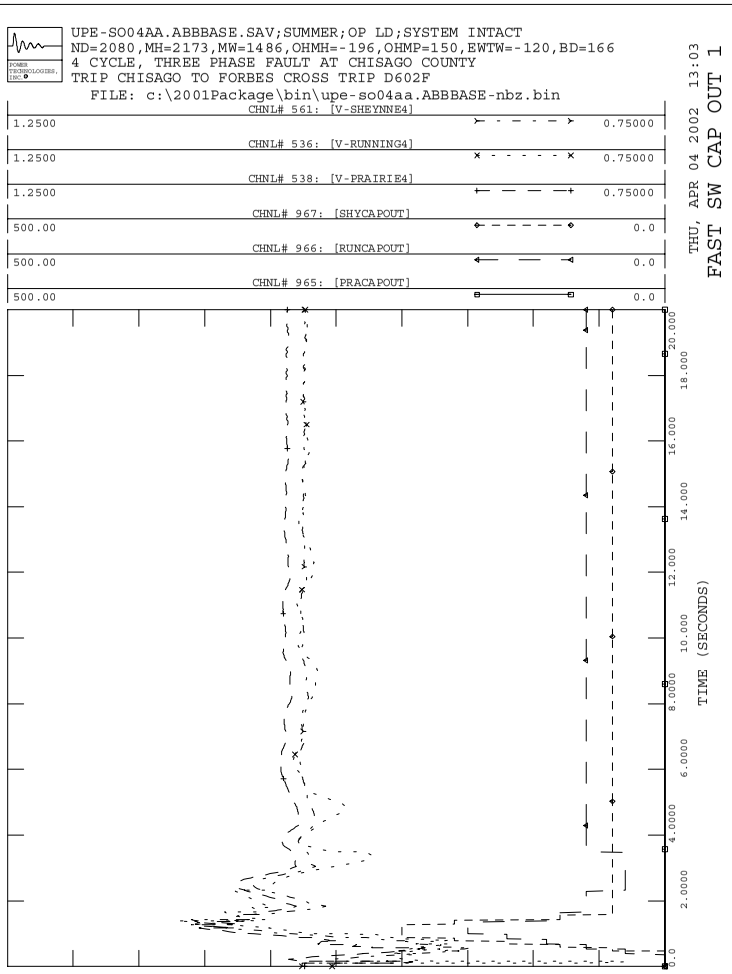
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

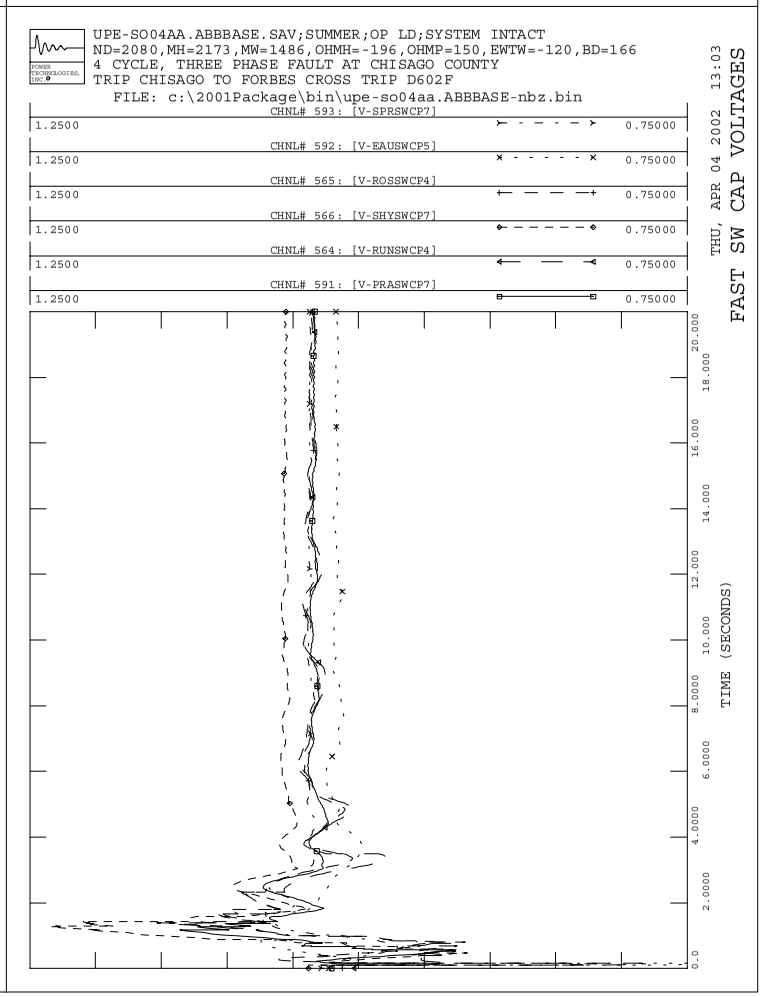


THU, APR 04 2002 13:03
VOLTAGES NB


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
THU, APR 04 2002 13:03
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
THU, APR 04 2002 13:03
FARGO/WATERTOWN SVS
TIME (SECONDS)

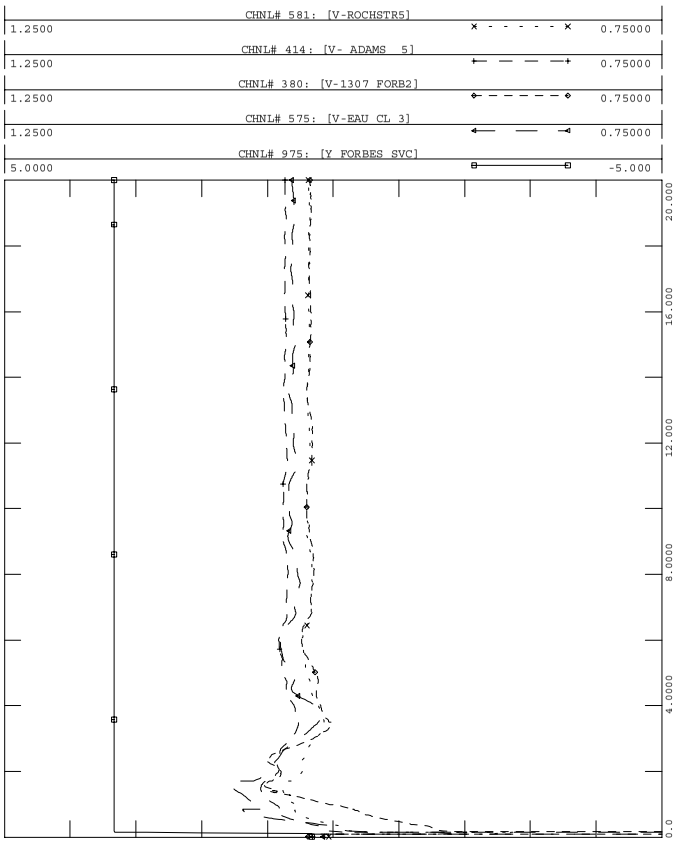

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
THU, APR 04 2002 13:03
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
THU, APR 04 2002 13:03
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03

SVC & WISCONSIN VOLT



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

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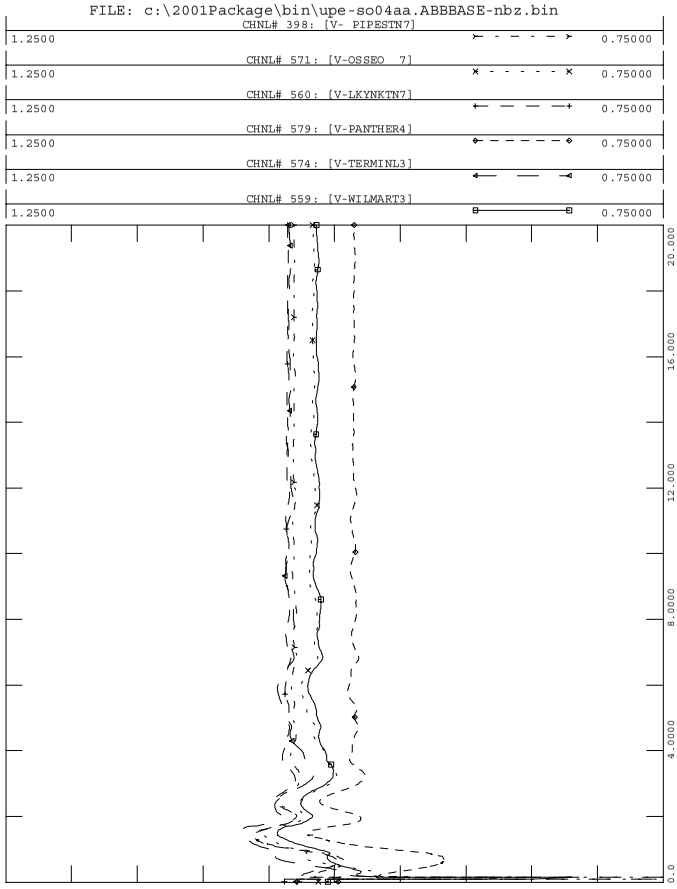
TC VOLTAGES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

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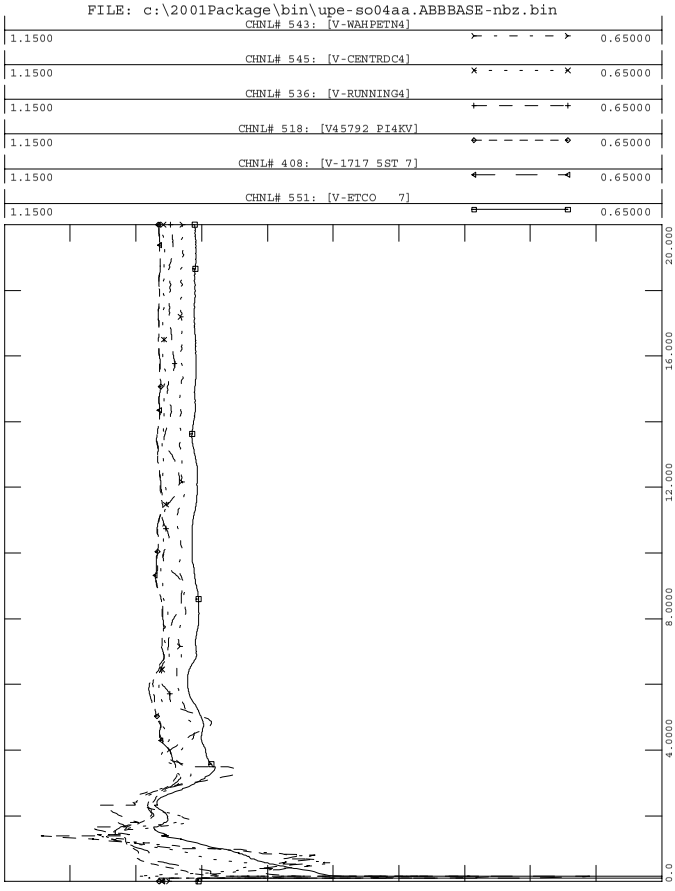
VOLTAGES 6



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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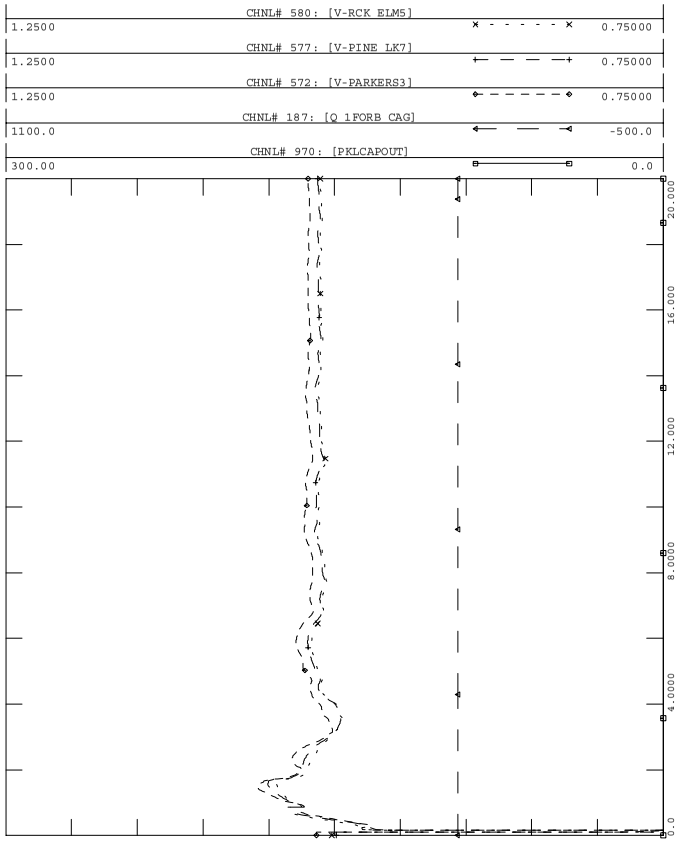
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03

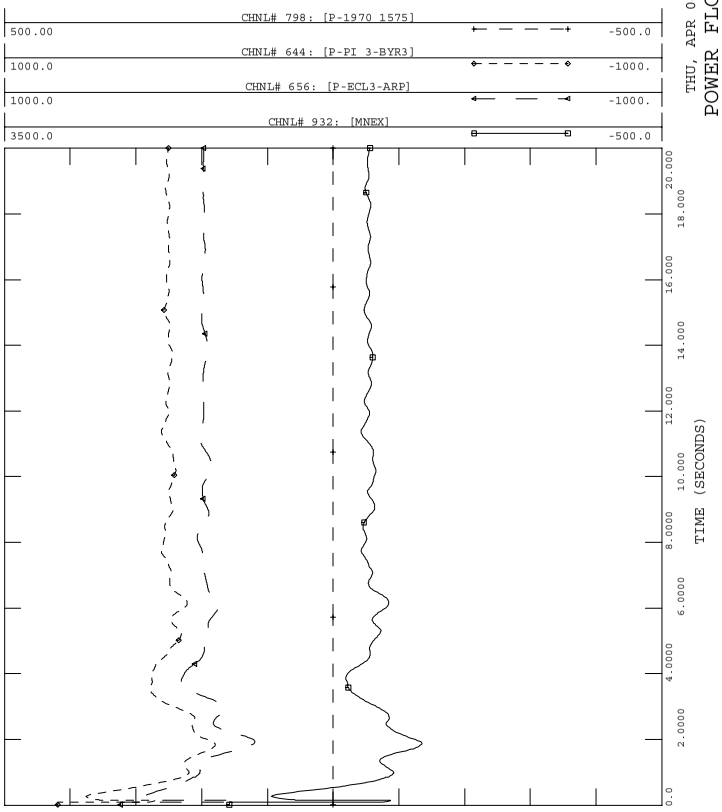
FORBES SVS OUT & VOLTAGES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03

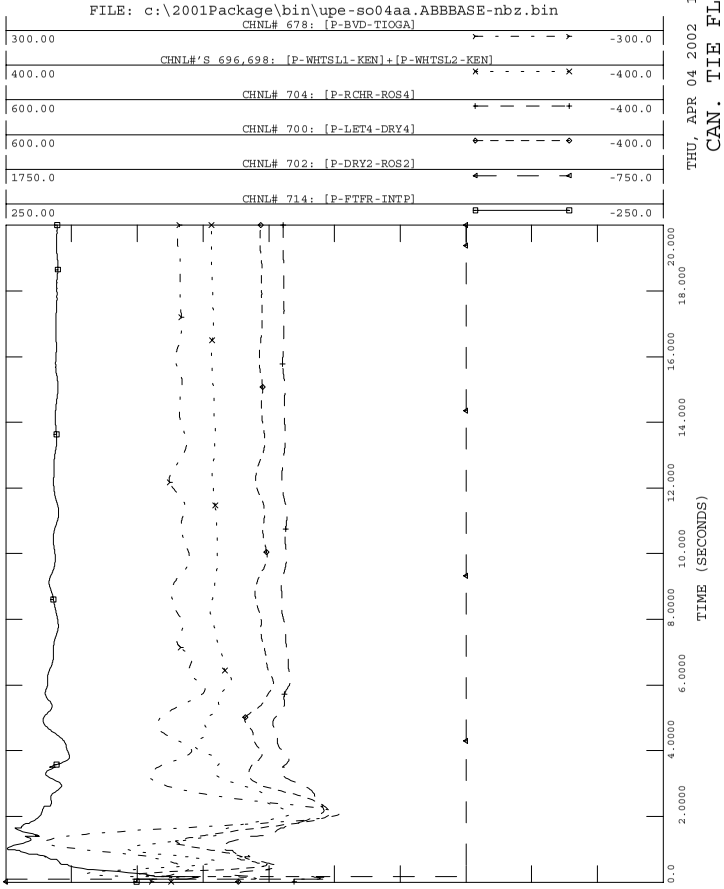
POWER FLOW SUMS 2



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03

CAN. TIE FLOWS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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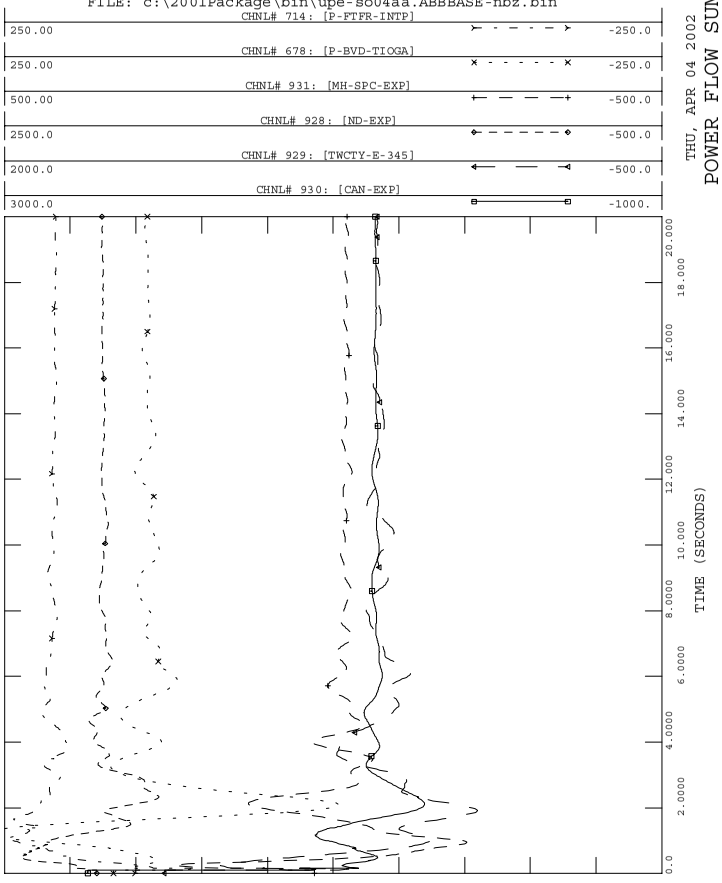
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03

POWER FLOW SUMS 1



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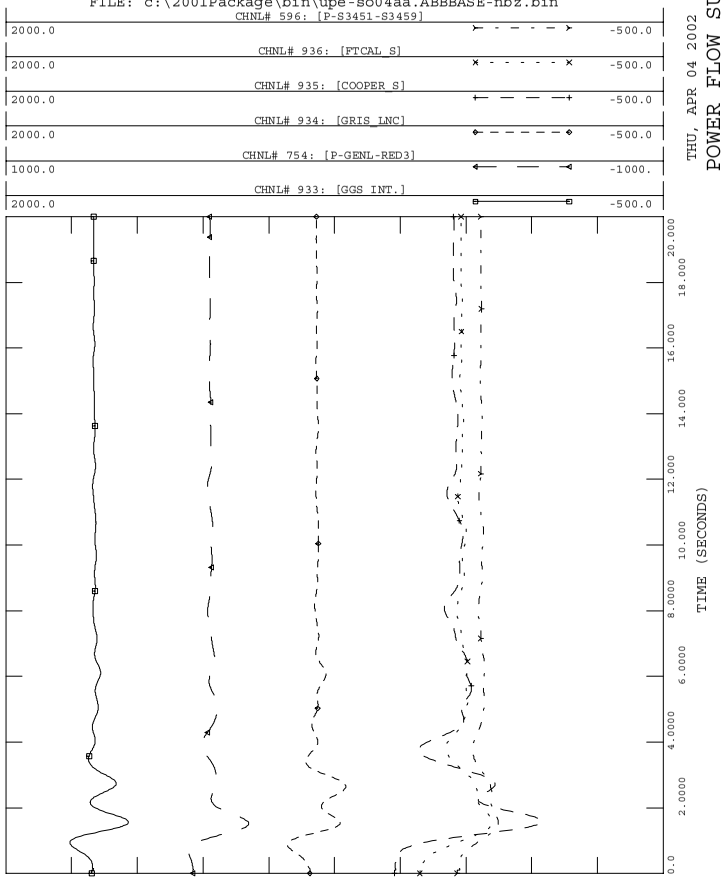
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03

POWER FLOW SUM 3



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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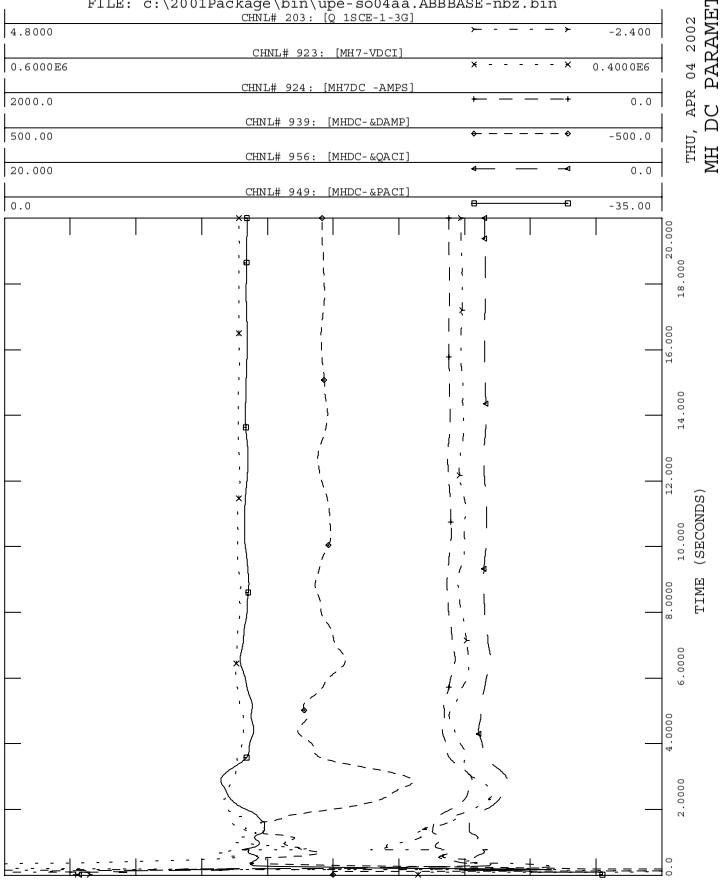
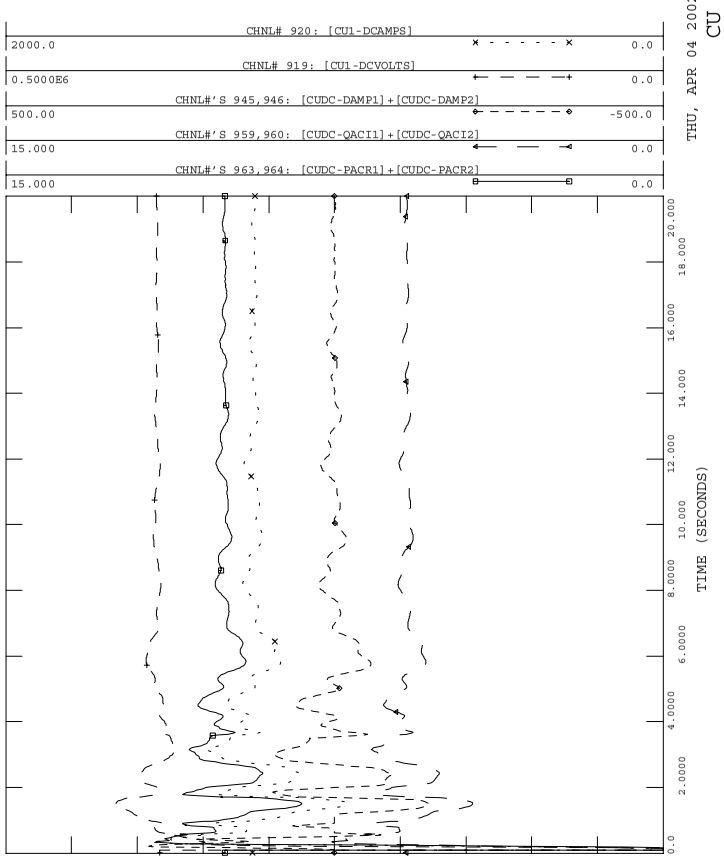
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03
MH DC PARAMETERS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03
CU DC #1



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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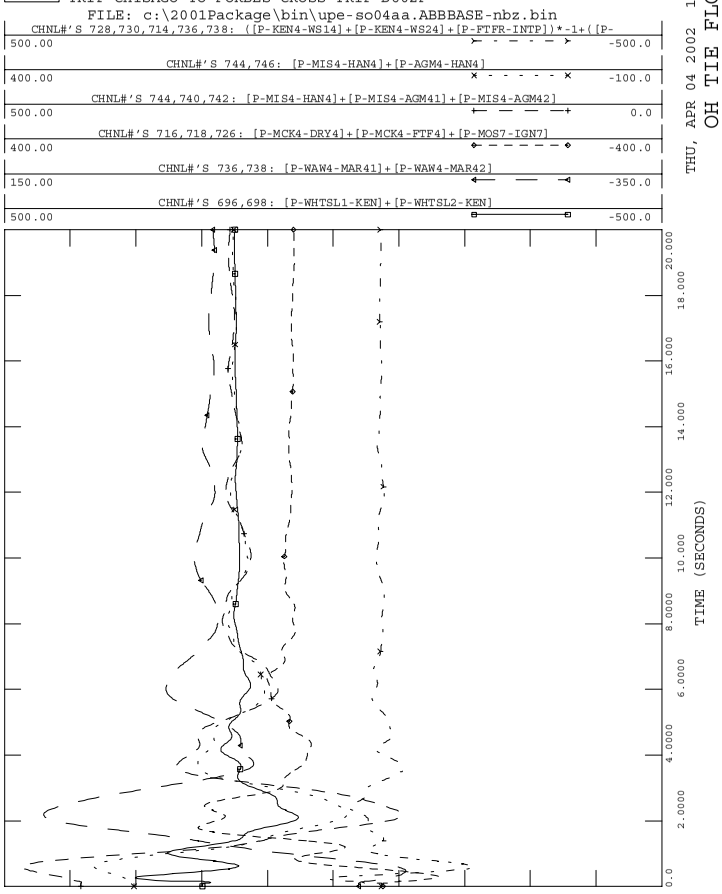
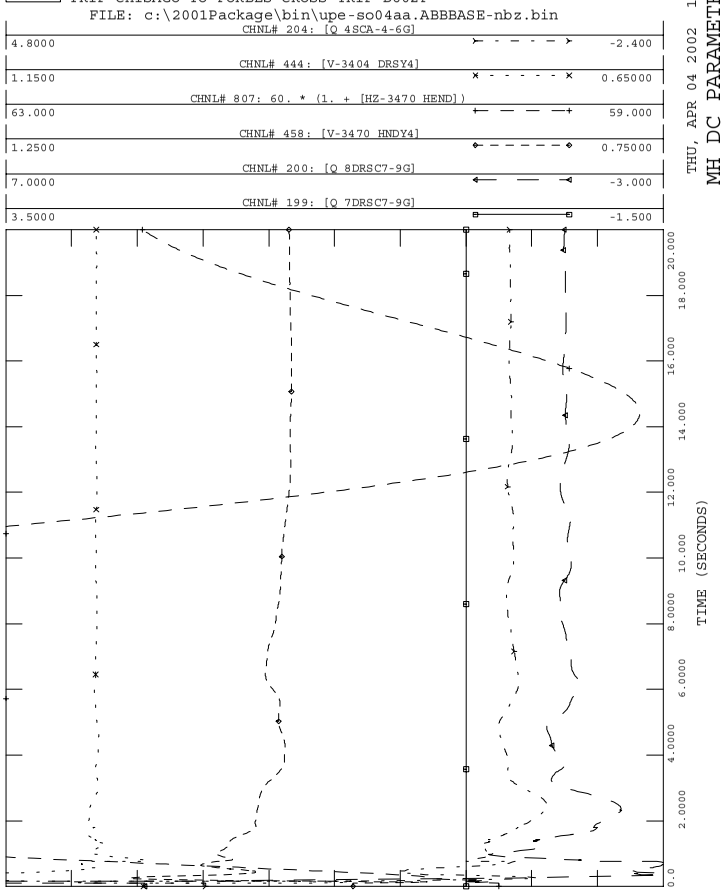
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03
OH TIE FLOWS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03
MH DC PARAMETERS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

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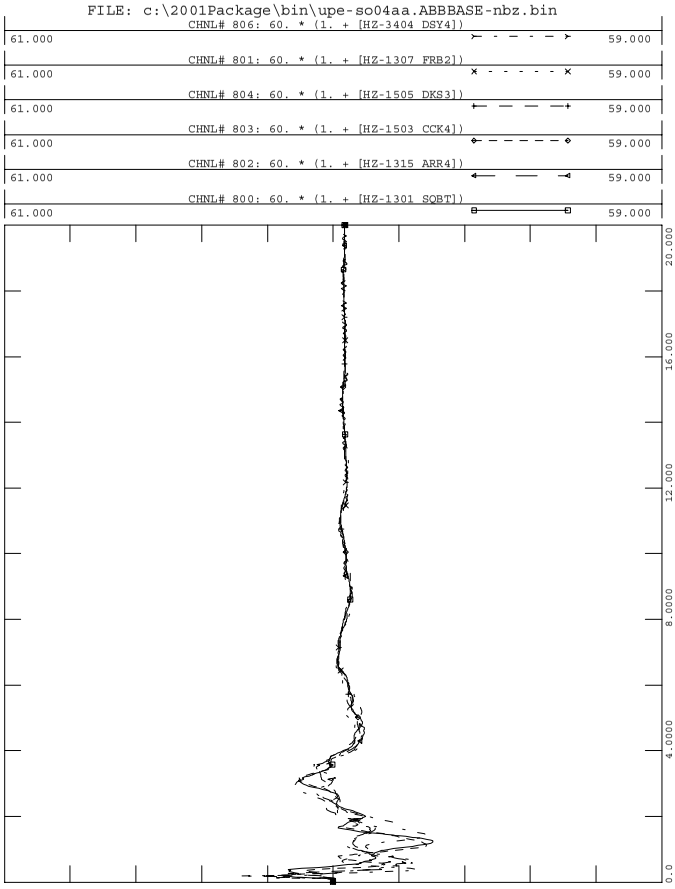
FREQ AT DC TERMINALS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

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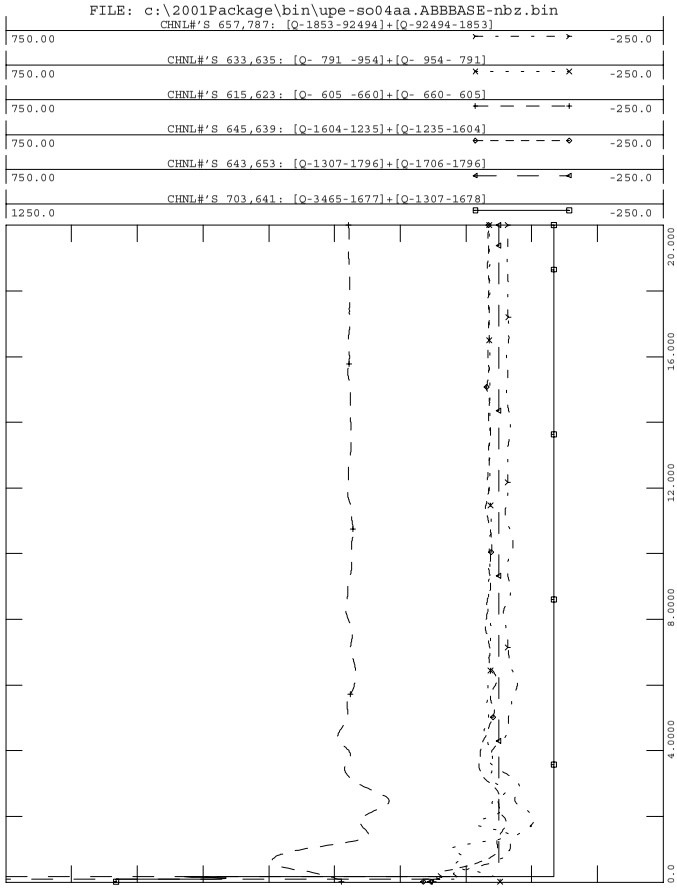
VAR LOSSES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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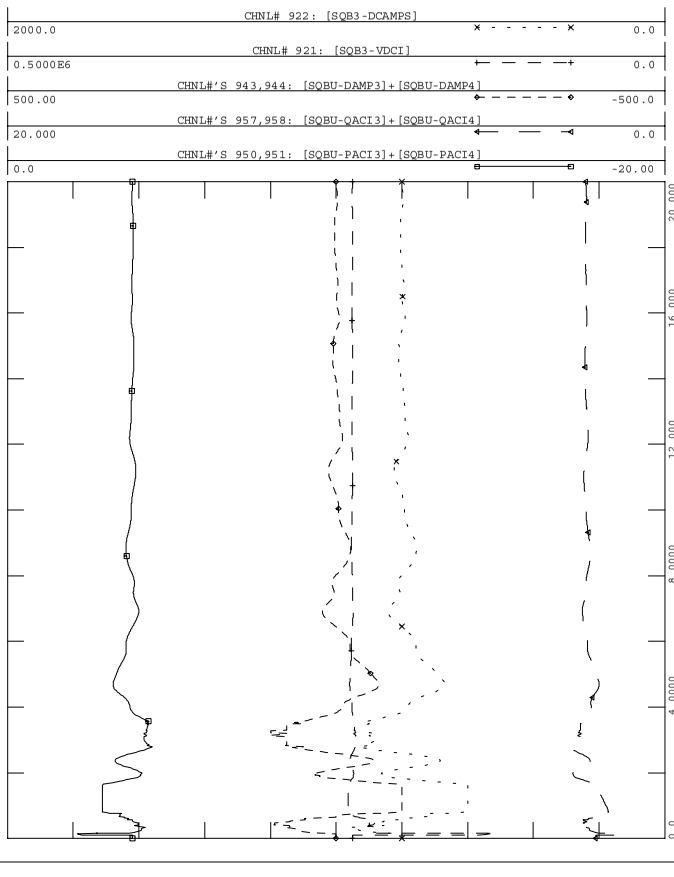
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03

SQB DC #3



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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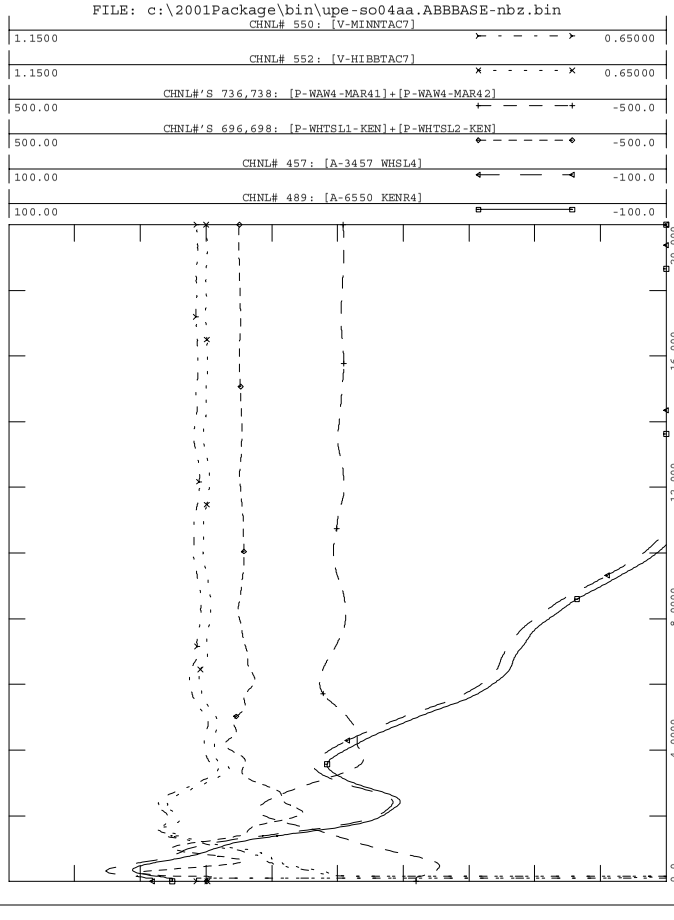
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

THU, APR 04 2002 13:03

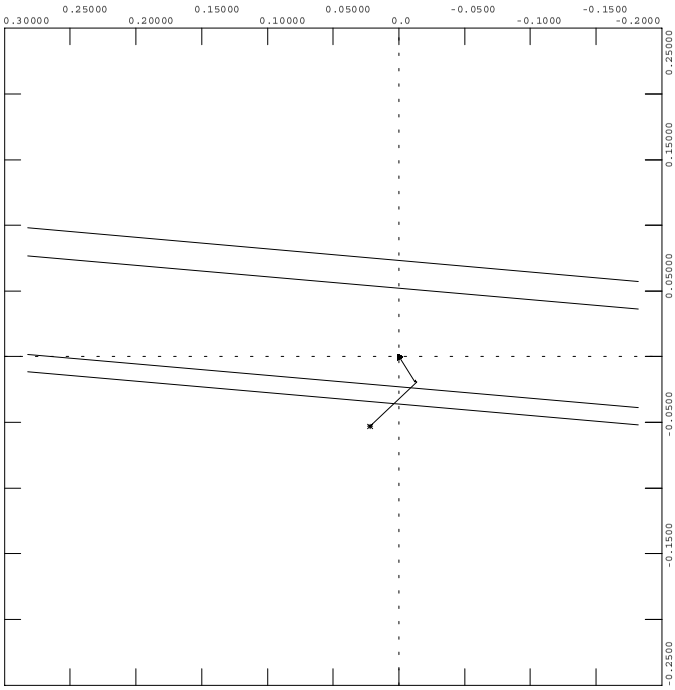
VOLTAGES, ANGLES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, APR 04 2002 13:03
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

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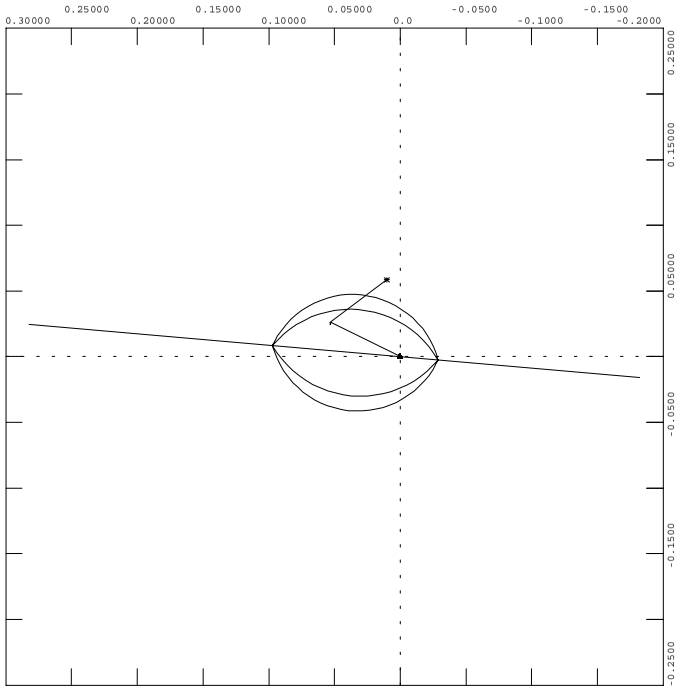

THU, APR 04 2002 13:03
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

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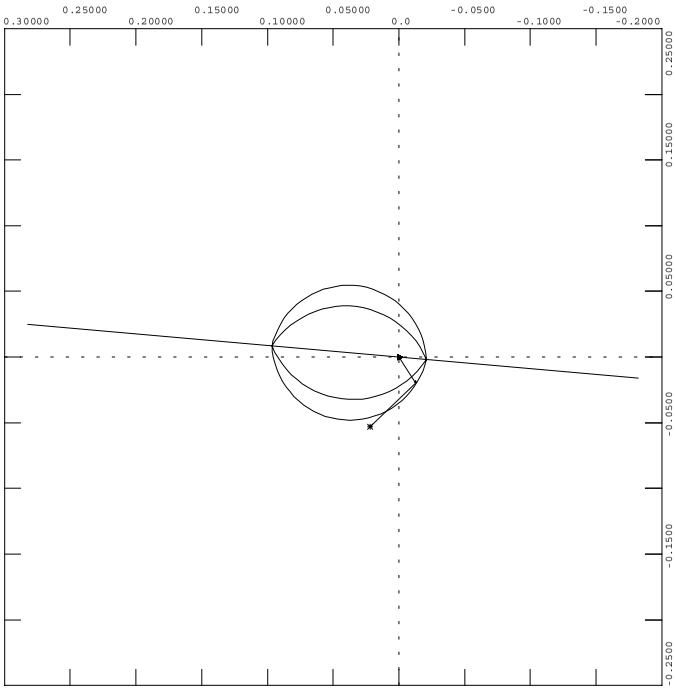

THU, APR 04 2002 13:03
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

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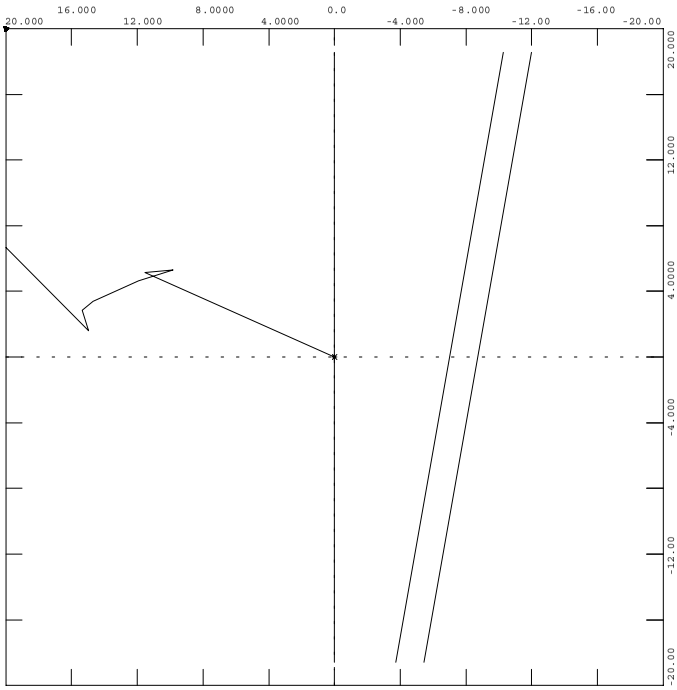
CHNL# 977: [DCAR-B]



THU, APR 04 2002 13:03
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

RELAY: SLINOS
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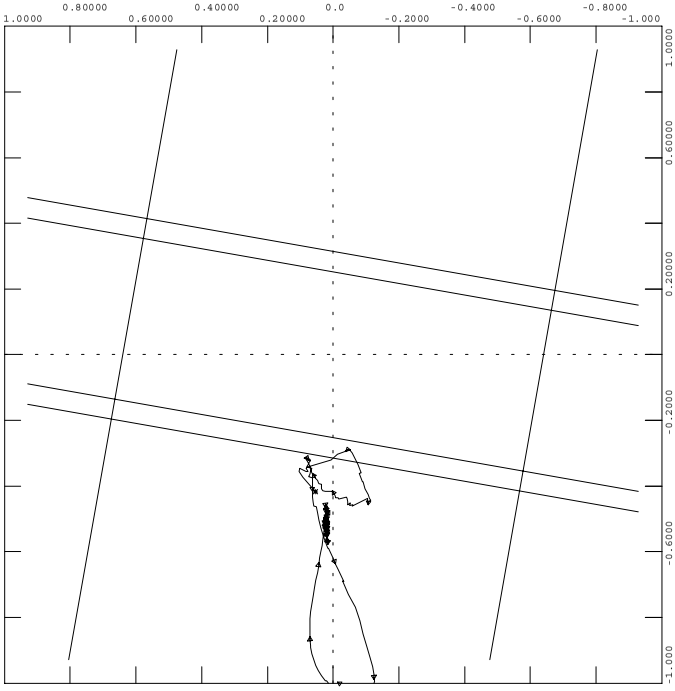

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

RELAY: SLINOS
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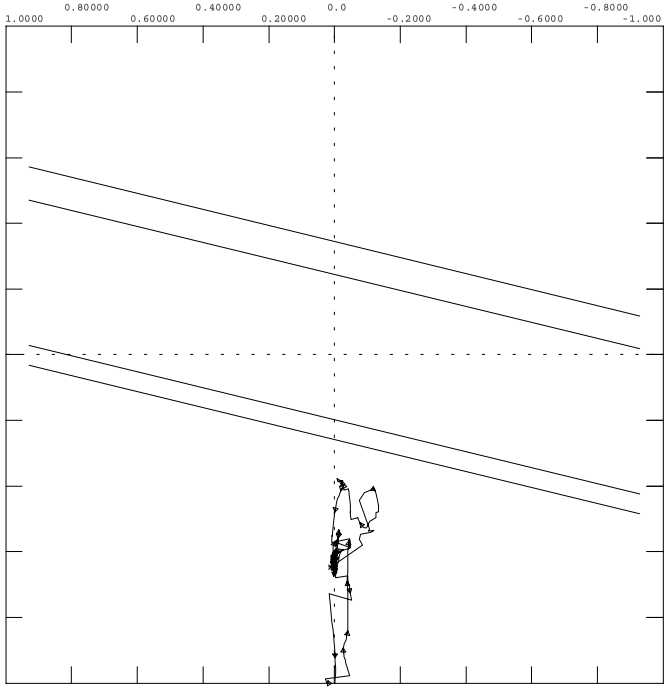

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

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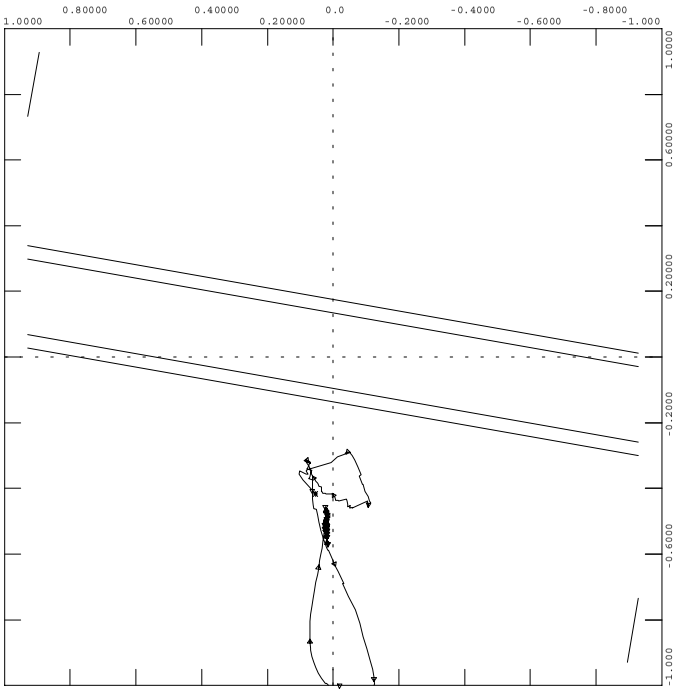

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

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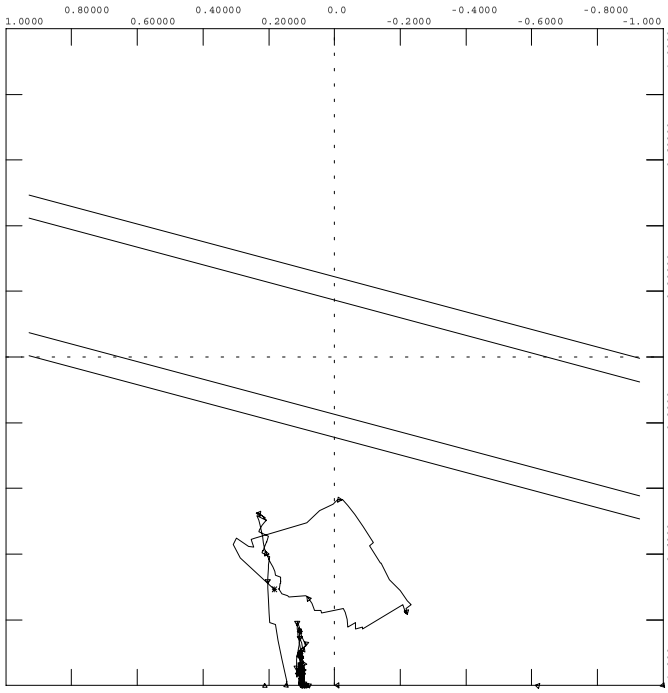
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

RELAY: SLLP
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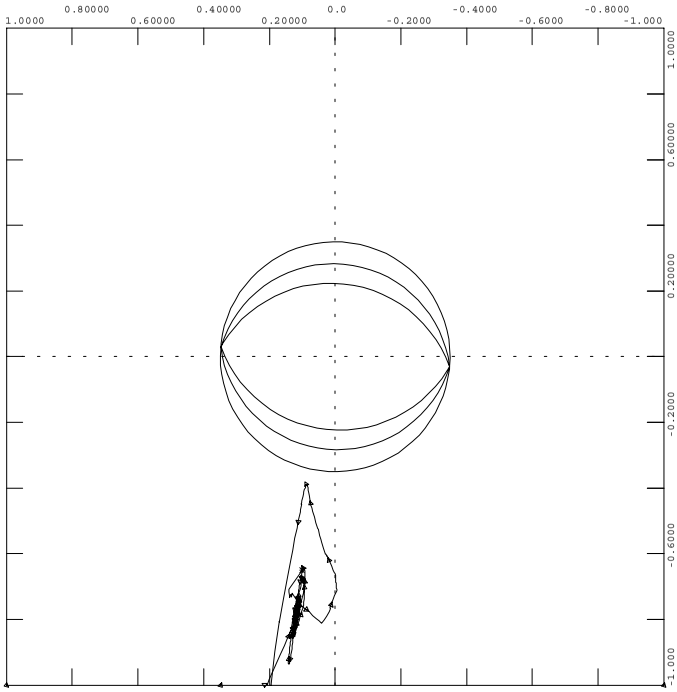
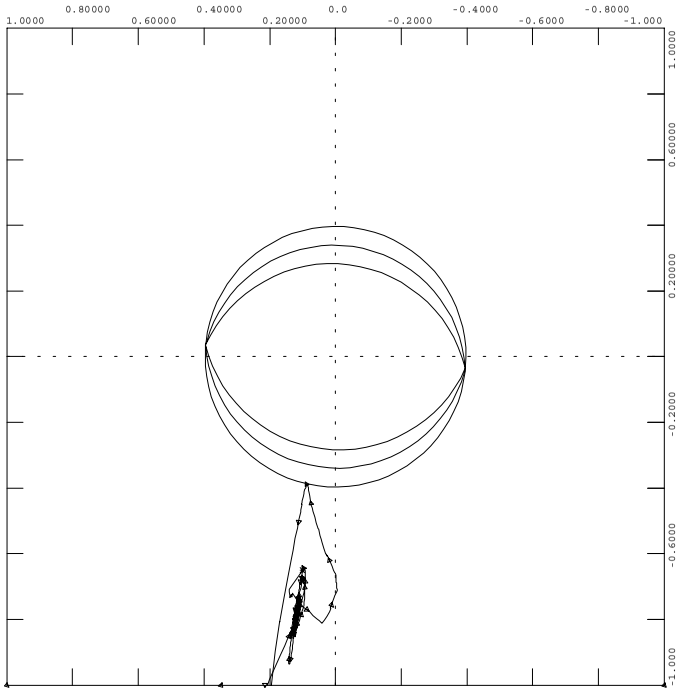
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

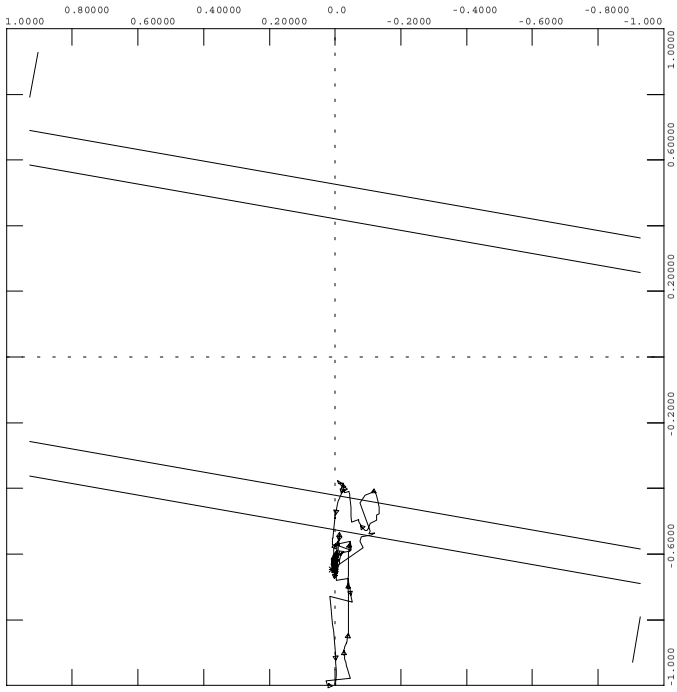
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

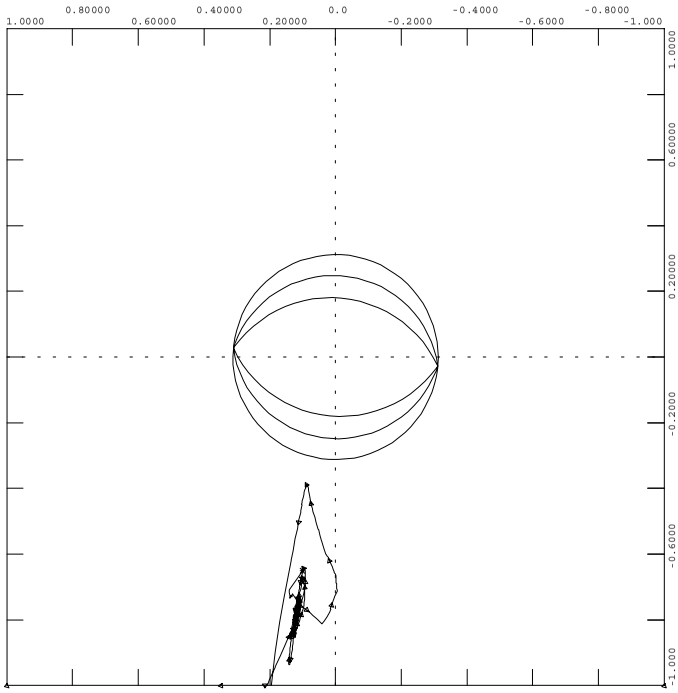
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

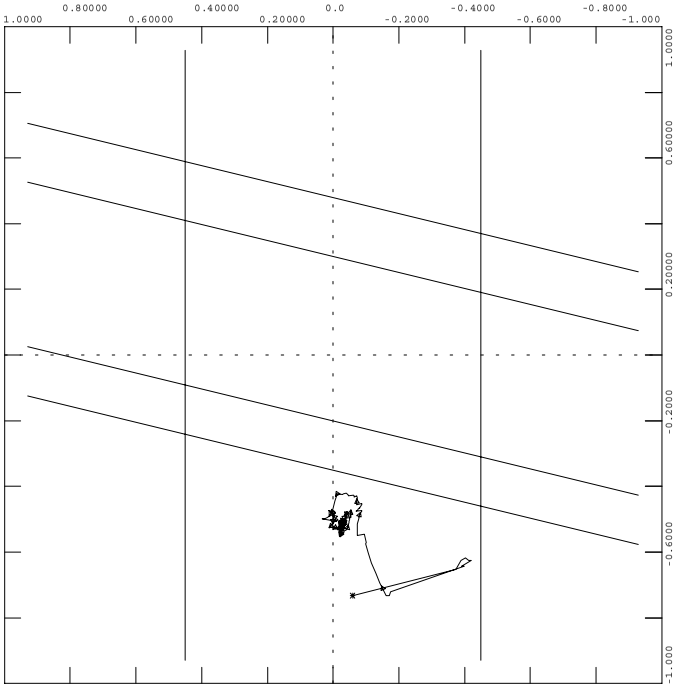
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE, THREE PHASE FAULT AT CHISAGO COUNTY
TRIP CHISAGO TO FORBES CROSS TRIP D602F

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-nbz.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



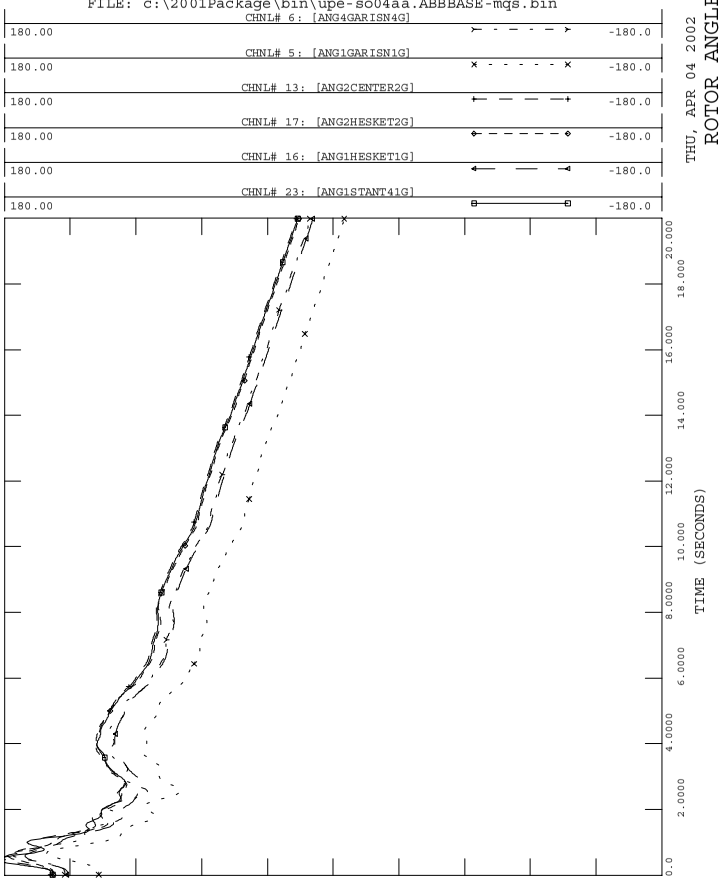
THU, APR 04 2002 13:03
MP-OH I.FALLS (779)

CONTINGENCY MQS

Single line to ground fault with breaker fail at Sherco with 8N28 stuck. Trip Sherco generator 3.

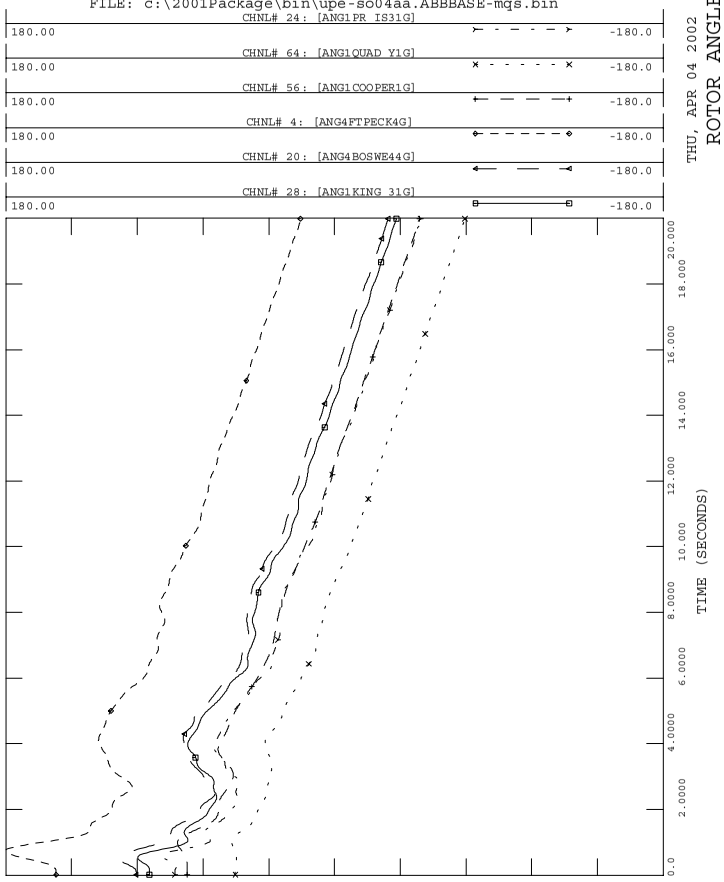
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

THU, APR 04 2002 13:19
ROTOR ANGLES 2



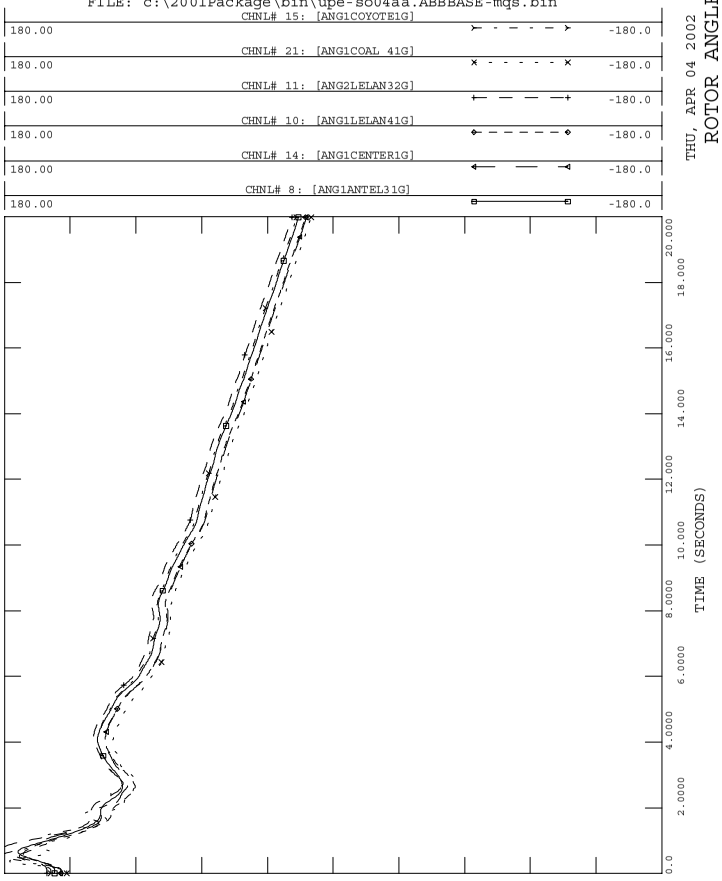
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

THU, APR 04 2002 13:19
ROTOR ANGLES 4



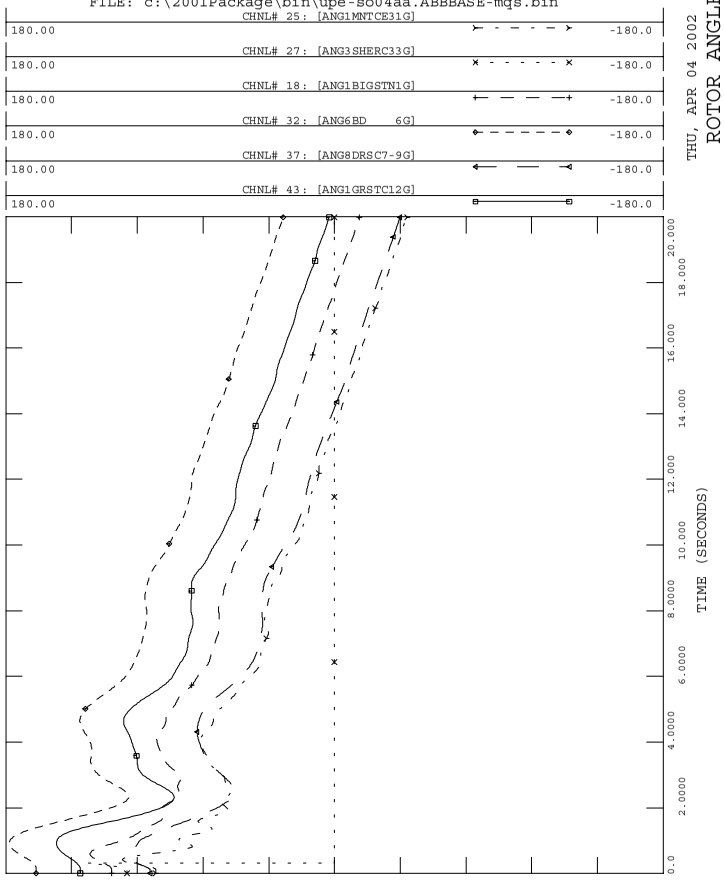
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

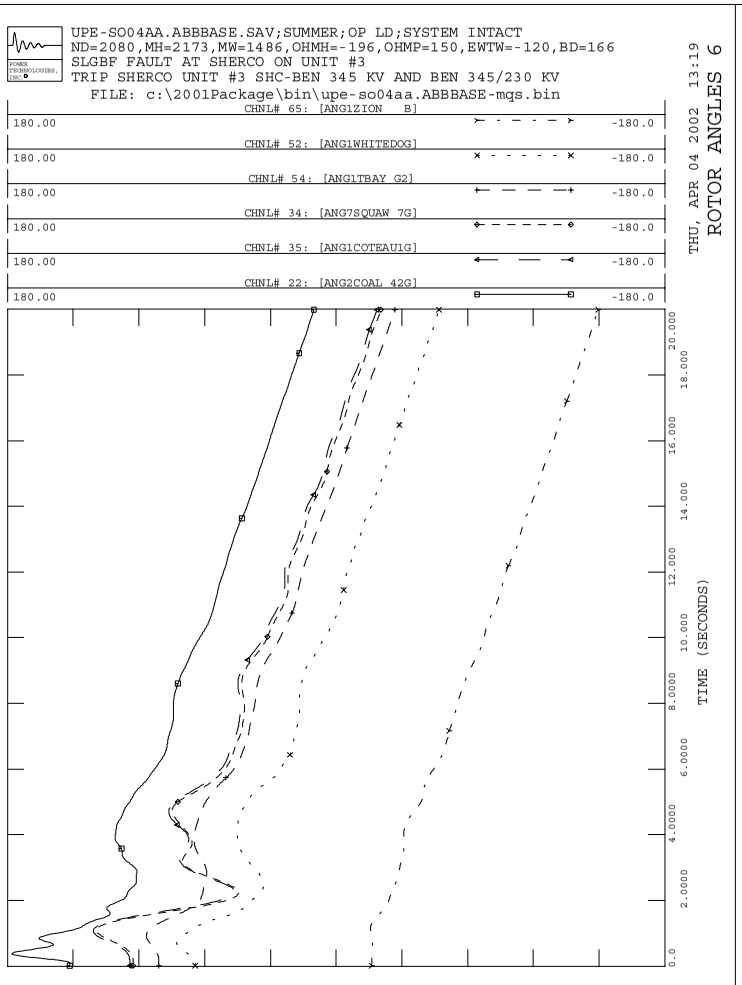
THU, APR 04 2002 13:19
ROTOR ANGLES 1

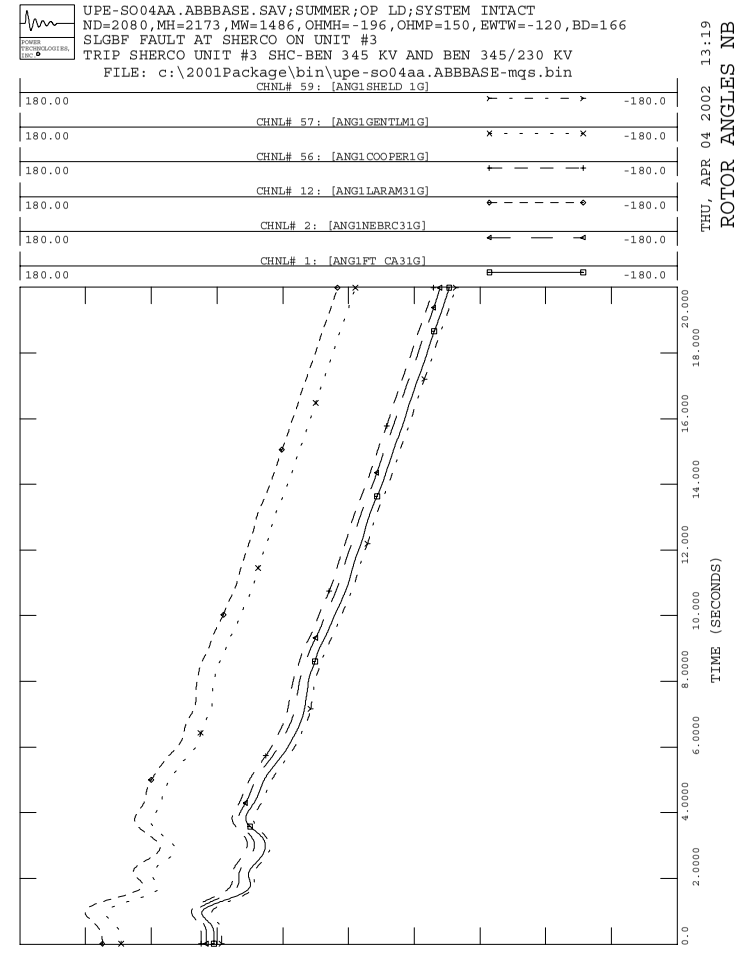


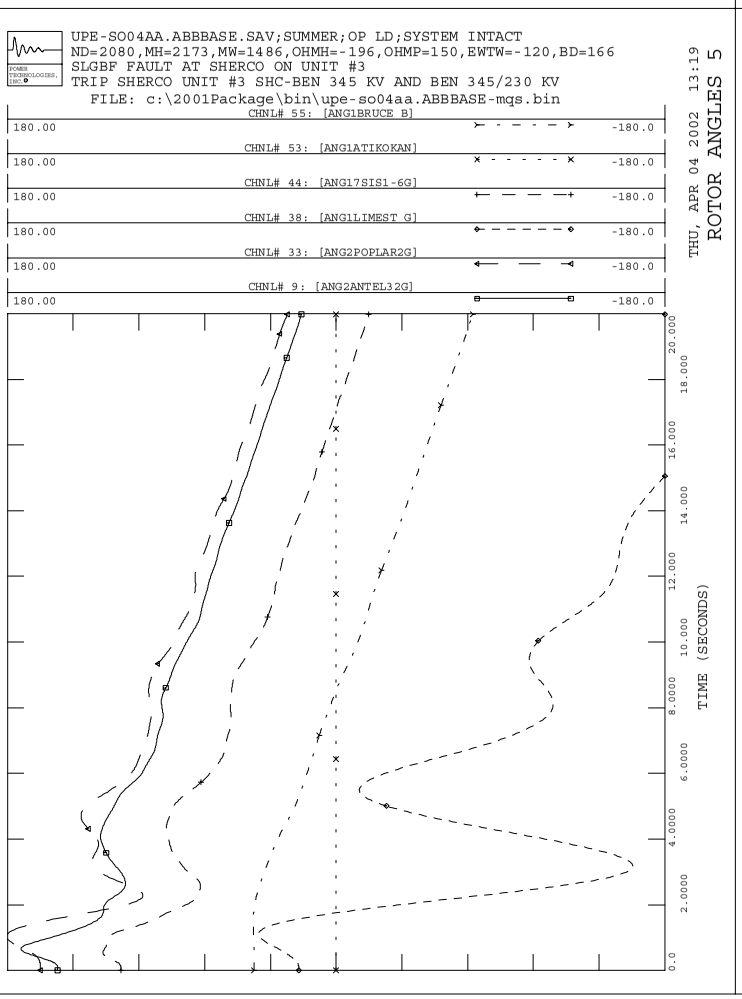
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

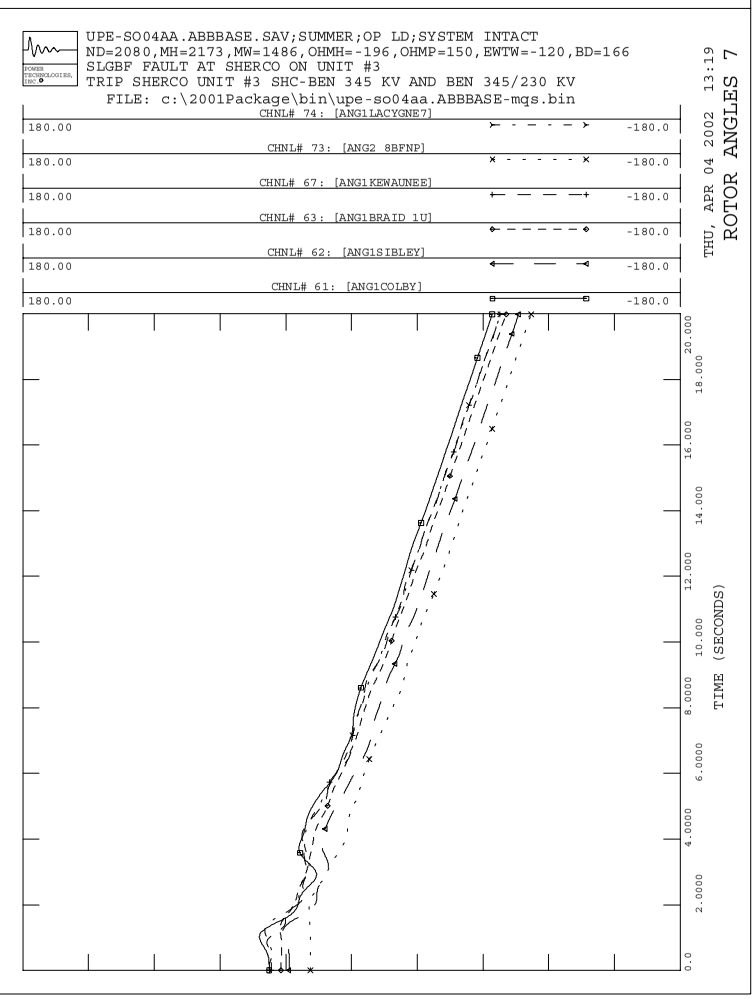
THU, APR 04 2002 13:19
ROTOR ANGLES 3



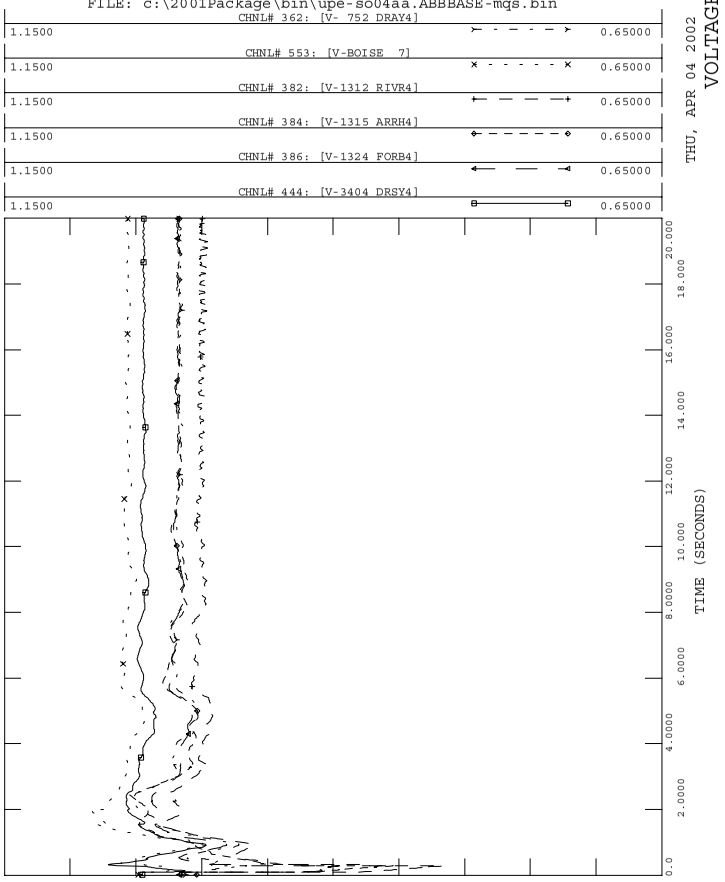

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:19
ROTOR ANGLES 6


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:19
ROTOR ANGLES NB


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:19
ROTOR ANGLES 5

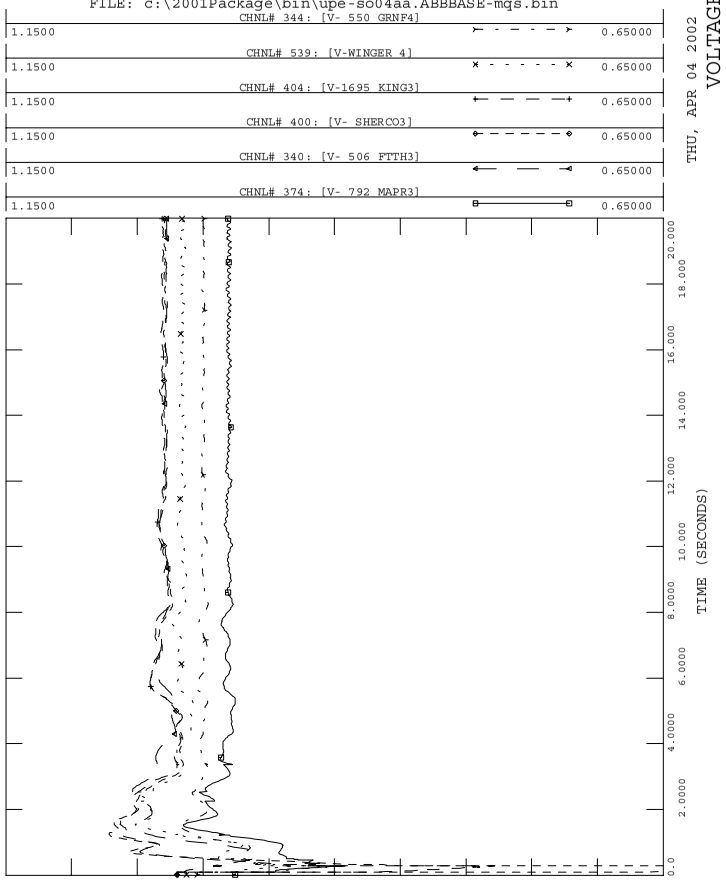

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:19
ROTOR ANGLES 7

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin



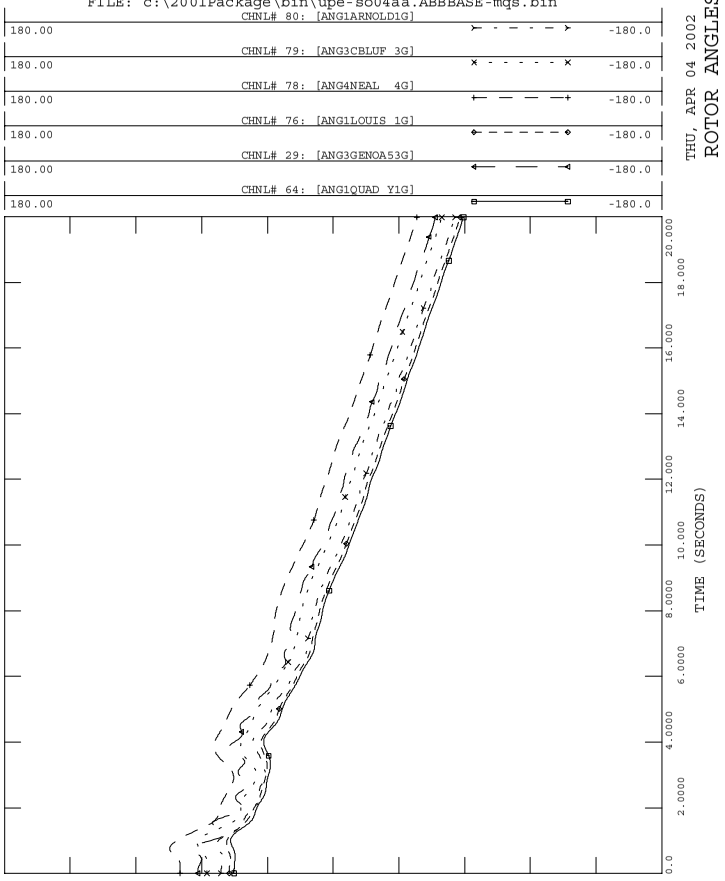
THU, APR 04 2002 13:19
VOLTAGES 1

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin



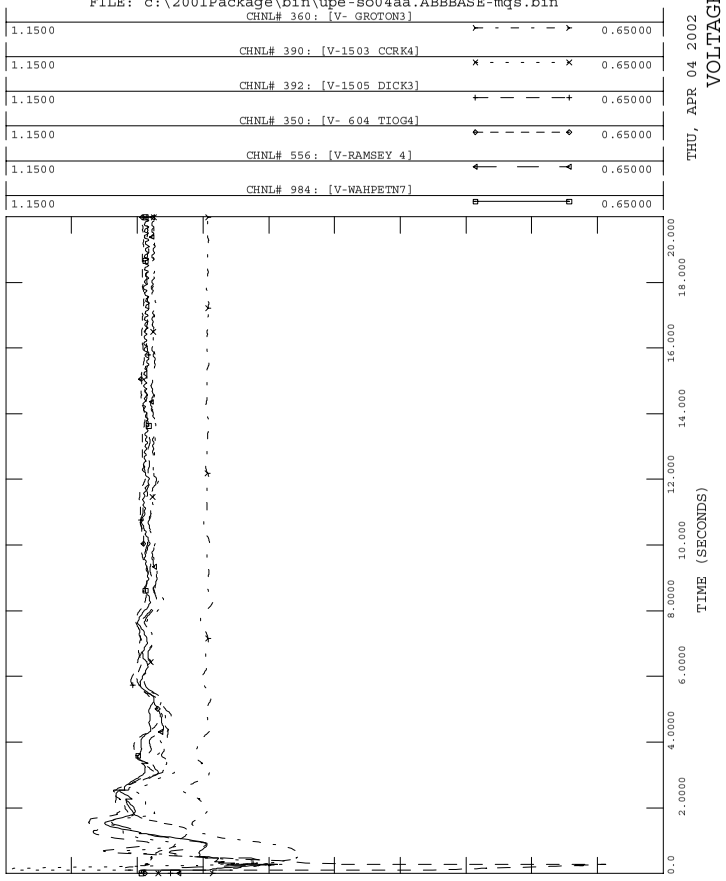
THU, APR 04 2002 13:19
VOLTAGES 3

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin



THU, APR 04 2002 13:19
ROTOR ANGLES IA

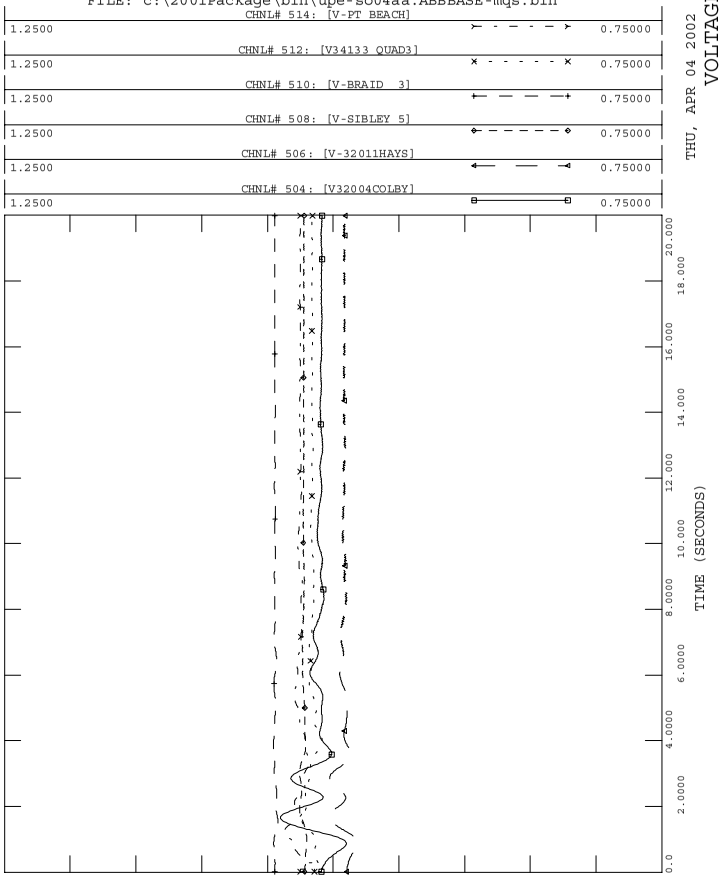
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin



THU, APR 04 2002 13:19
VOLTAGES 2

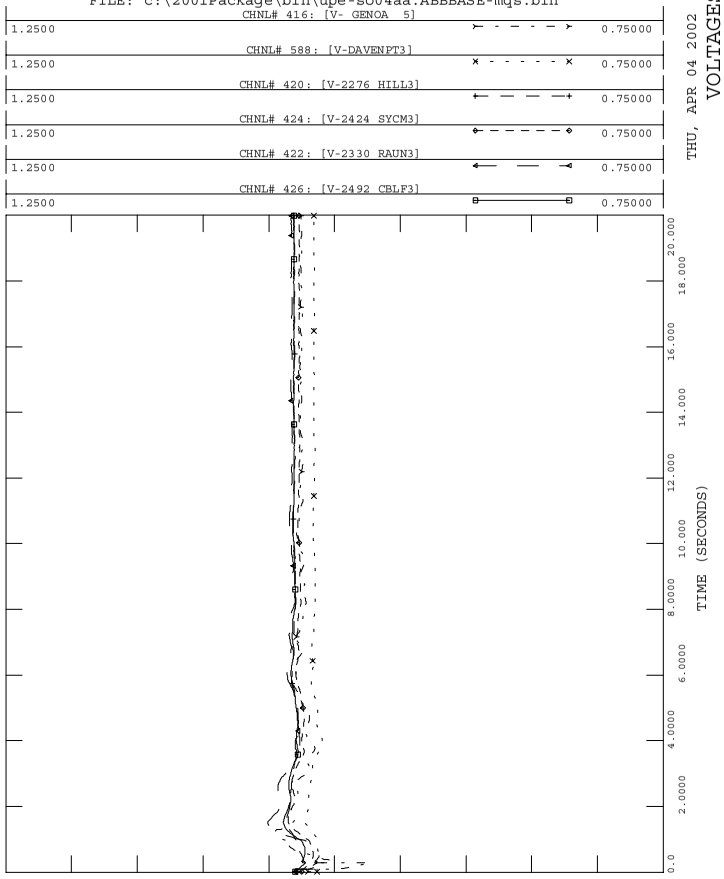
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

THU, APR 04 2002 13:19
VOLTAGES 5



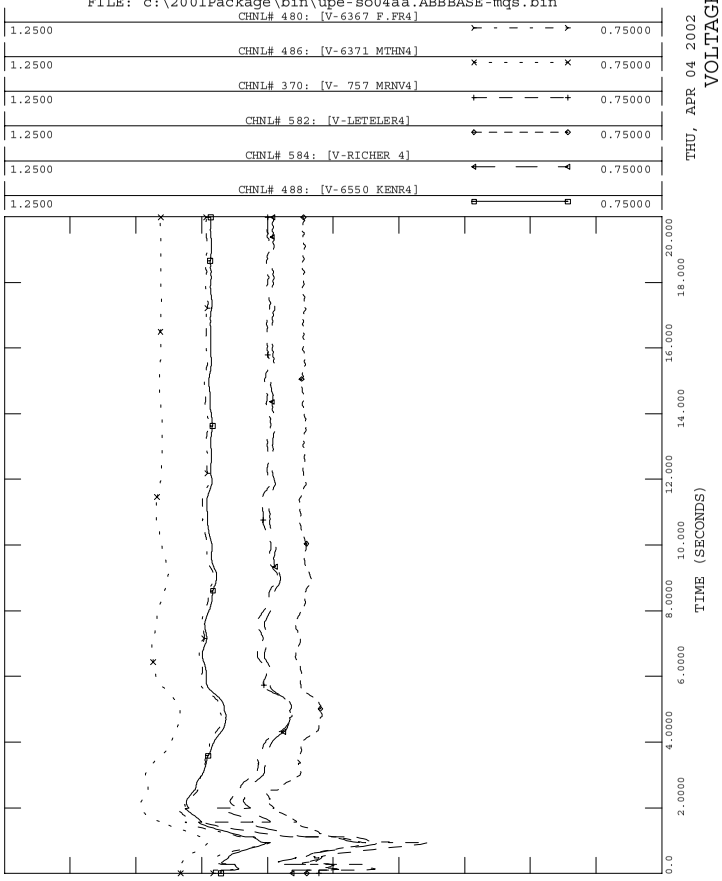
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

THU, APR 04 2002 13:19
VOLTAGES IA



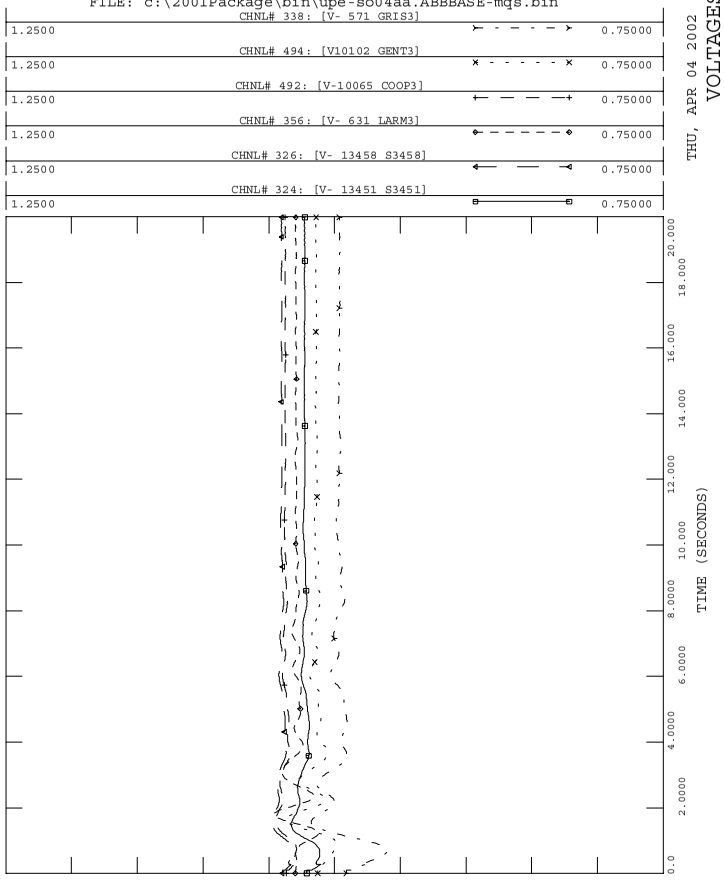
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

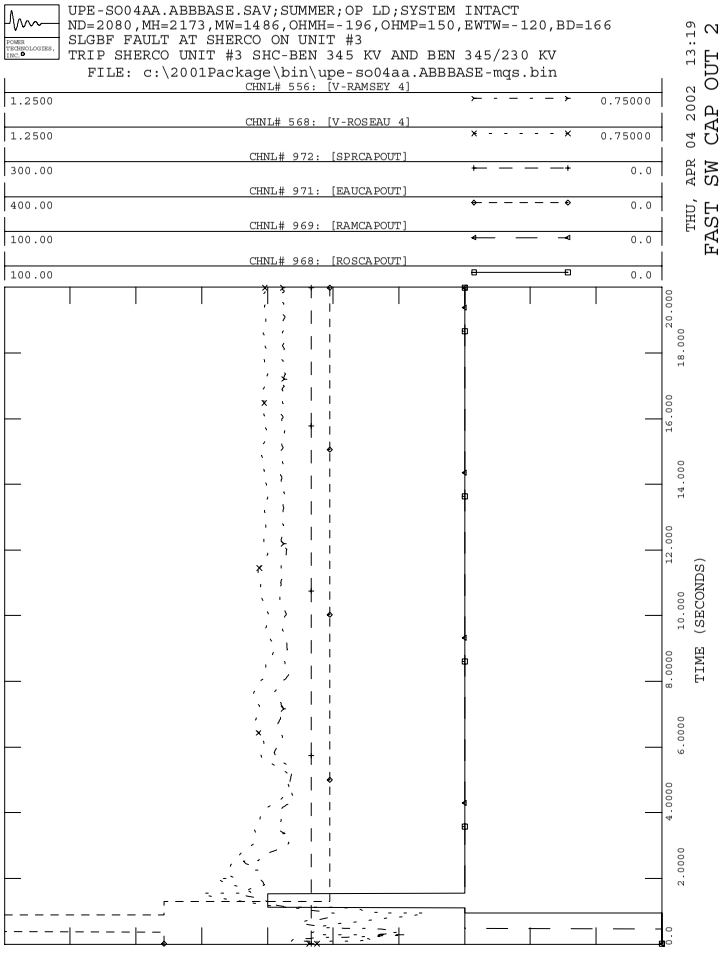
THU, APR 04 2002 13:19
VOLTAGES 4

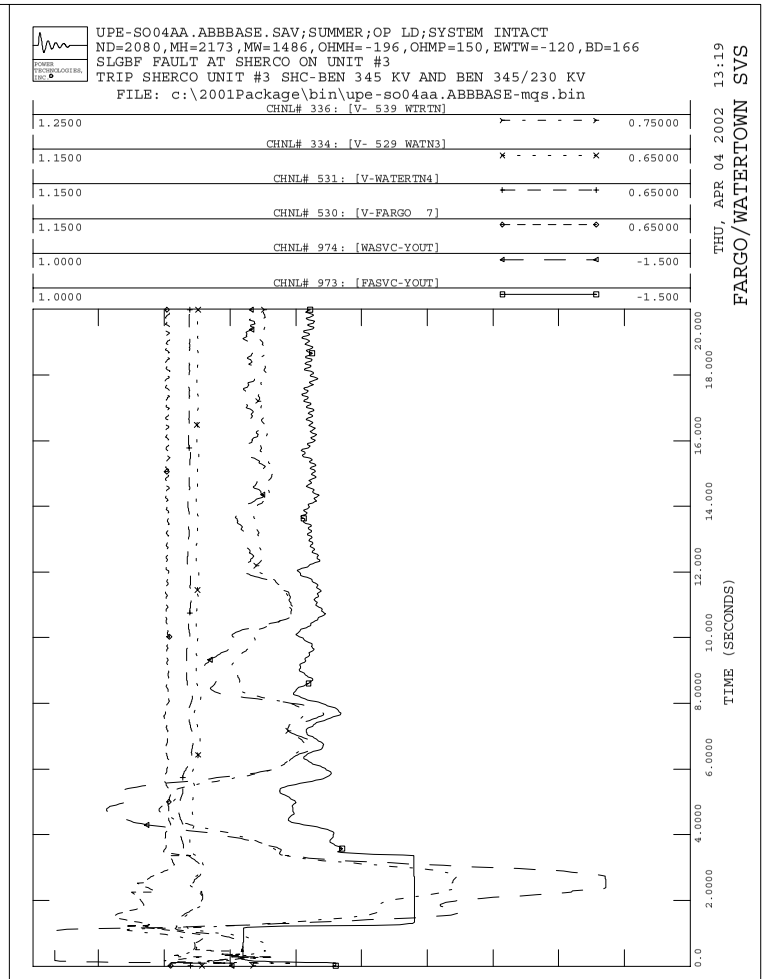


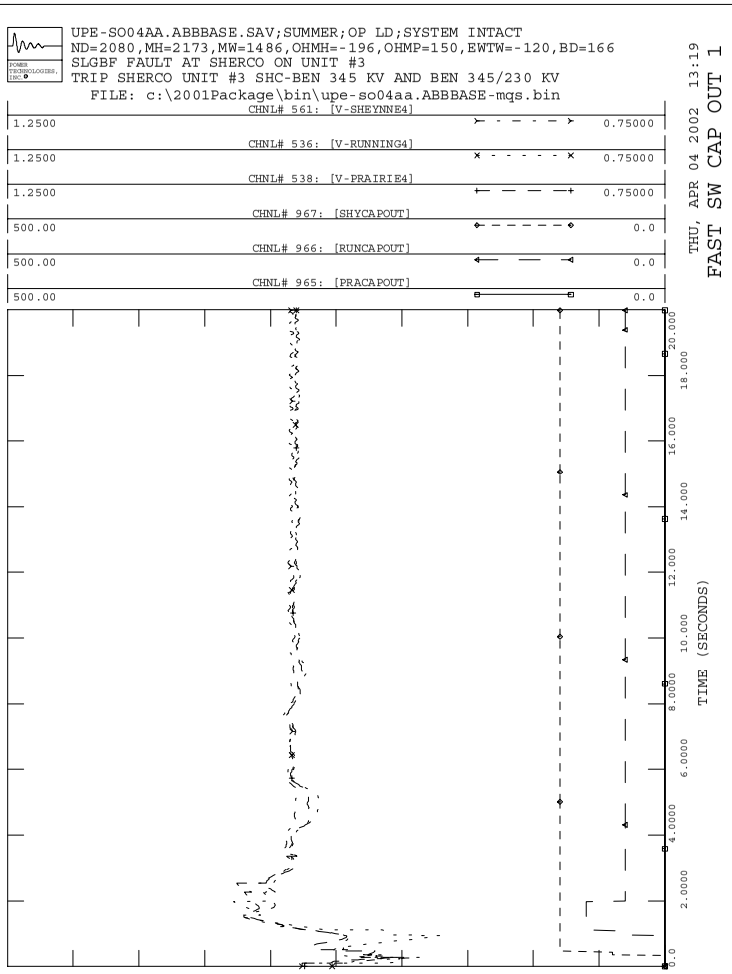
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

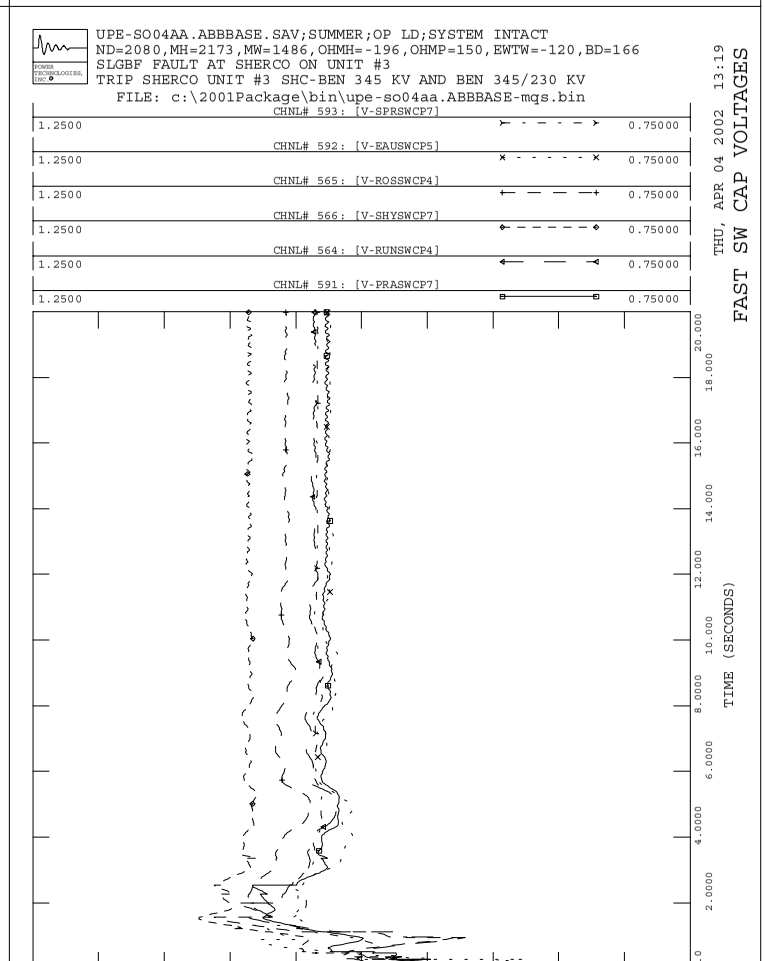
THU, APR 04 2002 13:19
VOLTAGES NB

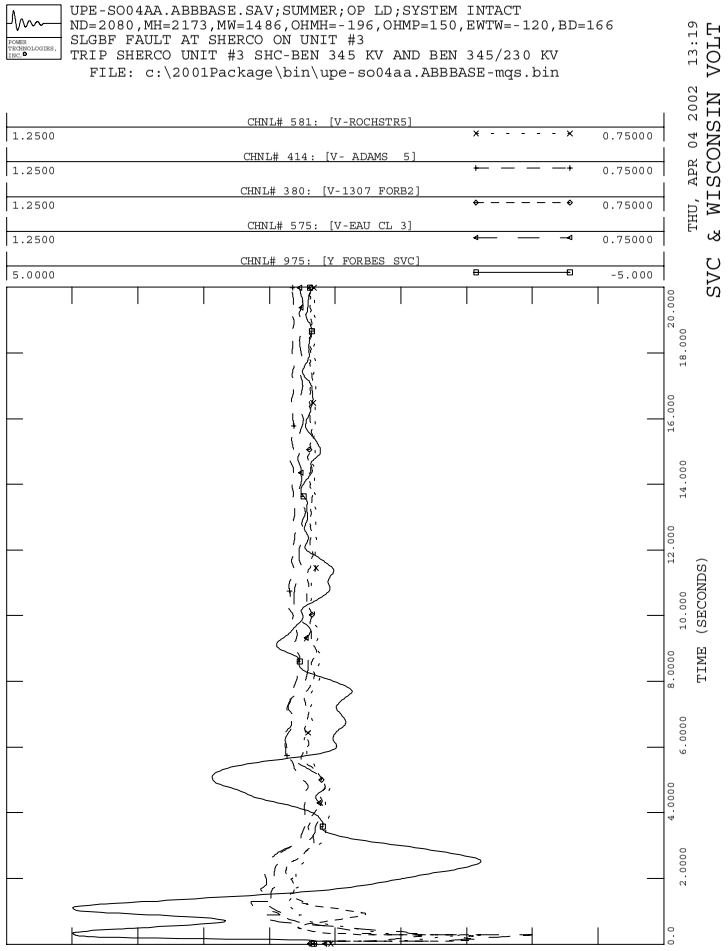


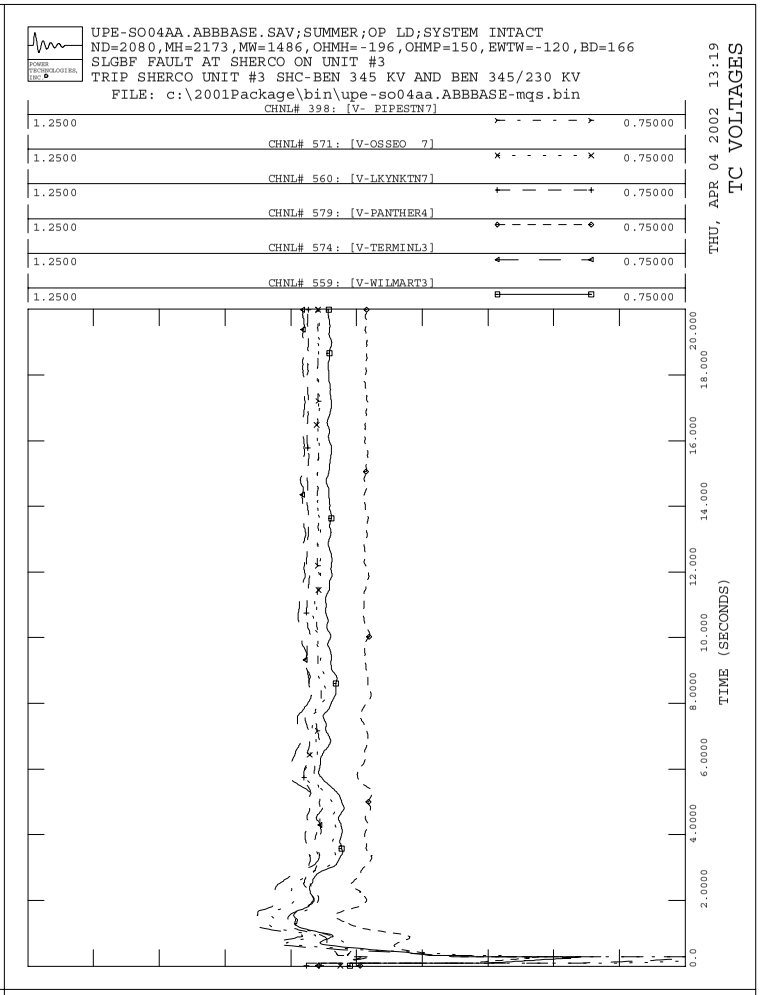

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
THU, APR 04 2002 13:19
FAST SW CAP OUT 2
TIME (SECONDS)

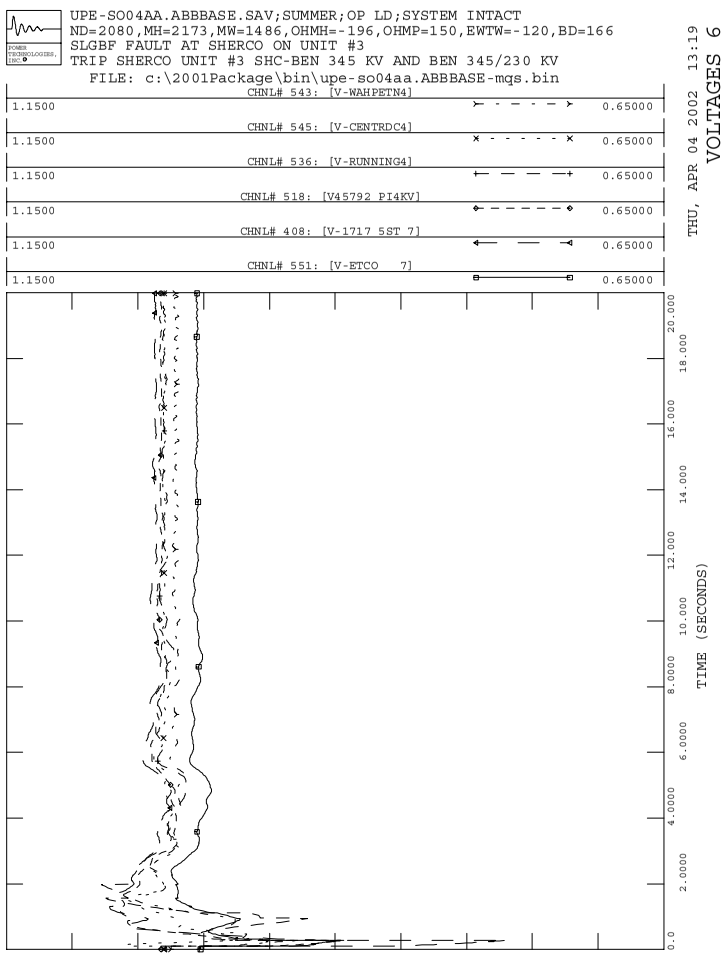

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
THU, APR 04 2002 13:19
FARGO/WATERTOWN SVS
TIME (SECONDS)

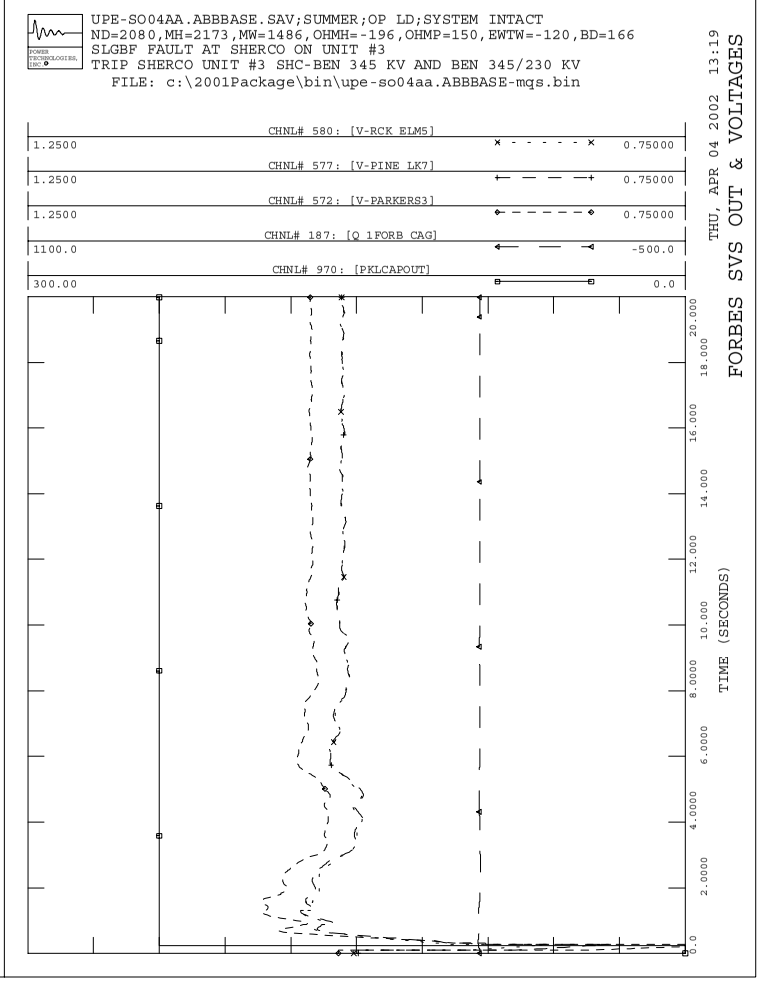

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
THU, APR 04 2002 13:19
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
THU, APR 04 2002 13:19
FAST SW CAP VOLTAGES
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 581: [V-ROCHSTR5]
CHNL# 414: [V- ADAMS 5]
CHNL# 380: [V-1307 FORB2]
CHNL# 575: [V-EAU CL 3]
CHNL# 975: [Y FORBES SVC]
THU, APR 04 2002 13:19
SVC & WISCONSIN VOLT
TIME (SECONDS)

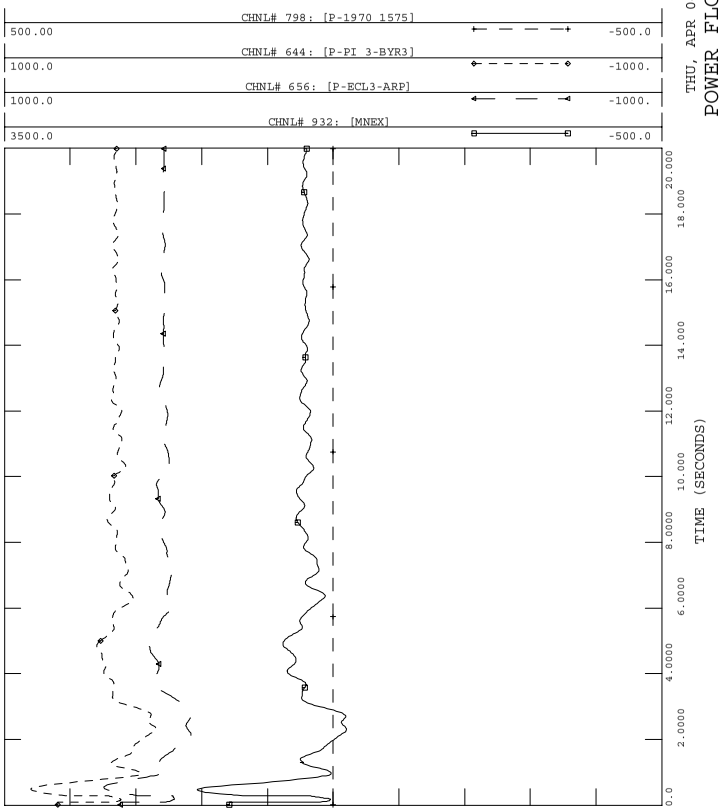

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 398: [V- PIPESTN7]
CHNL# 571: [V-OSSEO 7]
CHNL# 560: [V-LKYNKTN7]
CHNL# 579: [V-PANTHER4]
CHNL# 574: [V-TERMINL3]
CHNL# 559: [V-WILMART3]
THU, APR 04 2002 13:19
TC VOLTAGES
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 543: [V-WAHPETN4]
CHNL# 545: [V-CENTRDC4]
CHNL# 536: [V-RUNNING4]
CHNL# 518: [V45792 PI4KV]
CHNL# 408: [V-1717 5ST 7]
CHNL# 551: [V-ETCO 7]
THU, APR 04 2002 13:19
VOLTAGES 6
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 580: [V-RCK ELM5]
CHNL# 577: [V-PINE LK7]
CHNL# 572: [V-PARKERS3]
CHNL# 187: [Q 1FORB CAG]
CHNL# 970: [PKLCAPOUT]
THU, APR 04 2002 13:19
FORBES SVS OUT & VOLTAGES
TIME (SECONDS)

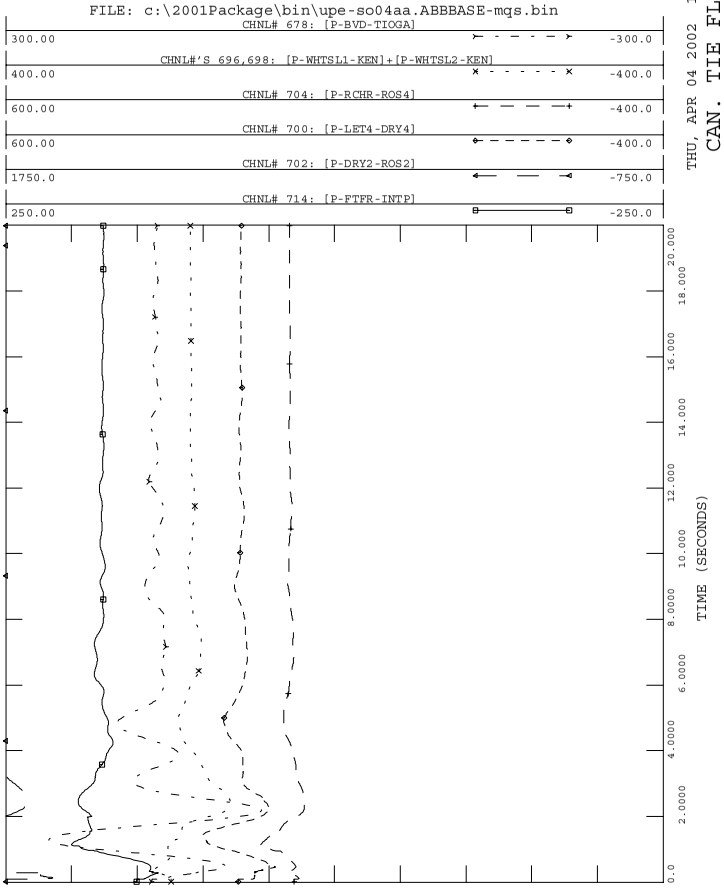
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

THU, APR 04 2002 13:19
POWER FLOW SUMS 2



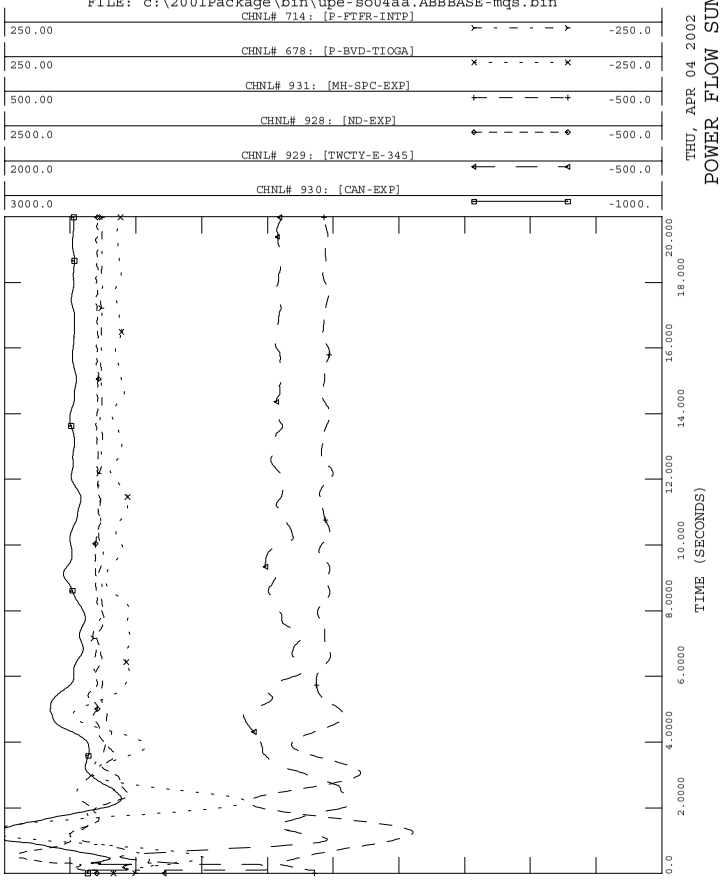
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

THU, APR 04 2002 13:19
CAN. TIE FLOWS



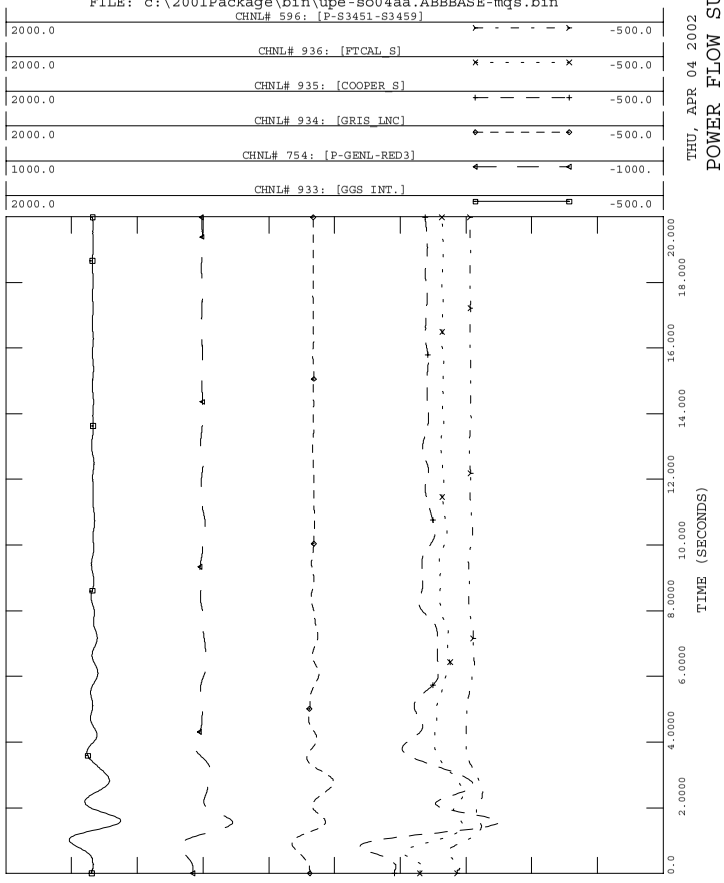
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

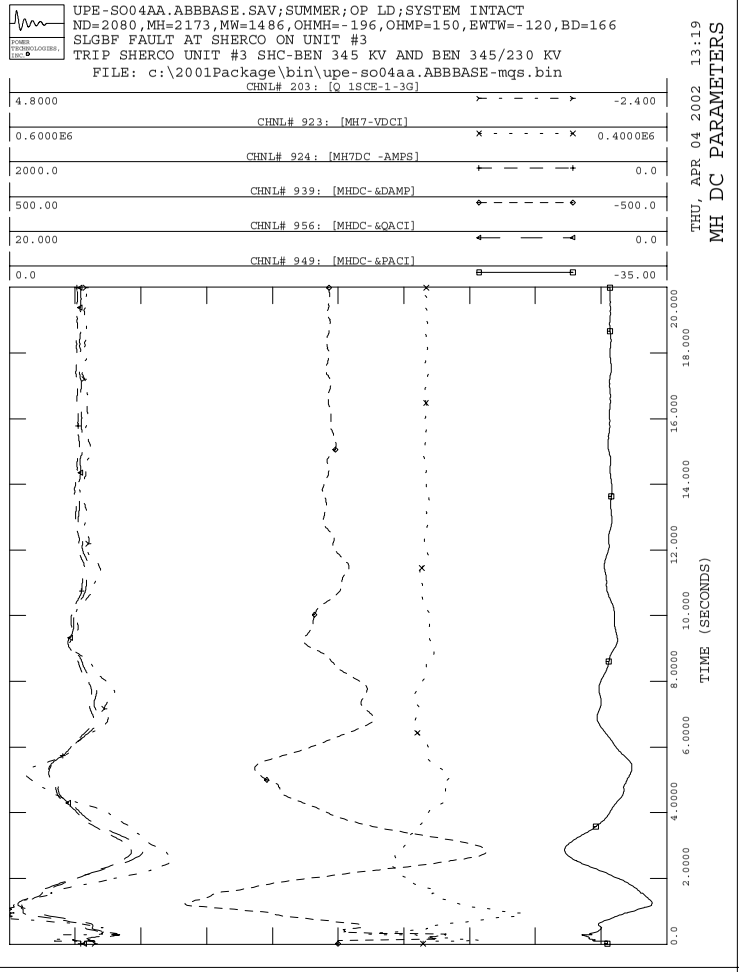
THU, APR 04 2002 13:19
POWER FLOW SUMS 1

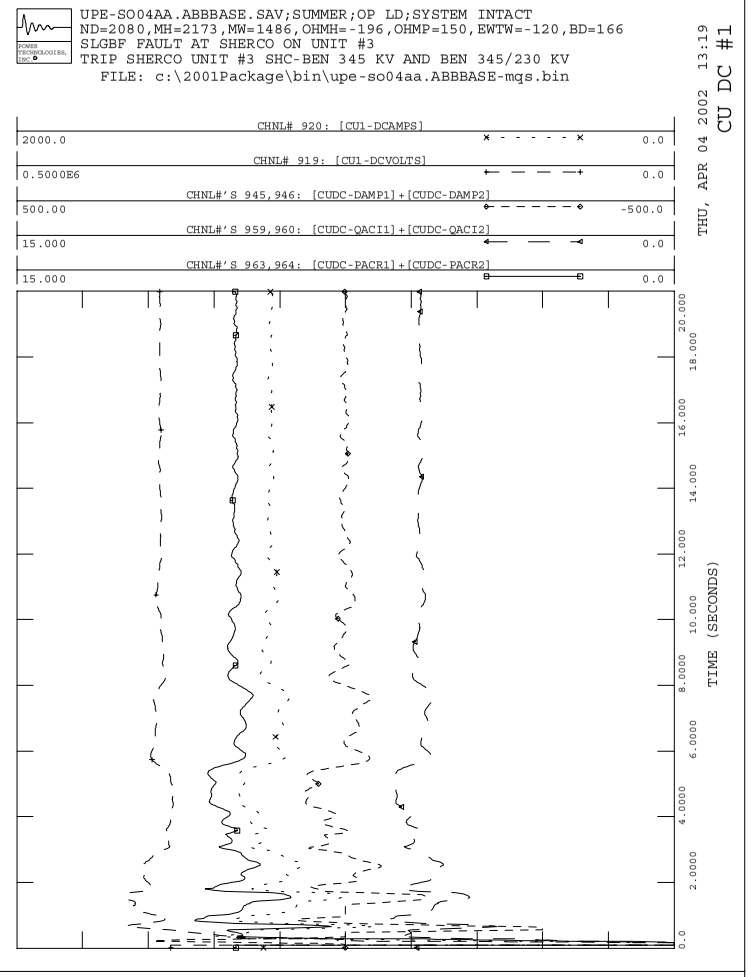


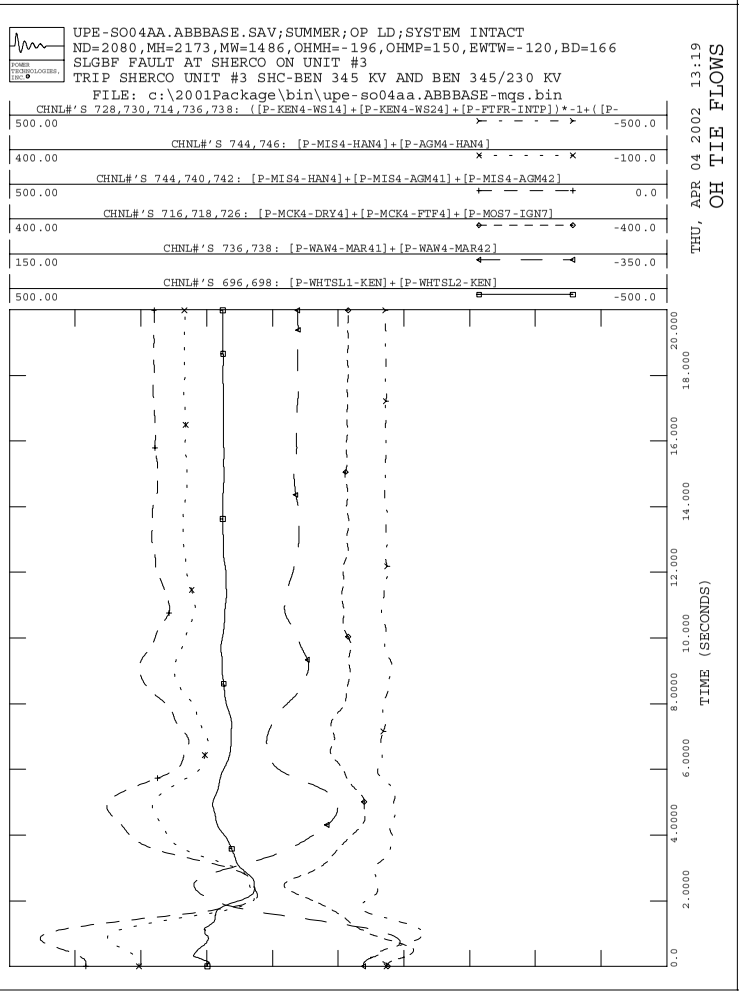
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

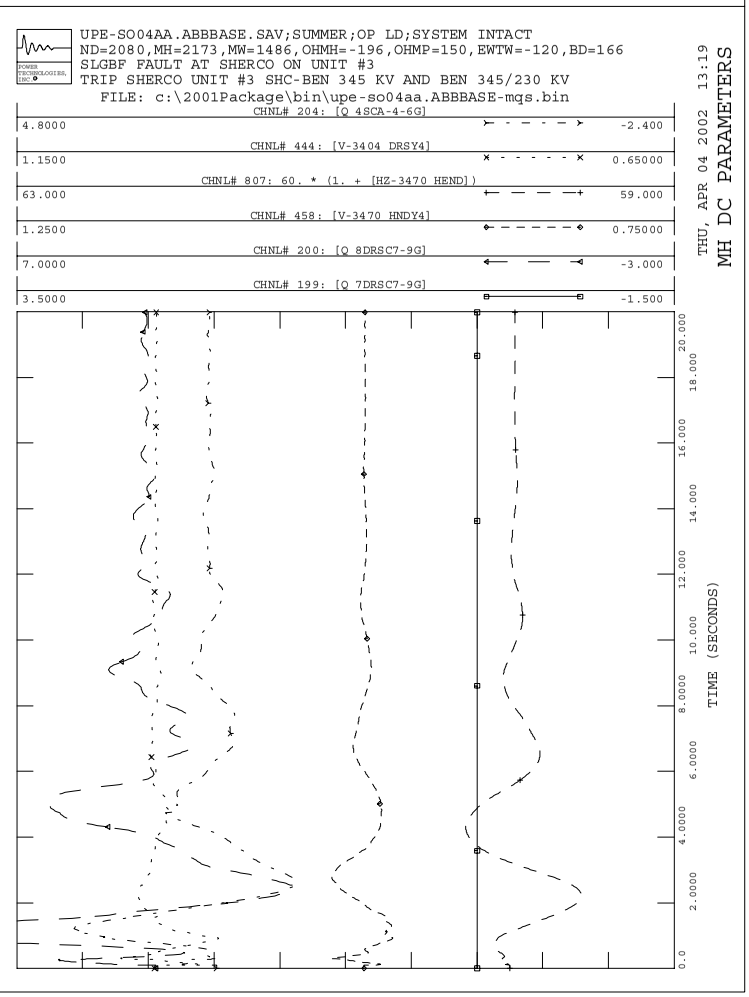
THU, APR 04 2002 13:19
POWER FLOW SUM 3



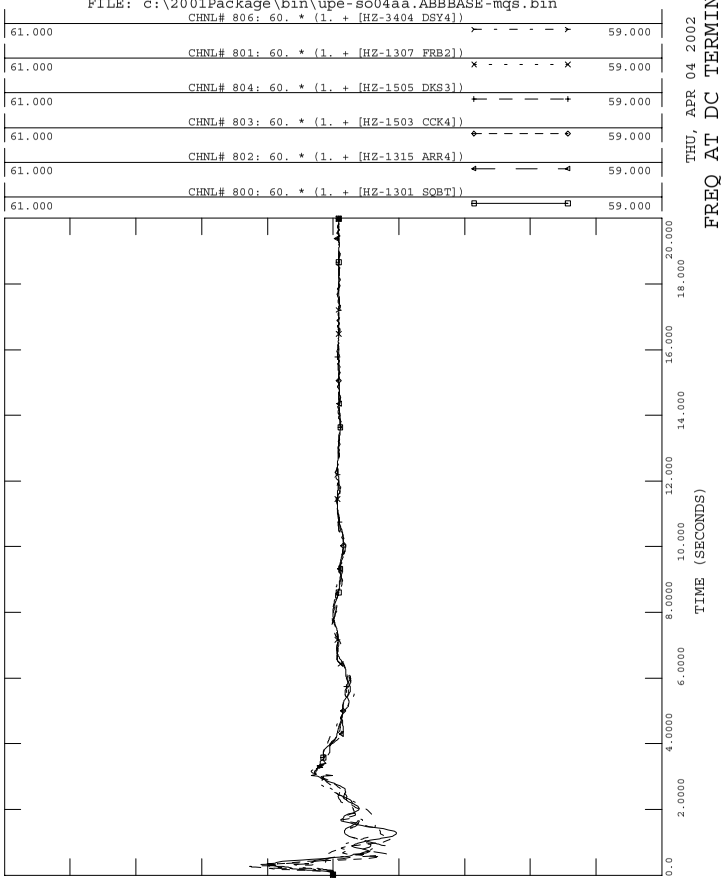

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
THU, APR 04 2002 13:19
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
THU, APR 04 2002 13:19
CU DC #1
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
THU, APR 04 2002 13:19
OH TIE FLOWS
TIME (SECONDS)

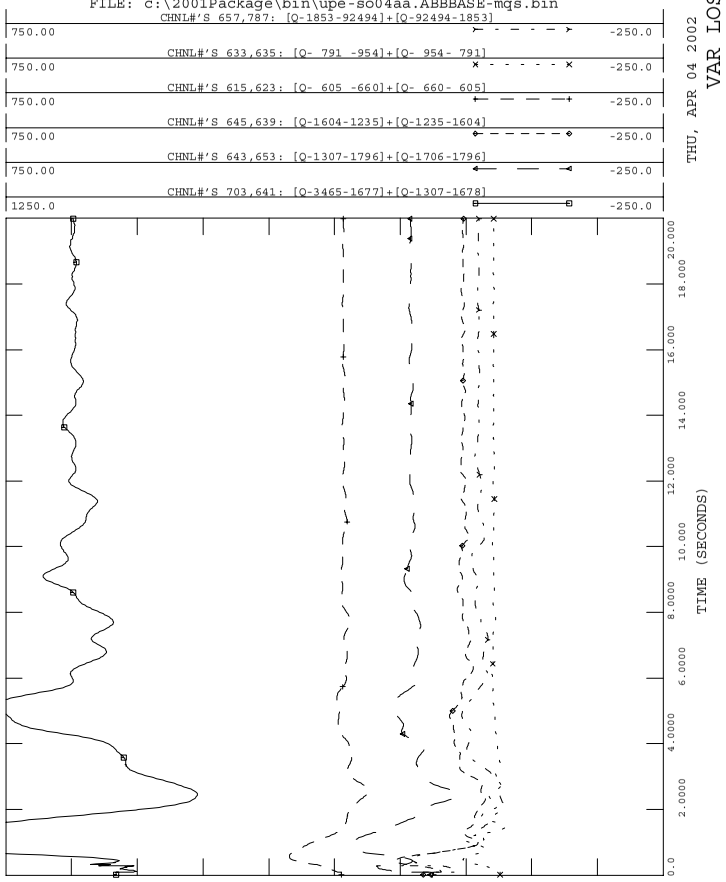

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
THU, APR 04 2002 13:19
MH DC PARAMETERS
TIME (SECONDS)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin



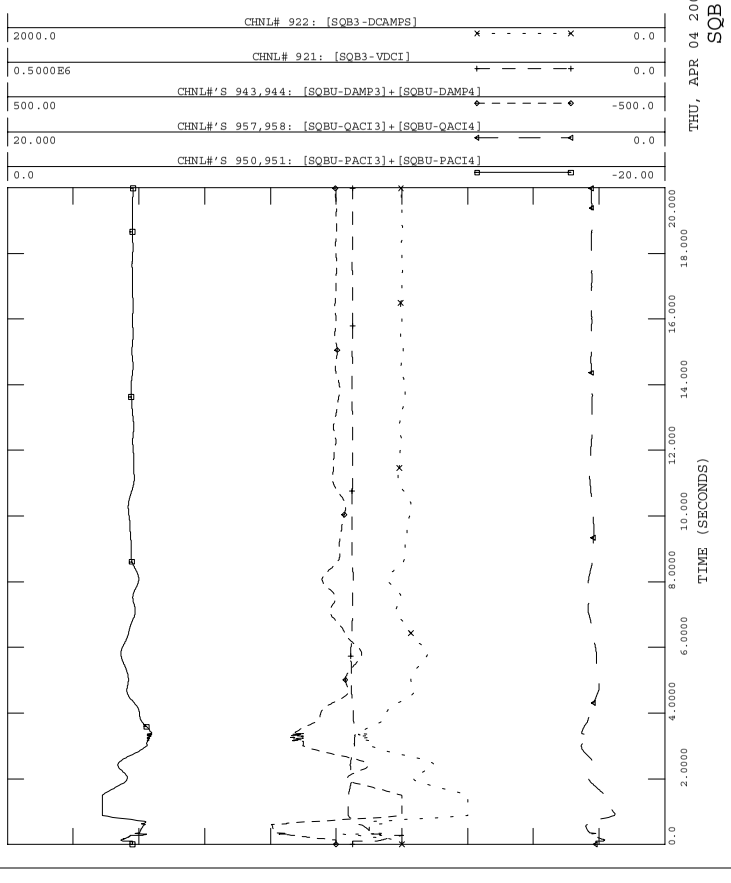
THU, APR 04 2002 13:19
FREQ AT DC TERMINALS

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin



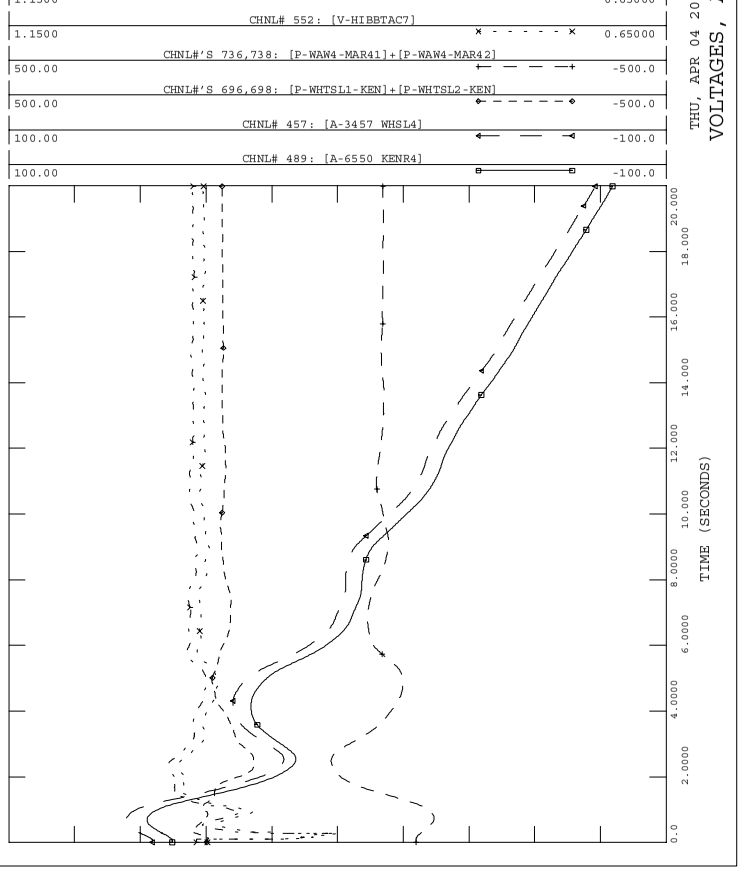
THU, APR 04 2002 13:19
VAR LOSSES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin



THU, APR 04 2002 13:19
SQB DC #3

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

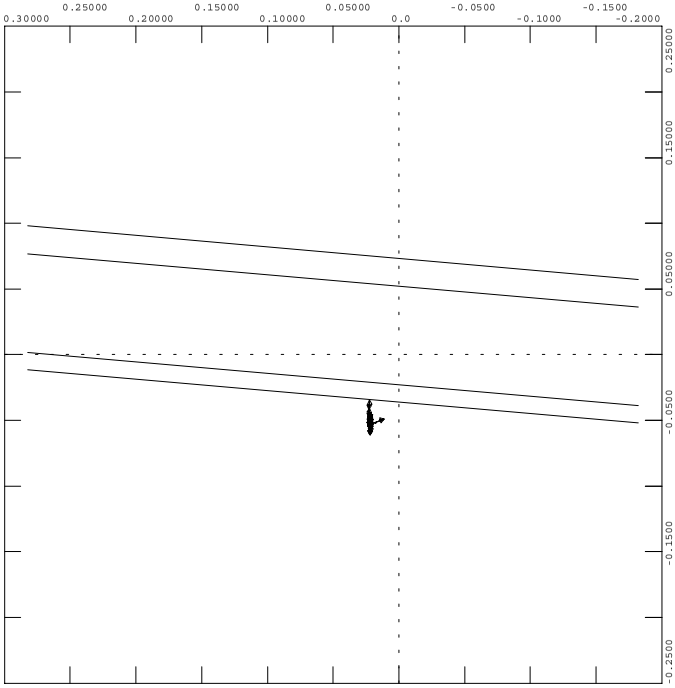


THU, APR 04 2002 13:19
VOLTAGES, ANGLES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, APR 04 2002 13:19
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

RELAY: RELAYG
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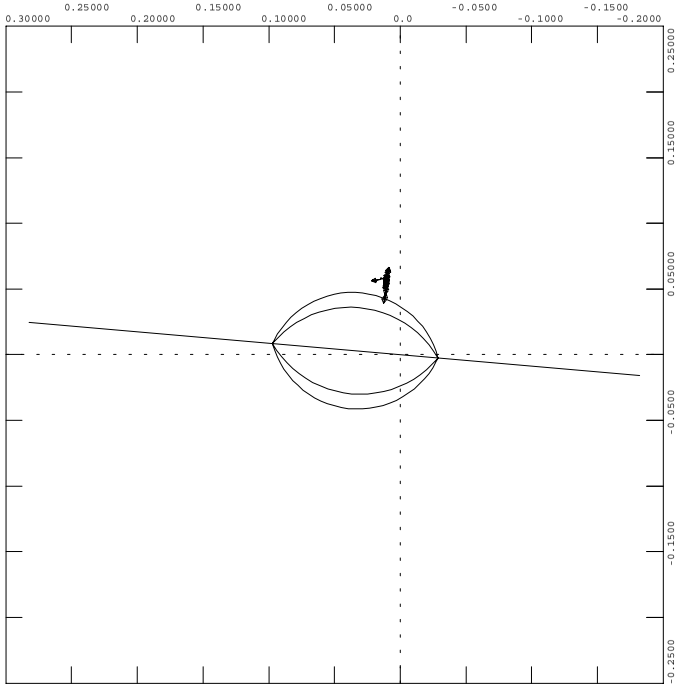
CHNL# 856: [X-DSY2-ROS2]

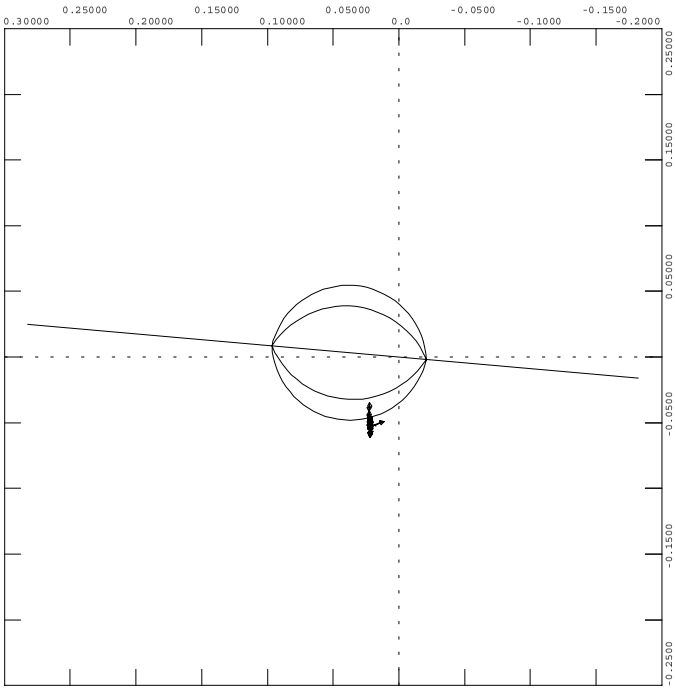


THU, APR 04 2002 13:19
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

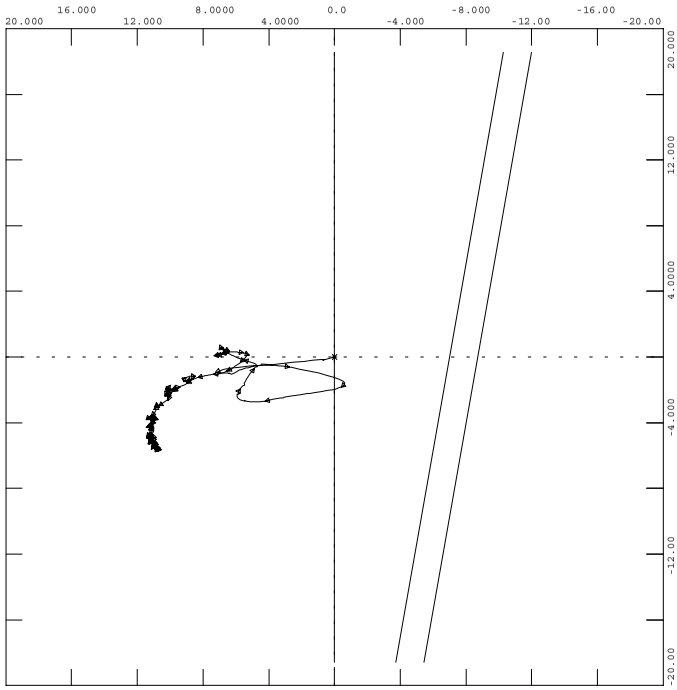


THU, APR 04 2002 13:19
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

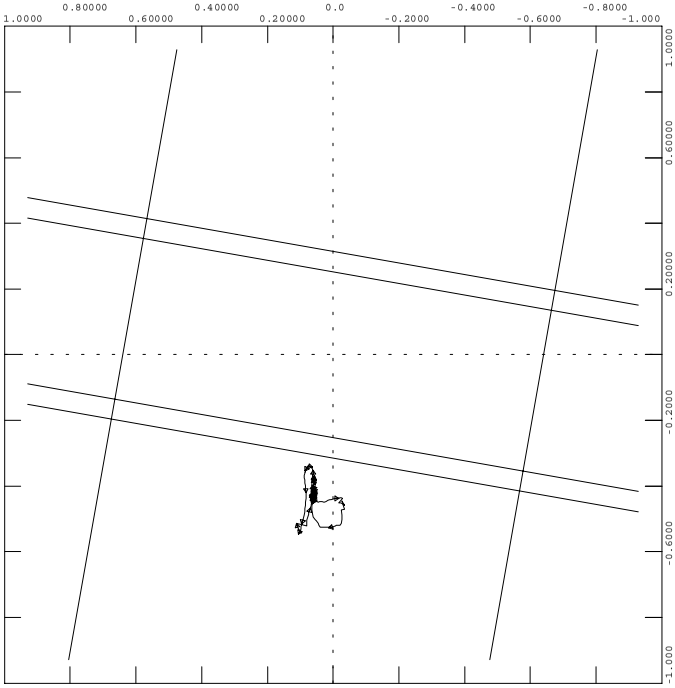


THU, APR 04 2002 13:19
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

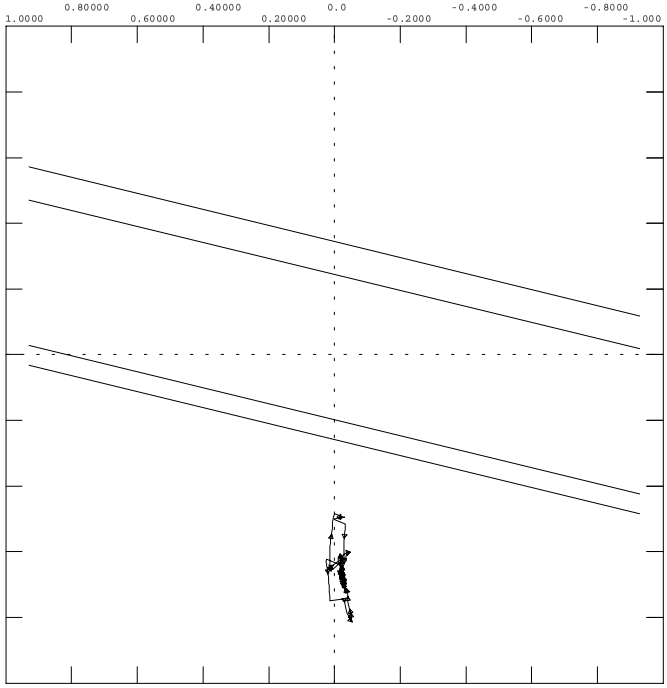
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

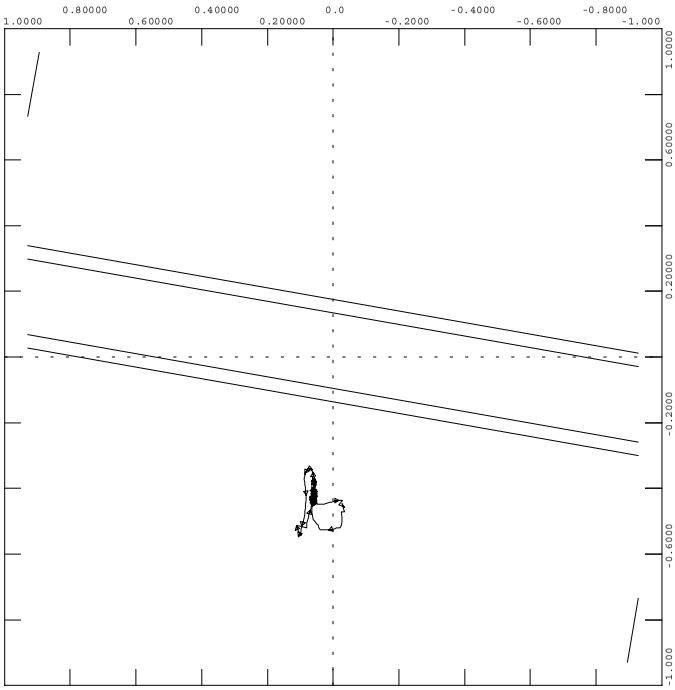
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

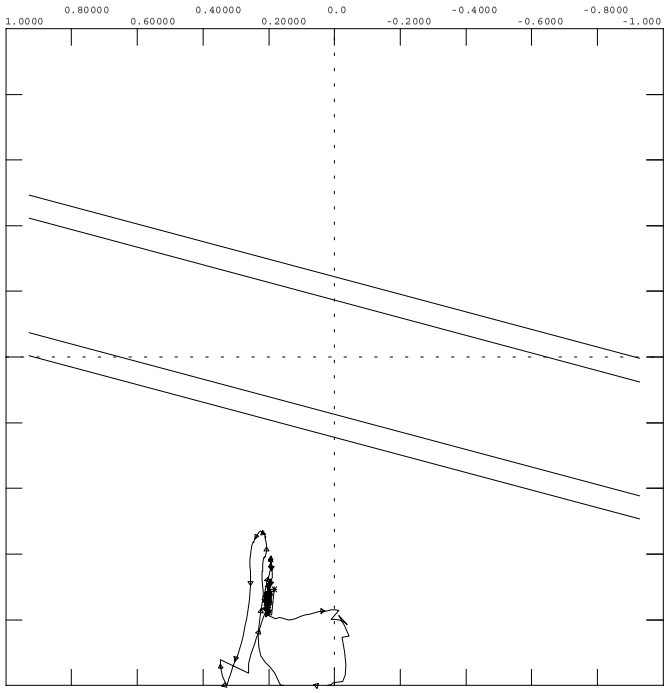
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

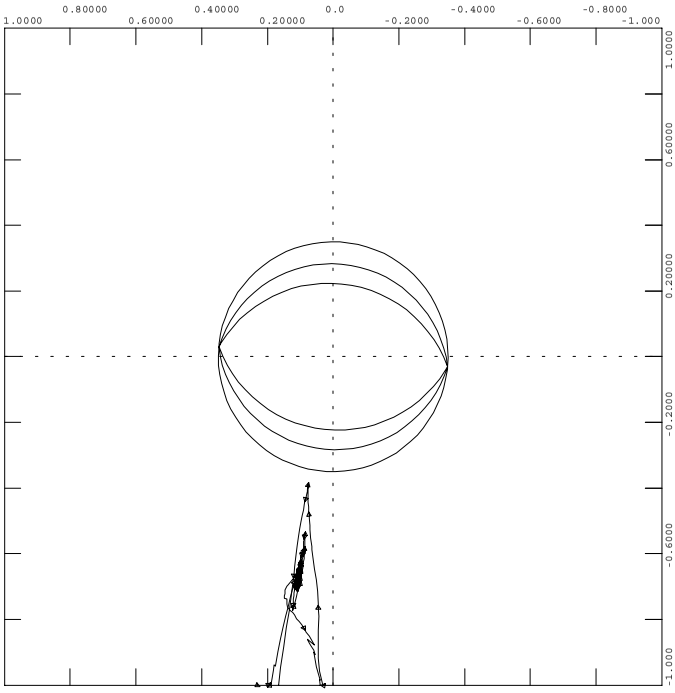
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

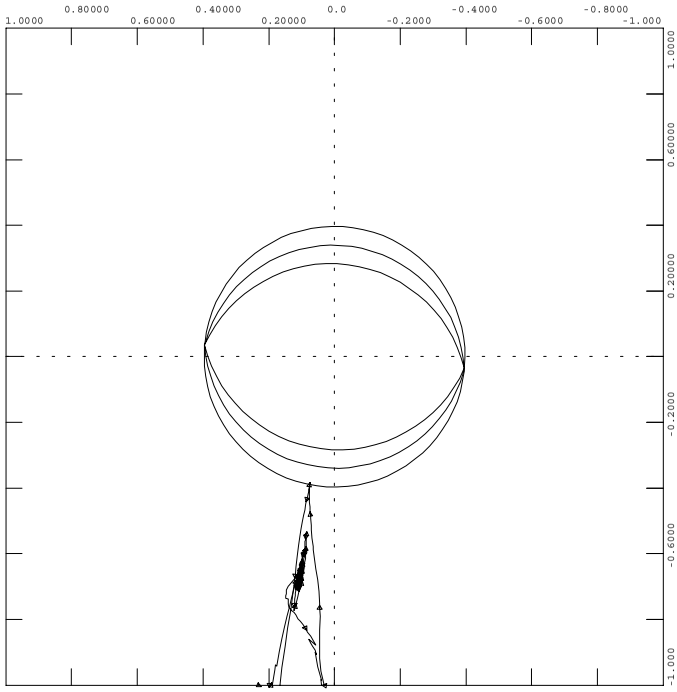
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

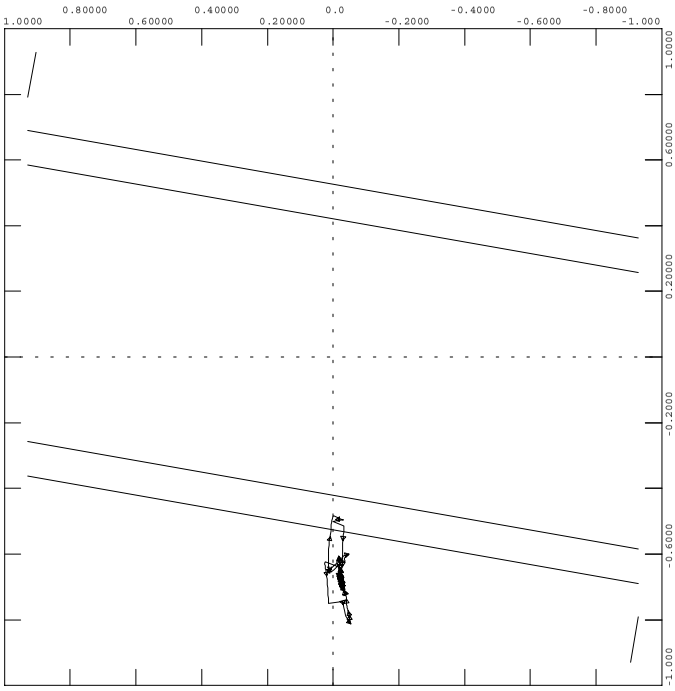
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

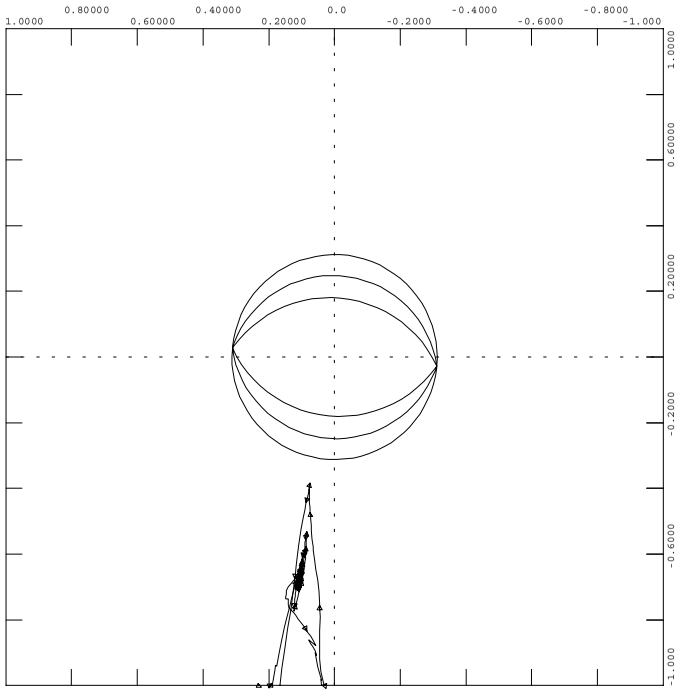
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

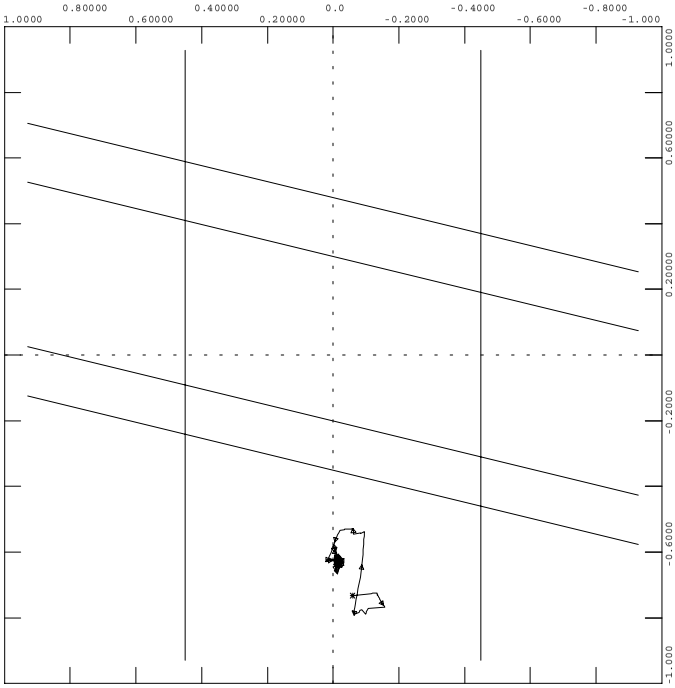
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-mqs.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



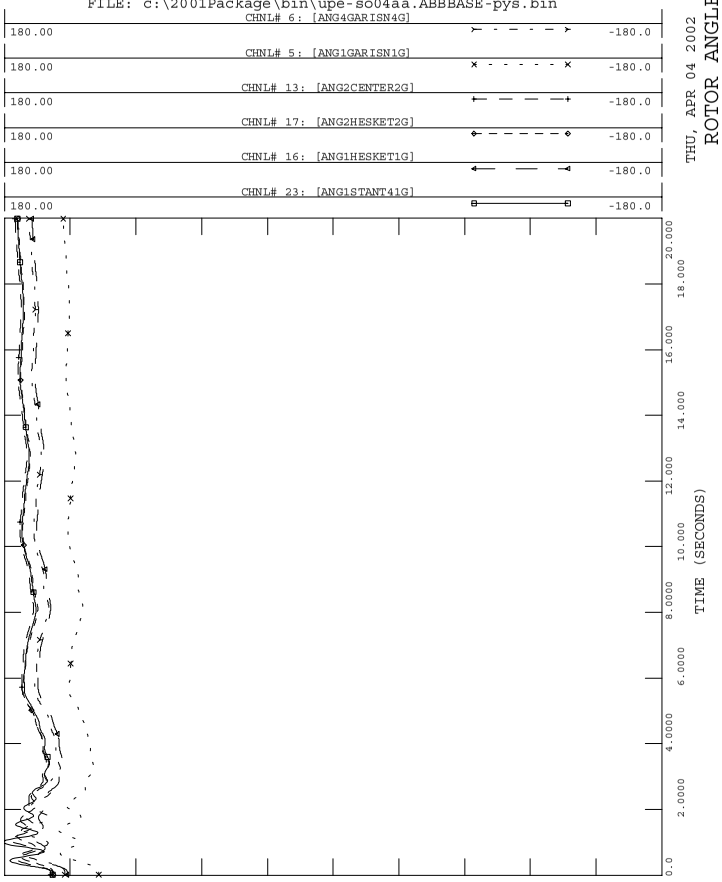
THU, APR 04 2002 13:19
MP-OH I.FALLS (779)
CHNL# 847: [R-1484 6011]

CONTINGENCY PYS

Single line to ground fault with breaker fail at Prairie Island with 8H9 stuck.

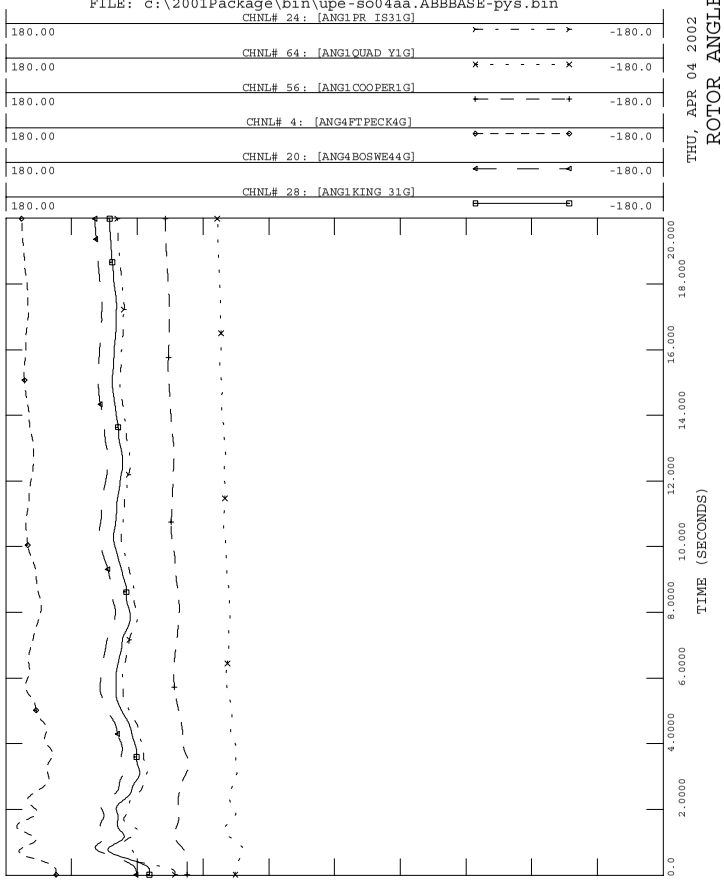
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
ROTOR ANGLES 2



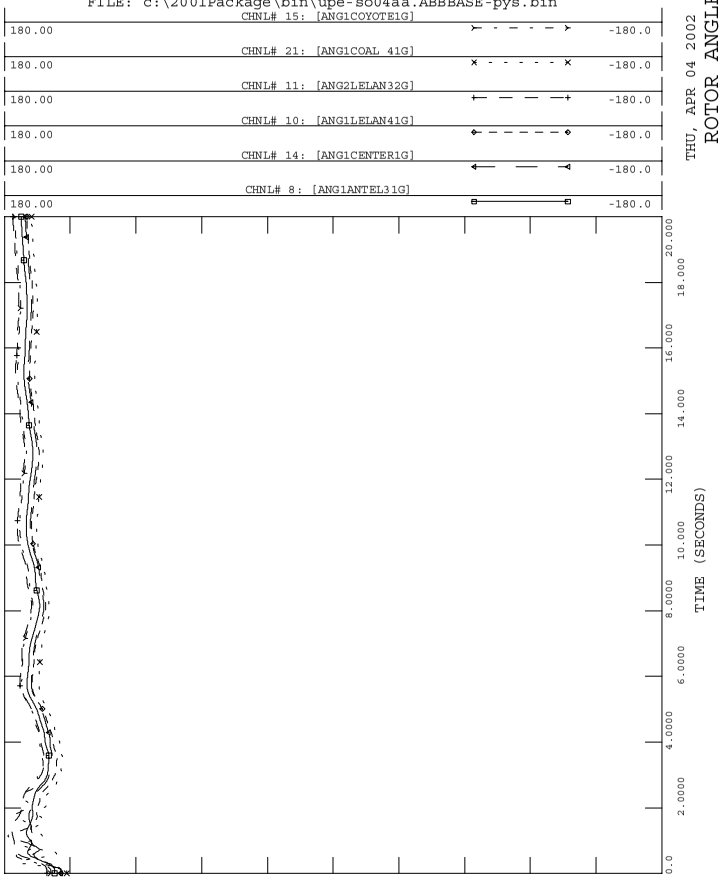
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
ROTOR ANGLES 4



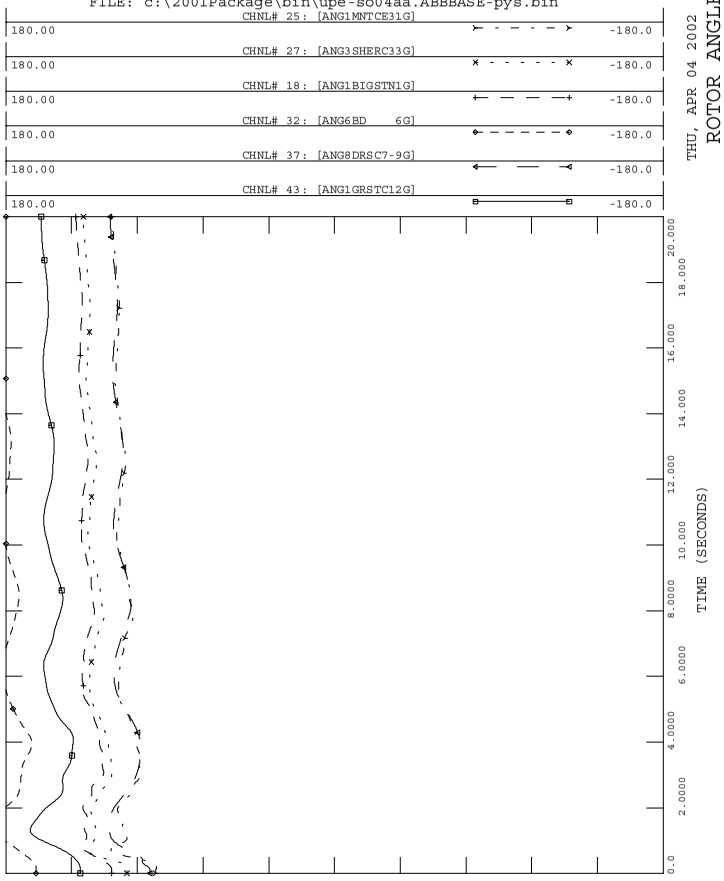
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
ROTOR ANGLES 1

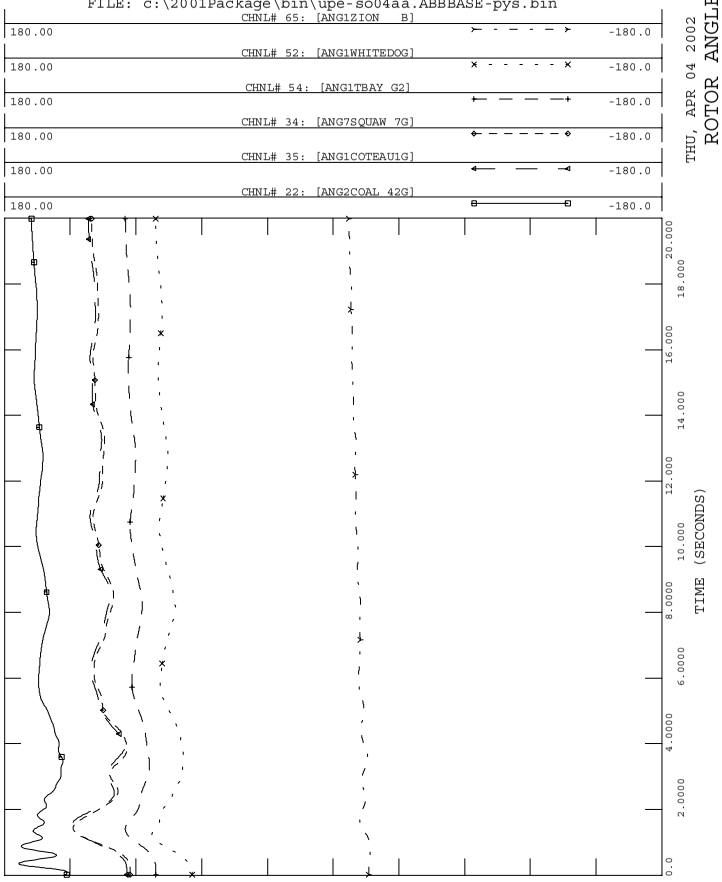


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
ROTOR ANGLES 3

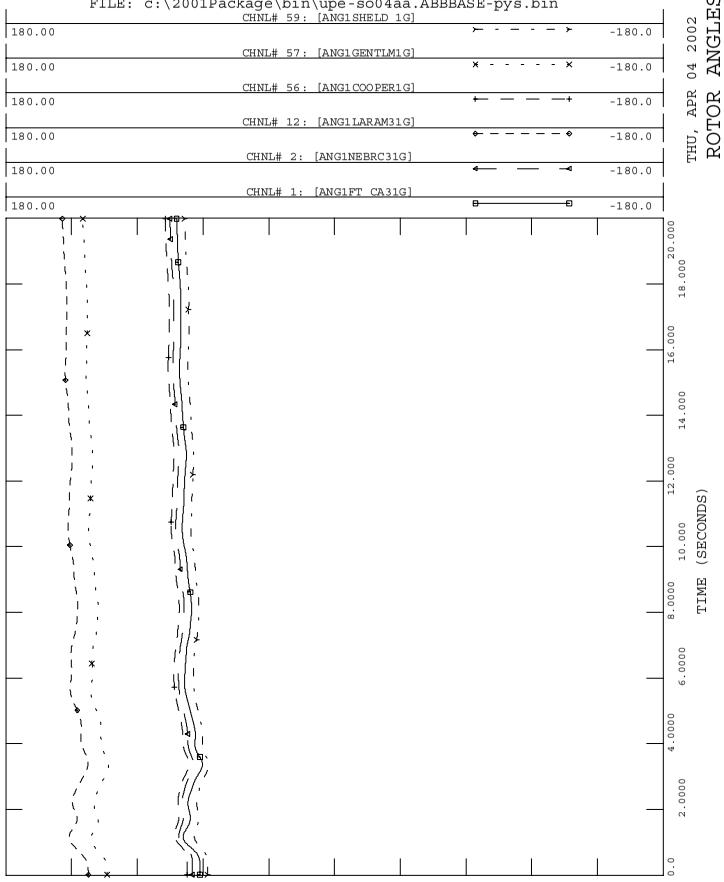


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



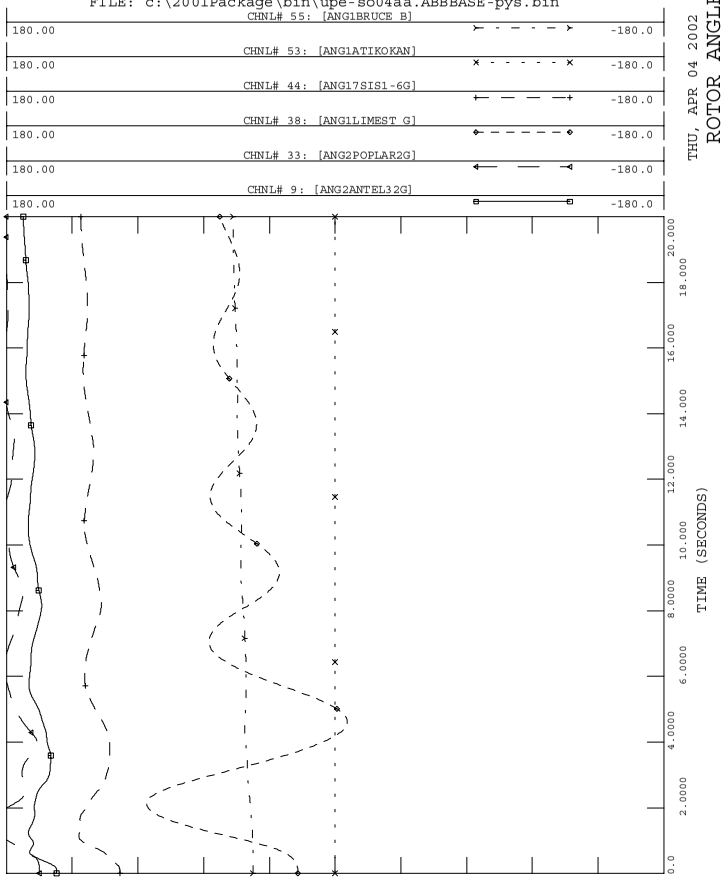
THU, APR 04 2002 13:33
ROTOR ANGLES 6

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



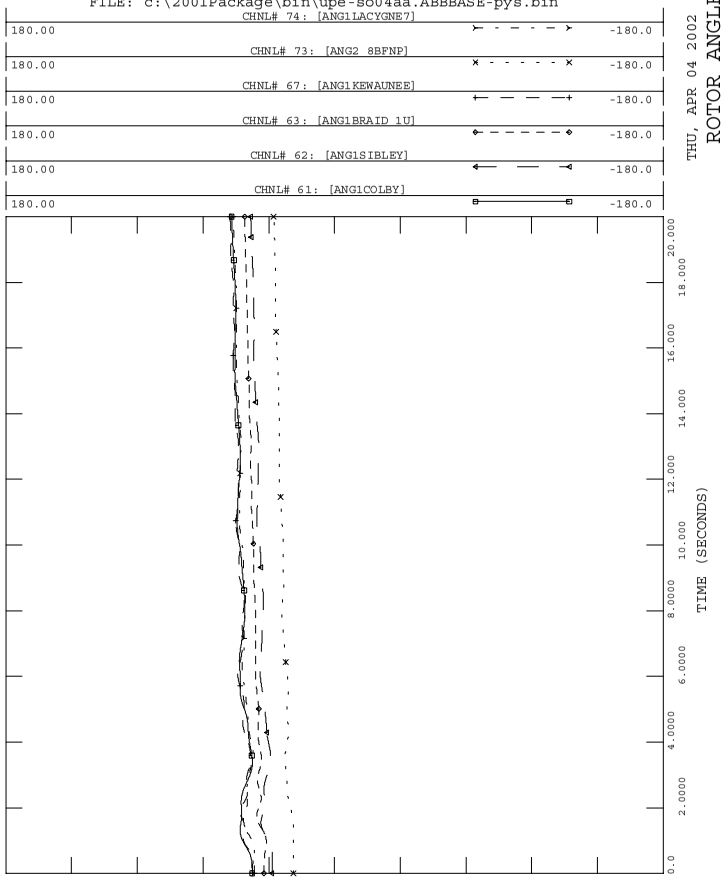
THU, APR 04 2002 13:33
ROTOR ANGLES NB

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



THU, APR 04 2002 13:33
ROTOR ANGLES 5

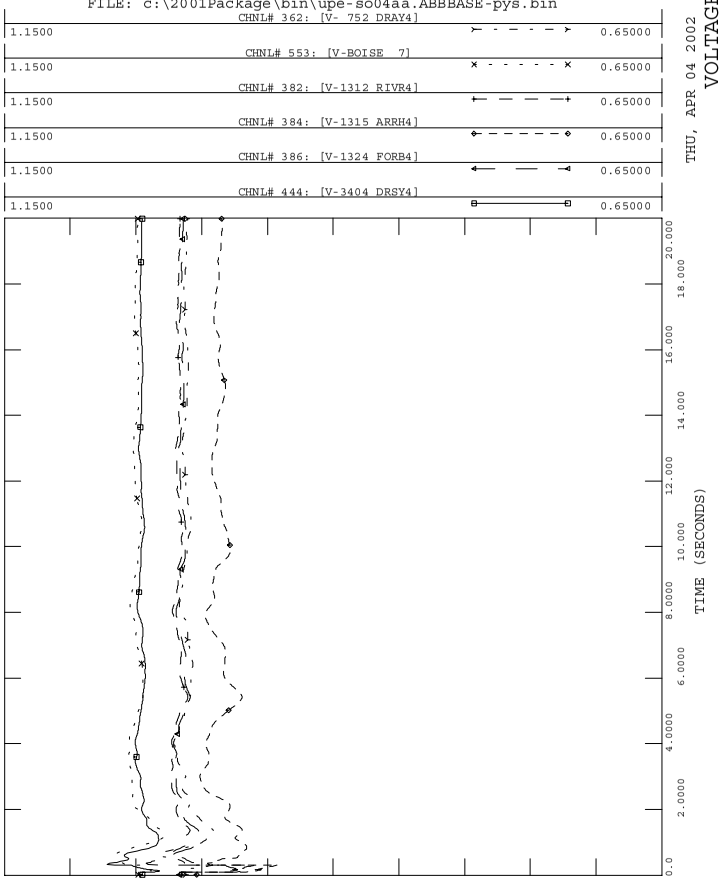
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



THU, APR 04 2002 13:33
ROTOR ANGLES 7

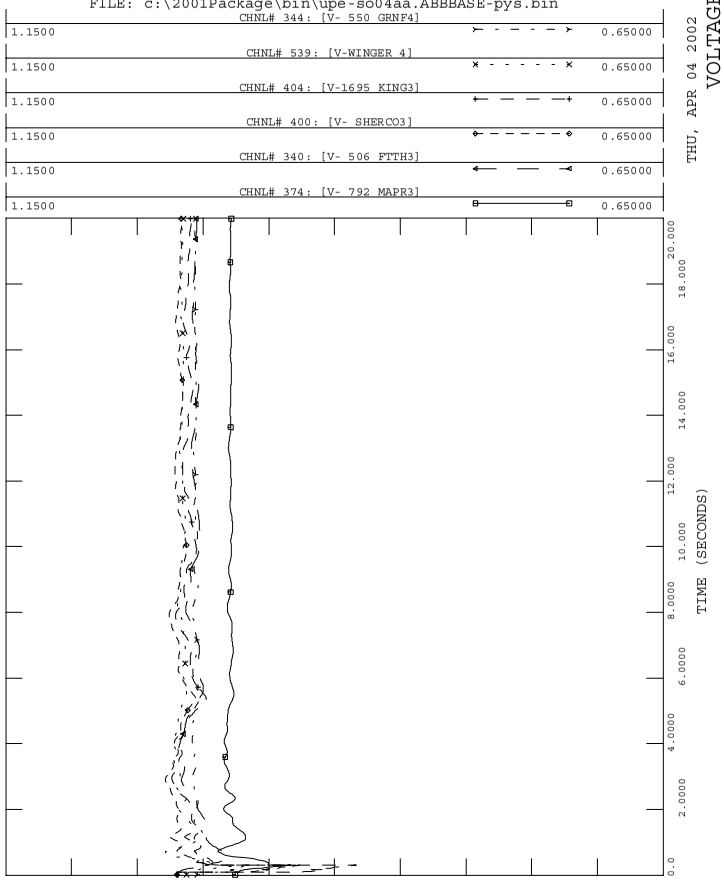
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
VOLTAGES 1



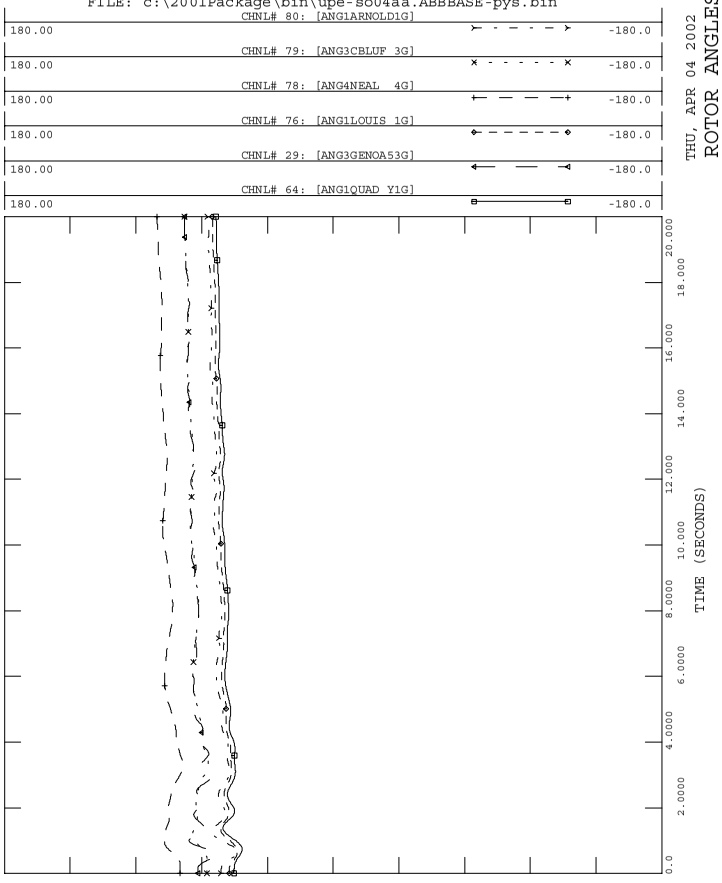
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
VOLTAGES 3



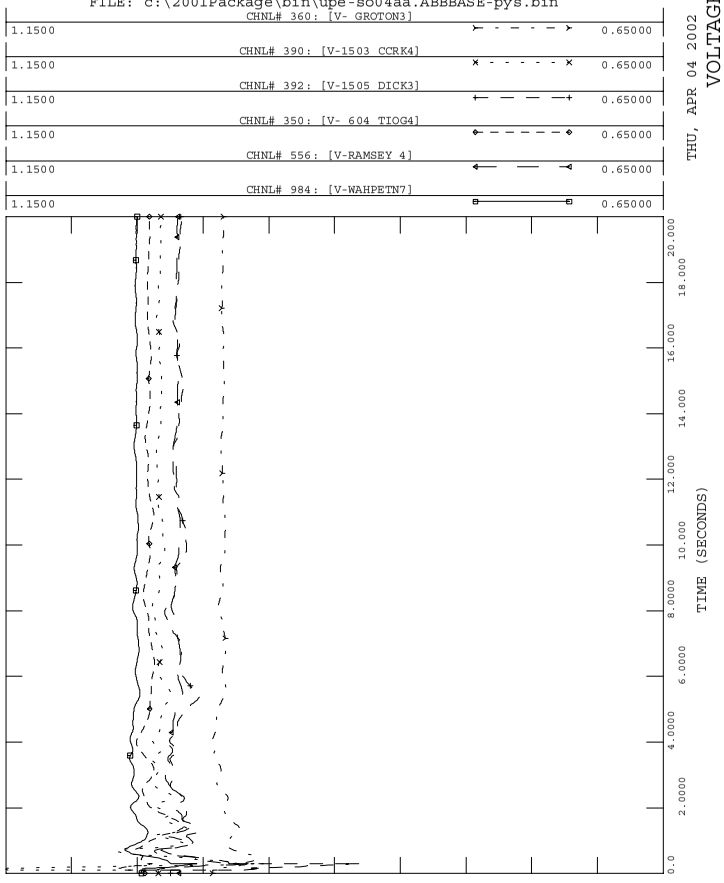
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
ROTOR ANGLES IA



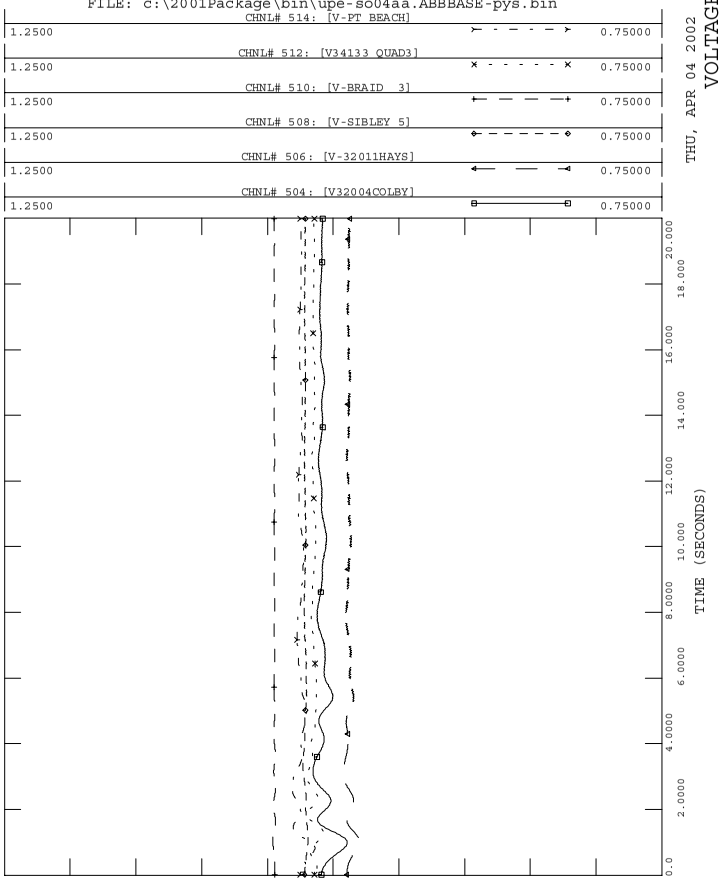
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
VOLTAGES 2



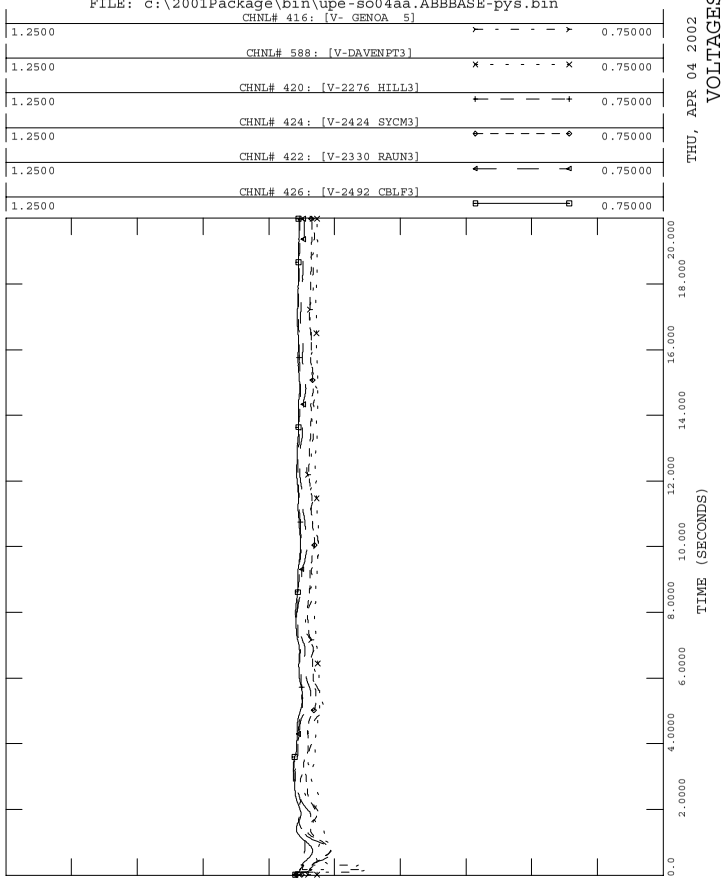
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
VOLTAGES 5



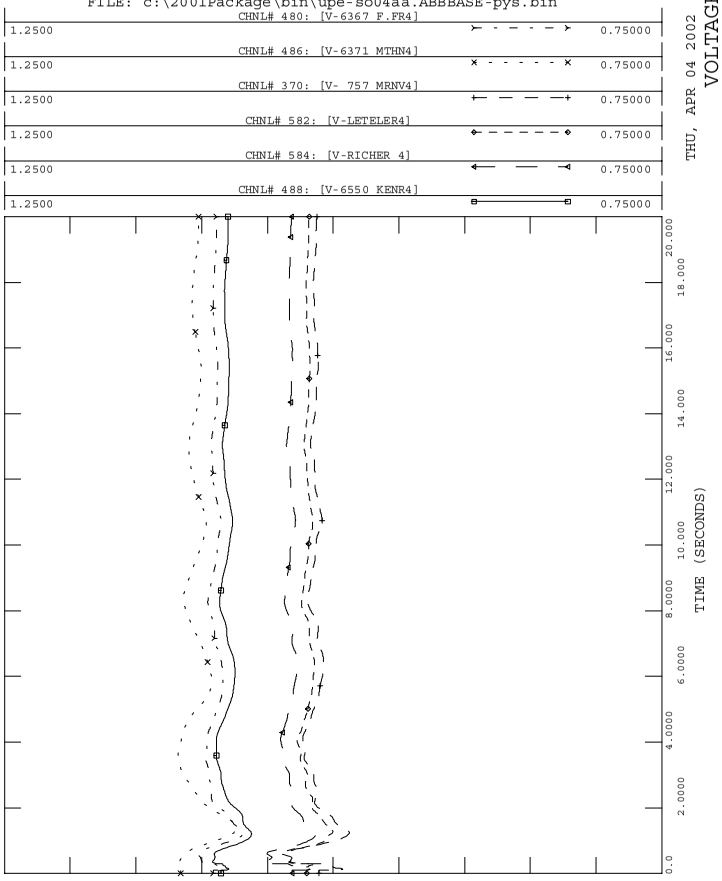
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
VOLTAGES IA



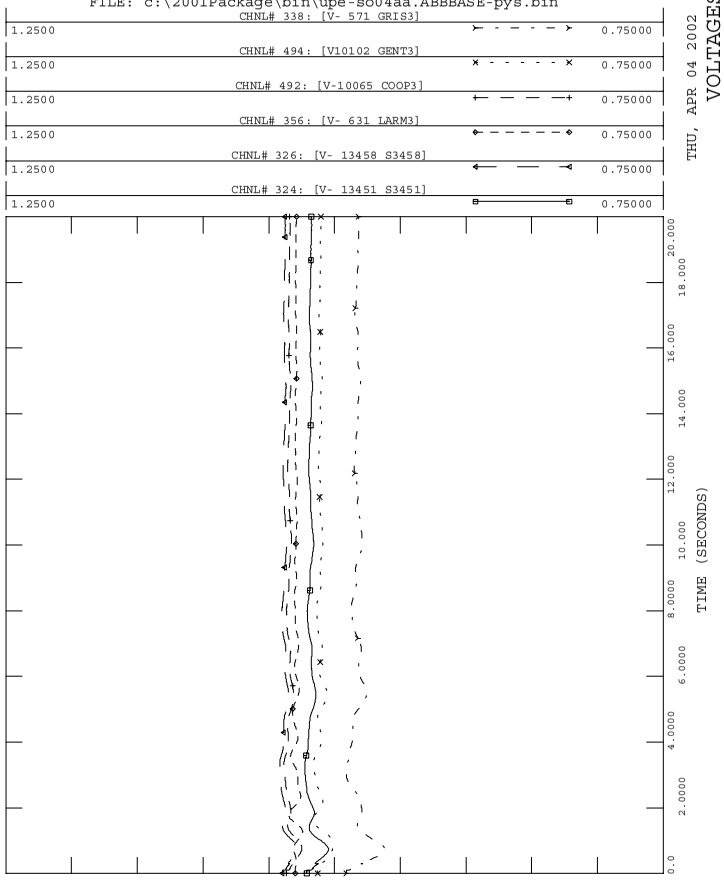
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
VOLTAGES 4

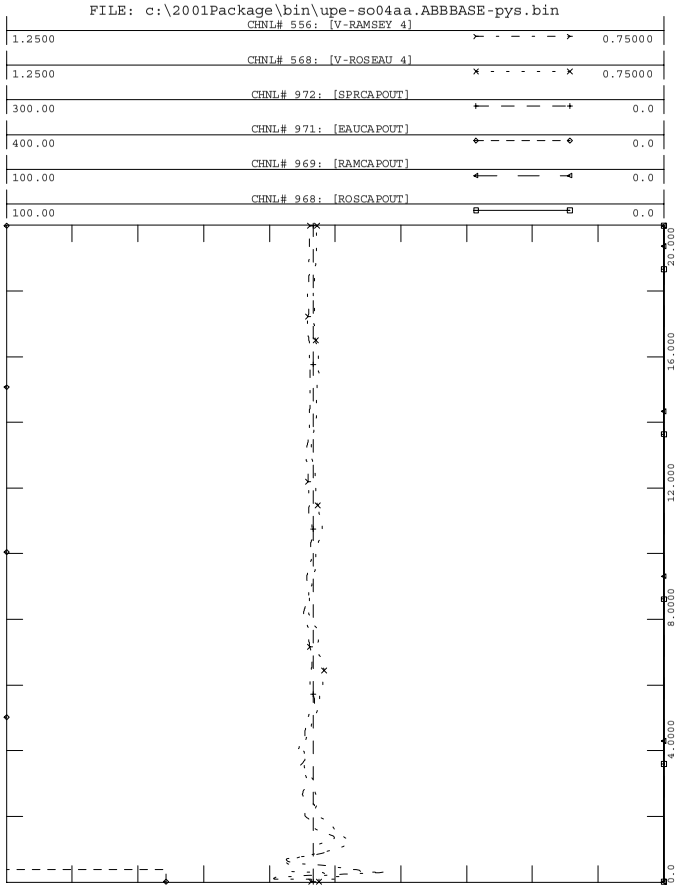


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
VOLTAGES NB

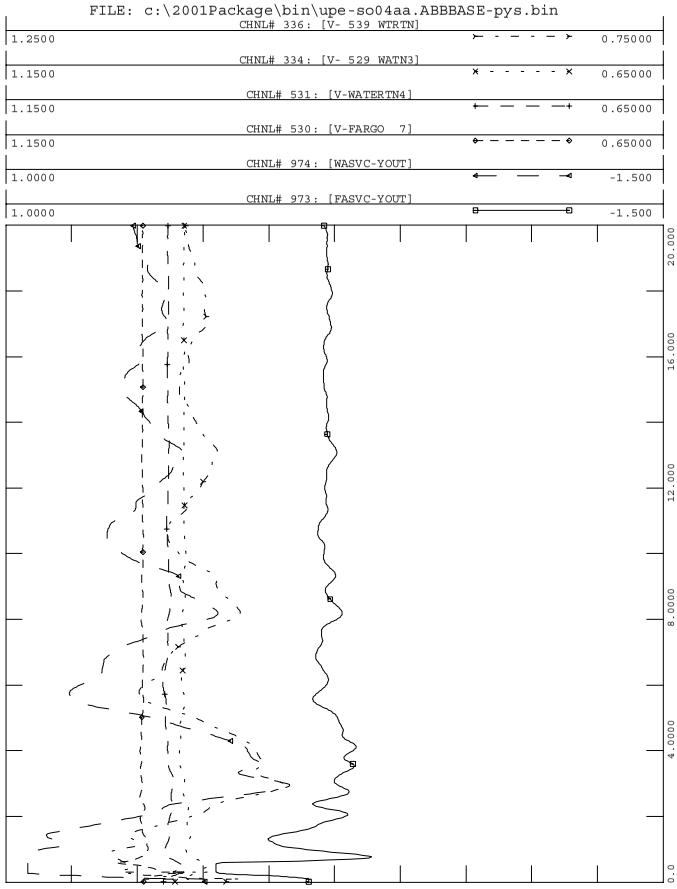


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



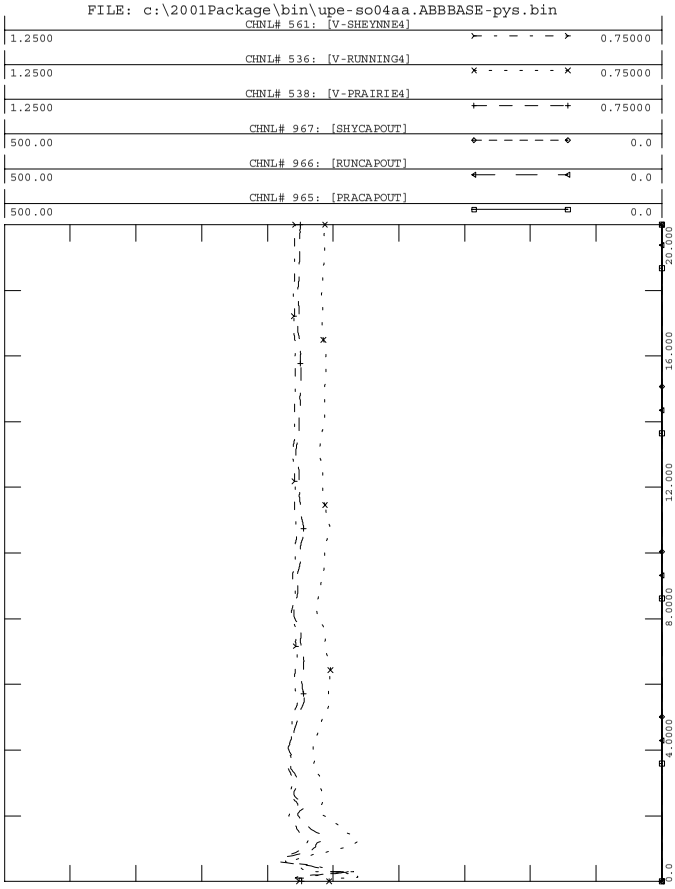
THU, APR 04 2002 13:33
FAST SW CAP OUT 2

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



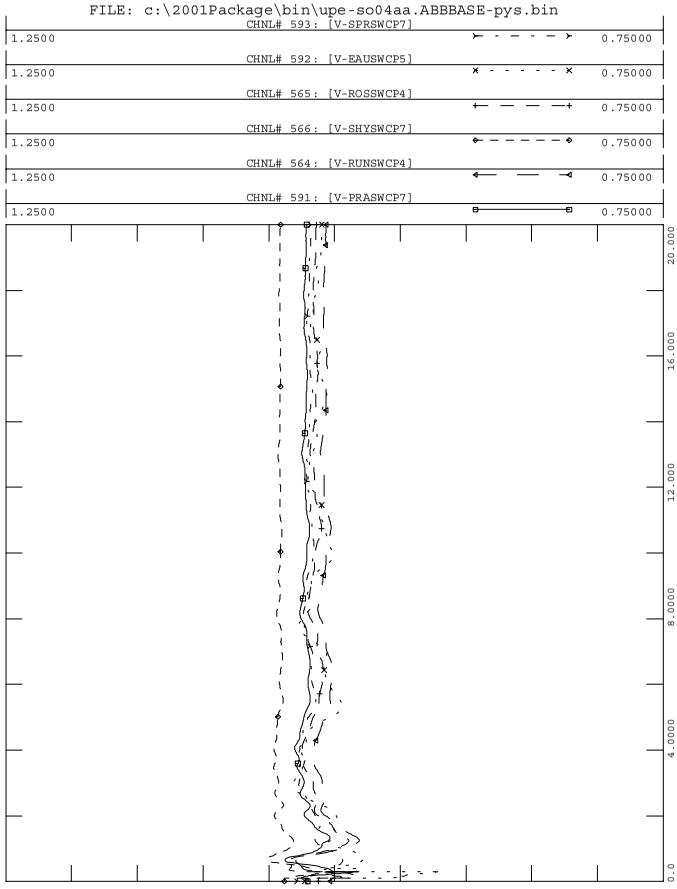
THU, APR 04 2002 13:33
FARGO/WATERTOWN SVS

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



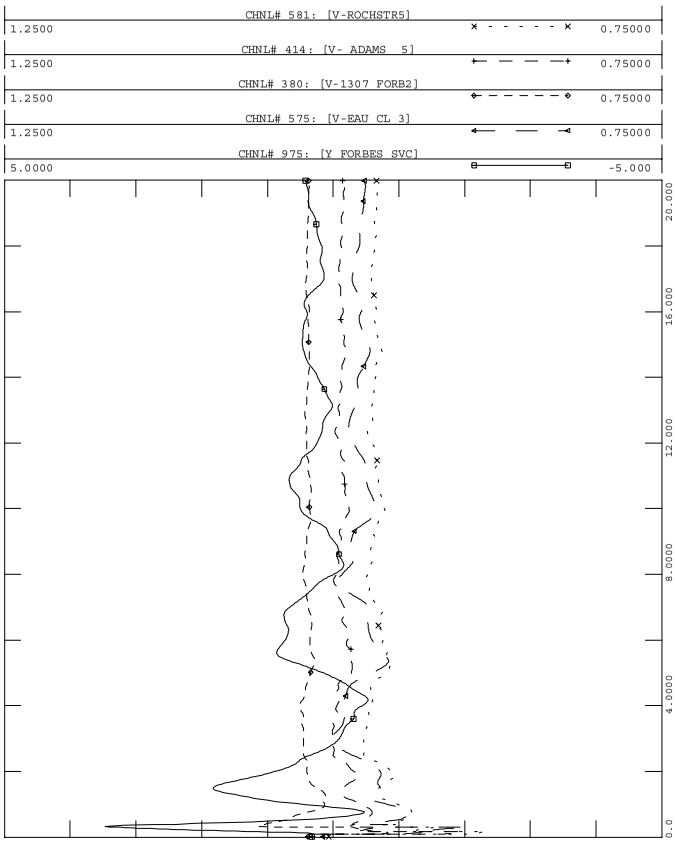
THU, APR 04 2002 13:33
FAST SW CAP OUT 1

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



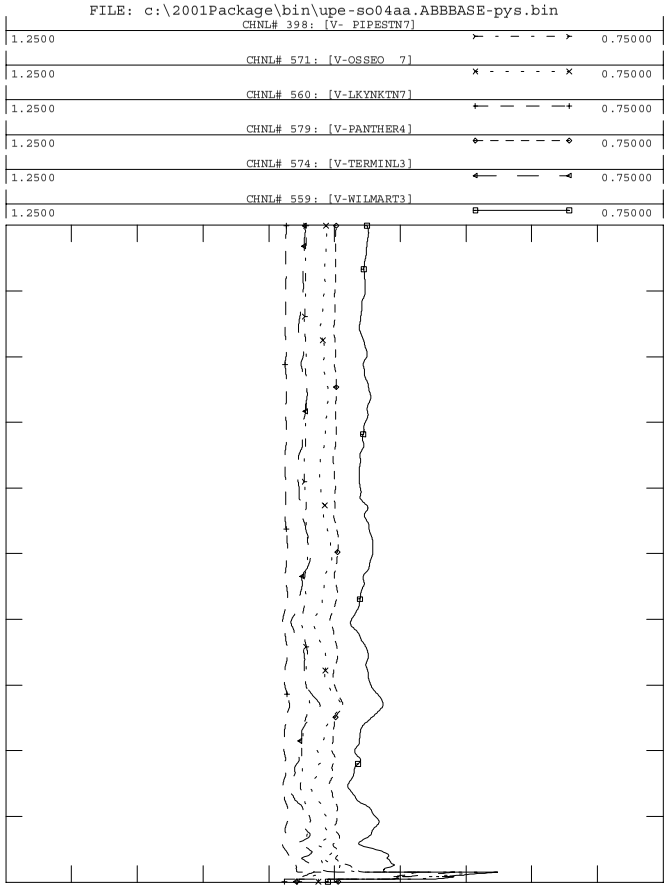
THU, APR 04 2002 13:33
FAST SW CAP VOLTAGES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



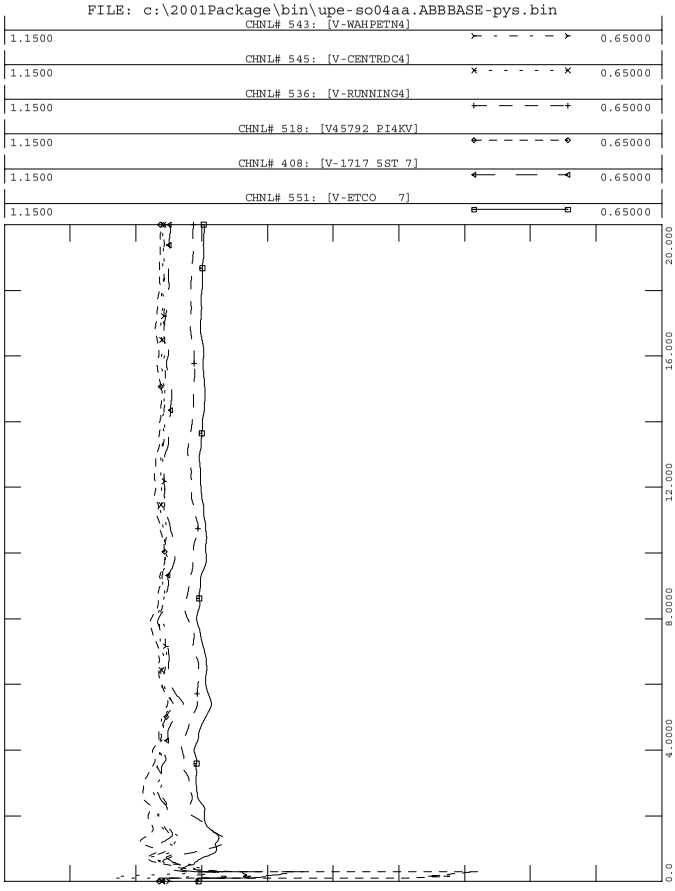
THU, APR 04 2002 13:33
SVC & WISCONSIN VOLT

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



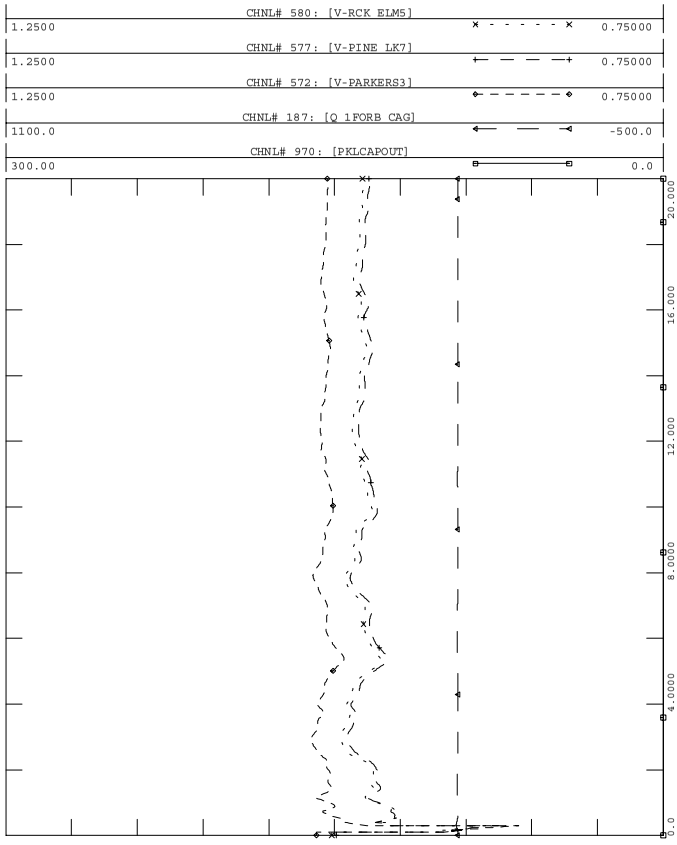
THU, APR 04 2002 13:33
TC VOLTAGES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



THU, APR 04 2002 13:33
VOLTAGES 6

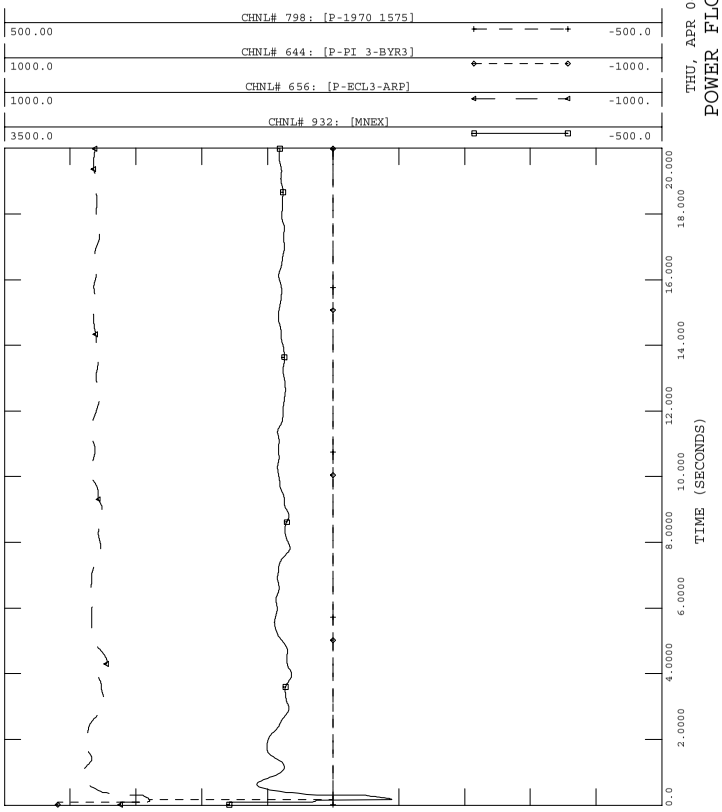
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin



THU, APR 04 2002 13:33
FORBES SVS OUT & VOLTAGES

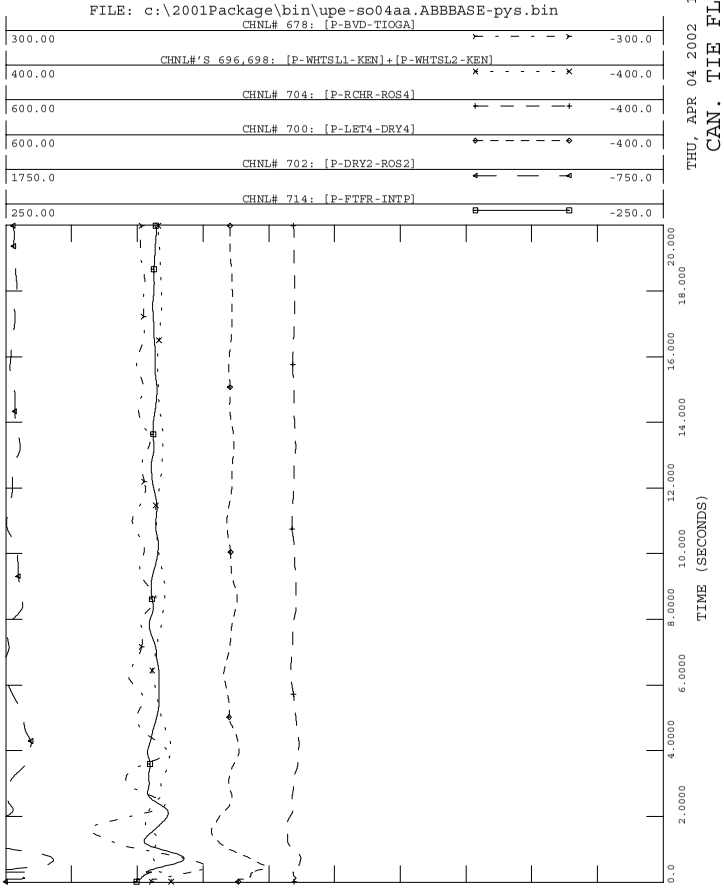
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
POWER FLOW SUMS 2



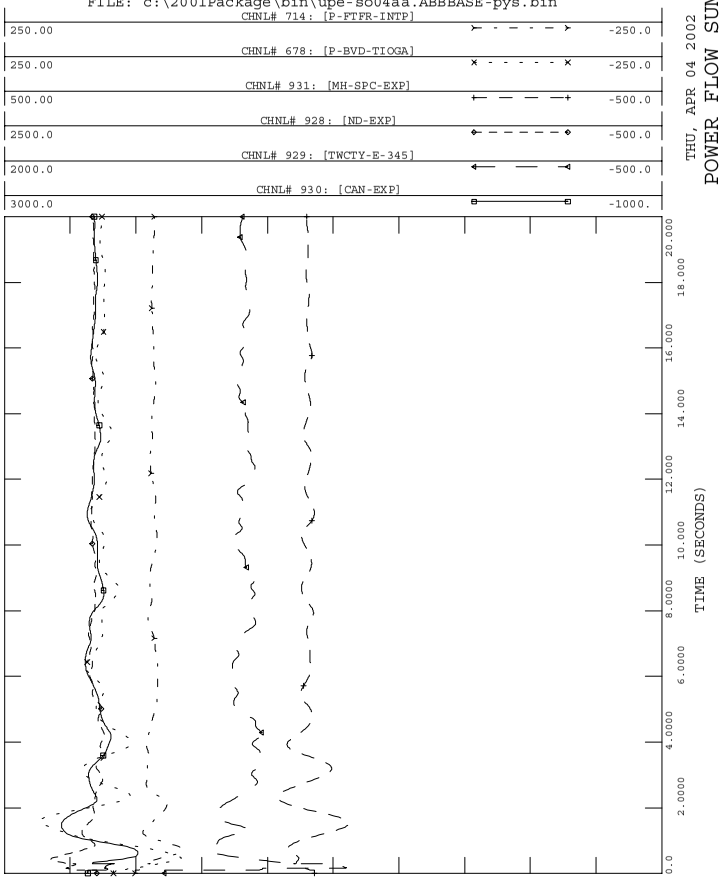
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
CAN. TIE FLOWS



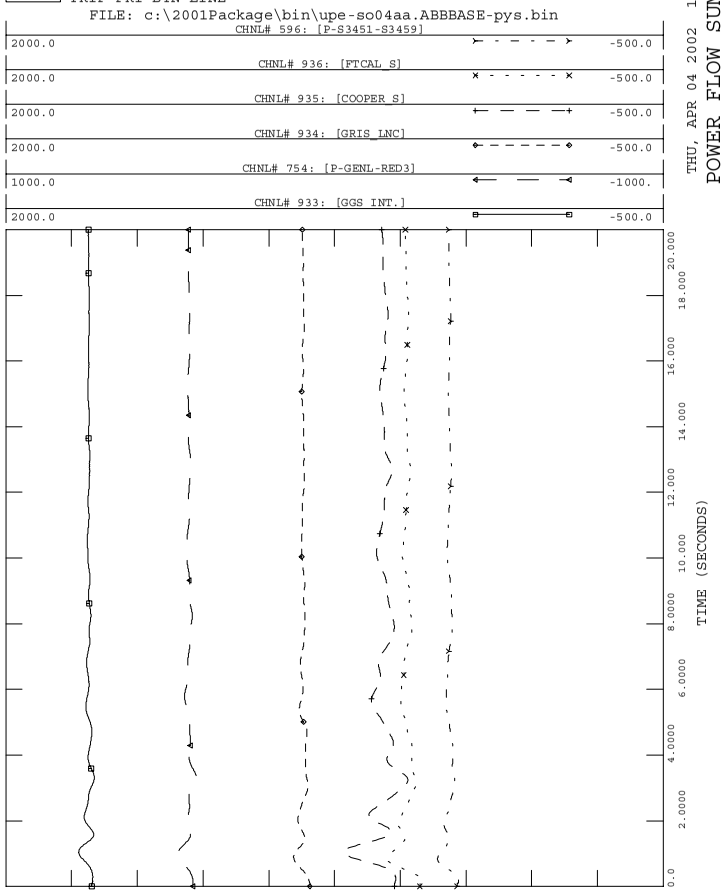
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
POWER FLOW SUMS 1



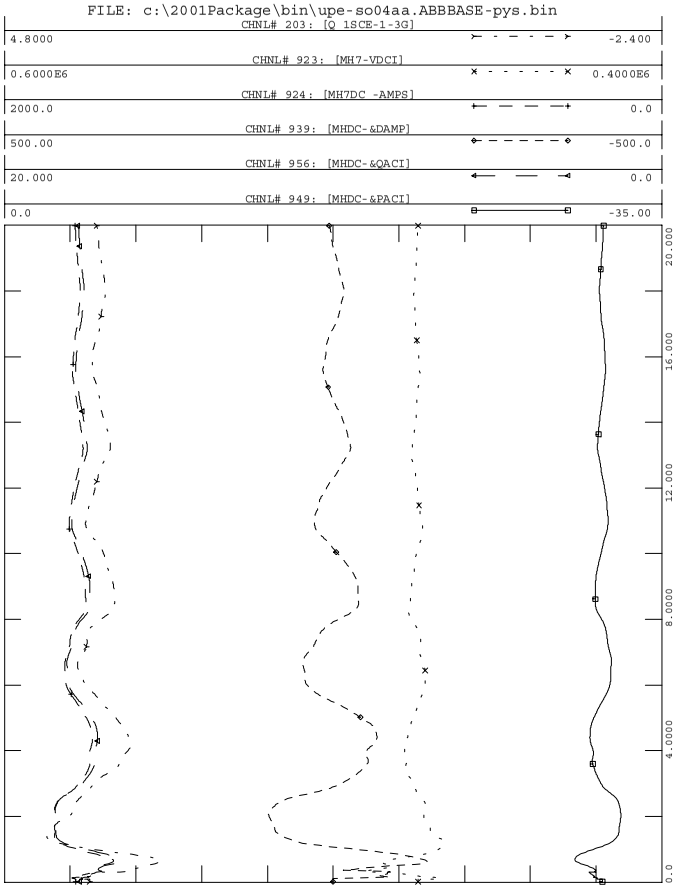
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
POWER FLOW SUM 3



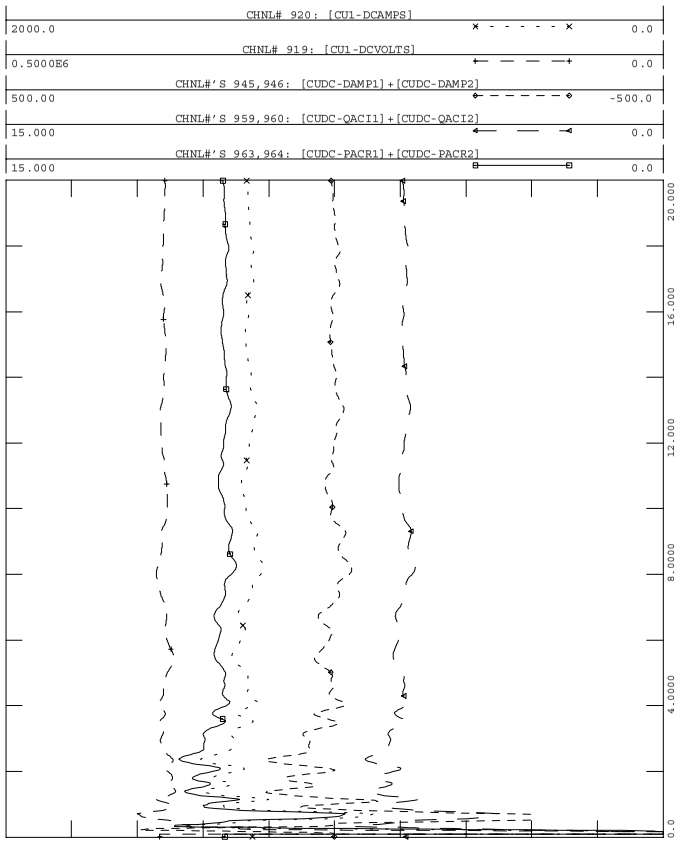
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
MH DC PARAMETERS



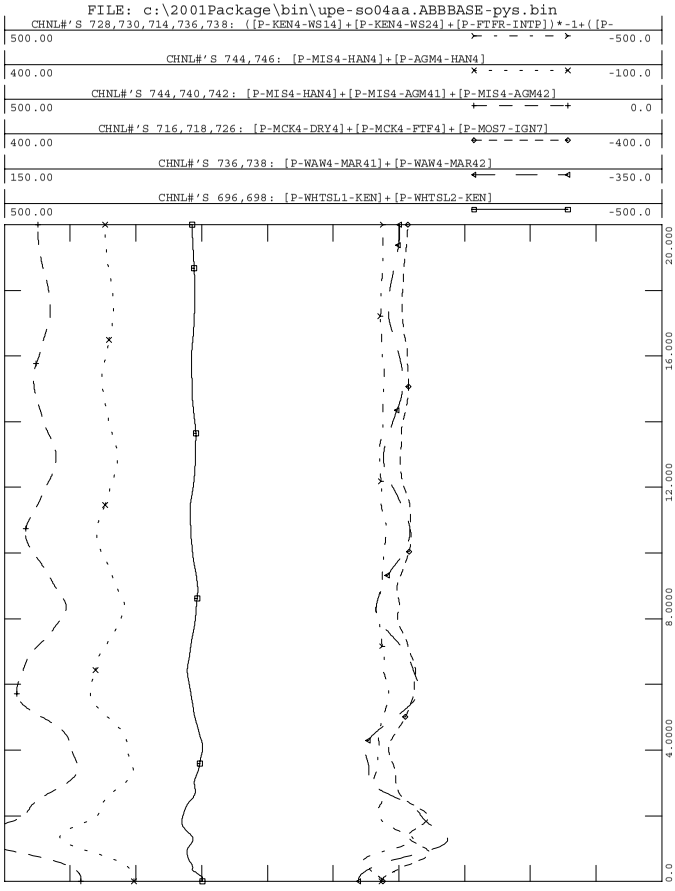
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
CU DC #1



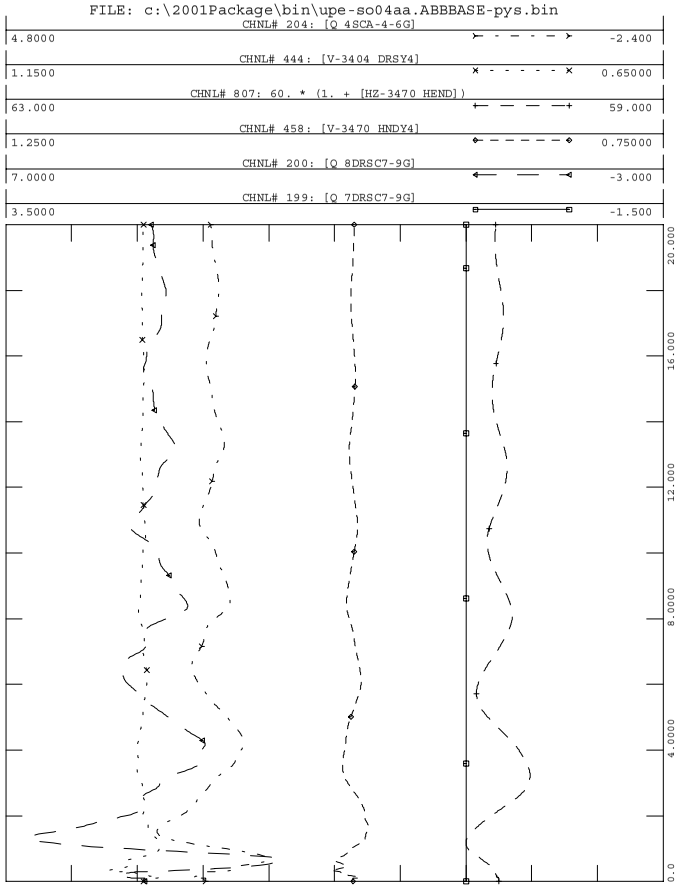
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33
OH TIE FLOWS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

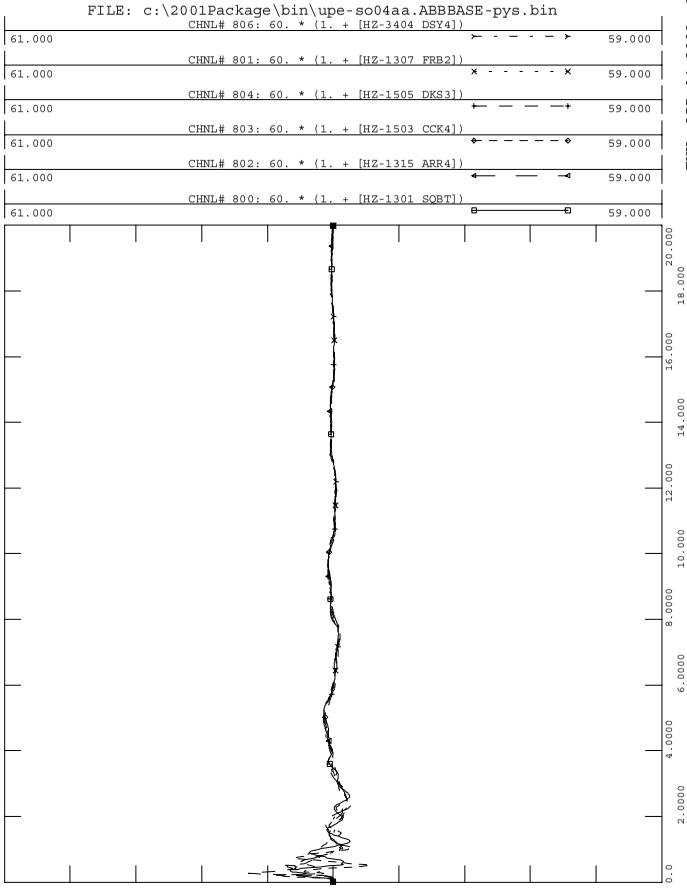
THU, APR 04 2002 13:33
MH DC PARAMETERS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33

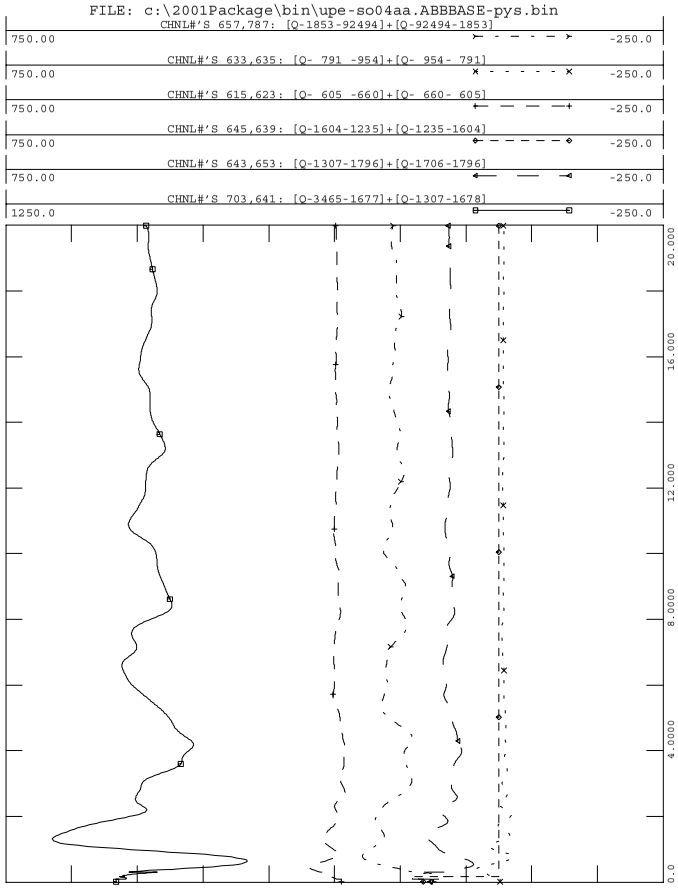
FREQ AT DC TERMINALS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33

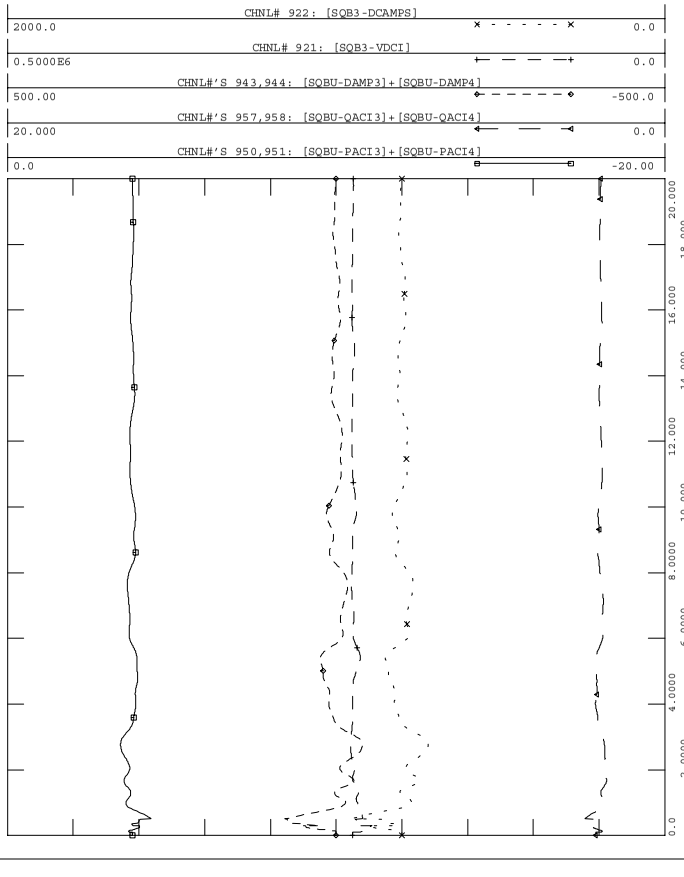
VAR LOSSES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33

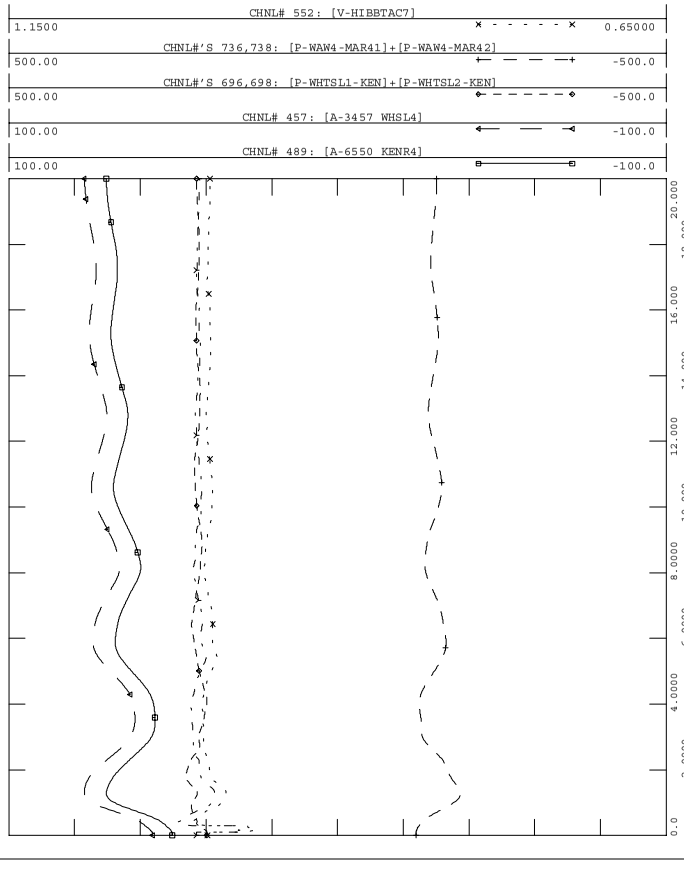
SQB DC #3



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

THU, APR 04 2002 13:33

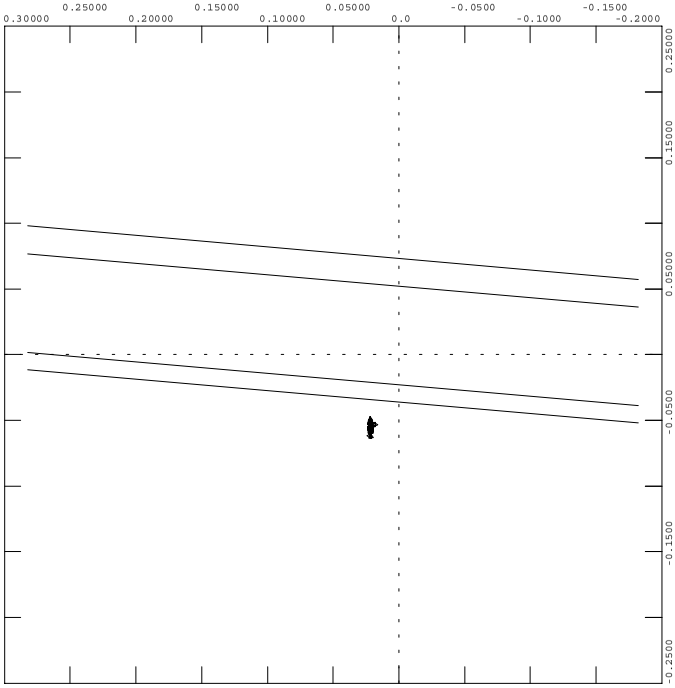
VOLTAGES, ANGLES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, APR 04 2002 13:33
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

RELAY: RELAYG
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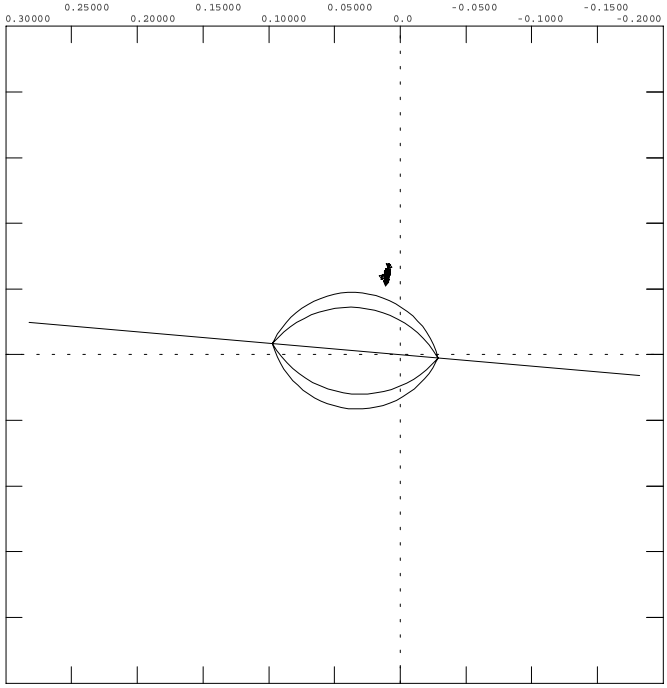
CHNL# 856: [X-DSY2-ROS2]

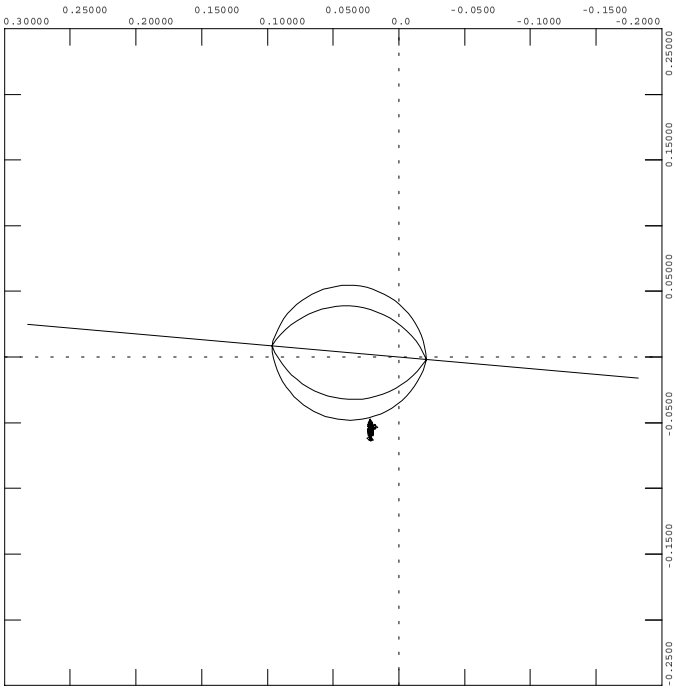


THU, APR 04 2002 13:33
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

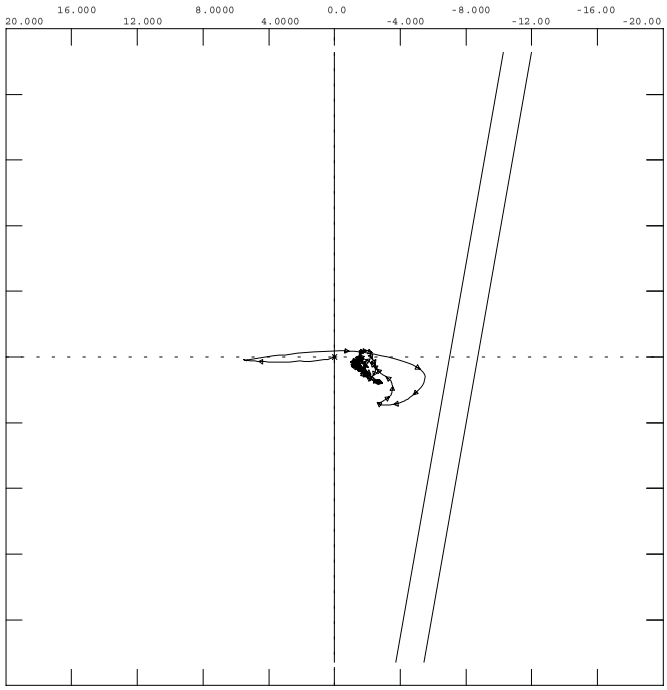


THU, APR 04 2002 13:33
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

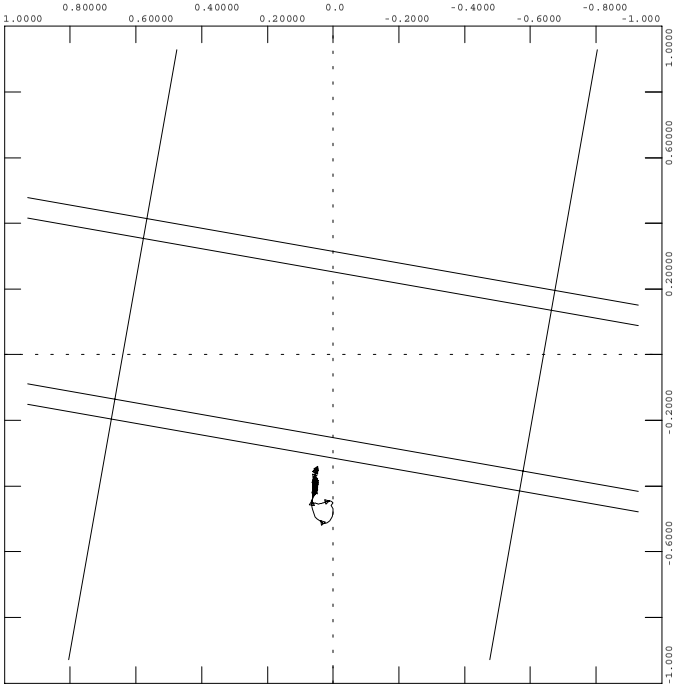


THU, APR 04 2002 13:33
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

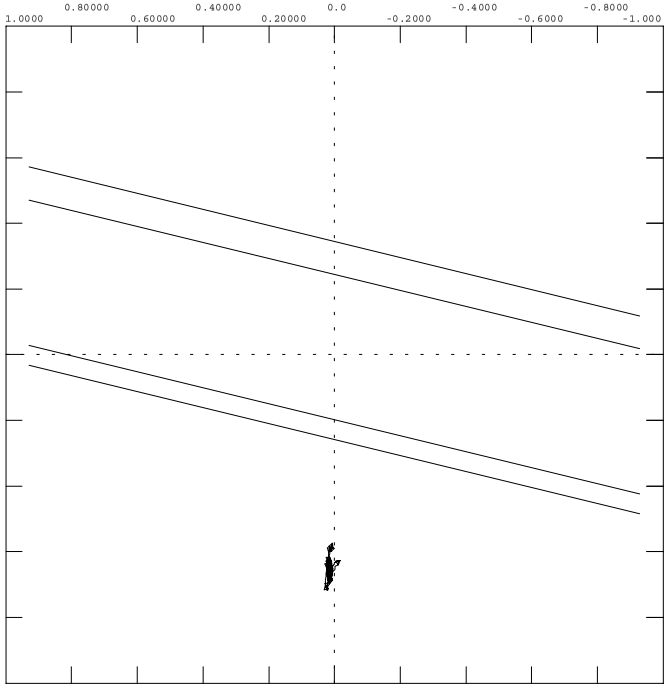
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

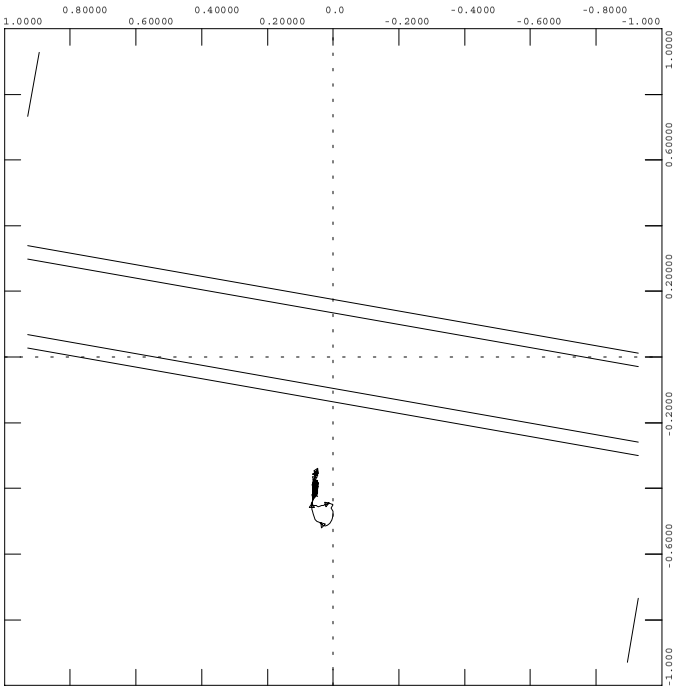
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

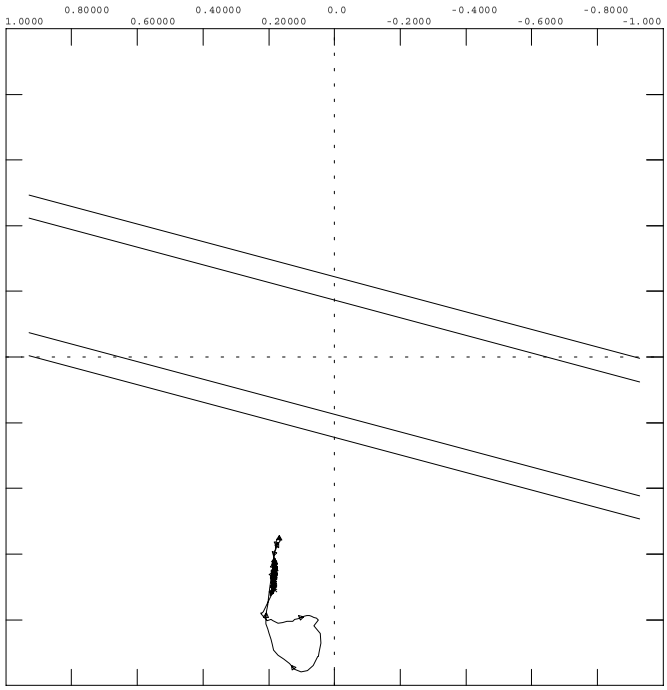
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

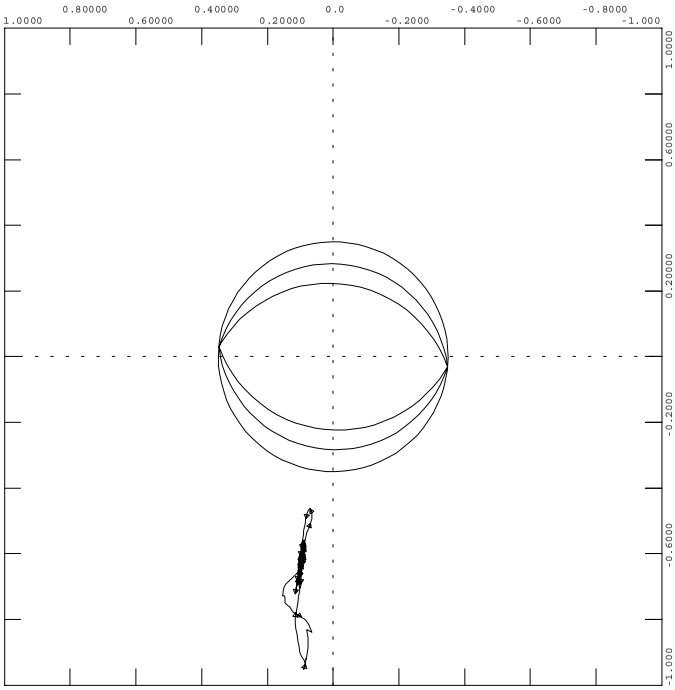
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

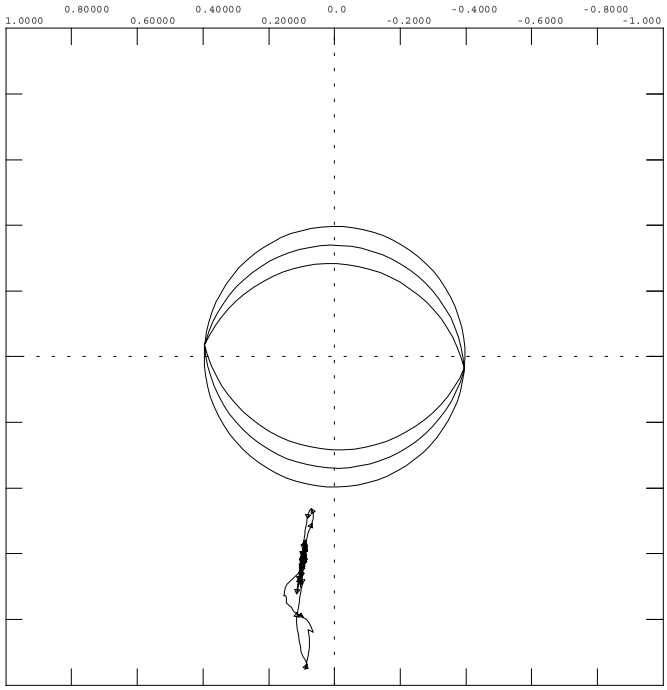
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

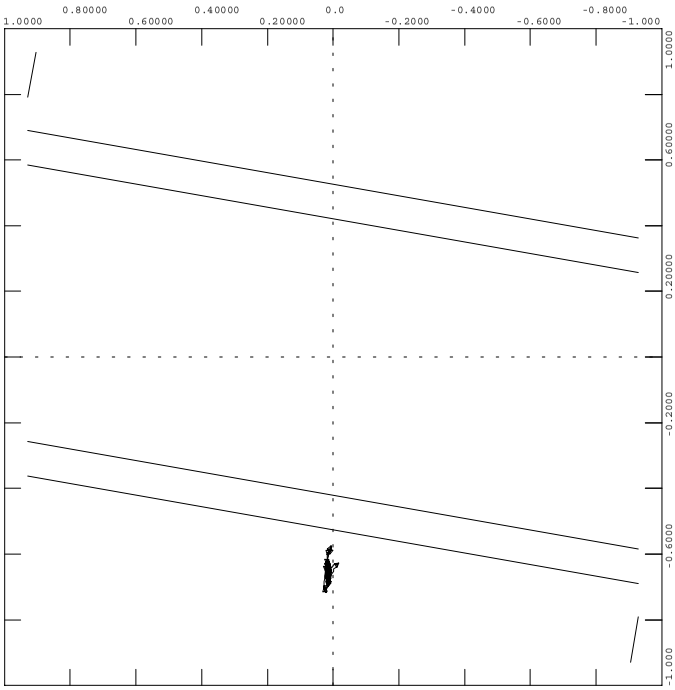
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

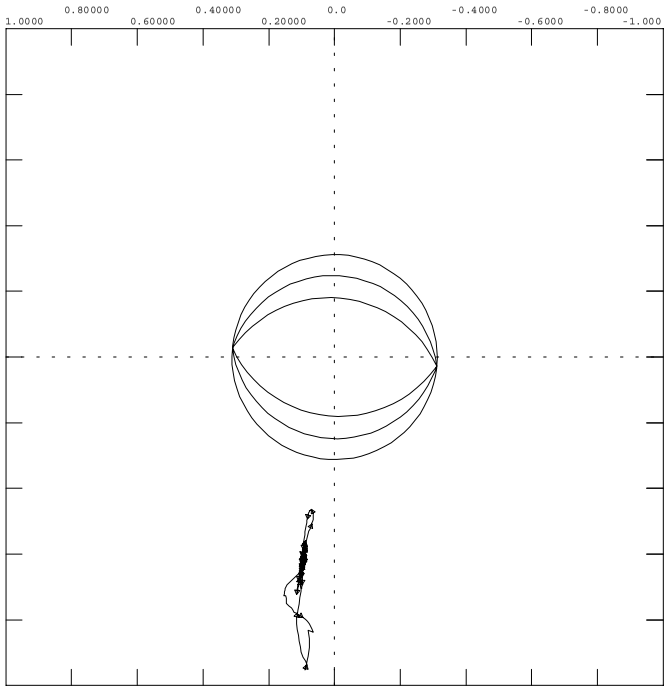
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

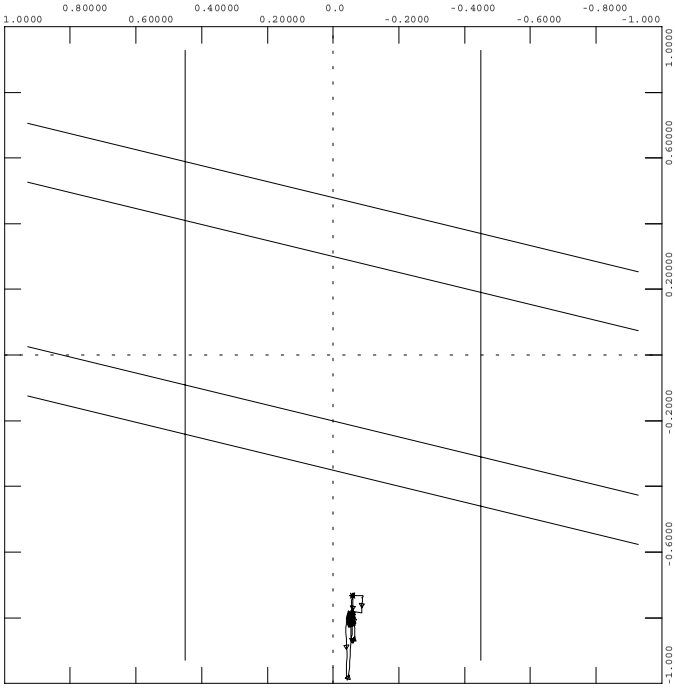
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
14 CYCLE SLG AT AT PRAIRIE ISLAND
TRIP PRI-BYN LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pys.bin

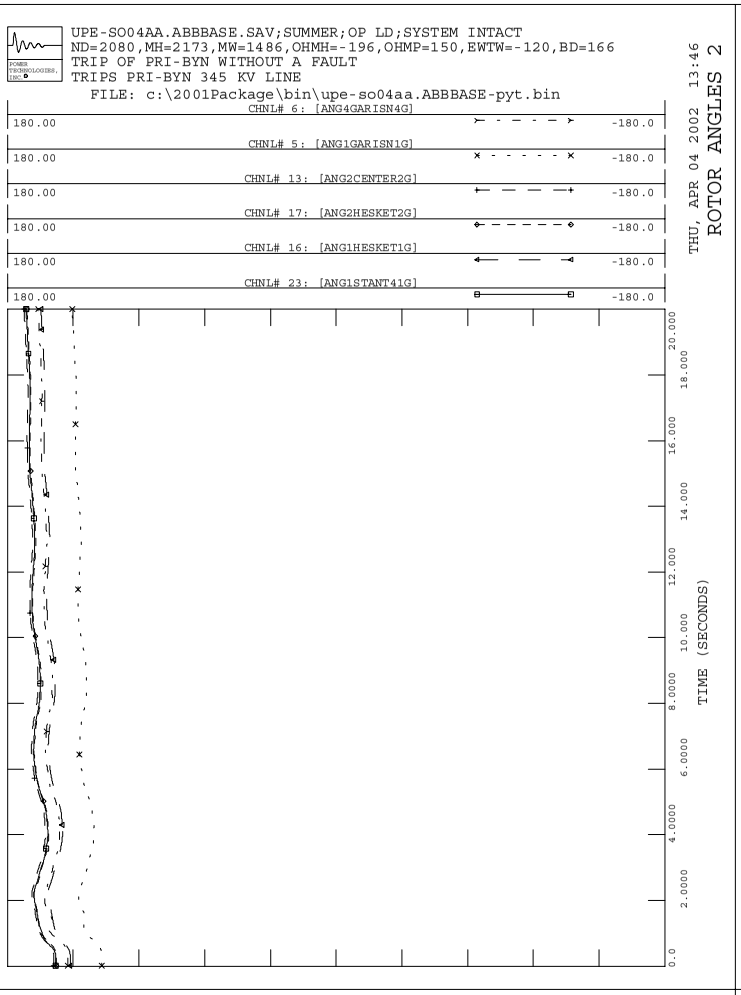
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

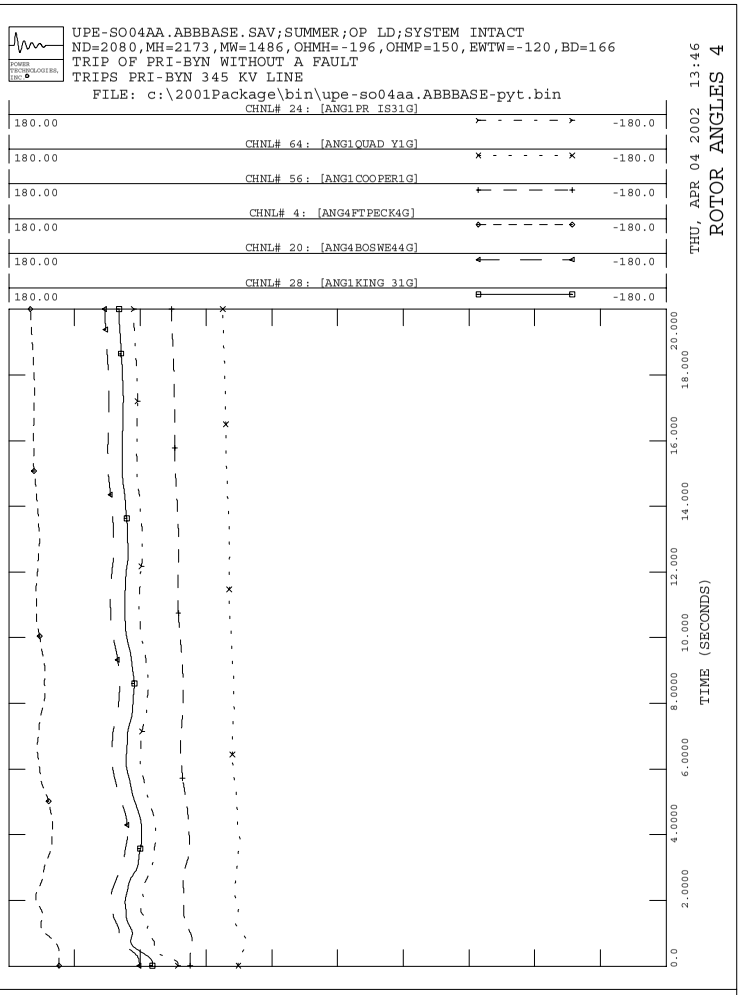


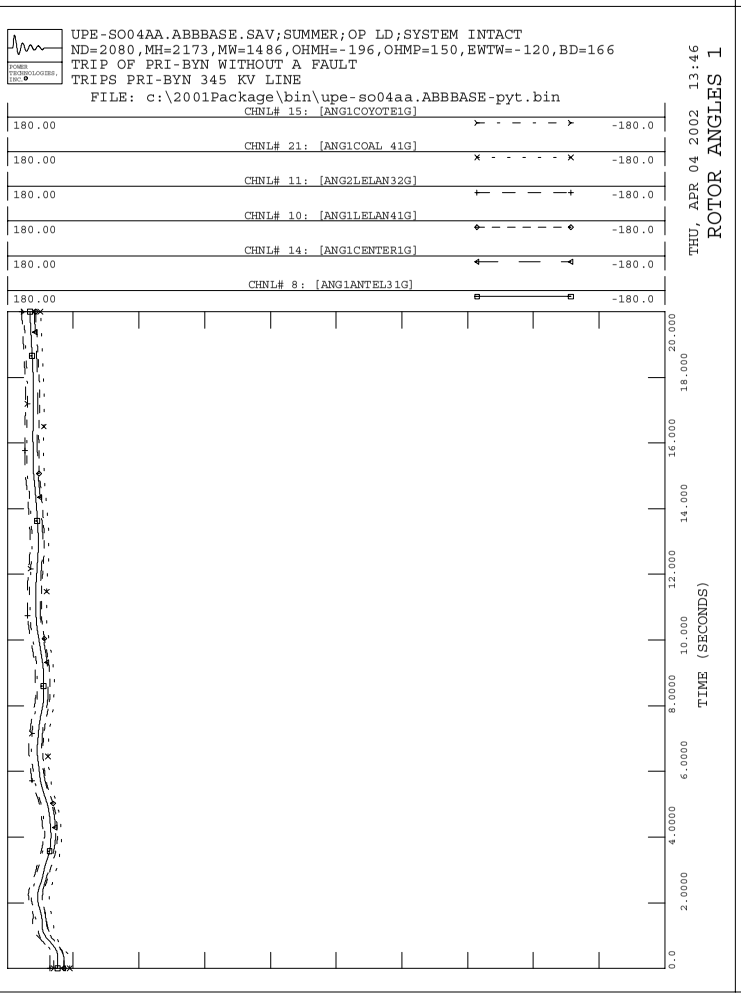
THU, APR 04 2002 13:33
MP-OH I.FALLS (779)
CHNL# 847: [R-1484 6011]

CONTINGENCY PYT

Trip of Prairie Island-Byron 345Kv


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:46
ROTOR ANGLES 2


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:46
ROTOR ANGLES 4


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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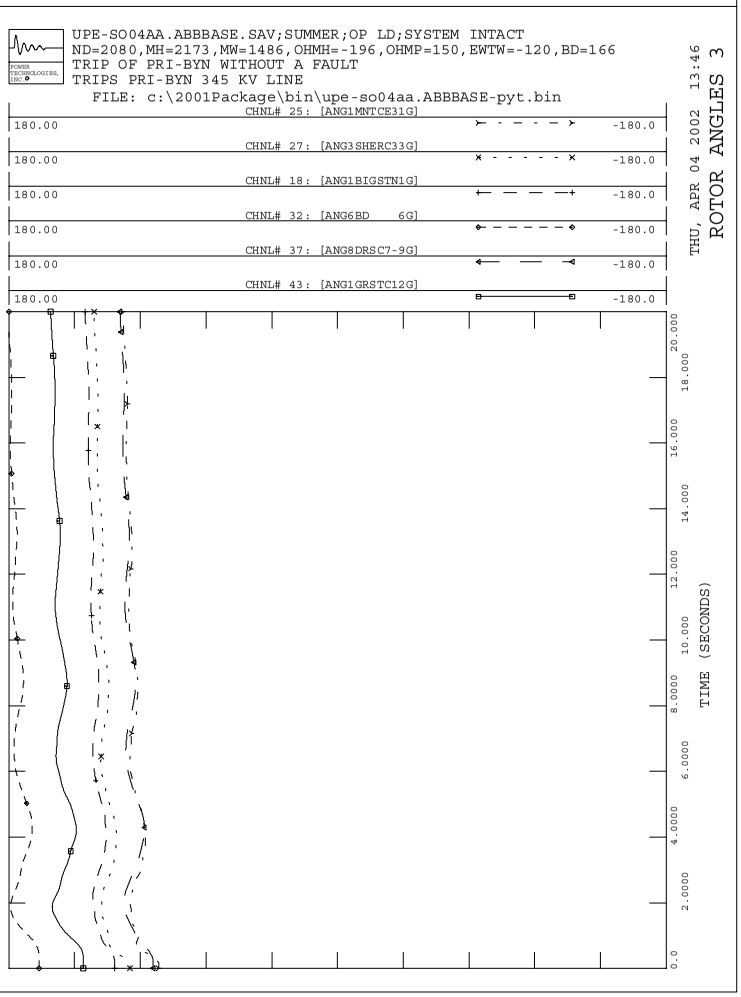
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:46
ROTOR ANGLES 1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TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
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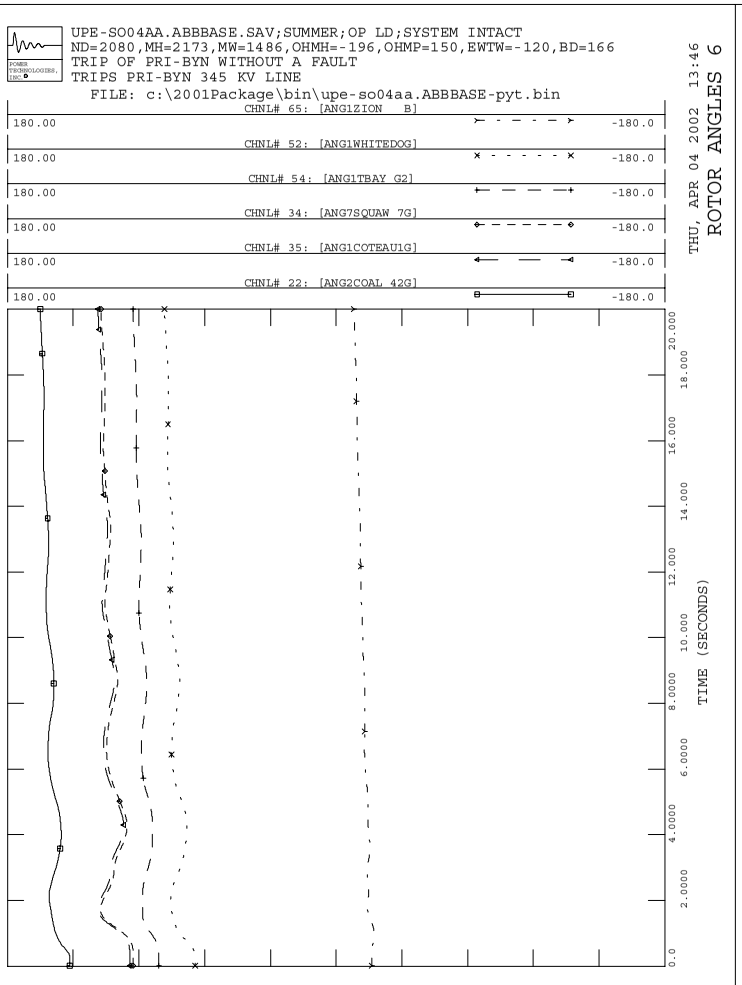
TIME (SECONDS)
THU, APR 04 2002 13:46
ROTOR ANGLES 3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TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
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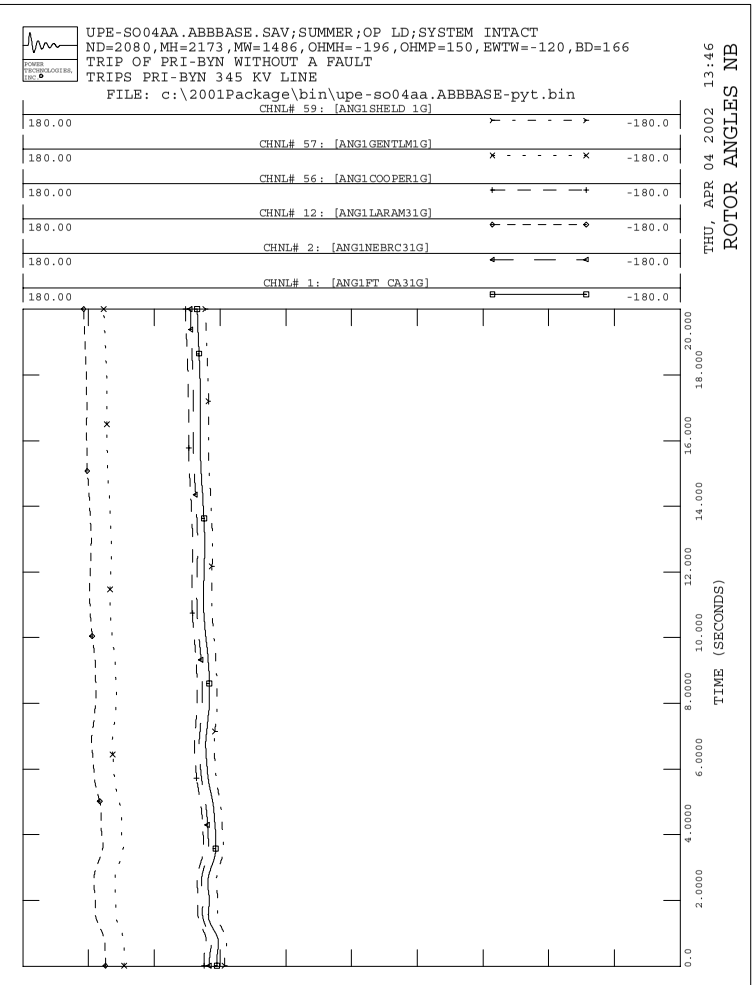
TIME (SECONDS)
THU, APR 04 2002 13:46
ROTOR ANGLES 6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TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
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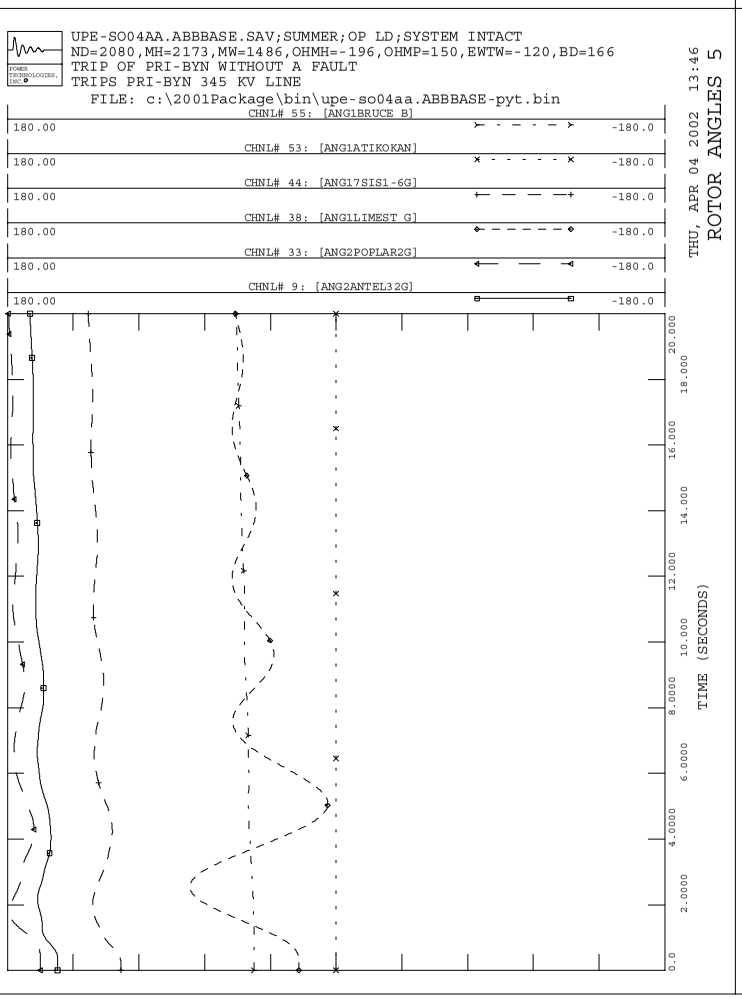
TIME (SECONDS)
THU, APR 04 2002 13:46
ROTOR ANGLES NB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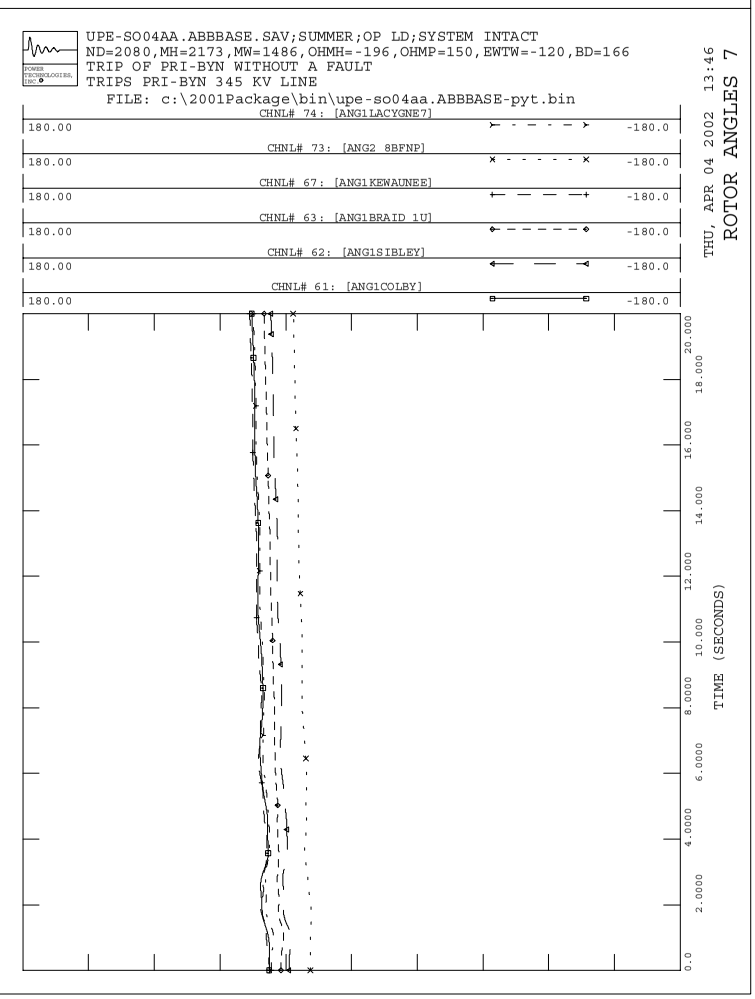
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:46
ROTOR ANGLES 5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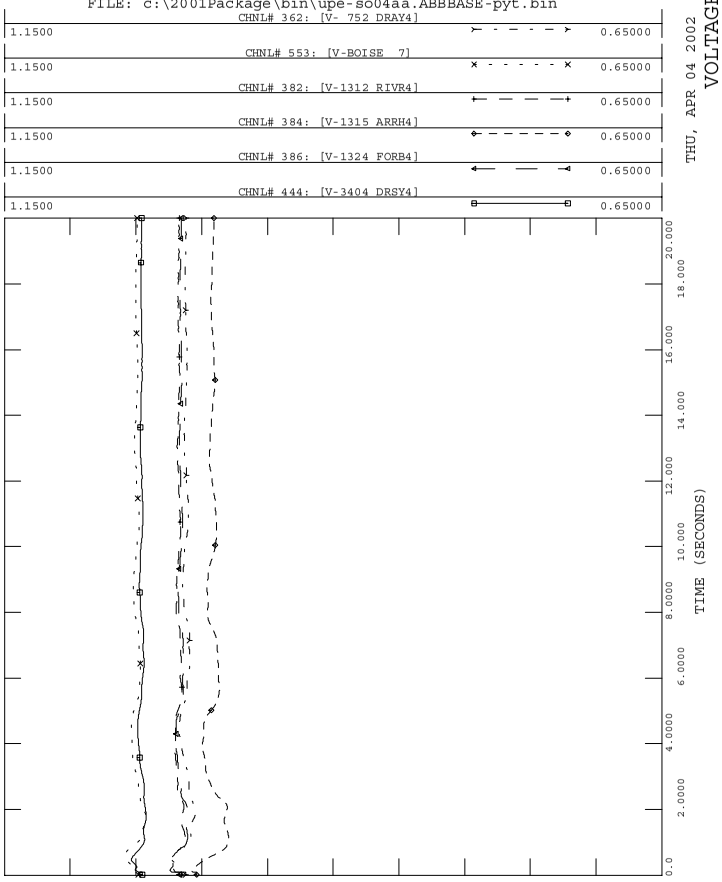
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
THU, APR 04 2002 13:46
ROTOR ANGLES 7

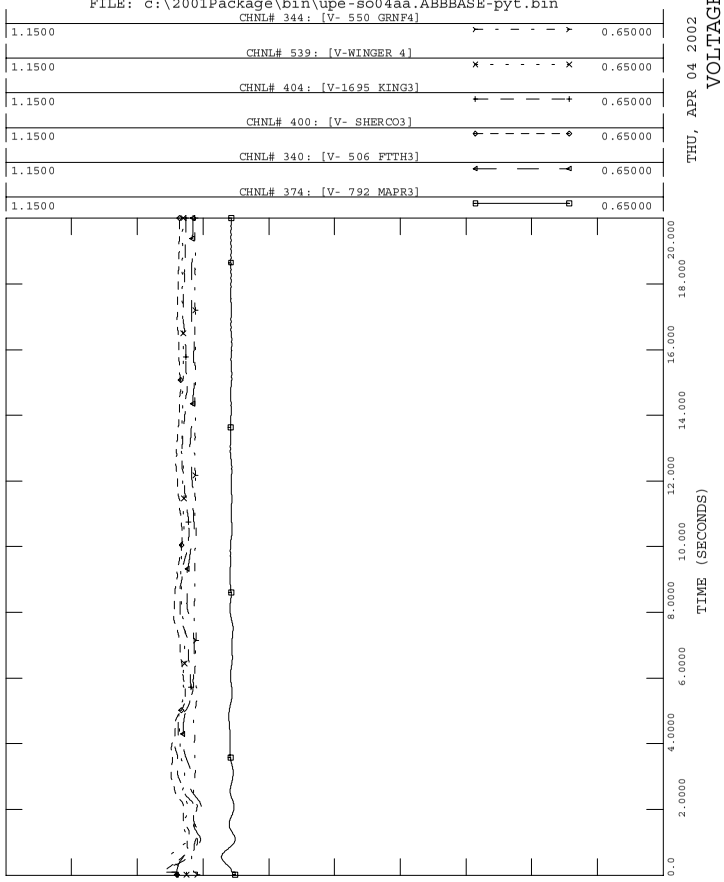
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
VOLTAGES 1



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
VOLTAGES 3



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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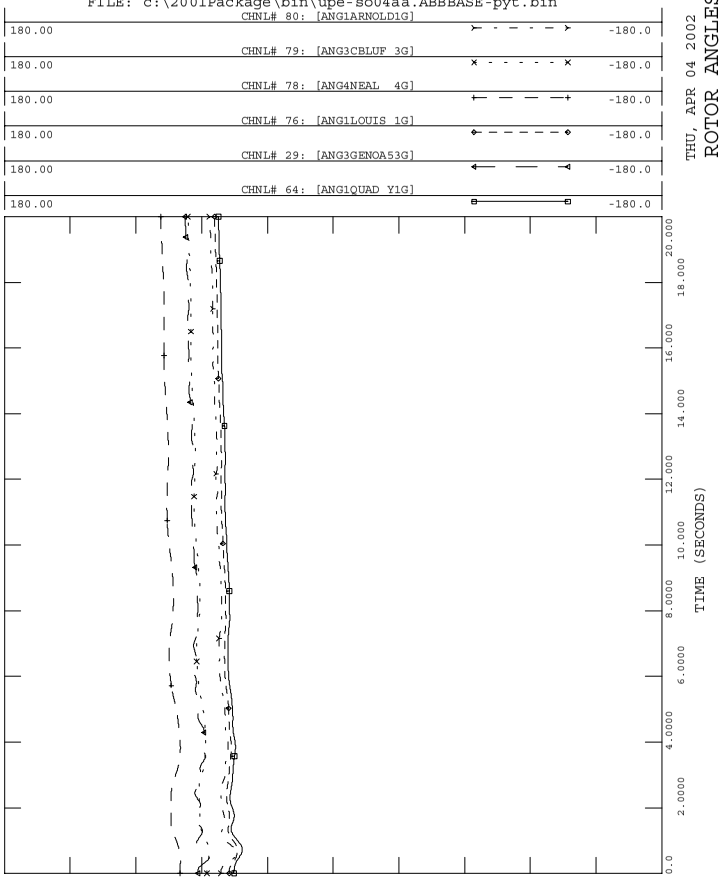
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
ROTOR ANGLES IA



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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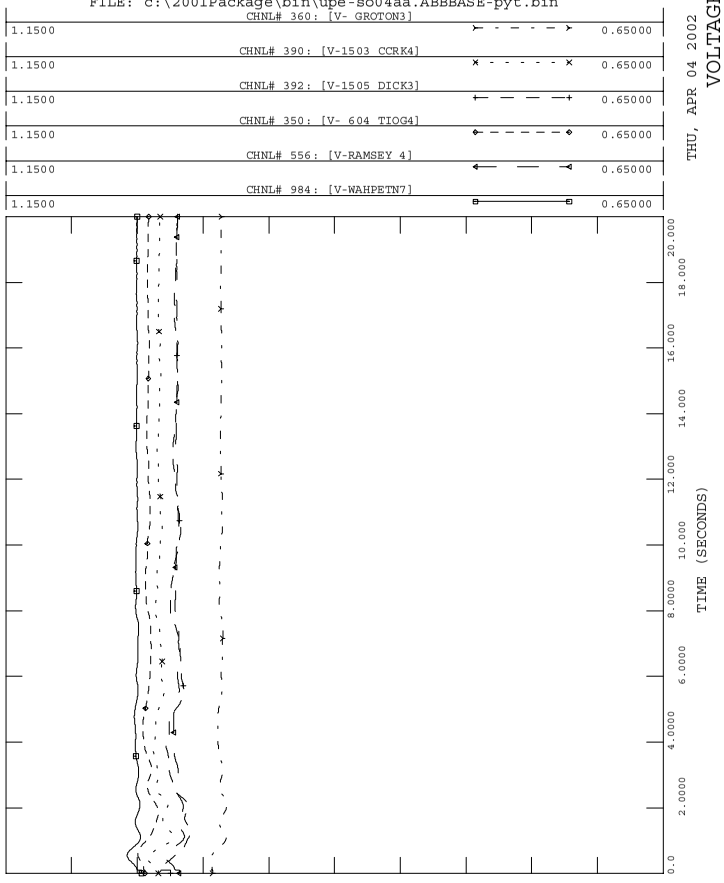
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
VOLTAGES 2



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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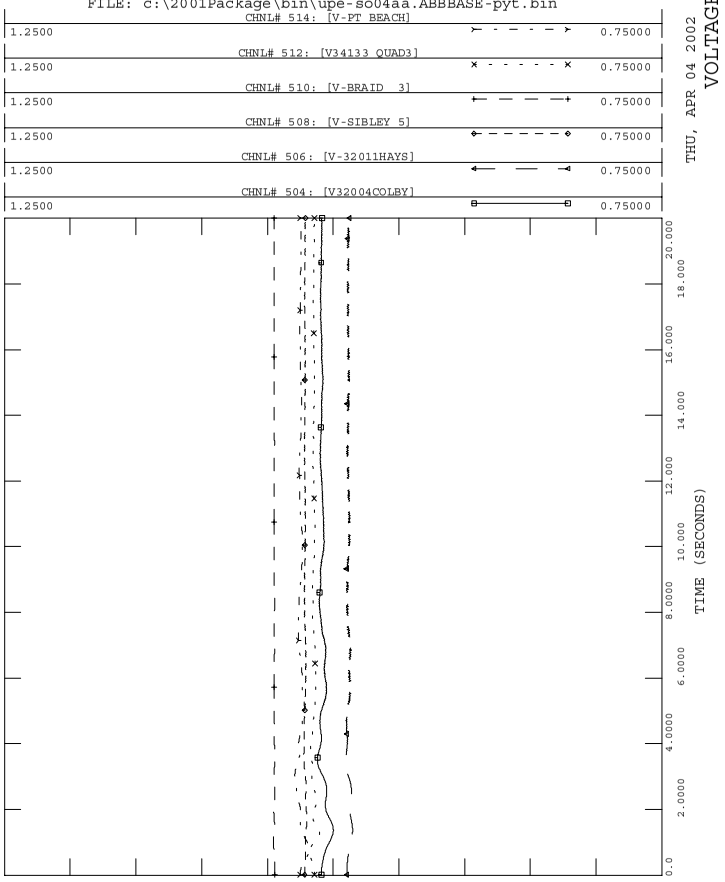
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin



THU, APR 04 2002 13:46
VOLTAGES 5

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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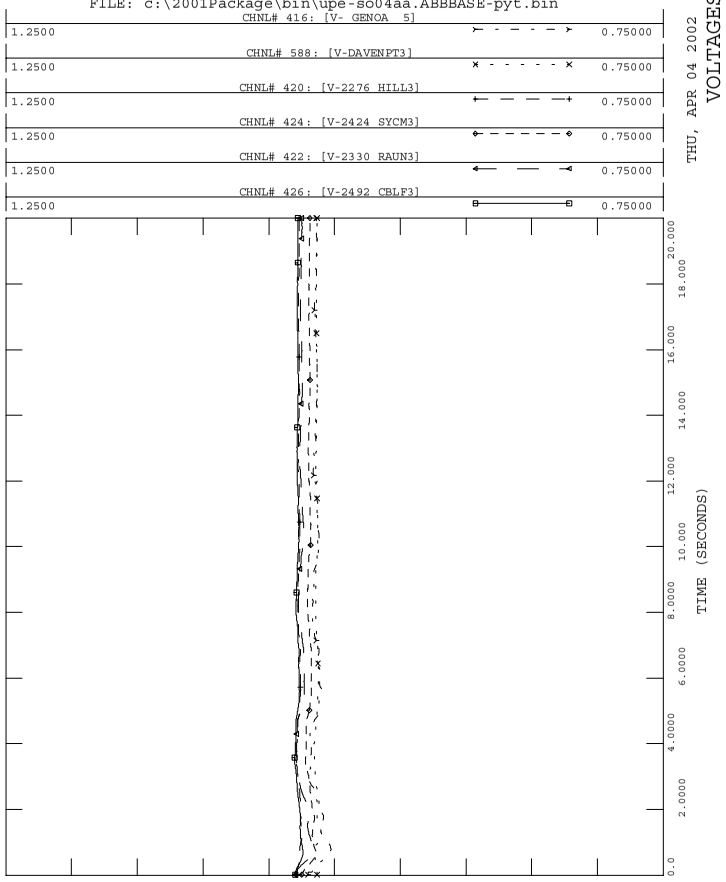
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin



THU, APR 04 2002 13:46
VOLTAGES IA

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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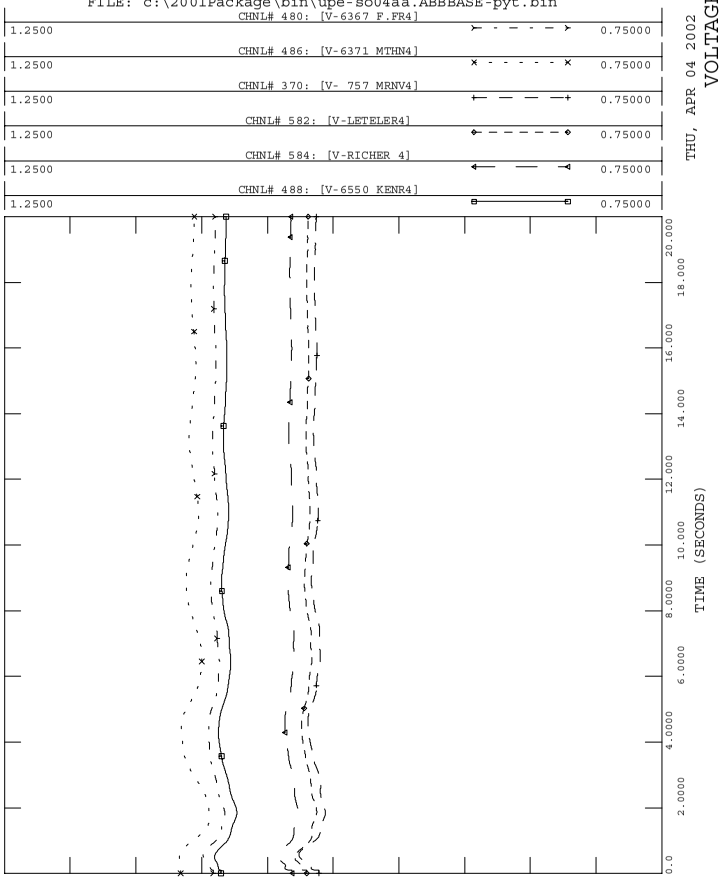
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin



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VOLTAGES 4

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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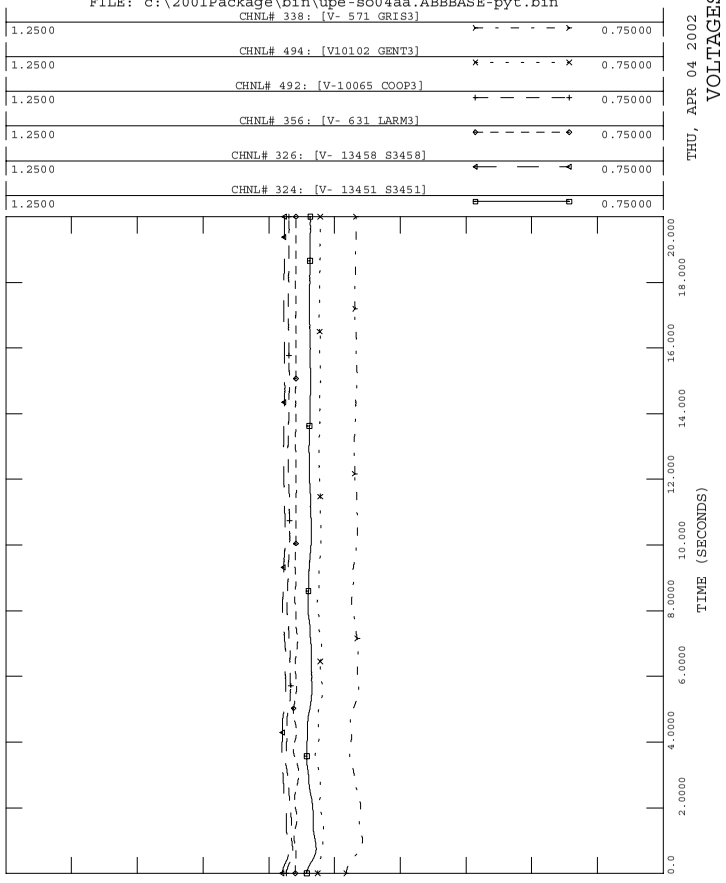
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin



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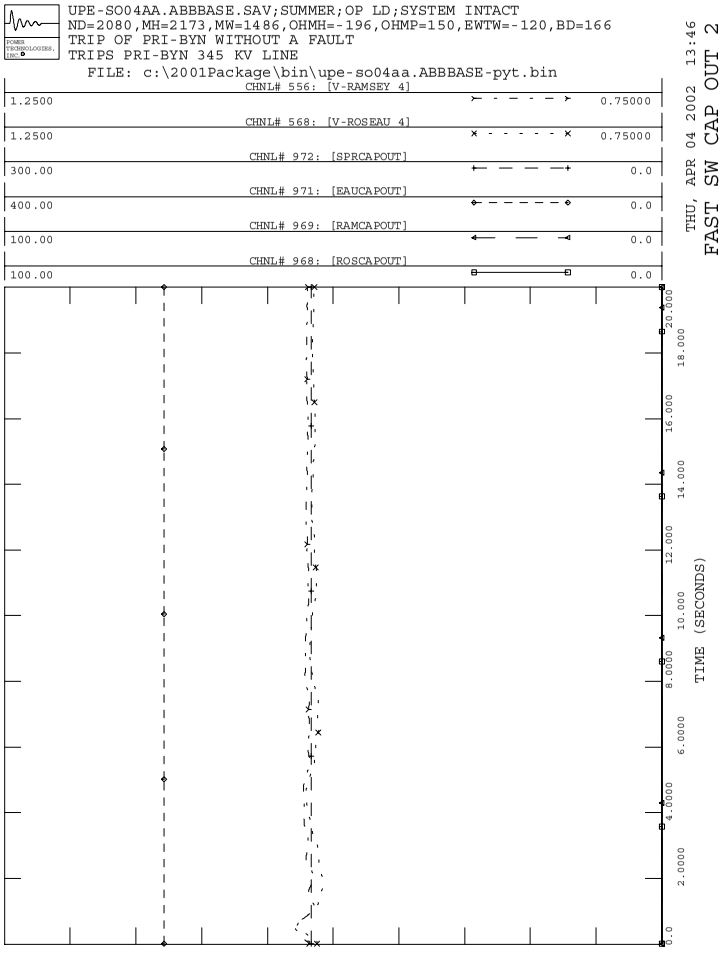
VOLTAGES NB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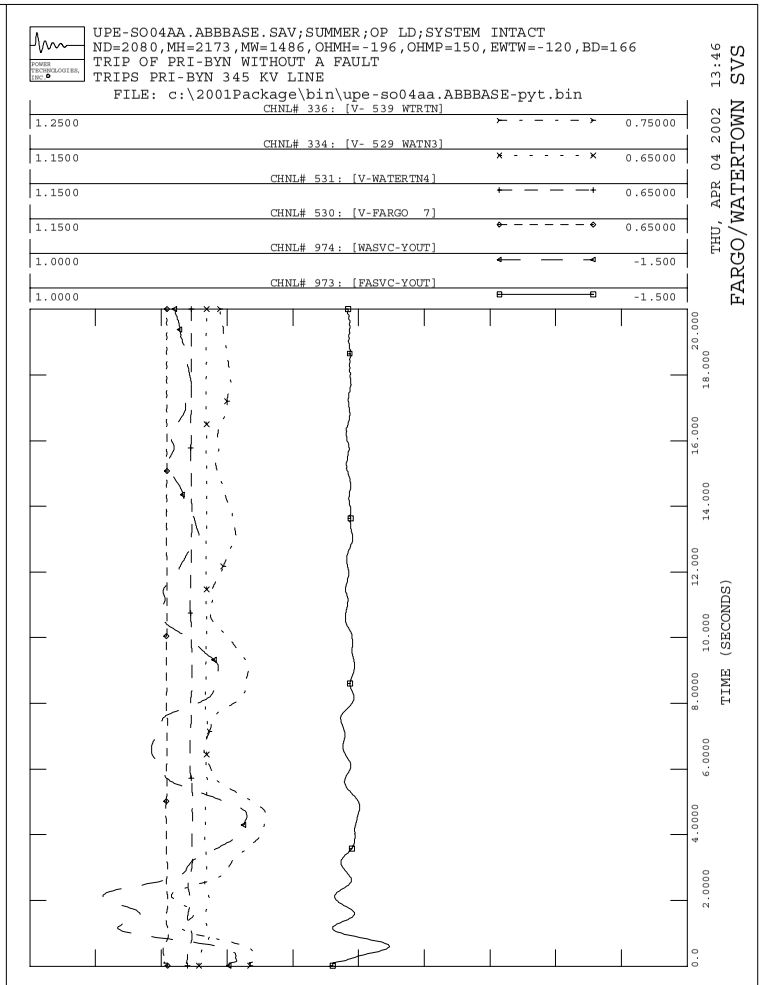
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
THU, APR 04 2002 13:46
FAST SW CAP OUT 2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TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
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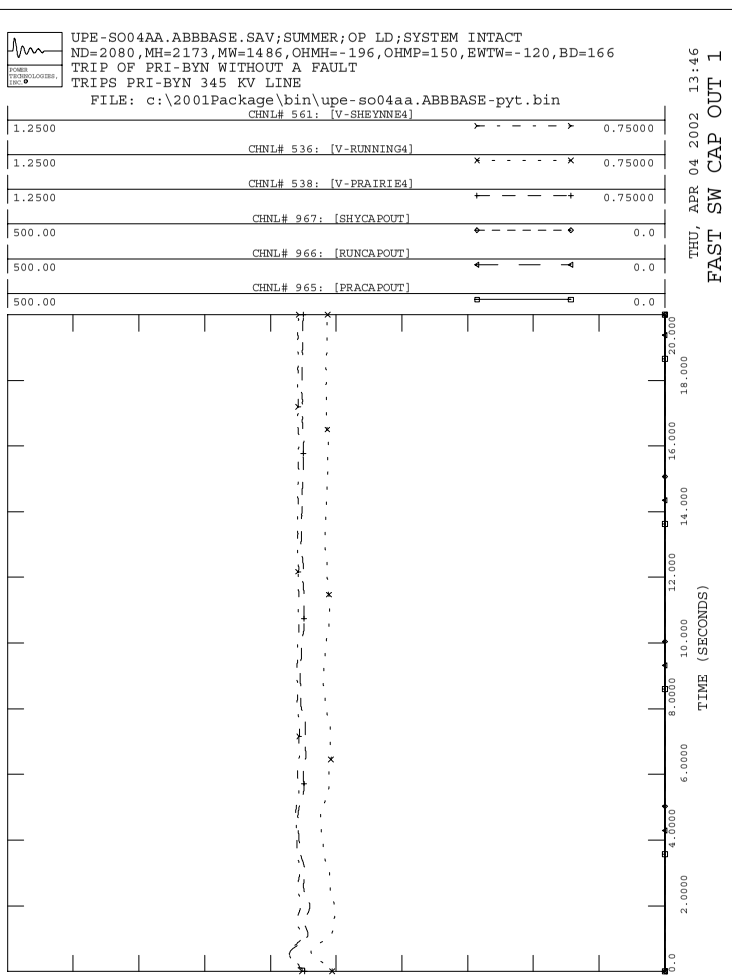
TIME (SECONDS)
THU, APR 04 2002 13:46
FARGO/WATERTOWN SVS


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
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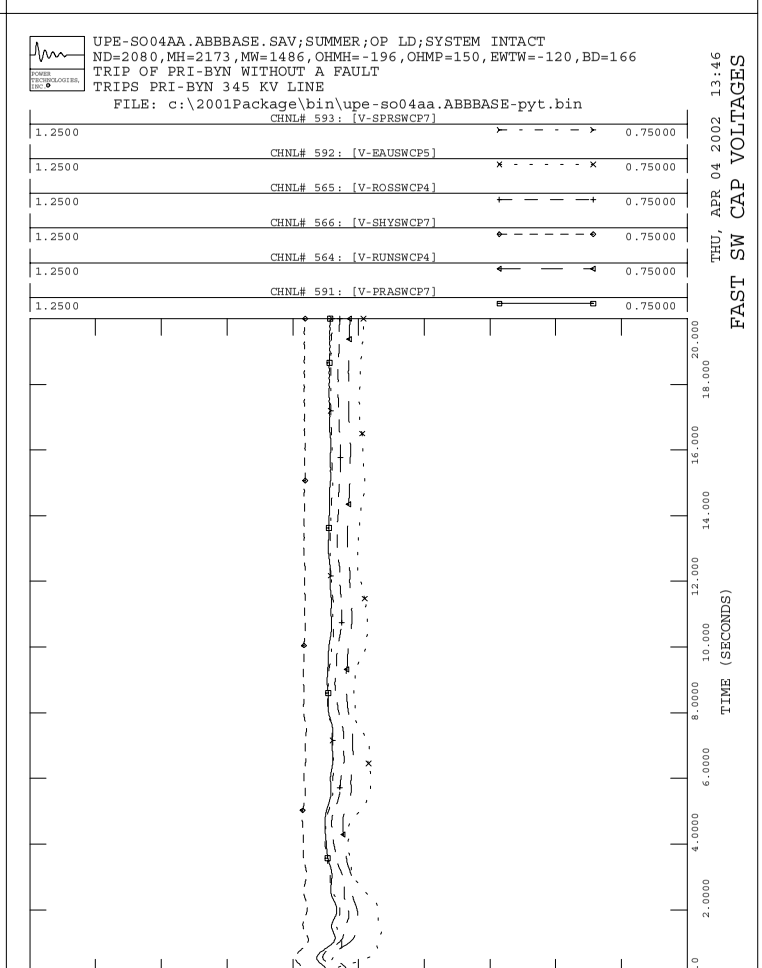
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
THU, APR 04 2002 13:46
FAST SW CAP OUT 1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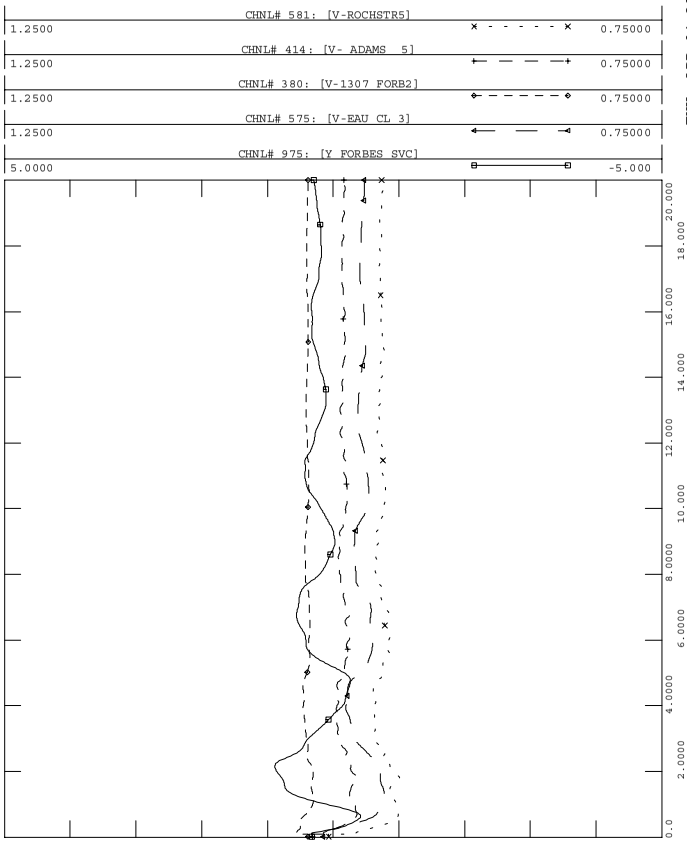
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
THU, APR 04 2002 13:46
FAST SW CAP VOLTAGES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46

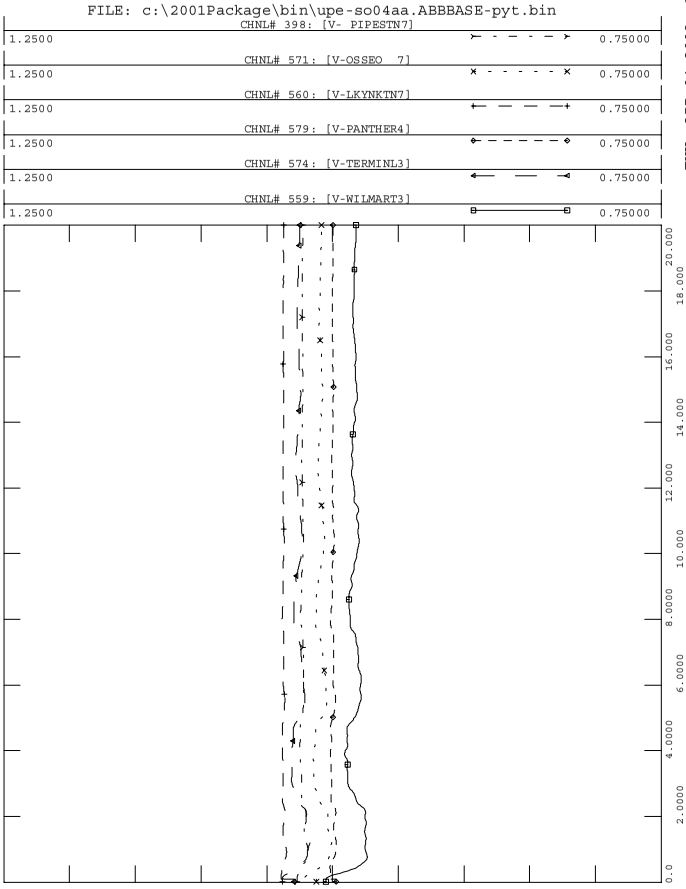
SVC & WISCONSIN VOLT



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46

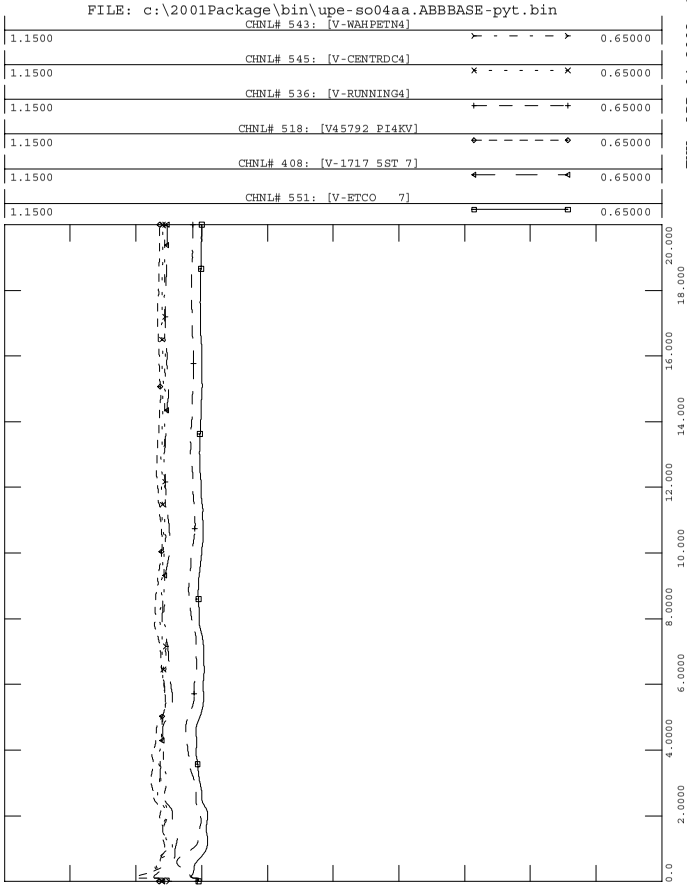
TC VOLTAGES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46

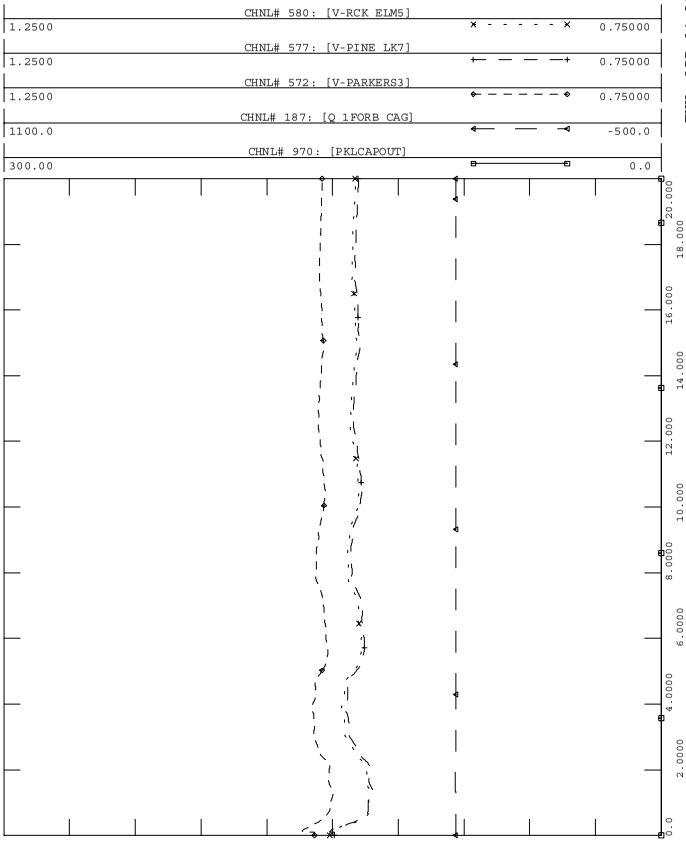
VOLTAGES 6



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

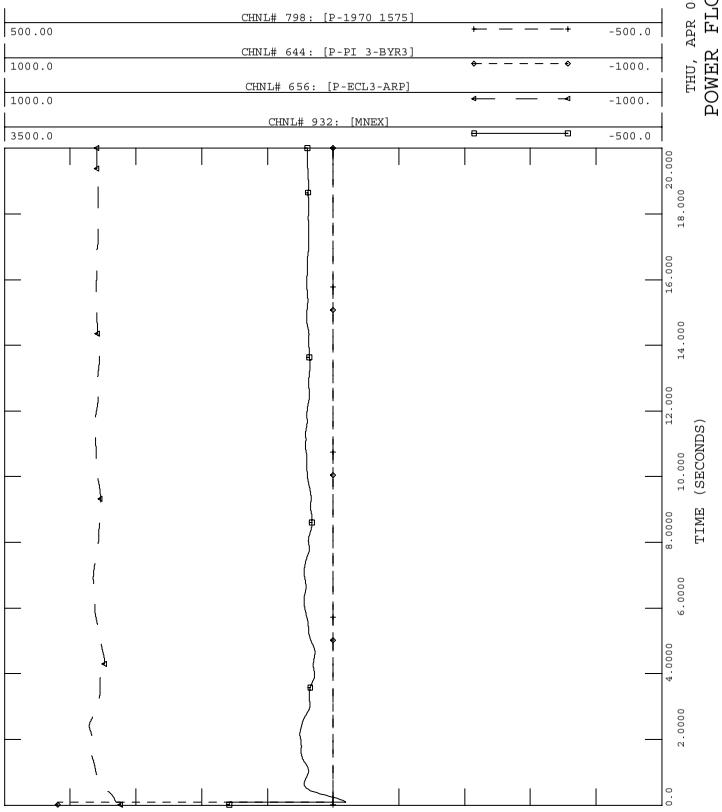
THU, APR 04 2002 13:46

FORBES SVS OUT & VOLTAGES



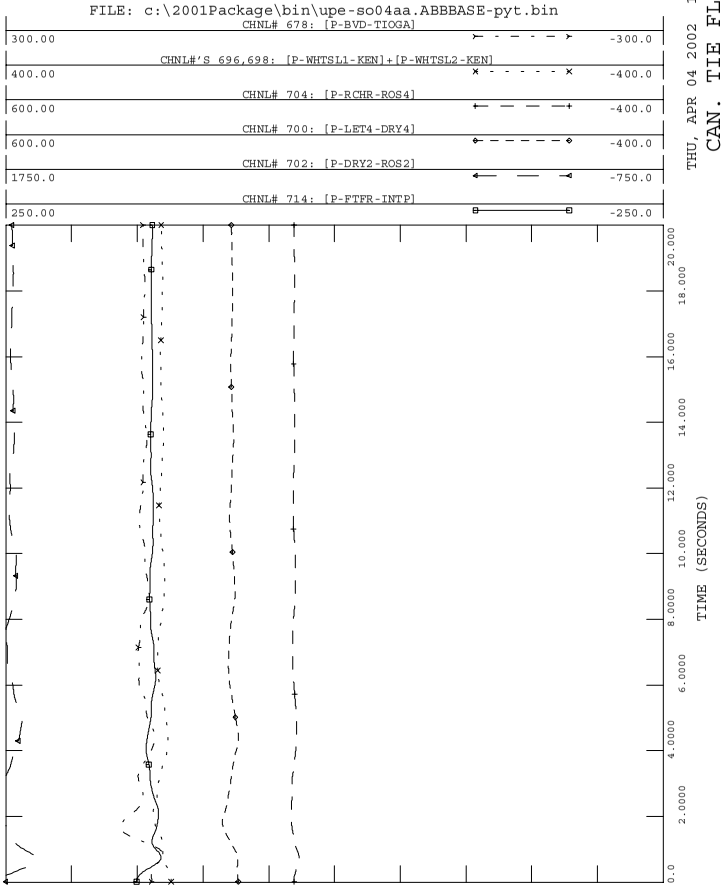
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
POWER FLOW SUMS 2



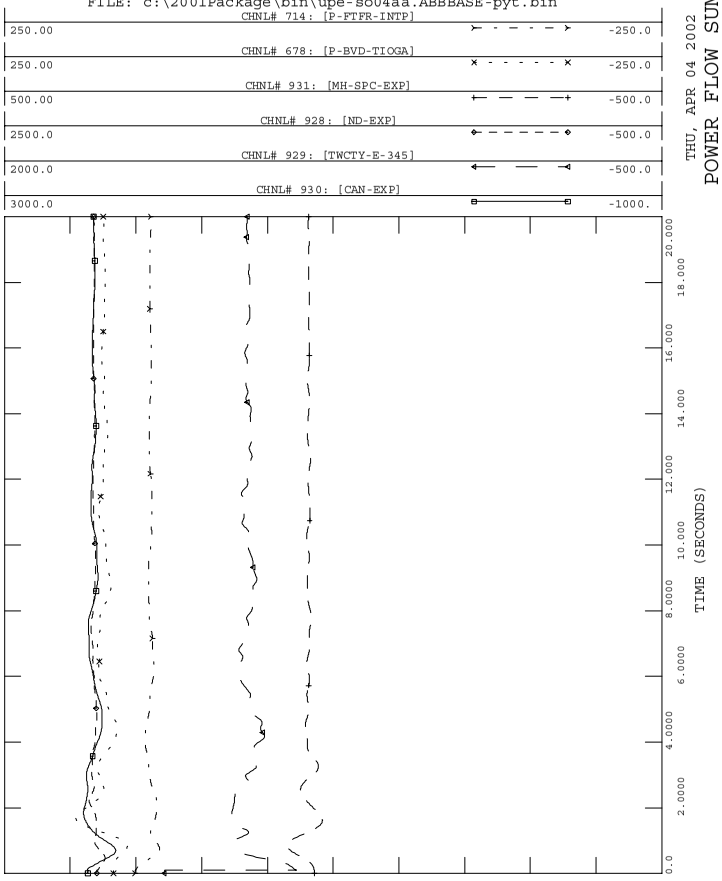
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
CAN. TIE FLOWS



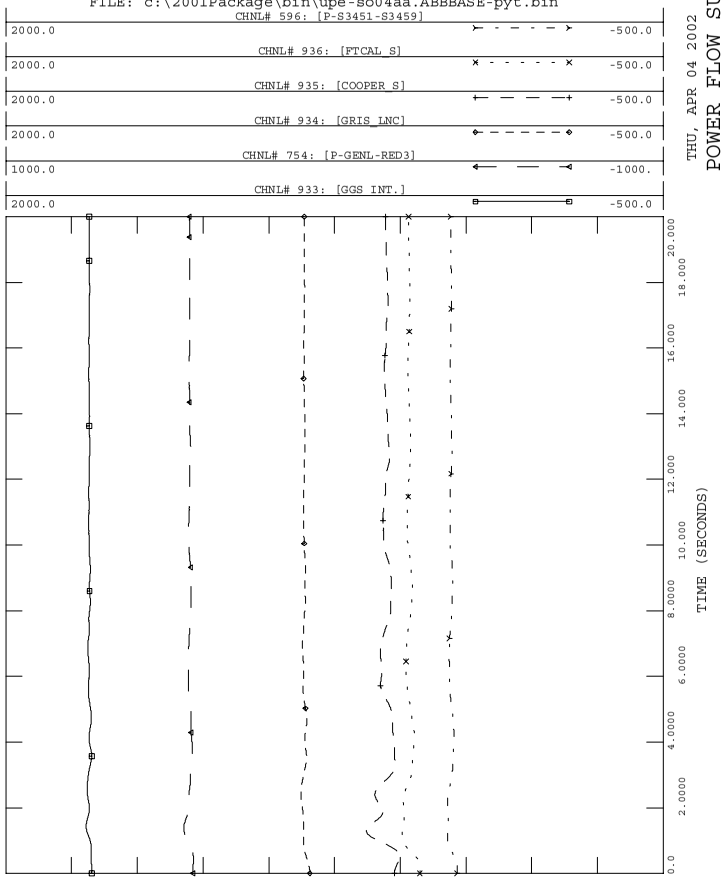
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
POWER FLOW SUMS 1



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
POWER FLOW SUM 3



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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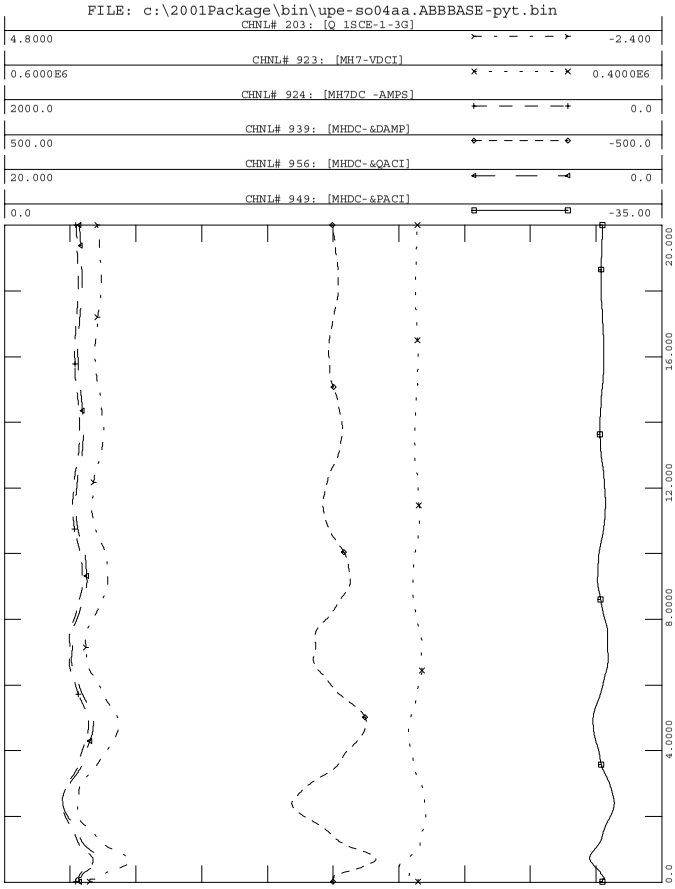
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
MH DC PARAMETERS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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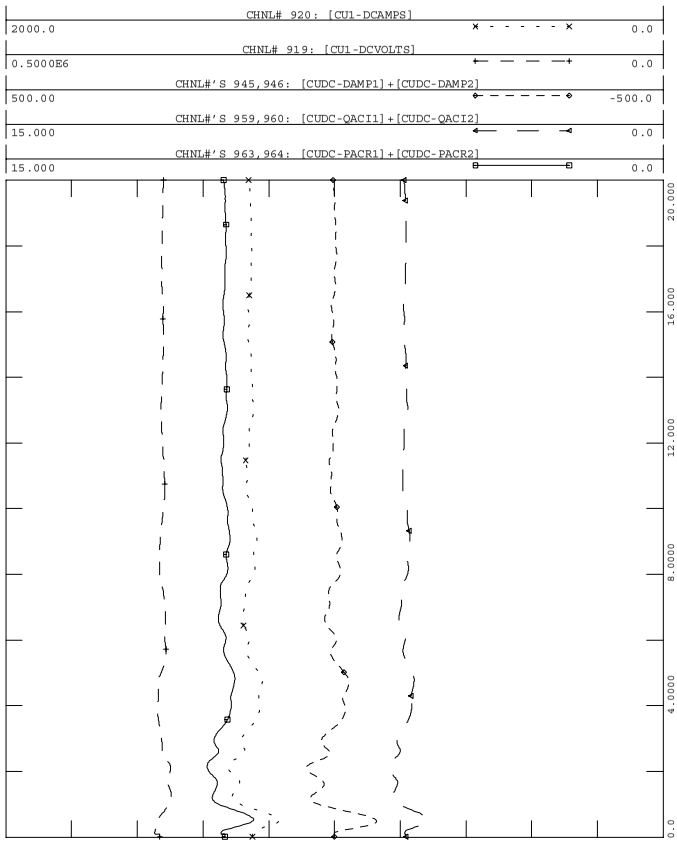
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
CU DC #1



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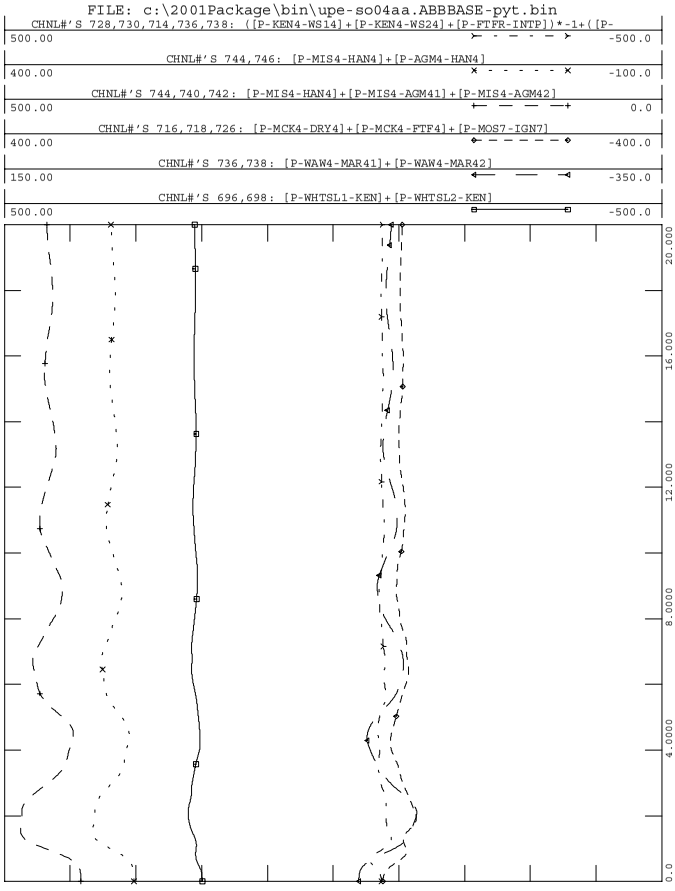
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
OH TIE FLOWS



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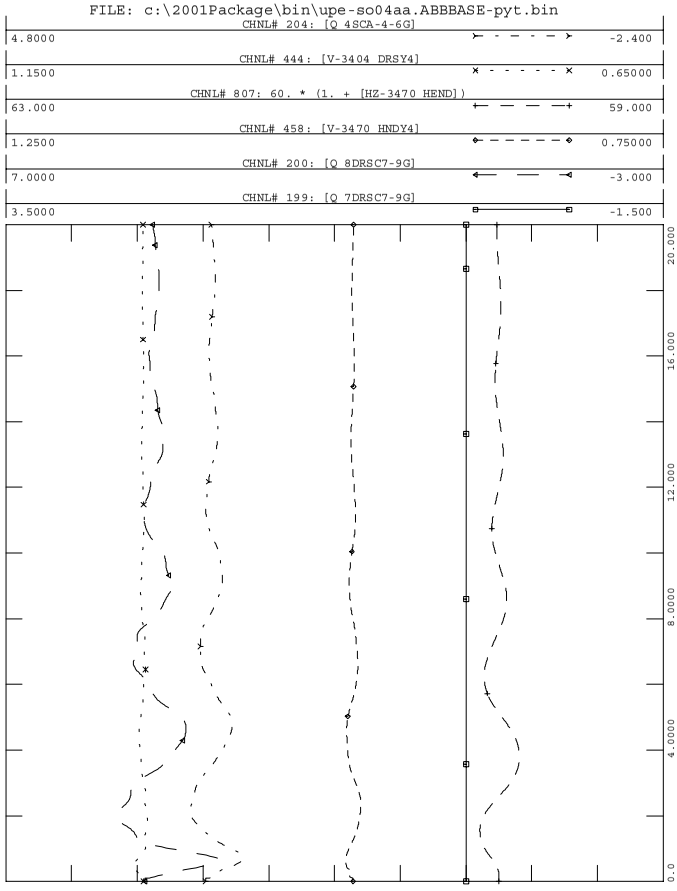
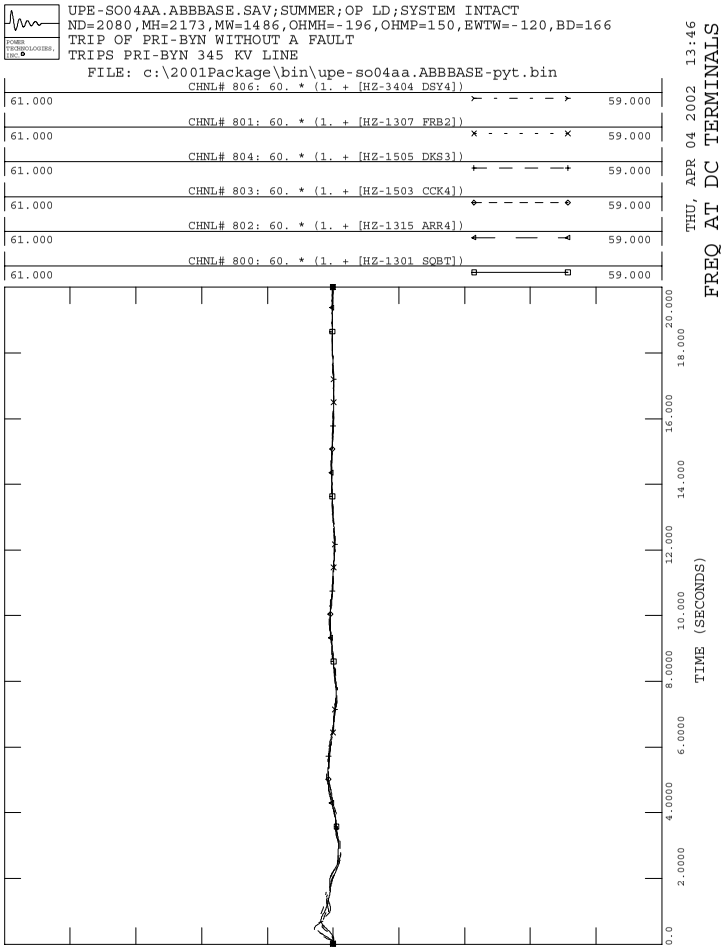
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

THU, APR 04 2002 13:46
MH DC PARAMETERS

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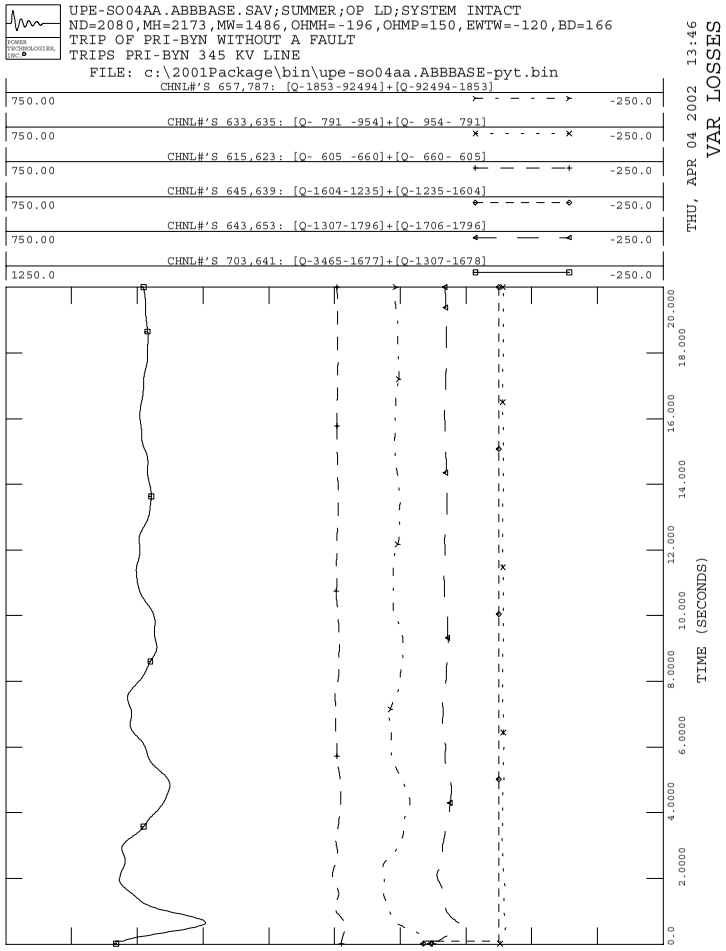
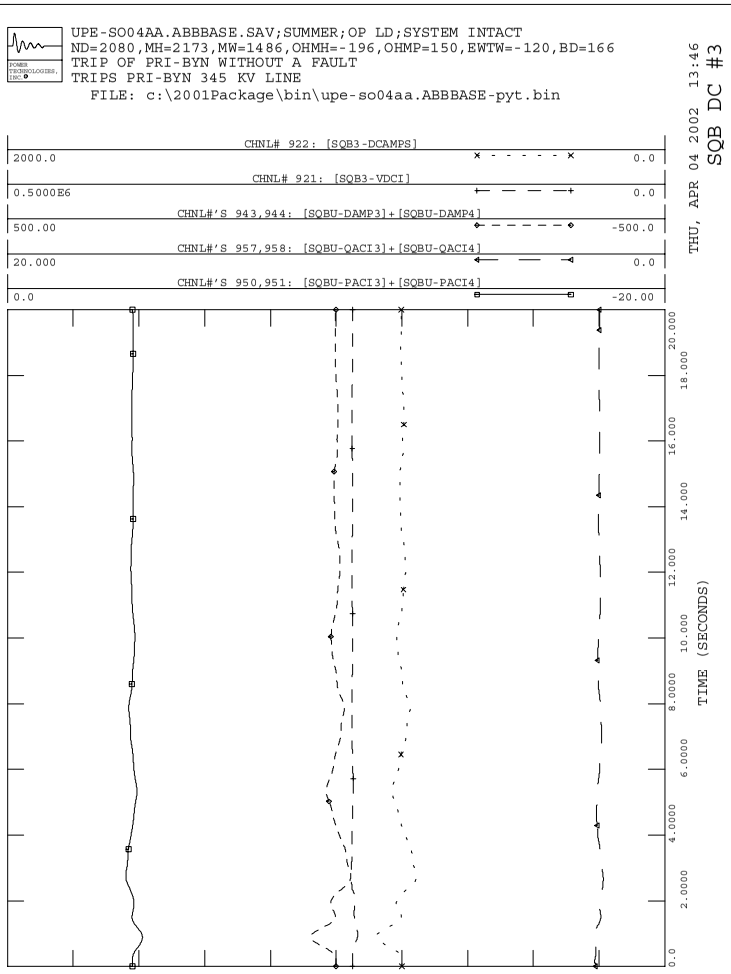
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
THU, APR 04 2002 13:46
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
THU, APR 04 2002 13:46
VAR LOSSES
TIME (SECONDS)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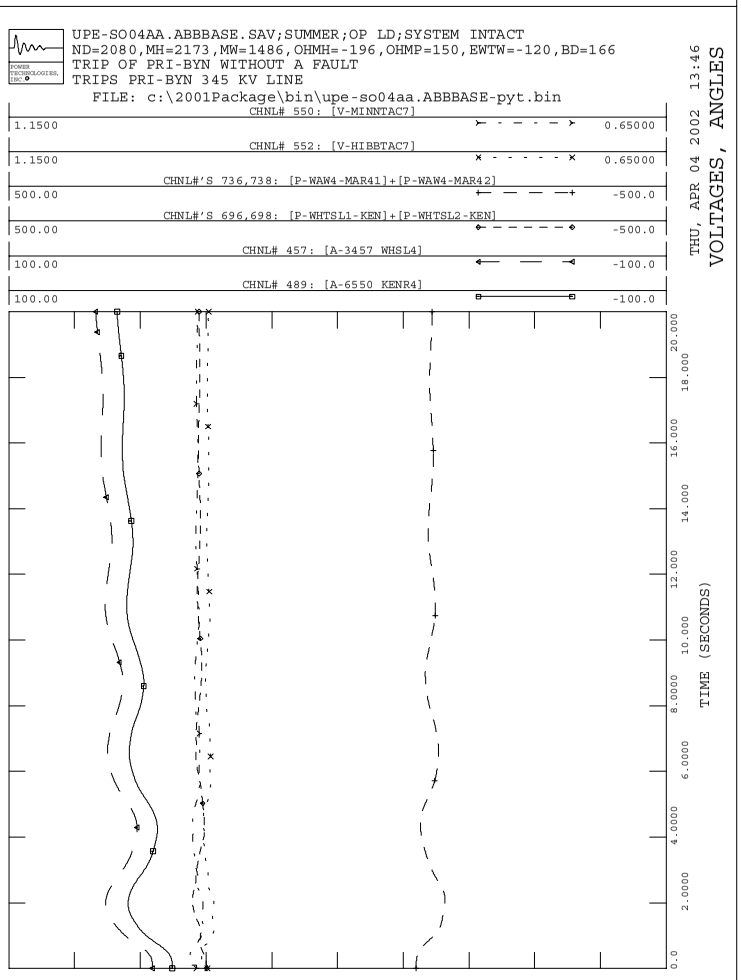
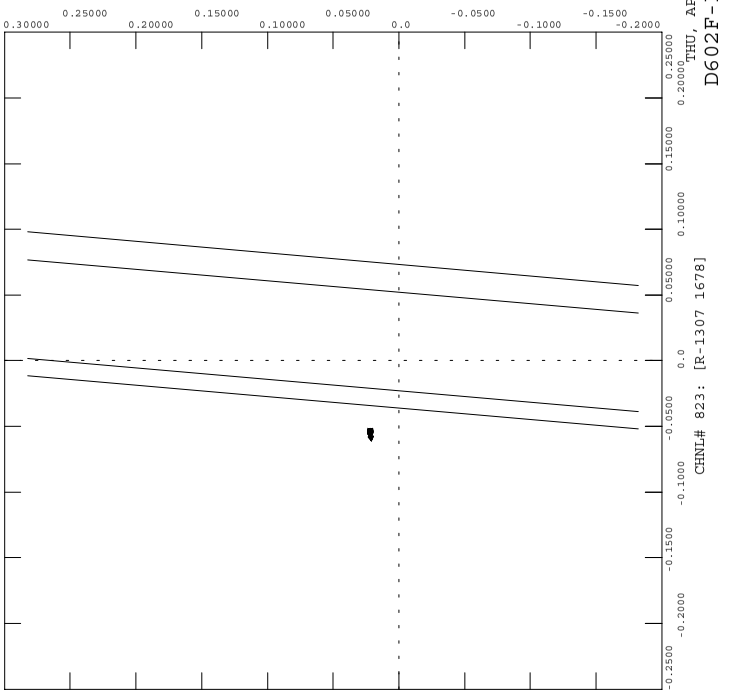
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
THU, APR 04 2002 13:46
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
THU, APR 04 2002 13:46
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

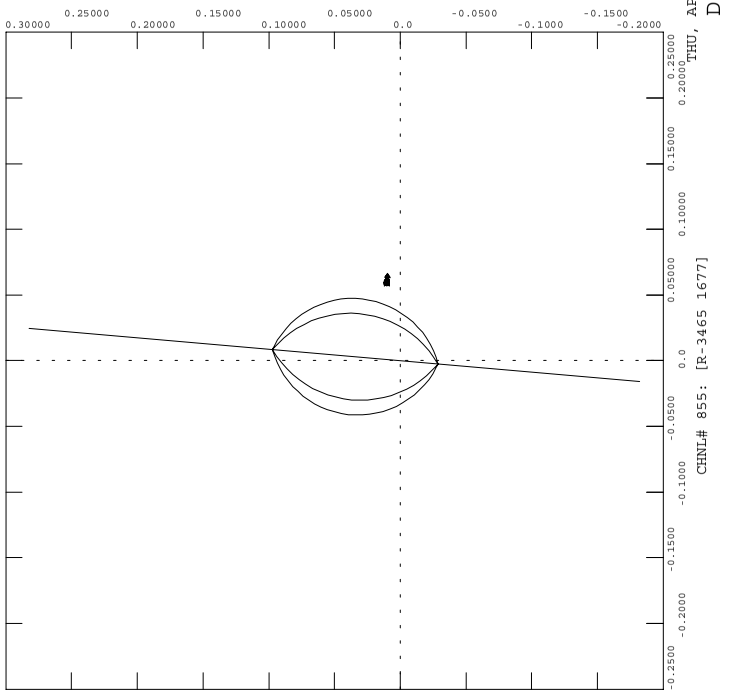


THU, APR 04 2002 13:46
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

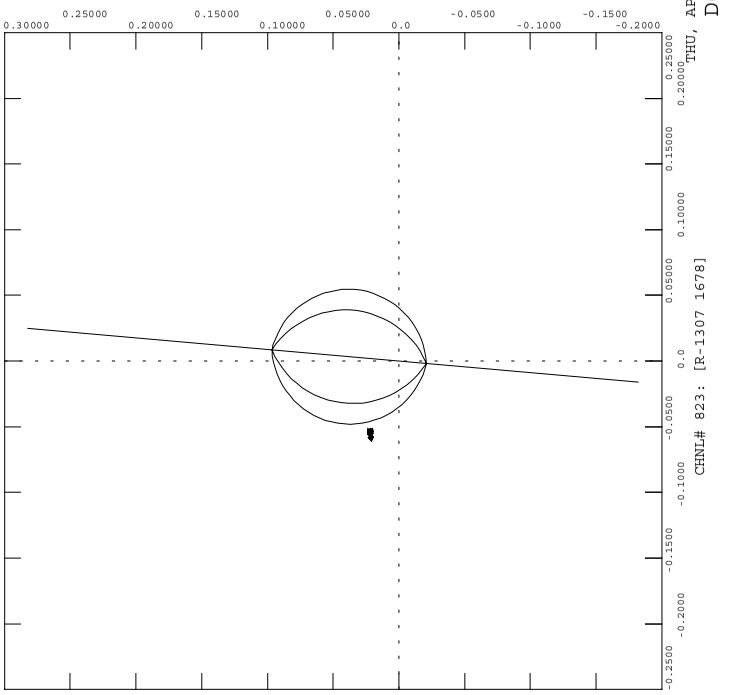


THU, APR 04 2002 13:46
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, APR 04 2002 13:46
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

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TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

RELAY: SLINOS
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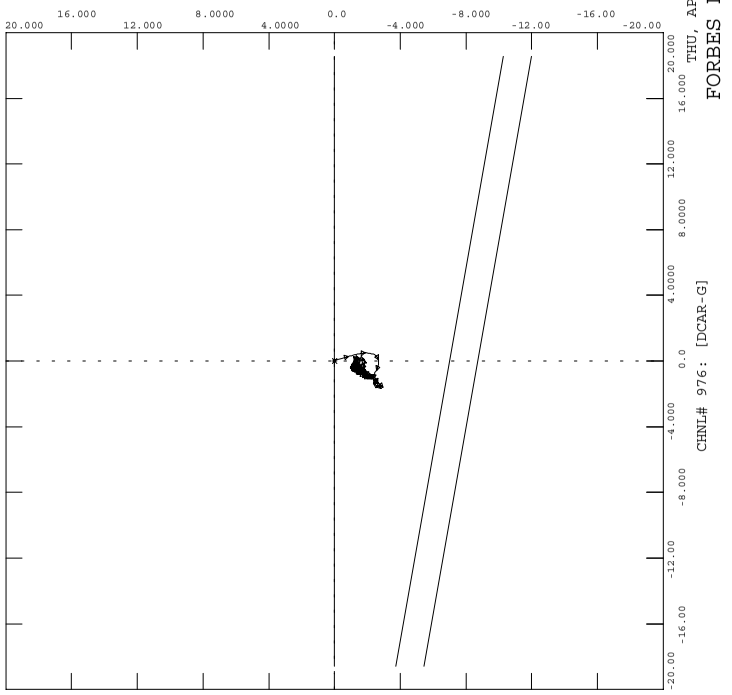
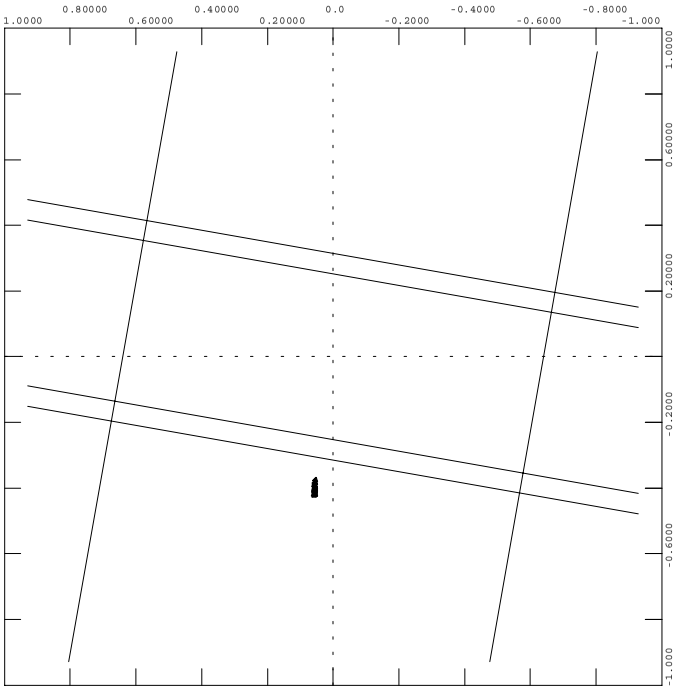


THU, APR 04 2002 13:46
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

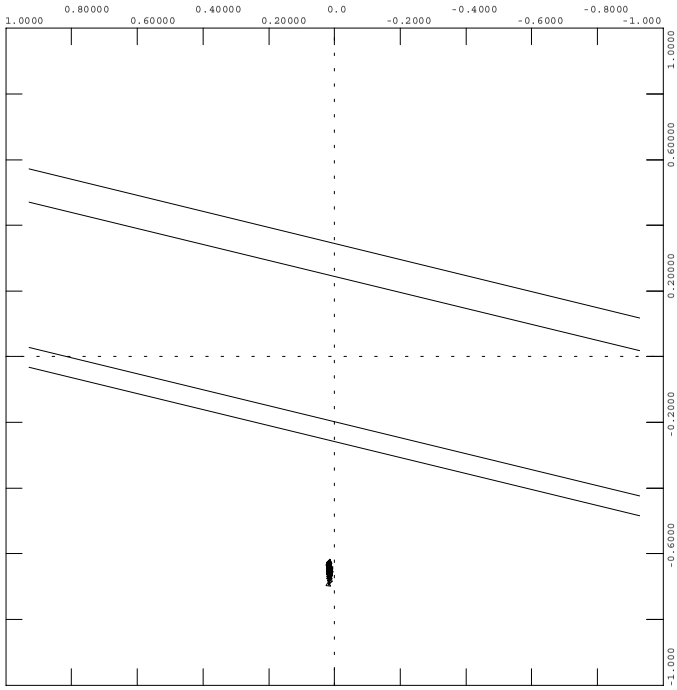
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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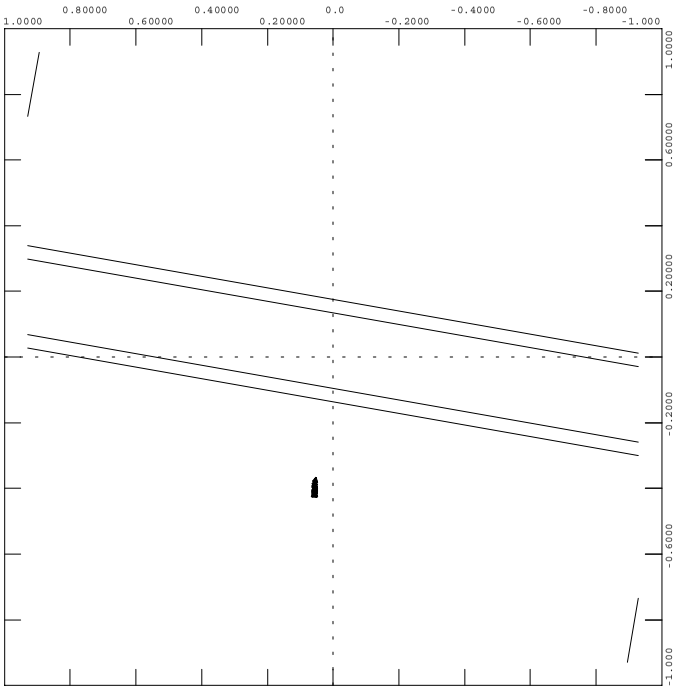

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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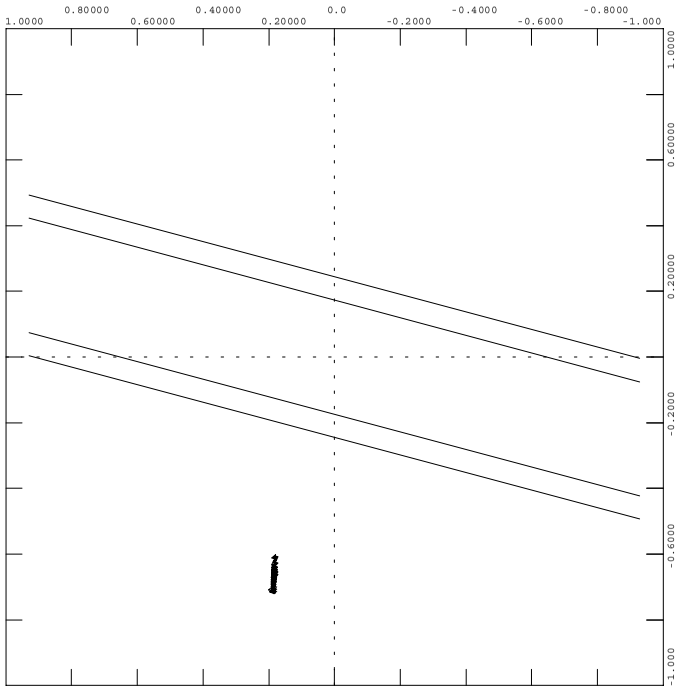

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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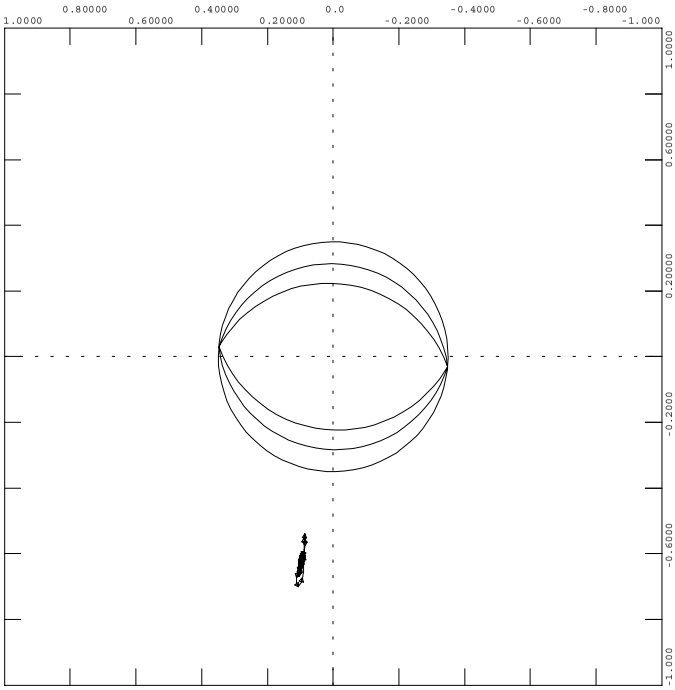
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

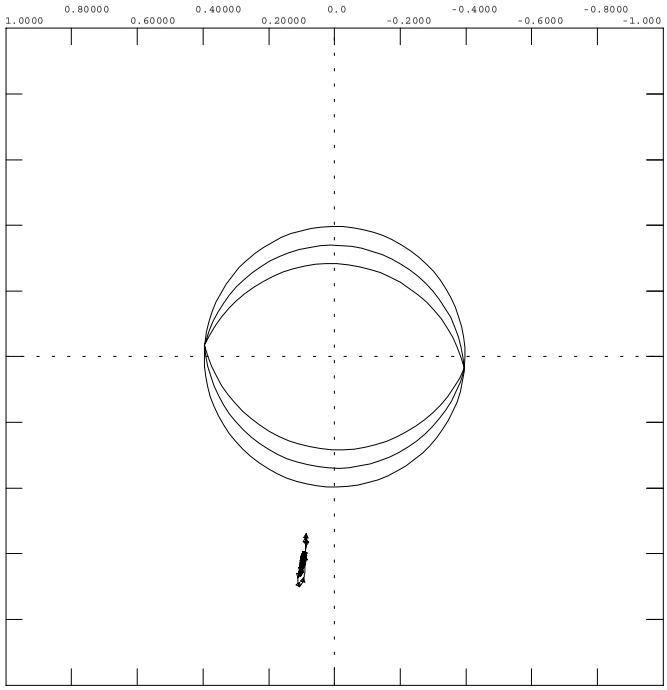
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



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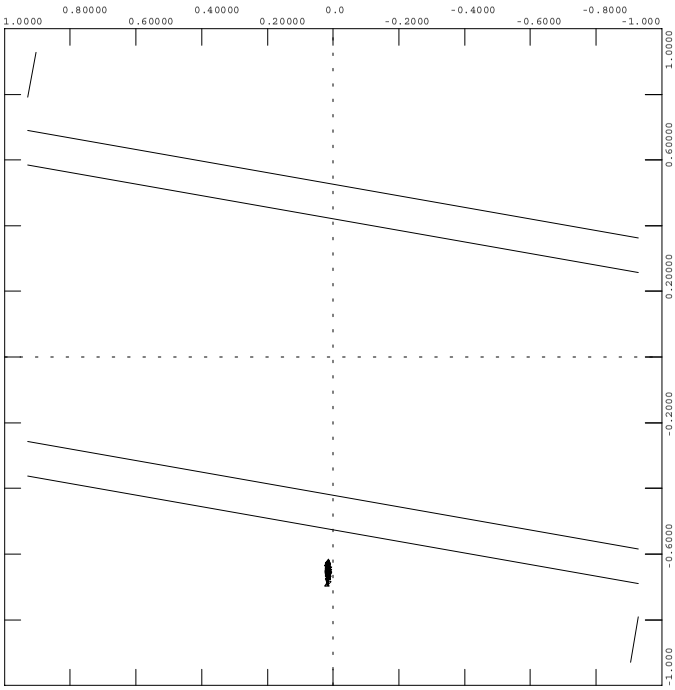
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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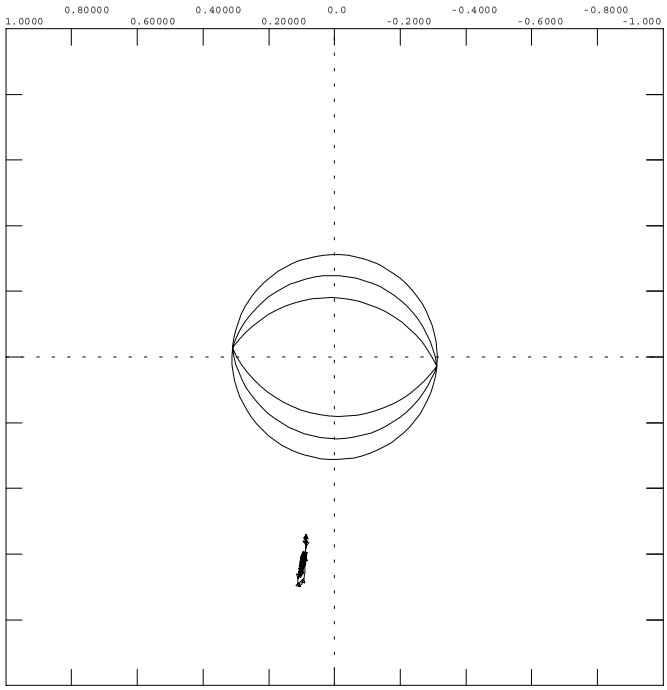
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

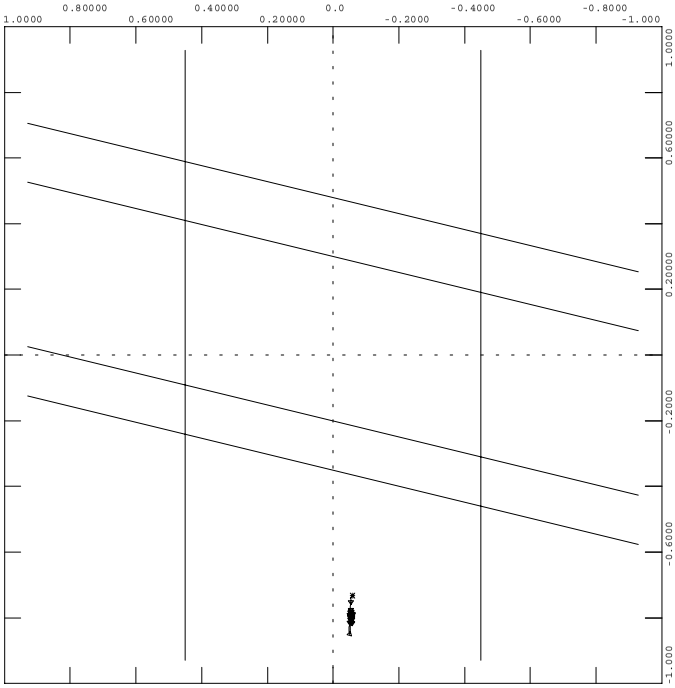
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
TRIP OF PRI-BYN WITHOUT A FAULT
TRIPS PRI-BYN 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.ABBBASE-pyt.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



THU, APR 04 2002 13:46
MP-OH I.FALLS (779)
CHNL# 847: [R-1484 6011]

APPENDIX 2

SCREENING OF MAPP CONTINGENCIES

WITH N-1 CONTINGENCY ANALYSES

ABBBASE Case (Without Future Coal or Wind Generation)

```
 SCREEN RESULTS FILE NAME: ABBBASESCREENACCC100PC.DAT

SCREENACCC PROGRAM (VERSION: BETA-9, 11/15/2000, SCS)  ----- DATE: THU, MAY 16 2002  8:36

***** ACCC FILE #1: upe-so04aa.ABBBASEMW100PC.OUT
***** ACCC DATE   : WED, MAY 15 2002  14:42

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166

ACCC FILE #1 SCANNING LIMIT/RATING:
  LOADING LIMIT  100.0% OF RATE: C

DISTRIBUTION FACTOR FILE:     upe-so04aa.ABBBASE.DFX
SUBSYSTEM DESCRIPTION FILE:   mapp.sys
MONITORED ELEMENT FILE:       mapp.mon
CONTINGENCY DESCRIPTION FILE: mapp.con


==============================================================================================
   1)  1677 ROSEAUN2 -  3465 DORSEY 2 CKT:  1          PST-CNT  RATING PERCENT
----------------------------------------------------------------------------------------------
  SINGLE 658  :   753 RUNNING4 -  1327 SHANNON4 CKT: 1  1986.6  1732.0   111.3
  SINGLE 2934 :  3461 RIDGEWY4 -  3477 RICHER 4 CKT: 1  1952.2  1732.0   109.2
  SINGLE 1373 :  1679 ROSEAU 4 -  3477 RICHER 4 CKT: 1  1939.9  1732.0   108.4
  SINGLE 675  :   757 MORANVI4 -  1679 ROSEAU 4 CKT: 1  1939.8  1732.0   108.4
  SINGLE 2610 :  3140 QE     6 -  3142 WJBUNN 6 CKT: 1  1909.9  1732.0   107.2
  SINGLE 657  :   753 RUNNING4 -   757 MORANVI4 CKT: 1  1901.0  1732.0   106.7
  SINGLE 2991 :  3606 WHSL2PH7 -  3607 WHITESH7 CKT: 1  1866.7  1732.0   104.7
  SINGLE 2993 :  3607 WHITESH7 -  3652 WHSL1PH7 CKT: 1  1866.6  1732.0   104.6
  SINGLE 2778 :  3420 BRANDON7 -  3700 CAN OXY7 CKT: 1  1856.8  1732.0   104.1
  SINGLE 2584 :  3112 CONDIE 6 -  3122 IPSCO  6 CKT: 1  1856.6  1732.0   104.0
  BASE CASE   : **       BASE CASE      **              1796.9  1732.0   100.5
…

==============================================================================================
   2)  2217 E MOLINE -  2267 SB 39  8 CKT:  1          PST-CNT  RATING PERCENT
----------------------------------------------------------------------------------------------
  SINGLE 1986 :  2263 A-R5  8  - 60264 RIVSID5G CKT: 1   159.8   125.0   127.9
  SINGLE 1943 :  2214 SB  A 5  -  2263 A-R5  8  CKT: 1   154.5   125.0   123.6
  SINGLE 1932 :  2211 DAVNPRT5 -  2262 SB 56 #2 CKT: 1   149.3   125.0   119.4
  SINGLE 1957 :  2219 SB 18  5 -  2270 SB 18 8  CKT: 2   147.2   125.0   117.8
  SINGLE 1931 :  2211 DAVNPRT5 -  2261 SB 56 #1 CKT: 1   147.3   125.0   117.8
  SINGLE 1916 :  2201 DAVNPRT3 -  2211 DAVNPRT5 CKT: 1   146.4   125.0   117.1
  SINGLE 1948 :  2217 E MOLINE -  2218 SB 43  5 CKT: 1   145.9   125.0   116.7
  SINGLE 1952 :  2218 SB 43  5 -  2219 SB 18  5 CKT: 1   144.2   125.0   115.4
  SINGLE 1949 :  2217 E MOLINE -  2231 SB 28  5 CKT: 1   143.6   125.0   114.9
  SINGLE 1988 :  2266 SB  E 8  -  2268 SB 37 8  CKT: 1   143.5   125.0   114.8
  BASE CASE   : **       BASE CASE      **              135.5   125.0   108.4

==============================================================================================
   3)  2308 BURT   5 - 60312 BURTMID8 CKT:  1          PST-CNT  RATING PERCENT
----------------------------------------------------------------------------------------------
  BASE CASE   : **       BASE CASE      **                61.1    61.0   100.2

==============================================================================================
   4)  2309 BURT 8   - 60312 BURTMID8 CKT:  1          PST-CNT  RATING PERCENT
----------------------------------------------------------------------------------------------
  BASE CASE   : **       BASE CASE      **                61.1    61.0   100.2

==============================================================================================
   5)  2474 KNXVL  8 -  2681 LUCAS  8 CKT:  1          PST-CNT  RATING PERCENT
----------------------------------------------------------------------------------------------
  SINGLE 2238 :  2467 BEACON 5 -  2640 EIC    5 CKT: 1    34.3    17.4   192.7
  SINGLE 456  :   560 CRESTON5 -   569 CRESTON8 CKT: 1    29.1    17.4   164.2
  SINGLE 2243 :  2468 BEACON 8 -  2474 KNXVL  8 CKT: 1    28.9    17.4   162.5
  SINGLE 2241 :  2467 BEACON 5 - 60430 BEAC MD8 CKT: 1    26.4    17.4   148.4
  SINGLE 2246 :  2468 BEACON 8 - 60430 BEAC MD8 CKT: 1    26.4    17.4   148.4
  SINGLE 2237 :  2455 MNTZUMA3 -  2660 OTTUMWA3 CKT: 1    25.4    17.4   142.7
  SINGLE 2495 :  2660 OTTUMWA3 - 62660 OTTUMWAY CKT: 1    25.4    17.4   142.7
  SINGLE 2498 :  2661 OTTUMWA5 - 62660 OTTUMWAY CKT: 1    25.4    17.4   142.7
  SINGLE 2176 :  2407 BOONVIL3 - 10065 COOPER 3 CKT: 1    23.5    17.4   132.2
  SINGLE 2190 :  2411 DMOINES8 - 60410 DMSMID28 CKT: 2    23.5    17.4   132.0
  BASE CASE   : **       BASE CASE      **                21.4    17.4   120.4
…
```

```
==========================================================================================
   6)  2542 WILMSBG7 -  2614 WILMSBG9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2358 :  2542 WILMSBG7 -  2614 WILMSBG9 CKT: 2    32.7    16.0   204.5
  BASE CASE   : **       BASE CASE      **                21.6    16.0   135.1

==========================================================================================
   7) 47626 ST CROIG - 57251 T OSCOLA CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1588 :  1804 LAW CRK4 -  1809 APPLRV 4 CKT: 1   100.1    52.8   178.0
  SINGLE 1912 :  2165 APL RVR5 - 57307 APLRVR 8 CKT: 1    63.6    52.8   115.1
  SINGLE 1913 :  2165 APL RVR5 - 57307 APLRVR 8 CKT: 2    63.6    52.8   115.1
  SINGLE 1408 :  1697 AS KING7 -  1878 WIL R T7 CKT: 1    62.2    52.8   112.8
  SINGLE 4262 : 46000 ROCKCR 4 - 57495 ROCKCR8  CKT: 1    61.6    52.8   111.5
  SINGLE 5739 : 57489 HOFFMAN9 - 57492 HOFFMAN8 CKT: 1    61.6    52.8   111.5
  SINGLE 5741 : 57492 HOFFMAN8 - 57495 ROCKCR8  CKT: 1    61.6    52.8   111.5
  SINGLE 1590 :  1804 LAW CRK4 -  7871 LAW CRK7 CKT: 1    61.4    52.8   111.0
  SINGLE 1673 :  1863 PINE LK7 -  1878 WIL R T7 CKT: 1    60.9    52.8   110.5
  SINGLE 1036 :  1383 STIN-MN7 -  1384 STIN-WI7 CKT: 1    60.7    52.8   110.2
  BASE CASE   : **       BASE CASE      **                57.1    52.8   103.3

==========================================================================================
   8) 49037 MILOMA   - 49064 W LKFLTP CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  BASE CASE   : **       BASE CASE      **                24.6    20.9   123.9
  SINGLE 4942 : 49059 ENTRPRIS - 52029 JACKN M8 CKT: 1    21.4    20.9   106.1
  SINGLE 4943 : 49061 RND LKTP - 49062 ROUND LK CKT: 1    20.6    20.9   102.2

==========================================================================================
   9) 49061 RND LKTP - 49064 W LKFLTP CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  BASE CASE   : **       BASE CASE      **                22.7    20.9   116.1

==========================================================================================
  10) 52000 MAGNLIA8 - 52025 MAGNLIA9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  BASE CASE   : **       BASE CASE      **                11.3     9.9   114.0

==========================================================================================
  11)   308 WLINC  7 - 16080 WLINC A9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 7    :   308 WLINC  7 - 16080 WLINC A9 CKT: 2    42.2    42.0   100.4

==========================================================================================
  12)  *** NOT CONVERGED ***                           PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 107  :   402 MI CTYW4 -   450 MT WEST4 CKT: 1     0.0     0.0     0.0
  SINGLE 108  :   403 DAWSONC4 -   405 FTPECK 4 CKT: 1     0.0     0.0     0.0
  SINGLE 110  :   403 DAWSONC4 -   413 MEDORA 4 CKT: 1     0.0     0.0     0.0
  SINGLE 117  :   405 FTPECK 4 -   414 FTPECK4G CKT: 1     0.0     0.0     0.0
  SINGLE 118  :   405 FTPECK 4 -   415 FTPECK5G CKT: 1     0.0     0.0     0.0
  SINGLE 133  :   413 MEDORA 4 -   425 BELFELD4 CKT: 1     0.0     0.0     0.0
  SINGLE 137  :   417 DICKNSN4 -   425 BELFELD4 CKT: 1     0.0     0.0     0.0
  SINGLE 152  :   424 BELFELD3 -   683 CHAR.CK3 CKT: 1     0.0     0.0     0.0
  SINGLE 153  :   424 BELFELD3 - 19042 BELFELDT CKT: 1     0.0     0.0     0.0
  SINGLE 154  :   425 BELFELD4 - 19042 BELFELDT CKT: 1     0.0     0.0     0.0
  SINGLE 156  :   426 BISMARK4 -   441 GARRISN4 CKT: 1     0.0     0.0     0.0
  SINGLE 158  :   426 BISMARK4 -   456 WASHBRN4 CKT: 1     0.0     0.0     0.0
  SINGLE 193  :   437 GRNDFKS4 -   755 PRAIRIE4 CKT: 1     0.0     0.0     0.0
  SINGLE 198  :   438 FORMAN 7 -   522 SUMMIT-7 CKT: 1     0.0     0.0     0.0
  SINGLE 203  :   441 GARRISN4 -   457 GARISN1G CKT: 1     0.0     0.0     0.0
  SINGLE 204  :   441 GARRISN4 -   458 GARISN2G CKT: 1     0.0     0.0     0.0
  SINGLE 205  :   441 GARRISN4 -   459 GARISN3G CKT: 1     0.0     0.0     0.0
  SINGLE 208  :   442 GARRISN7 -   460 GARISN4G CKT: 1     0.0     0.0     0.0
  SINGLE 209  :   442 GARRISN7 -   461 GARISN5G CKT: 1     0.0     0.0     0.0
  SINGLE 211  :   442 GARRISN7 -   808 BEULAH 7 CKT: 1     0.0     0.0     0.0
  SINGLE 214  :   443 GRNDFKS7 - 19005 GRNDFKS8 CKT: 1     0.0     0.0     0.0
  SINGLE 239  :   456 WASHBRN4 -   606 LELANDO4 CKT: 1     0.0     0.0     0.0
  SINGLE 244  :   475 BONESTL7 -   478 GREGORY7 CKT: 1     0.0     0.0     0.0
  SINGLE 245  :   475 BONESTL7 -   510 FTRANDL7 CKT: 1     0.0     0.0     0.0
  SINGLE 263  :   482 MISSION7 -   495 WITTEN 7 CKT: 1     0.0     0.0     0.0
  SINGLE 264  :   482 MISSION7 -   653 VETALTP7 CKT: 1     0.0     0.0     0.0
  SINGLE 265  :   482 MISSION7 - 10296 VALENTN7 CKT: 1     0.0     0.0     0.0
  SINGLE 306  :   503 BLAIR  4 -   530 WATERTN4 CKT: 1     0.0     0.0     0.0
  SINGLE 308  :   503 BLAIR  4 -   910 BIGSTON4 CKT: 1     0.0     0.0     0.0
```

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==========================================================================================
  12)  *** NOT CONVERGED ***  (CONT.)                                PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 316  :   506 FTTHOMP3 -   571 GR ISLD3 CKT: 1     0.0      0.0      0.0
  SINGLE 317  :   506 FTTHOMP3 -   605 LELANDO3 CKT: 1     0.0      0.0      0.0
  SINGLE 328  :   507 FTTHOMP4 -   523 SIOUXFL4 CKT: 1     0.0      0.0      0.0
  SINGLE 329  :   507 FTTHOMP4 -   540 BIGBND14 CKT: 1     0.0      0.0      0.0
  SINGLE 330  :   507 FTTHOMP4 -   541 BIGBND24 CKT: 1     0.0      0.0      0.0
  SINGLE 340  :   509 FTRANDL4 -   547 FTRDL34G CKT: 1     0.0      0.0      0.0
  SINGLE 341  :   509 FTRANDL4 -   548 FTRDL56G CKT: 1     0.0      0.0      0.0
  SINGLE 342  :   509 FTRANDL4 -   549 FTRDL78G CKT: 1     0.0      0.0      0.0
  SINGLE 344  :   509 FTRANDL4 - 10062 COLMBUS4 CKT: 1     0.0      0.0      0.0
  SINGLE 346  :   510 FTRANDL7 -   546 FTRDL12G CKT: 1     0.0      0.0      0.0
  SINGLE 347  :   510 FTRANDL7 - 10263 SPENCER7 CKT: 1     0.0      0.0      0.0
  SINGLE 353  :   511 GAVINS 7 - 10029 BLMFLD 7 CKT: 1     0.0      0.0      0.0
  SINGLE 362  :   513 HANLON 4 -   622 STORLA 4 CKT: 1     0.0      0.0      0.0
  SINGLE 369  :   514 HURON  4 - 22155 BRDLAND4 CKT: 1     0.0      0.0      0.0
  SINGLE 386  :   519 OAHE   4 -   556 OAHE2-3G CKT: 1     0.0      0.0      0.0
  SINGLE 387  :   519 OAHE   4 -   557 OAHE4-5G CKT: 1     0.0      0.0      0.0
  SINGLE 388  :   519 OAHE   4 -   558 OAHE6-7G CKT: 1     0.0      0.0      0.0
  SINGLE 389  :   520 OAHE   7 -   559 OAHE  1G CKT: 1     0.0      0.0      0.0
  SINGLE 392  :   522 SUMMIT-7 -   531 WATERTN7 CKT: 1     0.0      0.0      0.0
  SINGLE 394  :   522 SUMMIT-7 - 19022 SUMMIT-8 CKT: 1     0.0      0.0      0.0
  SINGLE 410  :   529 WATERTN3 -   537 WHITE  3 CKT: 1     0.0      0.0      0.0
  SINGLE 429  :   537 WHITE  3 - 45641 SPLTRTA3 CKT: 1     0.0      0.0      0.0
  SINGLE 432  :   540 BIGBND14 -   542 BGBND12G CKT: 1     0.0      0.0      0.0
  SINGLE 433  :   540 BIGBND14 -   543 BGBND34G CKT: 1     0.0      0.0      0.0
  SINGLE 434  :   541 BIGBND24 -   544 BGBND56G CKT: 1     0.0      0.0      0.0
  SINGLE 435  :   541 BIGBND24 -   545 BGBND78G CKT: 1     0.0      0.0      0.0
  SINGLE 436  :   550 GRANITF4 -   554 MORRIS 4 CKT: 1     0.0      0.0      0.0
  SINGLE 440  :   550 GRANITF4 - 46605 MNVLTAP4 CKT: 1     0.0      0.0      0.0
  SINGLE 442  :   551 GRANITF7 -   920 CANBY  7 CKT: 1     0.0      0.0      0.0
  SINGLE 453  :   555 MORRIS 7 -  1935 GRACEVT7 CKT: 1     0.0      0.0      0.0
  SINGLE 477  :   564 SIOUXCY3 - 45646 SPLTRTB3 CKT: 1     0.0      0.0      0.0
  SINGLE 493  :   571 GR ISLD3 - 10186 MCCOOL 3 CKT: 1     0.0      0.0      0.0
  SINGLE 494  :   571 GR ISLD3 - 10282 SWEET W3 CKT: 1     0.0      0.0      0.0
  SINGLE 501  :   573 STEGALL4 - 22156 STGXFMR4 CKT: 1     0.0      0.0      0.0
  SINGLE 508  :   580 SPENCR 8 -   581 SPENCER8 CKT: 1     0.0      0.0      0.0
  SINGLE 540  :   601 ANTELOP3 -   620 HURON  3 CKT: 1     0.0      0.0      0.0
  SINGLE 545  :   604 TIOGA4 4 -   608 LOGAN  4 CKT: 1     0.0      0.0      0.0
  SINGLE 547  :   604 TIOGA4 4 -  3203 BDV    4 CKT: 1     0.0      0.0      0.0
  SINGLE 548  :   605 LELANDO3 -   660 GROTON 3 CKT: 1     0.0      0.0      0.0
  SINGLE 552  :   606 LELANDO4 -   610 LELAN41G CKT: 1     0.0      0.0      0.0
  SINGLE 553  :   606 LELANDO4 -  1515 STANTON4 CKT: 1     0.0      0.0      0.0
  SINGLE 563  :   618 LARAM31G -   631 LARAMIE3 CKT: 1     0.0      0.0      0.0
  SINGLE 564  :   620 HURON  3 - 22154 BRDLNDTY CKT: 1     0.0      0.0      0.0
  SINGLE 571  :   631 LARAMIE3 -   635 STEGALL3 CKT: 1     0.0      0.0      0.0
  SINGLE 578  :   633 SIDNEY 3 - 10166 KEYSTON3 CKT: 1     0.0      0.0      0.0
  SINGLE 582  :   635 STEGALL3 - 22157 STEGALTY CKT: 1     0.0      0.0      0.0
  SINGLE 621  :   710 NARY   7 -   922 CASS LK7 CKT: 1     0.0      0.0      0.0
  SINGLE 622  :   712 PRAIRIE7 -  1620 PRASWCP7 CKT: 1     0.0      0.0      0.0
  SINGLE 650  :   749 CENTER1G -   751 CENTER 4 CKT: 1     0.0      0.0      0.0
  SINGLE 652  :   751 CENTER 4 -   842 HESKETT4 CKT: 1     0.0      0.0      0.0
  SINGLE 653  :   752 DRAYTON4 -   755 PRAIRIE4 CKT: 1     0.0      0.0      0.0
  SINGLE 654  :   752 DRAYTON4 -  3458 LETELER4 CKT: 1     0.0      0.0      0.0
  SINGLE 662  :   754 MAPLE R4 -   758 WINGER 4 CKT: 1     0.0      0.0      0.0
  SINGLE 665  :   754 MAPLE R4 -  1640 MAPLE R7 CKT: 1     0.0      0.0      0.0
  SINGLE 674  :   756 SQBUTTE4 -  1515 STANTON4 CKT: 1     0.0      0.0      0.0
  SINGLE 679  :   759 PICKERT4 - 79809 PICKERTY CKT: 1     0.0      0.0      0.0
  SINGLE 683  :   791 CENTER 3 -   954 JAMESTN3 CKT: 1     0.0      0.0      0.0
  SINGLE 684  :   792 MAPLE R3 -   916 BUFFALO3 CKT: 1     0.0      0.0      0.0
  SINGLE 693  :   808 BEULAH 7 -   843 HESKETT7 CKT: 1     0.0      0.0      0.0
  SINGLE 702  :   826 ELLENDL4 -   994 OAKES  4 CKT: 1     0.0      0.0      0.0
  SINGLE 703  :   827 ELLENDL7 -  1001 ABDNJCT7 CKT: 1     0.0      0.0      0.0
  SINGLE 710  :   842 HESKETT4 -   843 HESKETT7 CKT: 1     0.0      0.0      0.0
  SINGLE 712  :   843 HESKETT7 -   844 HESKET1G CKT: 1     0.0      0.0      0.0
  SINGLE 713  :   843 HESKETT7 -   845 HESKET2G CKT: 1     0.0      0.0      0.0
  SINGLE 725  :   902 ALEXAND7 -  1649 DGLASCO7 CKT: 1     0.0      0.0      0.0
  SINGLE 726  :   902 ALEXAND7 - 87901 ALEXSS   CKT: 1     0.0      0.0      0.0
  SINGLE 734  :   906 BAGLEY 7 -   924 CLEARBR7 CKT: 1     0.0      0.0      0.0
  SINGLE 736  :   906 BAGLEY 7 -   990 WINGER 7 CKT: 1     0.0      0.0      0.0
  SINGLE 738  :   908 BEMIDJI7 - 29922 BEMIDJIT CKT: 1     0.0      0.0      0.0
  SINGLE 740  :   910 BIGSTON4 -   912 BIGSTN1G CKT: 1     0.0      0.0      0.0
  SINGLE 742  :   910 BIGSTON4 - 79917 BIGSTONY CKT: 1     0.0      0.0      0.0
  SINGLE 743  :   911 BIGSTON7 -   948 HIWY12 7 CKT: 1     0.0      0.0      0.0
```

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==============================================================================================
  12)  *** NOT CONVERGED ***  (CONT.)                                PST-CNT  RATING PERCENT
----------------------------------------------------------------------------------------------
  SINGLE 745  :   911 BIGSTON7 - 79917 BIGSTONY CKT: 1     0.0     0.0     0.0
  SINGLE 746  :   913 MN PIPE7 -   924 CLEARBR7 CKT: 1     0.0     0.0     0.0
  SINGLE 747  :   913 MN PIPE7 - 78533 MN PIPE9 CKT: 1     0.0     0.0     0.0
  SINGLE 749  :   914 BRANDN 7 - 87189 BRANDN 9 CKT: 1     0.0     0.0     0.0
  SINGLE 752  :   916 BUFFALO3 -   954 JAMESTN3 CKT: 1     0.0     0.0     0.0
  SINGLE 763  :   922 CASS LK7 -   923 CASS N 7 CKT: 1     0.0     0.0     0.0
  SINGLE 765  :   923 CASS N 7 - 78544 NO PIPE9 CKT: 1     0.0     0.0     0.0
  SINGLE 766  :   924 CLEARBR7 -   926 CLBKPIP7 CKT: 1     0.0     0.0     0.0
  SINGLE 769  :   926 CLBKPIP7 - 78531 CLBK LK9 CKT: 1     0.0     0.0     0.0
  SINGLE 778  :   932 EDGETWN7 -   933 EDGETAP7 CKT: 1     0.0     0.0     0.0
  SINGLE 781  :   934 FERGSFL4 -   984 WAHPETN4 CKT: 1     0.0     0.0     0.0
  SINGLE 782  :   934 FERGSFL4 -  1940 HENNING4 CKT: 1     0.0     0.0     0.0
  SINGLE 786  :   937 FORMN  7 -   939 HOVINGJ7 CKT: 1     0.0     0.0     0.0
  SINGLE 787  :   937 FORMN  7 - 79871 FORMAN Y CKT: 1     0.0     0.0     0.0
  SINGLE 790  :   938 FORMAN 4 - 79871 FORMAN Y CKT: 1     0.0     0.0     0.0
  SINGLE 791  :   940 GRANTCO7 -   950 HOOT LK7 CKT: 1     0.0     0.0     0.0
  SINGLE 793  :   941 BROWNSV4 - 78188 BROWNSV9 CKT: 1     0.0     0.0     0.0
  SINGLE 794  :   942 HANKSON4 -   984 WAHPETN4 CKT: 1     0.0     0.0     0.0
  SINGLE 795  :   942 HANKSON4 - 77621 HANKSON9 CKT: 1     0.0     0.0     0.0
  SINGLE 803  :   948 HIWY12 7 -   970 ORTONVL7 CKT: 1     0.0     0.0     0.0
  SINGLE 806  :   950 HOOT LK7 - 77136 HOOT LK9 CKT: 1     0.0     0.0     0.0
  SINGLE 814  :   970 ORTONVL7 -  1935 GRACEVT7 CKT: 1     0.0     0.0     0.0
  SINGLE 819  :   973 PLUMTAP7 -   990 WINGER 7 CKT: 1     0.0     0.0     0.0
  SINGLE 831  :   987 WILTON 7 - 29768 WILTON T CKT: 1     0.0     0.0     0.0
  SINGLE 840  :   994 OAKES  4 - 77566 OAKES  9 CKT: 1     0.0     0.0     0.0
  SINGLE 875  :  1235 BYRON  3 -  1599 PL VLLY3 CKT: 1     0.0     0.0     0.0
  SINGLE 876  :  1235 BYRON  3 -  1604 PR ISLD3 CKT: 1     0.0     0.0     0.0
  SINGLE 883  :  1246 REDFLST7 -  1650 FRANKLN7 CKT: 1     0.0     0.0     0.0
  SINGLE 884  :  1246 REDFLST7 -  1653 MINVALY7 CKT: 1     0.0     0.0     0.0
  SINGLE 936  :  1307 FORBES 2 -  1678 ROSEAUS2 CKT: 1     0.0     0.0     0.0
  SINGLE 937  :  1307 FORBES 2 -  1796 CHIS-N 2 CKT: 1     0.0     0.0     0.0
  SINGLE 941  :  1311 WINGRIV4 -  1312 RIVERTN4 CKT: 1     0.0     0.0     0.0
  SINGLE 942  :  1311 WINGRIV4 -  1498 WINGRJCT CKT: 1     0.0     0.0     0.0
  SINGLE 943  :  1311 WINGRIV4 -  1955 INMAN  4 CKT: 1     0.0     0.0     0.0
  SINGLE 944  :  1312 RIVERTN4 -  1317 MUDLAKE4 CKT: 1     0.0     0.0     0.0
  SINGLE 947  :  1313 WINGRIV7 -  1342 VERNDLE7 CKT: 1     0.0     0.0     0.0
  SINGLE 949  :  1313 WINGRIV7 -  1498 WINGRJCT CKT: 1     0.0     0.0     0.0
  SINGLE 952  :  1314 98L TAP4 -  1325 BLCKBRY4 CKT: 1     0.0     0.0     0.0
  SINGLE 953  :  1315 ARROWHD4 -  1319 AHD PST  CKT: 1     0.0     0.0     0.0
  SINGLE 956  :  1317 MUDLAKE4 -  1508 BENTON 4 CKT: 1     0.0     0.0     0.0
  SINGLE 957  :  1318 ARROWHD3 -  1319 AHD PST  CKT: 1     0.0     0.0     0.0
  SINGLE 963  :  1326 BOSWELL4 -  1327 SHANNON4 CKT: 1     0.0     0.0     0.0
  SINGLE 982  :  1347 LONG PR7 -  1349 BLNCHRD7 CKT: 1     0.0     0.0     0.0
  SINGLE 985  :  1348 PEQUOT 7 - 44278 MERRFLD7 CKT: 1     0.0     0.0     0.0
  SINGLE 986  :  1349 BLNCHRD7 -  1350 LITTLEF7 CKT: 1     0.0     0.0     0.0
  SINGLE 987  :  1350 LITTLEF7 -  1665 WST CLD7 CKT: 1     0.0     0.0     0.0
  SINGLE 993  :  1353 RIVERTN7 -  1354 AITKNMN7 CKT: 1     0.0     0.0     0.0
  SINGLE 995  :  1353 RIVERTN7 - 44250 RIVTON 8 CKT: 1     0.0     0.0     0.0
  SINGLE 996  :  1353 RIVERTN7 - 44278 MERRFLD7 CKT: 1     0.0     0.0     0.0
  SINGLE 998  :  1354 AITKNMN7 - 44702 AITKIN 7 CKT: 1     0.0     0.0     0.0
  SINGLE 1072 :  1411 MNTCPTC7 -  1413 MNTC C G CKT: 1     0.0     0.0     0.0
  SINGLE 1089 :  1428 HIBBTAC7 -  1429 HIBBTACG CKT: 1     0.0     0.0     0.0
  SINGLE 1095 :  1432 NATIONLG -  1433 NATIONL7 CKT: 1     0.0     0.0     0.0
  SINGLE 1161 :  1506 ELK RIV4 -  1656 MNTCELO4 CKT: 1     0.0     0.0     0.0
  SINGLE 1178 :  1512 RAMSEY 4 - 42012 RAMSEY Y CKT: 1     0.0     0.0     0.0
  SINGLE 1185 :  1515 STANTON4 -  1523 STANT41G CKT: 1     0.0     0.0     0.0
  SINGLE 1190 :  1518 BUNKER 3 -  1662 SHERCO 3 CKT: 1     0.0     0.0     0.0
  SINGLE 1207 :  1525 HUTCHMN8 - 44954 HTCHHTI8 CKT: 1     0.0     0.0     0.0
  SINGLE 1216 :  1583 MCLEOD 4 -  1699 BLK DOG4 CKT: 1     0.0     0.0     0.0
  SINGLE 1217 :  1583 MCLEOD 4 -  1985 PANTHER4 CKT: 1     0.0     0.0     0.0
  SINGLE 1225 :  1599 PL VLLY3 -  1601 ADAMS  3 CKT: 1     0.0     0.0     0.0
  SINGLE 1228 :  1601 ADAMS  3 -  2050 HAZLTON3 CKT: 1     0.0     0.0     0.0
  SINGLE 1246 :  1608 WILMART3 -  1702 BLUE LK3 CKT: 1     0.0     0.0     0.0
  SINGLE 1247 :  1608 WILMART3 -  1889 LKFLDXL3 CKT: 1     0.0     0.0     0.0
  SINGLE 1269 :  1617 ELM CRK3 -  1655 MNTCELO3 CKT: 1     0.0     0.0     0.0
  SINGLE 1271 :  1617 ELM CRK3 -  1739 PARKERS3 CKT: 1     0.0     0.0     0.0
  SINGLE 1293 :  1629 PIPESTN7 -  1797 BUFFRID7 CKT: 1     0.0     0.0     0.0
  SINGLE 1297 :  1631 PATHFDR7 -  1632 SPLT RK7 CKT: 1     0.0     0.0     0.0
  SINGLE 1298 :  1632 SPLT RK7 -  1633 ANSON CG CKT: 1     0.0     0.0     0.0
  SINGLE 1306 :  1634 SPLT RK3 - 45641 SPLTRTA3 CKT: 1     0.0     0.0     0.0
  SINGLE 1307 :  1634 SPLT RK3 - 45646 SPLTRTB3 CKT: 1     0.0     0.0     0.0
  SINGLE 1322 :  1649 DGLASCO7 - 46585 DGLAS C8 CKT: 1     0.0     0.0     0.0
```

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==========================================================================================
  12)  *** NOT CONVERGED ***  (CONT.)                                PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1326 :  1651 GRANCTY7 -  1663 STREGIS7 CKT: 1     0.0     0.0     0.0
  SINGLE 1358 :  1662 SHERCO 3 -  1709 COON CK3 CKT: 1     0.0     0.0     0.0
  SINGLE 1359 :  1662 SHERCO 3 -  1776 MPLEGV23 CKT: 1     0.0     0.0     0.0
  SINGLE 1371 :  1677 ROSEAUN2 -  1678 ROSEAUS2 CKT: 1     0.0     0.0     0.0
  SINGLE 1372 :  1677 ROSEAUN2 -  3465 DORSEY 2 CKT: 1     0.0     0.0     0.0
  SINGLE 1402 :  1695 AS KING3 -  1727 KOLMNLK3 CKT: 1     0.0     0.0     0.0
  SINGLE 1404 :  1695 AS KING3 -  1853 EAU CL 3 CKT: 1     0.0     0.0     0.0
  SINGLE 1411 :  1699 BLK DOG4 -  1700 BLK DOG7 CKT: 1     0.0     0.0     0.0
  SINGLE 1436 :  1706 CHIS CO2 -  1796 CHIS-N 2 CKT: 1     0.0     0.0     0.0
  SINGLE 1451 :  1709 COON CK3 -  1727 KOLMNLK3 CKT: 1     0.0     0.0     0.0
  SINGLE 1452 :  1709 COON CK3 -  1757 TERMINL3 CKT: 1     0.0     0.0     0.0
  SINGLE 1453 :  1709 COON CK3 -  1776 MPLEGV23 CKT: 1     0.0     0.0     0.0
  SINGLE 1530 :  1744 REDROCK7 - 46756 NSSJCT 7 CKT: 1     0.0     0.0     0.0
  SINGLE 1635 :  1844 BIGFALL8 - 47879 WHTTAIL8 CKT: 1     0.0     0.0     0.0
  SINGLE 1684 :  1867 T CORNE8 - 57234 T SPEN8  CKT: 1     0.0     0.0     0.0
  SINGLE 1707 :  1889 LKFLDXL3 -  2010 LAKEFLD3 CKT: 1     0.0     0.0     0.0
  SINGLE 1714 :  1905 BENSON 7 -  1946 KERKHO 7 CKT: 1     0.0     0.0     0.0
  SINGLE 1734 :  1940 HENNING4 -  1955 INMAN  4 CKT: 1     0.0     0.0     0.0
  SINGLE 1735 :  1940 HENNING4 - 78929 HENNING9 CKT: 1     0.0     0.0     0.0
  SINGLE 1736 :  1945 KERKHOT7 -  1946 KERKHO 7 CKT: 1     0.0     0.0     0.0
  SINGLE 1753 :  1985 PANTHER4 - 46605 MNVLTAP4 CKT: 1     0.0     0.0     0.0
  SINGLE 1766 :  2011 LAKEFLD5 -  2597 TRIBOJI5 CKT: 1     0.0     0.0     0.0
  SINGLE 1874 :  2107 SENECA 5 -  2111 BELLCTR5 CKT: 1     0.0     0.0     0.0
  SINGLE 1875 :  2107 SENECA 5 -  2123 GENOA  5 CKT: 1     0.0     0.0     0.0
  SINGLE 2055 :  2328 NEAL N 5 -  2342 NEAL  2G CKT: 1     0.0     0.0     0.0
  SINGLE 2059 :  2330 RAUN   3 -  2343 NEAL  3G CKT: 1     0.0     0.0     0.0
  SINGLE 2060 :  2330 RAUN   3 -  2344 NEAL  4G CKT: 1     0.0     0.0     0.0
  SINGLE 2062 :  2330 RAUN   3 - 10140 HOSKINS3 CKT: 1     0.0     0.0     0.0
  SINGLE 2260 :  2487 SHENAND8 -  2488 CLARNDA8 CKT: 1     0.0     0.0     0.0
  SINGLE 2261 :  2488 CLARNDA8 - 60434 CLARMID8 CKT: 2     0.0     0.0     0.0
  SINGLE 2262 :  2488 CLARNDA8 - 60436 CLAR MD8 CKT: 1     0.0     0.0     0.0
  SINGLE 2263 :  2489 CLRNDA 5 - 60434 CLARMID8 CKT: 2     0.0     0.0     0.0
  SINGLE 2264 :  2489 CLRNDA 5 - 60436 CLAR MD8 CKT: 1     0.0     0.0     0.0
  SINGLE 2266 :  2491 CBLUF33G -  2492 CBLUFFS3 CKT: 1     0.0     0.0     0.0
  SINGLE 2538 :  3001 BD    1G -  3101 BD     6 CKT: 1     0.0     0.0     0.0
  SINGLE 2539 :  3002 BD    2G -  3101 BD     6 CKT: 1     0.0     0.0     0.0
  SINGLE 2540 :  3003 BD    3G -  3201 BD     4 CKT: 1     0.0     0.0     0.0
  SINGLE 2541 :  3004 BD    4G -  3201 BD     4 CKT: 1     0.0     0.0     0.0
  SINGLE 2542 :  3005 BD    5G -  3201 BD     4 CKT: 1     0.0     0.0     0.0
  SINGLE 2543 :  3006 BD    6G -  3201 BD     4 CKT: 1     0.0     0.0     0.0
  SINGLE 2544 :  3010 POPLAR1G -  3210 POPLAR 4 CKT: 1     0.0     0.0     0.0
  SINGLE 2545 :  3011 POPLAR2G -  3210 POPLAR 4 CKT: 1     0.0     0.0     0.0
  SINGLE 2546 :  3021 SHAND 1G -  3221 SHAND  4 CKT: 1     0.0     0.0     0.0
  SINGLE 2547 :  3030 EBCAMP1G -  3230 EBCAMPB4 CKT: 1     0.0     0.0     0.0
  SINGLE 2548 :  3031 EBCAMP3G -  3230 EBCAMPB4 CKT: 1     0.0     0.0     0.0
  SINGLE 2549 :  3032 EBCAMP5G -  3230 EBCAMPB4 CKT: 1     0.0     0.0     0.0
  SINGLE 2550 :  3033 EBCAMP7G -  3230 EBCAMPB4 CKT: 1     0.0     0.0     0.0
  SINGLE 2551 :  3042 QE    3G -  3140 QE     6 CKT: 1     0.0     0.0     0.0
  SINGLE 2552 :  3050 NIPAWI1G -  3250 NIPAWIN4 CKT: 1     0.0     0.0     0.0
  SINGLE 2553 :  3051 NIPAWI2G -  3250 NIPAWIN4 CKT: 1     0.0     0.0     0.0
  SINGLE 2554 :  3052 NIPAWI3G -  3250 NIPAWIN4 CKT: 1     0.0     0.0     0.0
  SINGLE 2555 :  3060 ISLAND1G -  3160 ISLAND 7 CKT: 1     0.0     0.0     0.0
  SINGLE 2556 :  3061 ISLAND4G -  3160 ISLAND 7 CKT: 1     0.0     0.0     0.0
  SINGLE 2557 :  3067 MER-GT1  -  3266 LLOYDMI4 CKT: 1     0.0     0.0     0.0
  SINGLE 2558 :  3068 MER-GT2  -  3266 LLOYDMI4 CKT: 1     0.0     0.0     0.0
  SINGLE 2559 :  3069 MER-ST   -  3266 LLOYDMI4 CKT: 1     0.0     0.0     0.0
  SINGLE 2560 :  3070 COTEAU1G -  3170 COTEAU 6 CKT: 1     0.0     0.0     0.0
  SINGLE 2561 :  3071 COTEAU2G -  3170 COTEAU 6 CKT: 1     0.0     0.0     0.0
  SINGLE 2562 :  3072 COTEAU3G -  3170 COTEAU 6 CKT: 1     0.0     0.0     0.0
  SINGLE 2670 :  3201 BD     4 -  3202 BDX    4 CKT: 1     0.0     0.0     0.0
  SINGLE 2676 :  3202 BDX    4 -  3203 BDV    4 CKT: 1     0.0     0.0     0.0
  SINGLE 2681 :  3210 POPLAR 4 -  3212 CONDIE 4 CKT: 1     0.0     0.0     0.0
  SINGLE 2682 :  3210 POPLAR 4 -  3286 ASSINIB4 CKT: 1     0.0     0.0     0.0
  SINGLE 2696 :  3249 CODETTE4 -  3250 NIPAWIN4 CKT: 1     0.0     0.0     0.0
  SINGLE 2702 :  3285 SWIFTCU4 -  3286 ASSINIB4 CKT: 1     0.0     0.0     0.0
  SINGLE 2714 :  3404 DORSEY 4 -  3427 ST.LEON4 CKT: 1     0.0     0.0     0.0
  SINGLE 2724 :  3404 DORSEY 4 -  3468 DC5 JCT4 CKT: 1     0.0     0.0     0.0
  SINGLE 2725 :  3404 DORSEY 4 -  3469 DC6 JCT4 CKT: 1     0.0     0.0     0.0
  SINGLE 2726 :  3404 DORSEY 4 -  3475 PORTSOU4 CKT: 1     0.0     0.0     0.0
  SINGLE 2727 :  3404 DORSEY 4 -  3491 NEEPAWA4 CKT: 1     0.0     0.0     0.0
  SINGLE 2729 :  3404 DORSEY 4 -  3581 DRSC7-9G CKT: 1     0.0     0.0     0.0
  SINGLE 2733 :  3405 KELSEY 6 -  3590 KLSY1-7G CKT: 1     0.0     0.0     0.0
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  12)  *** NOT CONVERGED ***  (CONT.)                          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2738 :  3407 MYSLKRD4 -  3408 PIPELAK4 CKT: 1     0.0     0.0     0.0
  SINGLE 2741 :  3408 PIPELAK4 -  3508 DUNLOP 4 CKT: 1     0.0     0.0     0.0
  SINGLE 2742 :  3409 PONTON 4 -  3462 JENPEG 4 CKT: 1     0.0     0.0     0.0
  SINGLE 2744 :  3409 PONTON 4 -  3508 DUNLOP 4 CKT: 1     0.0     0.0     0.0
  SINGLE 2751 :  3411 GR.RPDS4 -  3591 GRSTC12G CKT: 1     0.0     0.0     0.0
  SINGLE 2752 :  3411 GR.RPDS4 -  3592 GRAMP34G CKT: 1     0.0     0.0     0.0
  SINGLE 2790 :  3425 CORNWLS4 -  3475 PORTSOU4 CKT: 1     0.0     0.0     0.0
  SINGLE 2845 :  3436 PINEFLS7 -  3595 PNFL1-6G CKT: 1     0.0     0.0     0.0
  SINGLE 2851 :  3437 GREATFL7 -  3596 GTFL1-6G CKT: 1     0.0     0.0     0.0
  SINGLE 2854 :  3438 MCARTHR7 -  3597 MCA 1-8G CKT: 1     0.0     0.0     0.0
  SINGLE 2857 :  3439 7SISTER7 -  3598 7SIS1-6G CKT: 1     0.0     0.0     0.0
  SINGLE 2928 :  3455 SLAVEFL7 -  3600 SLFL1-8G CKT: 1     0.0     0.0     0.0
  SINGLE 2930 :  3458 LETELER4 -  3460 LAVEREN4 CKT: 1     0.0     0.0     0.0
  SINGLE 2937 :  3462 JENPEG 4 -  3588 JNPG1-6G CKT: 1     0.0     0.0     0.0
  SINGLE 2942 :  3468 DC5 JCT4 -  3585 SCE-1-3G CKT: 1     0.0     0.0     0.0
  SINGLE 2947 :  3470 HENDAY 4 -  3582 LIMEST G CKT: 1     0.0     0.0     0.0
  SINGLE 2951 :  3471 LONGSPR4 -  3583 LSP1-10G CKT: 1     0.0     0.0     0.0
  SINGLE 2955 :  3473 RADSNDC6 -  3474 KETTLDC6 CKT: 1     0.0     0.0     0.0
  SINGLE 2956 :  3474 KETTLDC6 -  3584 KET1-12G CKT: 1     0.0     0.0     0.0
  SINGLE 3057 : 10000 AINSWRT7 - 10038 CALAMS 7 CKT: 1     0.0     0.0     0.0
  SINGLE 3071 : 10007 ATKINSN7 - 10088 EMMET  7 CKT: 1     0.0     0.0     0.0
  SINGLE 3081 : 10011 AXTELL 3 - 10282 SWEET W3 CKT: 1     0.0     0.0     0.0
  SINGLE 3092 : 10017 BATTLCR7 - 10212 NORFK.N7 CKT: 1     0.0     0.0     0.0
  SINGLE 3116 : 10029 BLMFLD 7 - 10072 CREITON7 CKT: 1     0.0     0.0     0.0
  SINGLE 3125 : 10038 CALAMS 7 - 10288 THEDFRD7 CKT: 1     0.0     0.0     0.0
  SINGLE 3127 : 10039 CALAWAY7 - 10181 MAXWELL7 CKT: 1     0.0     0.0     0.0
  SINGLE 3132 : 10044 CANADAY7 - 10045 CANADY1G CKT: 1     0.0     0.0     0.0
  SINGLE 3170 : 10063 COLMBUS7 - 10110 GENOA  7 CKT: 1     0.0     0.0     0.0
  SINGLE 3174 : 10065 COOPER 3 - 10067 COOPER1G CKT: 1     0.0     0.0     0.0
  SINGLE 3205 : 10088 EMMET  7 - 10220 ONEILL 7 CKT: 1     0.0     0.0     0.0
  SINGLE 3224 : 10102 GENTLMN3 - 10106 GENTLM2G CKT: 1     0.0     0.0     0.0
  SINGLE 3225 : 10102 GENTLMN3 - 10166 KEYSTON3 CKT: 1     0.0     0.0     0.0
  SINGLE 3226 : 10102 GENTLMN3 - 10238 REDWILO3 CKT: 1     0.0     0.0     0.0
  SINGLE 3227 : 10102 GENTLMN3 - 10282 SWEET W3 CKT: 1     0.0     0.0     0.0
  SINGLE 3228 : 10102 GENTLMN3 - 10282 SWEET W3 CKT: 2     0.0     0.0     0.0
  SINGLE 3230 : 10103 GENTLMN4 - 10105 GENTLM1G CKT: 1     0.0     0.0     0.0
  SINGLE 3257 : 10119 GR ISLD7 - 10265 ST.LIB 7 CKT: 1     0.0     0.0     0.0
  SINGLE 3281 : 10139 HOSKNS Y - 10140 HOSKINS3 CKT: 1     0.0     0.0     0.0
  SINGLE 3282 : 10139 HOSKNS Y - 10142 HOSKINS7 CKT: 1     0.0     0.0     0.0
  SINGLE 3340 : 10181 MAXWELL7 - 10288 THEDFRD7 CKT: 1     0.0     0.0     0.0
  SINGLE 3387 : 10220 ONEILL 7 - 10263 SPENCER7 CKT: 1     0.0     0.0     0.0
  SINGLE 3437 : 10285 TEKAMAH5 - 10362 TEKAMA Y CKT: 1     0.0     0.0     0.0
  SINGLE 3471 : 10329 PLATTE1G - 10336 SUB-D  7 CKT: 1     0.0     0.0     0.0
  SINGLE 3493 : 13011 FT CAL1G - 13451 S3451  3 CKT: 1     0.0     0.0     0.0
  SINGLE 3496 : 13021 NEBCTY1G - 13458 S3458  3 CKT: 1     0.0     0.0     0.0
  SINGLE 3508 : 13035 N OMA 5G - 13211 S1211  5 CKT: 1     0.0     0.0     0.0
  SINGLE 3761 : 19000 GRNDFKST - 19001 GRNDFKS9 CKT: 1     0.0     0.0     0.0
  SINGLE 3805 : 22154 BRDLNDTY - 22155 BRDLAND4 CKT: 1     0.0     0.0     0.0
  SINGLE 3806 : 22156 STGXFMR4 - 22157 STEGALTY CKT: 1     0.0     0.0     0.0
  SINGLE 3832 : 29006 DRAYTO29 - 29889 DRAYTO2T CKT: 1     0.0     0.0     0.0
  SINGLE 3851 : 29368 WILTON 8 - 29768 WILTON T CKT: 1     0.0     0.0     0.0
  SINGLE 3854 : 29415 BEMIDJI8 - 29922 BEMIDJIT CKT: 1     0.0     0.0     0.0
  SINGLE 3908 : 31019 JUD-LRG1 - 31020 JUD-LRG3 CKT: 1     0.0     0.0     0.0
  SINGLE 4035 : 44019 NORTHTW8 - 44031 WOODCRT8 CKT: 1     0.0     0.0     0.0
  SINGLE 4049 : 44031 WOODCRT8 - 44040 PRKWD  8 CKT: 1     0.0     0.0     0.0
  SINGLE 4075 : 44250 RIVTON 8 - 44268 OKLWNTP8 CKT: 1     0.0     0.0     0.0
  SINGLE 4076 : 44250 RIVTON 8 - 44270 CRSSLKS8 CKT: 1     0.0     0.0     0.0
  SINGLE 4089 : 44268 OKLWNTP8 - 44269 PINCTRT8 CKT: 1     0.0     0.0     0.0
  SINGLE 4202 : 44700 MCGREGR7 - 44701 KIMBRLY7 CKT: 1     0.0     0.0     0.0
  SINGLE 4203 : 44701 KIMBRLY7 - 44702 AITKIN 7 CKT: 1     0.0     0.0     0.0
  SINGLE 4356 : 46578 BELGRAD8 - 46596 PAYNES 8 CKT: 1     0.0     0.0     0.0
  SINGLE 4358 : 46579 BROOTEN8 - 49176 BANGORTP CKT: 1     0.0     0.0     0.0
  SINGLE 4362 : 46582 GLENWD 8 - 49178 LEVEN    CKT: 1     0.0     0.0     0.0
  SINGLE 4364 : 46583 VILLARD8 - 46584 WESTPRT8 CKT: 1     0.0     0.0     0.0
  SINGLE 4365 : 46583 VILLARD8 - 49178 LEVEN    CKT: 1     0.0     0.0     0.0
  SINGLE 4366 : 46584 WESTPRT8 - 46585 DGLAS C8 CKT: 1     0.0     0.0     0.0
  SINGLE 4368 : 46585 DGLAS C8 - 46586 OSAKIS 8 CKT: 1     0.0     0.0     0.0
  SINGLE 4369 : 46586 OSAKIS 8 - 49168 W UNION  CKT: 1     0.0     0.0     0.0
  SINGLE 4370 : 46587 SAUKCMU8 - 49168 W UNION  CKT: 1     0.0     0.0     0.0
  SINGLE 4371 : 46587 SAUKCMU8 - 49170 KANDTATP CKT: 1     0.0     0.0     0.0
  SINGLE 4391 : 46604 WLMSTAP8 - 49176 BANGORTP CKT: 1     0.0     0.0     0.0
  SINGLE 5004 : 49170 KANDTATP - 49323 GROVE    CKT: 1     0.0     0.0     0.0
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  12)  *** NOT CONVERGED ***  (CONT.)                          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 5137 : 52080 HAYWD#18 - 57276 T GLEN   CKT: 1     0.0     0.0     0.0
  SINGLE 5471 : 57075 BELLCNTR - 57084 T SG     CKT: 1     0.0     0.0     0.0
  SINGLE 5480 : 57084 T SG     - 57086 BOAZ     CKT: 1     0.0     0.0     0.0
  SINGLE 5611 : 57276 T GLEN   - 57278 GLENVILL CKT: 1     0.0     0.0     0.0
  SINGLE 5711 : 57434 CHERRY G - 57436 T SV     CKT: 1     0.0     0.0     0.0
  SINGLE 5793 : 77515 FORMN  9 - 79871 FORMAN Y CKT: 1     0.0     0.0     0.0
  SINGLE 5814 :   856 LEWIS  7 -   855 LEWIS71G CKT: 1     0.0     0.0     0.0
  SINGLE 5815 :   939 HOVINGJ7 - 77530 HOVINGJ9 CKT: 1     0.0     0.0     0.0
  SINGLE 5816 :  1318 ARROWHD3 - 94246 TRIPOLI3 CKT: 1     0.0     0.0     0.0
  SINGLE 5822 :  1853 EAU CL 3 - 92494 ARP 345  CKT: 1     0.0     0.0     0.0
  SINGLE 5824 :  1866 T-CRNRS7 - 94177 WIEN     CKT: 1     0.0     0.0     0.0
  SINGLE 5861 :  3599 PDB1-16G -  3453 POINTDB8 CKT: 1     0.0     0.0     0.0
  SINGLE 5866 : 10238 REDWILO3 - 88100 MINGO  3 CKT: 1     0.0     0.0     0.0
  SINGLE 5885 : 42012 RAMSEY Y - 42312 RAMSEY T CKT: 1     0.0     0.0     0.0

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  13)   406 FTPECK 7 -   410 FTPECK3G CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 122  :   406 FTPECK 7 -   410 FTPECK3G CKT: 2    42.9    28.0   153.1

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  14)   404 DAWSONC7 -   832 GLENDCT7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 129  :   411 MI CTYE4 -   804 BAKER  4 CKT: 1    73.4    67.7   107.8

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  15)   805 BAKER  7 -   832 GLENDCT7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 129  :   411 MI CTYE4 -   804 BAKER  4 CKT: 1    88.1    67.7   129.4

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  16)   515 HURON  7 -   528 WOONSKT7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 331  :   507 FTTHOMP4 -   622 STORLA 4 CKT: 1   106.0    88.0   118.9

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  17)   528 WOONSKT7 -   623 STORLA 7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 331  :   507 FTTHOMP4 -   622 STORLA 4 CKT: 1    95.8    88.0   111.5

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  18)  1517 WILLMAR7 -  1519 WILLMAR8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 437  :   550 GRANITF4 -  1516 WILLMAR4 CKT: 1    79.1    65.8   120.2
  SINGLE 1186 :  1516 WILLMAR4 -  1519 WILLMAR8 CKT: 1    75.1    65.8   114.1

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  19)  1517 WILLMAR7 -  1945 KERKHOT7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 437  :   550 GRANITF4 -  1516 WILLMAR4 CKT: 1    79.1    77.0   112.4
  SINGLE 1186 :  1516 WILLMAR4 -  1519 WILLMAR8 CKT: 1    75.2    77.0   109.1

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  20)   561 DENISON5 -   582 DENISN 8 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 461  :   561 DENISON5 -   582 DENISN 8 CKT: 1    74.3    63.0   118.0

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  21)   561 DENISON5 -   582 DENISN 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 462  :   561 DENISON5 -   582 DENISN 8 CKT: 2    73.8    63.0   117.2

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  22)   562 EAGLE  4 -   579 EAGLE  8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 467  :   562 EAGLE  4 -   579 EAGLE  8 CKT: 2    99.1    75.0   132.2

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  23)  2328 NEAL N 5 -  2341 NEAL  1G CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 474  :   564 SIOUXCY3 -  2330 RAUN   3 CKT: 1   150.4   150.0   100.3
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  24)   574 SIOUXCY8 -  2338 PLYMOTH8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 485  :   566 SIOUXCY5 -  2337 PLYMOTH5 CKT: 1    63.4    50.0   125.9
  SINGLE 2083 :  2337 PLYMOTH5 - 60328 PLY MID8 CKT: 1    49.8    50.0   100.4
  SINGLE 2084 :  2338 PLYMOTH8 - 60328 PLY MID8 CKT: 1    49.8    50.0   100.4

==========================================================================================
  25)   498 J1CENTR8 -  2346 RCKVALY8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 507  :   579 EAGLE  8 -  2346 RCKVALY8 CKT: 1    45.1    41.0   114.1

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  26)   808 BEULAH 7 -   818 COYOTE 7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 682  :   791 CENTER 3 -   816 COYOTE 3 CKT: 1   301.8   101.4   290.1

==========================================================================================
  27)   808 BEULAH 7 -   843 HESKETT7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 682  :   791 CENTER 3 -   816 COYOTE 3 CKT: 1   115.0    88.0   128.6

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  28)   816 COYOTE 3 -   818 COYOTE 7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 682  :   791 CENTER 3 -   816 COYOTE 3 CKT: 1   402.0   172.0   233.7

==========================================================================================
  29)   418 DKSN-ND7 -   870 N ENGLN7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 688  :   804 BAKER  4 -   810 BOWMAN 4 CKT: 1    83.1    67.7   122.8
  SINGLE 694  :   810 BOWMAN 4 -   847 HETINGR4 CKT: 1    77.6    67.7   114.6

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  30)   848 HETINGR7 -   870 N ENGLN7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 688  :   804 BAKER  4 -   810 BOWMAN 4 CKT: 1    79.4    67.7   118.9
  SINGLE 694  :   810 BOWMAN 4 -   847 HETINGR4 CKT: 1    73.9    67.7   110.7

==========================================================================================
  31)  1353 RIVERTN7 - 44250 RIVTON 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4184 : 44628 BALLCLB8 - 44638 DEER RV8 CKT: 1    60.5    44.0   137.5
  SINGLE 880  :  1242 MILACA 4 - 44384 MILACA 8 CKT: 1    57.3    44.0   130.2
  SINGLE 879  :  1242 MILACA 4 -  1508 BENTON 4 CKT: 1    57.3    44.0   130.1
  SINGLE 4183 : 44628 BALLCLB8 - 44634 BENA TP8 CKT: 1    57.0    44.0   129.6
  SINGLE 1139 :  1482 28L TAP7 -  1490 COHSSTTP CKT: 1    56.8    44.0   129.1
  SINGLE 4187 : 44633 SALEMSW8 - 44634 BENA TP8 CKT: 1    55.6    44.0   126.4
  SINGLE 1140 :  1490 COHSSTTP -  1491 LAKEHD 7 CKT: 1    54.9    44.0   124.8
  SINGLE 4084 : 44256 THUN LK8 - 44633 SALEMSW8 CKT: 1    53.9    44.0   122.5
  SINGLE 4083 : 44256 THUN LK8 - 44280 BLINDLK8 CKT: 1    52.3    44.0   119.0
  SINGLE 1137 :  1480 DEER RV7 -  1491 LAKEHD 7 CKT: 1    51.2    44.0   116.4
…

==========================================================================================
  32) 44353 GILMAN 8 - 44371 MAYHWSW8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4129 : 44379 BENTON 8 - 44382 MINDEN 8 CKT: 1    21.2    22.0   107.5
  SINGLE 880  :  1242 MILACA 4 - 44384 MILACA 8 CKT: 1    22.0    22.0   102.6
  SINGLE 879  :  1242 MILACA 4 -  1508 BENTON 4 CKT: 1    22.0    22.0   102.5

==========================================================================================
  33) 44393 SAND SW8 - 44398 SNDSTN 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1000 :  1355 CROMWLL7 - 44611 CROMWLL8 CKT: 1    38.2    19.8   188.4
  SINGLE 4171 : 44609 KETTLER8 - 44611 CROMWLL8 CKT: 1    25.3    19.8   124.5

==========================================================================================
  34)  1376 HIBBARD7 -  1380 WNTR ST7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1021 :  1373 ARROWHD7 -  1379 GARY   7 CKT: 1   193.9   185.0   105.1
```

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==================================================================================================
  35)  1465 NSM 3B G -  1483 NSMSYNC9 CKT:  1          PST-CNT  RATING PERCENT
--------------------------------------------------------------------------------------------------
  SINGLE 1133 :  1466 SBAYP 2G -  1467 NSM 2ABG CKT: 1    54.2    36.0   147.5
  SINGLE 1129 :  1462 NSM 3A G -  1483 NSMSYNC9 CKT: 1    53.6    36.0   145.8
  SINGLE 1045 :  1392 SLVRBAY7 -  1462 NSM 3A G CKT: 1    46.7    36.0   126.3

==================================================================================================
  36)  1462 NSM 3A G -  1483 NSMSYNC9 CKT:  1          PST-CNT  RATING PERCENT
--------------------------------------------------------------------------------------------------
  SINGLE 1132 :  1465 NSM 3B G -  1483 NSMSYNC9 CKT: 1    53.6    36.0   146.1
  SINGLE 1046 :  1392 SLVRBAY7 -  1465 NSM 3B G CKT: 1    49.3    36.0   133.4
  SINGLE 1133 :  1466 SBAYP 2G -  1467 NSM 2ABG CKT: 1    48.8    36.0   132.9

==================================================================================================
  37) 44656 PIKE RV8 - 44665 VIRGNIA8 CKT:  1          PST-CNT  RATING PERCENT
--------------------------------------------------------------------------------------------------
  SINGLE 1115 :  1449 SHANNON7 - 44650 SHANNON8 CKT: 1    21.8    22.0   100.2

==================================================================================================
  38)  1463 SBAYP 1G -  1483 NSMSYNC9 CKT:  1          PST-CNT  RATING PERCENT
--------------------------------------------------------------------------------------------------
  SINGLE 1130 :  1463 SBAYP 1G -  1464 NSM B1 G CKT: 1    38.6    36.0   104.3

==================================================================================================
  39)  1466 SBAYP 2G -  1483 NSMSYNC9 CKT:  1          PST-CNT  RATING PERCENT
--------------------------------------------------------------------------------------------------
  SINGLE 1133 :  1466 SBAYP 2G -  1467 NSM 2ABG CKT: 1    71.8    36.0   193.6

==================================================================================================
  40)  1439 BLCKBRY7 - 44639 BLCKBRY8 CKT:  1          PST-CNT  RATING PERCENT
--------------------------------------------------------------------------------------------------
  SINGLE 1139 :  1482 28L TAP7 -  1490 COHSSTTP CKT: 1    49.8    32.9   151.4
  SINGLE 1140 :  1490 COHSSTTP -  1491 LAKEHD 7 CKT: 1    44.7    32.9   135.9
  SINGLE 1137 :  1480 DEER RV7 -  1491 LAKEHD 7 CKT: 1    33.6    32.9   102.2

==================================================================================================
  41) 44025 SPRLKPK8 - 44040 PRKWD  8 CKT:  1          PST-CNT  RATING PERCENT
--------------------------------------------------------------------------------------------------
  SINGLE 1148 :  1502 BLAINE 4 - 44036 BLAINE 8 CKT: 1    65.6    56.0   116.4

==================================================================================================
  42) 44359 HARRIS 8 - 44363 NBRNCH 8 CKT:  1          PST-CNT  RATING PERCENT
--------------------------------------------------------------------------------------------------
  SINGLE 4028 : 44014 HUGO   8 - 44036 BLAINE 8 CKT: 1    64.9    26.0   307.5
  SINGLE 4025 : 44011 FOREST 8 - 44014 HUGO   8 CKT: 1    40.2    26.0   162.2
  SINGLE 1148 :  1502 BLAINE 4 - 44036 BLAINE 8 CKT: 1    28.1    26.0   111.0

==================================================================================================
  43) 44359 HARRIS 8 - 44374 RUSH CY8 CKT:  1          PST-CNT  RATING PERCENT
--------------------------------------------------------------------------------------------------
  SINGLE 4028 : 44014 HUGO   8 - 44036 BLAINE 8 CKT: 1    73.4    26.0   323.5
  SINGLE 4025 : 44011 FOREST 8 - 44014 HUGO   8 CKT: 1    45.0    26.0   176.1
  SINGLE 1148 :  1502 BLAINE 4 - 44036 BLAINE 8 CKT: 1    32.2    26.0   124.7
  SINGLE 4026 : 44011 FOREST 8 - 44048 MARTNTP8 CKT: 1    27.5    26.0   104.5

==================================================================================================
  44) 44806 HIGHLND8 - 44807 HOWARDL8 CKT:  1          PST-CNT  RATING PERCENT
--------------------------------------------------------------------------------------------------
  SINGLE 4314 : 46552 WAKEFLD8 - 49282 FAIRHVTP CKT: 1    18.7    15.0   124.3
  SINGLE 1170 :  1509 ELK RIV8 - 44811 OTSEGO 8 CKT: 1    18.4    15.0   123.3
  SINGLE 1168 :  1508 BENTON 4 - 44379 BENTON 8 CKT: 1    17.8    15.0   119.1
  SINGLE 4305 : 46540 LUXBGTP8 - 49282 FAIRHVTP CKT: 1    17.7    15.0   117.7
  SINGLE 5890 : 44922 ELKRWS28 - 44042 ELKR14S8 CKT: 1    17.3    15.0   115.7
  SINGLE 4062 : 44047 CABLETP8 - 44379 BENTON 8 CKT: 1    17.3    15.0   115.1
  SINGLE 4304 : 46540 LUXBGTP8 - 49280 WATKINS  CKT: 1    16.5    15.0   110.0
  SINGLE 4216 : 44800 ALBERTV8 - 44811 OTSEGO 8 CKT: 1    16.1    15.0   107.4
  SINGLE 4060 : 44046 BRGGLKS8 - 44047 CABLETP8 CKT: 1    16.0    15.0   106.4
  SINGLE 4246 : 44921 ELKRWS18 - 44922 ELKRWS28 CKT: 1    15.8    15.0   104.9
…
```

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==========================================================================================
  45) 44807 HOWARDL8 - 44816 HWRDLKS8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1170 :  1509 ELK RIV8 - 44811 OTSEGO 8 CKT: 1    24.2    20.0   121.3
  SINGLE 4314 : 46552 WAKEFLD8 - 49282 FAIRHVTP CKT: 1    24.3    20.0   120.6
  SINGLE 1168 :  1508 BENTON 4 - 44379 BENTON 8 CKT: 1    23.7    20.0   117.6
  SINGLE 4305 : 46540 LUXBGTP8 - 49282 FAIRHVTP CKT: 1    23.4    20.0   116.3
  SINGLE 5890 : 44922 ELKRWS28 - 44042 ELKR14S8 CKT: 1    23.2    20.0   115.1
  SINGLE 4062 : 44047 CABLETP8 - 44379 BENTON 8 CKT: 1    23.1    20.0   114.6
  SINGLE 4304 : 46540 LUXBGTP8 - 49280 WATKINS  CKT: 1    22.3    20.0   110.3
  SINGLE 4216 : 44800 ALBERTV8 - 44811 OTSEGO 8 CKT: 1    21.8    20.0   109.1
  SINGLE 4060 : 44046 BRGGLKS8 - 44047 CABLETP8 CKT: 1    21.8    20.0   108.0
  SINGLE 4246 : 44921 ELKRWS18 - 44922 ELKRWS28 CKT: 1    21.5    20.0   106.8
…

==========================================================================================
  46)  1511 PRKWD  7 - 44040 PRKWD  8 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1176 :  1511 PRKWD  7 - 44040 PRKWD  8 CKT: 1   159.1   131.4   121.1

==========================================================================================
  47)  1511 PRKWD  7 - 44040 PRKWD  8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1177 :  1511 PRKWD  7 - 44040 PRKWD  8 CKT: 2   139.4   105.0   132.7

==========================================================================================
  48) 44011 FOREST 8 - 44014 HUGO   8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1180 :  1513 RUSH CY4 - 44374 RUSH CY8 CKT: 1    44.2    26.0   182.5
  SINGLE 4114 : 44359 HARRIS 8 - 44374 RUSH CY8 CKT: 1    43.6    26.0   181.6
  SINGLE 4113 : 44359 HARRIS 8 - 44363 NBRNCH 8 CKT: 1    39.7    26.0   163.6
  SINGLE 4028 : 44014 HUGO   8 - 44036 BLAINE 8 CKT: 1    18.8    26.0   106.4

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  49) 44011 FOREST 8 - 44048 MARTNTP8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4028 : 44014 HUGO   8 - 44036 BLAINE 8 CKT: 1    34.8    26.0   190.5
  SINGLE 1180 :  1513 RUSH CY4 - 44374 RUSH CY8 CKT: 1    28.3    26.0   118.4
  SINGLE 4114 : 44359 HARRIS 8 - 44374 RUSH CY8 CKT: 1    27.7    26.0   117.1

==========================================================================================
  50)  1525 HUTCHMN8 - 44952 HUTCHCP8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1195 :  1519 WILLMAR8 - 44559 SVEATAP8 CKT: 1    24.5    22.0   110.2

==========================================================================================
  51) 44571 HUTCHTP8 - 44952 HUTCHCP8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1195 :  1519 WILLMAR8 - 44559 SVEATAP8 CKT: 1    24.9    22.0   115.7

==========================================================================================
  52) 44933 WILSWTP8 - 44934 WILMRTP8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1196 :  1519 WILLMAR8 - 44932 WILMRSO8 CKT: 1    62.0    26.0   243.2
  SINGLE 4248 : 44931 WILMRMN8 - 44932 WILMRSO8 CKT: 1    39.2    26.0   151.1

==========================================================================================
  53)  1519 WILLMAR8 - 44932 WILMRSO8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1197 :  1519 WILLMAR8 - 44933 WILSWTP8 CKT: 1    72.3    63.1   111.4

==========================================================================================
  54) 44931 WILMRMN8 - 44932 WILMRSO8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1197 :  1519 WILLMAR8 - 44933 WILSWTP8 CKT: 1    48.4    43.0   112.1

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  55) 37009 RUTLAND  - 52067 TRUMANT8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1255 :  1611 WILMART8 - 46648 EASTWDT8 CKT: 1    66.1    52.0   134.0
```

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==========================================================================================
  56) 46530 MADELVL8 - 46657 BUTERTP8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1255 :  1611 WILMART8 - 46648 EASTWDT8 CKT: 1    41.9    39.6   173.5

==========================================================================================
  57) 46530 MADELVL8 - 52038 MADLIAJ8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1255 :  1611 WILMART8 - 46648 EASTWDT8 CKT: 1    51.2    39.6   182.2

==========================================================================================
  58) 52035 TRUMANM8 - 52036 TRUMAN 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1255 :  1611 WILMART8 - 46648 EASTWDT8 CKT: 1    59.5    52.0   127.9

==========================================================================================
  59) 52035 TRUMANM8 - 52067 TRUMANT8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1255 :  1611 WILMART8 - 46648 EASTWDT8 CKT: 1    60.3    52.0   127.8

==========================================================================================
  60) 52037 LEWISVL8 - 52054 HANSKAT8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1255 :  1611 WILMART8 - 46648 EASTWDT8 CKT: 1    50.3    52.0   125.0

==========================================================================================
  61) 52038 MADLIAJ8 - 52054 HANSKAT8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1255 :  1611 WILMART8 - 46648 EASTWDT8 CKT: 1    59.7    29.7   259.9

==========================================================================================
  62) 46554 LAFAYET8 - 46560 WINTHRP8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1267 :  1615 FTRIDLY7 - 46900 FTRIDGL8 CKT: 1    36.9    40.7   114.0

==========================================================================================
  63) 46554 LAFAYET8 - 49312 LAFAYETT CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1267 :  1615 FTRIDLY7 - 46900 FTRIDGL8 CKT: 1    36.7    40.7   114.7

==========================================================================================
  64) 46900 FTRIDGL8 - 49298 SCHILLTP CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1267 :  1615 FTRIDLY7 - 46900 FTRIDGL8 CKT: 1    29.8    40.7   105.6

==========================================================================================
  65) 49298 SCHILLTP - 49312 LAFAYETT CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1267 :  1615 FTRIDLY7 - 46900 FTRIDGL8 CKT: 1    32.5    40.7   114.3

==========================================================================================
  66)  1707 CHIS CO3 -  1894 CHIS CO4 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1401 :  1695 AS KING3 -  1707 CHIS CO3 CKT: 1   486.3   448.0   108.5
  SINGLE 1439 :  1707 CHIS CO3 -  1727 KOLMNLK3 CKT: 1   460.4   448.0   102.8
  SINGLE 1711 :  1897 CHI    7 -  7871 LAW CRK7 CKT: 1   454.7   448.0   101.5

==========================================================================================
  67) 46837 SCANTAP8 - 47626 ST CROIG CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1588 :  1804 LAW CRK4 -  1809 APPLRV 4 CKT: 1    81.1    68.2   111.4

==========================================================================================
  68) 57251 T OSCOLA - 57262 BORDER   CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1588 :  1804 LAW CRK4 -  1809 APPLRV 4 CKT: 1    82.7    48.4   164.0

==========================================================================================
  69) 57262 BORDER   - 57312 SAND LK  CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1588 :  1804 LAW CRK4 -  1809 APPLRV 4 CKT: 1    80.0    48.4   160.5
```

```
==========================================================================================
  70) 57307 APLRVR 8 - 57311 GARFIELD CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1588 :  1804 LAW CRK4 -  1809 APPLRV 4 CKT: 1    60.3    51.7   114.5

==========================================================================================
  71) 57311 GARFIELD - 57312 SAND LK  CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1588 :  1804 LAW CRK4 -  1809 APPLRV 4 CKT: 1    75.6    51.7   142.5

==========================================================================================
  72) 57390 FALUN  9 - 57398 ALPHA  9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1588 :  1804 LAW CRK4 -  1809 APPLRV 4 CKT: 1    20.4    16.5   124.2
  SINGLE 1589 :  1804 LAW CRK4 -  1894 CHIS CO4 CKT: 1    19.0    16.5   115.4
  SINGLE 5639 : 57311 GARFIELD - 57319 BALSM L8 CKT: 1    17.0    16.5   103.5
  SINGLE 4781 : 47626 ST CROIG - 57251 T OSCOLA CKT: 1    16.4    16.5   100.4

==========================================================================================
  73) 57398 ALPHA  9 - 57999 WAYNE  9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1588 :  1804 LAW CRK4 -  1809 APPLRV 4 CKT: 1    22.1    16.5   129.8
  SINGLE 1589 :  1804 LAW CRK4 -  1894 CHIS CO4 CKT: 1    20.6    16.5   121.0
  SINGLE 5639 : 57311 GARFIELD - 57319 BALSM L8 CKT: 1    18.4    16.5   109.2
  SINGLE 4781 : 47626 ST CROIG - 57251 T OSCOLA CKT: 1    17.9    16.5   106.1
  SINGLE 5647 : 57319 BALSM L8 - 57329 BLSM LK9 CKT: 1    17.7    16.5   105.1
  SINGLE 5635 : 57307 APLRVR 8 - 57313 BUNYAN   CKT: 1    17.4    16.5   103.9
  SINGLE 5640 : 57313 BUNYAN   - 57314 T LUC    CKT: 1    17.0    16.5   101.3
  SINGLE 5655 : 57329 BLSM LK9 - 57336 EURKA T9 CKT: 1    17.0    16.5   101.3
  SINGLE 5598 : 57251 T OSCOLA - 57262 BORDER   CKT: 1    16.9    16.5   100.3

==========================================================================================
  74)  1831 BAYFRT88 -  1841 BAYFRNT8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1605 :  1821 BAYFRNT7 -  1831 BAYFRT88 CKT: 1    28.5    22.0   129.6

==========================================================================================
  75) 47552 TREMVAL8 - 47559 BLAIR  8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1658 :  1857 JACKSON5 -  1868 TREMVAL5 CKT: 1    53.5    52.8   102.3

==========================================================================================
  76) 47560 ALMA CE8 - 57157 MERRILLA CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1658 :  1857 JACKSON5 -  1868 TREMVAL5 CKT: 1    39.7    34.1   132.1

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  77) 47581 WISSOTAG - 47583 WISOTBC8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1679 :  1866 T-CRNRS7 -  1873 HYDROLN7 CKT: 1    42.4    40.7   101.2

==========================================================================================
  78) 57243 LUBLIN   - 57244 TACO TP  CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1694 :  1874 CORNELL7 - 57457 ANDERSN7 CKT: 1    40.9    39.6   102.0
  SINGLE 1699 :  1882 JIMFLS 7 - 57457 ANDERSN7 CKT: 1    40.5    39.6   100.8

==========================================================================================
  79) 57245 GILMAN   - 57246 HOLCOMBE CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1694 :  1874 CORNELL7 - 57457 ANDERSN7 CKT: 1    45.9    39.6   108.7
  SINGLE 1699 :  1882 JIMFLS 7 - 57457 ANDERSN7 CKT: 1    45.5    39.6   107.5

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  80)  1915 GLNDALE7 - 49246 GLENDALE CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1717 :  1915 GLNDALE7 - 49246 GLENDALE CKT: 1    59.0    58.8   100.4

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  81)  1915 GLNDALE7 - 49246 GLENDALE CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1718 :  1915 GLNDALE7 - 49246 GLENDALE CKT: 2    59.0    58.8   100.4
```

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==========================================================================================
  82)  2004 ELK    5 - 52008 ELK    8 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1757 :  2004 ELK    5 - 52008 ELK    8 CKT: 1    56.0    37.5   149.3

==========================================================================================
  83)  2004 ELK    5 - 52008 ELK    8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1758 :  2004 ELK    5 - 52008 ELK    8 CKT: 2    51.7    42.0   123.1

==========================================================================================
  84)  2127 HARMONY5 - 57026 HARMNY   CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1887 :  2127 HARMONY5 - 57026 HARMNY   CKT: 2    41.8    33.0   126.5
  SINGLE 1789 :  2022 ADAMS  5 - 52093 ADAMS  8 CKT: 1    37.6    33.0   113.9
  SINGLE 1902 :  2149 WABACO 5 - 57498 WABACO 8 CKT: 1    35.0    33.0   106.0

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  85)  2127 HARMONY5 - 57026 HARMNY   CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1886 :  2127 HARMONY5 - 57026 HARMNY   CKT: 1    41.8    33.0   126.5
  SINGLE 1789 :  2022 ADAMS  5 - 52093 ADAMS  8 CKT: 1    37.6    33.0   113.9
  SINGLE 1902 :  2149 WABACO 5 - 57498 WABACO 8 CKT: 1    35.0    33.0   106.0

==========================================================================================
  86)  2053 HAZL S 5 - 52428 HAZLTNS8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1805 :  2051 HAZLTON5 - 52429 HAZLTNN8 CKT: 1    51.4    37.5   137.0

==========================================================================================
  87)  2051 HAZLTON5 - 52429 HAZLTNN8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1808 :  2053 HAZL S 5 - 52428 HAZLTNS8 CKT: 1    51.9    37.5   138.4

==========================================================================================
  88)  2123 GENOA  5 - 57110 GENOA    CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1883 :  2123 GENOA  5 - 57110 GENOA    CKT: 1    50.4    37.4   134.7

==========================================================================================
  89)  2123 GENOA  5 - 57110 GENOA    CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1884 :  2123 GENOA  5 - 57110 GENOA    CKT: 2    70.3    66.0   106.5

==========================================================================================
  90) 46619 ALTURA 8 - 57016 T STOC   CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1902 :  2149 WABACO 5 - 57498 WABACO 8 CKT: 1    50.7    51.7   107.7

==========================================================================================
  91) 46619 ALTURA 8 - 57019 WEAVER   CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1902 :  2149 WABACO 5 - 57498 WABACO 8 CKT: 1    53.7    51.7   114.1
  SINGLE 5167 : 52107 PLAINVW8 - 57498 WABACO 8 CKT: 1    51.6    51.7   101.9

==========================================================================================
  92) 57016 T STOC   - 57074 UTICA    CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1902 :  2149 WABACO 5 - 57498 WABACO 8 CKT: 1    47.9    51.7   104.5

==========================================================================================
  93) 57019 WEAVER   - 57174 ALMA 8   CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1902 :  2149 WABACO 5 - 57498 WABACO 8 CKT: 1    57.4    51.7   114.6
  SINGLE 5167 : 52107 PLAINVW8 - 57498 WABACO 8 CKT: 1    51.9    51.7   102.4

==========================================================================================
  94)  2157 BARRON 5 - 57296 BARRON8  CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1908 :  2157 BARRON 5 - 57296 BARRON8  CKT: 1    80.3    73.7   109.0
```

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==========================================================================================
  95) 57319 BALSM L8 - 57329 BLSM LK9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 5635 : 57307 APLRVR 8 - 57313 BUNYAN   CKT: 1    20.0    15.0   133.1
  SINGLE 4262 : 46000 ROCKCR 4 - 57495 ROCKCR8  CKT: 1    19.4    15.0   129.2
  SINGLE 5739 : 57489 HOFFMAN9 - 57492 HOFFMAN8 CKT: 1    19.3    15.0   128.9
  SINGLE 5741 : 57492 HOFFMAN8 - 57495 ROCKCR8  CKT: 1    19.3    15.0   128.9
  SINGLE 5640 : 57313 BUNYAN   - 57314 T LUC    CKT: 1    18.5    15.0   123.5
  SINGLE 5634 : 57307 APLRVR 8 - 57311 GARFIELD CKT: 1    17.1    15.0   113.7
  SINGLE 5691 : 57398 ALPHA  9 - 57999 WAYNE  9 CKT: 1    16.3    15.0   108.5
  SINGLE 5690 : 57390 FALUN  9 - 57398 ALPHA  9 CKT: 1    15.9    15.0   105.8
  SINGLE 1910 :  2161 WASHCO 5 - 57323 WASHCO   CKT: 1    15.3    15.0   102.1

==========================================================================================
  96)  2211 DAVNPRT5 -  2220 SB 85 5  CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1921 :  2204 E MOLIN3 -  2217 E MOLINE CKT: 1   232.4   223.0   108.9

==========================================================================================
  97)  2266 SB  E 8  -  2268 SB 37 8  CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1975 :  2255 27TAP 8  -  2267 SB 39  8 CKT: 1   114.6   112.0   103.8

==========================================================================================
  98)  2271 SB GRS 8 -  2272 SB  R 8  CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 1986 :  2263 A-R5  8  - 60264 RIVSID5G CKT: 1    70.9    71.0   102.2

==========================================================================================
  99)  2312 HOPE 8   -  2375 EAGLGRV8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2042 :  2311 HOPE 5   - 60344 HOPE MD8 CKT: 1    47.9    45.0   112.3
  SINGLE 2044 :  2312 HOPE 8   - 60344 HOPE MD8 CKT: 1    47.9    45.0   112.3
  SINGLE 2115 :  2373 WRIGHT 5 - 60314 WRI MID8 CKT: 1    43.3    45.0   110.0
  SINGLE 2117 :  2374 WRIGHT 8 - 60314 WRI MID8 CKT: 1    43.3    45.0   110.0

==========================================================================================
 100)  2373 WRIGHT 5 - 60314 WRI MID8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2042 :  2311 HOPE 5   - 60344 HOPE MD8 CKT: 1    98.9    91.0   108.7
  SINGLE 2044 :  2312 HOPE 8   - 60344 HOPE MD8 CKT: 1    98.9    91.0   108.7

==========================================================================================
 101)  2374 WRIGHT 8 -  2375 EAGLGRV8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2042 :  2311 HOPE 5   - 60344 HOPE MD8 CKT: 1    62.5    64.0   103.0
  SINGLE 2044 :  2312 HOPE 8   - 60344 HOPE MD8 CKT: 1    62.5    64.0   103.0

==========================================================================================
 102)  2374 WRIGHT 8 - 60314 WRI MID8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2042 :  2311 HOPE 5   - 60344 HOPE MD8 CKT: 1    98.9    91.0   108.7
  SINGLE 2044 :  2312 HOPE 8   - 60344 HOPE MD8 CKT: 1    98.9    91.0   108.7

==========================================================================================
 103)  2322 HAMPTON8 -  2375 EAGLGRV8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2121 :  2377 HAMPTON5 - 60354 HAMP MD5 CKT: 1    16.6    45.0   158.1
  SINGLE 2047 :  2322 HAMPTON8 - 60354 HAMP MD5 CKT: 1    16.6    45.0   157.6

==========================================================================================
 104)  2521 M-TOWN 7 -  2630 WELSBGT7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2334 :  2527 FRNKLIN7 -  2533 IA FALS7 CKT: 1    90.3    90.0   106.6
  SINGLE 2120 :  2376 FRANKLN5 -  2527 FRNKLIN7 CKT: 1    90.3    90.0   106.4

==========================================================================================
 105)  2382 FLOYD  8 -  2385 WAVRLYJ8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2127 :  2381 FLOYD  5 - 60316 FLYDMID8 CKT: 1    45.0    41.0   124.5
  SINGLE 2129 :  2382 FLOYD  8 - 60316 FLYDMID8 CKT: 1    45.0    41.0   124.4
```

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==========================================================================================
 106)  2426 SYCAMOR8 -  2429 2BRDWAY8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2213 :  2426 SYCAMOR8 -  2429 2BRDWAY8 CKT: 2    77.3    72.0   106.6
  SINGLE 2214 :  2426 SYCAMOR8 -  2430 JOHN DR8 CKT: 1    72.7    72.0   100.3

==========================================================================================
 107)  2533 IA FALS7 -  2629 IA FALS9 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2341 :  2533 IA FALS7 -  2629 IA FALS9 CKT: 1    31.7    25.0   126.7

==========================================================================================
 108)  2533 IA FALS7 -  2629 IA FALS9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2342 :  2533 IA FALS7 -  2629 IA FALS9 CKT: 2    31.9    25.0   127.4

==========================================================================================
 109)  2542 WILMSBG7 -  2614 WILMSBG9 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2357 :  2542 WILMSBG7 -  2614 WILMSBG9 CKT: 1    34.5    16.0   215.5

==========================================================================================
 110)  2559 MARION 7 -  2560 MARION 9 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2385 :  2559 MARION 7 -  2560 MARION 9 CKT: 1    65.6    63.0   104.2

==========================================================================================
 111)  2578 DUNDEE 9 -  2593 DUNDEE 7 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2412 :  2578 DUNDEE 9 -  2593 DUNDEE 7 CKT: 1    17.2    16.0   107.5

==========================================================================================
 112)  2578 DUNDEE 9 -  2593 DUNDEE 7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2413 :  2578 DUNDEE 9 -  2593 DUNDEE 7 CKT: 2    17.2    16.0   107.6

==========================================================================================
 113)  3107 REGINA 6 -  3207 REGINA 4 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2578 :  3107 REGINA 6 -  3207 REGINA 4 CKT: 1   227.2   207.0   109.8

==========================================================================================
 114)  3107 REGINA 6 -  3207 REGINA 4 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2579 :  3107 REGINA 6 -  3207 REGINA 4 CKT: 2   226.7   207.0   109.5

==========================================================================================
 115)  3140 QE     6 -  3241 QE 2   4 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2618 :  3140 QE     6 -  3240 QE 1   4 CKT: 1   221.8   186.0   119.3
  SINGLE 2692 :  3238 BEATTY 4 -  3240 QE 1   4 CKT: 1   221.9   186.0   119.3

==========================================================================================
 116)  3140 QE     6 -  3240 QE 1   4 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2619 :  3140 QE     6 -  3241 QE 2   4 CKT: 1   221.7   186.0   119.2
  SINGLE 2693 :  3238 BEATTY 4 -  3241 QE 2   4 CKT: 1   221.7   186.0   119.2

==========================================================================================
 117)  3644 FR55-TP7 -  3646 LINE2TP7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2629 :  3160 ISLAND 7 -  3645 LINE1TP7 CKT: 1    68.5    65.0   109.4
  SINGLE 3023 :  3643 FR54-TP7 -  3645 LINE1TP7 CKT: 1    68.4    65.0   109.4

==========================================================================================
 118)  3643 FR54-TP7 -  3645 LINE1TP7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2630 :  3160 ISLAND 7 -  3646 LINE2TP7 CKT: 1    68.5    65.0   109.4
  SINGLE 3024 :  3644 FR55-TP7 -  3646 LINE2TP7 CKT: 1    68.4    65.0   109.4

==========================================================================================
 119)  3185 SWIFTCU6 -  3385 SWIFTCU8 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2660 :  3185 SWIFTCU6 -  3385 SWIFTCU8 CKT: 1    85.5    67.0   127.7
```

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==========================================================================================
 120)  3185 SWIFTCU6 -  3385 SWIFTCU8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2661 :  3185 SWIFTCU6 -  3385 SWIFTCU8 CKT: 2    85.6    61.0   140.3

==========================================================================================
 121)  3166 LLOYDM 6 -  3266 LLOYDMI4 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2697 :  3266 LLOYDMI4 -  3296 BRADA  4 CKT: 1   172.4   150.0   114.9

==========================================================================================
 122)  3404 DORSEY 4 -  3499 DORSY2M4 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2939 :  3465 DORSEY 2 -  3467 DORSEYM4 CKT: 1  1793.9  1200.0   143.1
  SINGLE 2723 :  3404 DORSEY 4 -  3467 DORSEYM4 CKT: 1  1757.4  1200.0   140.1

==========================================================================================
 123)  3465 DORSEY 2 -  3499 DORSY2M4 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2939 :  3465 DORSEY 2 -  3467 DORSEYM4 CKT: 1  1845.4  1200.0   153.8
  SINGLE 2723 :  3404 DORSEY 4 -  3467 DORSEYM4 CKT: 1  1796.8  1200.0   149.7

==========================================================================================
 124)  3404 DORSEY 4 -  3467 DORSEYM4 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2940 :  3465 DORSEY 2 -  3499 DORSY2M4 CKT: 1  1789.5  1200.0   142.7
  SINGLE 2728 :  3404 DORSEY 4 -  3499 DORSY2M4 CKT: 1  1766.2  1200.0   140.2

==========================================================================================
 125)  3465 DORSEY 2 -  3467 DORSEYM4 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2940 :  3465 DORSEY 2 -  3499 DORSY2M4 CKT: 1  1841.5  1200.0   153.5
  SINGLE 2728 :  3404 DORSEY 4 -  3499 DORSY2M4 CKT: 1  1798.7  1200.0   149.9

==========================================================================================
 126)  3449 AMY ST.8 -  3648 DEMEURN8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2888 :  3443 HARROW 7 -  3647 SCOTHS57 CKT: 1    55.1    46.0   118.1
  SINGLE 2911 :  3449 AMY ST.8 -  3494 SHELOIL8 CKT: 1    50.4    46.0   108.0
  SINGLE 2906 :  3448 TRANSCO8 -  3494 SHELOIL8 CKT: 1    50.1    46.0   107.3
  SINGLE 2935 :  3461 RIDGEWY4 -  3489 RIDGEWY8 CKT: 1    46.7    46.0   100.0
  SINGLE 2936 :  3461 RIDGEWY4 -  3489 RIDGEWY8 CKT: 2    46.7    46.0   100.0

==========================================================================================
 127)  3451 MC.PHIL8 -  3658 MCPHL-P7 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2921 :  3451 MC.PHIL8 -  3658 MCPHL-P7 CKT: 1    98.4    92.0   107.0

==========================================================================================
 128)  3451 MC.PHIL8 -  3658 MCPHL-P7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2922 :  3451 MC.PHIL8 -  3658 MCPHL-P7 CKT: 2    98.4    92.0   107.0

==========================================================================================
 129)  3468 DC5 JCT4 -  3585 SCE-1-3G CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 2943 :  3469 DC6 JCT4 -  3586 SCA-4-6G CKT: 1   479.8   480.0   103.3

==========================================================================================
 130) 10003 ALBION 7 - 10004 ALBION 9 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3060 : 10003 ALBION 7 - 10004 ALBION 9 CKT: 1    15.0    11.0   136.1

==========================================================================================
 131) 10005 ALDA   7 - 10006 ALDA   9 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3066 : 10005 ALDA   7 - 10006 ALDA   9 CKT: 1    34.0    31.0   109.6

==========================================================================================
 132) 10005 ALDA   7 - 10006 ALDA   9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3067 : 10005 ALDA   7 - 10006 ALDA   9 CKT: 2    34.1    31.0   110.1
```

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==========================================================================================
 133) 10021 BEATRCE7 - 10022 BEATRCE9 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3096 : 10021 BEATRCE7 - 10022 BEATRCE9 CKT: 1    50.0    35.0   143.0

==========================================================================================
 134) 10025 BELDEN 7 - 10026 BELDEN 8 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3106 : 10025 BELDEN 7 - 10026 BELDEN 8 CKT: 1    25.5    25.0   102.1

==========================================================================================
 135) 10025 BELDEN 7 - 10026 BELDEN 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3107 : 10025 BELDEN 7 - 10026 BELDEN 8 CKT: 2    25.4    25.0   101.7

==========================================================================================
 136) 10027 BEVERLY7 - 10028 BEVERLY8 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3111 : 10027 BEVERLY7 - 10028 BEVERLY8 CKT: 1    27.8    16.0   173.5

==========================================================================================
 137) 10043 CANADAY4 - 10355 CANADY Y CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3124 : 10037 C.CREEK4 - 10243 RIVERDL4 CKT: 1   131.0   125.0   104.8

==========================================================================================
 138) 10044 CANADAY7 - 10355 CANADY Y CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3124 : 10037 C.CREEK4 - 10243 RIVERDL4 CKT: 1   129.0   125.0   103.2

==========================================================================================
 139) 10063 COLMBUS7 - 10064 COLMBUS9 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3167 : 10063 COLMBUS7 - 10064 COLMBUS9 CKT: 1    53.8    46.0   117.0

==========================================================================================
 140) 10063 COLMBUS7 - 10064 COLMBUS9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3168 : 10063 COLMBUS7 - 10064 COLMBUS9 CKT: 2    53.9    46.0   117.1

==========================================================================================
 141) 10074 CRESTON7 - 10075 CRESTON9 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3187 : 10074 CRESTON7 - 10075 CRESTON9 CKT: 1    11.3    11.0   102.3

==========================================================================================
 142) 10162 KEARNEY7 - 10163 KEARNEY9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3317 : 10162 KEARNEY7 - 10163 KEARNEY9 CKT: 2    36.8    35.0   105.2

==========================================================================================
 143)   479 MARTIN 7 -   653 VETALTP7 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3339 : 10181 MAXWELL7 - 10204 N.PLATT7 CKT: 1    65.3    66.0   101.2

==========================================================================================
 144) 10182 MCCOOK 7 - 10183 MCCOOK 8 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3341 : 10182 MCCOOK 7 - 10183 MCCOOK 8 CKT: 1    39.0    35.0   111.5

==========================================================================================
 145) 10182 MCCOOK 7 - 10183 MCCOOK 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3342 : 10182 MCCOOK 7 - 10183 MCCOOK 8 CKT: 2    39.0    35.0   111.5

==========================================================================================
 146) 10248 SCHUYLR7 - 10249 SCHUYLR9 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3408 : 10248 SCHUYLR7 - 10249 SCHUYLR9 CKT: 1    35.6    35.0   101.8

==========================================================================================
 147) 10316 YORK   7 - 10317 YORK   9 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3463 : 10316 YORK   7 - 10317 YORK   9 CKT: 1    34.6    31.0   111.5
```

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==========================================================================================
 148) 10316 YORK   7 - 10317 YORK   9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3464 : 10316 YORK   7 - 10317 YORK   9 CKT: 2    34.7    31.0   111.9

==========================================================================================
 149) 13919 S919   8 - 13950 S950   8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3622 : 13907 S907   8 - 13911 S911   8 CKT: 1    91.9    72.0   127.0
  SINGLE 3539 : 13209 S1209  5 - 14609 S1209T1T CKT: 1    83.1    72.0   114.2
  SINGLE 3631 : 13909 S909   8 - 14609 S1209T1T CKT: 1    83.1    72.0   114.2
  SINGLE 3623 : 13907 S907   8 - 13919 S919   8 CKT: 1    82.2    72.0   113.1
  SINGLE 3548 : 13211 S1211  5 - 14611 S1211T1T CKT: 1    82.1    72.0   112.6
  SINGLE 3636 : 13911 S911   8 - 14611 S1211T1T CKT: 1    81.2    72.0   111.2
  SINGLE 3500 : 13031 N OMA 1G - 13911 S911   8 CKT: 1    77.5    72.0   106.9
  SINGLE 3526 : 13201 S1201  5 - 13229 S1229  5 CKT: 1    76.2    72.0   104.7
  SINGLE 3552 : 13217 S1217  5 - 14617 S1217T1T CKT: 1    74.7    72.0   102.6
  SINGLE 3643 : 13917 S917   8 - 14617 S1217T1T CKT: 1    74.7    72.0   102.6
…

==========================================================================================
 150) 13035 N OMA 5G - 13211 S1211  5 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3507 : 13035 N OMA 5G - 13135 NO5 AUX9 CKT: 1   255.1   250.0   102.0

==========================================================================================
 151) 13217 S1217  5 - 13227 S1227  5 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3526 : 13201 S1201  5 - 13229 S1229  5 CKT: 1   273.1   270.0   102.7

==========================================================================================
 152) 13227 S1227  5 - 13231 S1231  5 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3526 : 13201 S1201  5 - 13229 S1229  5 CKT: 1   347.2   335.0   104.3

==========================================================================================
 153) 13906 S906 N 8 - 13938 S938   8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3531 : 13206 S1206  5 - 14606 S1206T1T CKT: 1    99.4    80.0   123.9
  SINGLE 3699 : 14606 S1206T1T - 14906 S906 S 8 CKT: 1    99.4    80.0   123.9

==========================================================================================
 154) 13938 S938   8 - 14906 S906 S 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3533 : 13206 S1206  5 - 14706 S1206T2T CKT: 1    72.3    60.0   120.1
  SINGLE 3620 : 13906 S906 N 8 - 14706 S1206T2T CKT: 1    72.3    60.0   120.1
  SINGLE 3619 : 13906 S906 N 8 - 13938 S938   8 CKT: 1    63.6    60.0   106.2

==========================================================================================
 155) 13209 S1209  5 - 13231 S1231  5 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3535 : 13209 S1209  5 - 13231 S1231  5 CKT: 2   232.5   227.0   101.3

==========================================================================================
 156) 13906 S906 N 8 - 13928 S928   8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3648 : 13921 S921   8 - 13942 S942   8 CKT: 1    87.1    71.0   123.9
  SINGLE 3555 : 13221 S1221  5 - 14621 S1221T9T CKT: 1    77.9    71.0   110.3
  SINGLE 3649 : 13921 S921   8 - 14621 S1221T9T CKT: 1    77.9    71.0   110.3

==========================================================================================
 157) 13201 S1201  5 - 13229 S1229  5 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3561 : 13227 S1227  5 - 13231 S1231  5 CKT: 1   372.1   321.0   116.0

==========================================================================================
 158) 13222 S1222  5 - 13229 S1229  5 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3561 : 13227 S1227  5 - 13231 S1231  5 CKT: 1   322.2   305.0   106.4
```

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==========================================================================================
 159) 13907 S907   8 - 13911 S911   8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3577 : 13250 S1250  5 - 14650 S1250T1T CKT: 1    77.4    72.0   105.7
  SINGLE 3646 : 13919 S919   8 - 13950 S950   8 CKT: 1    77.4    72.0   105.7
  SINGLE 3656 : 13950 S950   8 - 14650 S1250T1T CKT: 1    77.4    72.0   105.7

==========================================================================================
 160) 13921 S921   8 - 13942 S942   8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3618 : 13906 S906 N 8 - 13928 S928   8 CKT: 1    86.9    71.0   127.6

==========================================================================================
 161) 13911 S911   8 - 13913 S913   8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3624 : 13908 S908   8 - 13910 S910   8 CKT: 1    91.9    90.0   101.7

==========================================================================================
 162) 14691 FREM A 8 - 14696 FREM 67G CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3711 : 14691 FREM A 8 - 14696 FREM 67G CKT: 1    26.1    25.0   104.5

==========================================================================================
 163) 14691 FREM A 8 - 14696 FREM 67G CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3712 : 14691 FREM A 8 - 14696 FREM 67G CKT: 2    26.1    25.0   104.5

==========================================================================================
 164) 13976 S976   8 - 14693 FREM D 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3713 : 14691 FREM A 8 - 14698 FREM  8G CKT: 1    77.4    72.0   115.0

==========================================================================================
 165) 22165 AVSDC1TY - 22166 AVSDC2TY CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3809 : 22165 AVSDC1TY - 22169 AVSDC5TY CKT: 1    98.7    72.0   129.8

==========================================================================================
 166) 22166 AVSDC2TY - 22170 AVSDC6TY CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3809 : 22165 AVSDC1TY - 22169 AVSDC5TY CKT: 1    62.3    72.0   117.3

==========================================================================================
 167) 22169 AVSDC5TY - 22170 AVSDC6TY CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3809 : 22165 AVSDC1TY - 22169 AVSDC5TY CKT: 1    37.3    72.0   117.6

==========================================================================================
 168) 22171 AVSDC7TY - 22175 AVSD11TY CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3817 : 22171 AVSDC7TY - 22172 AVSDC8TY CKT: 1    82.2    72.0   107.8

==========================================================================================
 169) 22171 AVSDC7TY - 22172 AVSDC8TY CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3818 : 22171 AVSDC7TY - 22175 AVSD11TY CKT: 1    93.4    72.0   118.3

==========================================================================================
 170) 22172 AVSDC8TY - 22176 AVSD12TY CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3818 : 22171 AVSDC7TY - 22175 AVSD11TY CKT: 1    72.4    72.0   117.2

==========================================================================================
 171) 22175 AVSD11TY - 22176 AVSD12TY CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 3818 : 22171 AVSDC7TY - 22175 AVSD11TY CKT: 1    30.8    72.0   116.8

==========================================================================================
 172)  1513 RUSH CY4 - 44374 RUSH CY8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4028 : 44014 HUGO   8 - 44036 BLAINE 8 CKT: 1   127.6   105.0   121.5
```

```
==========================================================================================
 173) 44048 MARTNTP8 - 44363 NBRNCH 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4028 : 44014 HUGO   8 - 44036 BLAINE 8 CKT: 1    44.2    26.0   234.6

==========================================================================================
 174) 44032 ZIMERMN8 - 44058 EBNORTH8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4104 : 44354 MILACAD8 - 44384 MILACA 8 CKT: 1    53.7    56.0   101.9

==========================================================================================
 175) 44035 PIPETAP8 - 44042 ELKR14S8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4104 : 44354 MILACAD8 - 44384 MILACA 8 CKT: 1    56.3    56.0   101.9

==========================================================================================
 176) 44035 PIPETAP8 - 44058 EBNORTH8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4104 : 44354 MILACAD8 - 44384 MILACA 8 CKT: 1    55.3    56.0   101.9

==========================================================================================
 177) 44352 CAMBRDG8 - 44360 BRAHAM 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4106 : 44355 RUSHDST8 - 44374 RUSH CY8 CKT: 1    22.2    22.0   109.6

==========================================================================================
 178) 38308 SAND46 9 - 44394 SAND MP8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4139 : 44393 SAND SW8 - 44395 HINCKTP8 CKT: 1    10.2     9.0   113.9

==========================================================================================
 179) 44806 HIGHLND8 - 44808 MAPLELK8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4314 : 46552 WAKEFLD8 - 49282 FAIRHVTP CKT: 1    15.0    15.0   102.0

==========================================================================================
 180) 46560 WINTHRP8 - 49310 HEARTLND CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4340 : 46566 GRENISL8 - 46864 CARVRCO8 CKT: 1    48.7    51.7   104.1
  SINGLE 4338 : 46565 ARLNGTN8 - 46566 GRENISL8 CKT: 1    48.4    51.7   103.2

==========================================================================================
 181) 49236 LEMAY LK - 49237 LMAYLKTP CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4556 : 46821 LEBNON 8 - 49232 PILOTKTP CKT: 1    51.8    26.4   197.3

==========================================================================================
 182) 46666 REDWING8 - 46667 FRONTNC8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4669 : 47556 ALMA   8 - 57174 ALMA 8   CKT: 1    49.9    52.8   100.1

==========================================================================================
 183)  1877 SEVN ML5 - 47653 SEVN ML8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4692 : 47572 T TRUAX8 - 47576 EAUCLAI8 CKT: 1   149.6   145.0   103.2
  SINGLE 4693 : 47572 T TRUAX8 - 47633 TRUAX  8 CKT: 1   149.6   145.0   103.2

==========================================================================================
 184)  1802 REDCDR 5 - 47652 REDCDR 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4743 : 47603 ELMWOOD8 - 57184 RCK ELM8 CKT: 1    93.8    91.0   103.0

==========================================================================================
 185) 47610 CEDARFA8 - 47611 MENOMONG CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4743 : 47603 ELMWOOD8 - 57184 RCK ELM8 CKT: 1    53.3    52.8   100.1

==========================================================================================
 186) 47630 RICE LK8 - 47905 RL TP1 8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 5625 : 57296 BARRON8  - 57328 T BARMUN CKT: 1    54.5    46.2   124.8
  SINGLE 4804 : 47656 POK TAP8 - 57328 T BARMUN CKT: 1    47.7    46.2   106.9
  SINGLE 4805 : 47658 T CAM N8 - 47659 CMR TAP8 CKT: 1    47.7    46.2   106.9
  SINGLE 4803 : 47656 POK TAP8 - 47659 CMR TAP8 CKT: 1    47.7    46.2   106.9
  SINGLE 4786 : 47630 RICE LK8 - 47658 T CAM N8 CKT: 1    46.3    46.2   104.7
```

```
==========================================================================================
 187) 57296 BARRON8  - 57328 T BARMUN CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 4787 : 47630 RICE LK8 - 47905 RL TP1 8 CKT: 1    55.4    52.8   102.4
  SINGLE 4888 : 47905 RL TP1 8 - 57296 BARRON8  CKT: 1    55.4    52.8   102.4

==========================================================================================
 188)  1828 OSPREY 7 -  1844 BIGFALL8 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 5595 : 57247 CONRATH  - 57335 FLAMBEAU CKT: 1    29.3    27.0   108.5
  SINGLE 5596 : 57247 CONRATH  - 57359 HOLC DST CKT: 1    27.7    27.0   102.7

==========================================================================================
 189) 57329 BLSM LK9 - 57336 EURKA T9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 5635 : 57307 APLRVR 8 - 57313 BUNYAN   CKT: 1    18.0    16.5   108.1

==========================================================================================
 190) 57399 GRANTDPC - 57489 HOFFMAN9 CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 5740 : 57489 HOFFMAN9 - 57999 WAYNE  9 CKT: 1    17.2    16.5   101.7

==========================================================================================
 191)  1506 ELK RIV4 - 44042 ELKR14S8 CKT:  2          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 5818 :  1506 ELK RIV4 - 44042 ELKR14S8 CKT: 1   107.8   105.2   102.5

==========================================================================================
 192) 44808 MAPLELK8 - 44824 MAPLE 1G CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 5890 : 44922 ELKRWS28 - 44042 ELKR14S8 CKT: 1    28.9    26.0   116.3

==========================================================================================
 193) 44817 GOOSETP8 - 44824 MAPLE 1G CKT:  1          PST-CNT  RATING PERCENT
------------------------------------------------------------------------------------------
  SINGLE 5890 : 44922 ELKRWS28 - 44042 ELKR14S8 CKT: 1    28.8    26.0   116.3
```

APPENDIX 3

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 1 (HETTINGER)

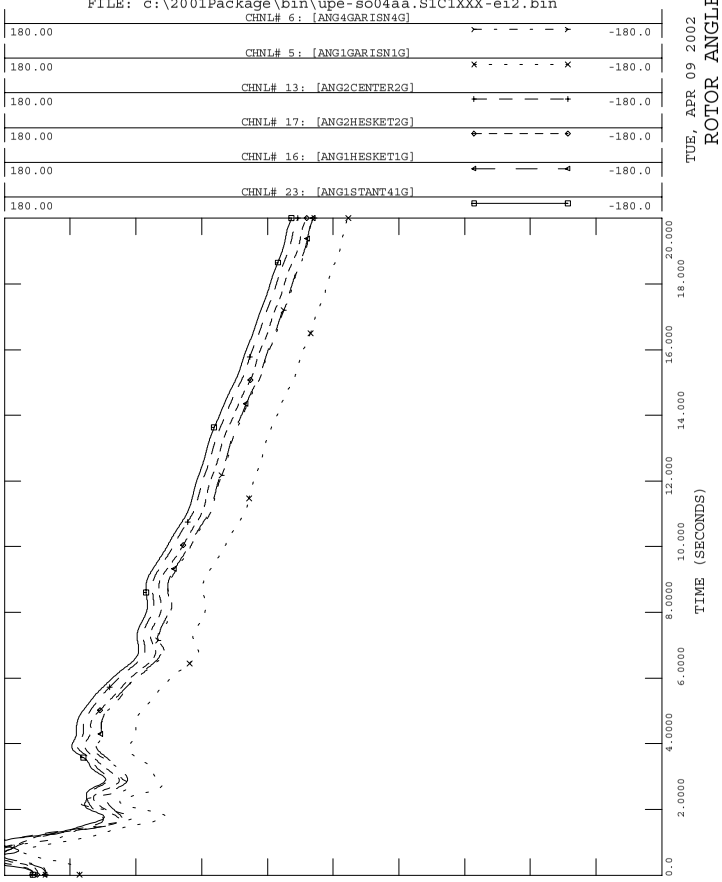
CASE S1C1XXX

CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

TUE, APR 09 2002 18:26
ROTOR ANGLES 2



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BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
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TUE, APR 09 2002 18:26
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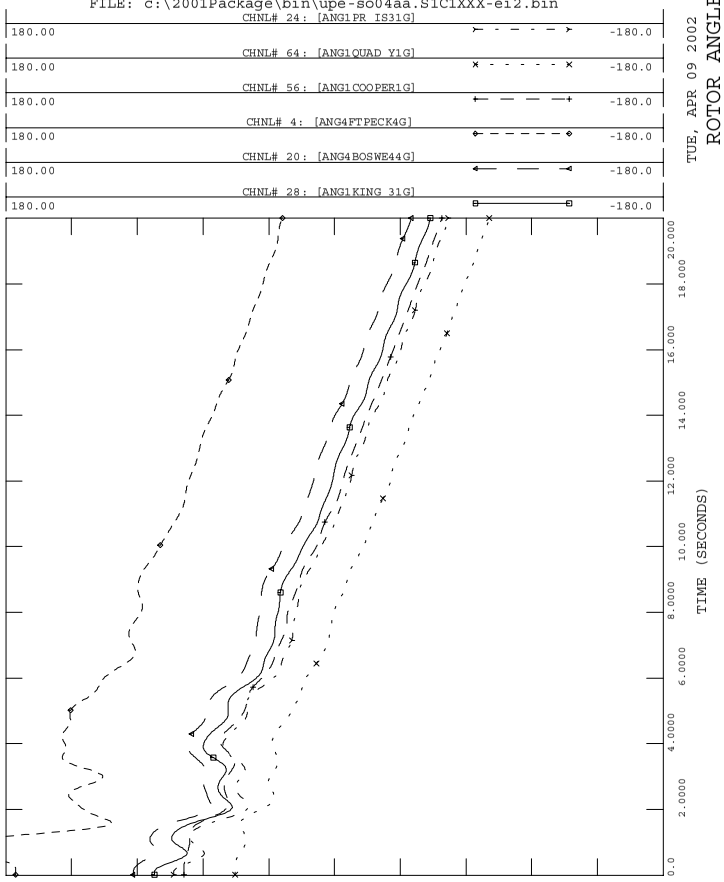

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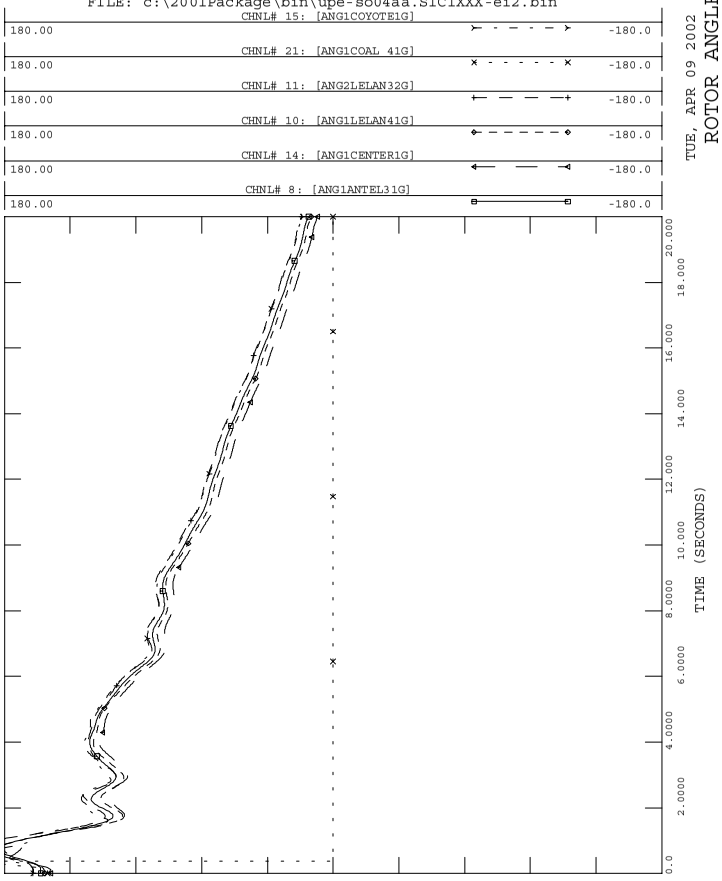

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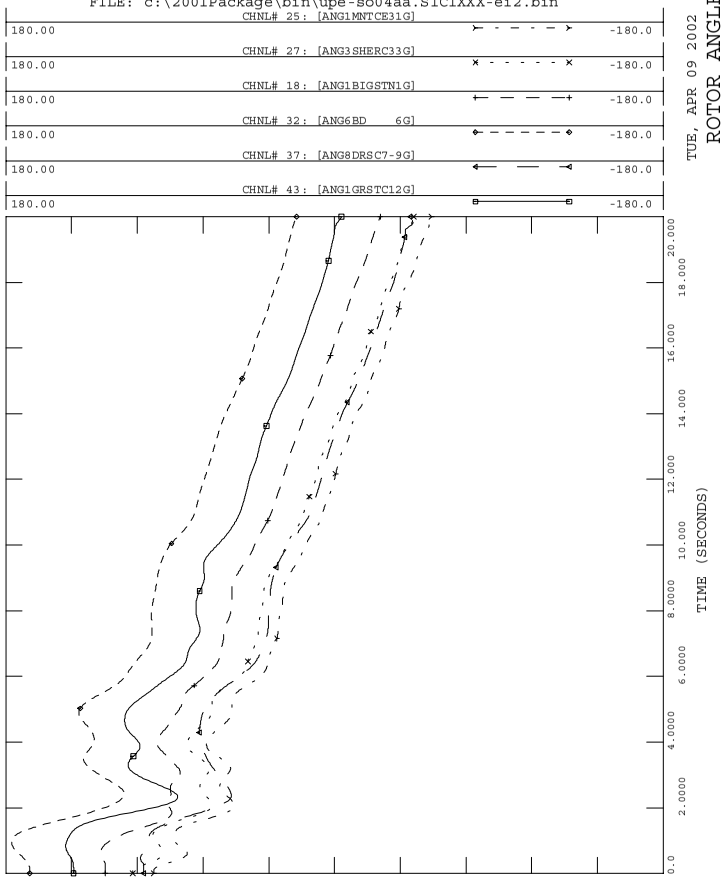
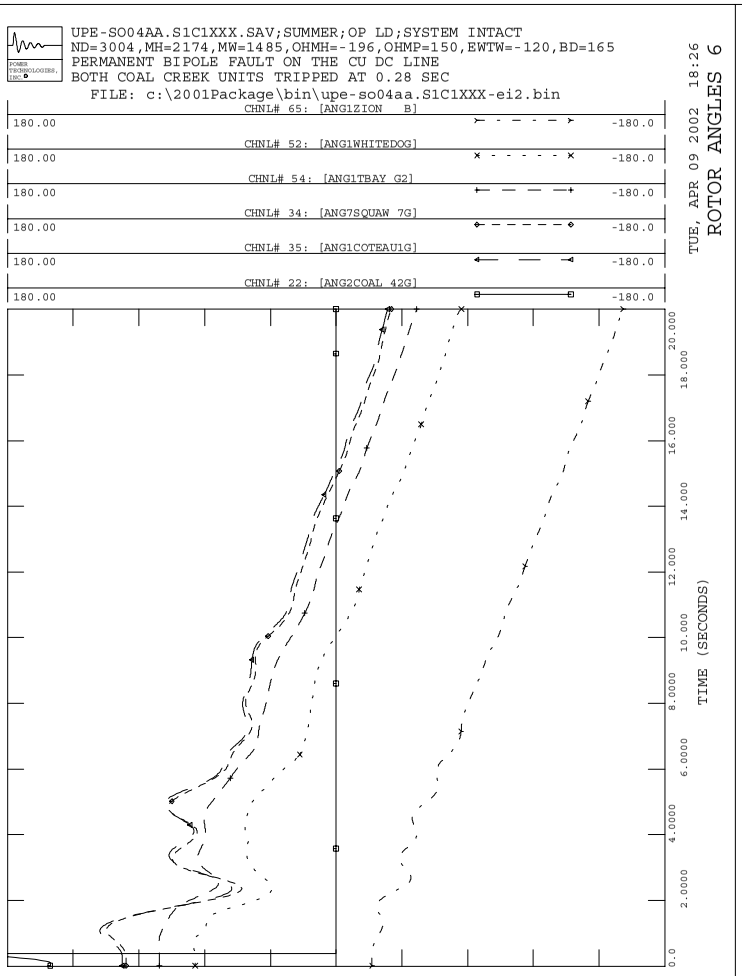
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

TUE, APR 09 2002 18:26
ROTOR ANGLES 3

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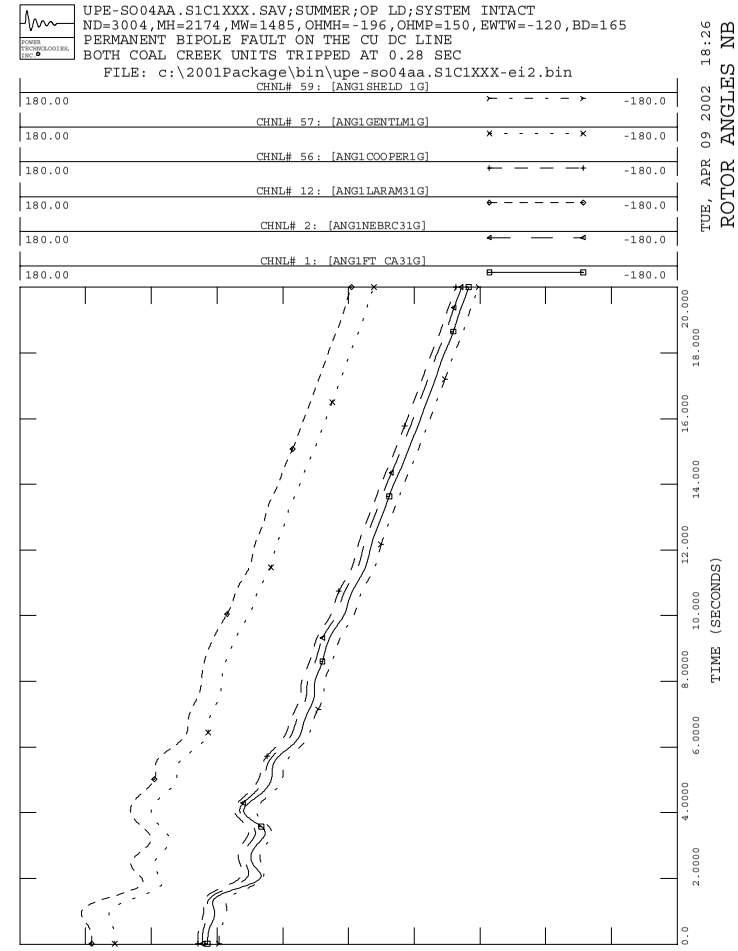
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 18:26
ROTOR ANGLES 6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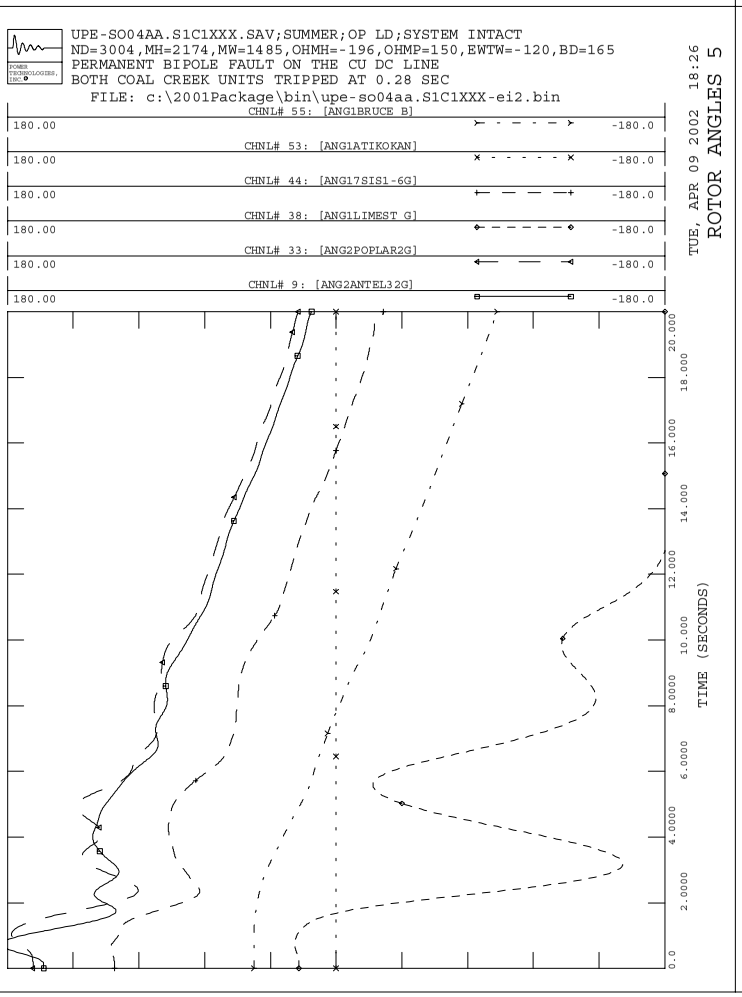
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 18:26
ROTOR ANGLES NB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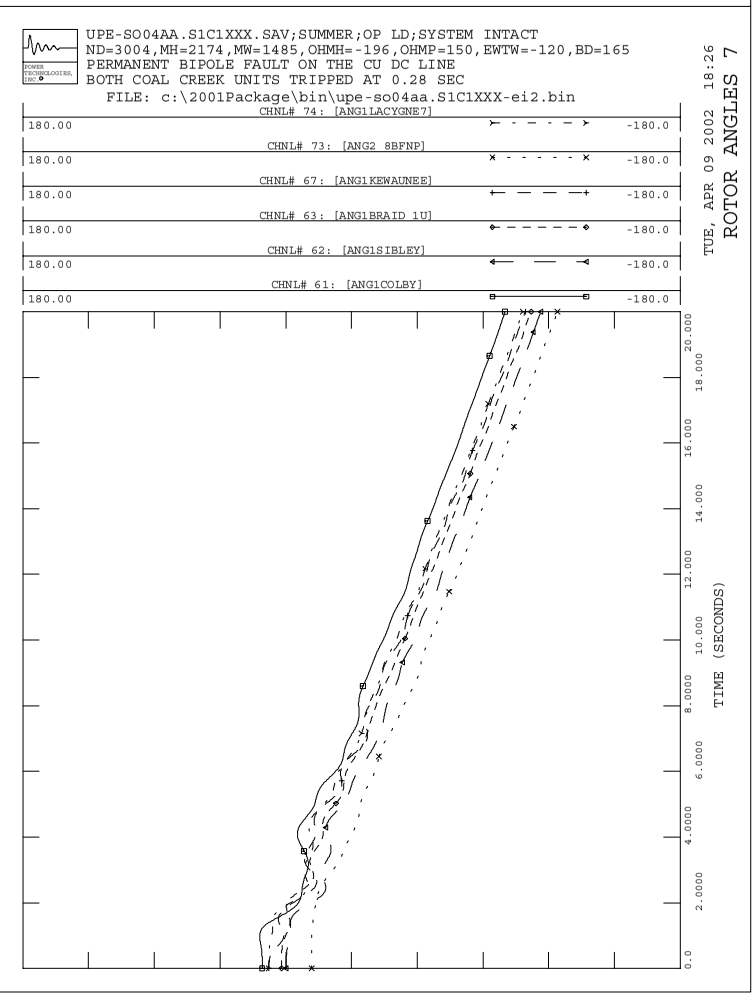
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 18:26
ROTOR ANGLES 5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PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 18:26
ROTOR ANGLES 7

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
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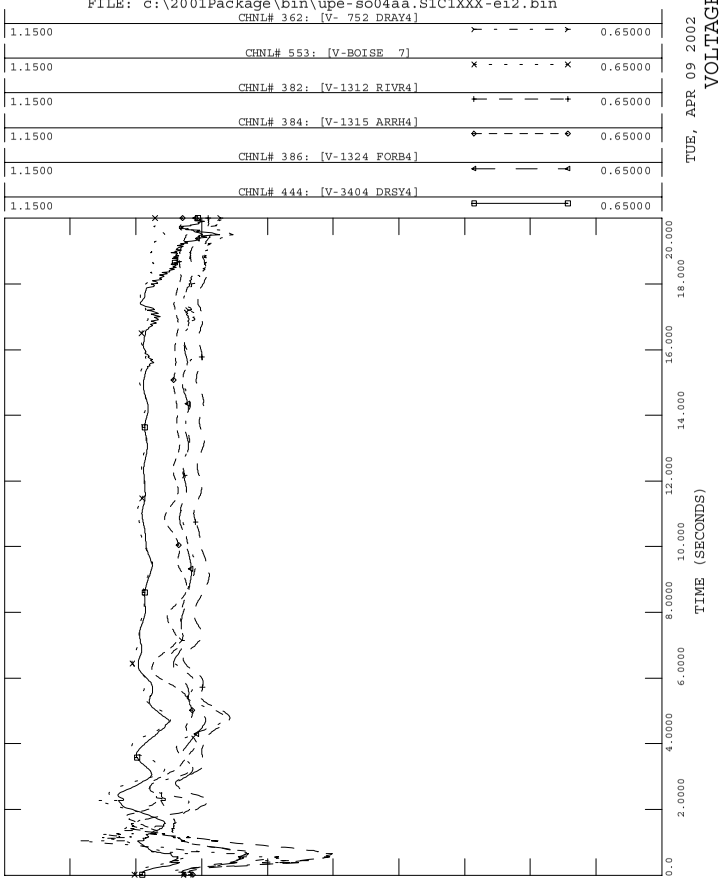

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VOLTAGES 1

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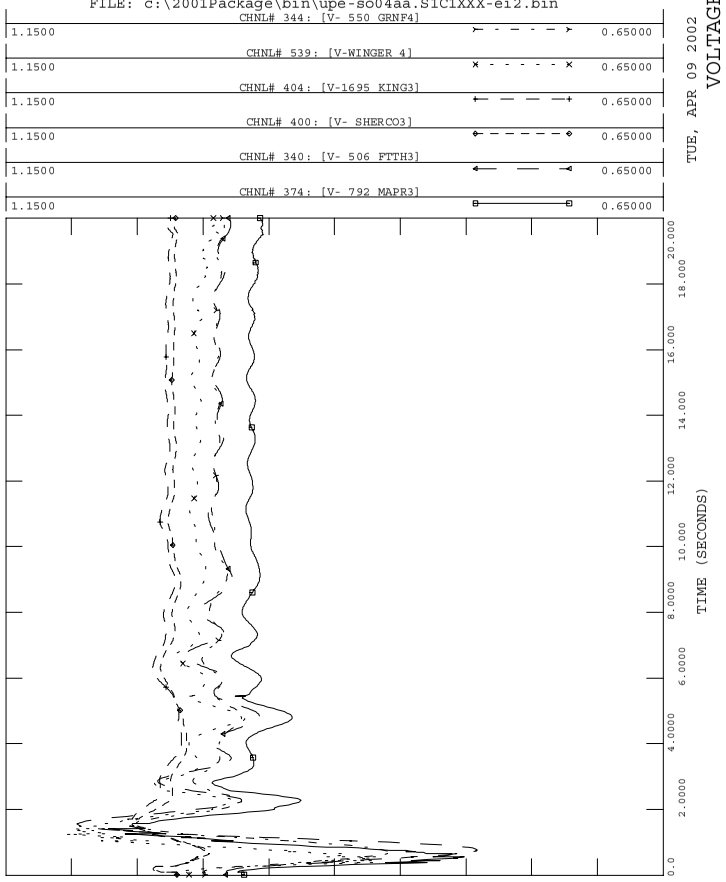

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VOLTAGES 3

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BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
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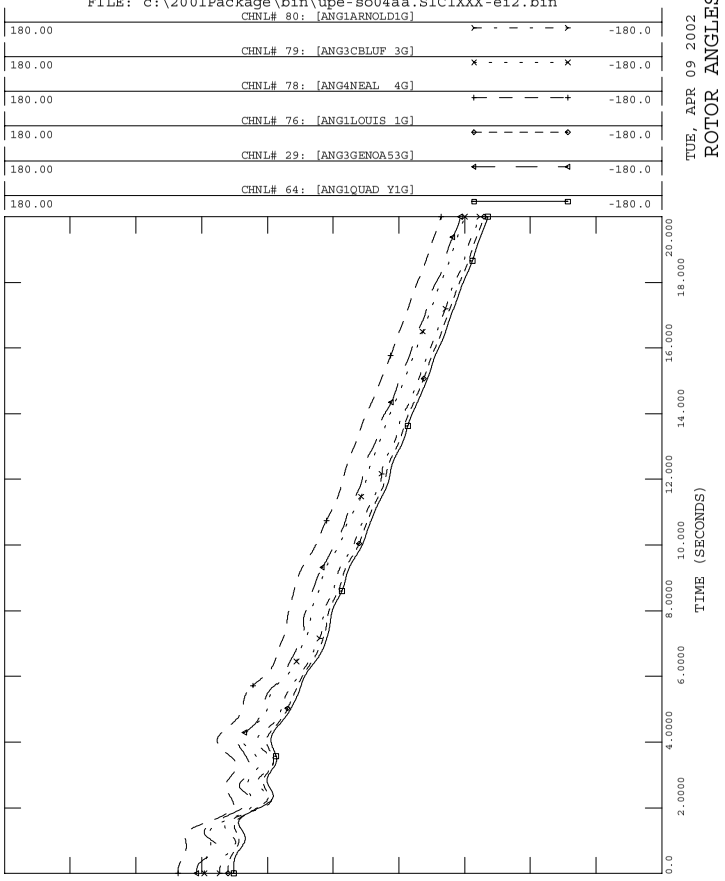

TUE, APR 09 2002 18:26
ROTOR ANGLES IA

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BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
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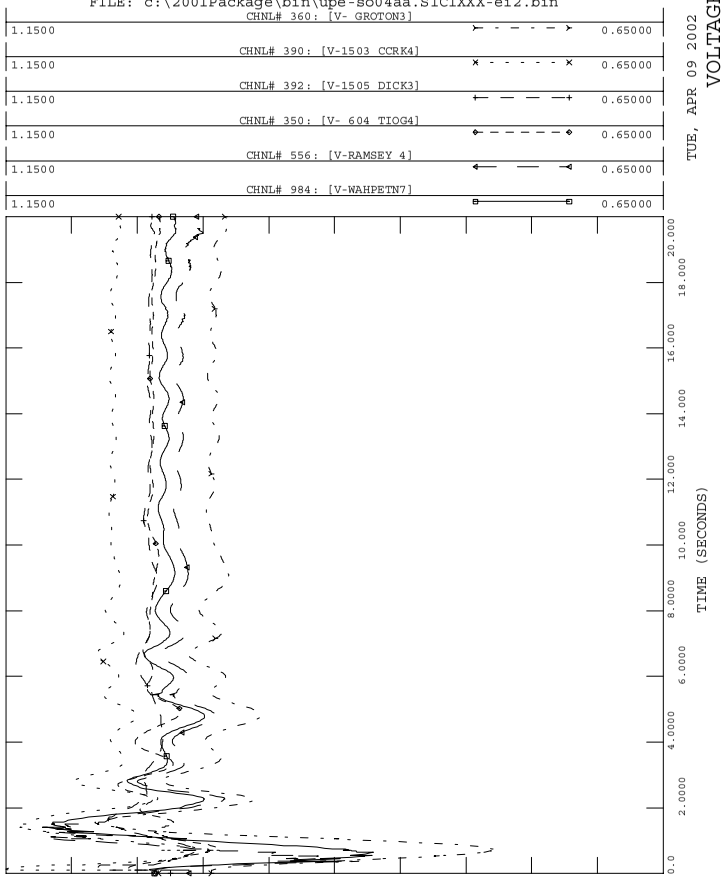

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VOLTAGES 2

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BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
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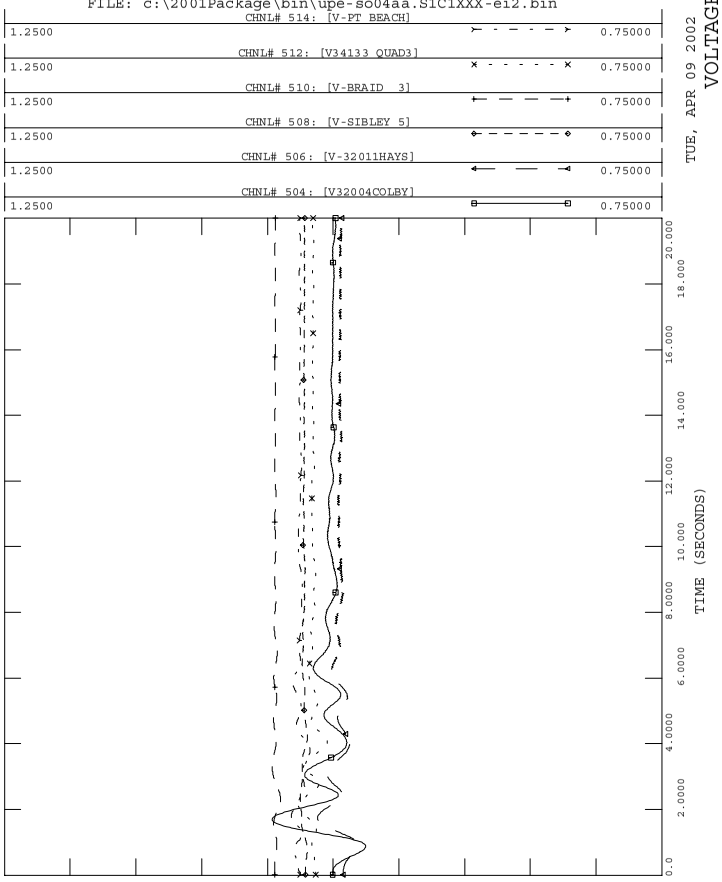

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VOLTAGES 5

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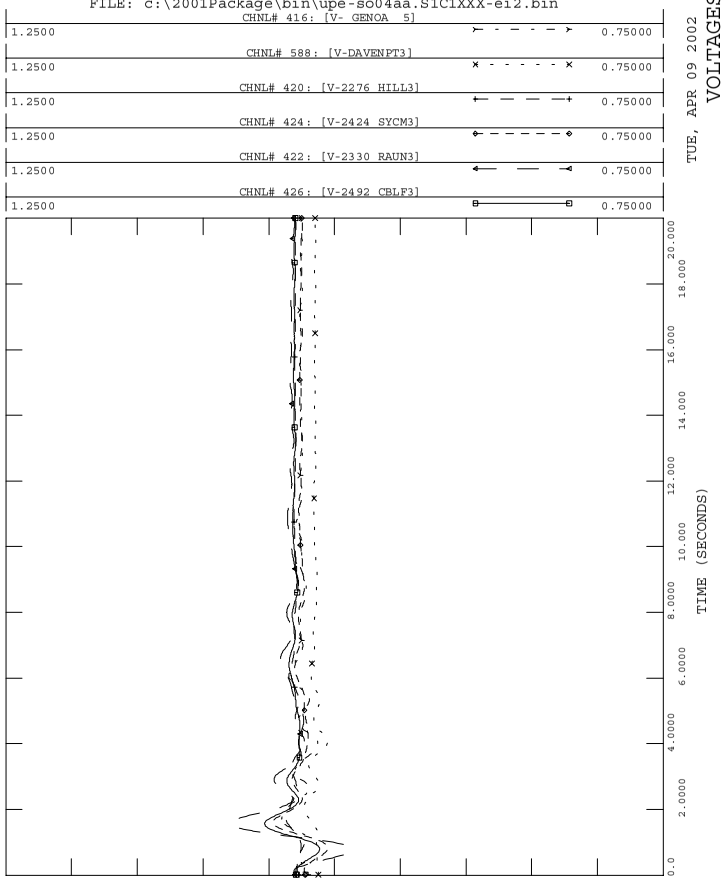

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VOLTAGES IA

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BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
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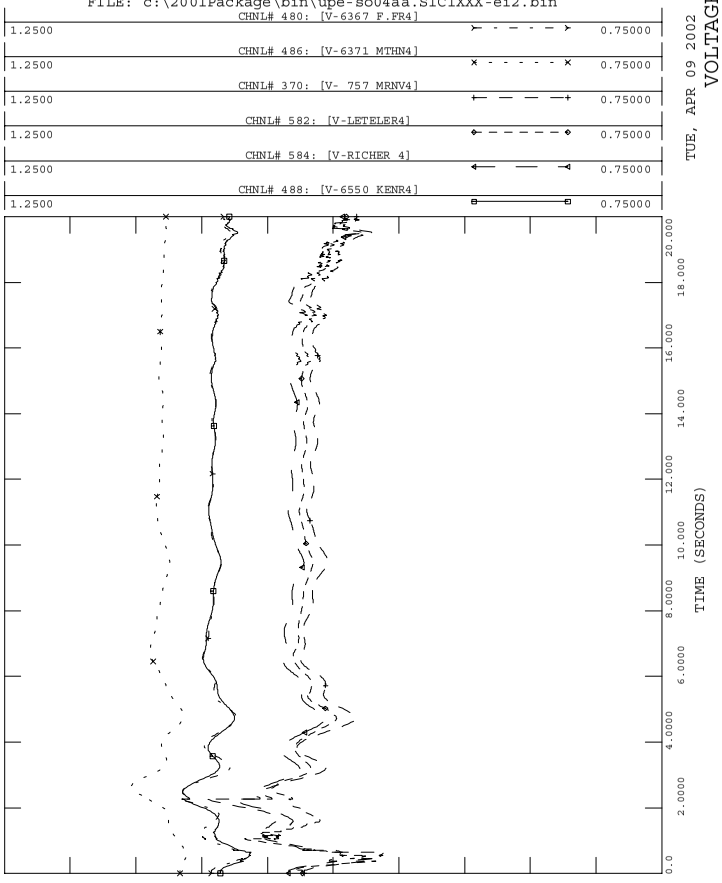

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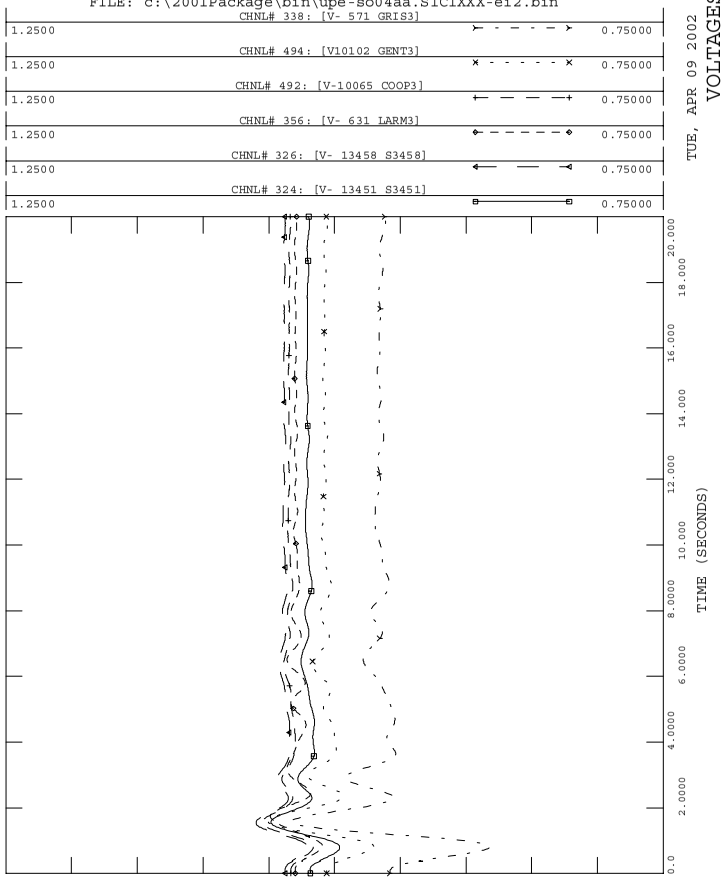

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BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
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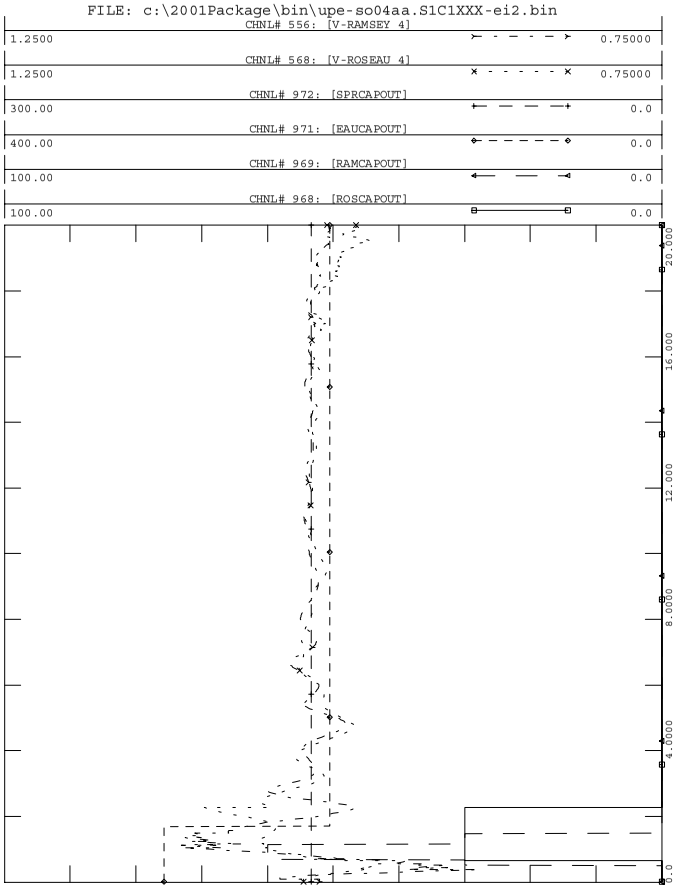

TUE, APR 09 2002 18:26
FAST SW CAP OUT 2

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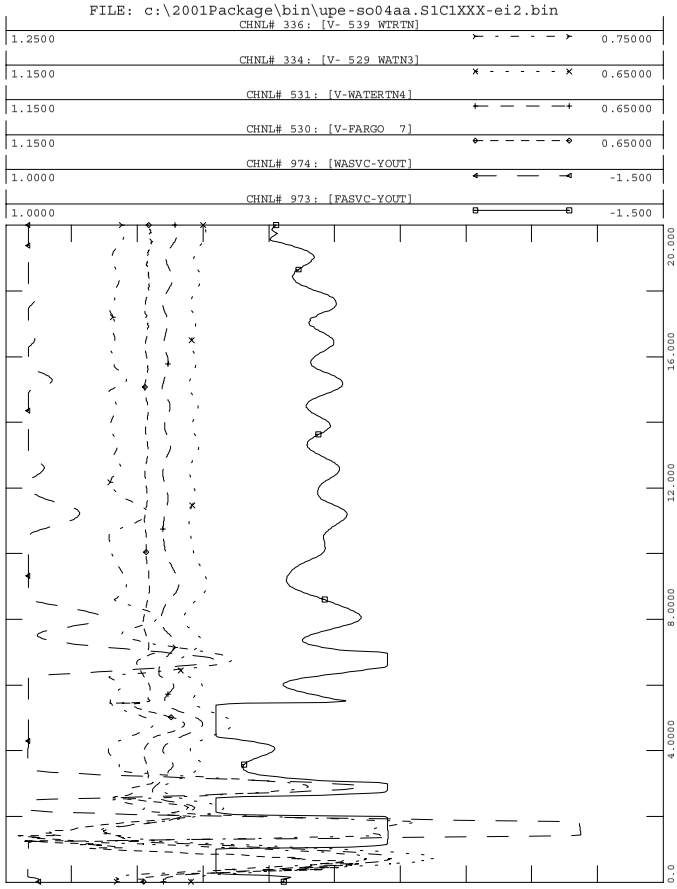
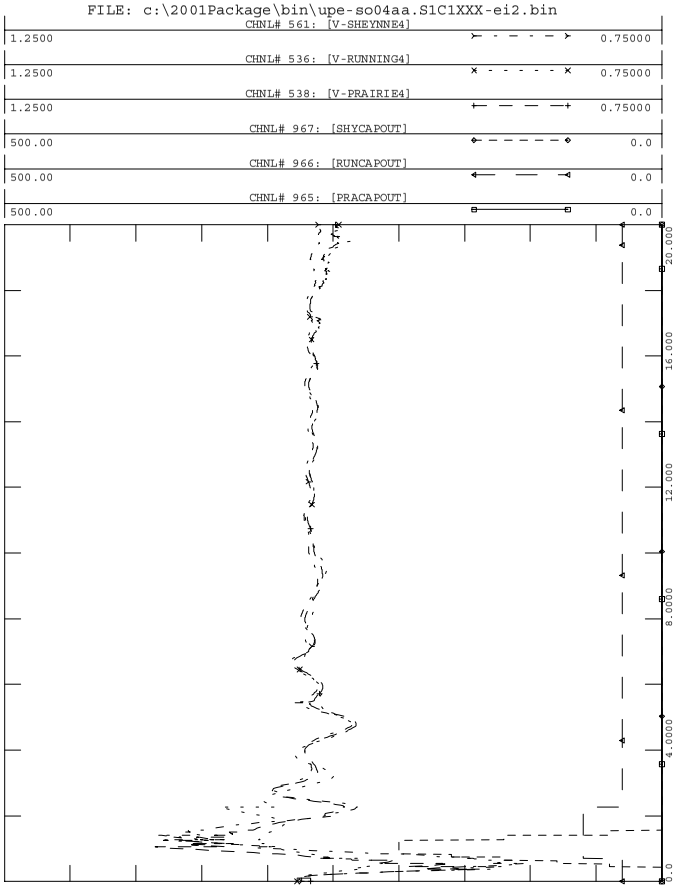
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin



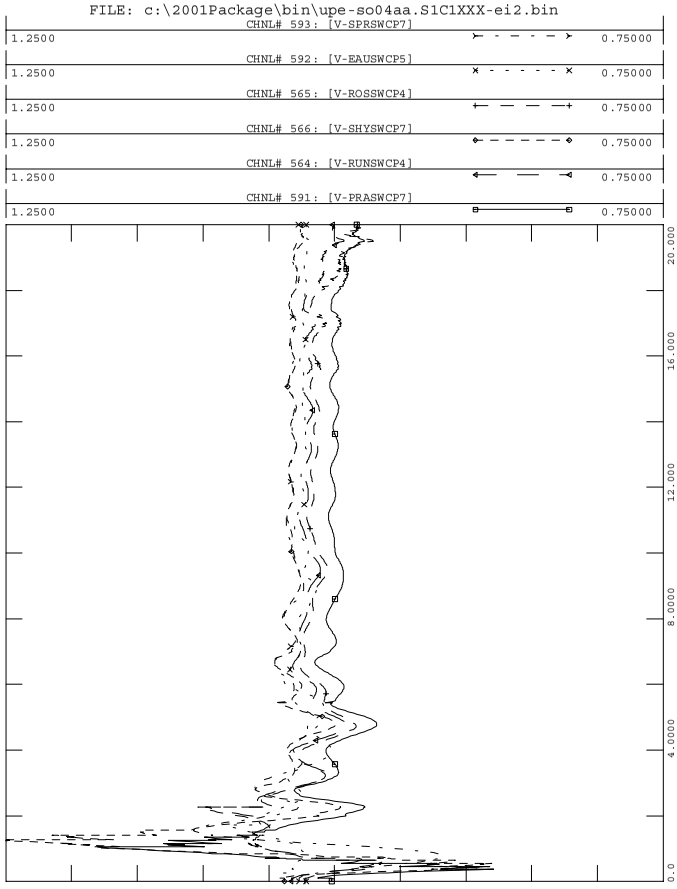
TUE, APR 09 2002 18:26
FARGO/WATERTOWN SVS

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin



TUE, APR 09 2002 18:26
FAST SW CAP OUT 1

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

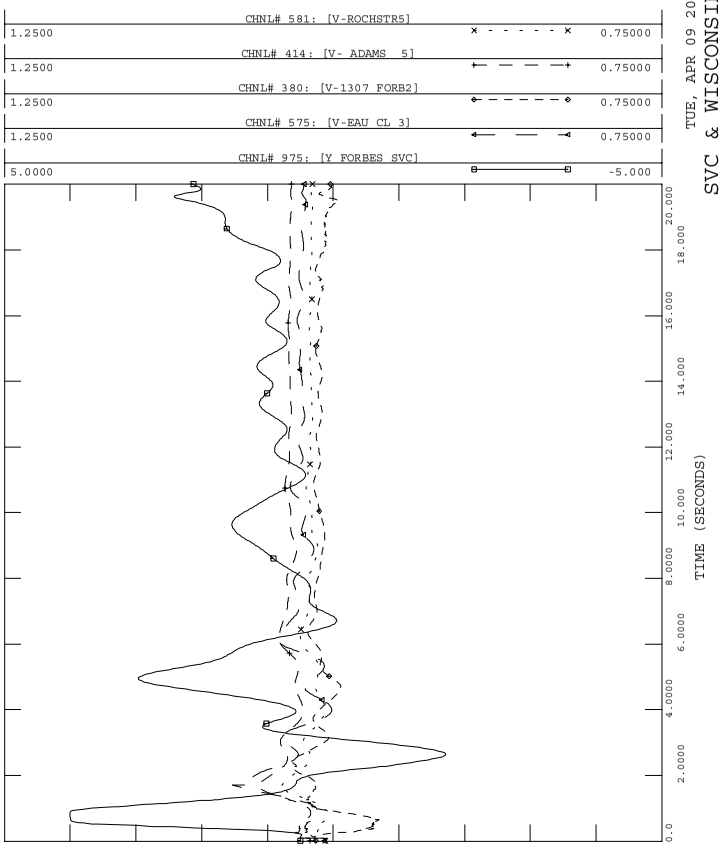


TUE, APR 09 2002 18:26
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

TUE, APR 09 2002 18:26

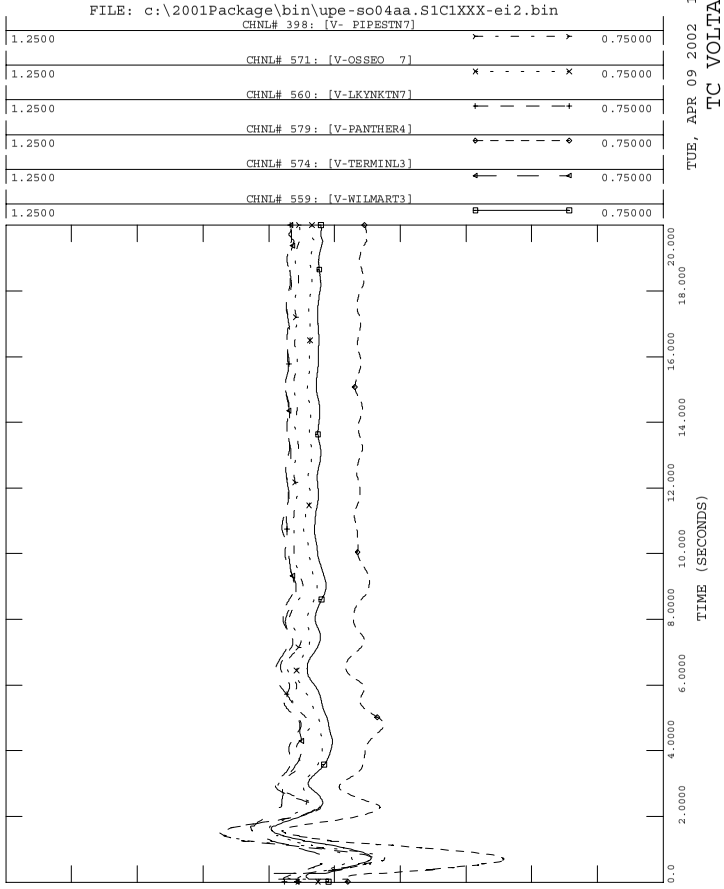
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

TUE, APR 09 2002 18:26

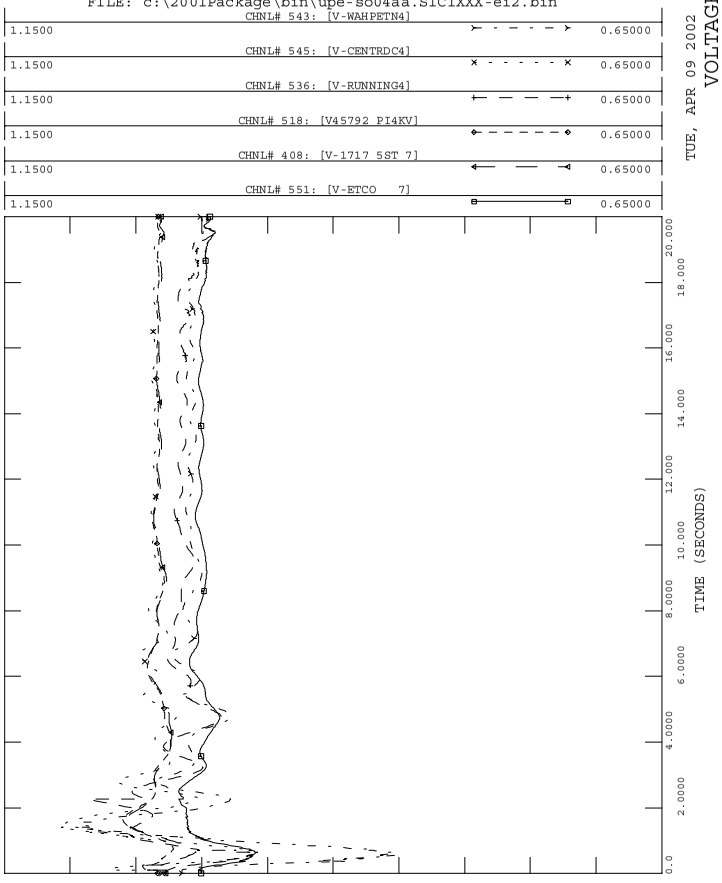
TC VOLTAGES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

TUE, APR 09 2002 18:26

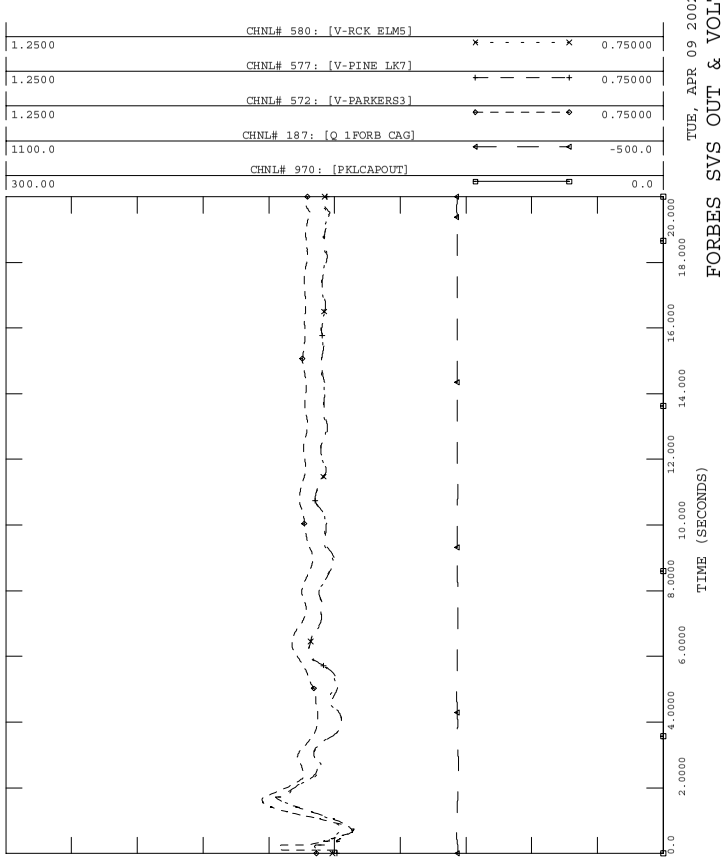
VOLTAGES 6



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

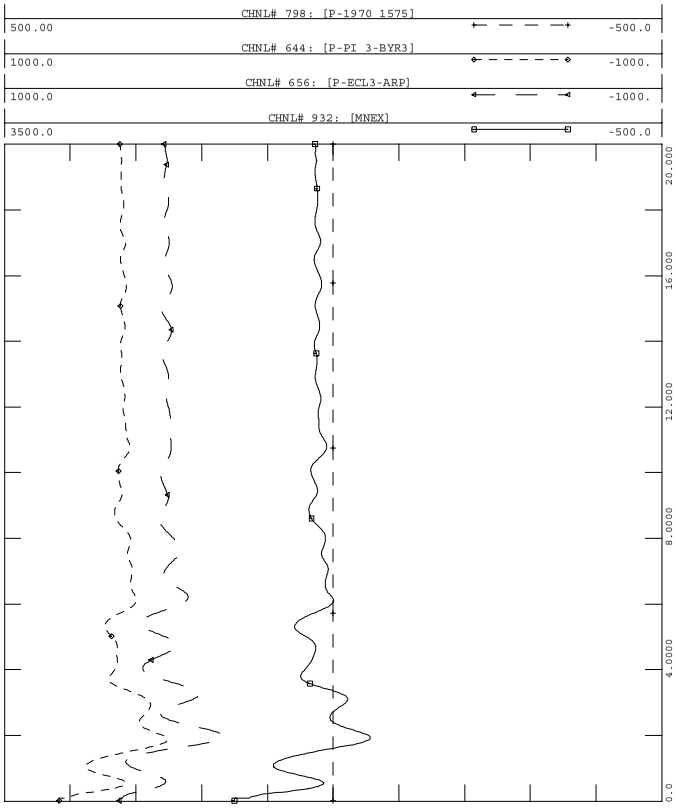
TUE, APR 09 2002 18:26

FORBES SVS OUT & VOLTAGES



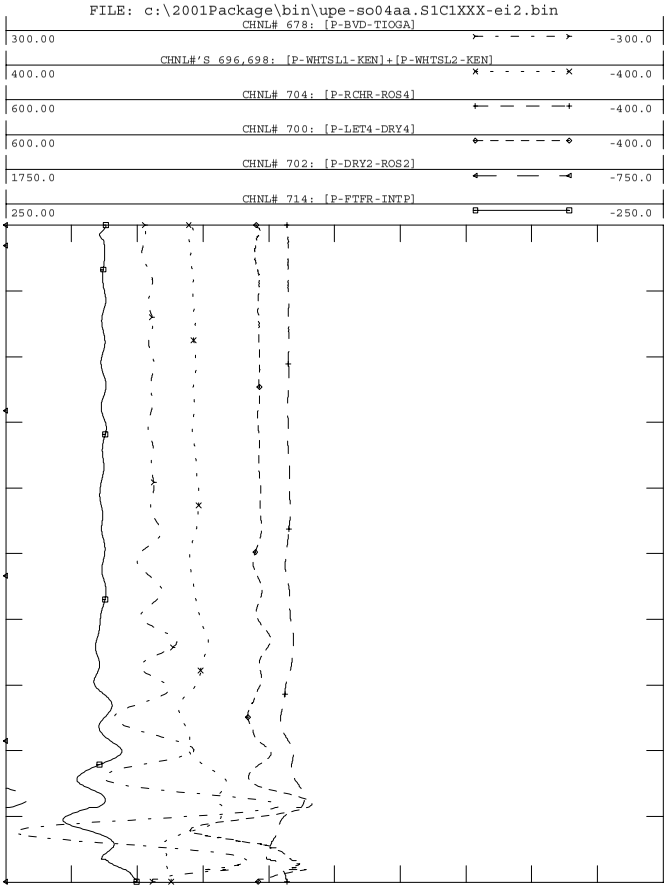
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

TUE, APR 09 2002 18:26
POWER FLOW SUMS 2



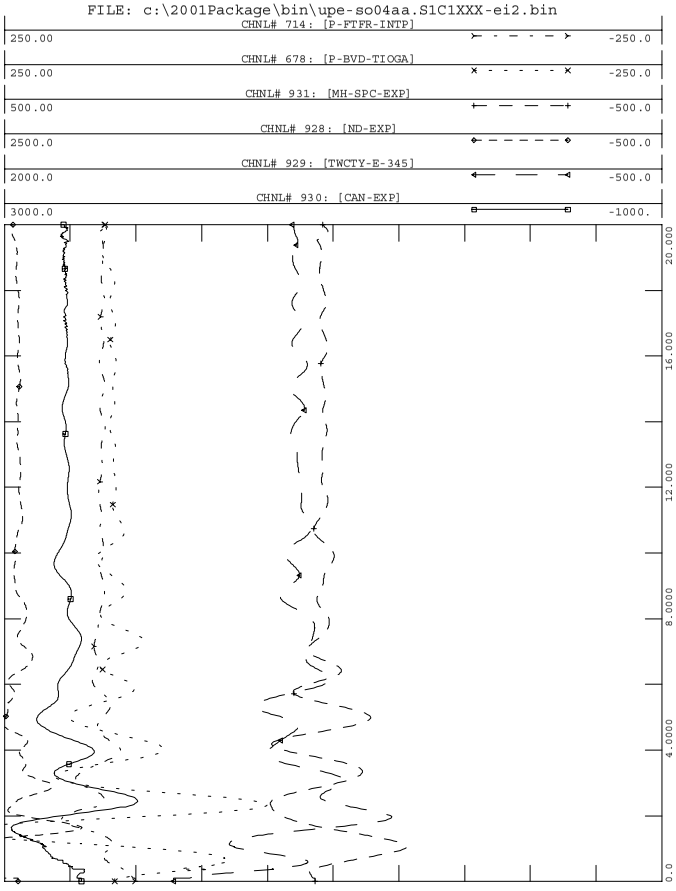
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

TUE, APR 09 2002 18:26
CAN. TIE FLOWS



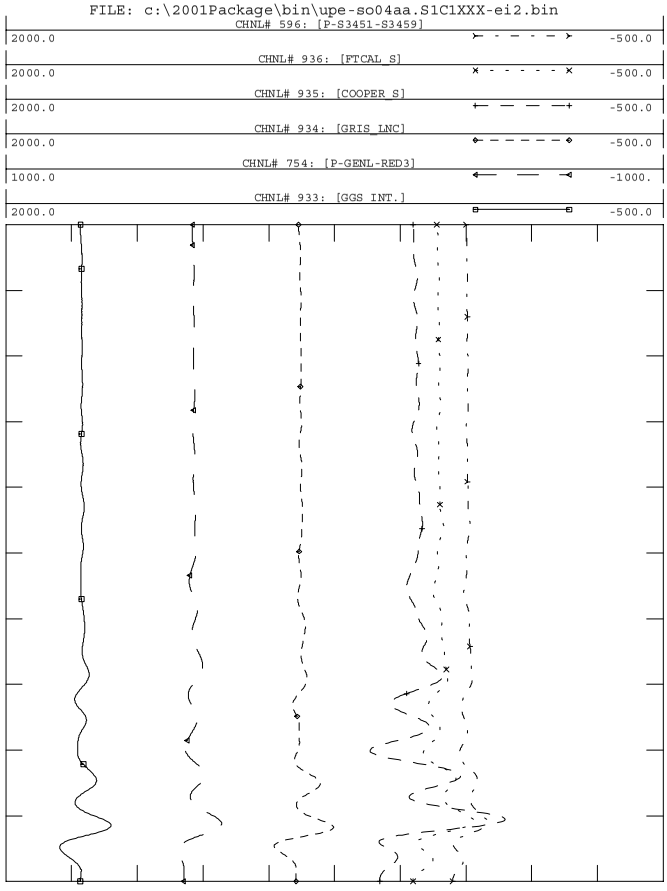
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

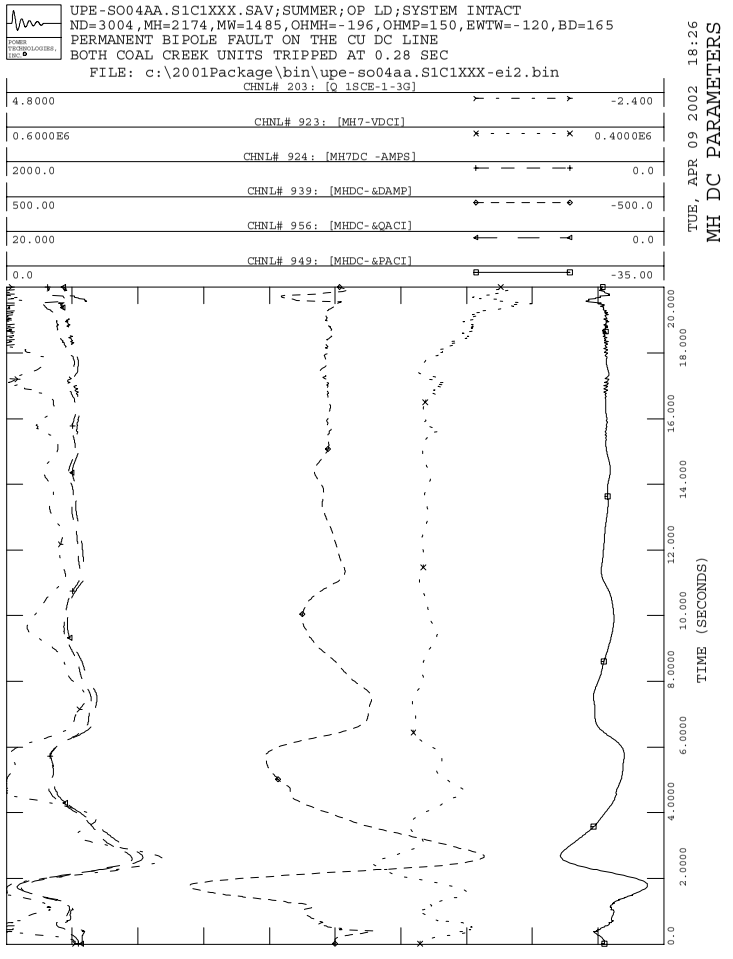
TUE, APR 09 2002 18:26
POWER FLOW SUMS 1

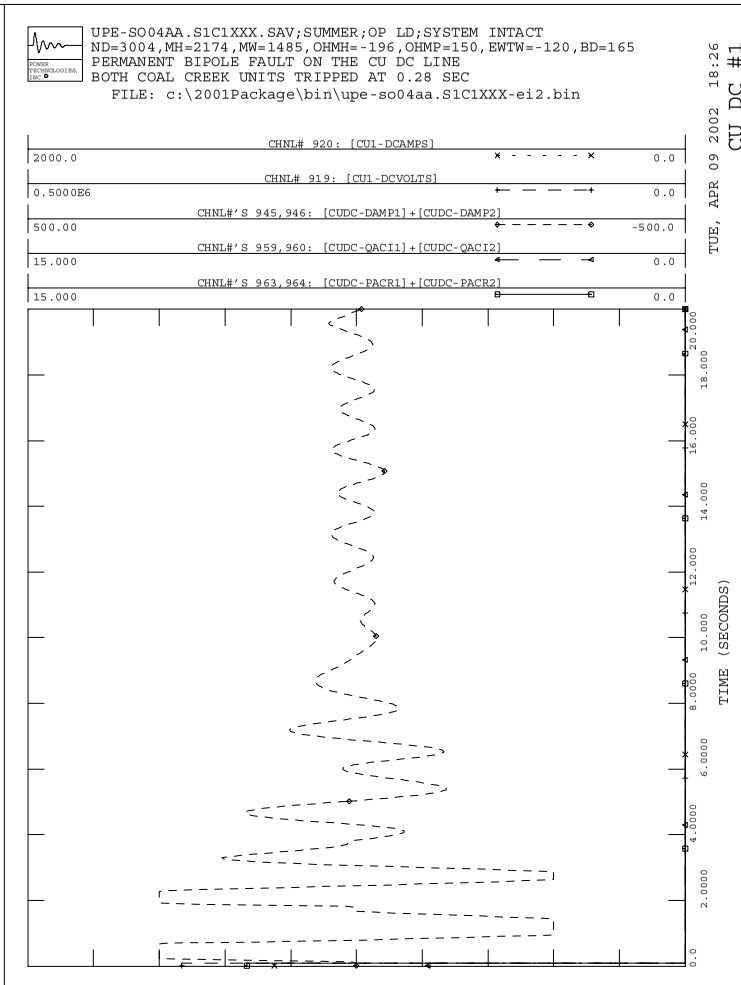


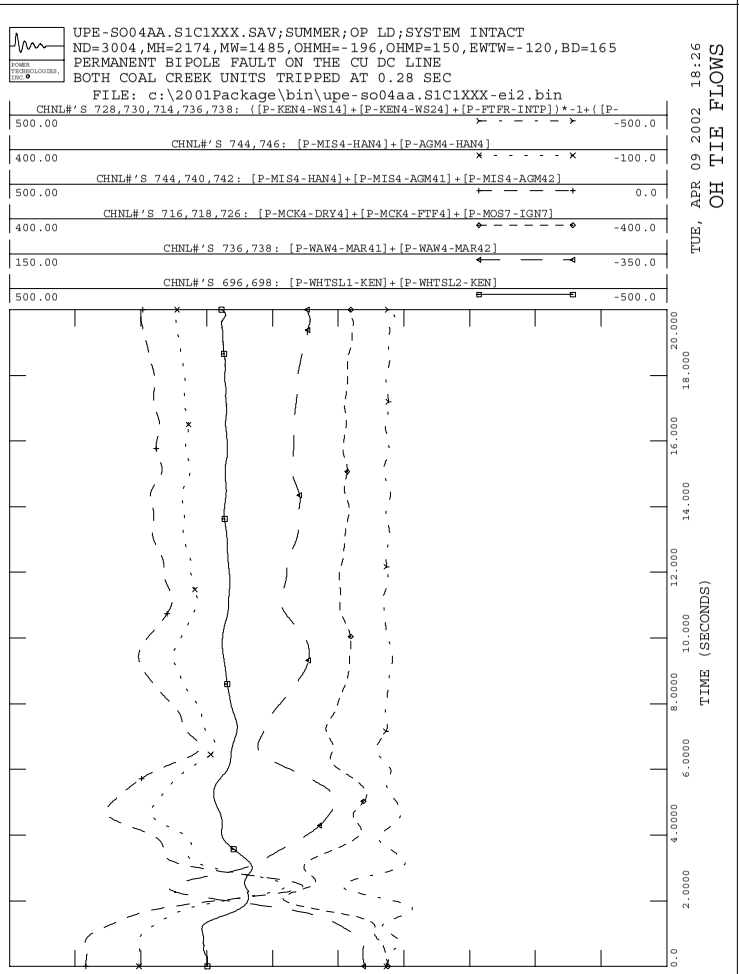
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

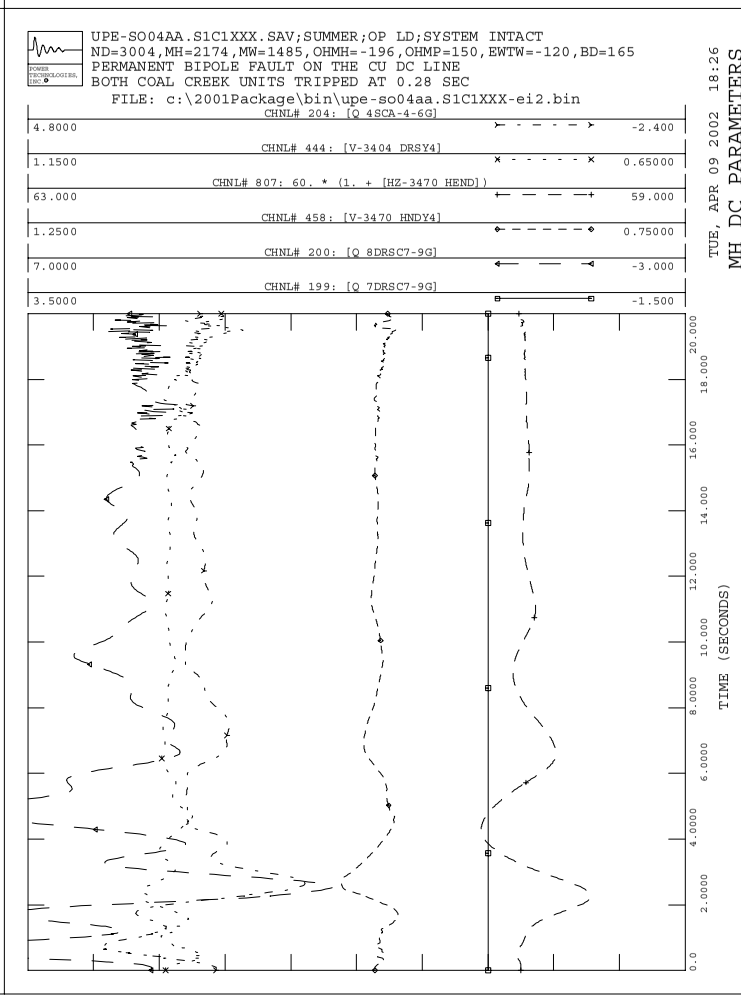
TUE, APR 09 2002 18:26
POWER FLOW SUM 3

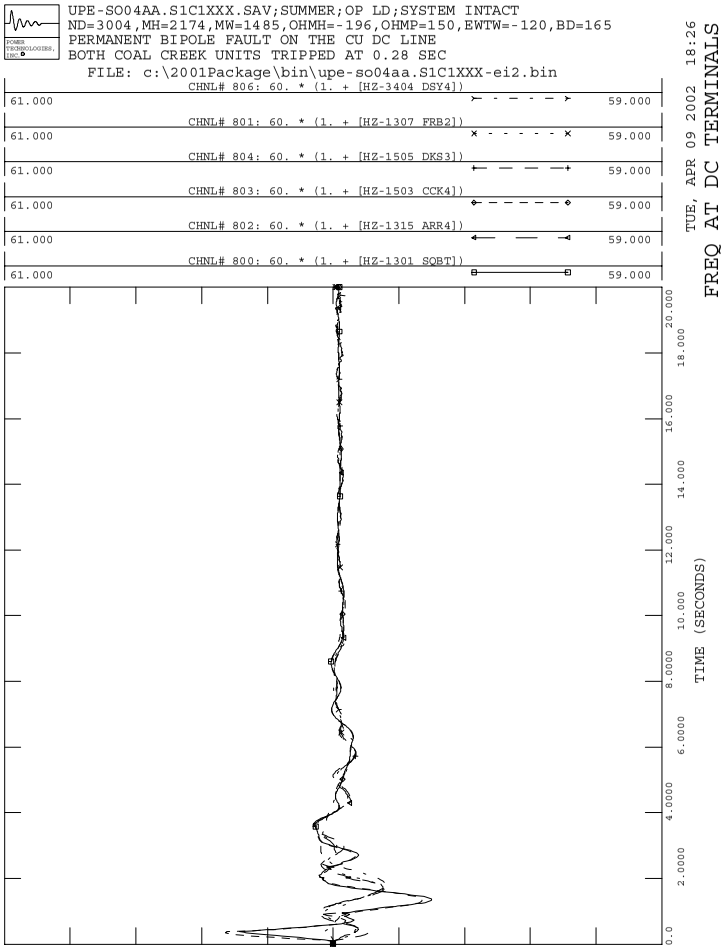


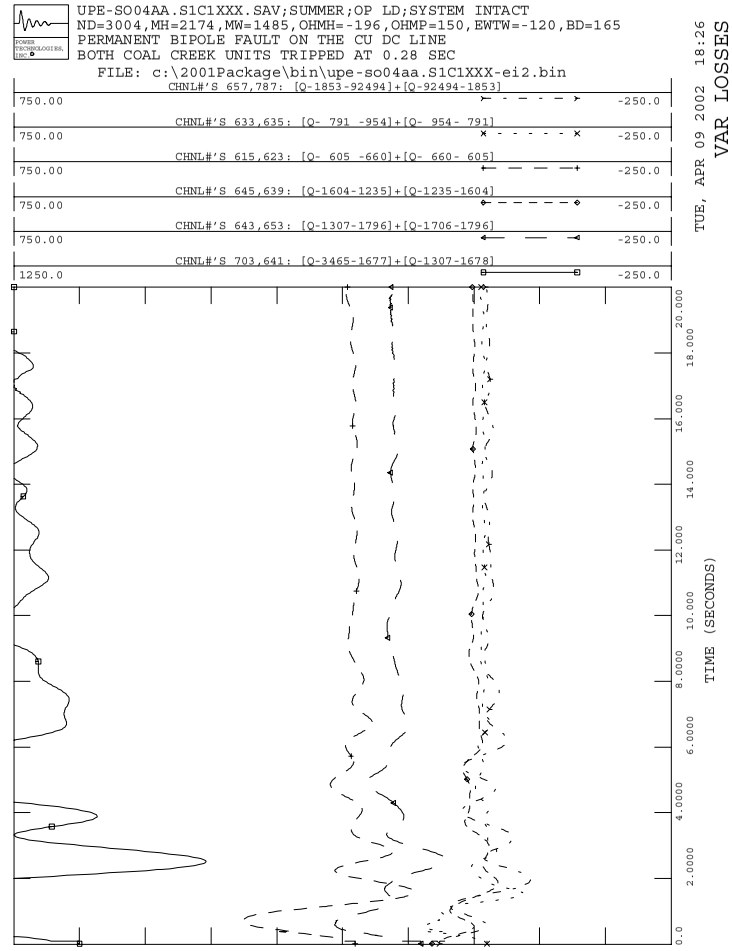

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TUE, APR 09 2002 18:26
MH DC PARAMETERS
TIME (SECONDS)

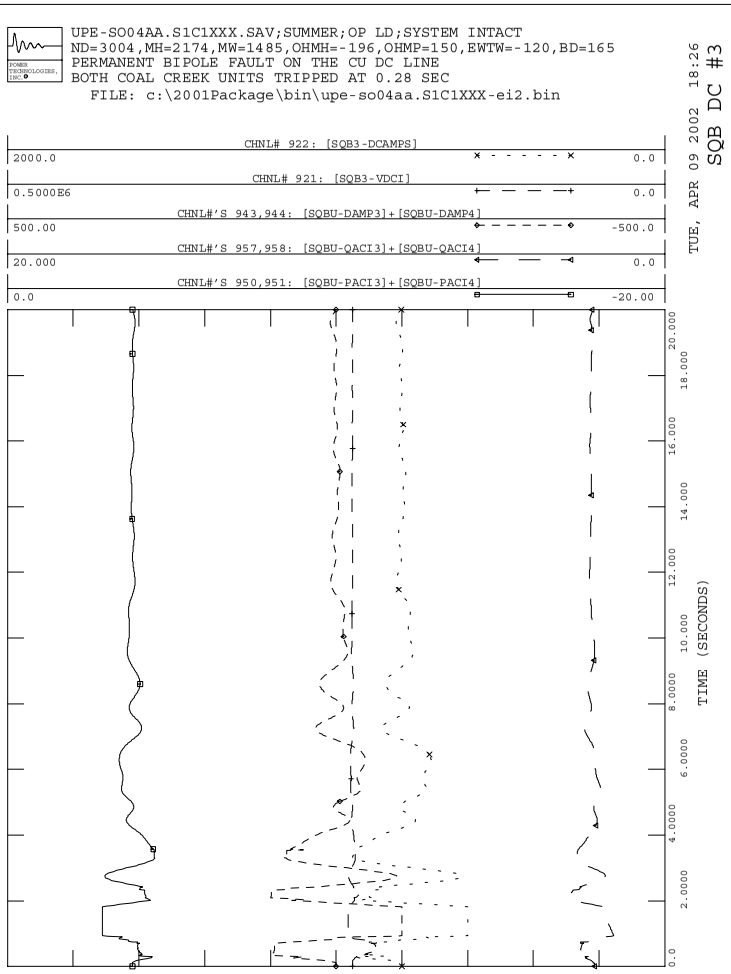

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TUE, APR 09 2002 18:26
CU DC #1
TIME (SECONDS)

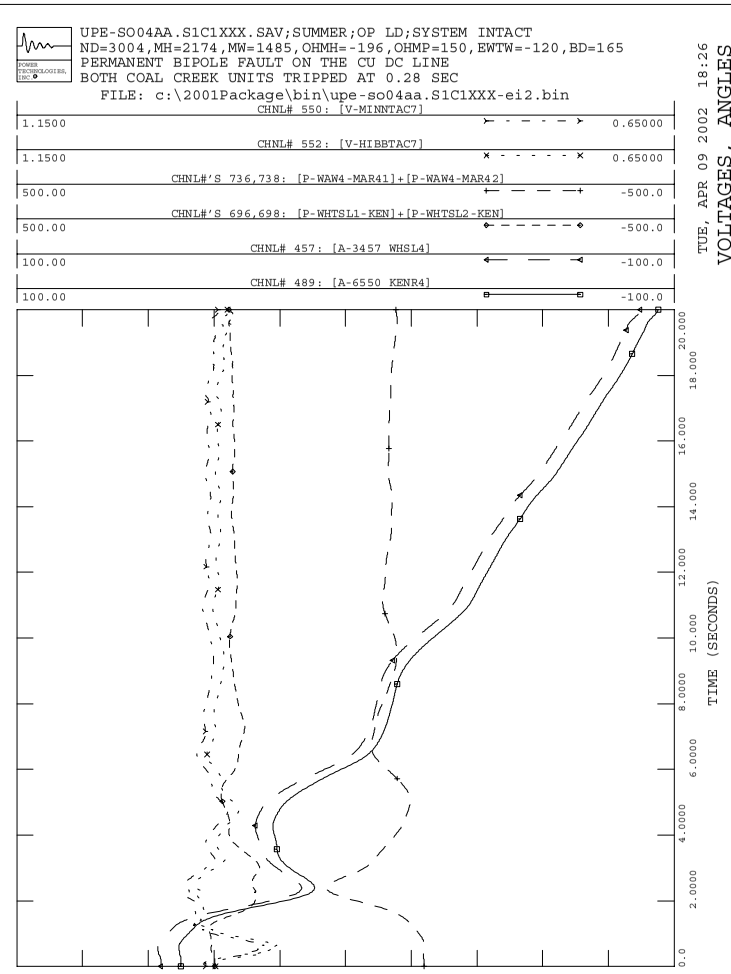

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TUE, APR 09 2002 18:26
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TUE, APR 09 2002 18:26
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
TUE, APR 09 2002 18:26
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
TUE, APR 09 2002 18:26
VAR LOSSES
TIME (SECONDS)

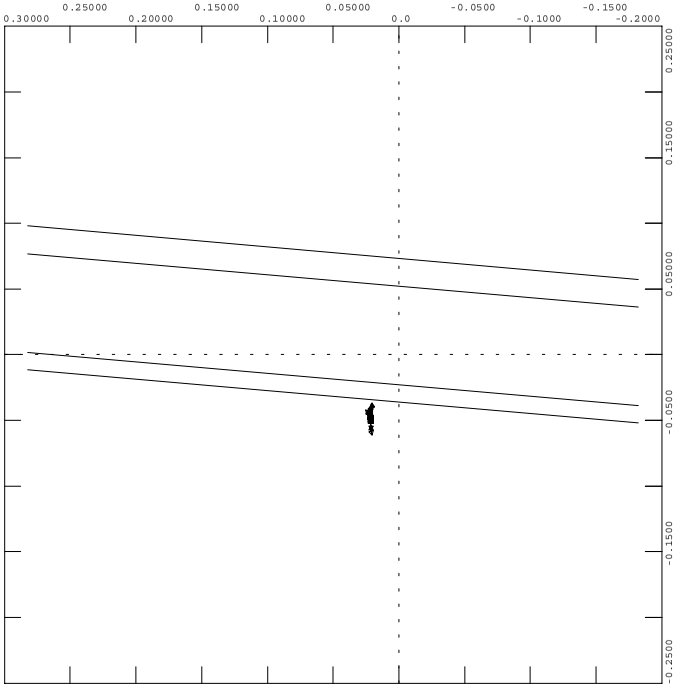

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
TUE, APR 09 2002 18:26
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
TUE, APR 09 2002 18:26
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

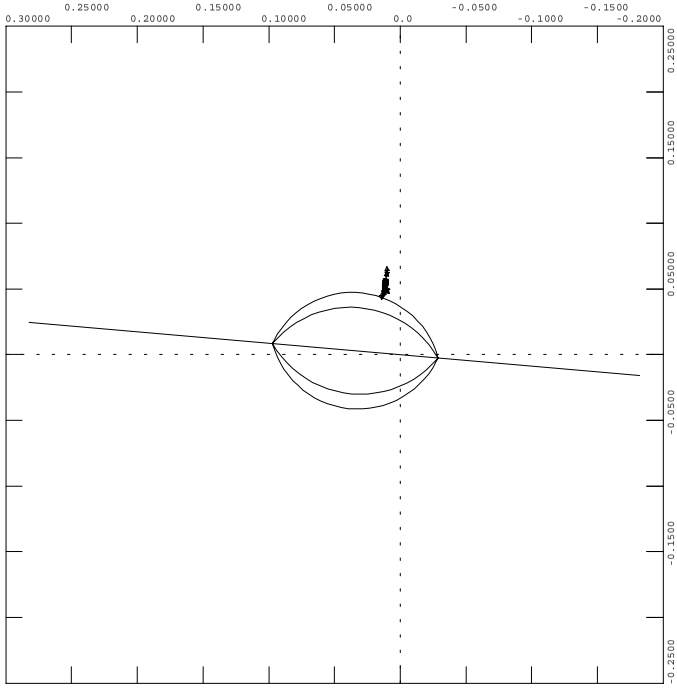


TUE, APR 09 2002 18:26
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

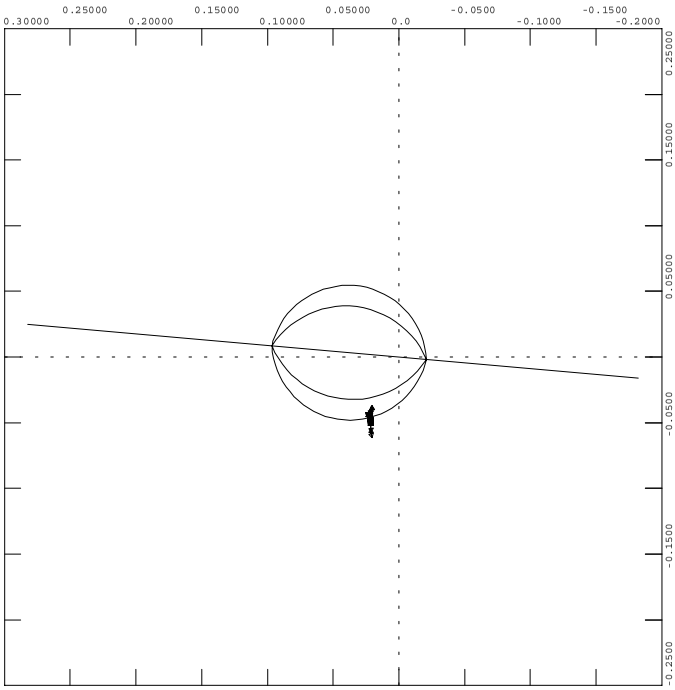


TUE, APR 09 2002 18:26
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

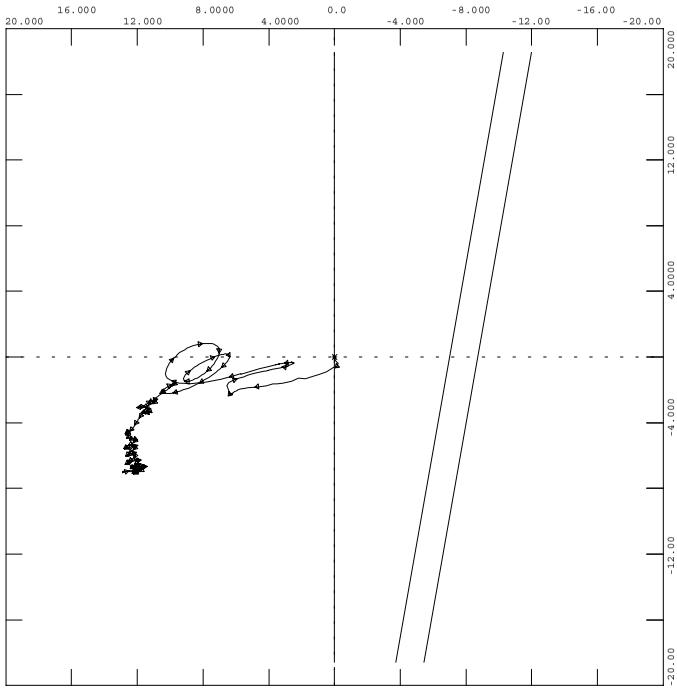


TUE, APR 09 2002 18:26
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

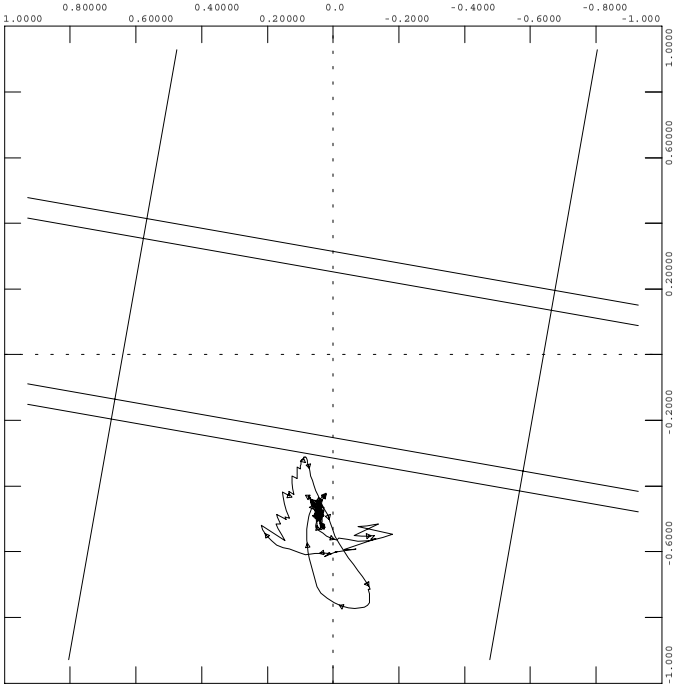


TUE, APR 09 2002 18:26
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

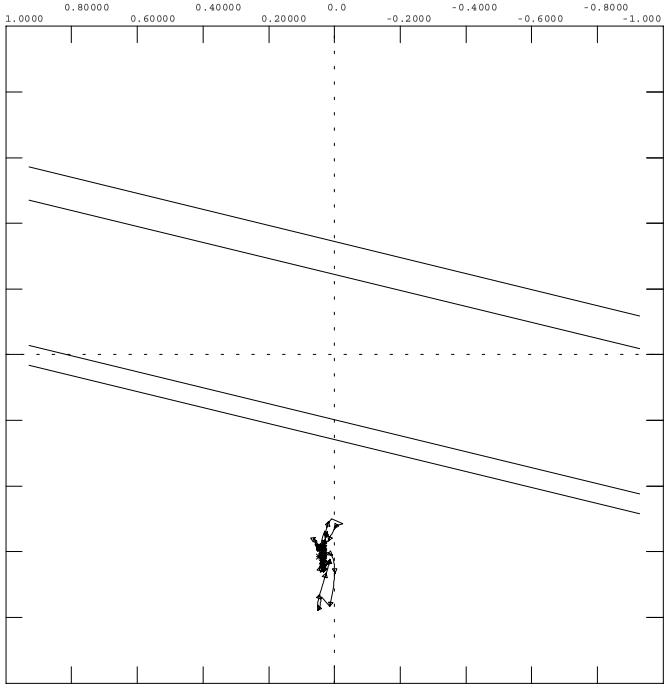


TUE, APR 09 2002 18:26
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

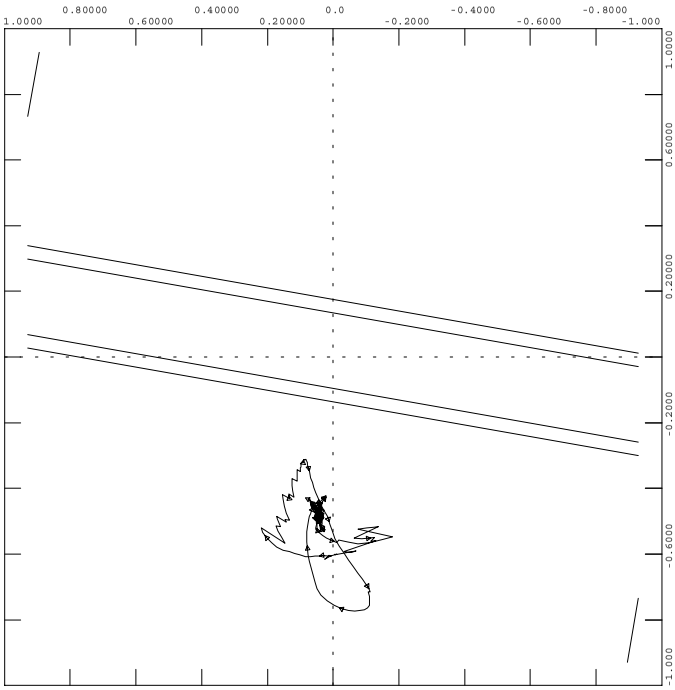


TUE, APR 09 2002 18:26
R50M AT MORANVILLE (520)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

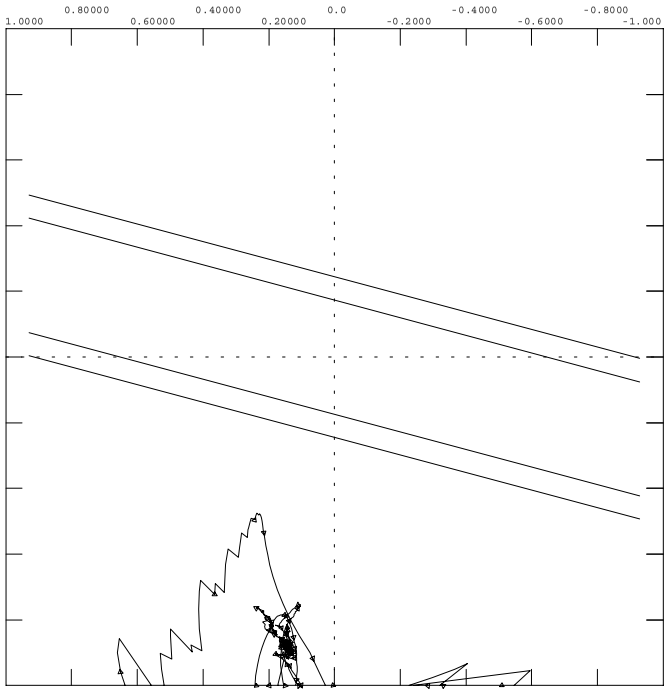


TUE, APR 09 2002 18:26
L20D AT DRAYTON (506)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

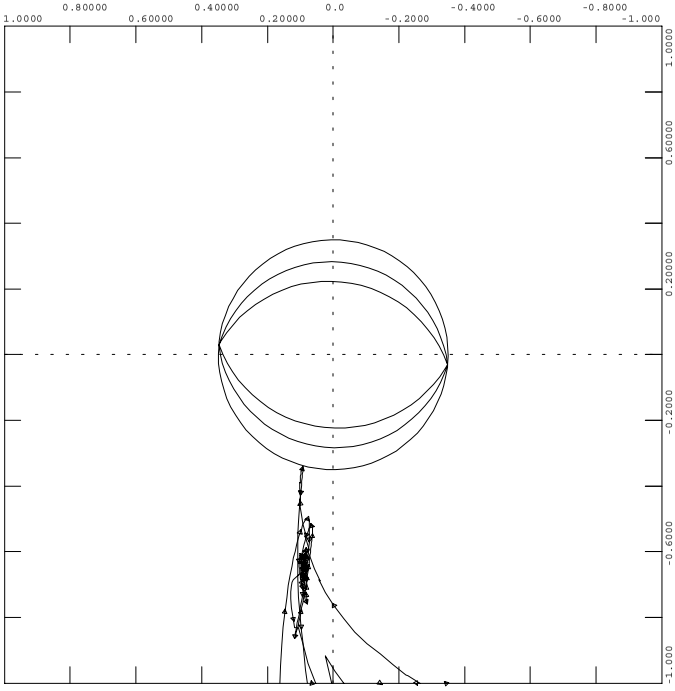


TUE, APR 09 2002 18:26
L20D-PRAIRIE (510)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

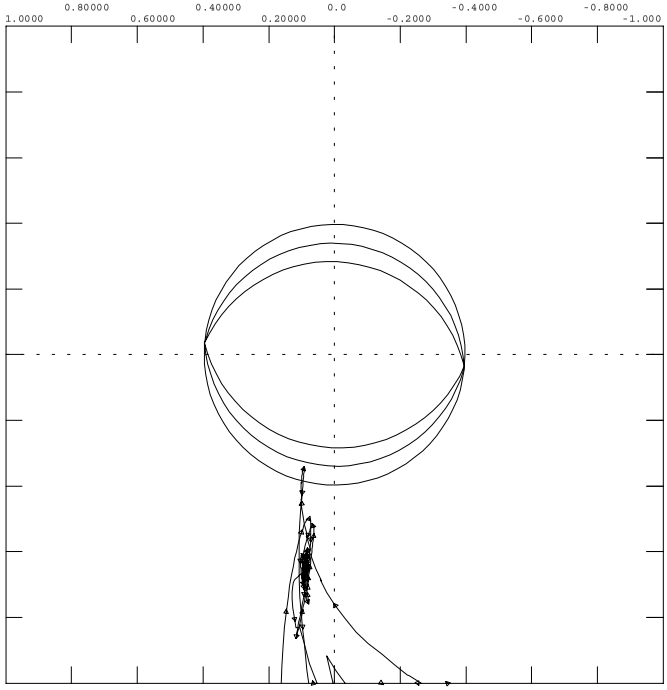
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

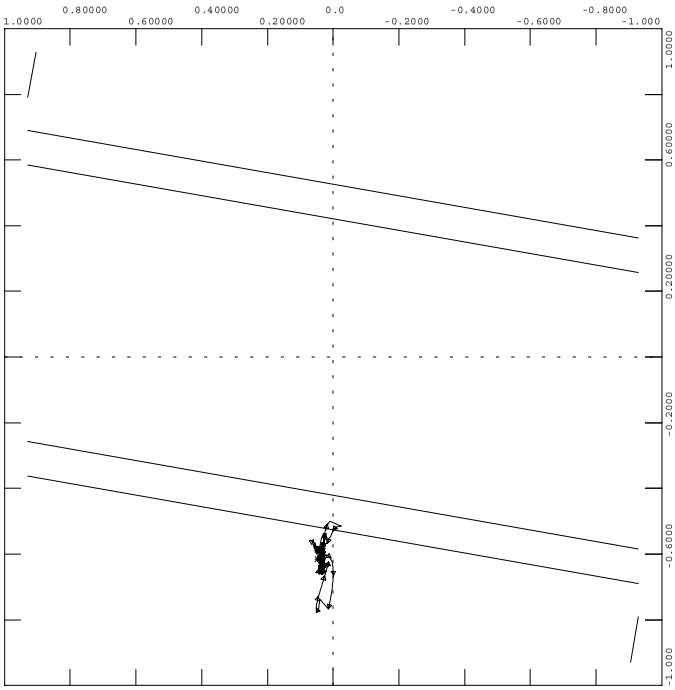
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

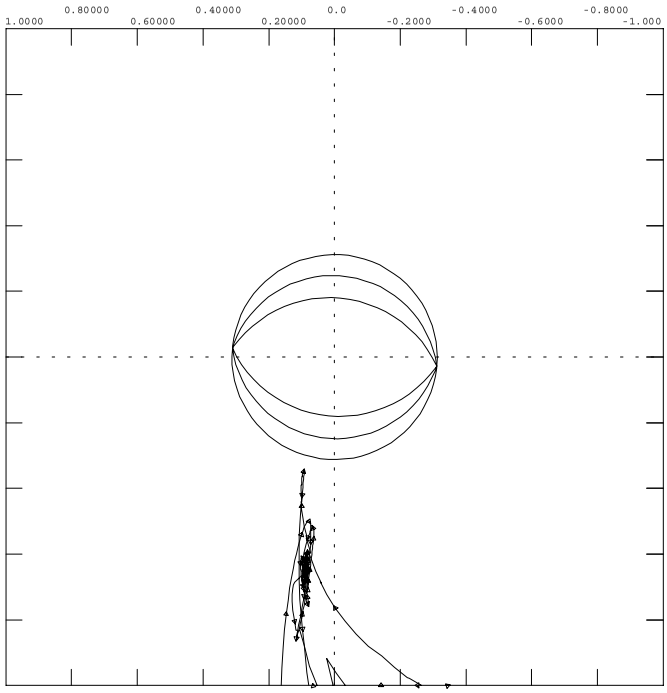
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



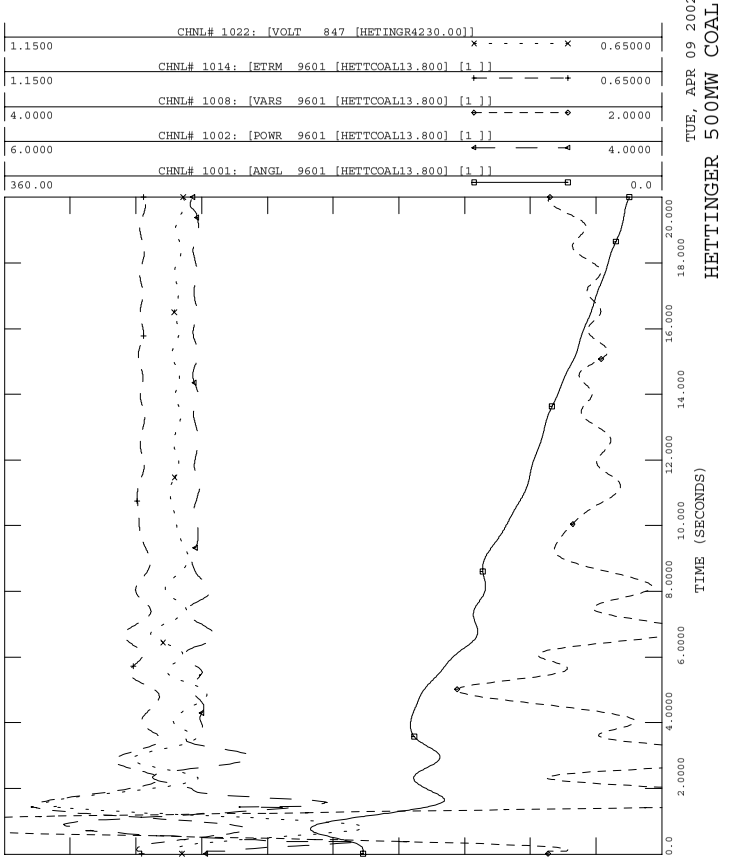
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

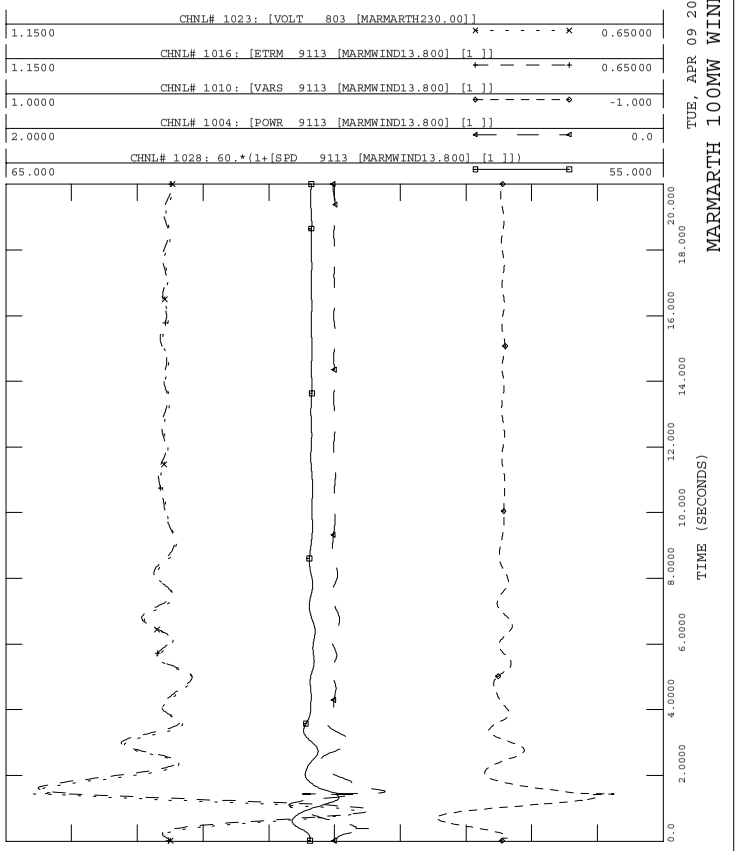


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin



TUE, APR 09 2002 18:26
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

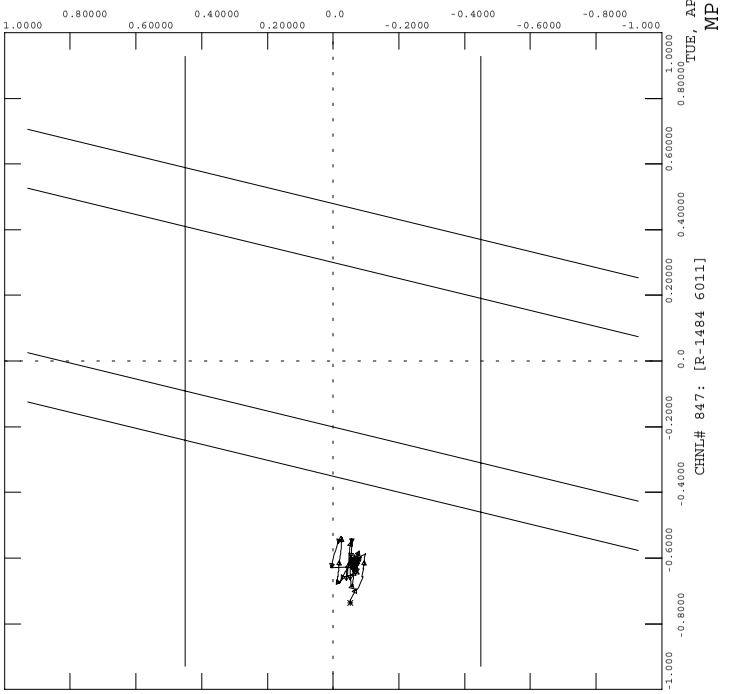


TUE, APR 09 2002 18:26
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

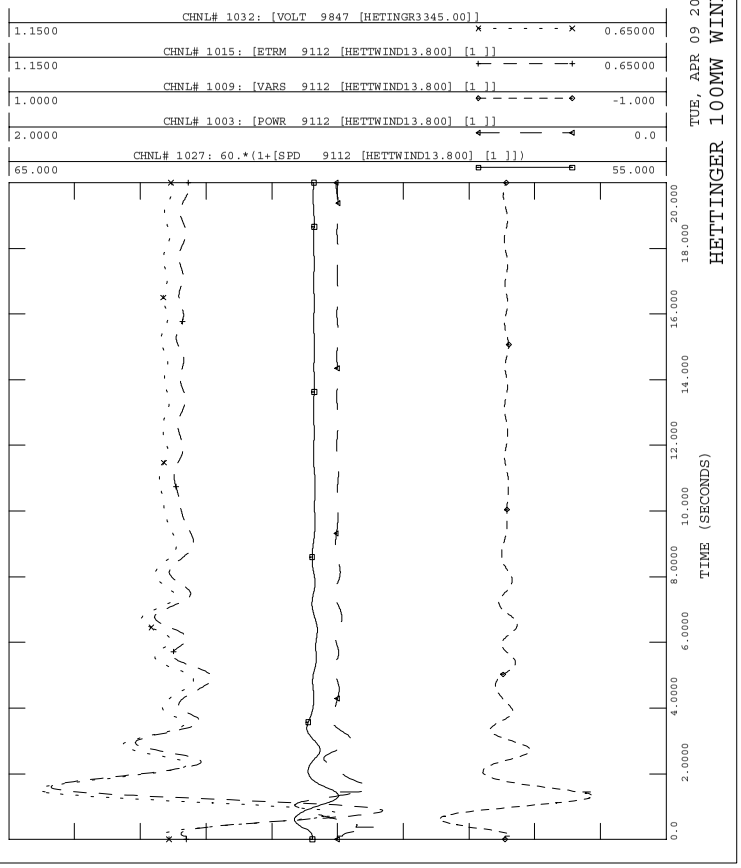
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



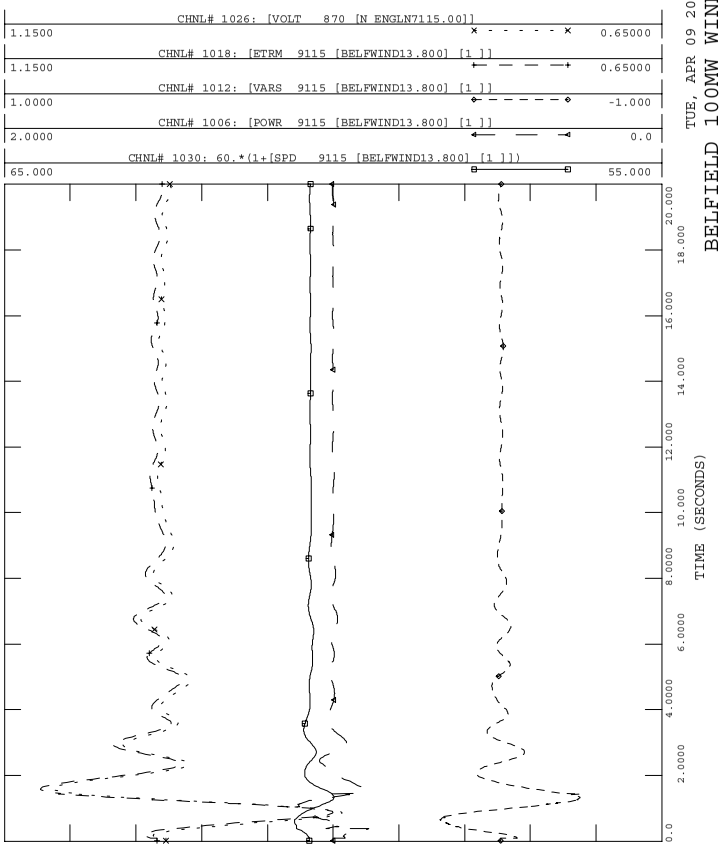
TUE, APR 09 2002 18:26
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin



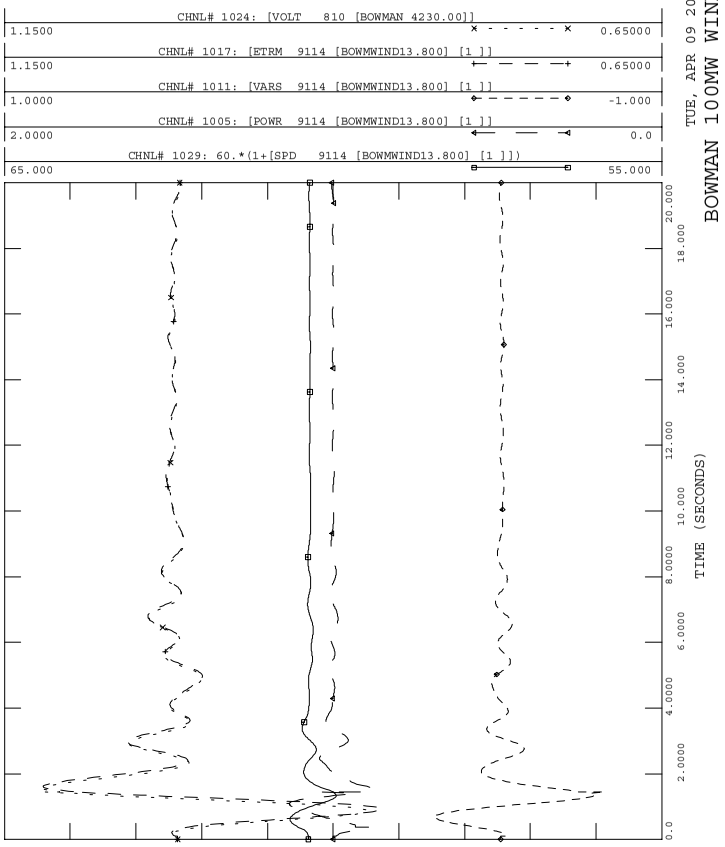
TUE, APR 09 2002 18:26
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin



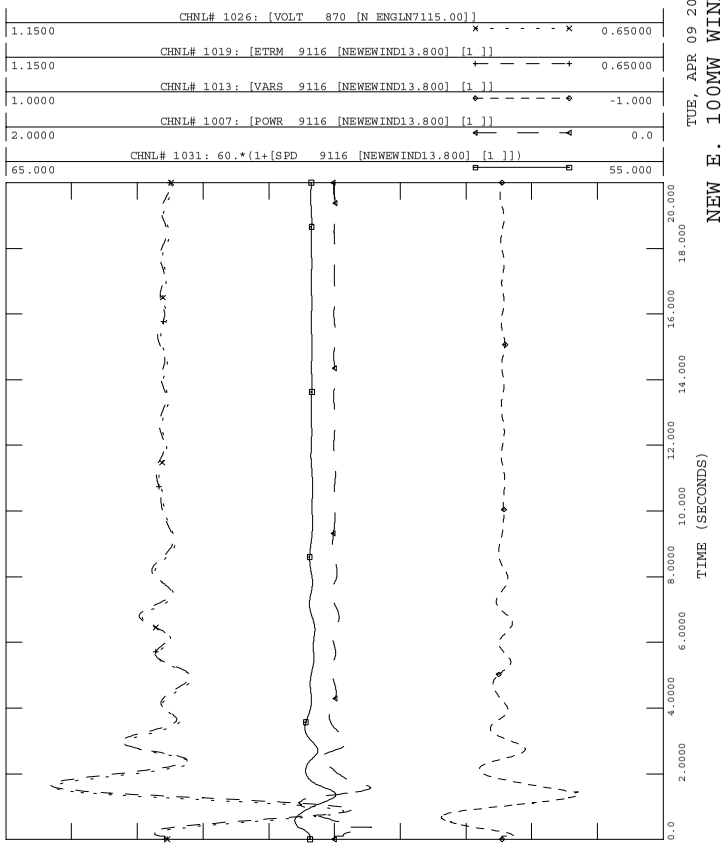
TUE, APR 09 2002 18:26
BELFIELD 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin



TUE, APR 09 2002 18:26
BOWMAN 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ei2.bin



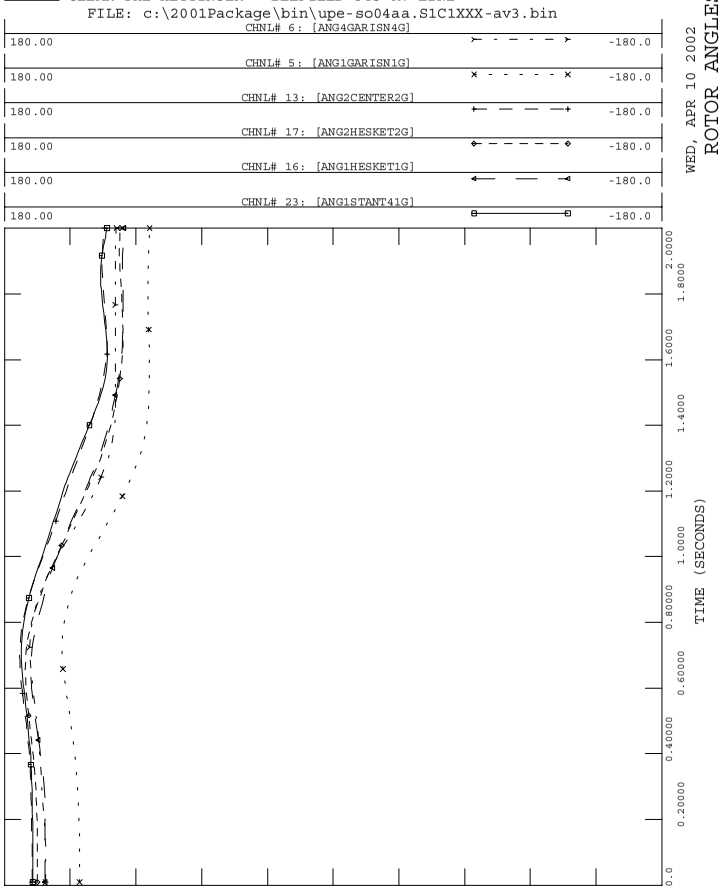
TUE, APR 09 2002 18:26
NEW E. 100MW WIND UNIT

CONTINGENCY AV3

4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Belfield 345 kV line

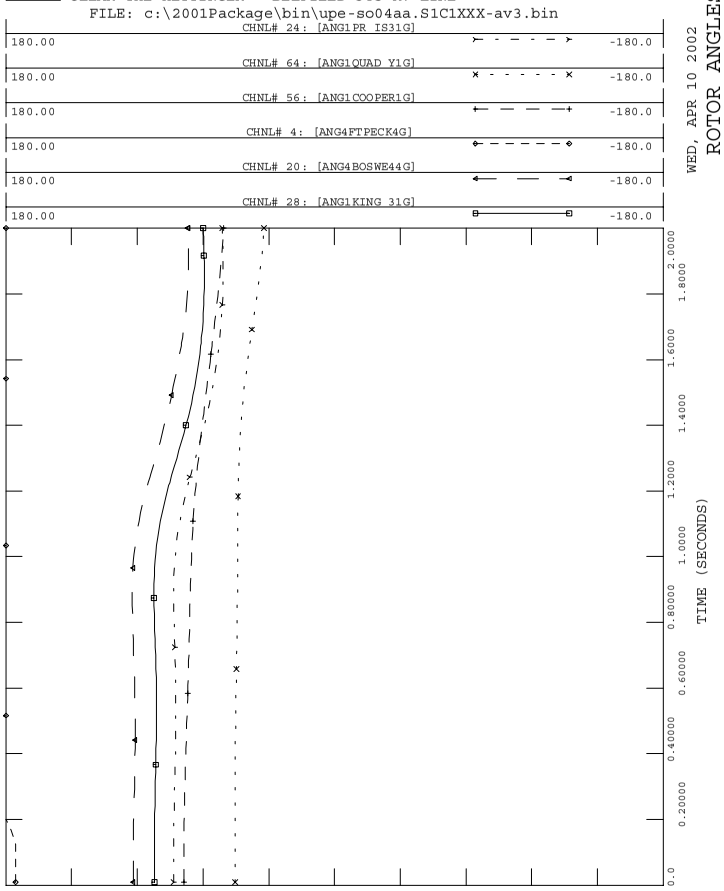
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
ROTOR ANGLES 2



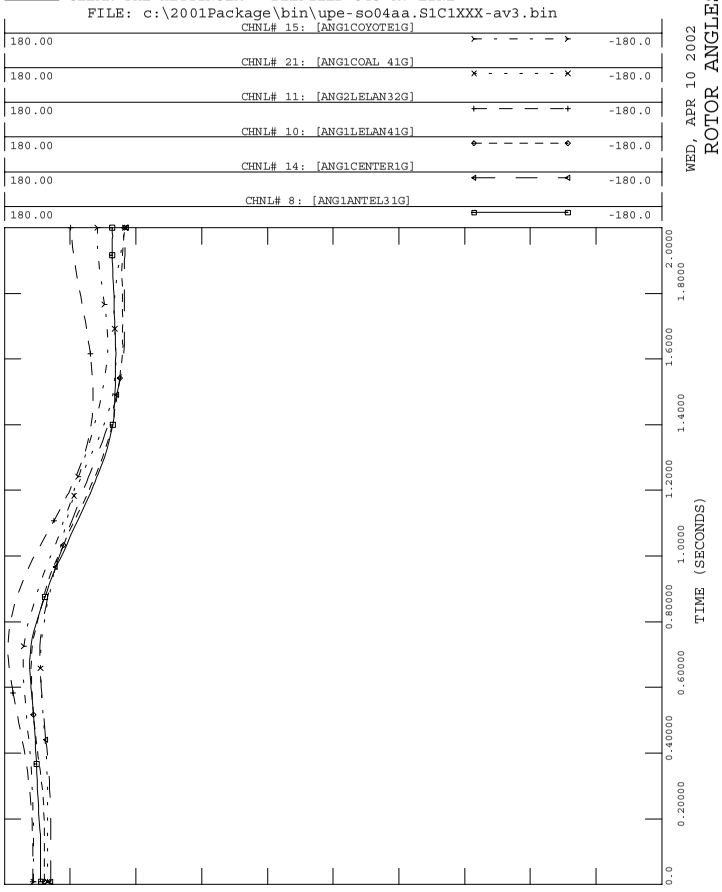
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
ROTOR ANGLES 4



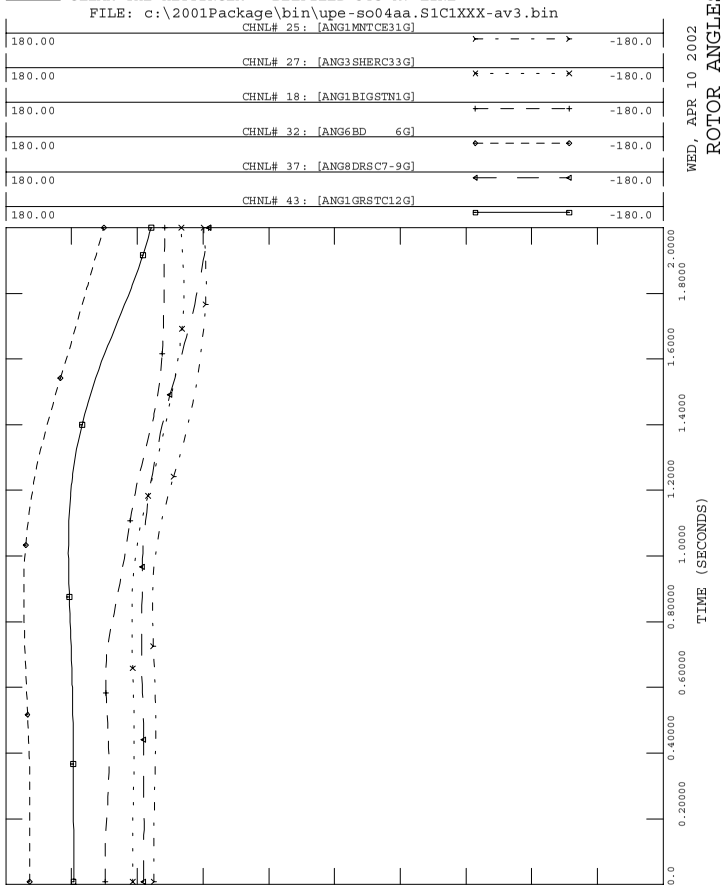
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
ROTOR ANGLES 1



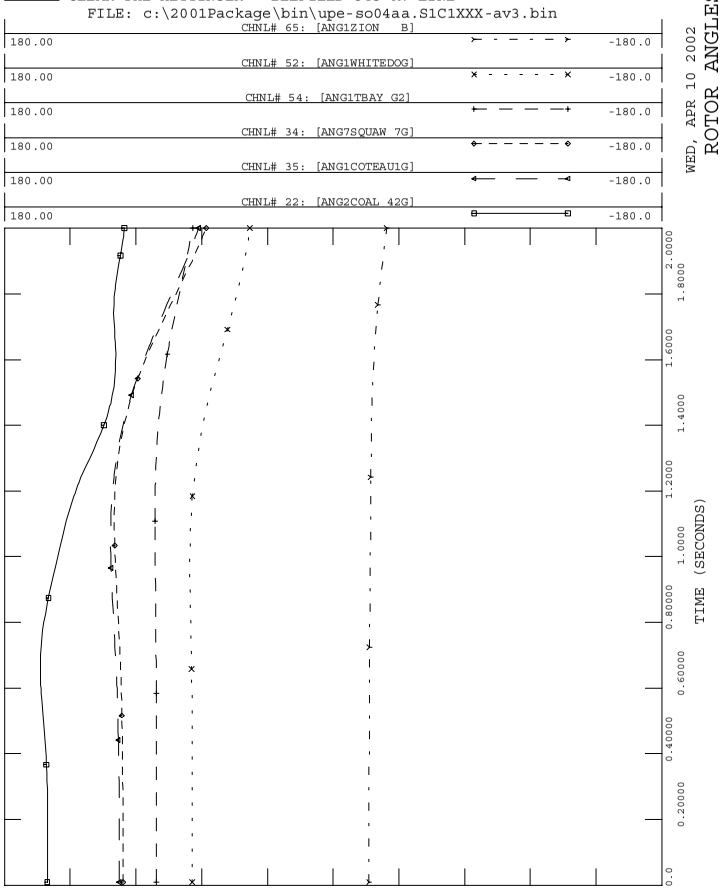
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
ROTOR ANGLES 3



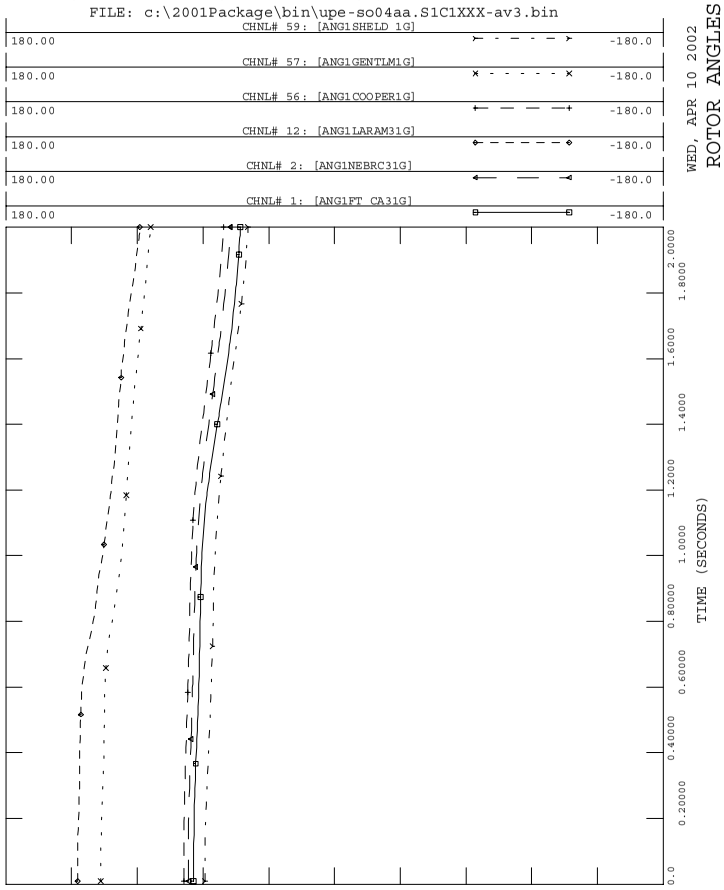
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
ROTOR ANGLES 6



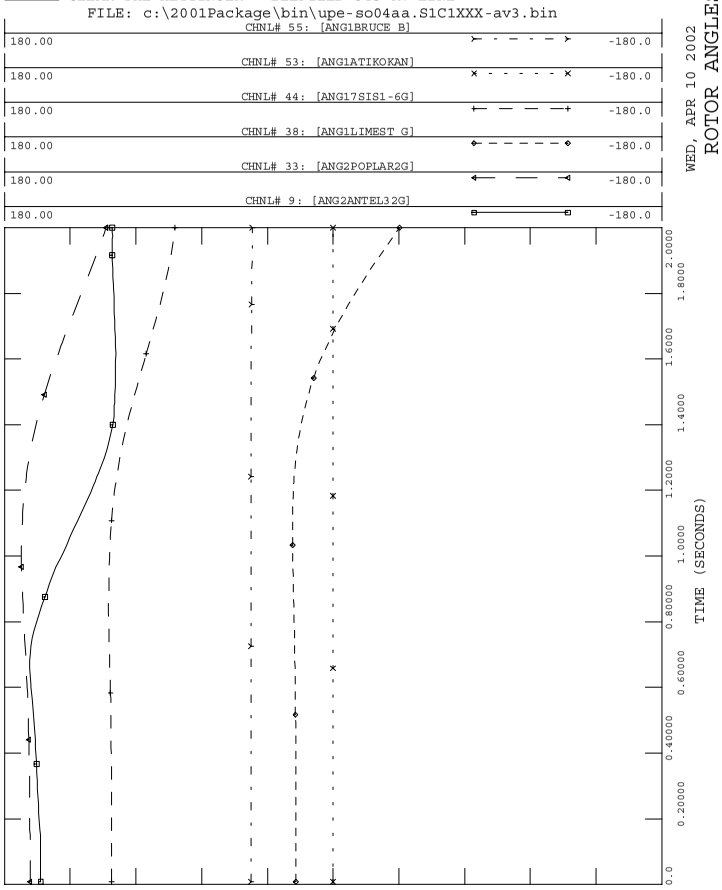
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
ROTOR ANGLES NB



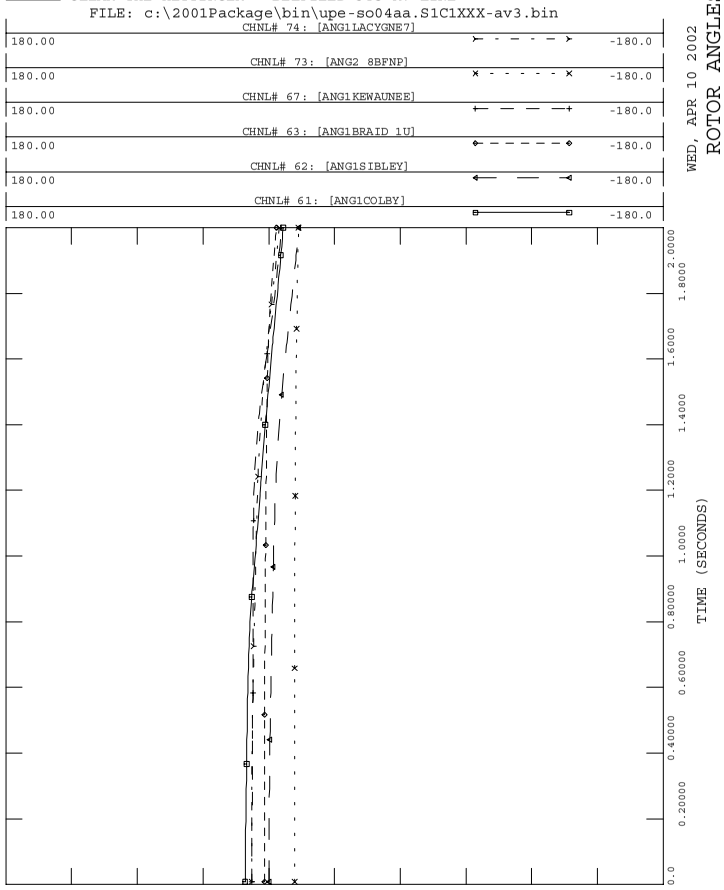
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
ROTOR ANGLES 5



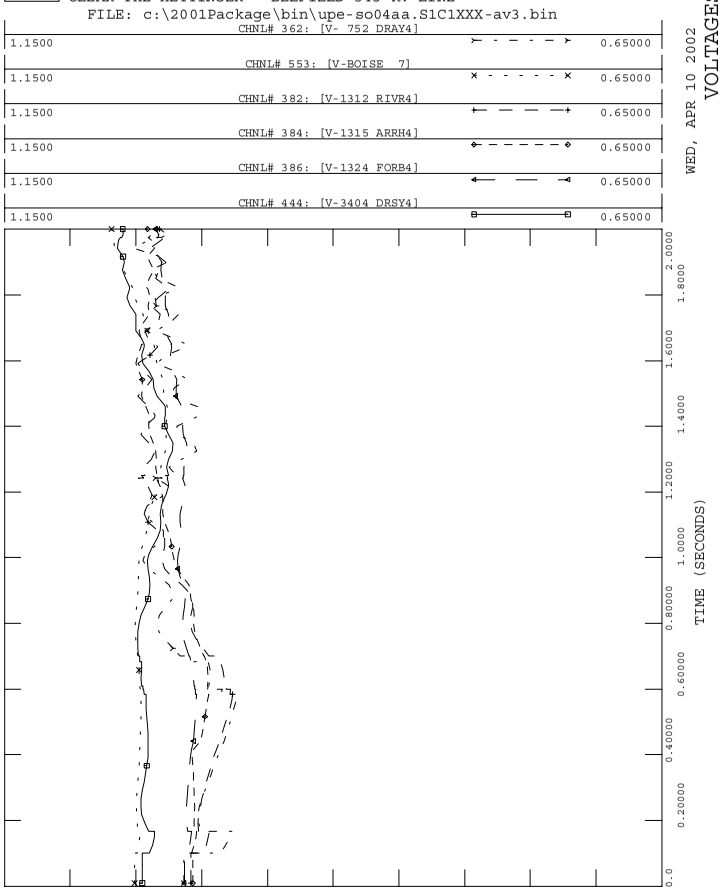
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
ROTOR ANGLES 7



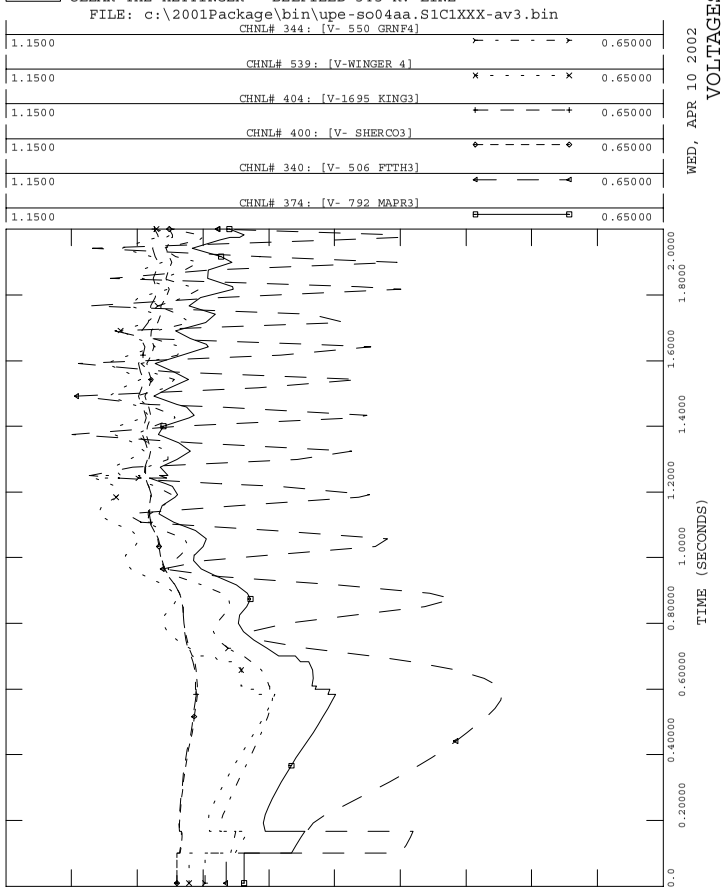
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
VOLTAGES 1



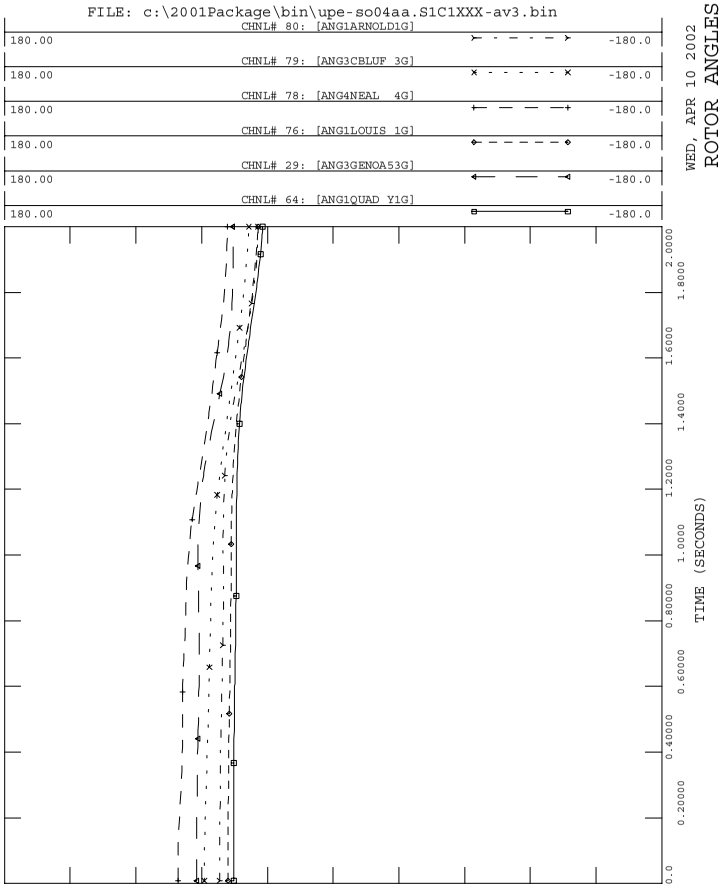
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
VOLTAGES 3



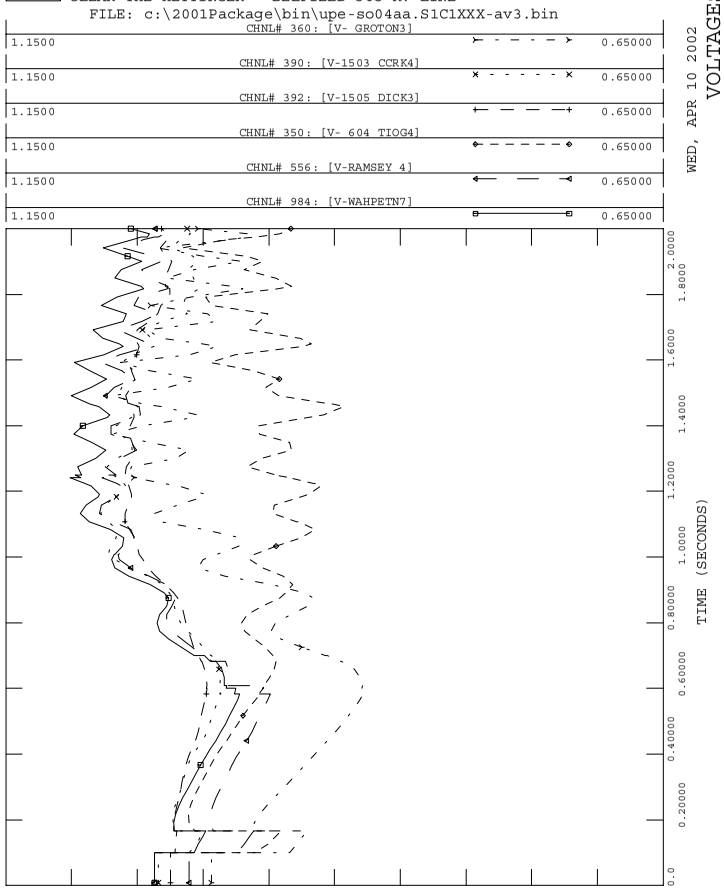
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
ROTOR ANGLES IA

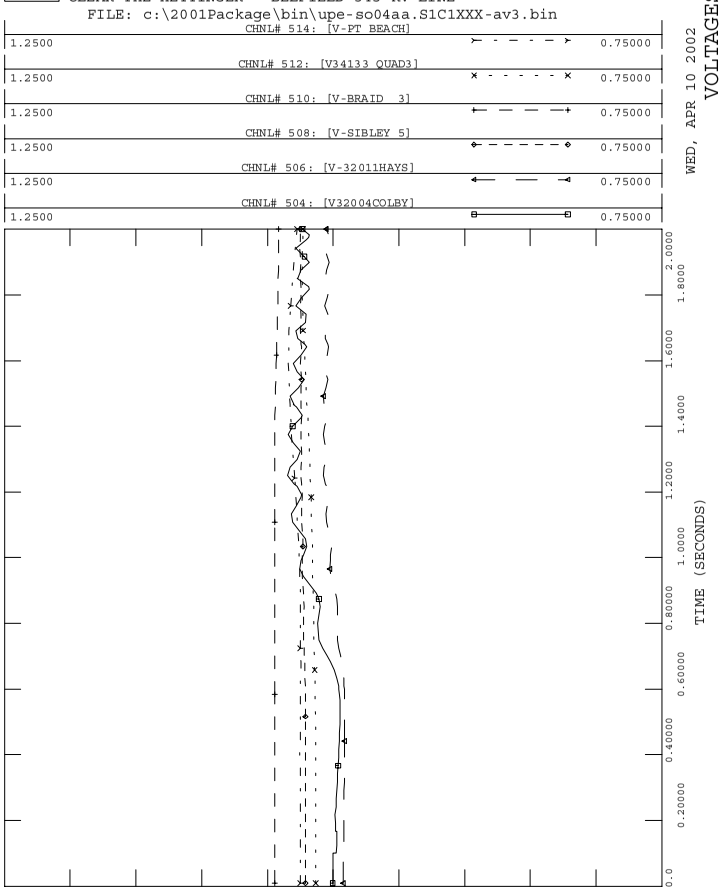


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
VOLTAGES 2



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin



WED, APR 10 2002 8:24
VOLTAGES 5

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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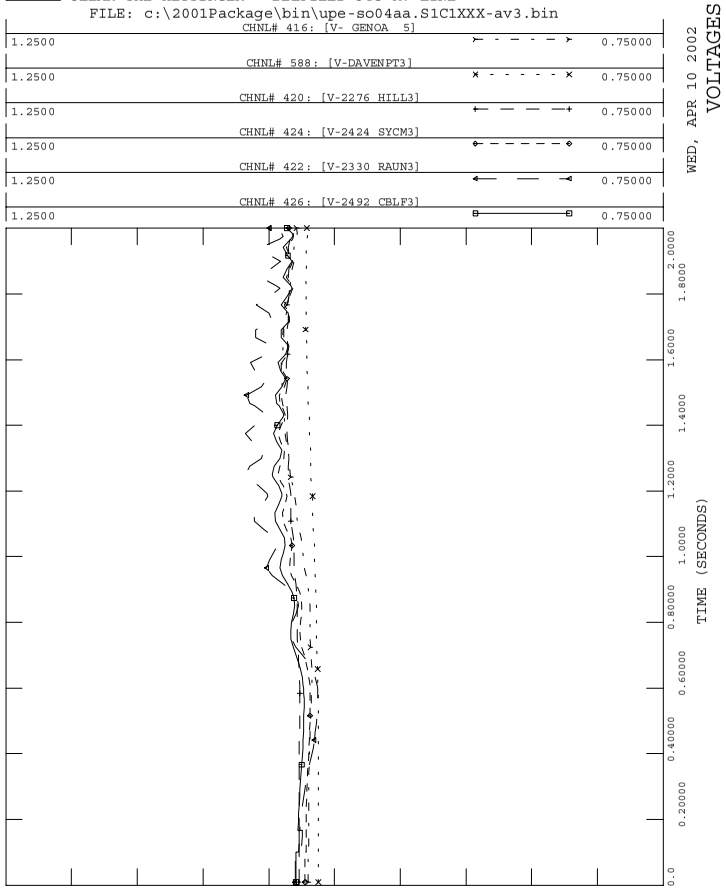
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin



WED, APR 10 2002 8:24
VOLTAGES IA

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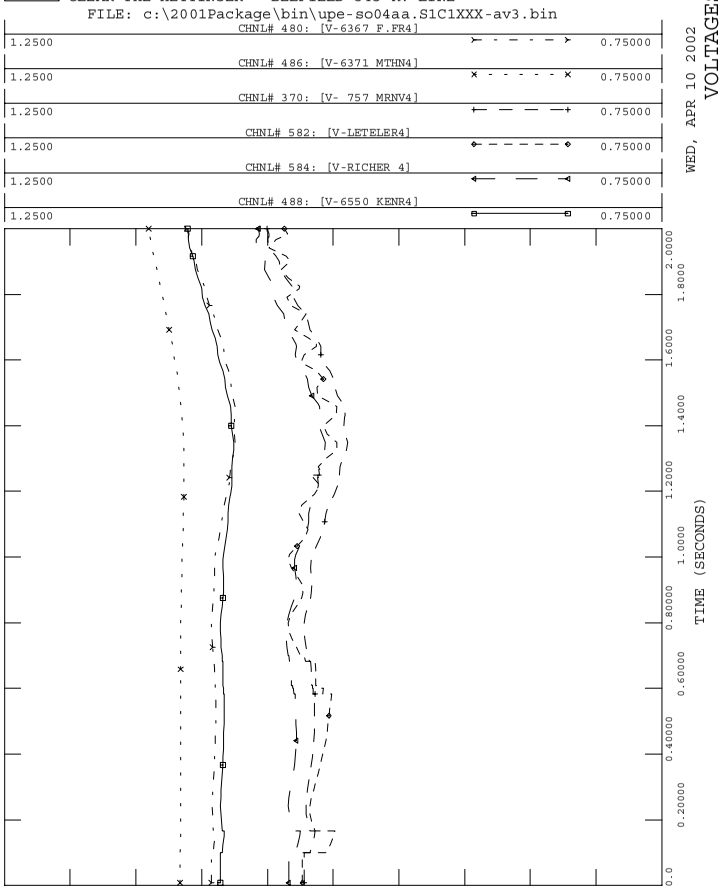
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin



WED, APR 10 2002 8:24
VOLTAGES 4

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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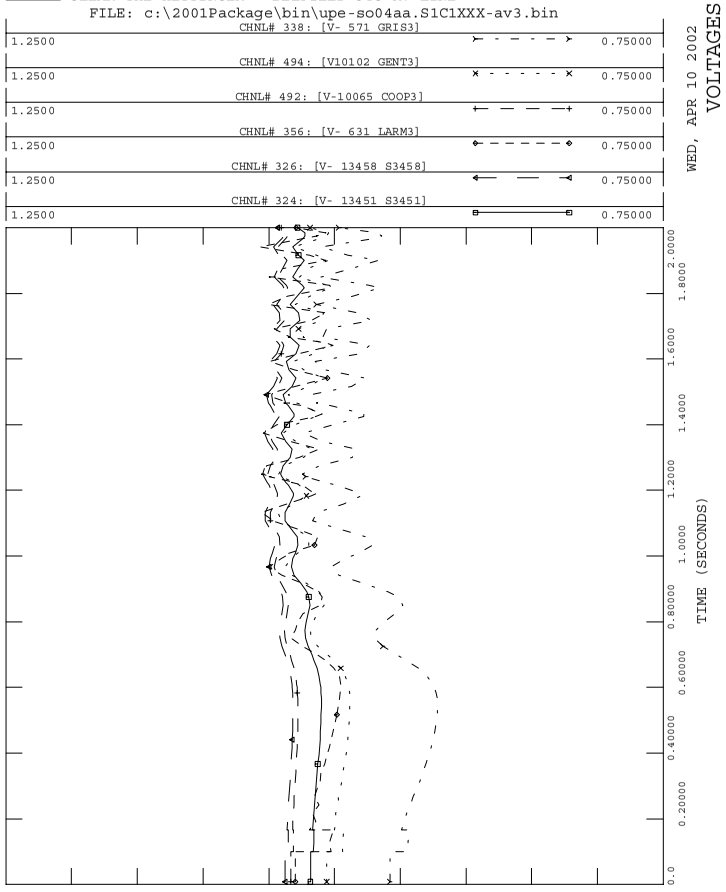
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin



WED, APR 10 2002 8:24
VOLTAGES NB

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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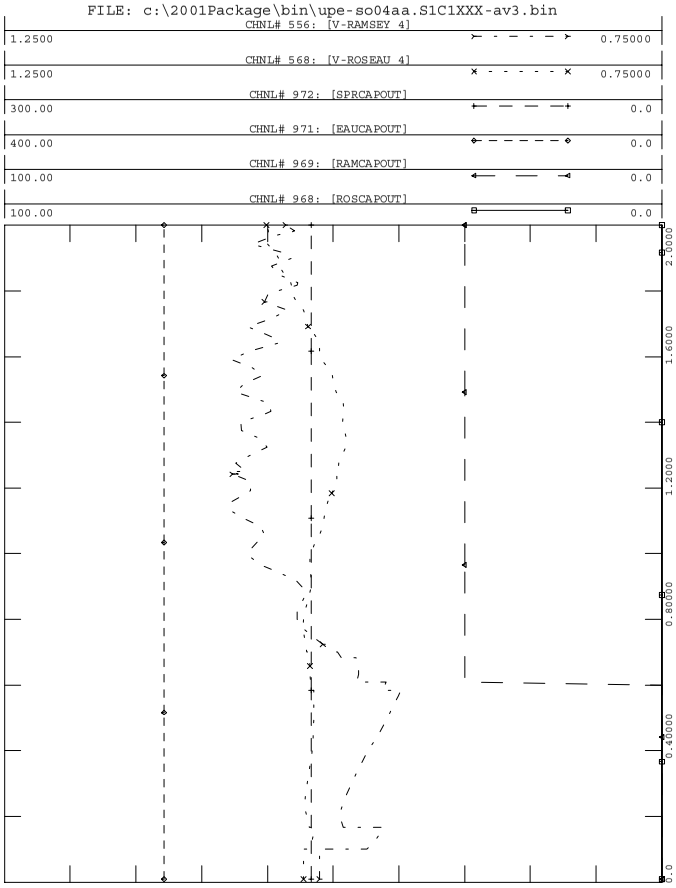
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin



WED, APR 10 2002 8:24
FAST SW CAP OUT 2

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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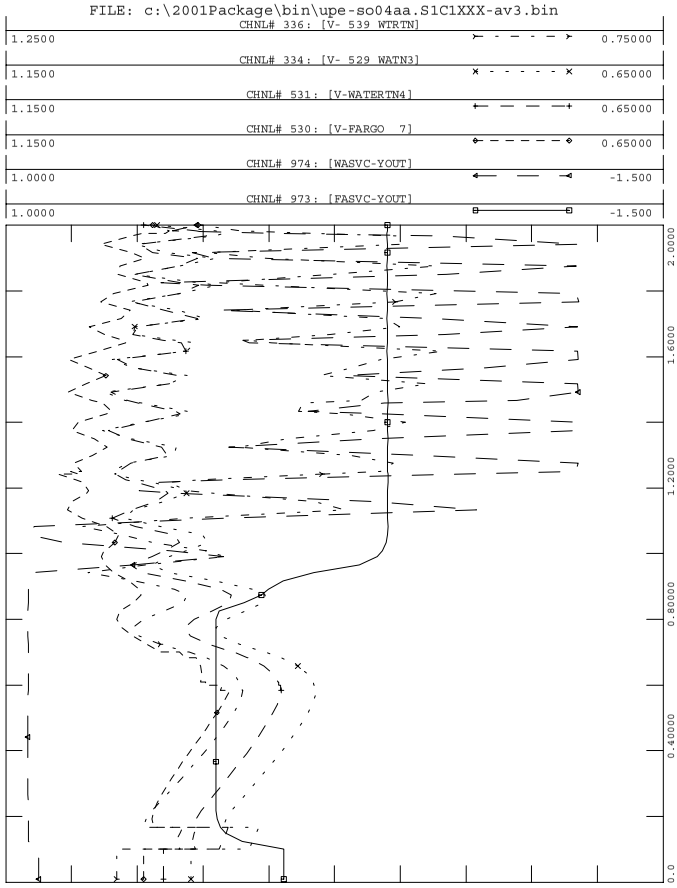
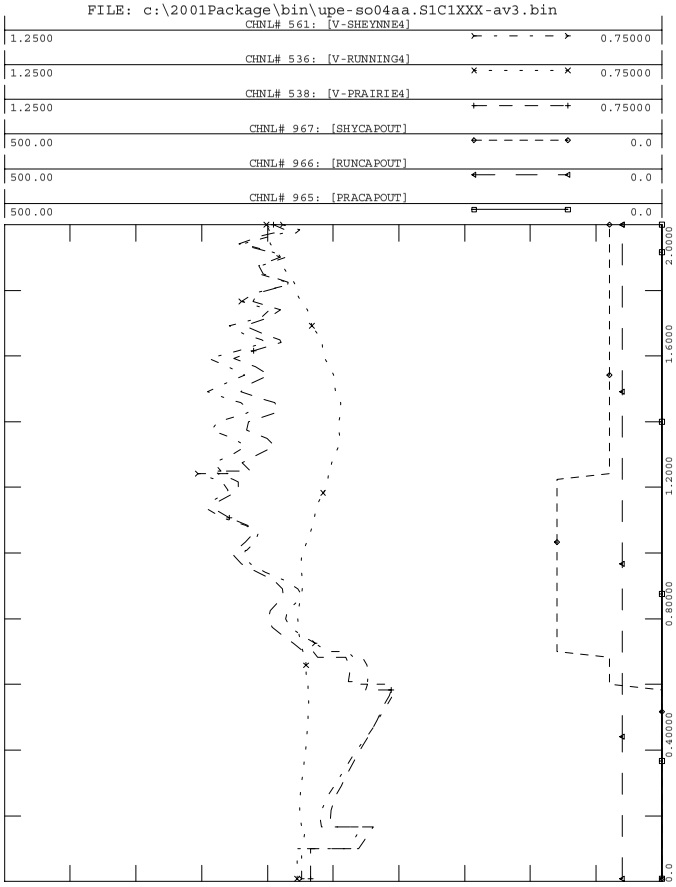
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin



WED, APR 10 2002 8:24
FARGO/WATERTOWN SVS

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin



WED, APR 10 2002 8:24
FAST SW CAP OUT 1

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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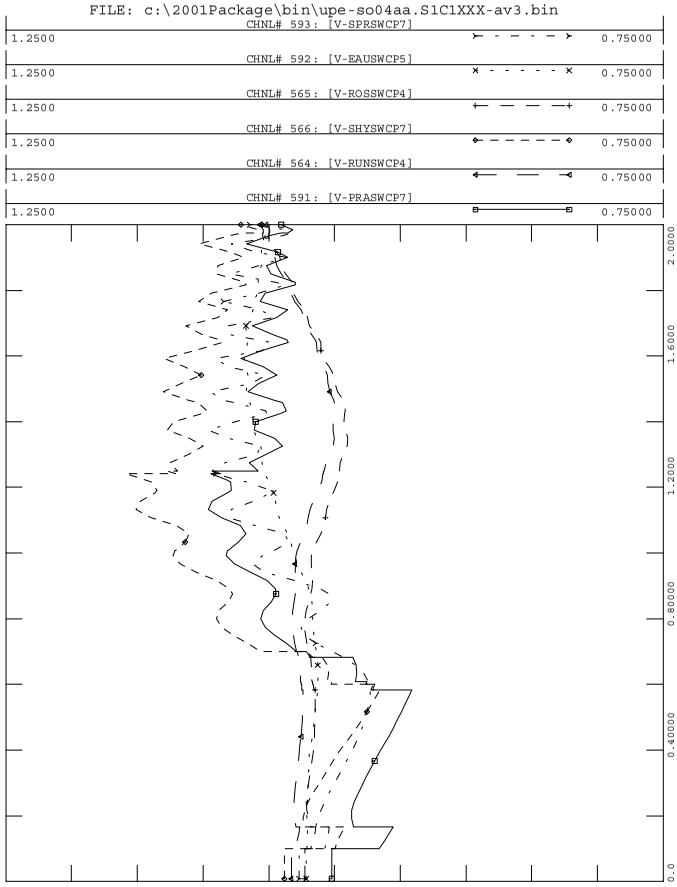
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin



WED, APR 10 2002 8:24
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

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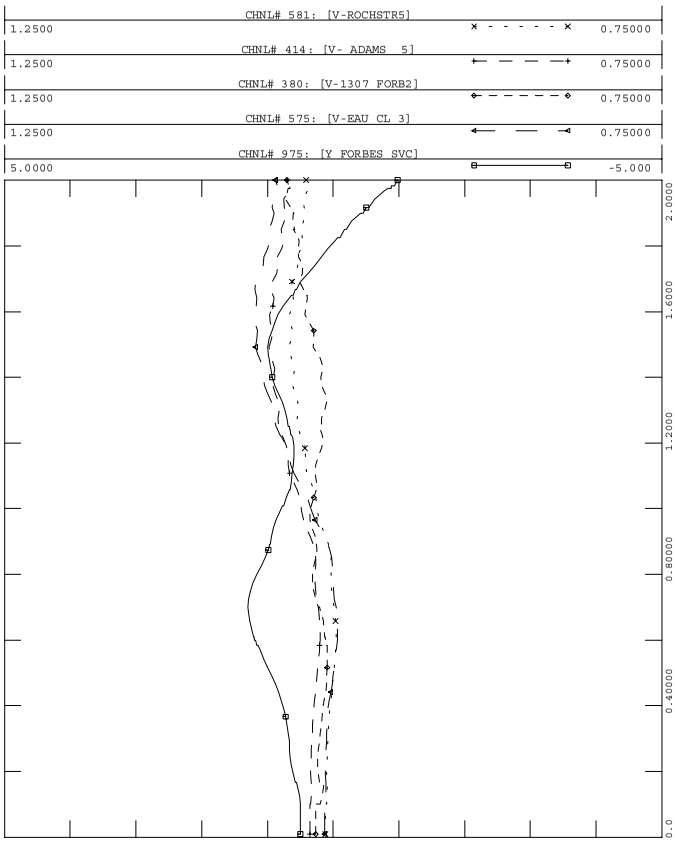
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

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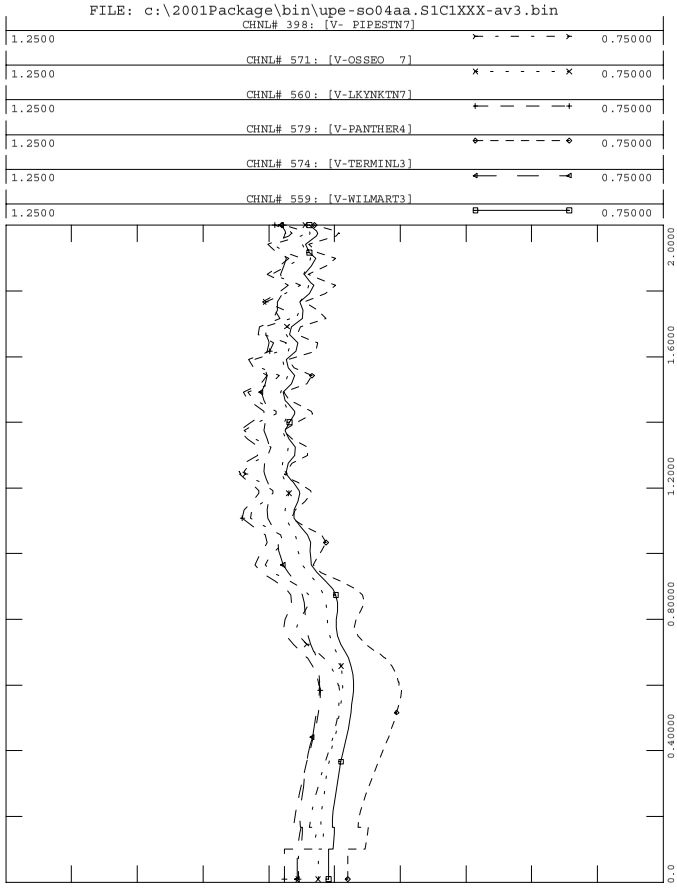
TC VOLTAGES



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

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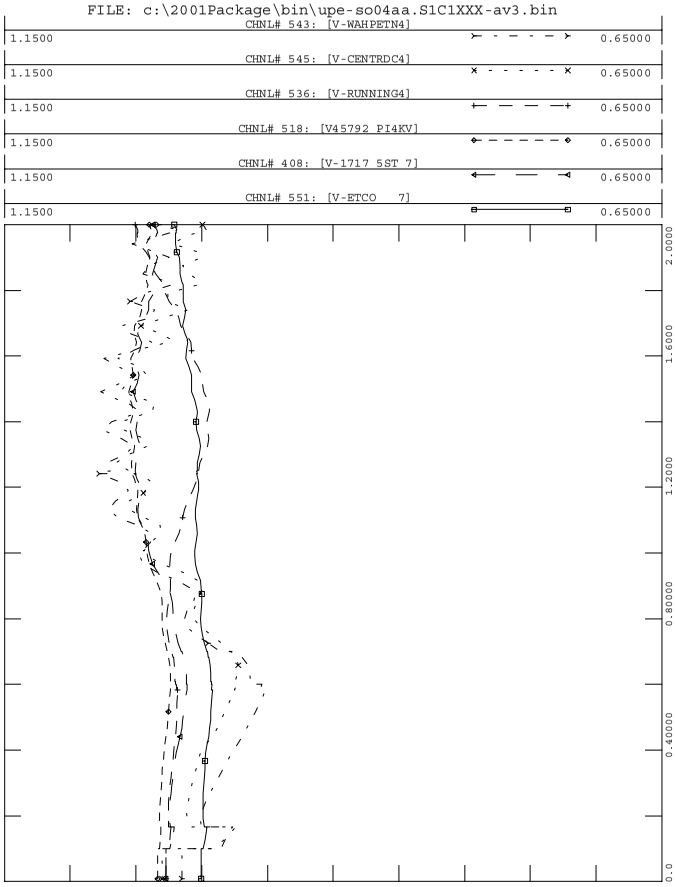
VOLTAGES 6



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

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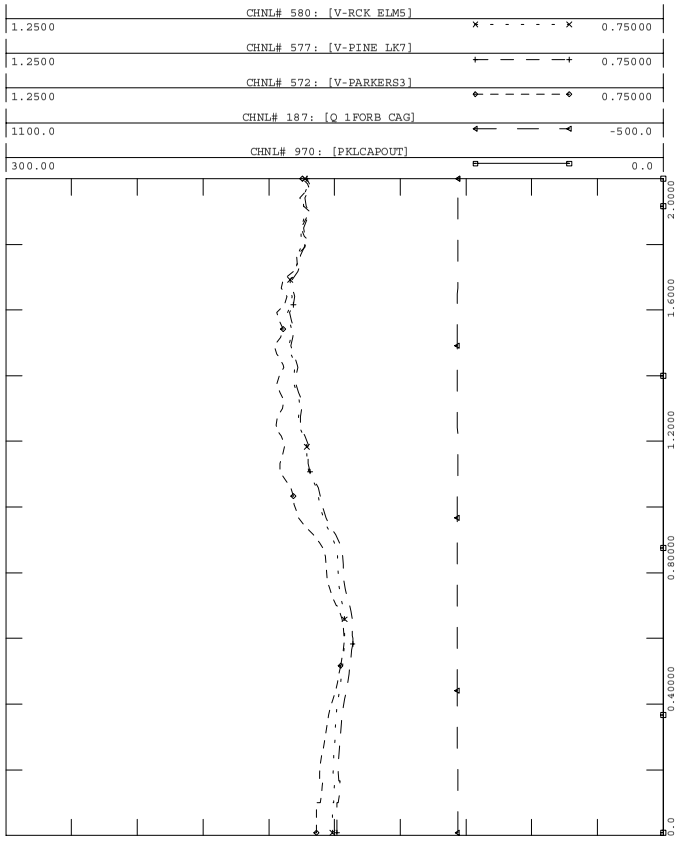
FORBES SVS OUT & VOLTAGES



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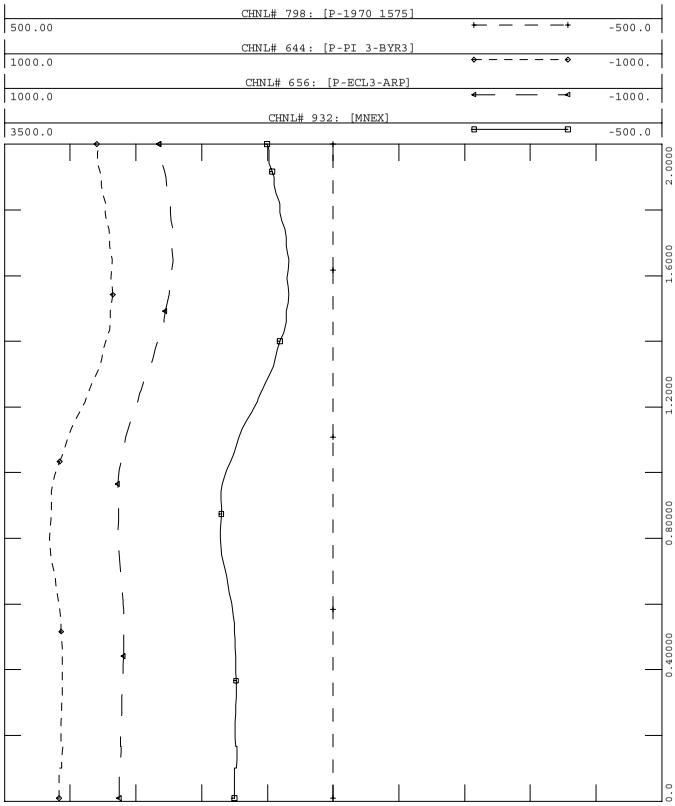
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
POWER FLOW SUMS 2



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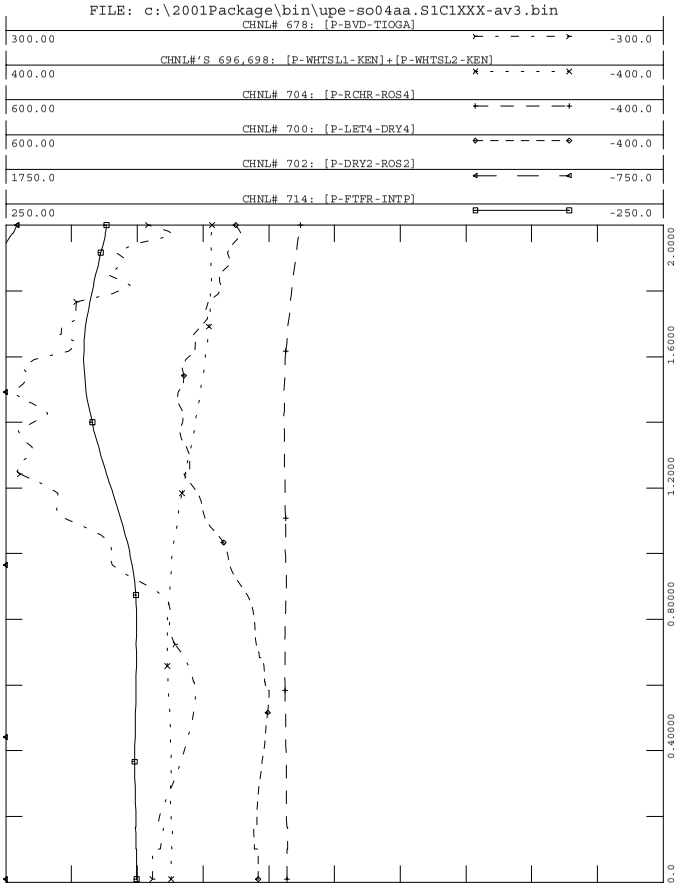
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
CAN. TIE FLOWS



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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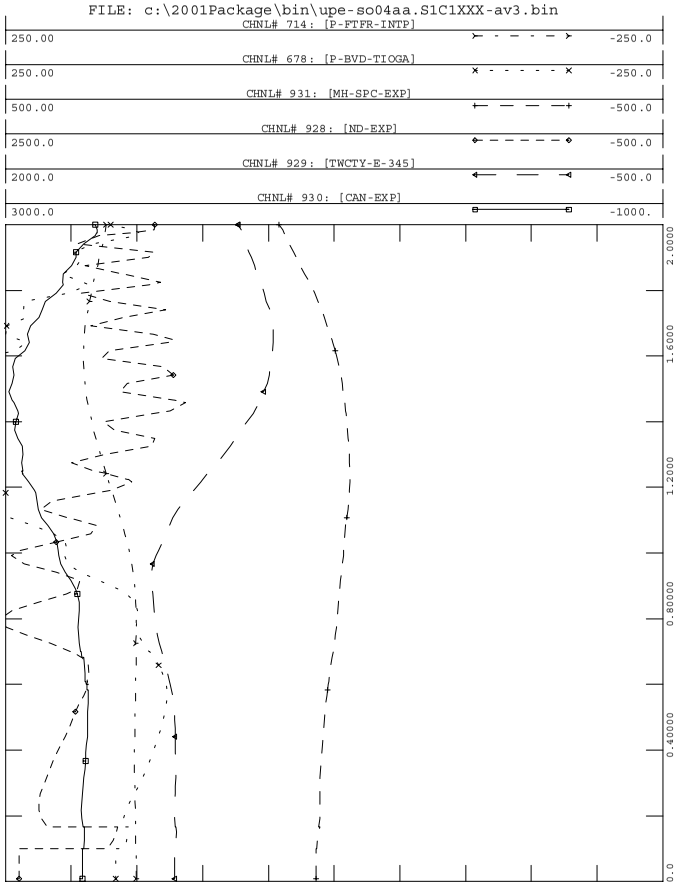
WED, APR 10 2002 8:24
POWER FLOW SUMS 1



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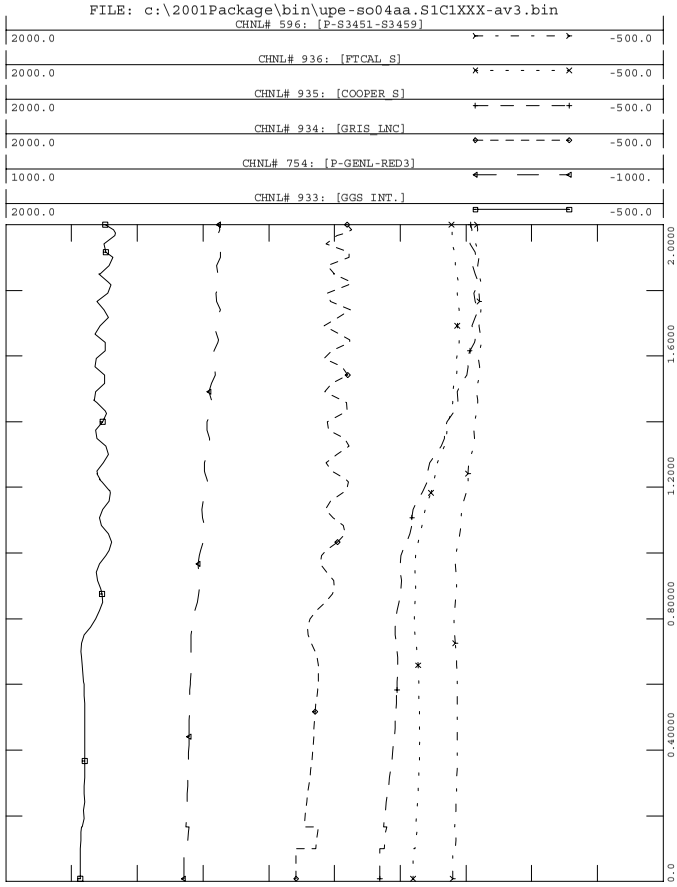
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24
POWER FLOW SUM 3



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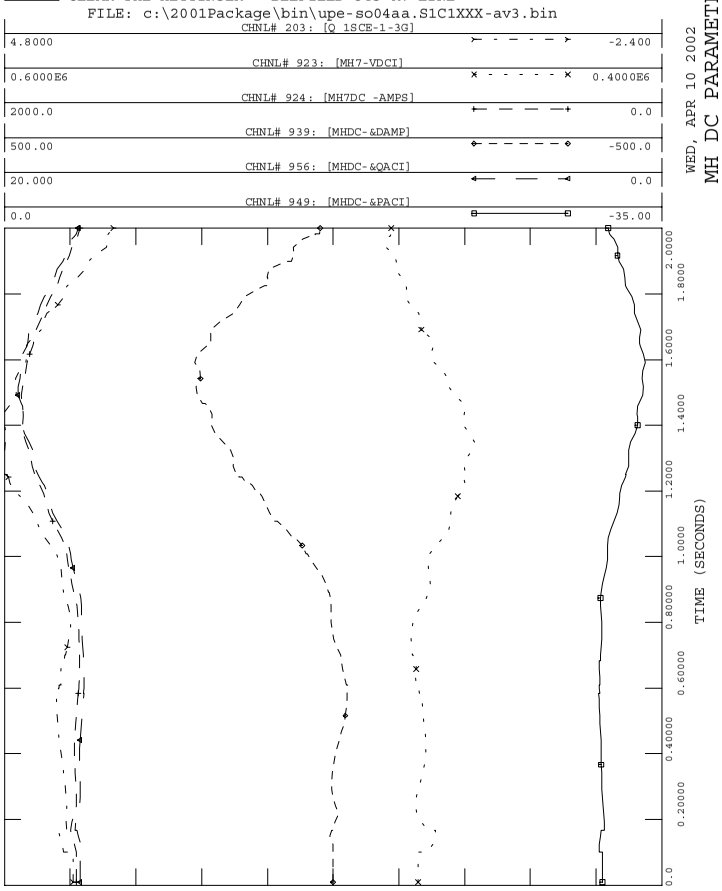
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24

MH DC PARAMETERS



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

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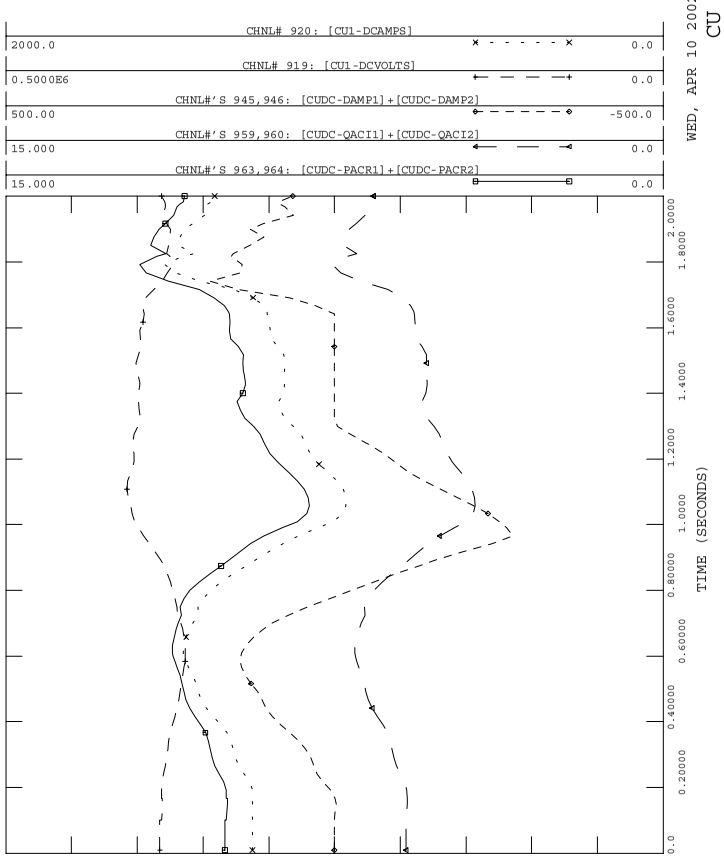
CU DC #1



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

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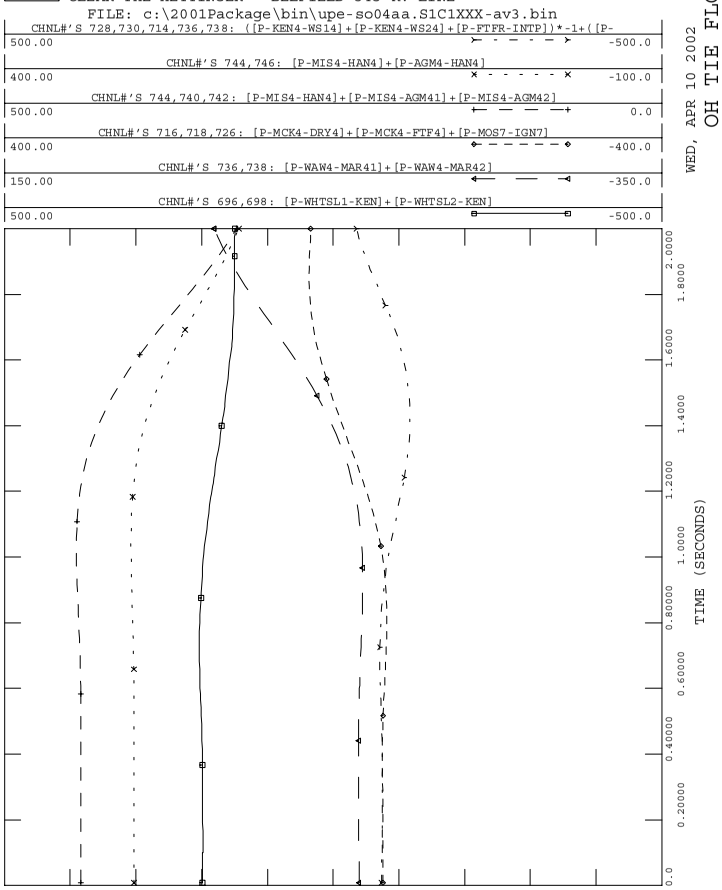
OH TIE FLOWS



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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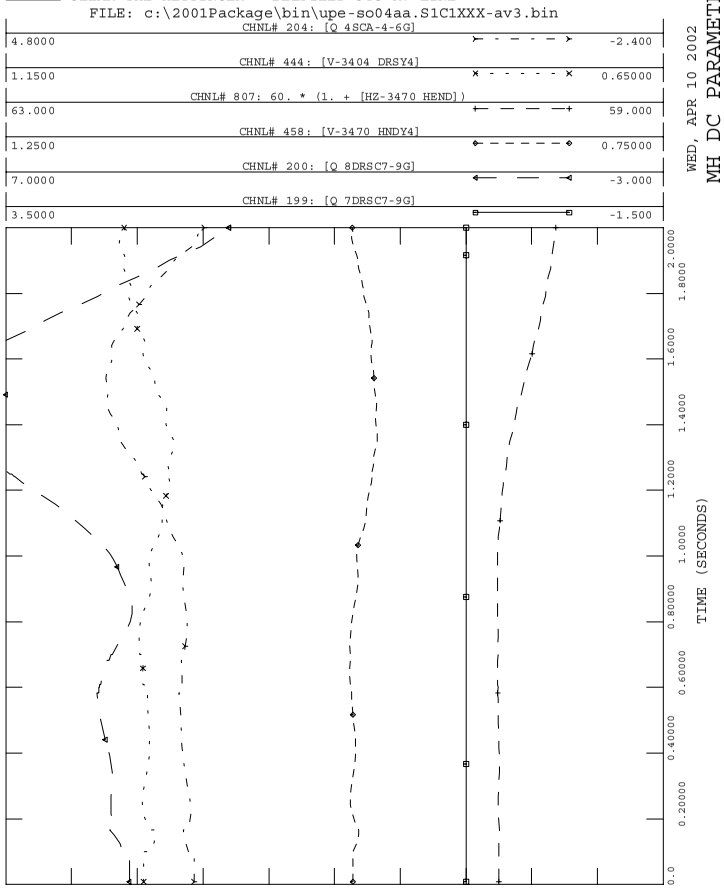
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24

MH DC PARAMETERS



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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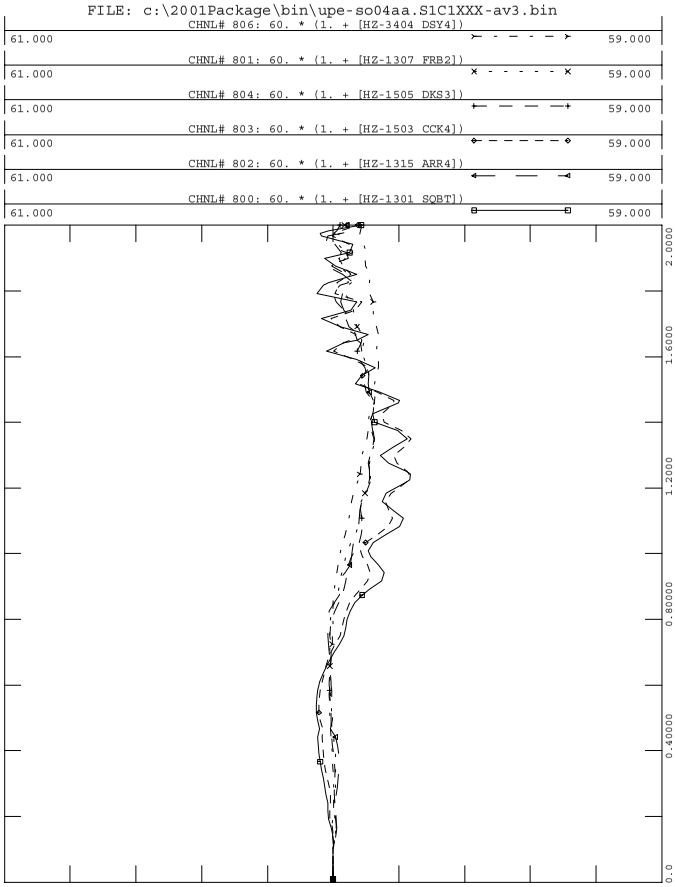
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24

FREQ AT DC TERMINALS



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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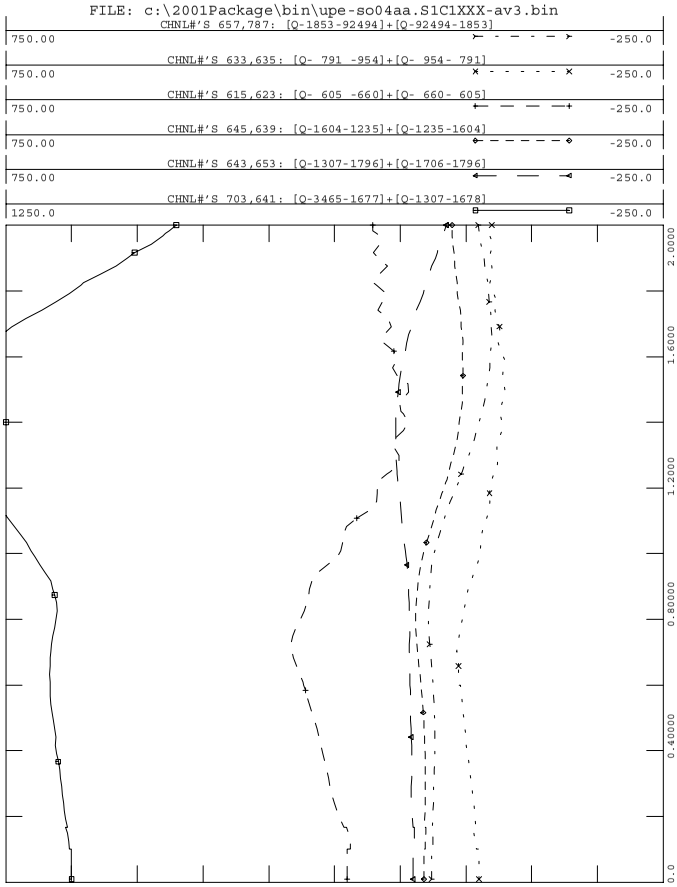
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24

VAR LOSSES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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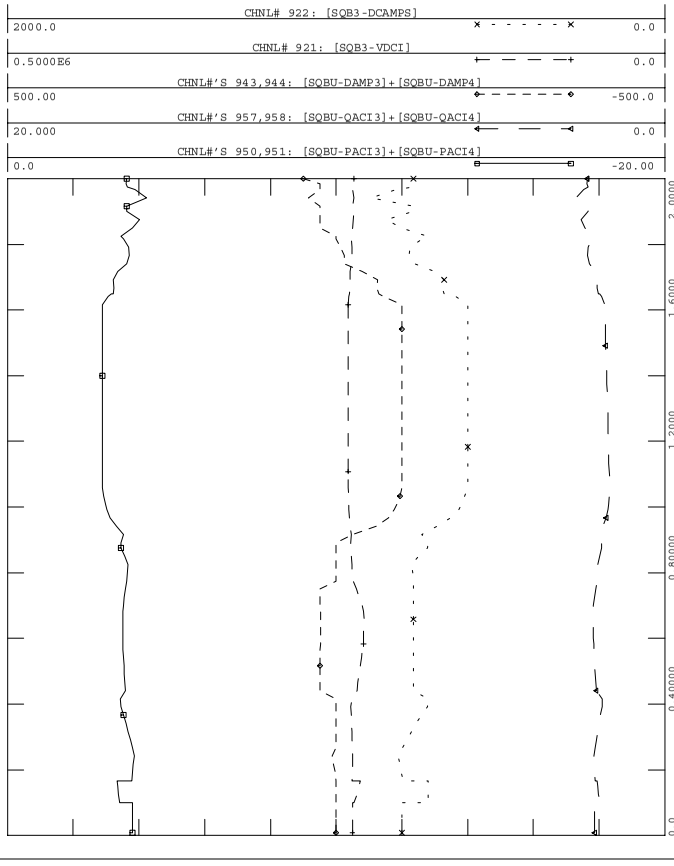
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24

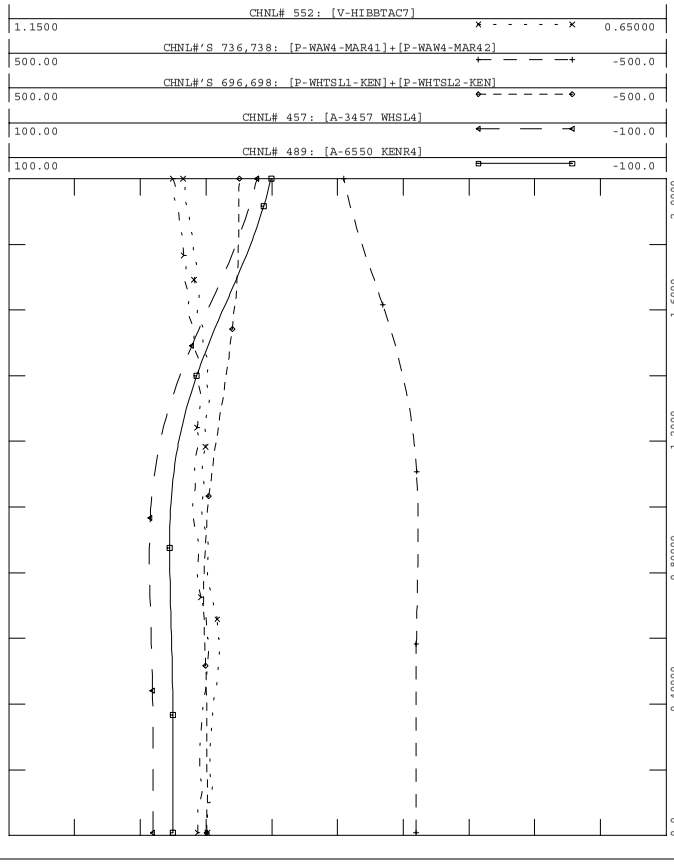
SQB DC #3



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

WED, APR 10 2002 8:24

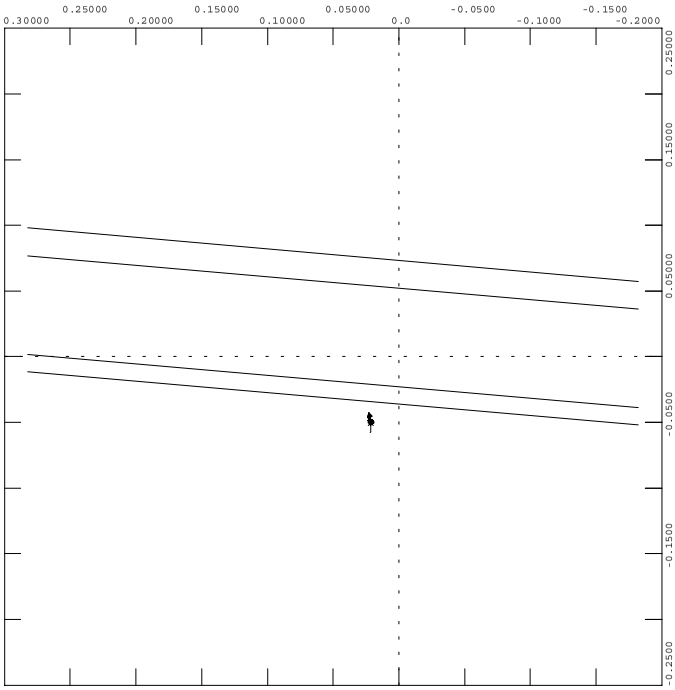
VOLTAGES, ANGLES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



WED, APR 10 2002 8:24
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

RELAY: RELAYG
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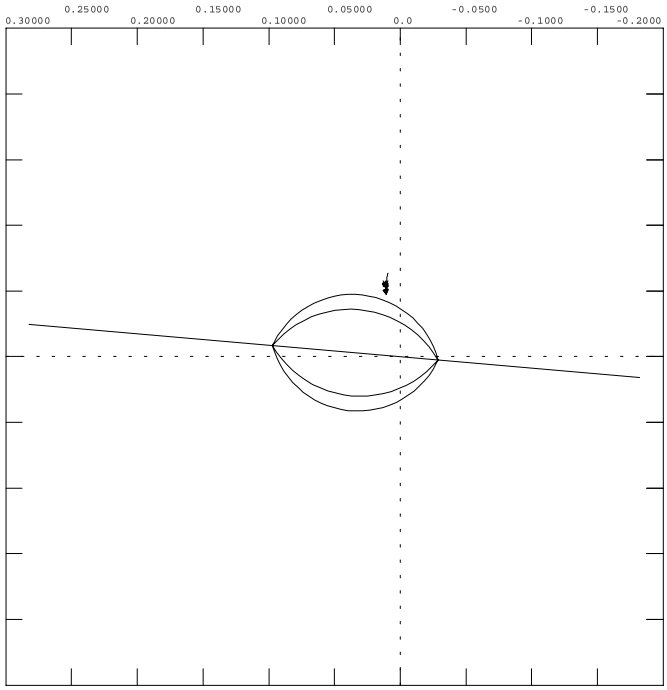

WED, APR 10 2002 8:24
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

RELAY: RELAYG
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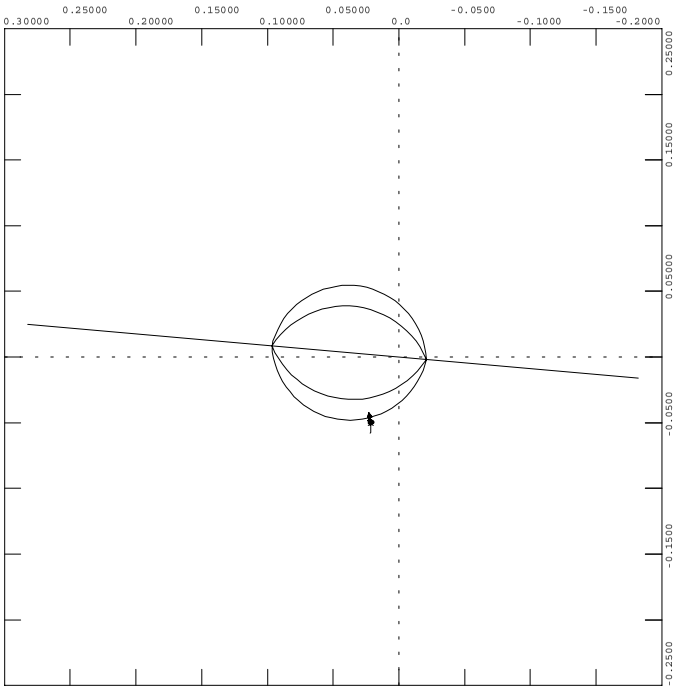
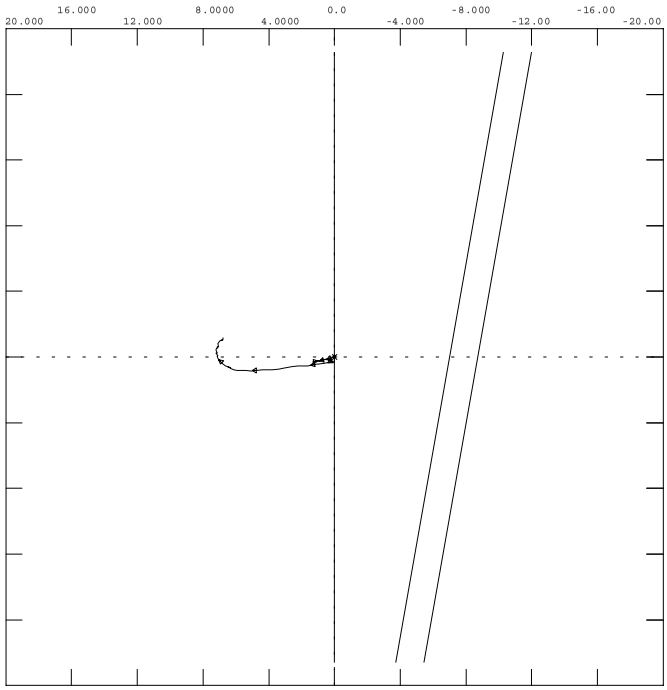


WED, APR 10 2002 8:24
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

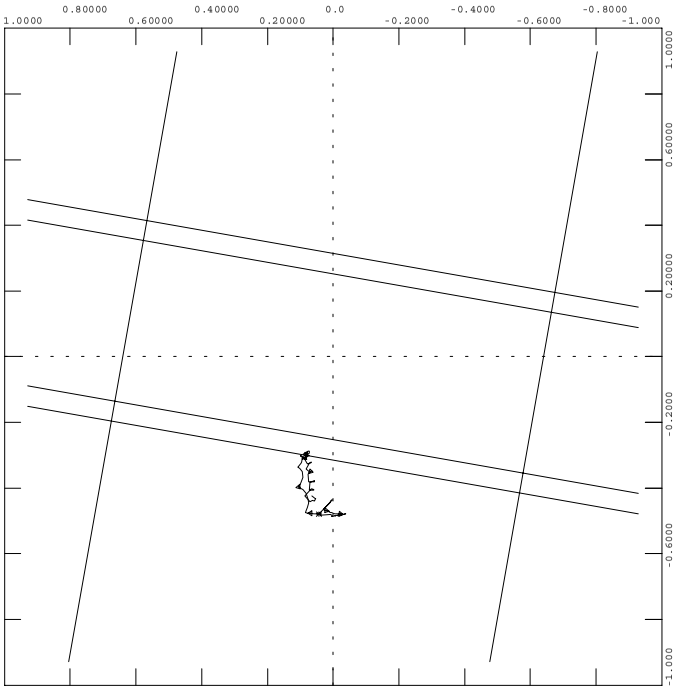


WED, APR 10 2002 8:24
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

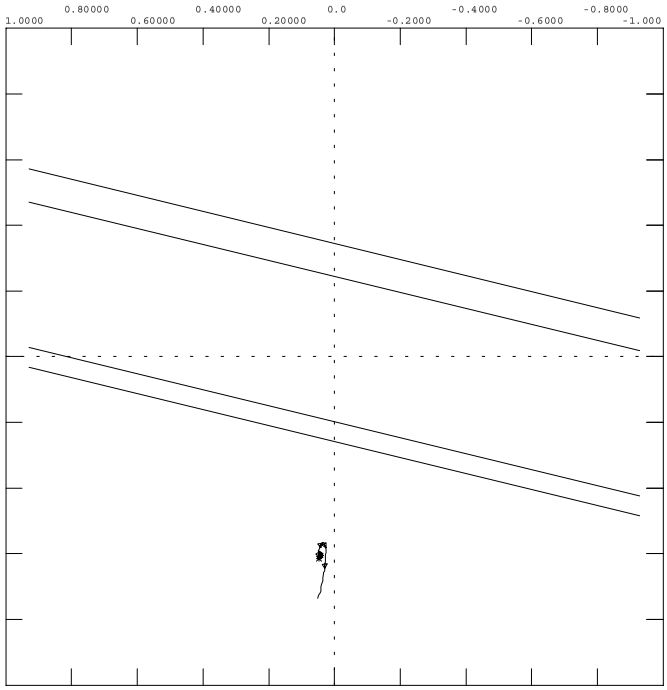
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

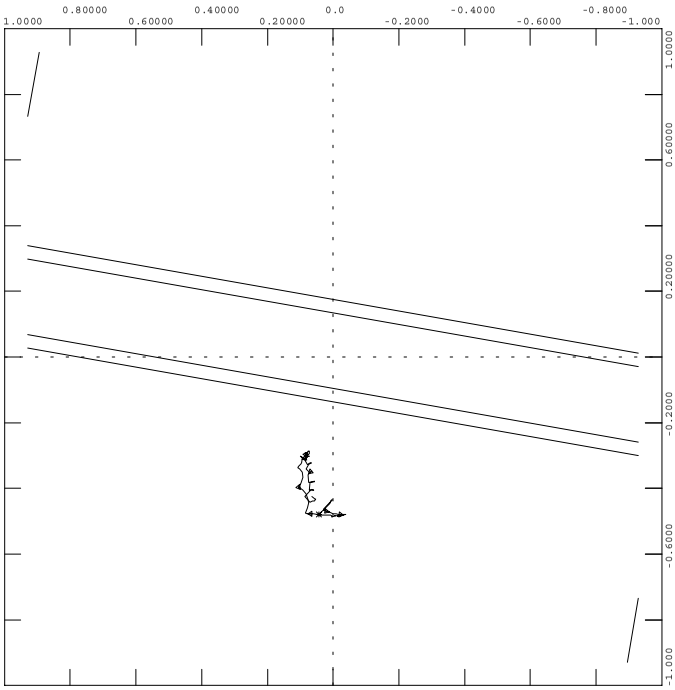
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

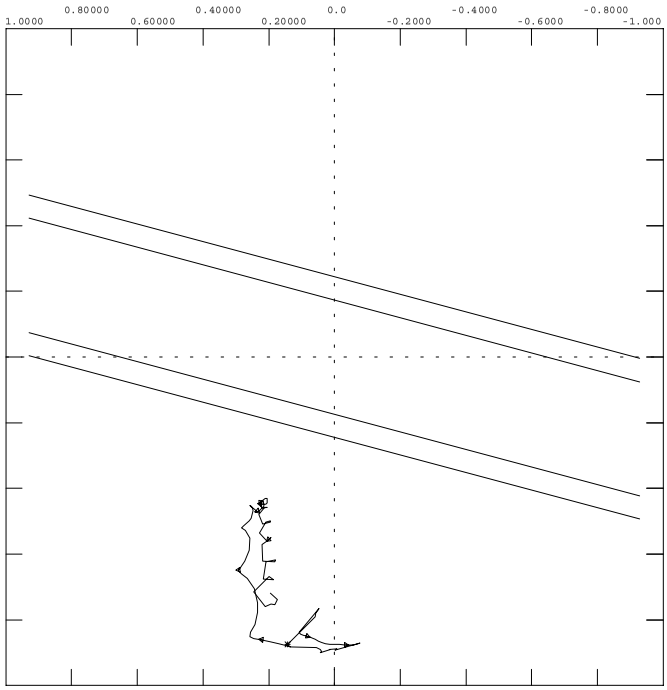
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

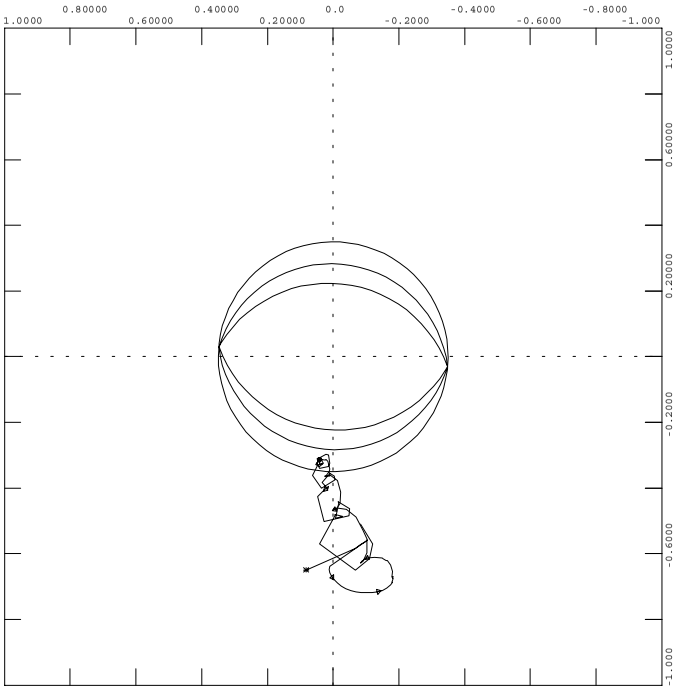
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

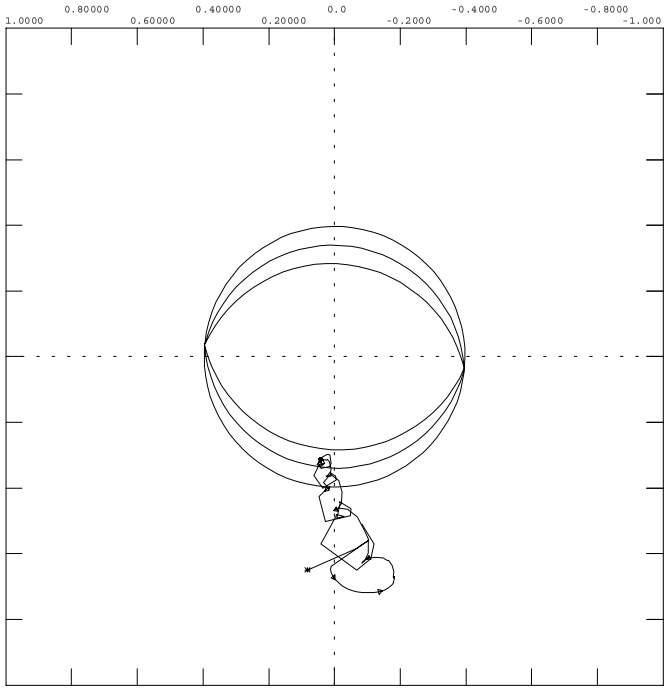
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

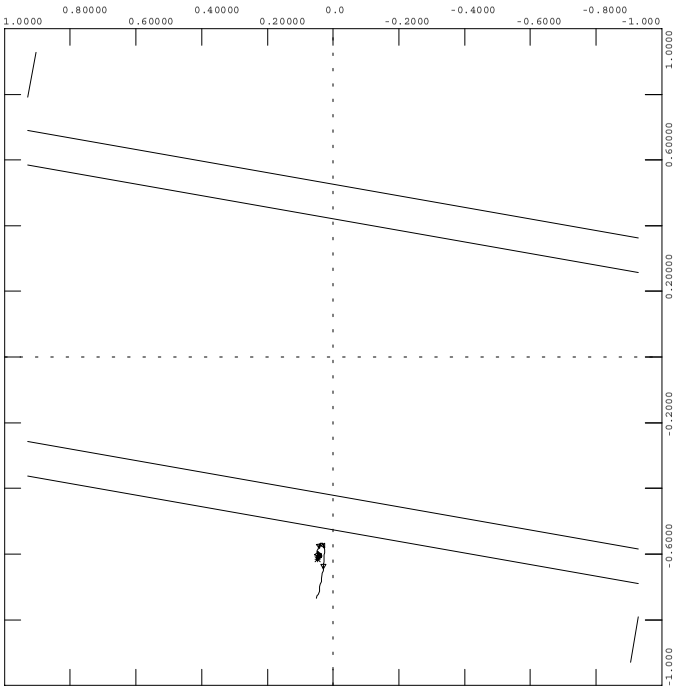
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

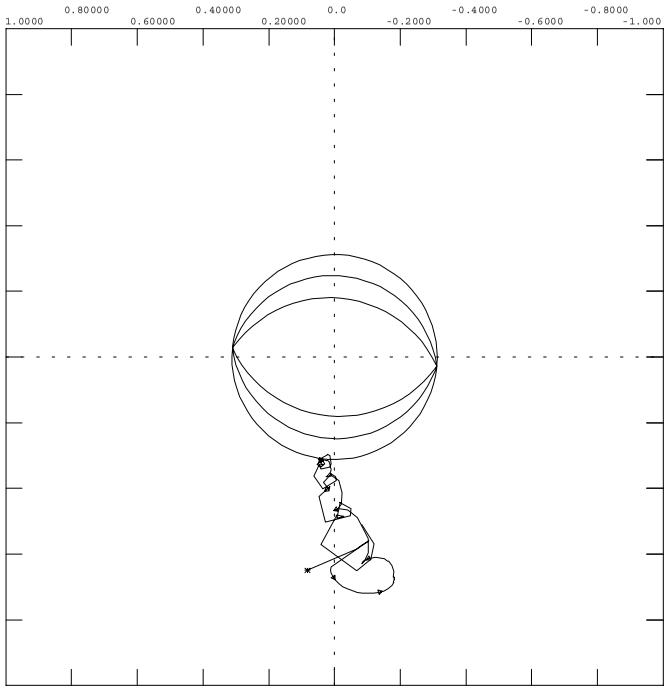
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



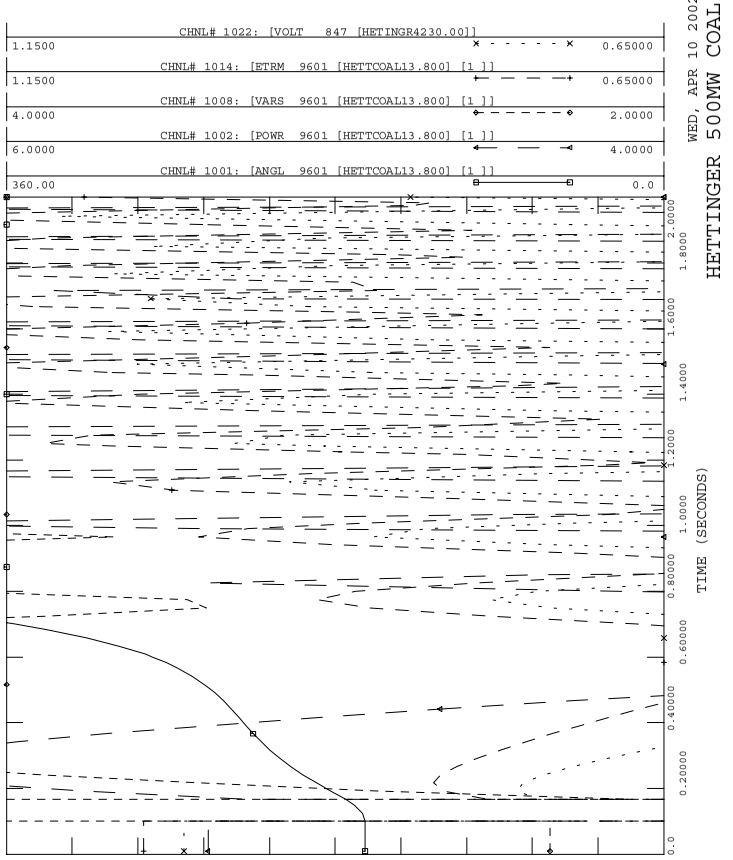
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

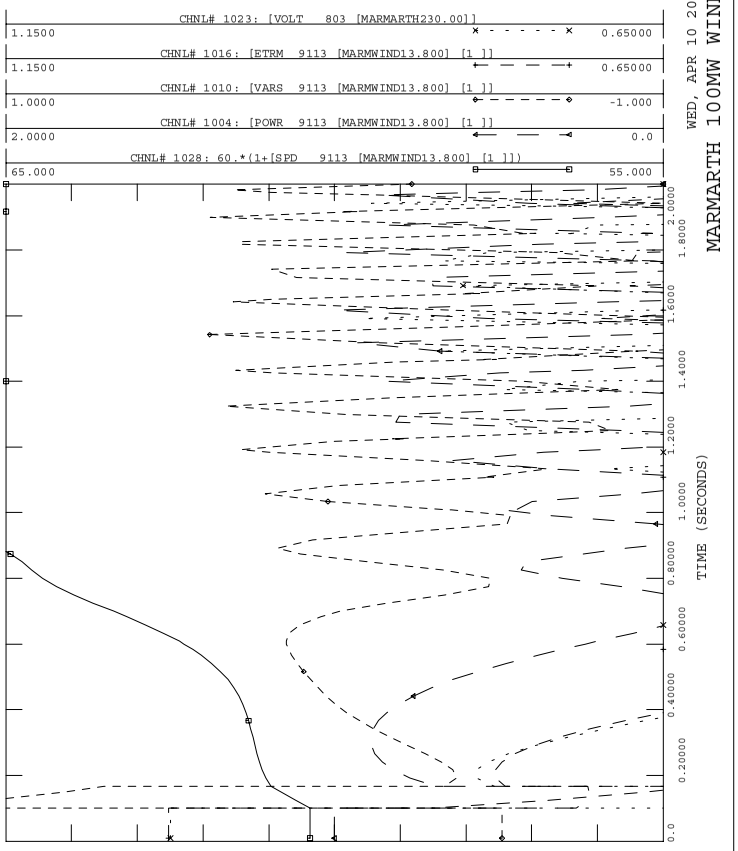


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin



WED, APR 10 2002 8:24
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

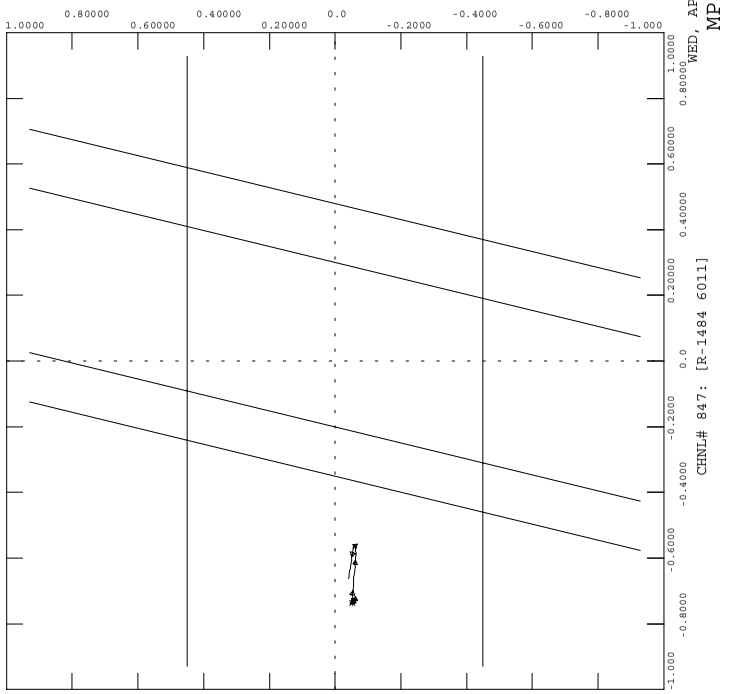


WED, APR 10 2002 8:24
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

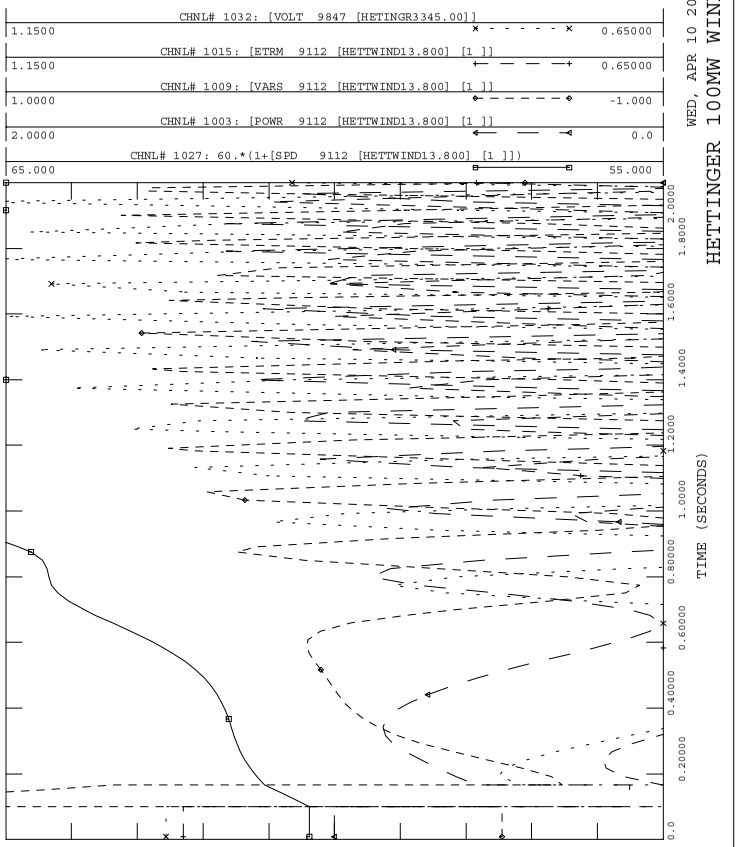
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



WED, APR 10 2002 8:24
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-av3.bin



WED, APR 10 2002 8:24
HETTINGER 100MW WIND UNIT

BELFIELD 100MW WIND UNIT

BOWMAN 100MW WIND UNIT

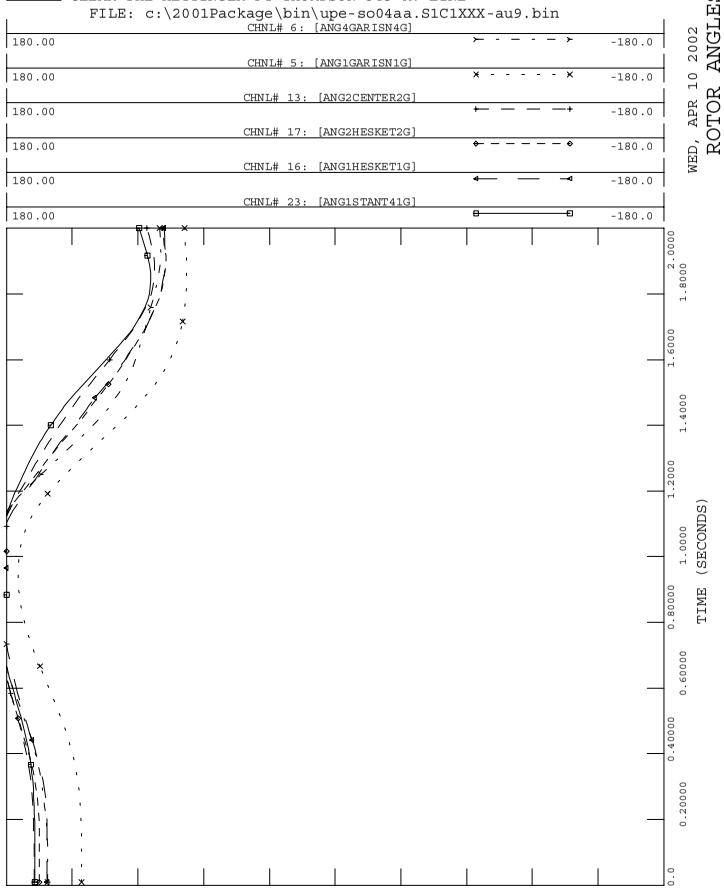
NEW E. 100MW WIND UNIT

CONTINGENCY AU9

4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Ft. Thompson 345 kV line

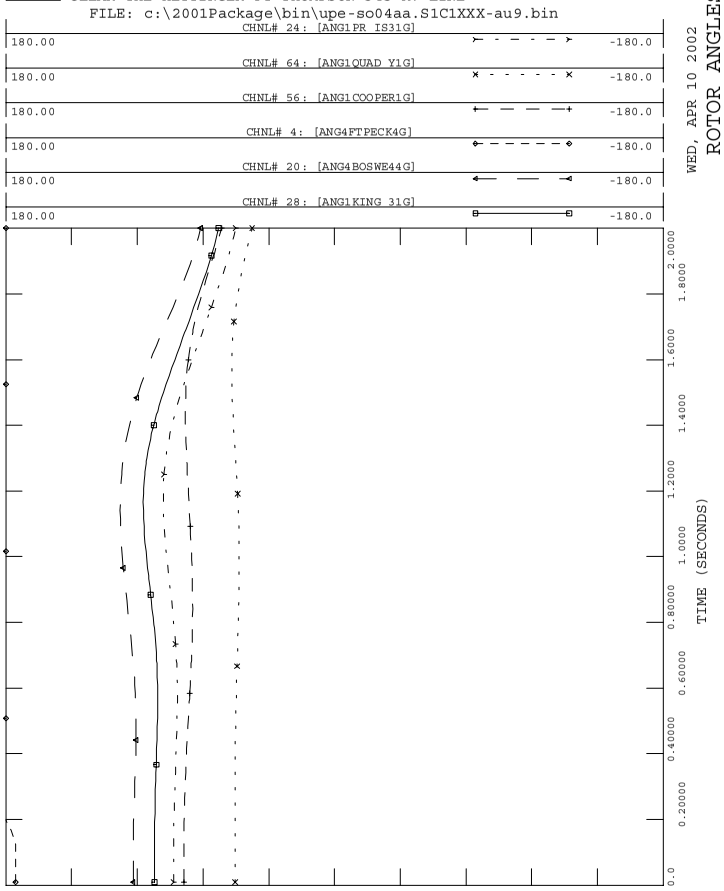
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
ROTOR ANGLES 2



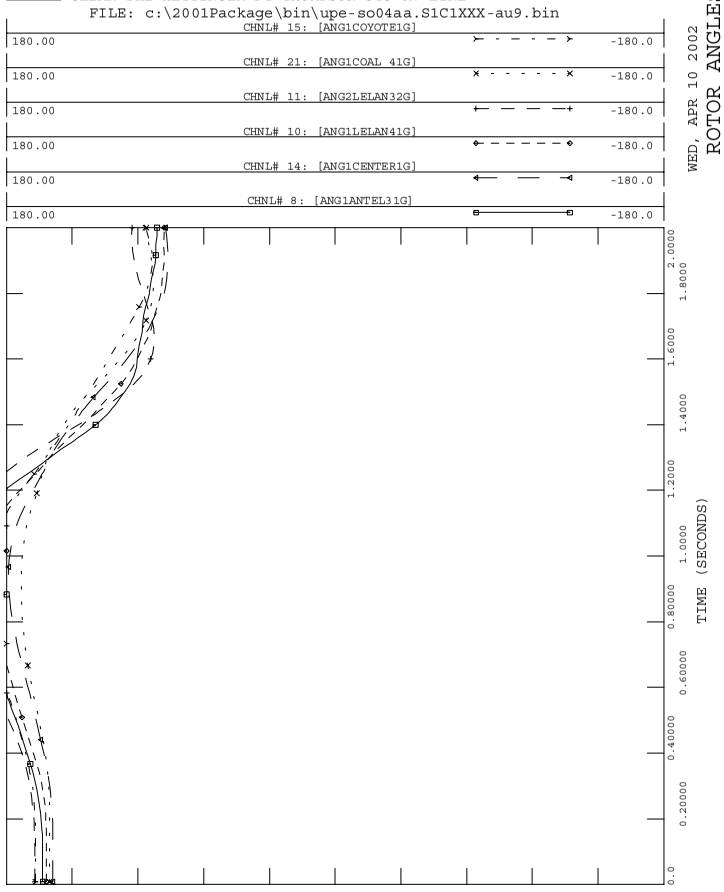
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
ROTOR ANGLES 4



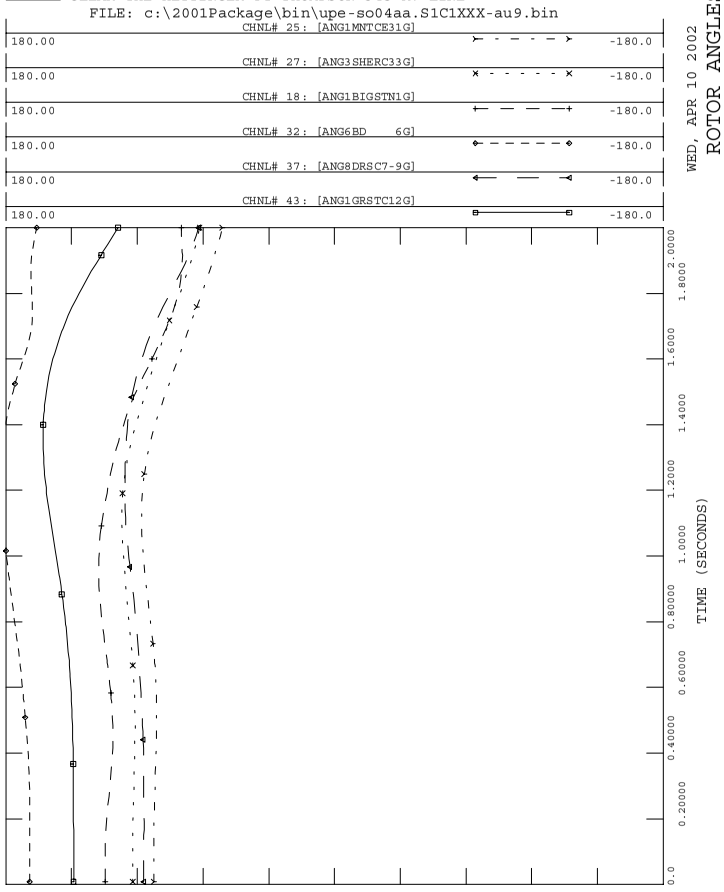
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
ROTOR ANGLES 1



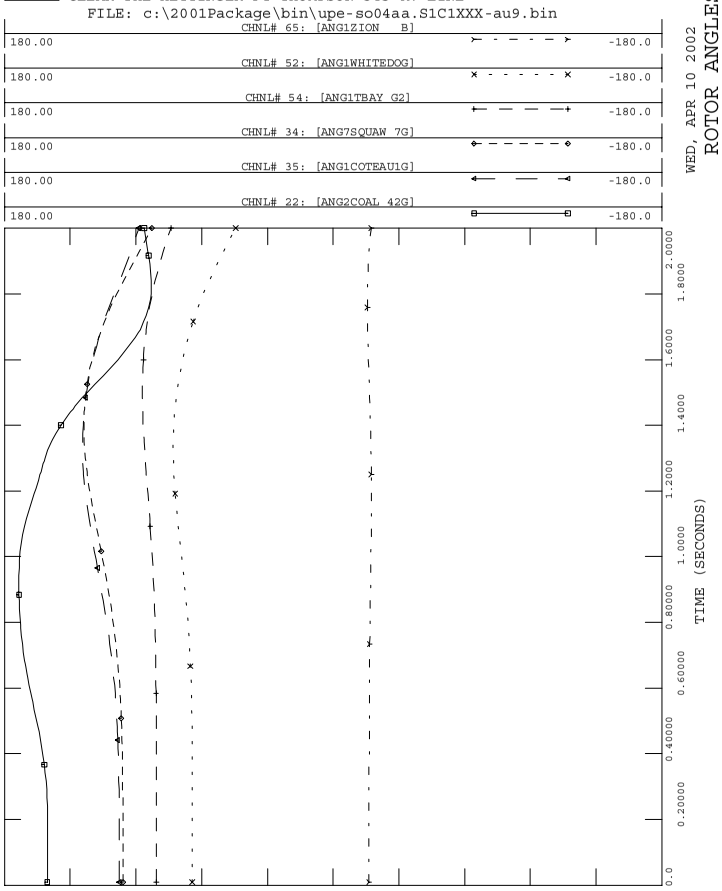
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
ROTOR ANGLES 3



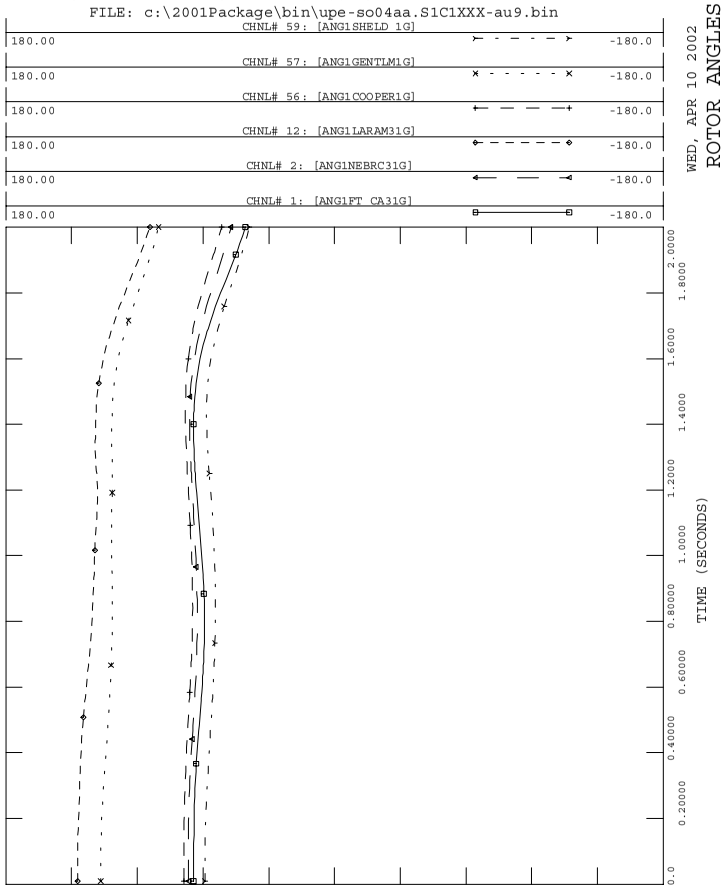
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
ROTOR ANGLES 6



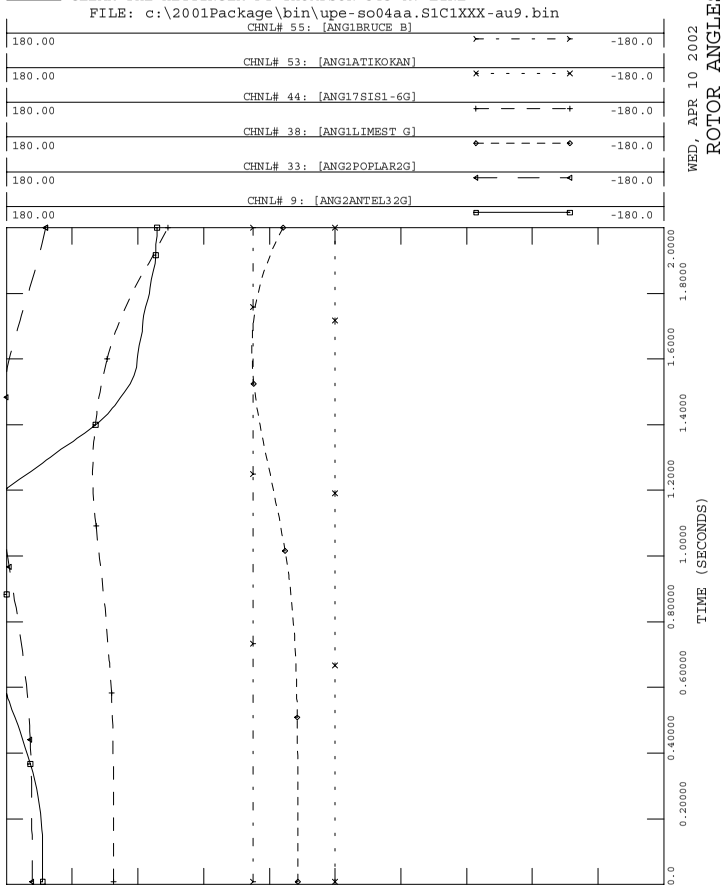
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
ROTOR ANGLES NB



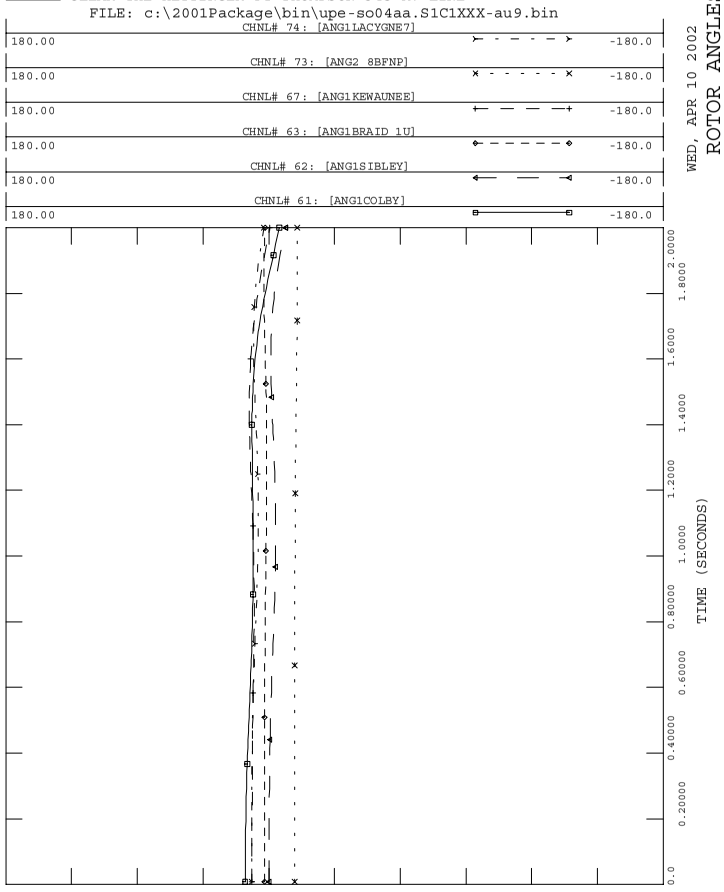
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
ROTOR ANGLES 5



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
ROTOR ANGLES 7



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

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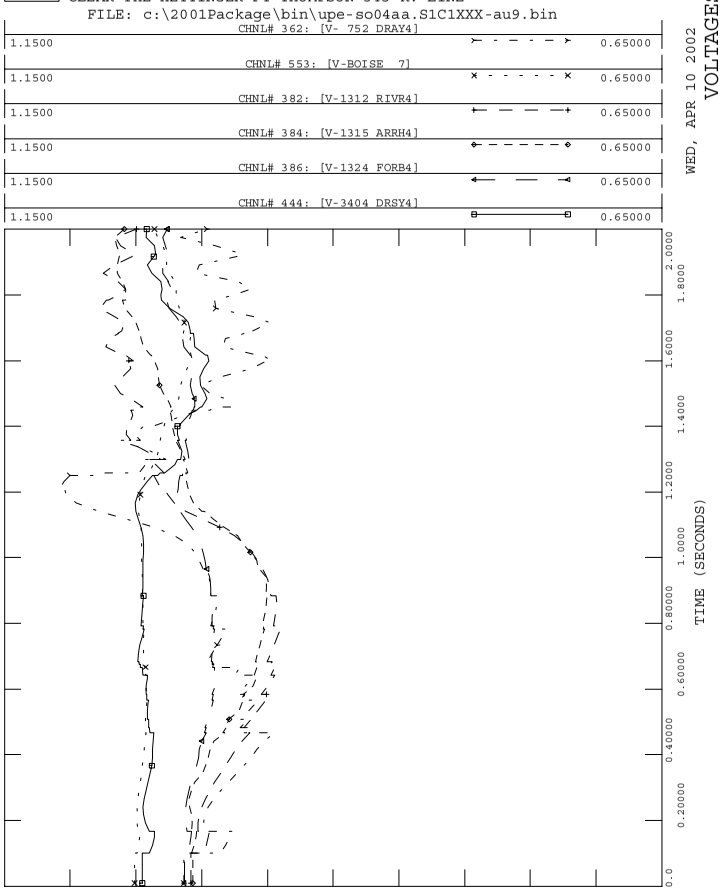
VOLTAGES 1



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

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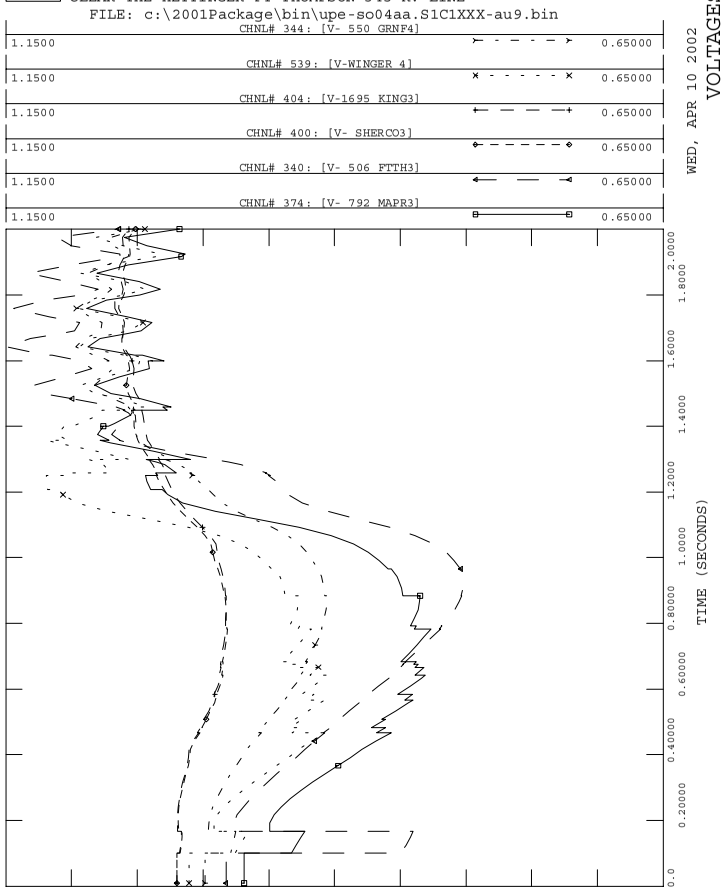
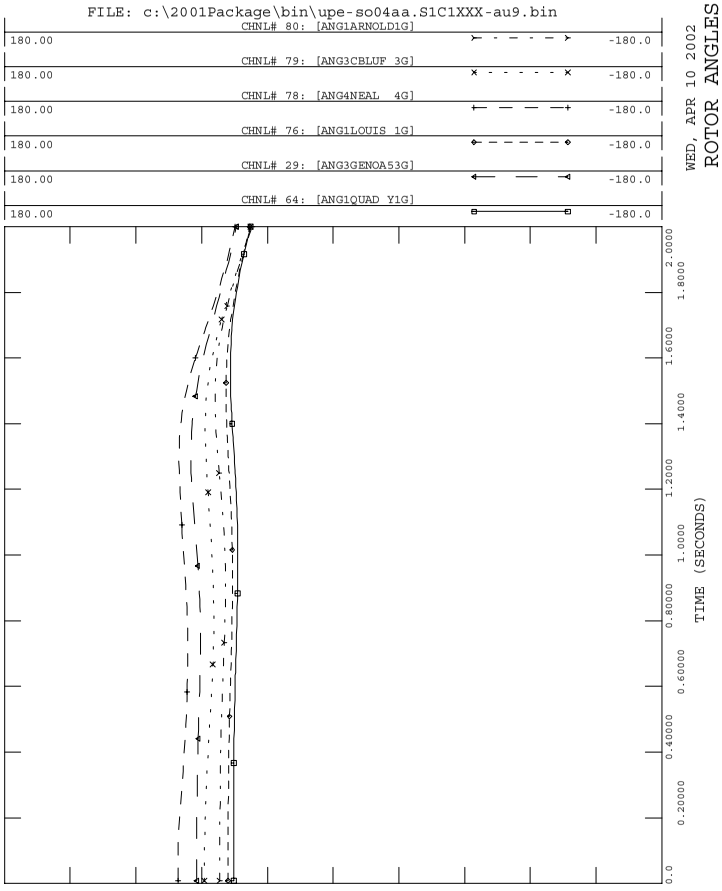
VOLTAGES 3



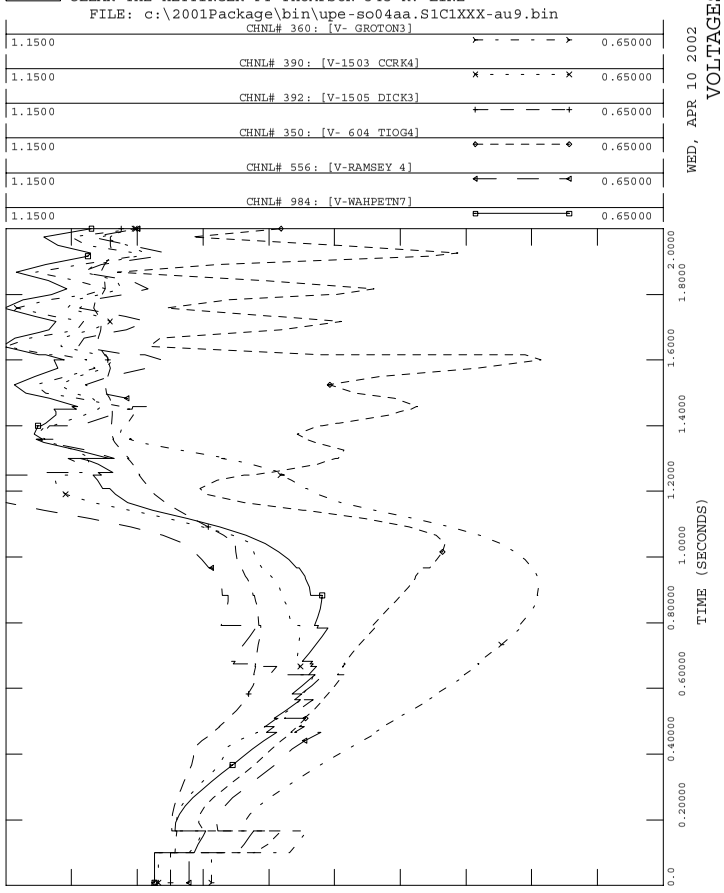
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
ROTOR ANGLES IA



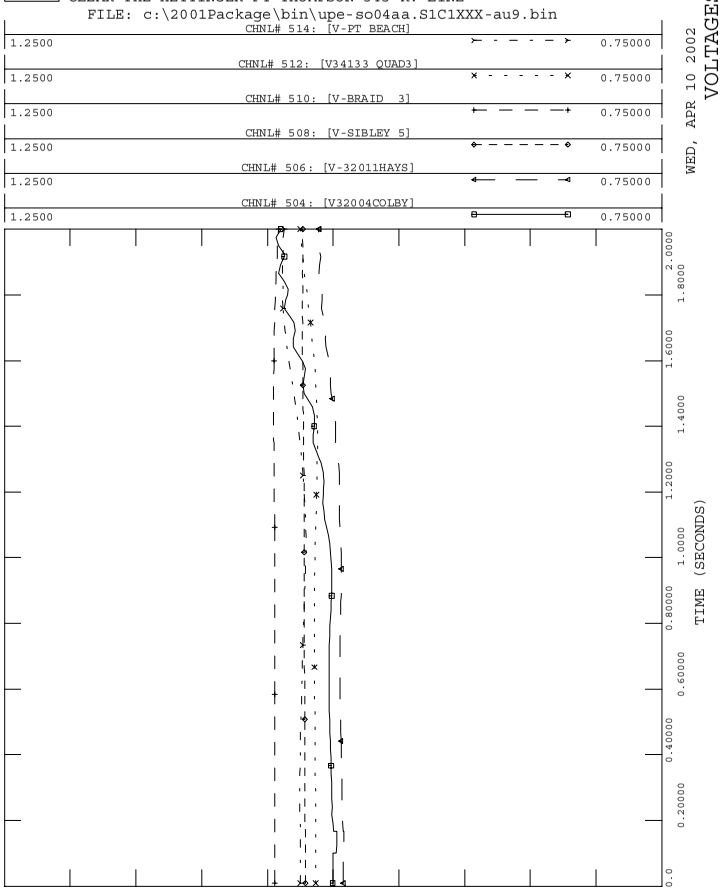
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
VOLTAGES 2



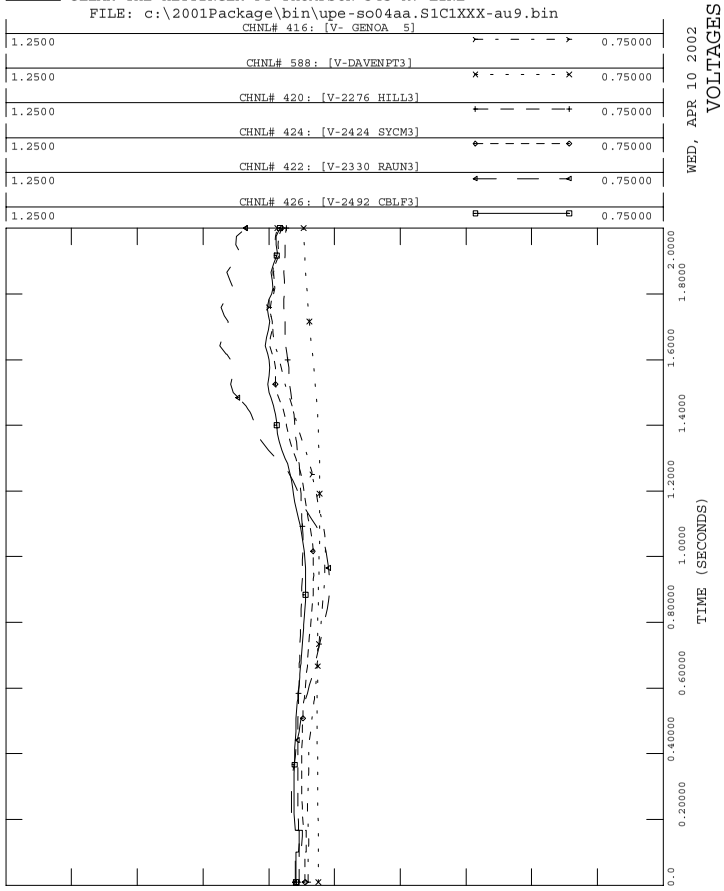
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
VOLTAGES 5



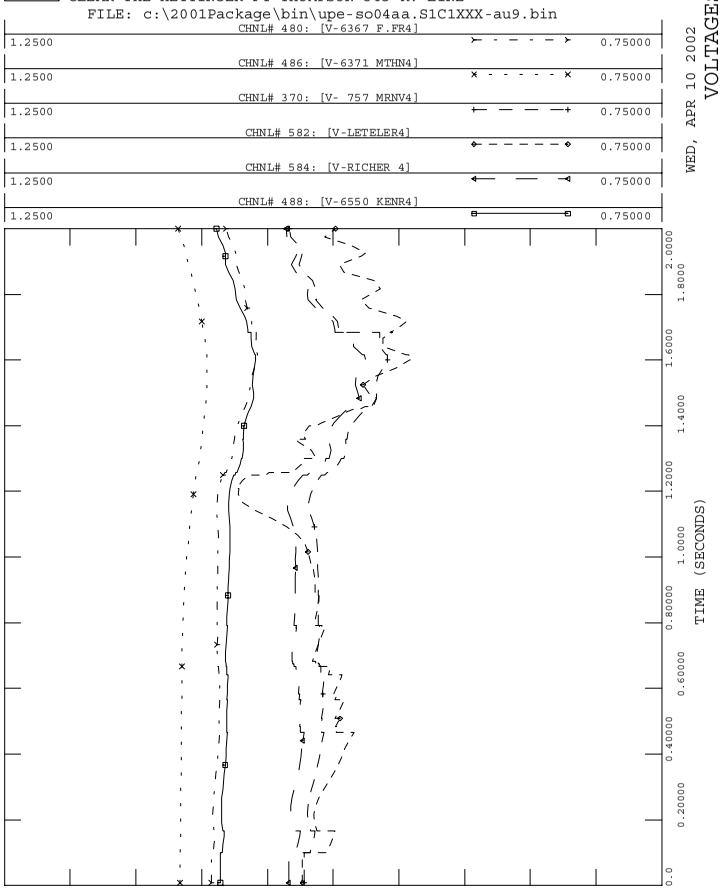
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
VOLTAGES IA



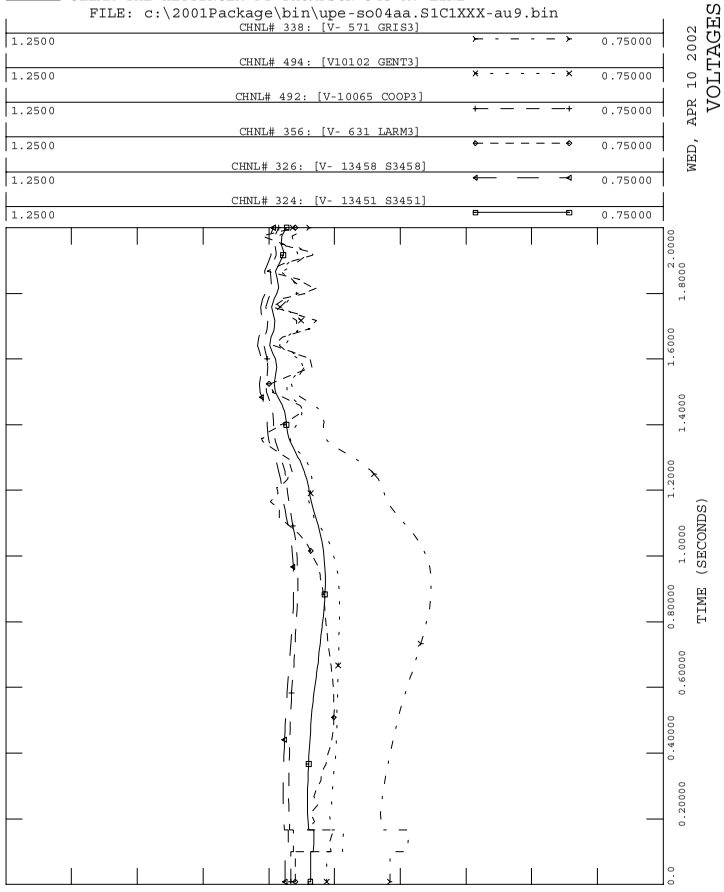
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
VOLTAGES 4



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

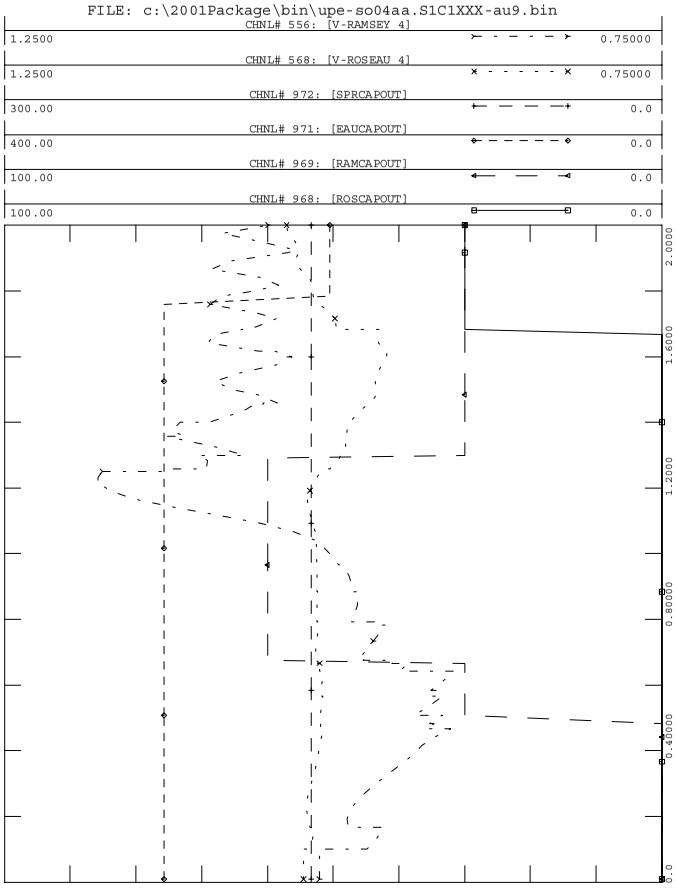
WED, APR 10 2002 8:32
VOLTAGES NB



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32

FAST SW CAP OUT 2



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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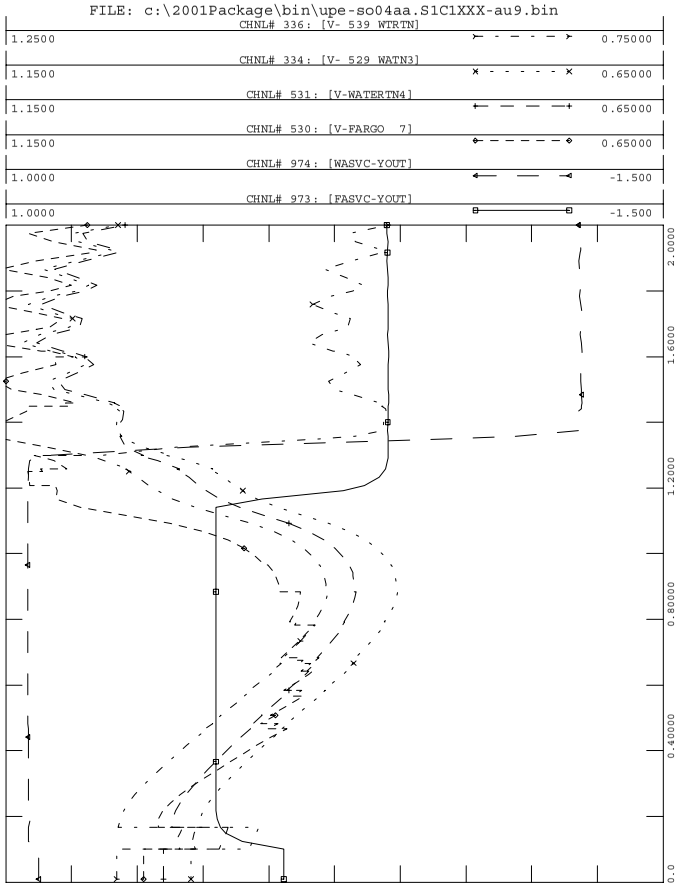
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32

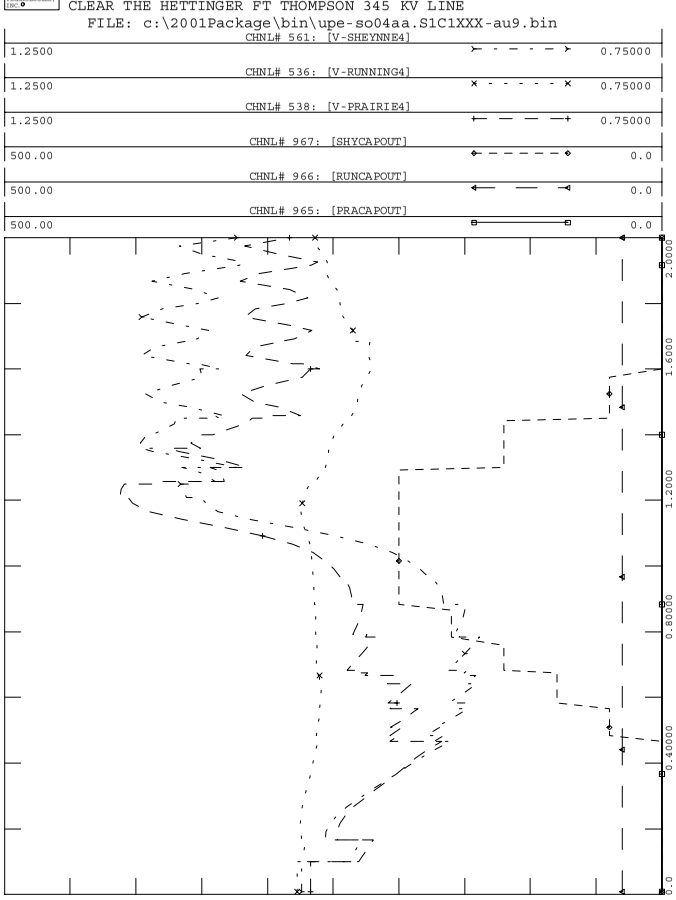
FARGO/WATERTOWN SVS



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32

FAST SW CAP OUT 1



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

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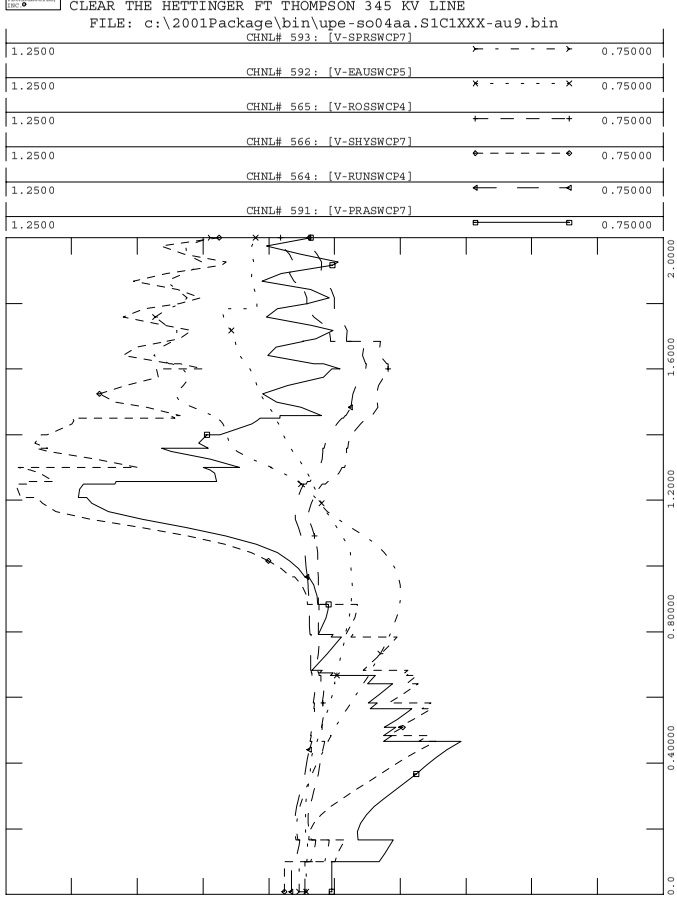
FAST SW CAP VOLTAGES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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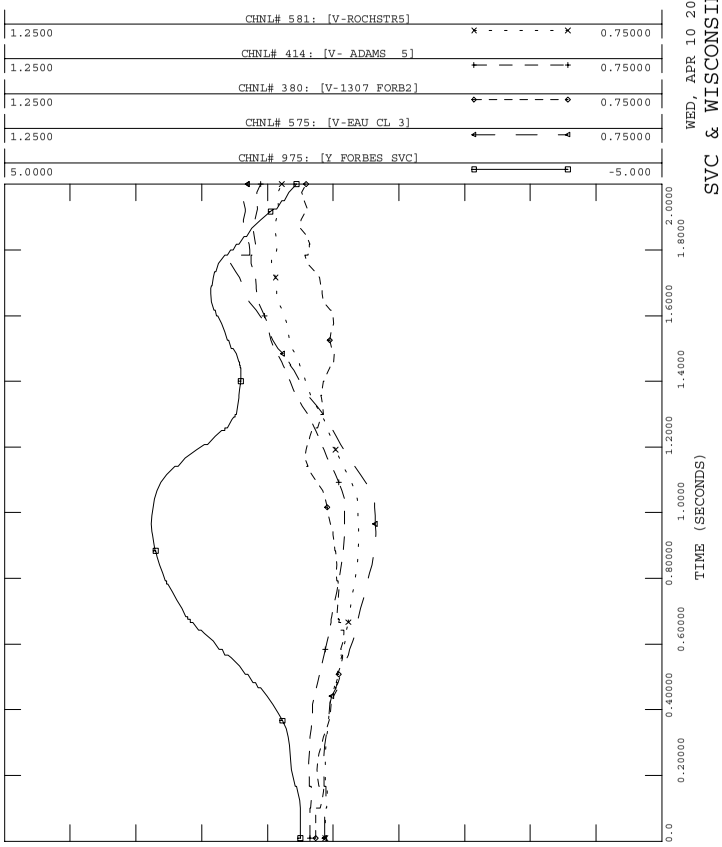
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32

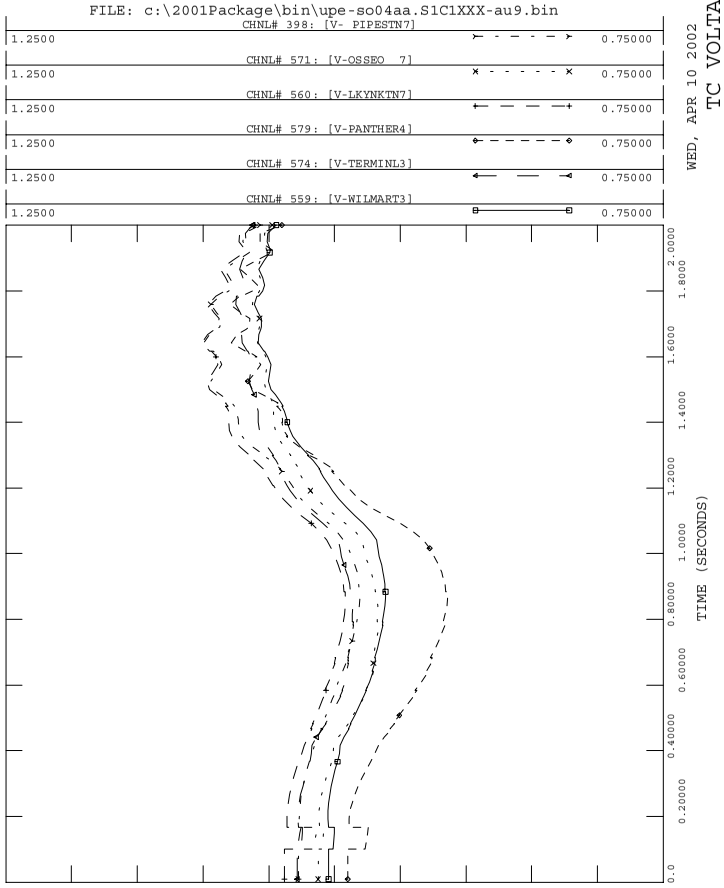
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32

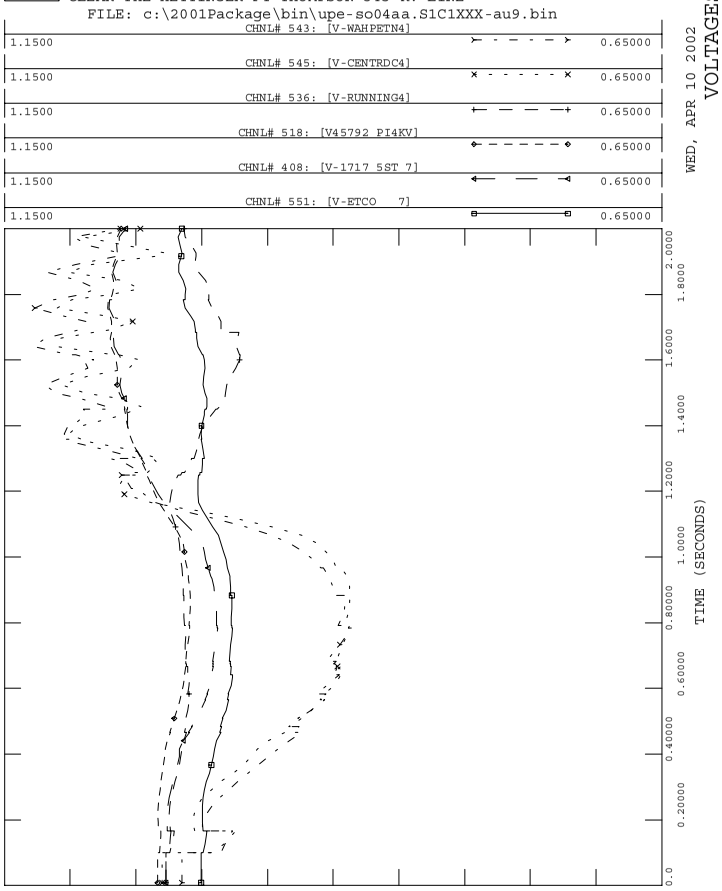
TC VOLTAGES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32

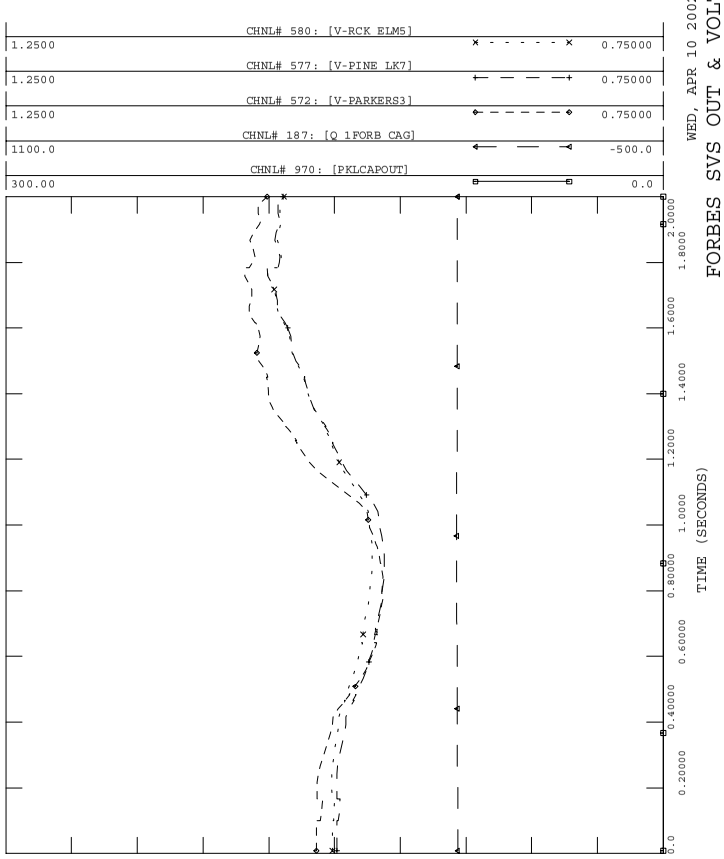
VOLTAGES 6



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

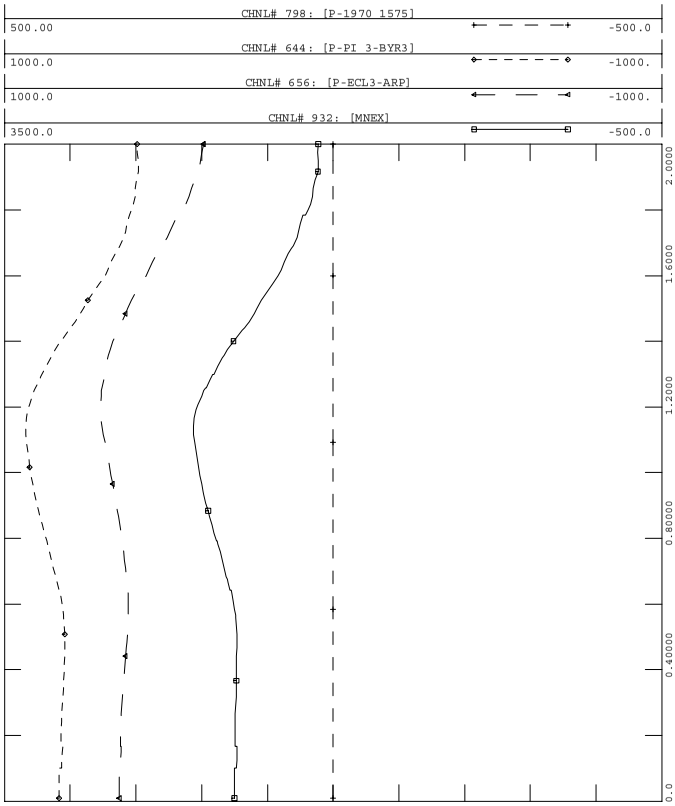
WED, APR 10 2002 8:32

FORBES SVS OUT & VOLTAGES



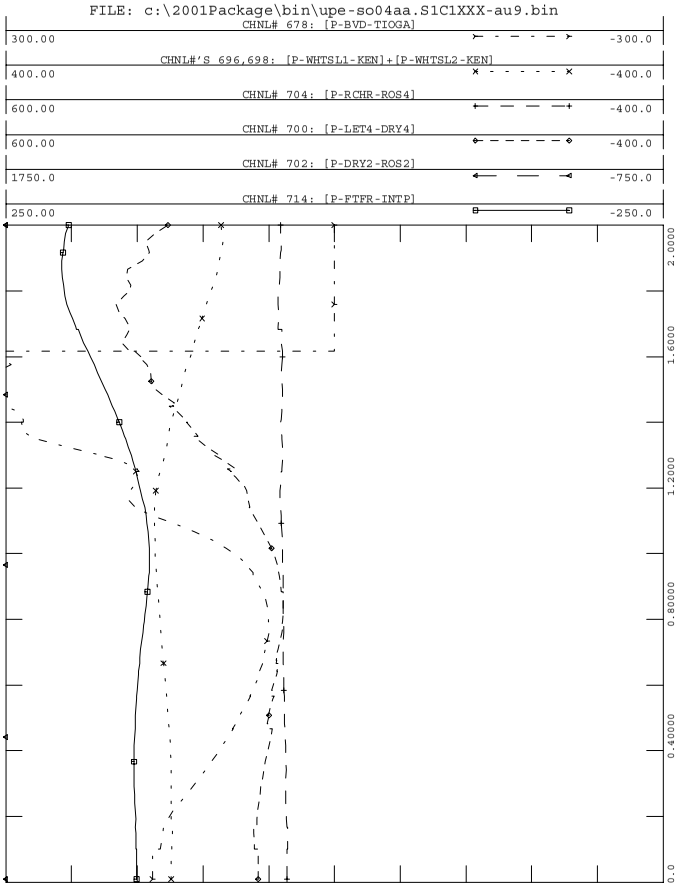
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
POWER FLOW SUMS 2



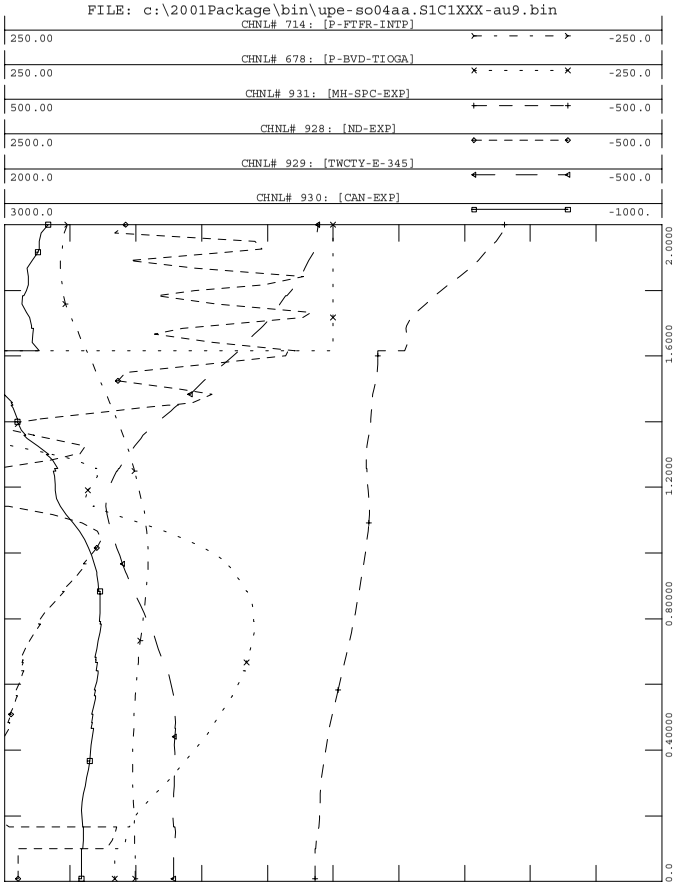
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:32
CAN. TIE FLOWS



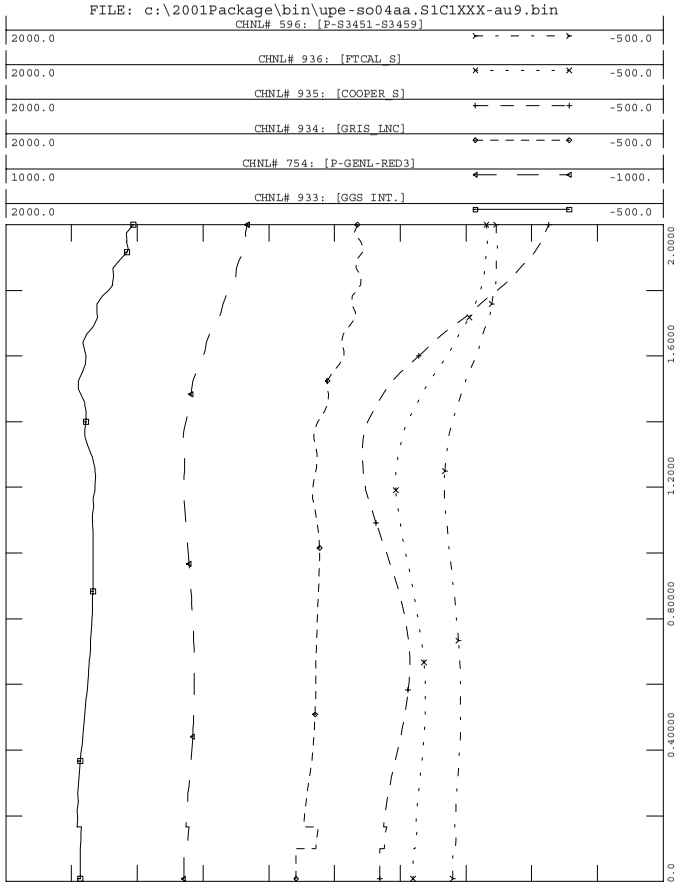
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

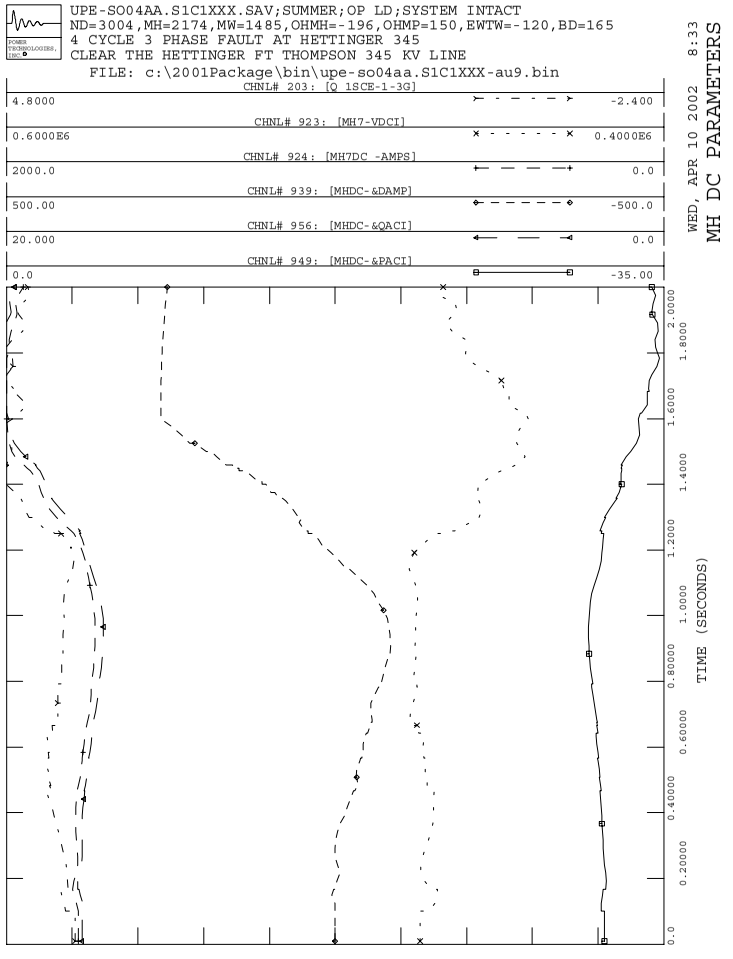
WED, APR 10 2002 8:32
POWER FLOW SUMS 1

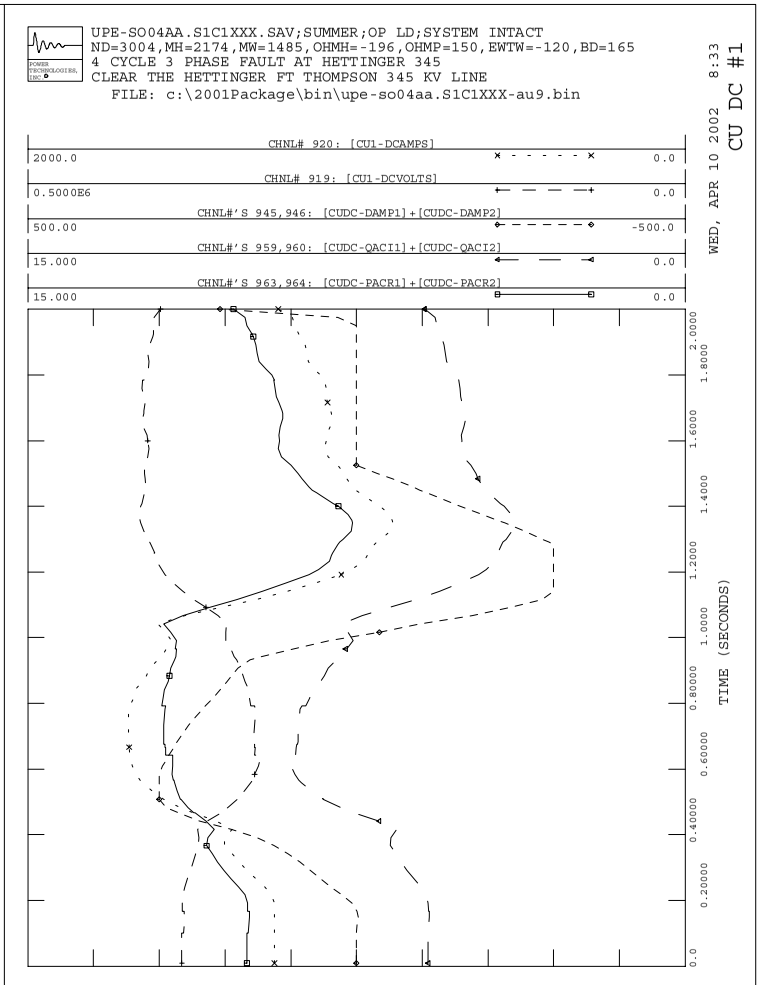


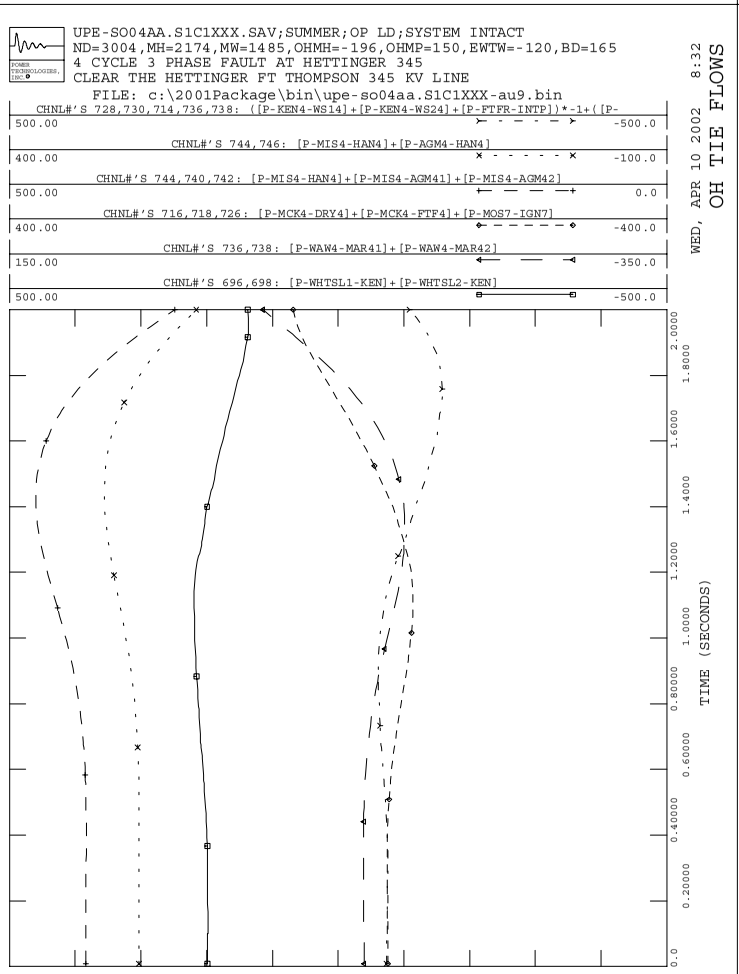
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

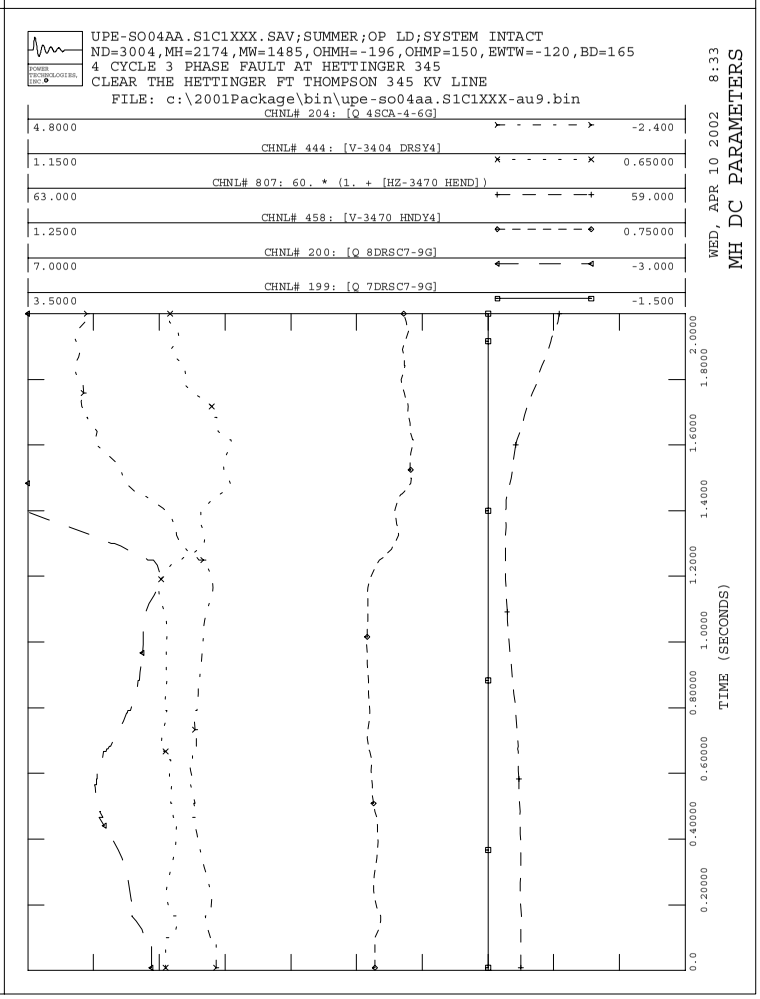
WED, APR 10 2002 8:32
POWER FLOW SUM 3




UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TIME (SECONDS)
WED, APR 10 2002 8:33
MH DC PARAMETERS


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TIME (SECONDS)
WED, APR 10 2002 8:33
CU DC #1

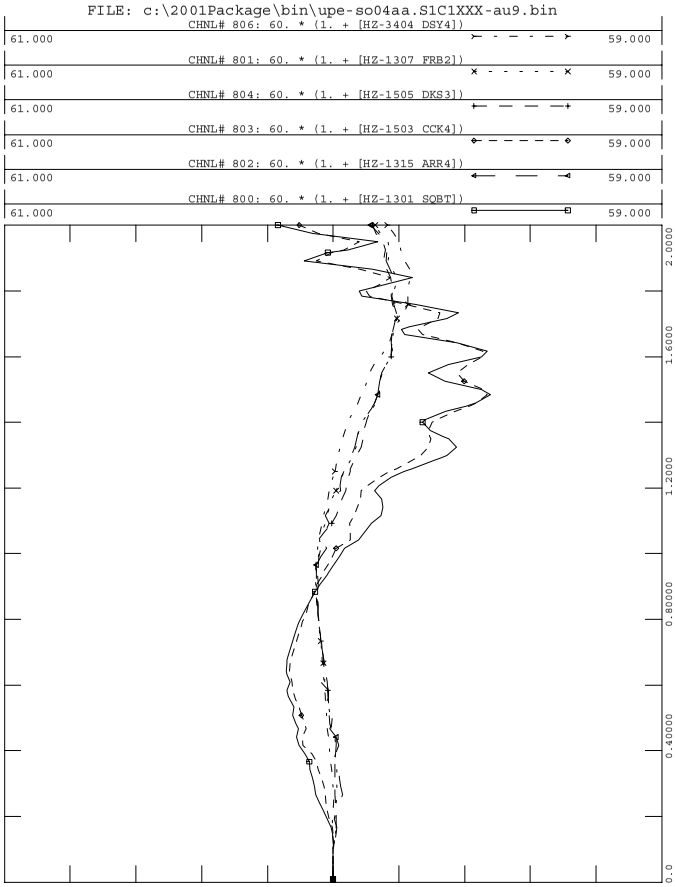

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TIME (SECONDS)
WED, APR 10 2002 8:32
OH TIE FLOWS


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TIME (SECONDS)
WED, APR 10 2002 8:33
MH DC PARAMETERS

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:33

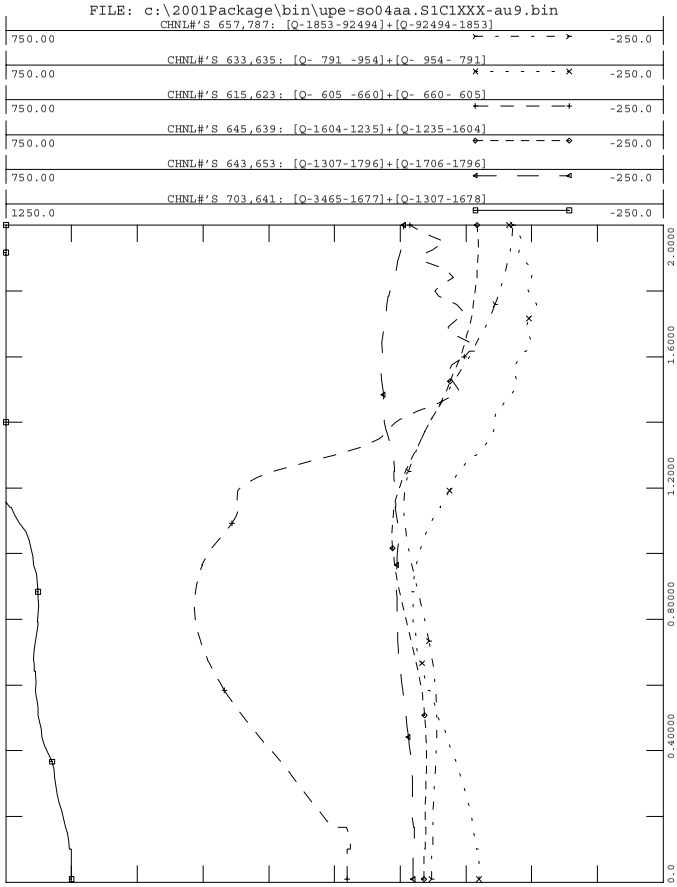
FREQ AT DC TERMINALS



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:33

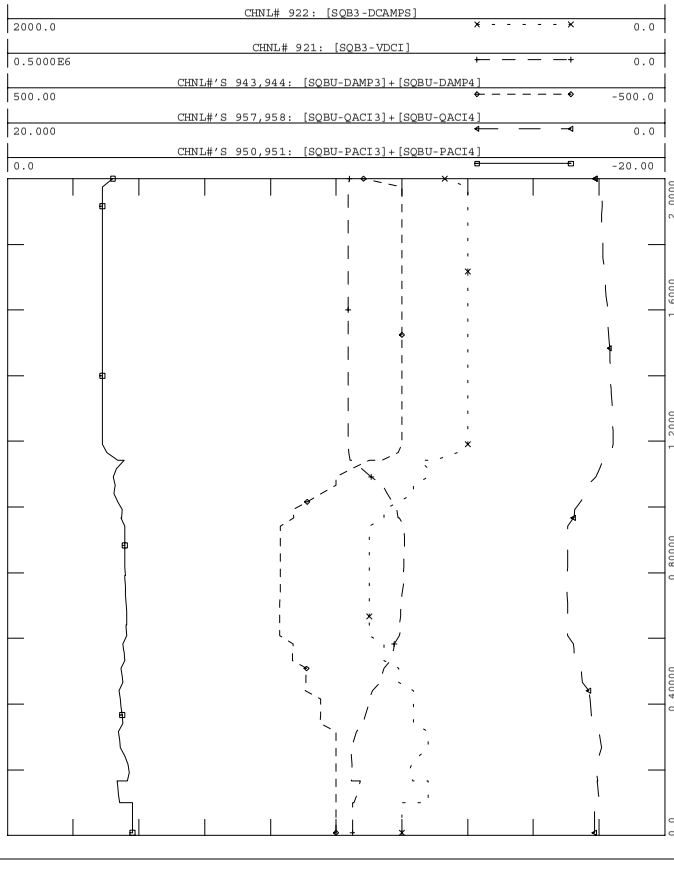
VAR LOSSES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:33

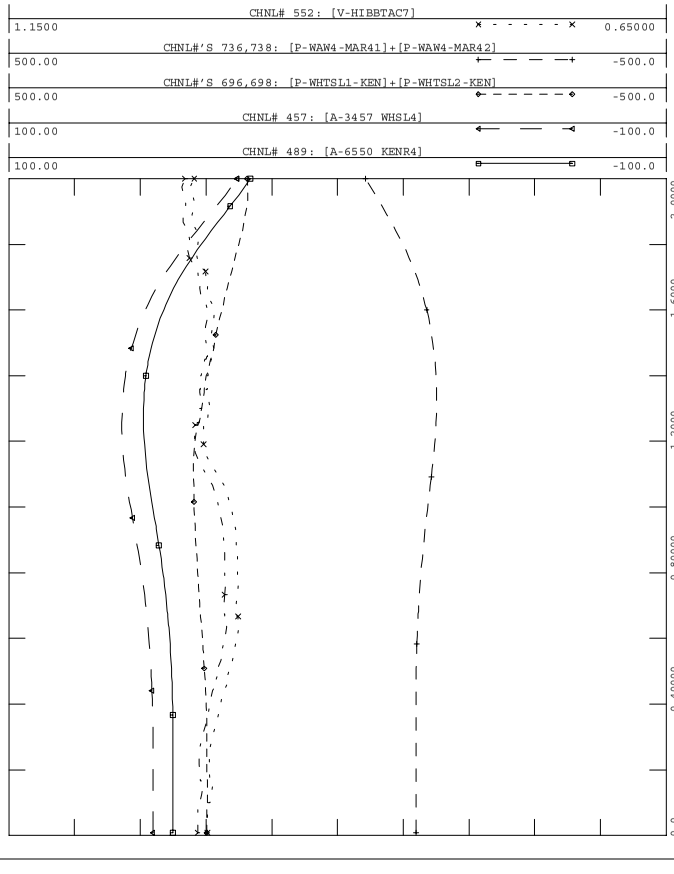
SQB DC #3



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

WED, APR 10 2002 8:33

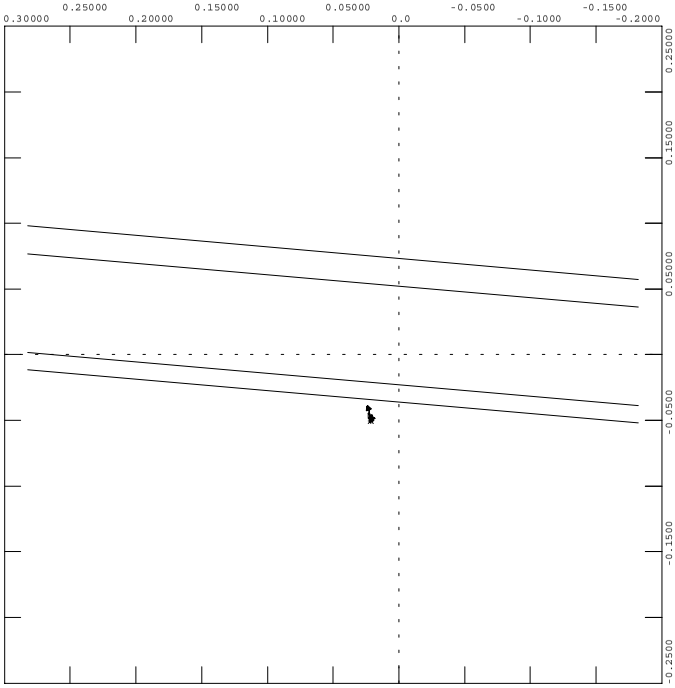
VOLTAGES, ANGLES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

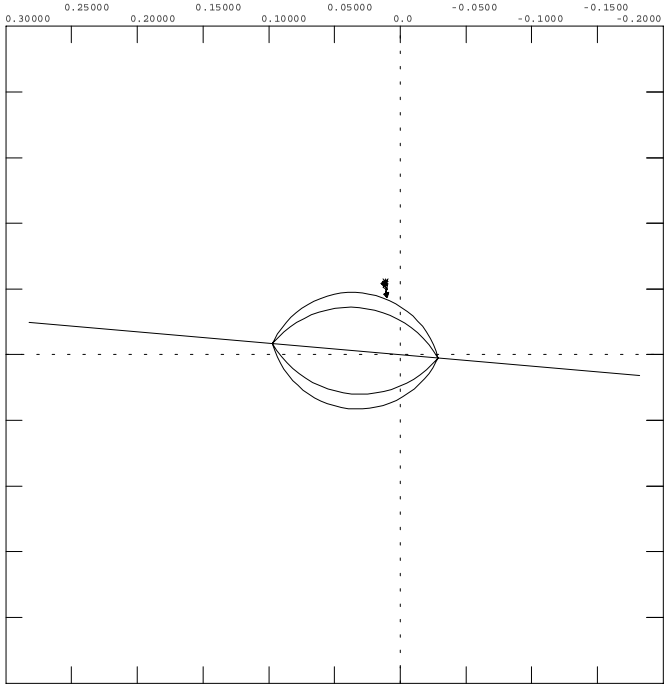


WED, APR 10 2002 8:33
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]



WED, APR 10 2002 8:33
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
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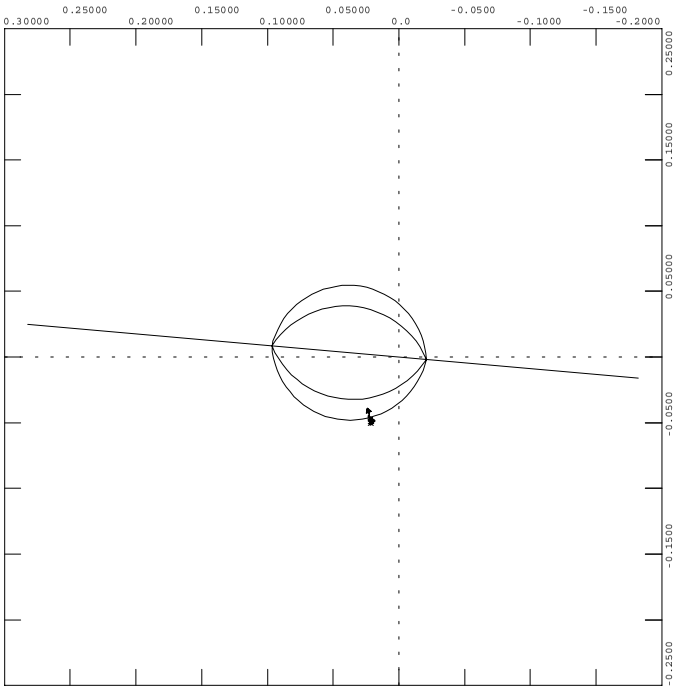
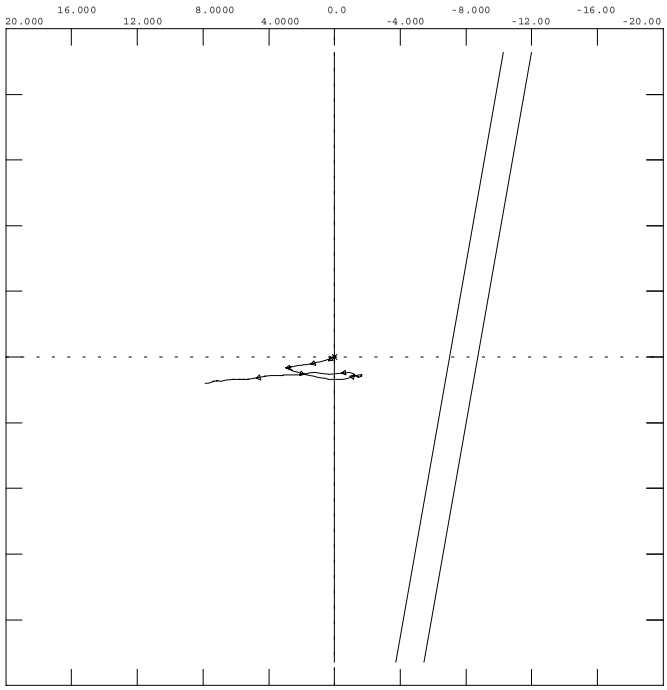


WED, APR 10 2002 8:33
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

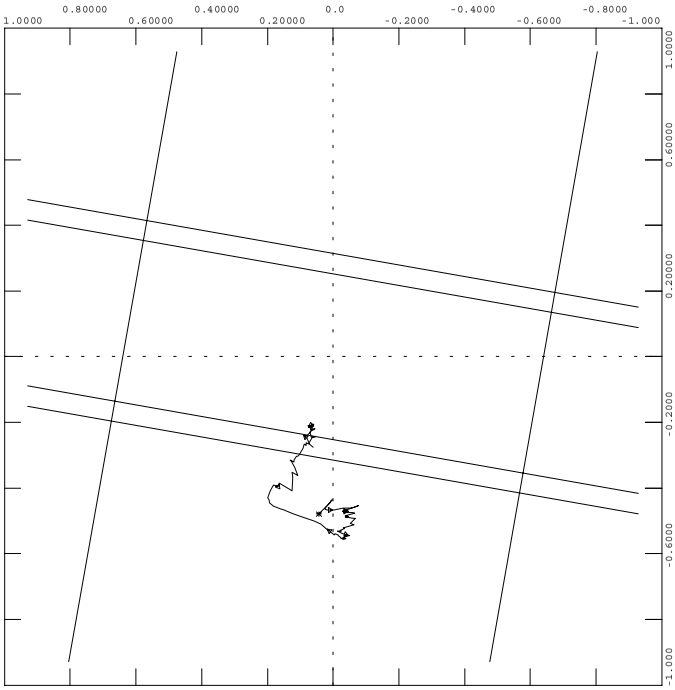


WED, APR 10 2002 8:33
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

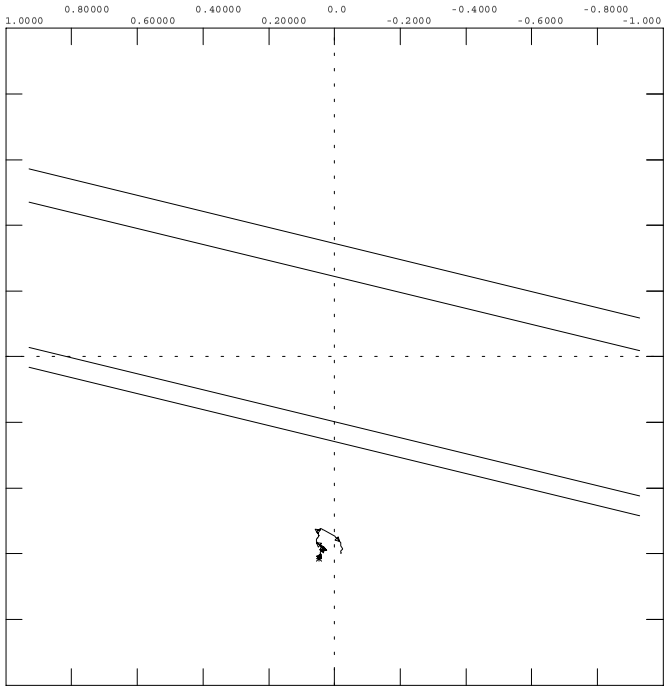
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

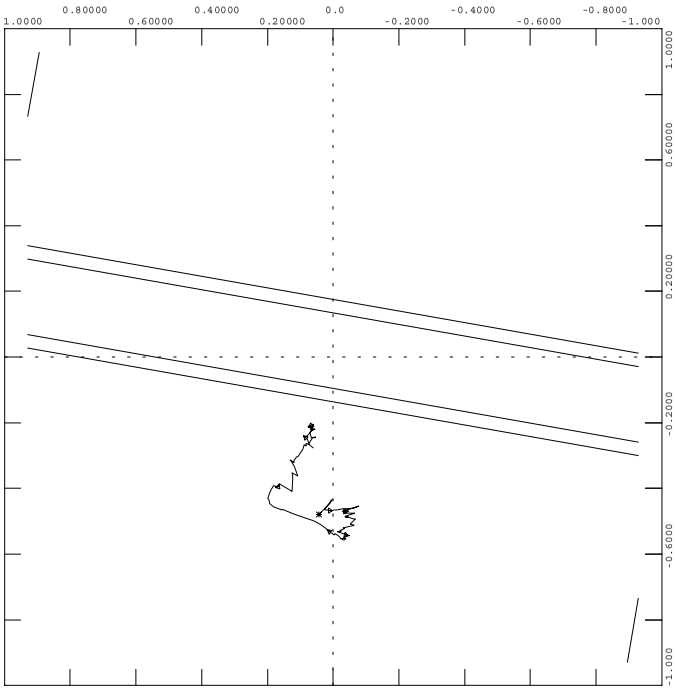
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

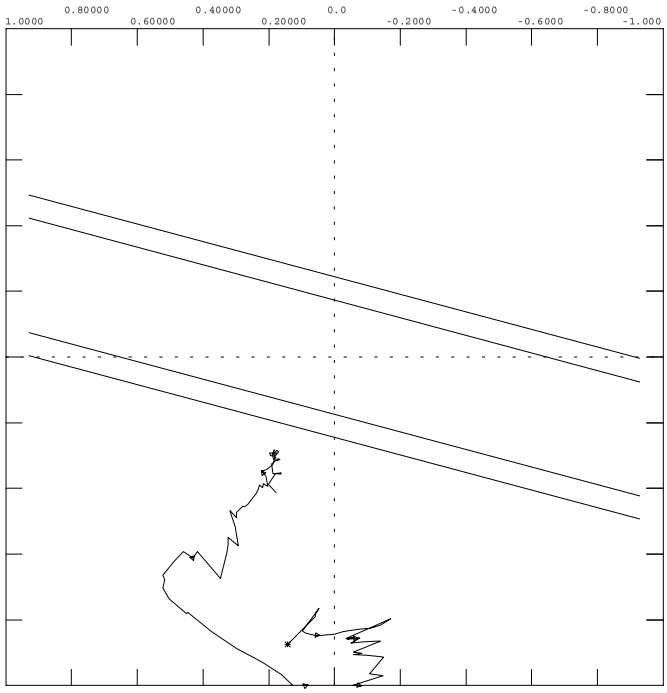
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

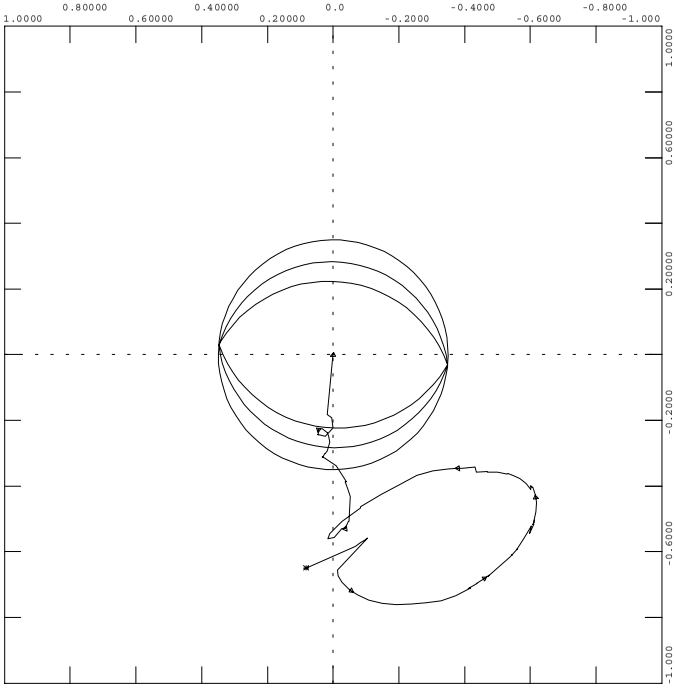
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

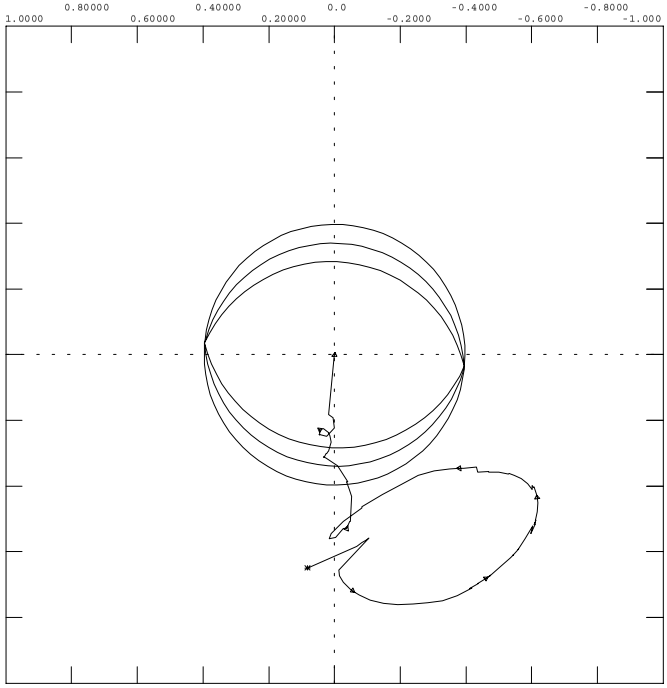
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

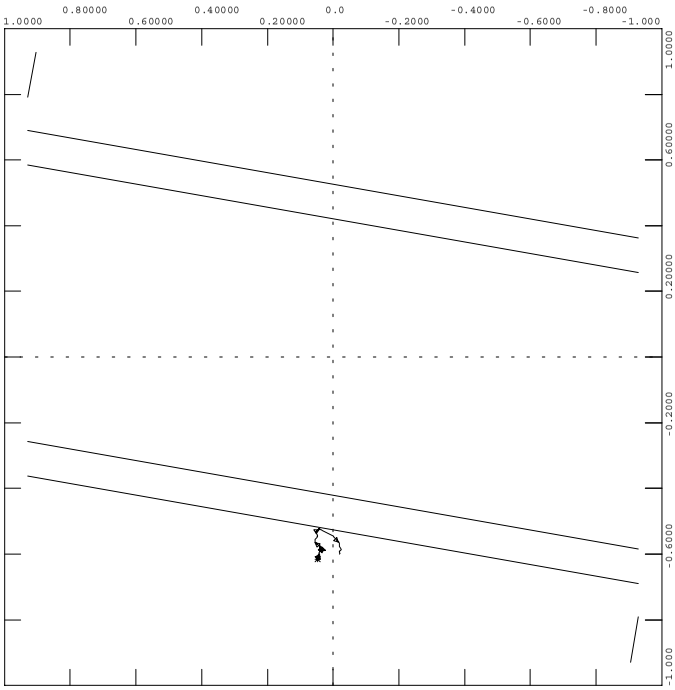
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

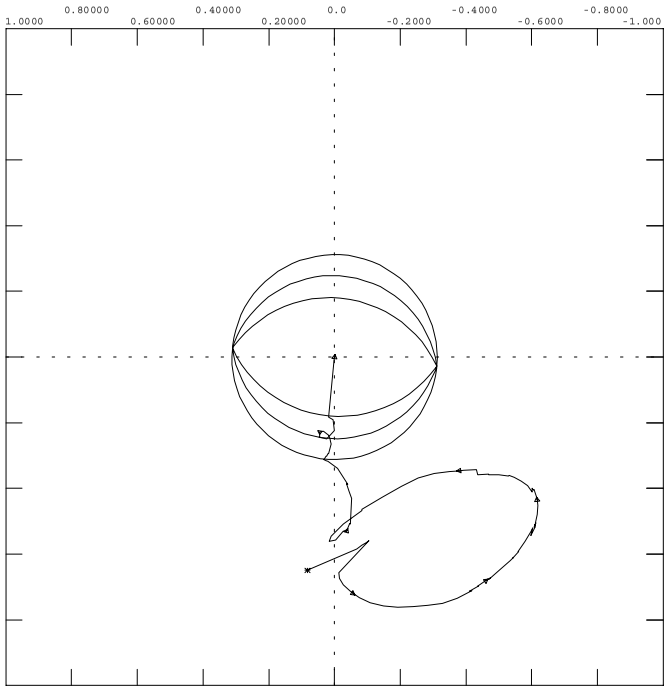
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



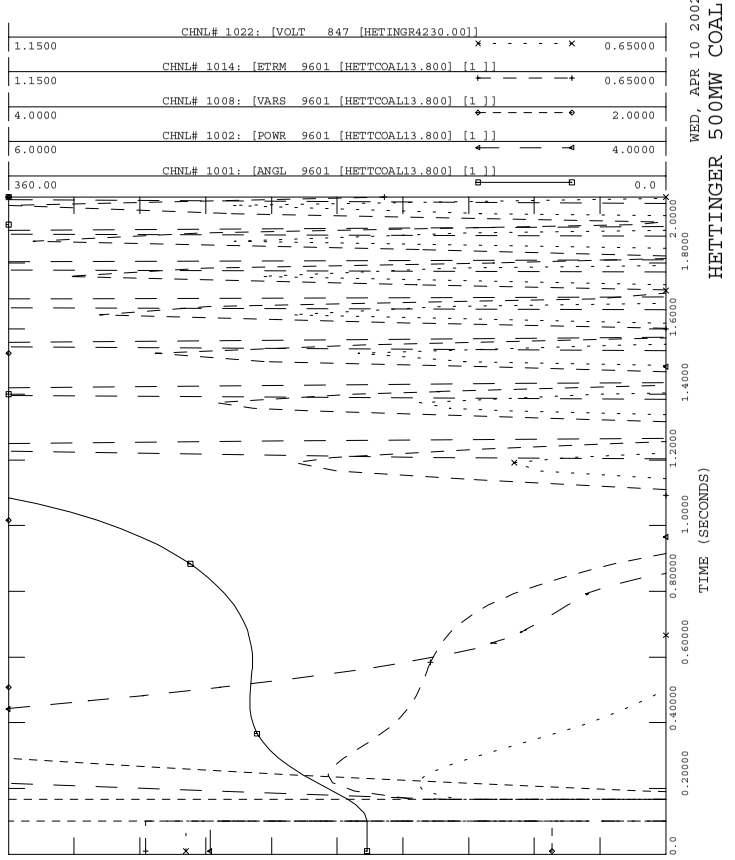
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

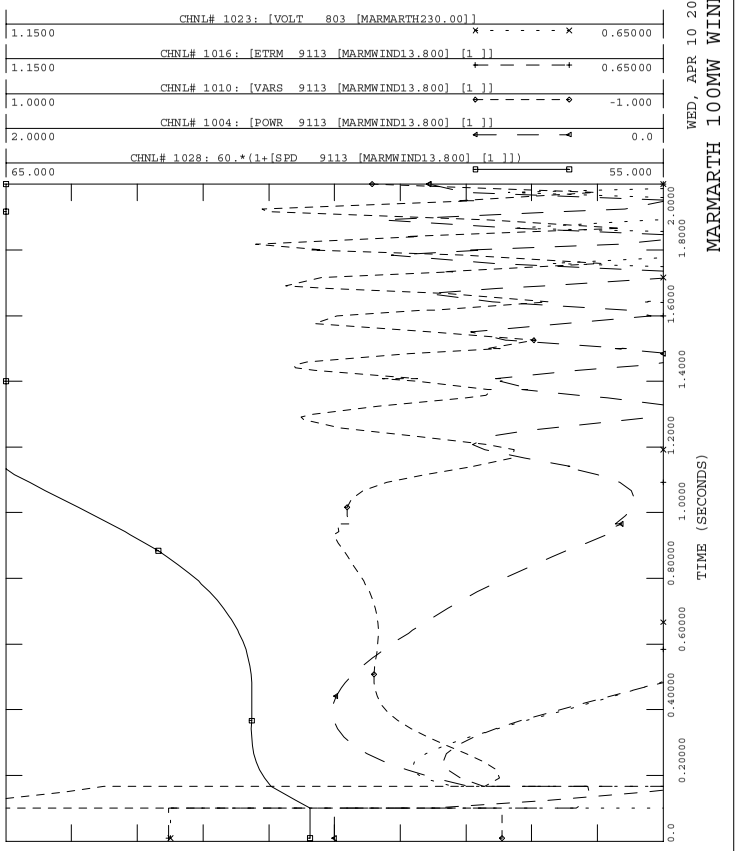


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin



WED, APR 10 2002 8:33
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

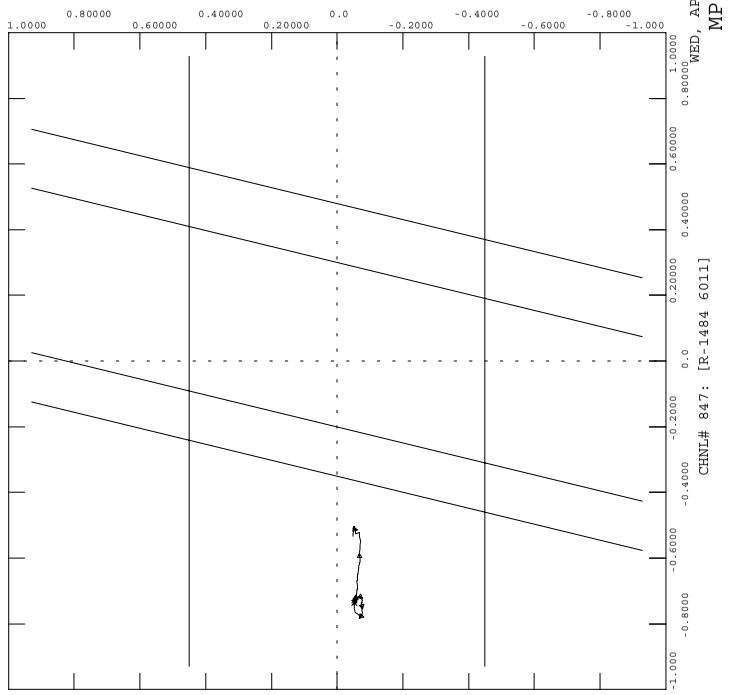


WED, APR 10 2002 8:33
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

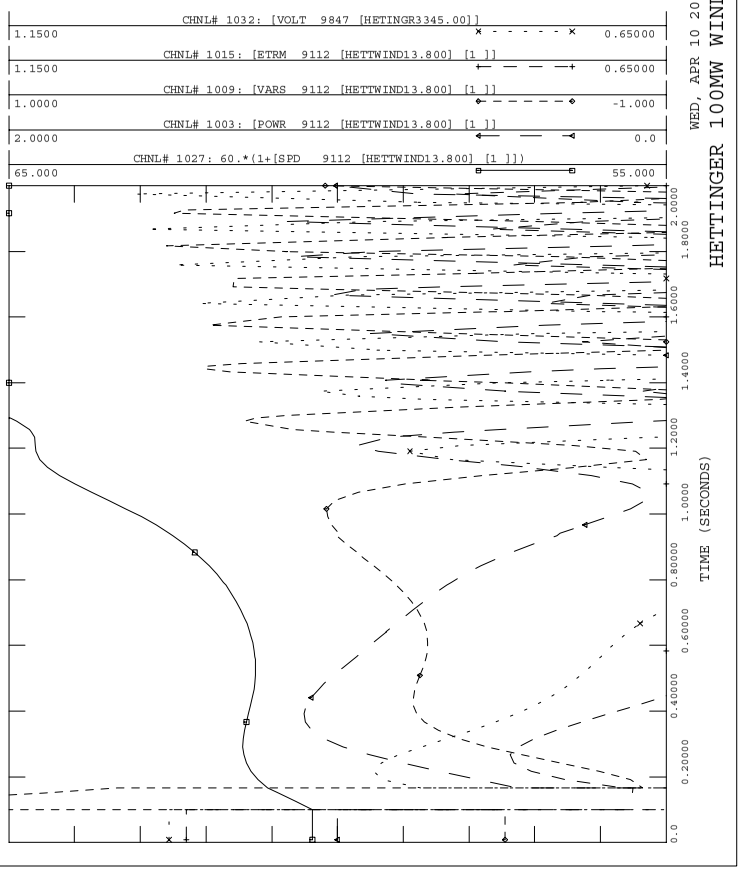
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



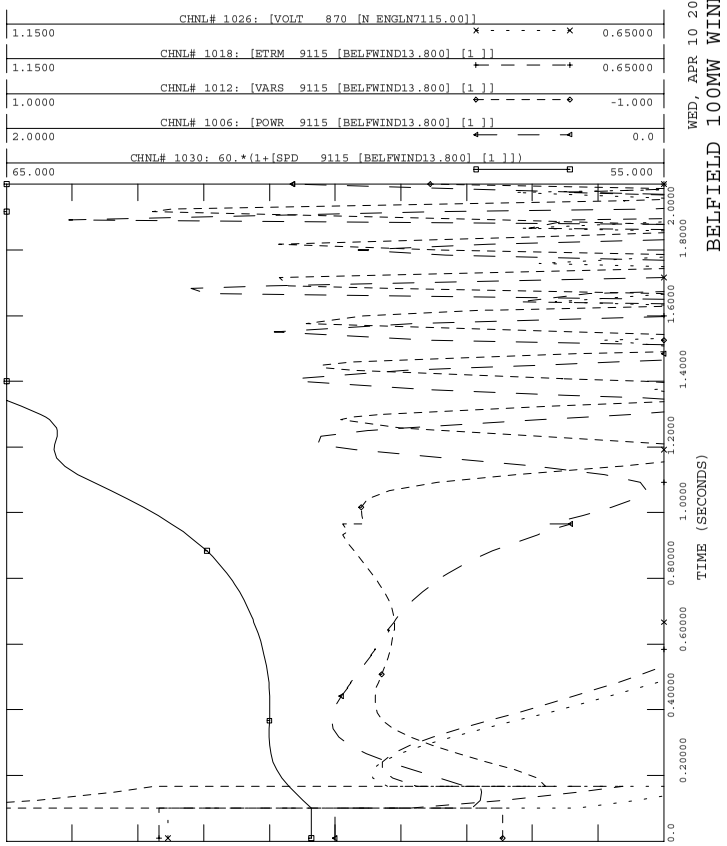
WED, APR 10 2002 8:33
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin



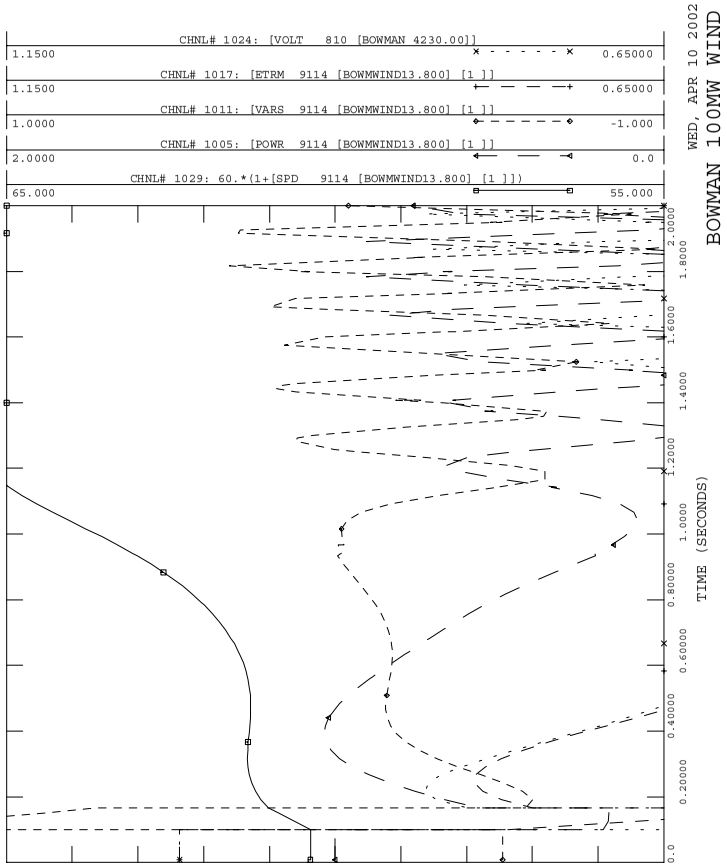
WED, APR 10 2002 8:33
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin



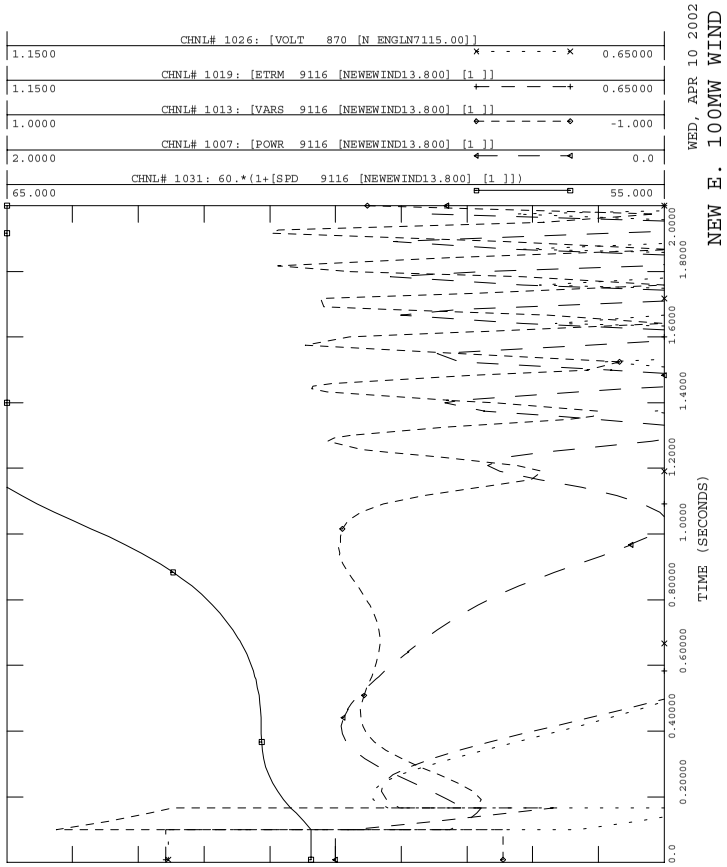
WED, APR 10 2002 8:33
BELFIELD 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin



WED, APR 10 2002 8:33
BOWMAN 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-au9.bin



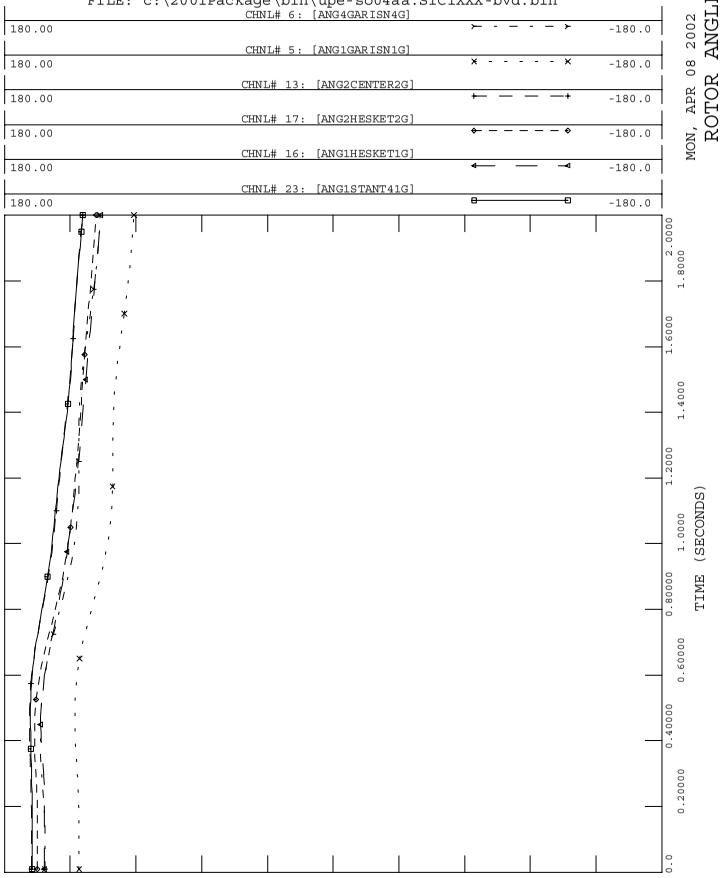
WED, APR 10 2002 8:33
NEW E. 100MW WIND UNIT

CONTINGENCY BV3

4 cycle 3 phase fault at Hettinger end of Hettinger - Belfield 345 kV line. Trip of Hettinger 500 MW Coal Unit @ 12 cy

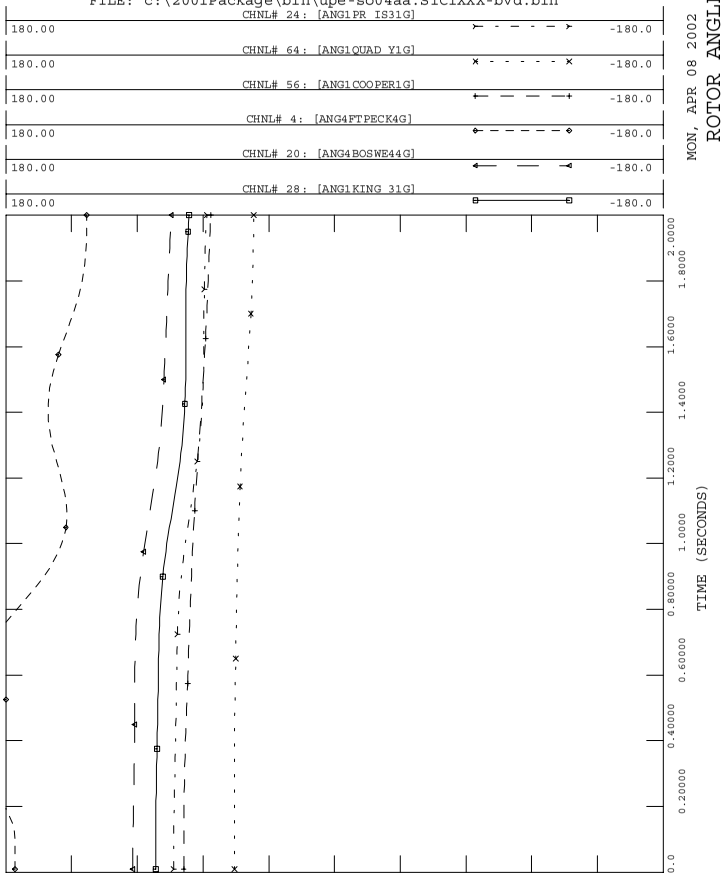
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
ROTOR ANGLES 2



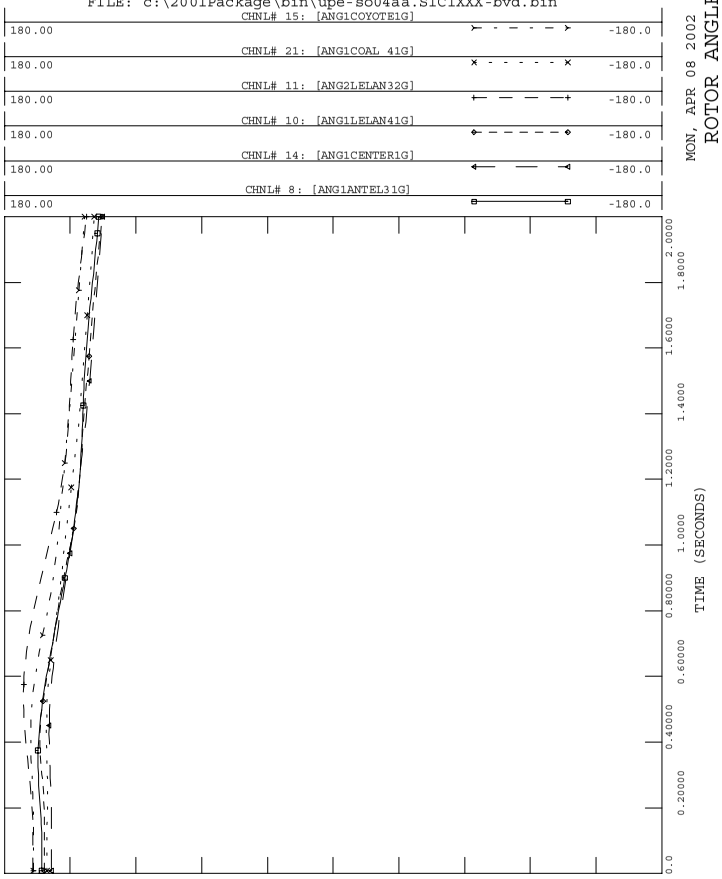
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
ROTOR ANGLES 4



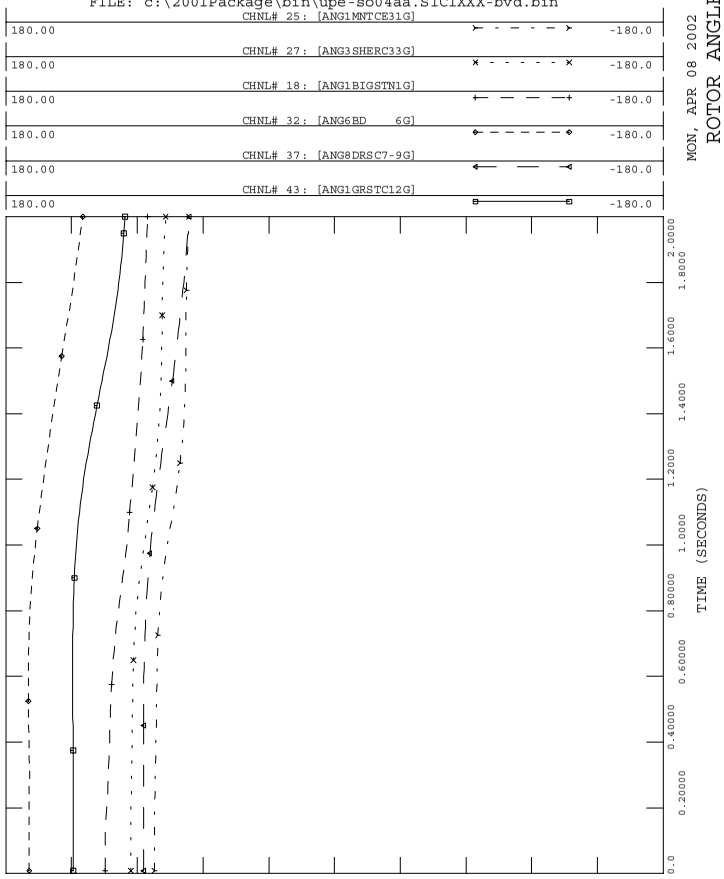
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
ROTOR ANGLES 1



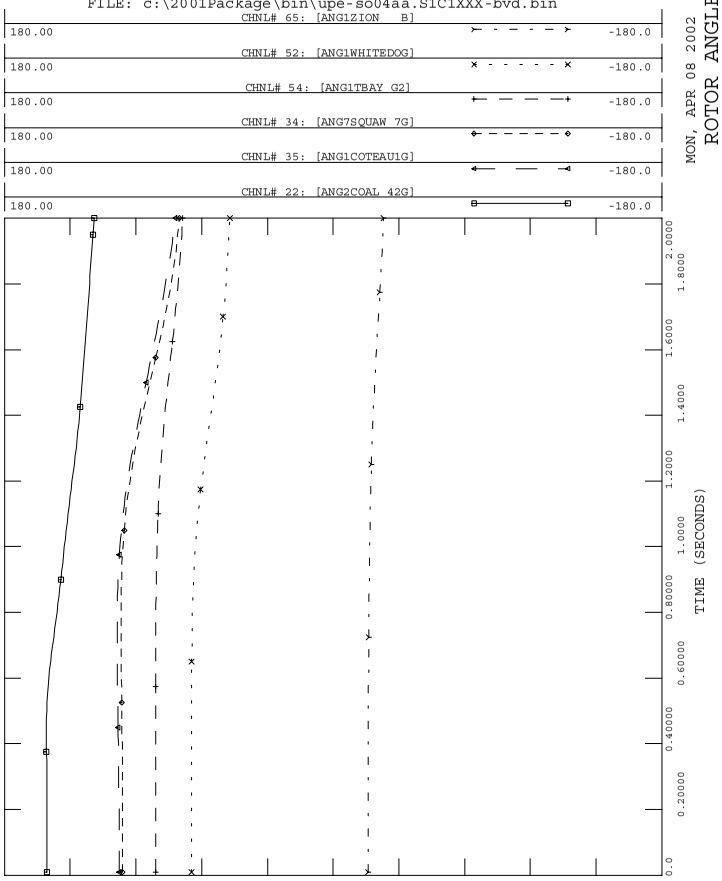
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
ROTOR ANGLES 3



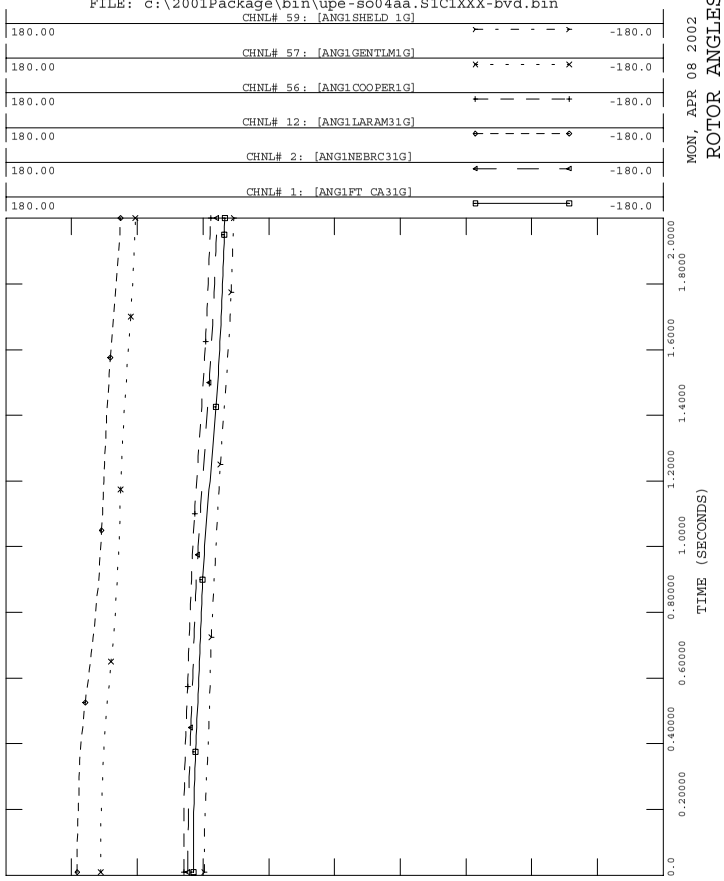
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
ROTOR ANGLES 6



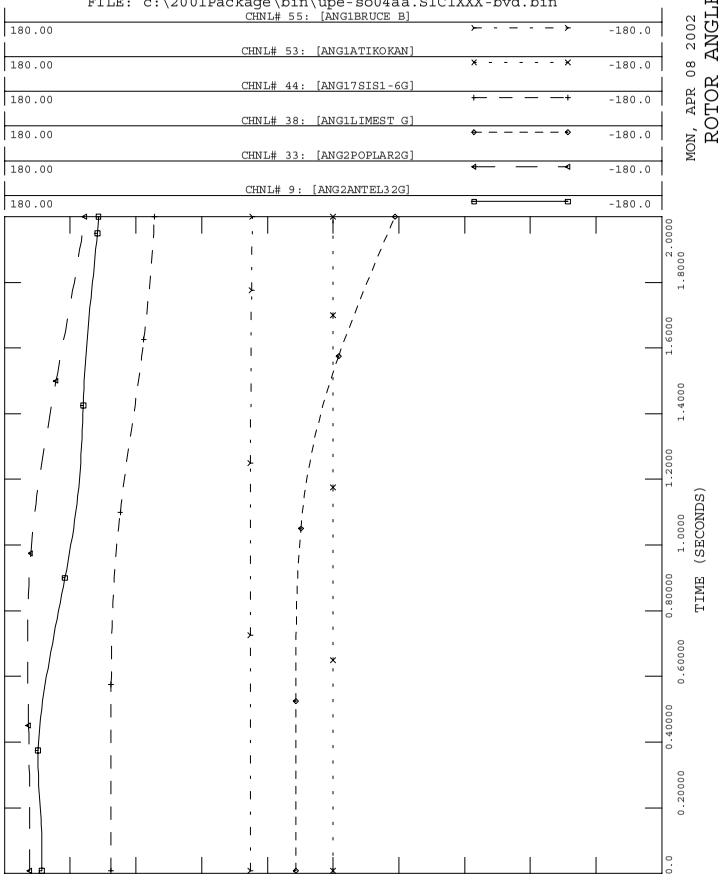
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
ROTOR ANGLES NB



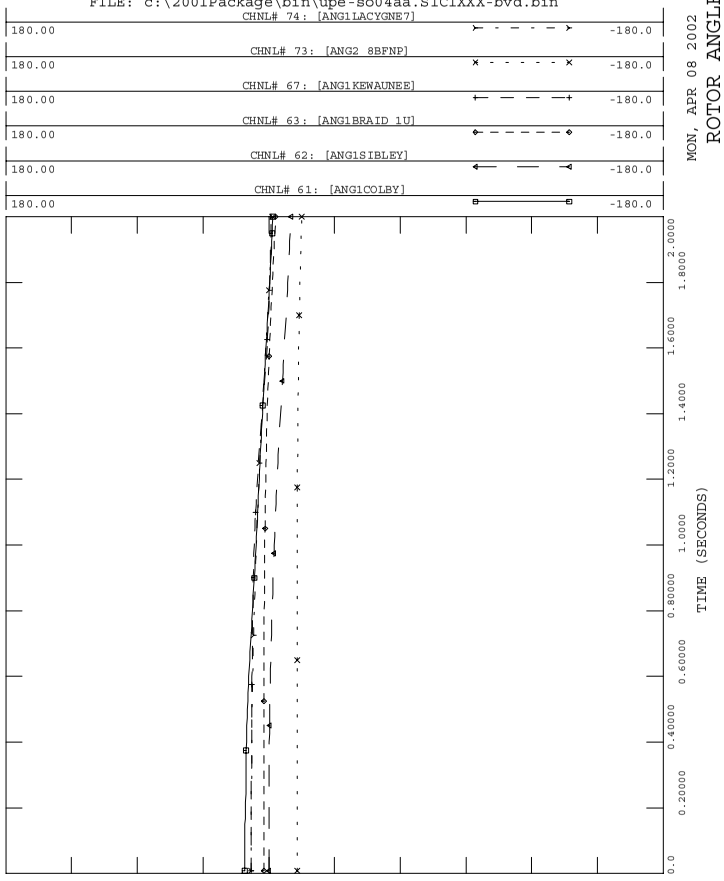
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
ROTOR ANGLES 5



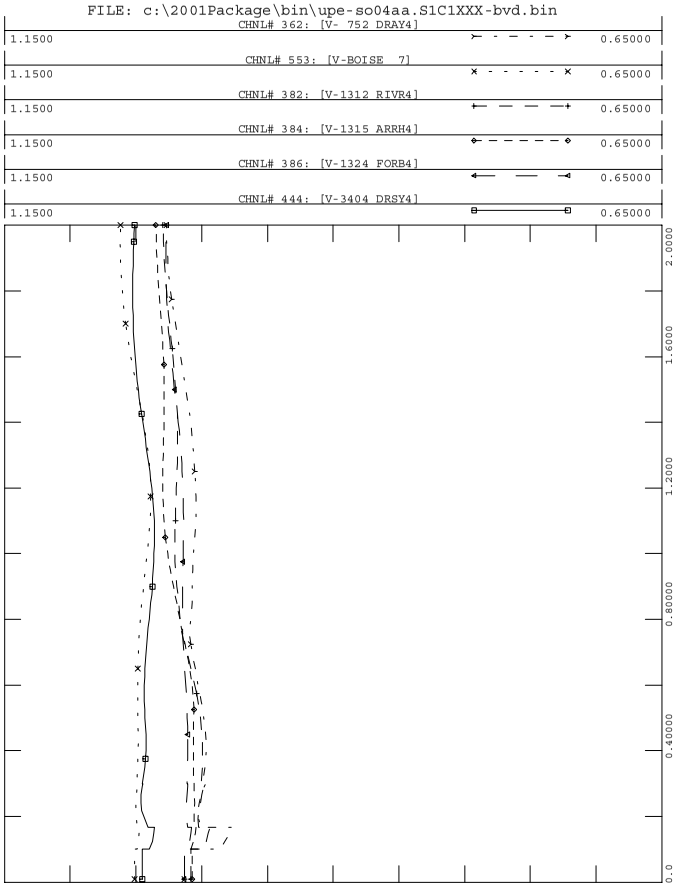
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
ROTOR ANGLES 7



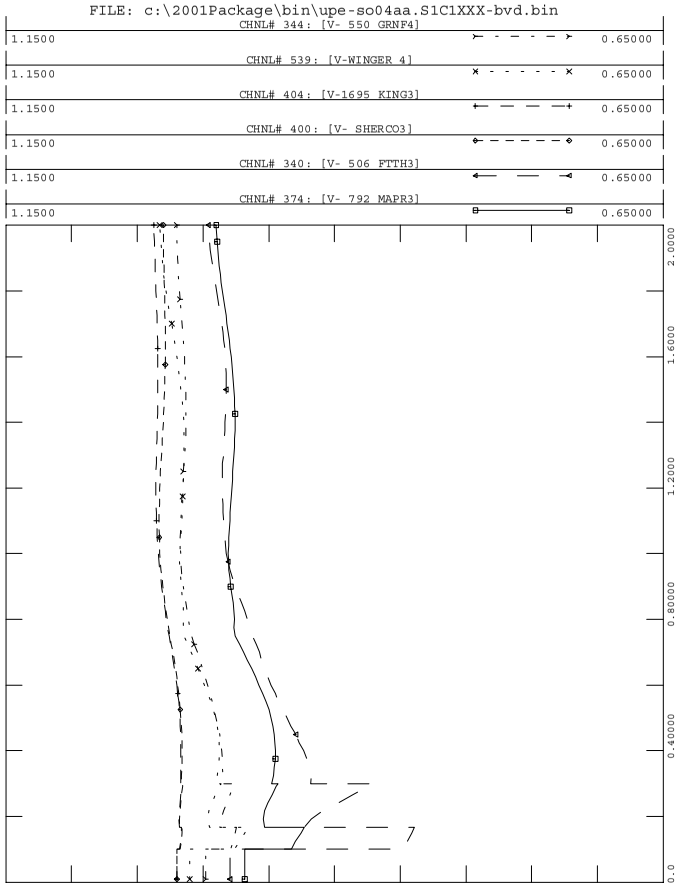
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
VOLTAGES 1



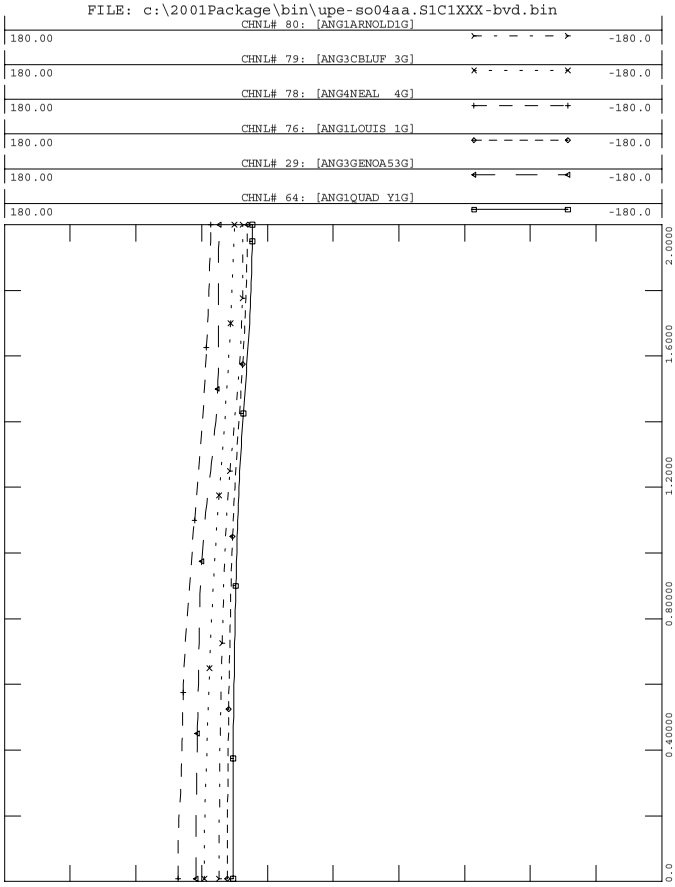
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
VOLTAGES 3



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
ROTOR ANGLES IA



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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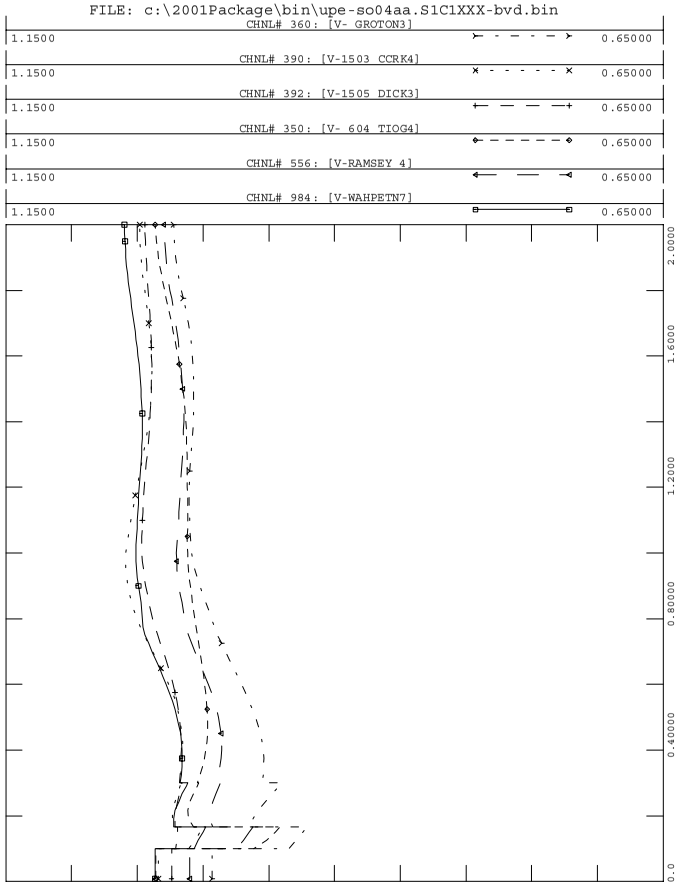
VOLTAGES 2



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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
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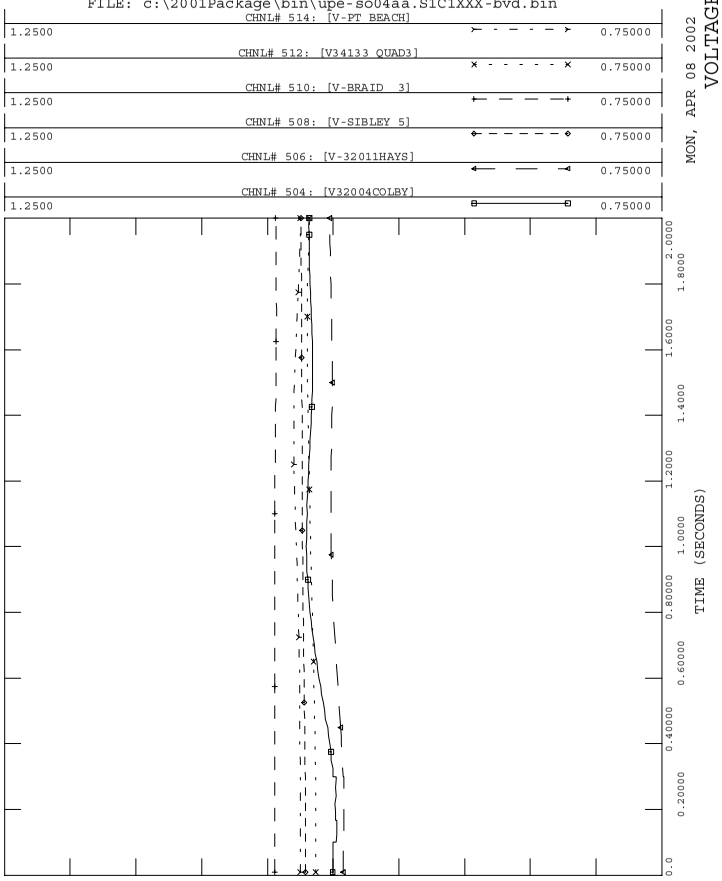

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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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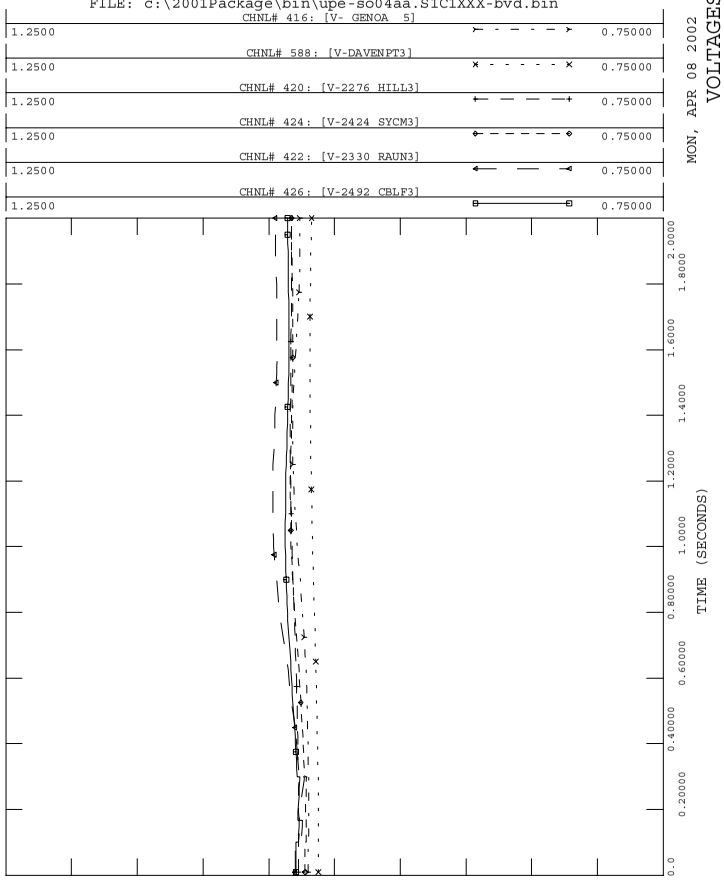
VOLTAGES IA



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TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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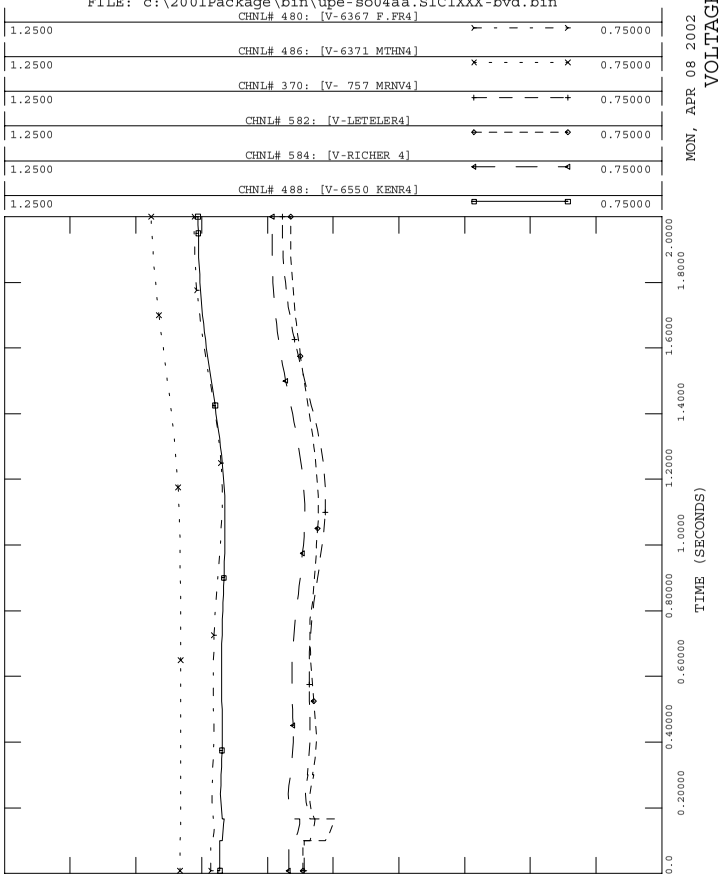
VOLTAGES 4



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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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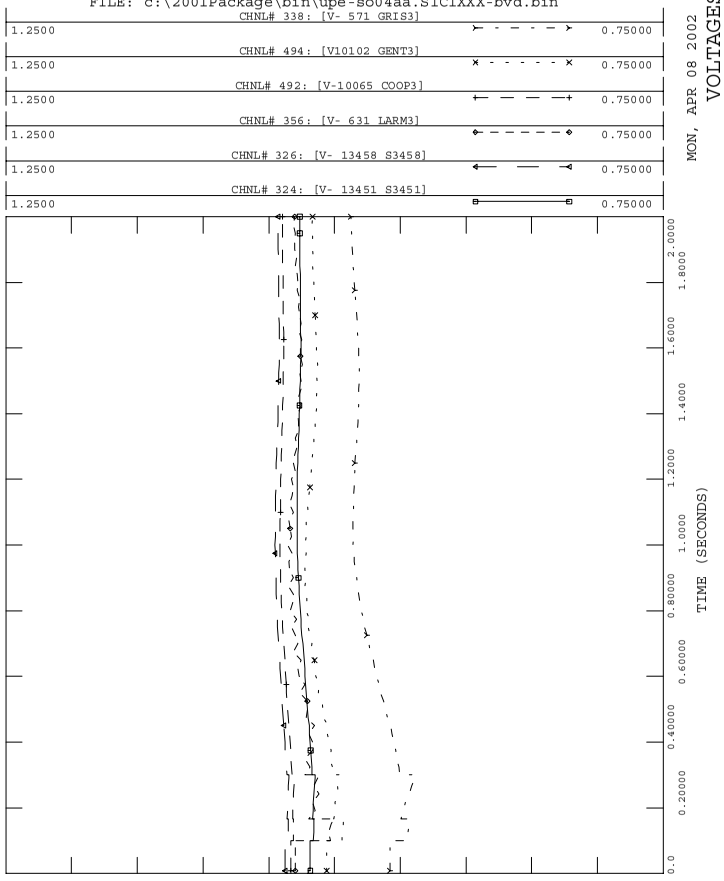
VOLTAGES NB



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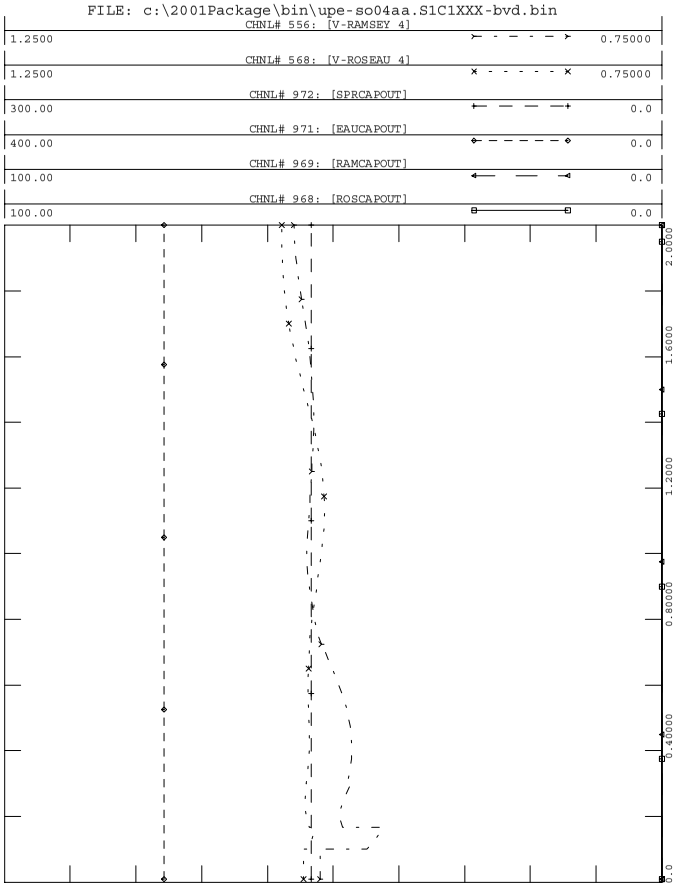
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin



MON, APR 08 2002 10:31
FAST SW CAP OUT 2

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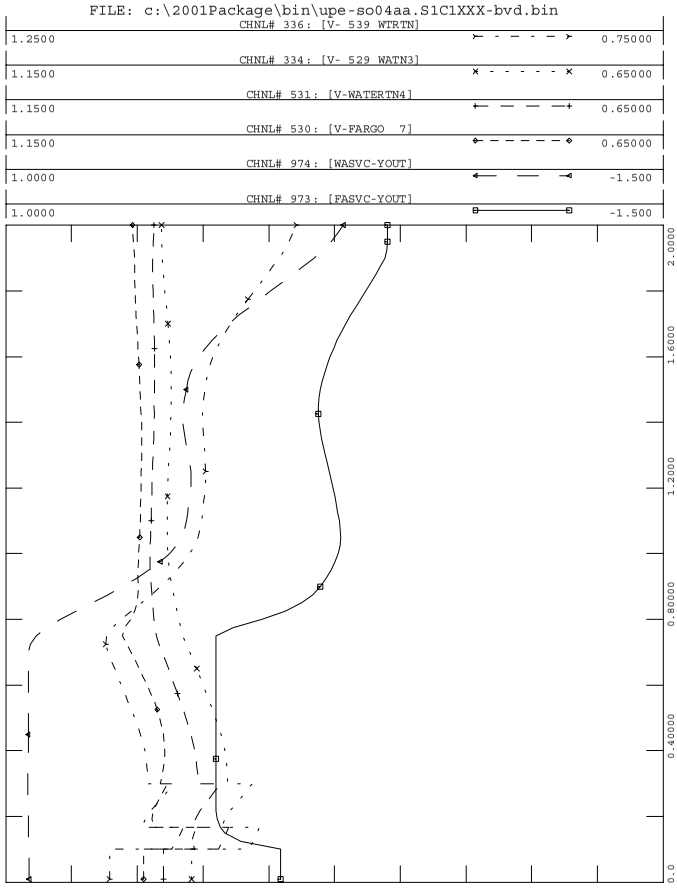
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin



MON, APR 08 2002 10:31
FARGO/WATERTOWN SVS

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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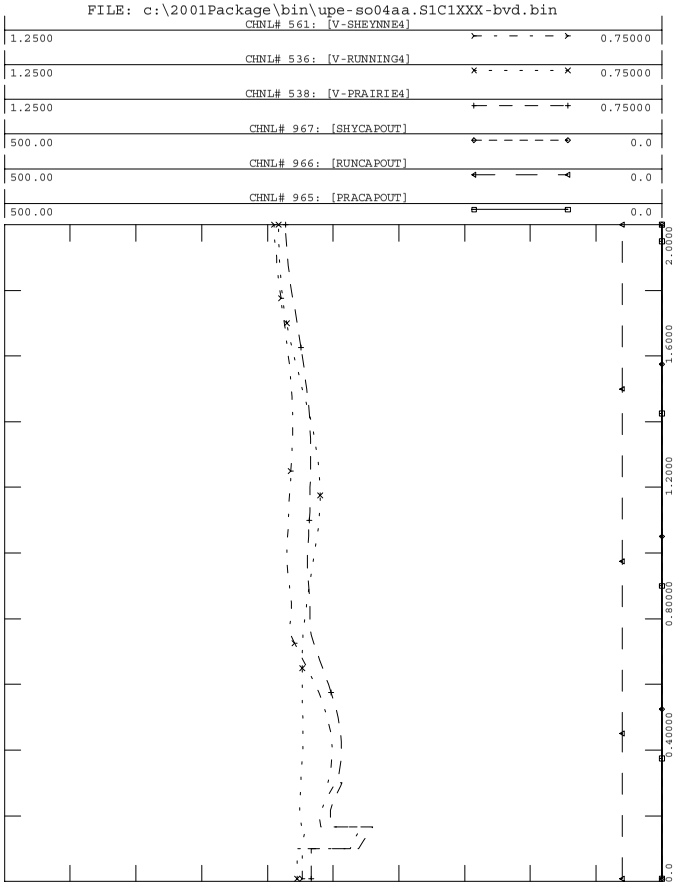
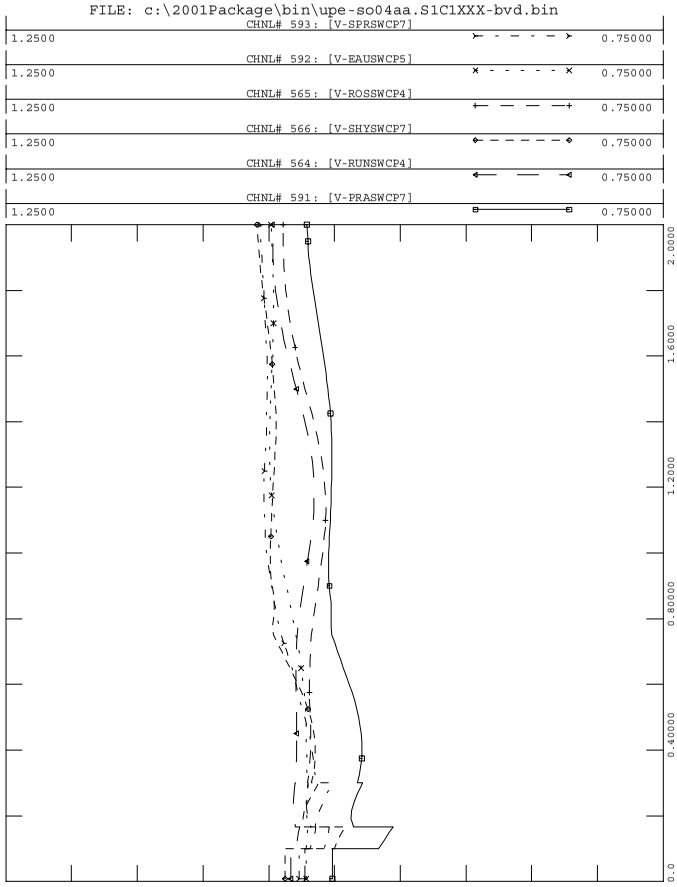
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin



MON, APR 08 2002 10:31
FAST SW CAP OUT 1

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin



MON, APR 08 2002 10:31
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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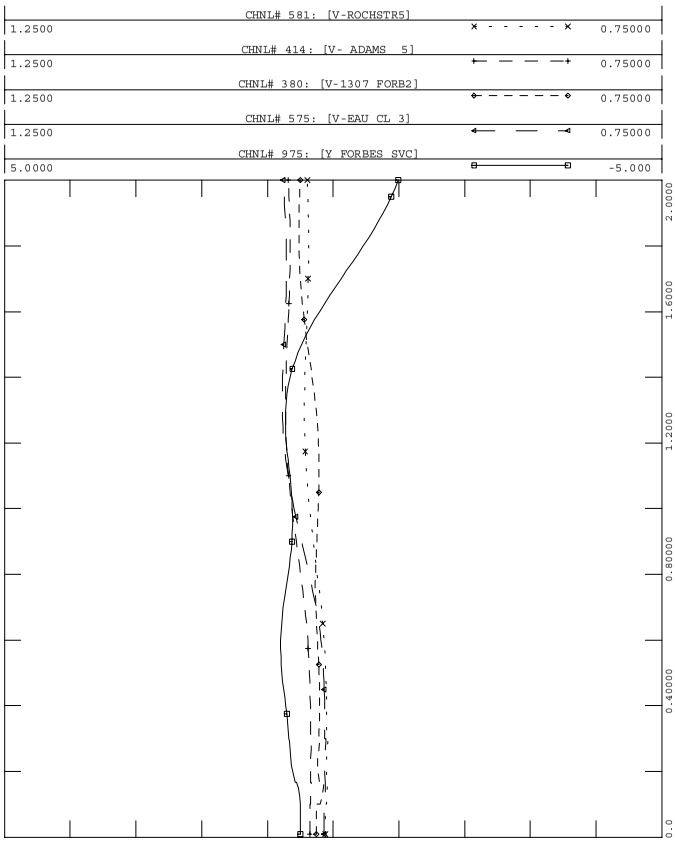
SVC & WISCONSIN VOLT



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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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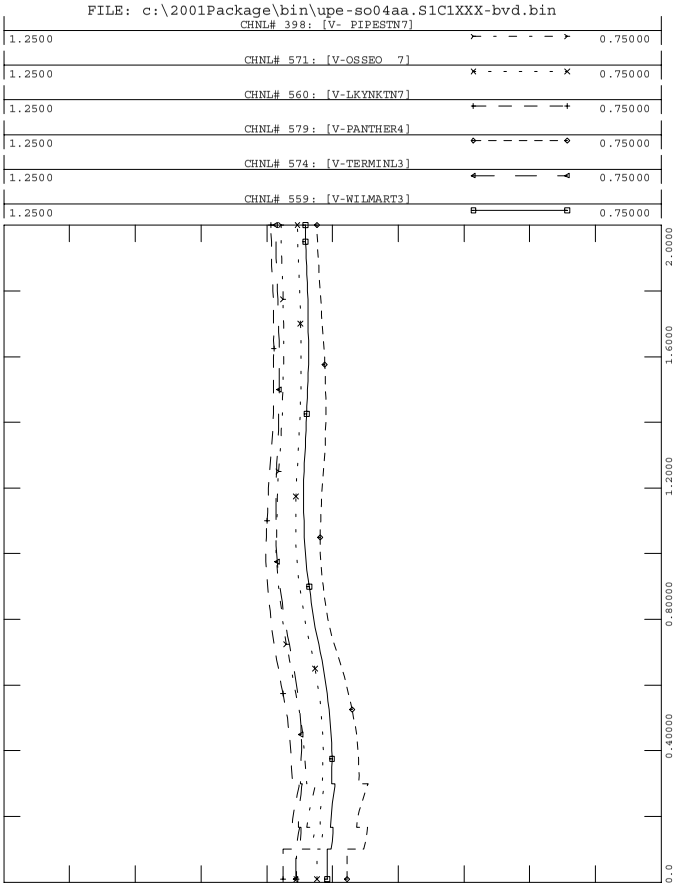
TC VOLTAGES



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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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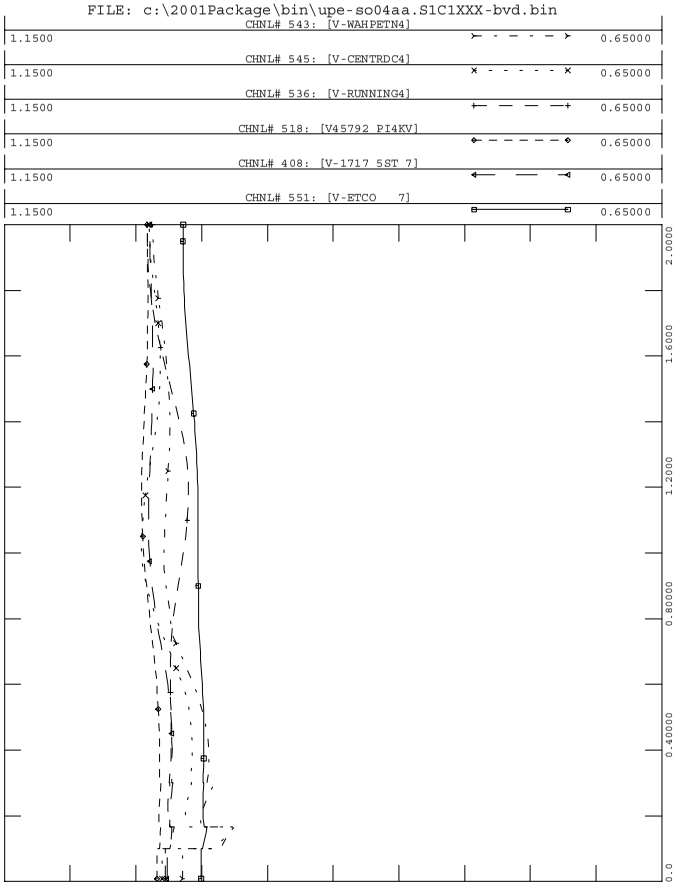
VOLTAGES 6



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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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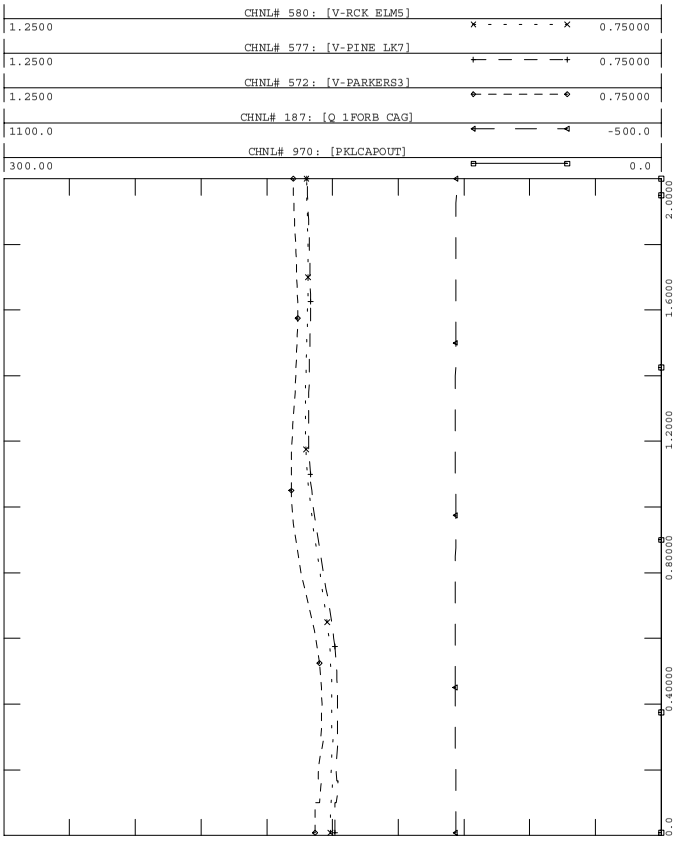
FORBES SVS OUT & VOLTAGES



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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
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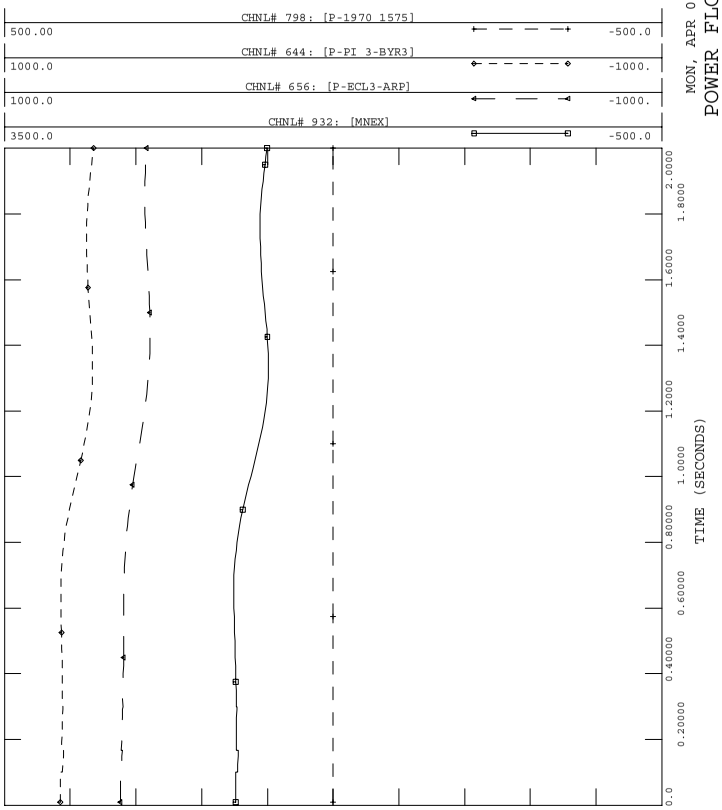
MON, APR 08 2002 10:31
POWER FLOW SUMS 2



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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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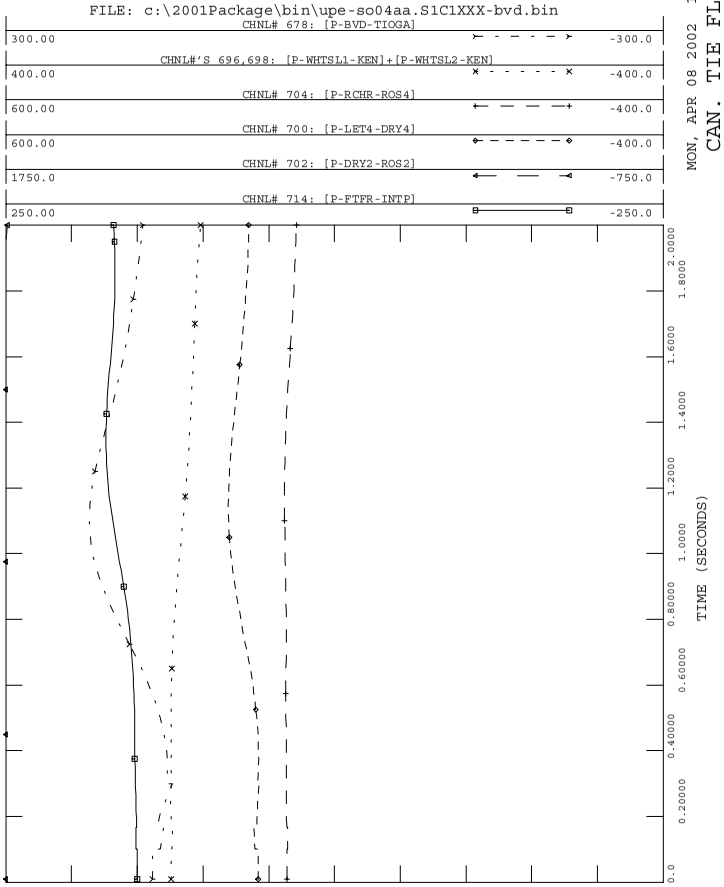
CAN. TIE FLOWS



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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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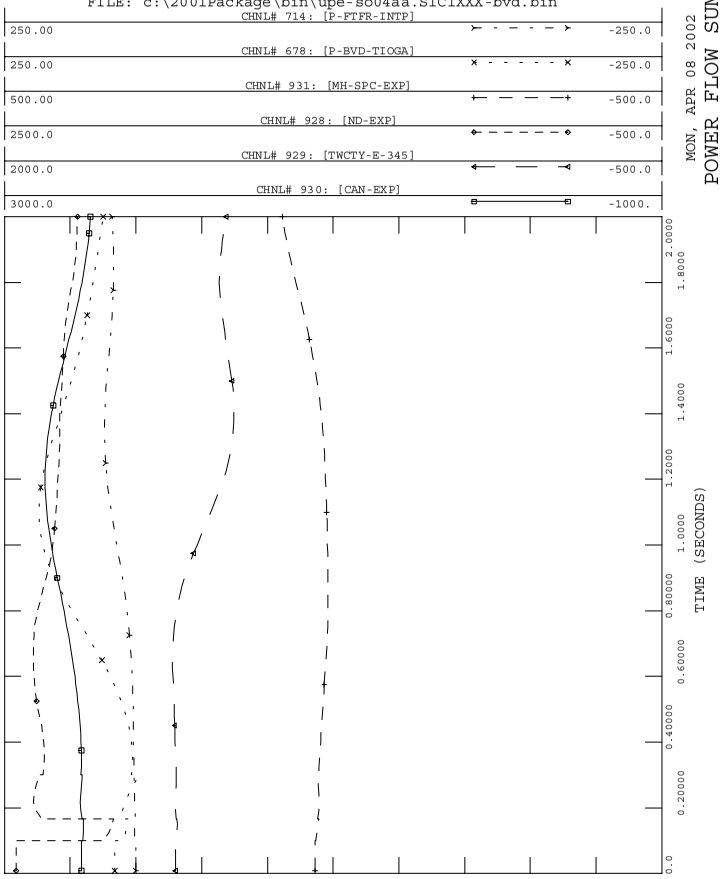
POWER FLOW SUMS 1



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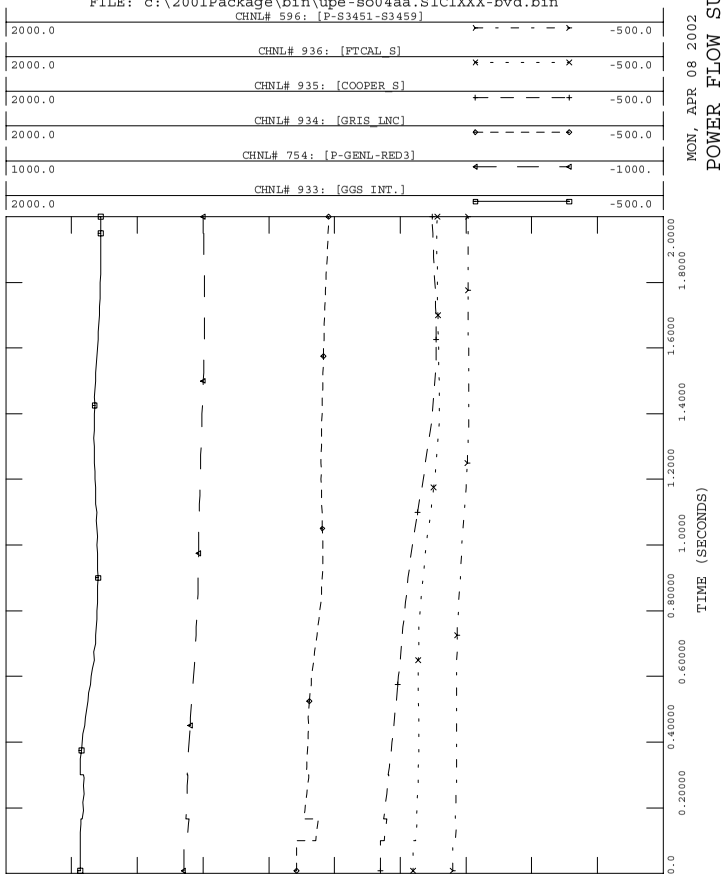
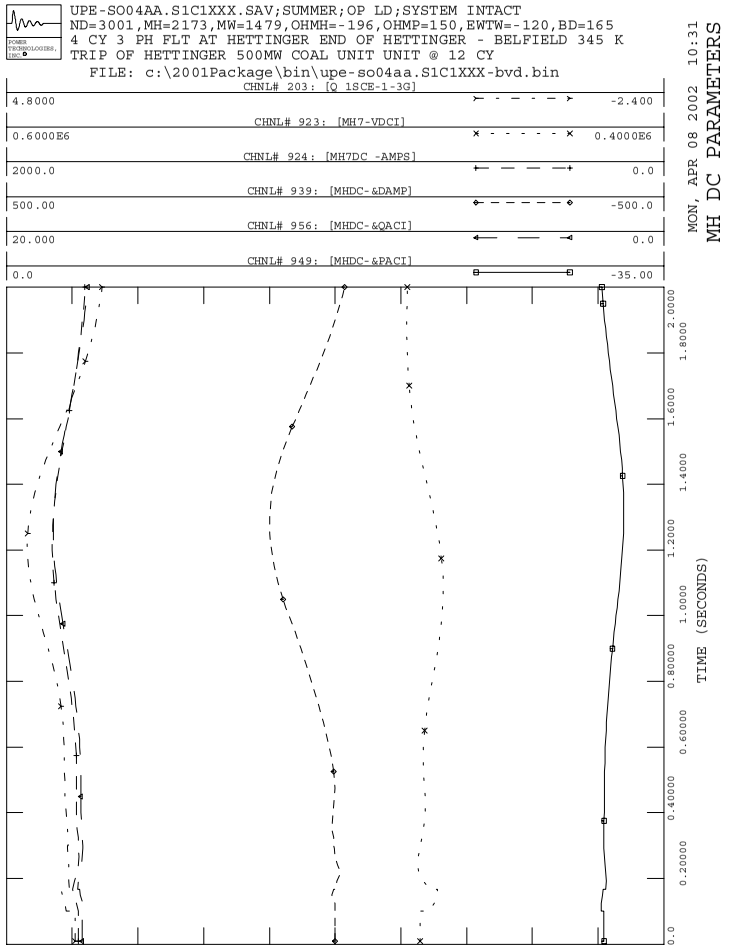
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31
POWER FLOW SUM 3

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ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
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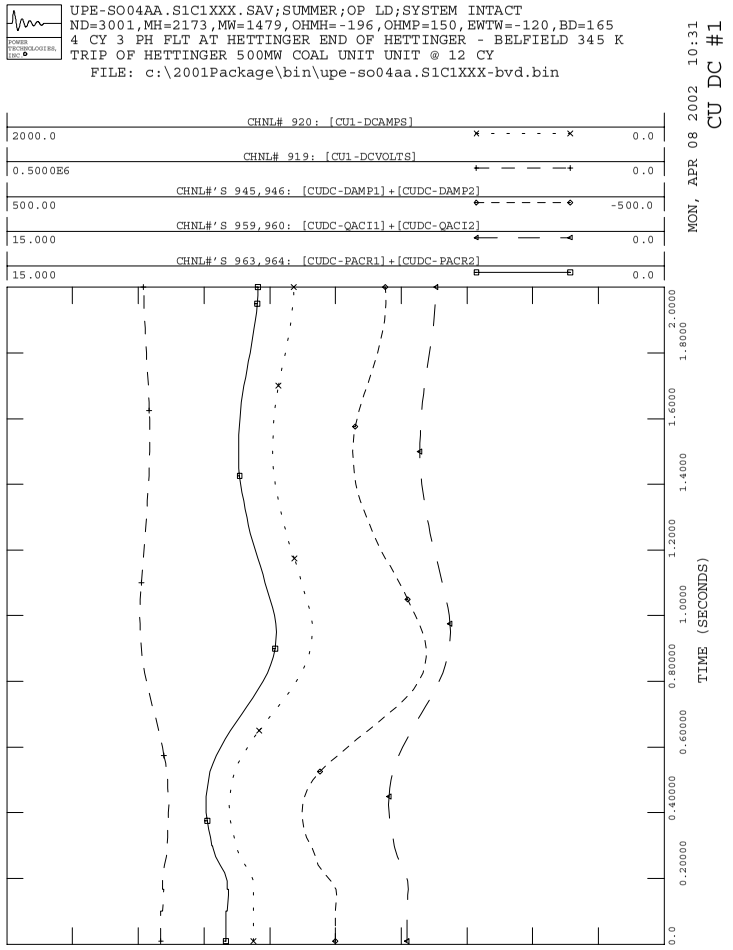
TIME (SECONDS)
MON, APR 08 2002 10:31
MH DC PARAMETERS


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin
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2000.0
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CHNL# 919: [CU1-DCVOLTS]
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CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
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-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
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CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
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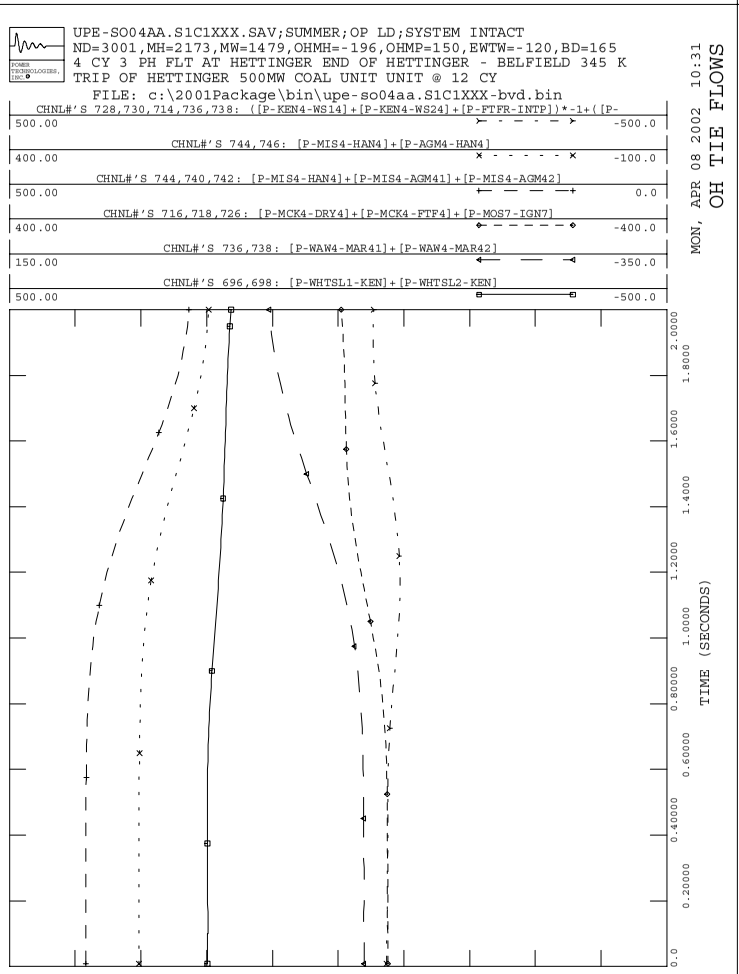
TIME (SECONDS)
MON, APR 08 2002 10:31
CU DC #1


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
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-100.0
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400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
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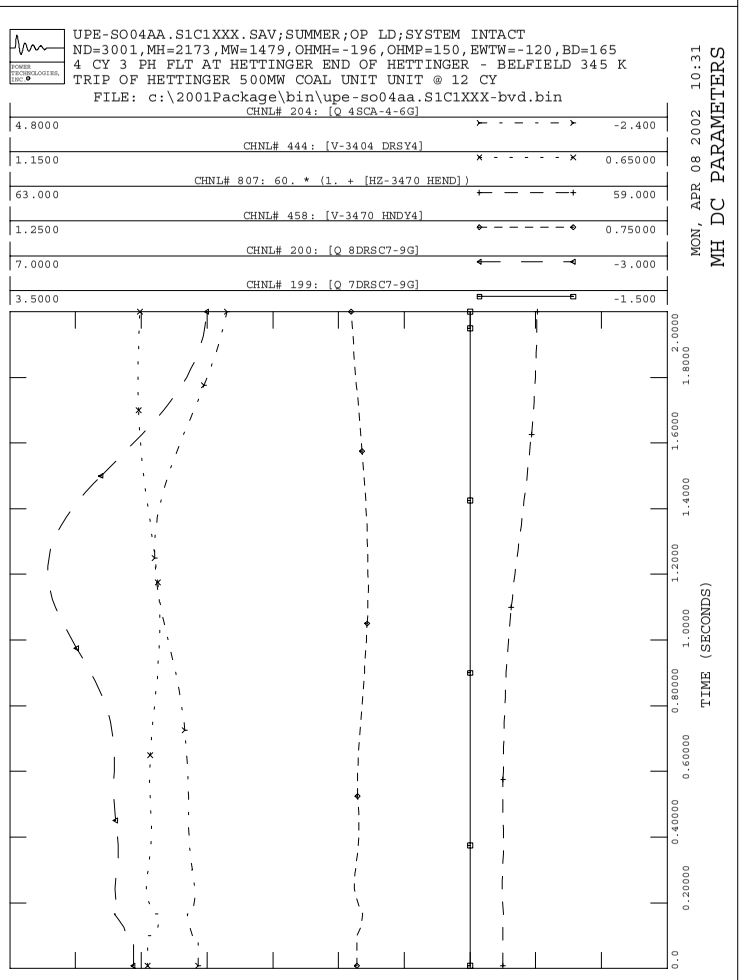
TIME (SECONDS)
MON, APR 08 2002 10:31
OH TIE FLOWS


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin
CHNL# 204: [Q 4SCA-4-6G]
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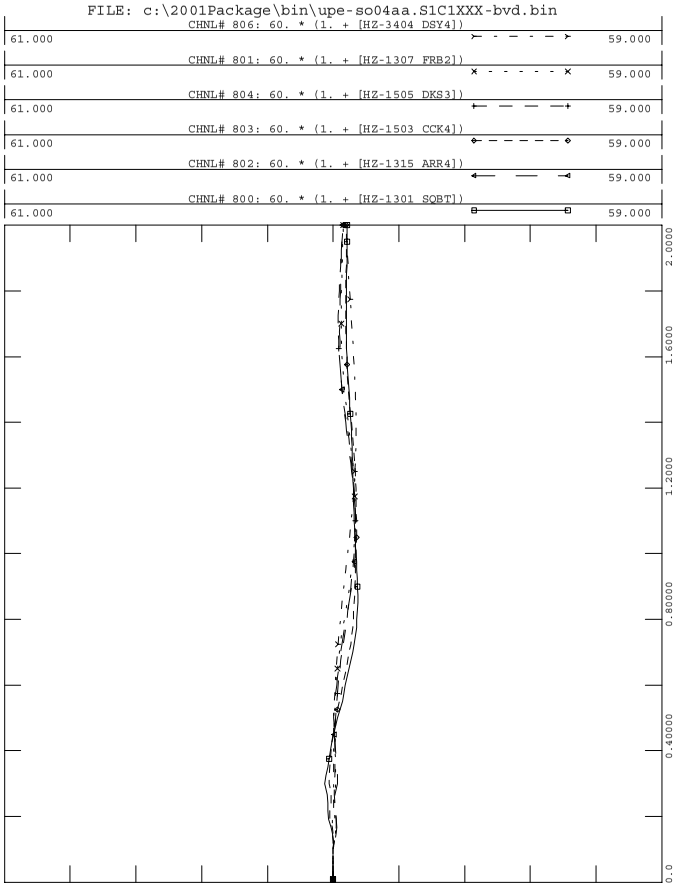
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TIME (SECONDS)
MON, APR 08 2002 10:31
MH DC PARAMETERS

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

MON, APR 08 2002 10:31

FREQ AT DC TERMINALS



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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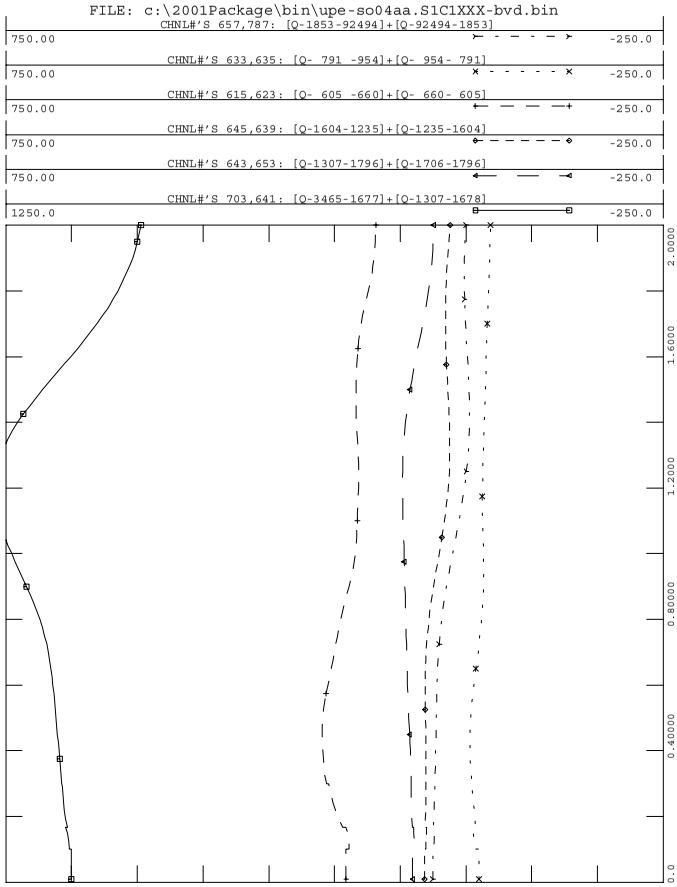
VAR LOSSES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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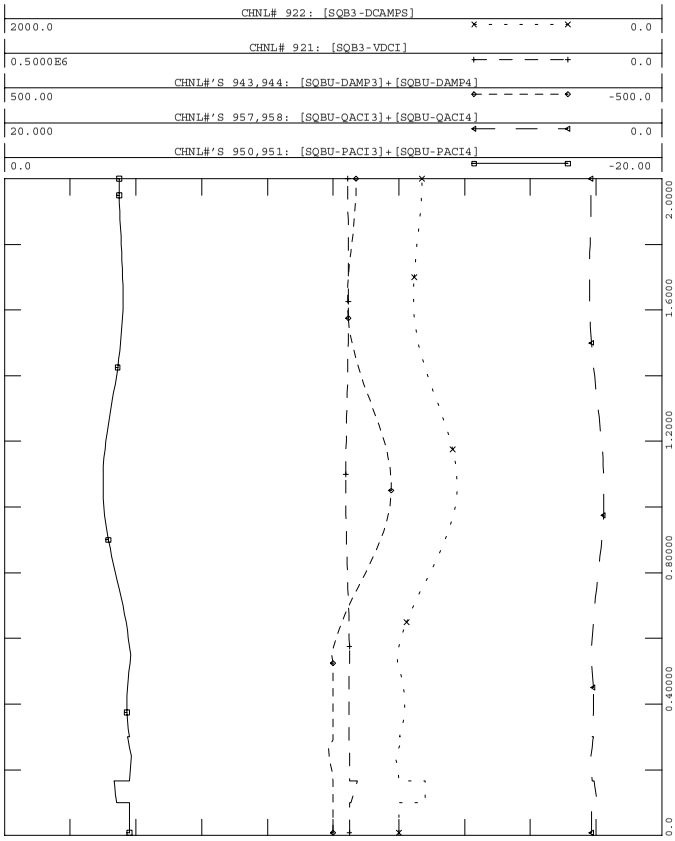
SQB DC #3



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ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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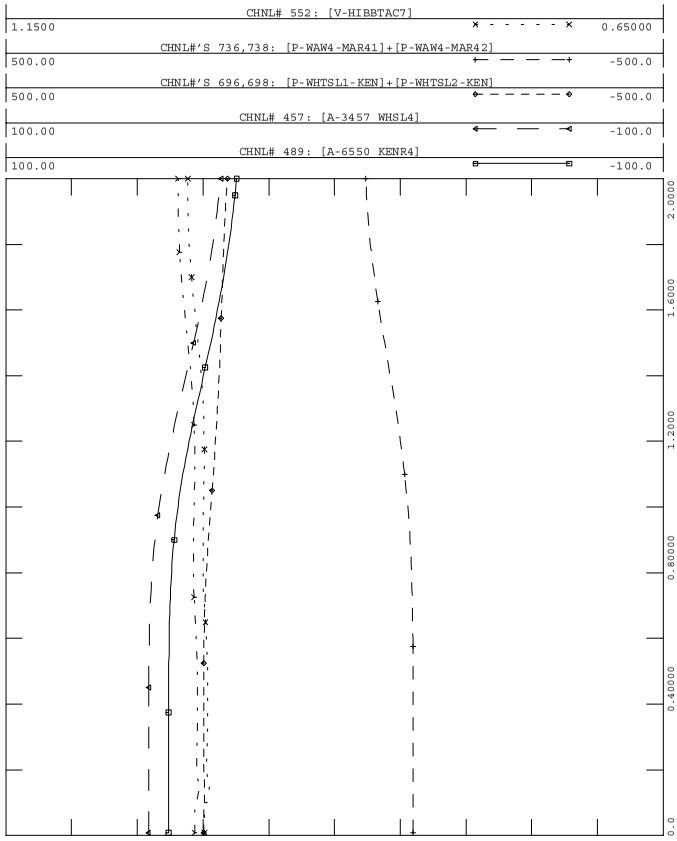
VOLTAGES, ANGLES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

RELAY: SLINOS
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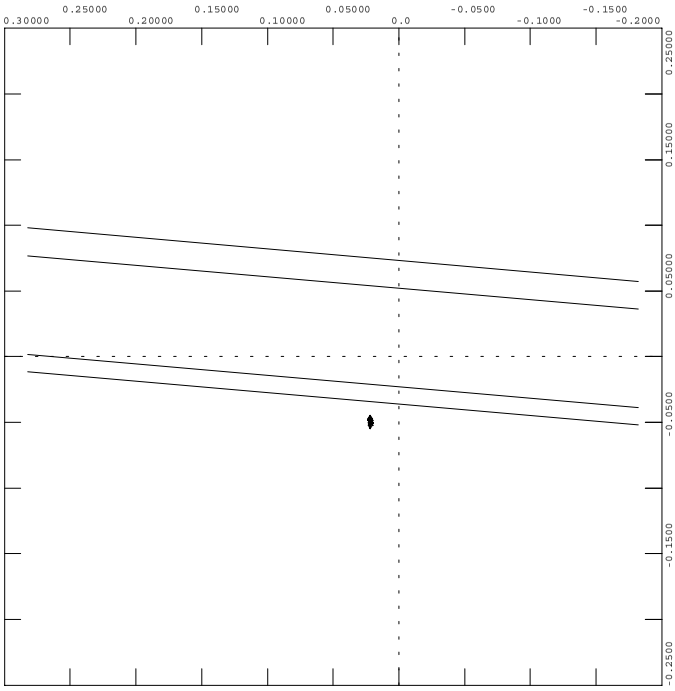
CHNL# 824: [X-FRB2-ROS2]



MON, APR 08 2002 10:31
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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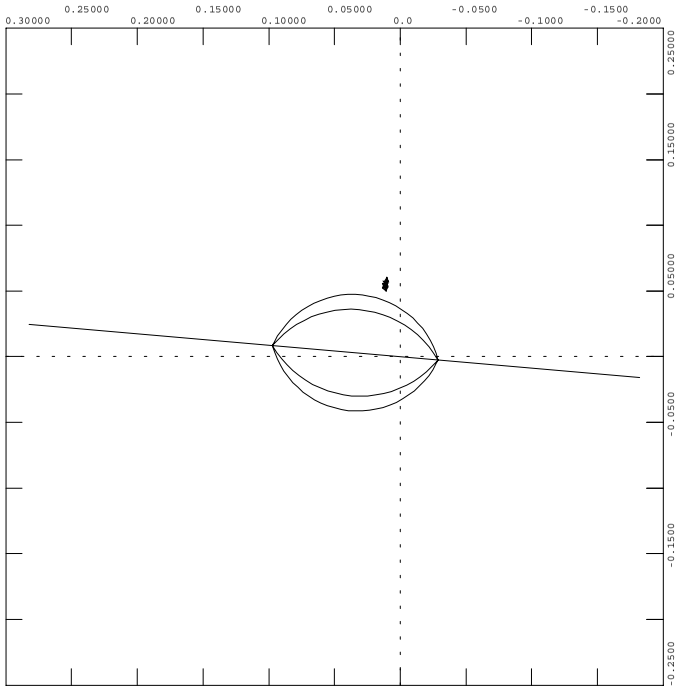

MON, APR 08 2002 10:31
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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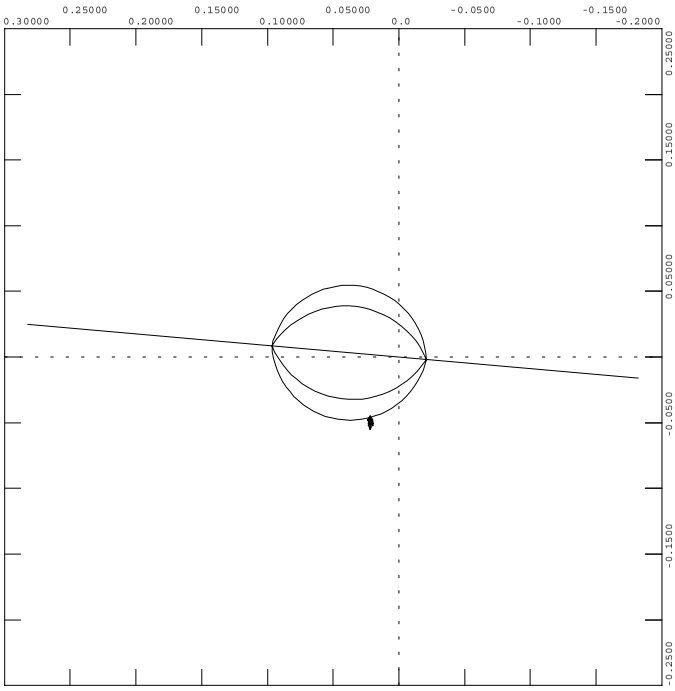
CHNL# 824: [X-FRB2-ROS2]



MON, APR 08 2002 10:31
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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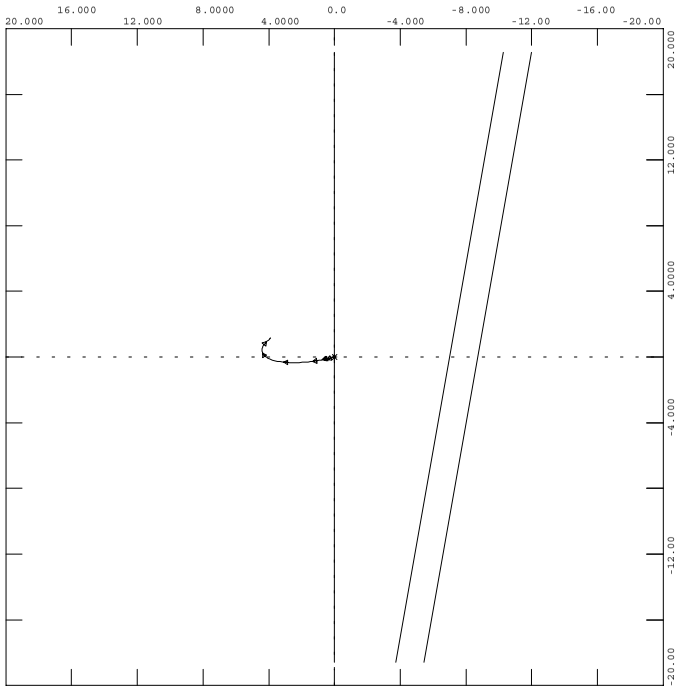
CHNL# 977: [DCAR-B]



MON, APR 08 2002 10:31
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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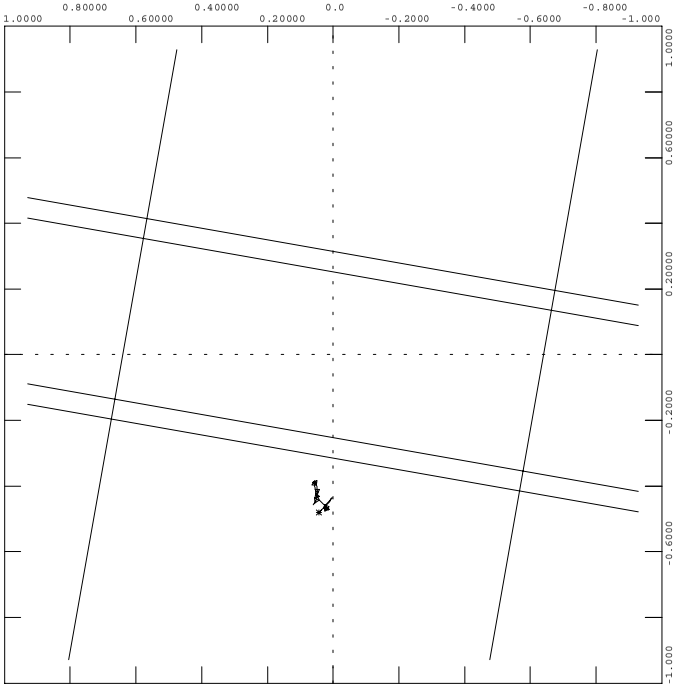
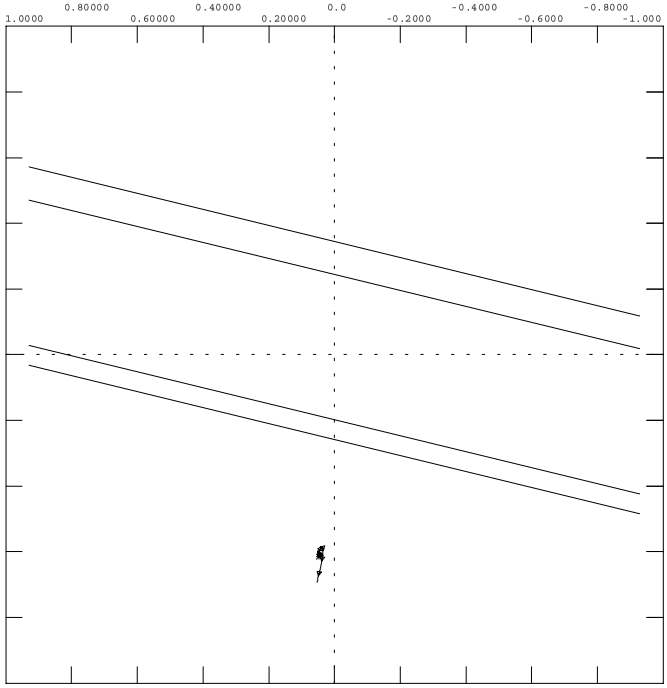


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

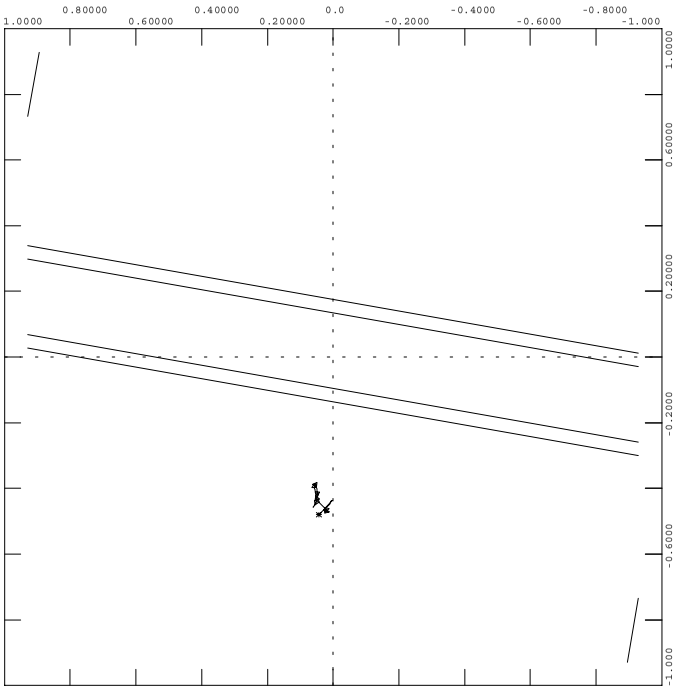
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

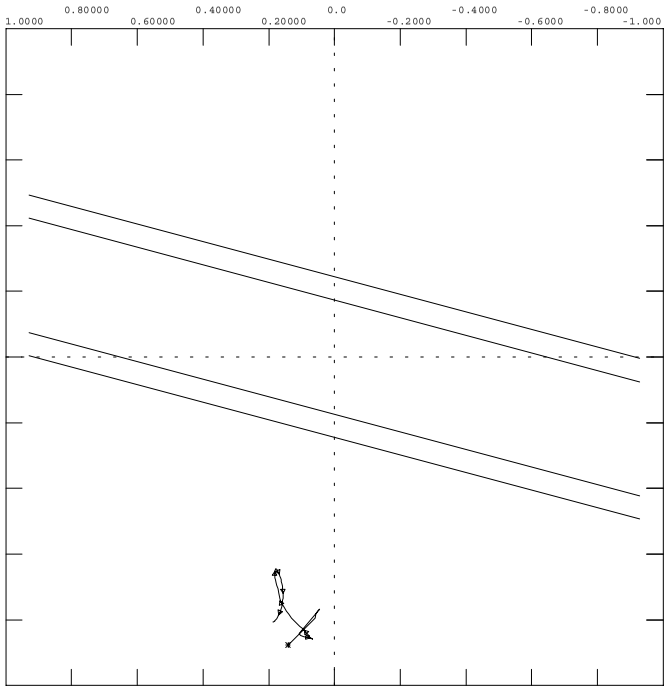
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

RELAY: SLLP
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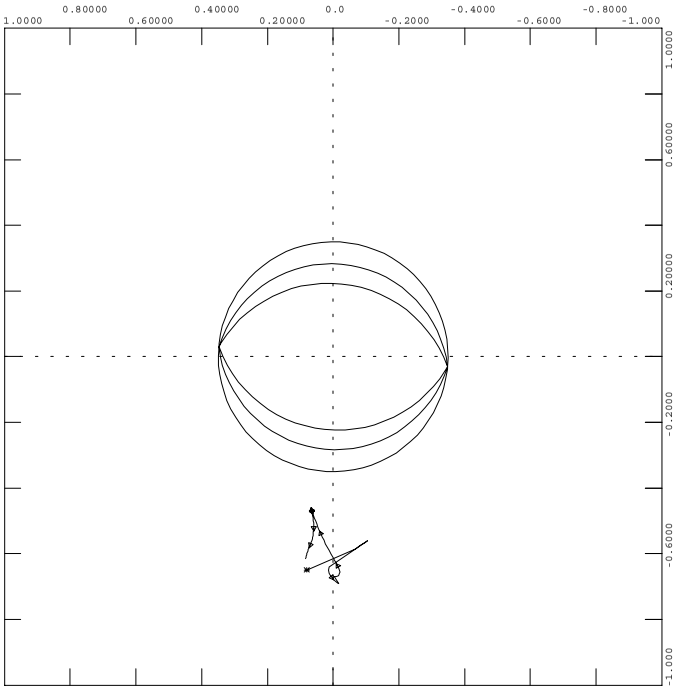
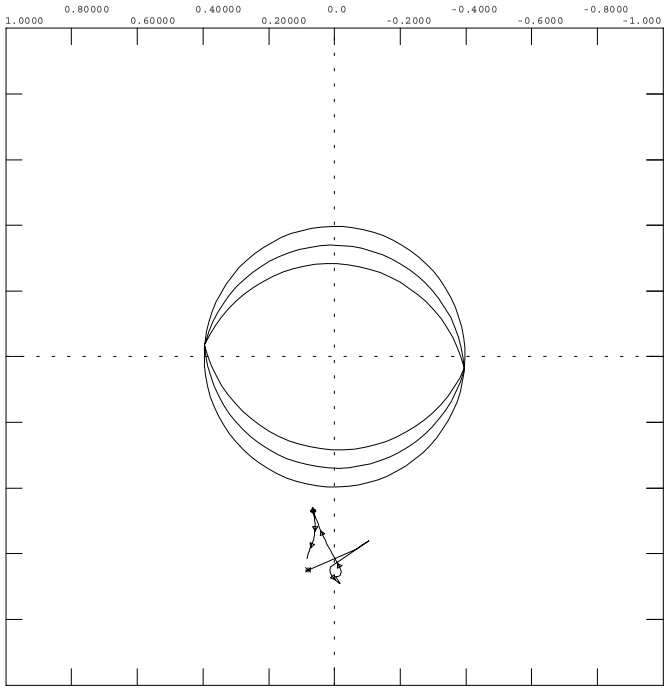
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

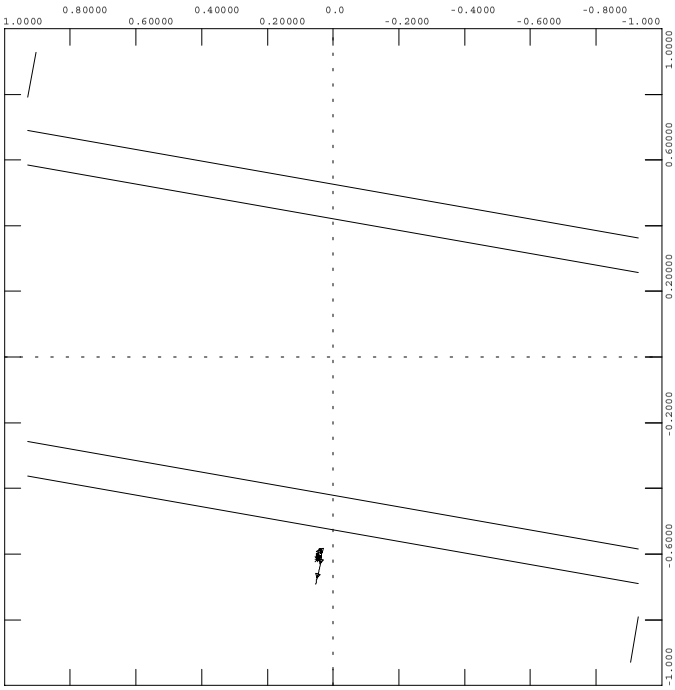
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

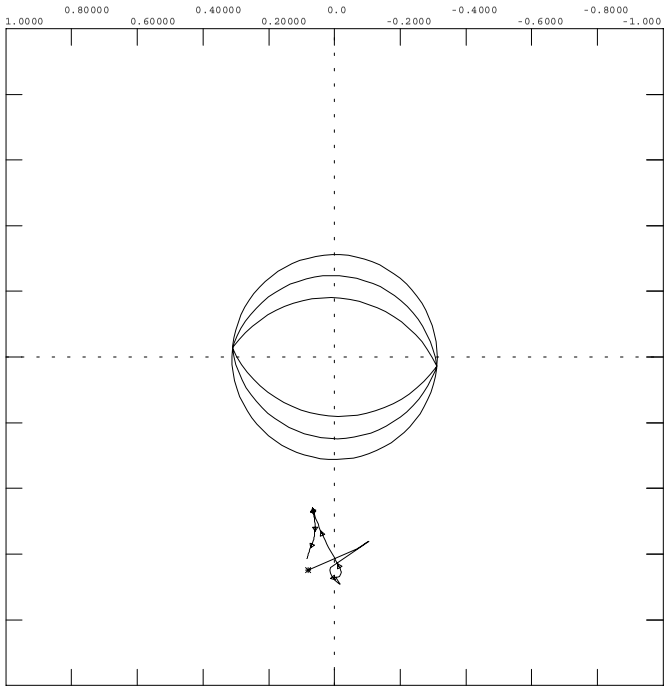
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



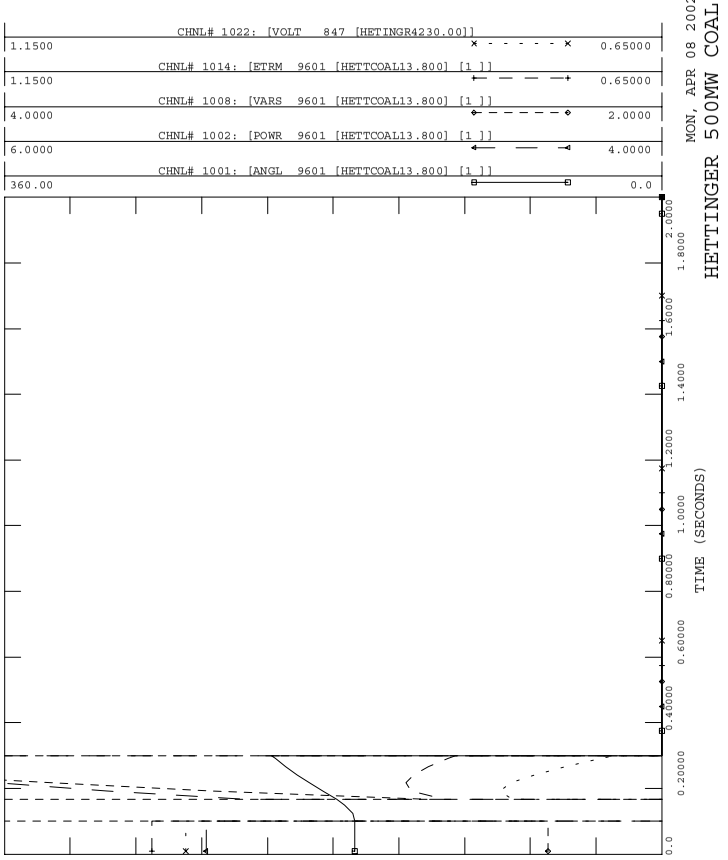
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

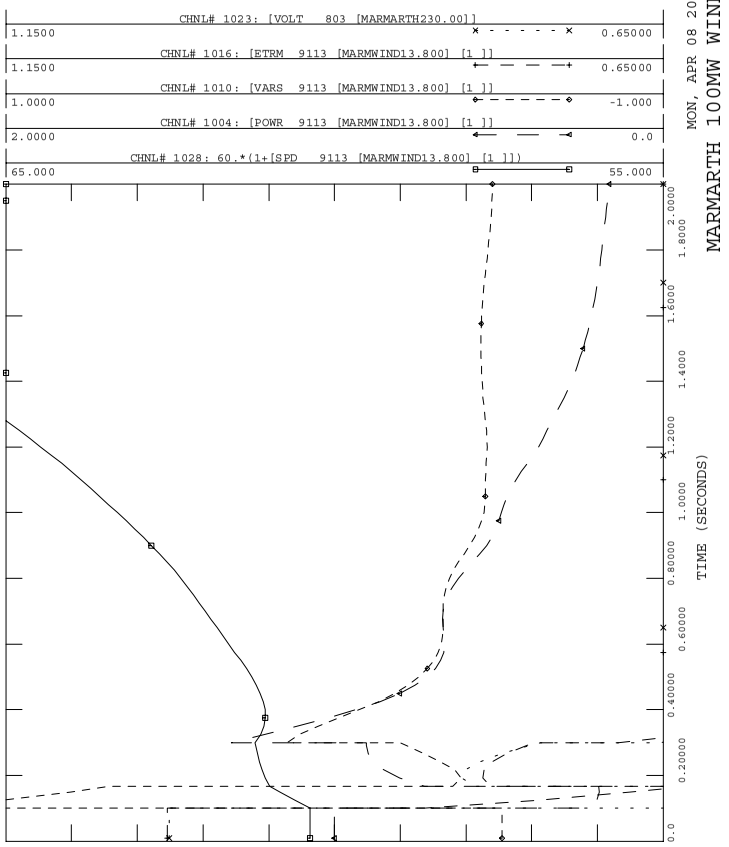


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin



MON, APR 08 2002 10:31
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

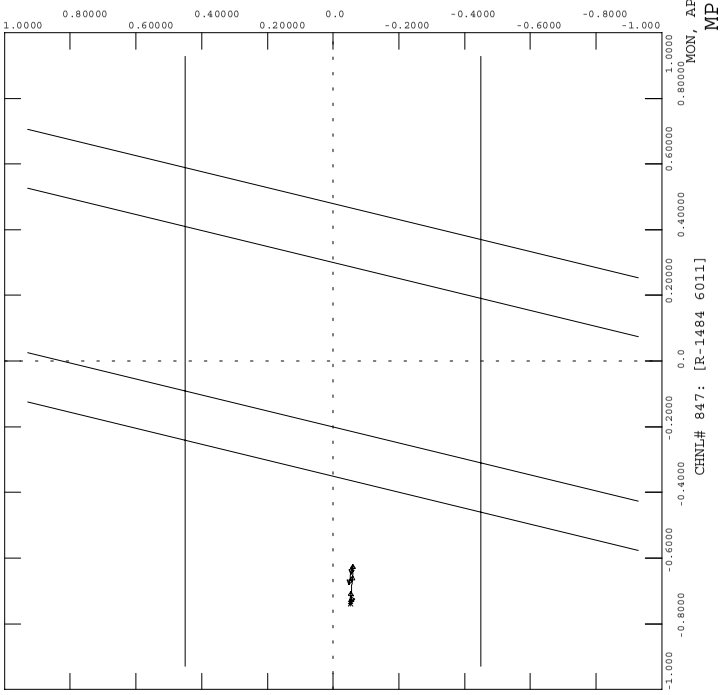


MON, APR 08 2002 10:31
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

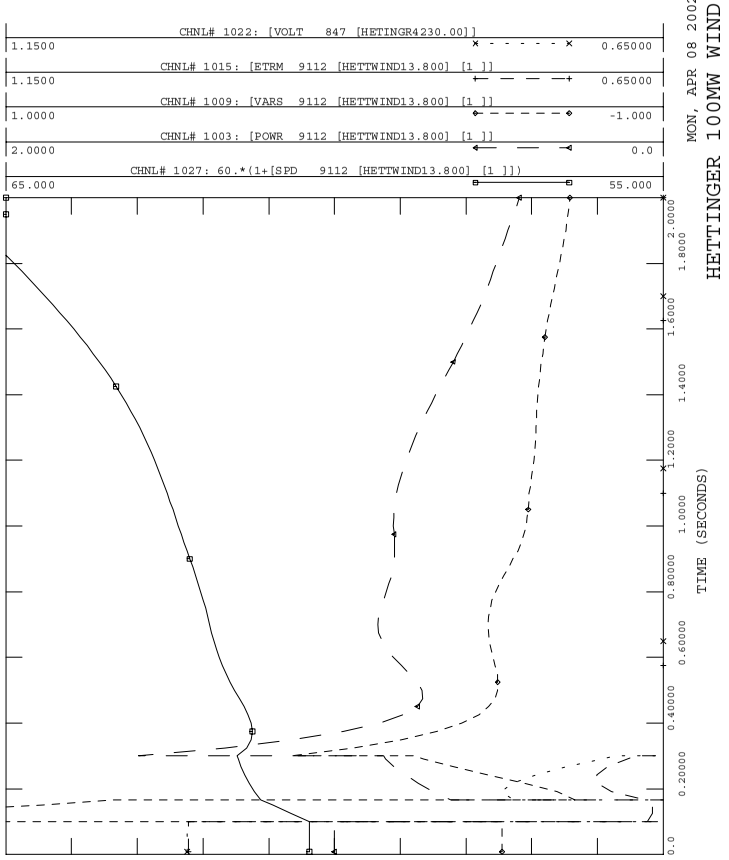
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, APR 08 2002 10:31
MP-OH I.FALLS (779)
CHNL# 847: [R-1484 6011]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin



MON, APR 08 2002 10:31
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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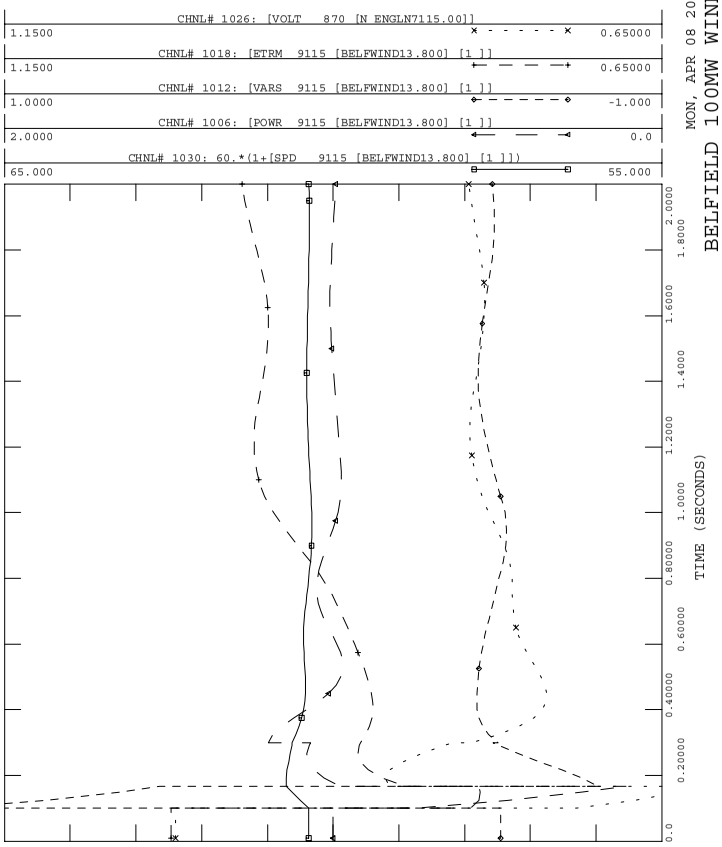
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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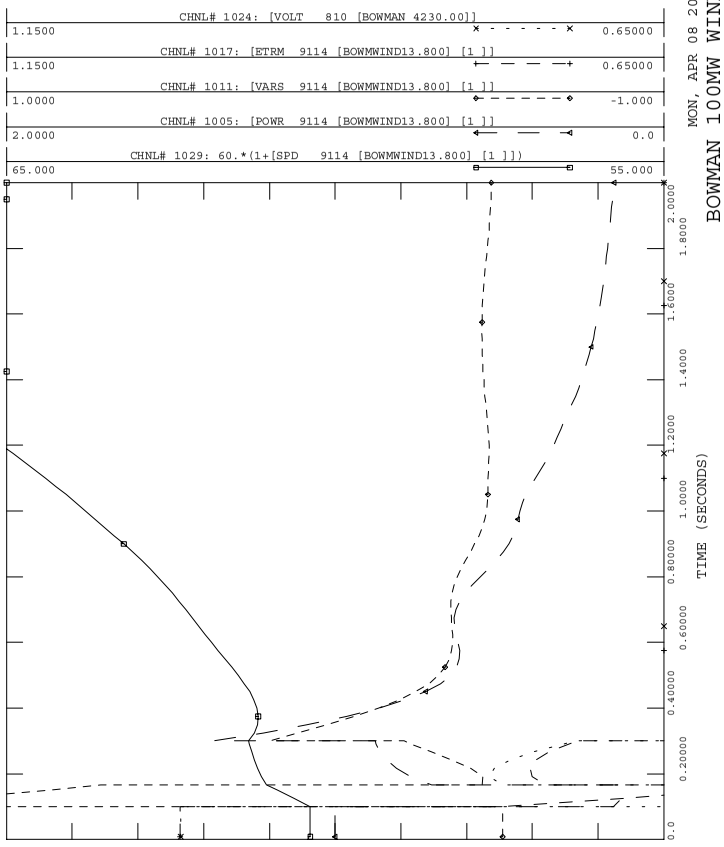
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bvd.bin

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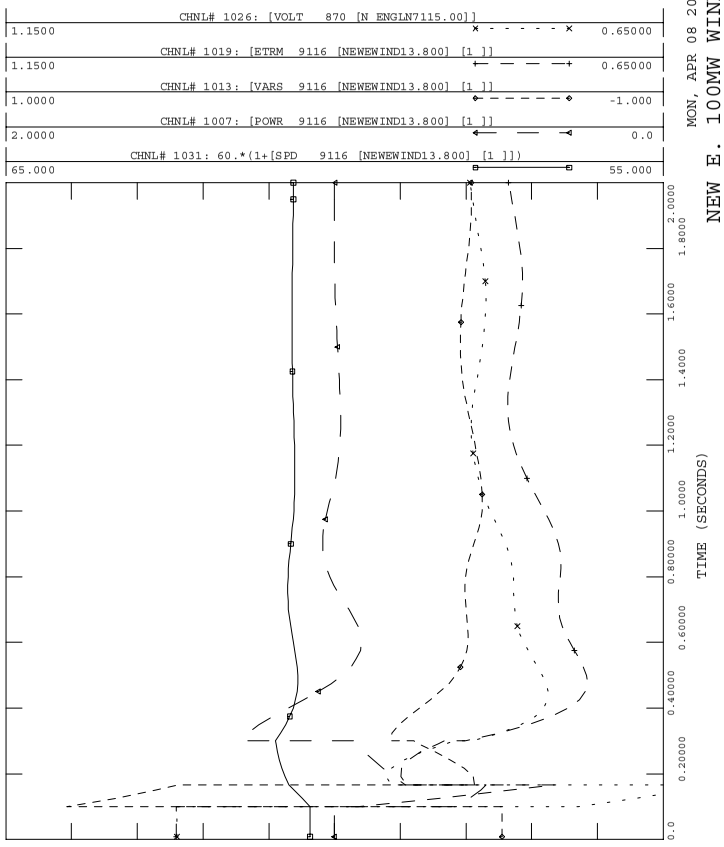
NEW E. 100MW WIND UNIT



CONTINGENCY BU9

4 cycle 3 phase fault at Hettinger end of Hettinger - Ft.Thompson 345 kV line. Trip Hettinger Coal Unit @ 12 cy

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

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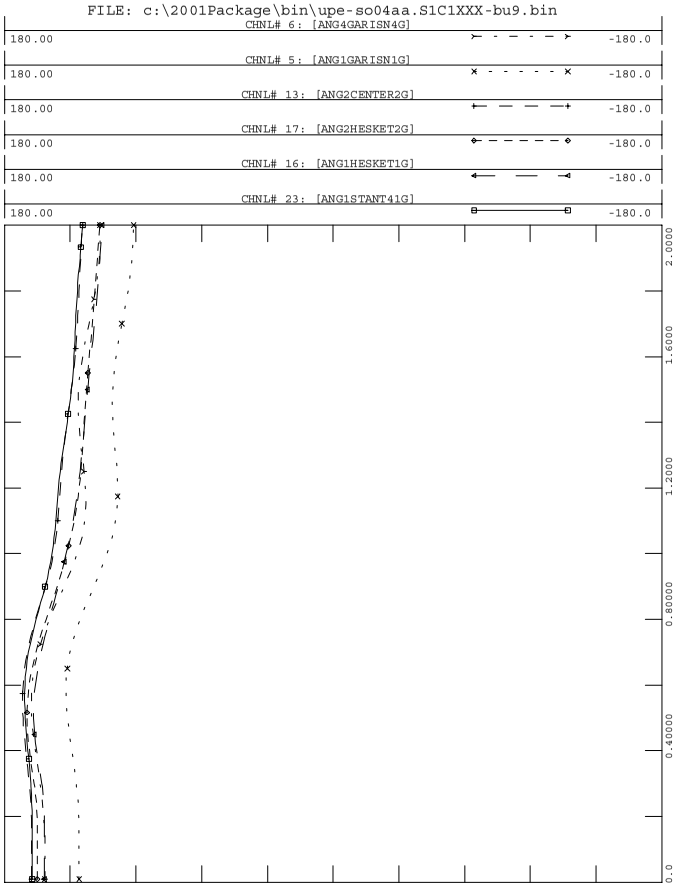
ROTOR ANGLES 2



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

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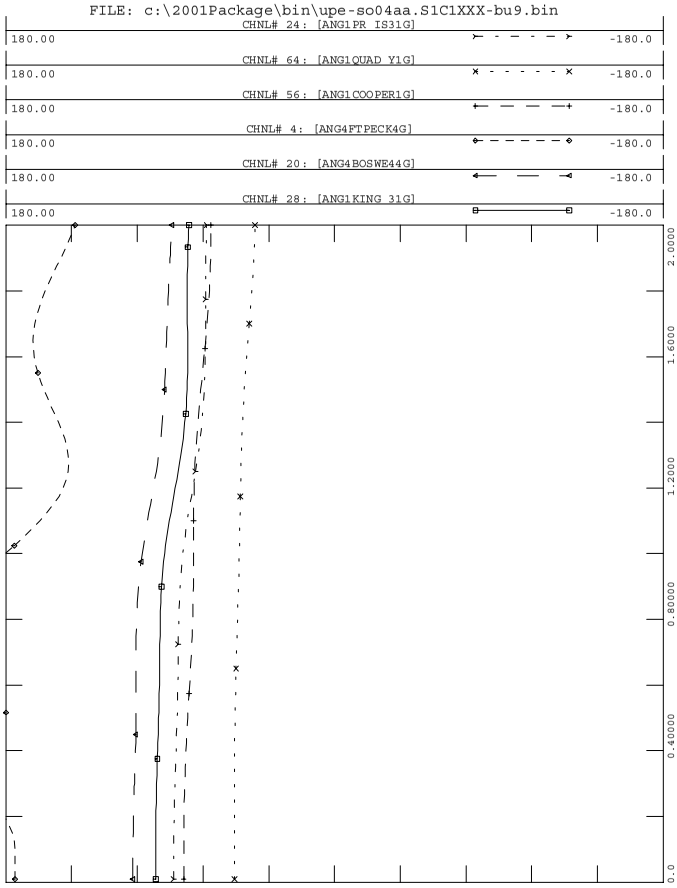
ROTOR ANGLES 4



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

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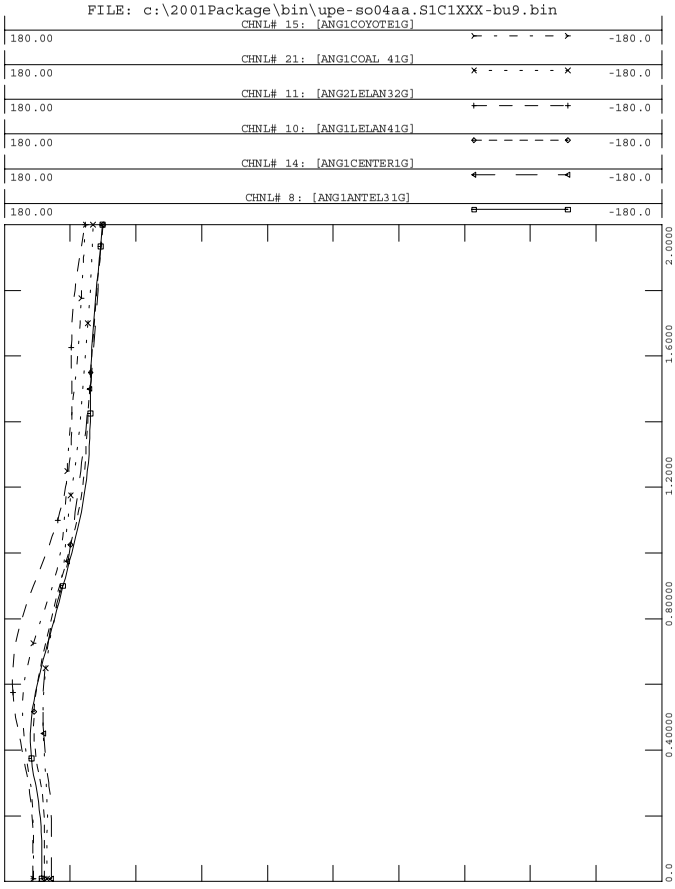
ROTOR ANGLES 1



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

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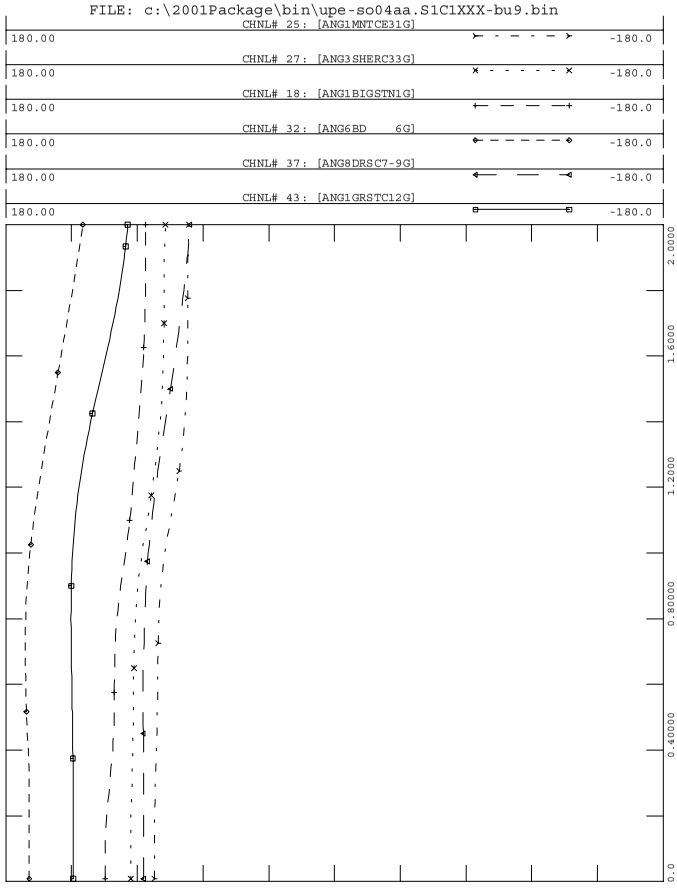
ROTOR ANGLES 3



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

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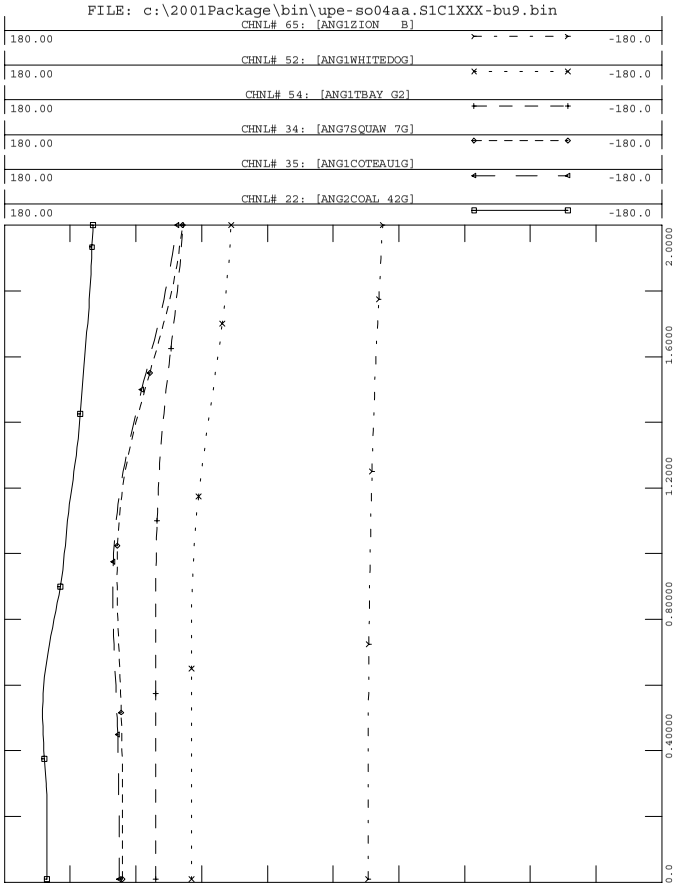
ROTOR ANGLES 6



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

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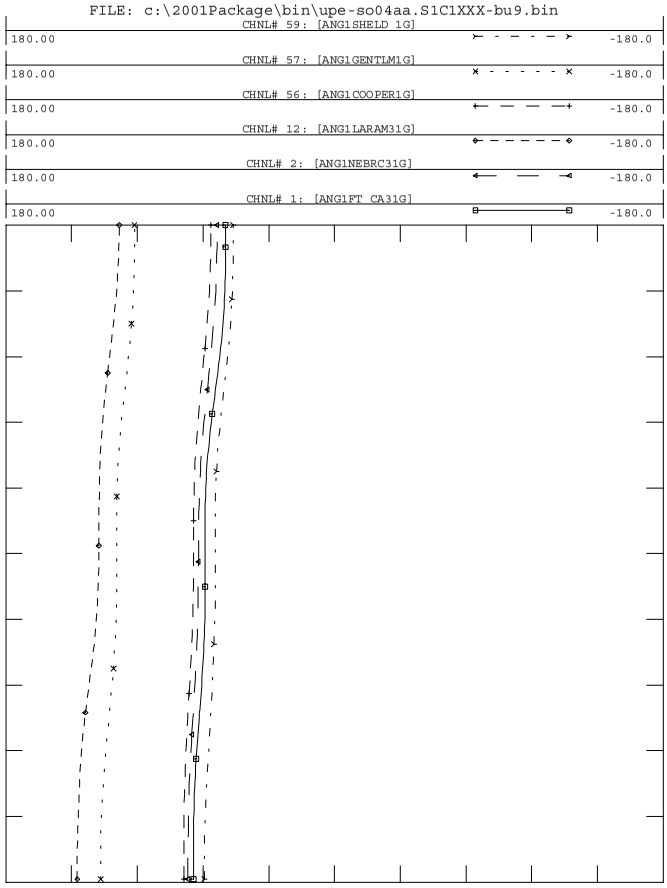
ROTOR ANGLES NB



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

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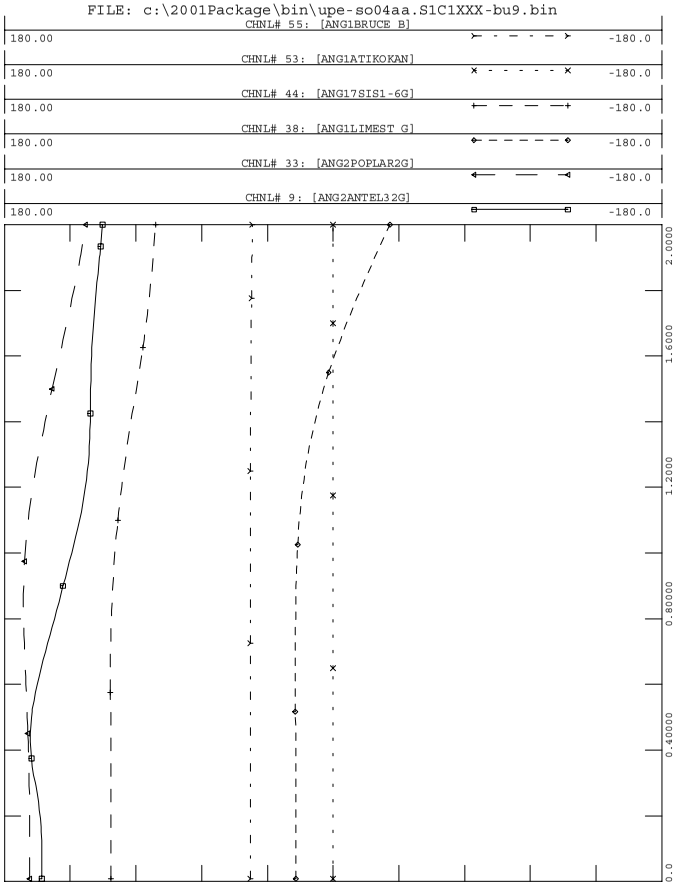
ROTOR ANGLES 5



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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
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MON, APR 08 2002 10:49
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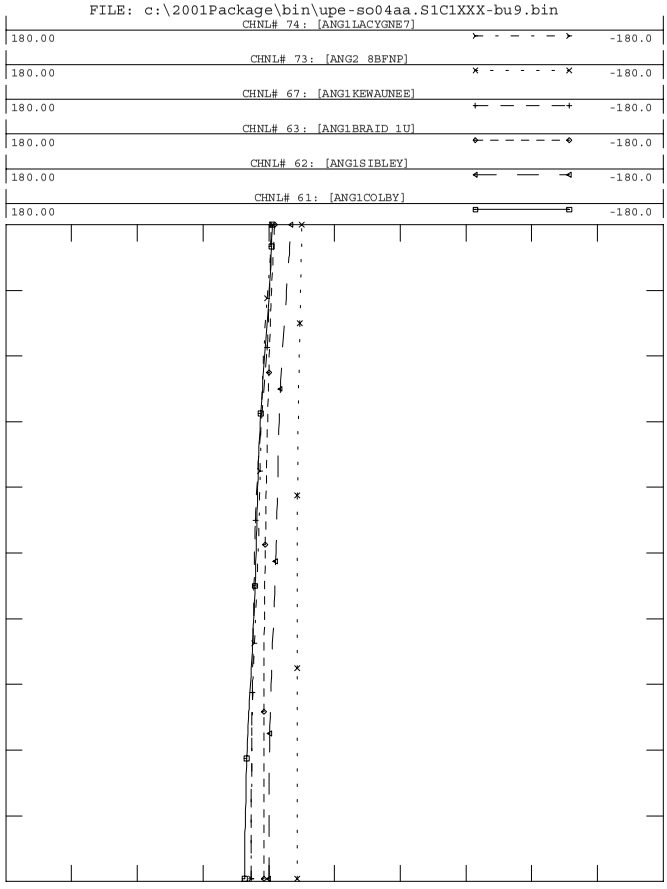

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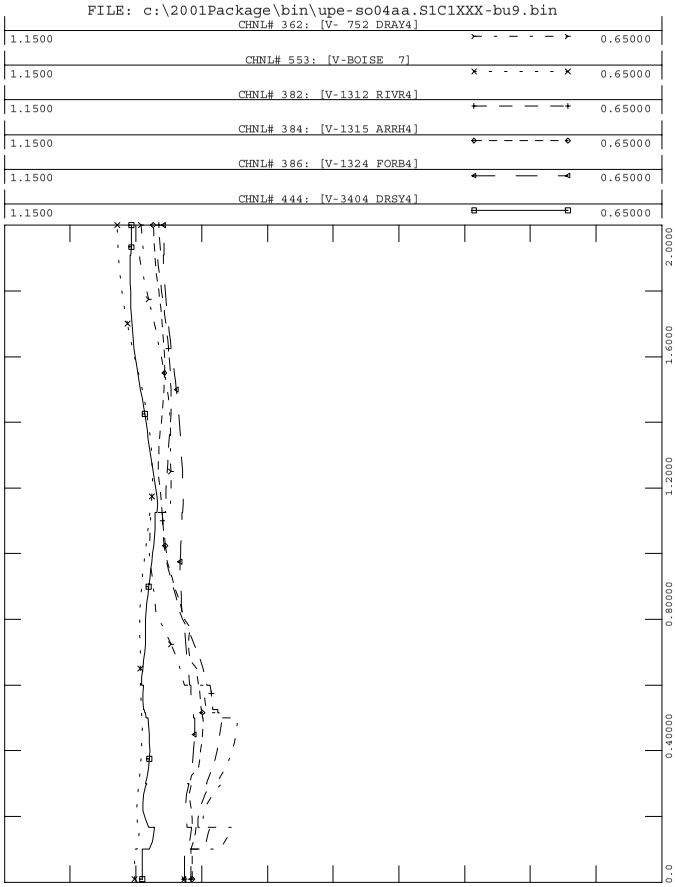
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

MON, APR 08 2002 10:49
VOLTAGES 1



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TRIP HETTINGER COAL UNIT @ 12 CY
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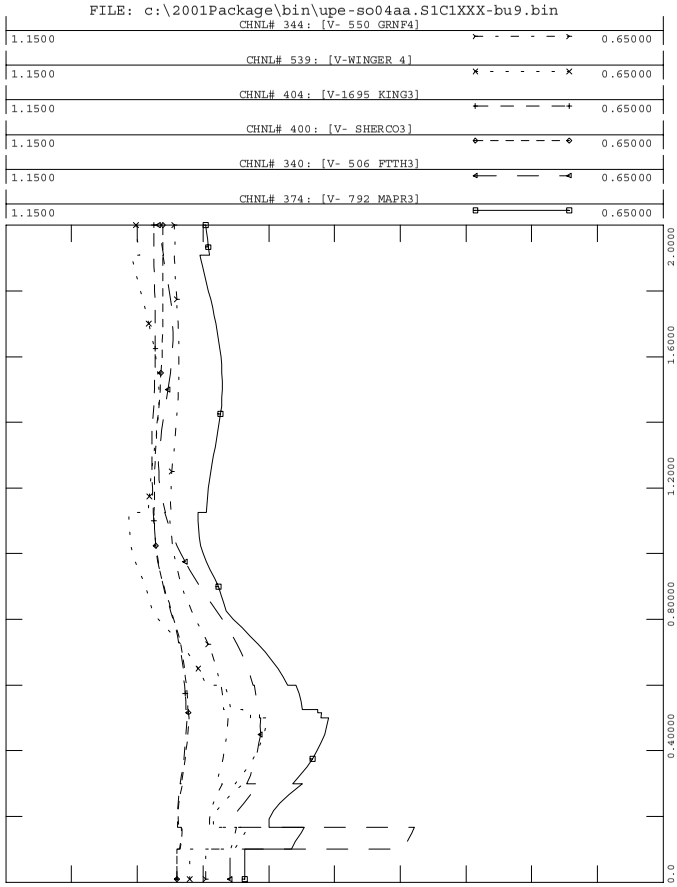
VOLTAGES 3



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TRIP HETTINGER COAL UNIT @ 12 CY
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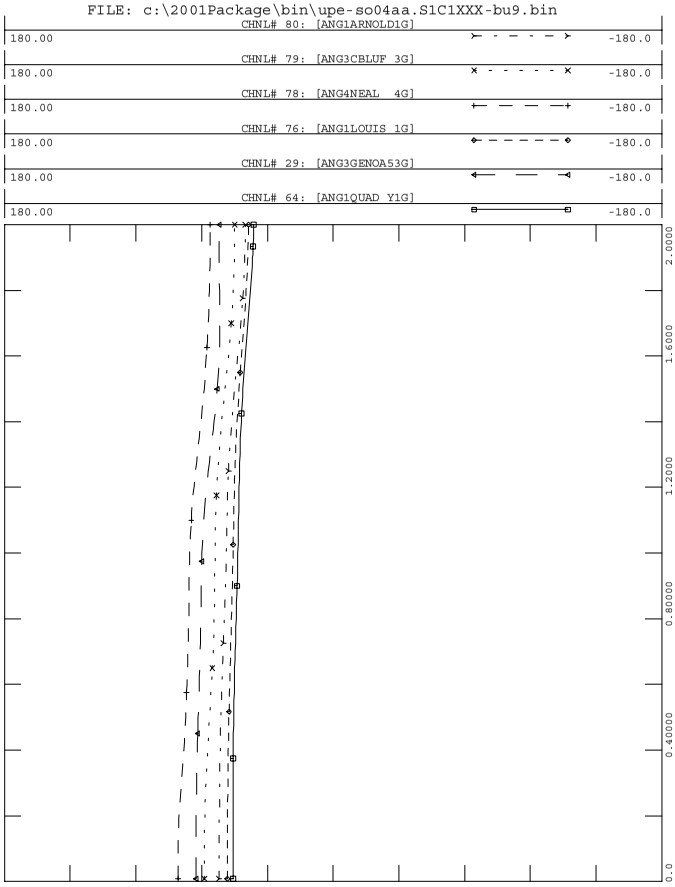
ROTOR ANGLES IA



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TRIP HETTINGER COAL UNIT @ 12 CY
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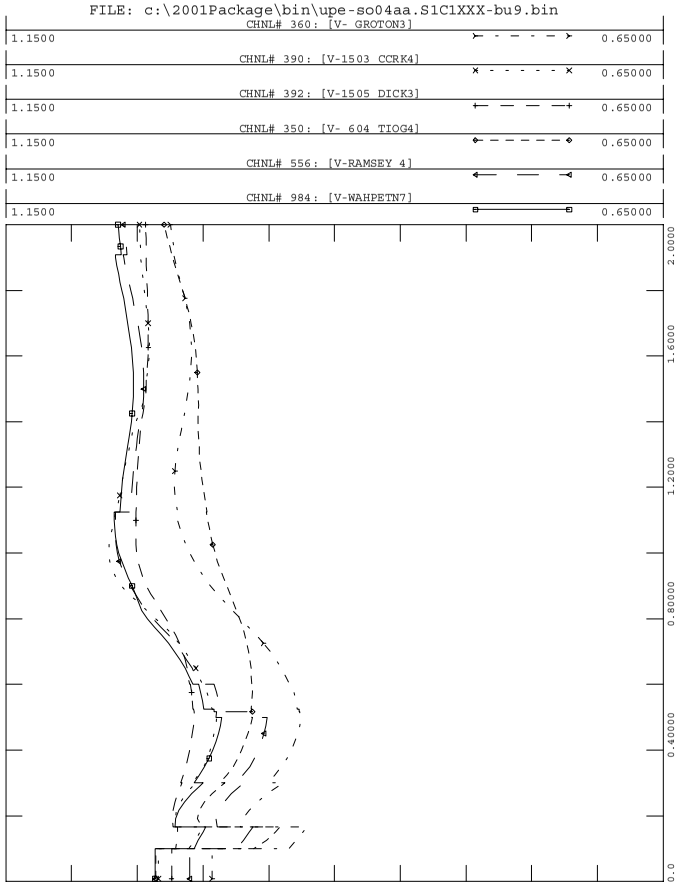
MON, APR 08 2002 10:49
VOLTAGES 2



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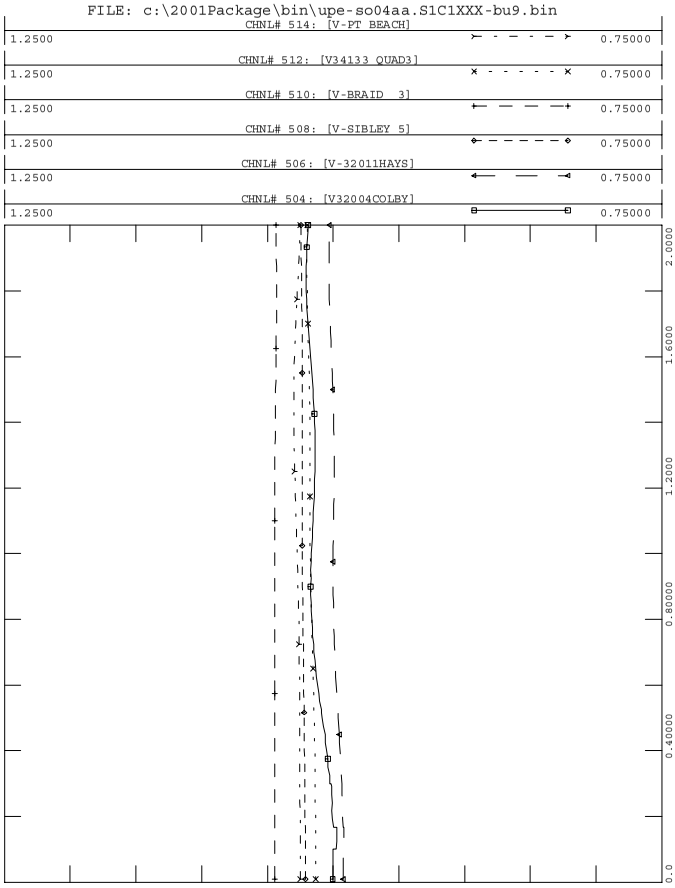
MON, APR 08 2002 10:49
VOLTAGES 5



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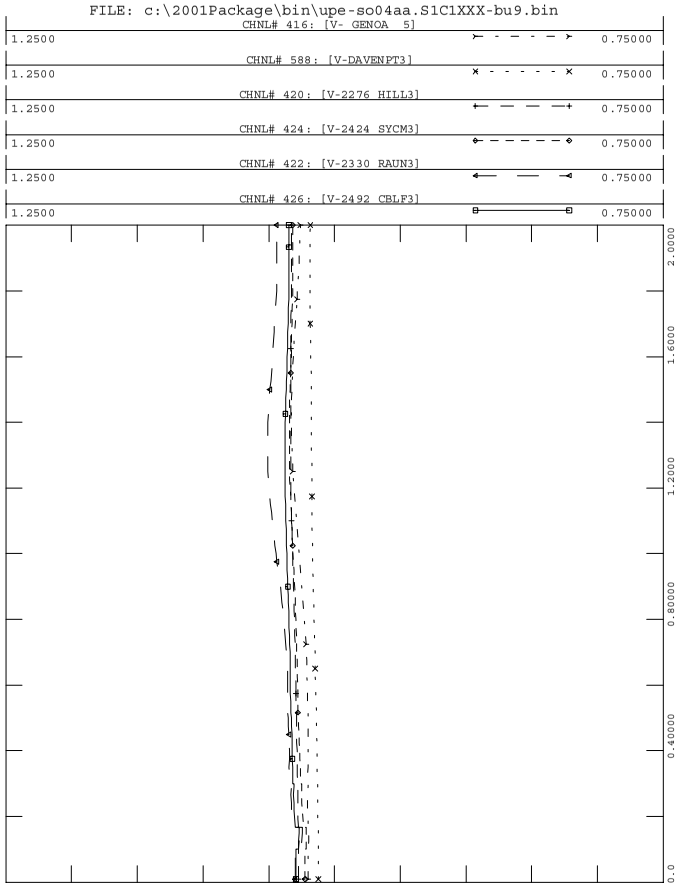
MON, APR 08 2002 10:49
VOLTAGES IA



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TRIP HETTINGER COAL UNIT @ 12 CY
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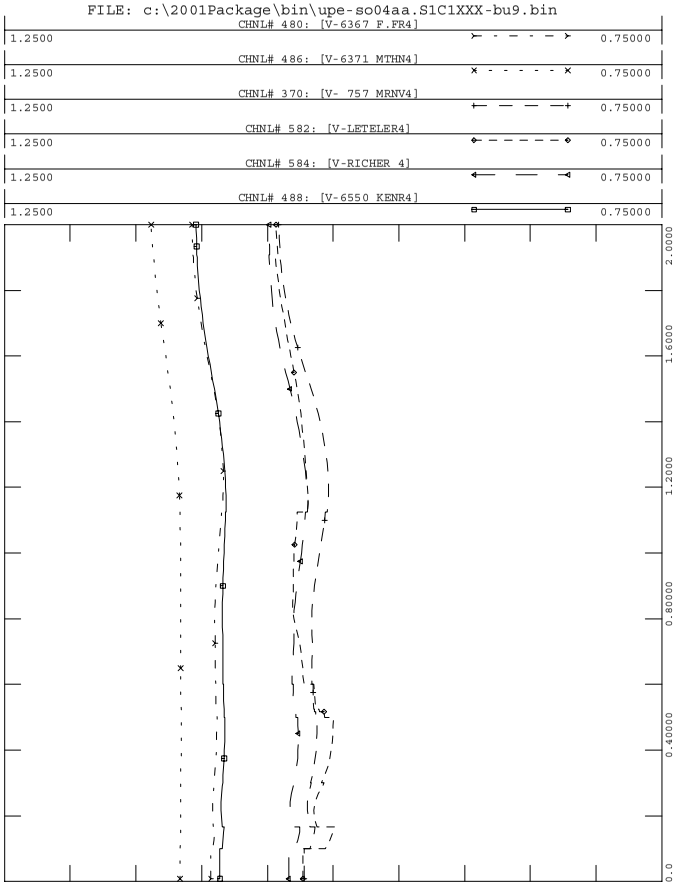
MON, APR 08 2002 10:49
VOLTAGES 4



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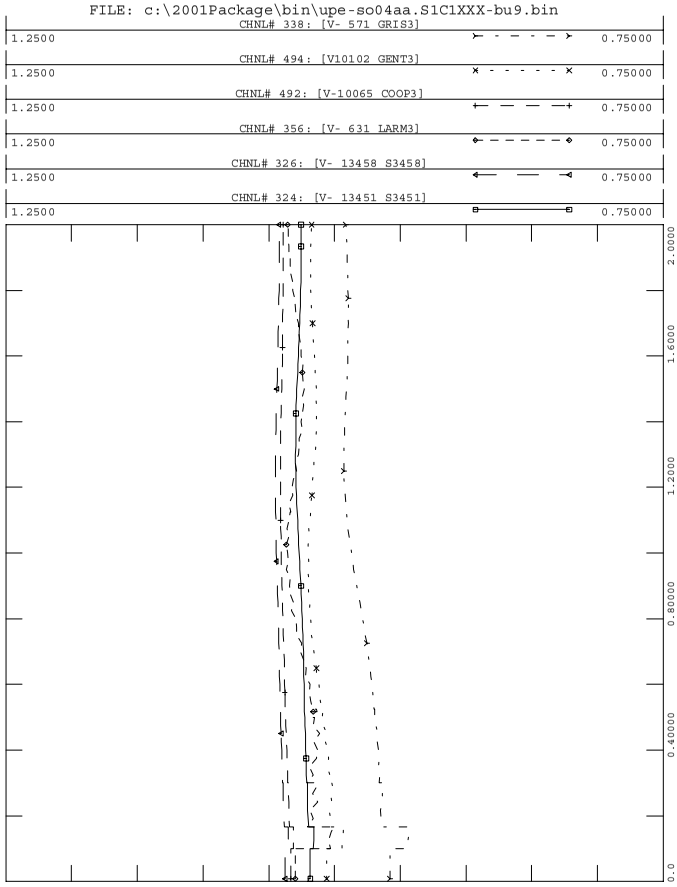
VOLTAGES NB



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TRIP HETTINGER COAL UNIT @ 12 CY
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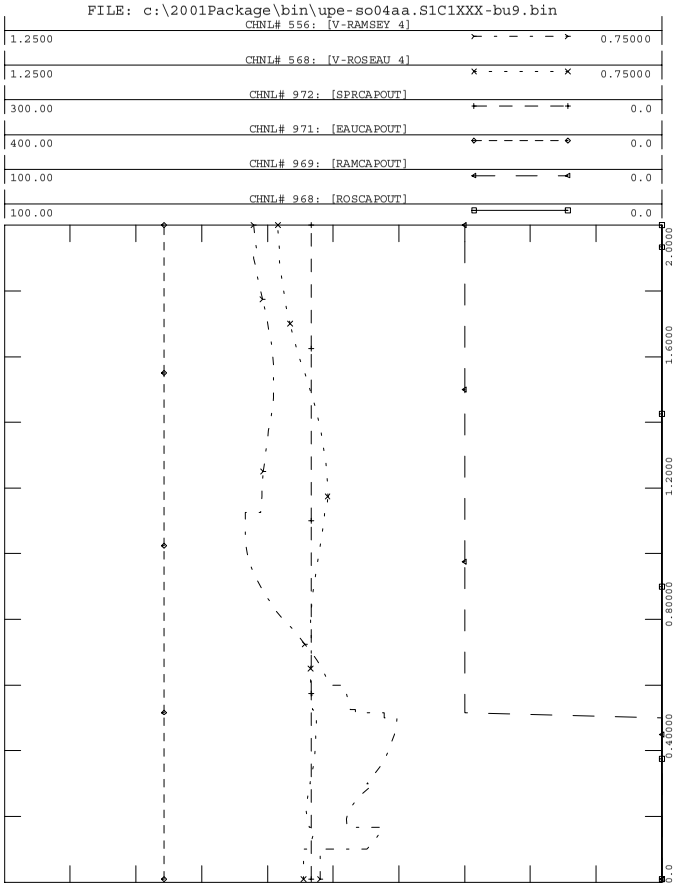

MON, APR 08 2002 10:49
FAST SW CAP OUT 2

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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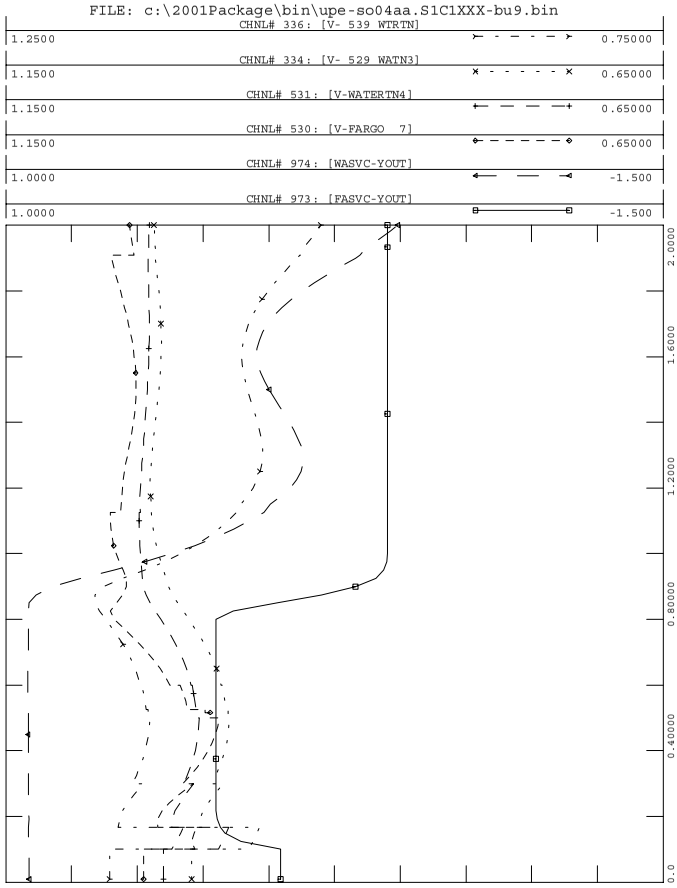
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin



MON, APR 08 2002 10:49
FARGO/WATERTOWN SVS

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
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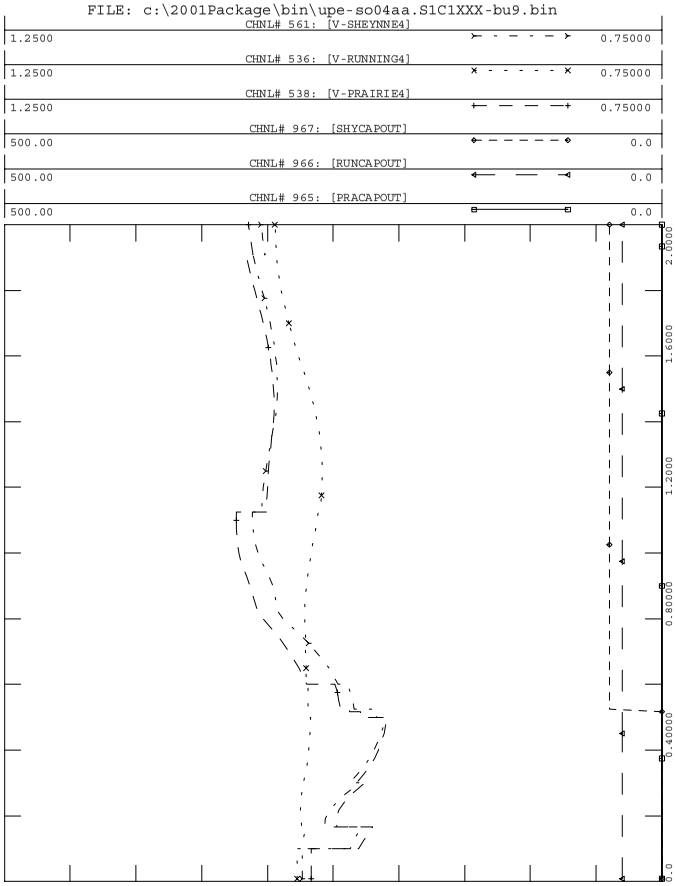

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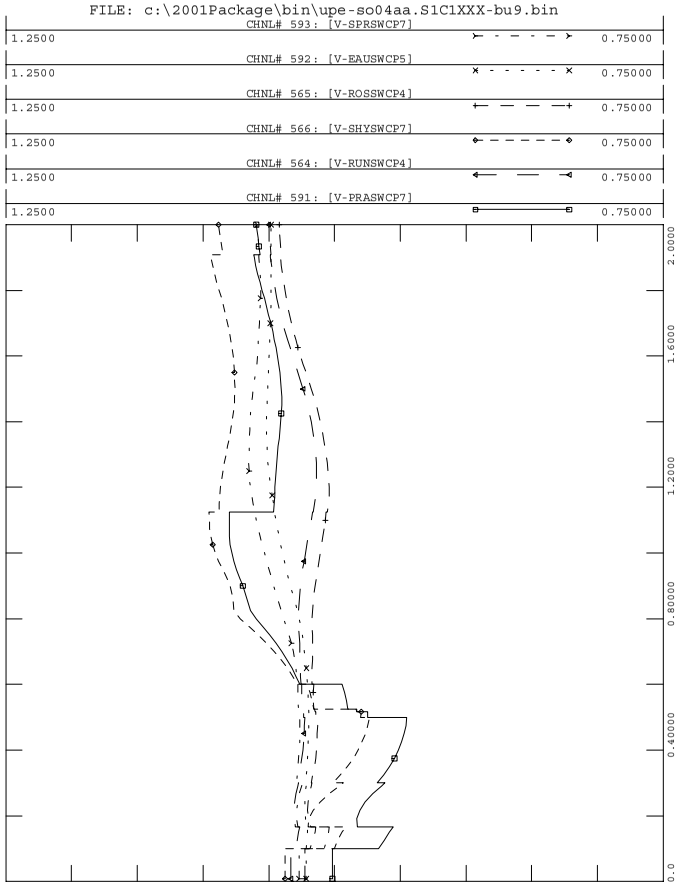
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin



MON, APR 08 2002 10:49
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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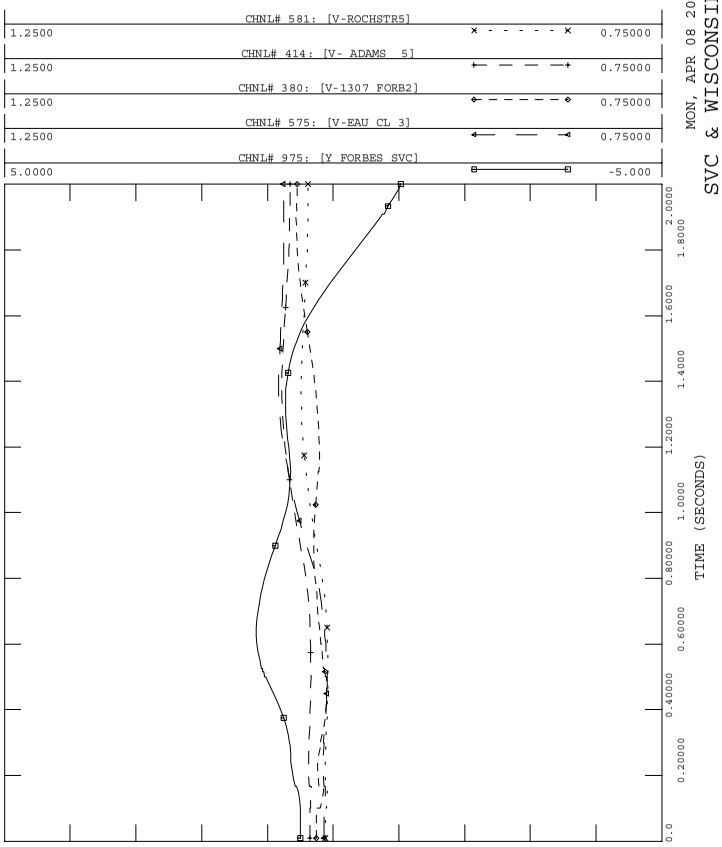
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

MON, APR 08 2002 10:49

SVC & WISCONSIN VOLT



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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
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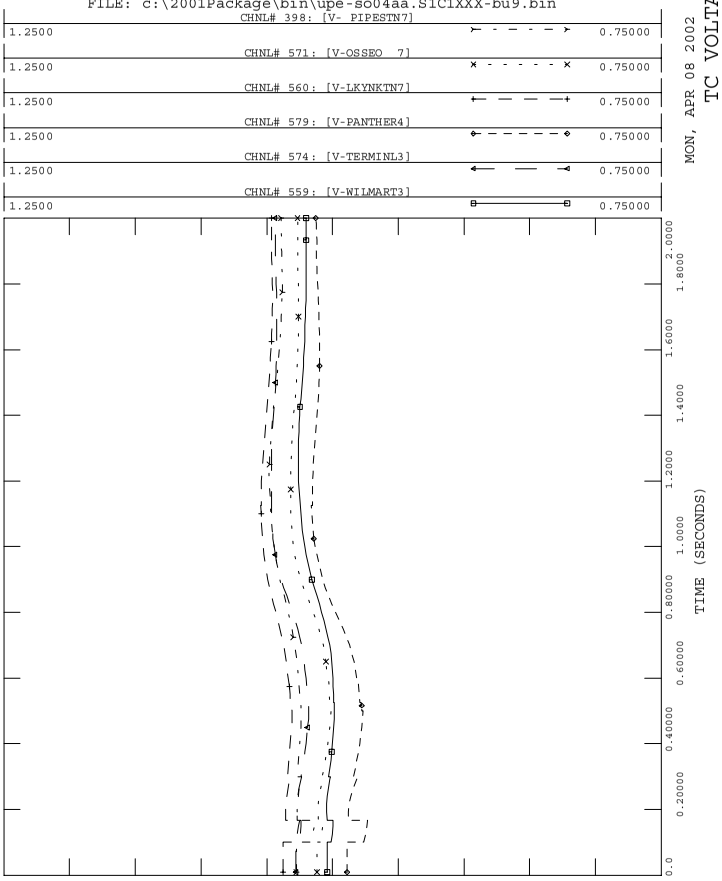
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

MON, APR 08 2002 10:49

TC VOLTAGES



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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
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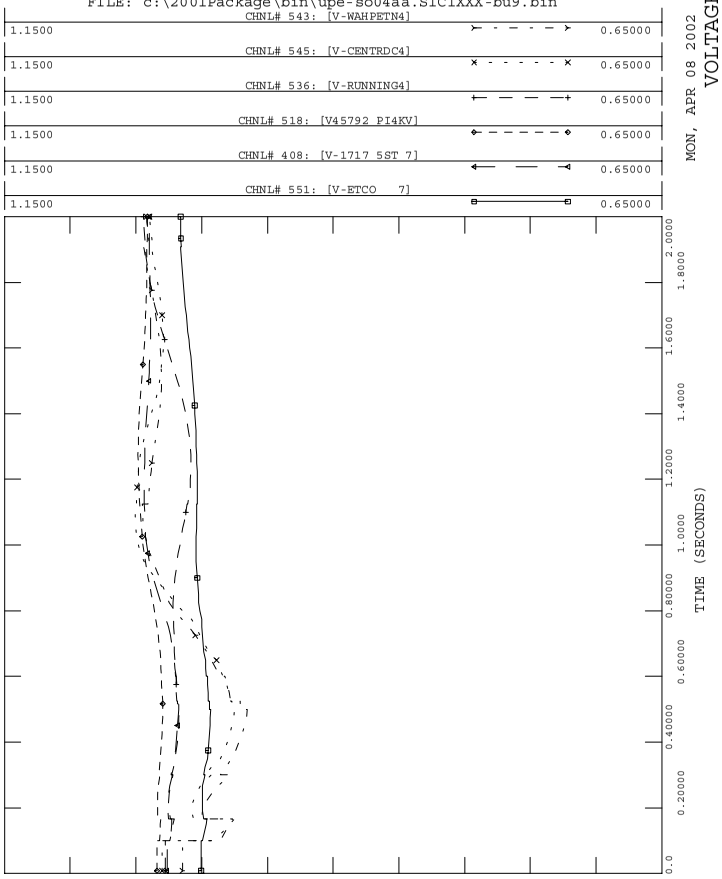
MON, APR 08 2002 10:49

VOLTAGES 6



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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
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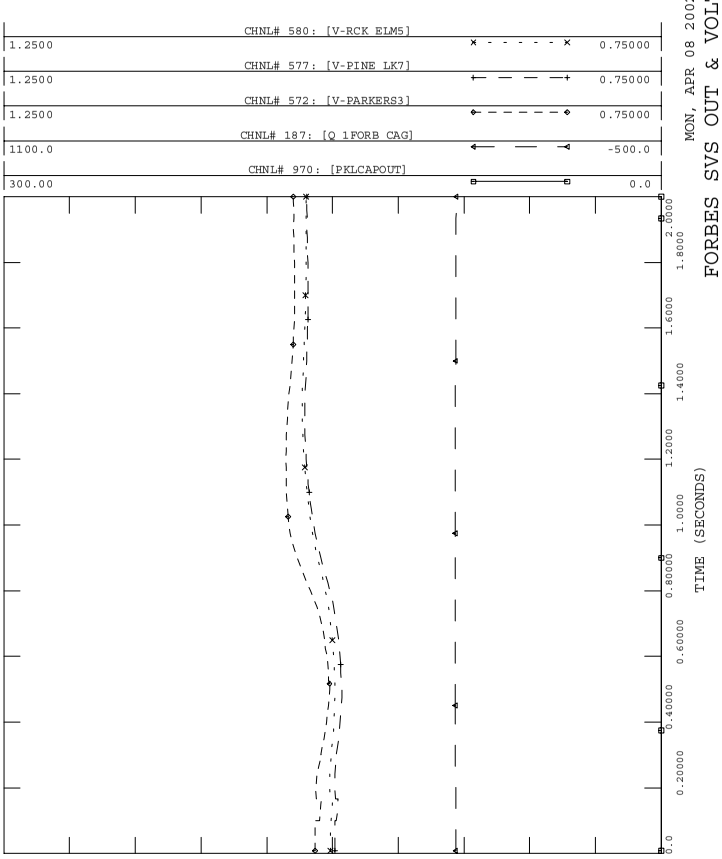
MON, APR 08 2002 10:49

FORBES SVS OUT & VOLTAGES



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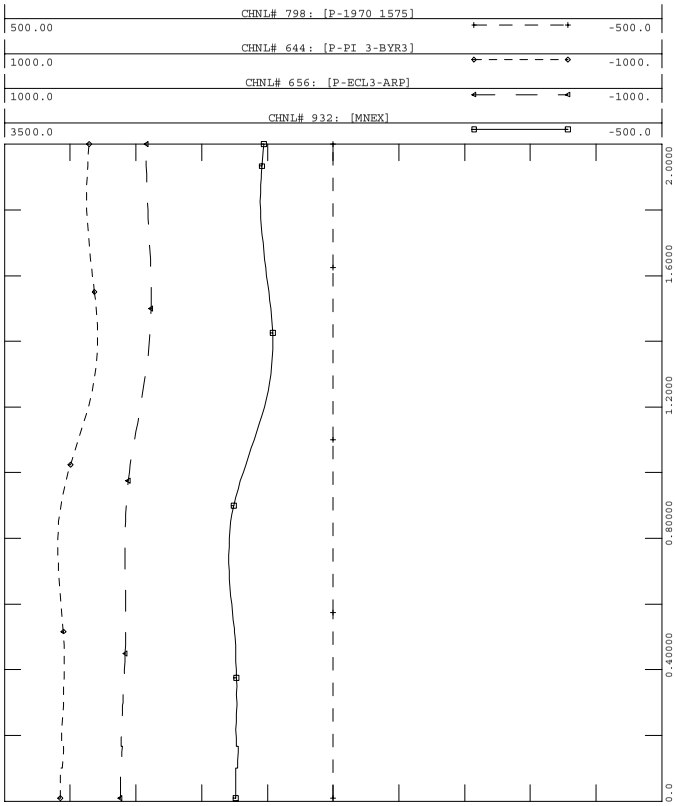
MON, APR 08 2002 10:49
POWER FLOW SUMS 2



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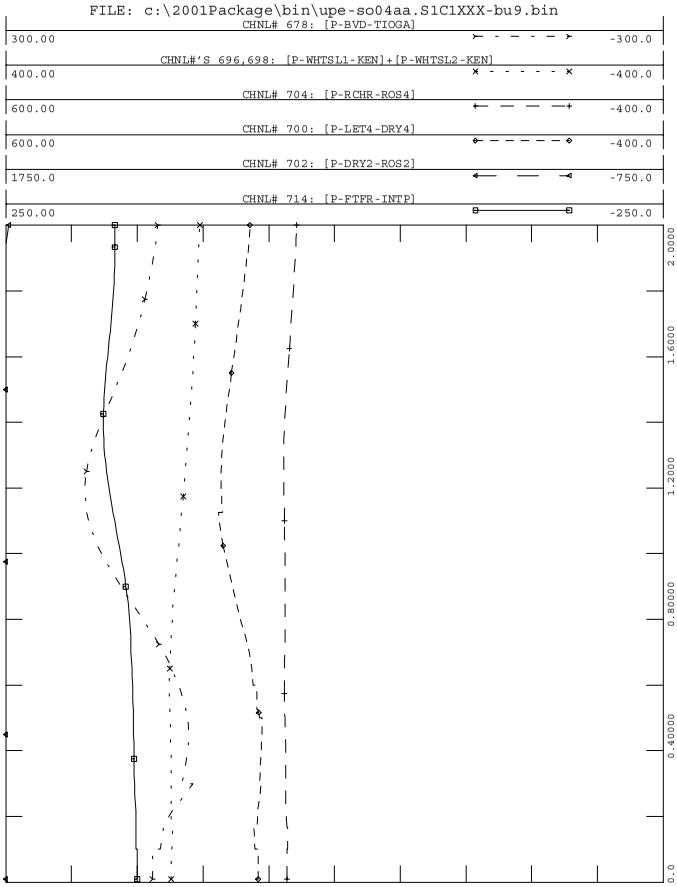
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

MON, APR 08 2002 10:49
CAN. TIE FLOWS



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MON, APR 08 2002 10:49
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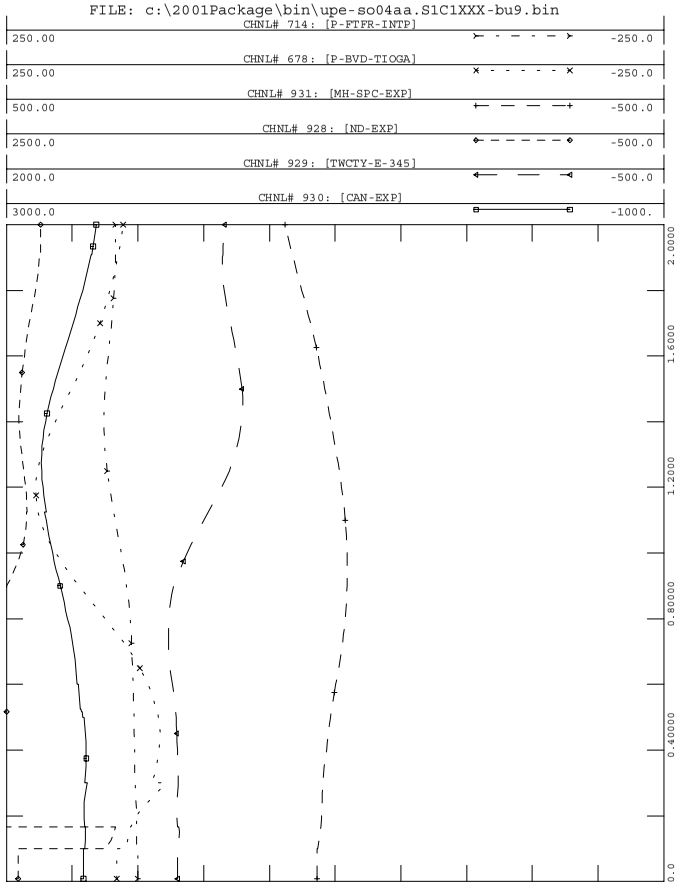

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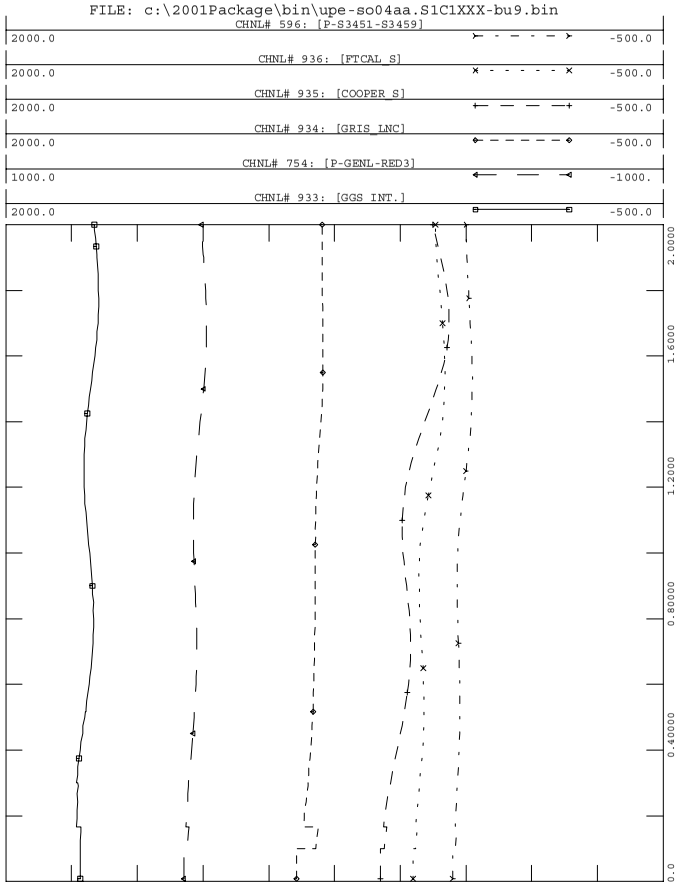
MON, APR 08 2002 10:49
POWER FLOW SUM 3



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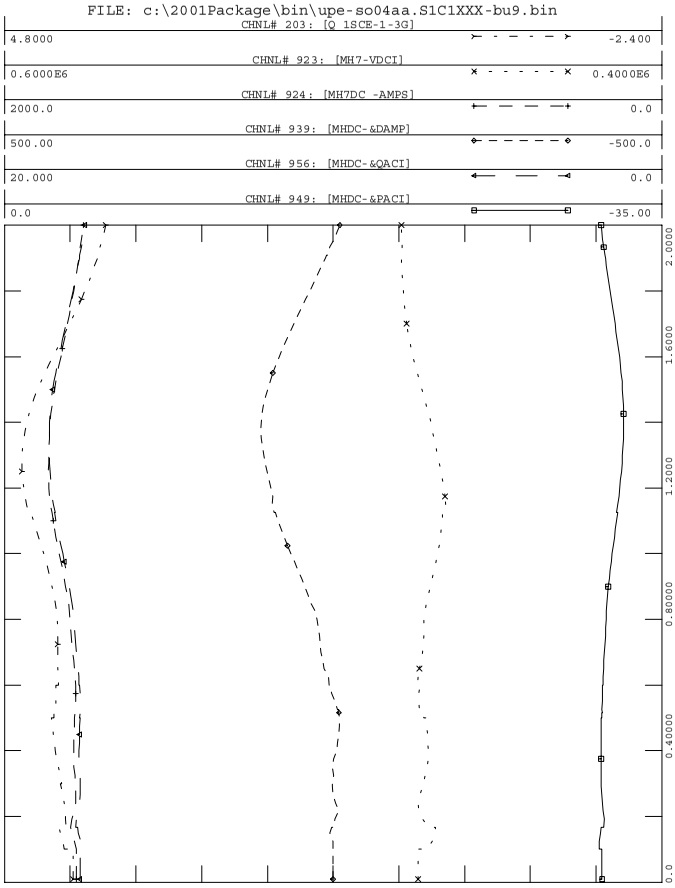
MON, APR 08 2002 10:49
MH DC PARAMETERS



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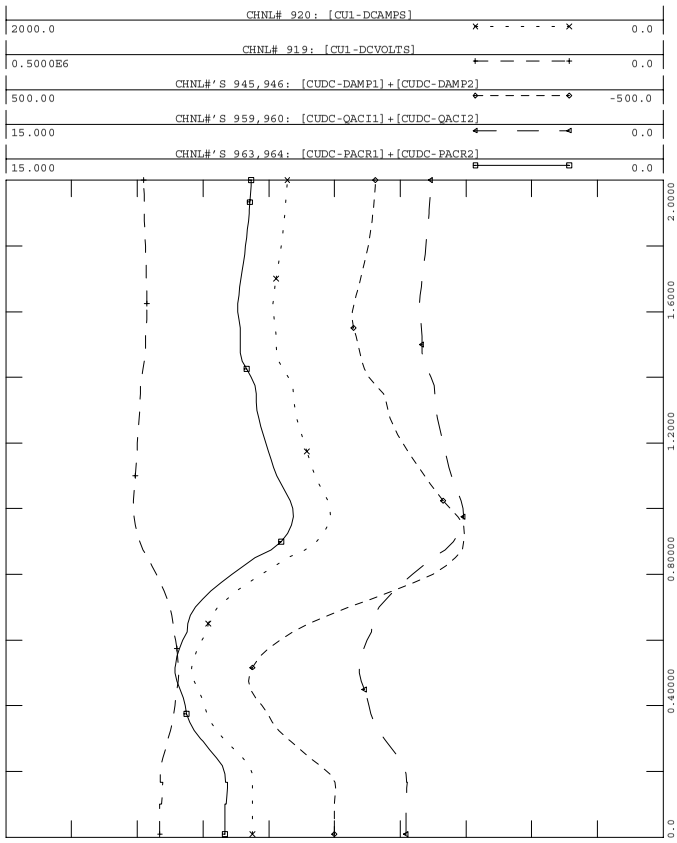
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

MON, APR 08 2002 10:49
CU DC #1



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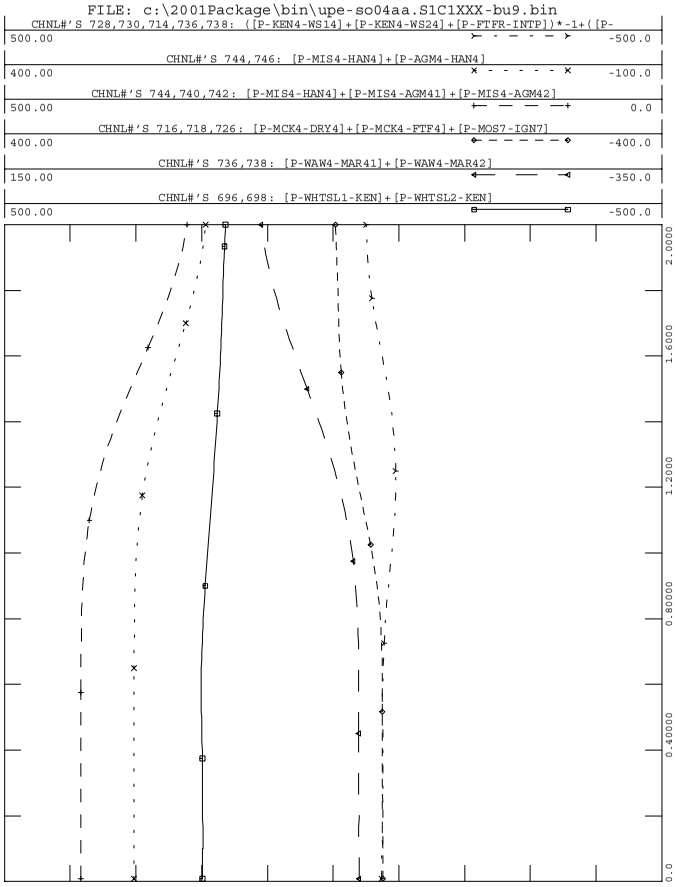
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

MON, APR 08 2002 10:49
OH TIE FLOWS



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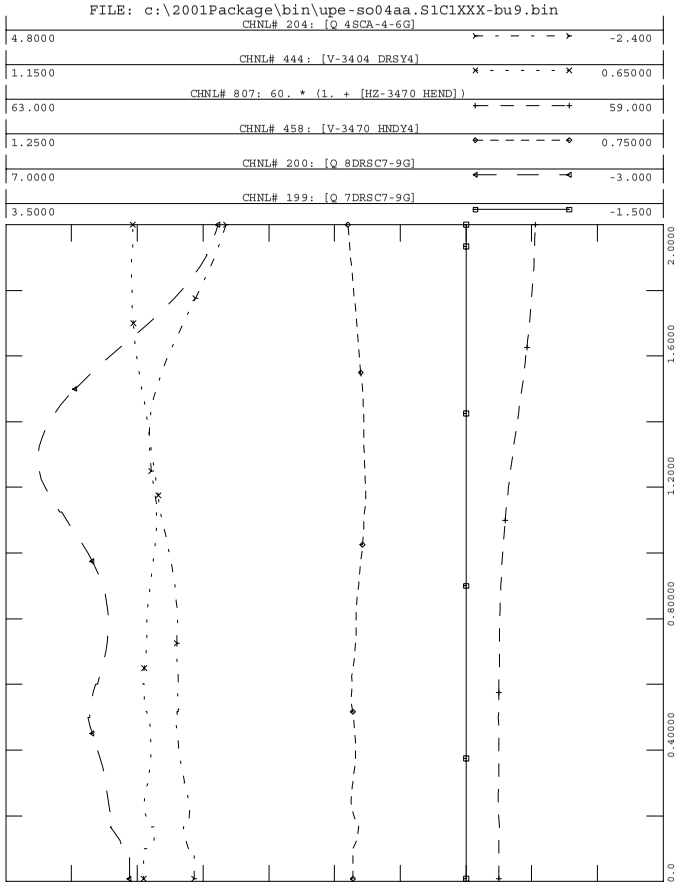
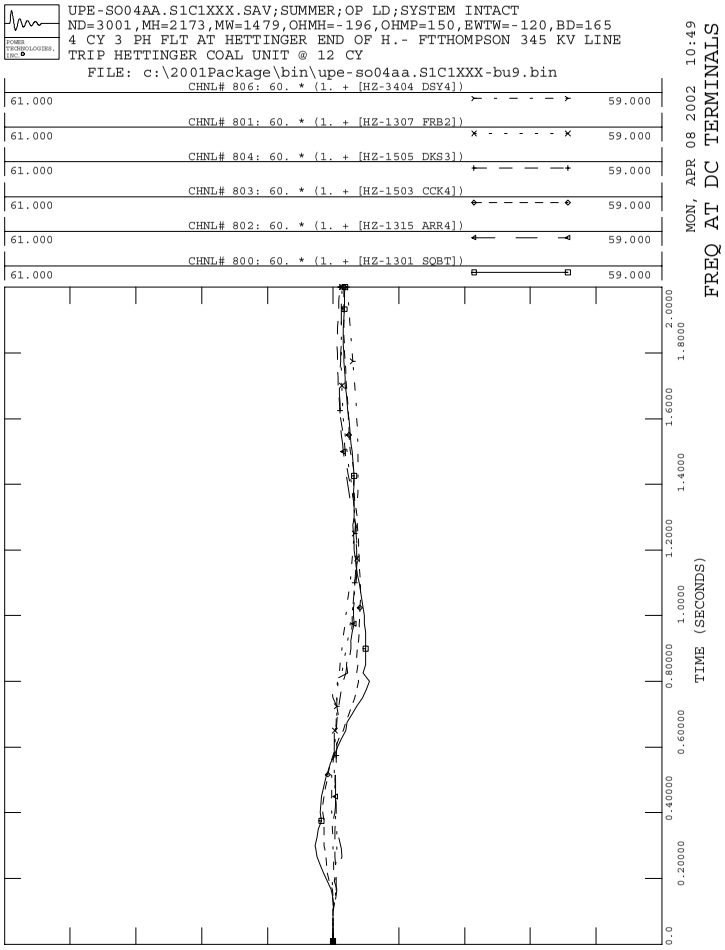
MH DC PARAMETERS

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ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
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TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin
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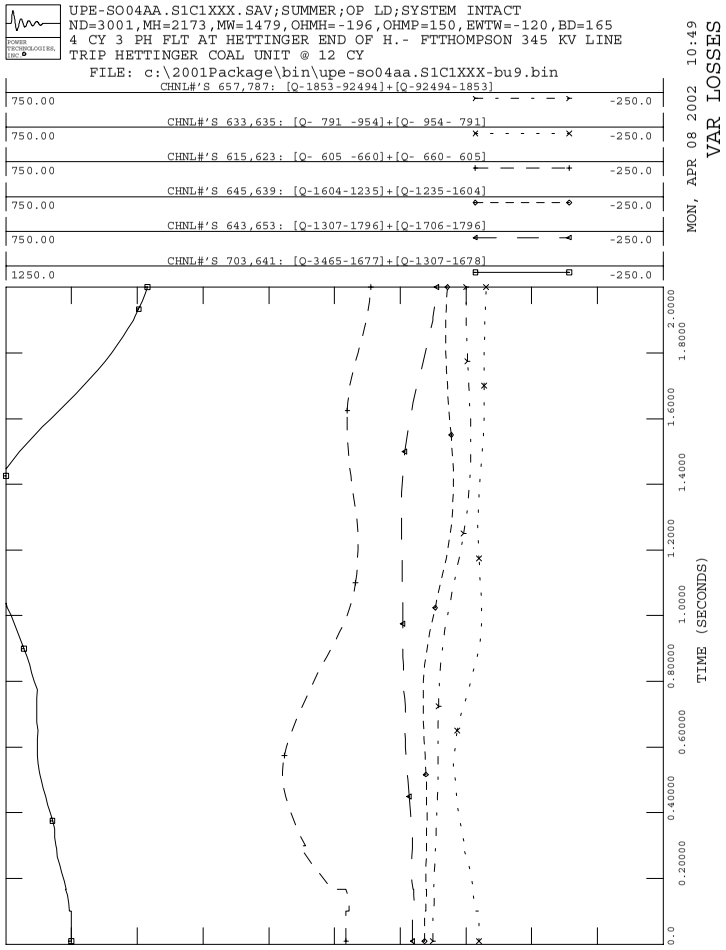
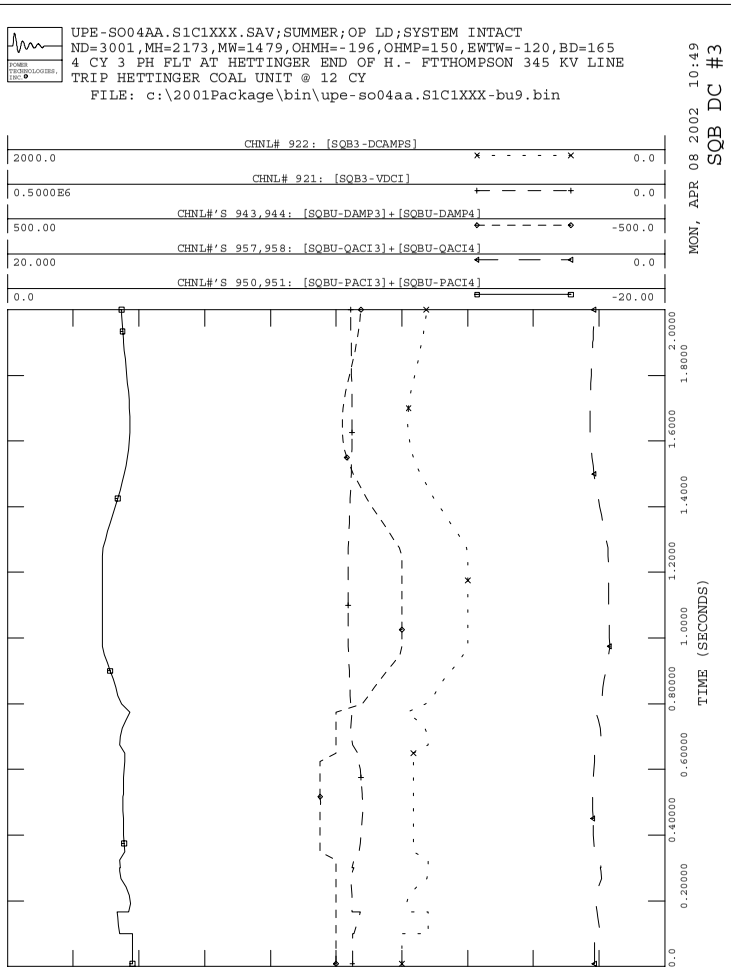
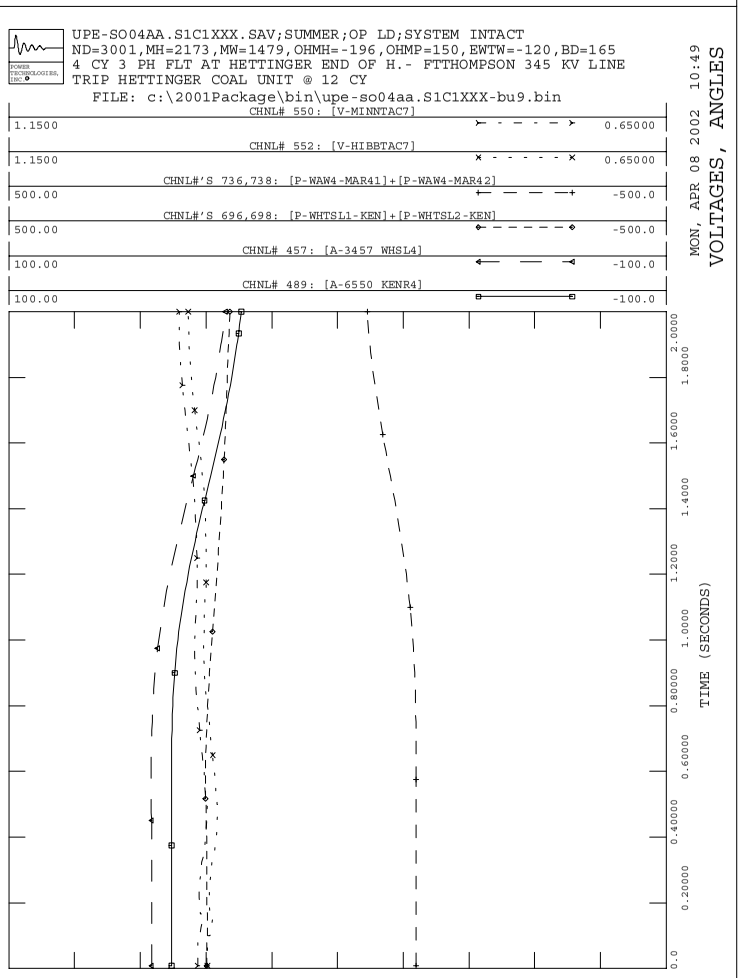
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
MON, APR 08 2002 10:49
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
MON, APR 08 2002 10:49
VAR LOSSES
TIME (SECONDS)

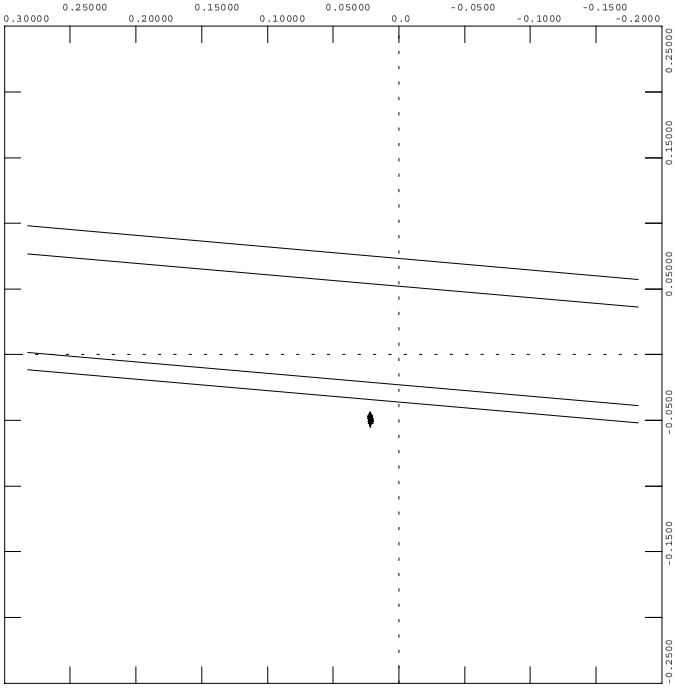

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
MON, APR 08 2002 10:49
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
MON, APR 08 2002 10:49
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

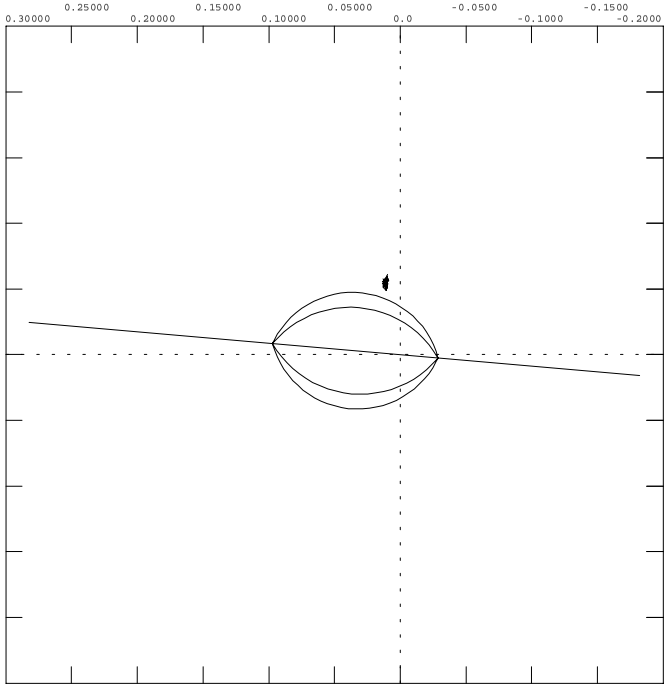


MON, APR 08 2002 10:49
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

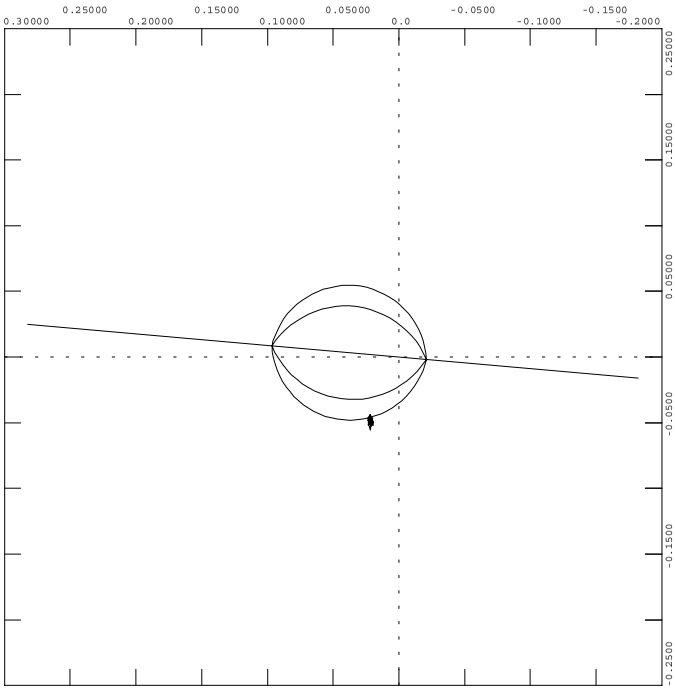


MON, APR 08 2002 10:49
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

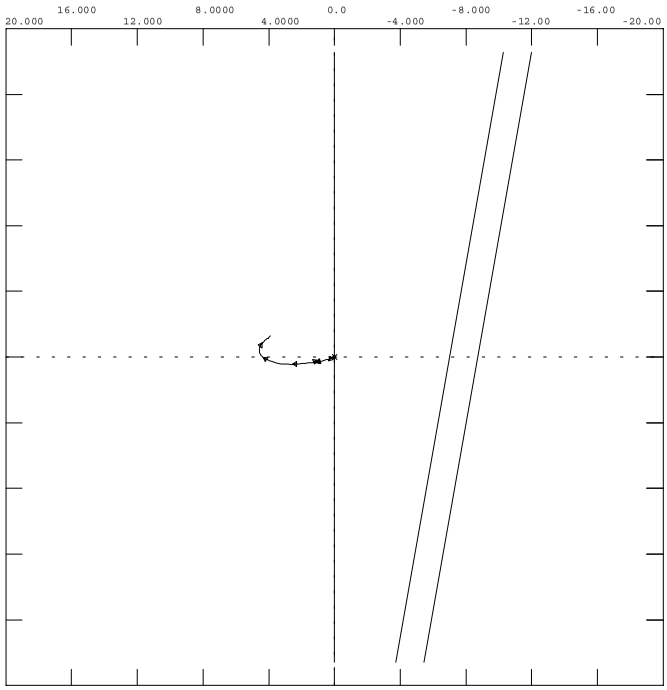


MON, APR 08 2002 10:49
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

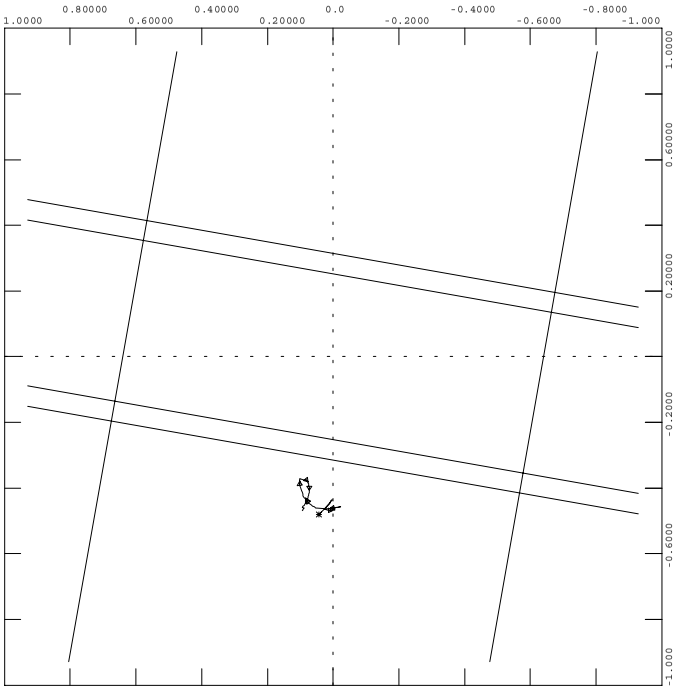


MON, APR 08 2002 10:49
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

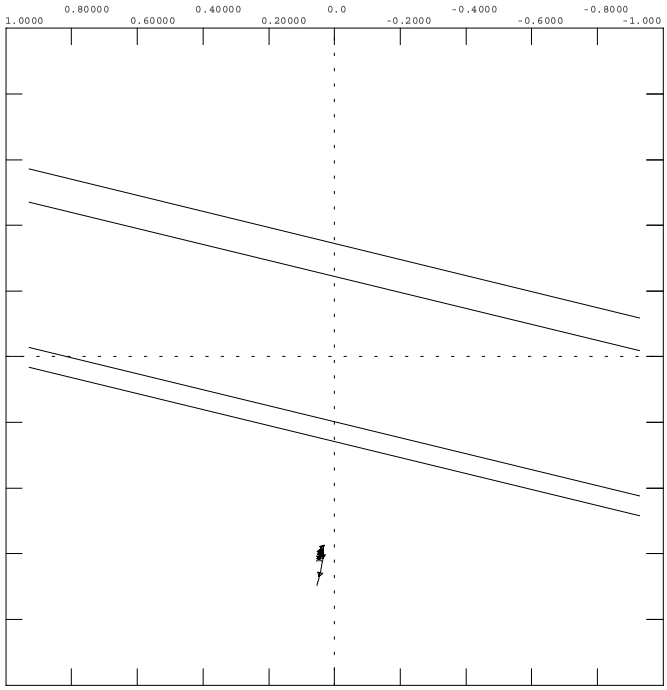
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

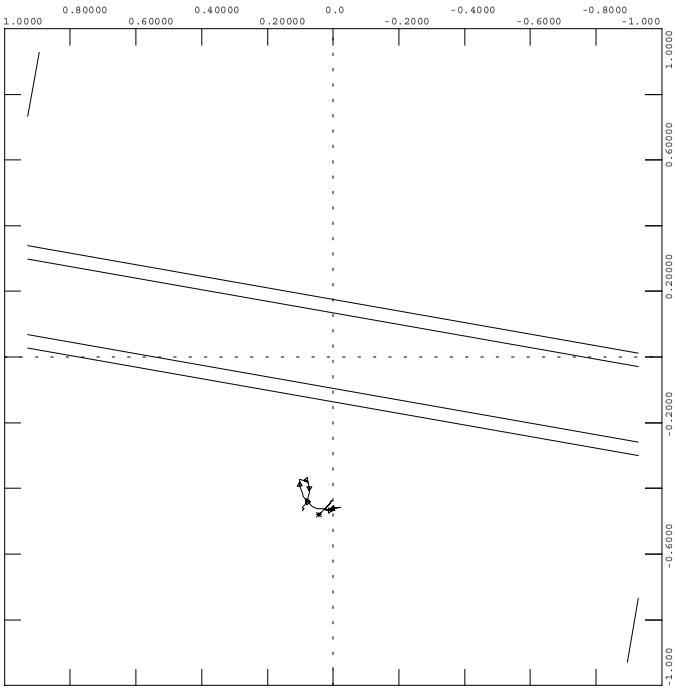
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

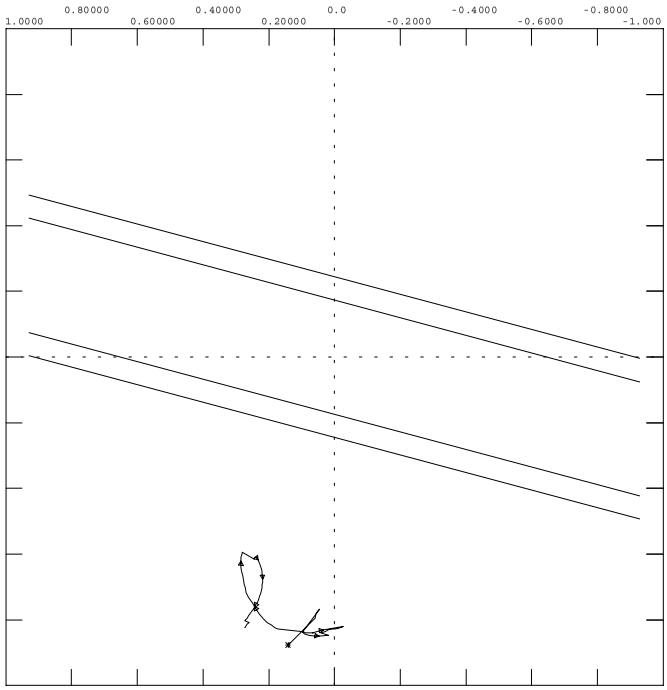
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

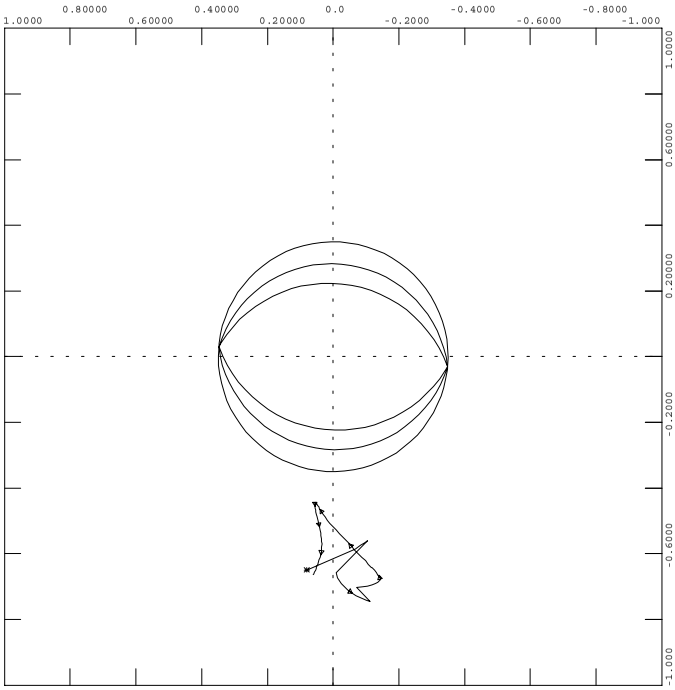
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

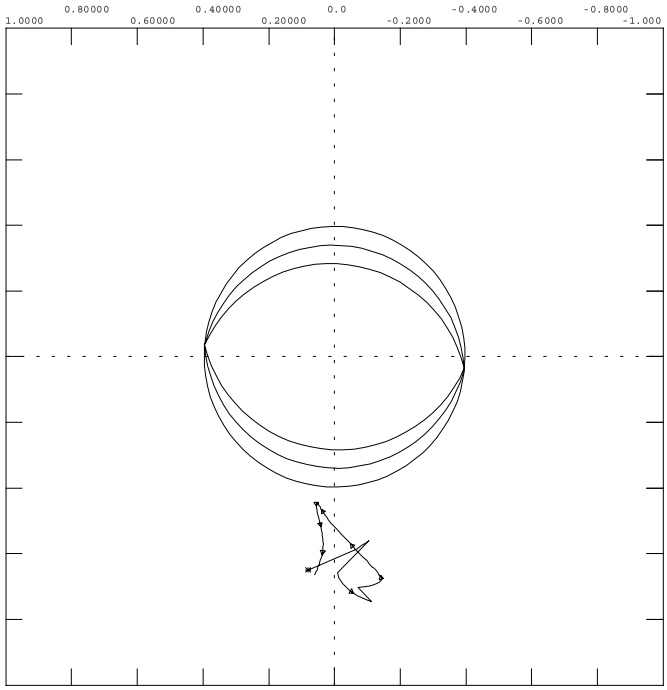
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

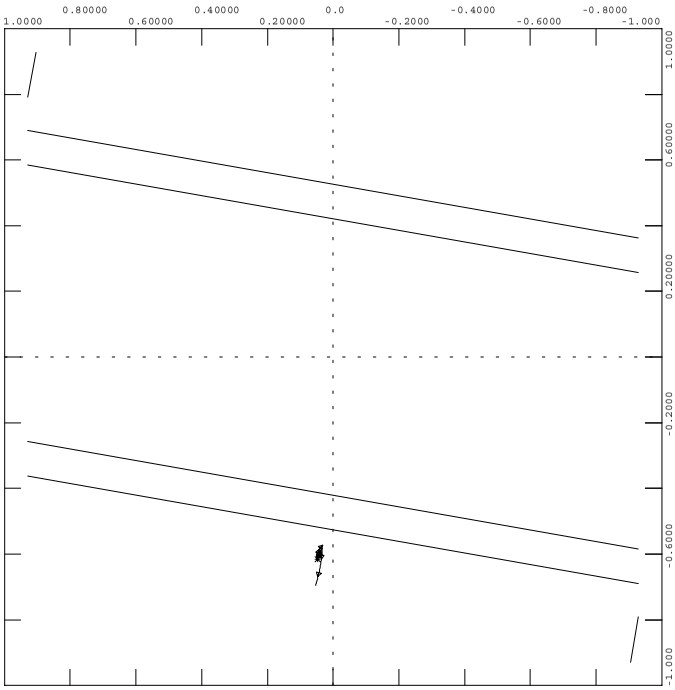
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

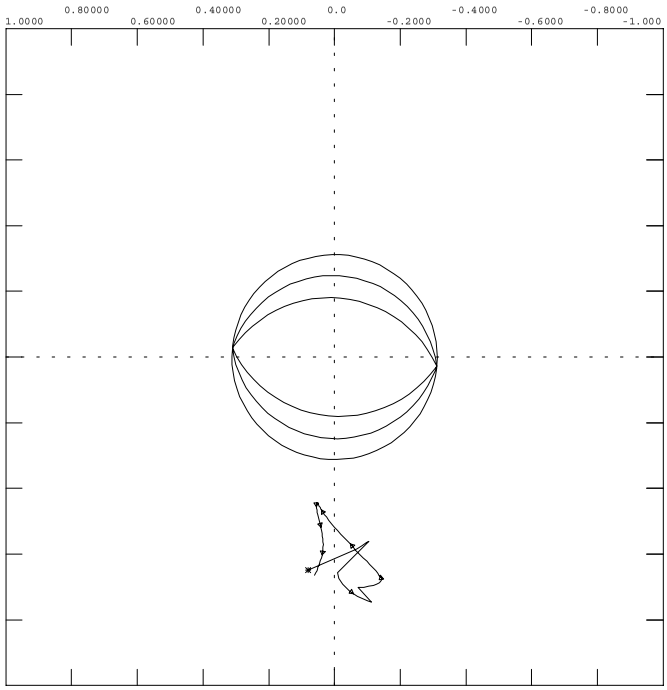
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



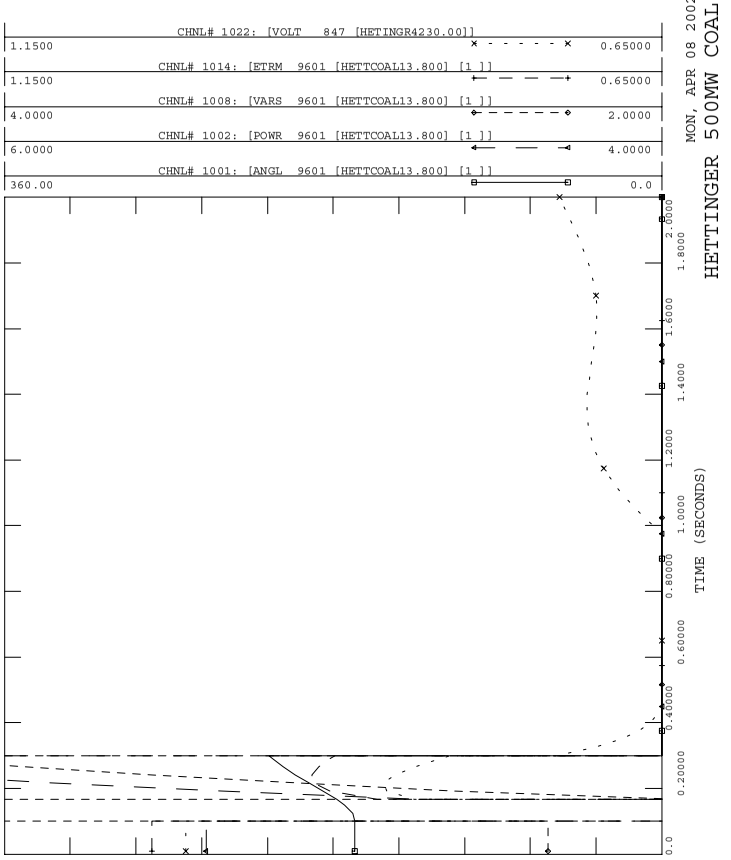
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

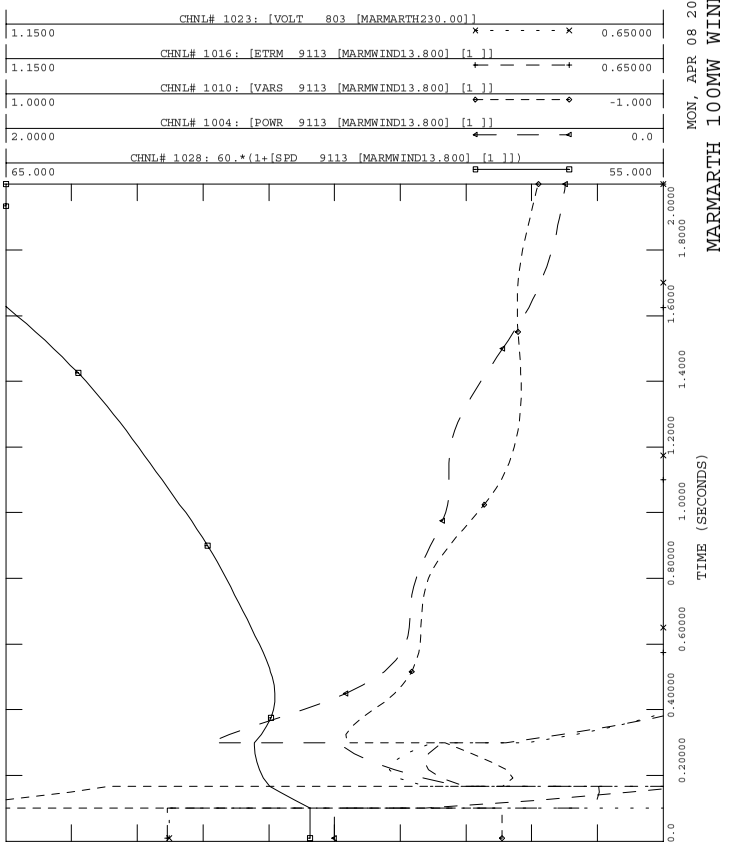


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin



MON, APR 08 2002 10:49
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

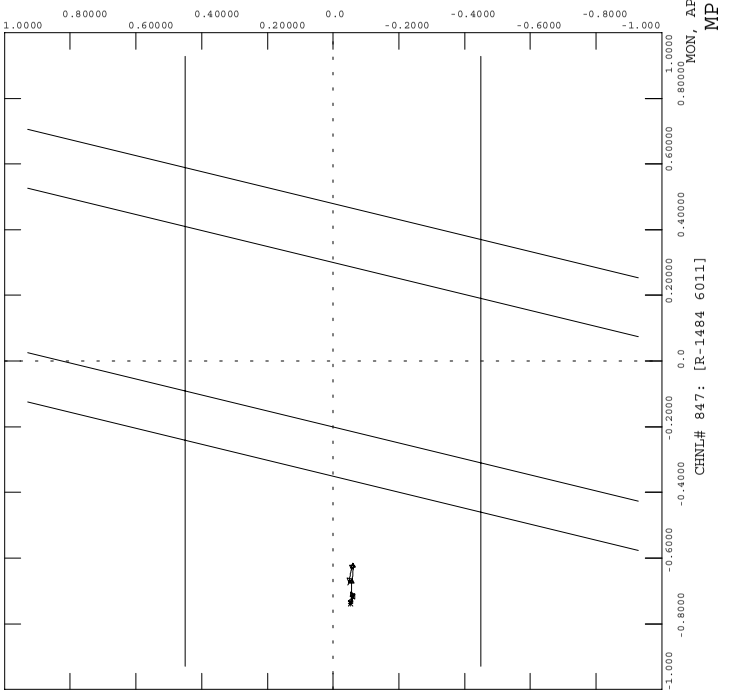


MON, APR 08 2002 10:49
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
TRIP HETTINGER COAL UNIT @ 12 CY

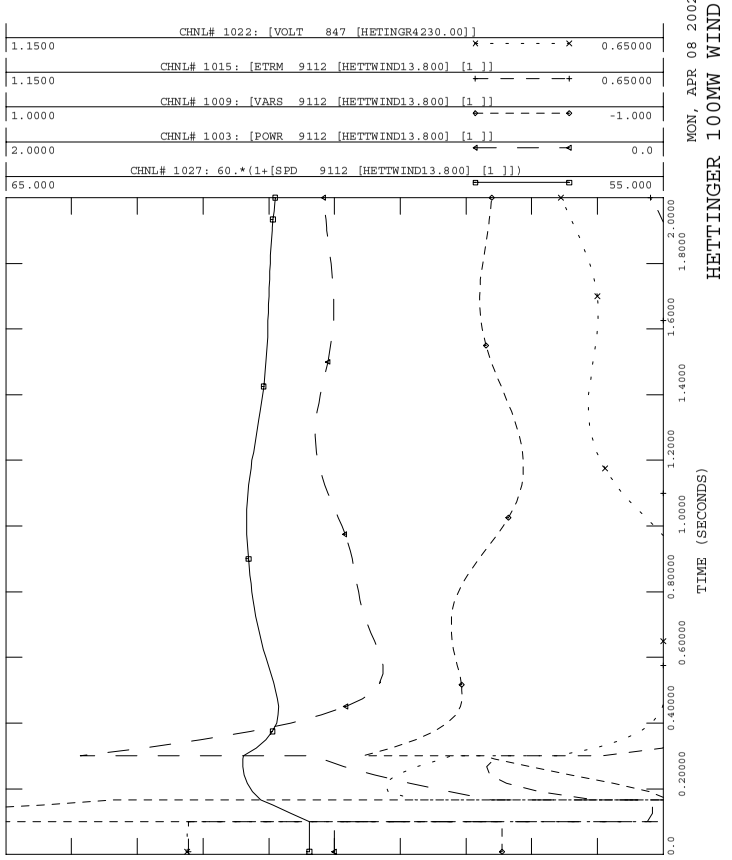
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, APR 08 2002 10:49
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

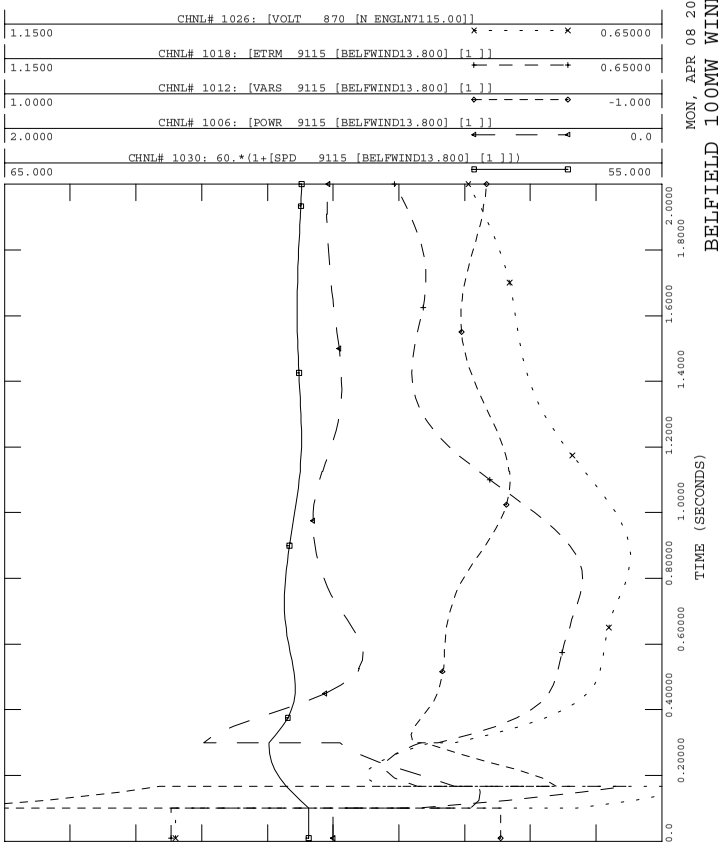


MON, APR 08 2002 10:49
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

MON, APR 08 2002 10:49

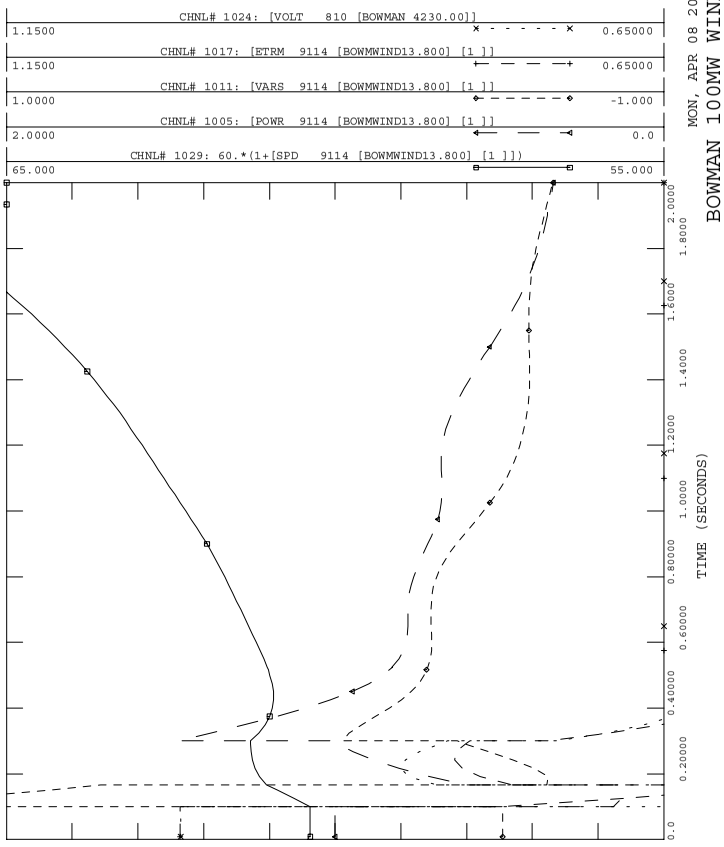
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

MON, APR 08 2002 10:49

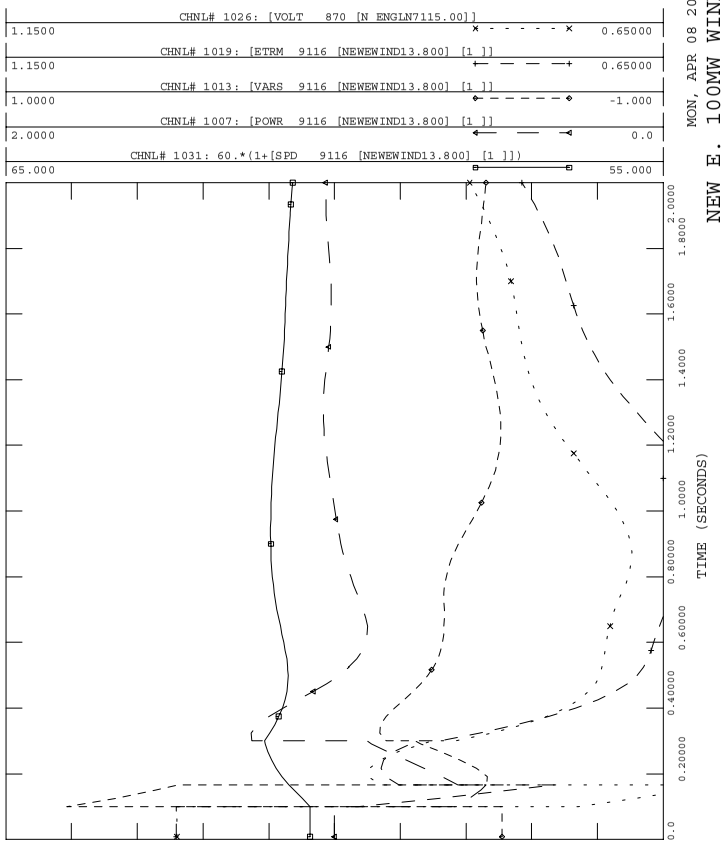
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-bu9.bin

MON, APR 08 2002 10:49

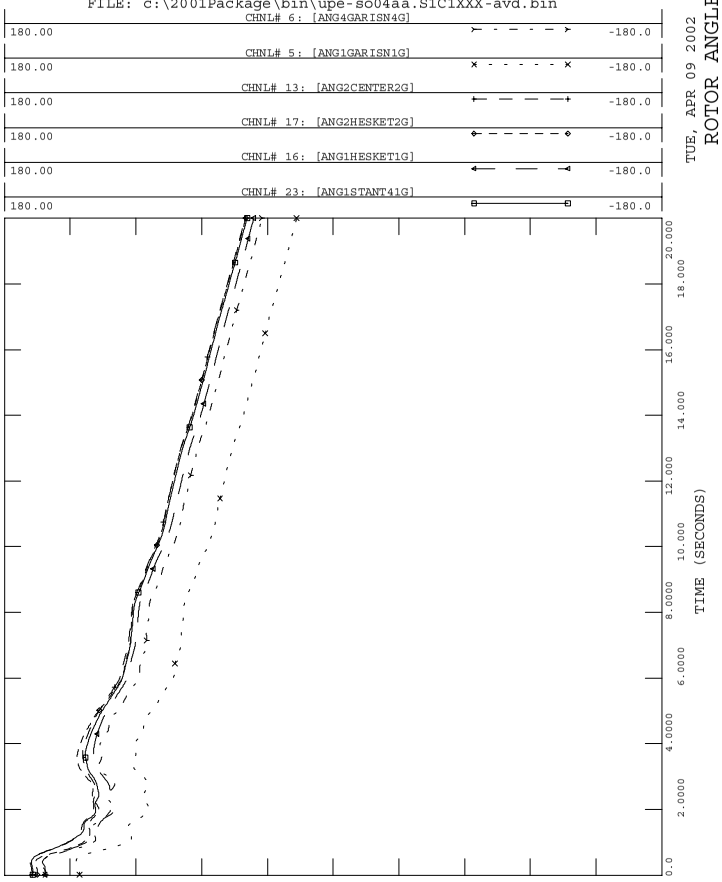
NEW E. 100MW WIND UNIT



CONTINGENCY AVD

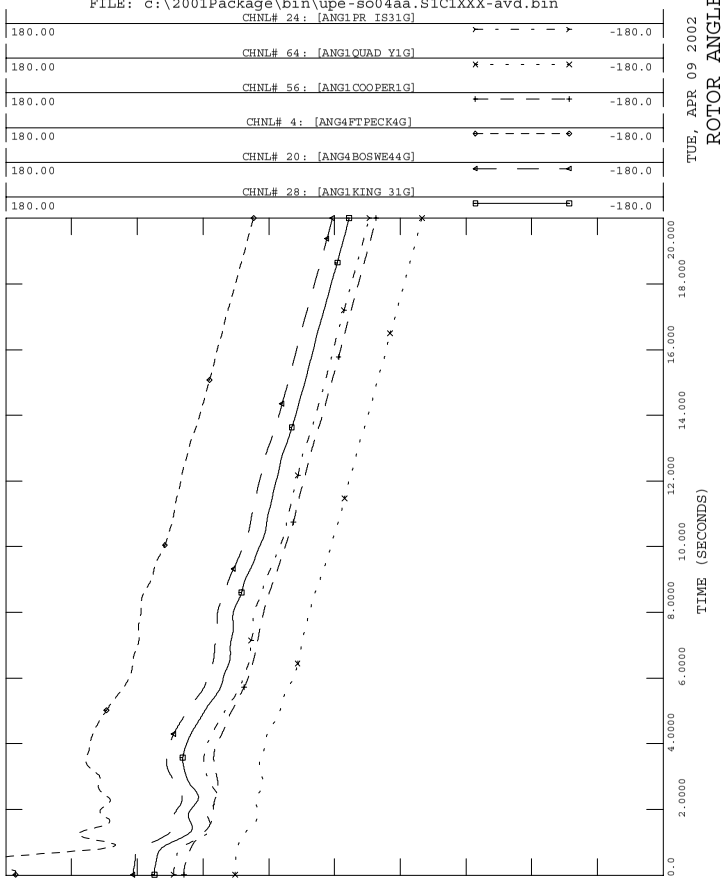
4 cycle 3 phase fault at Hettinger end of Hettinger - Belfield 345 kV line. Trip Hettinger coal and Bowman/Marmarth wind @ 12 cy

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



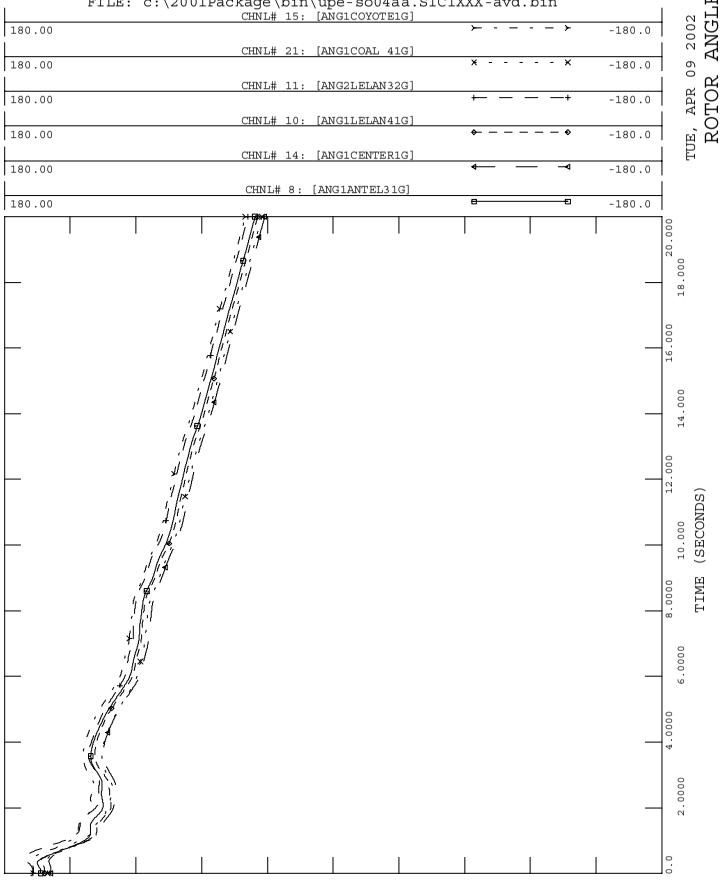
TUE, APR 09 2002 20:00
ROTOR ANGLES 2

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



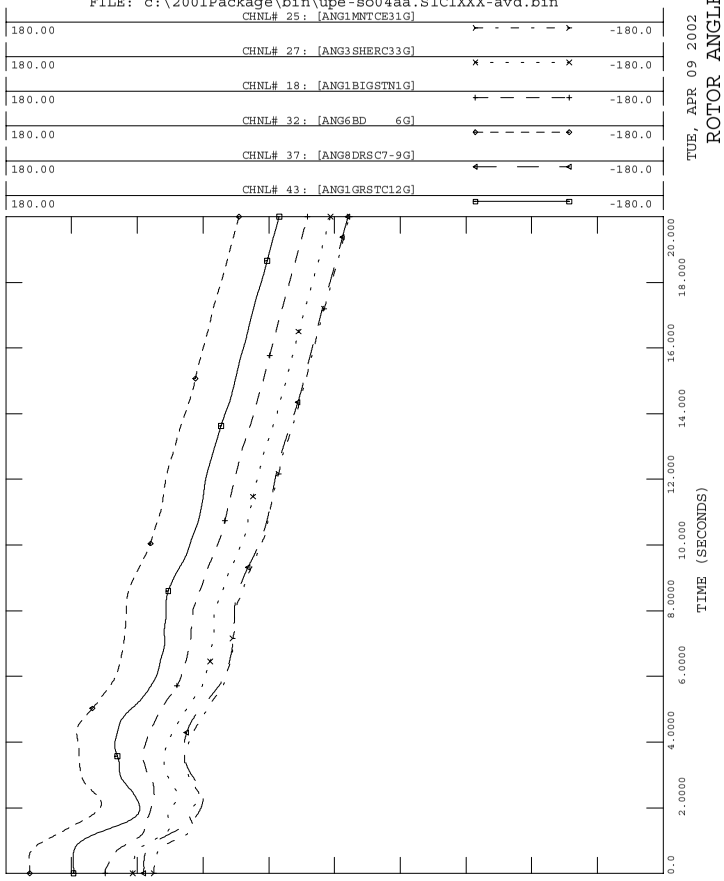
TUE, APR 09 2002 20:00
ROTOR ANGLES 4

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

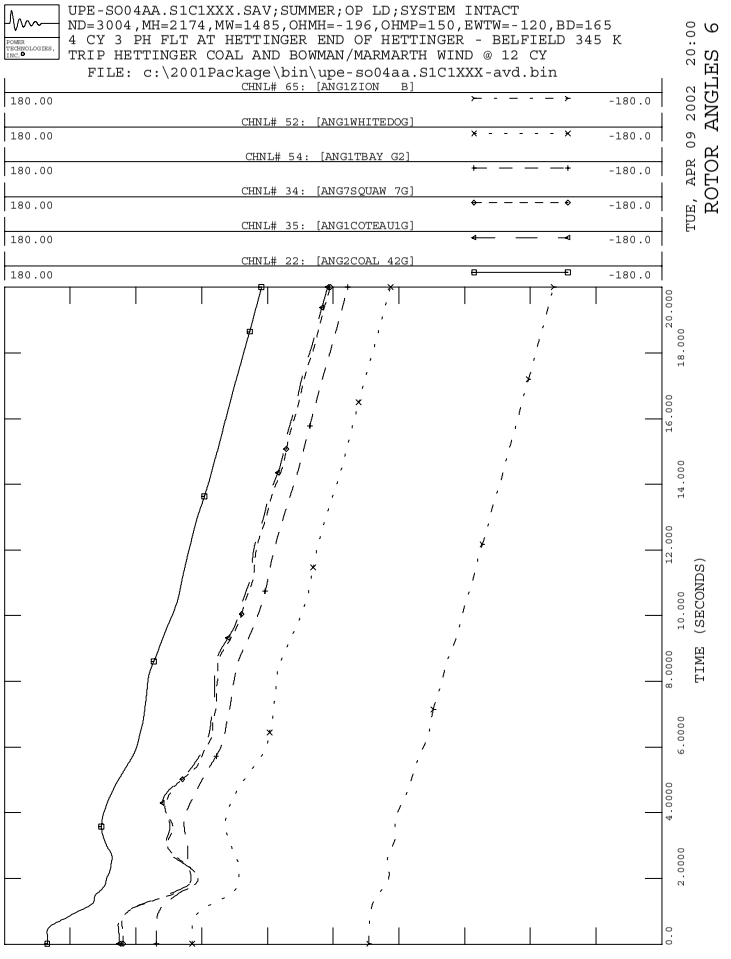


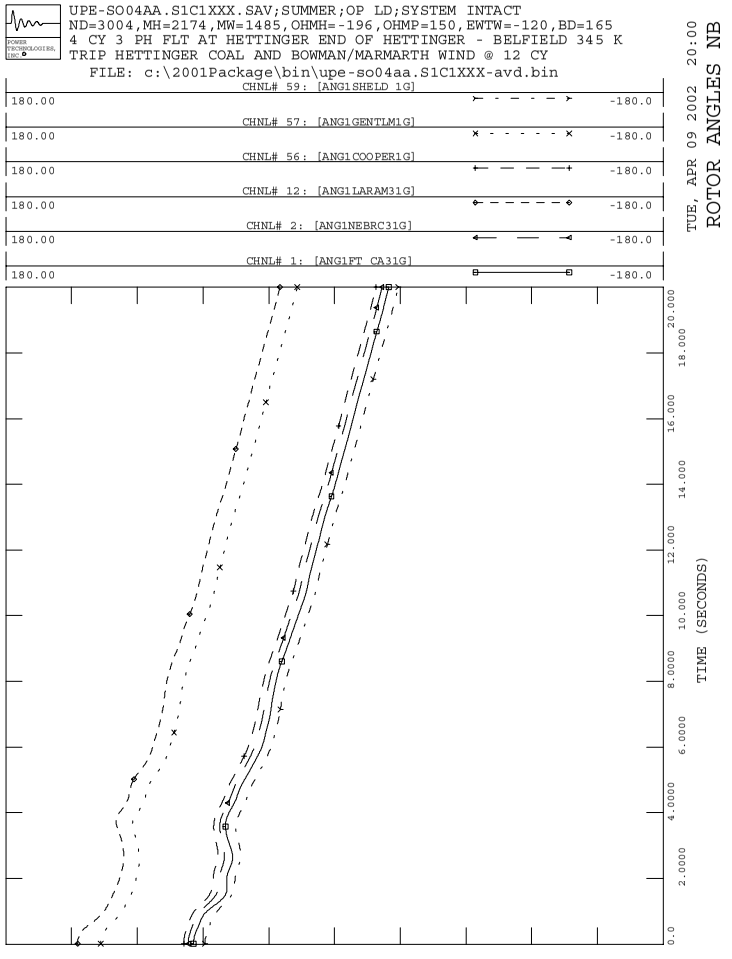
TUE, APR 09 2002 20:00
ROTOR ANGLES 1

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



TUE, APR 09 2002 20:00
ROTOR ANGLES 3


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:00
ROTOR ANGLES 6


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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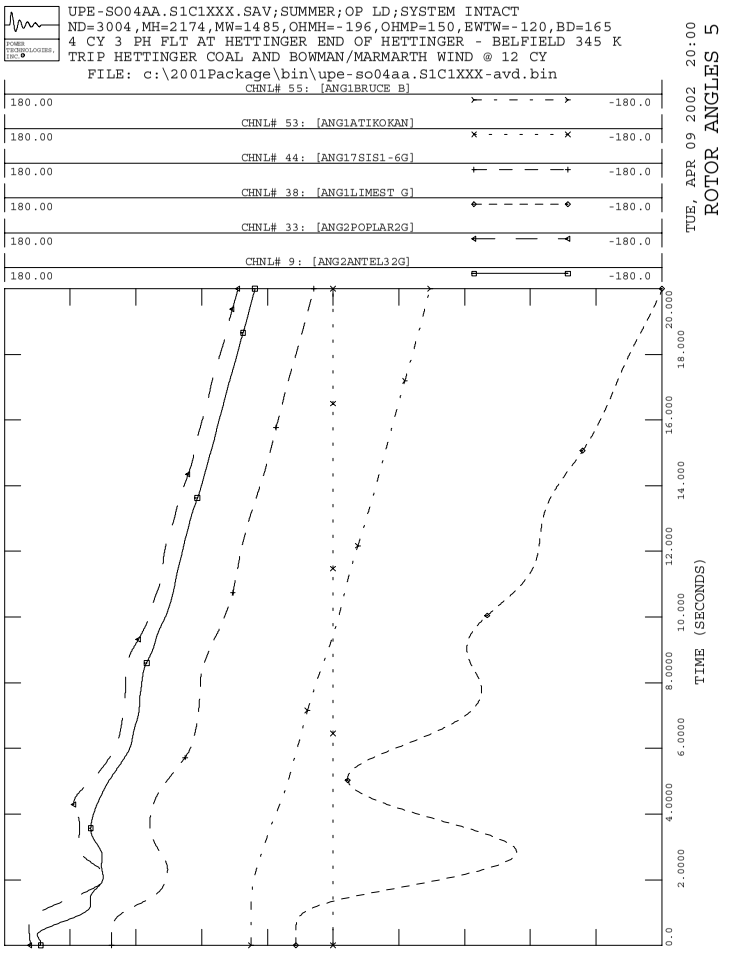
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:00
ROTOR ANGLES NB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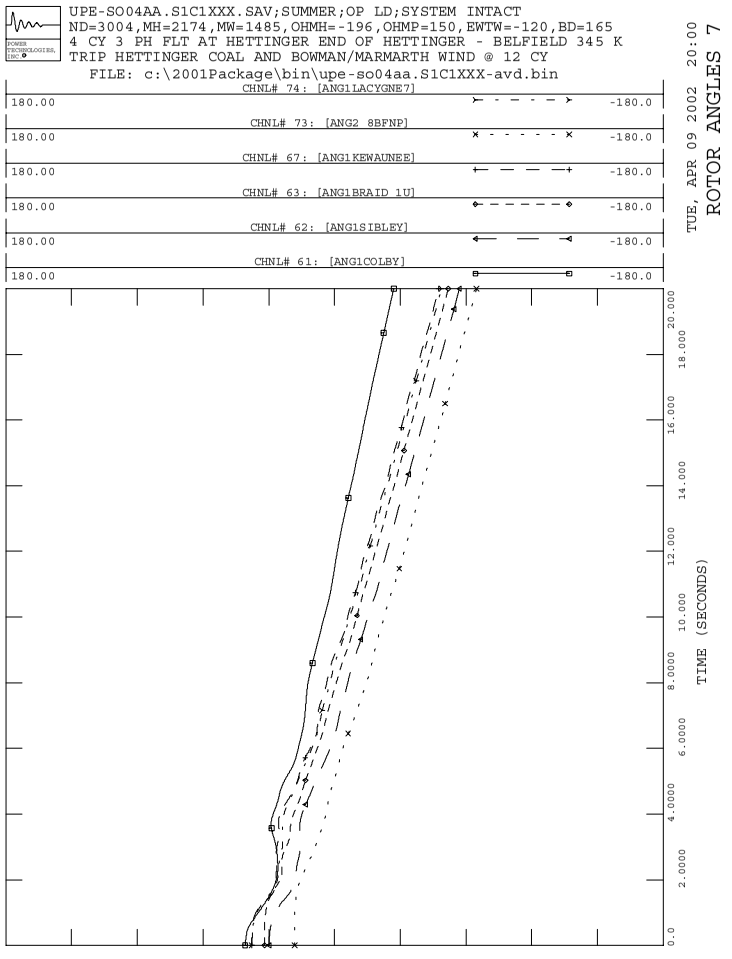
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:00
ROTOR ANGLES 5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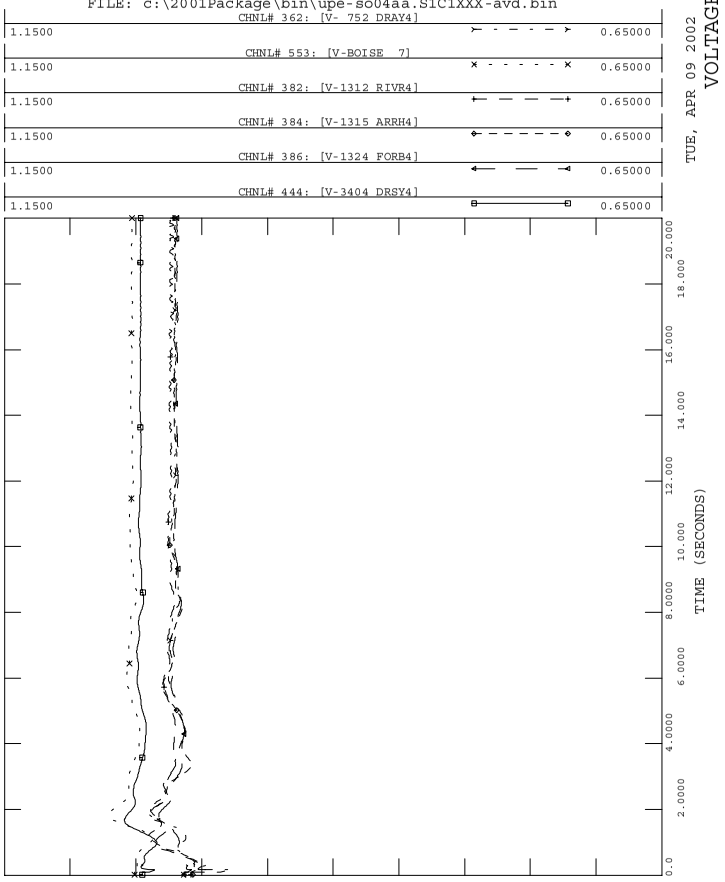
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:00
ROTOR ANGLES 7

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



TUE, APR 09 2002 20:00
VOLTAGES 1

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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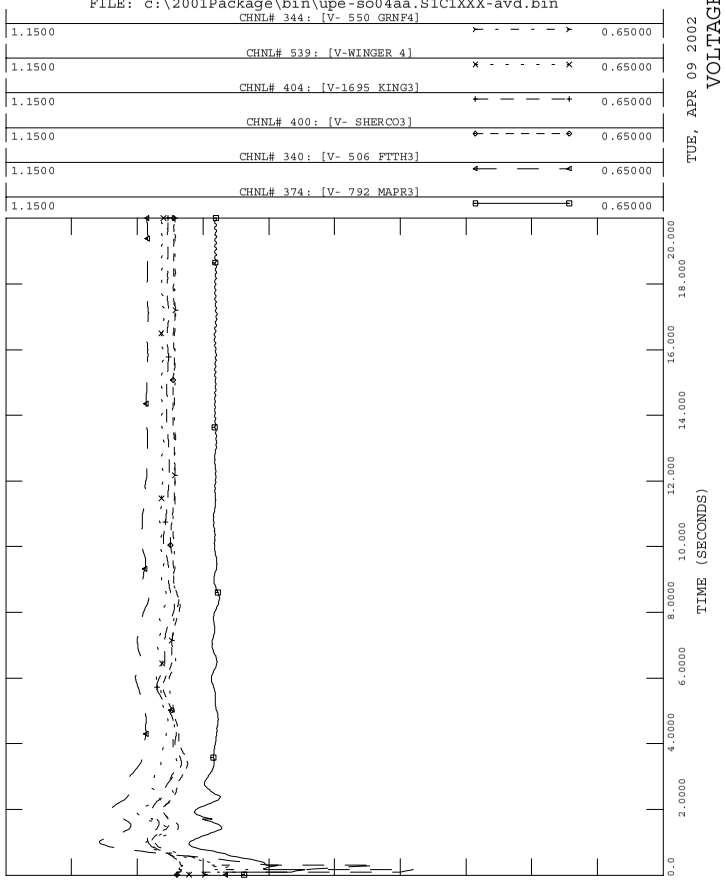
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



TUE, APR 09 2002 20:00
VOLTAGES 3

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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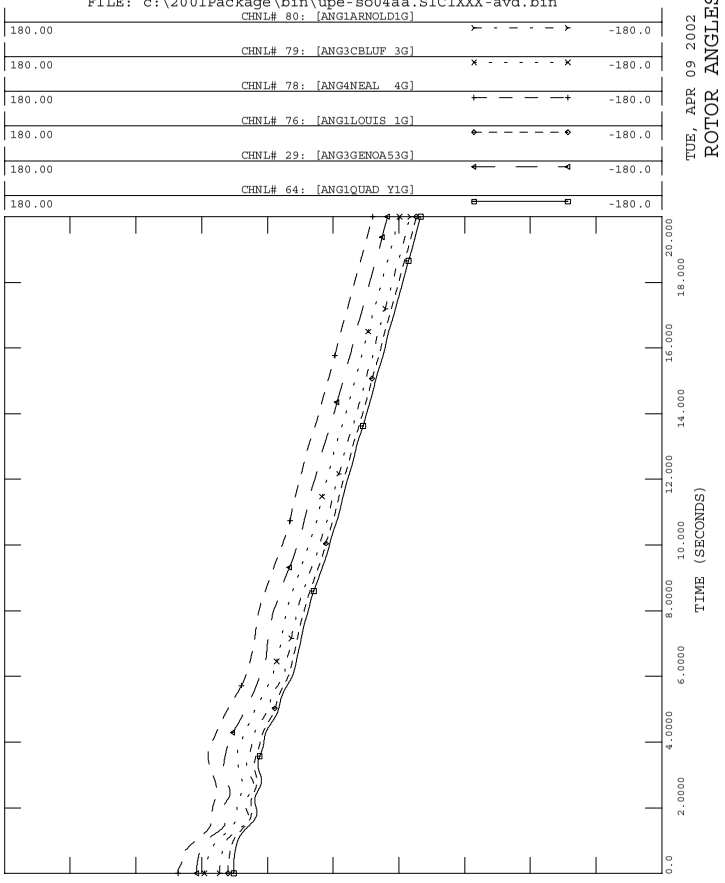
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



TUE, APR 09 2002 20:00
ROTOR ANGLES IA

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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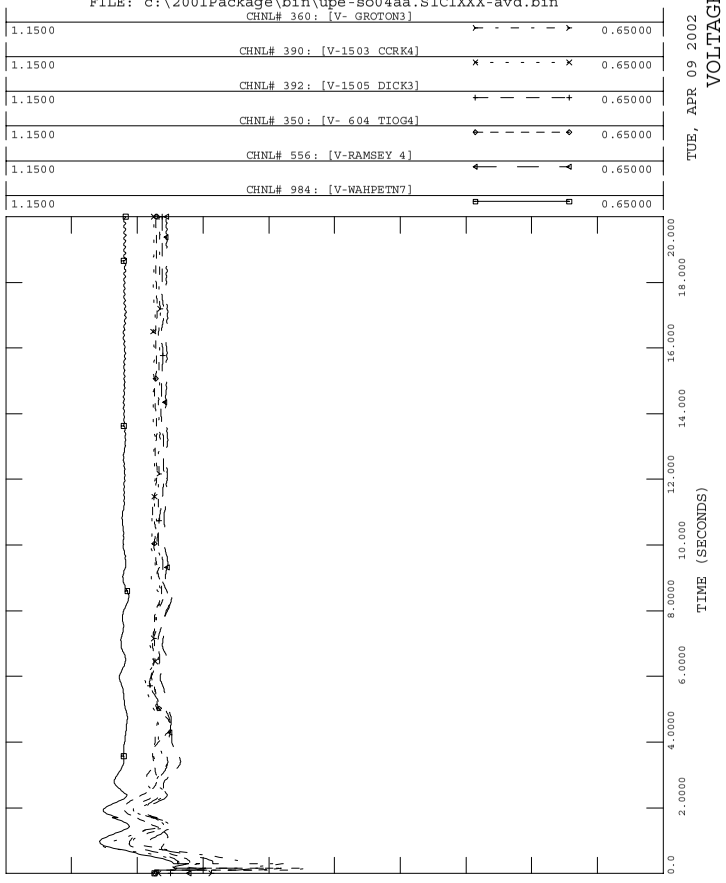
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



TUE, APR 09 2002 20:00
VOLTAGES 2

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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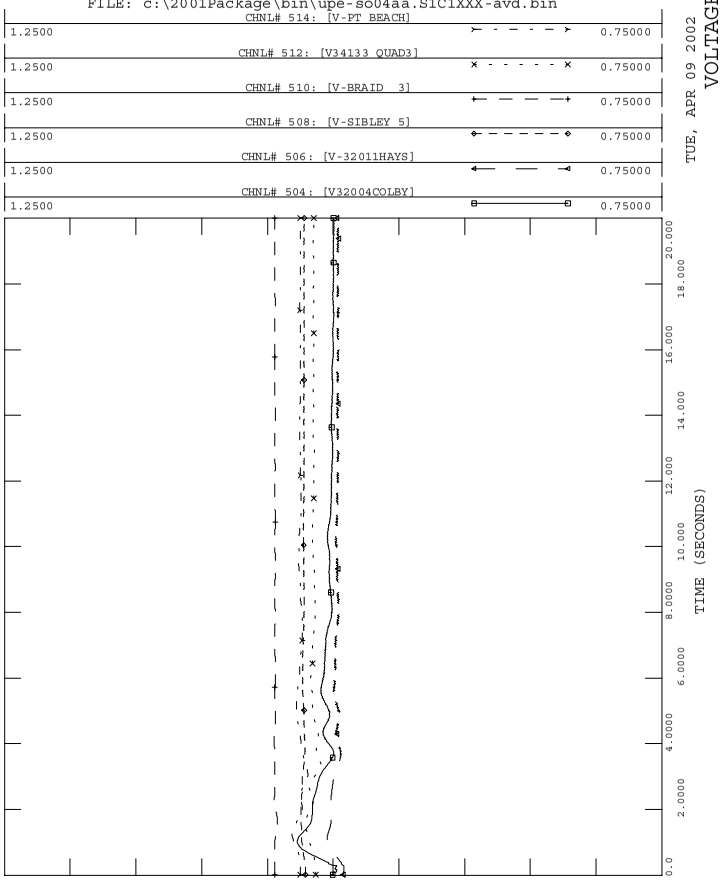
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



TUE, APR 09 2002 20:00
VOLTAGES 5

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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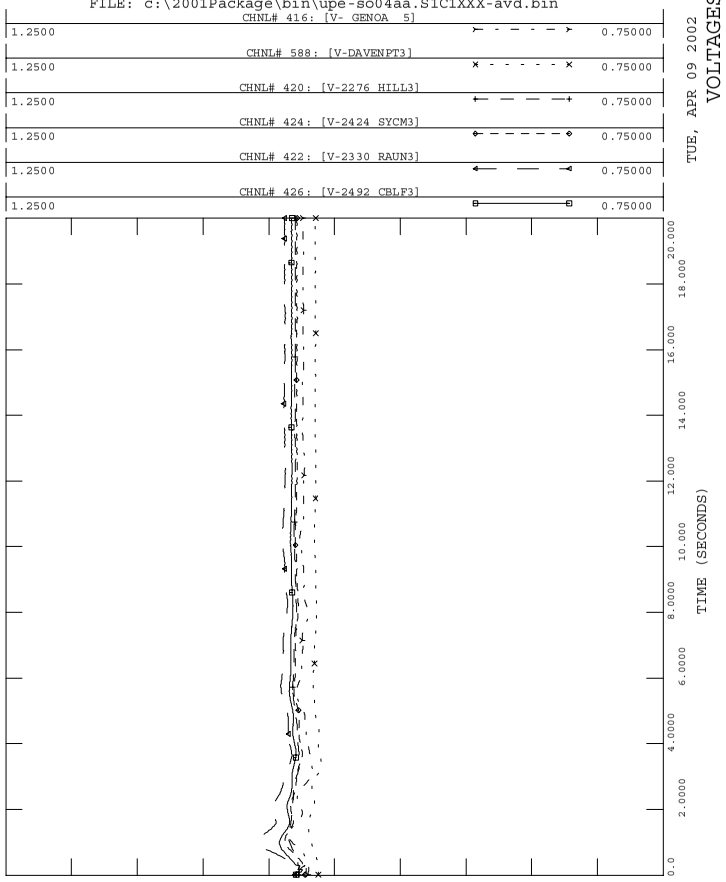
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



TUE, APR 09 2002 20:00
VOLTAGES IA

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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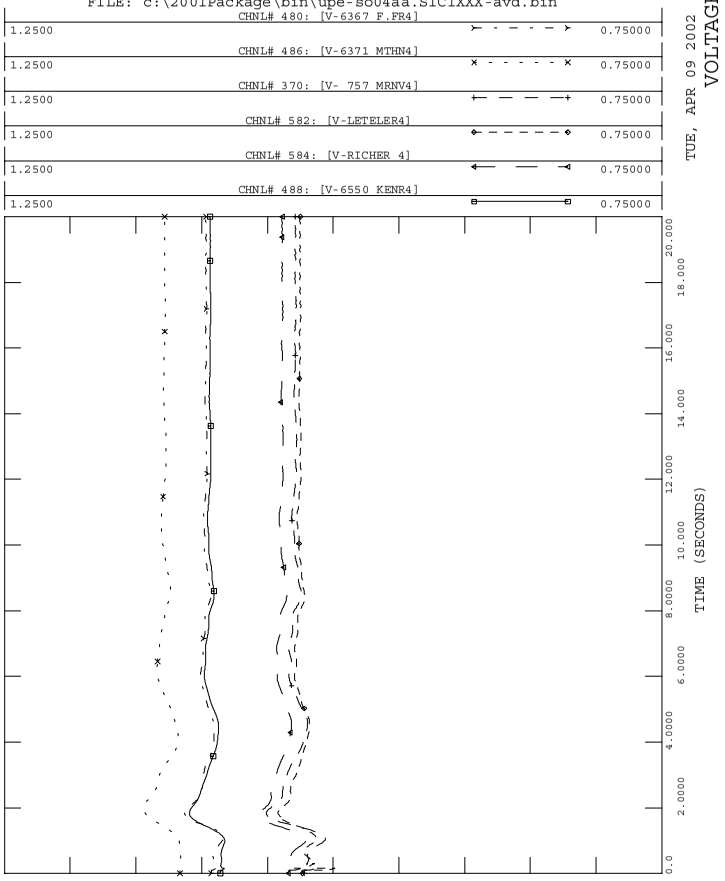
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



TUE, APR 09 2002 20:00
VOLTAGES 4

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
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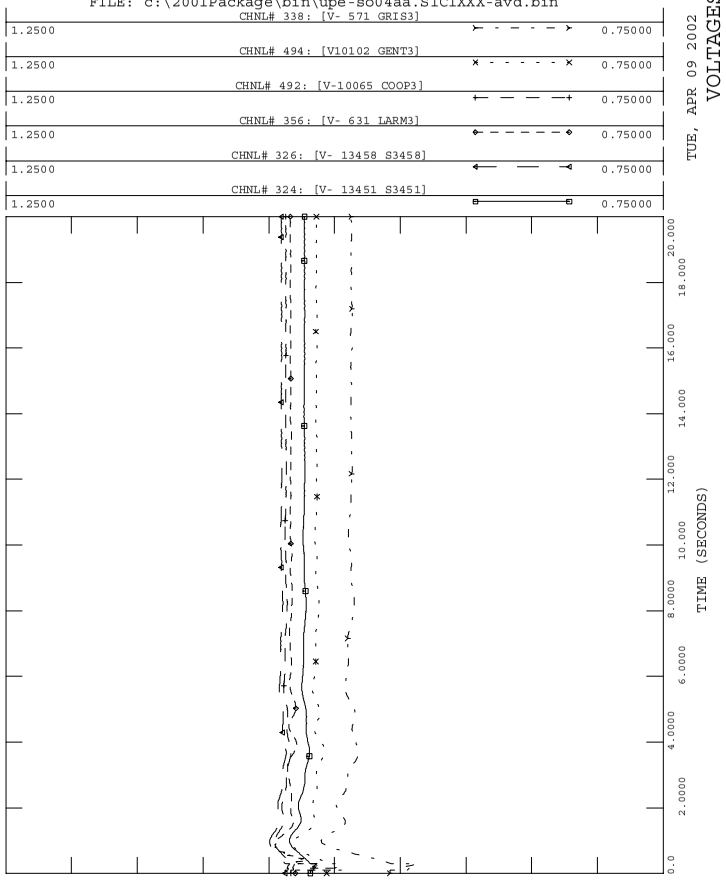
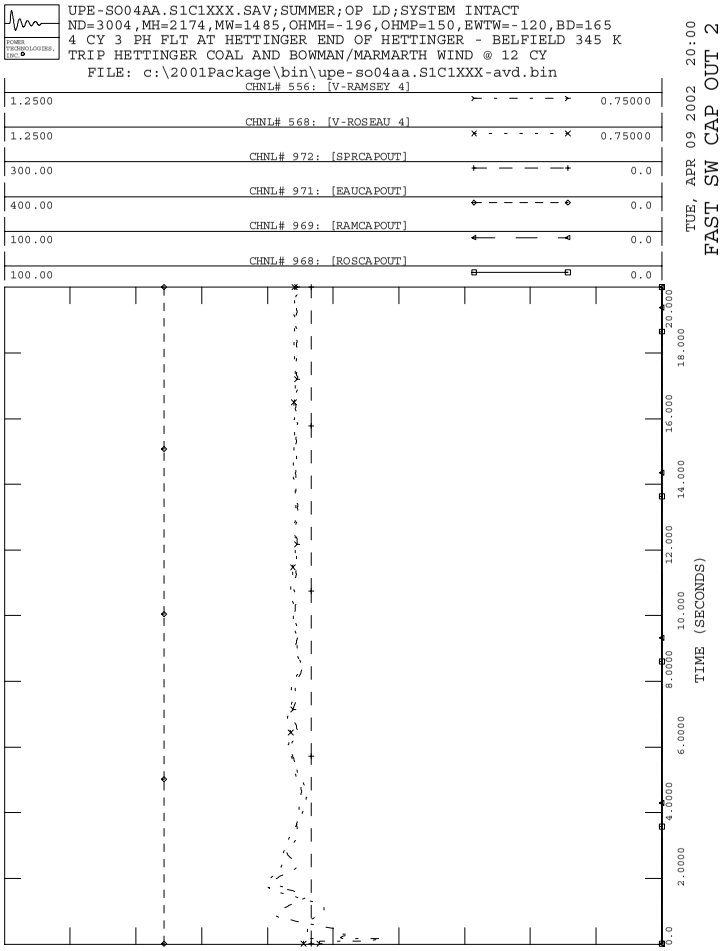
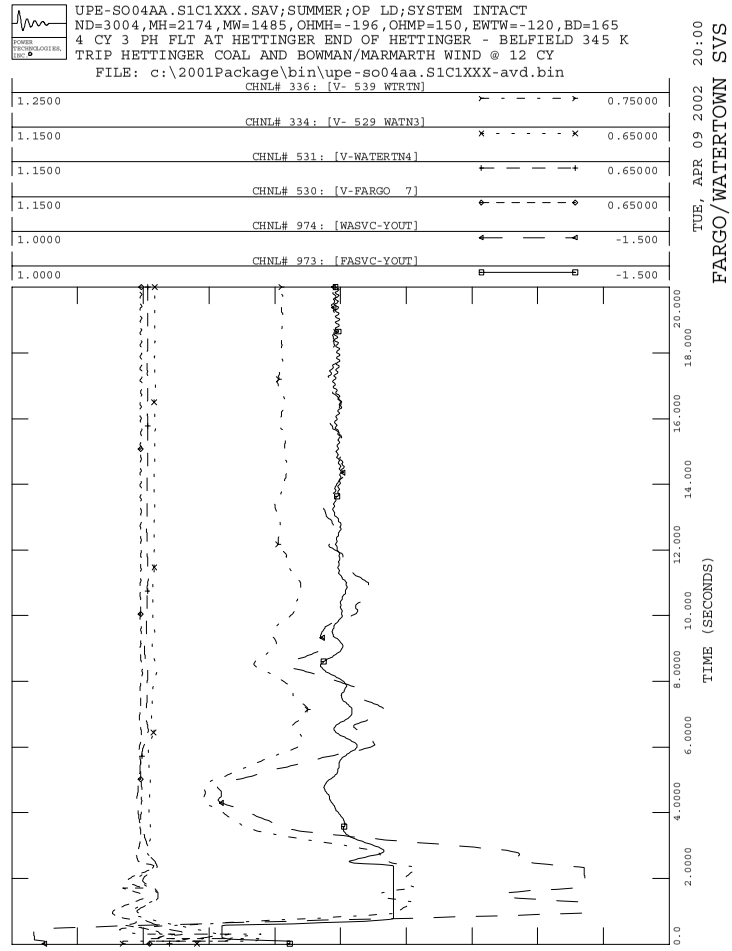
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



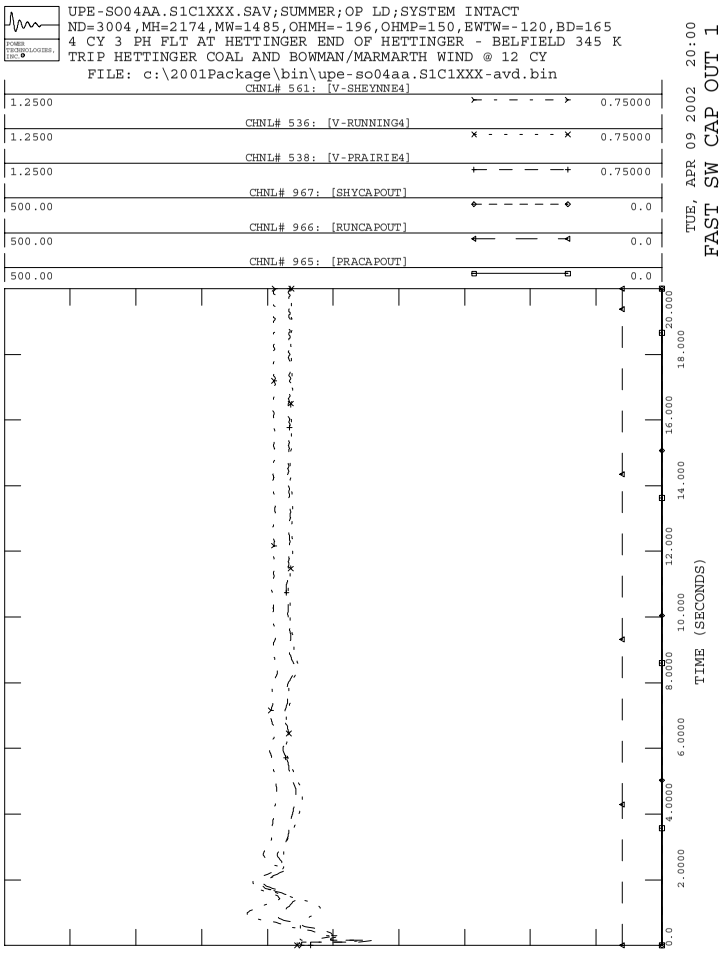
TUE, APR 09 2002 20:00
VOLTAGES NB



TUE, APR 09 2002 20:00
FAST SW CAP OUT 2



TUE, APR 09 2002 20:00
FARGO/WATERTOWN SVS



TUE, APR 09 2002 20:00
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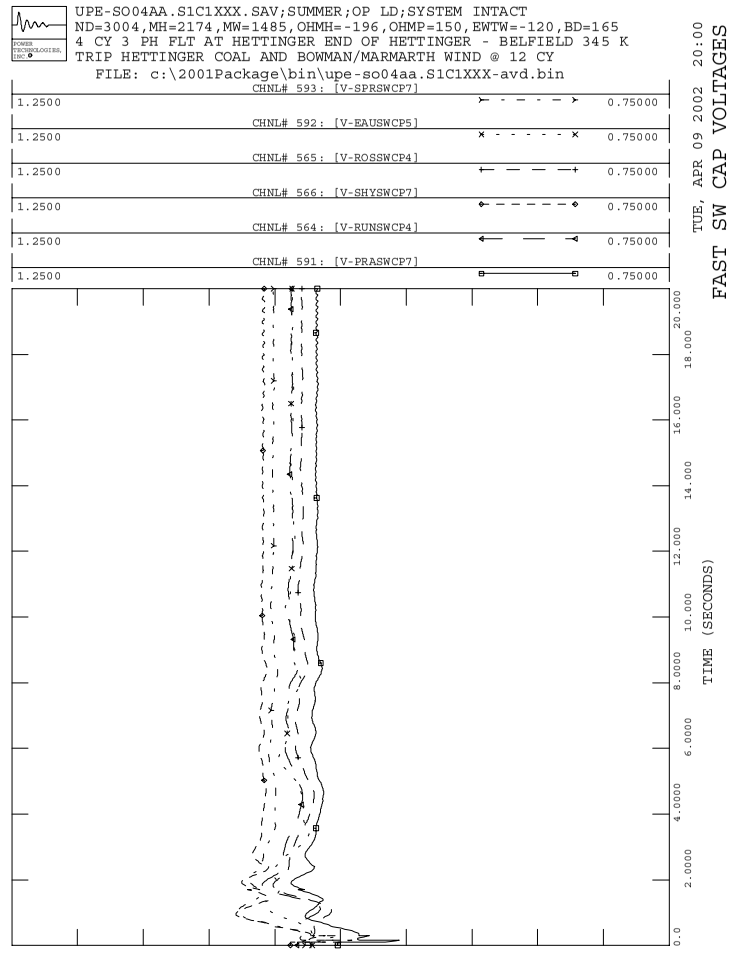
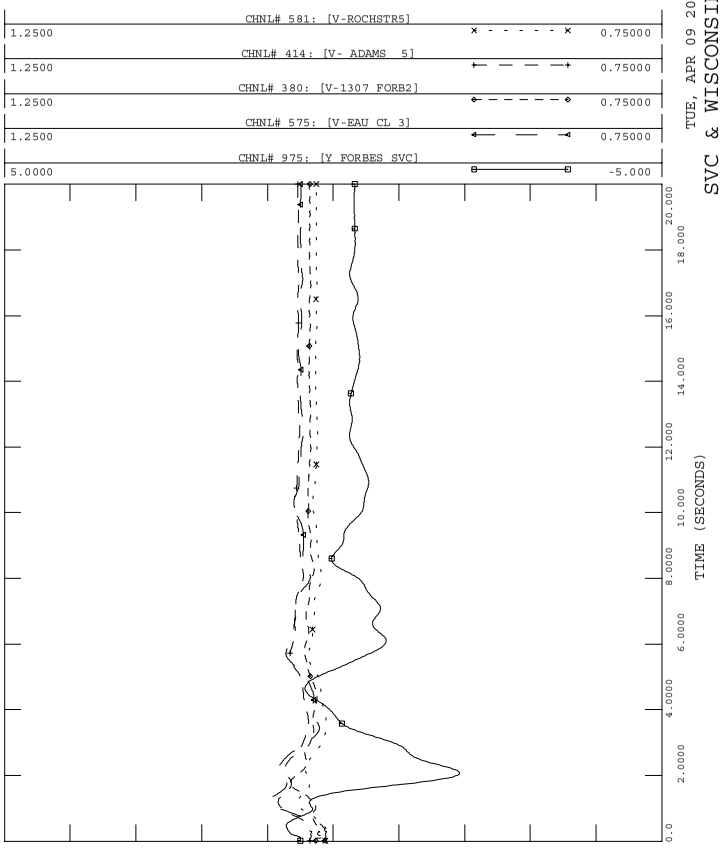


TUE, APR 09 2002 20:00
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00

SVC & WISCONSIN VOLT



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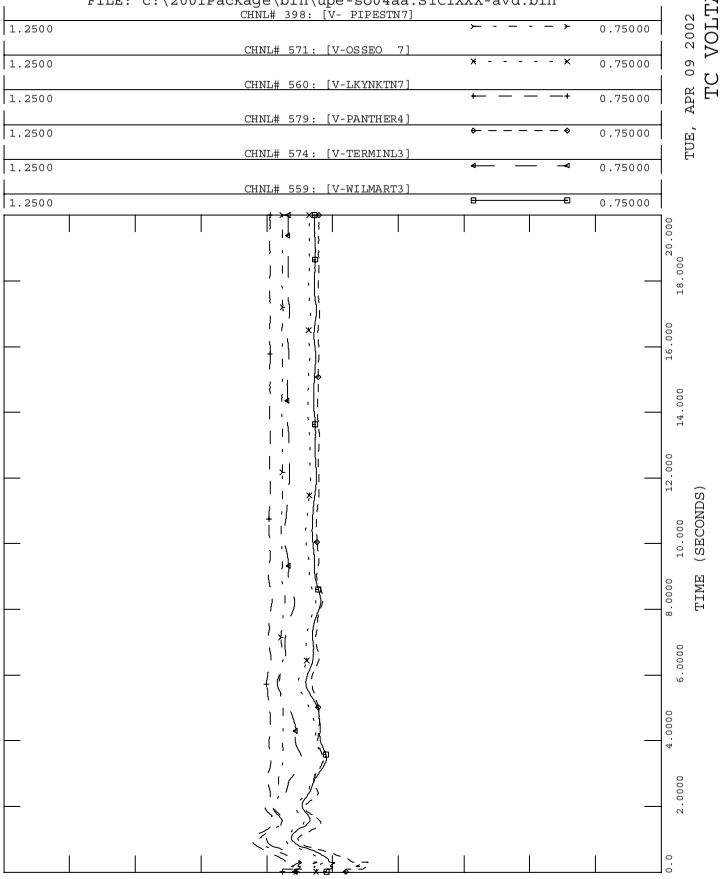
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00

TC VOLTAGES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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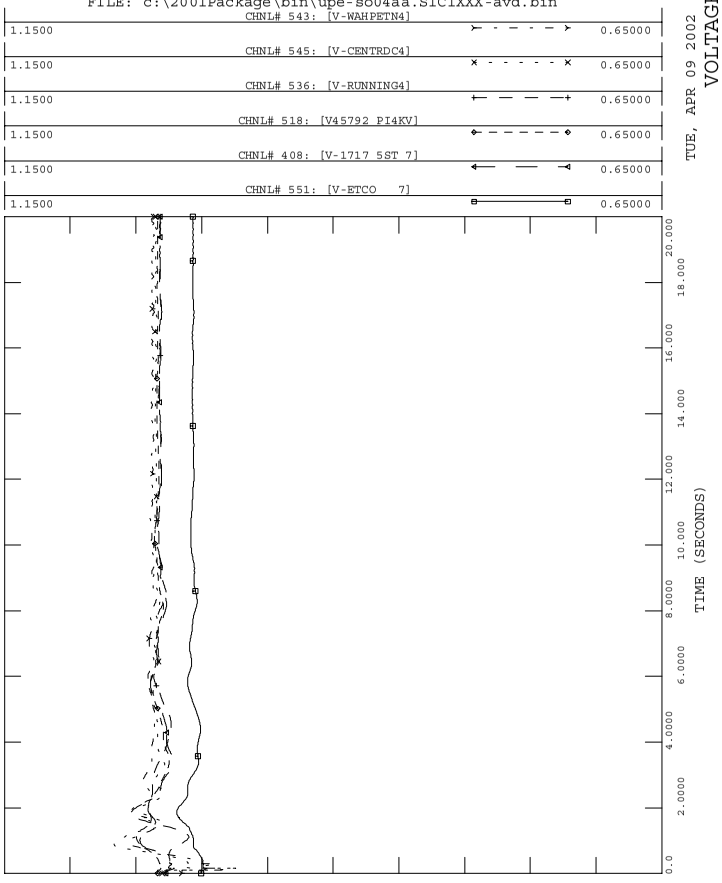
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00

VOLTAGES 6



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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
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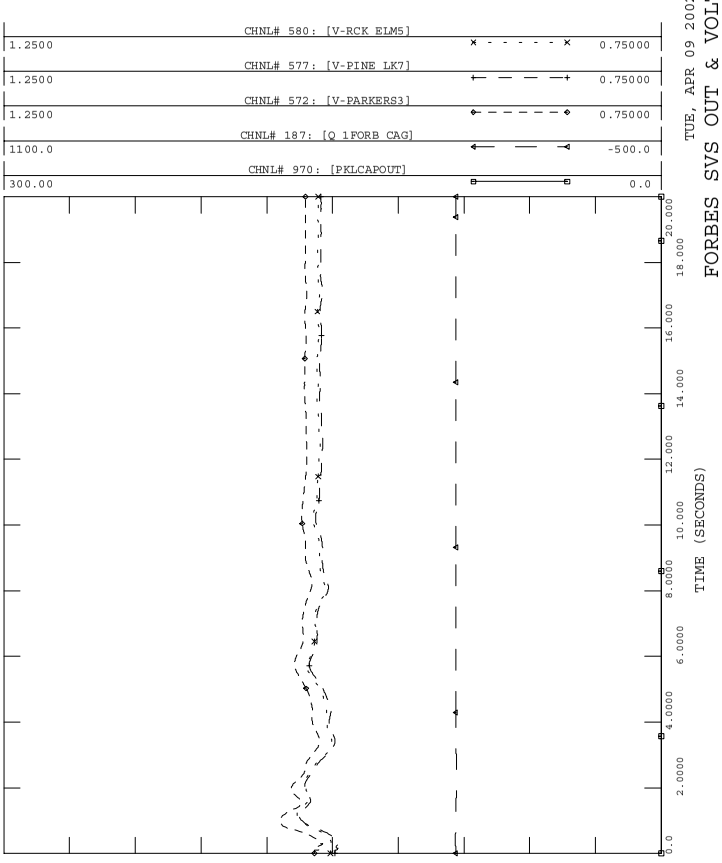
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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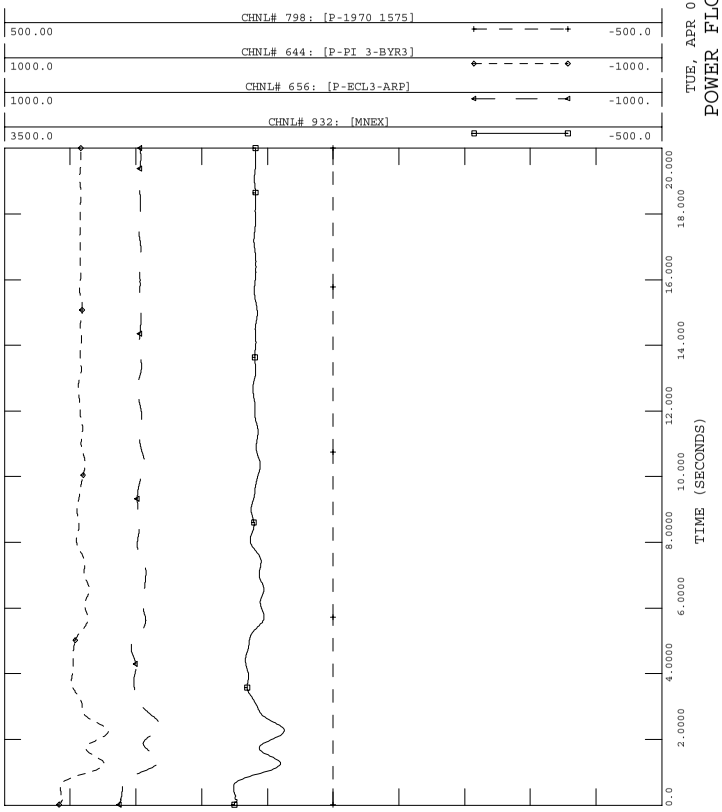
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00
POWER FLOW SUMS 2



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
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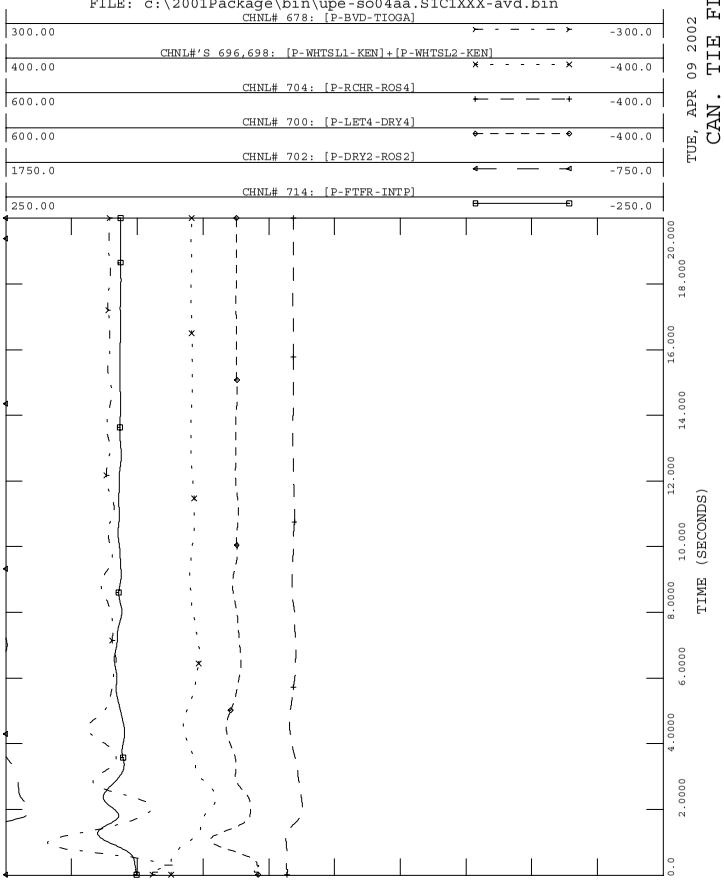
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00
CAN. TIE FLOWS



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
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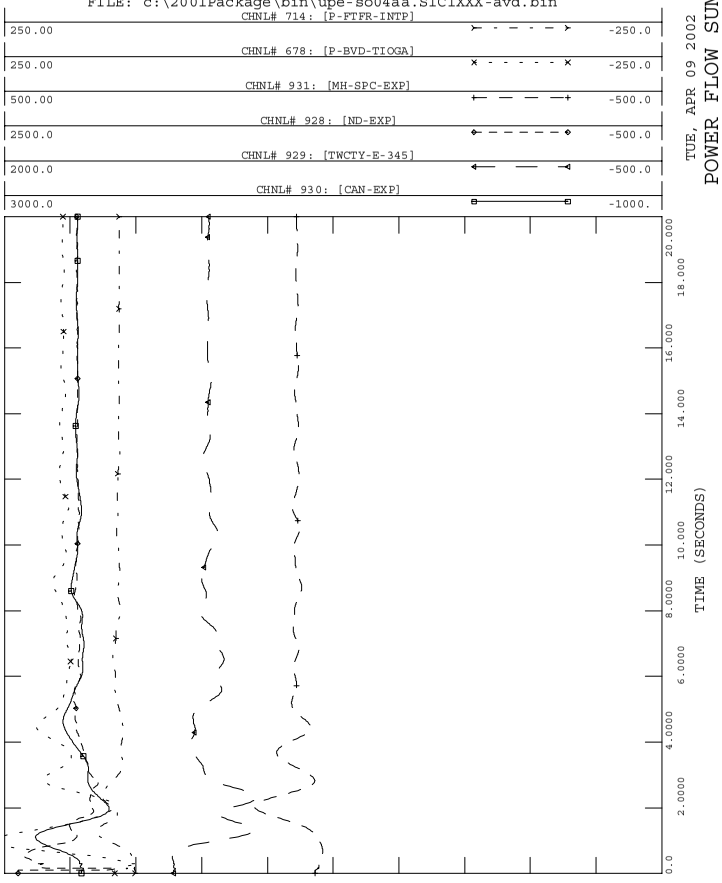
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00
POWER FLOW SUMS 1



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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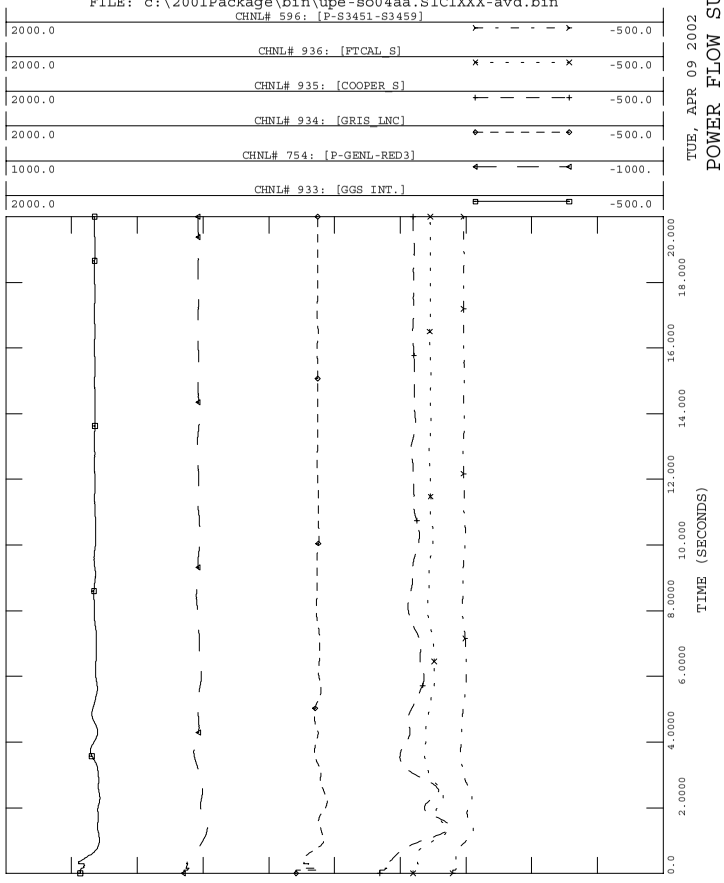
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00
POWER FLOW SUM 3



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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
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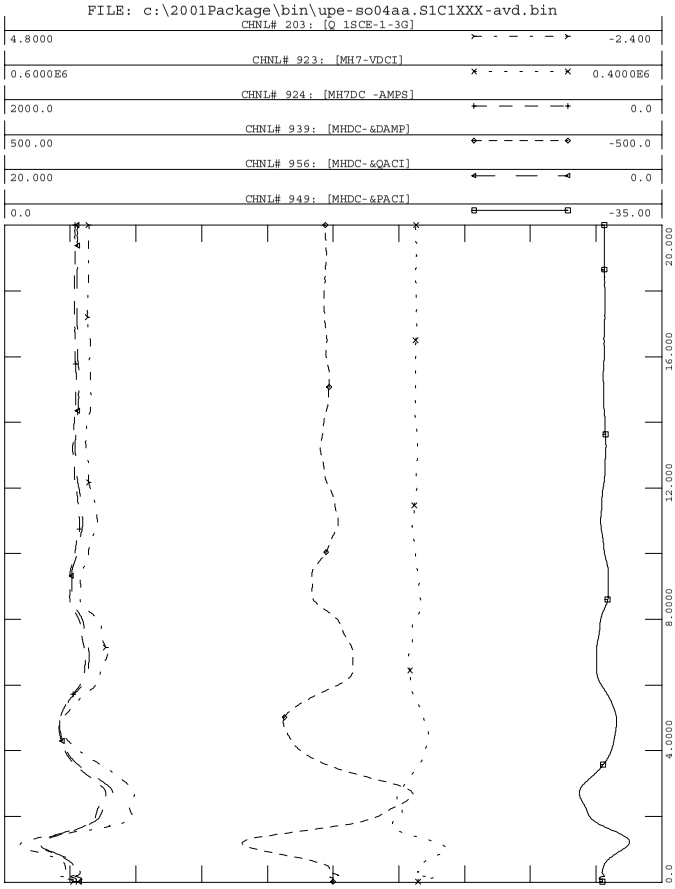
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00
MH DC PARAMETERS



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
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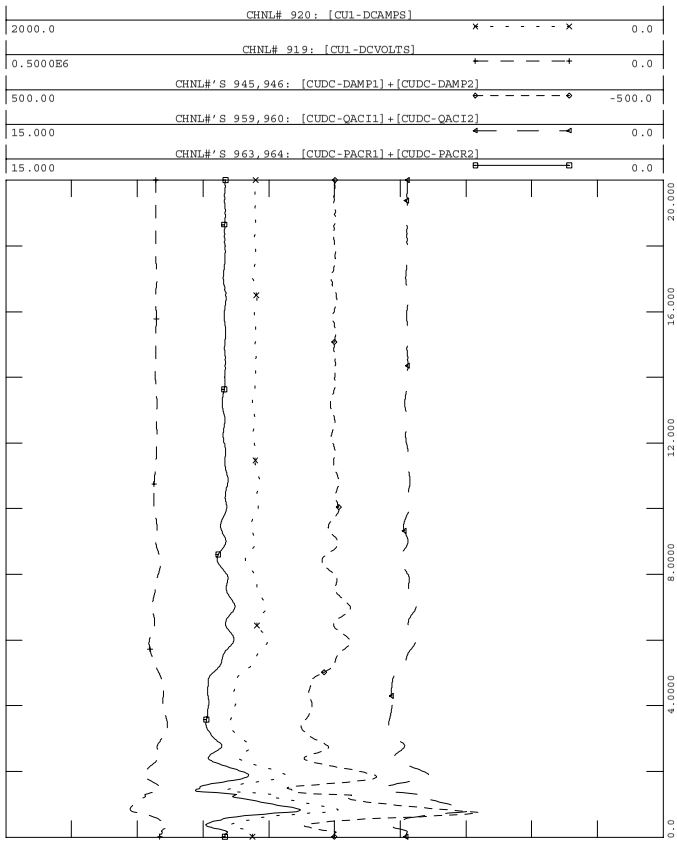
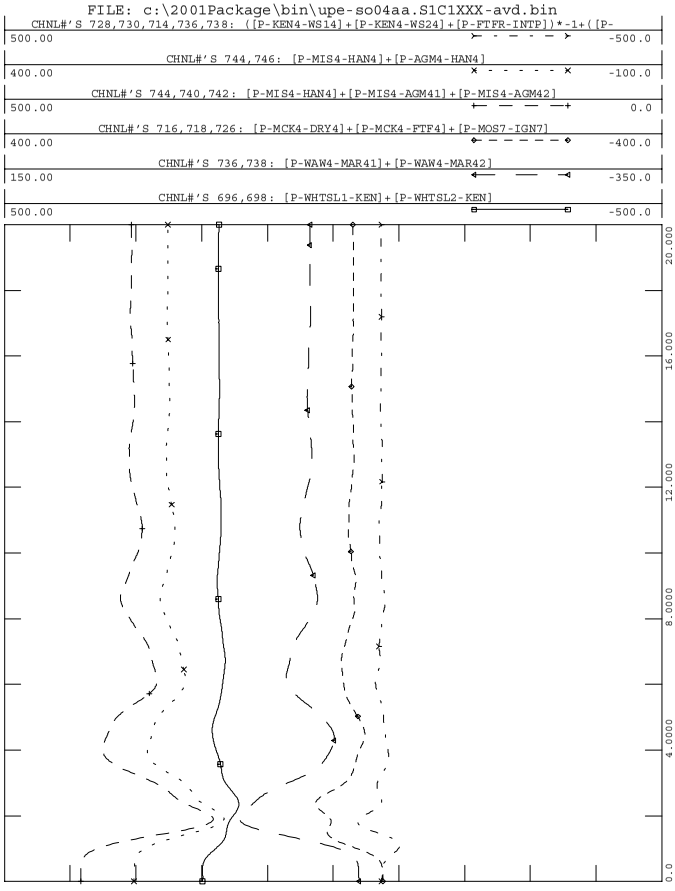
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00
CU DC #1



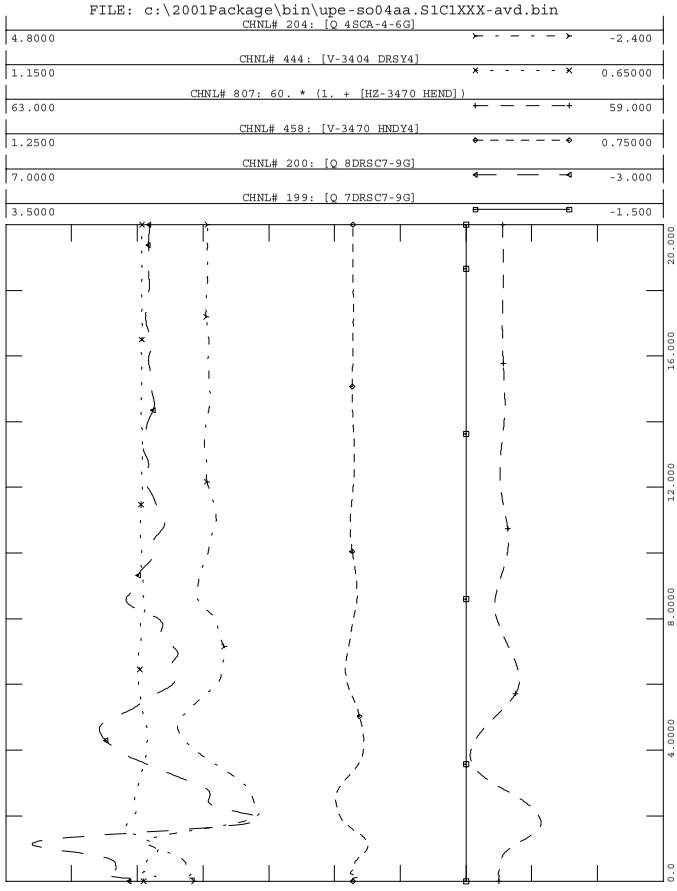
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

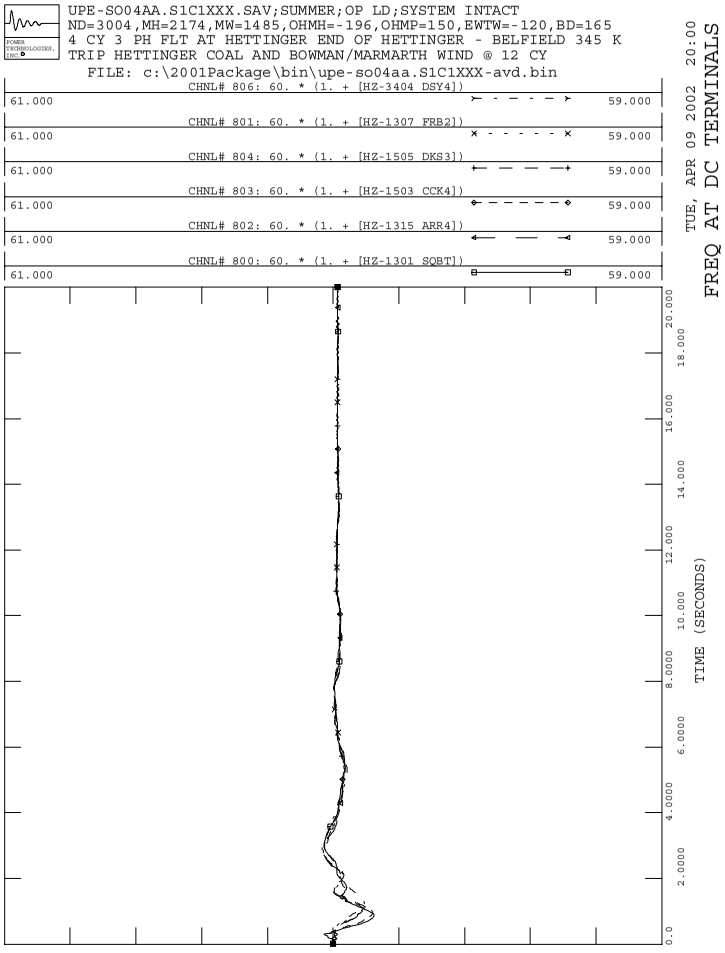
TUE, APR 09 2002 20:00
OH TIE FLOWS

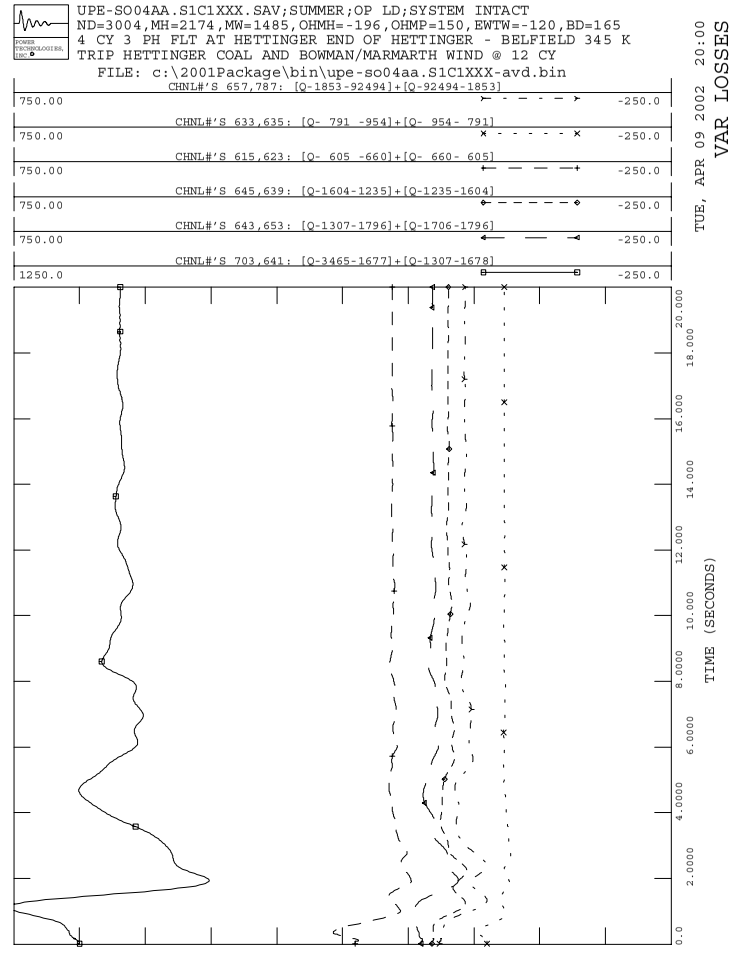


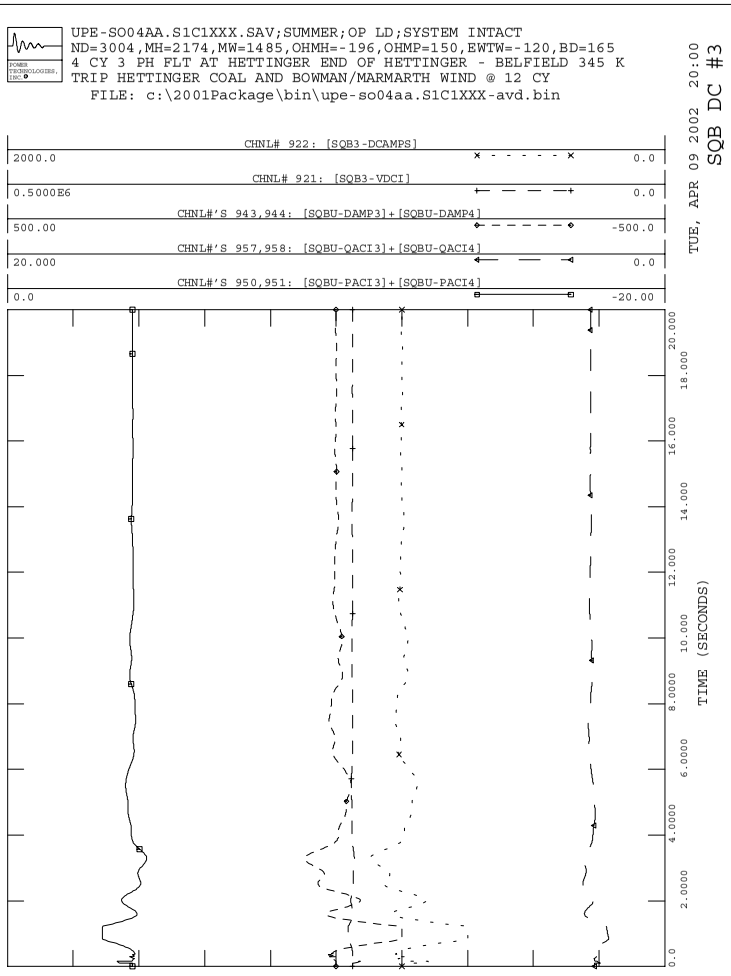
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

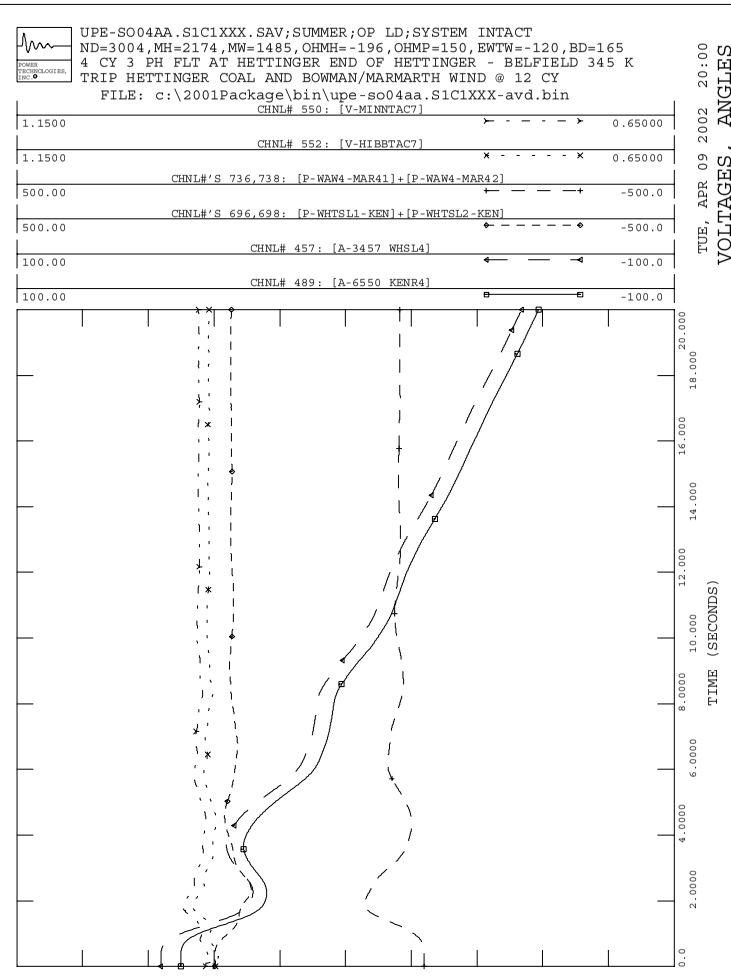
TUE, APR 09 2002 20:00
MH DC PARAMETERS




UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
TIME (SECONDS)
TUE, APR 09 2002 20:00
FREQ AT DC TERMINALS


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
TIME (SECONDS)
TUE, APR 09 2002 20:00
VAR LOSSES

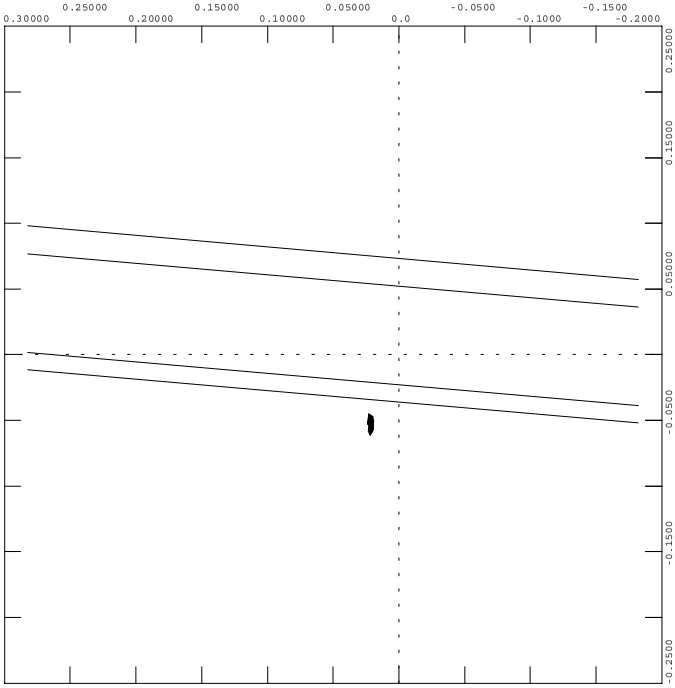

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
TIME (SECONDS)
TUE, APR 09 2002 20:00
SQB DC #3


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
TIME (SECONDS)
TUE, APR 09 2002 20:00
VOLTAGES, ANGLES

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

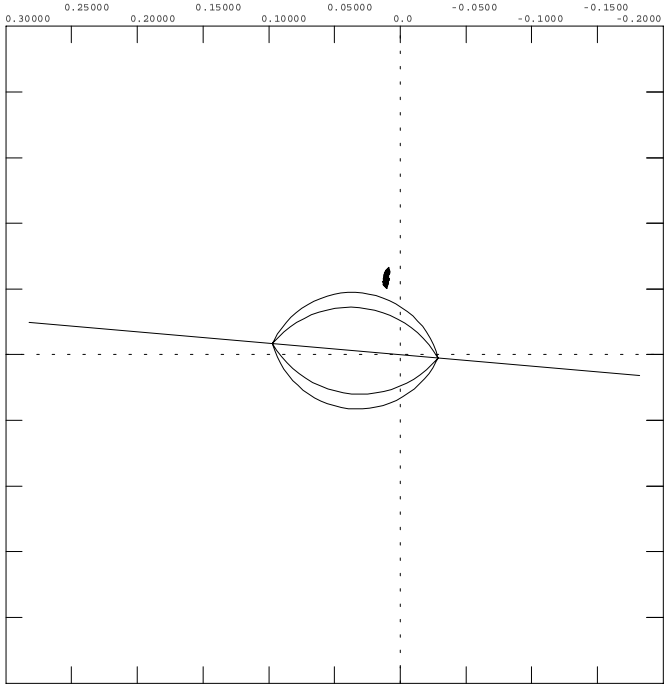


TUE, APR 09 2002 20:00
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

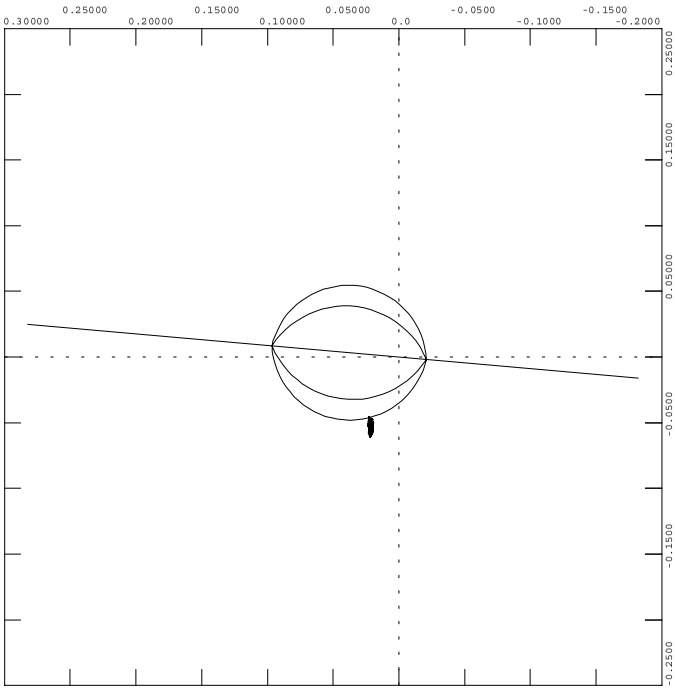


TUE, APR 09 2002 20:00
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

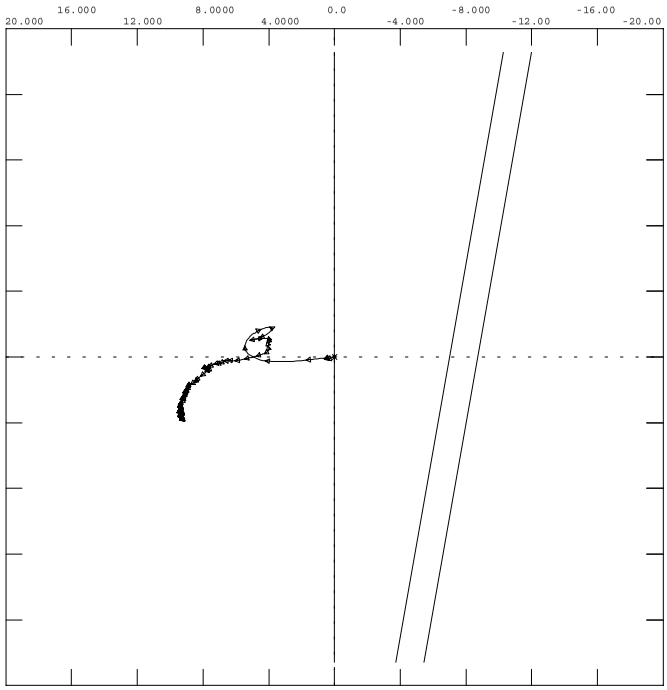


TUE, APR 09 2002 20:00
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

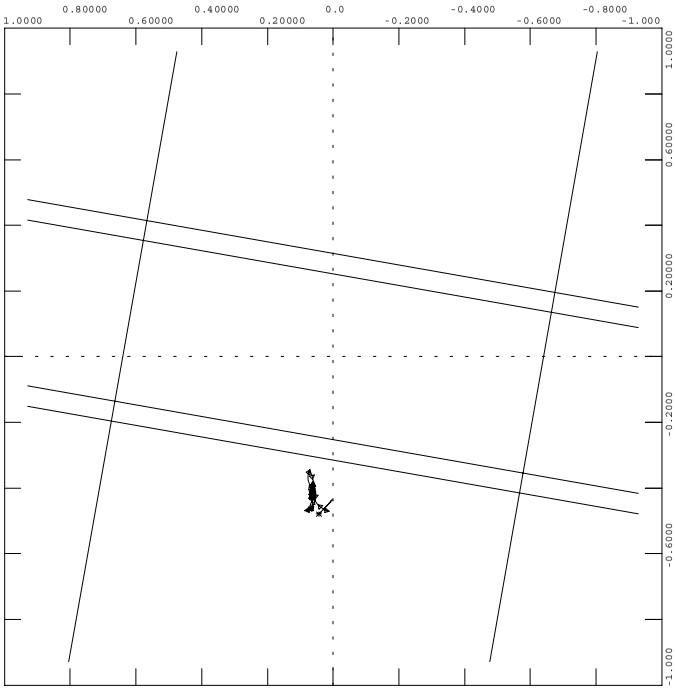


TUE, APR 09 2002 20:00
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

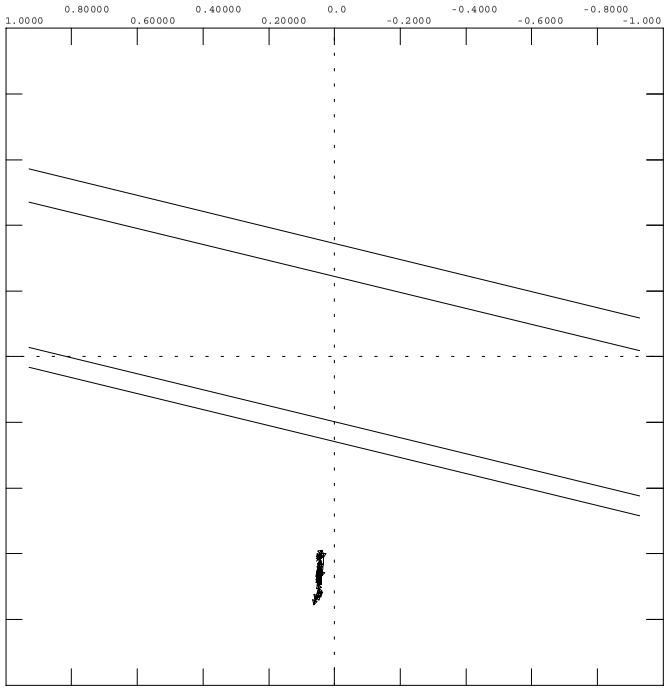
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

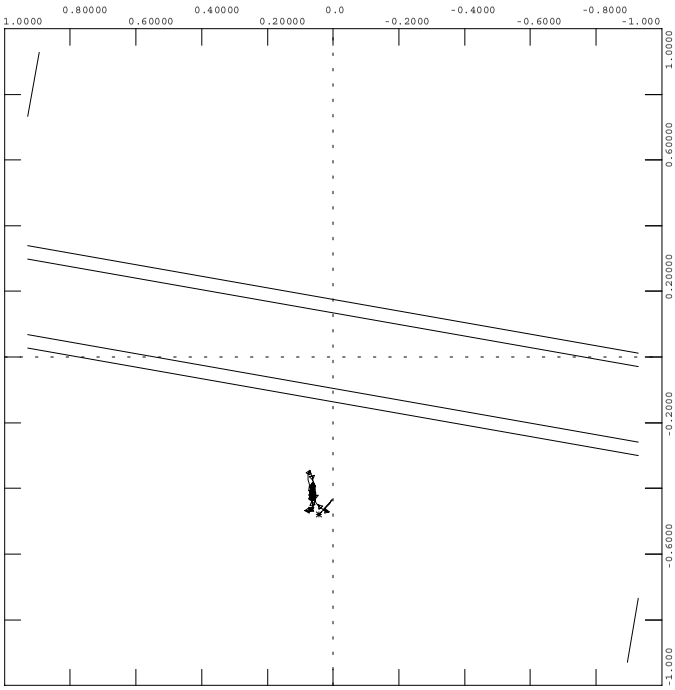
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

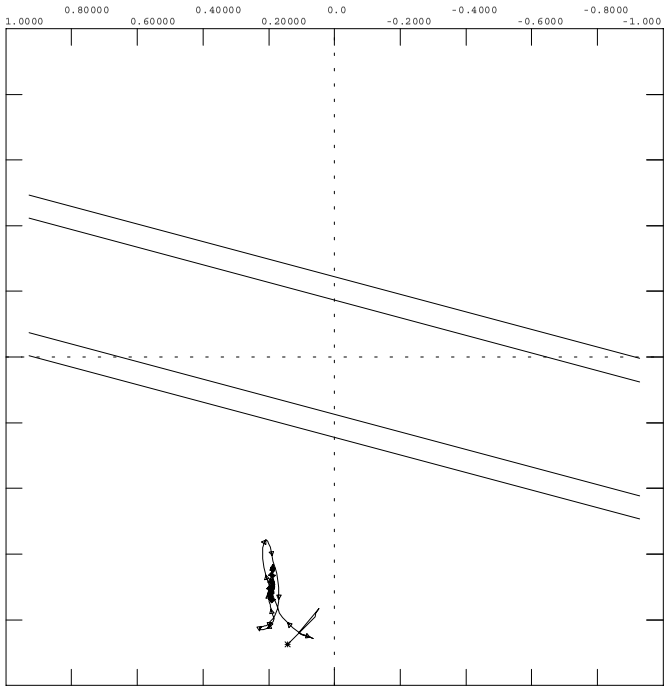
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

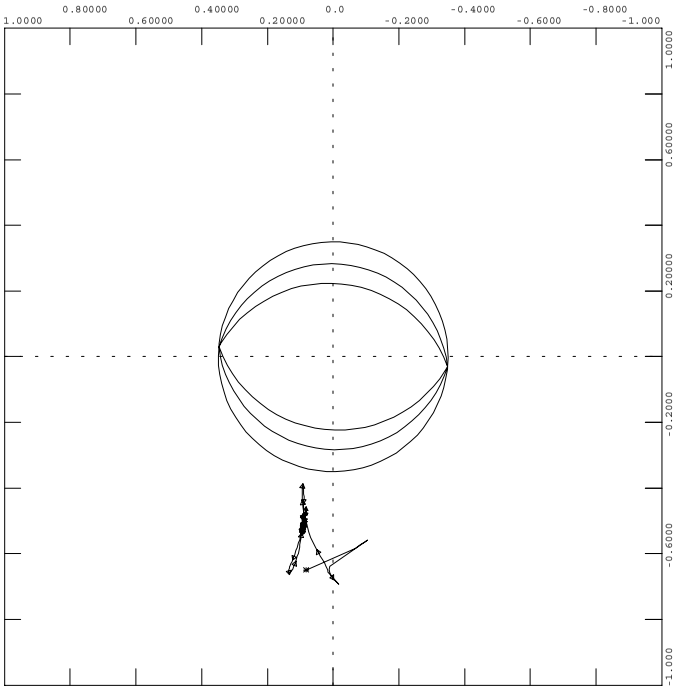
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

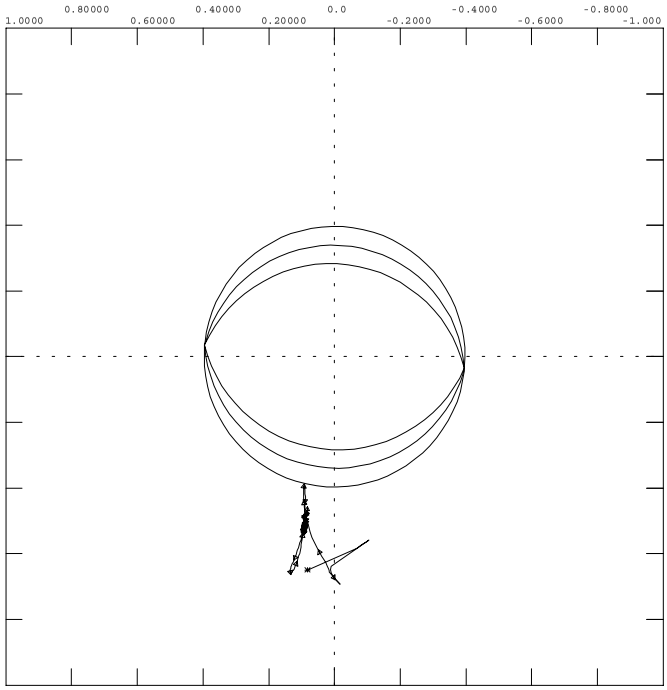
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

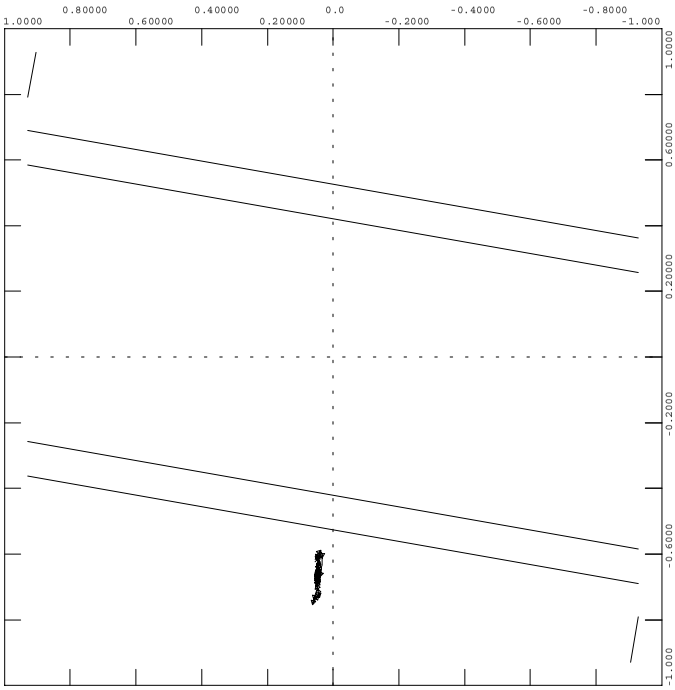
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

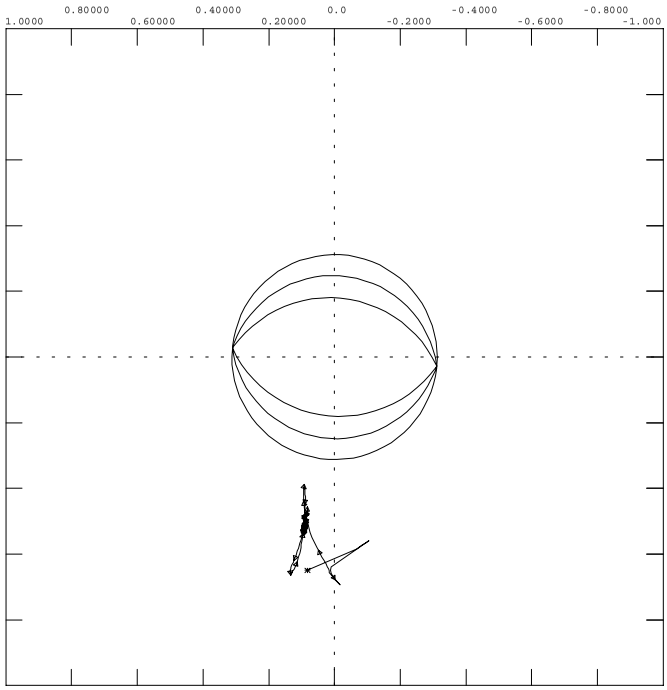
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



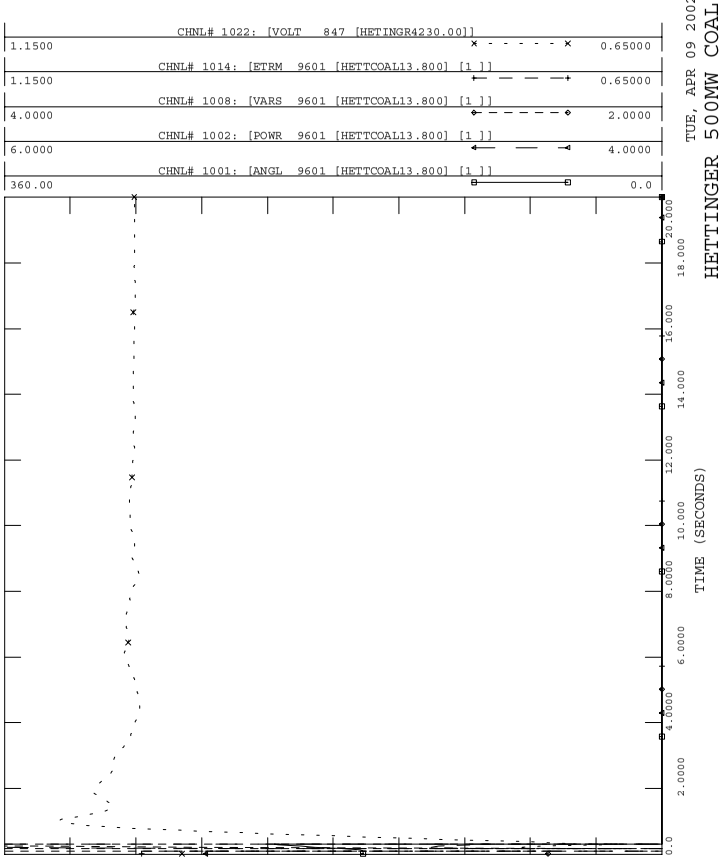
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

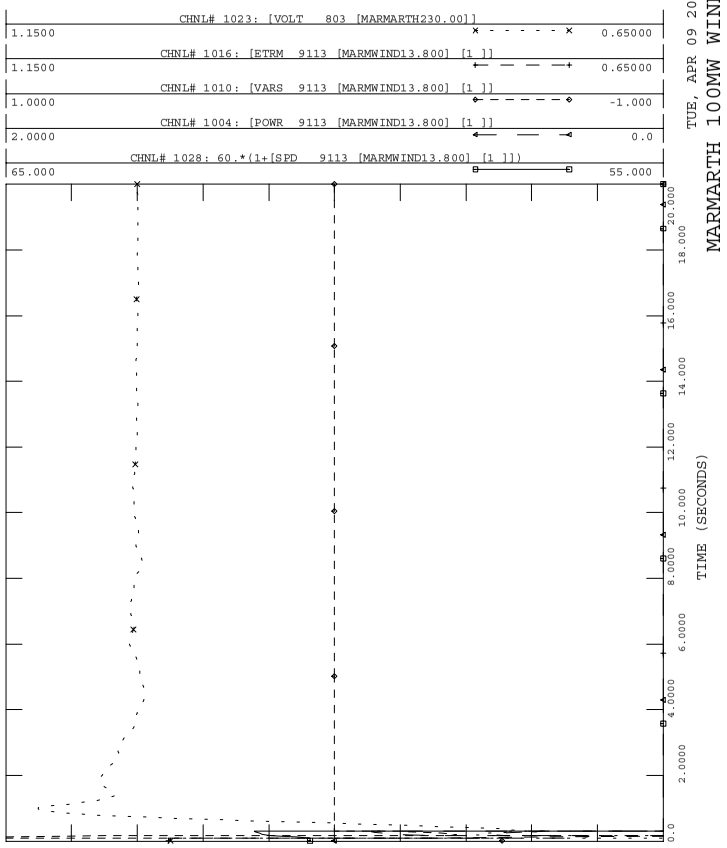


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin



TUE, APR 09 2002 20:00
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

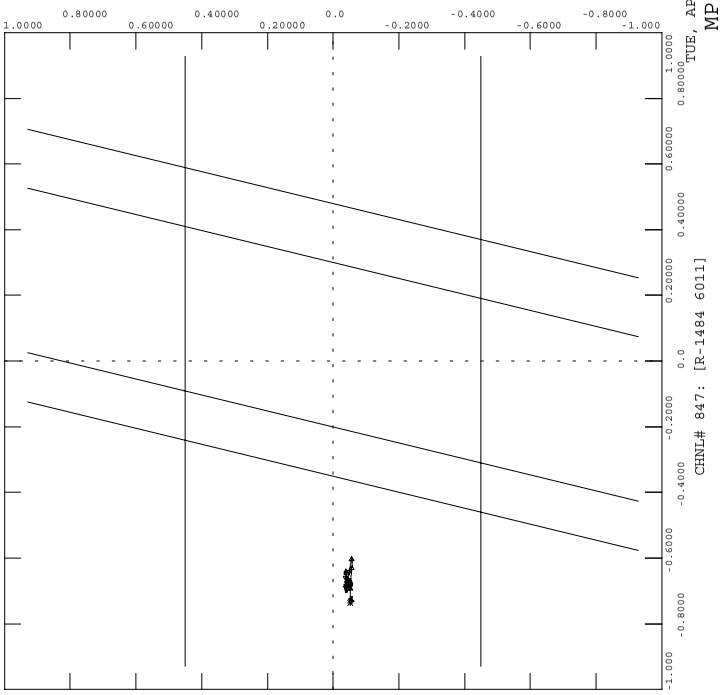


TUE, APR 09 2002 20:00
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

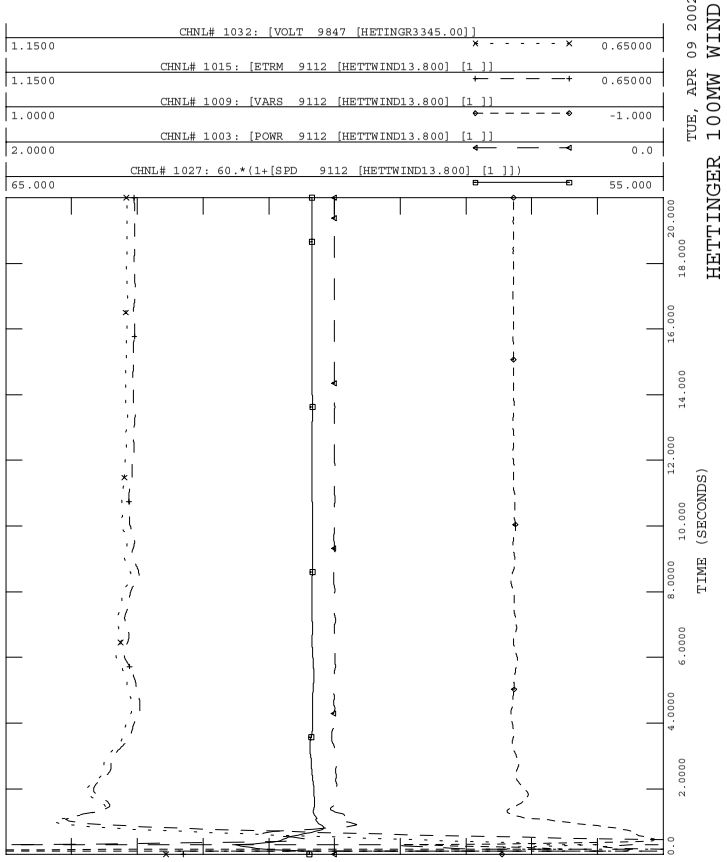
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



TUE, APR 09 2002 20:00
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

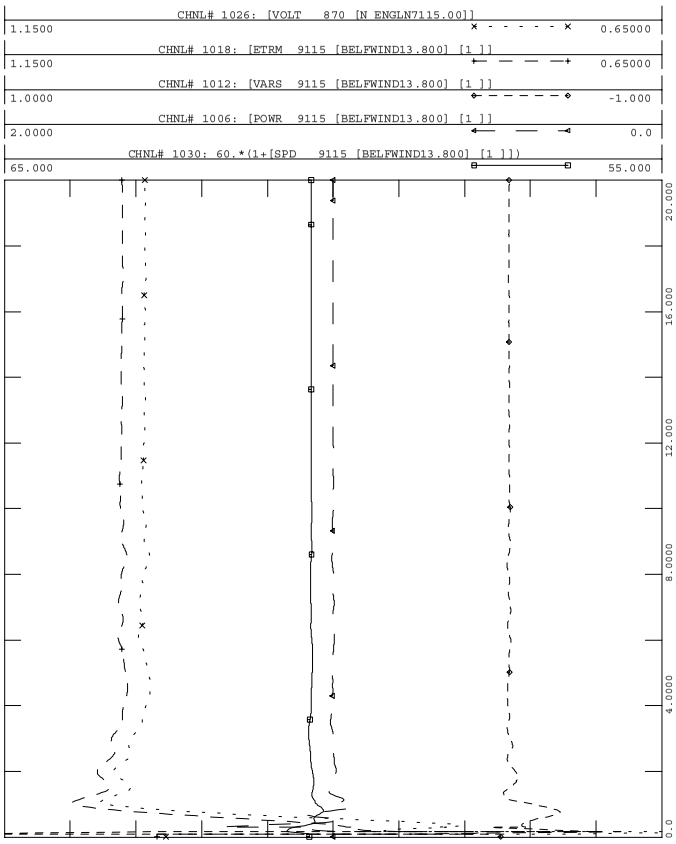


TUE, APR 09 2002 20:00
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00

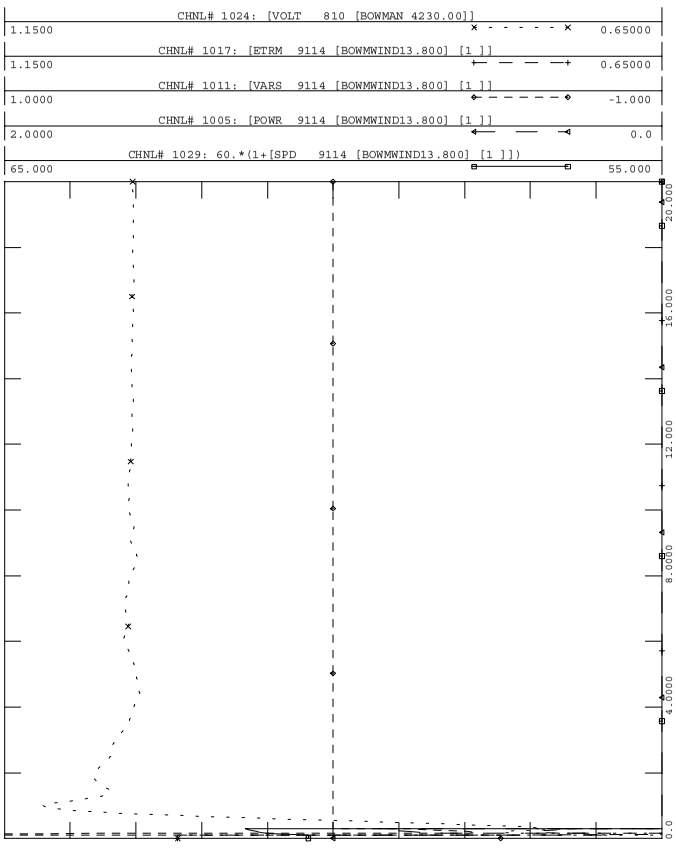
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00

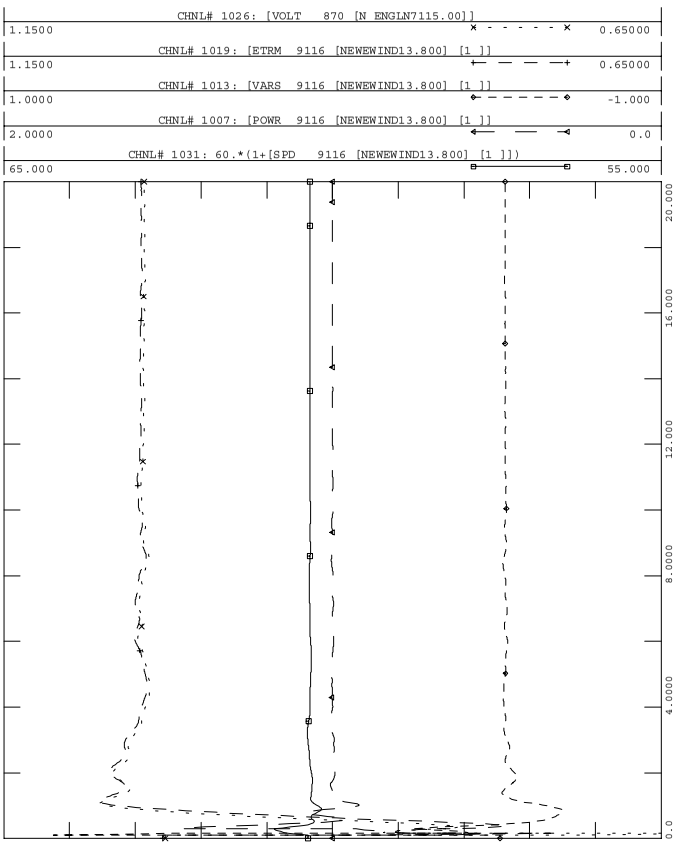
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-avd.bin

TUE, APR 09 2002 20:00

NEW E. 100MW WIND UNIT

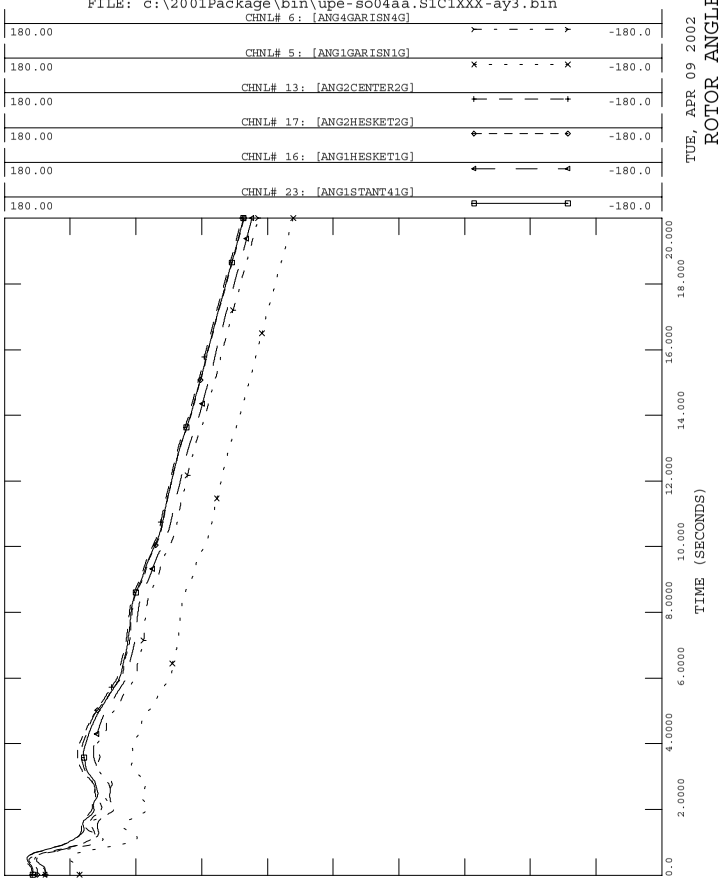


CONTINGENCY AY3

4 cycle 3 phase fault at Hettinger end of Hettinger- FtThompson 345 kV line. Trip Hettinger coal and Bowman/Marmarth wind @ 12 cy

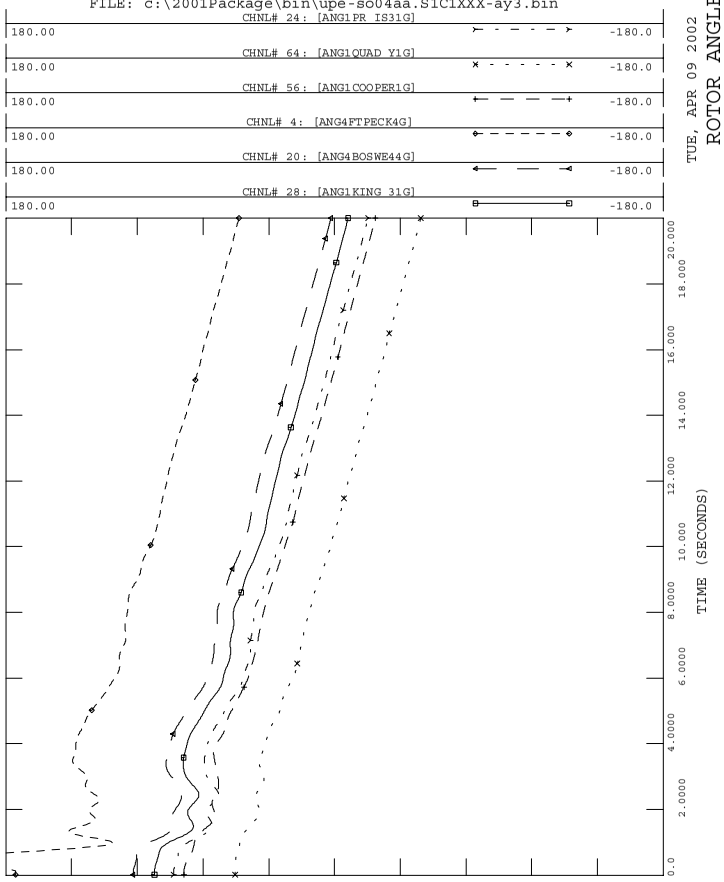
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
ROTOR ANGLES 2



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
ROTOR ANGLES 4



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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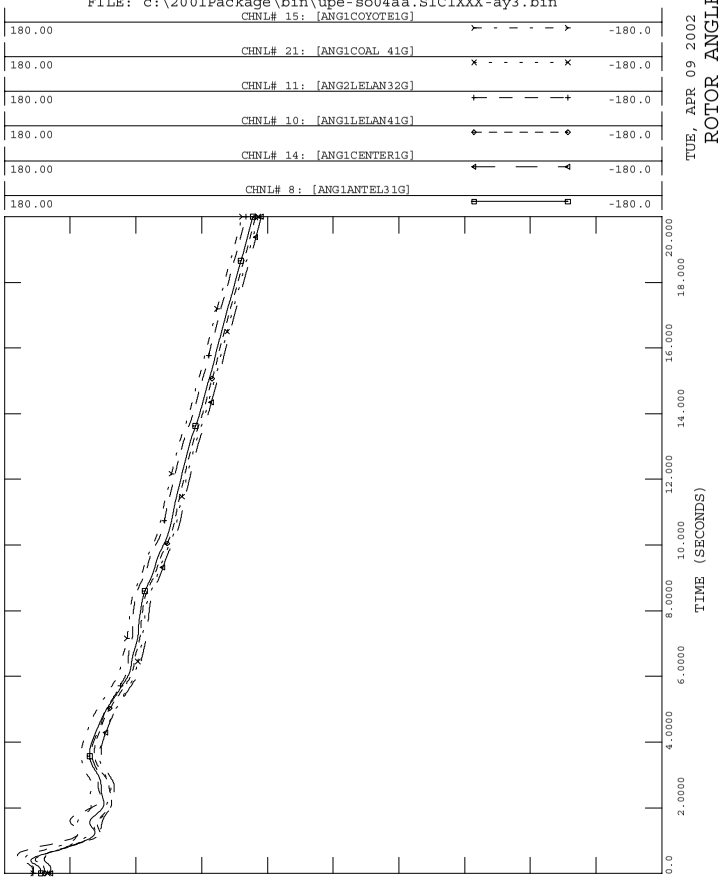
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
ROTOR ANGLES 1



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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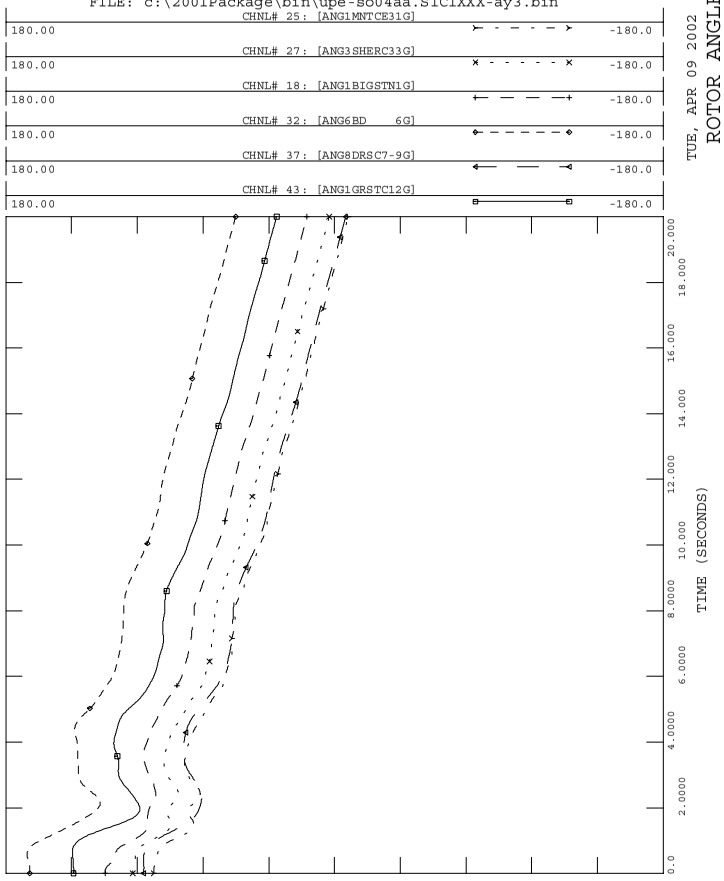
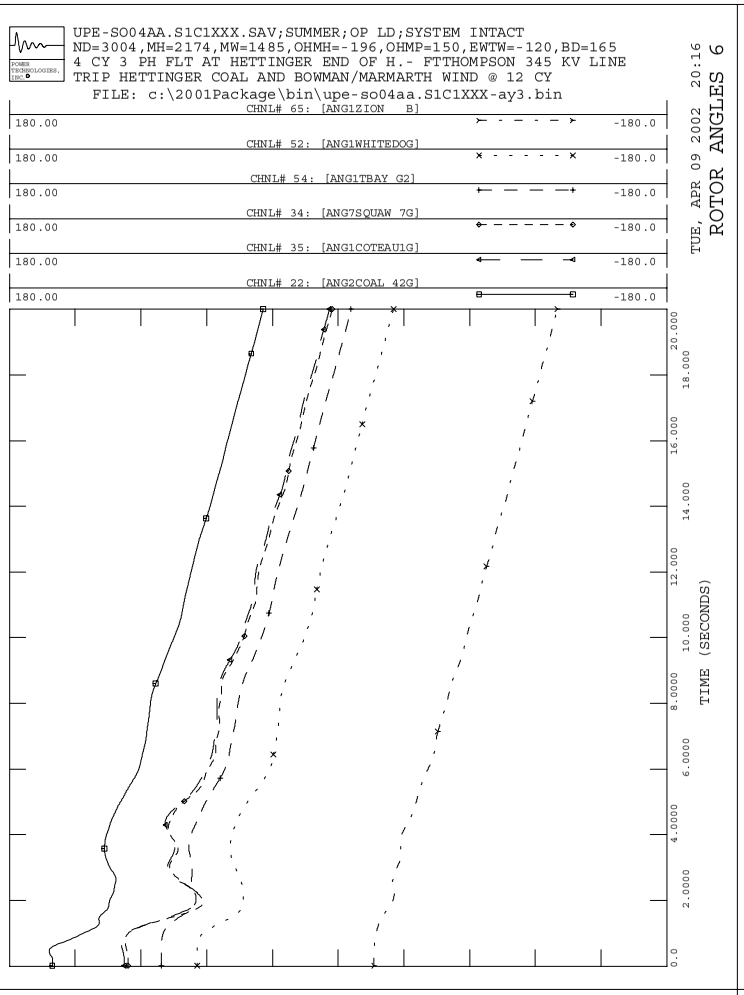
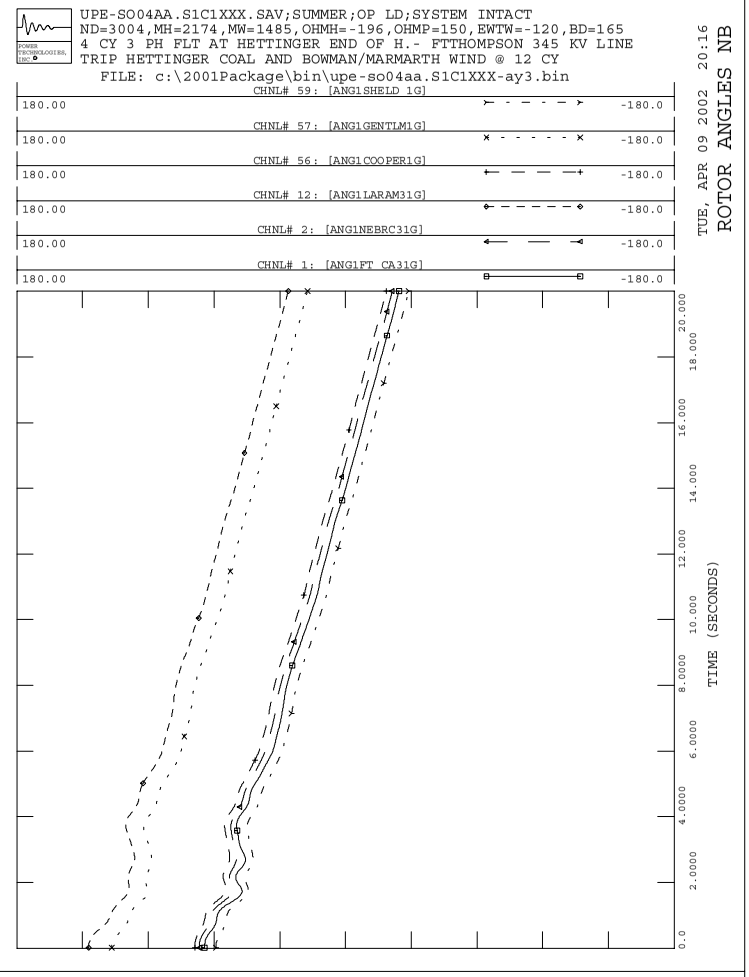
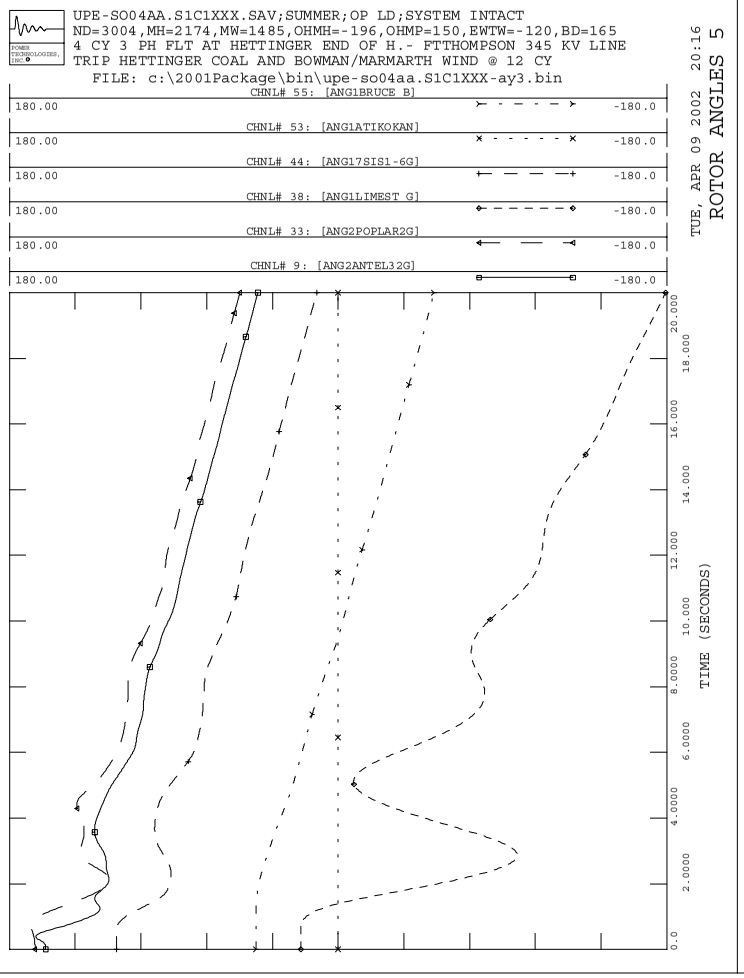
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
ROTOR ANGLES 3




UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:16
ROTOR ANGLES 6


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:16
ROTOR ANGLES NB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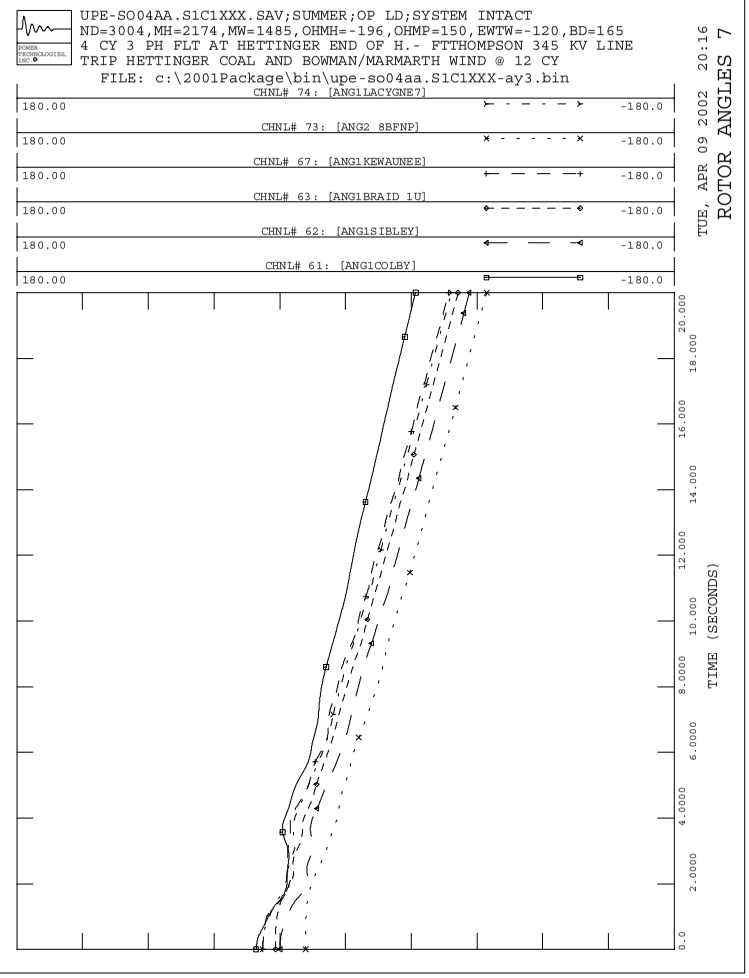
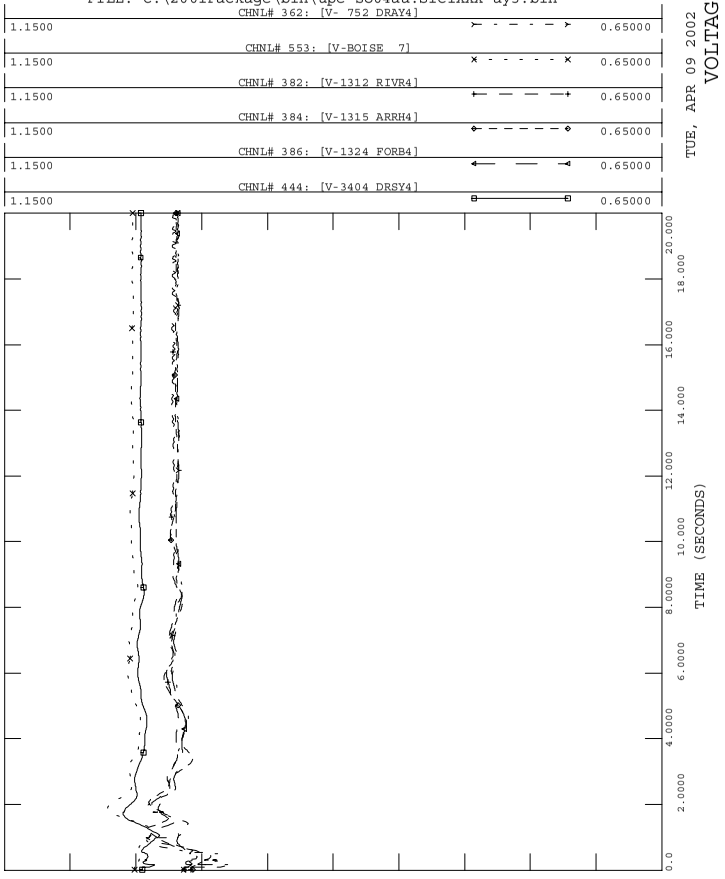
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:16
ROTOR ANGLES 5

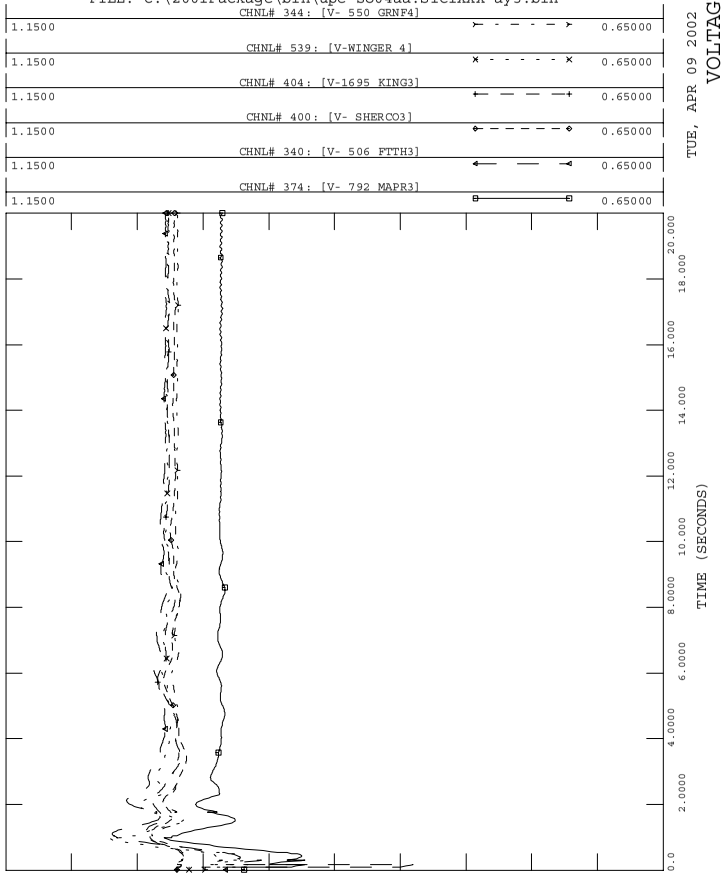

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:16
ROTOR ANGLES 7

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin



TUE, APR 09 2002 20:16
VOLTAGES 1

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin



TUE, APR 09 2002 20:16
VOLTAGES 3

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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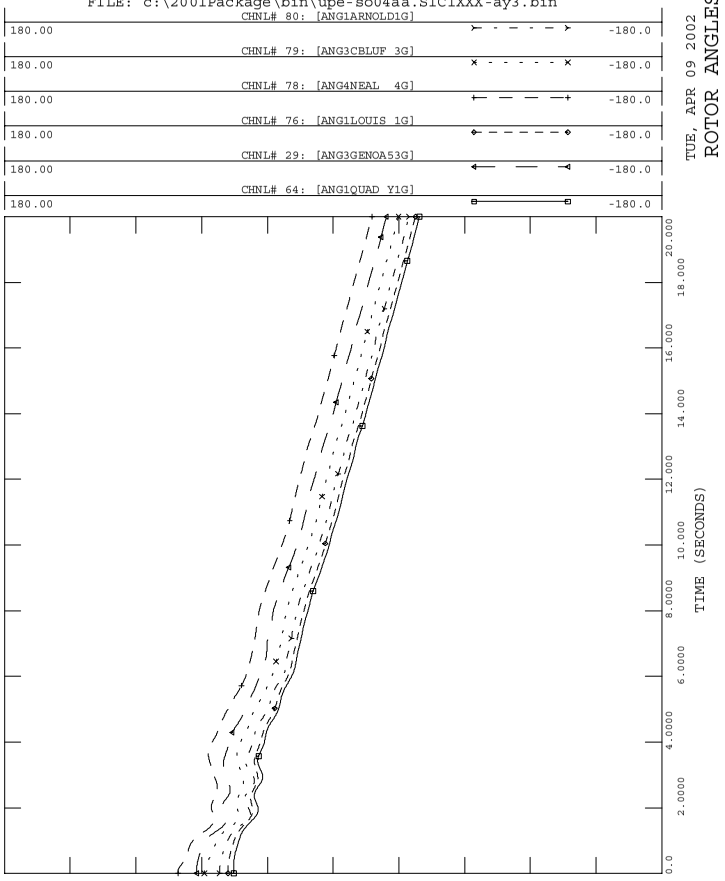
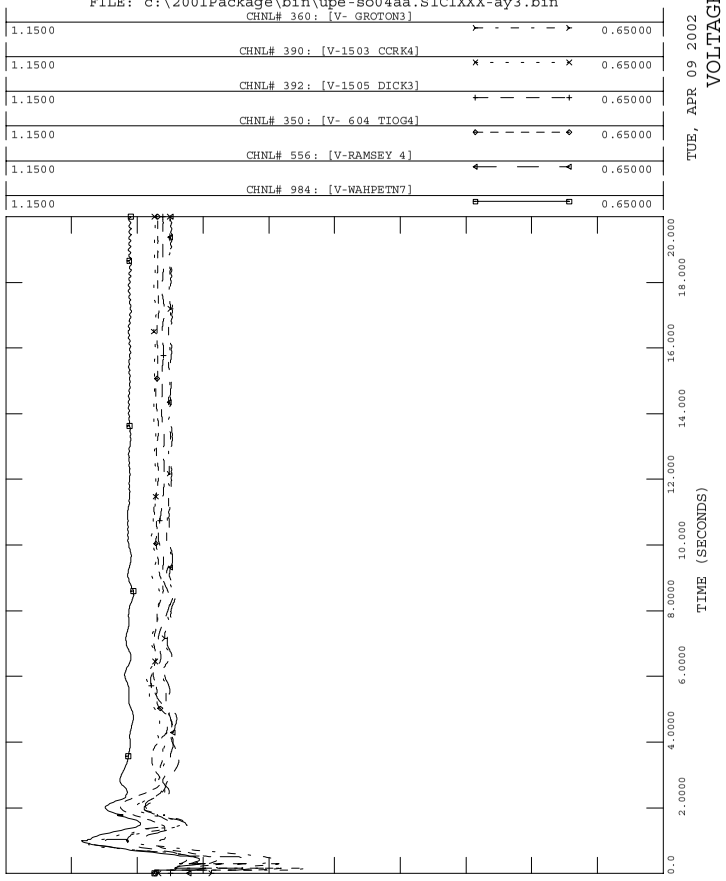
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin



TUE, APR 09 2002 20:16
ROTOR ANGLES IA

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin



TUE, APR 09 2002 20:16
VOLTAGES 2

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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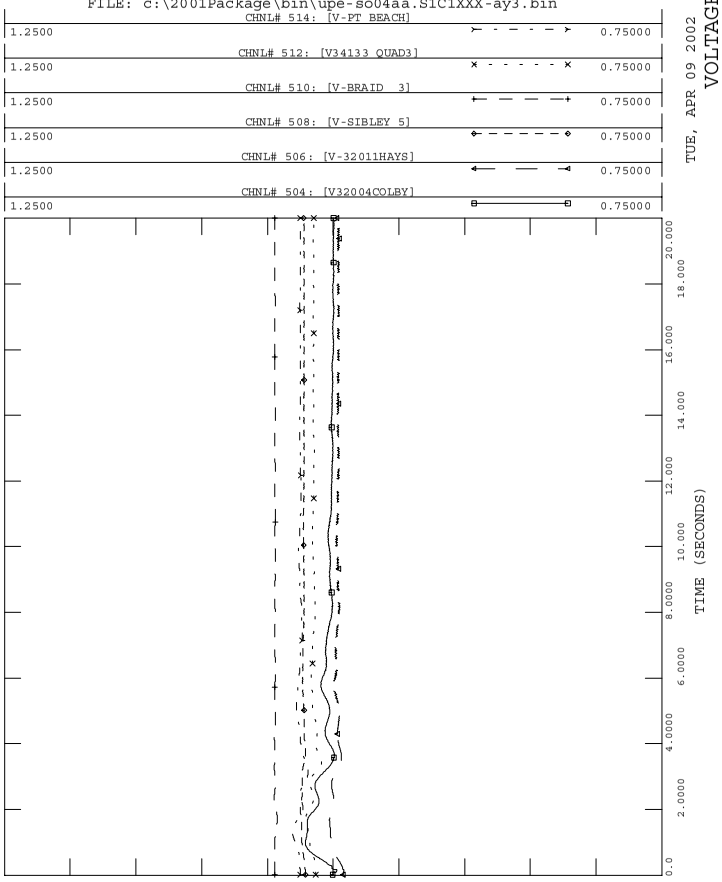
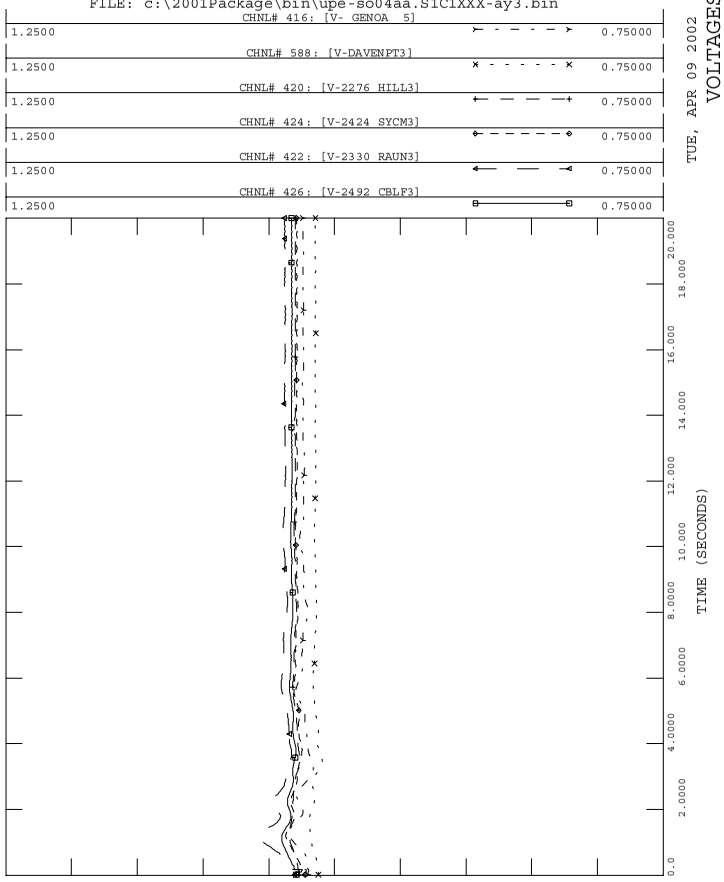
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
VOLTAGES 5



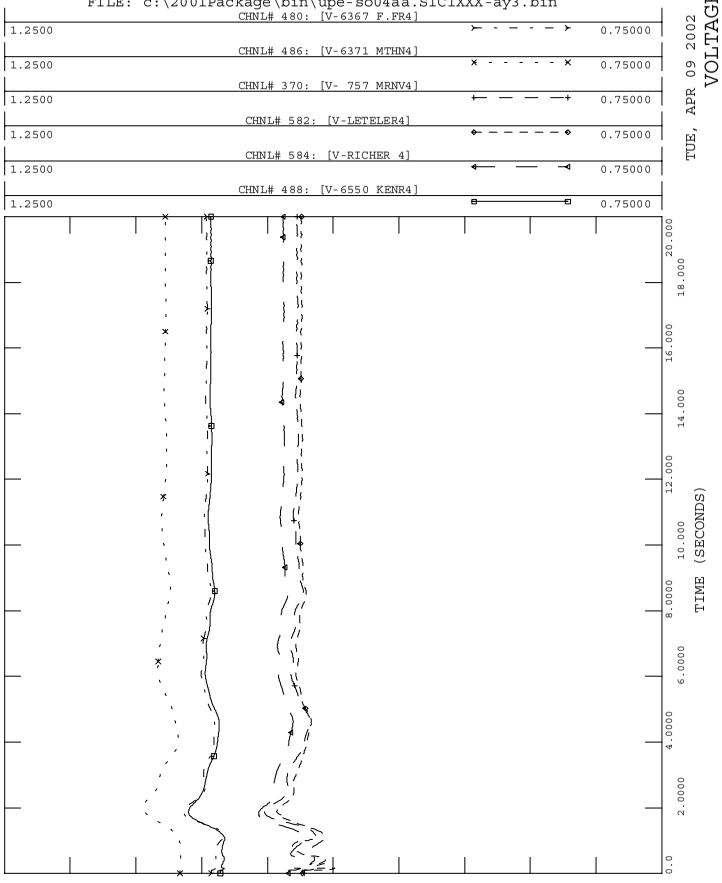
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
VOLTAGES IA



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
VOLTAGES 4



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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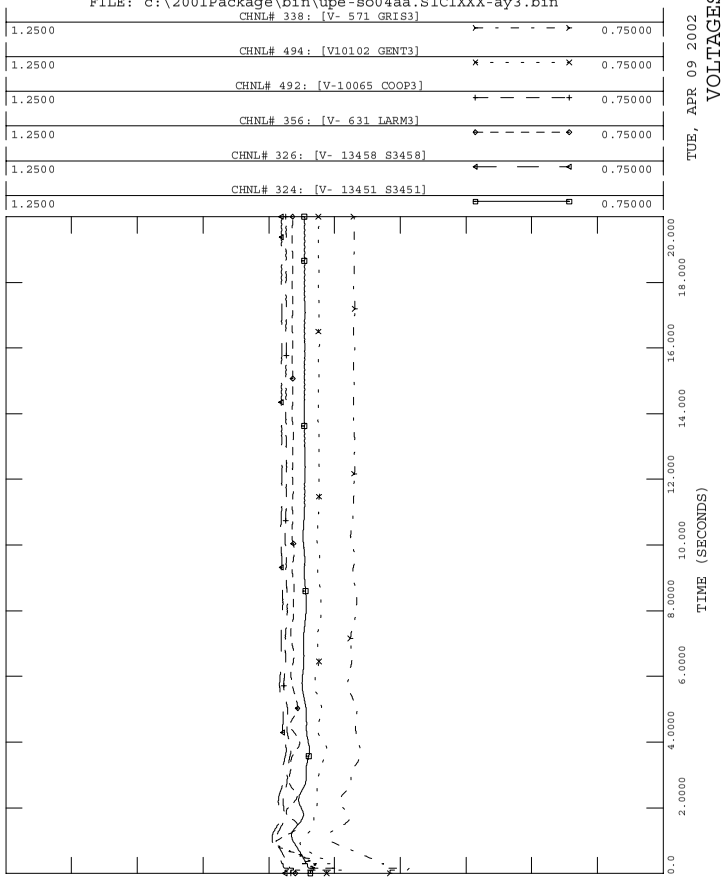
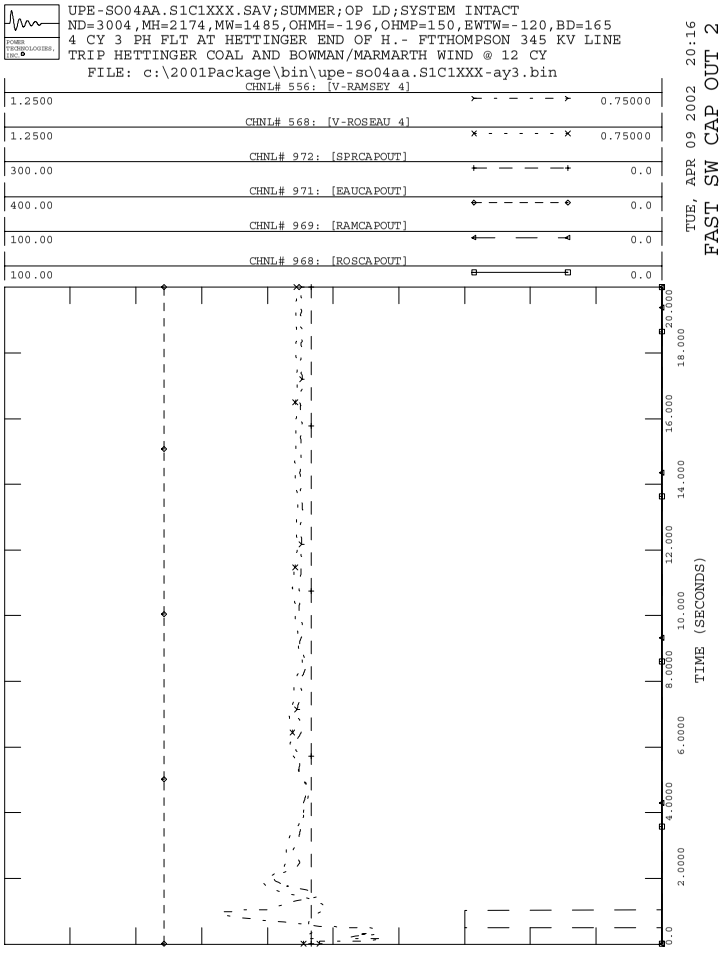
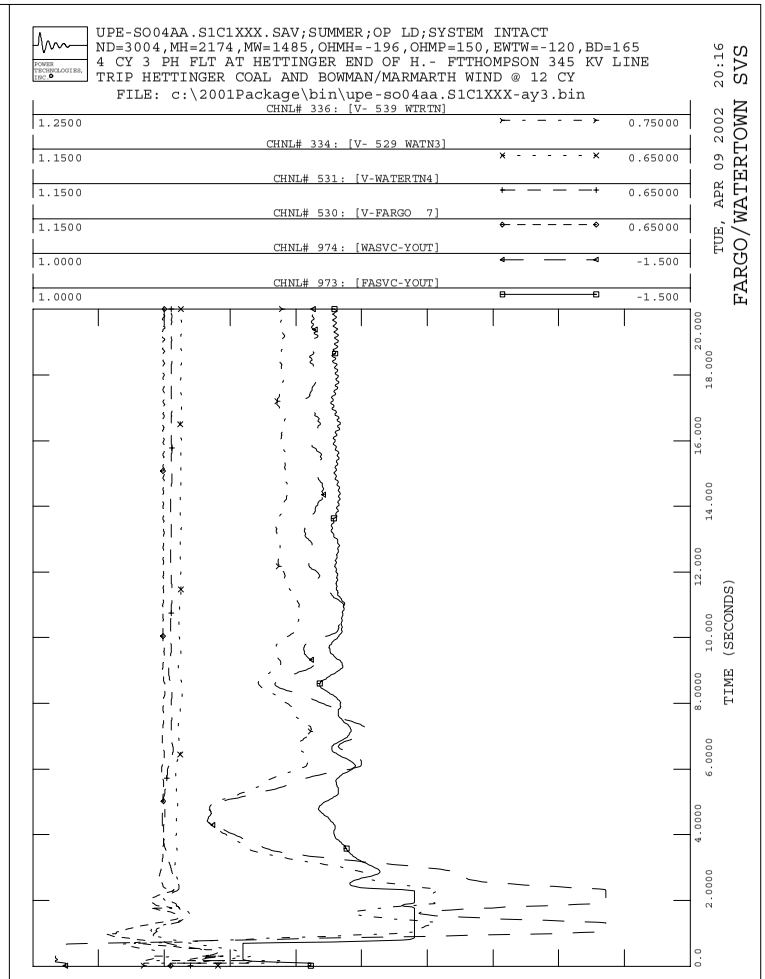
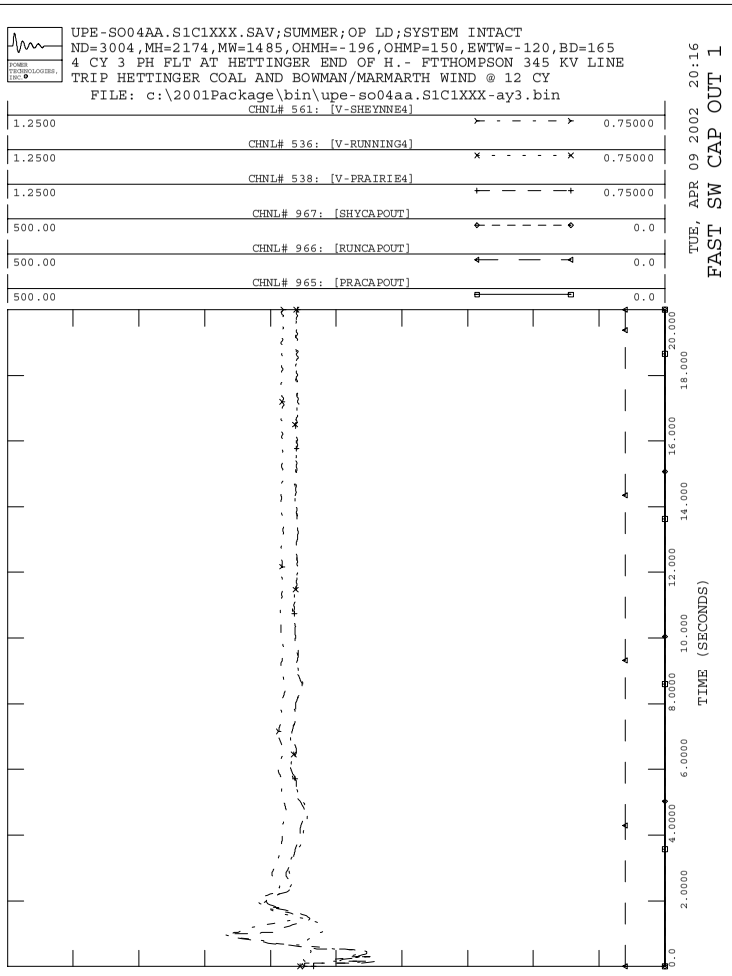
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

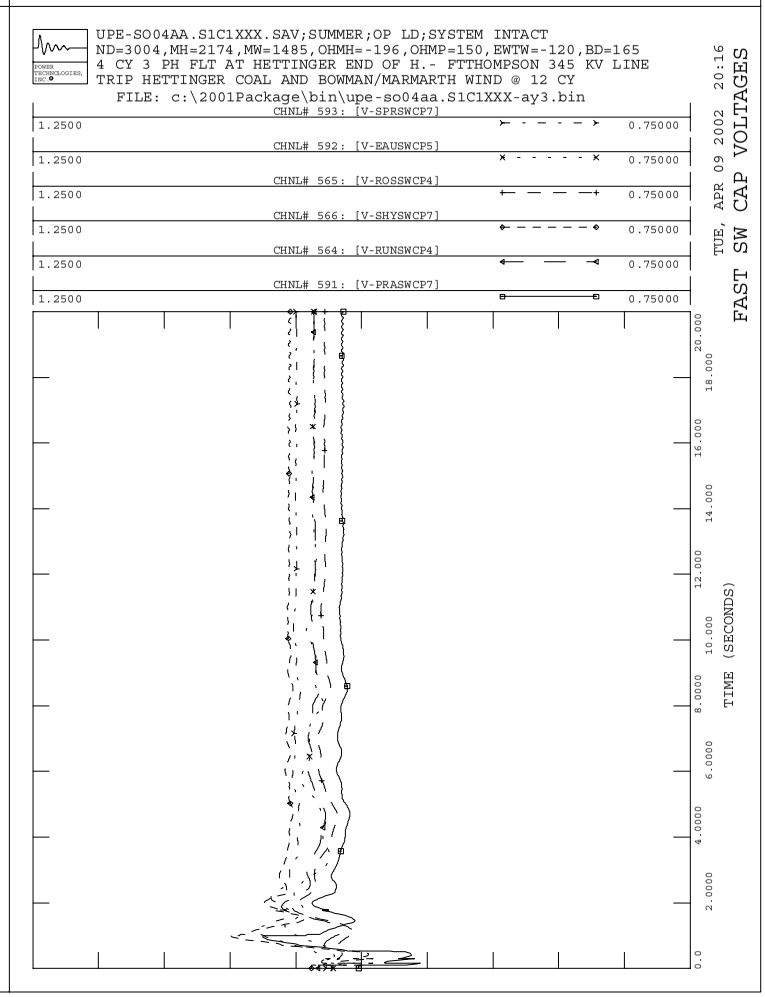
TUE, APR 09 2002 20:16
VOLTAGES NB




UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TUE, APR 09 2002 20:16
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TUE, APR 09 2002 20:16
FARGO/WATERTOWN SVS
TIME (SECONDS)

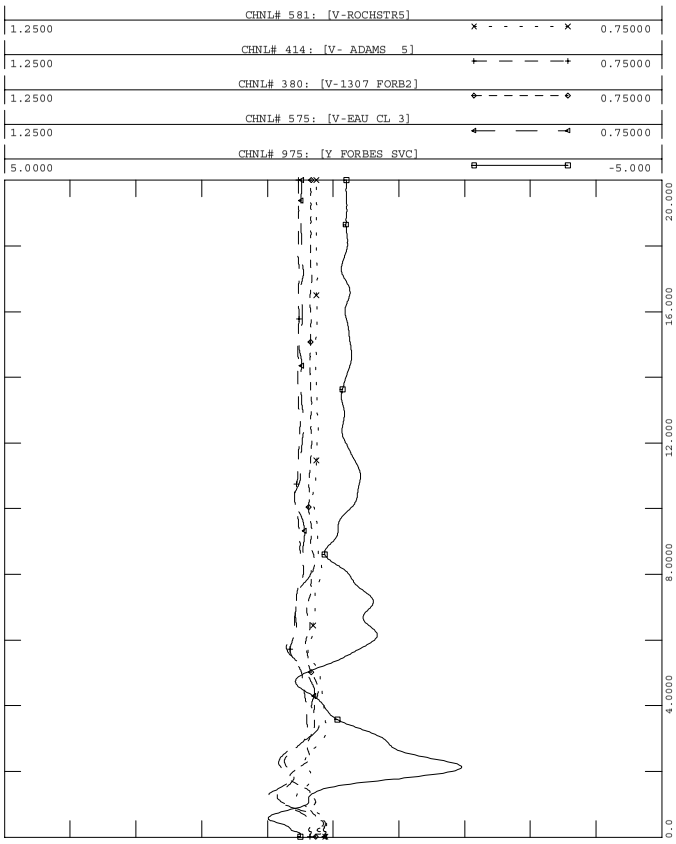

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TUE, APR 09 2002 20:16
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TUE, APR 09 2002 20:16
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16

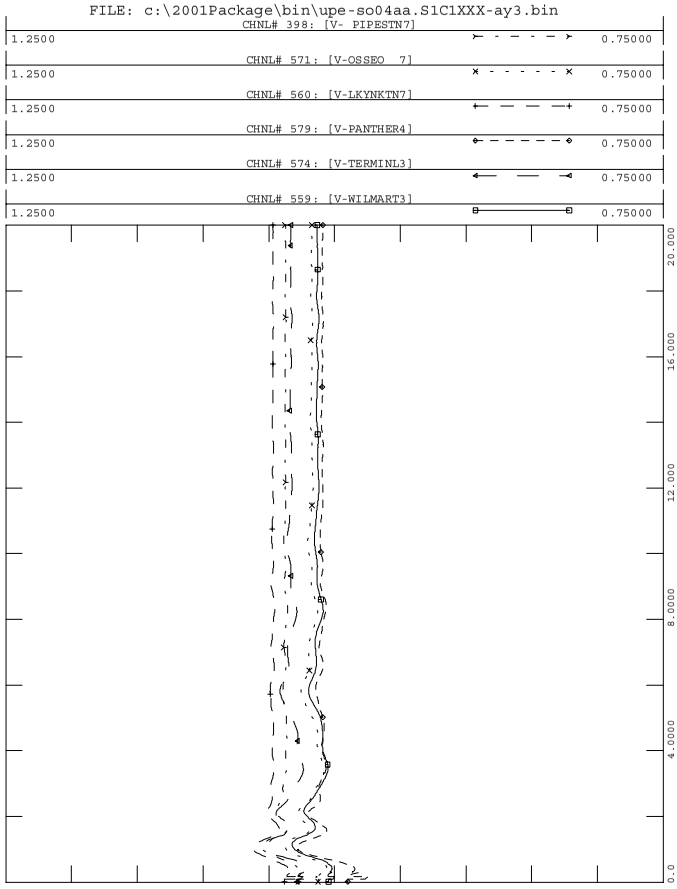
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16

TC VOLTAGES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

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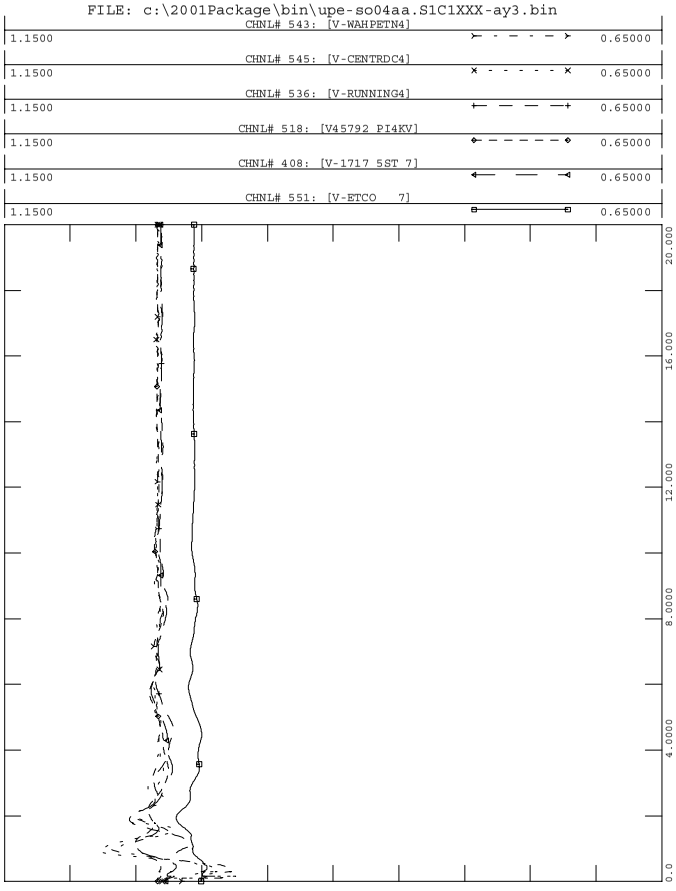
VOLTAGES 6



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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

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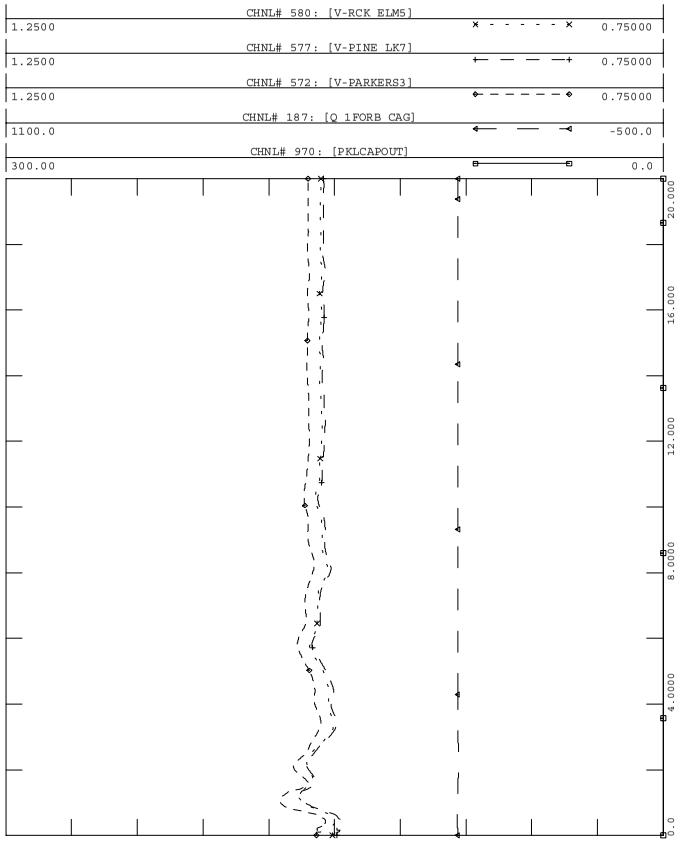
FORBES SVS OUT & VOLTAGES



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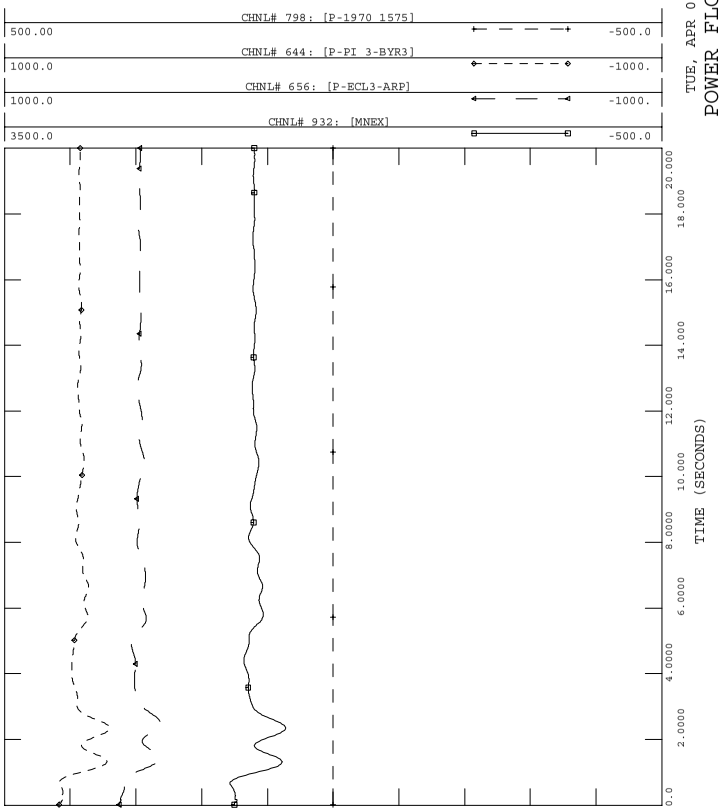
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
POWER FLOW SUMS 2



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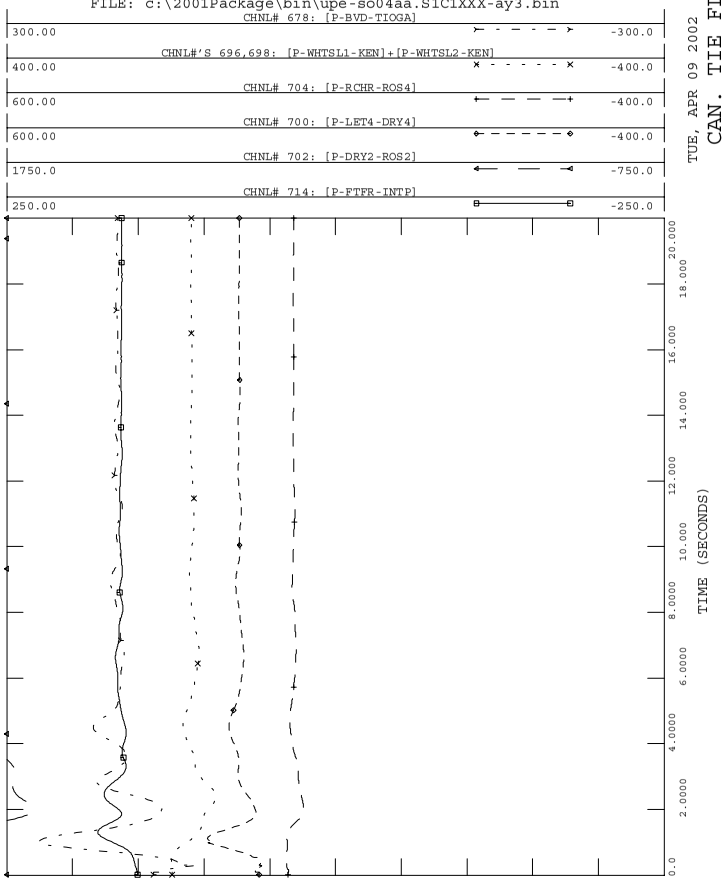
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
CAN. TIE FLOWS



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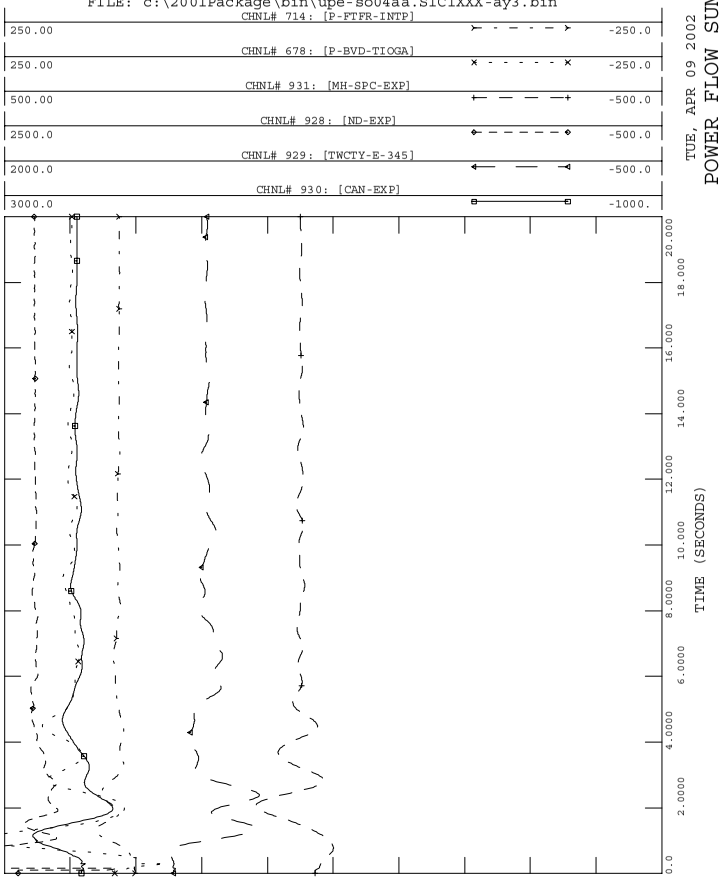
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
POWER FLOW SUMS 1



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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

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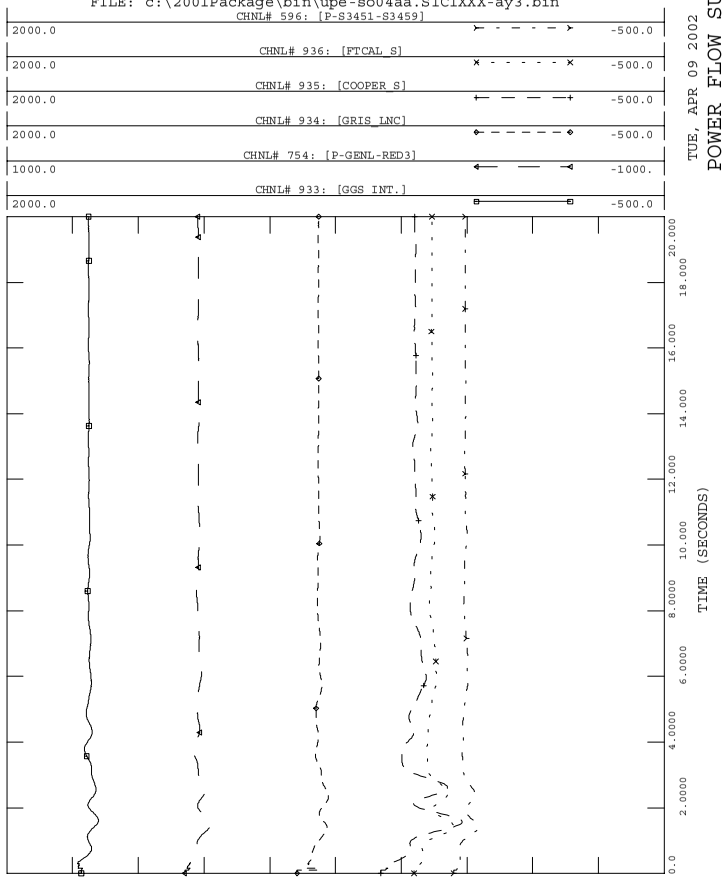
POWER FLOW SUM 3



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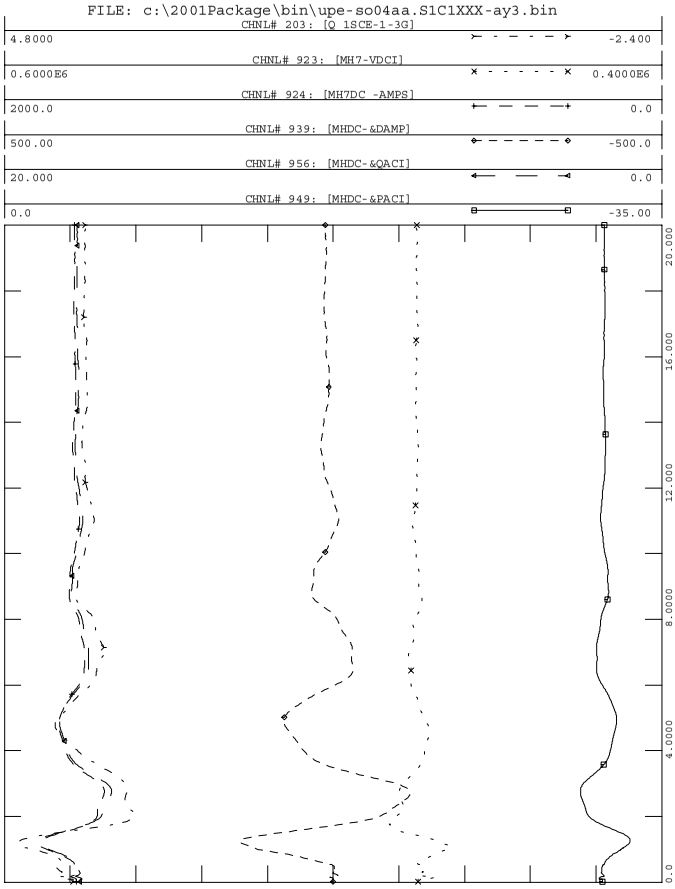
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
MH DC PARAMETERS



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TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

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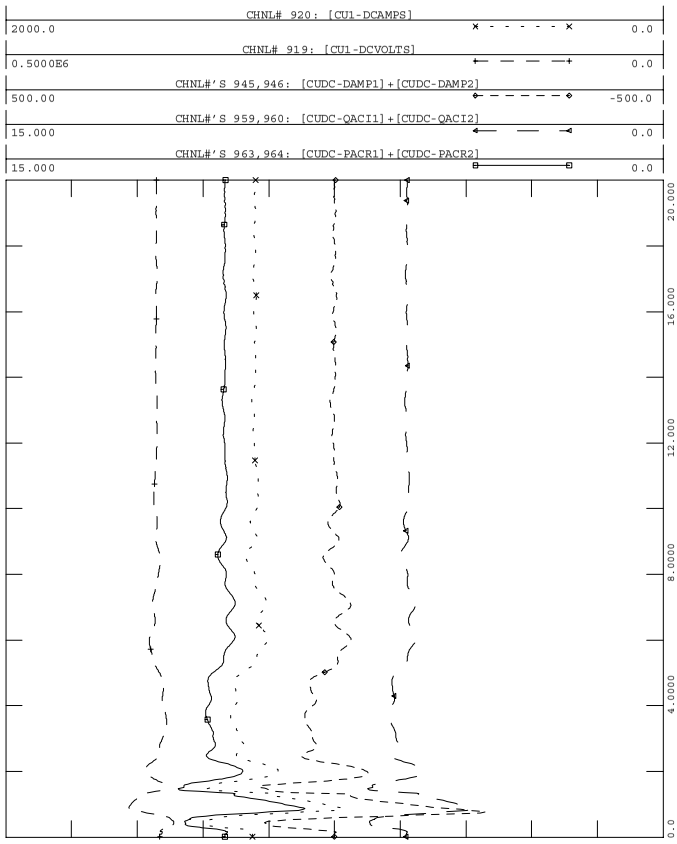
CU DC #1



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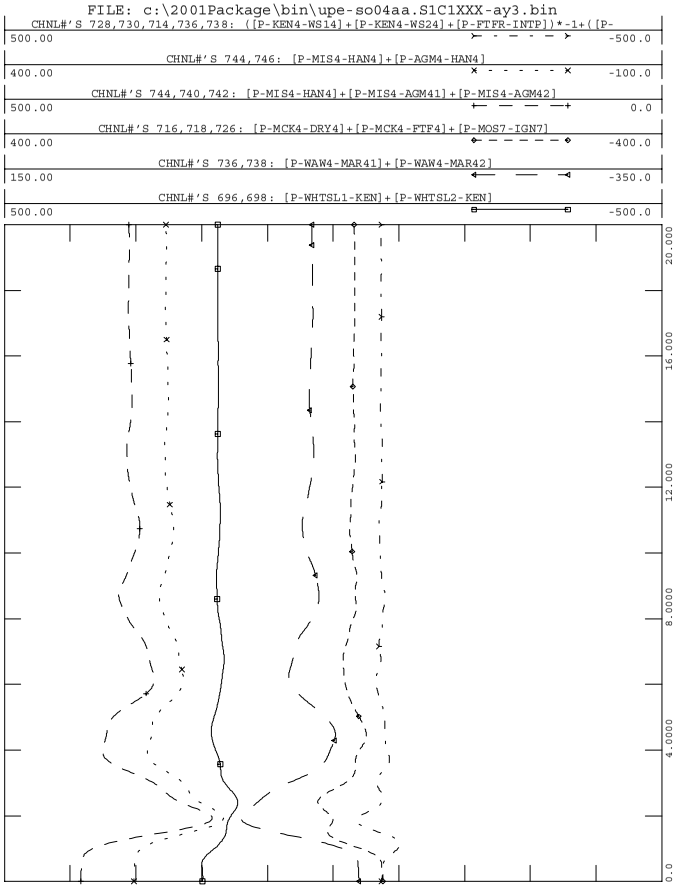
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
OH TIE FLOWS



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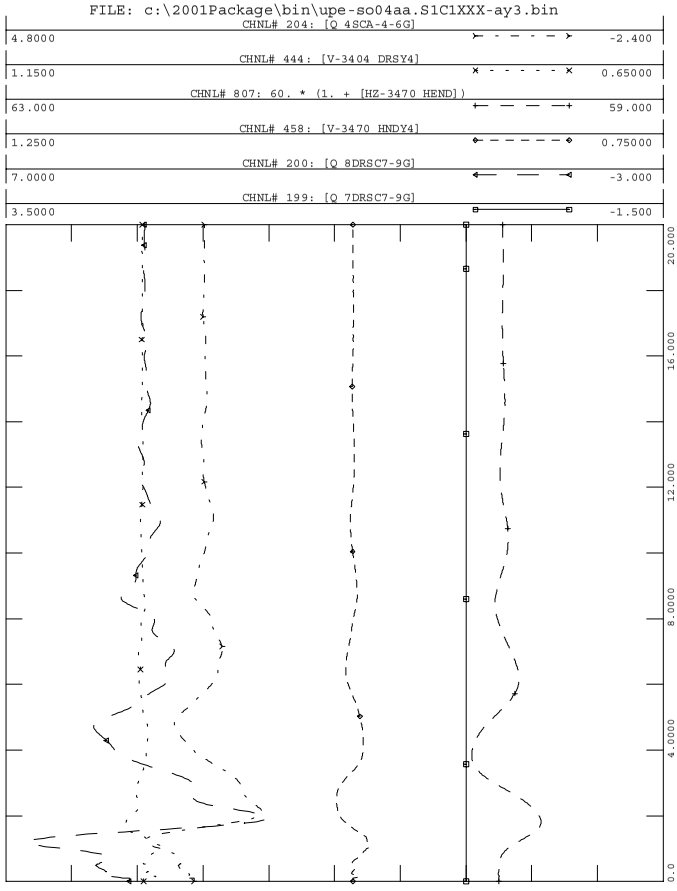
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

TUE, APR 09 2002 20:16
MH DC PARAMETERS



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TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

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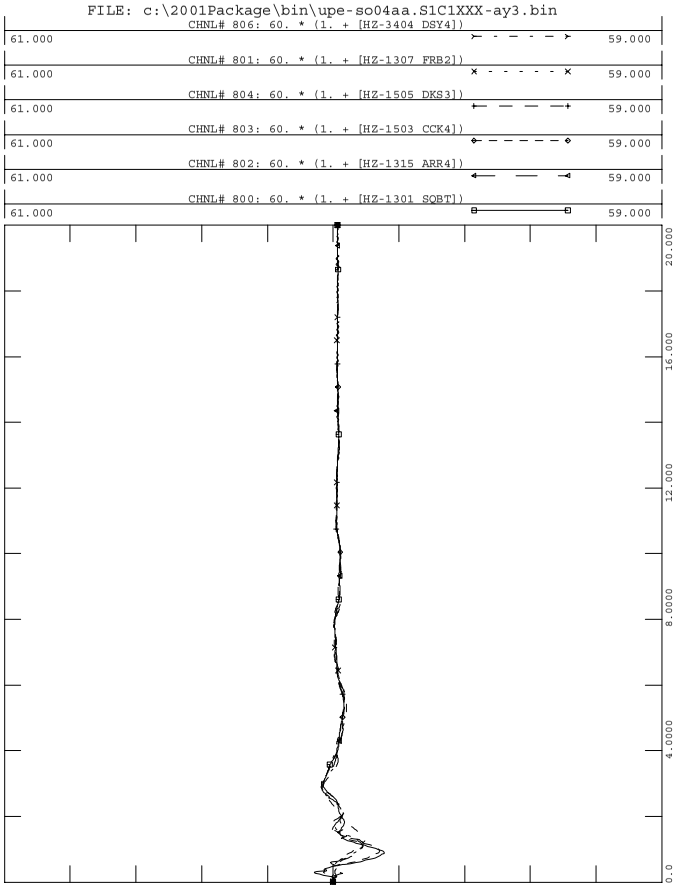
FREQ AT DC TERMINALS



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FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

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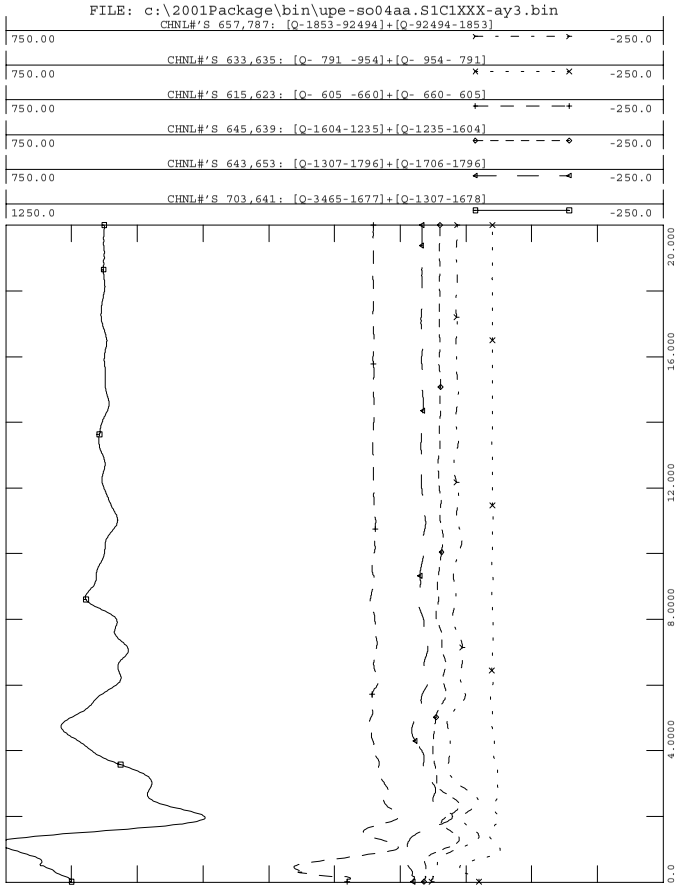
VAR LOSSES



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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

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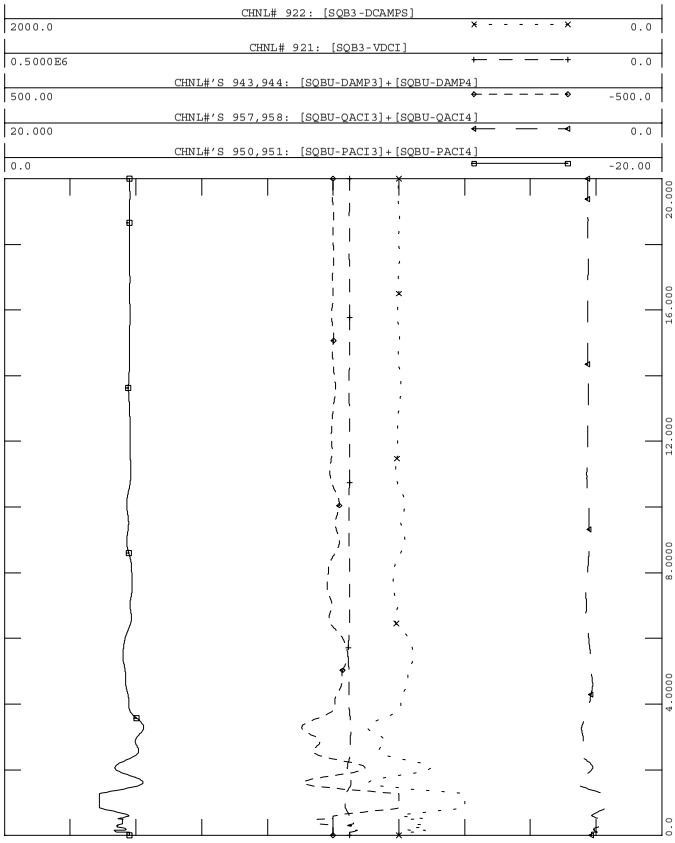
SQB DC #3



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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

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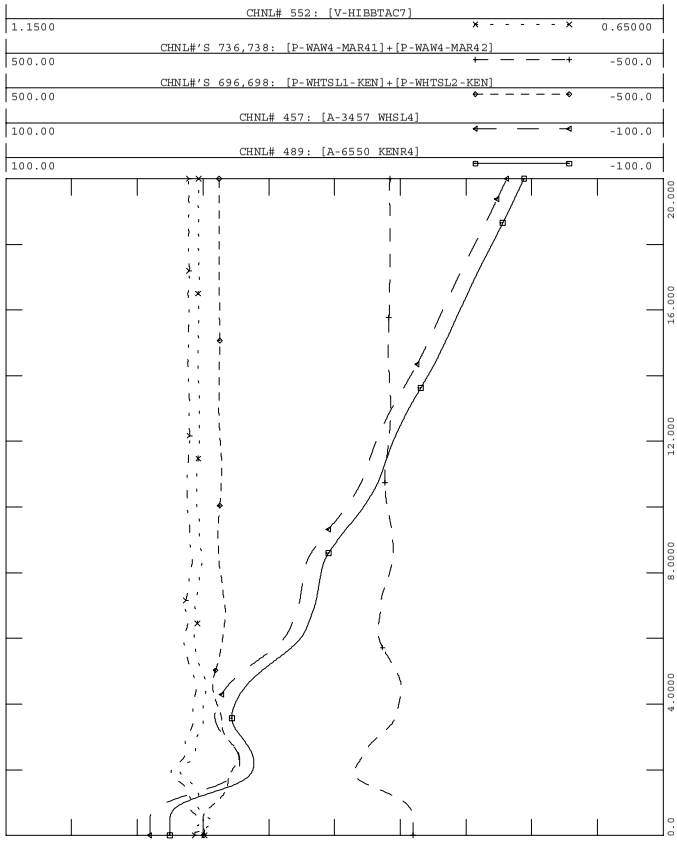
VOLTAGES, ANGLES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

RELAY: SLINOS
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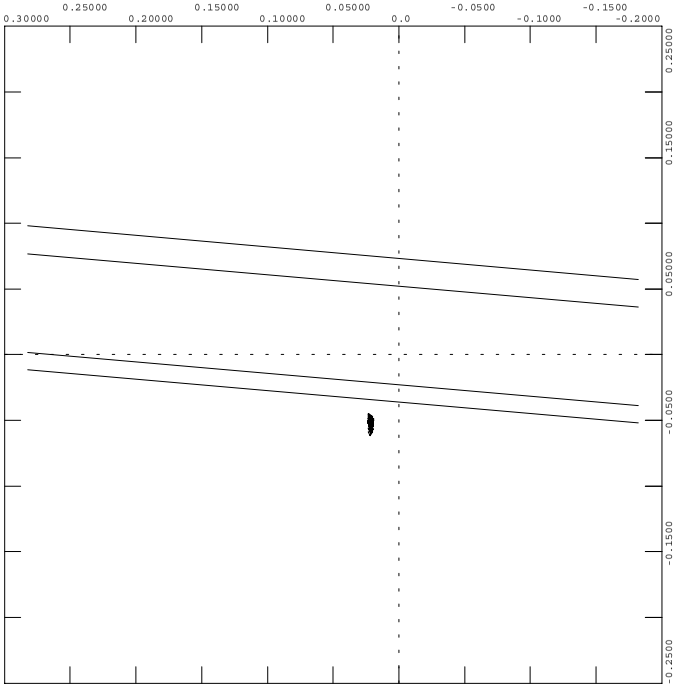
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 09 2002 20:16
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

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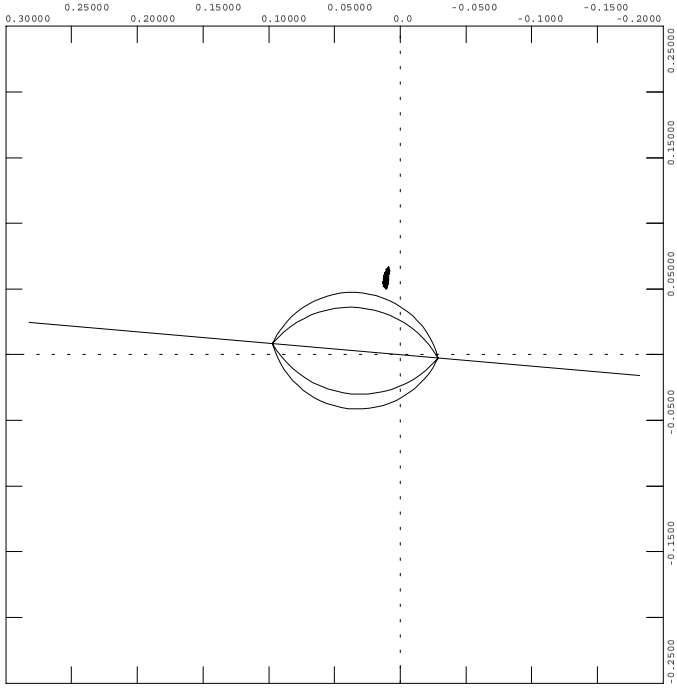

TUE, APR 09 2002 20:16
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

RELAY: RELAYG
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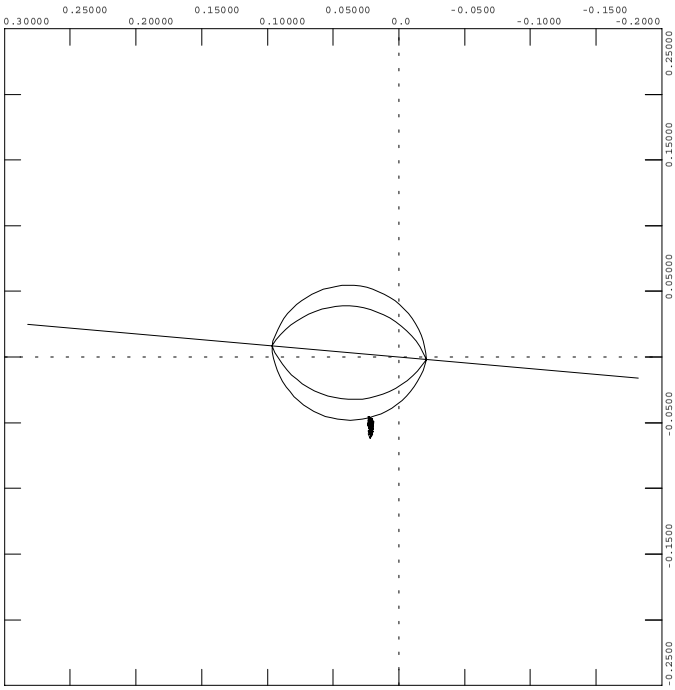

TUE, APR 09 2002 20:16
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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

RELAY: SLINOS
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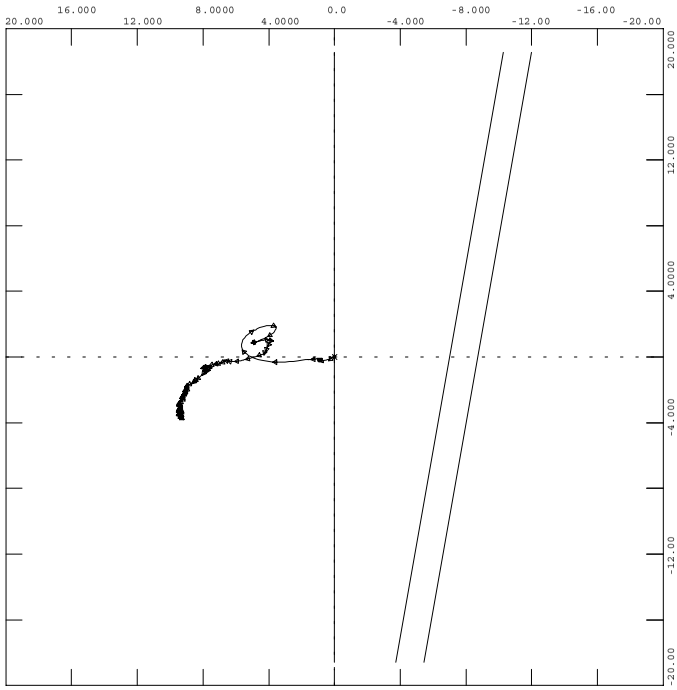
CHNL# 977: [DCAR-B]



TUE, APR 09 2002 20:16
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

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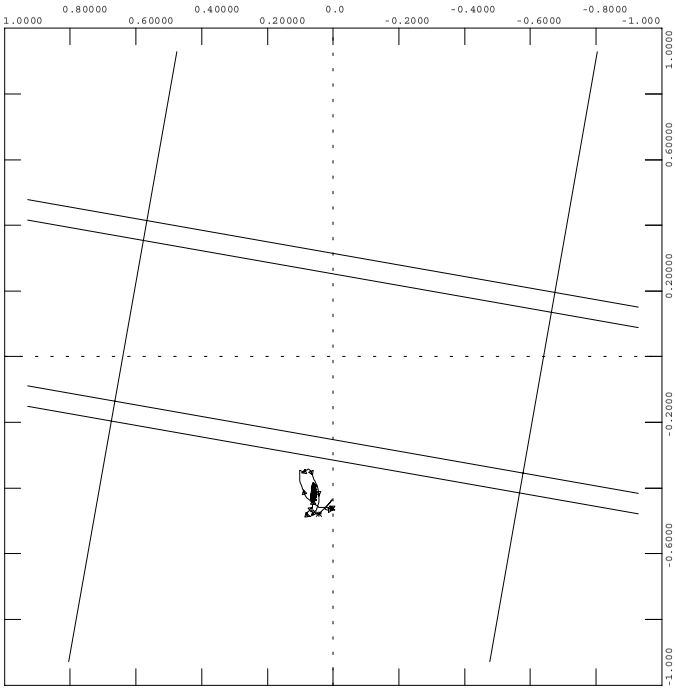
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



TUE, APR 09 2002 20:16
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

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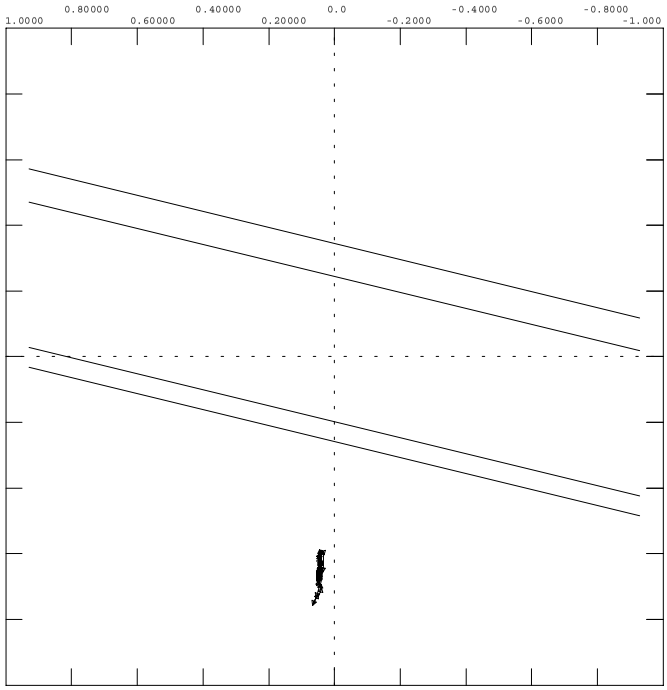

TUE, APR 09 2002 20:16
R50M AT MORANVILLE (520)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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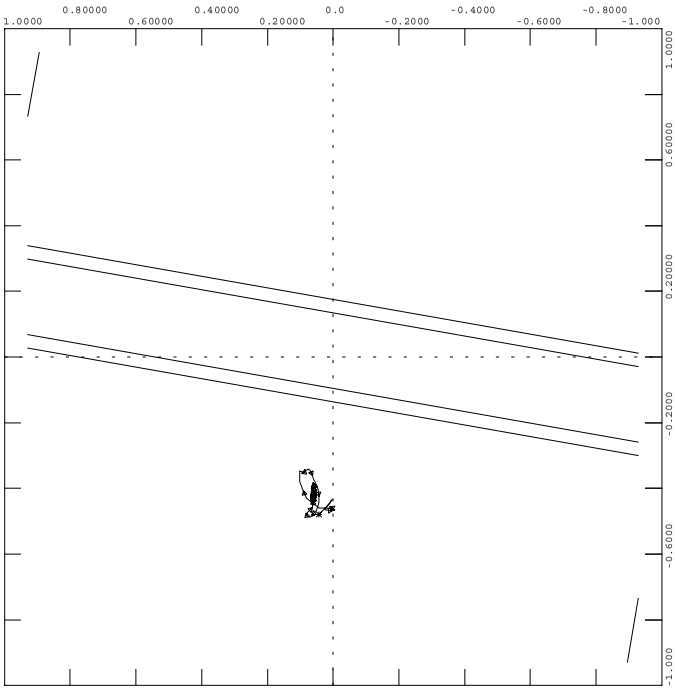
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

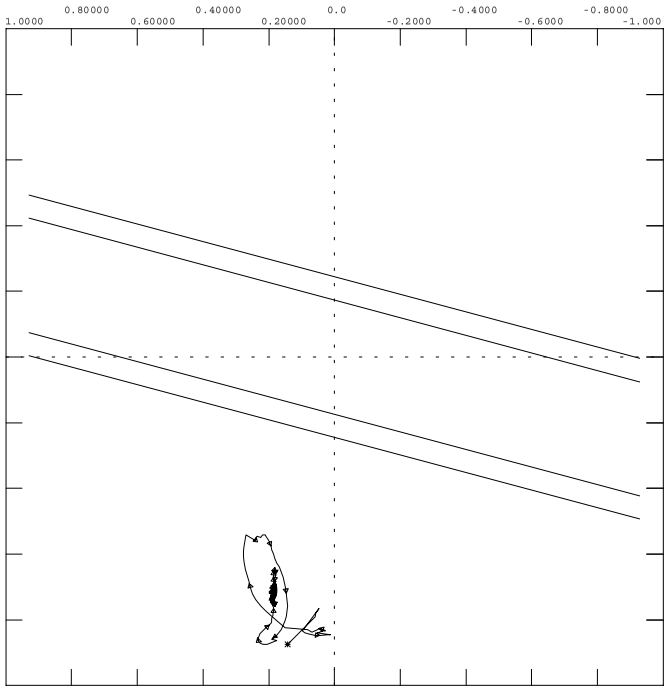


TUE, APR 09 2002 20:16
L20D AT DRAYTON (506)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



TUE, APR 09 2002 20:16
L20D-PRAIRIE (510)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

RELAY: SLLP
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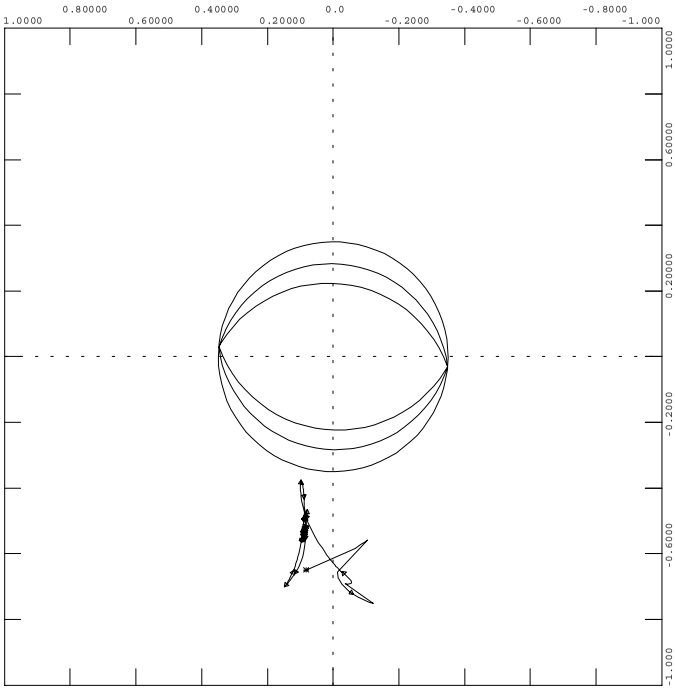
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

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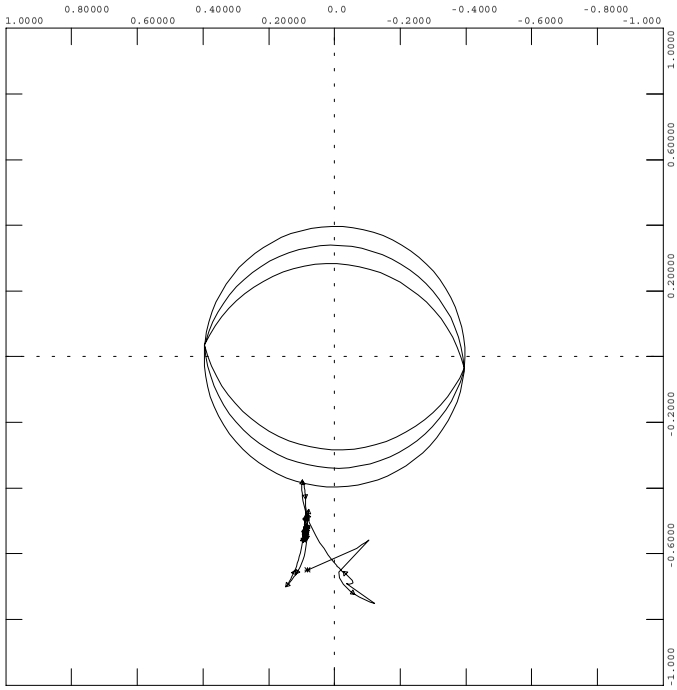
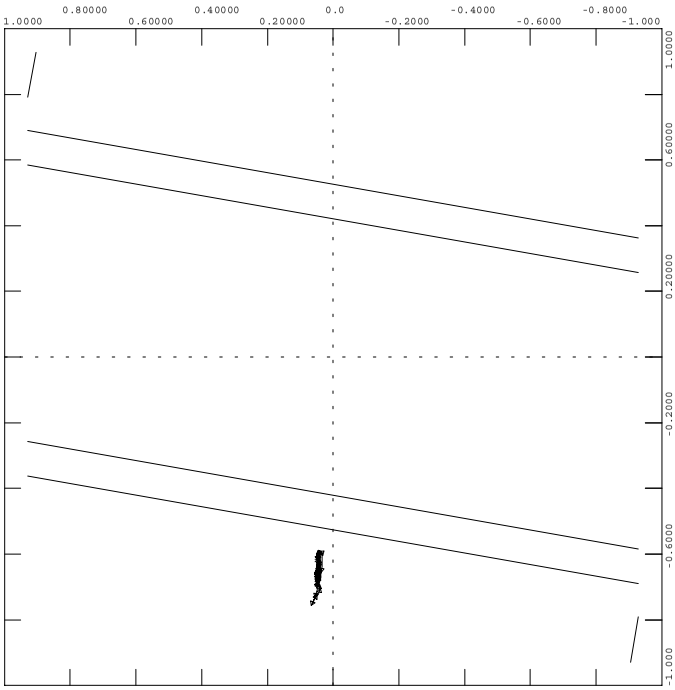


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

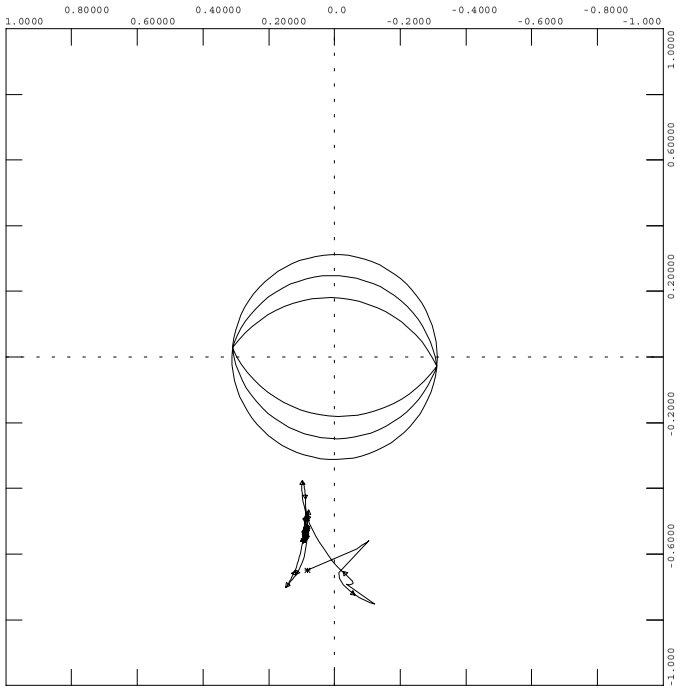
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



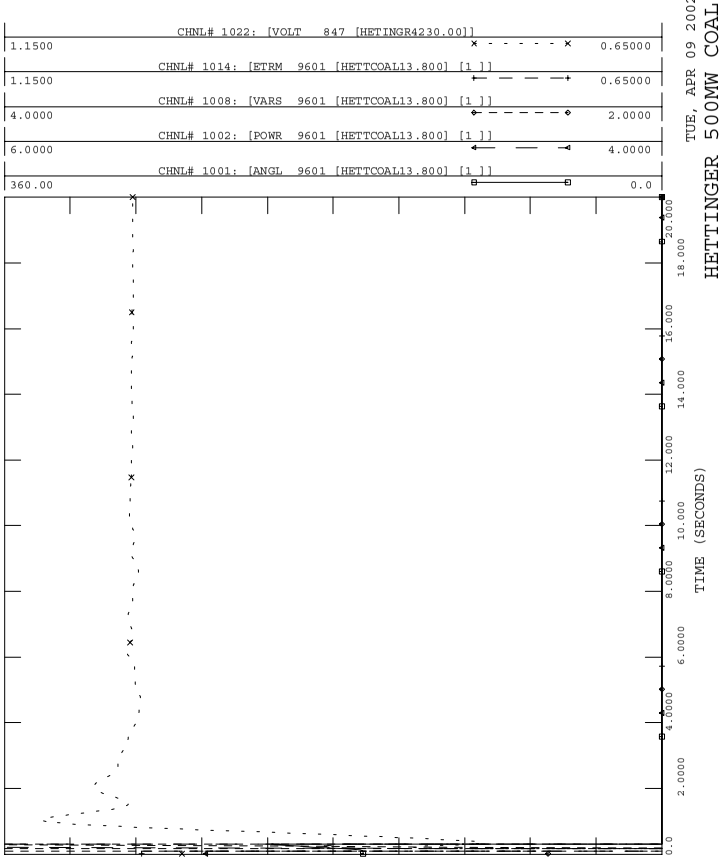
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

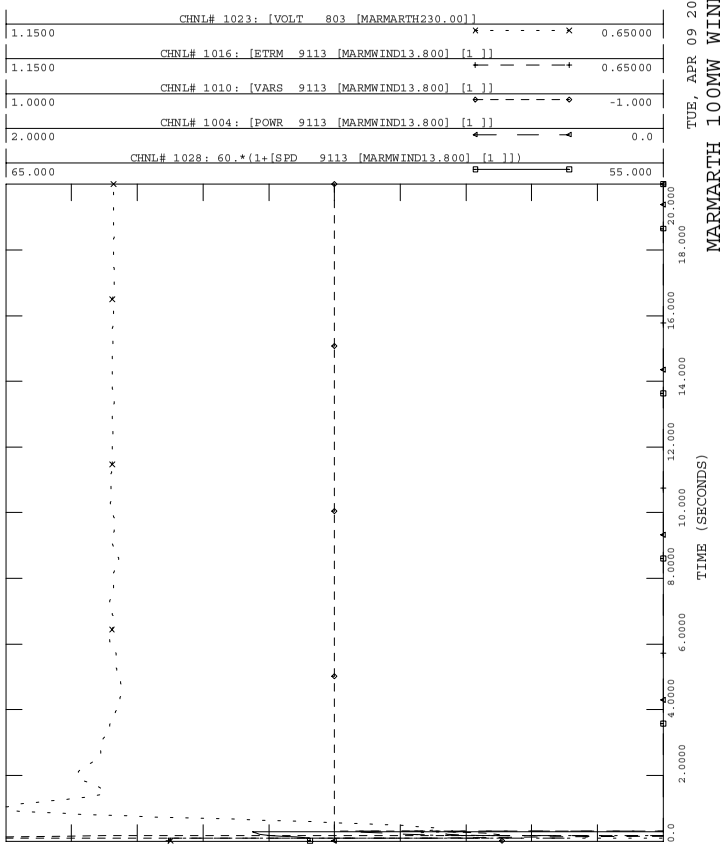
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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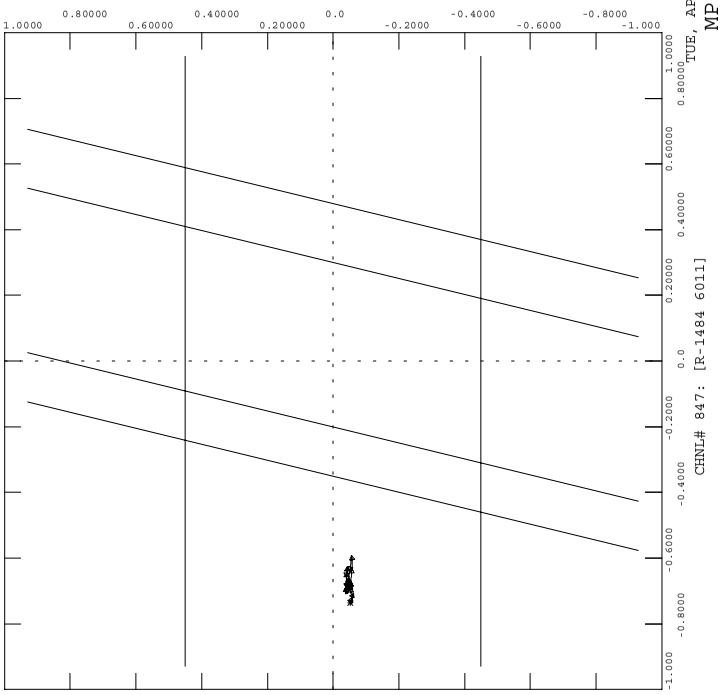
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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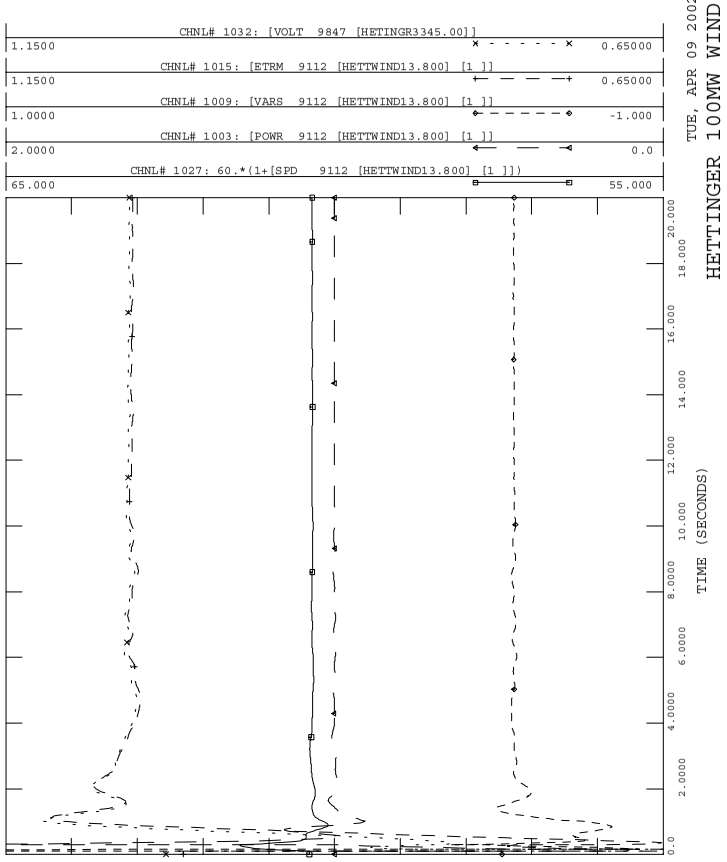
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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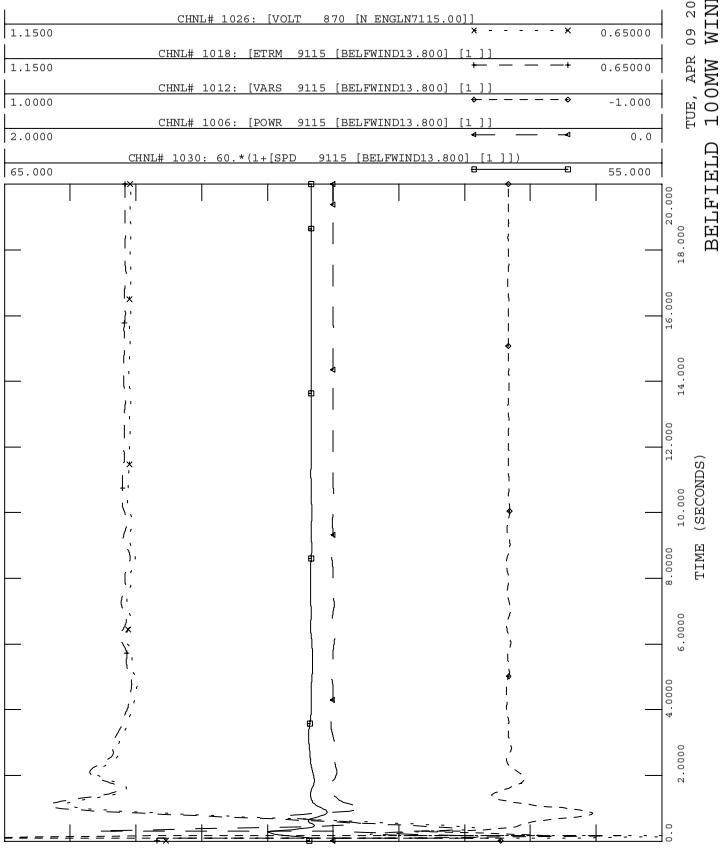
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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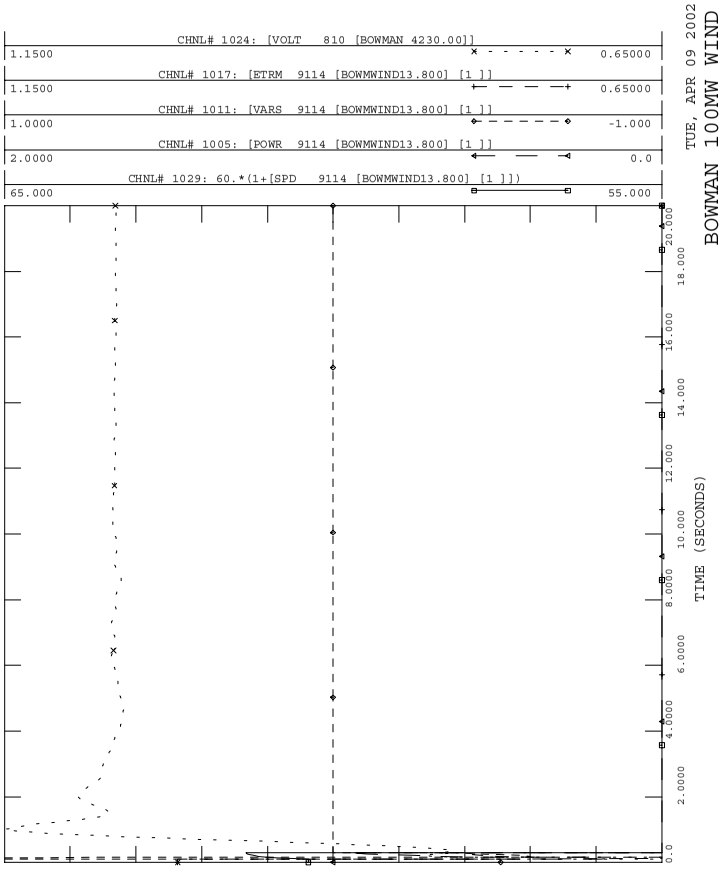
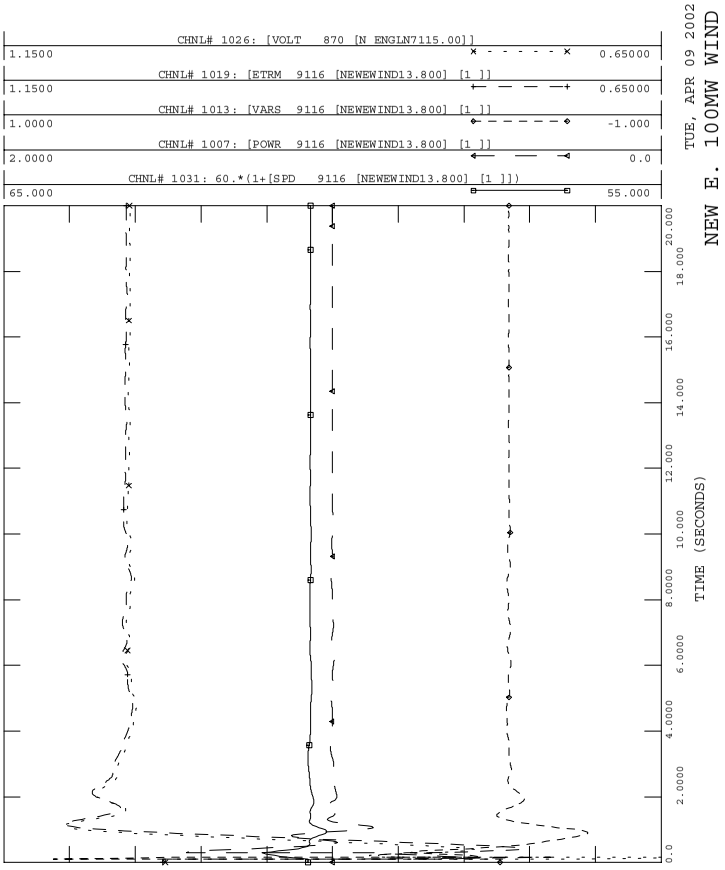
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL AND BOWMAN/MARMARTH WIND @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXX-ay3.bin



APPENDIX 4

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 1 (HETTINGER)

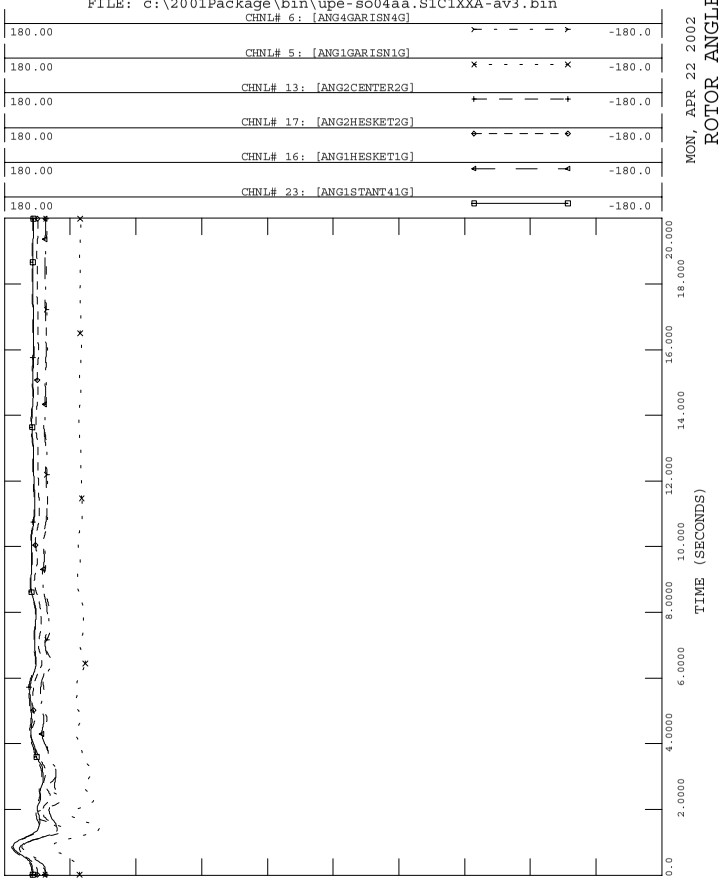
CASE S1C1XXA

CONTINGENCY AV3

4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Belfield 345 kV line

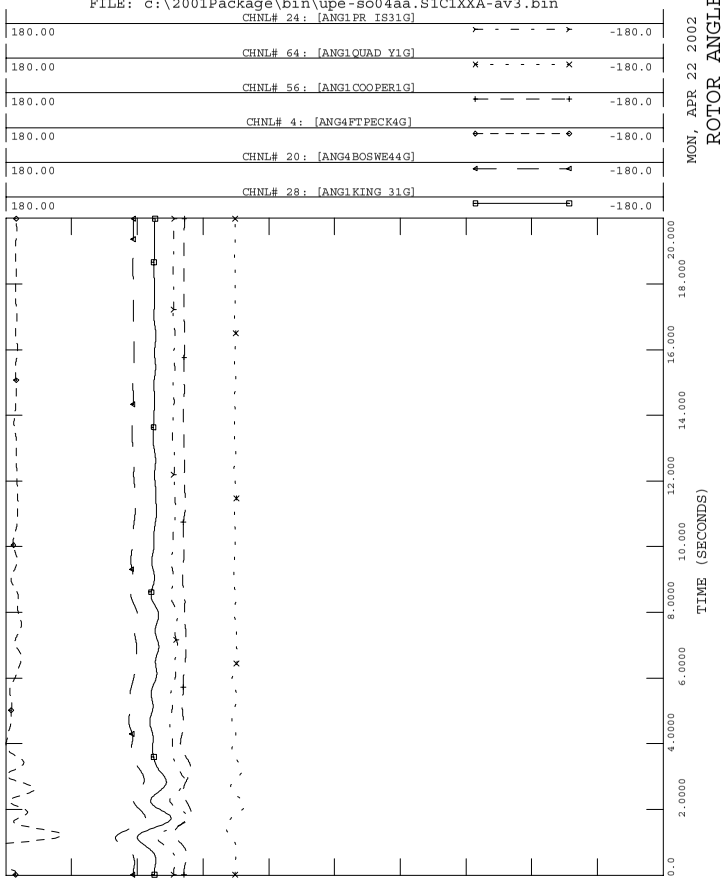
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
ROTOR ANGLES 2



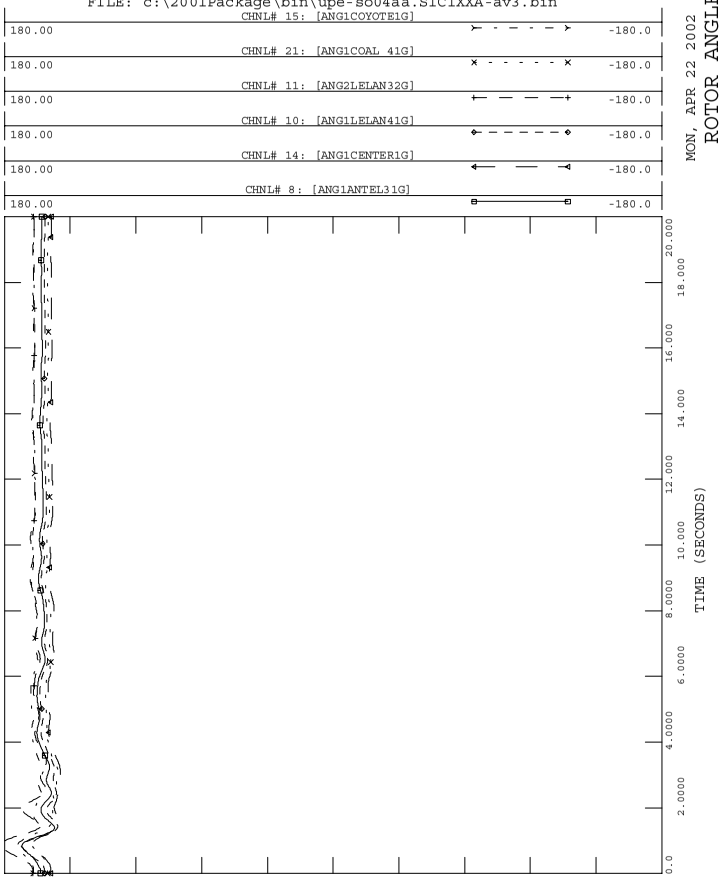
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
ROTOR ANGLES 4



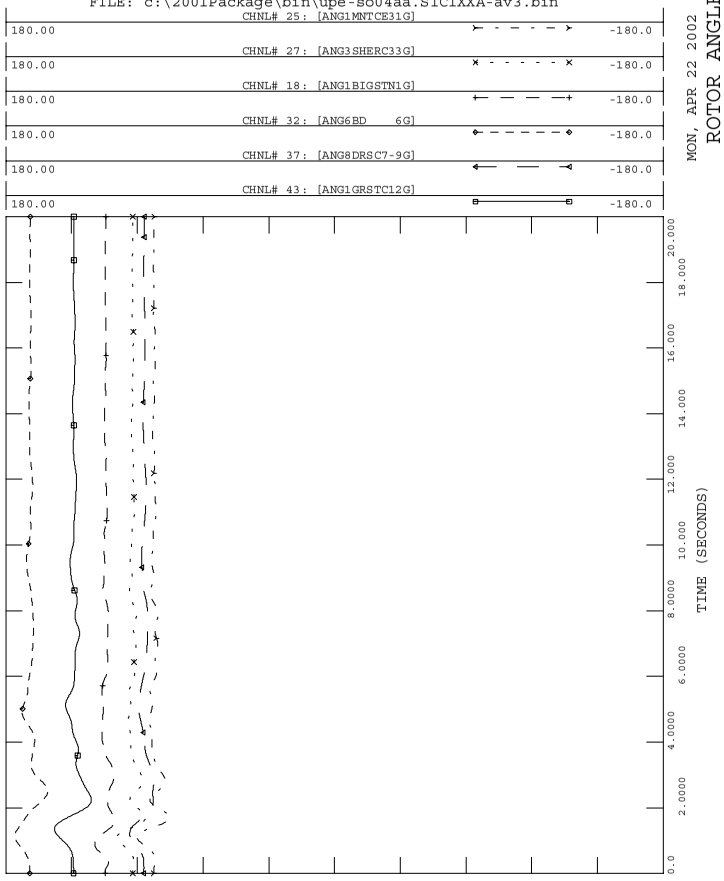
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
ROTOR ANGLES 1

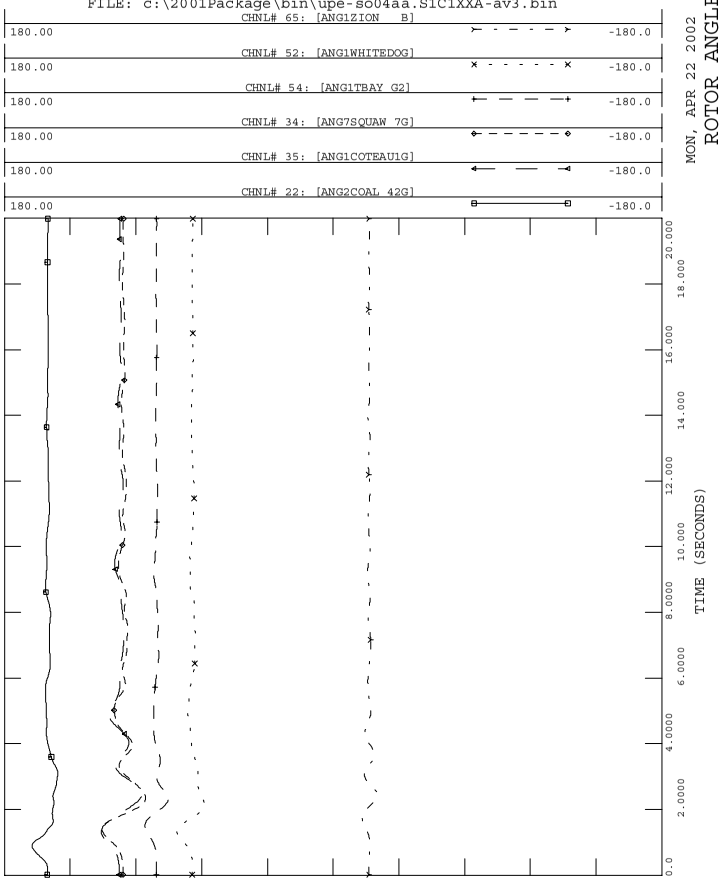


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
ROTOR ANGLES 3



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



MON, APR 22 2002 12:33
ROTOR ANGLES 6

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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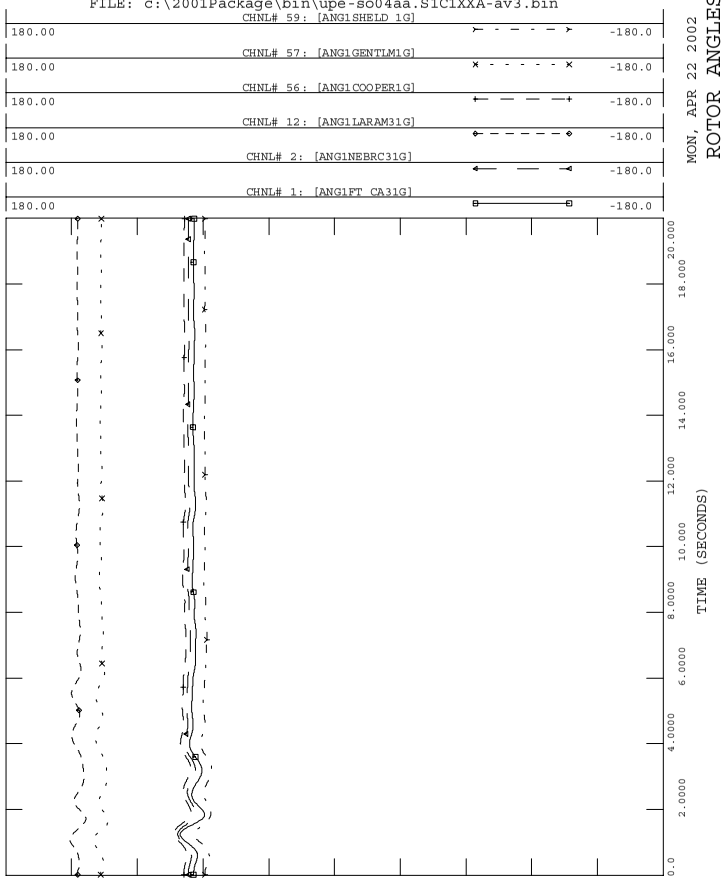
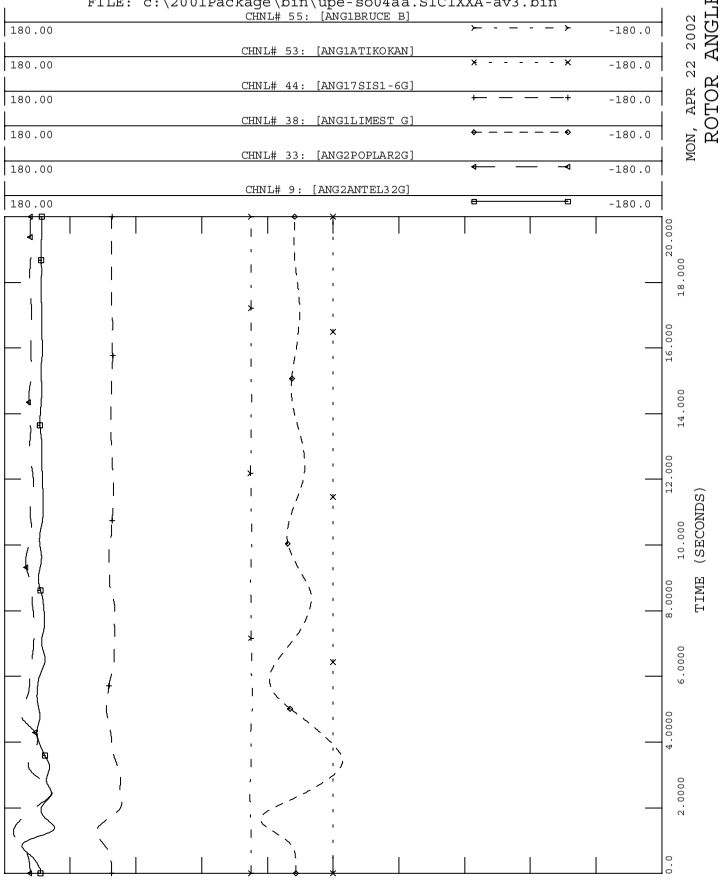
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



MON, APR 22 2002 12:33
ROTOR ANGLES NB

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



MON, APR 22 2002 12:33
ROTOR ANGLES 5

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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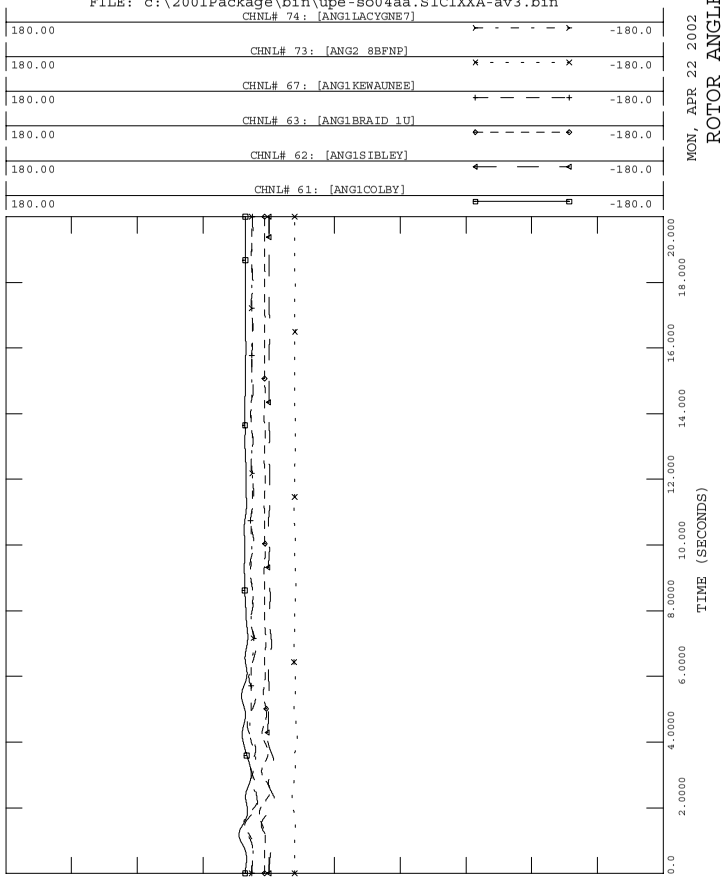
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



MON, APR 22 2002 12:33
ROTOR ANGLES 7

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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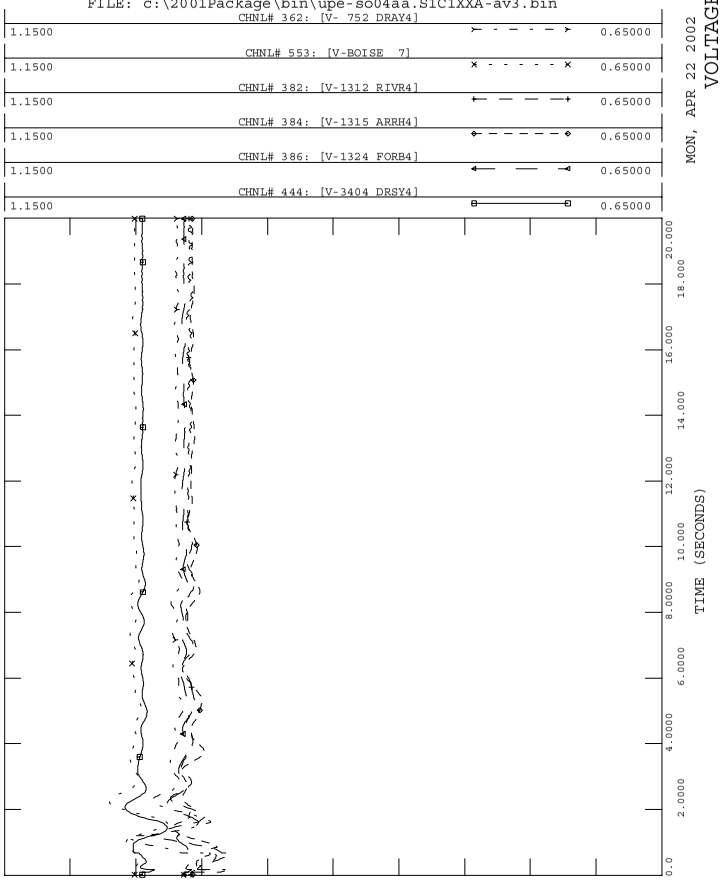
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
VOLTAGES 1



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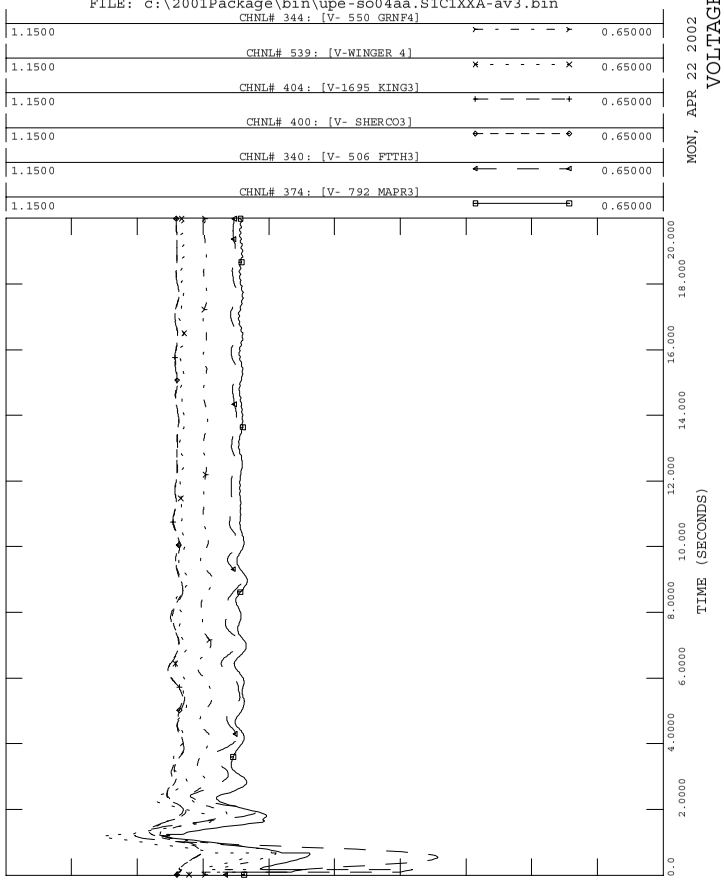
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
VOLTAGES 3



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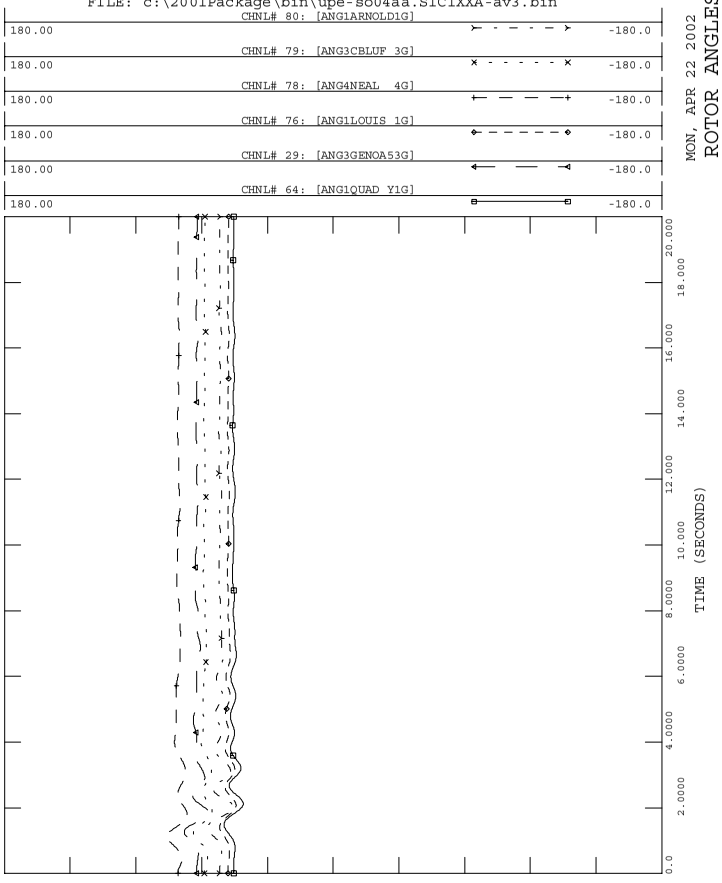
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
ROTOR ANGLES IA



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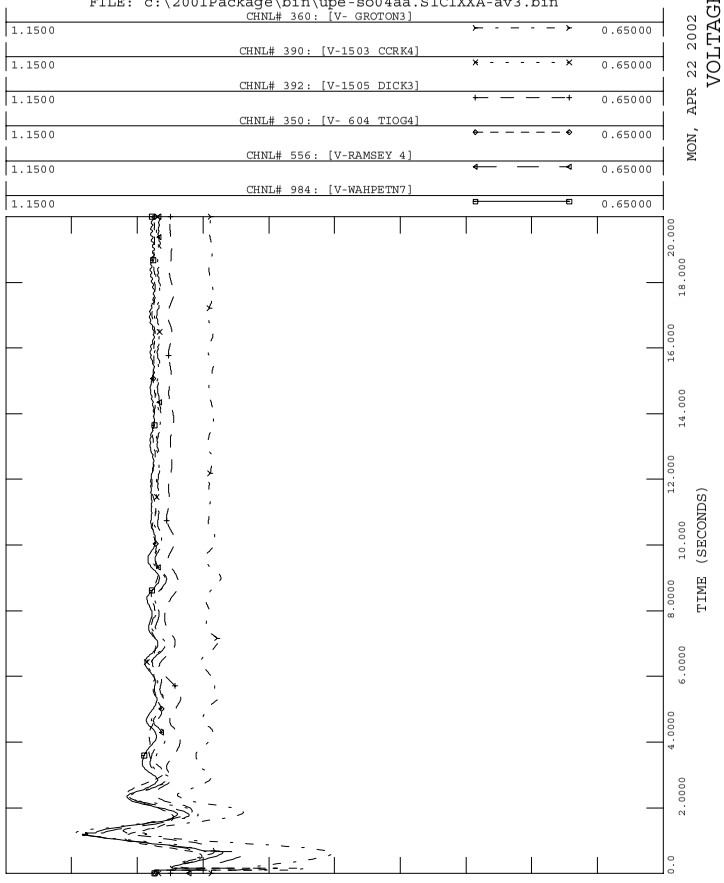
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
VOLTAGES 2



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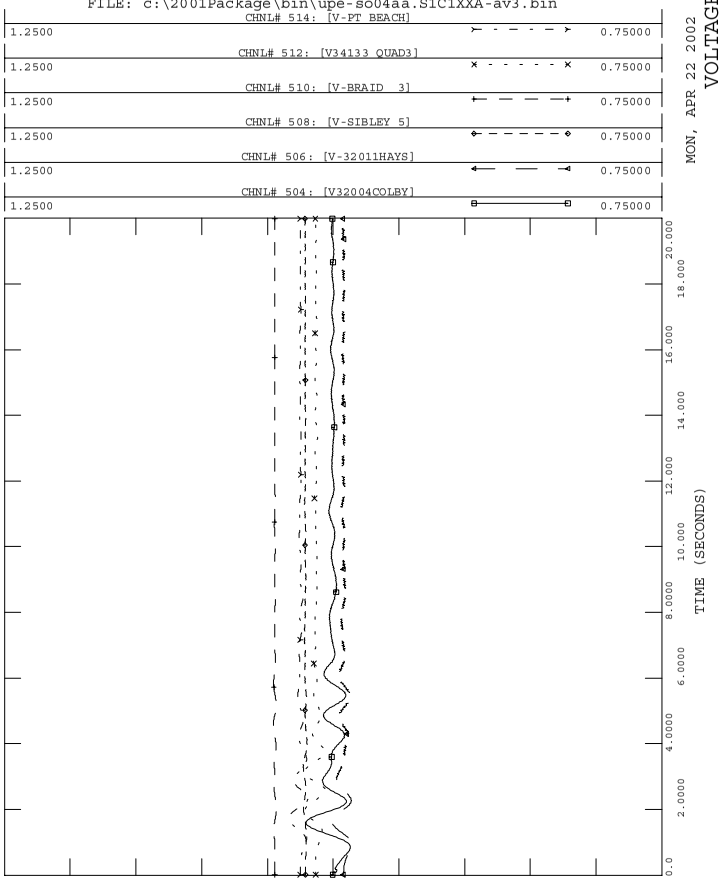
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
VOLTAGES 5



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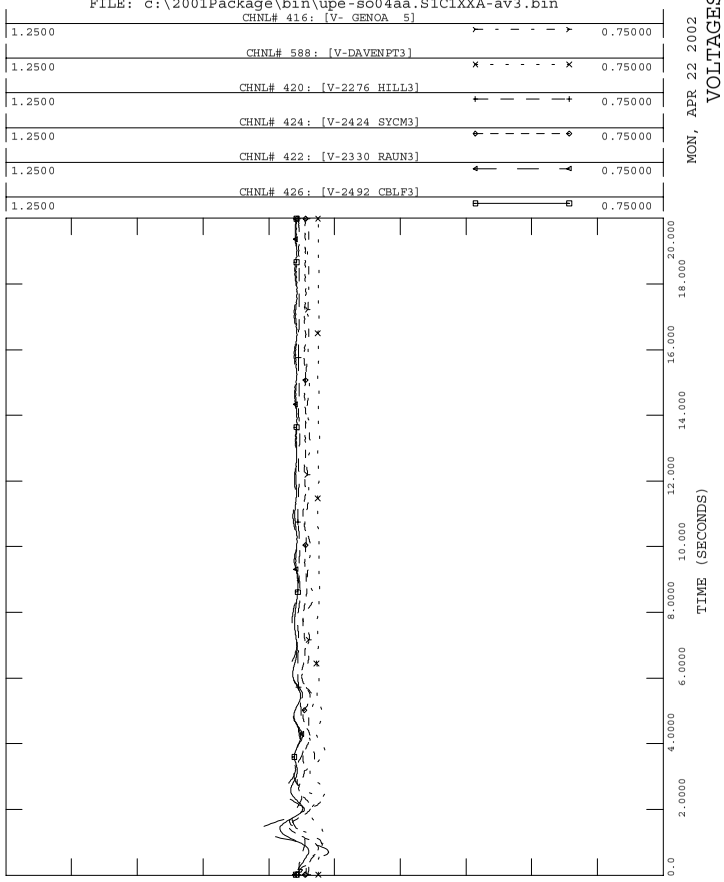
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
VOLTAGES IA



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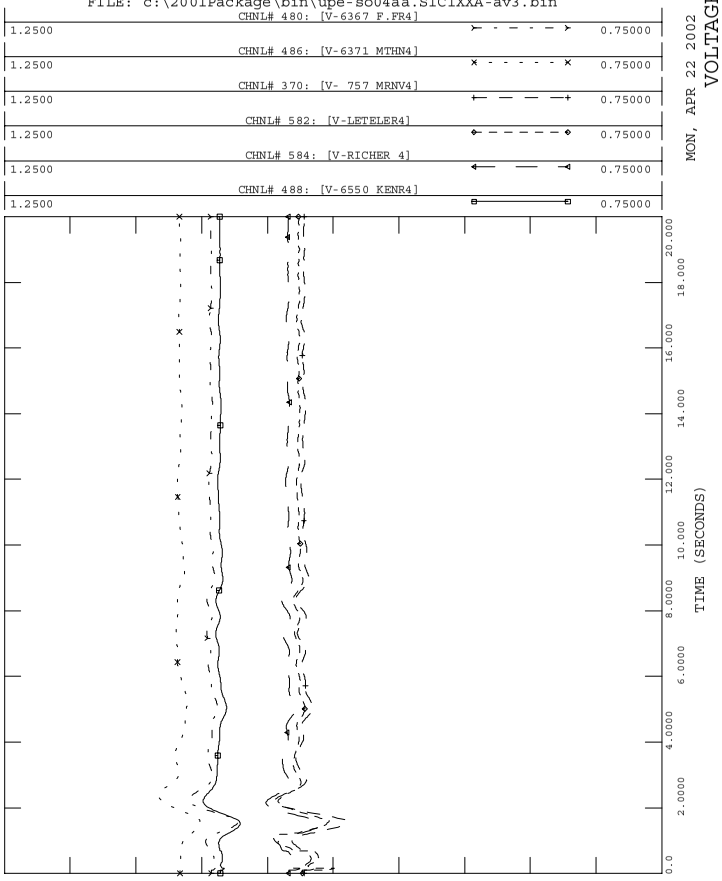
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
VOLTAGES 4



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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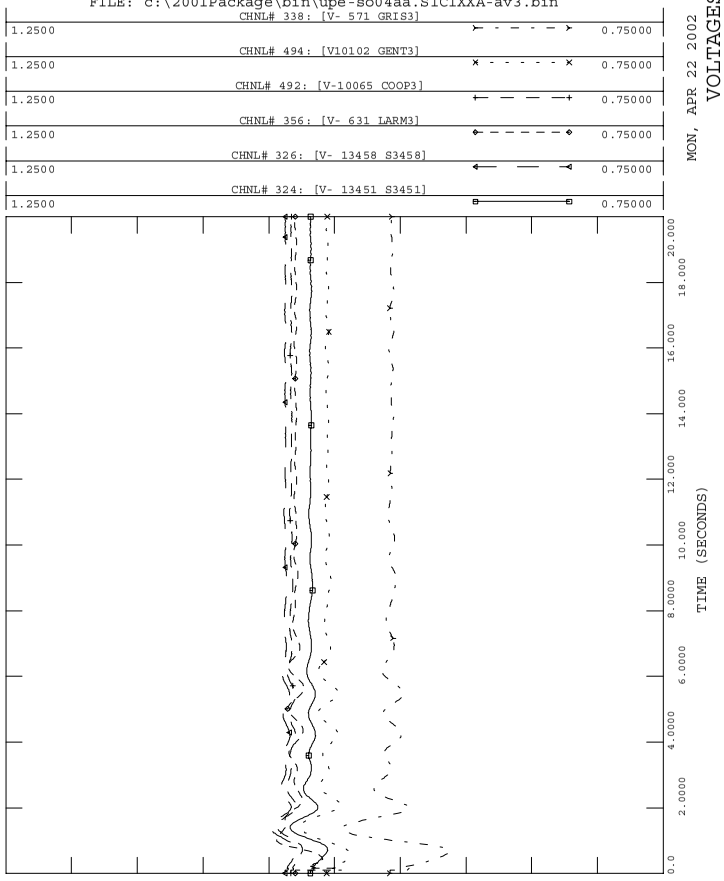
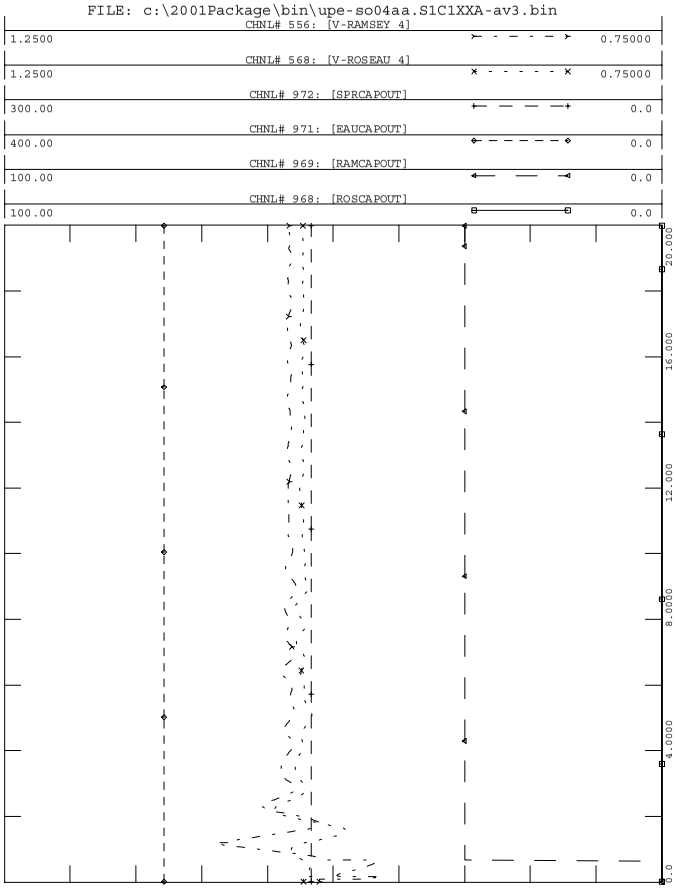
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
VOLTAGES NB

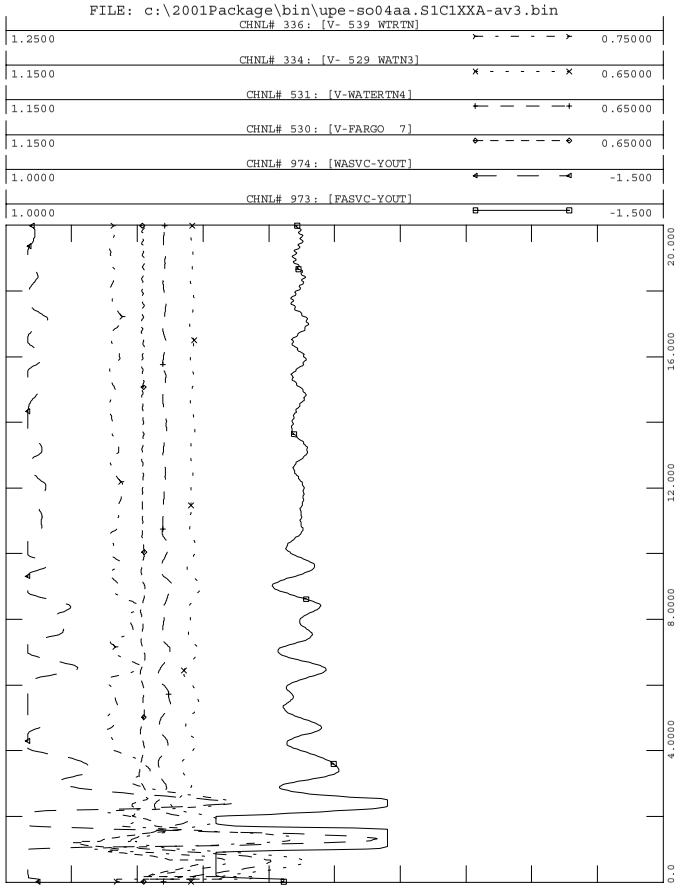


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



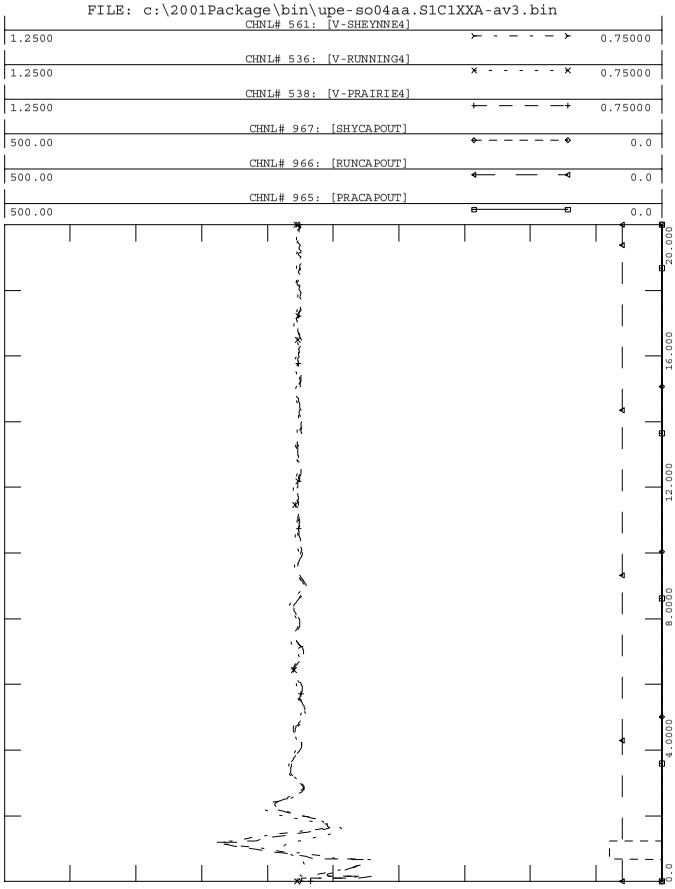
MON, APR 22 2002 12:33
FAST SW CAP OUT 2

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



MON, APR 22 2002 12:33
FARGO/WATERTOWN SVS

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



MON, APR 22 2002 12:33
FAST SW CAP OUT 1

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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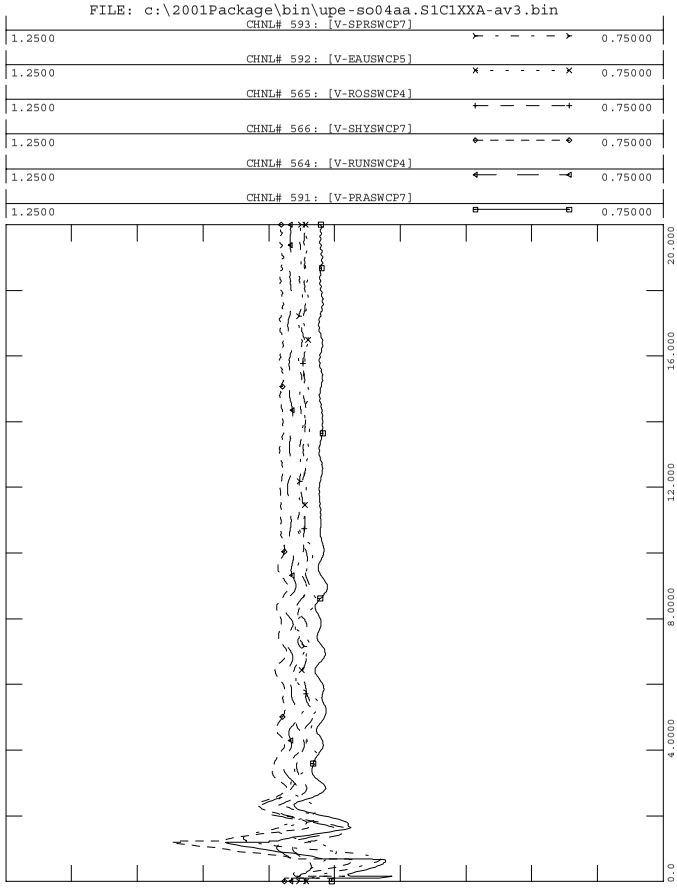
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

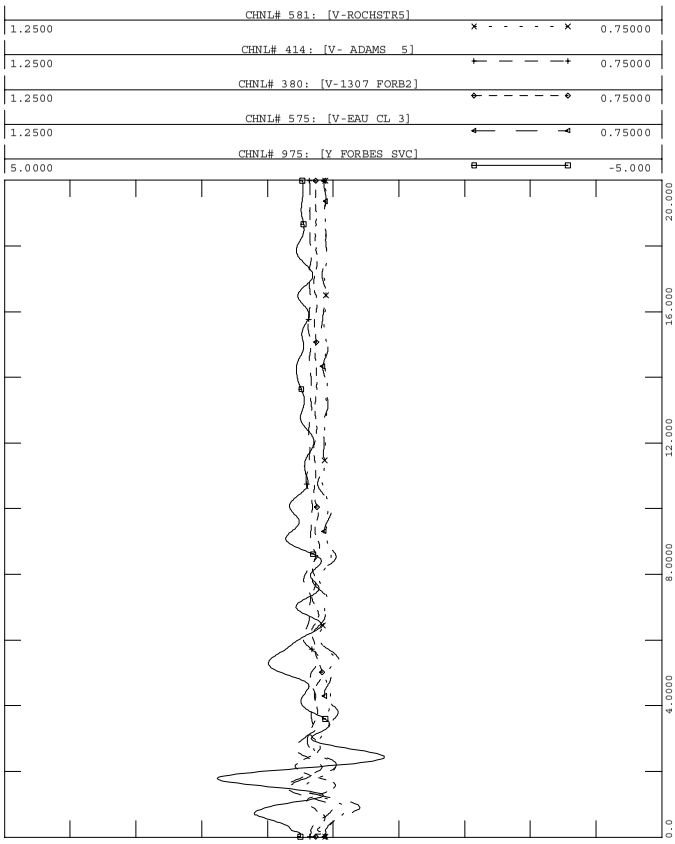


MON, APR 22 2002 12:33
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33

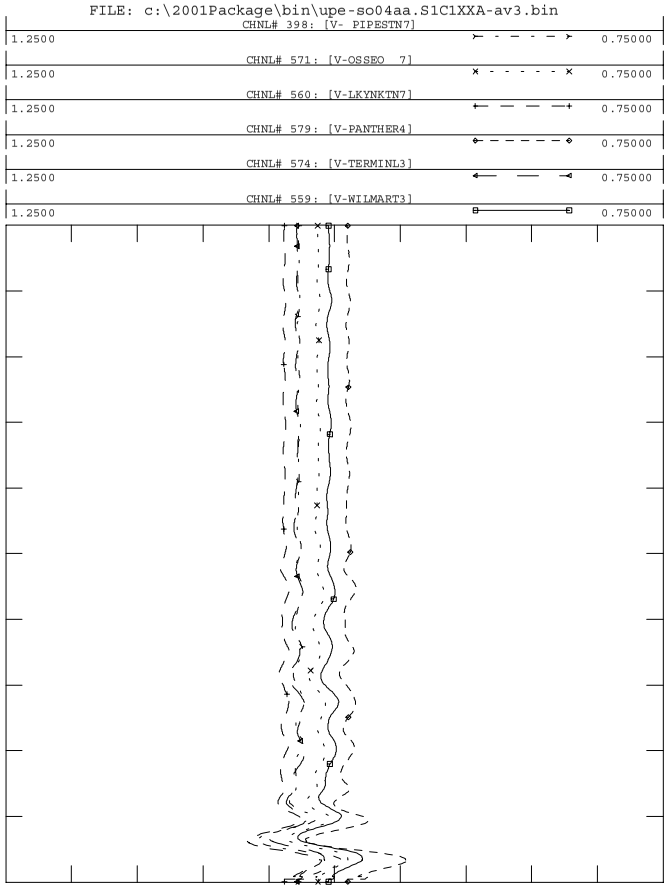
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33

TC VOLTAGES



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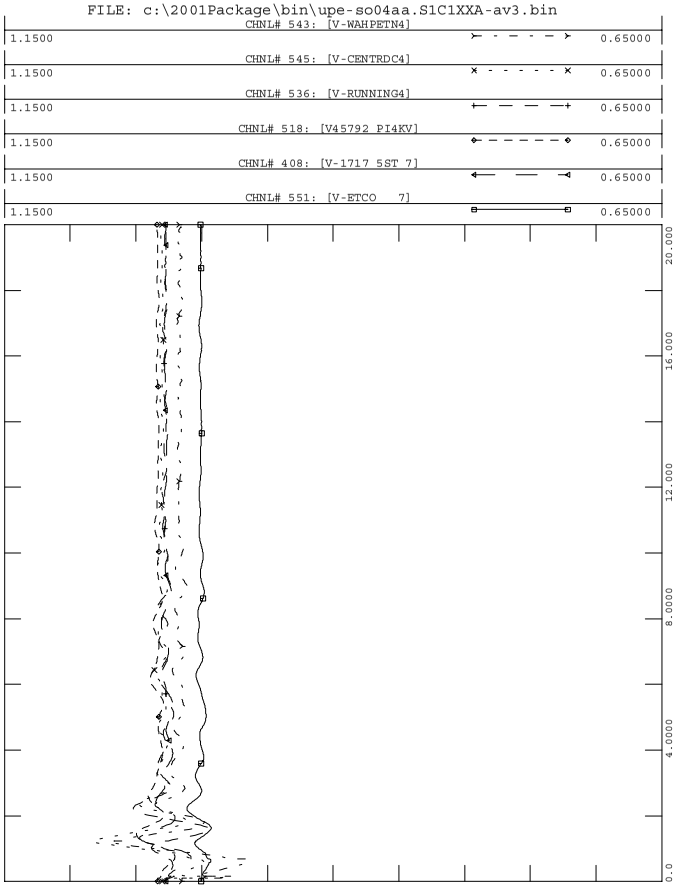
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33

VOLTAGES 6



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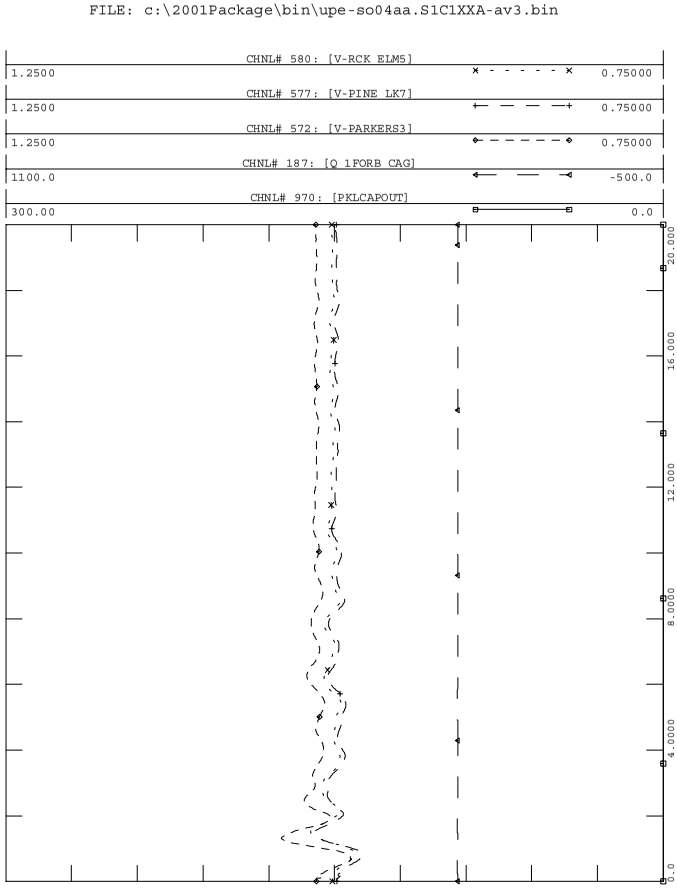
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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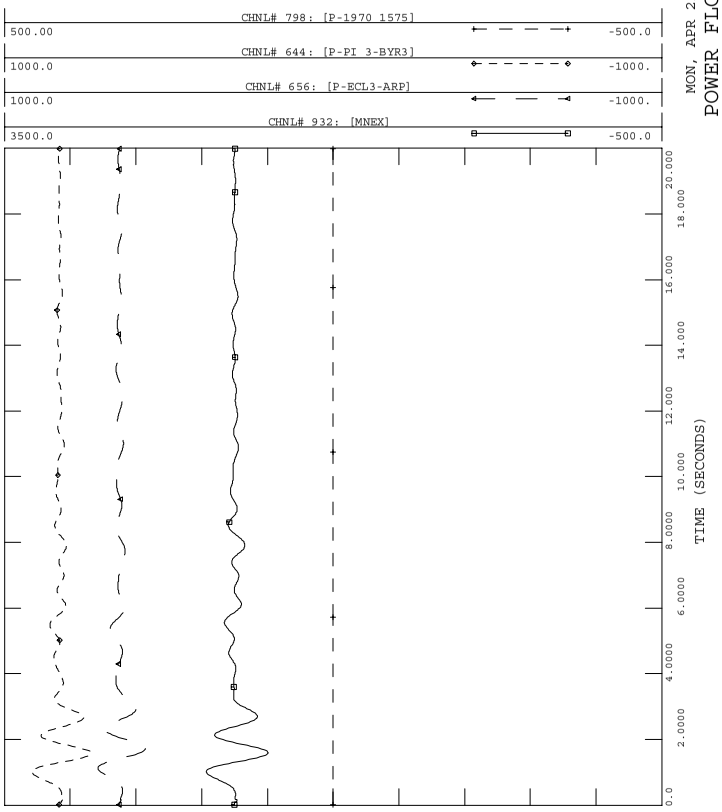
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
POWER FLOW SUMS 2



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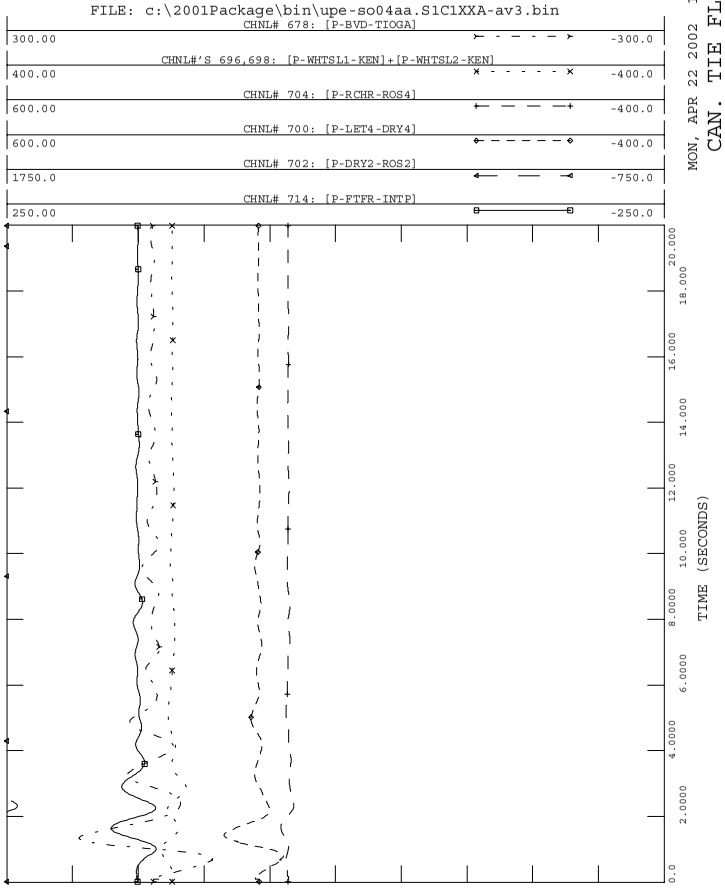
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
CAN. TIE FLOWS



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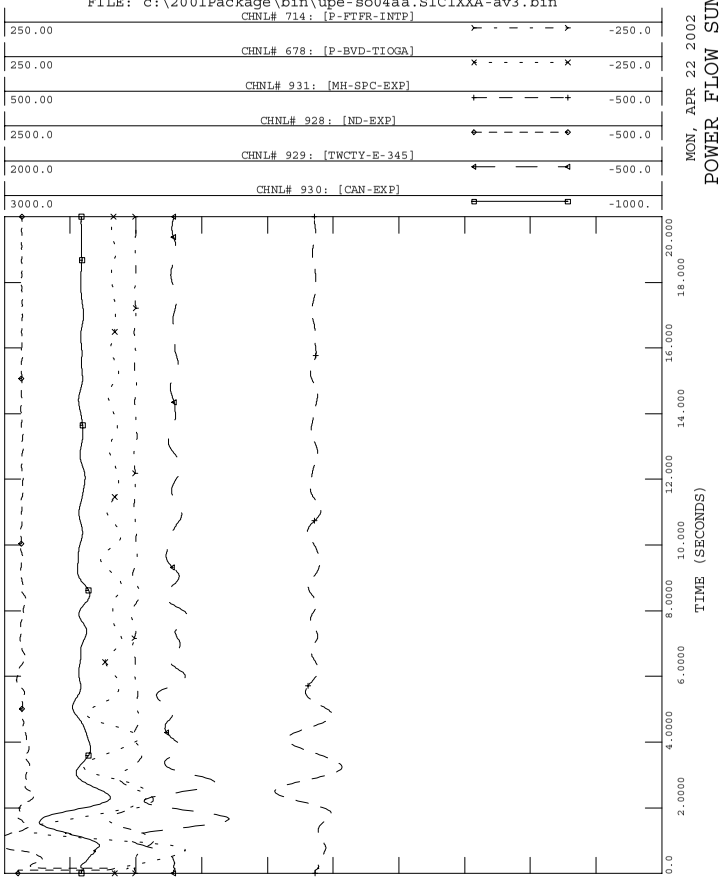
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
POWER FLOW SUMS 1



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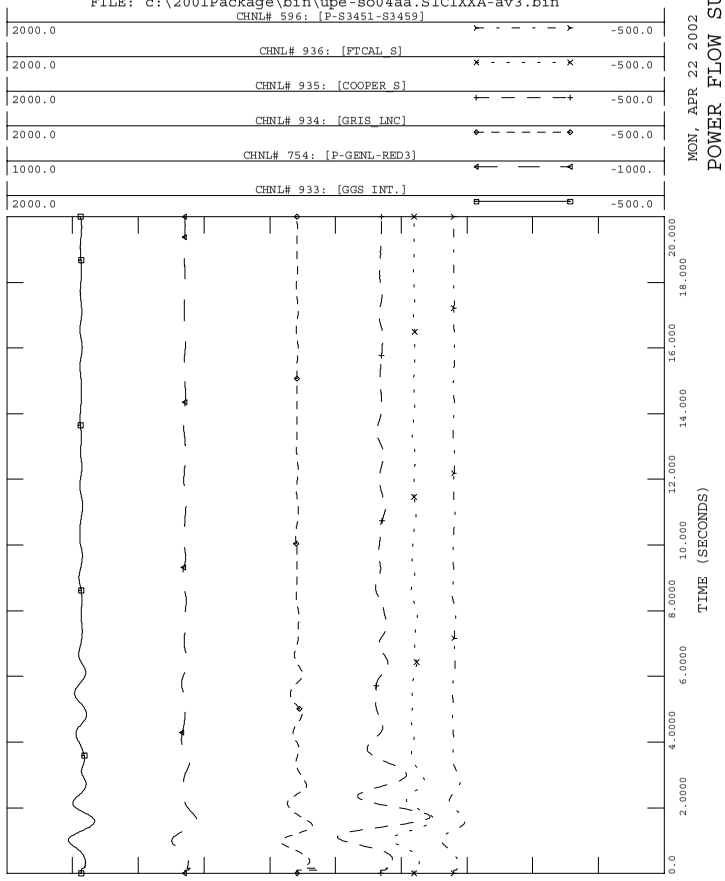
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
POWER FLOW SUM 3



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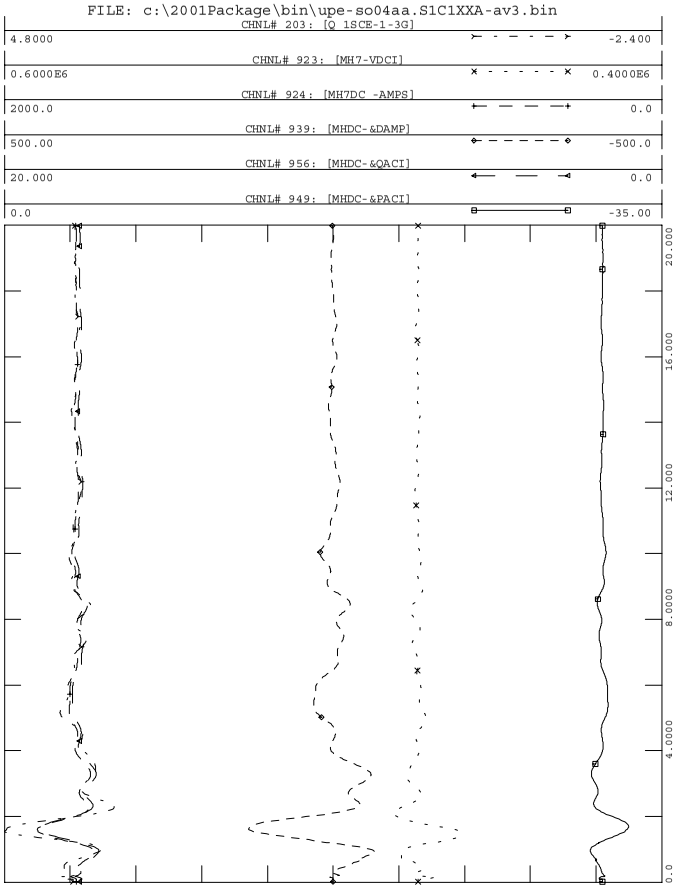
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
MH DC PARAMETERS



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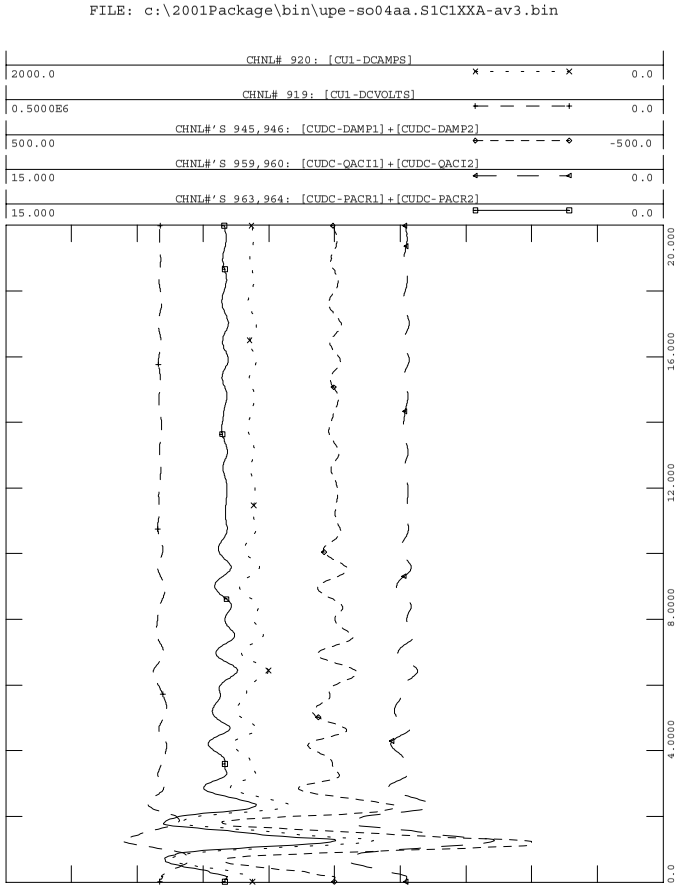
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
CU DC #1



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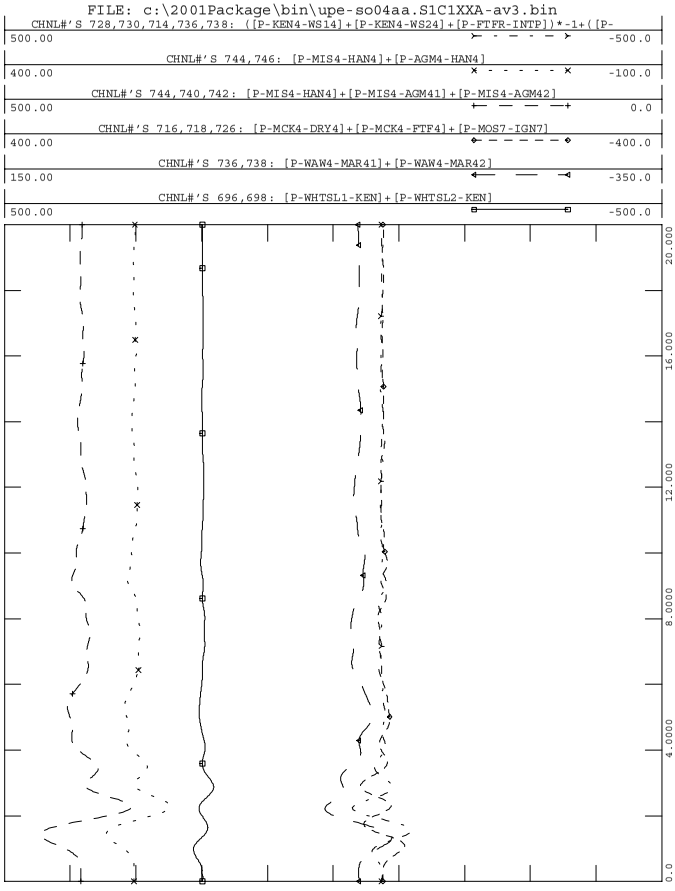
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
OH TIE FLOWS



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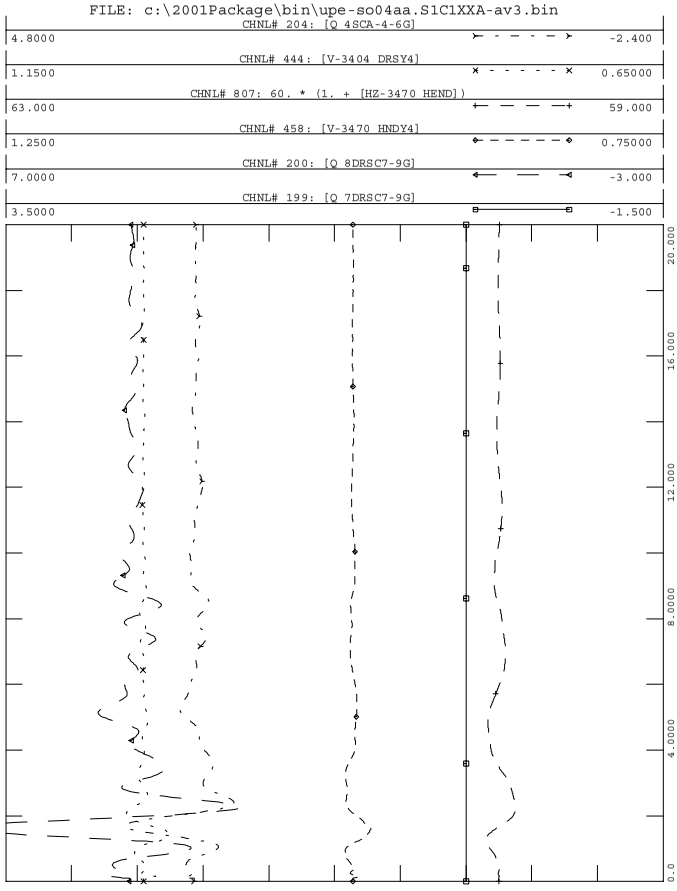
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33
MH DC PARAMETERS



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

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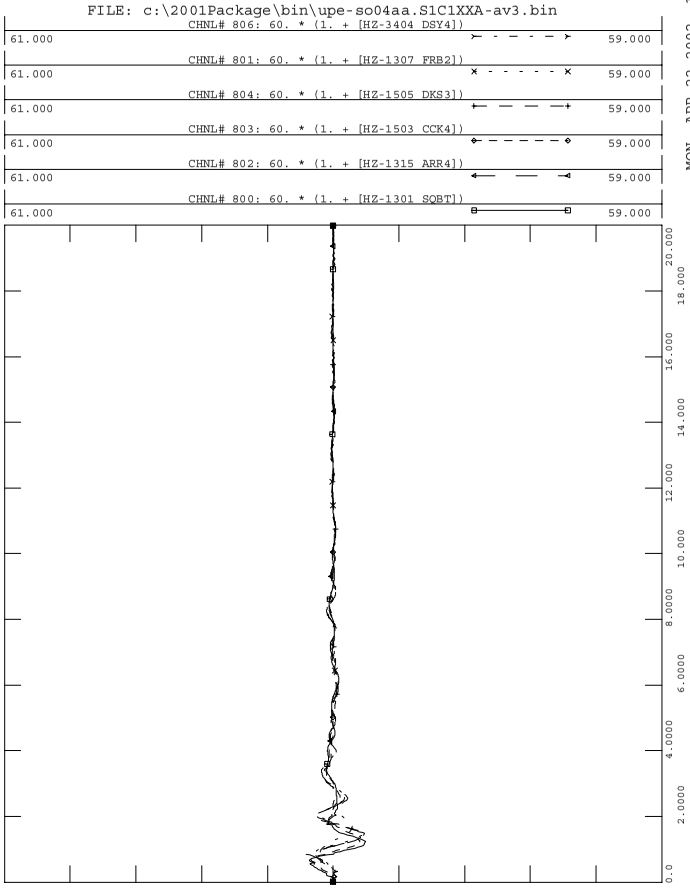
FREQ AT DC TERMINALS



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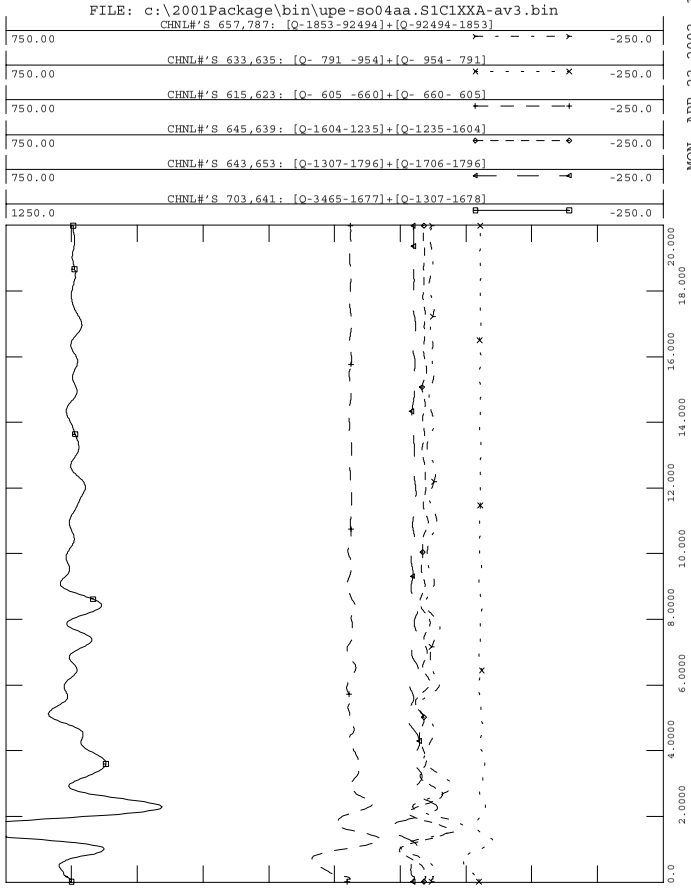
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33

VAR LOSSES



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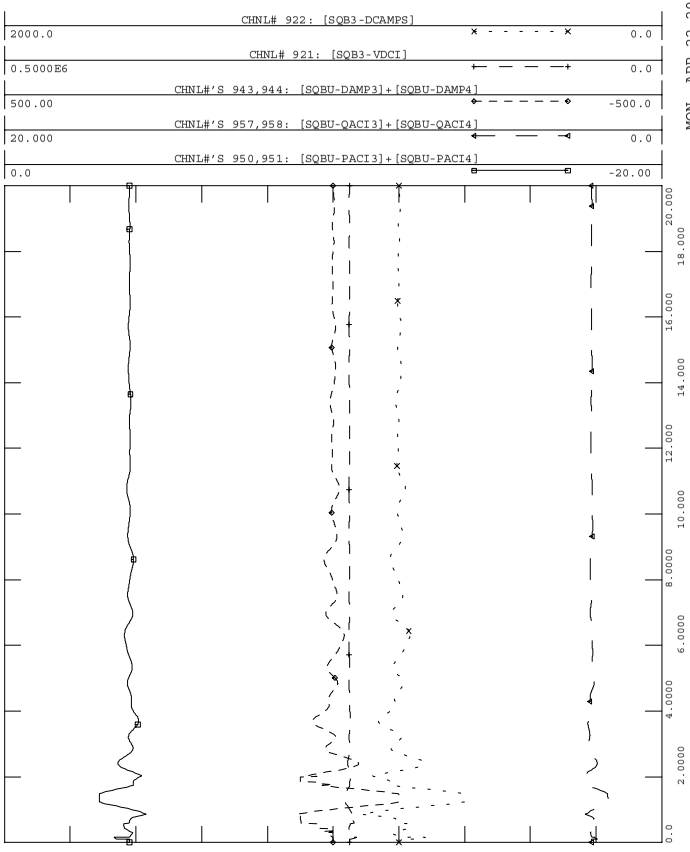
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33

SQB DC #3



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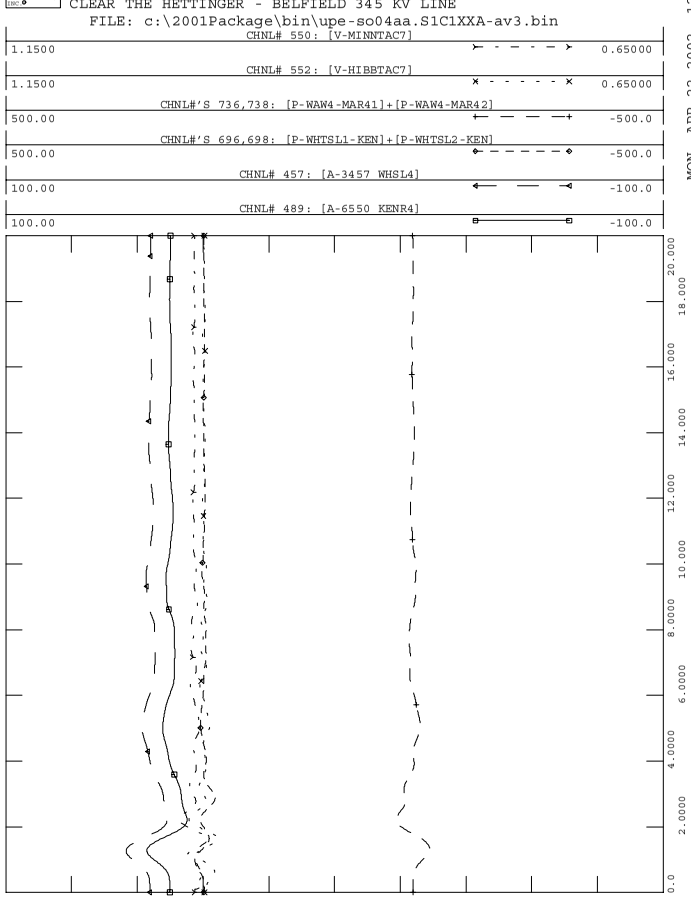
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

MON, APR 22 2002 12:33

VOLTAGES, ANGLES



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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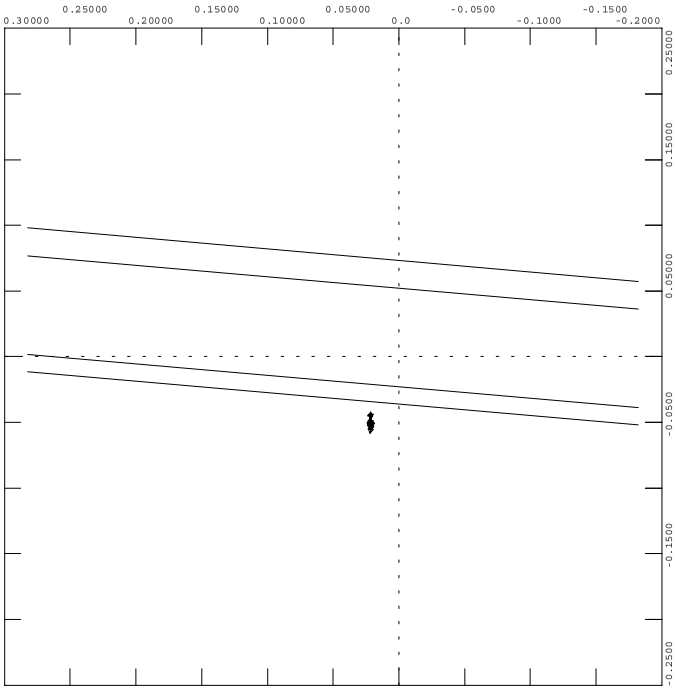
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



MON, APR 22 2002 12:33
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

RELAY: RELAYG
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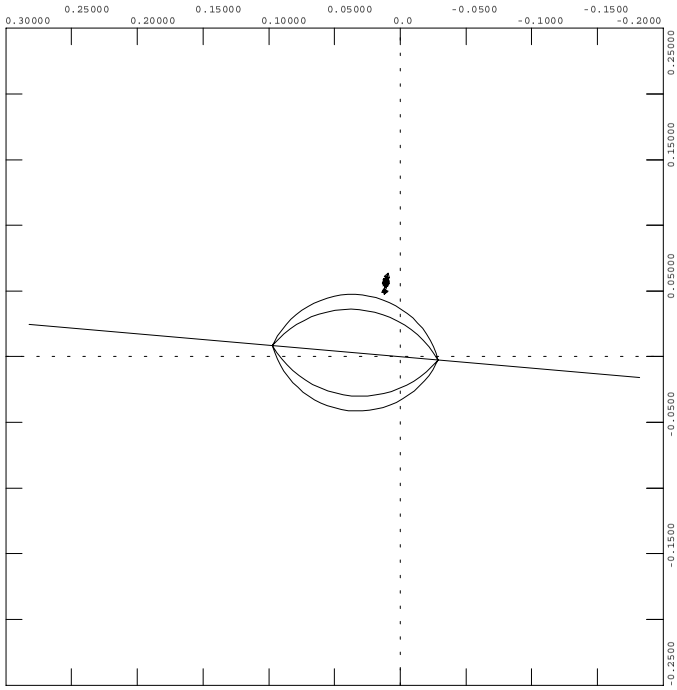

MON, APR 22 2002 12:33
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

RELAY: RELAYG
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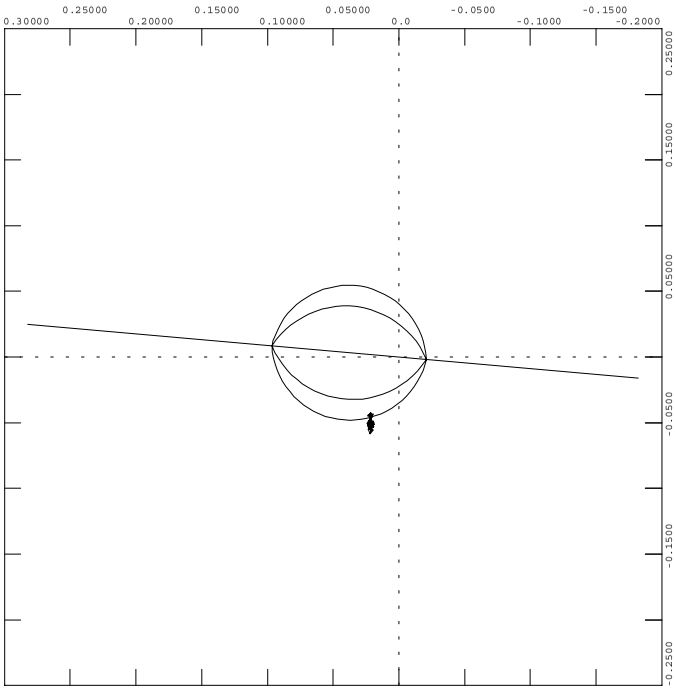
CHNL# 824: [X-FRB2-ROS2]



MON, APR 22 2002 12:33
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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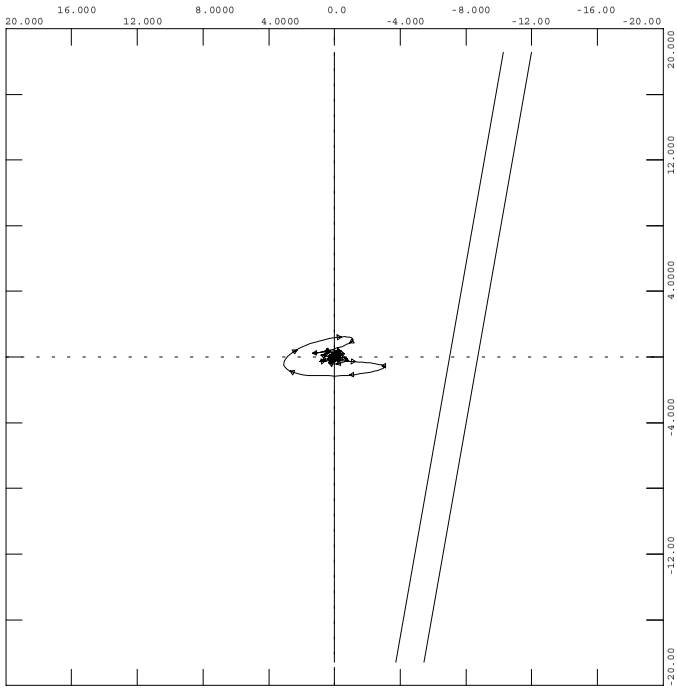

MON, APR 22 2002 12:33
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

RELAY: SLINOS
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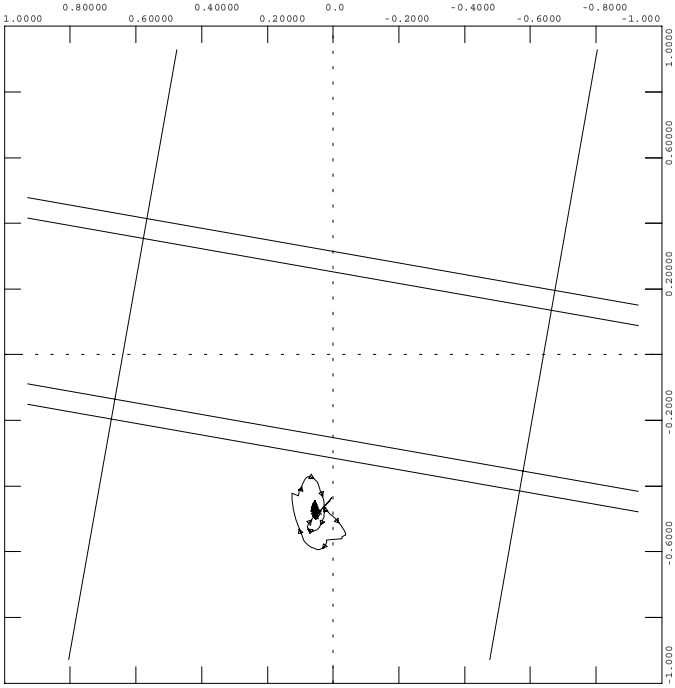
CHNL# 816: [X-DRY4-LET4]



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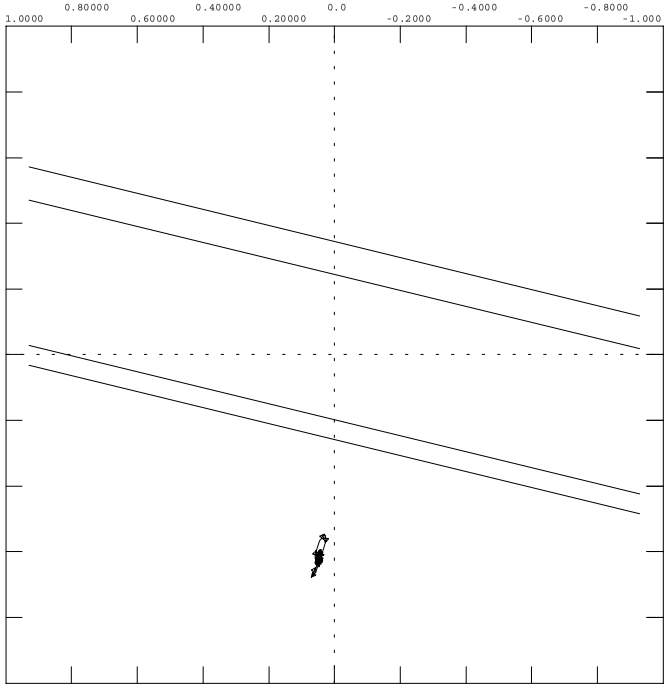
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



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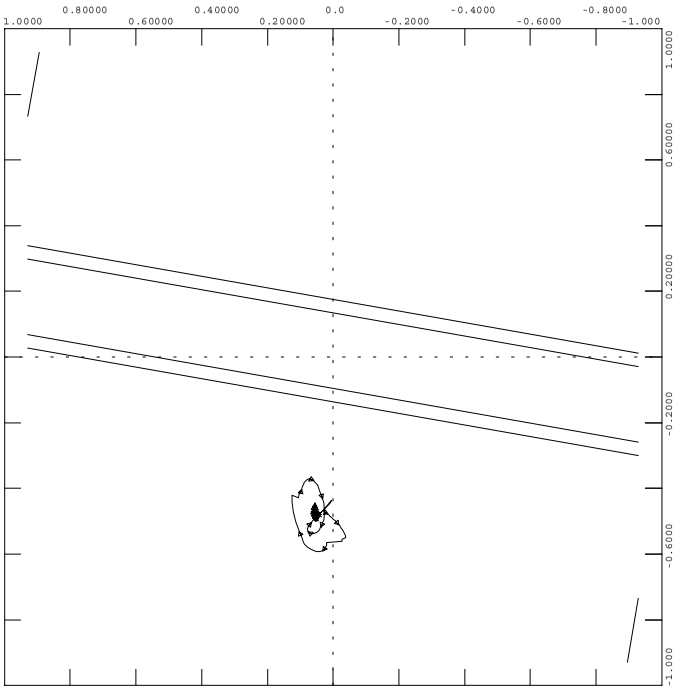
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

RELAY: SLINOS
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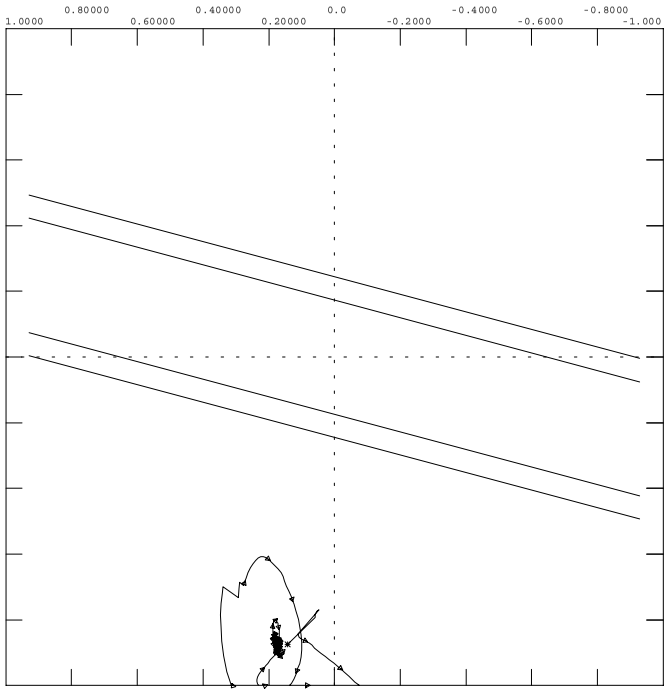
CHNL# 820: [X-PRA4-DRY4]



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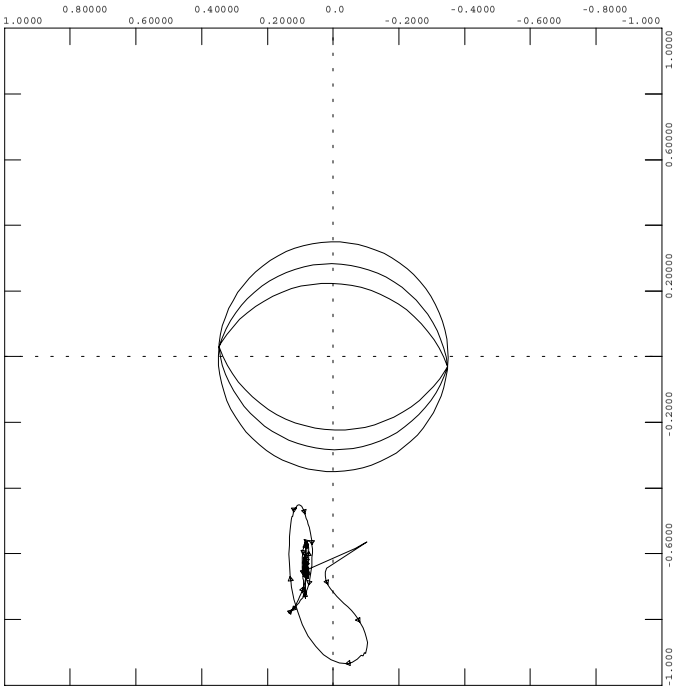
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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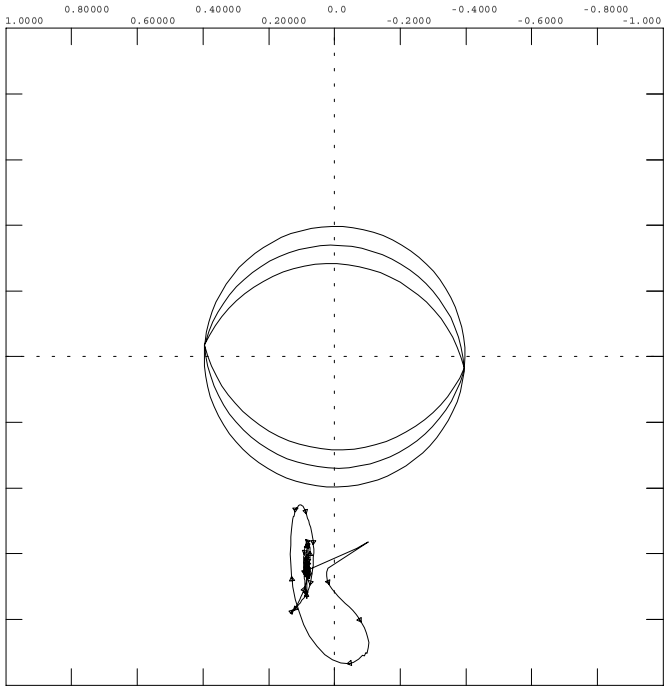
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

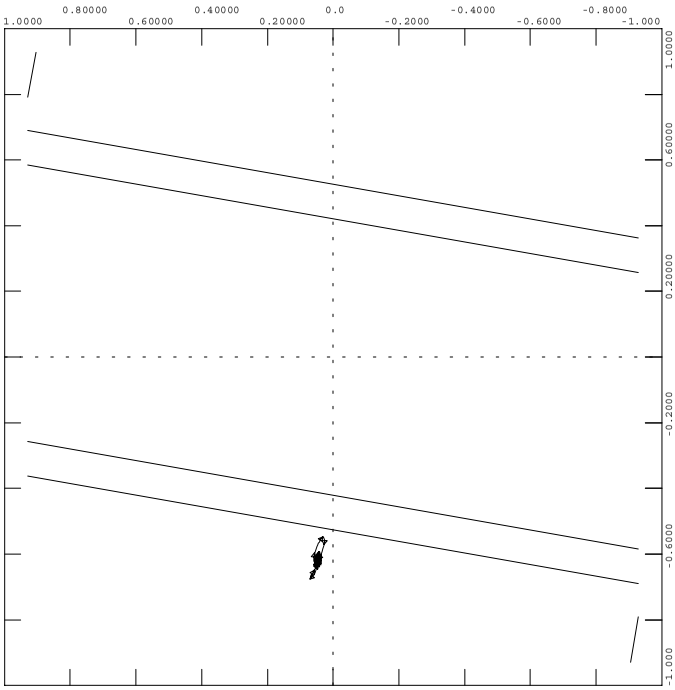
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

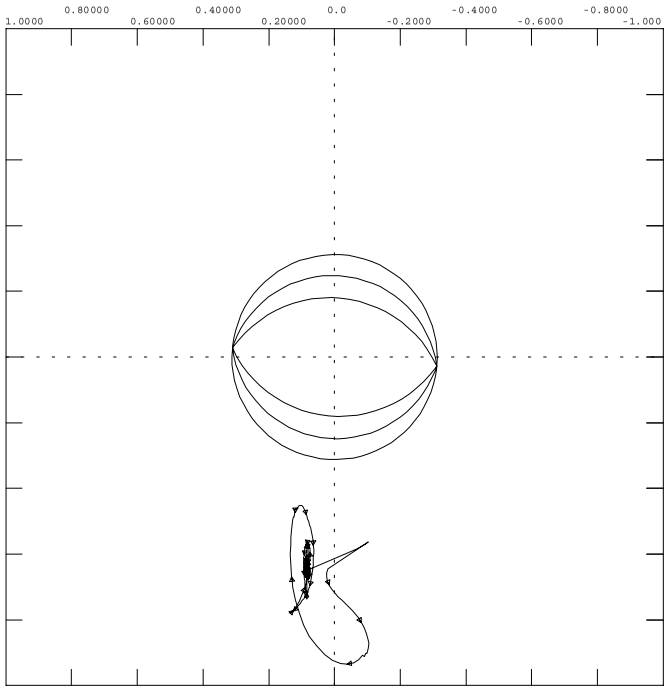
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



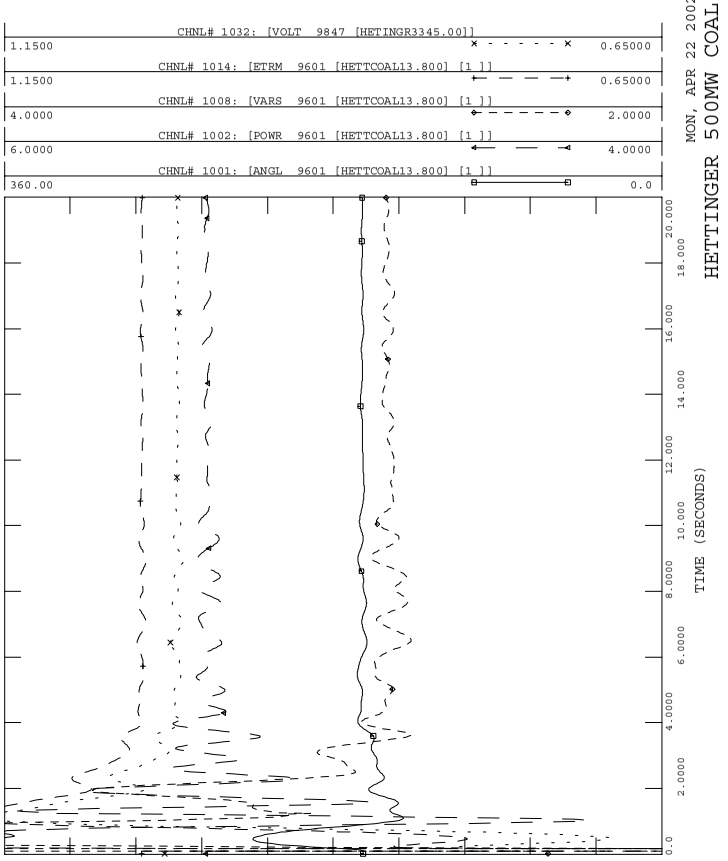
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

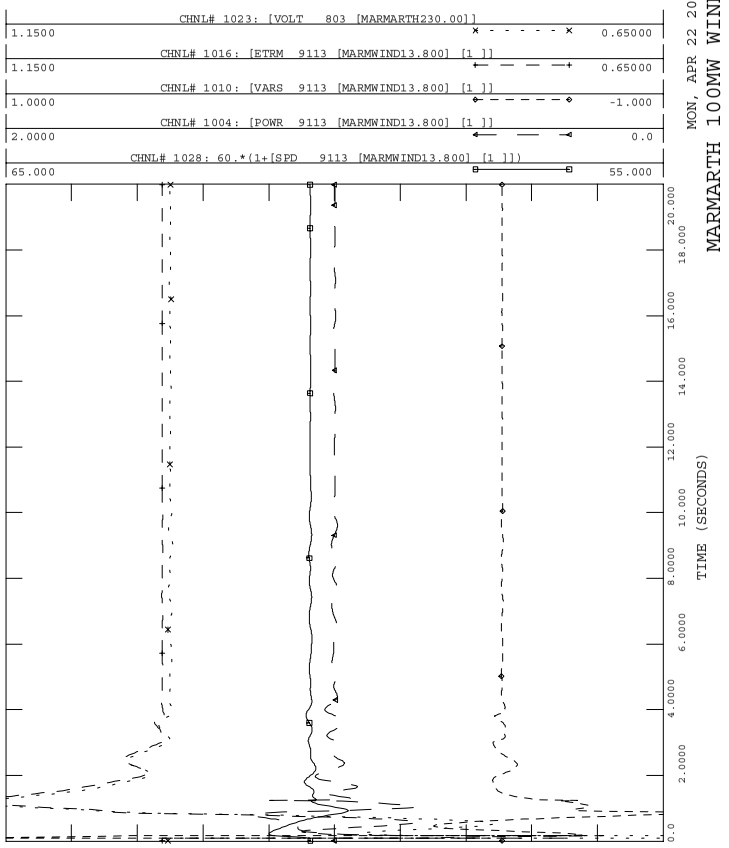


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



MON, APR 22 2002 12:33
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

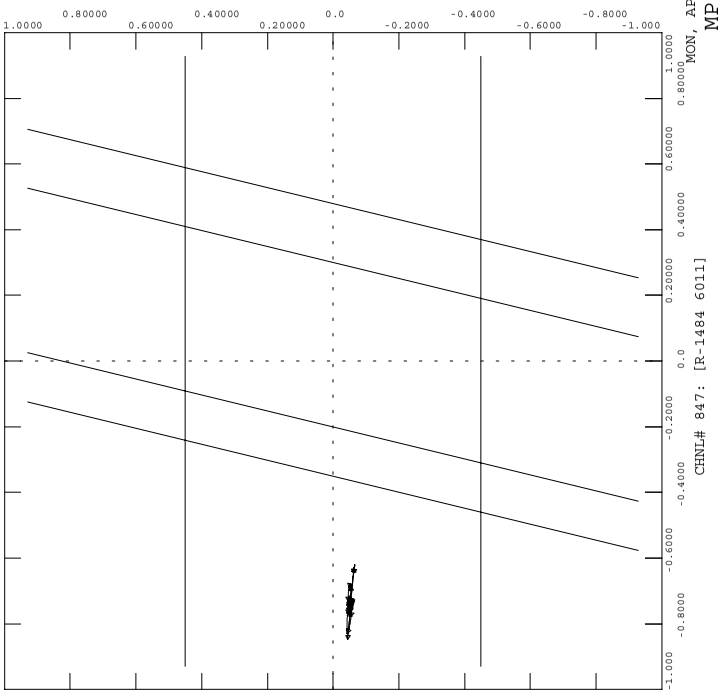


MON, APR 22 2002 12:33
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

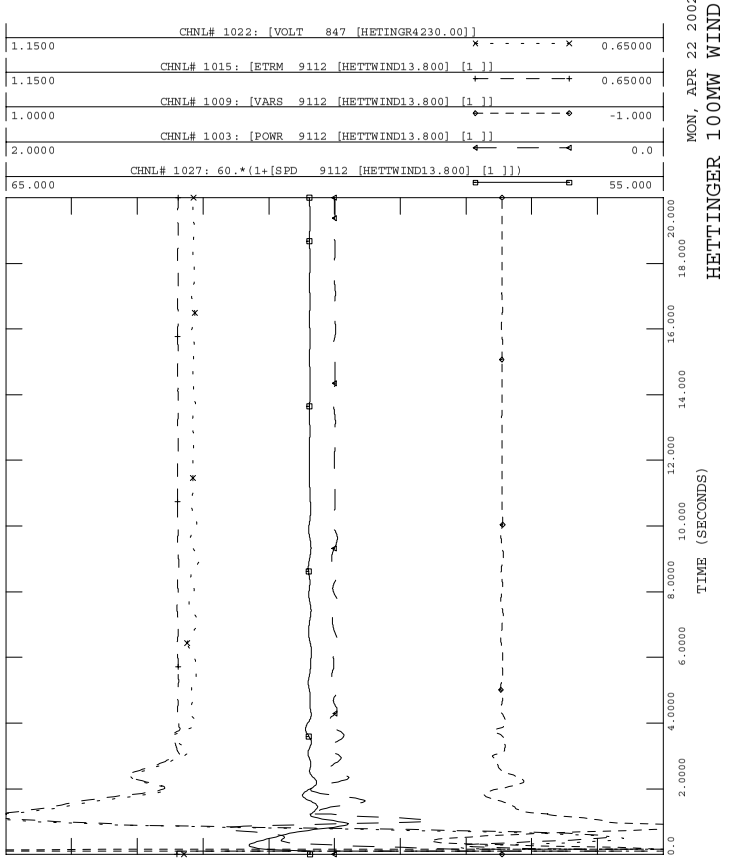
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



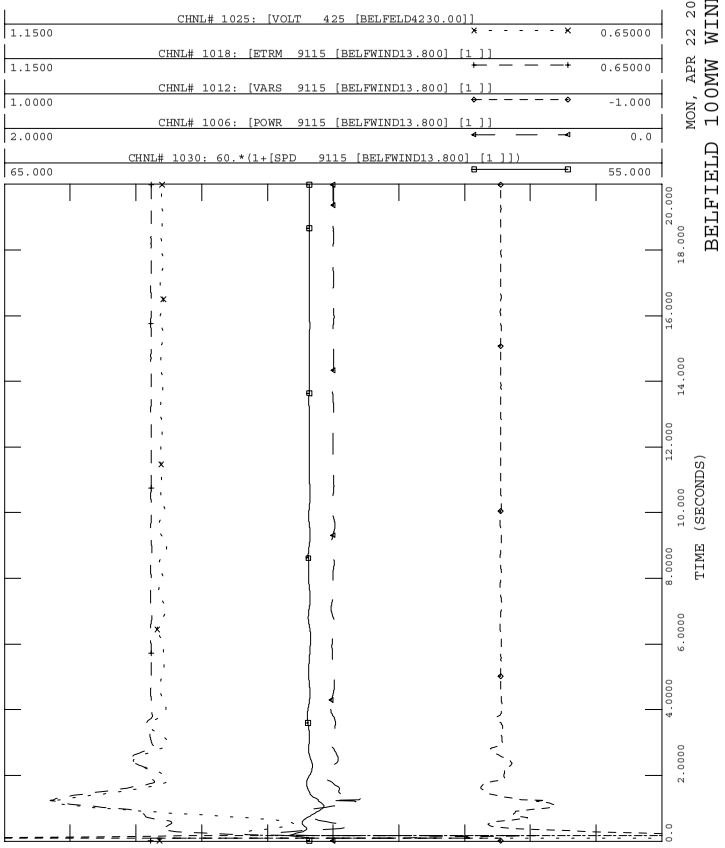
MON, APR 22 2002 12:33
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin

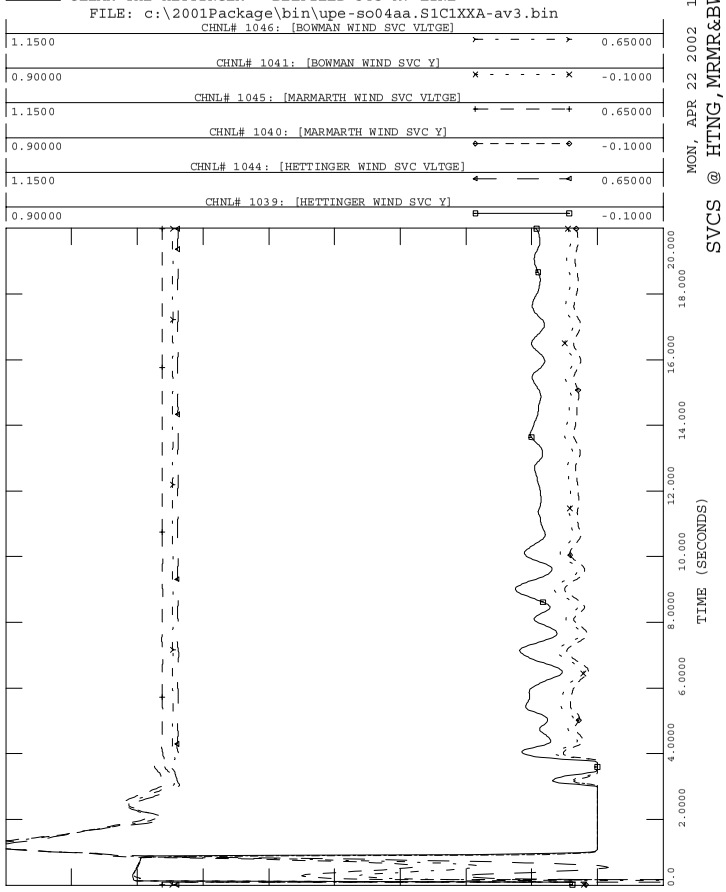


MON, APR 22 2002 12:33
HETTINGER 100MW WIND UNIT

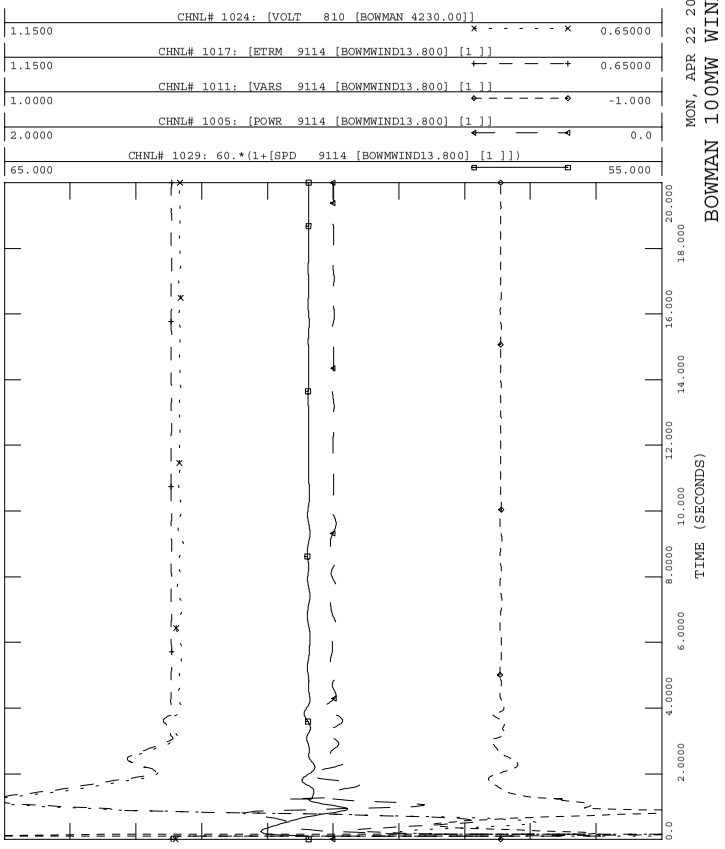
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



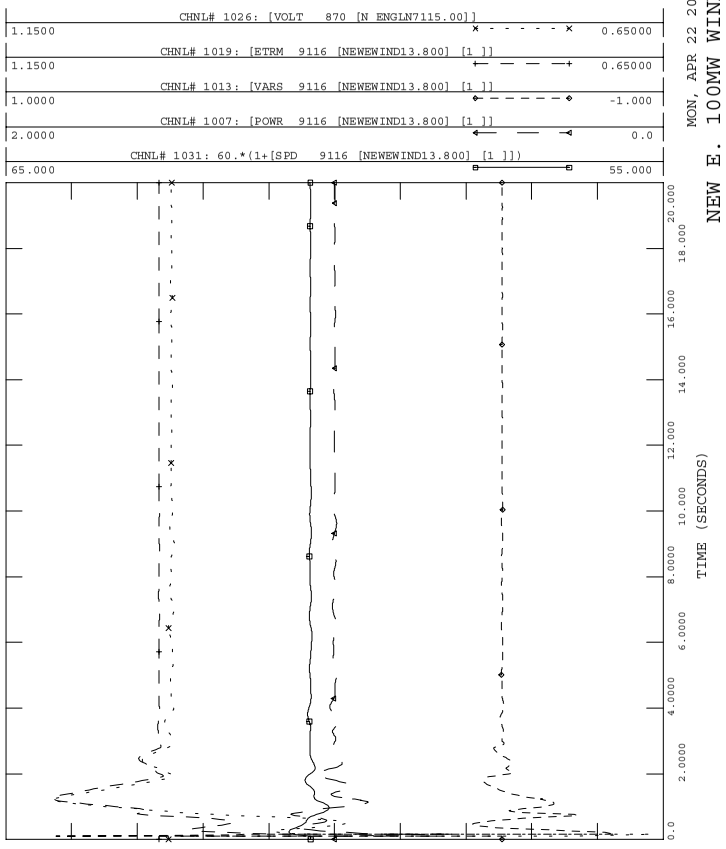
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



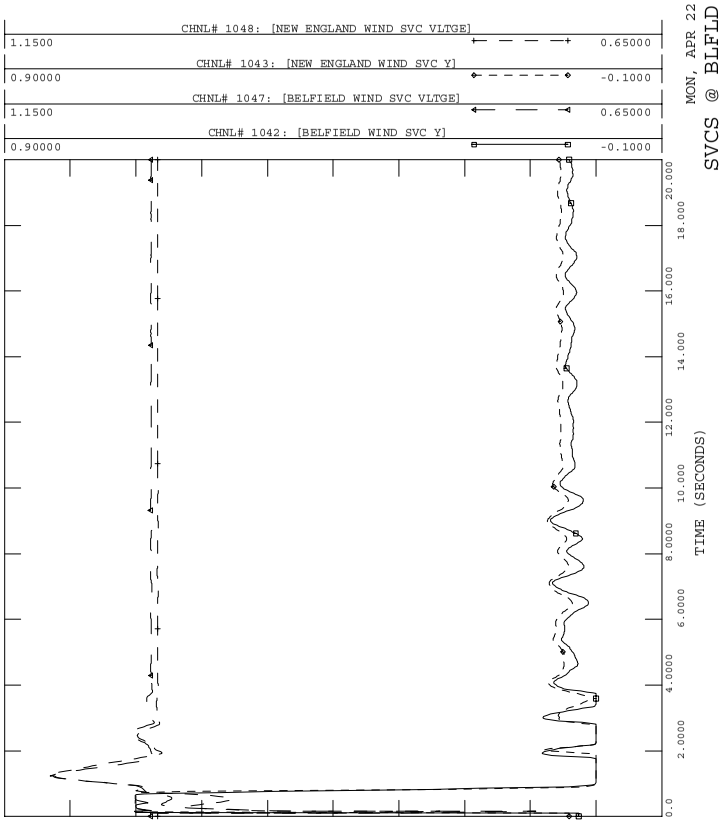
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-av3.bin



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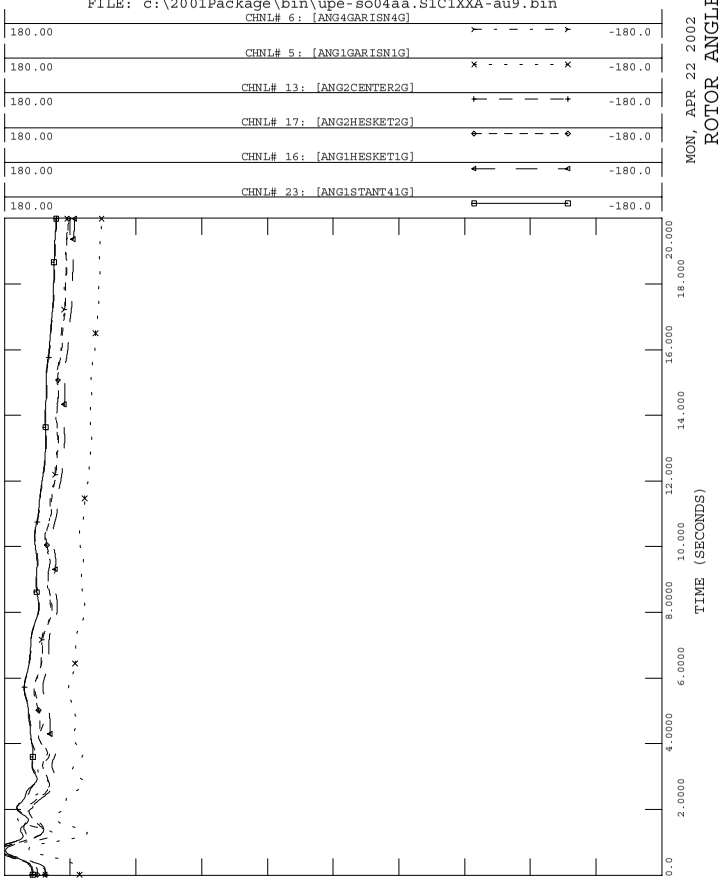
SVCS @ BLFLD & NWENG

CONTINGENCY AU9

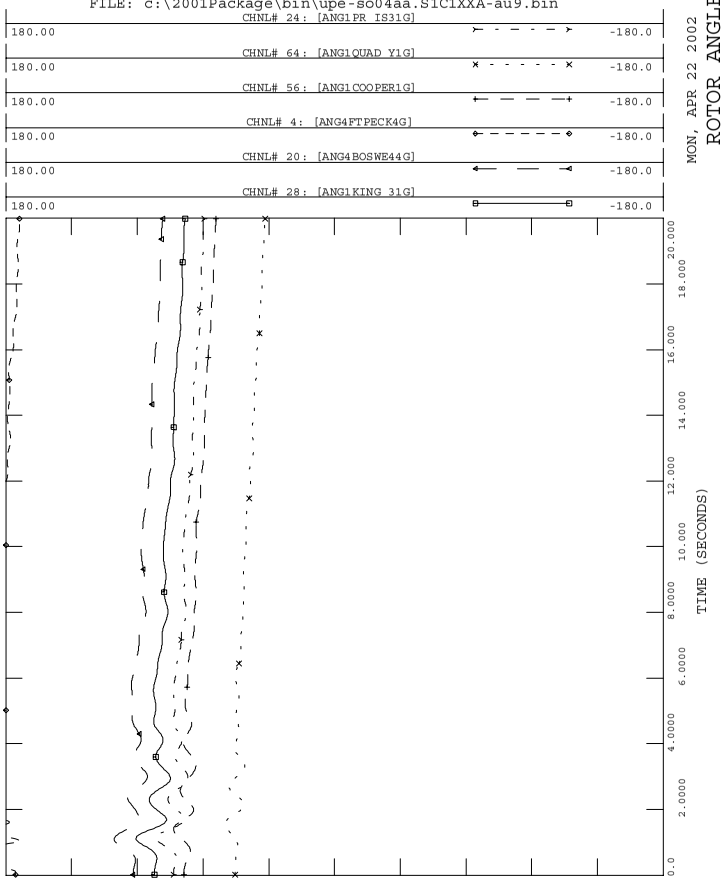
4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Ft. Thompson 345 kV line

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin



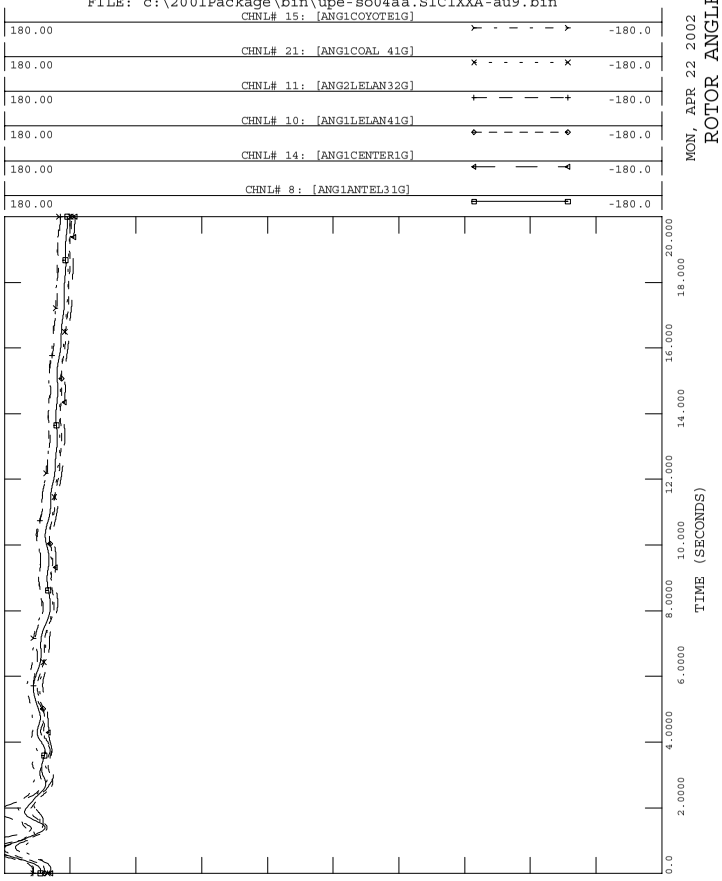
MON, APR 22 2002 12:49
ROTOR ANGLES 2

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin



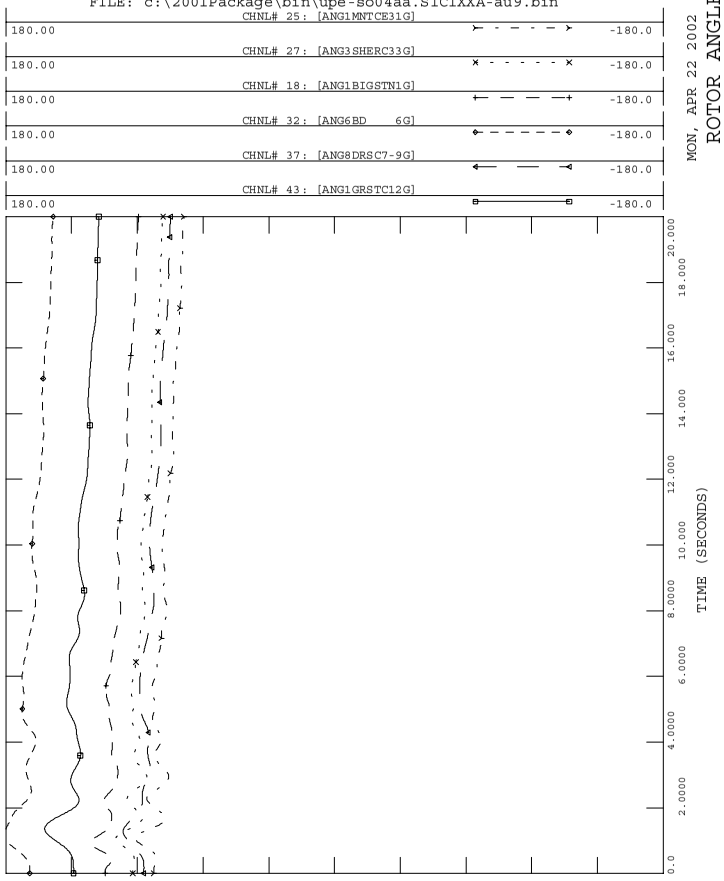
MON, APR 22 2002 12:49
ROTOR ANGLES 4

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

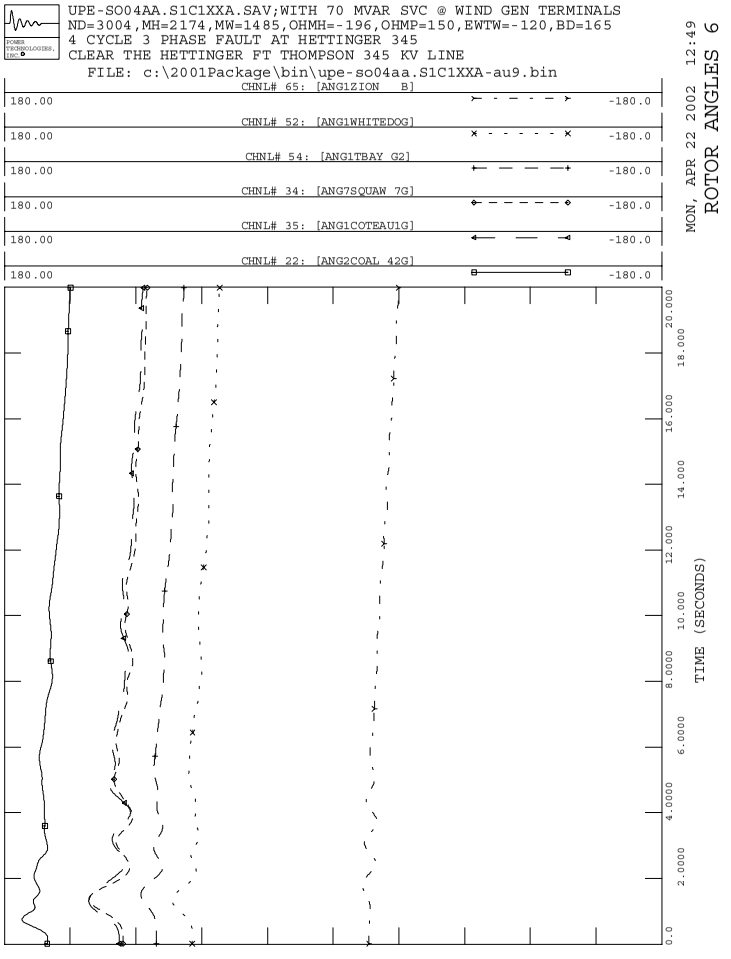


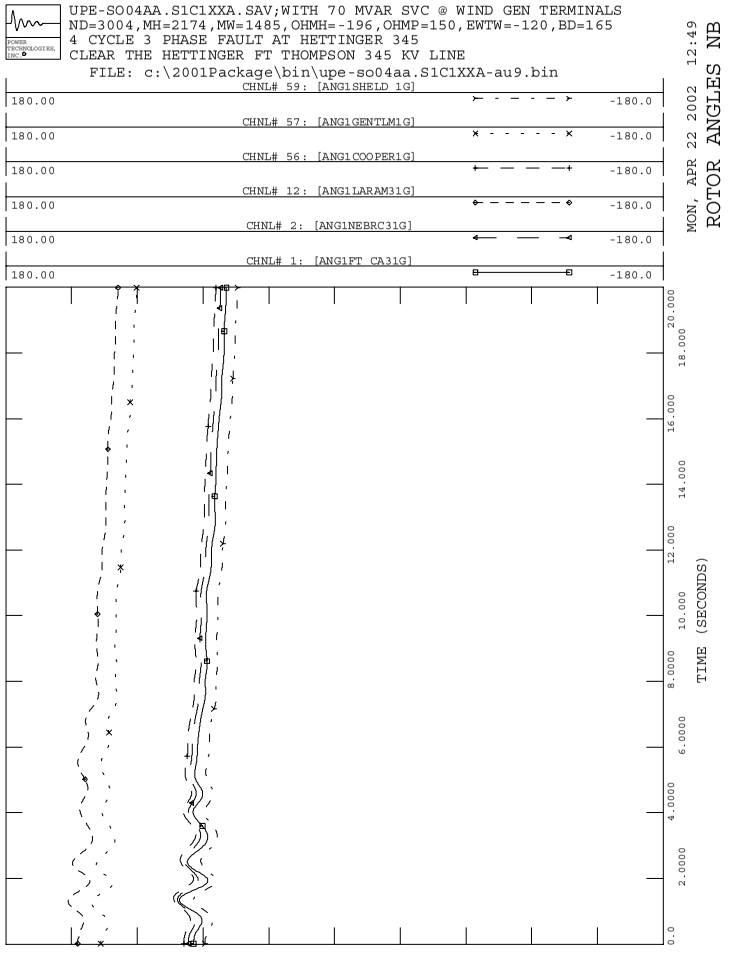
MON, APR 22 2002 12:49
ROTOR ANGLES 1

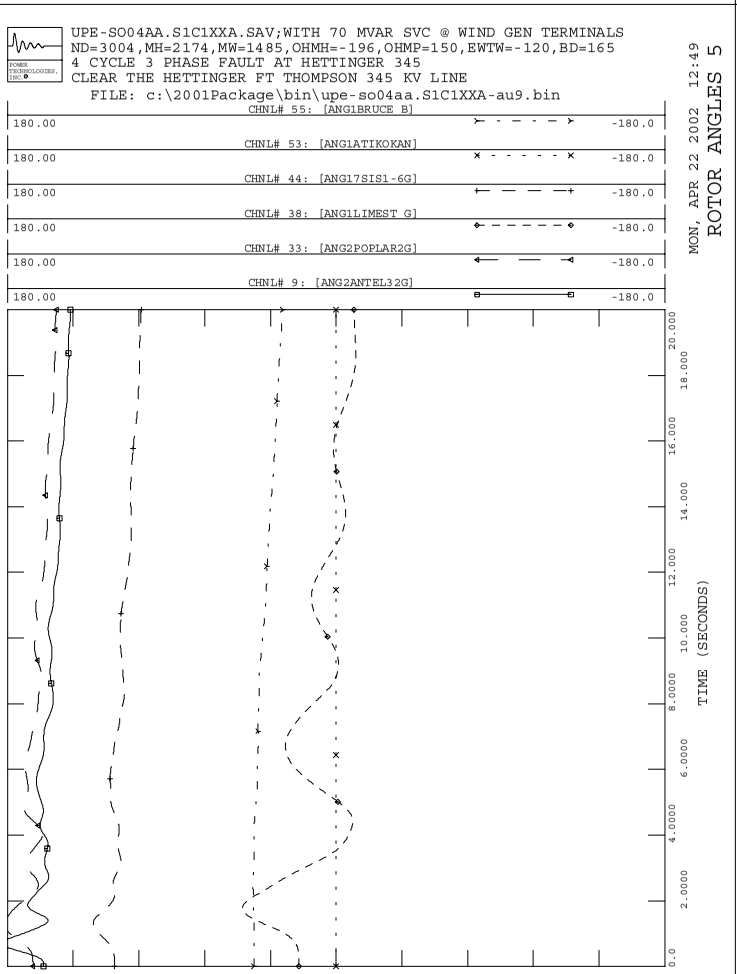
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

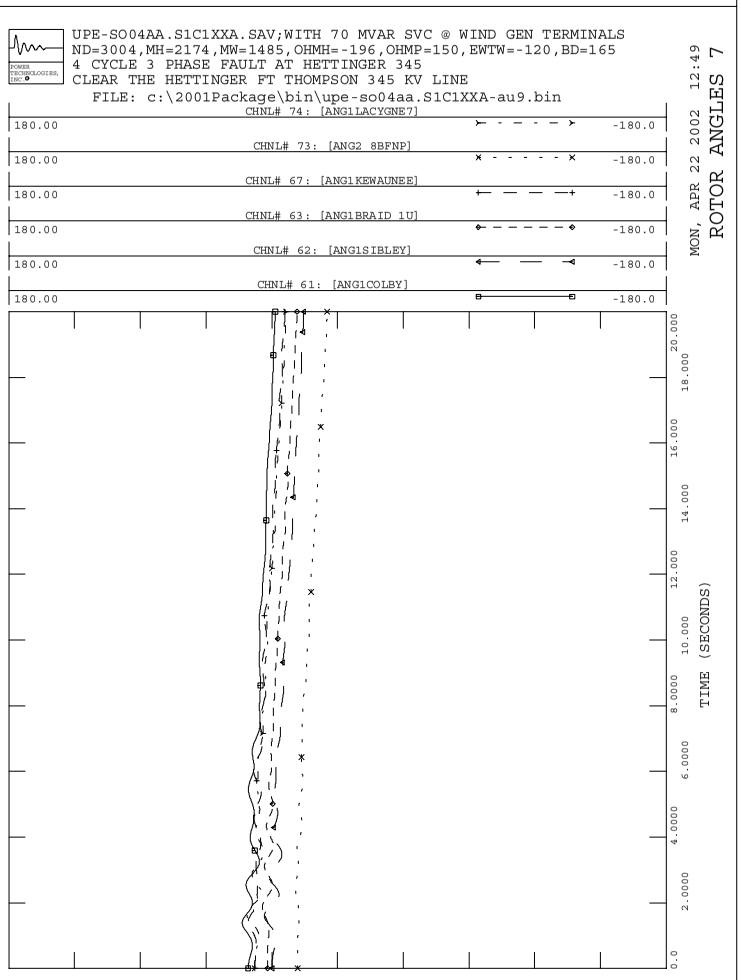


MON, APR 22 2002 12:49
ROTOR ANGLES 3


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
MON, APR 22 2002 12:49
ROTOR ANGLES 6


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
MON, APR 22 2002 12:49
ROTOR ANGLES NB


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
MON, APR 22 2002 12:49
ROTOR ANGLES 5


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
MON, APR 22 2002 12:49
ROTOR ANGLES 7

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

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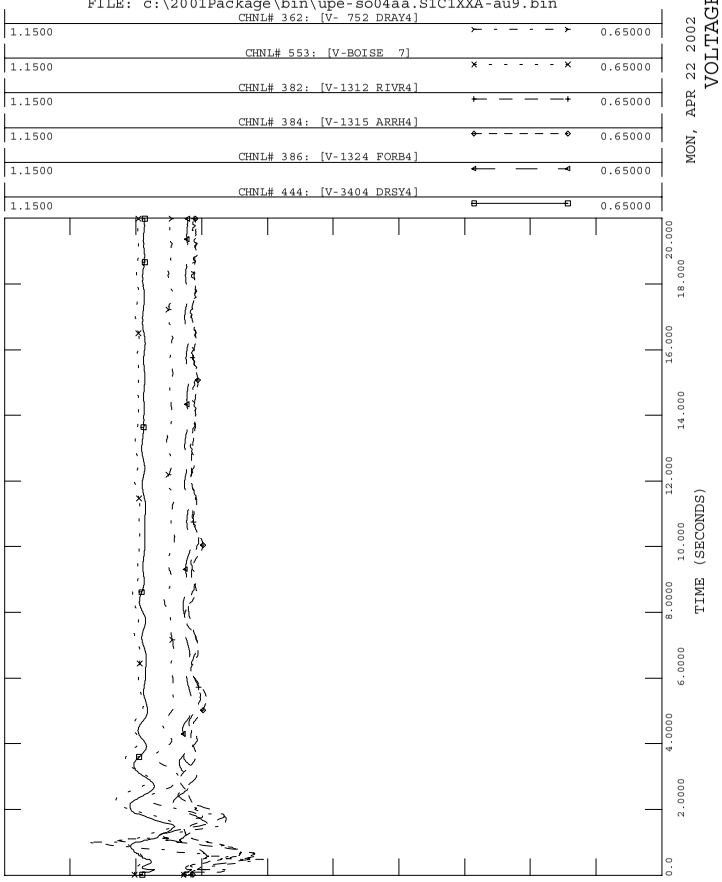
VOLTAGES 1



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

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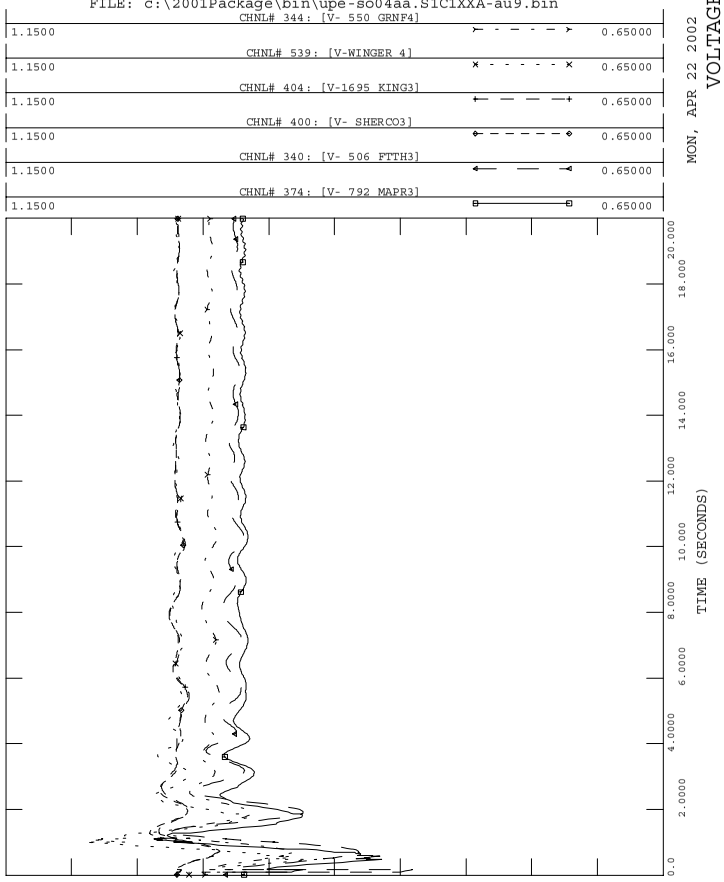
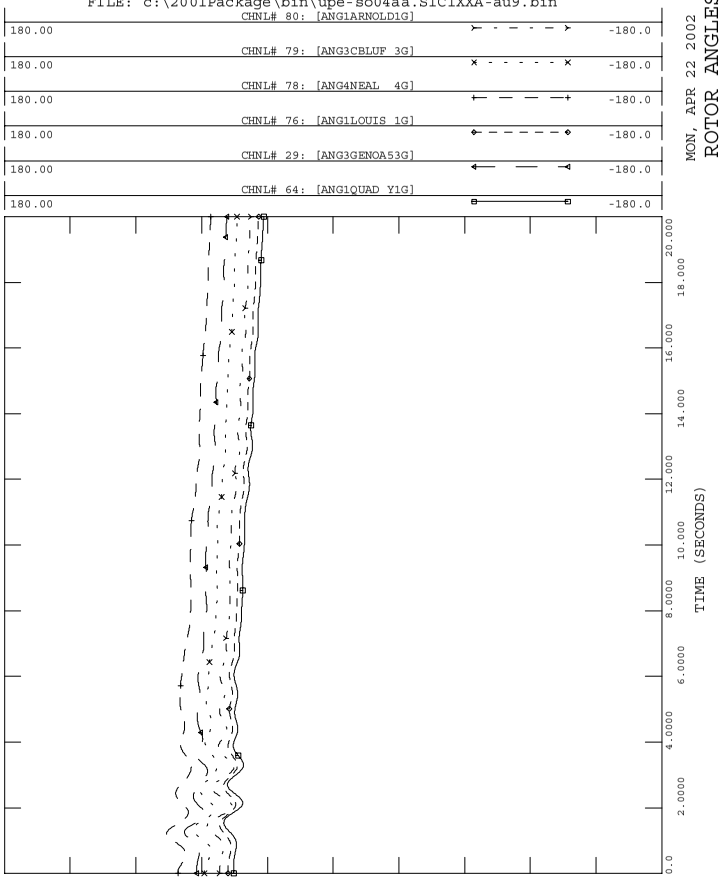
VOLTAGES 3



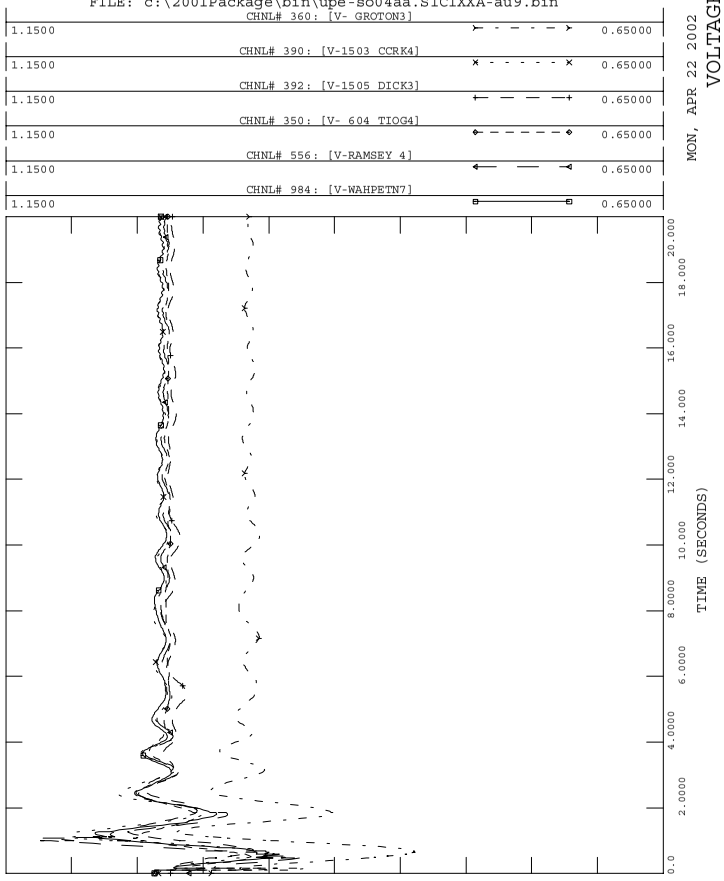
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49
ROTOR ANGLES IA



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49
VOLTAGES 2



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

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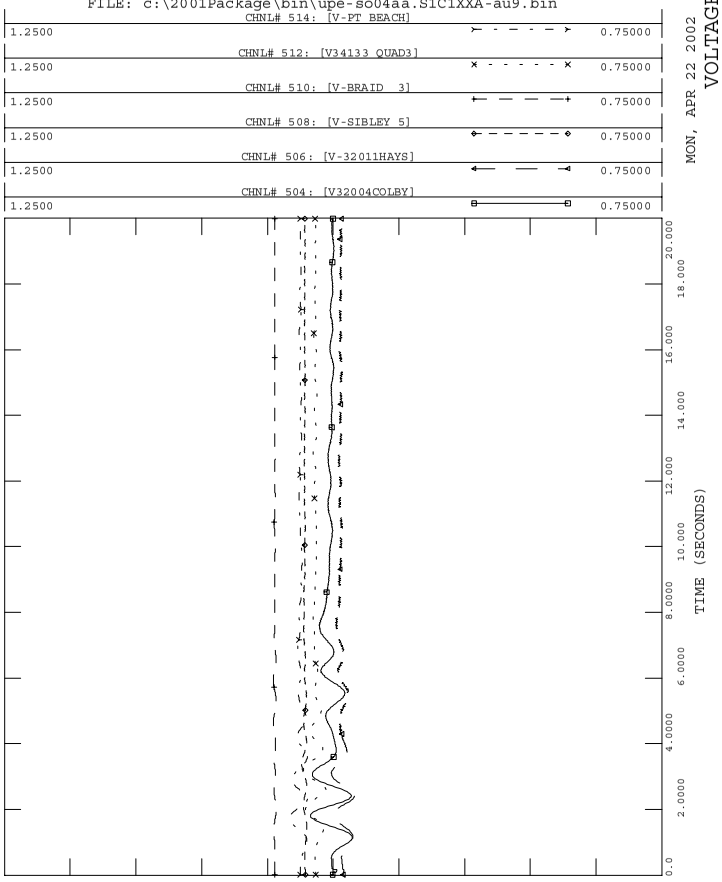
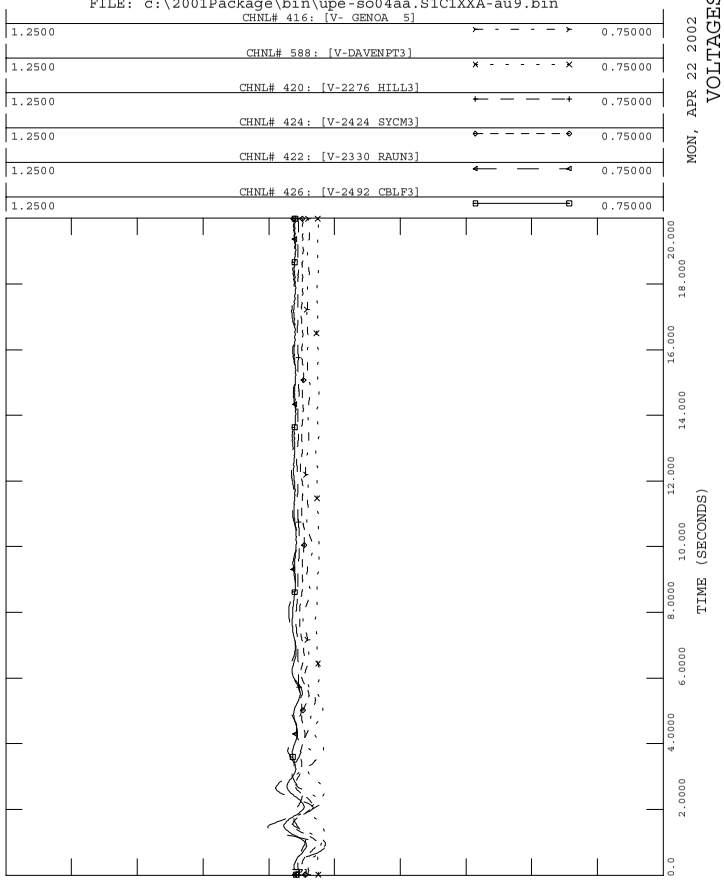
VOLTAGES 5



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49
VOLTAGES IA



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

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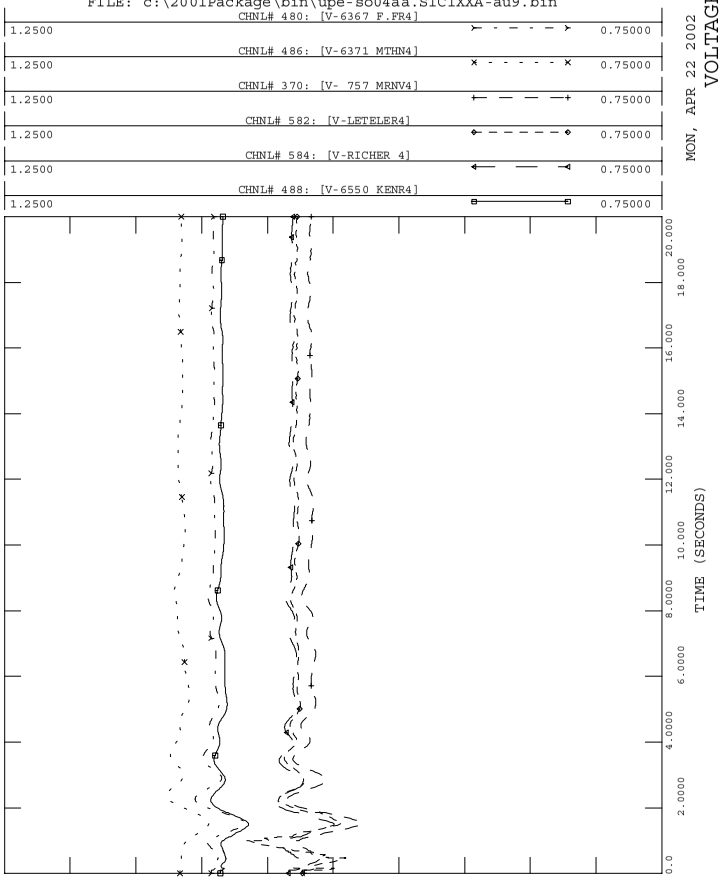
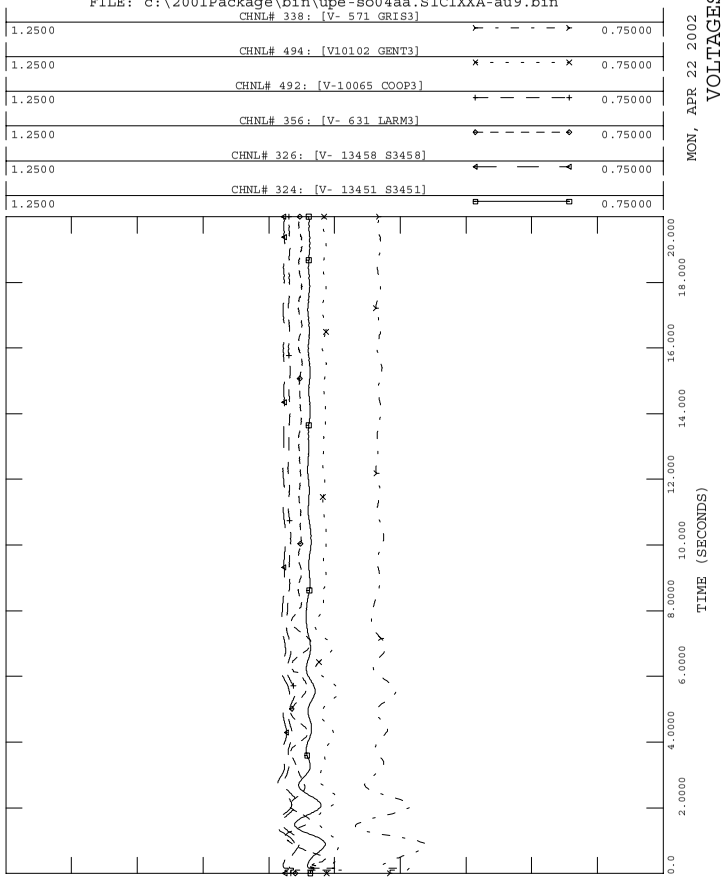
VOLTAGES 4

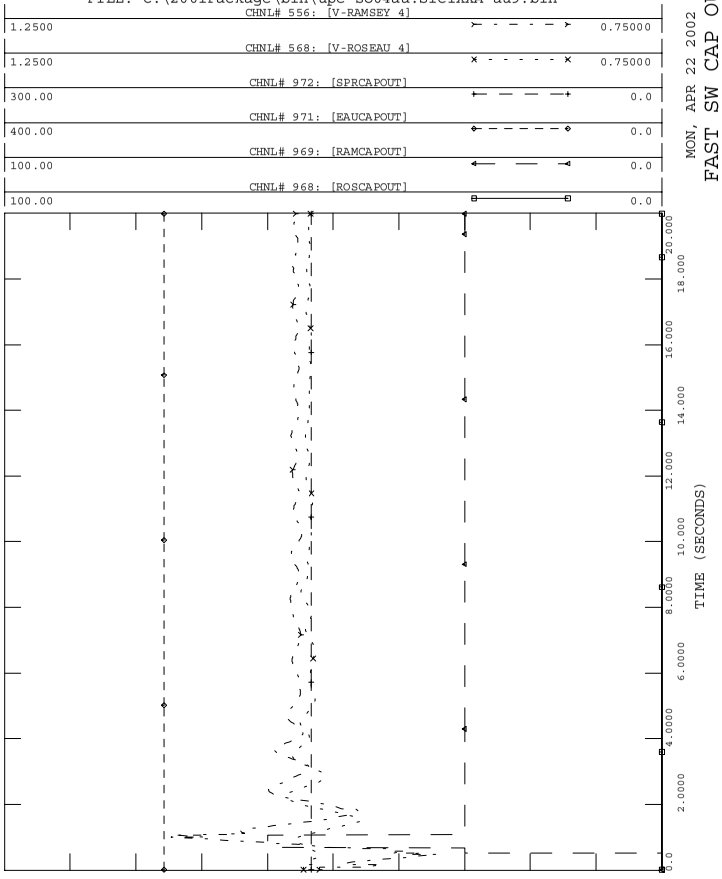


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49
VOLTAGES NB

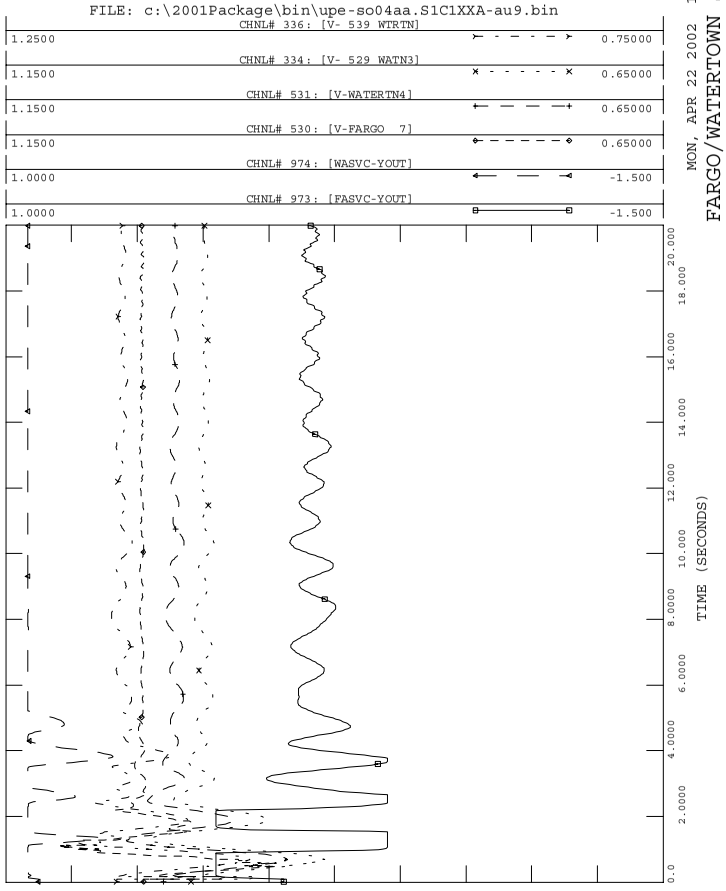


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin



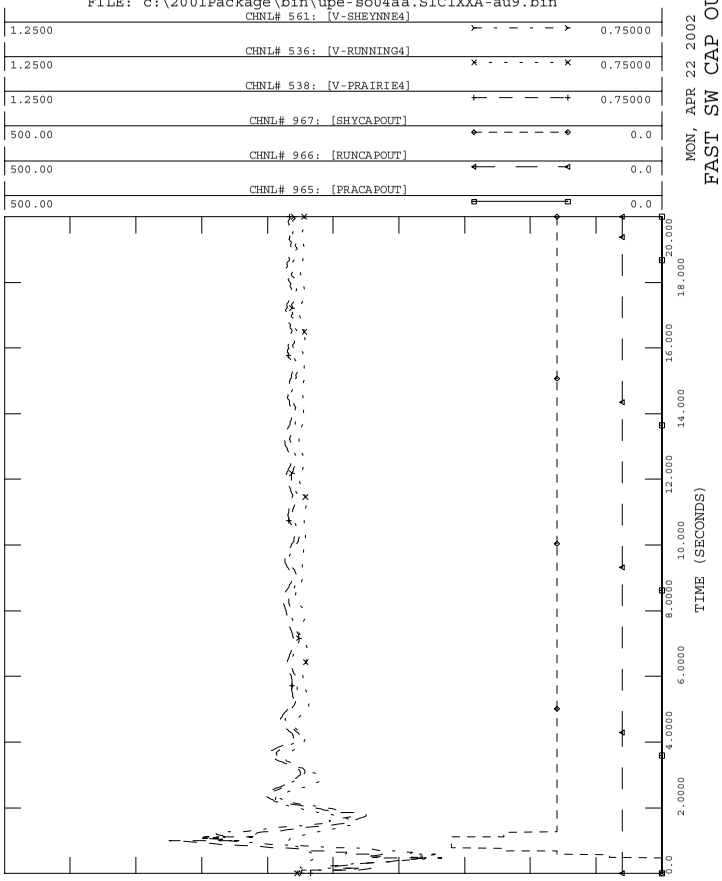
MON, APR 22 2002 12:49
FAST SW CAP OUT 2

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin



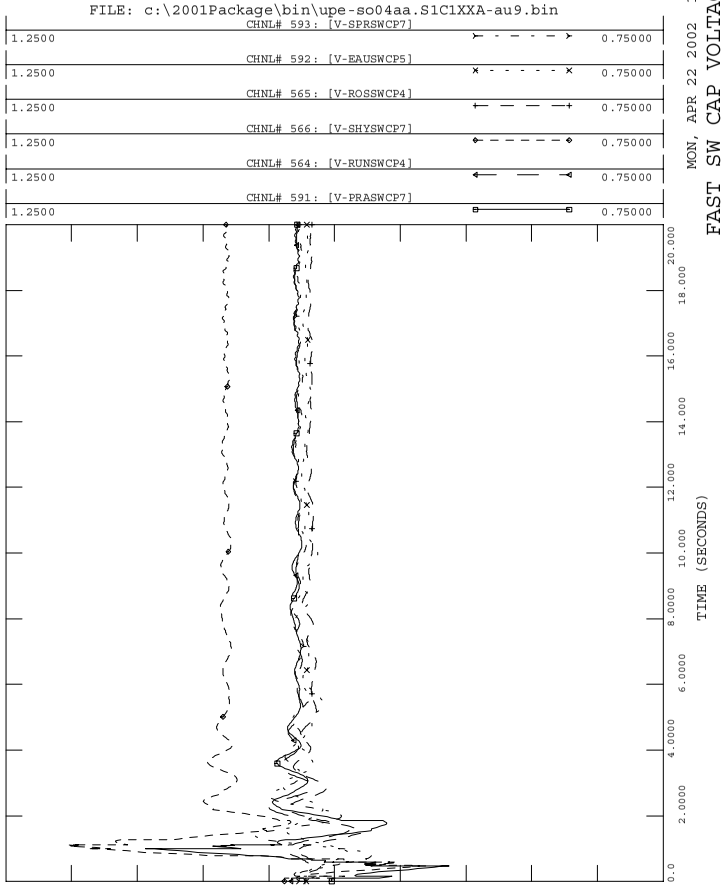
MON, APR 22 2002 12:49
FARGO/WATERTOWN SVS

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin



MON, APR 22 2002 12:49
FAST SW CAP OUT 1

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

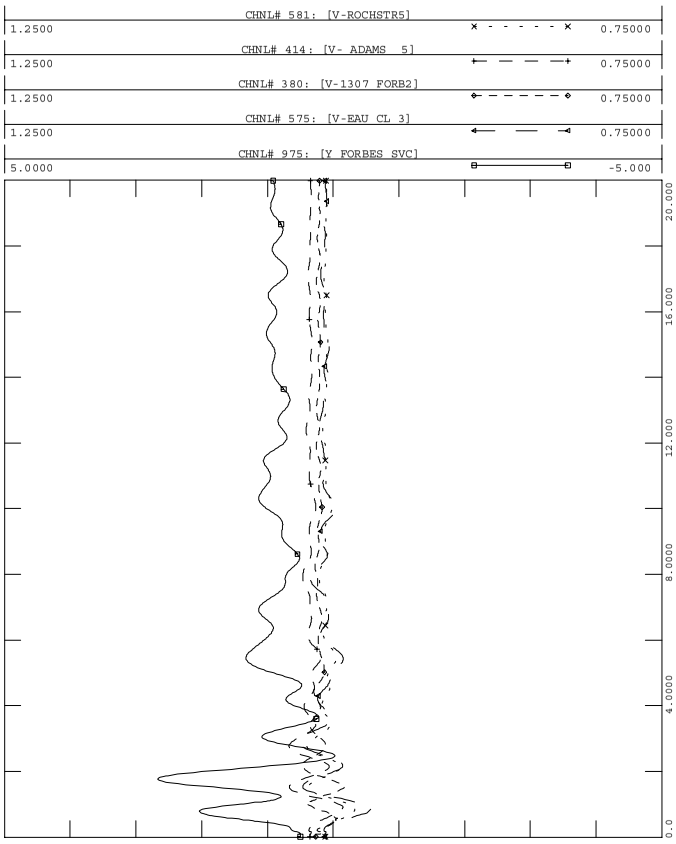


MON, APR 22 2002 12:49
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49

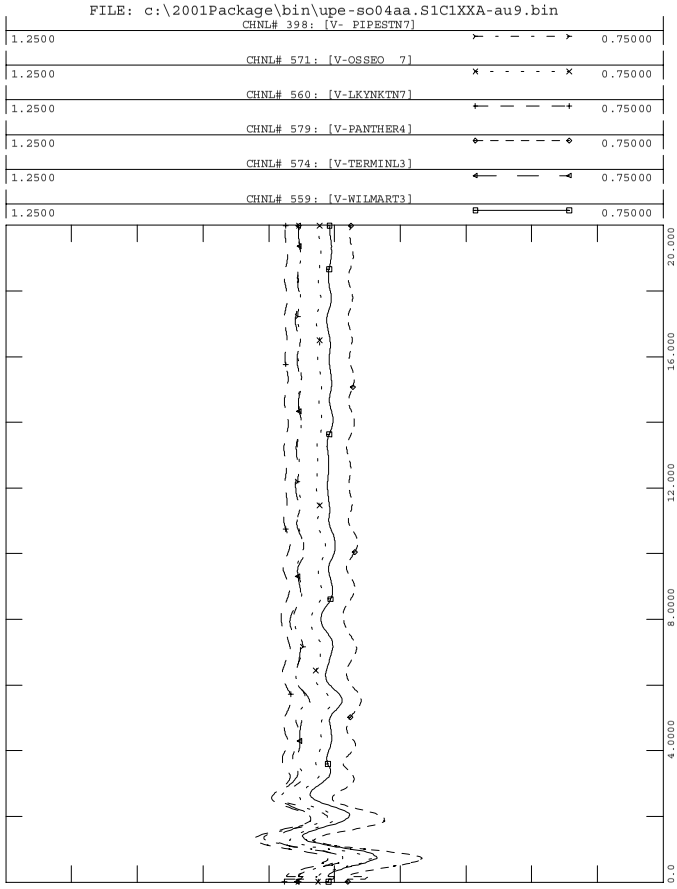
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49

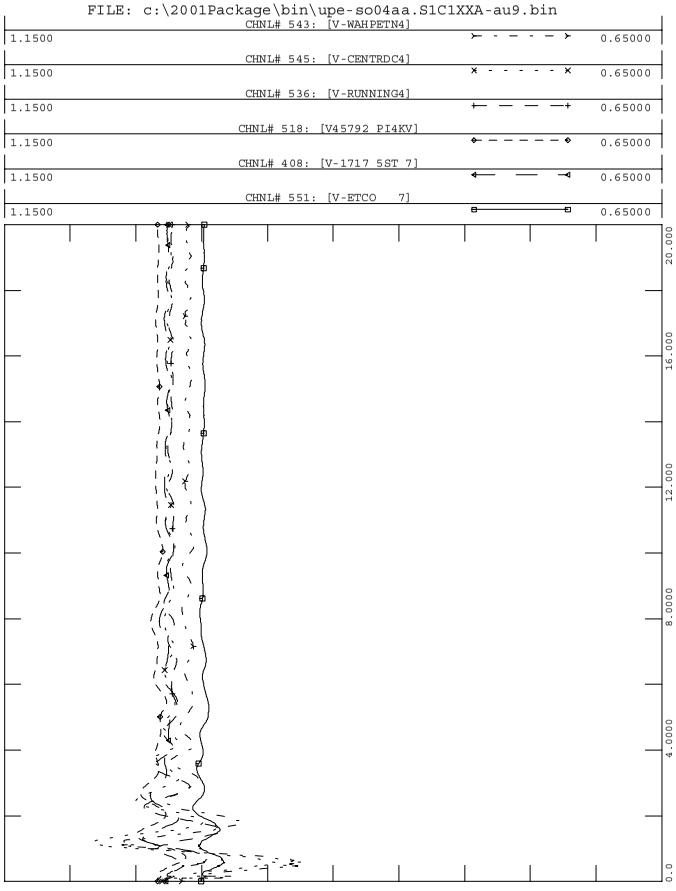
TC VOLTAGES



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49

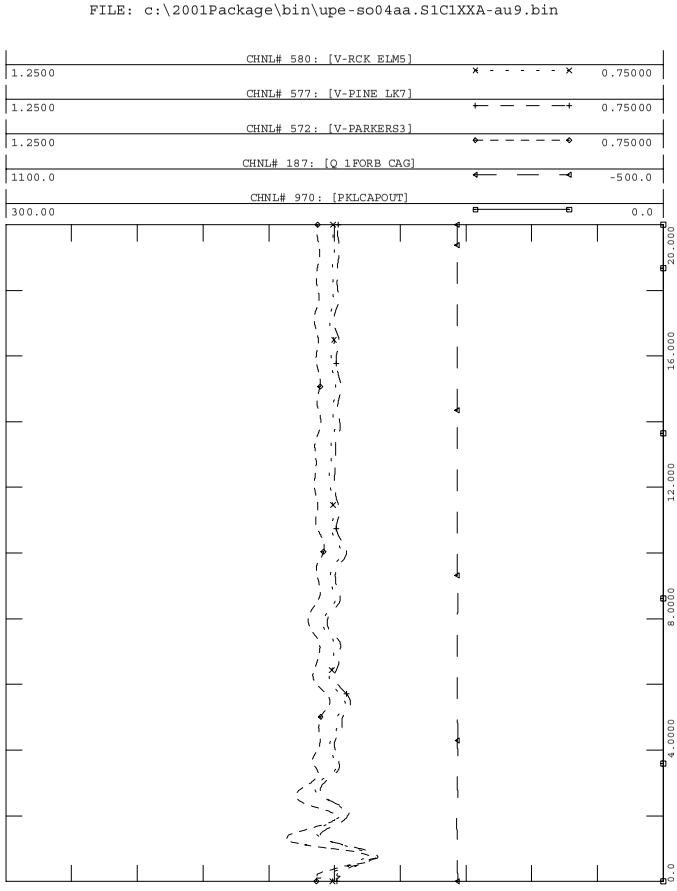
VOLTAGES 6



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

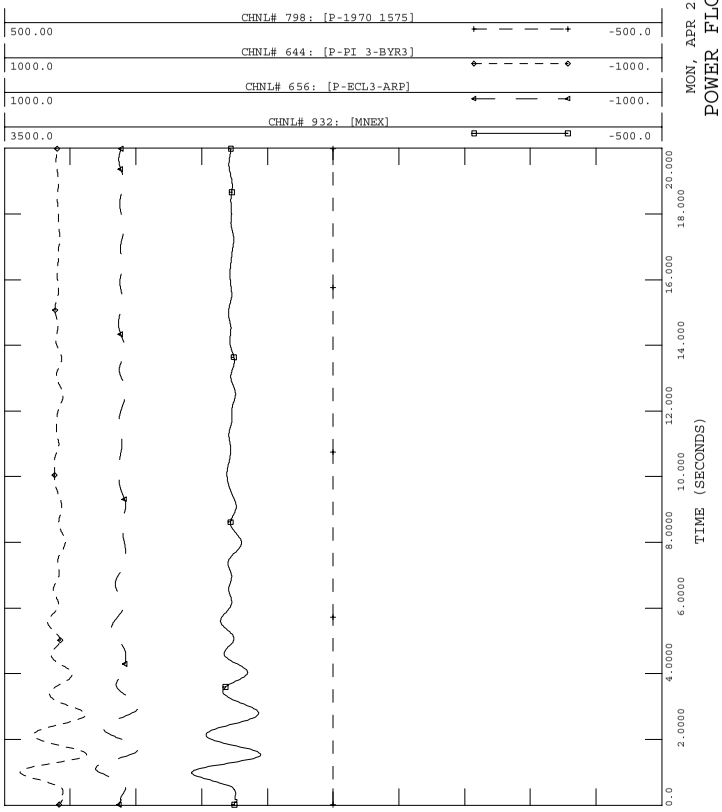
MON, APR 22 2002 12:49

FORBES SVS OUT & VOLTAGES



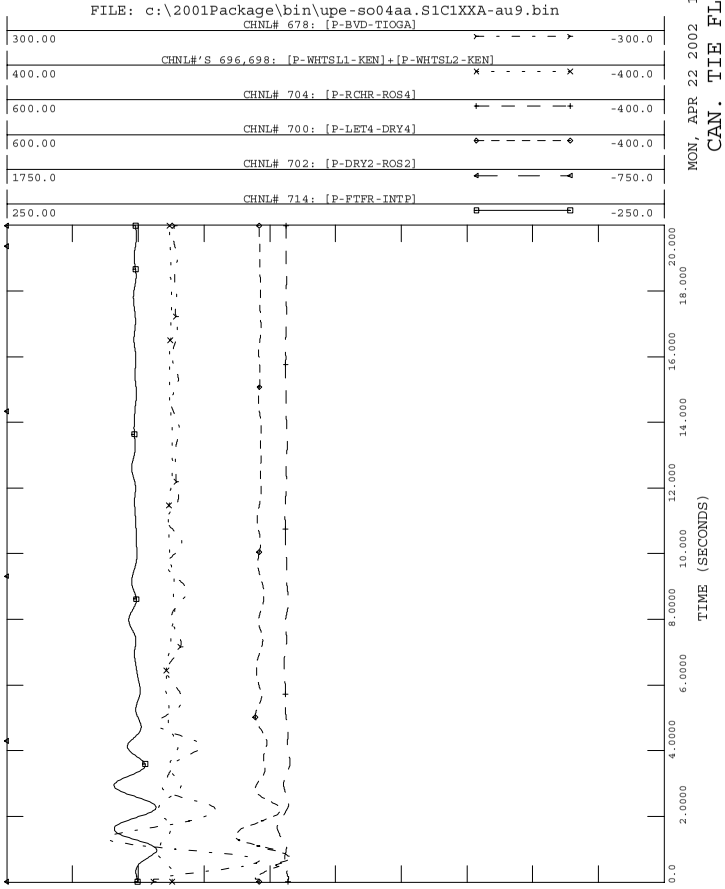
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49
POWER FLOW SUMS 2



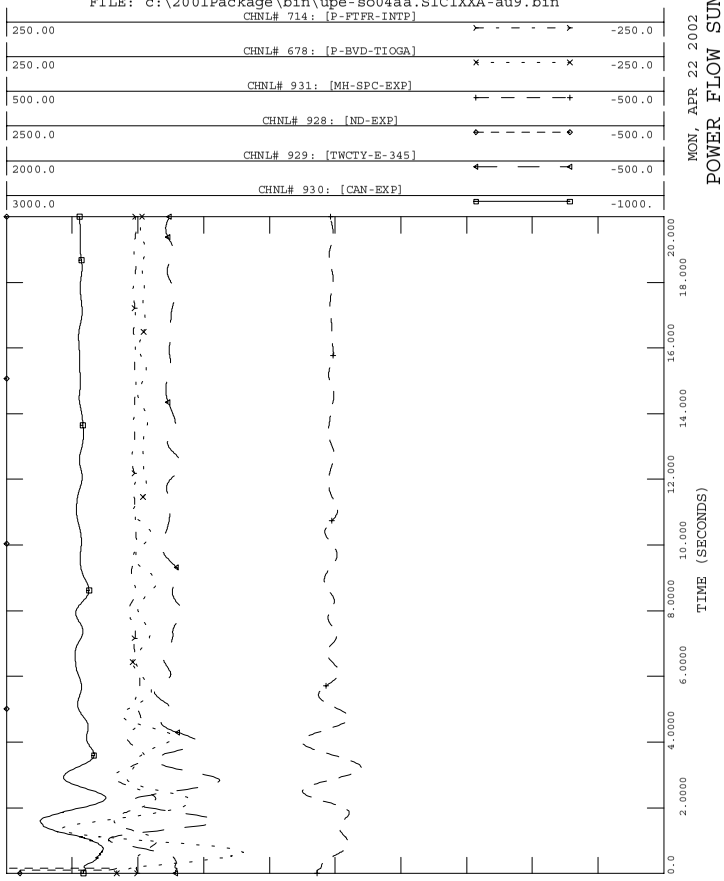
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49
CAN. TIE FLOWS



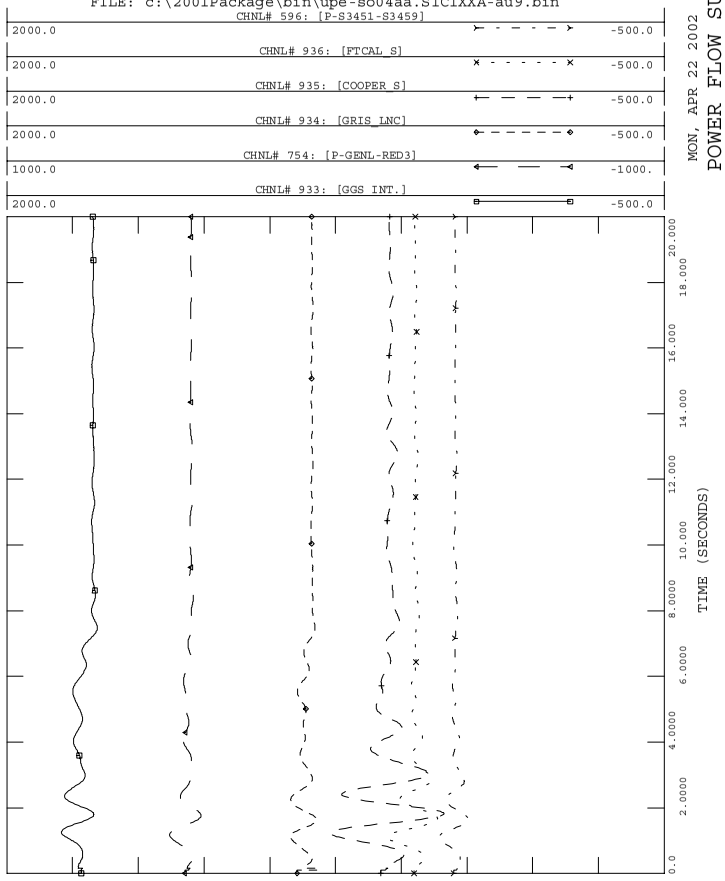
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

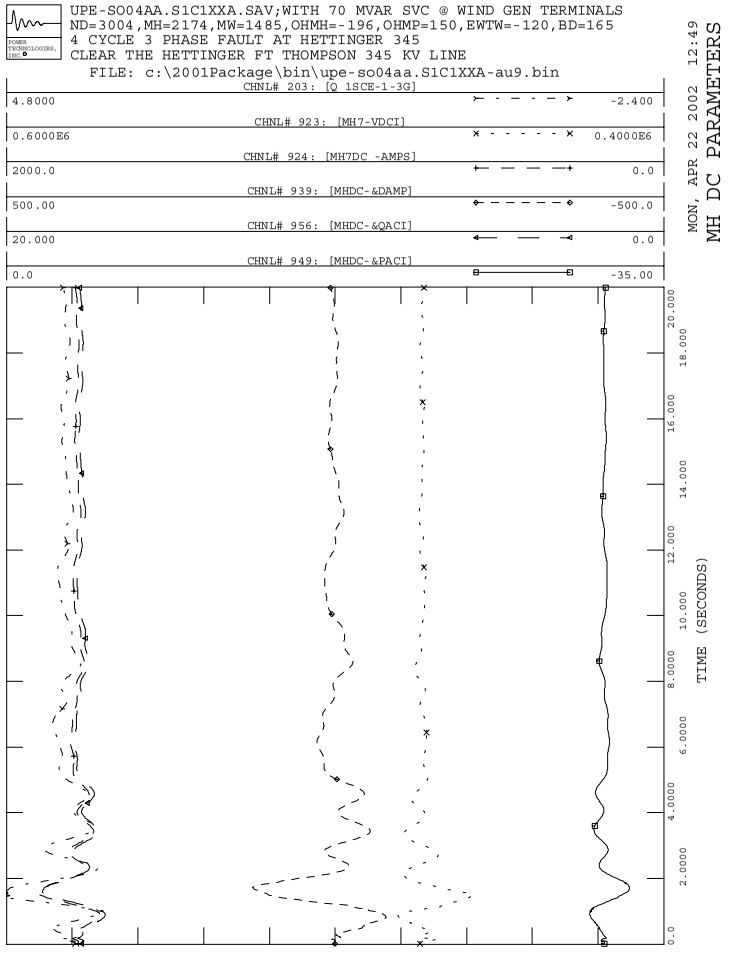
MON, APR 22 2002 12:49
POWER FLOW SUMS 1

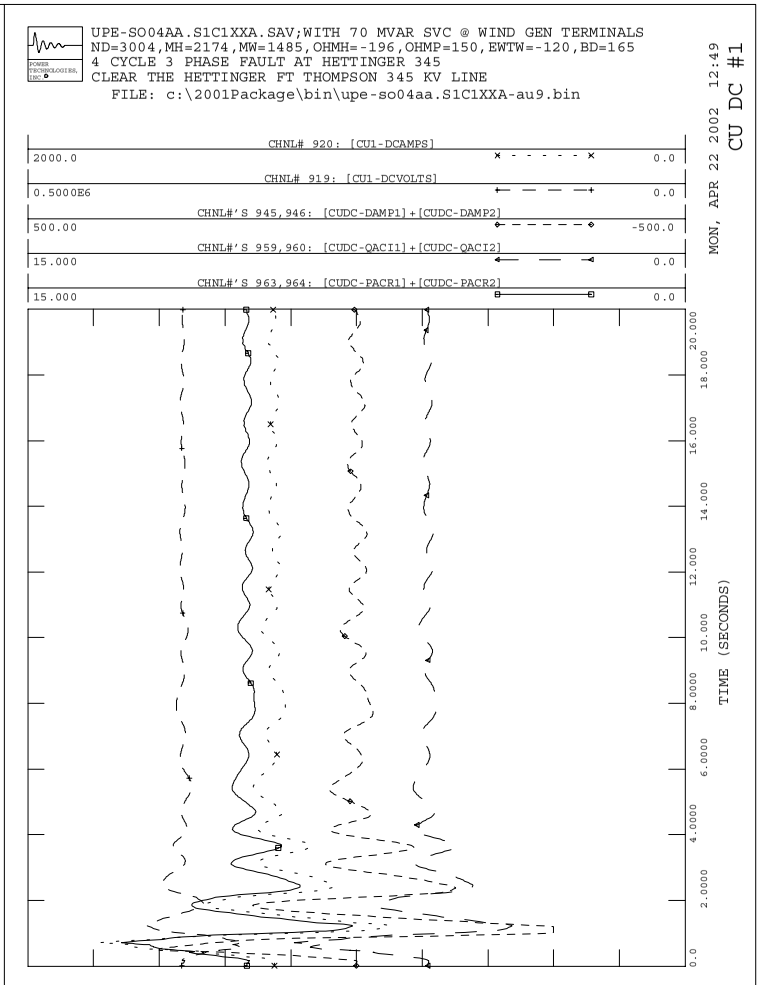


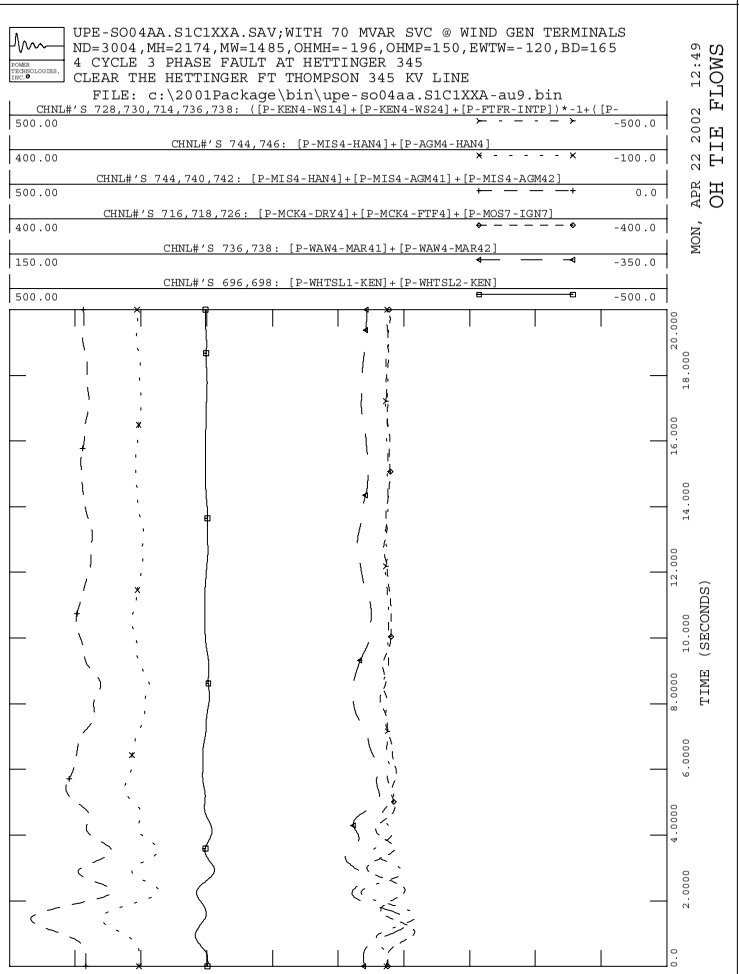
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

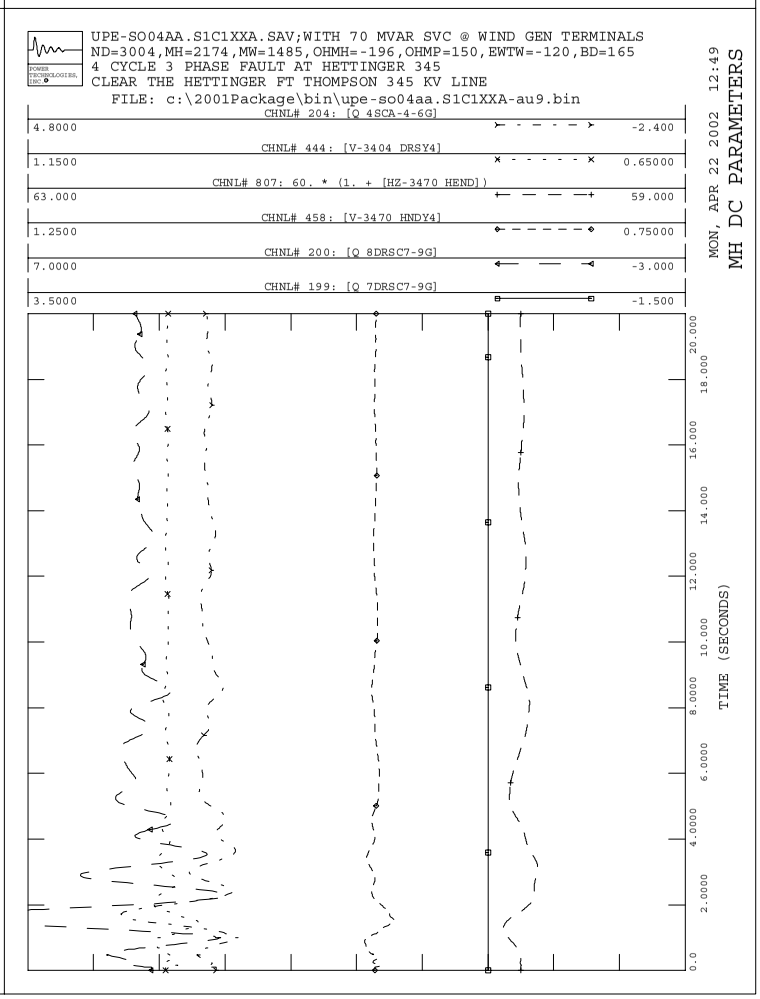
MON, APR 22 2002 12:49
POWER FLOW SUM 3




UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
MON, APR 22 2002 12:49
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
MON, APR 22 2002 12:49
CU DC #1
TIME (SECONDS)

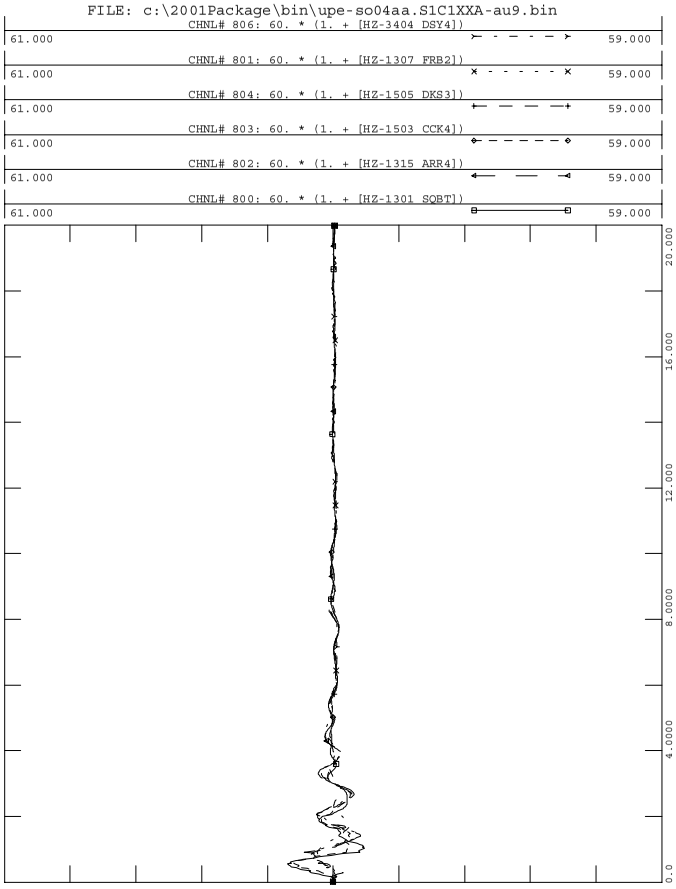

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
MON, APR 22 2002 12:49
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
MON, APR 22 2002 12:49
MH DC PARAMETERS
TIME (SECONDS)

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49

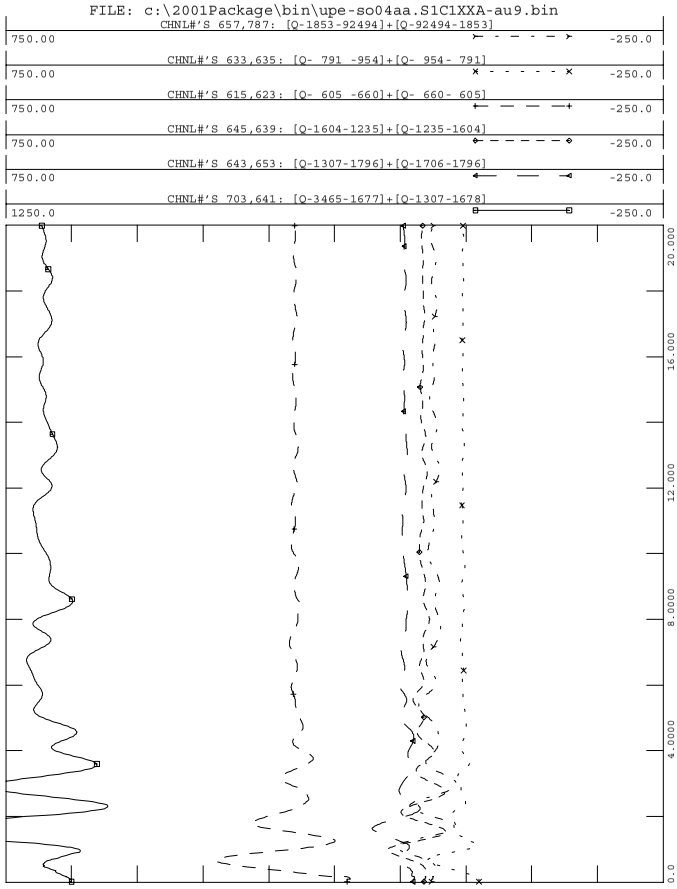
FREQ AT DC TERMINALS



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49

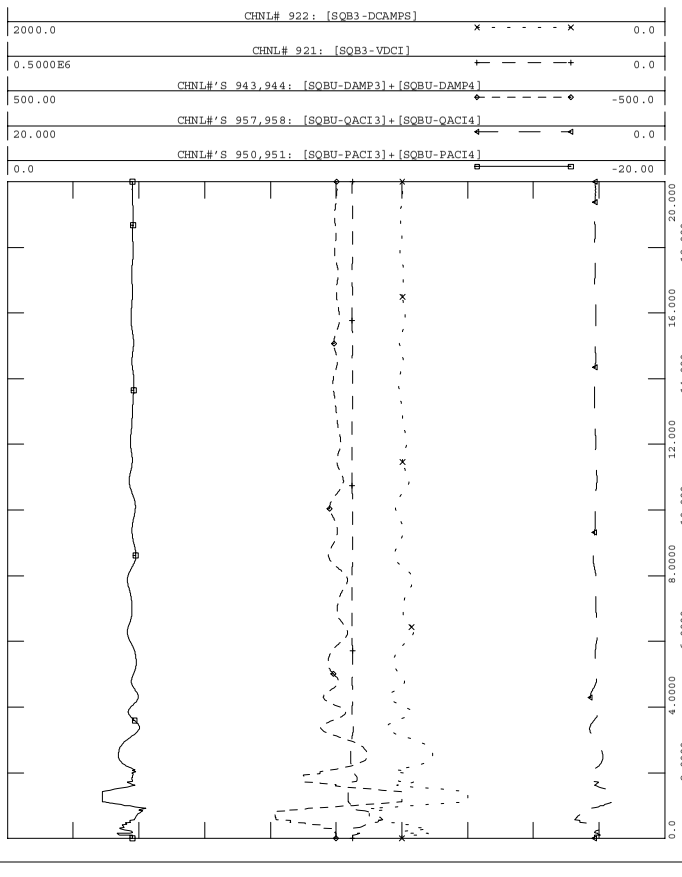
VAR LOSSES



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49

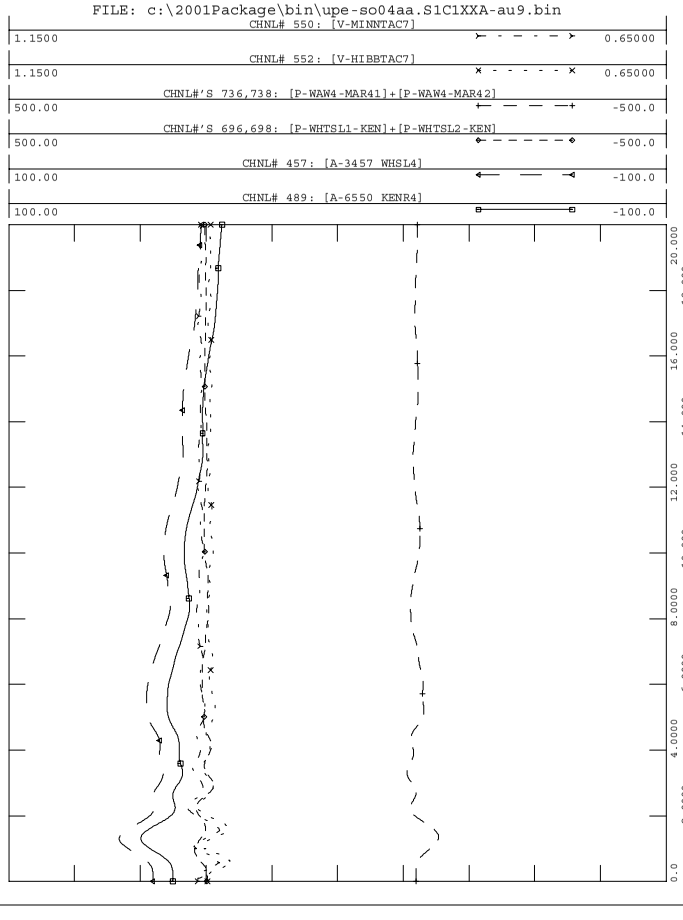
SQB DC #3



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

MON, APR 22 2002 12:49

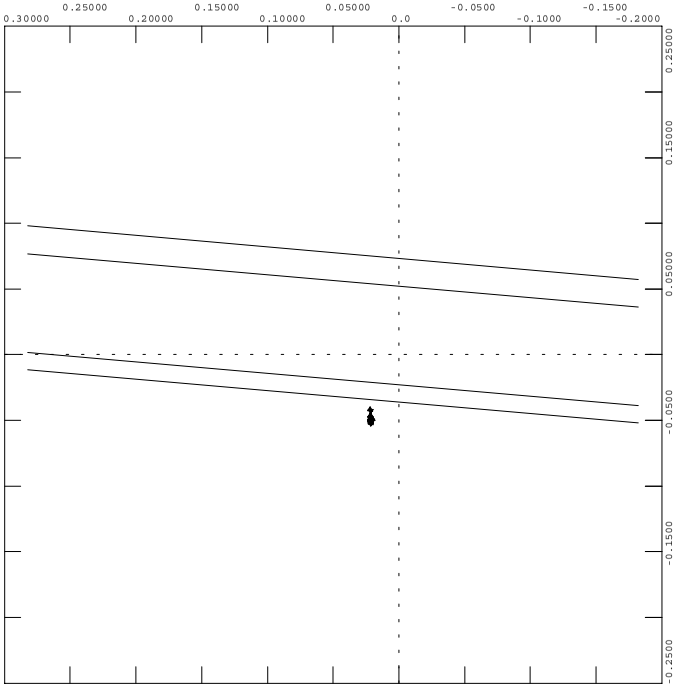
VOLTAGES, ANGLES



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

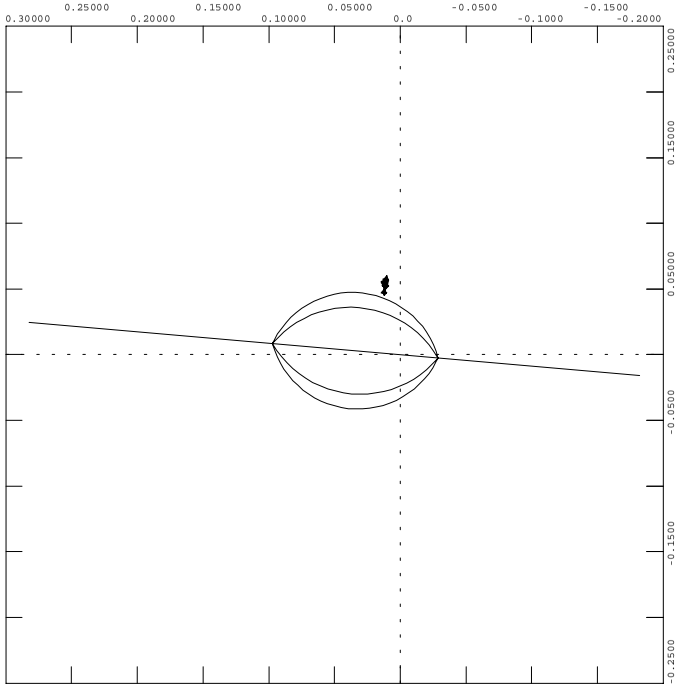


MON, APR 22 2002 12:49
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

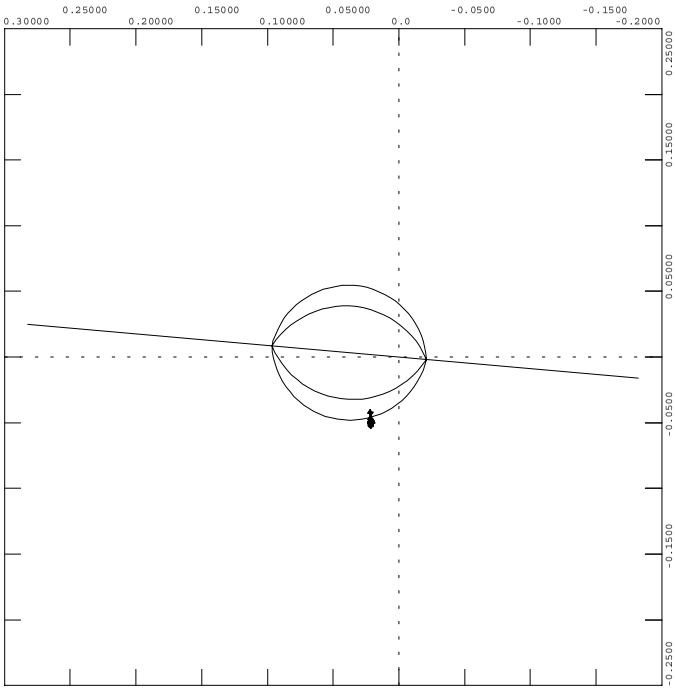


MON, APR 22 2002 12:49
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

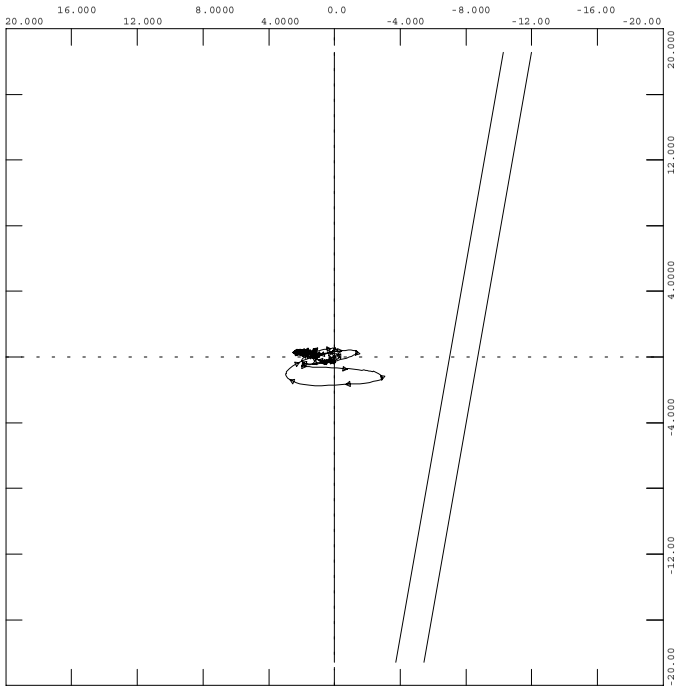


MON, APR 22 2002 12:49
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

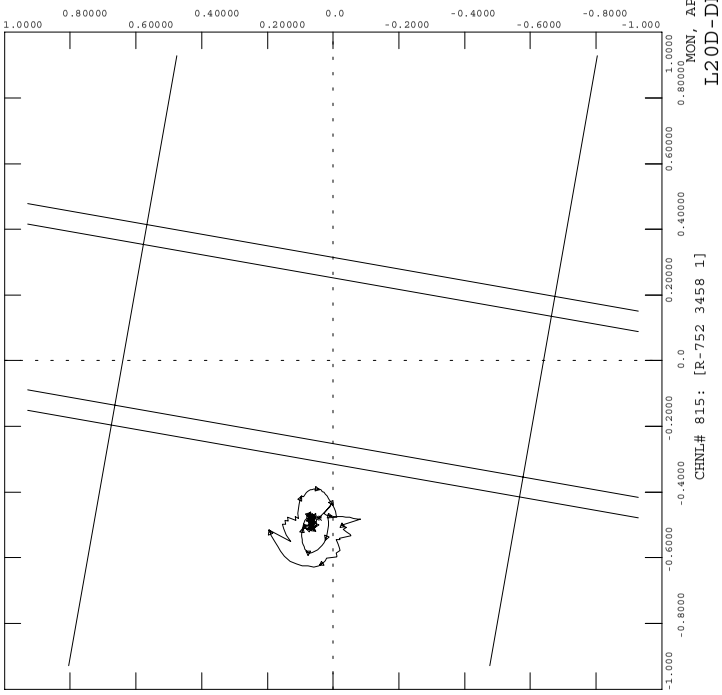


MON, APR 22 2002 12:49
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

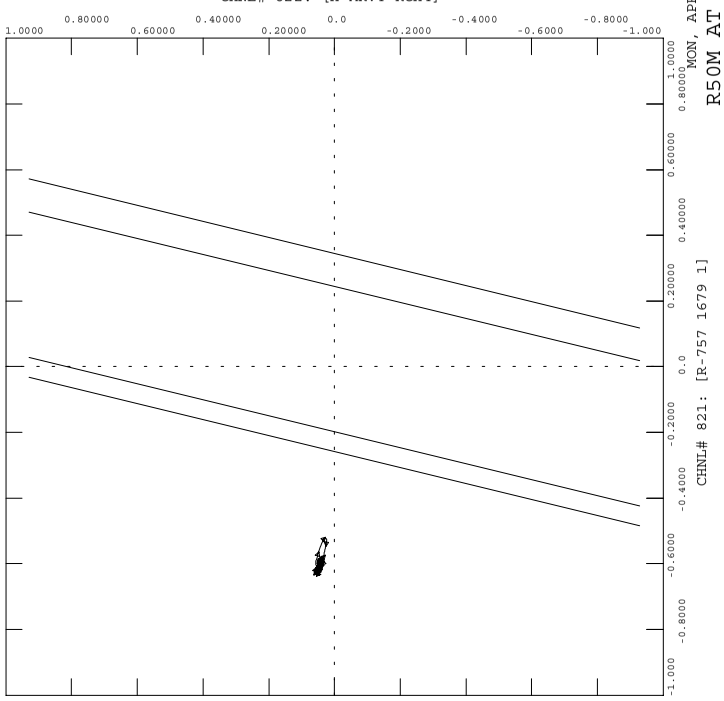
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

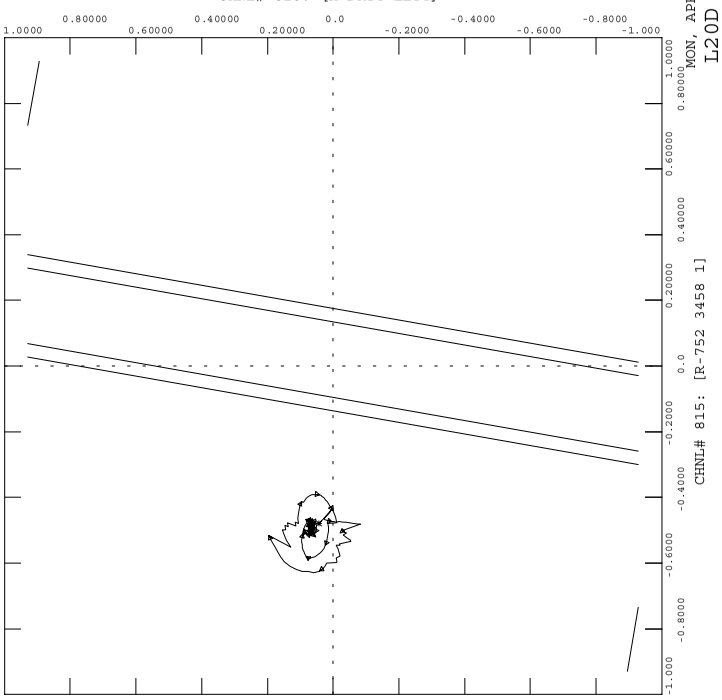
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

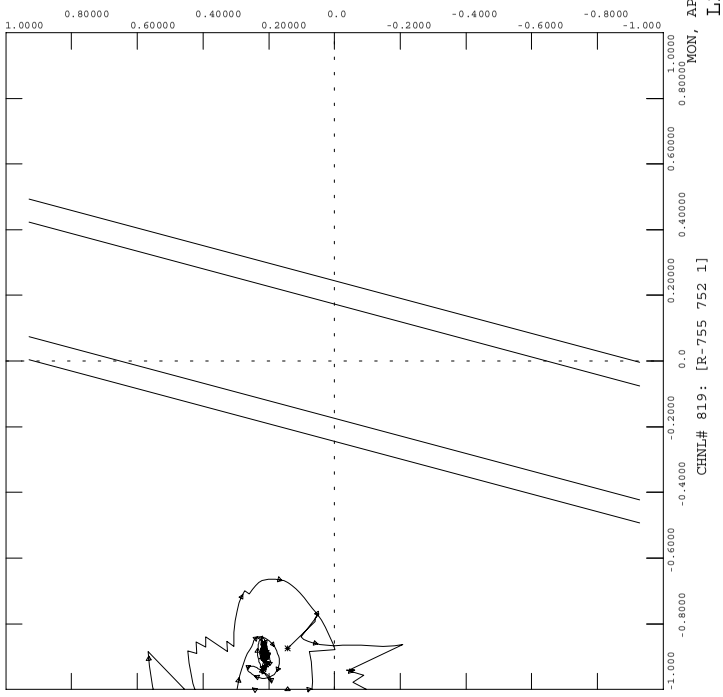
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

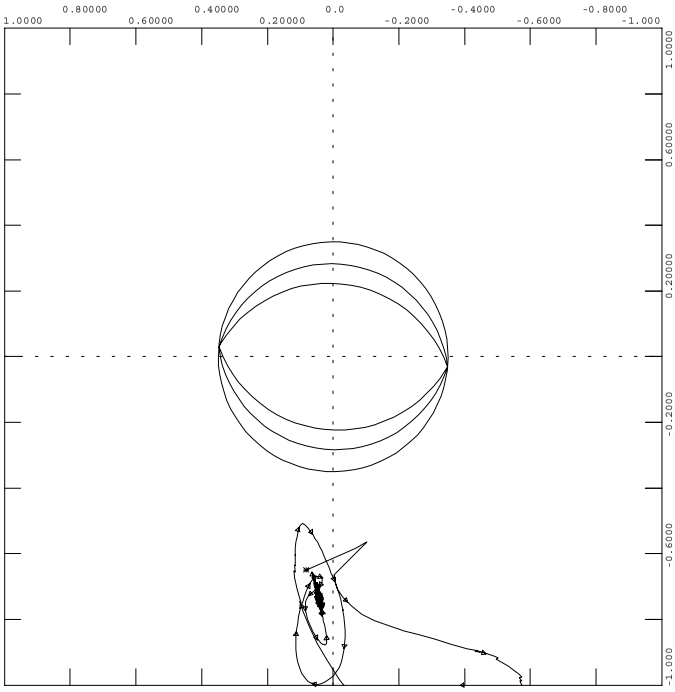
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

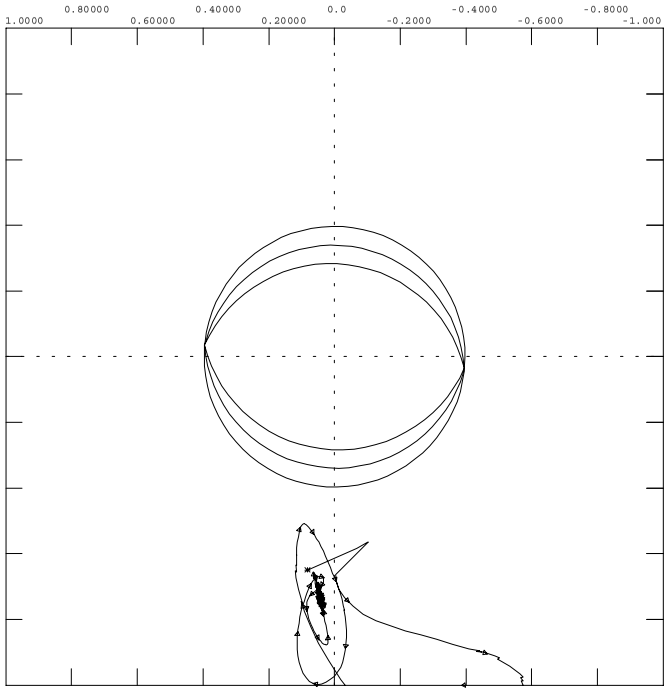
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

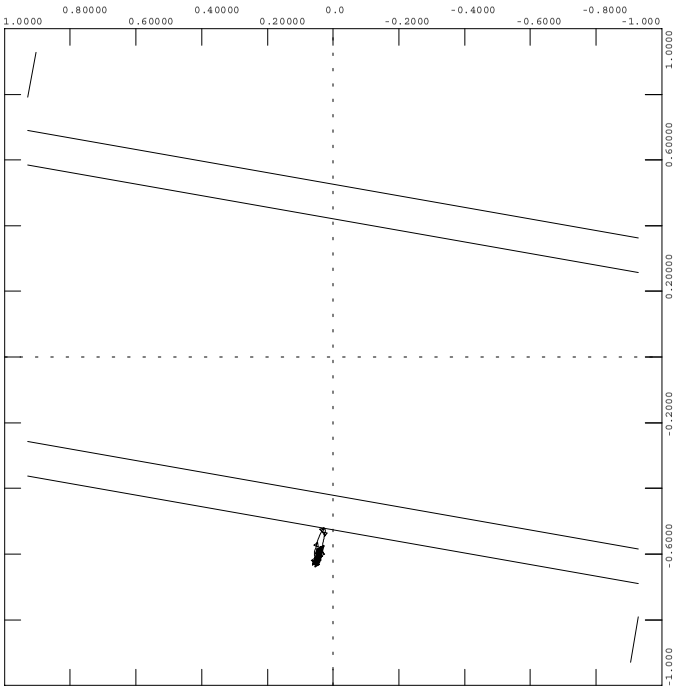
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

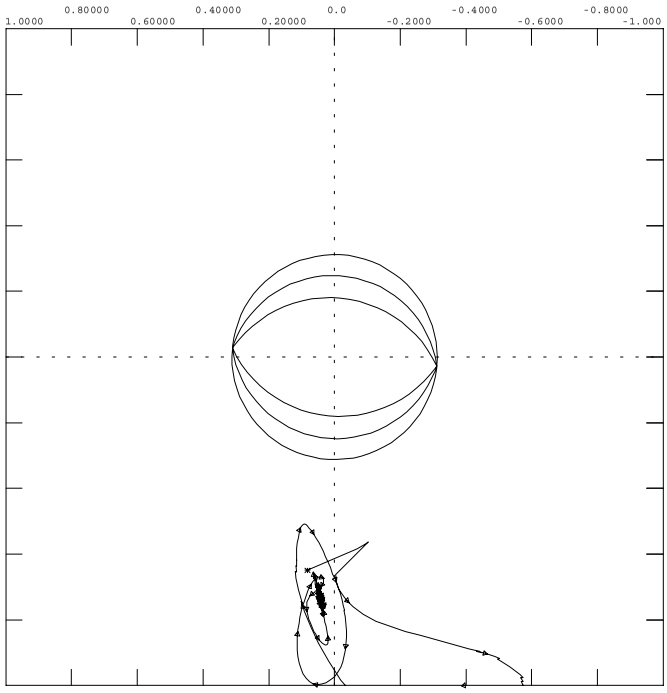
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



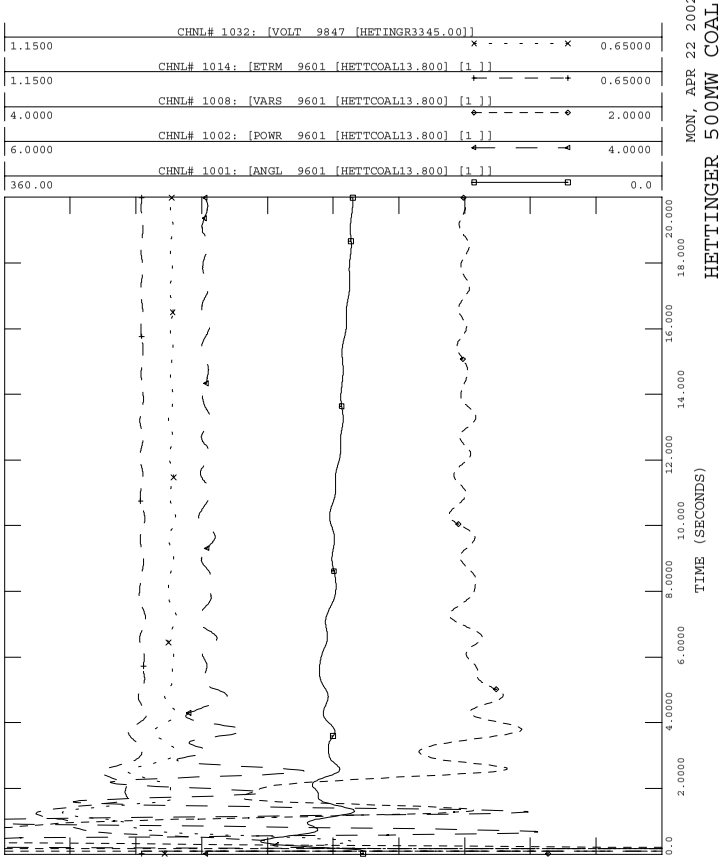
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

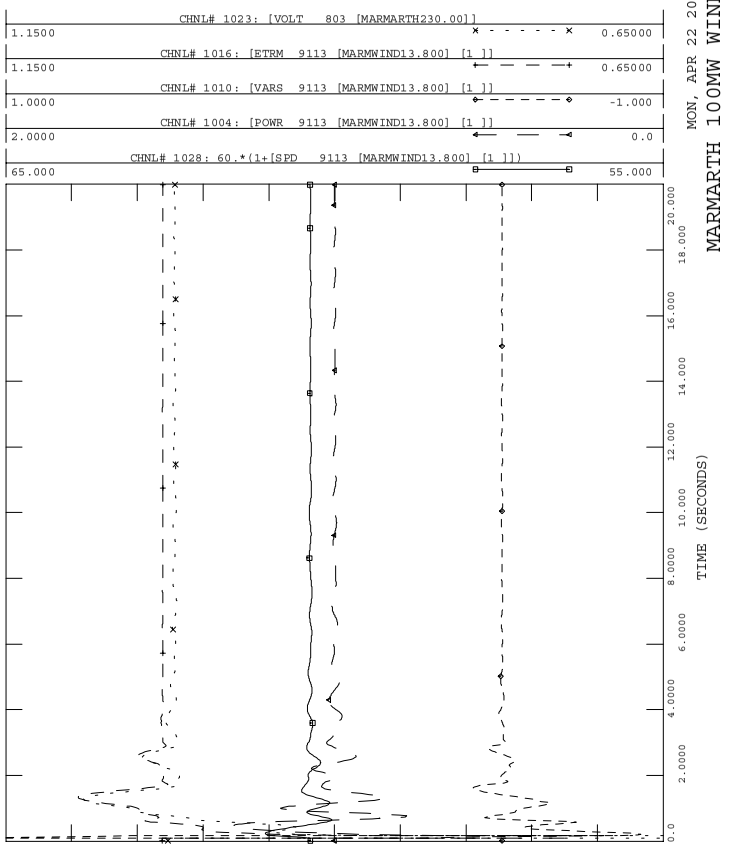
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin



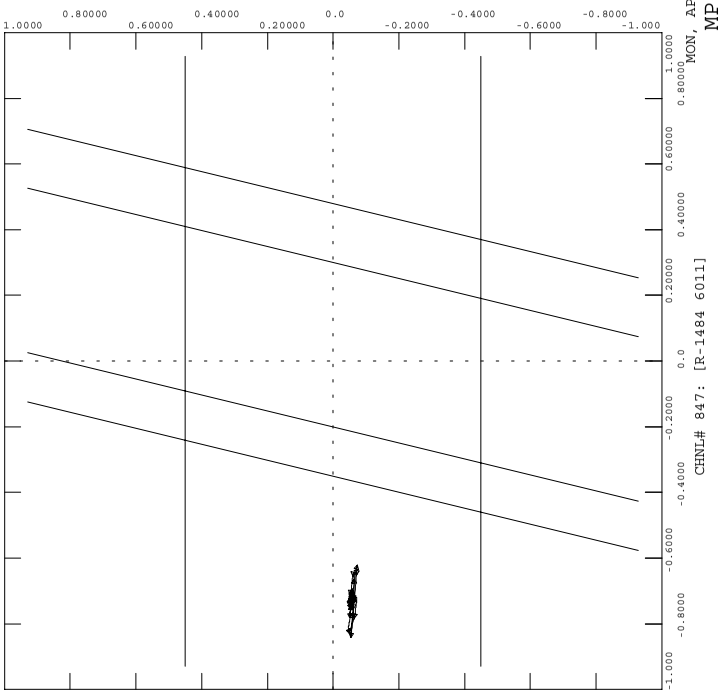
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin



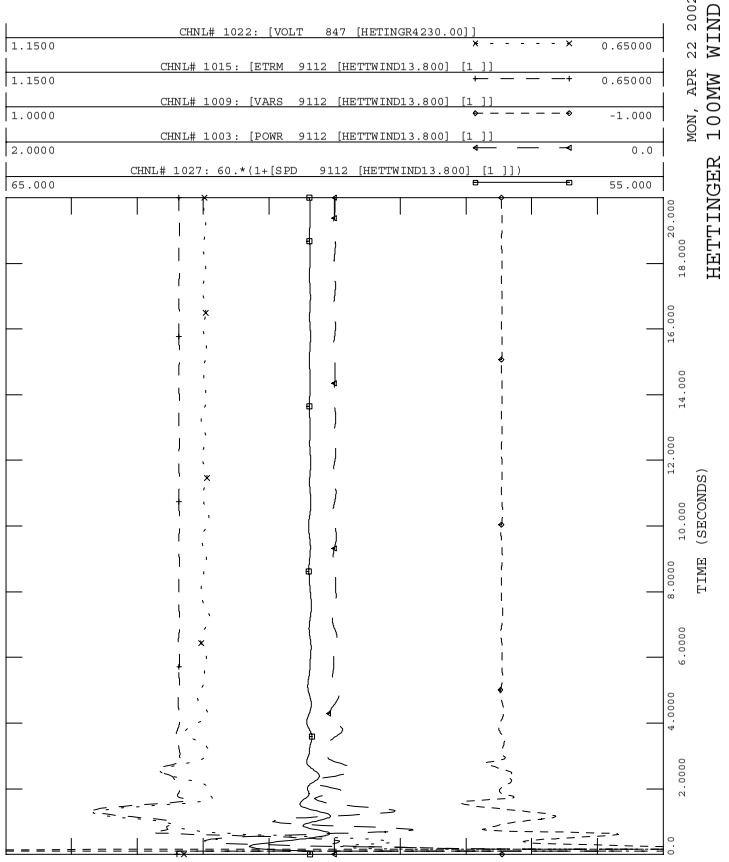
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

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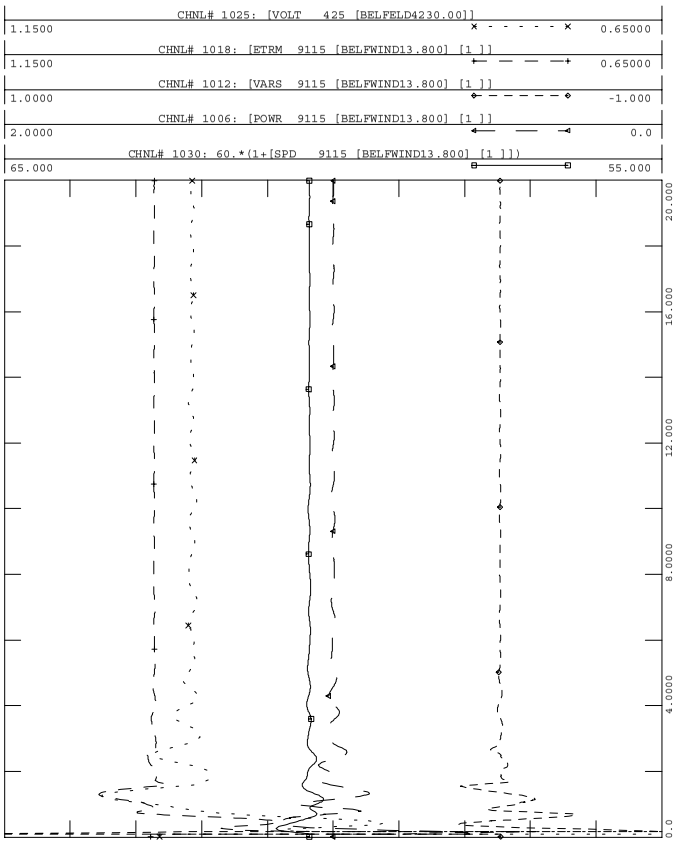
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

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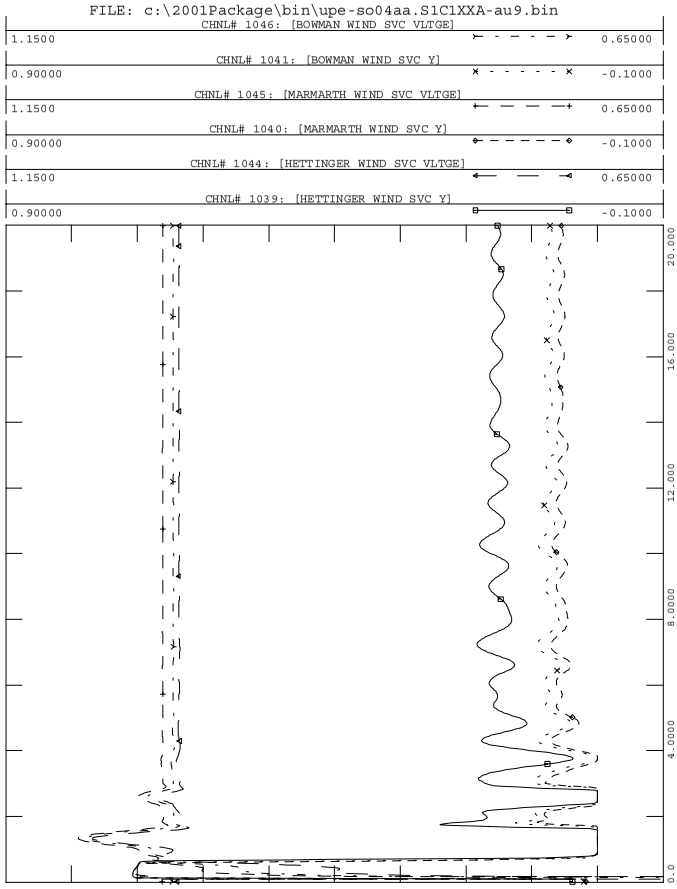
SVCS @ HTNG,MRMR&BWMN



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

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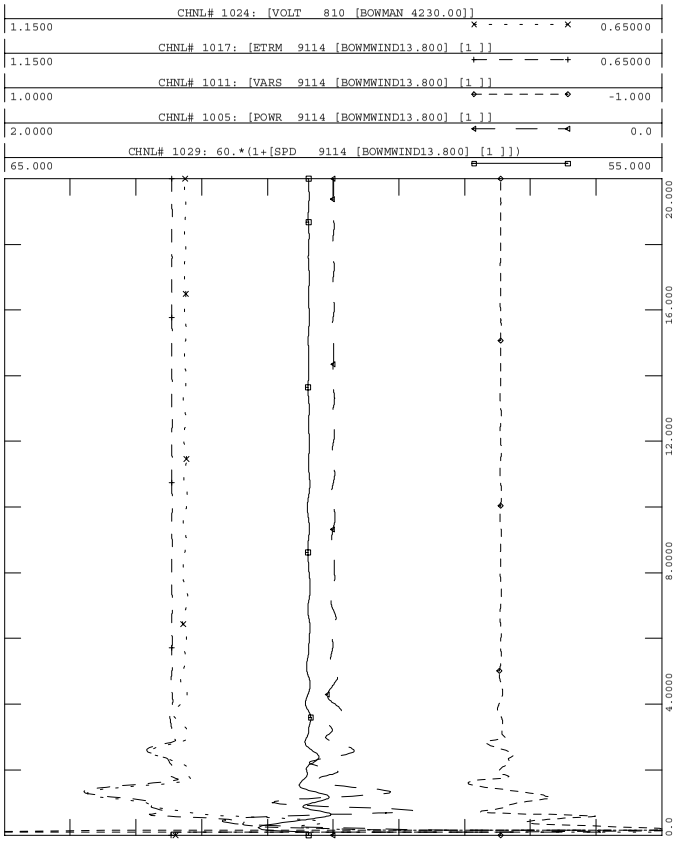
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin

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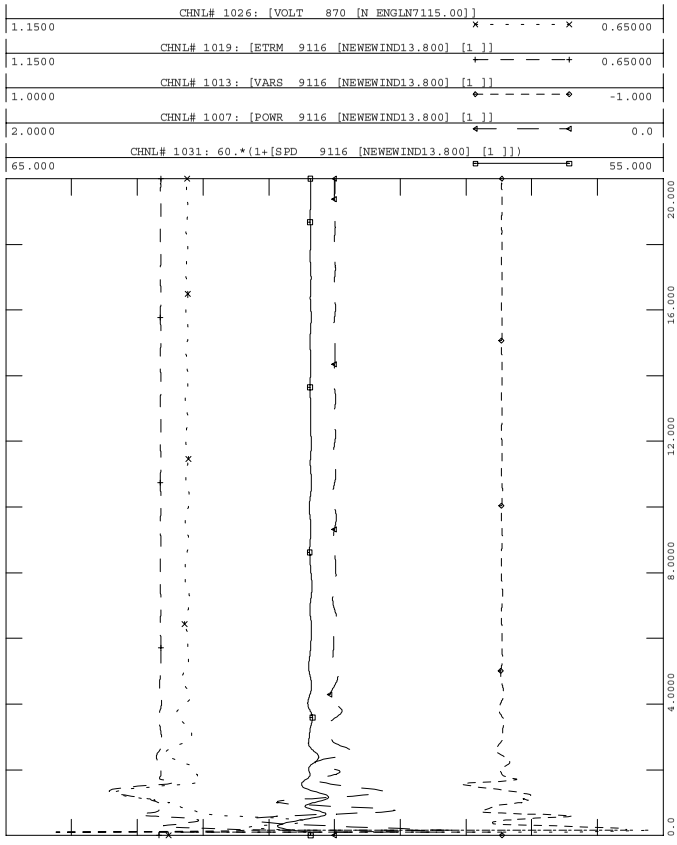
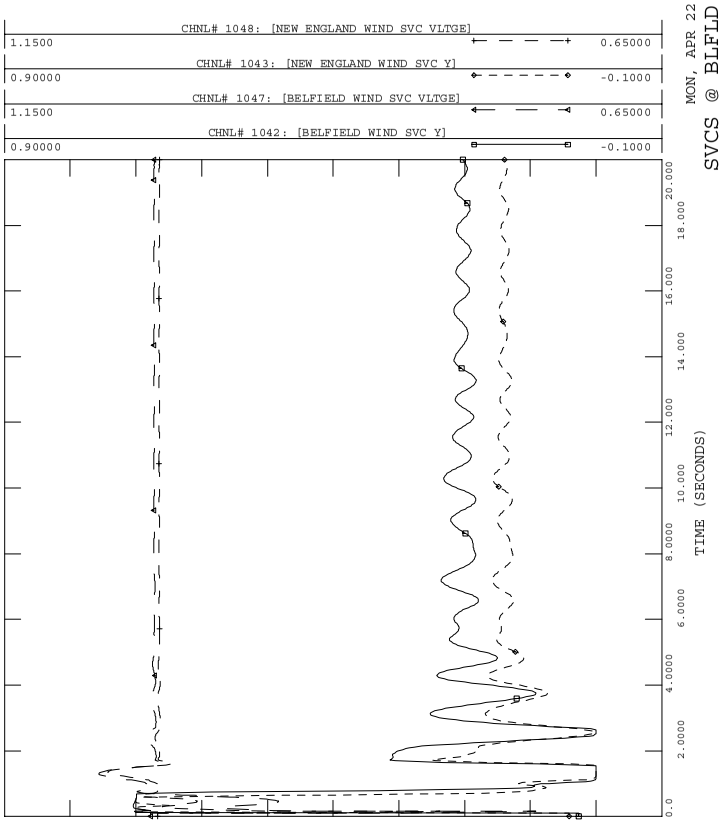
NEW E. 100MW WIND UNIT



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-au9.bin



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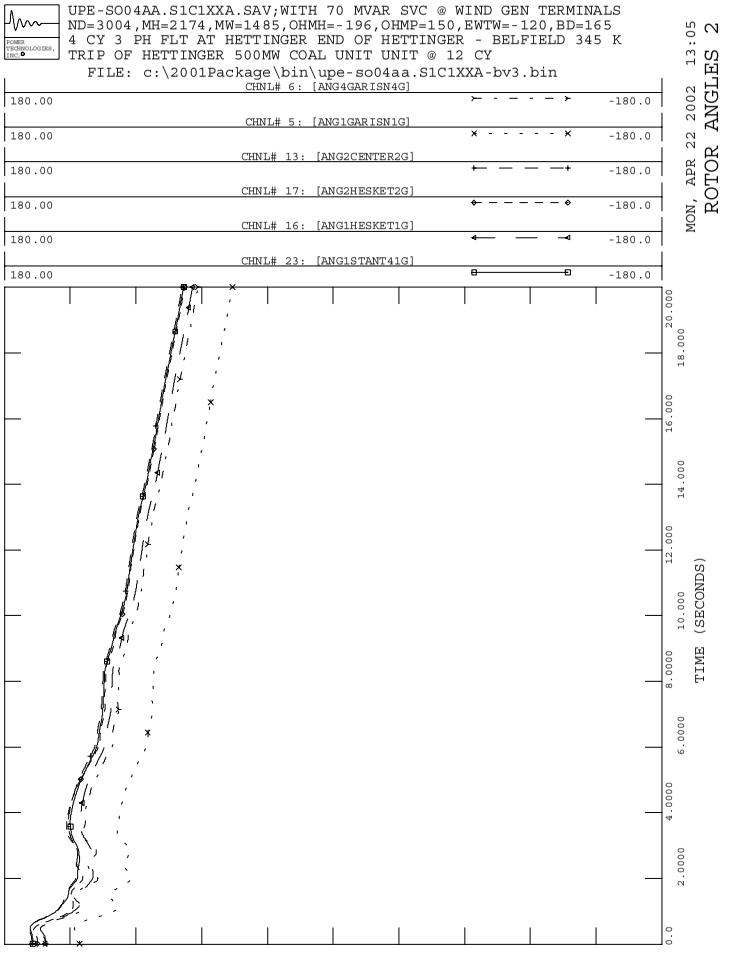
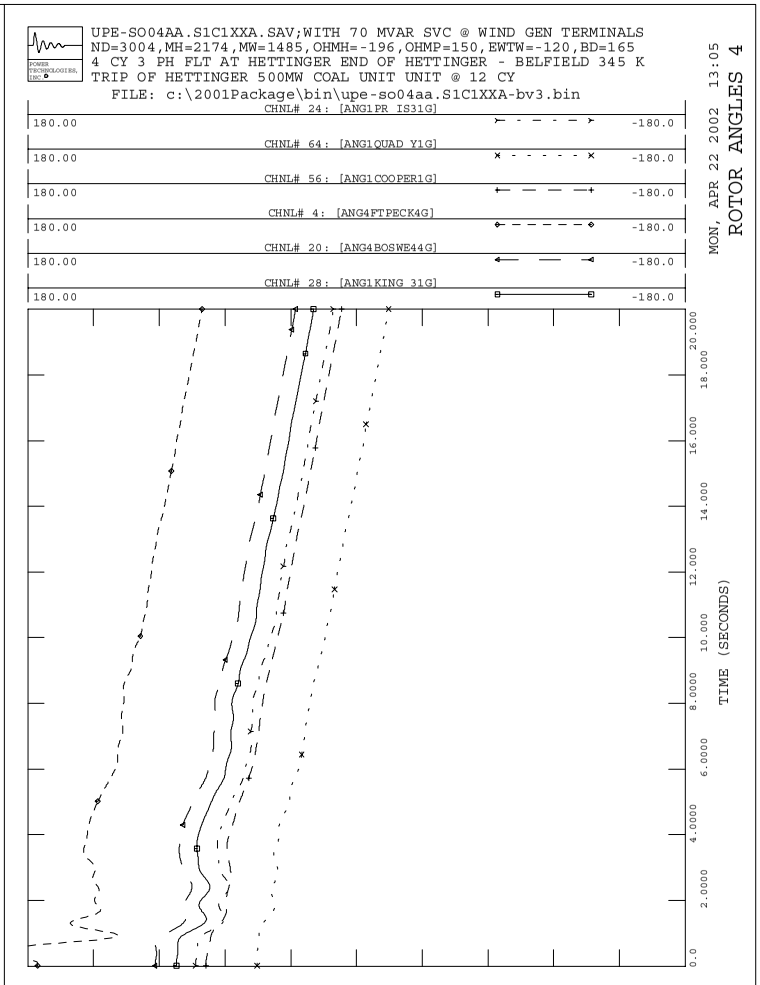
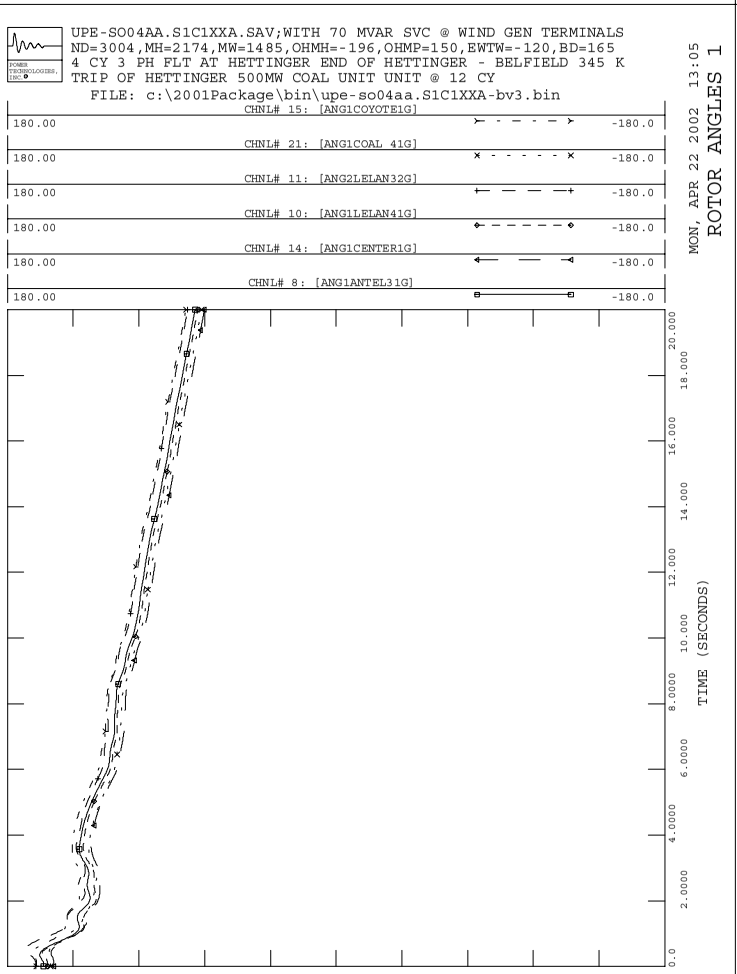
SVCS @ BLFLD & NWENG

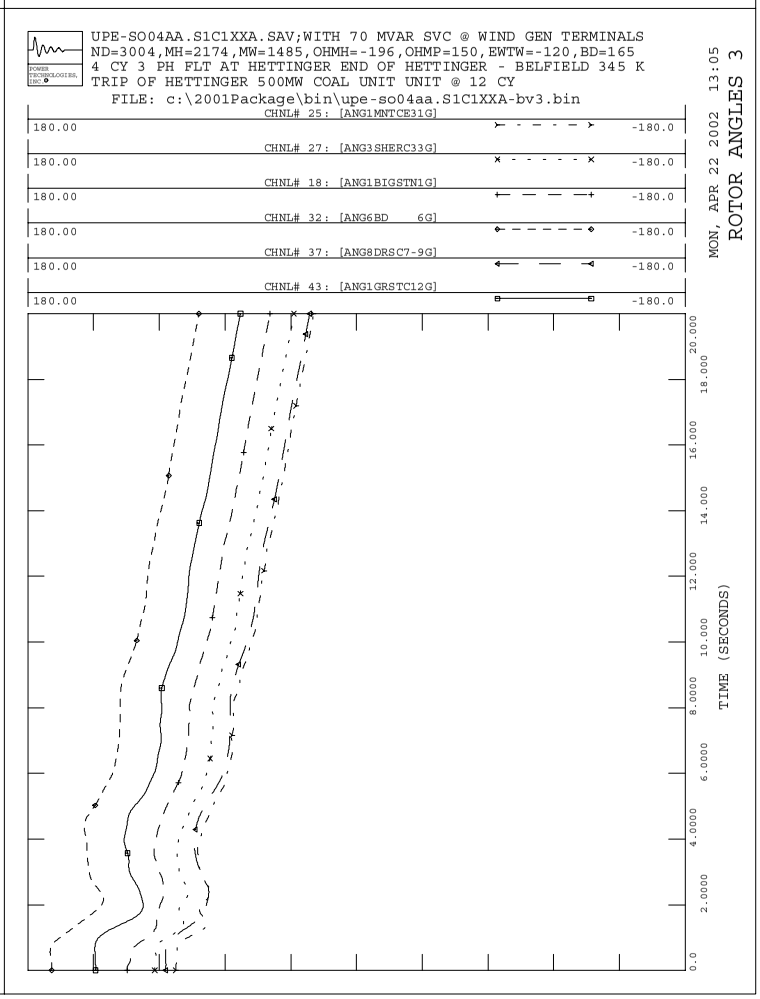
CONTINGENCY BV3

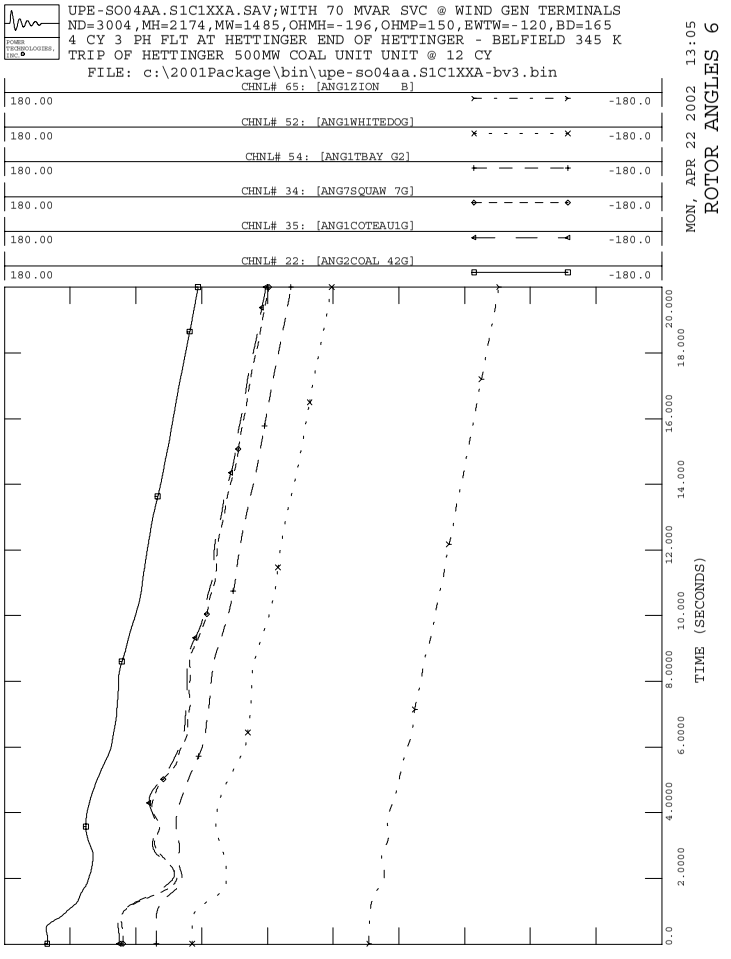
4 cycle 3 phase fault at Hettinger end of Hettinger - Belfield 345 kV line. Trip of Hettinger 500 MW Coal Unit @ 12 cy

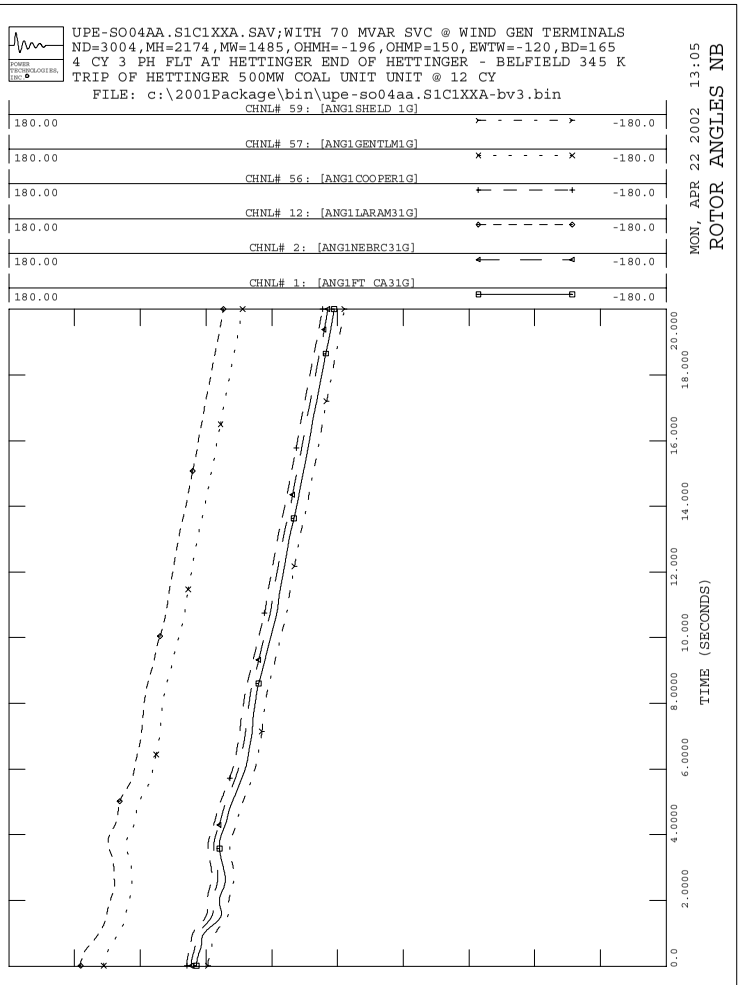

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
MON, APR 22 2002 13:05
ROTOR ANGLES 2
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

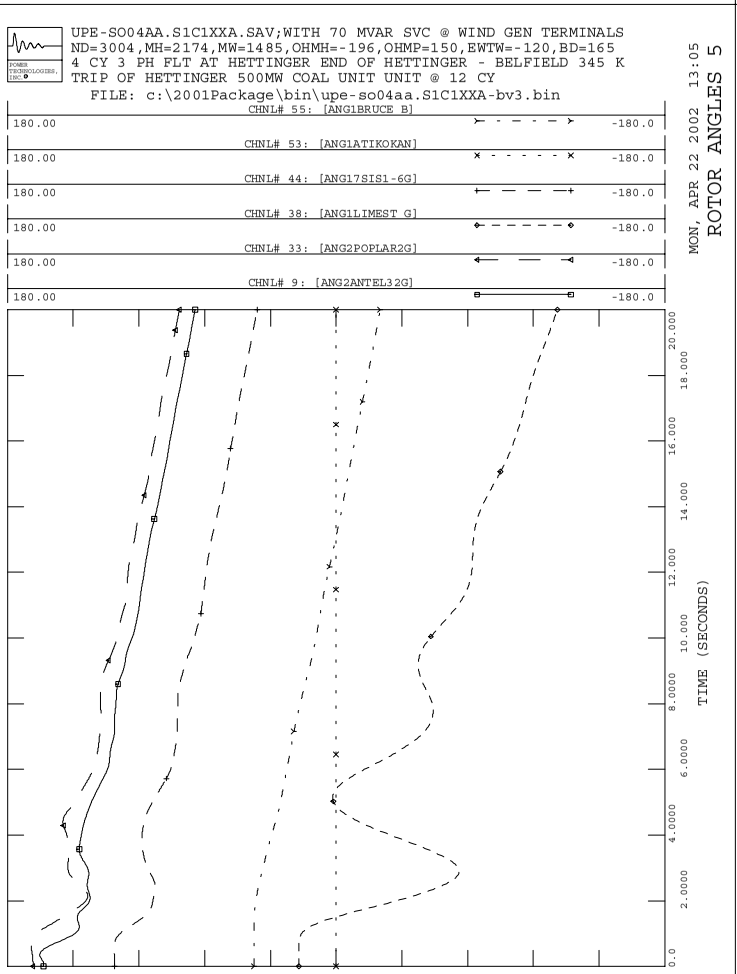

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
MON, APR 22 2002 13:05
ROTOR ANGLES 4
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

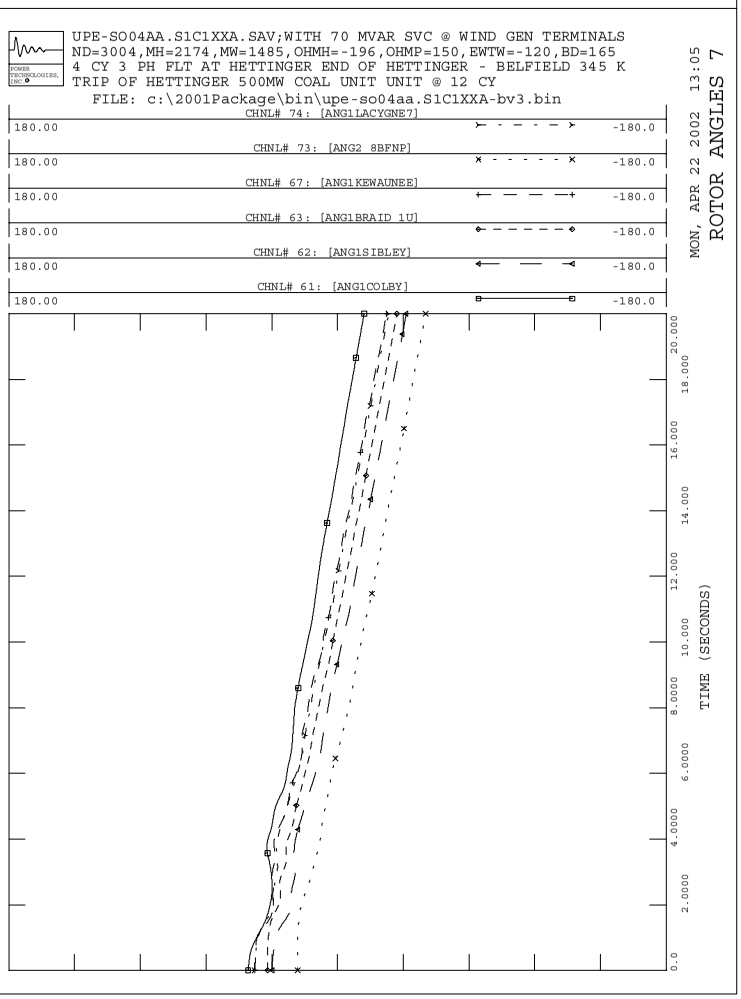

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
MON, APR 22 2002 13:05
ROTOR ANGLES 1
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
MON, APR 22 2002 13:05
ROTOR ANGLES 3
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
MON, APR 22 2002 13:05
ROTOR ANGLES 6


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
MON, APR 22 2002 13:05
ROTOR ANGLES NB


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
MON, APR 22 2002 13:05
ROTOR ANGLES 5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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
MON, APR 22 2002 13:05
ROTOR ANGLES 7

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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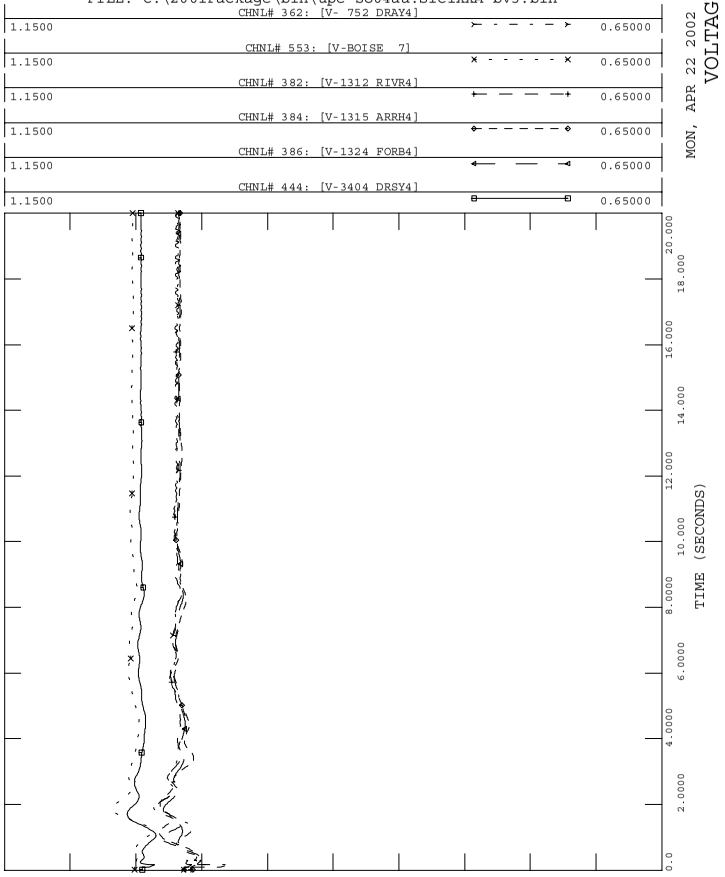
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin



MON, APR 22 2002 13:05
VOLTAGES 1

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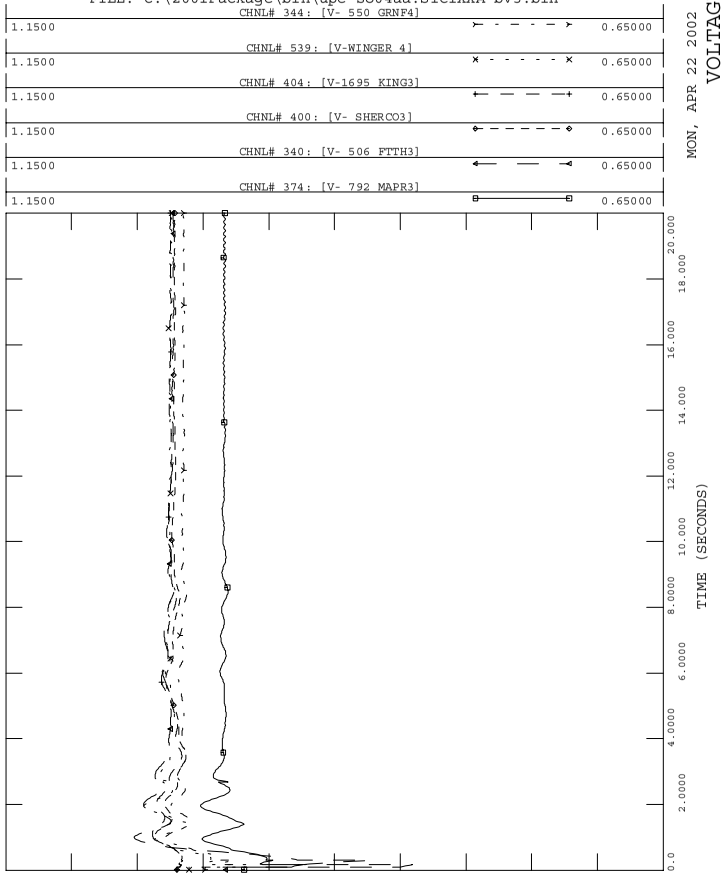
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin



MON, APR 22 2002 13:05
VOLTAGES 3

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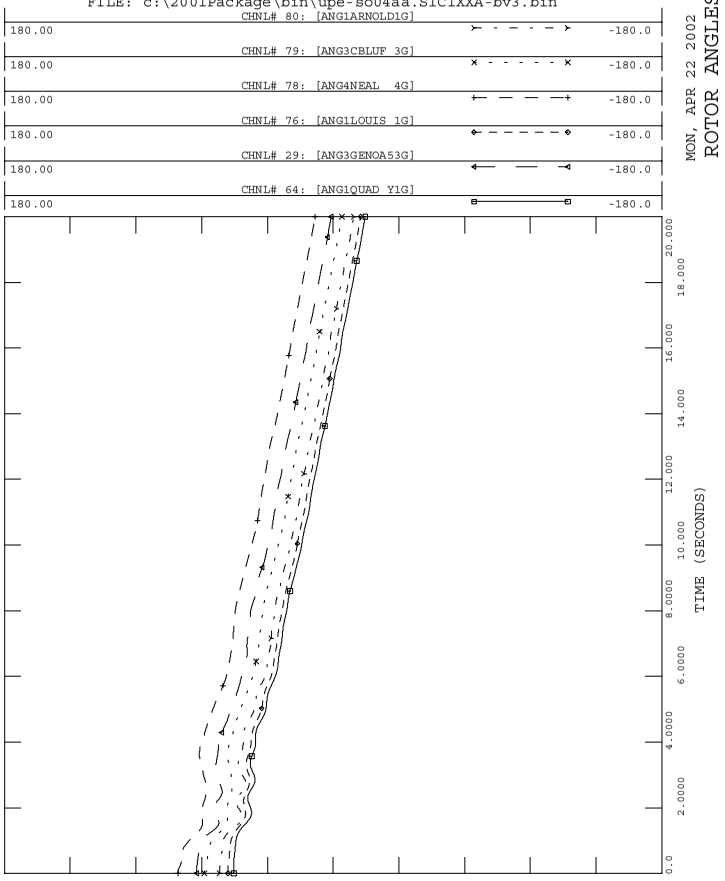
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin



MON, APR 22 2002 13:05
ROTOR ANGLES IA

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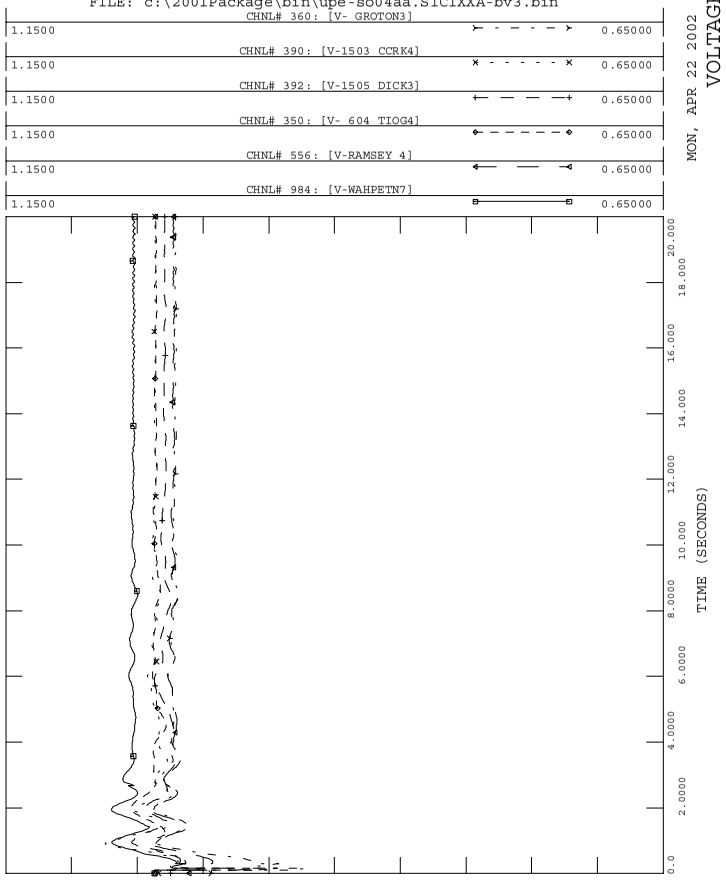
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin



MON, APR 22 2002 13:05
VOLTAGES 2

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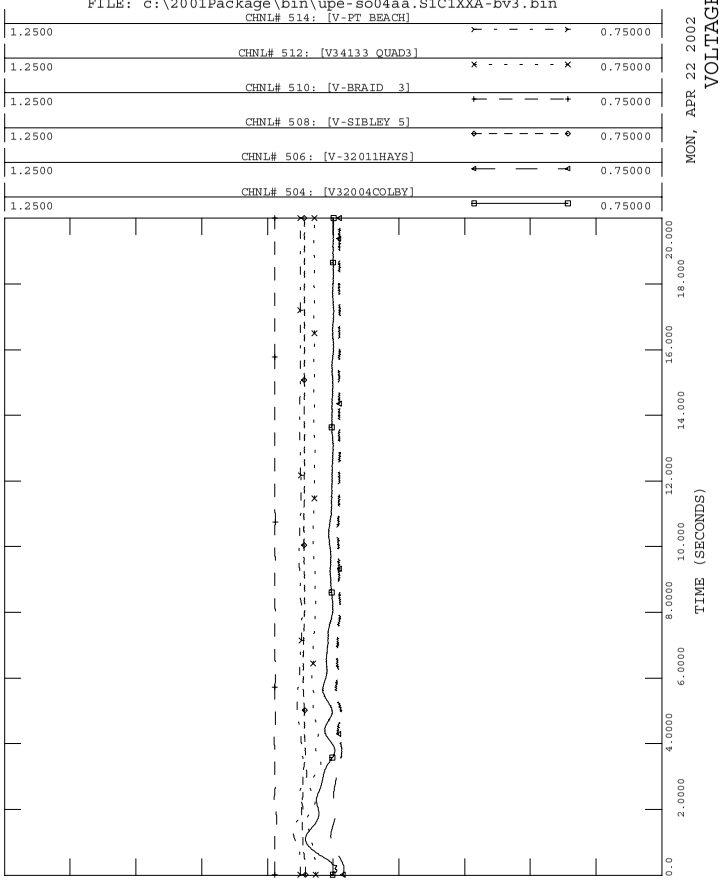
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05
VOLTAGES 5



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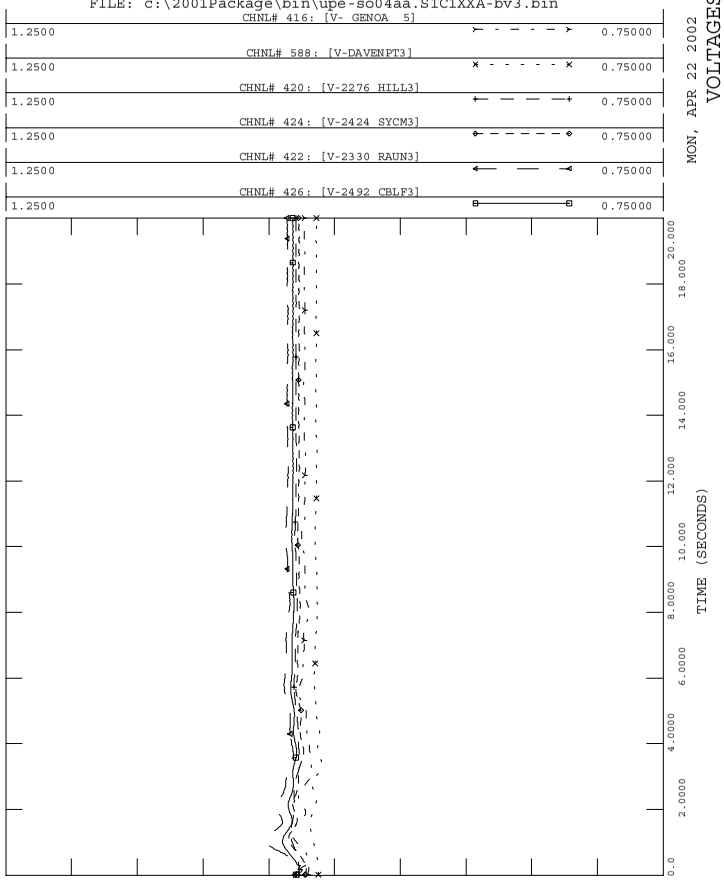
MON, APR 22 2002 13:05
VOLTAGES IA



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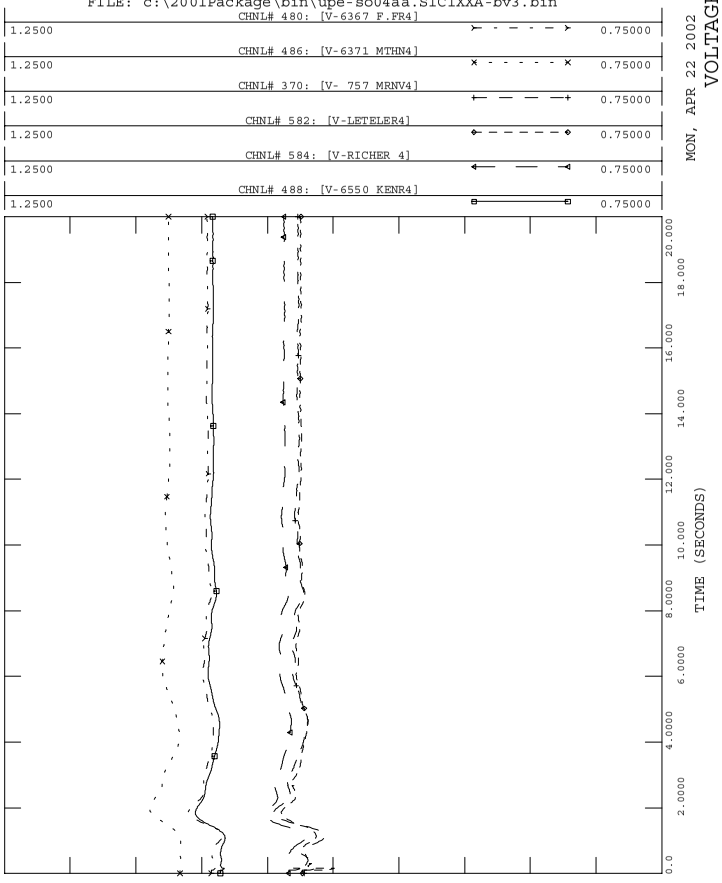
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05
VOLTAGES 4



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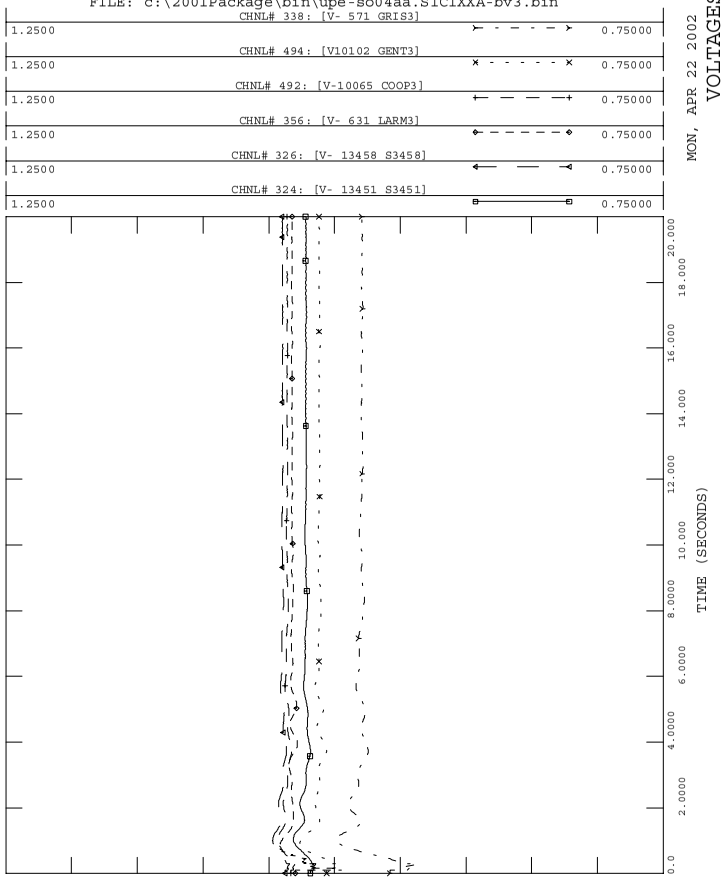
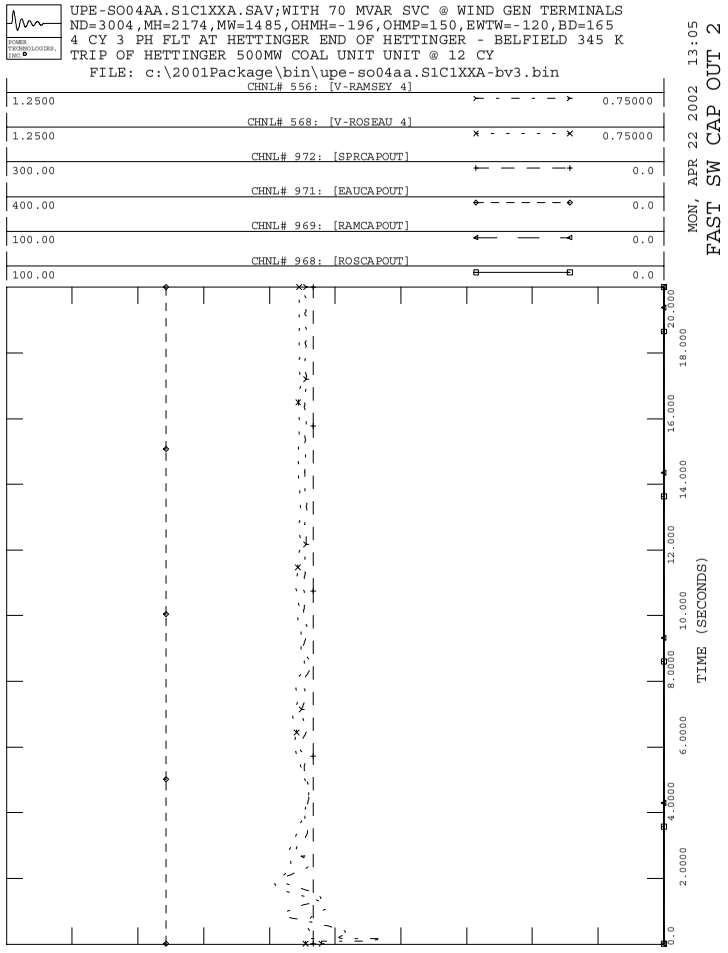
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05
VOLTAGES NB

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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
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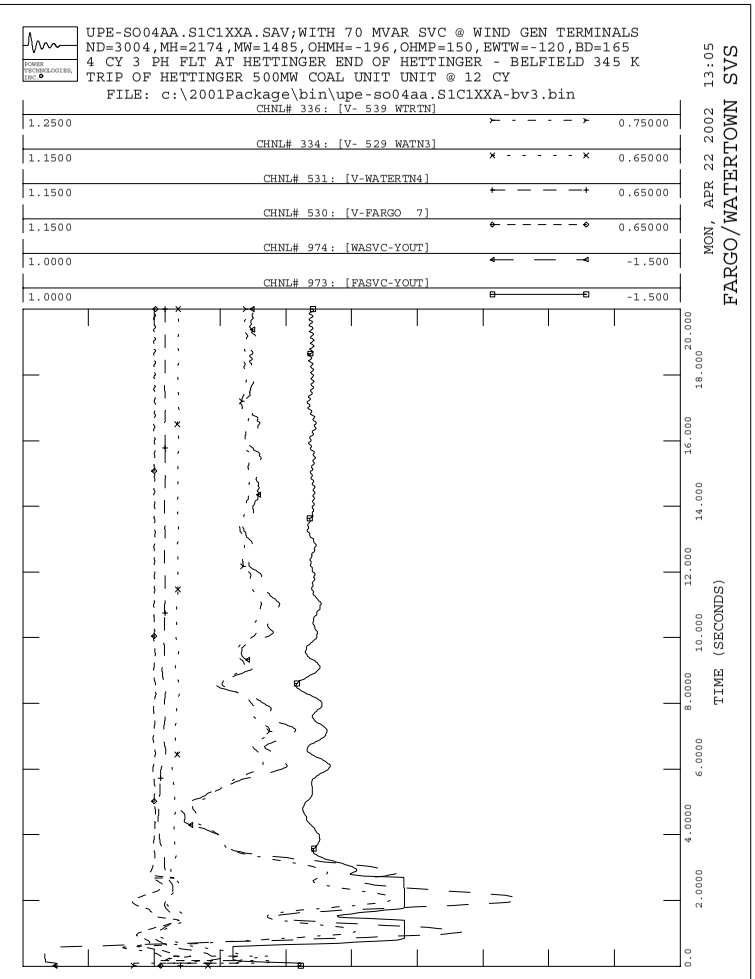
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
MON, APR 22 2002 13:05
FAST SW CAP OUT 2
TIME (SECONDS)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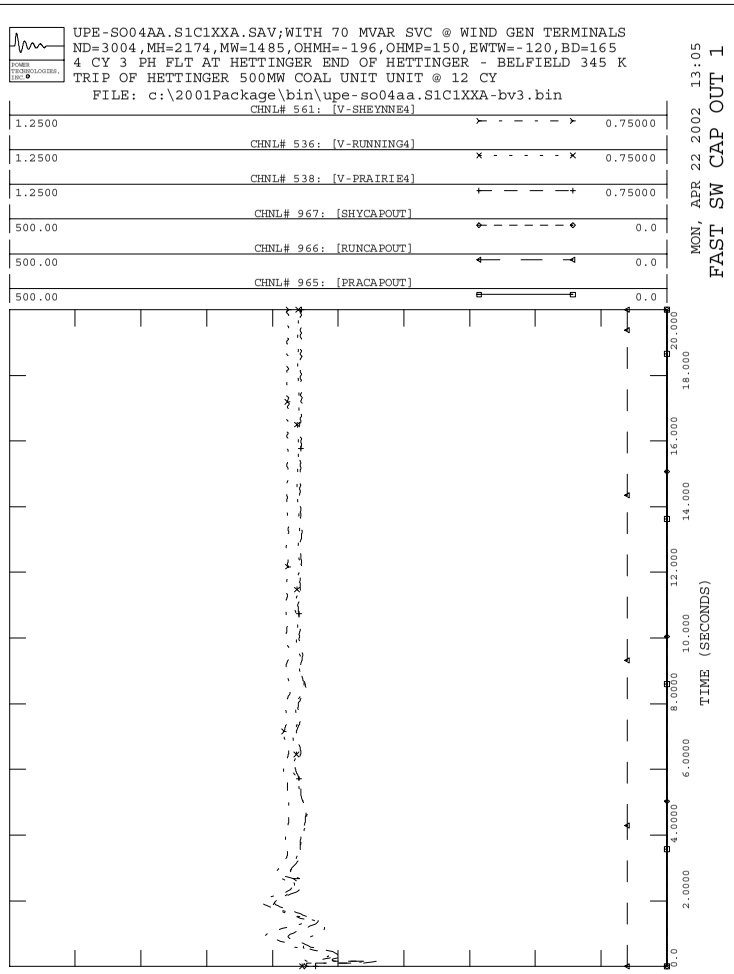
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
MON, APR 22 2002 13:05
FARGO/WATERTOWN SVS
TIME (SECONDS)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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
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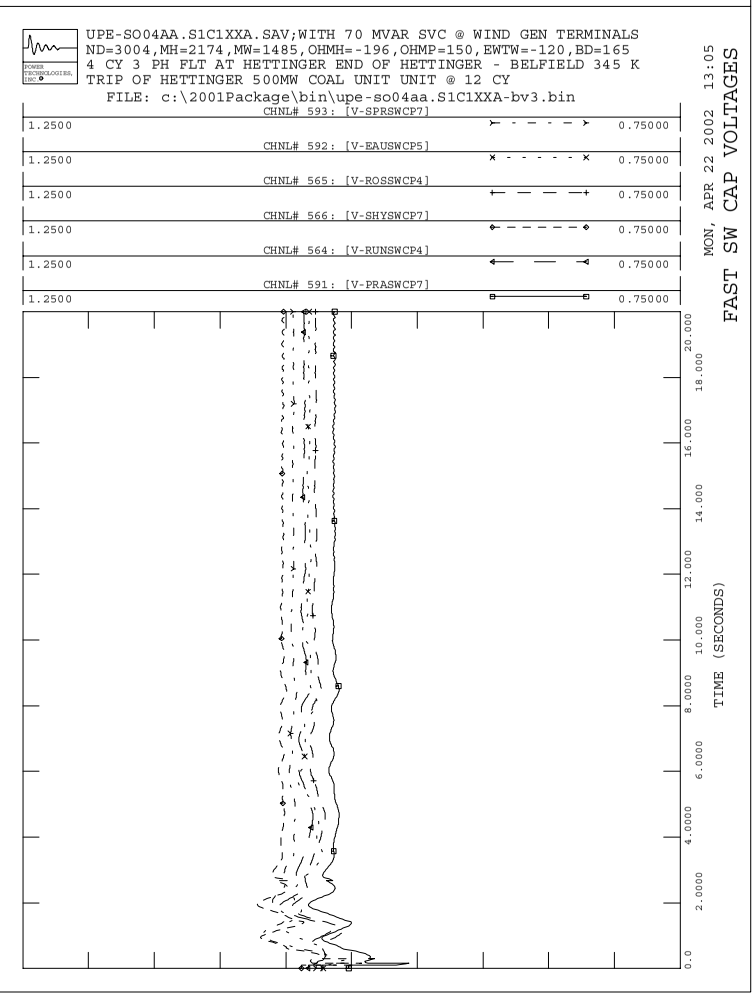
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
MON, APR 22 2002 13:05
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
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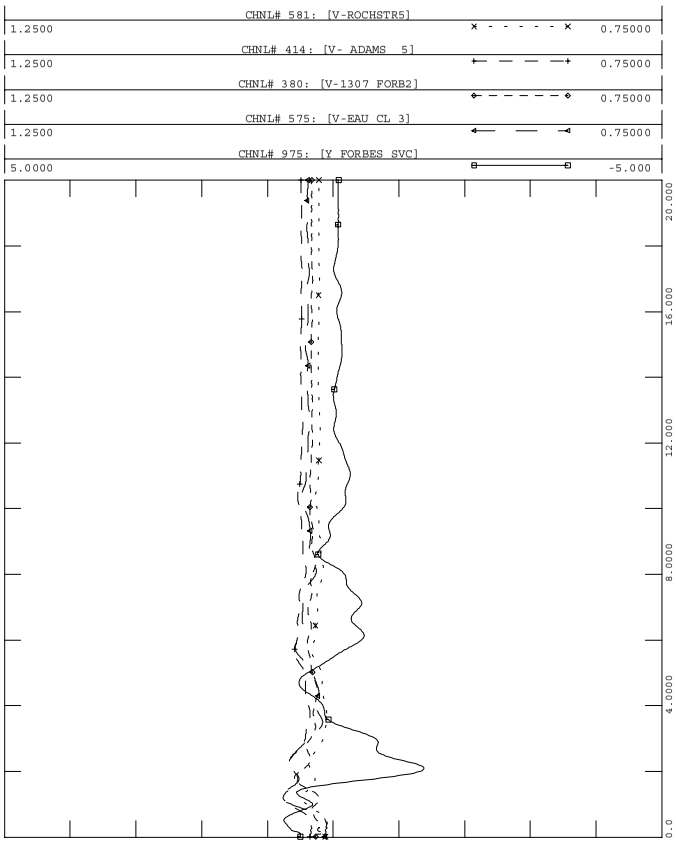
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
MON, APR 22 2002 13:05
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05

SVC & WISCONSIN VOLT



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4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
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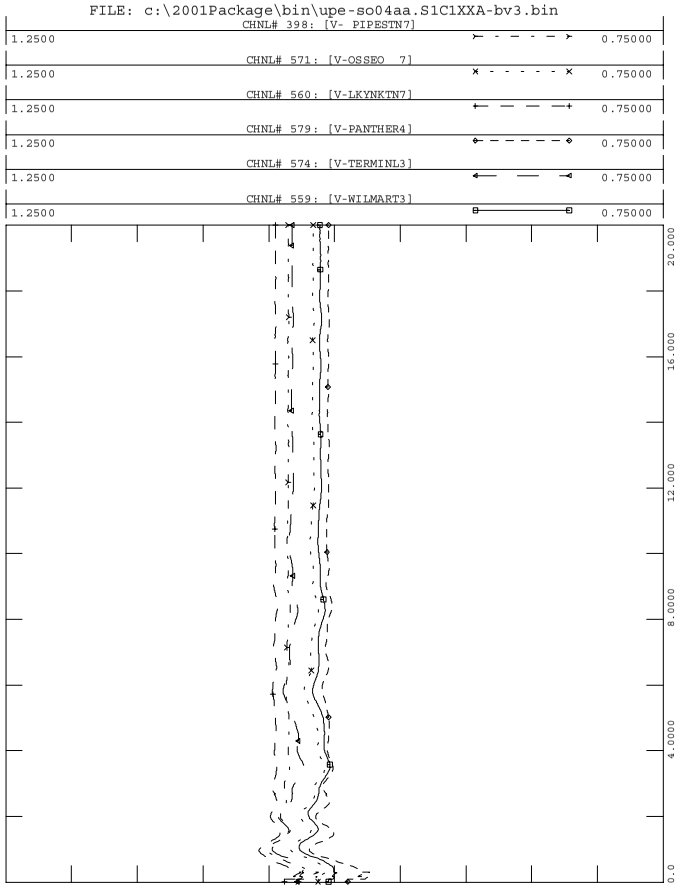
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05

TC VOLTAGES



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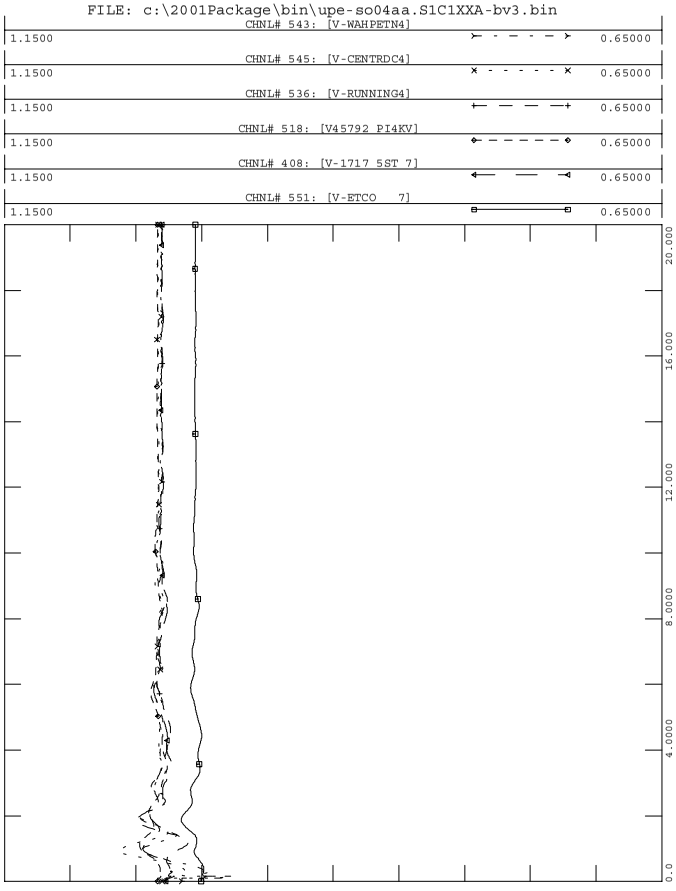
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05

VOLTAGES 6



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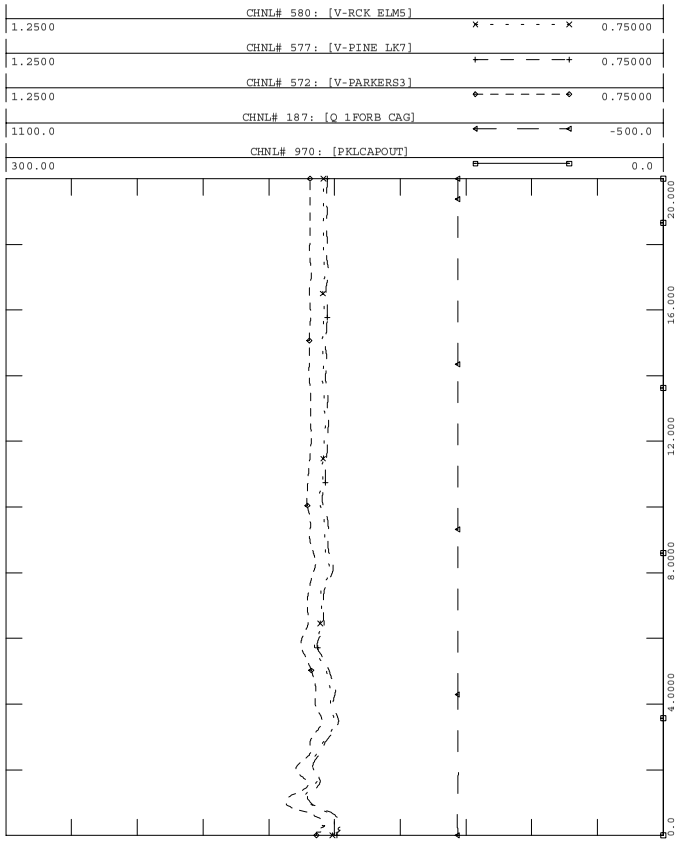
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05

FORBES SVS OUT & VOLTAGES



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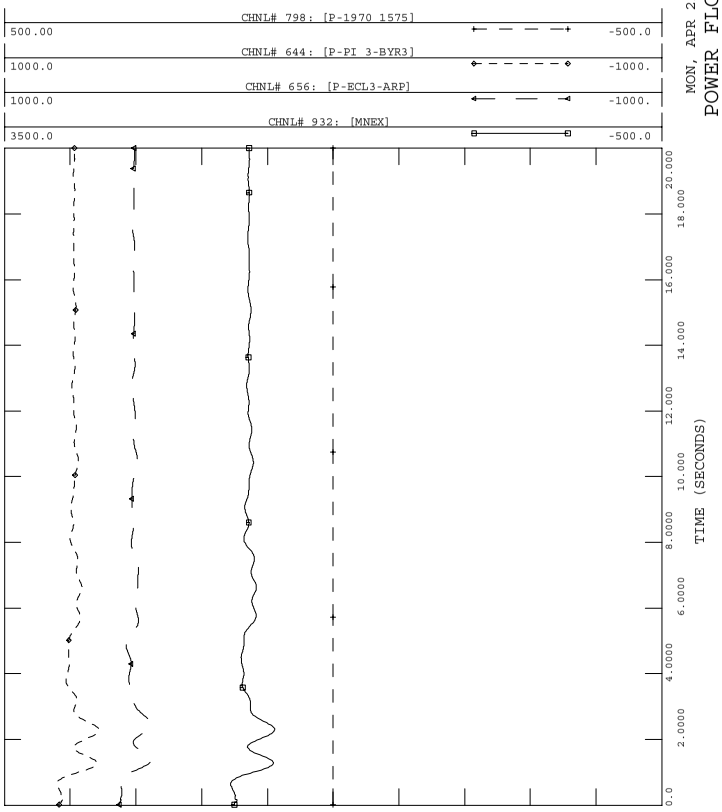
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05
POWER FLOW SUMS 2



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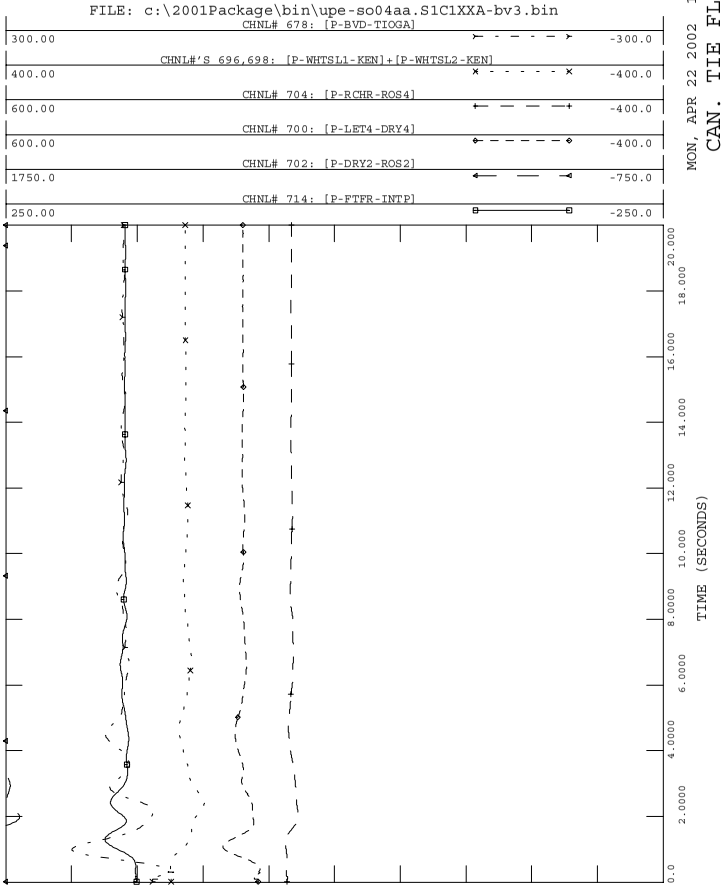
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05
CAN. TIE FLOWS



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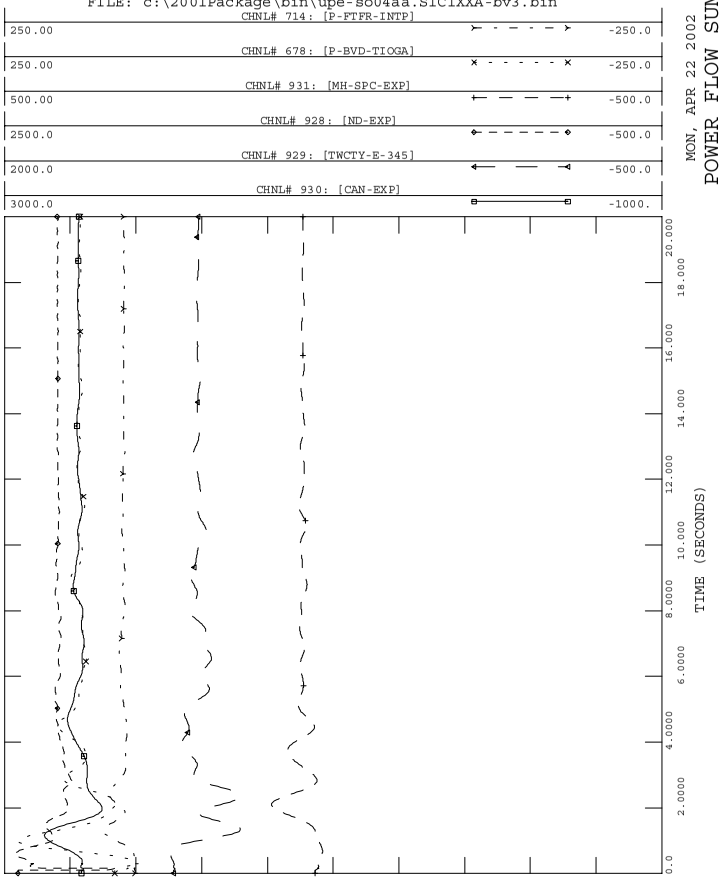
MON, APR 22 2002 13:05
POWER FLOW SUMS 1



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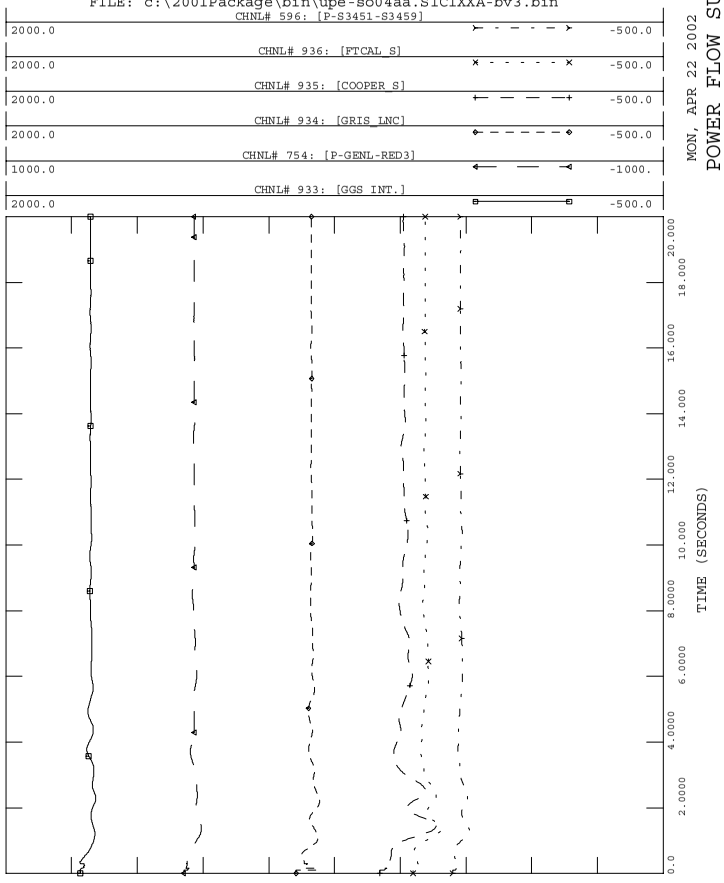
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05
POWER FLOW SUM 3



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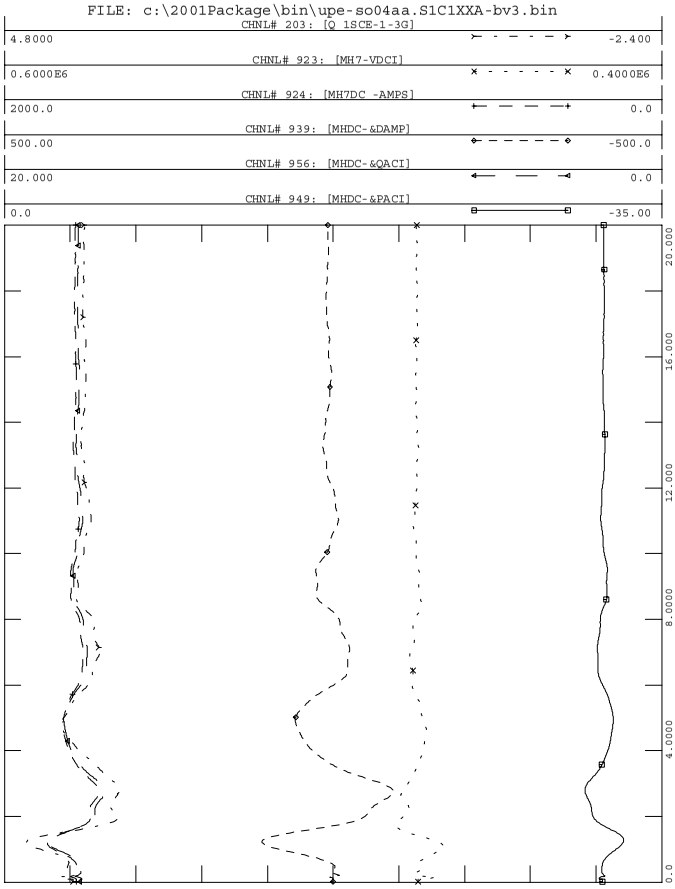
MON, APR 22 2002 13:05
MH DC PARAMETERS



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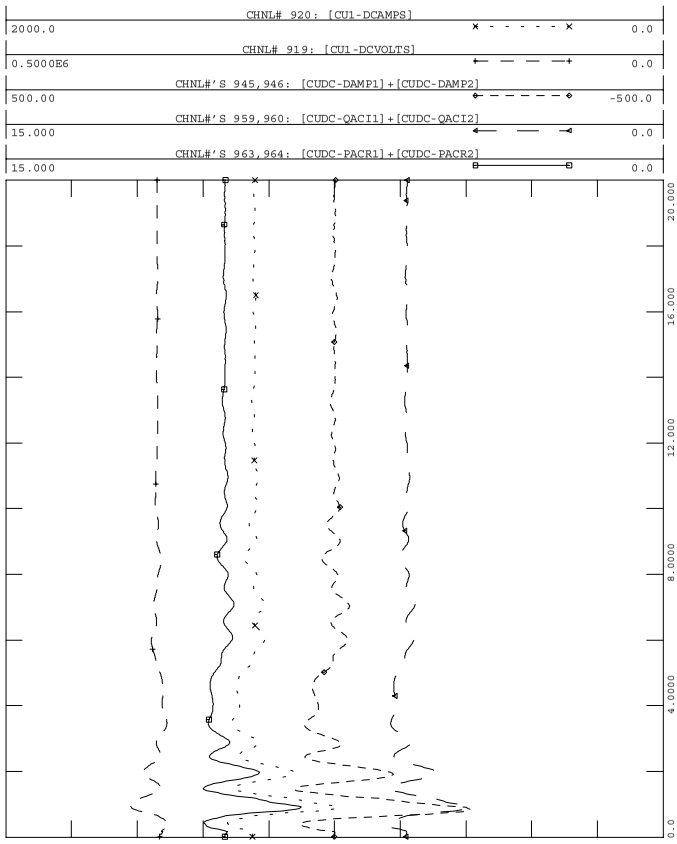
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05
CU DC #1



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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
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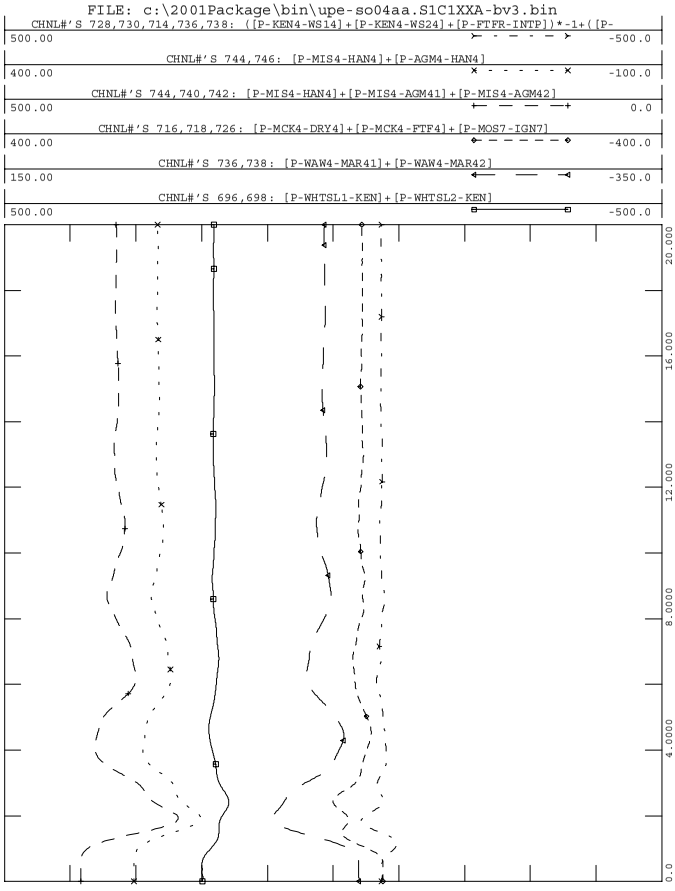
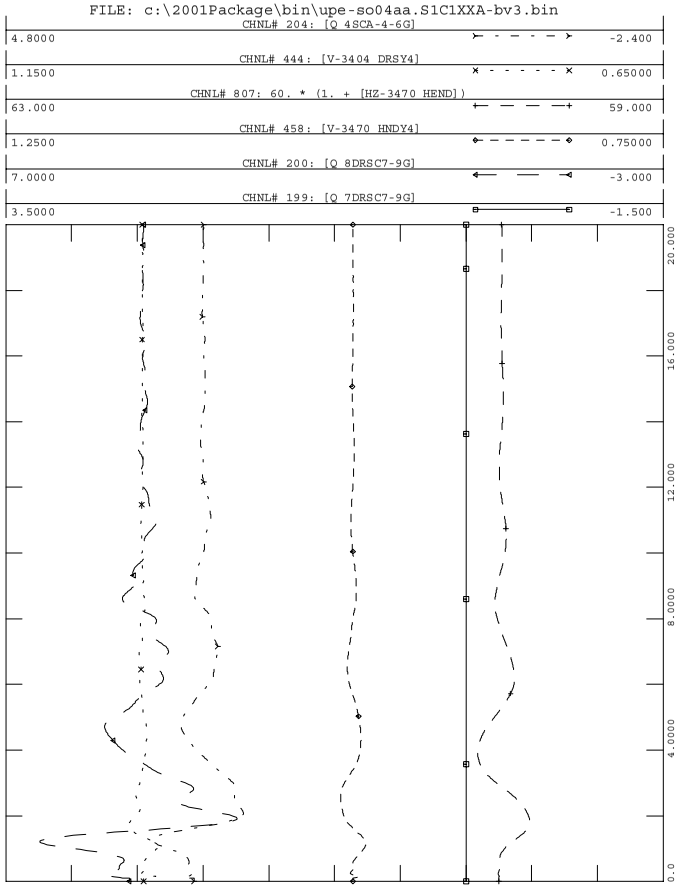
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05
OH TIE FLOWS



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05
MH DC PARAMETERS



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

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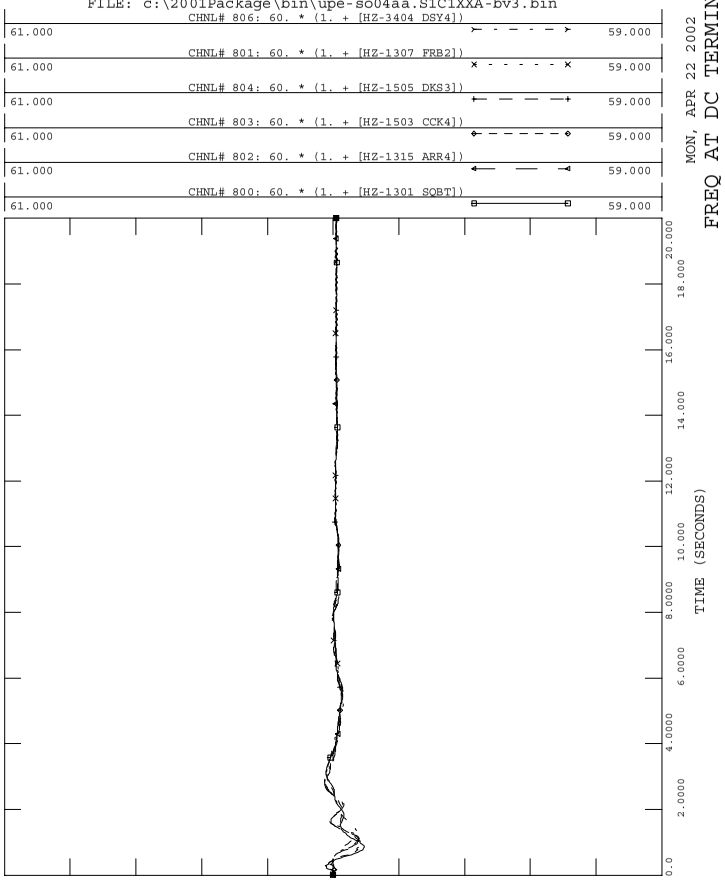
FREQ AT DC TERMINALS



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

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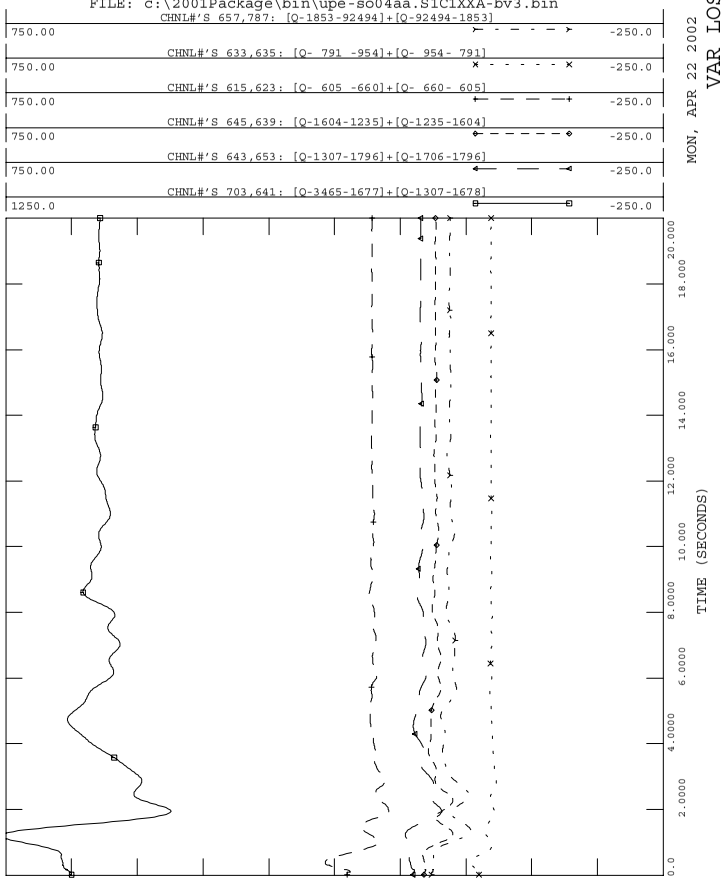
VAR LOSSES



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

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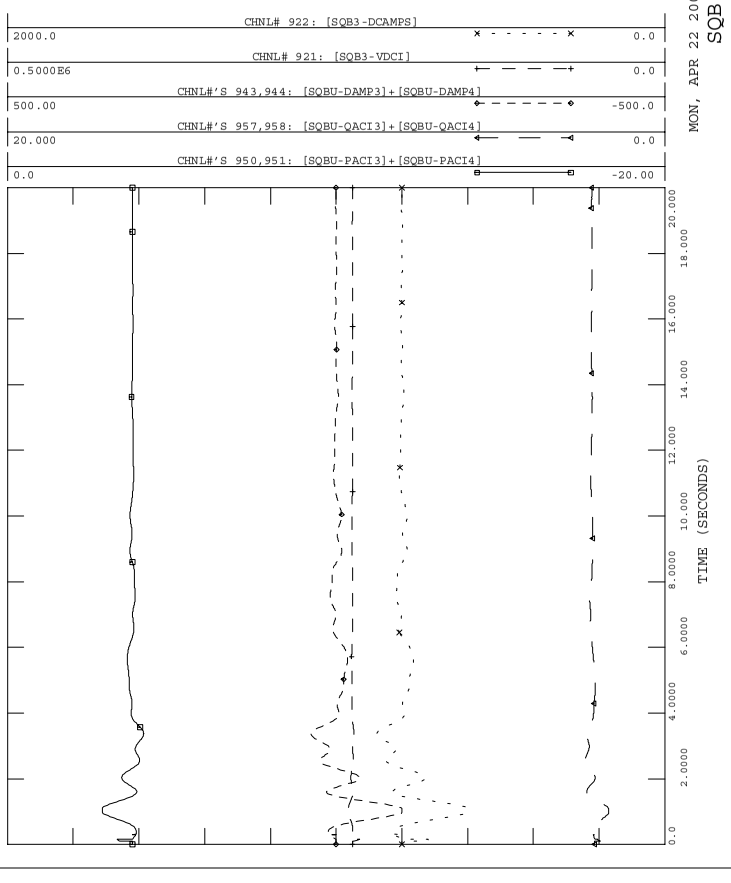
SQB DC #3



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

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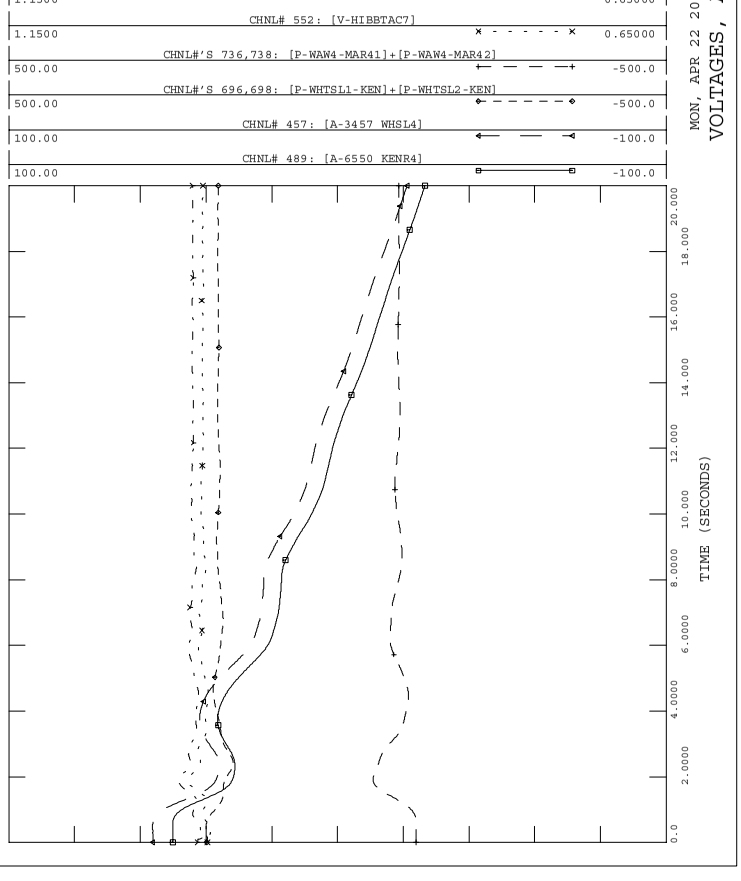
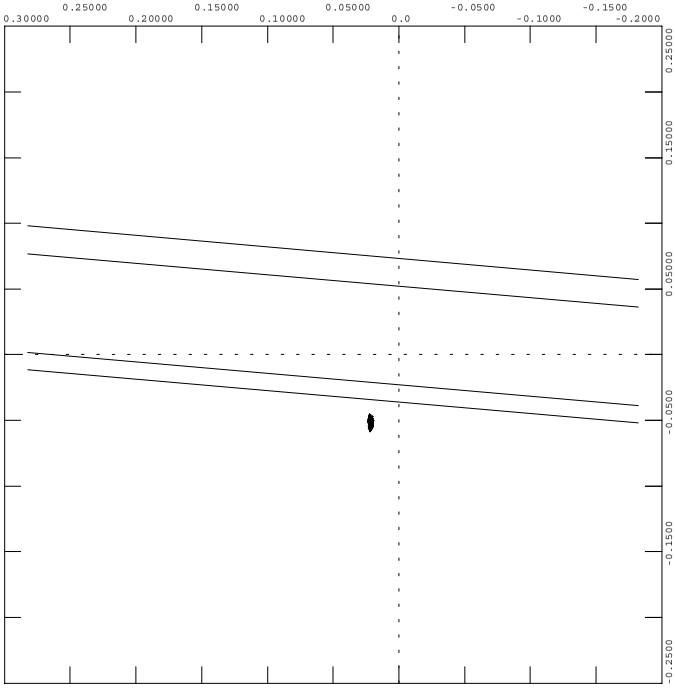
VOLTAGES, ANGLES



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

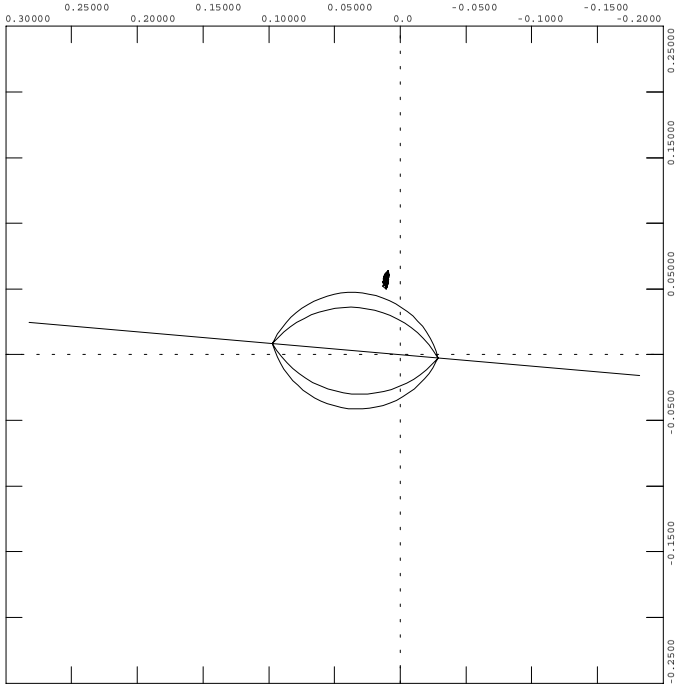


MON, APR 22 2002 13:05
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

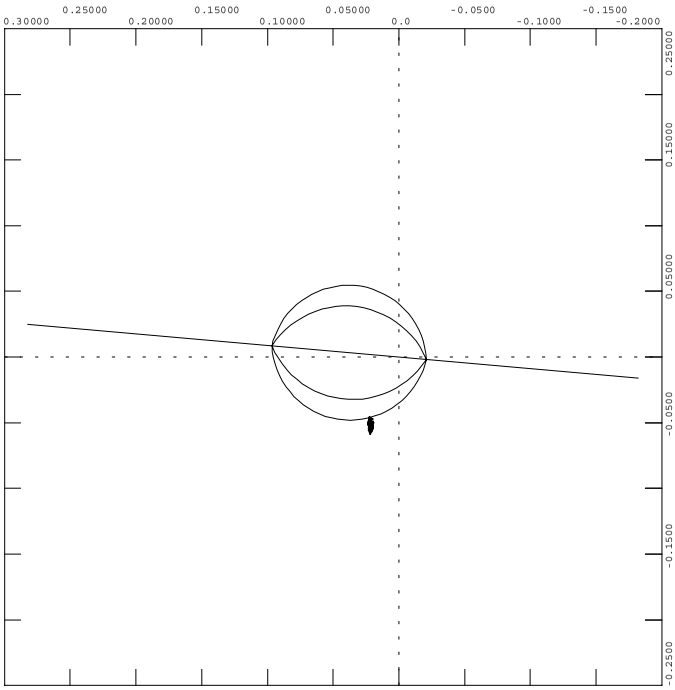


MON, APR 22 2002 13:05
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

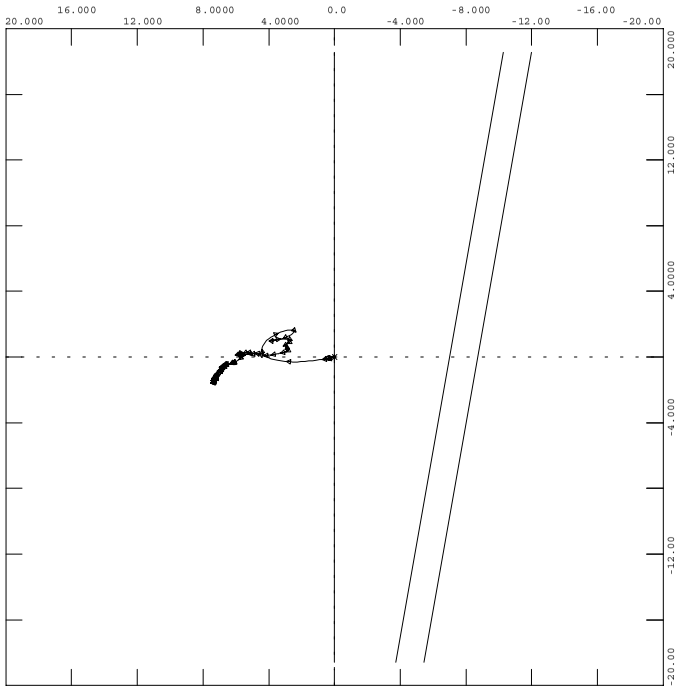


MON, APR 22 2002 13:05
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

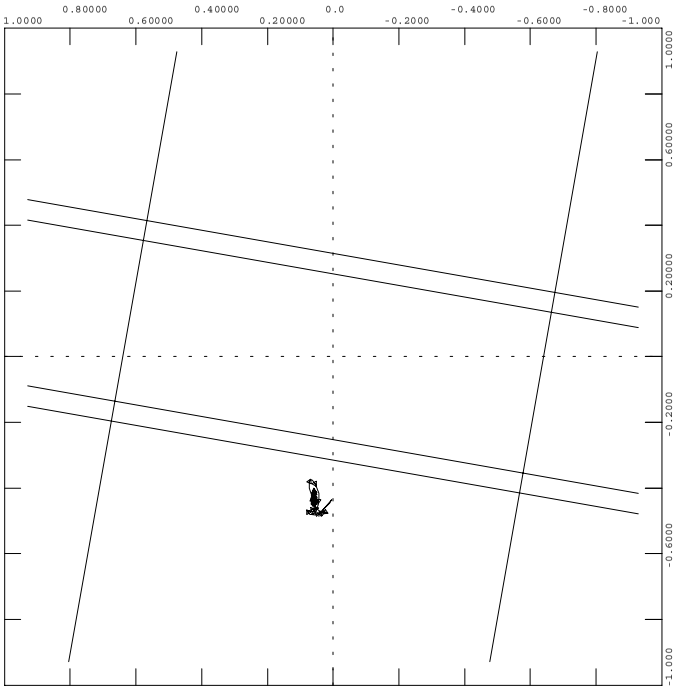


MON, APR 22 2002 13:05
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

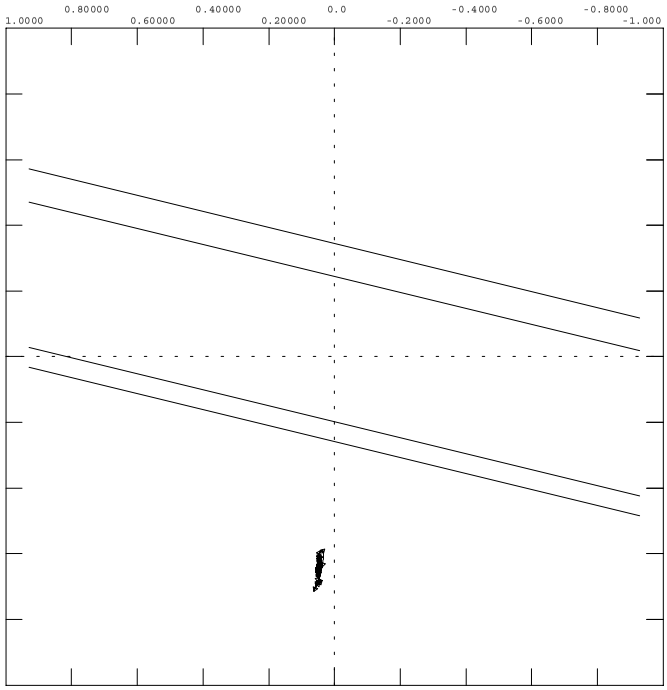
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

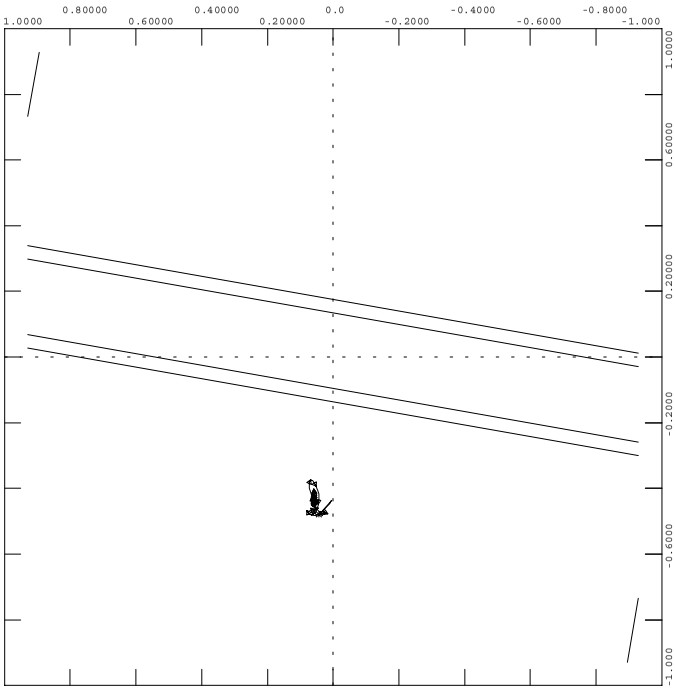
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

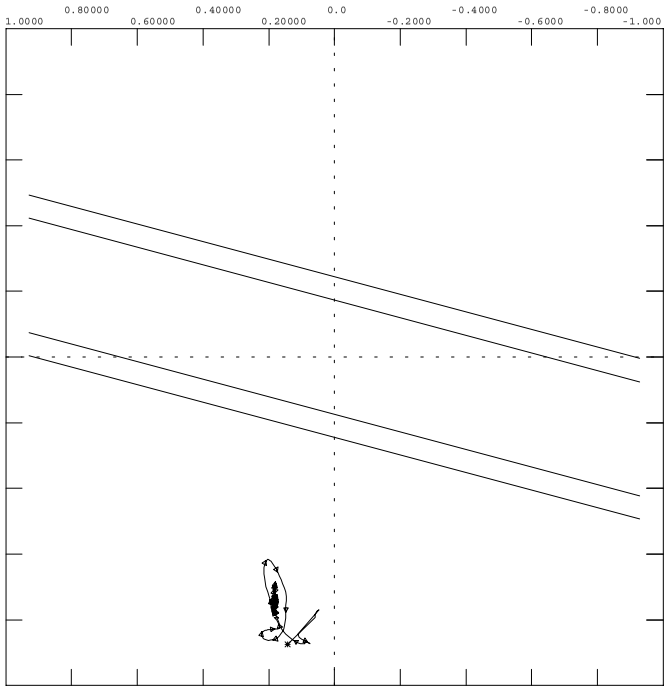
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

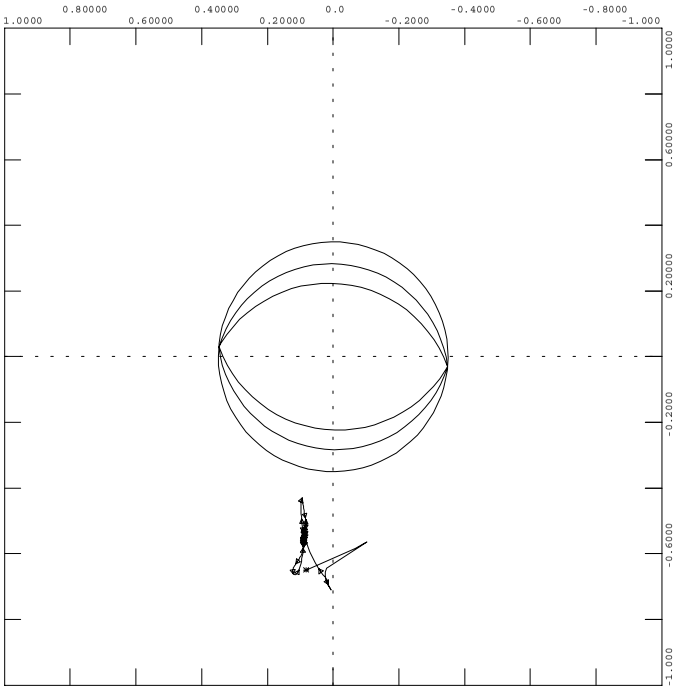
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

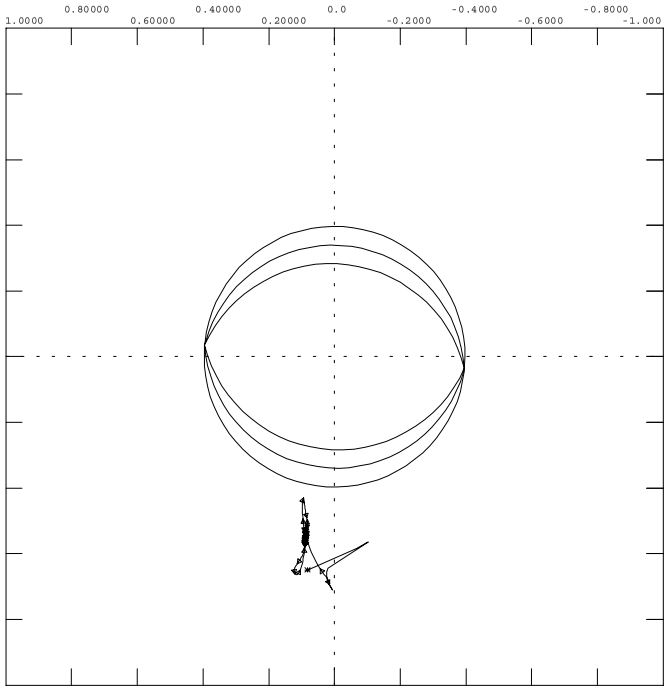
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

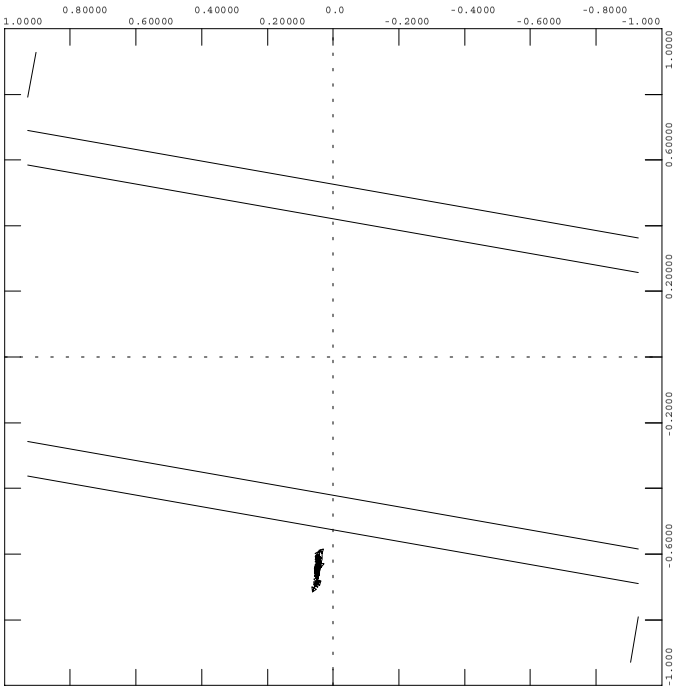
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

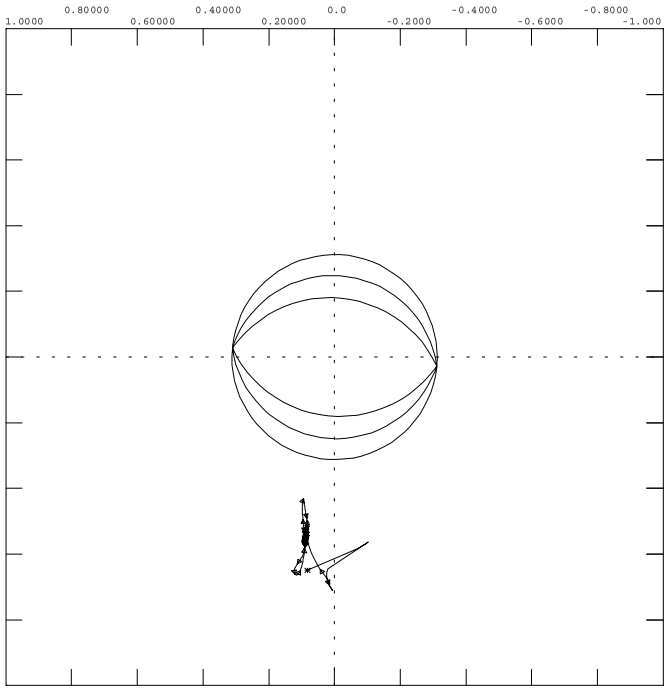
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



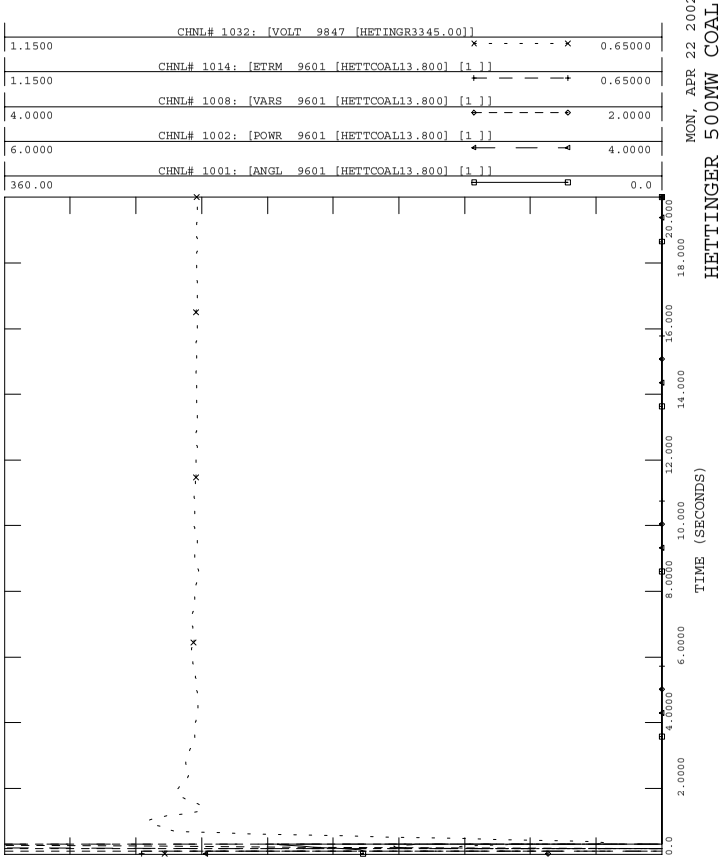
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

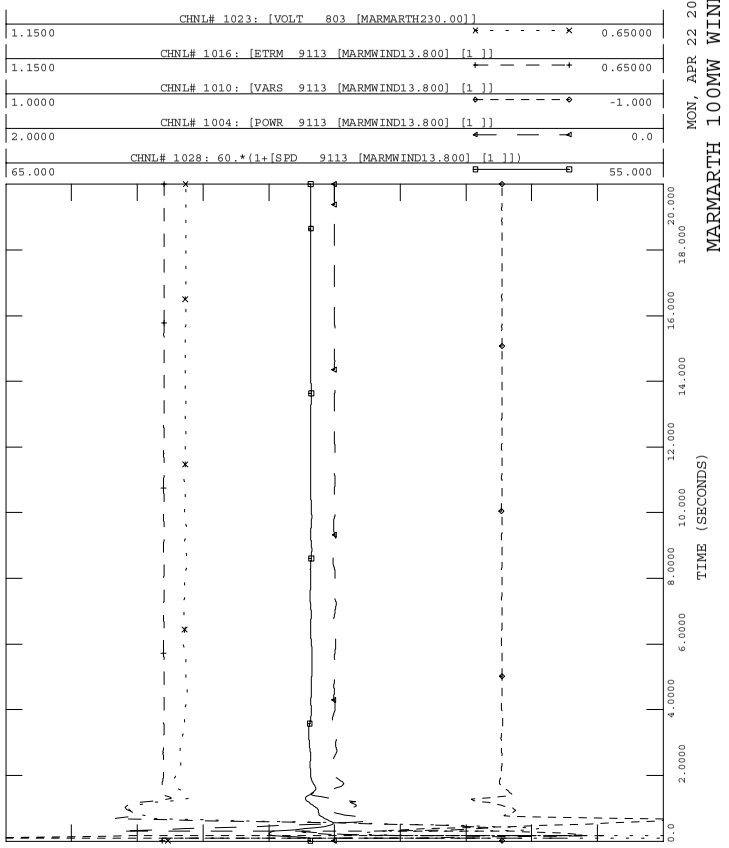


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin



MON, APR 22 2002 13:05
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

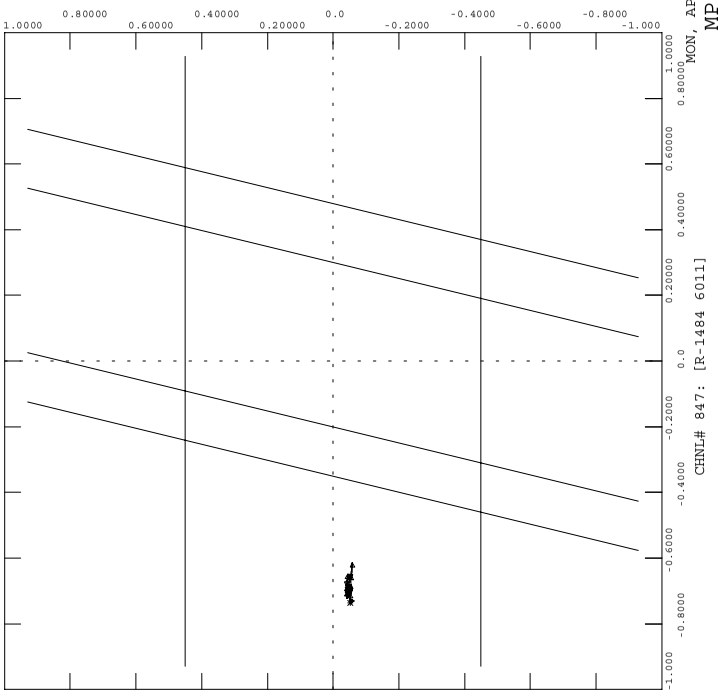


MON, APR 22 2002 13:05
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY

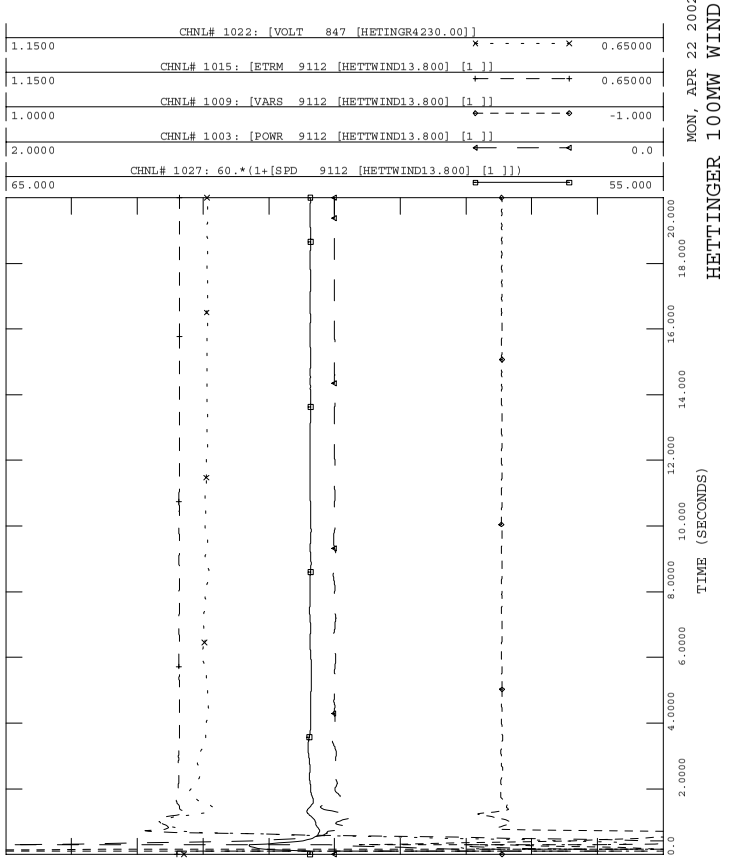
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, APR 22 2002 13:05
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin



MON, APR 22 2002 13:05
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

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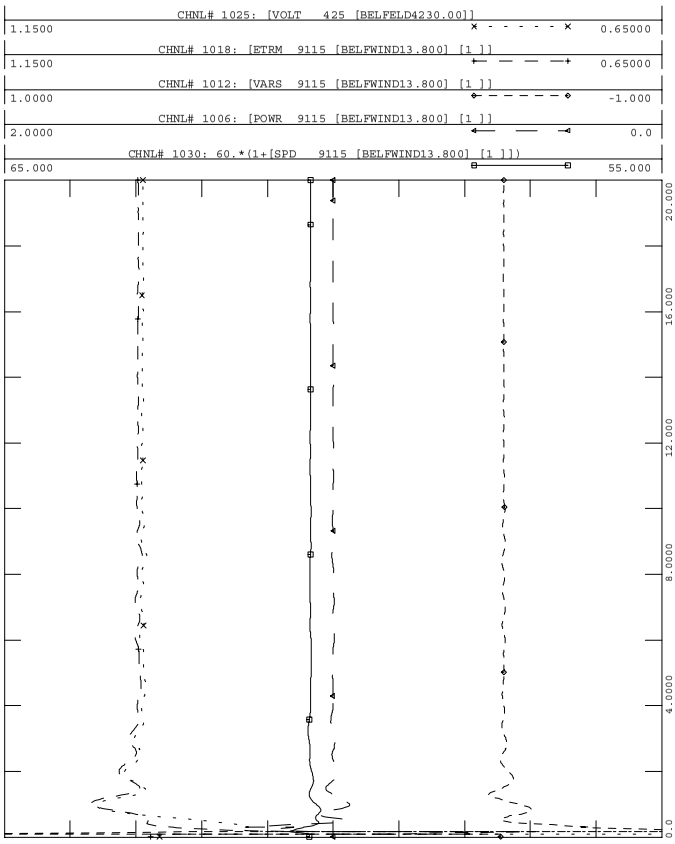
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

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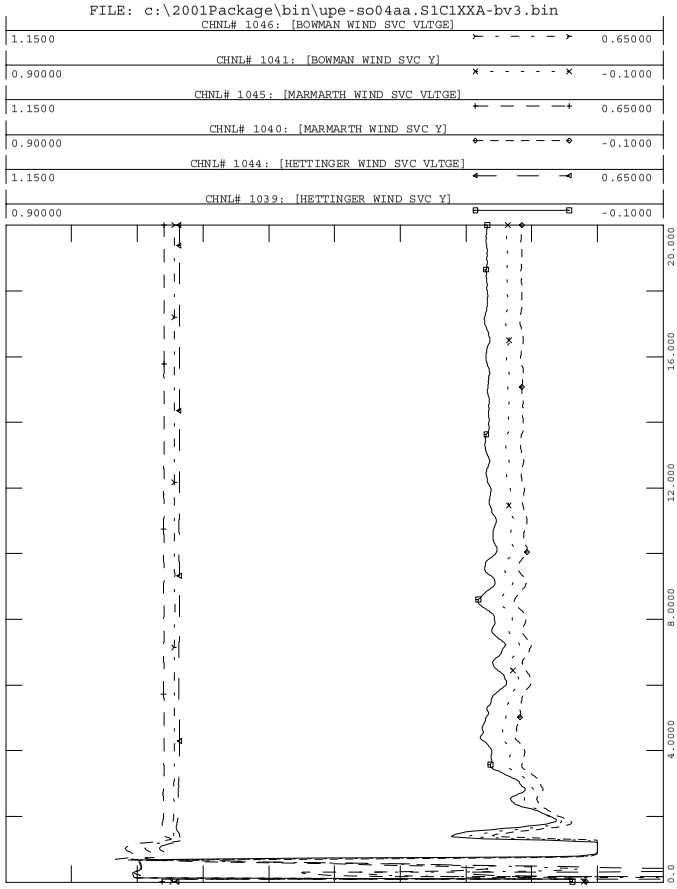
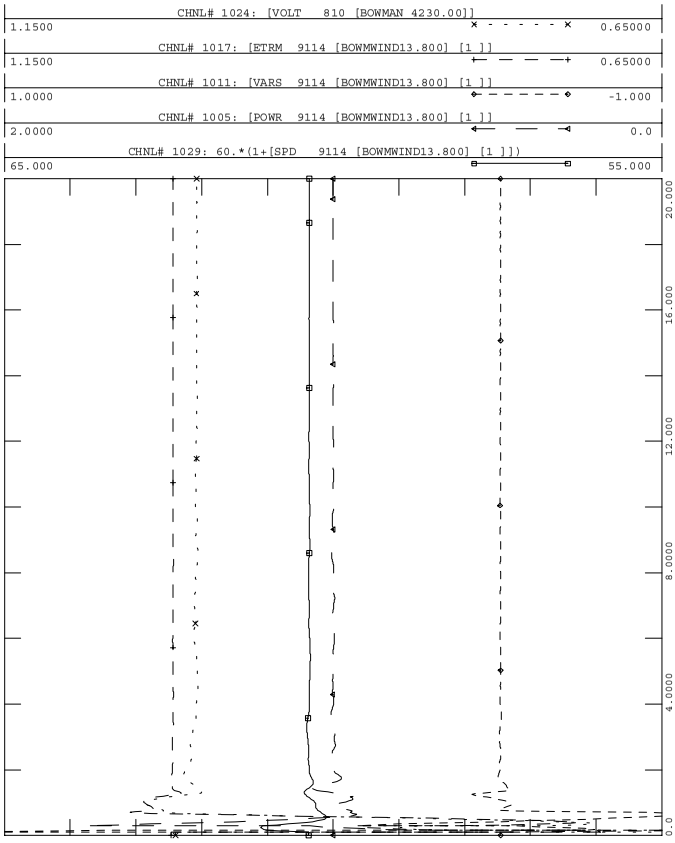
SVCS @ HTNG,MRMR&BWMN



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05

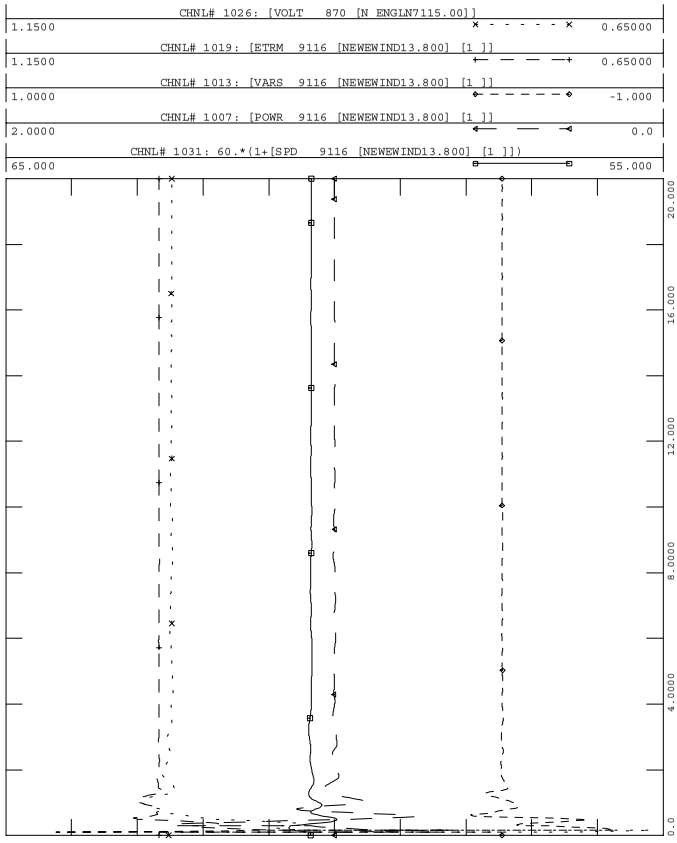
BOWMAN 100MW WIND UNIT



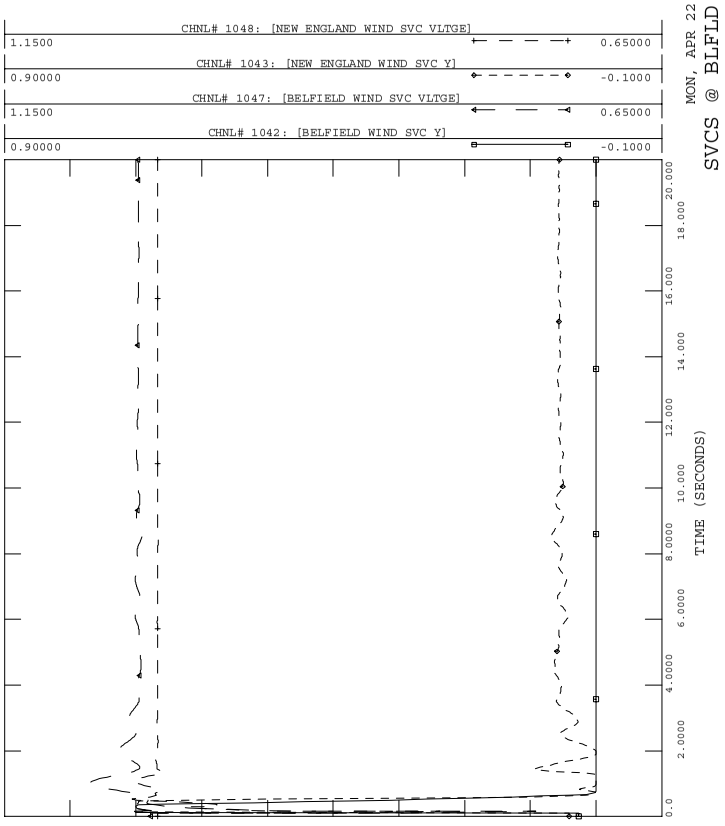
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin

MON, APR 22 2002 13:05

NEW E. 100MW WIND UNIT



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF HETTINGER - BELFIELD 345 K
TRIP OF HETTINGER 500MW COAL UNIT UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bv3.bin



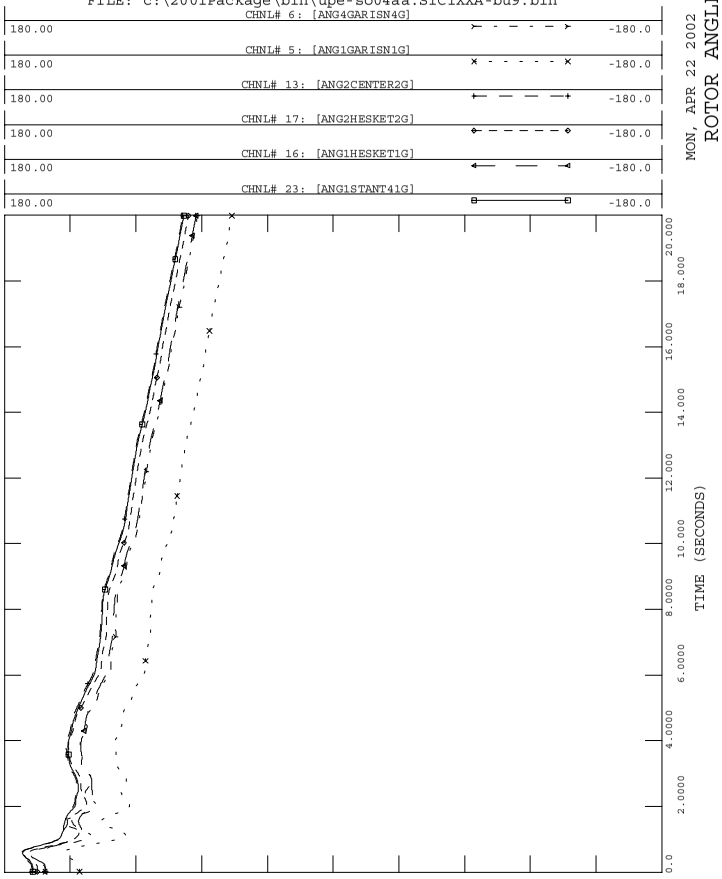
MON, APR 22 2002 13:05

SVCS @ BLFLD & NWENG

CONTINGENCY BU9

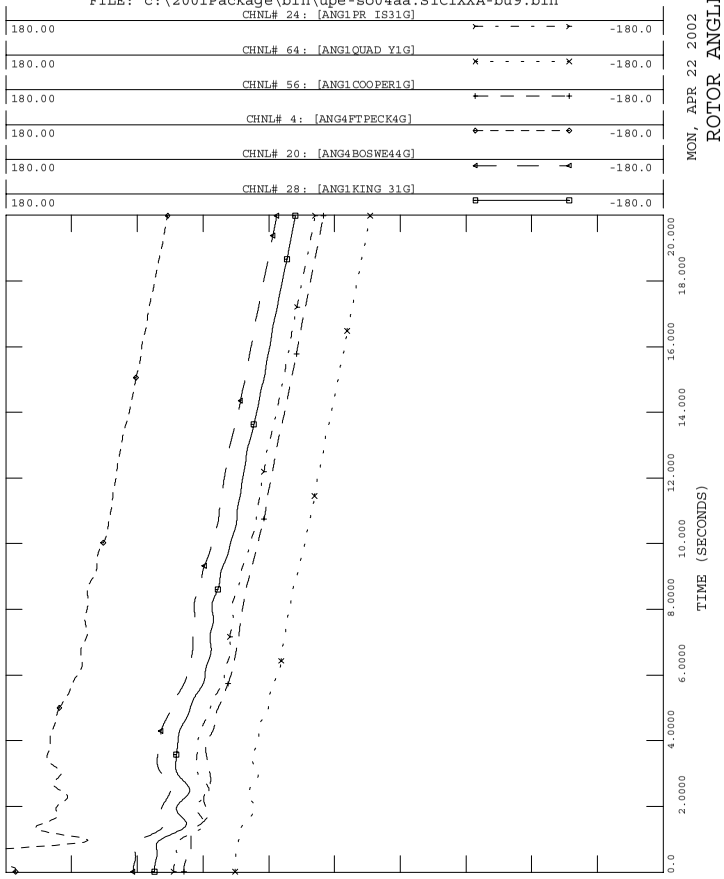
4 cycle 3 phase fault at Hettinger end of Hettinger - Ft.Thompson 345 kV line. Trip Hettinger Coal Unit @ 12 cy

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



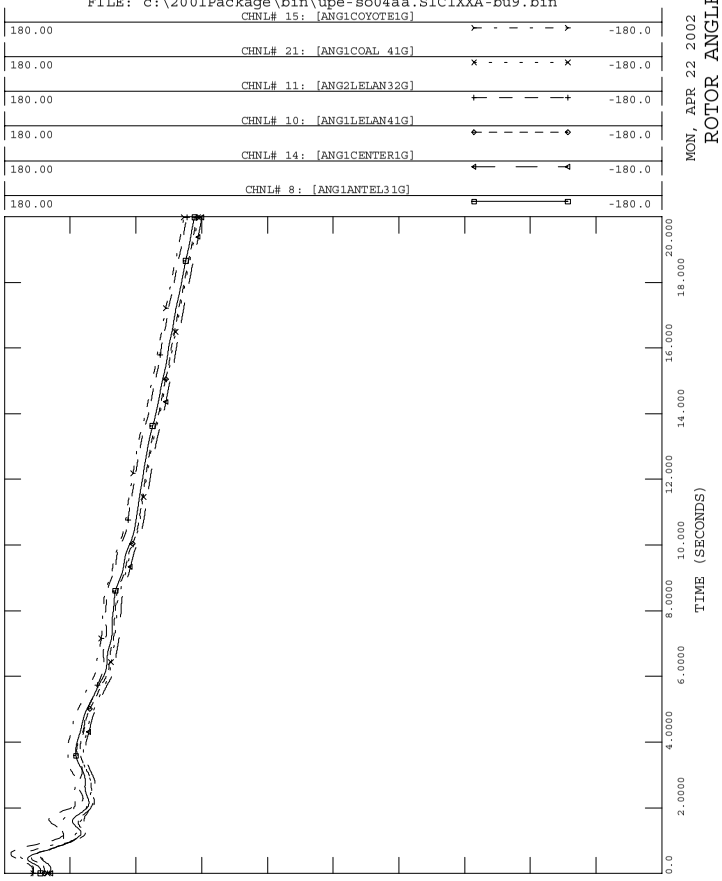
MON, APR 22 2002 13:21
ROTOR ANGLES 2

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



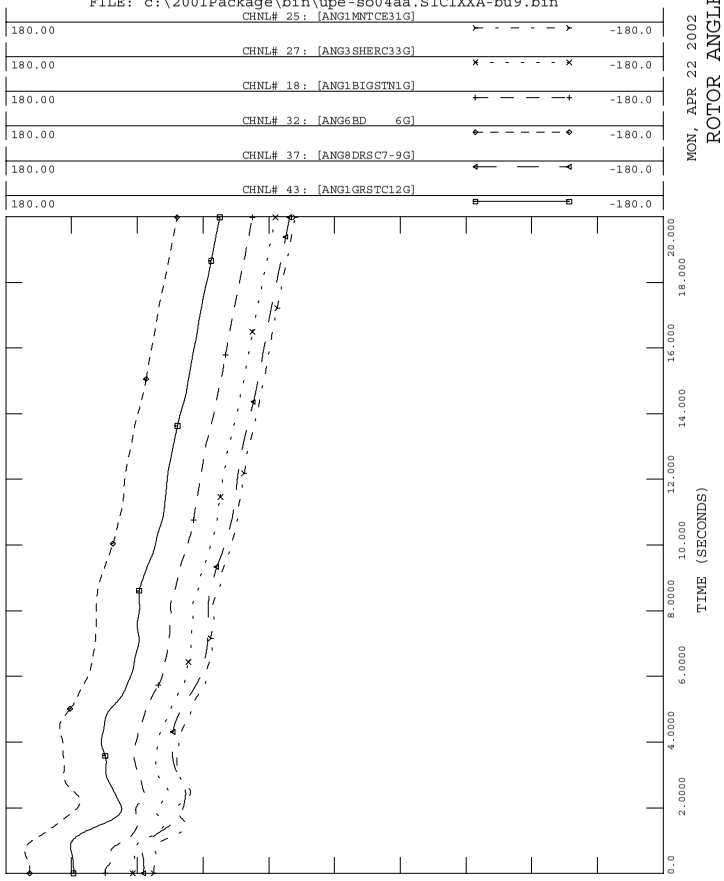
MON, APR 22 2002 13:21
ROTOR ANGLES 4

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

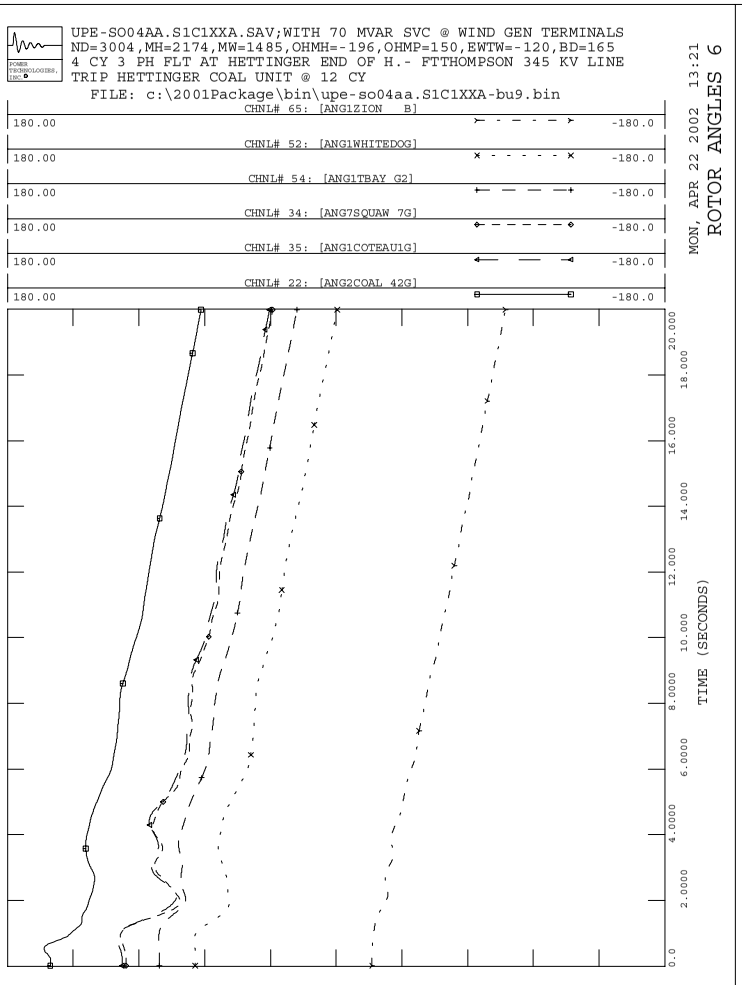


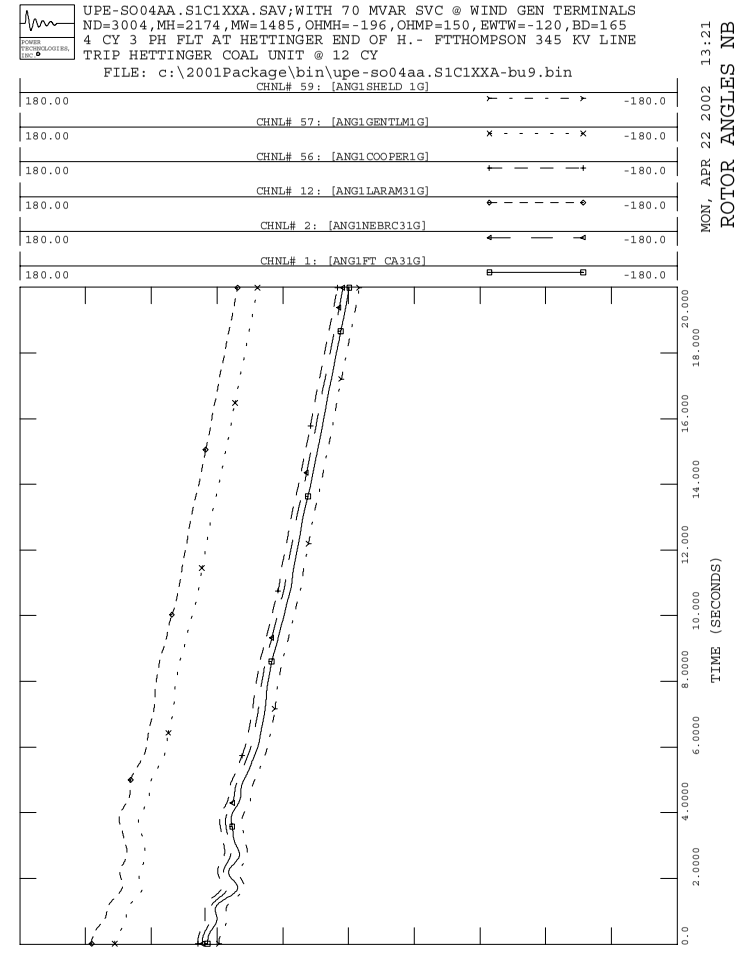
MON, APR 22 2002 13:21
ROTOR ANGLES 1

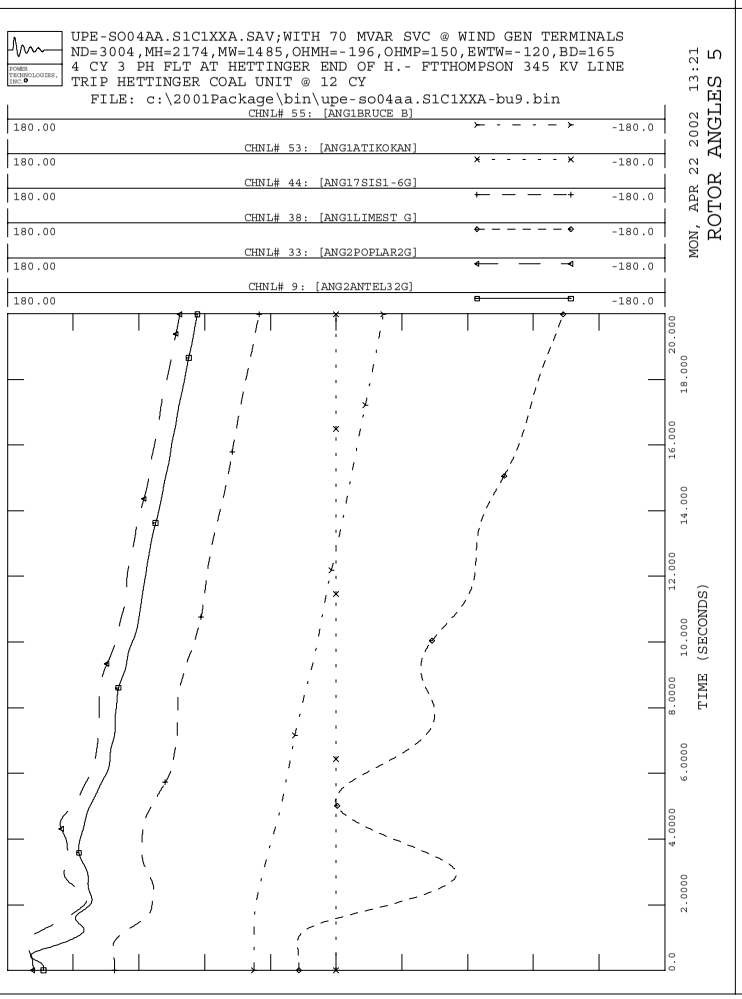
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

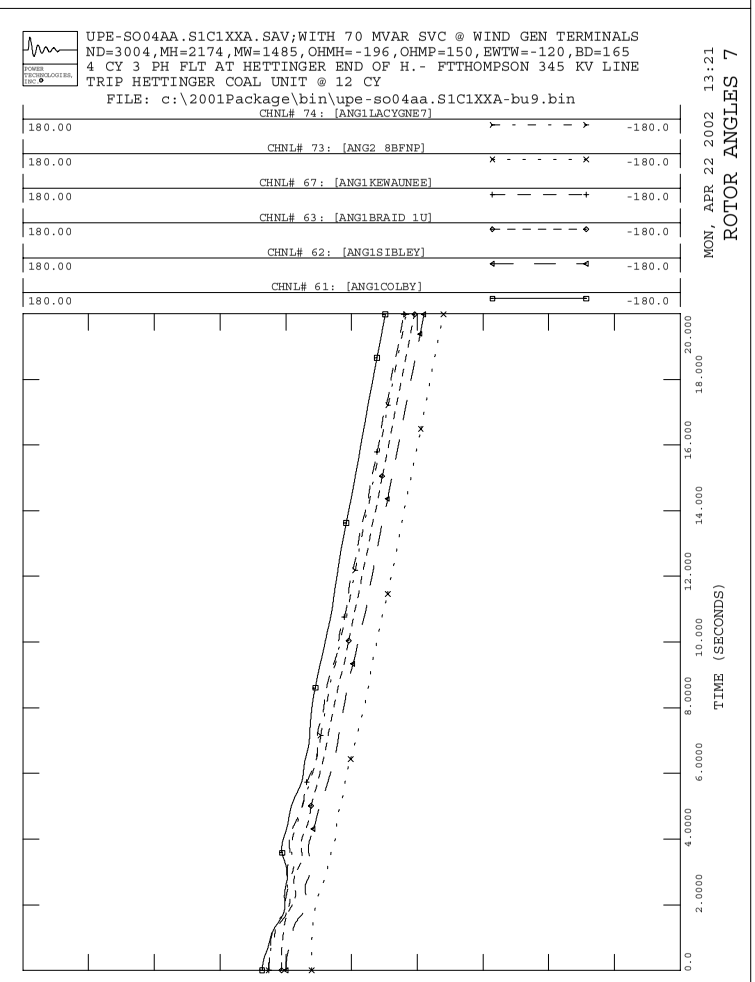


MON, APR 22 2002 13:21
ROTOR ANGLES 3


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
MON, APR 22 2002 13:21
ROTOR ANGLES 6
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

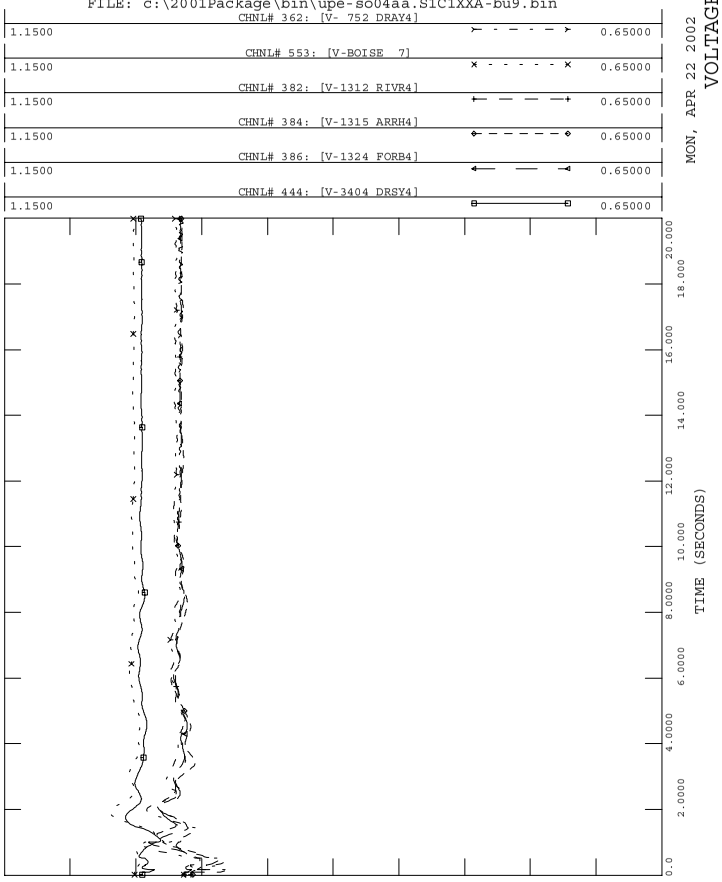

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
MON, APR 22 2002 13:21
ROTOR ANGLES NB
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
MON, APR 22 2002 13:21
ROTOR ANGLES 5
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
MON, APR 22 2002 13:21
ROTOR ANGLES 7
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

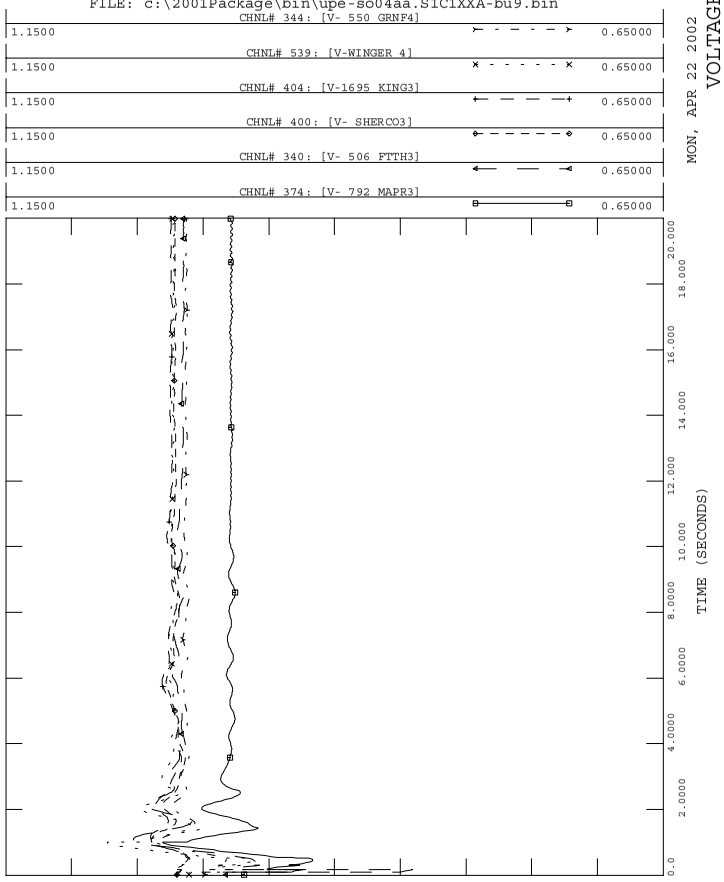
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
VOLTAGES 1



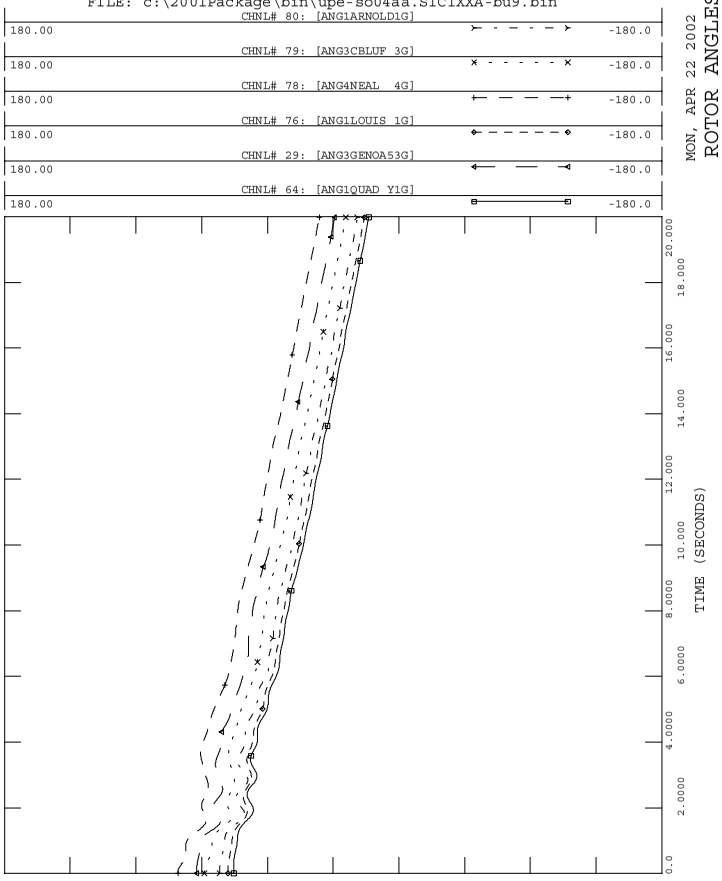
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
VOLTAGES 3



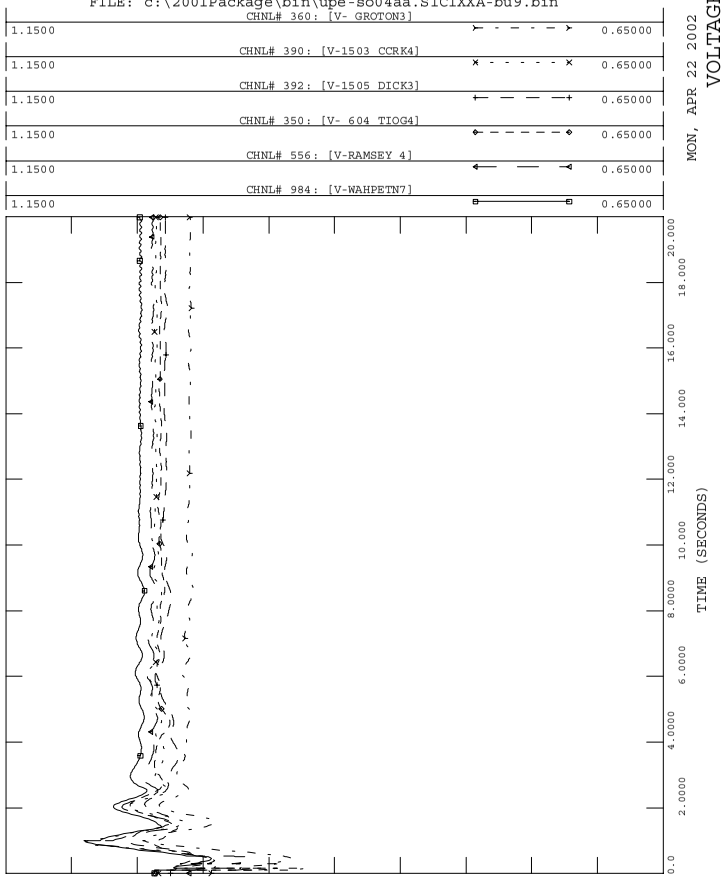
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
ROTOR ANGLES IA



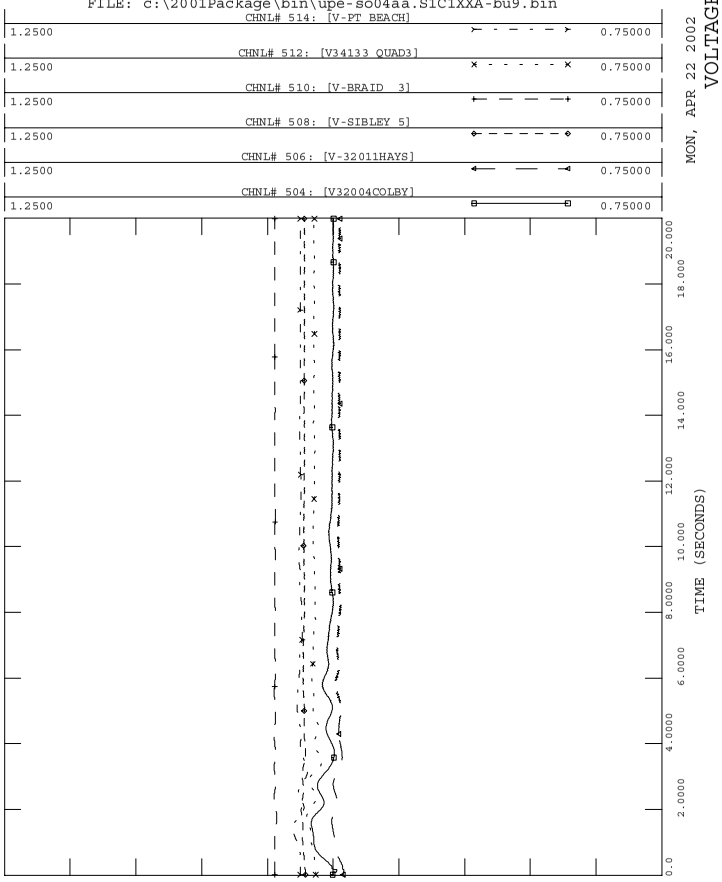
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
VOLTAGES 2



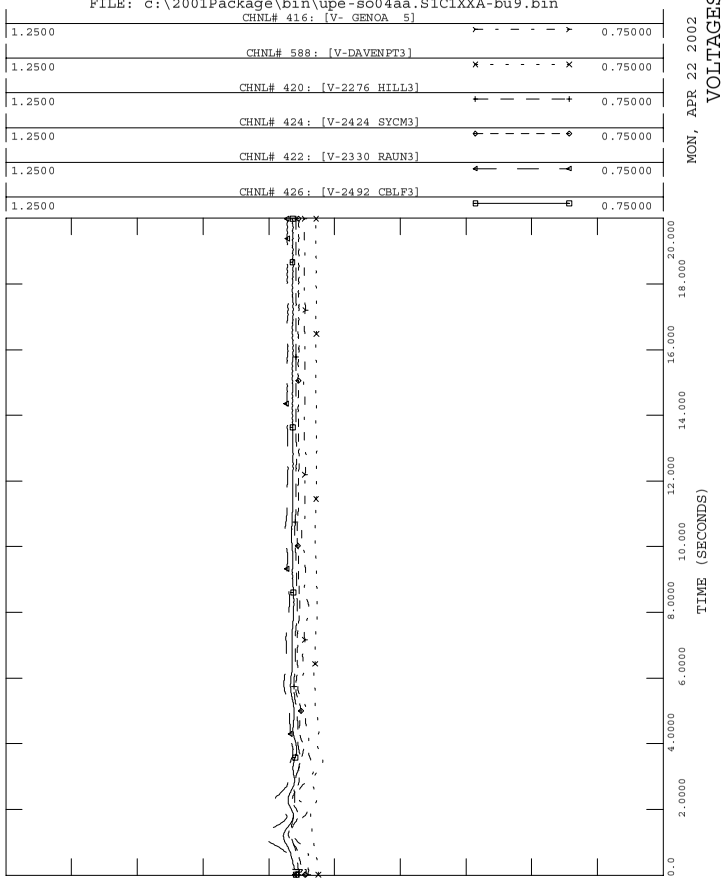
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
VOLTAGES 5



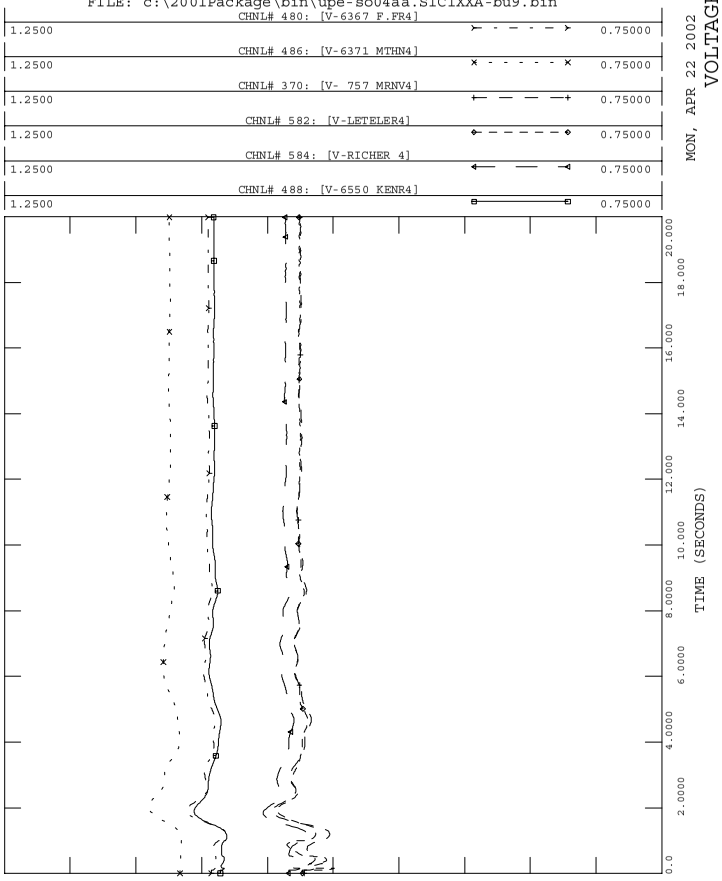
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
VOLTAGES IA



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
VOLTAGES 4



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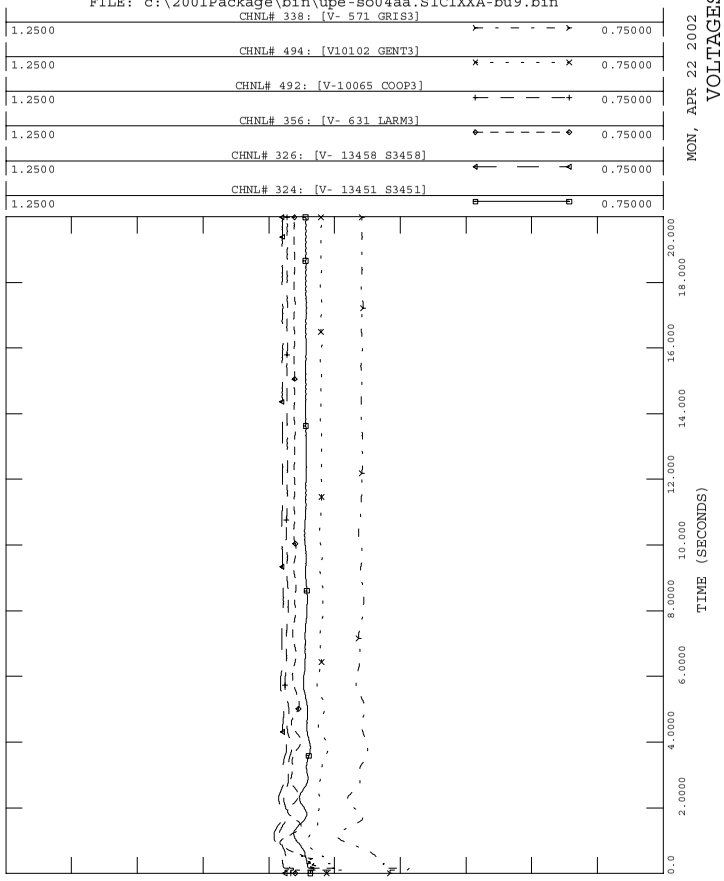
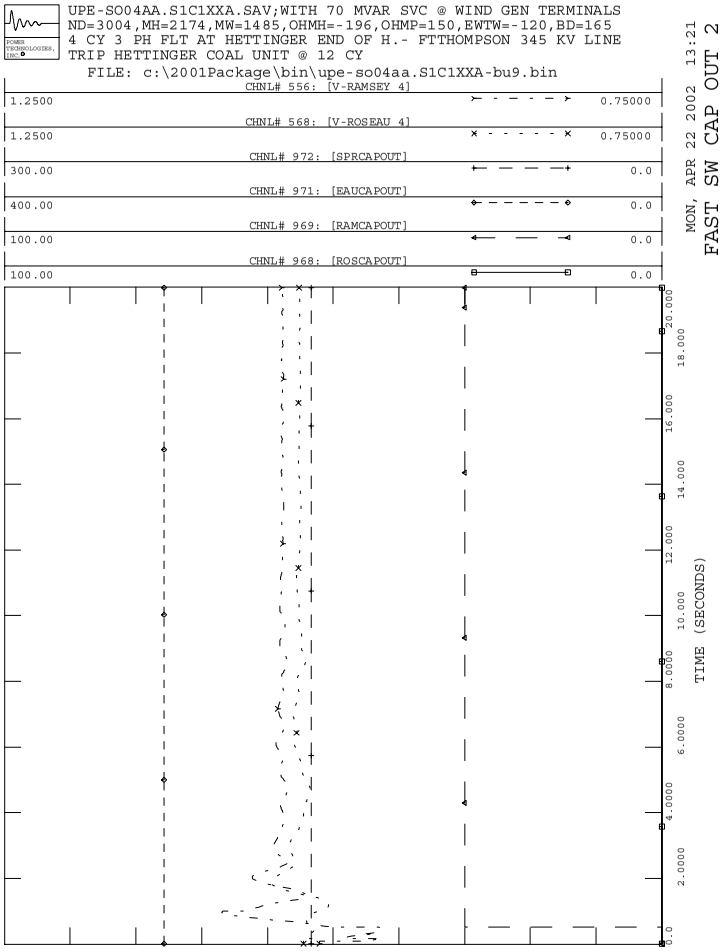
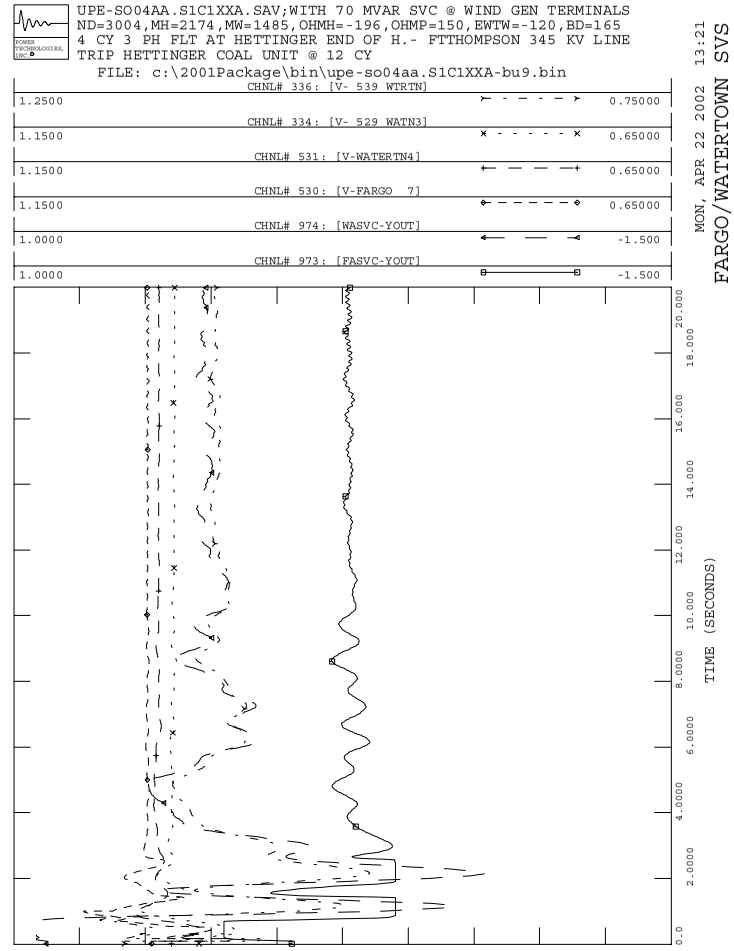
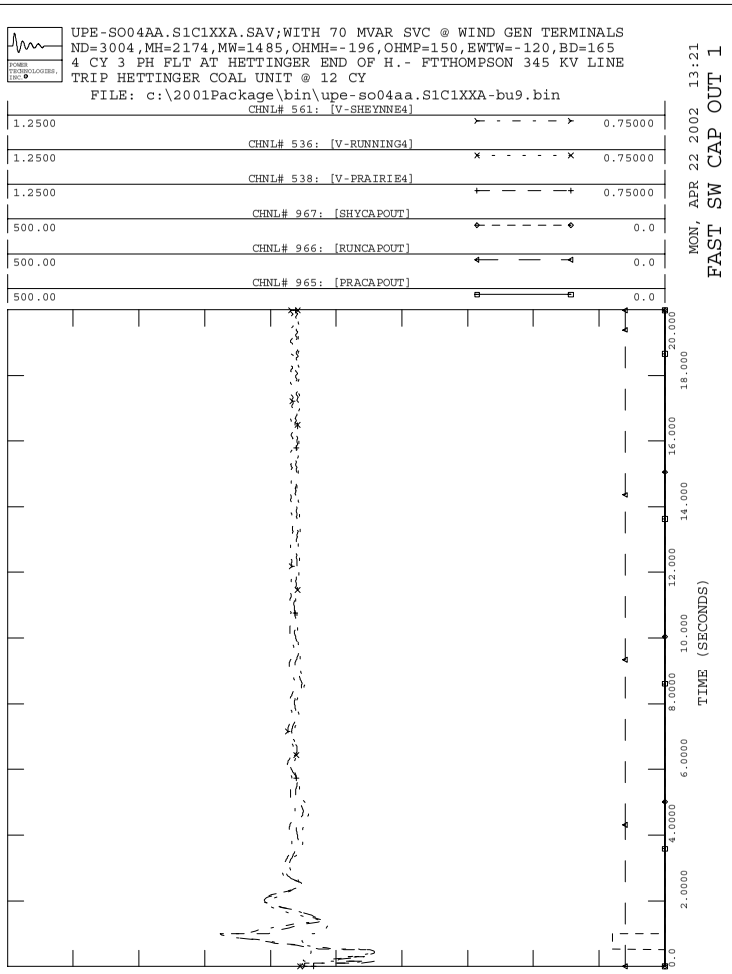
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

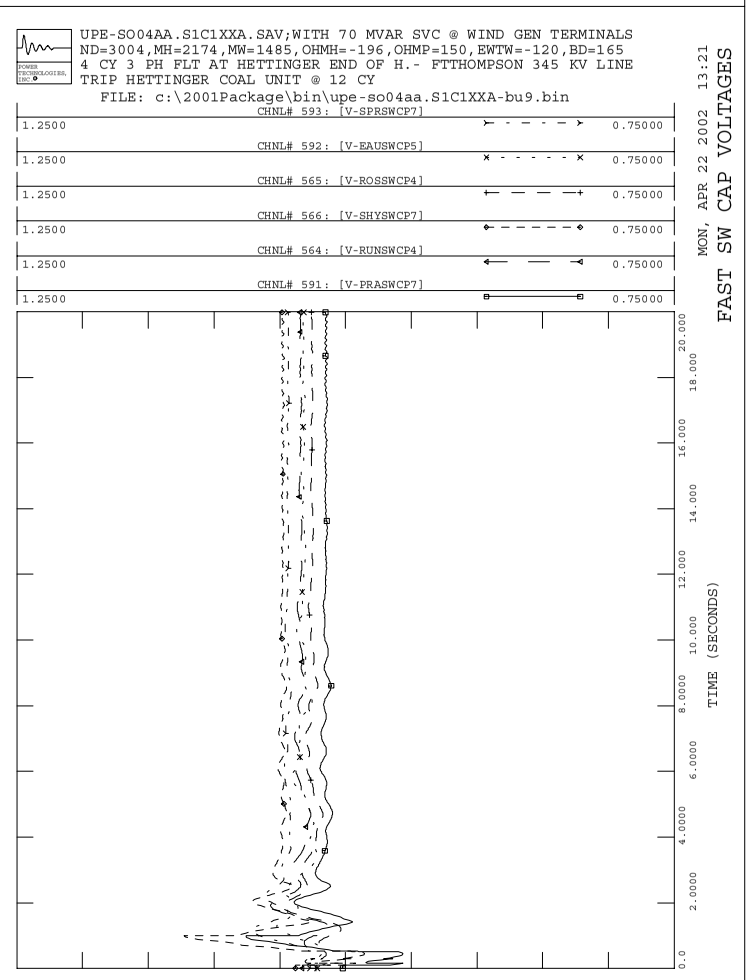
MON, APR 22 2002 13:21
VOLTAGES NB




UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
MON, APR 22 2002 13:21
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
MON, APR 22 2002 13:21
FARGO/WATERTOWN SVS
TIME (SECONDS)

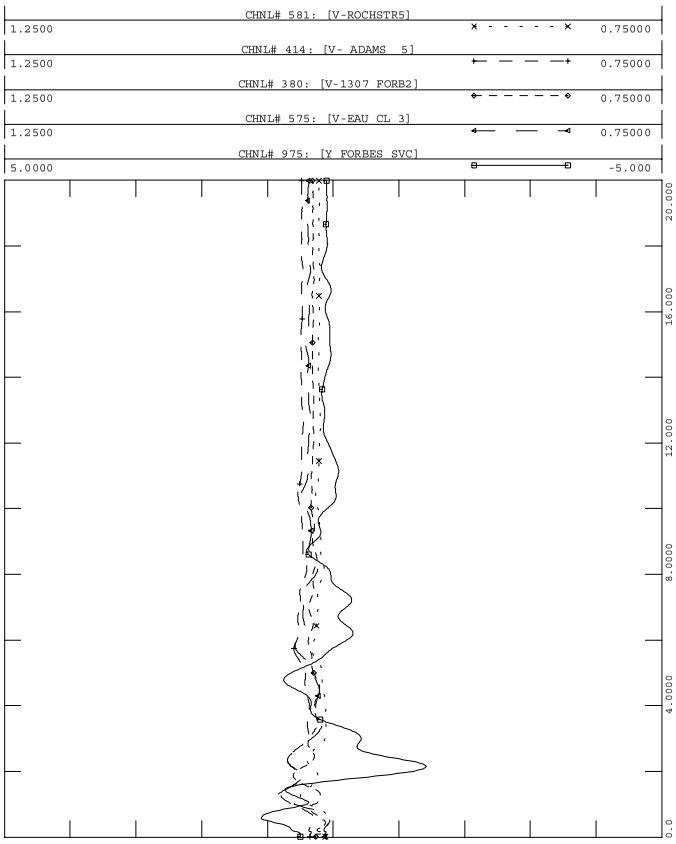

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
MON, APR 22 2002 13:21
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
MON, APR 22 2002 13:21
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21

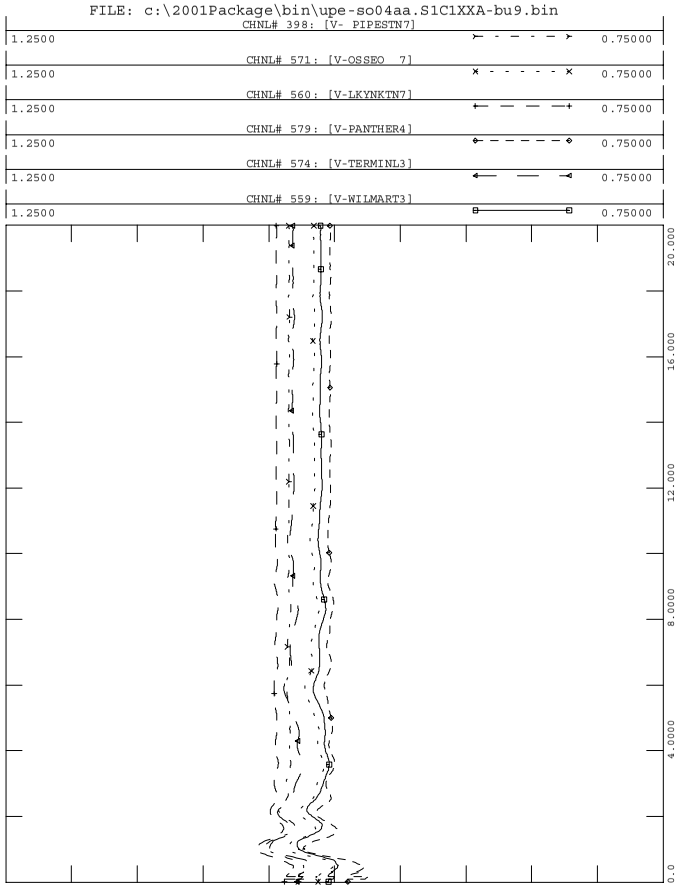
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21

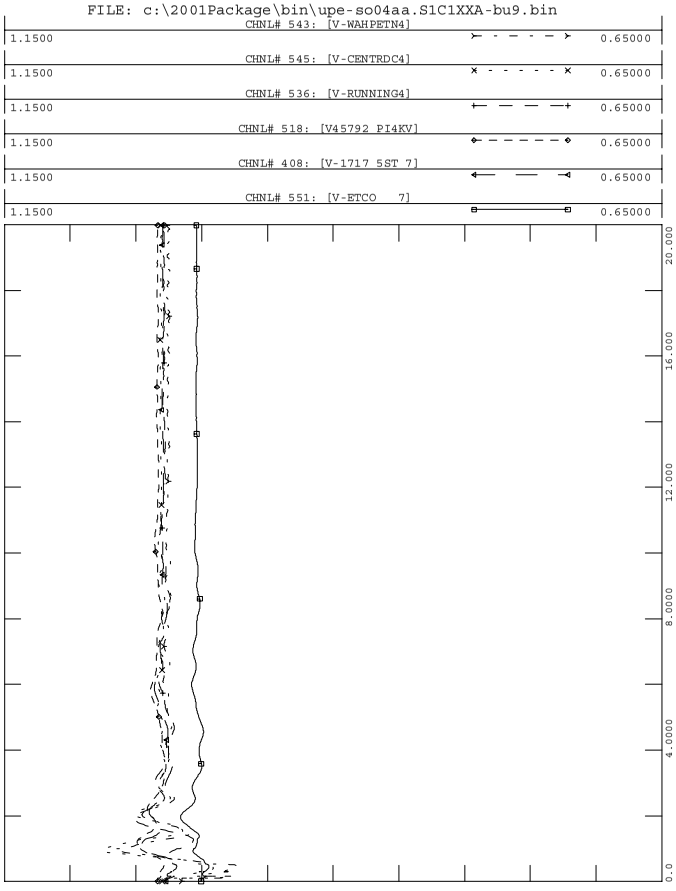
TC VOLTAGES



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21

VOLTAGES 6



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

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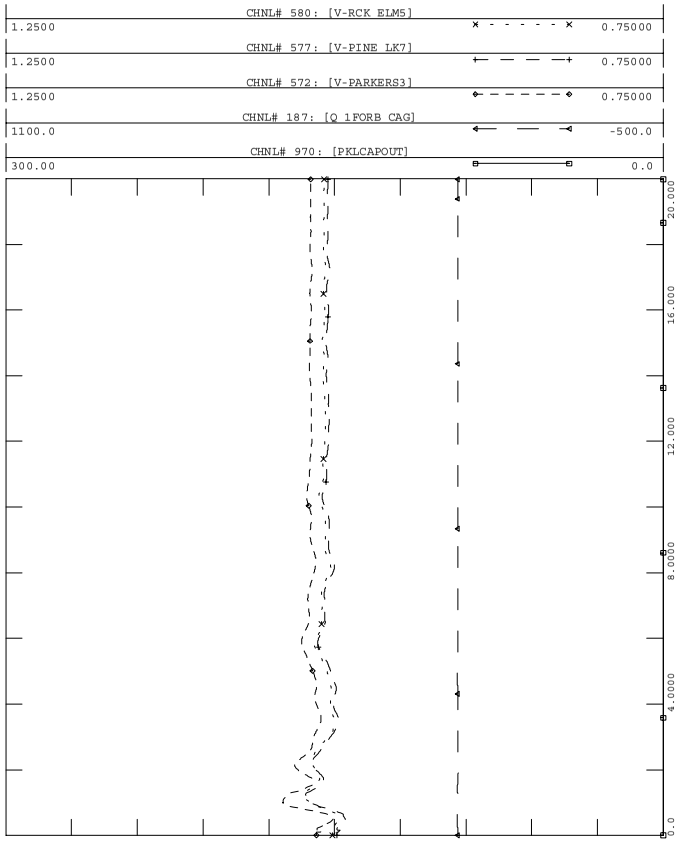
FORBES SVS OUT & VOLTAGES



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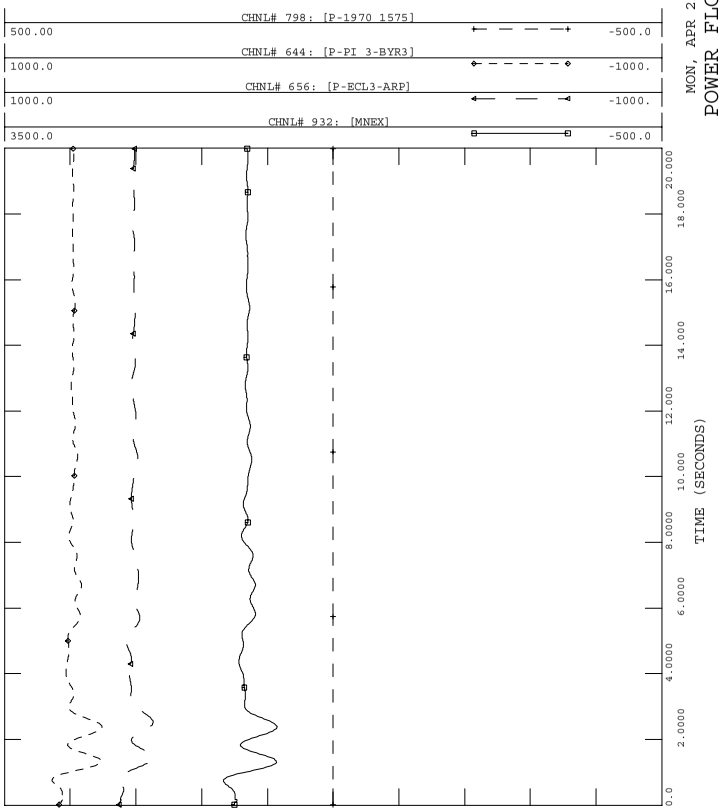
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
POWER FLOW SUMS 2



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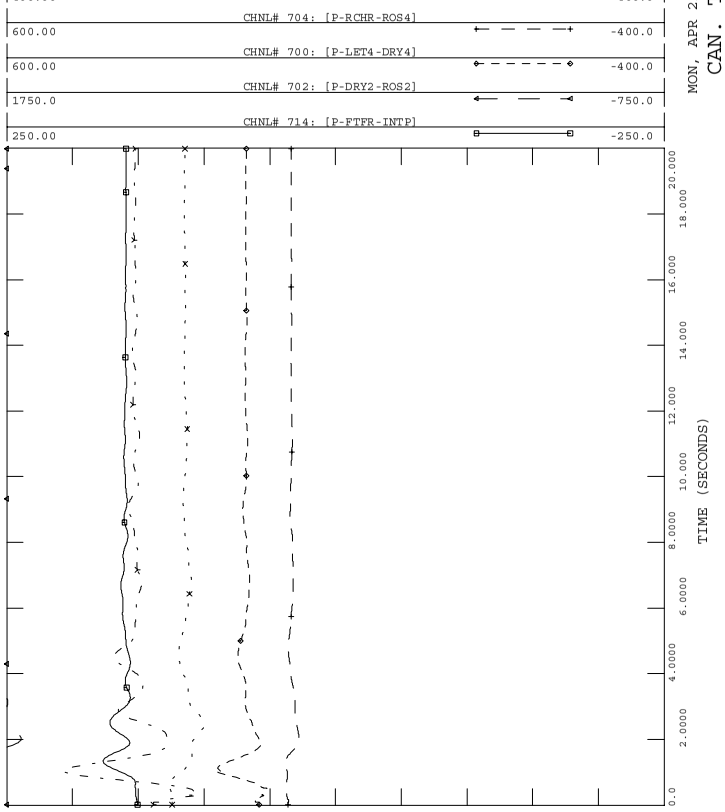
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
CAN. TIE FLOWS



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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
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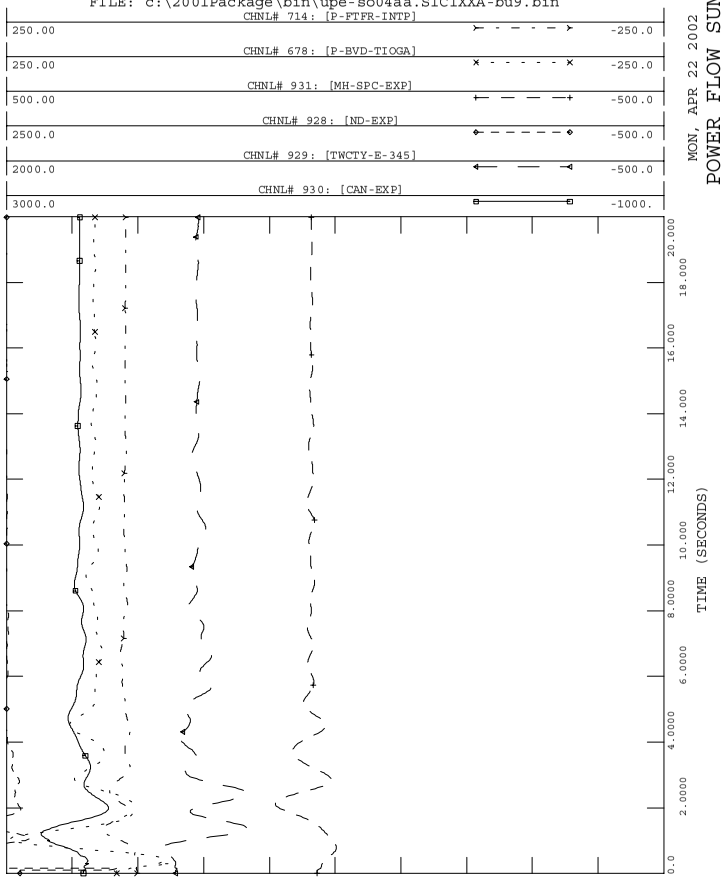
MON, APR 22 2002 13:21
POWER FLOW SUMS 1



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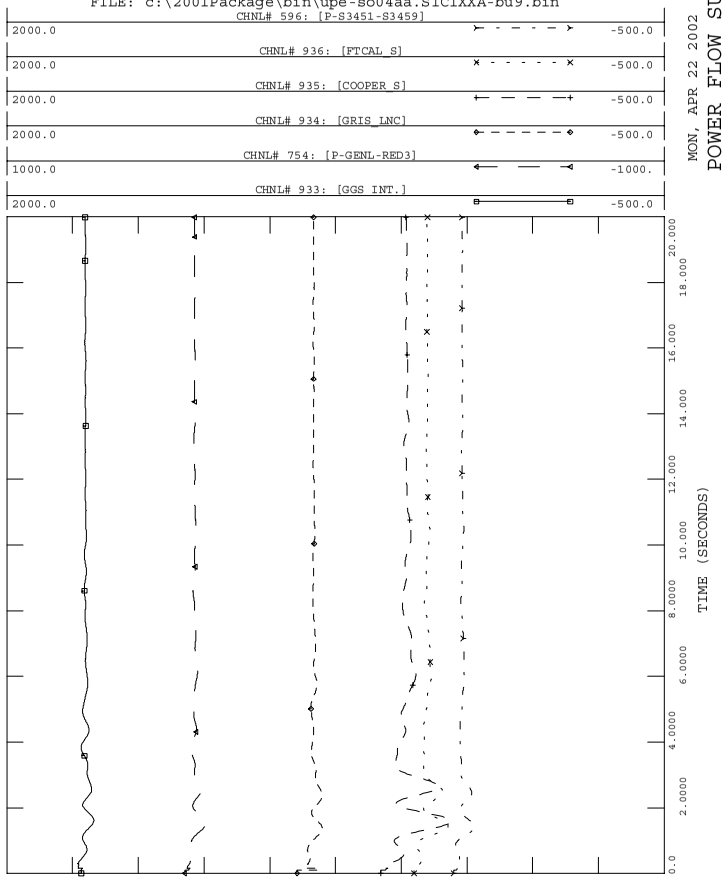
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
POWER FLOW SUM 3



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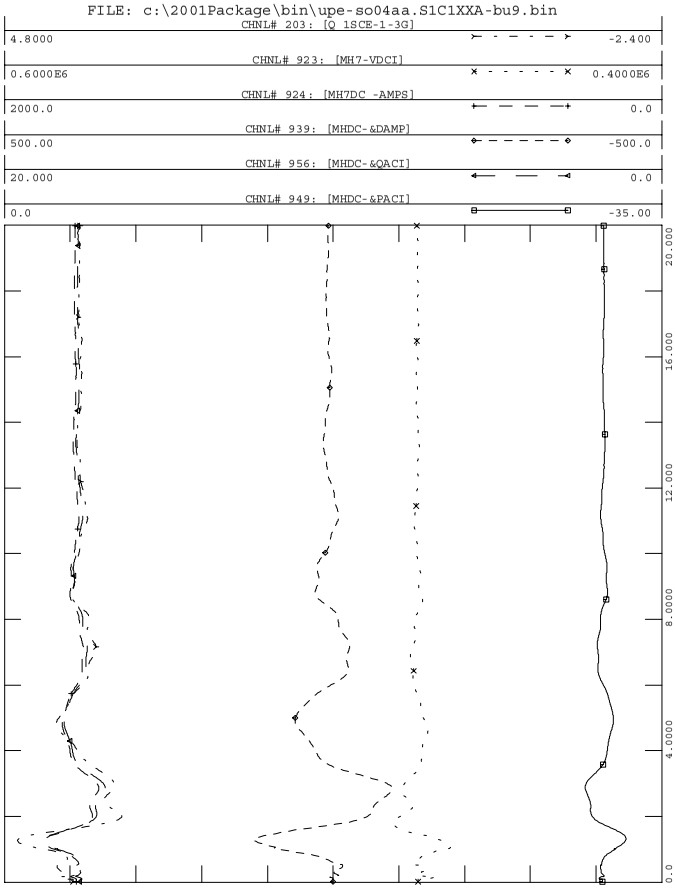
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
MH DC PARAMETERS



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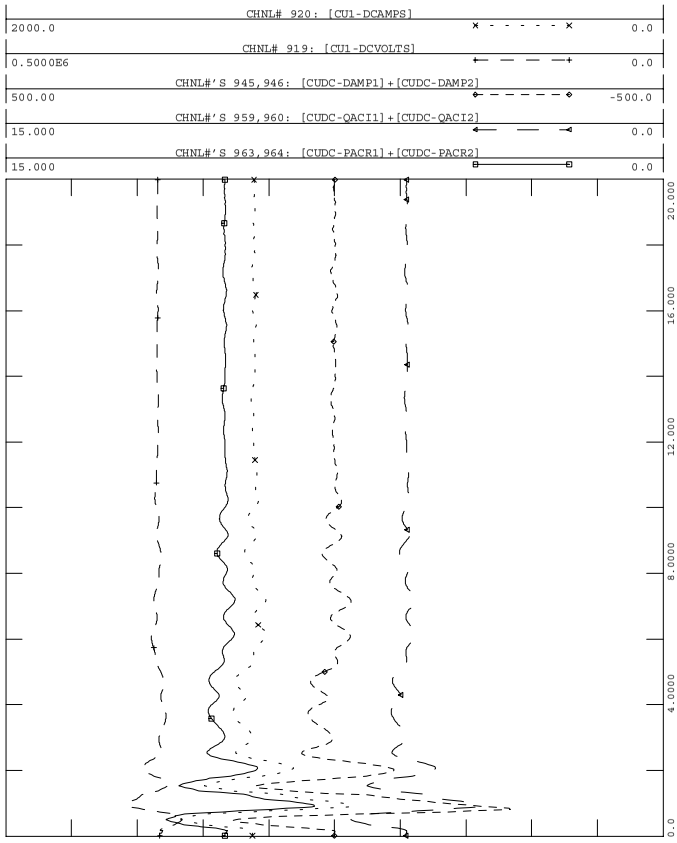
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
CU DC #1



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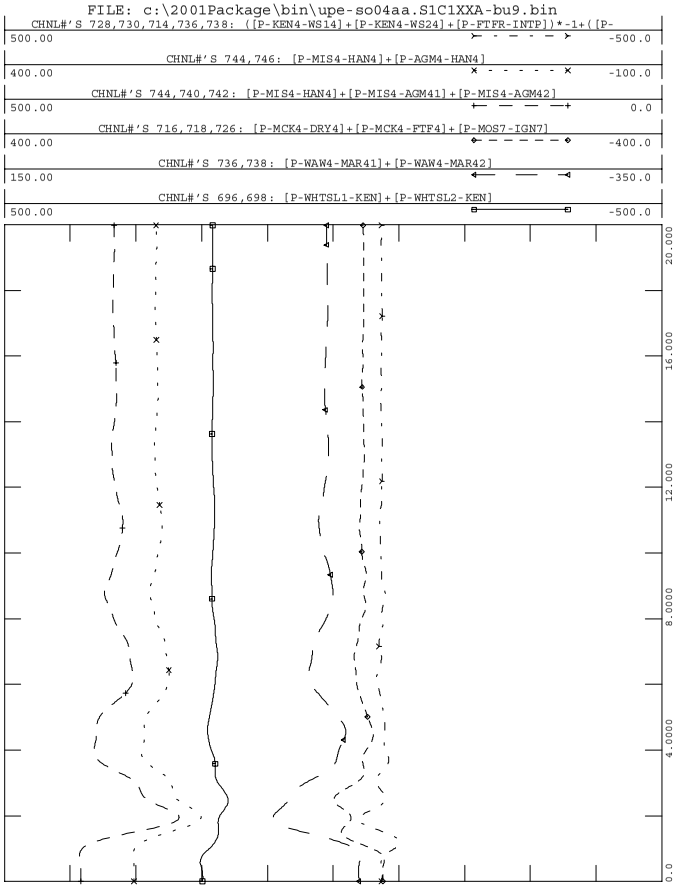
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
OH TIE FLOWS



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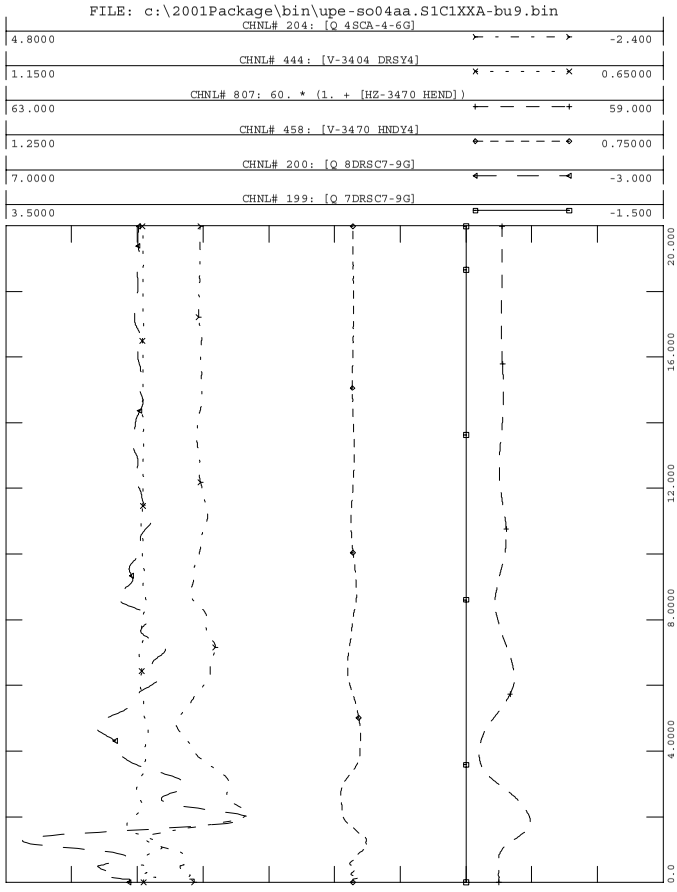
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

MON, APR 22 2002 13:21
MH DC PARAMETERS



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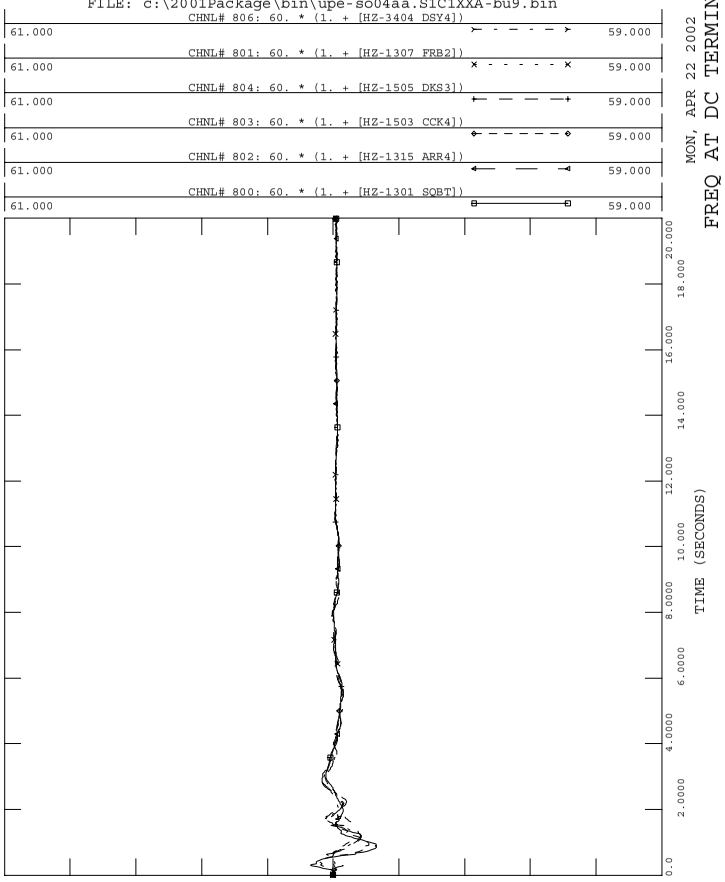
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



MON, APR 22 2002 13:21
FREQ AT DC TERMINALS

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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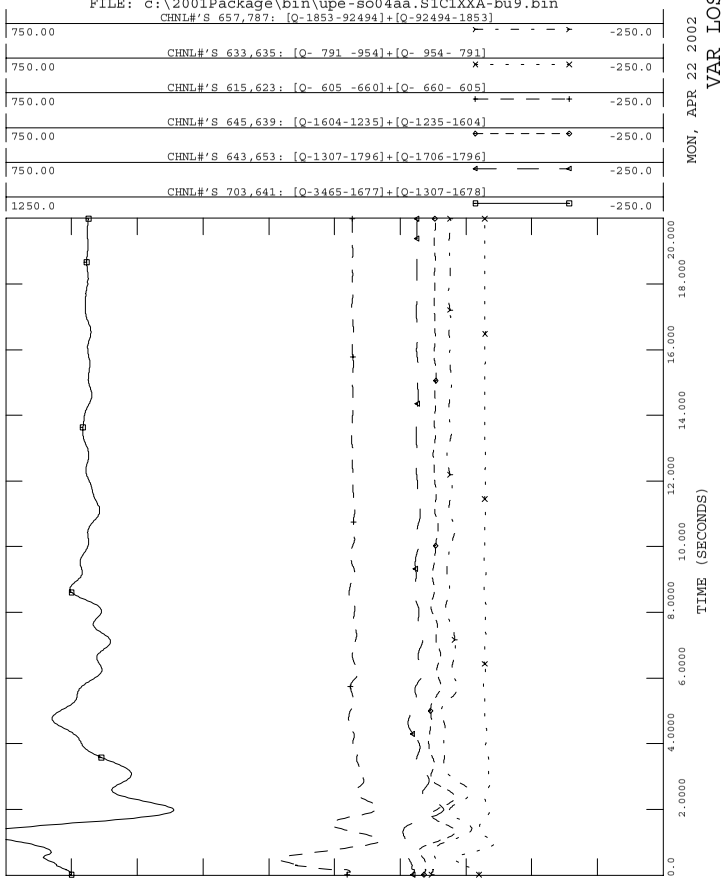
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



MON, APR 22 2002 13:21
VAR LOSSES

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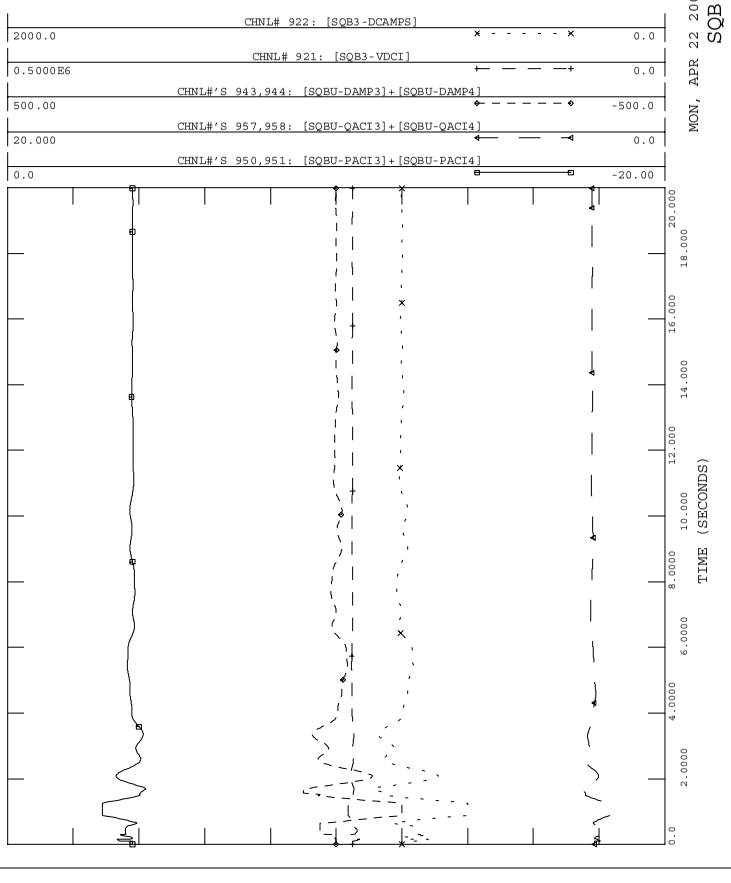
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



MON, APR 22 2002 13:21
SQB DC #3

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
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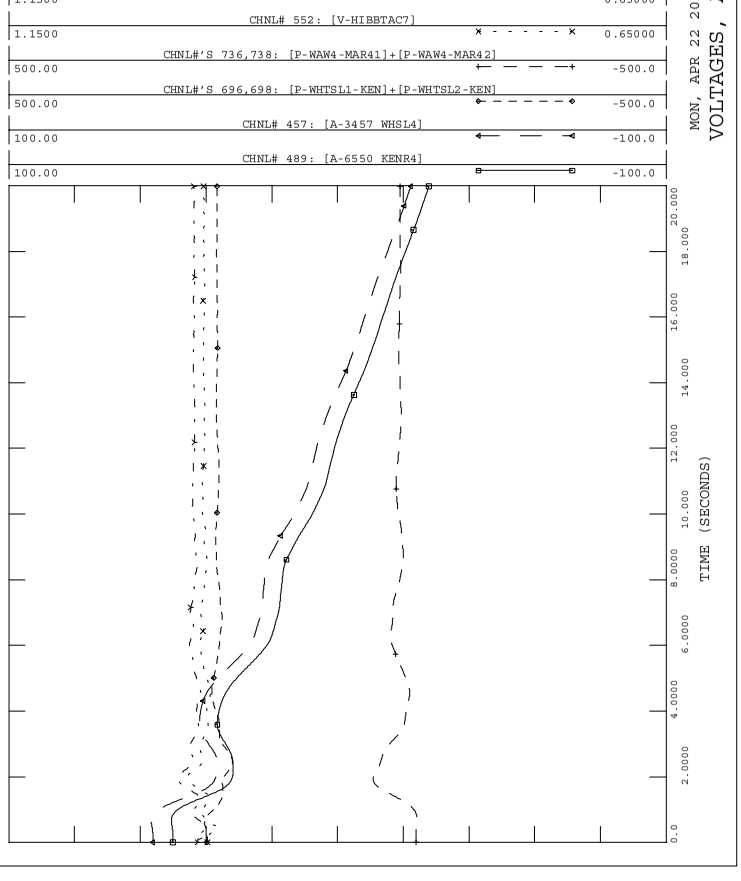
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



MON, APR 22 2002 13:21
VOLTAGES, ANGLES

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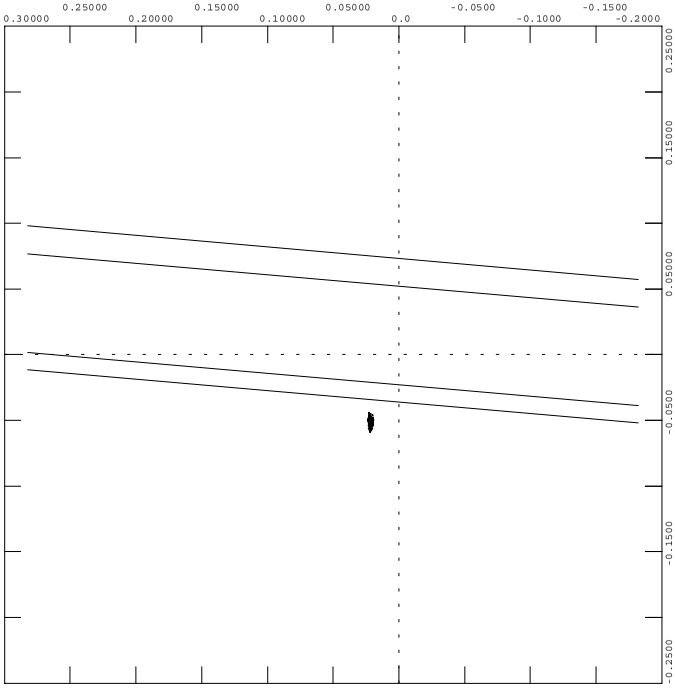
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



MON, APR 22 2002 13:21
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

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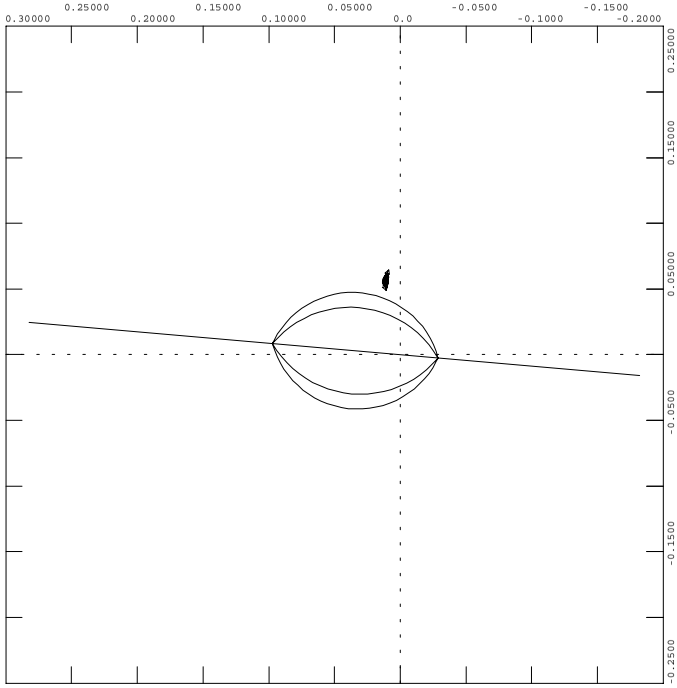

MON, APR 22 2002 13:21
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

RELAY: RELAYG
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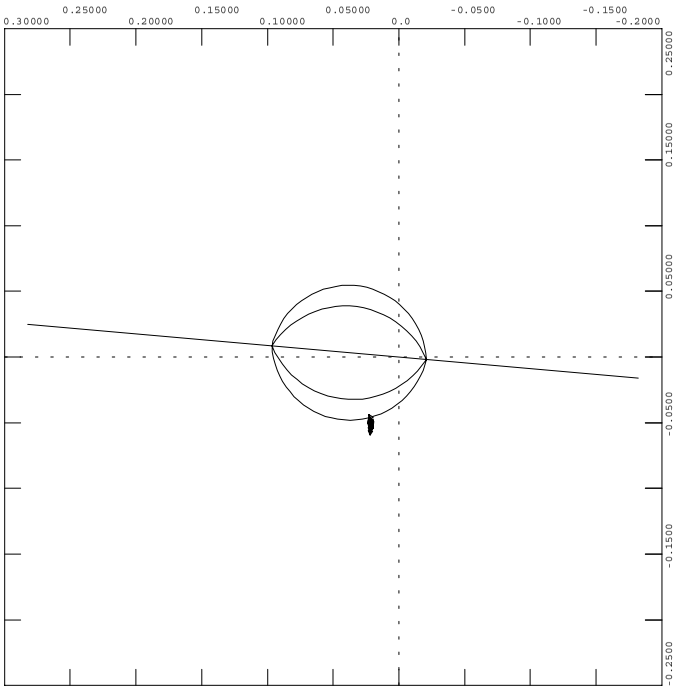
CHNL# 824: [X-FRB2-ROS2]



MON, APR 22 2002 13:21
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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

RELAY: SLINOS
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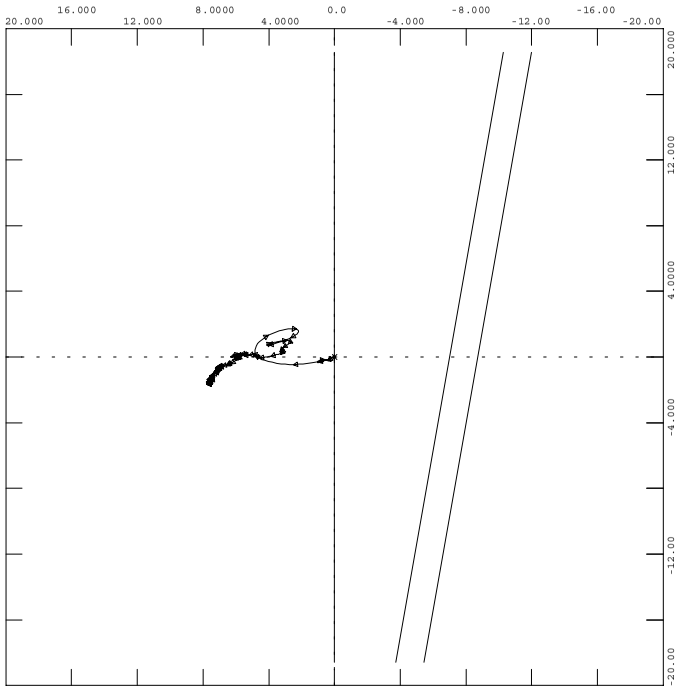
CHNL# 977: [DCAR-B]



MON, APR 22 2002 13:21
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

RELAY: SLINOS
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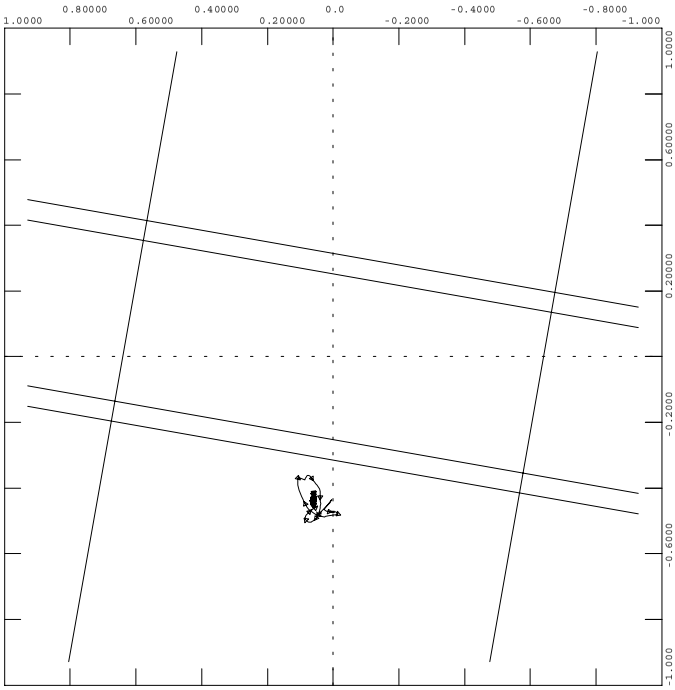
CHNL# 816: [X-DRY4-LET4]



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4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

RELAY: SLINOS
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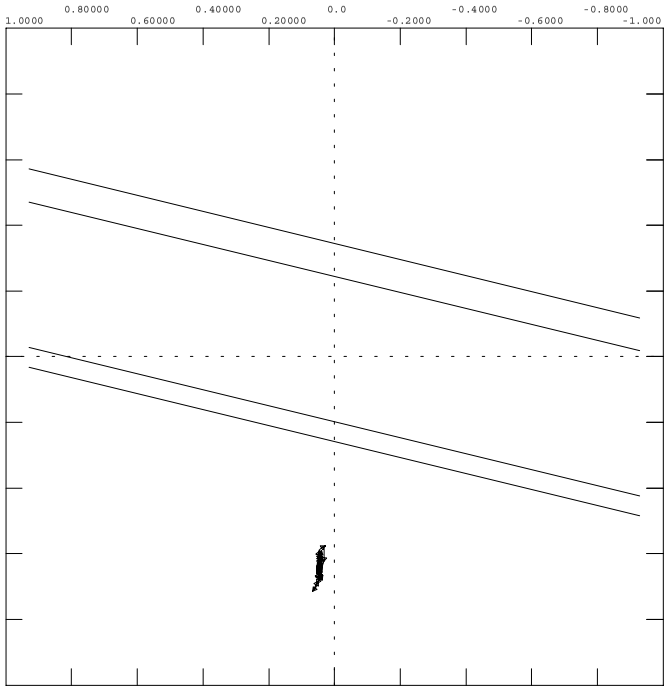
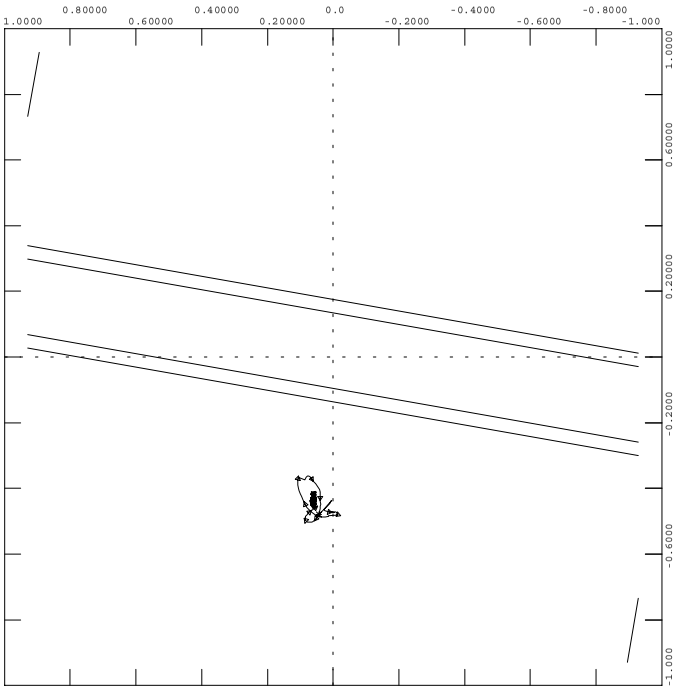
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

RELAY: SLINOS
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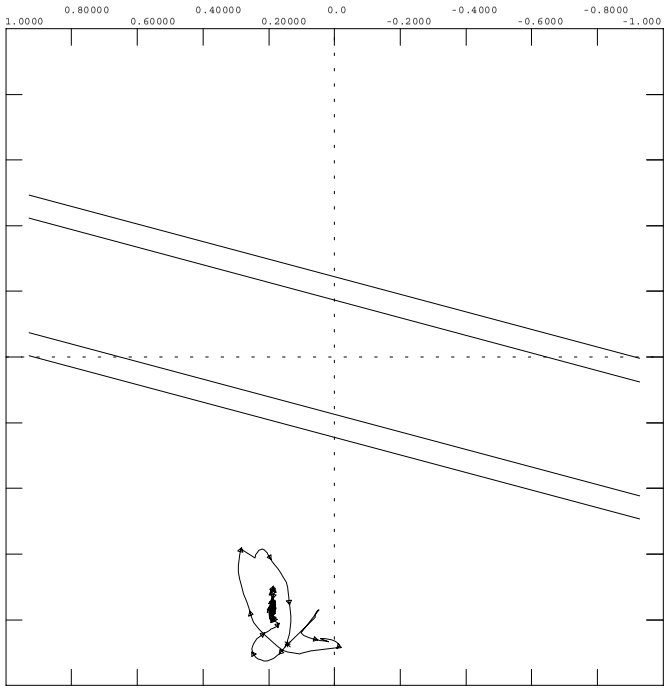
CHNL# 820: [X-PRA4-DRY4]



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ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

RELAY: SLLP
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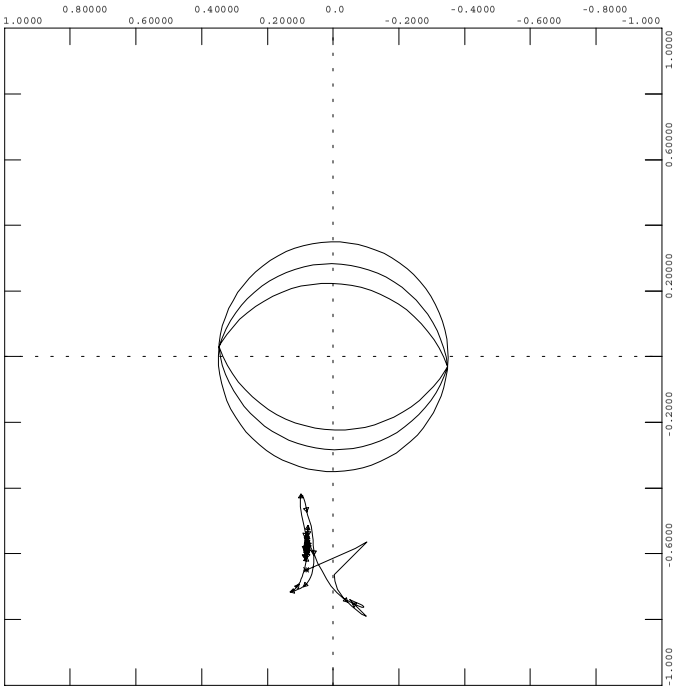
CHNL# 814: [X-TGA4-BD 4]



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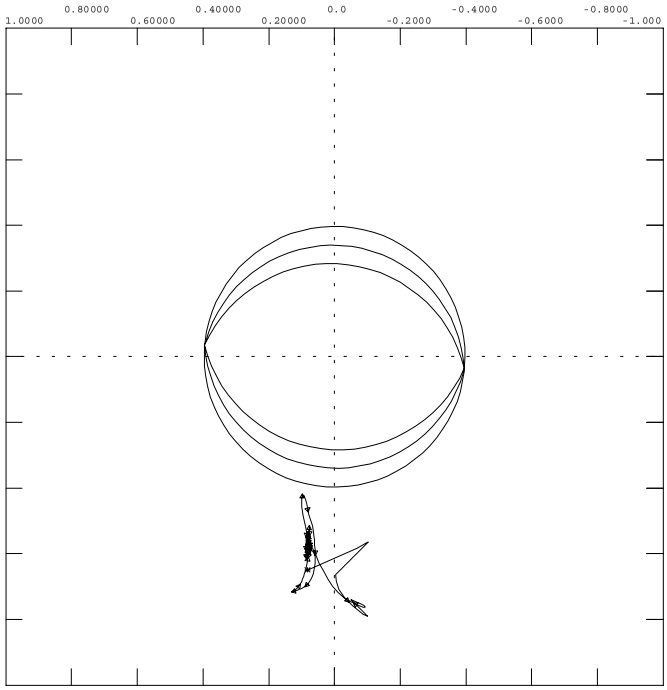
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

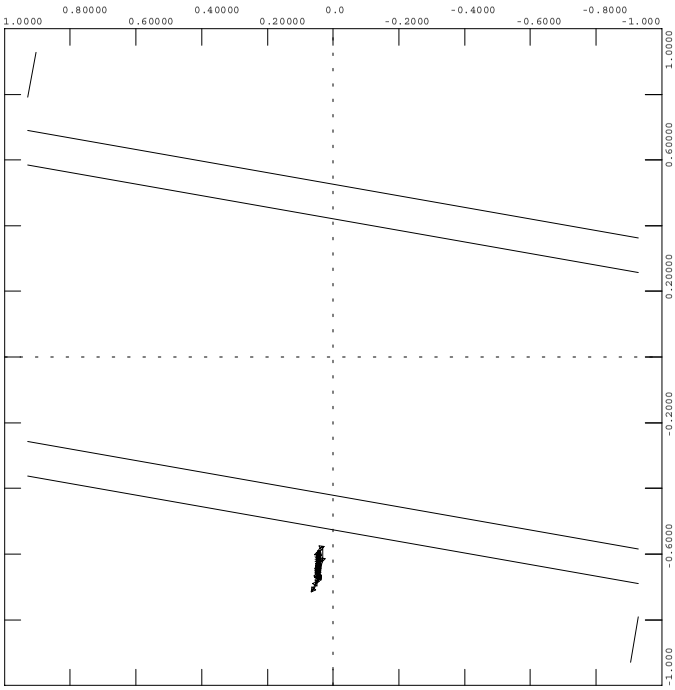
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

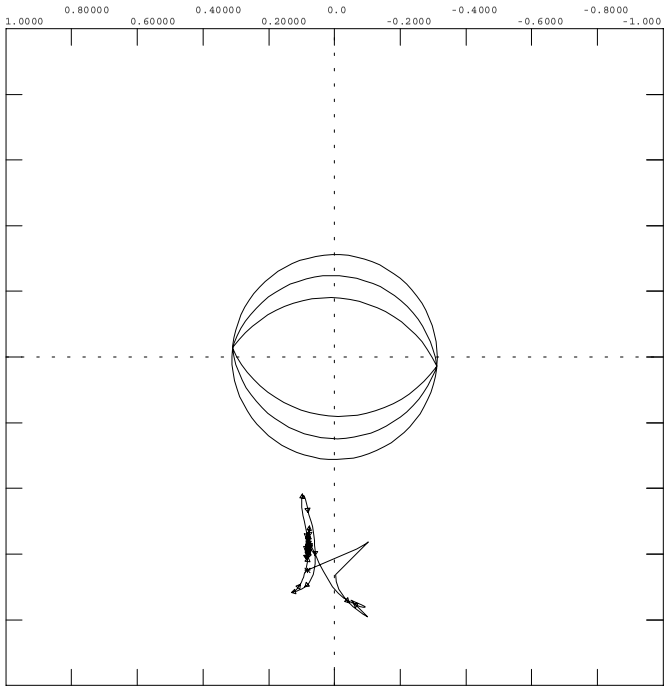
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



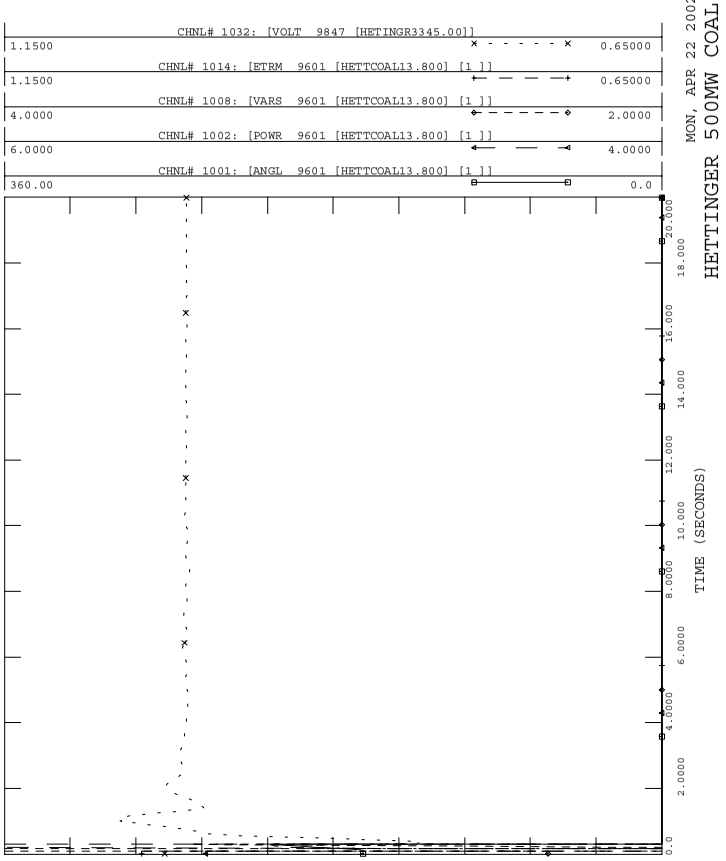
UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

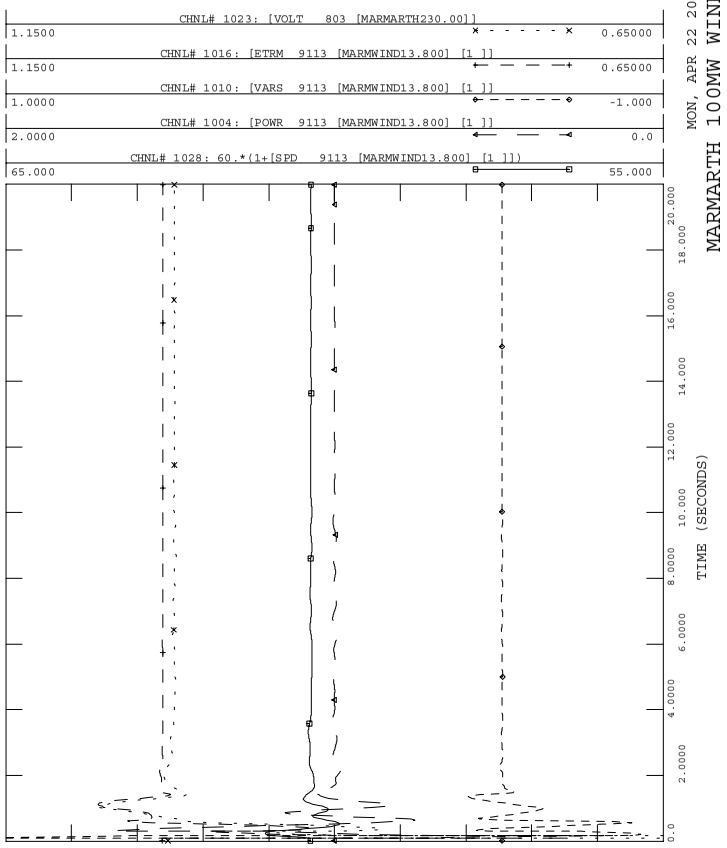


UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



MON, APR 22 2002 13:21
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

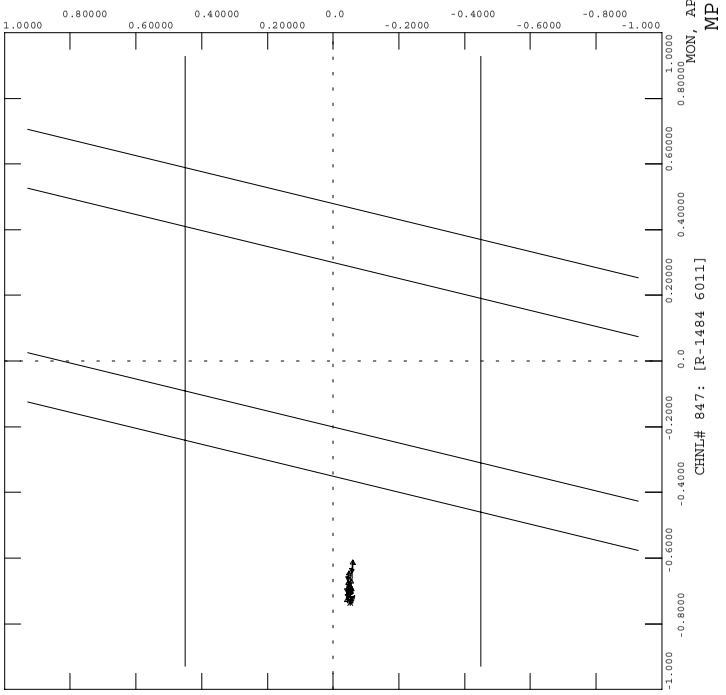


MON, APR 22 2002 13:21
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY

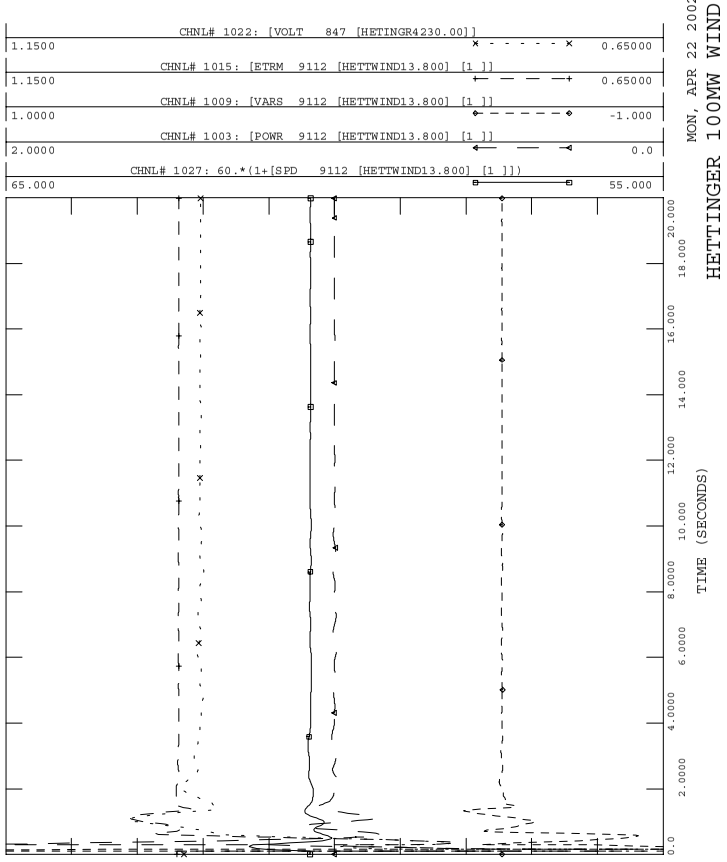
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



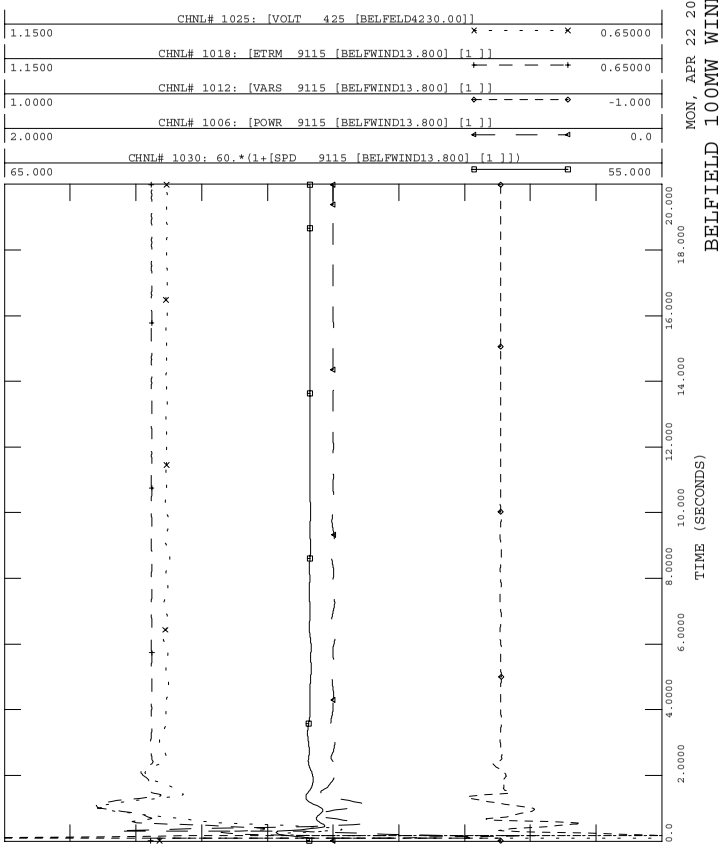
MON, APR 22 2002 13:21
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



MON, APR 22 2002 13:21
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



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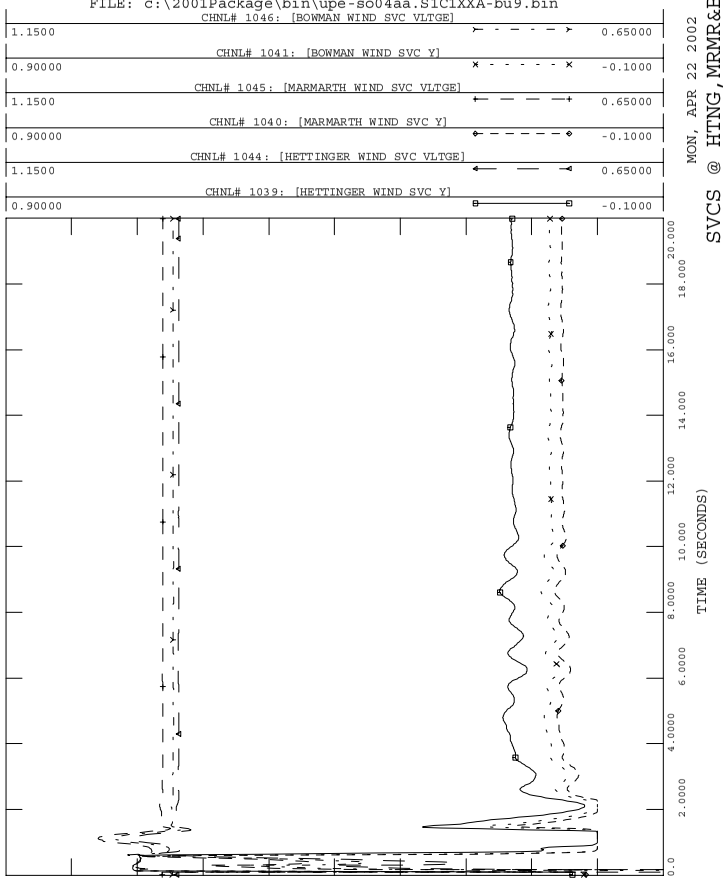
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



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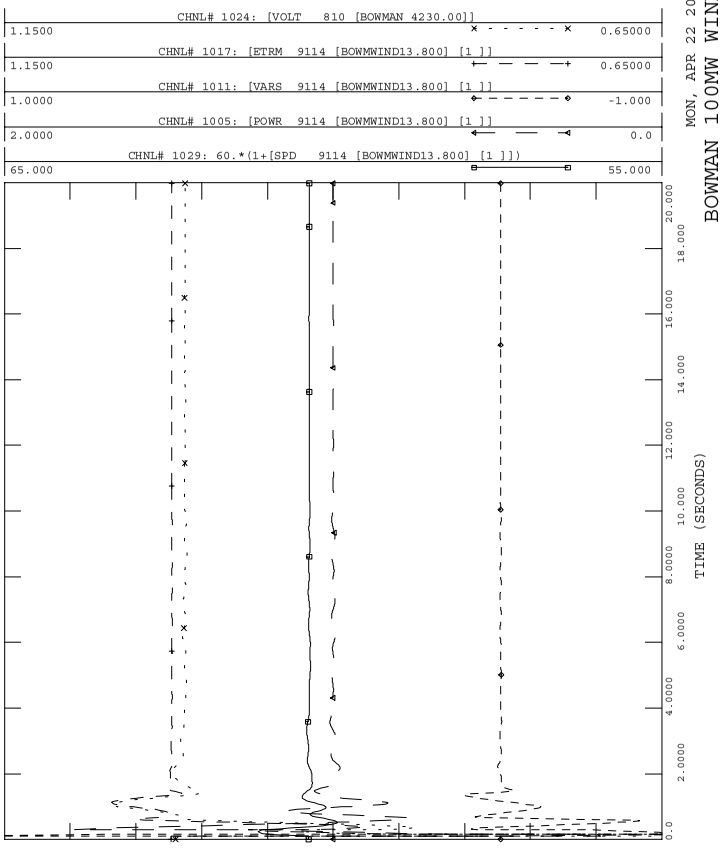
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



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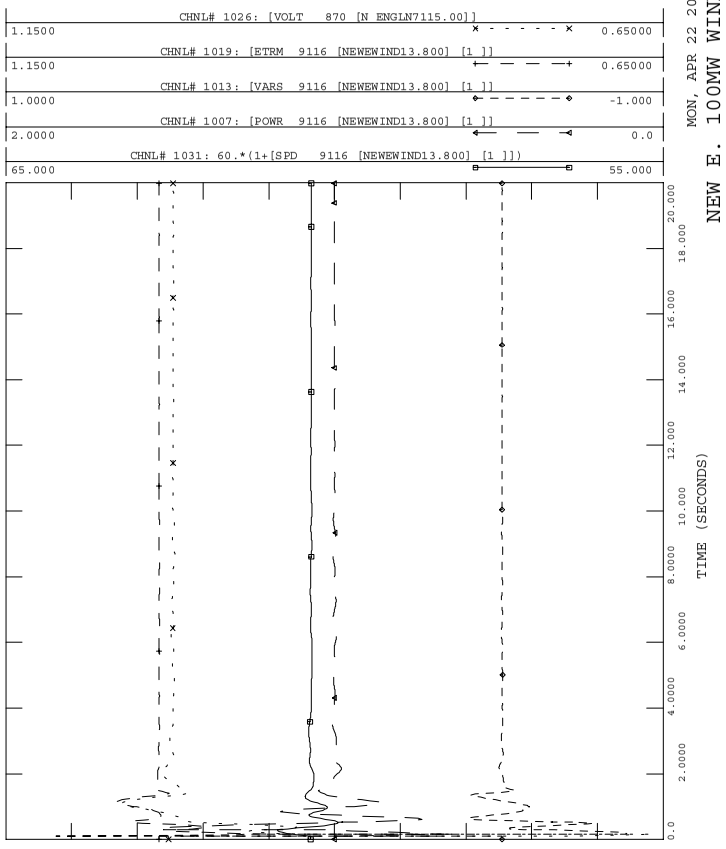
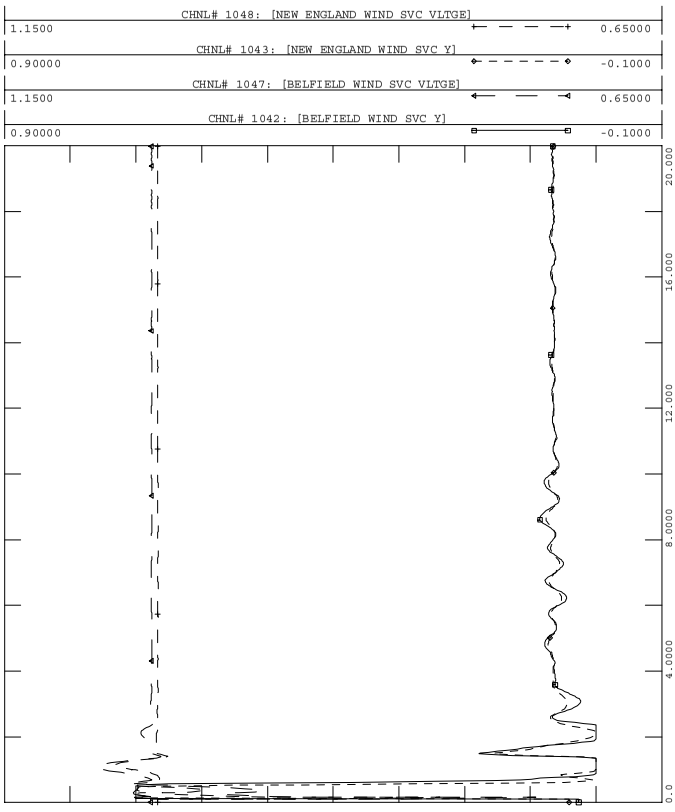
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CY 3 PH FLT AT HETTINGER END OF H.- FTTHOMPSON 345 KV LINE
TRIP HETTINGER COAL UNIT @ 12 CY
FILE: c:\2001Package\bin\upe-so04aa.S1C1XXA-bu9.bin



MON, APR 22 2002 13:21

SVCS @ BLFLD & NWENG

APPENDIX 5

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 1 (HETTINGER)

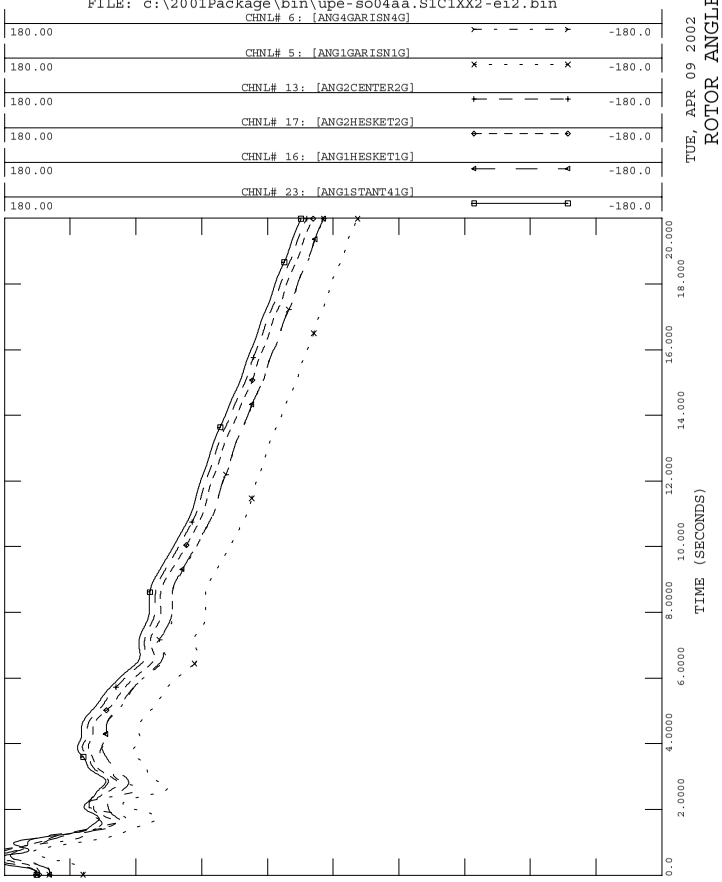
CASE S1C1XX2

CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
ROTOR ANGLES 2



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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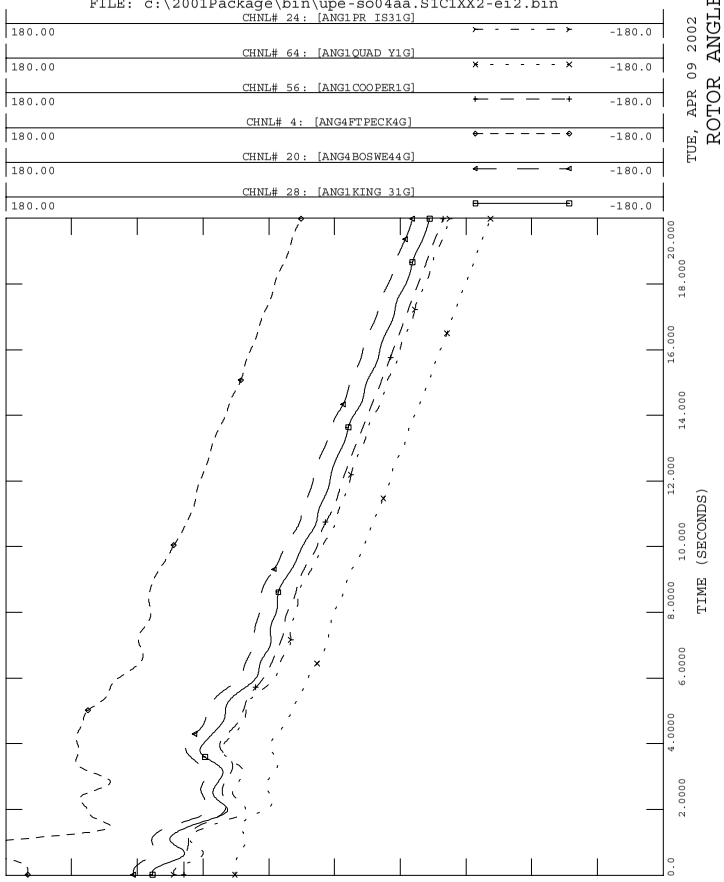
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
ROTOR ANGLES 4



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
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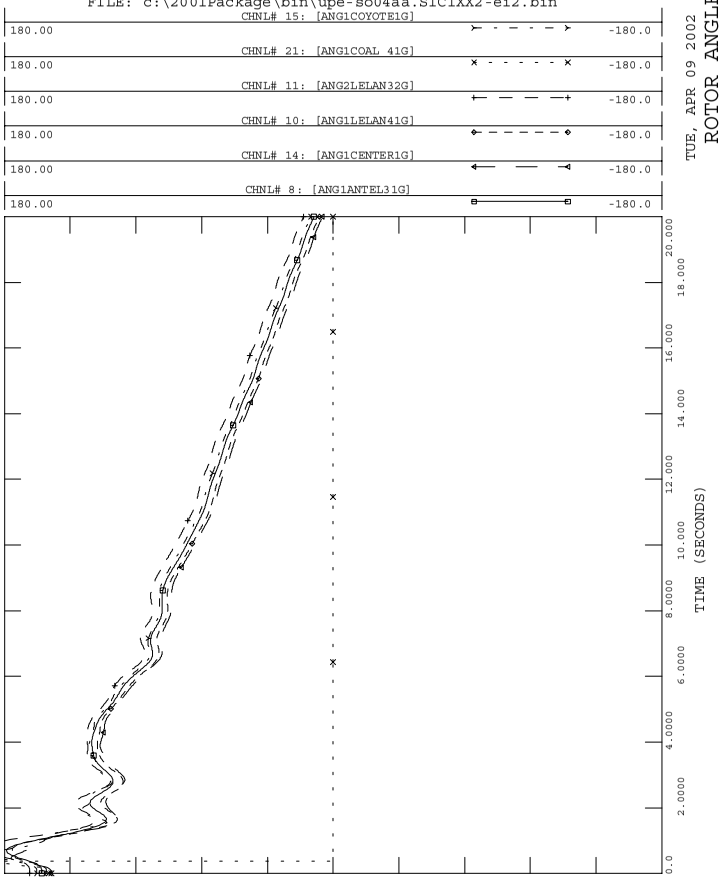

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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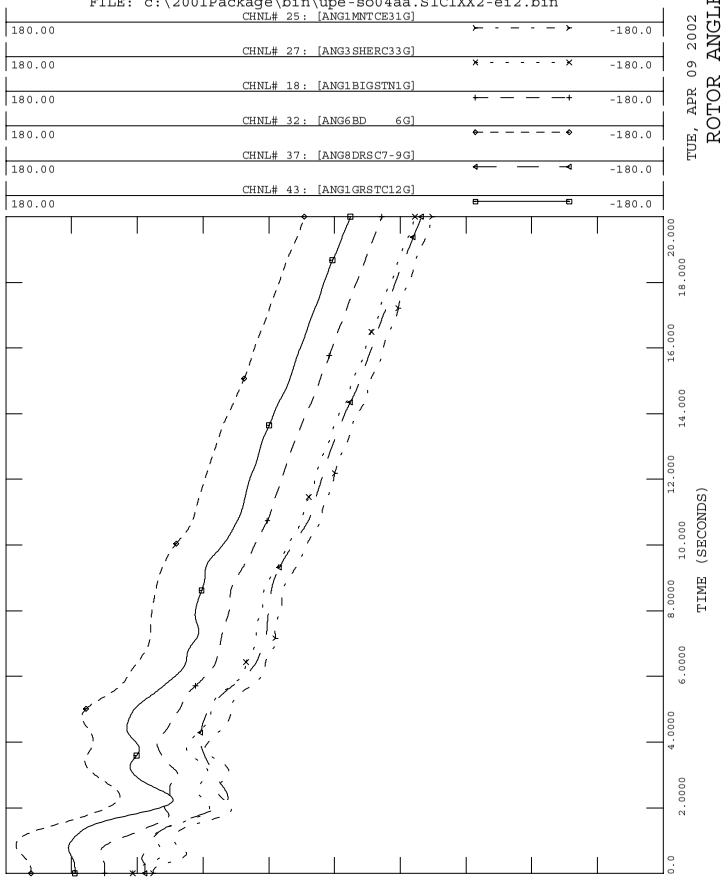
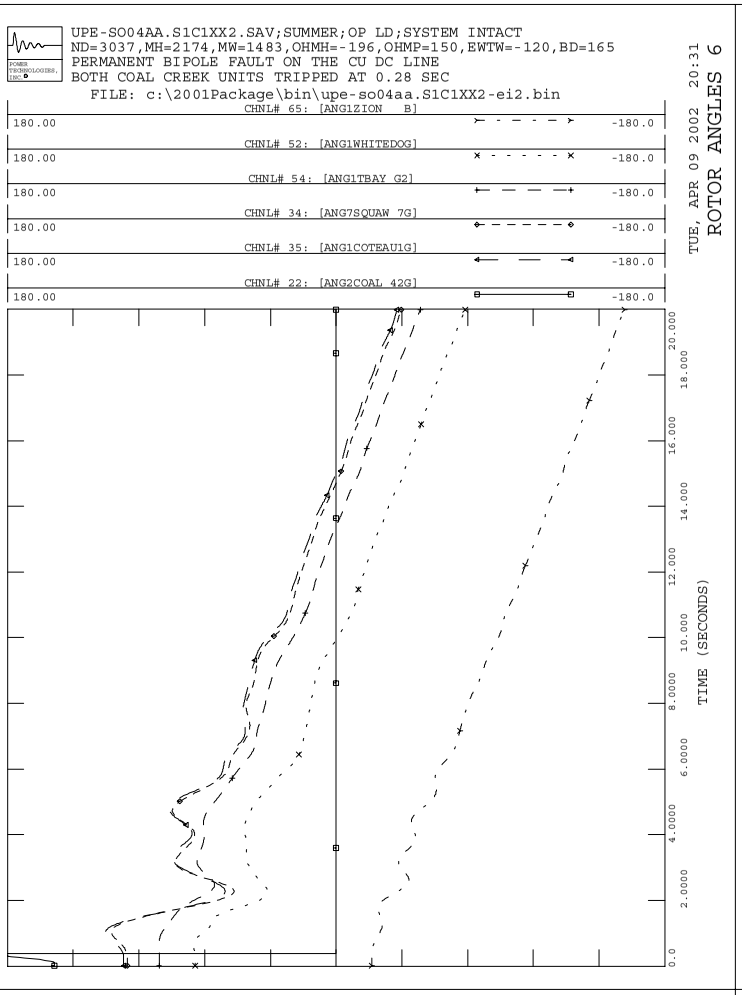
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
ROTOR ANGLES 3

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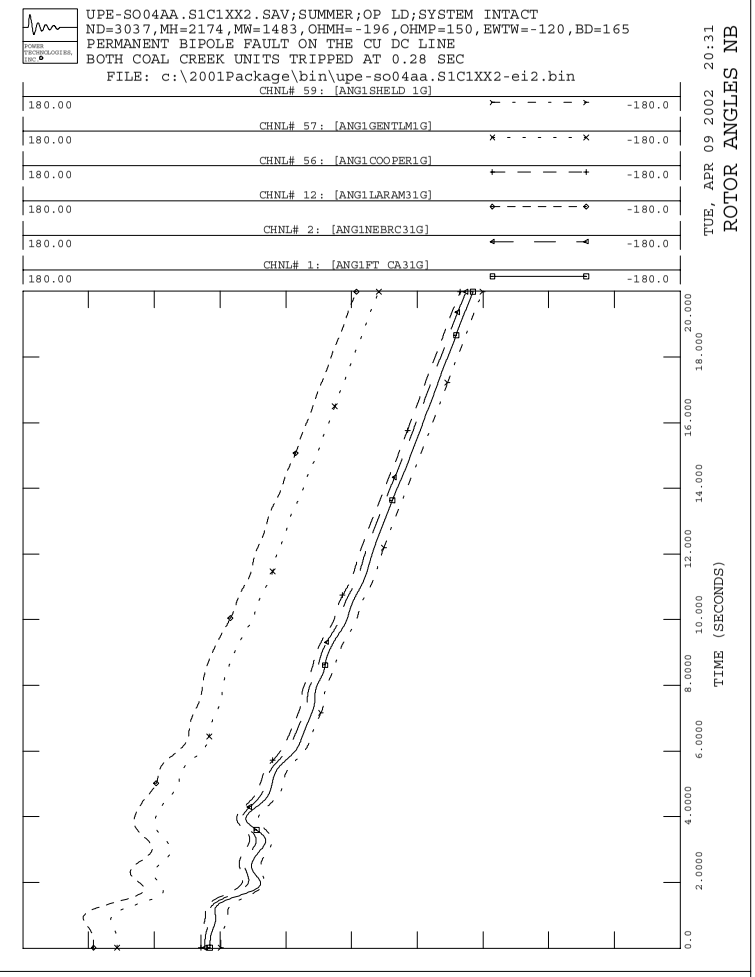
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:31
ROTOR ANGLES 6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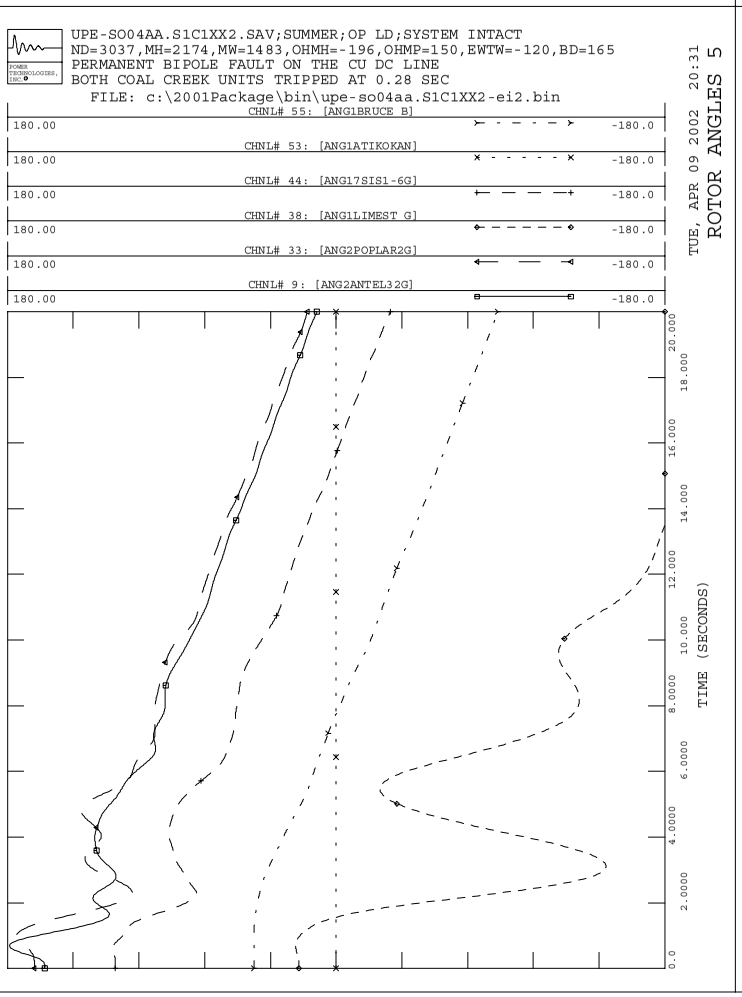
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:31
ROTOR ANGLES NB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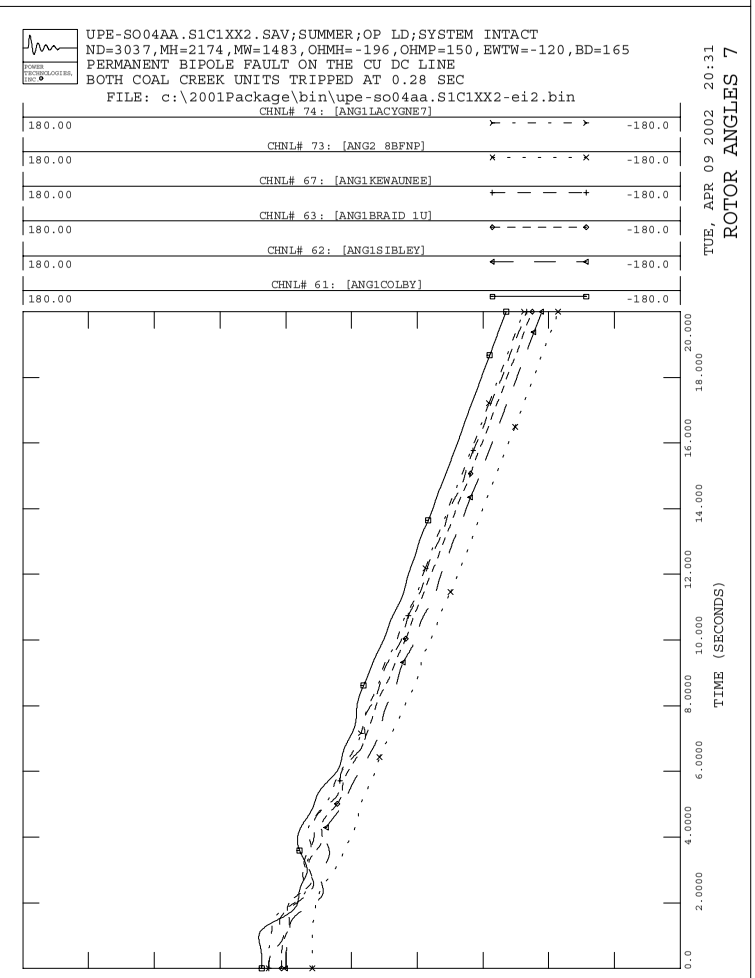
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:31
ROTOR ANGLES 5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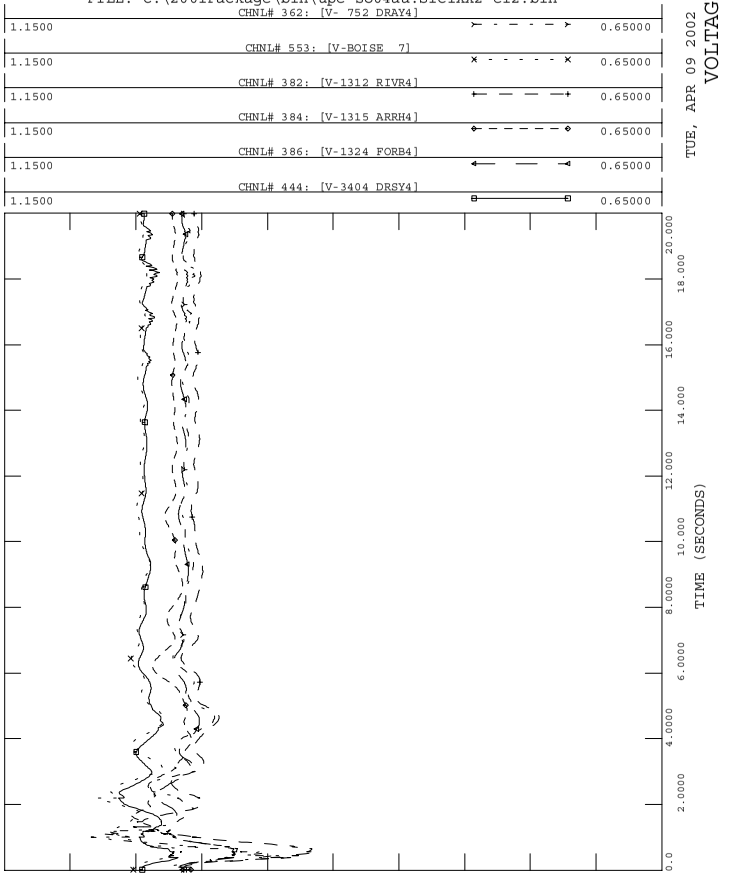
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 20:31
ROTOR ANGLES 7

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



TUE, APR 09 2002 20:31
VOLTAGES 1

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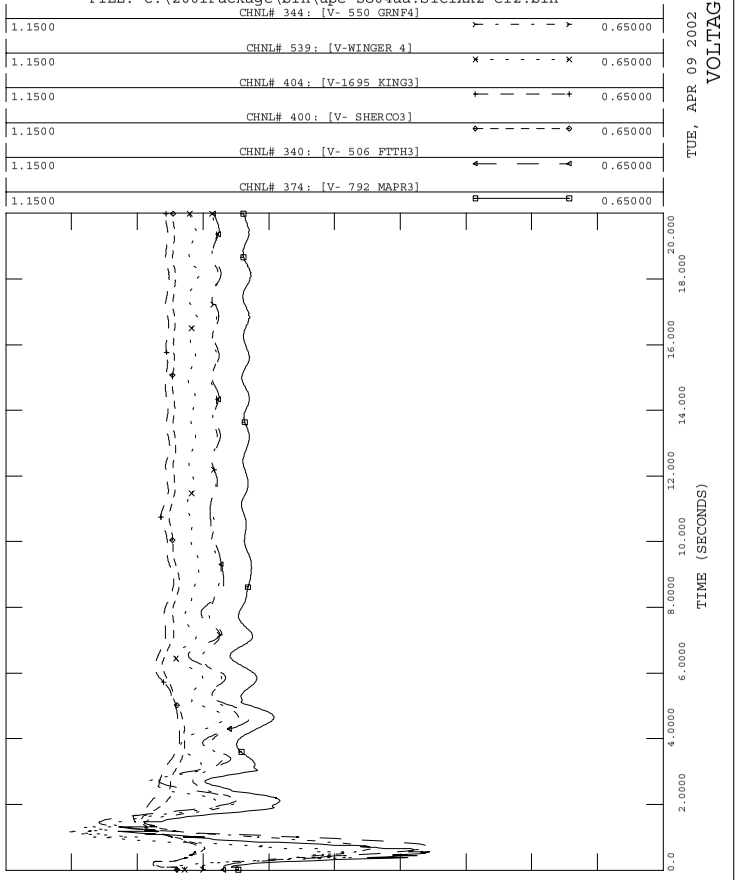
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



TUE, APR 09 2002 20:31
VOLTAGES 3

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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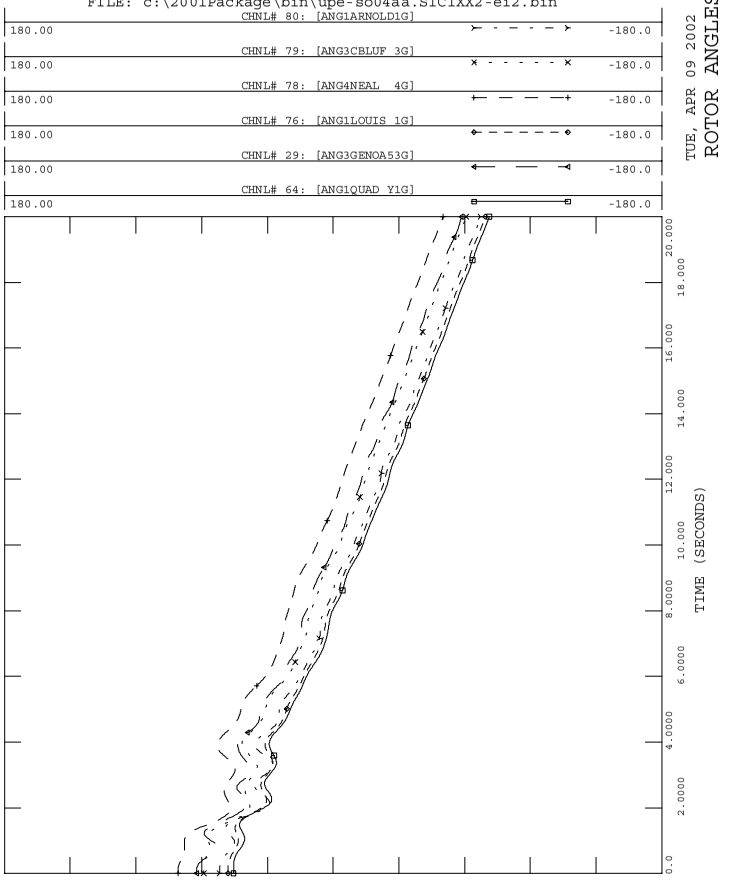
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



TUE, APR 09 2002 20:31
ROTOR ANGLES IA

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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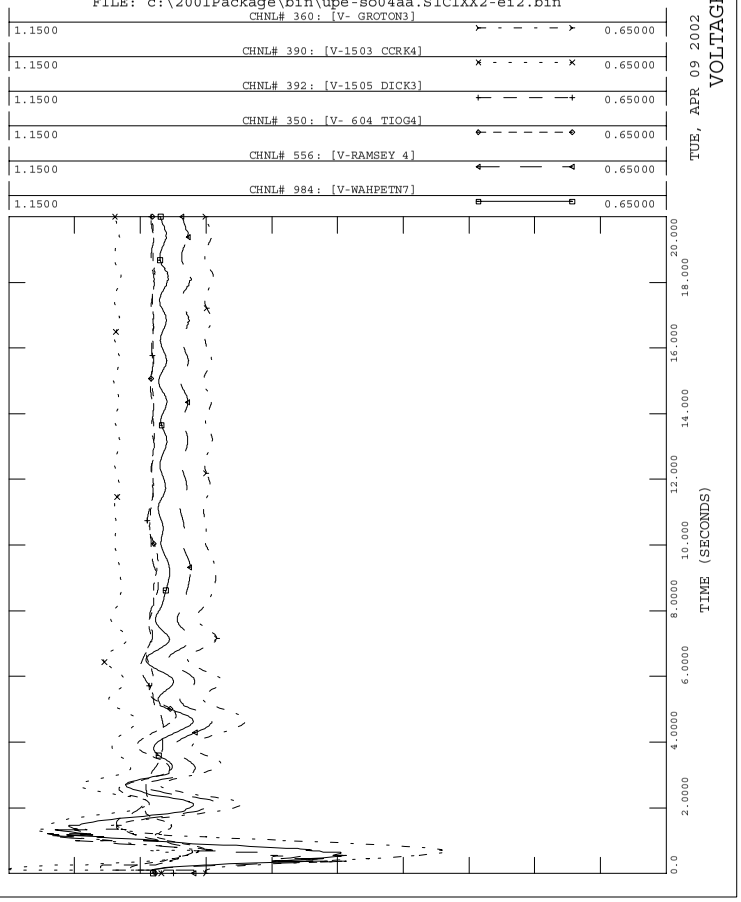
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



TUE, APR 09 2002 20:31
VOLTAGES 2

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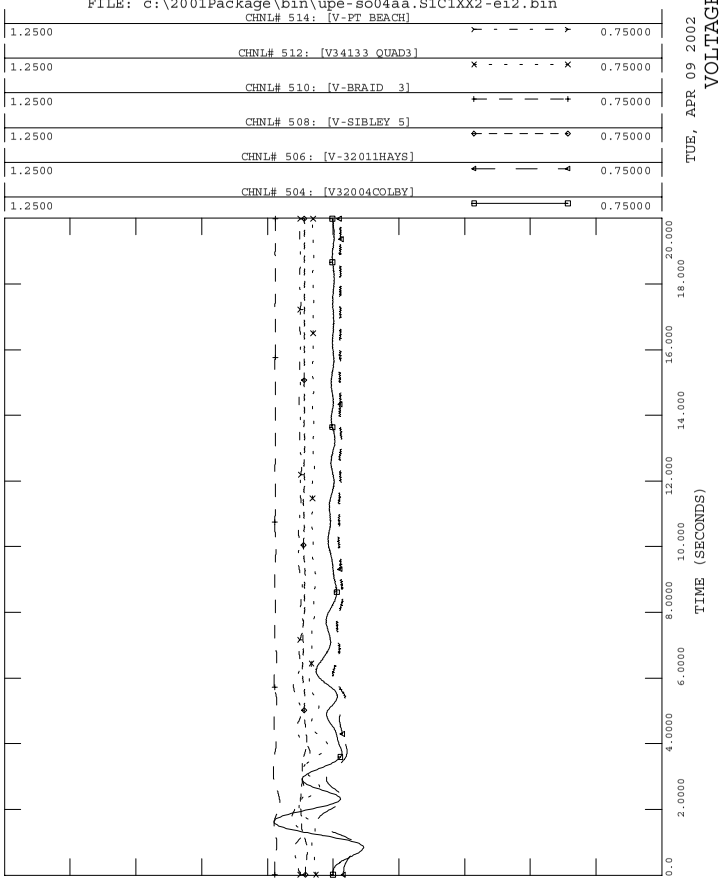
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
VOLTAGES 5



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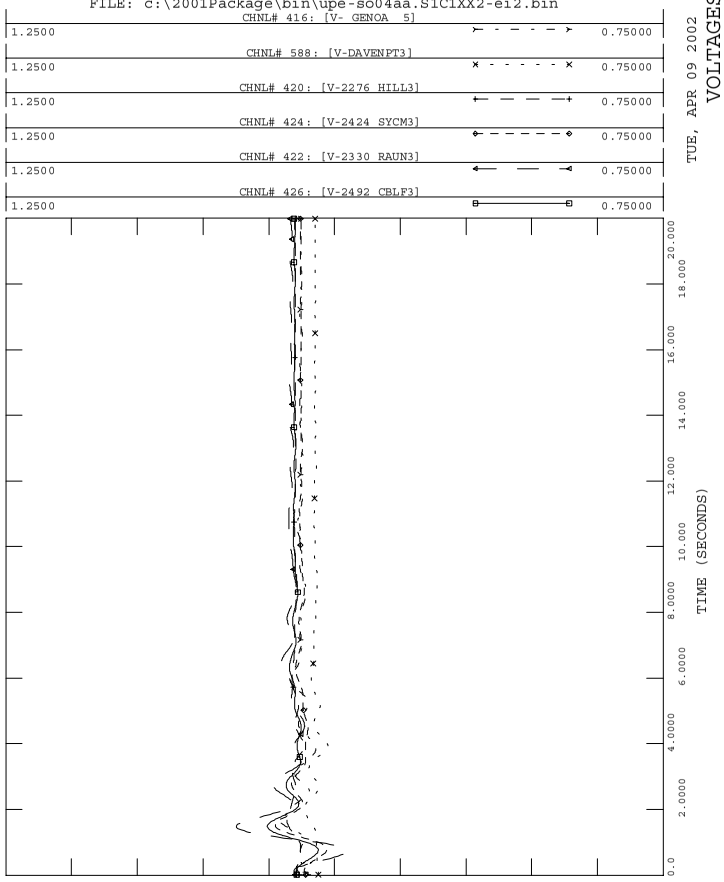
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
VOLTAGES IA



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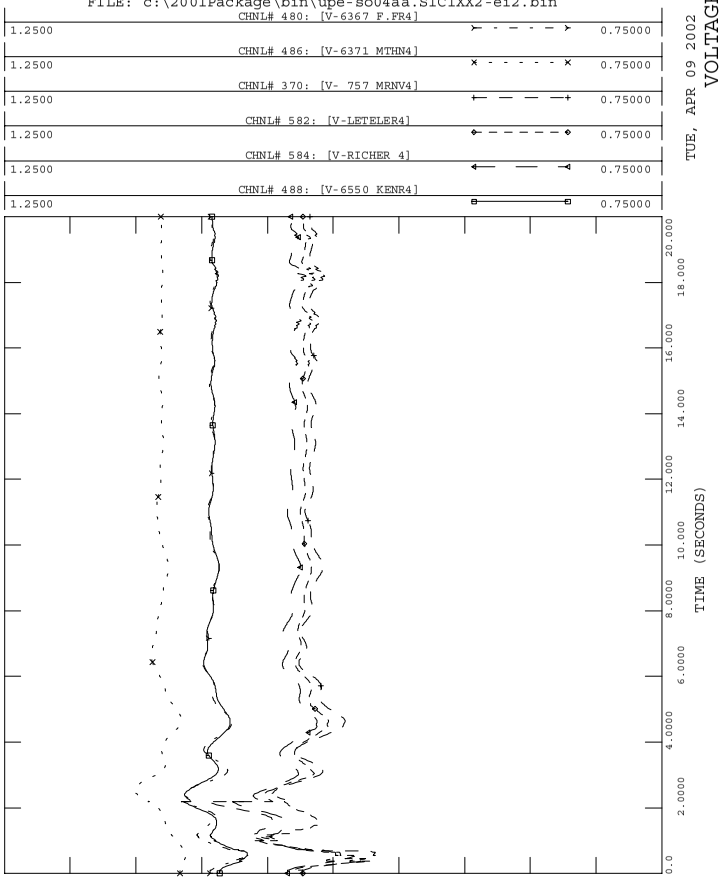
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
VOLTAGES 4



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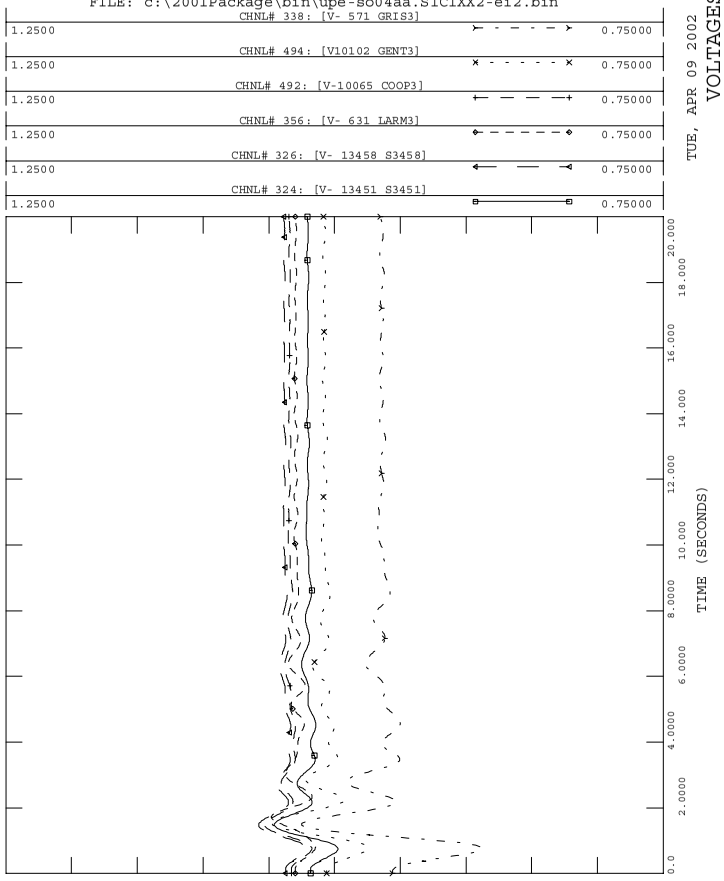
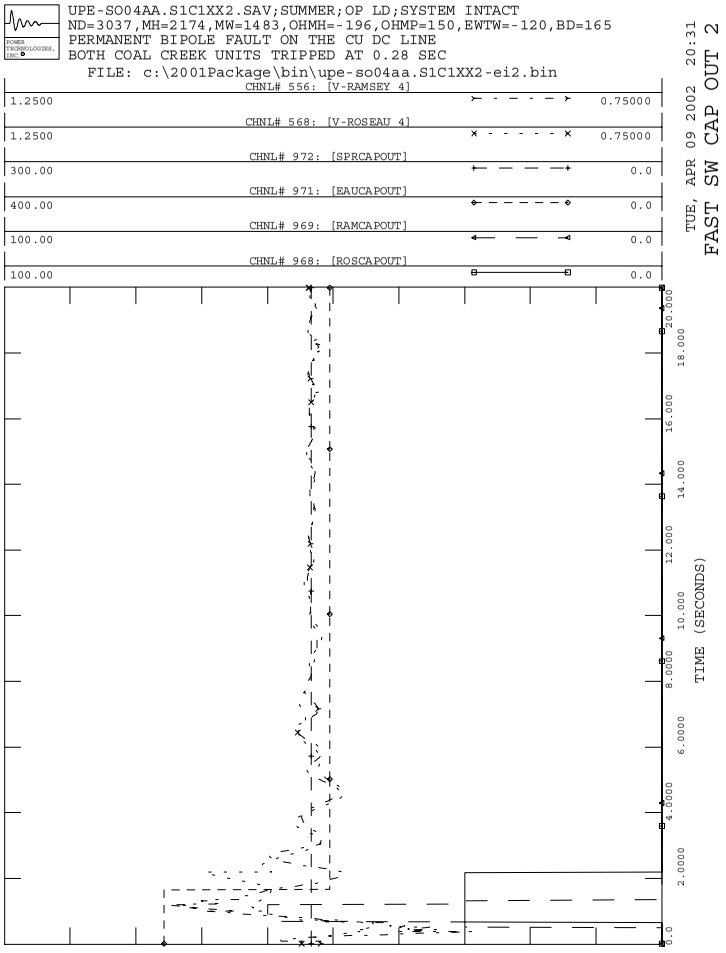
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
VOLTAGES NB




UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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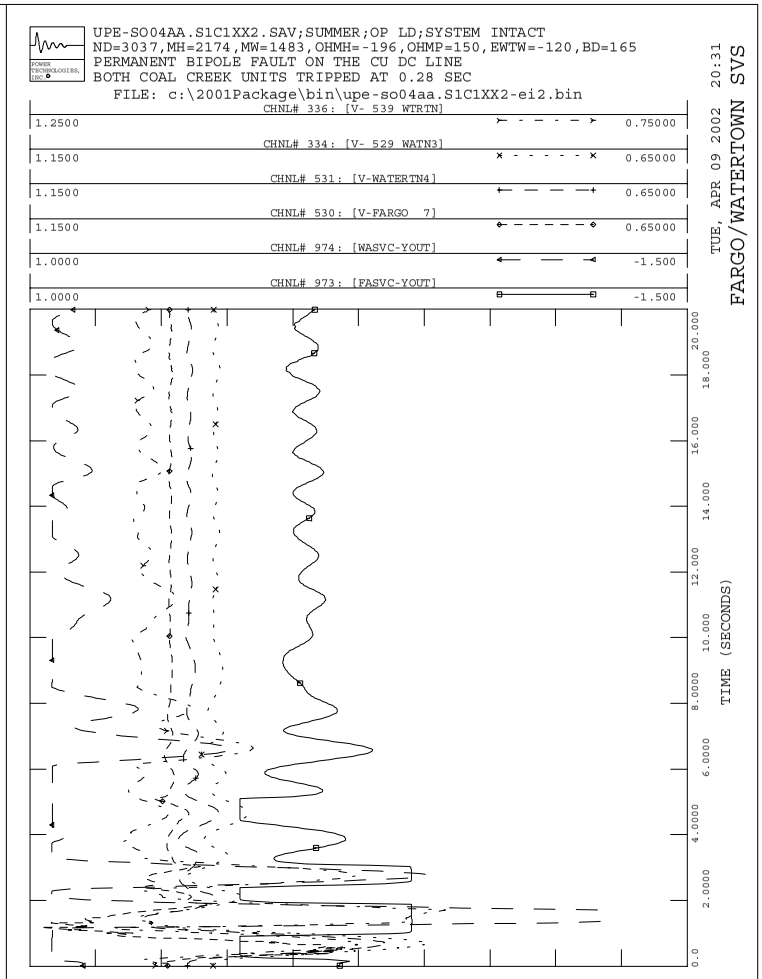
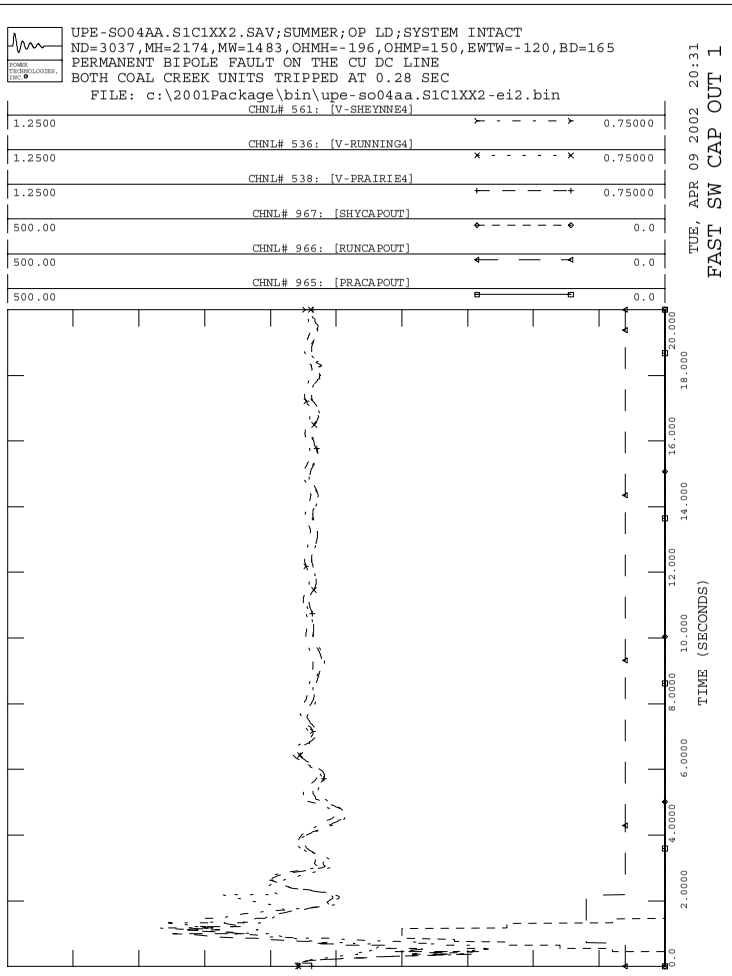
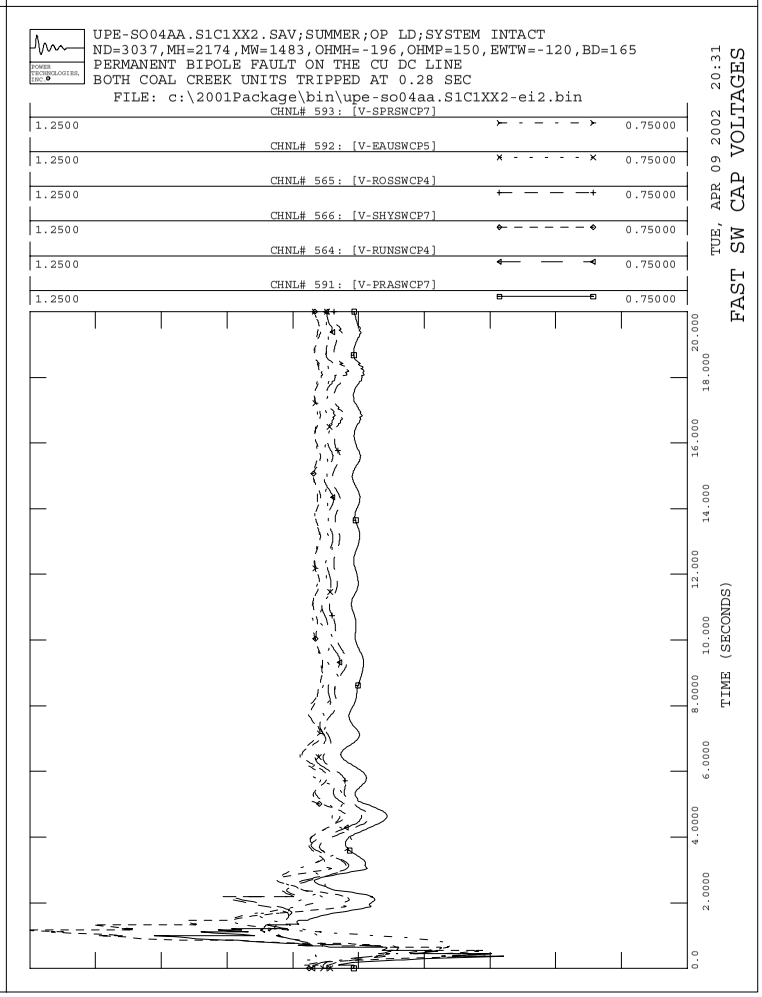
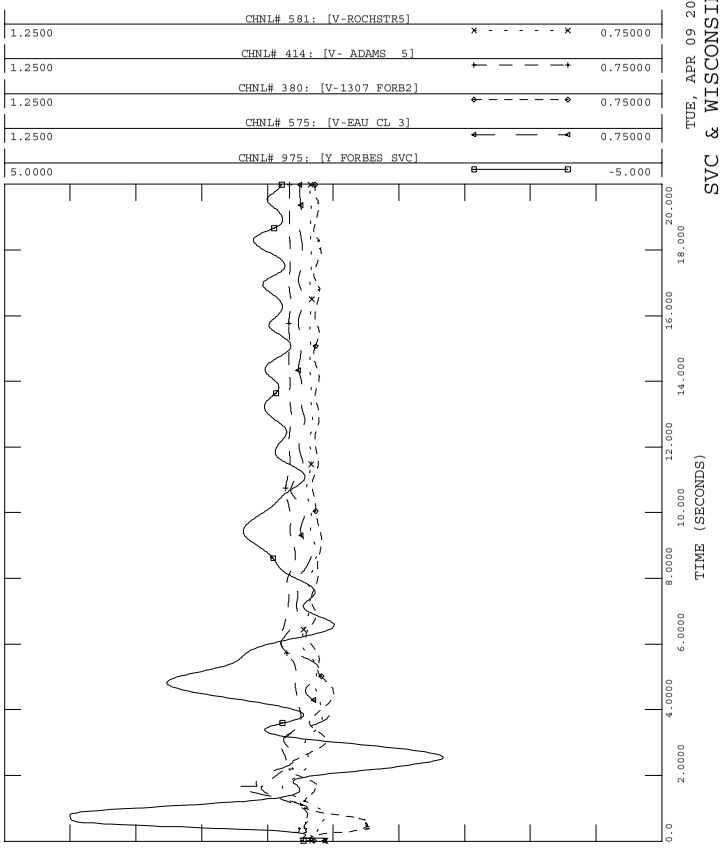
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TUE, APR 09 2002 20:31
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TUE, APR 09 2002 20:31
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TUE, APR 09 2002 20:31
FAST SW CAP OUT 1
TIME (SECONDS)

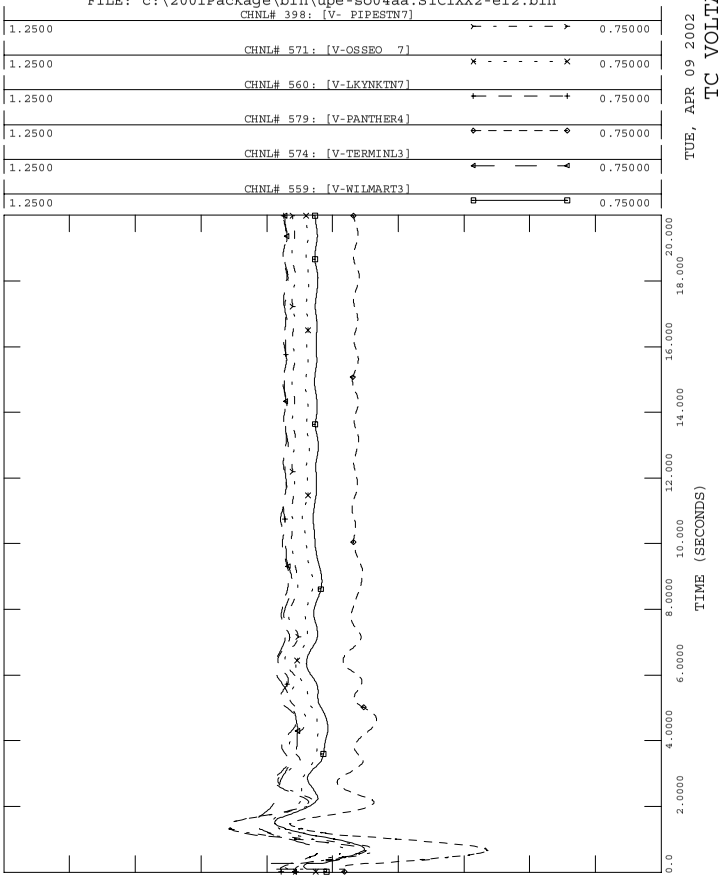

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TUE, APR 09 2002 20:31
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



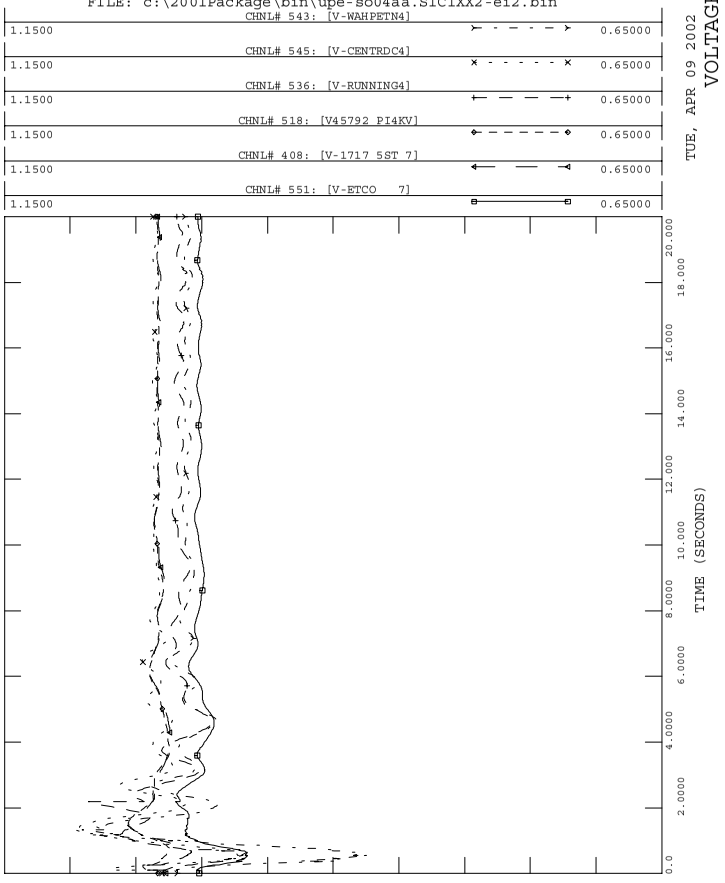
TUE, APR 09 2002 20:31
SVC & WISCONSIN VOLT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



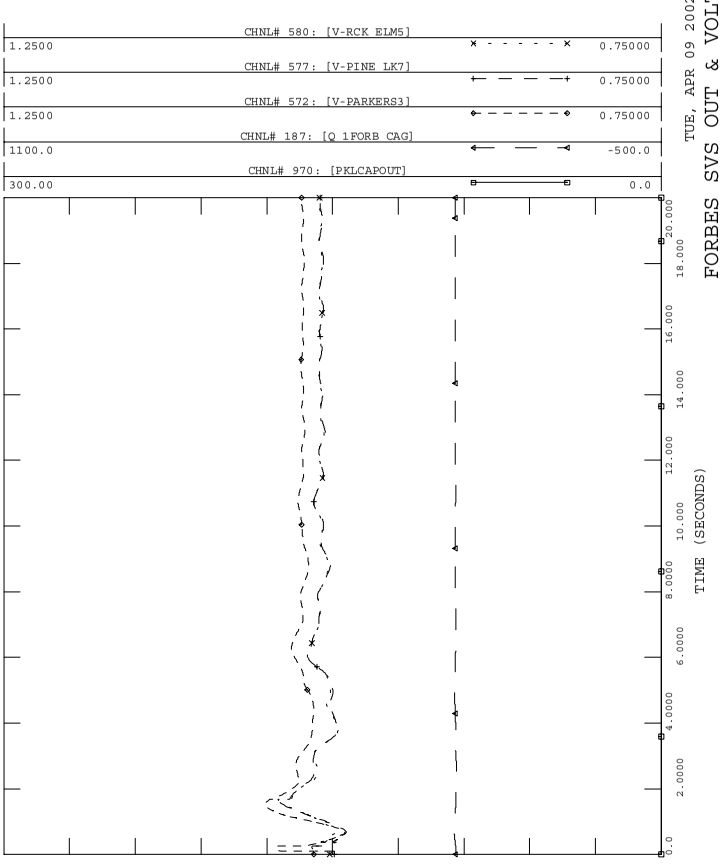
TUE, APR 09 2002 20:31
TC VOLTAGES

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



TUE, APR 09 2002 20:31
VOLTAGES 6

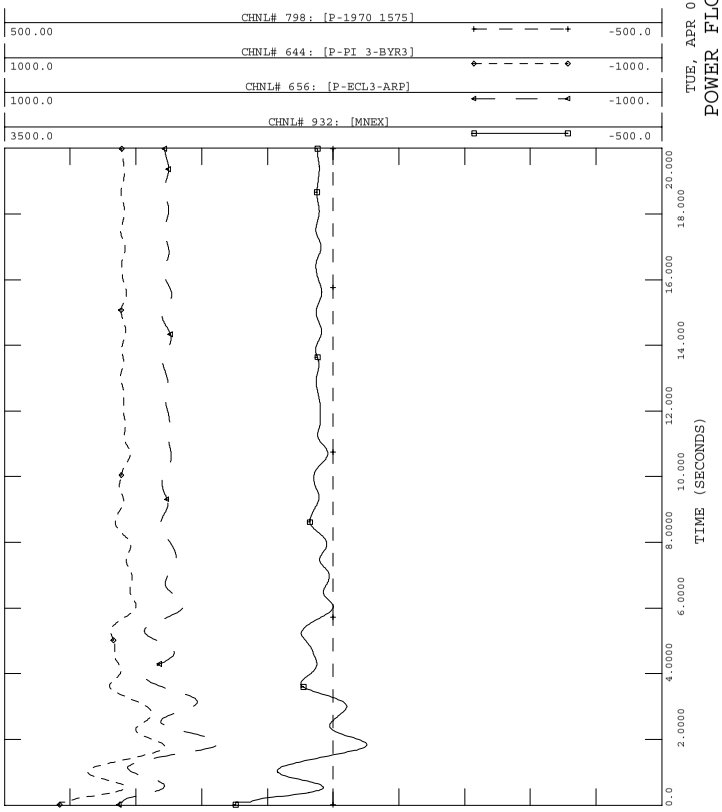
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



TUE, APR 09 2002 20:31
FORBES SVS OUT & VOLTAGES

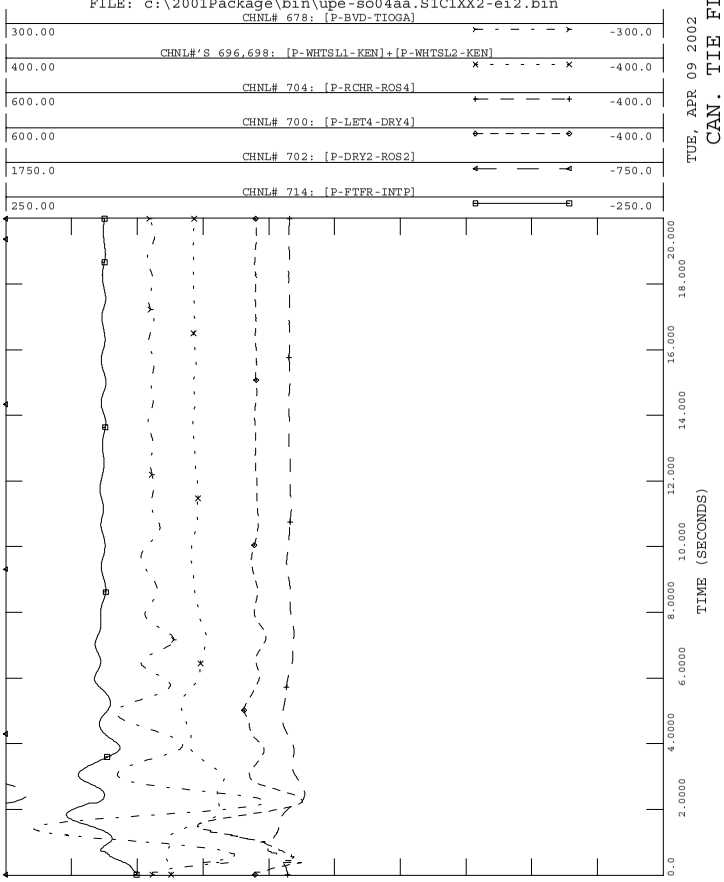
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
POWER FLOW SUMS 2



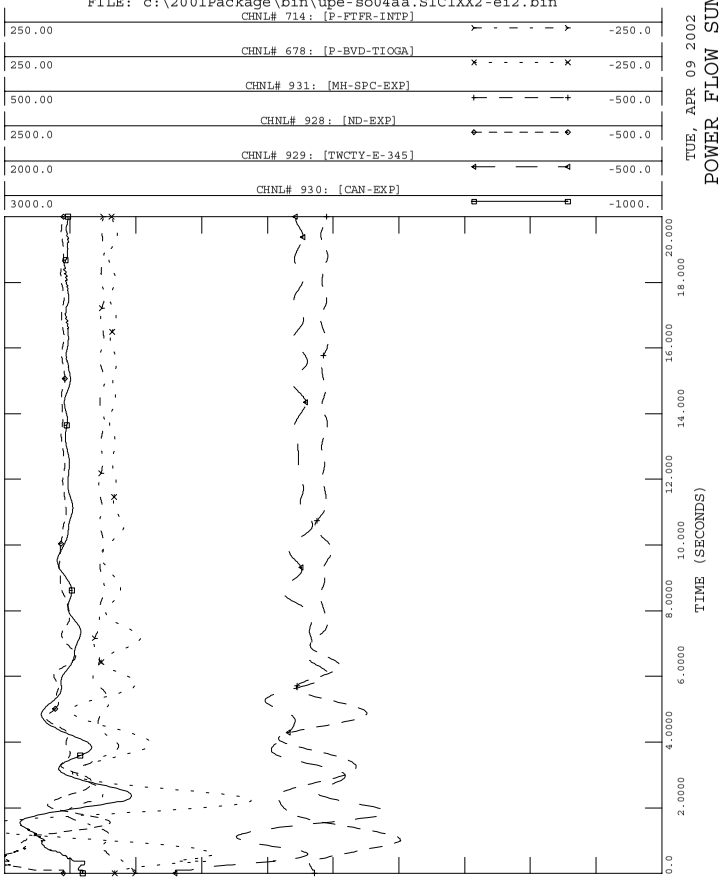
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
CAN. TIE FLOWS



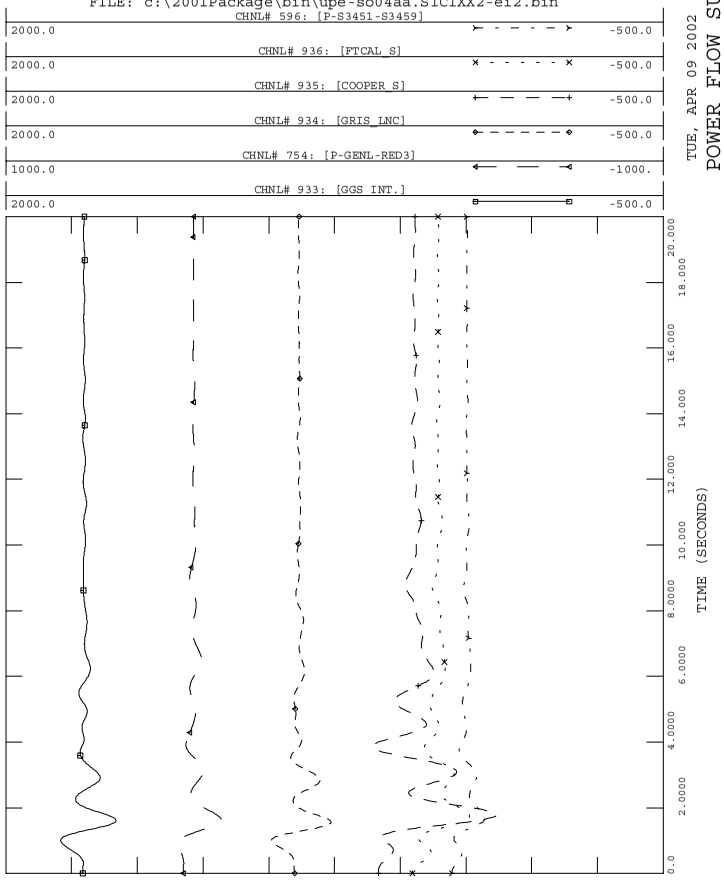
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
POWER FLOW SUMS 1



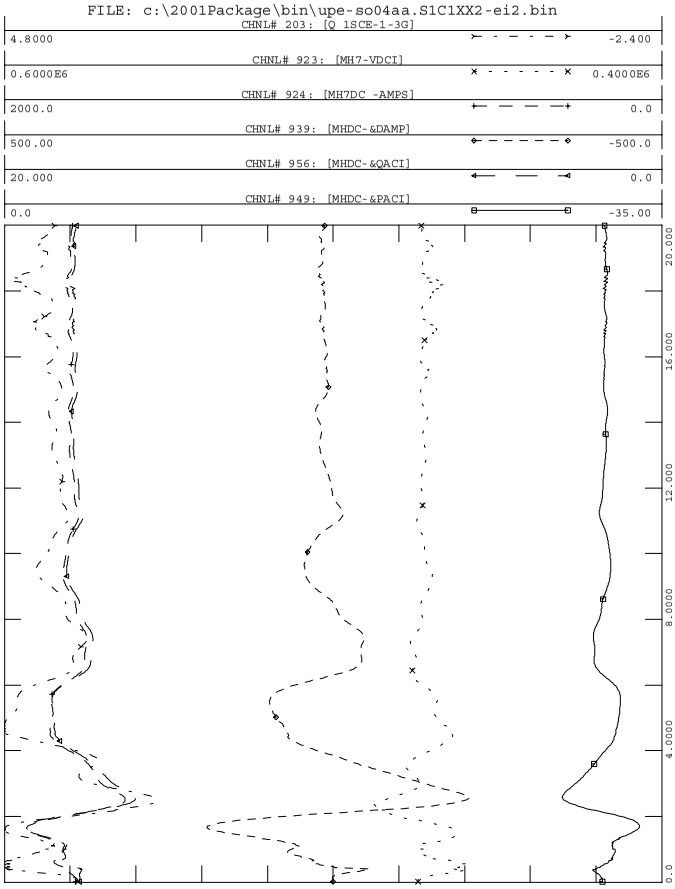
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
POWER FLOW SUM 3



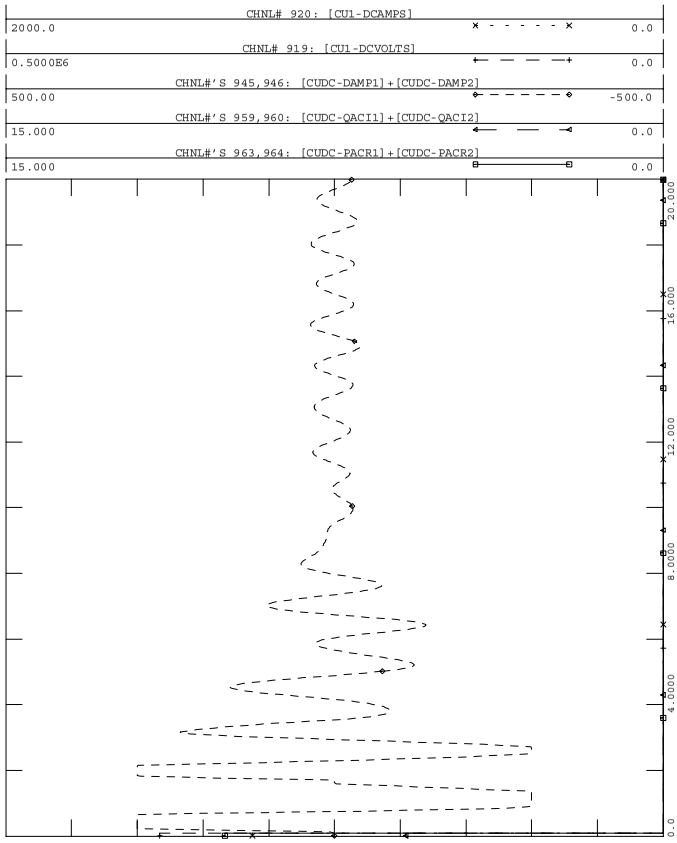
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
MH DC PARAMETERS



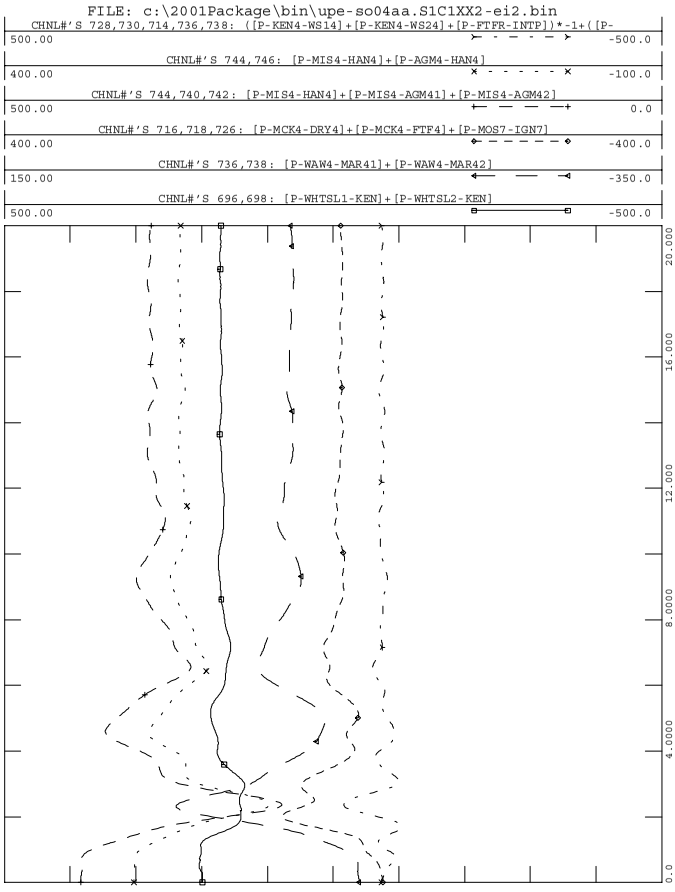
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

TUE, APR 09 2002 20:31
CU DC #1



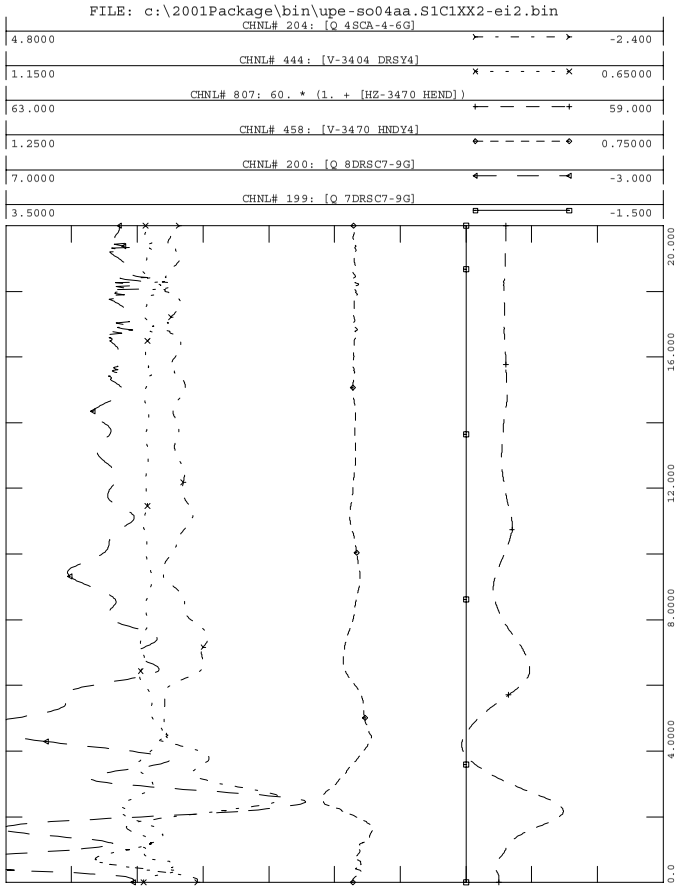
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

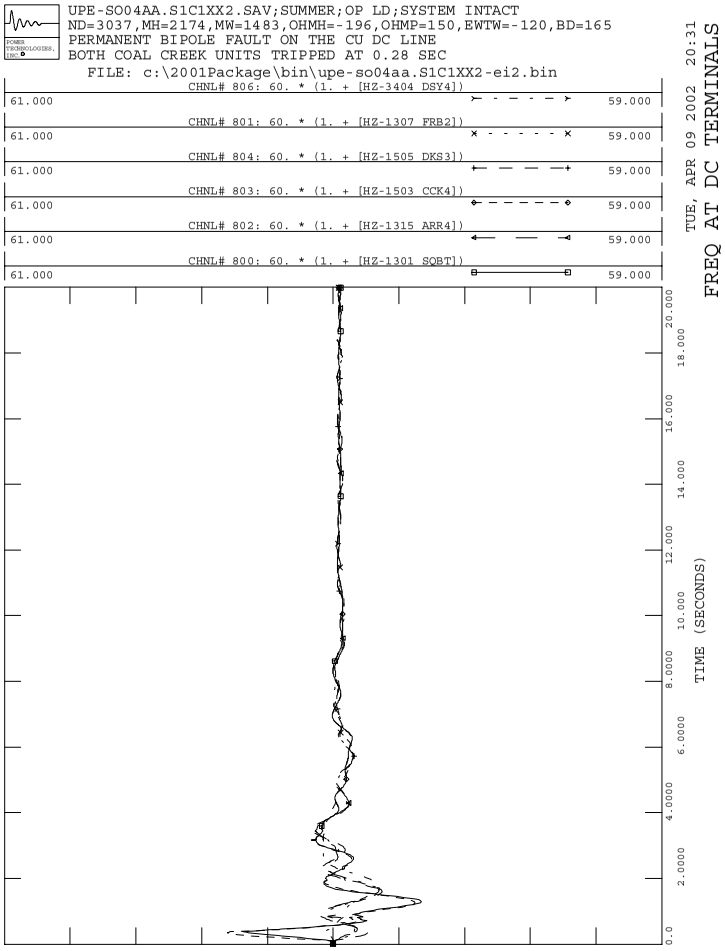
TUE, APR 09 2002 20:31
OH TIE FLOWS

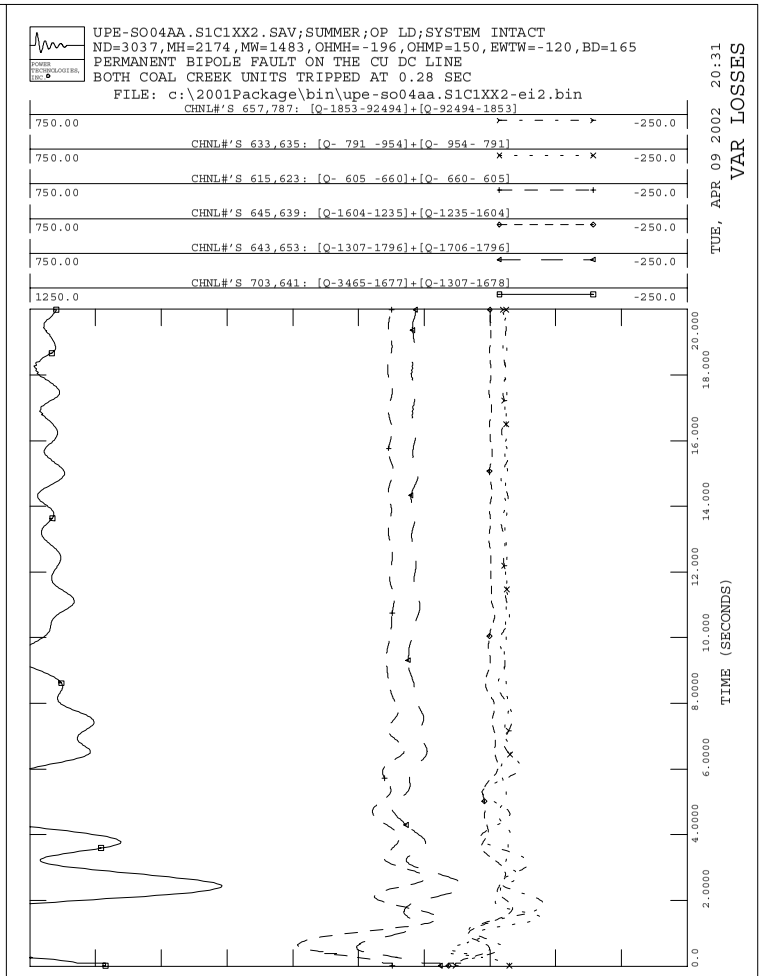


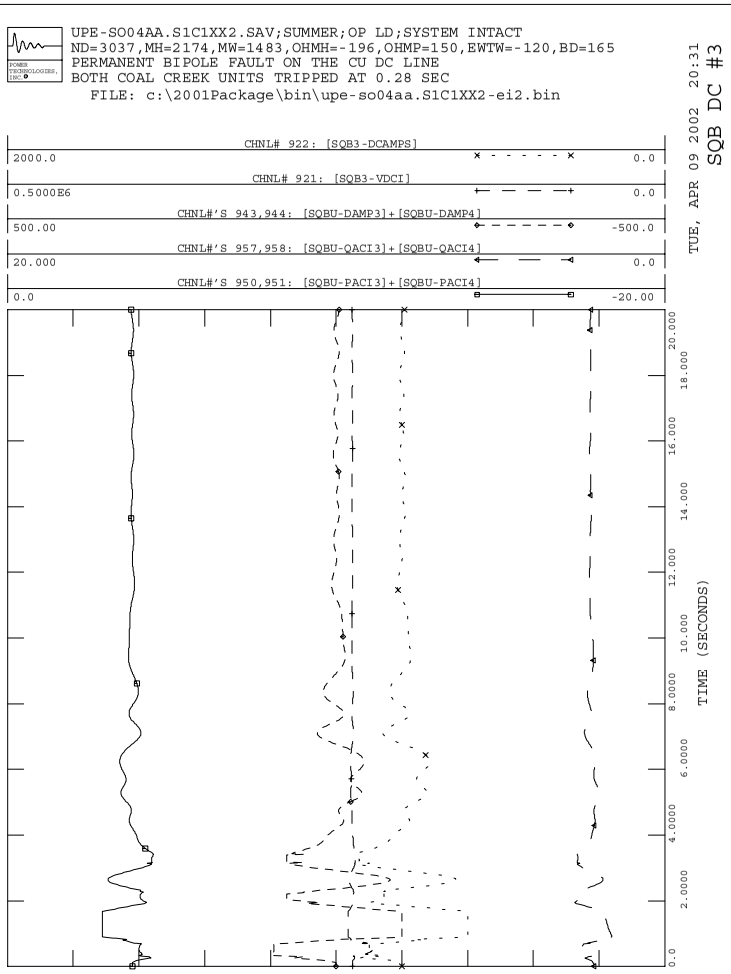
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

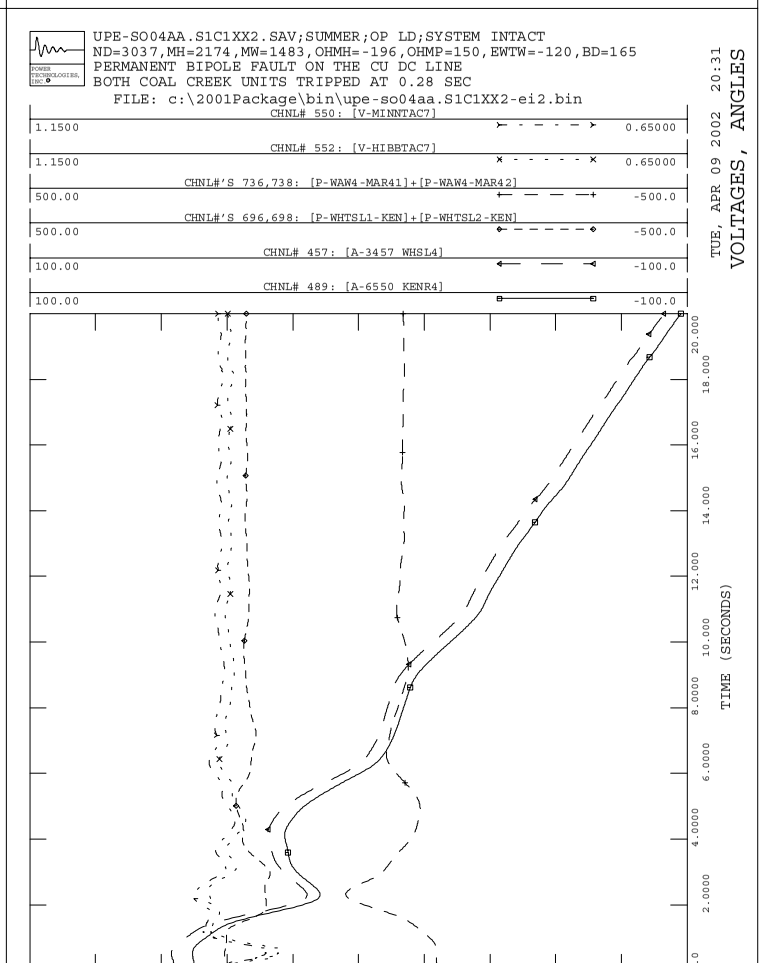
TUE, APR 09 2002 20:31
MH DC PARAMETERS




UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
TUE, APR 09 2002 20:31
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
TUE, APR 09 2002 20:31
VAR LOSSES
TIME (SECONDS)

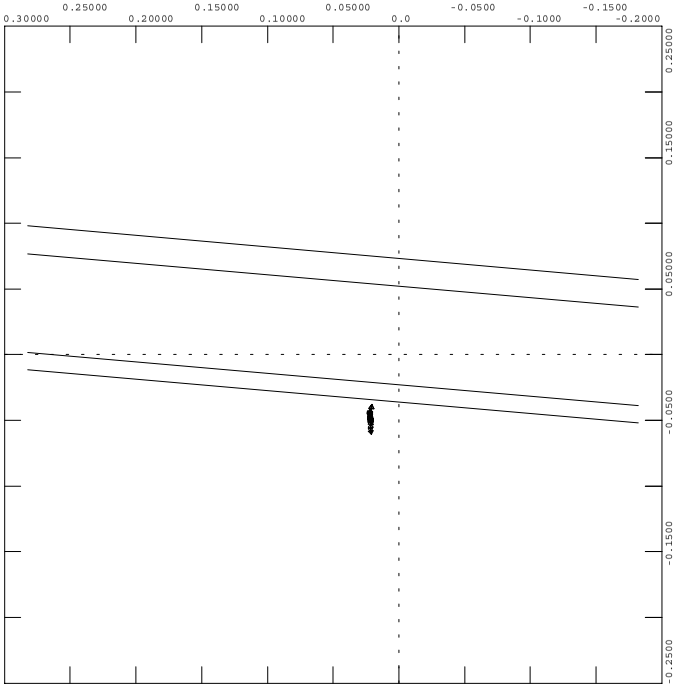

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
TUE, APR 09 2002 20:31
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
TUE, APR 09 2002 20:31
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

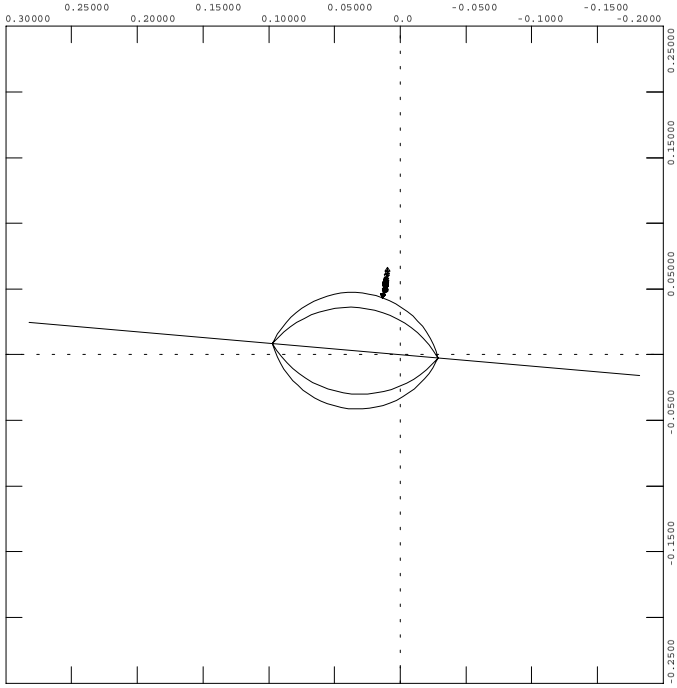


TUE, APR 09 2002 20:31
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

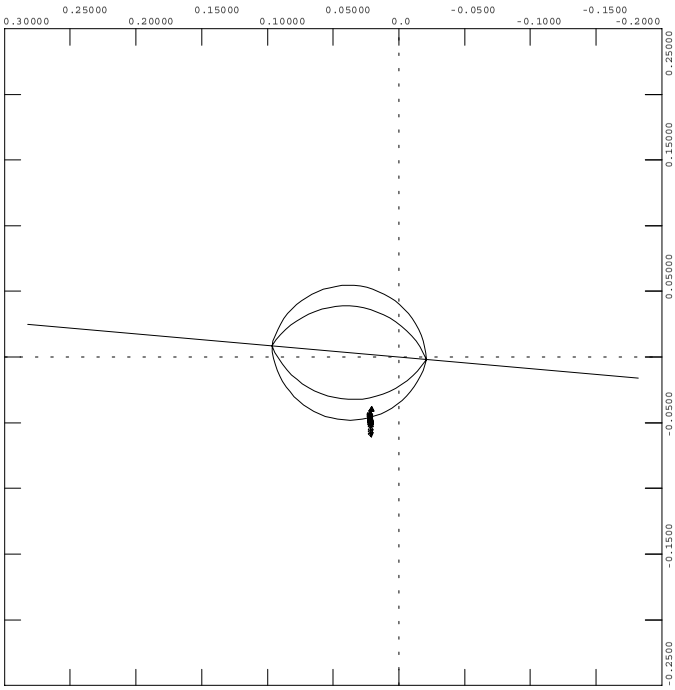


TUE, APR 09 2002 20:31
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

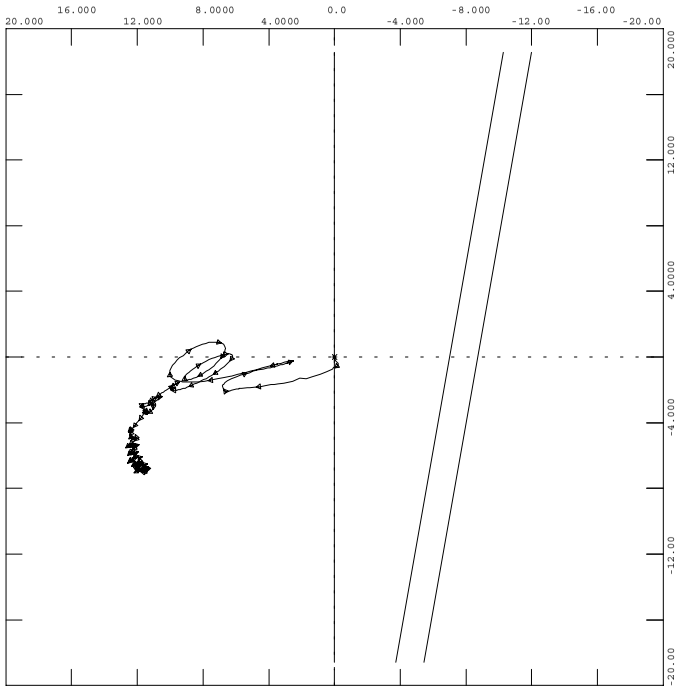


TUE, APR 09 2002 20:31
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

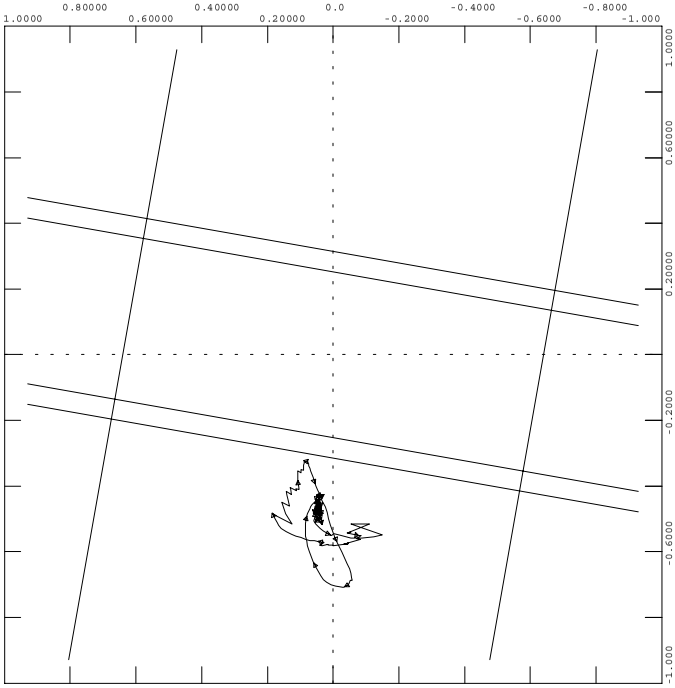


TUE, APR 09 2002 20:31
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

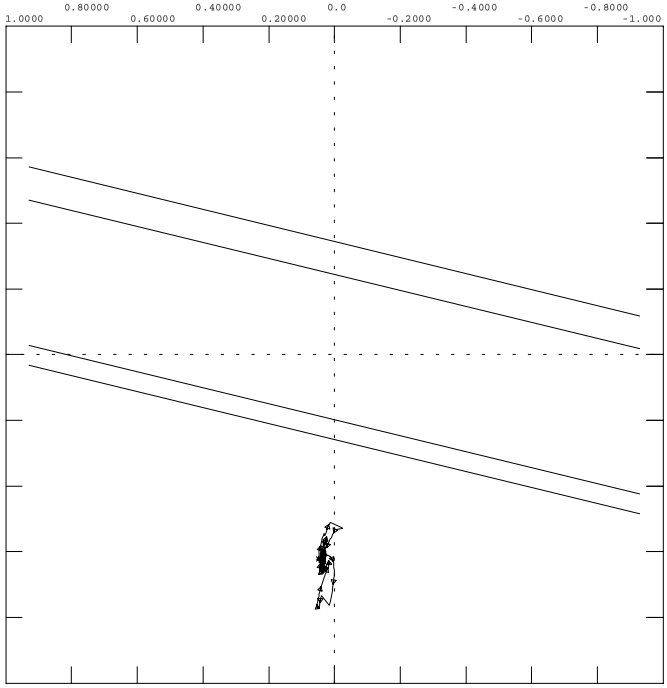


TUE, APR 09 2002 20:31
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

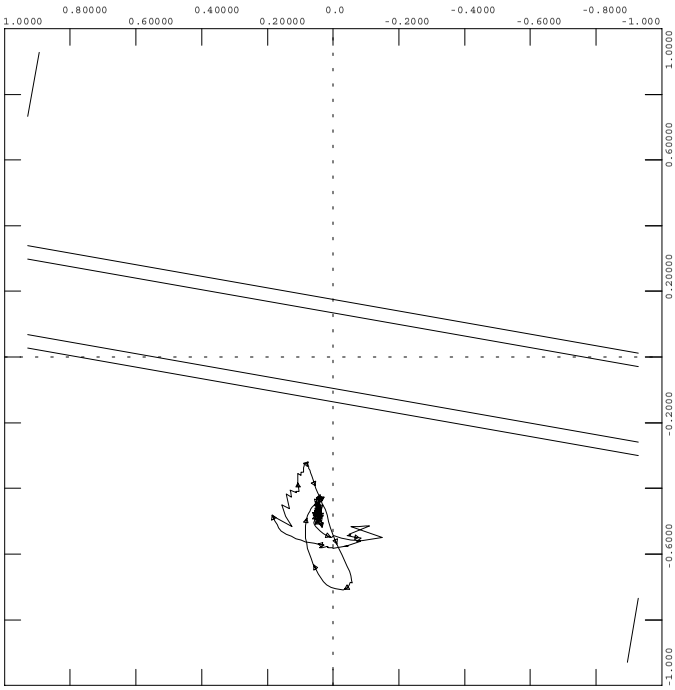


TUE, APR 09 2002 20:31
R50M AT MORANVILLE (520)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

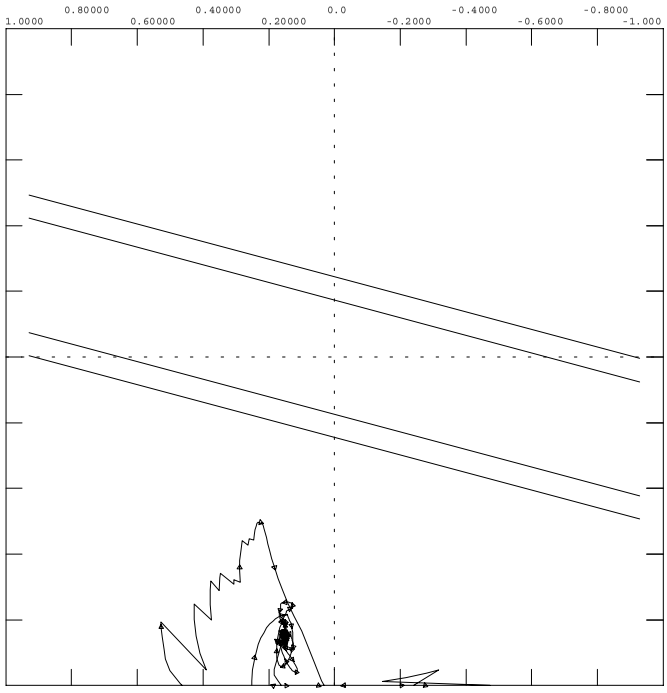


TUE, APR 09 2002 20:31
L20D AT DRAYTON (506)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

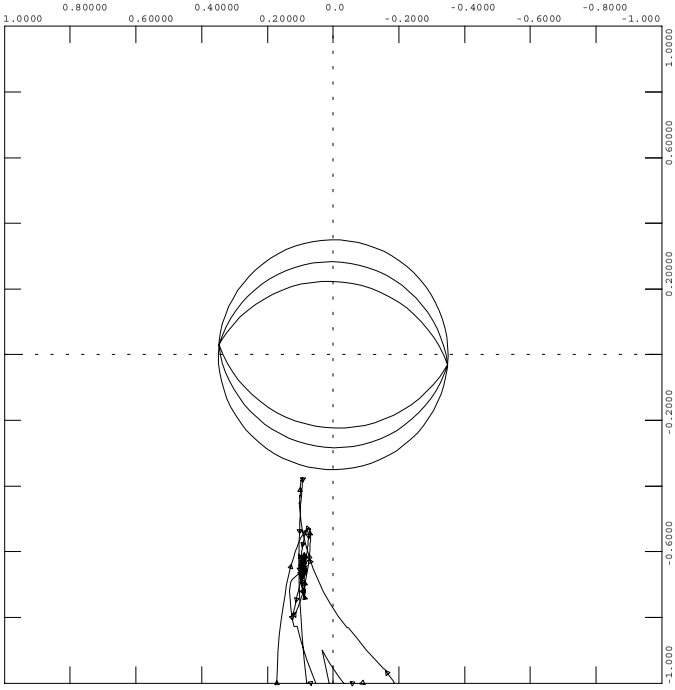


TUE, APR 09 2002 20:31
L20D-PRAIRIE (510)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

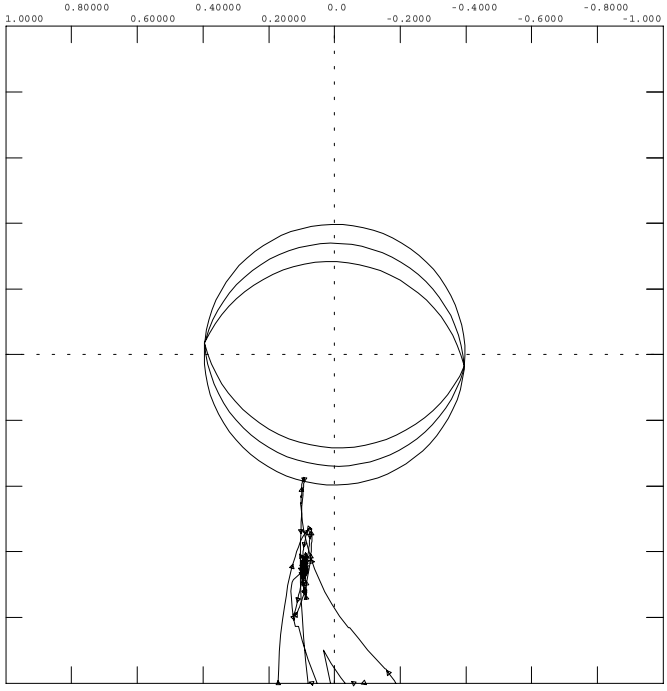
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

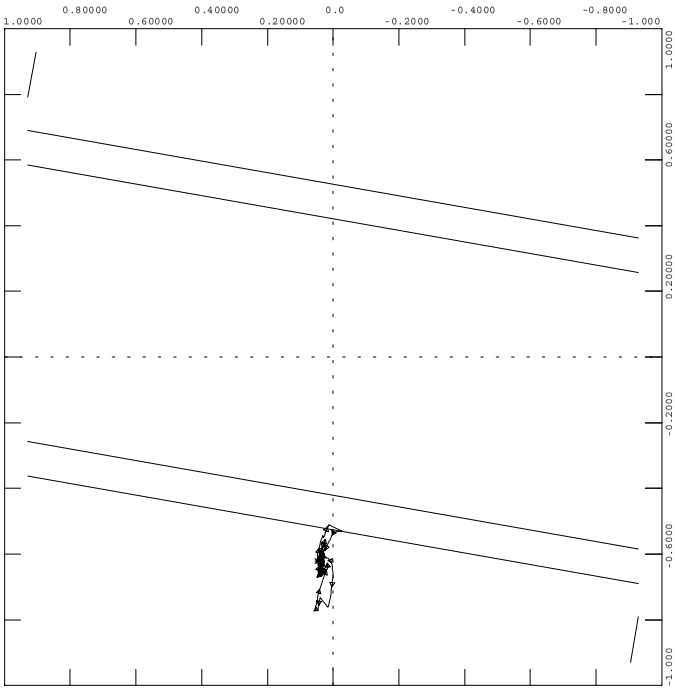
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

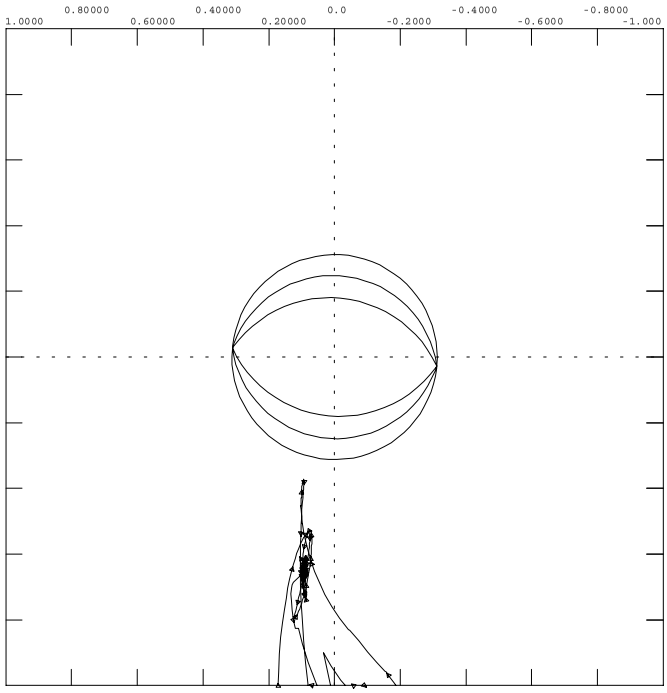
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



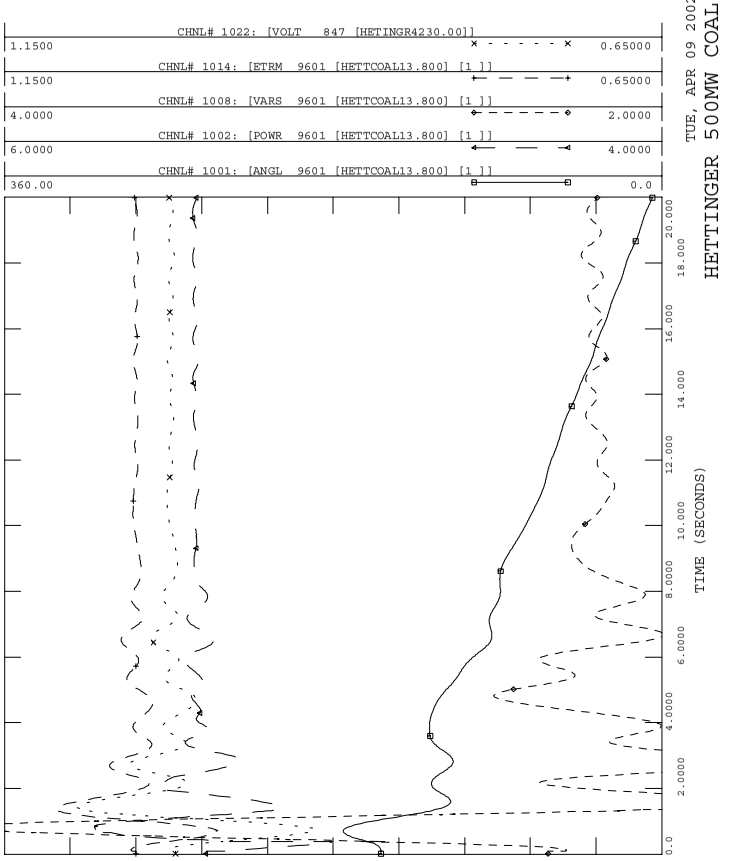
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

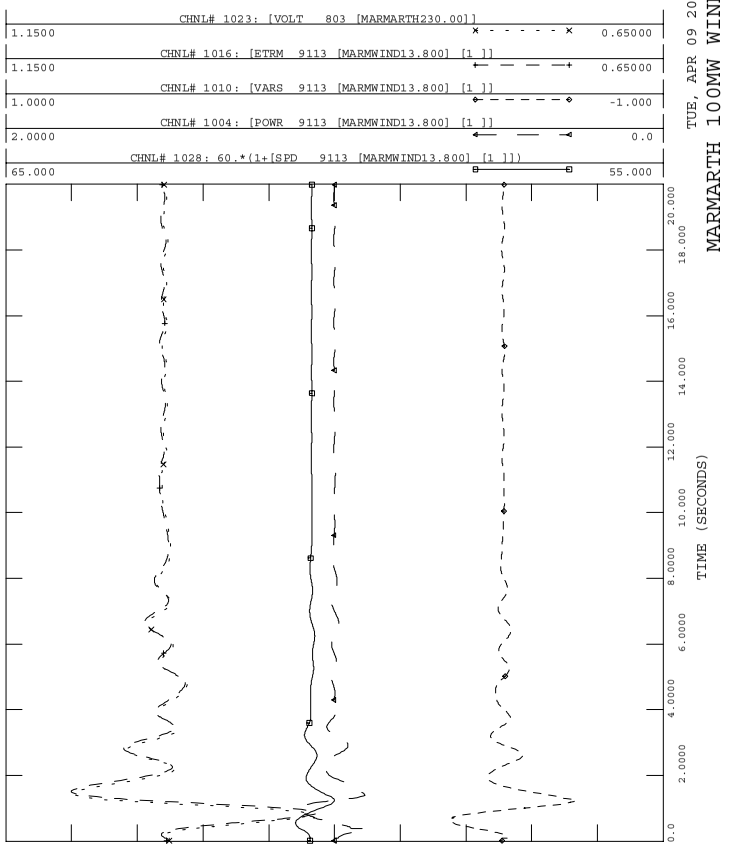


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



TUE, APR 09 2002 20:31
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

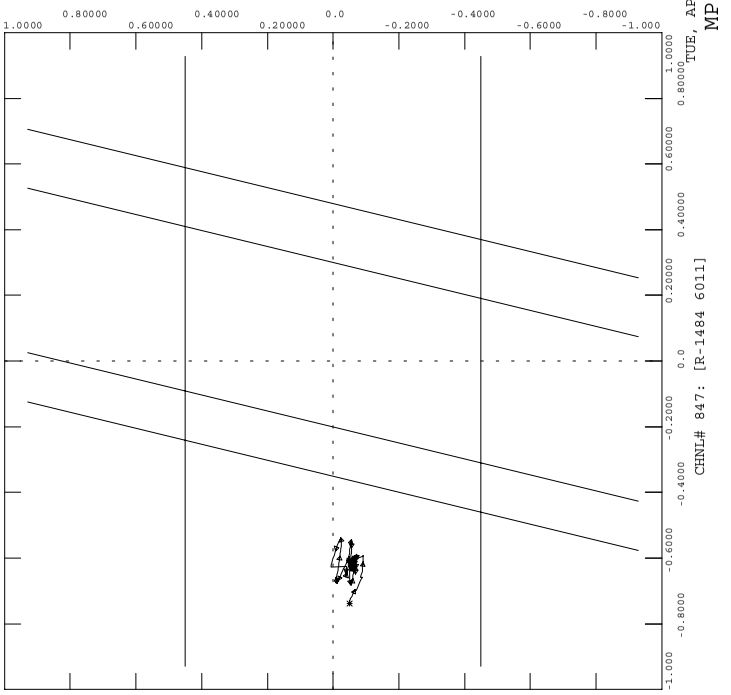


TUE, APR 09 2002 20:31
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

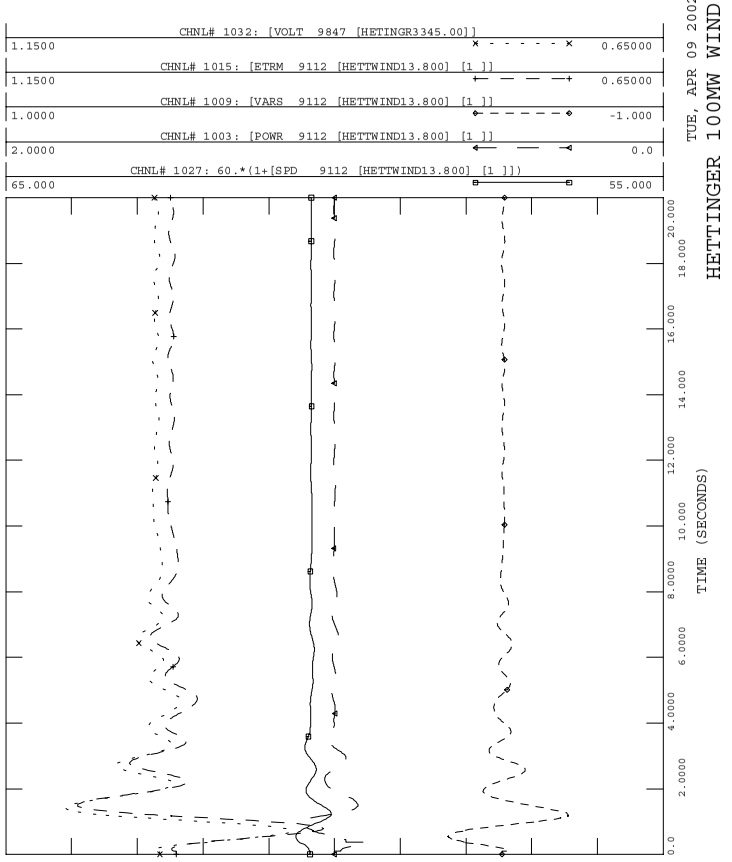
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



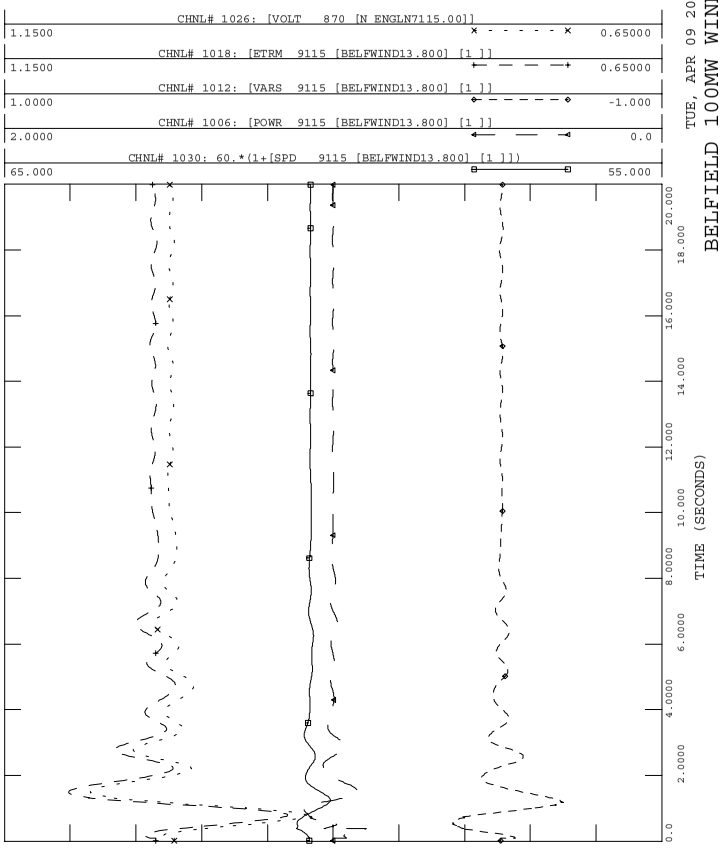
TUE, APR 09 2002 20:31
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



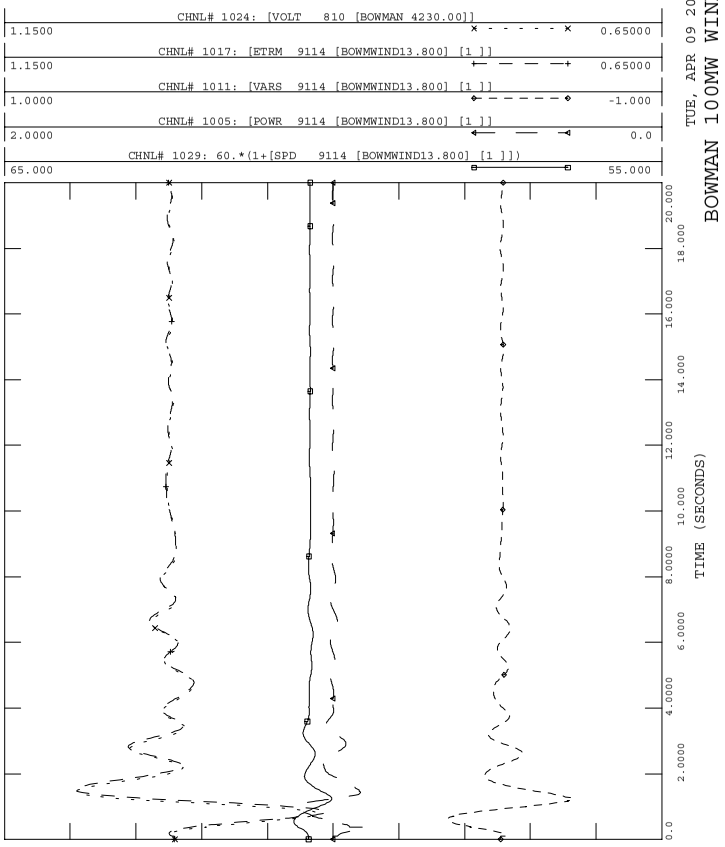
TUE, APR 09 2002 20:31
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



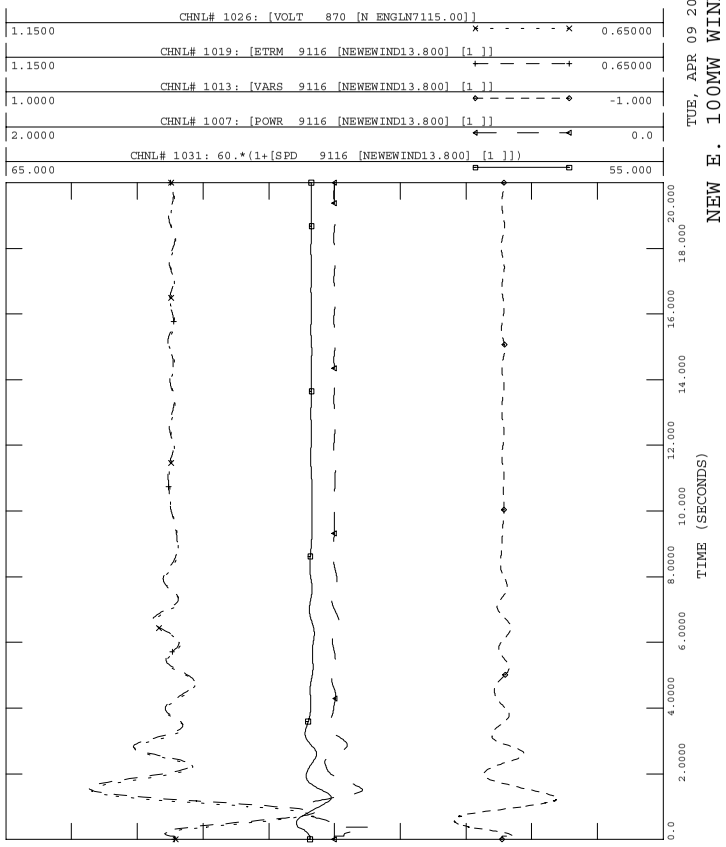
TUE, APR 09 2002 20:31
BELFIELD 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



TUE, APR 09 2002 20:31
BOWMAN 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-ei2.bin



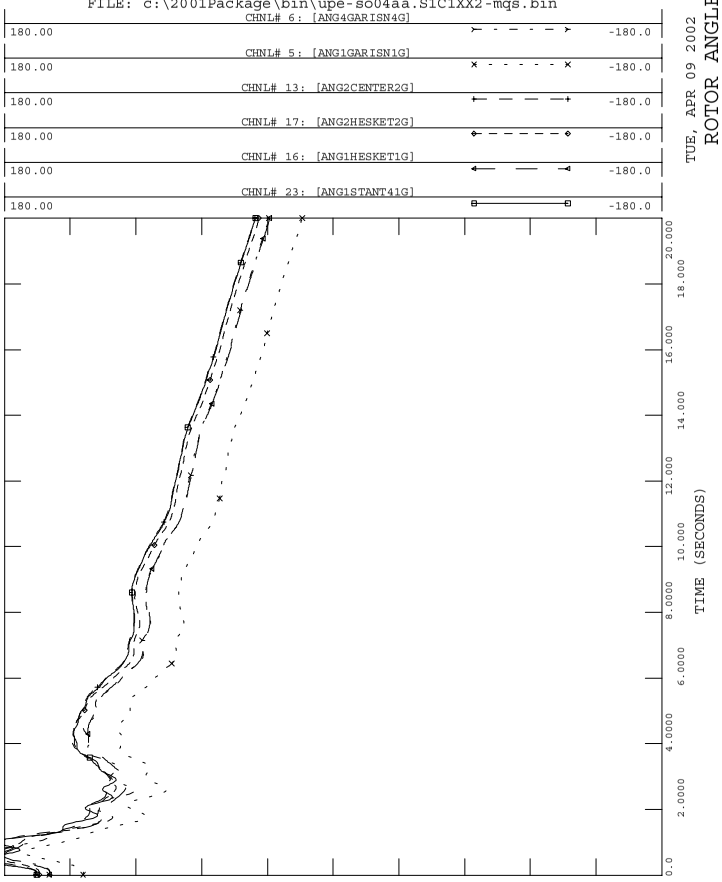
TUE, APR 09 2002 20:31
NEW E. 100MW WIND UNIT

CONTINGENCY MQS

Single line to ground fault with breaker fail at Sherco with 8N28 stuck. Trip Sherco generator 3.

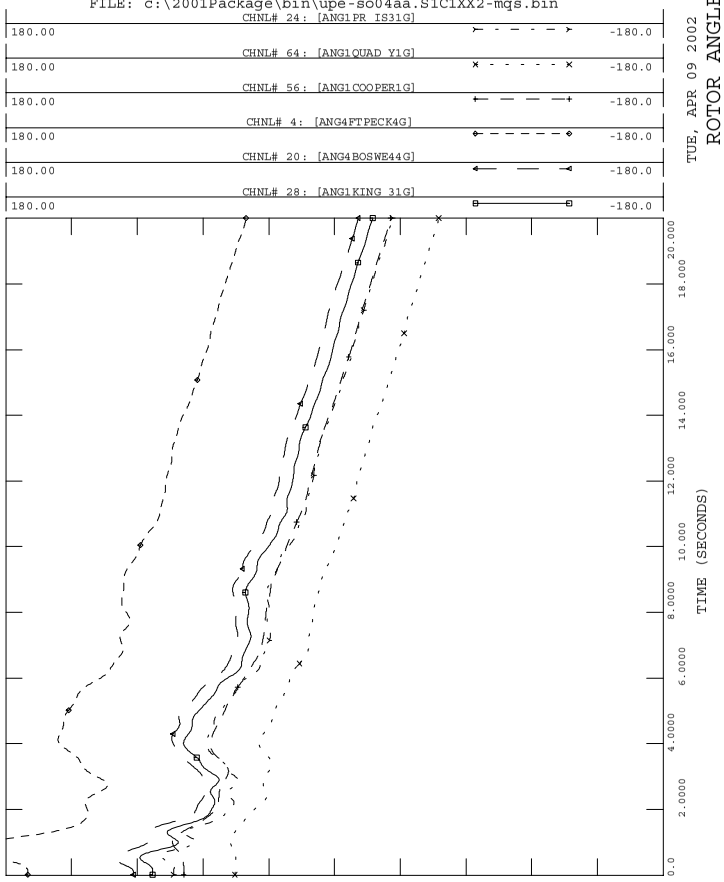
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
ROTOR ANGLES 2



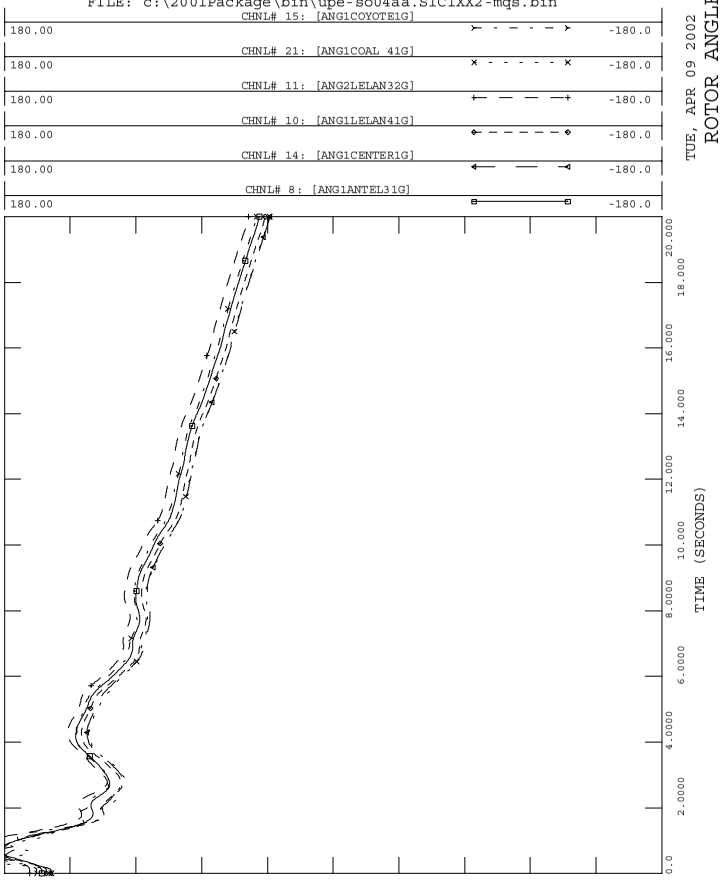
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
ROTOR ANGLES 4



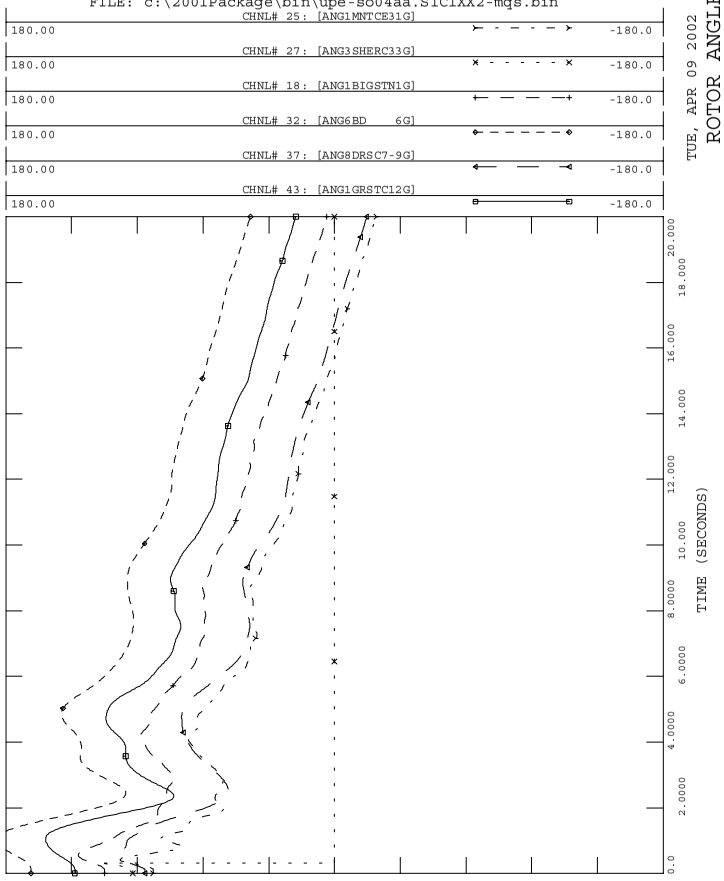
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
ROTOR ANGLES 1

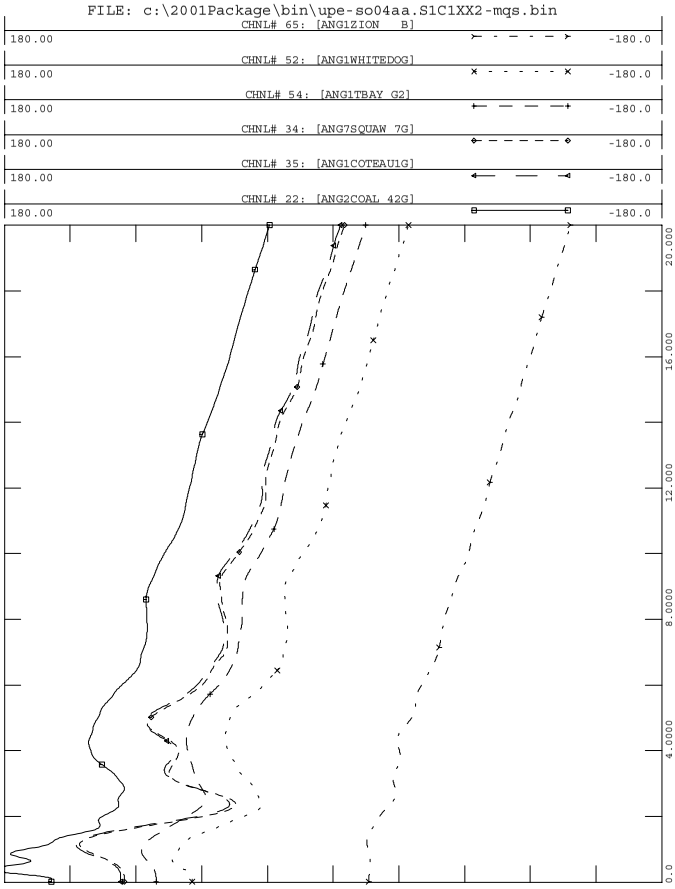


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
ROTOR ANGLES 3

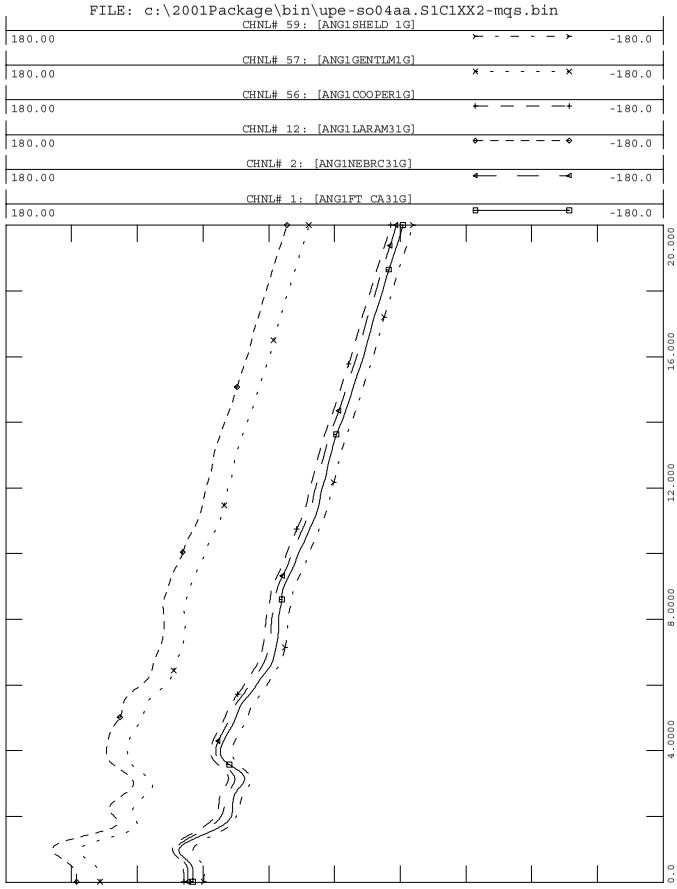


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin



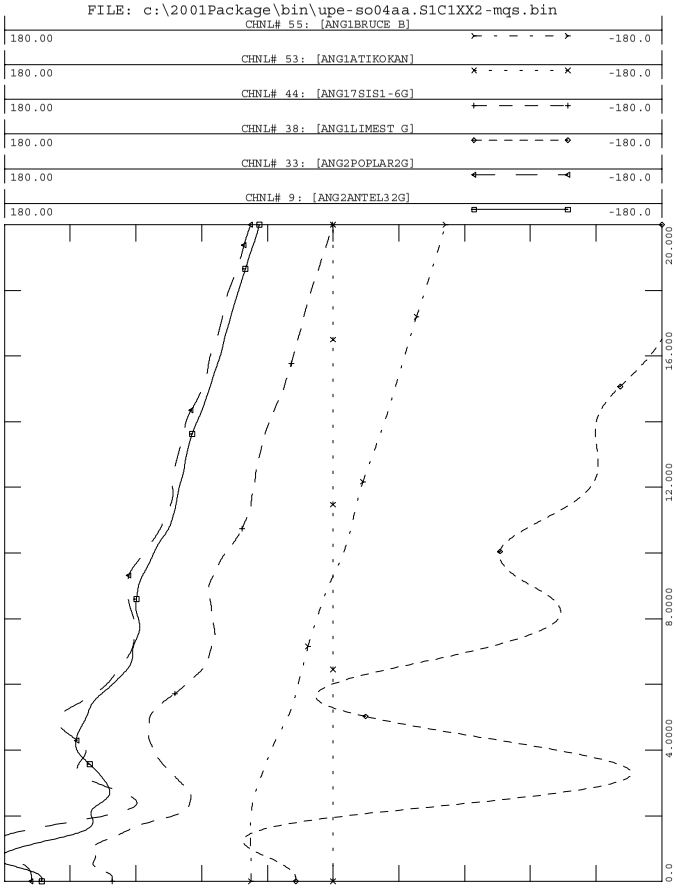
TUE, APR 09 2002 20:46
ROTOR ANGLES 6

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin



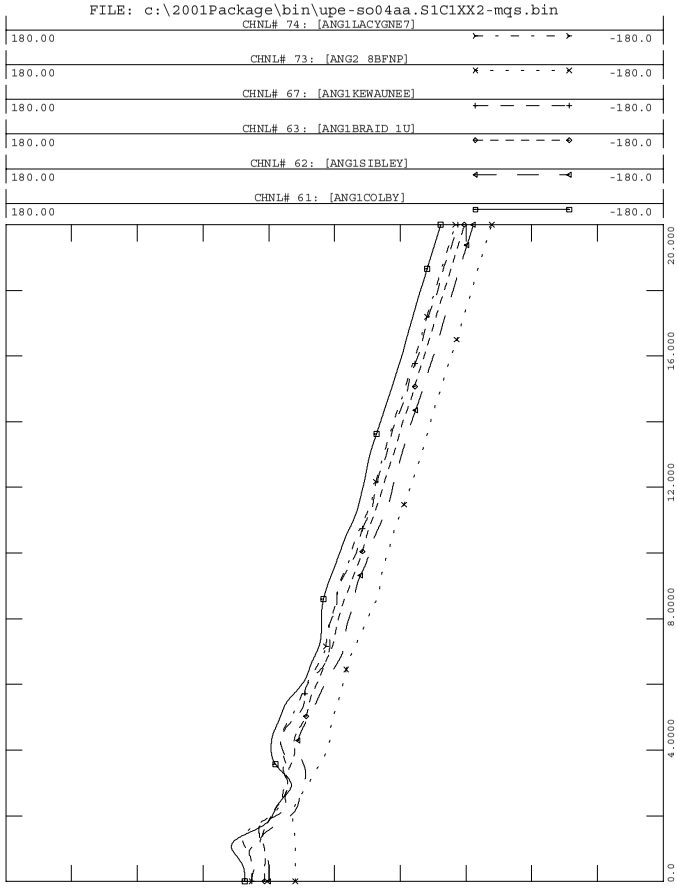
TUE, APR 09 2002 20:46
ROTOR ANGLES NB

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin



TUE, APR 09 2002 20:46
ROTOR ANGLES 5

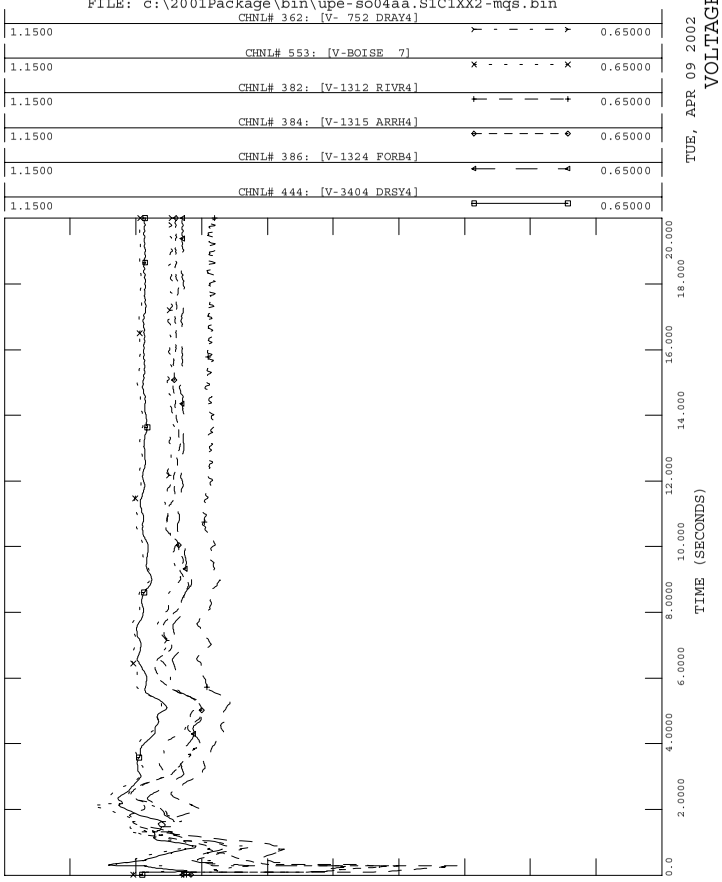
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin



TUE, APR 09 2002 20:46
ROTOR ANGLES 7

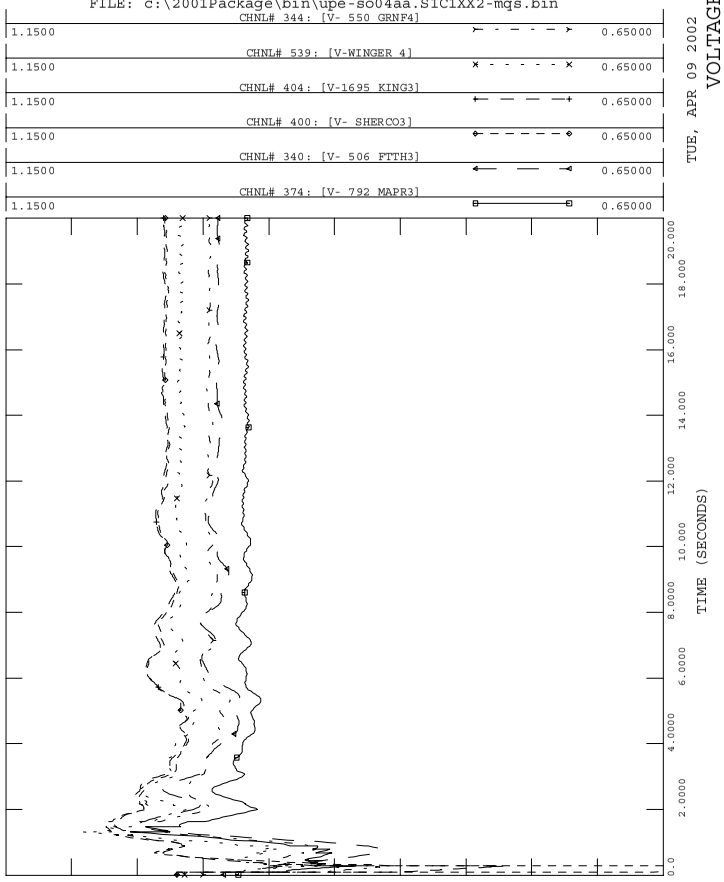
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
VOLTAGES 1



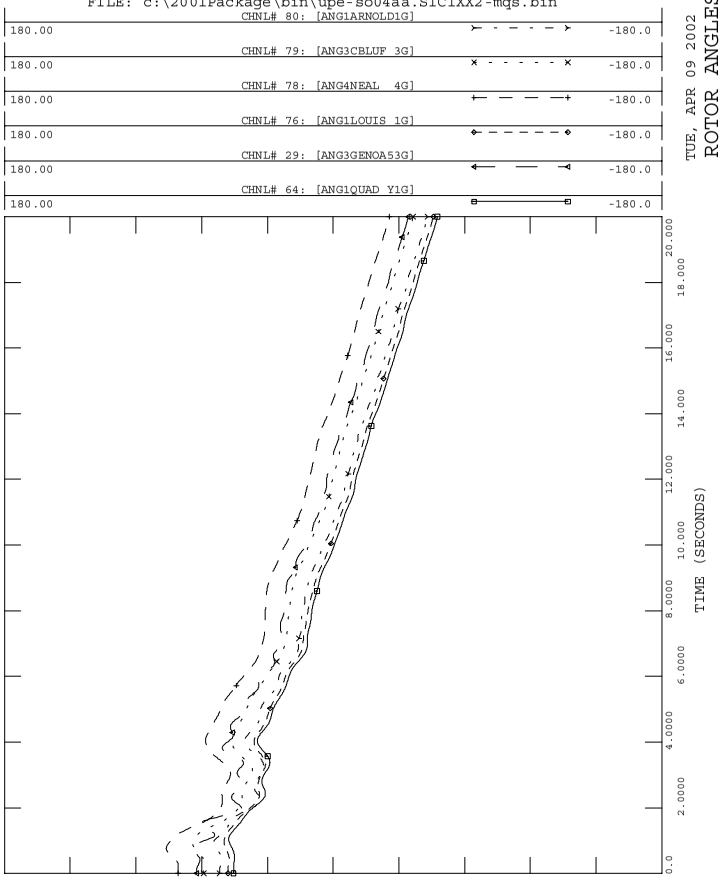
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
VOLTAGES 3



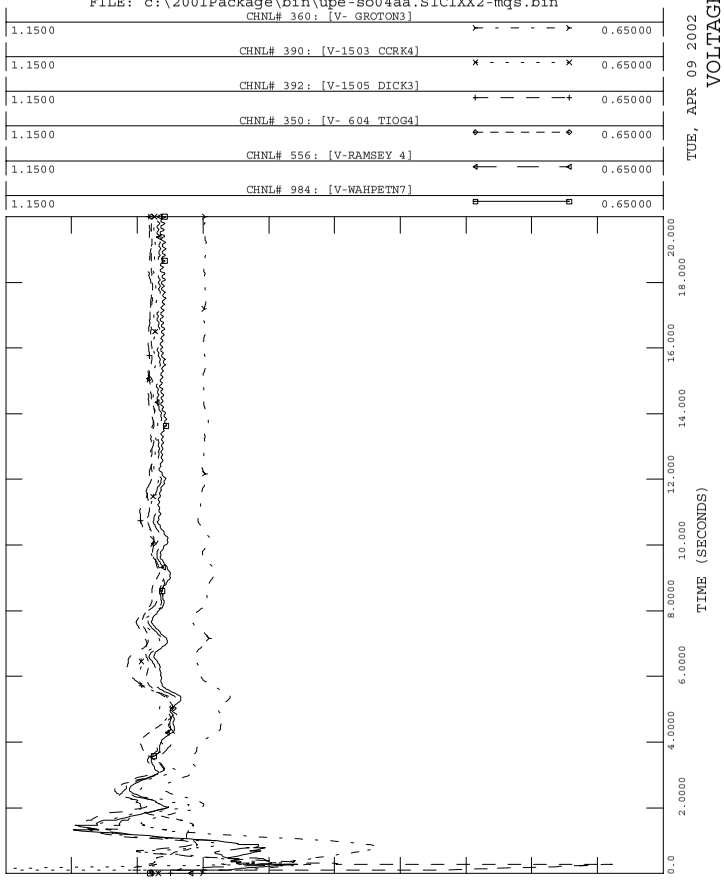
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
ROTOR ANGLES IA



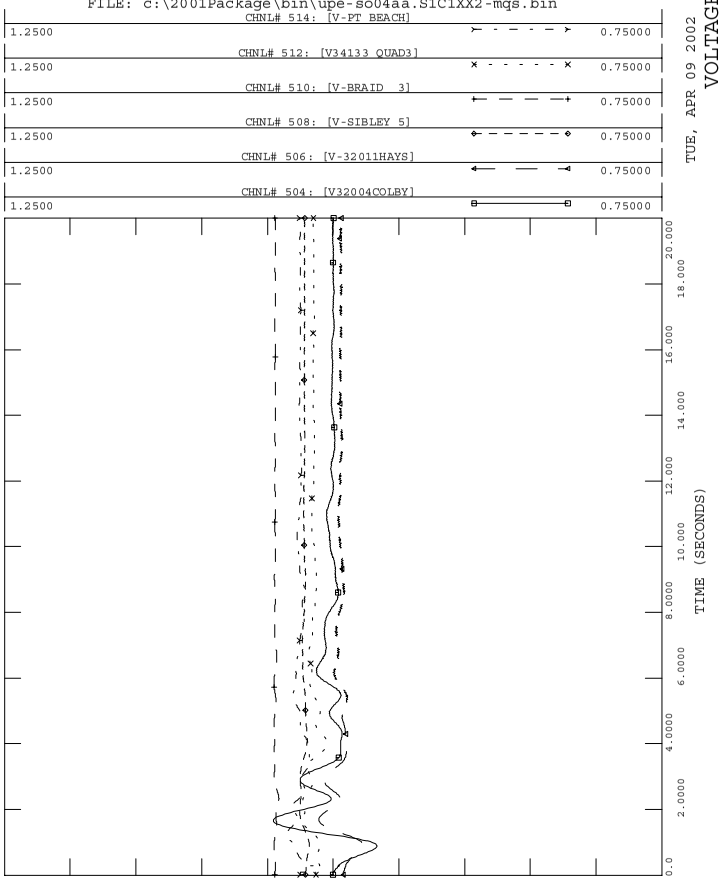
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
VOLTAGES 2



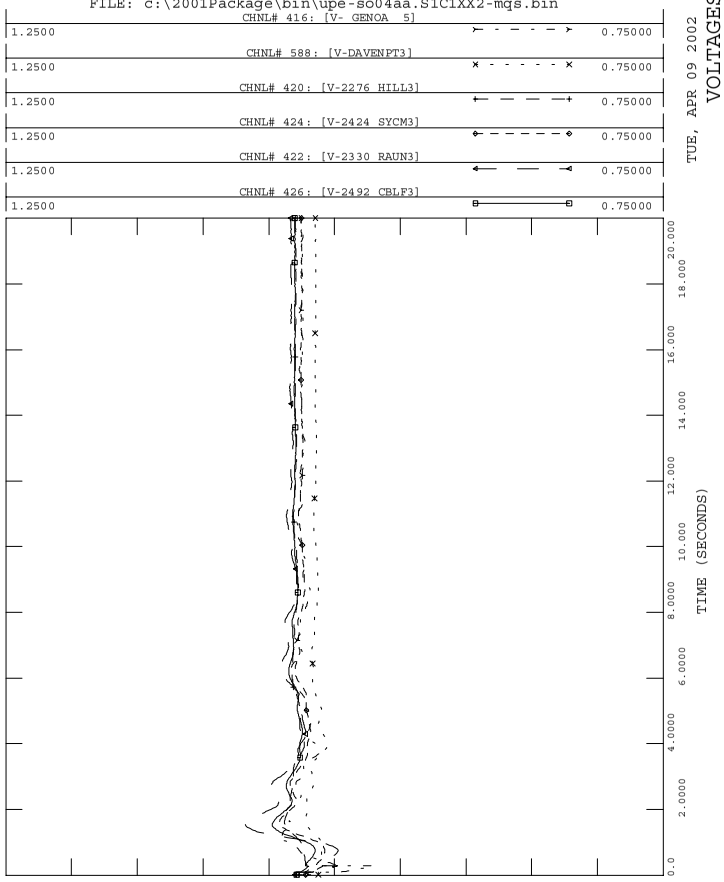
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
VOLTAGES 5



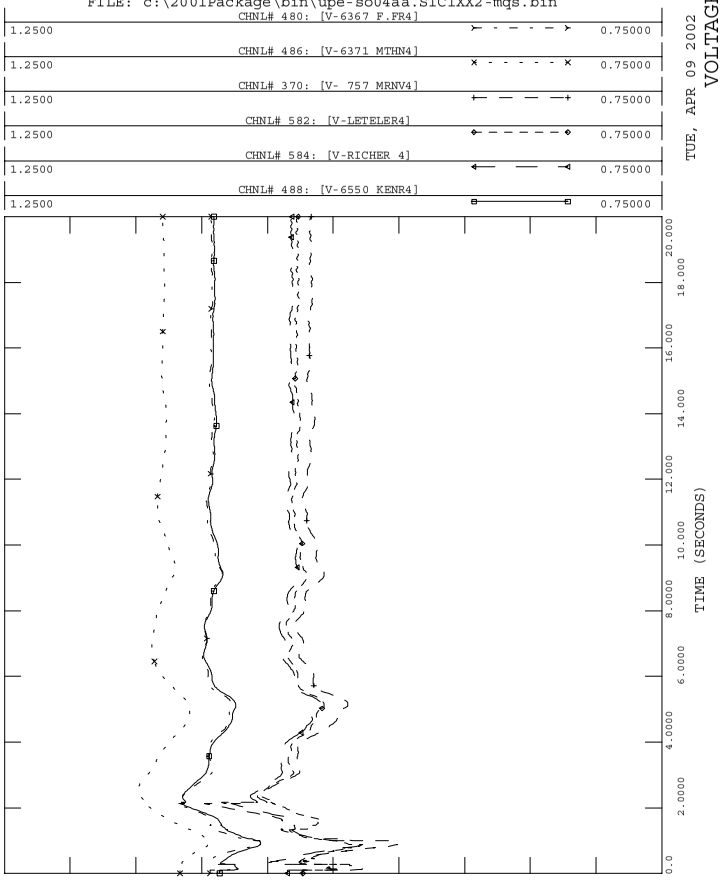
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
VOLTAGES IA



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
VOLTAGES 4



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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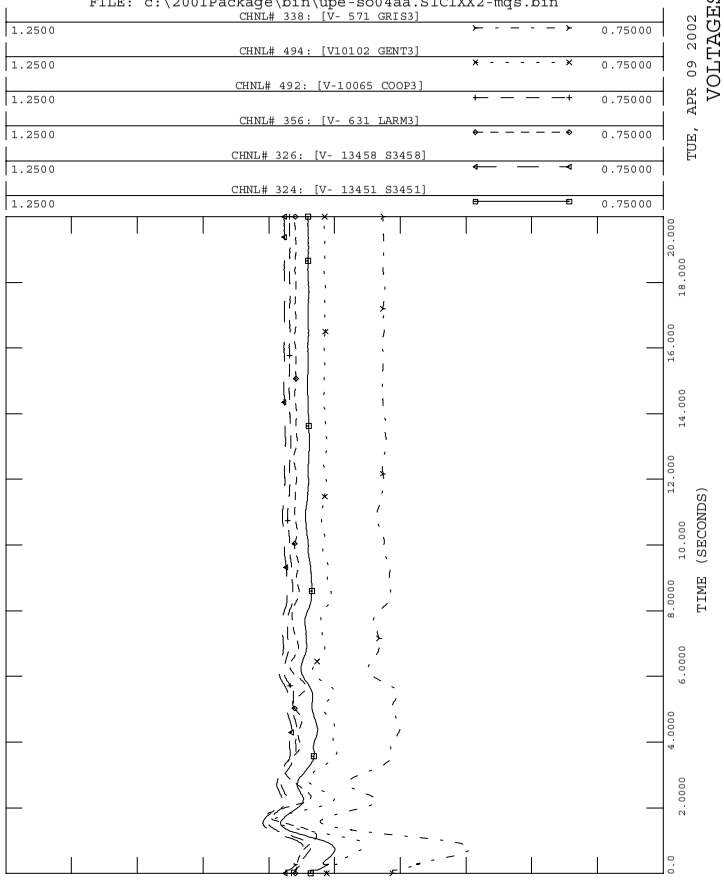
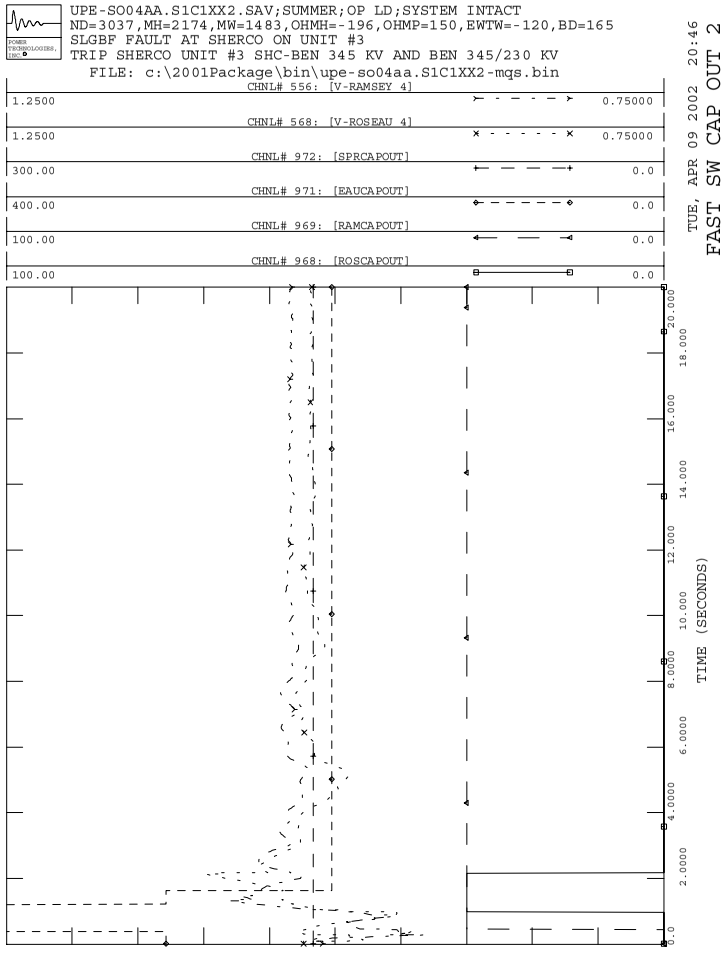
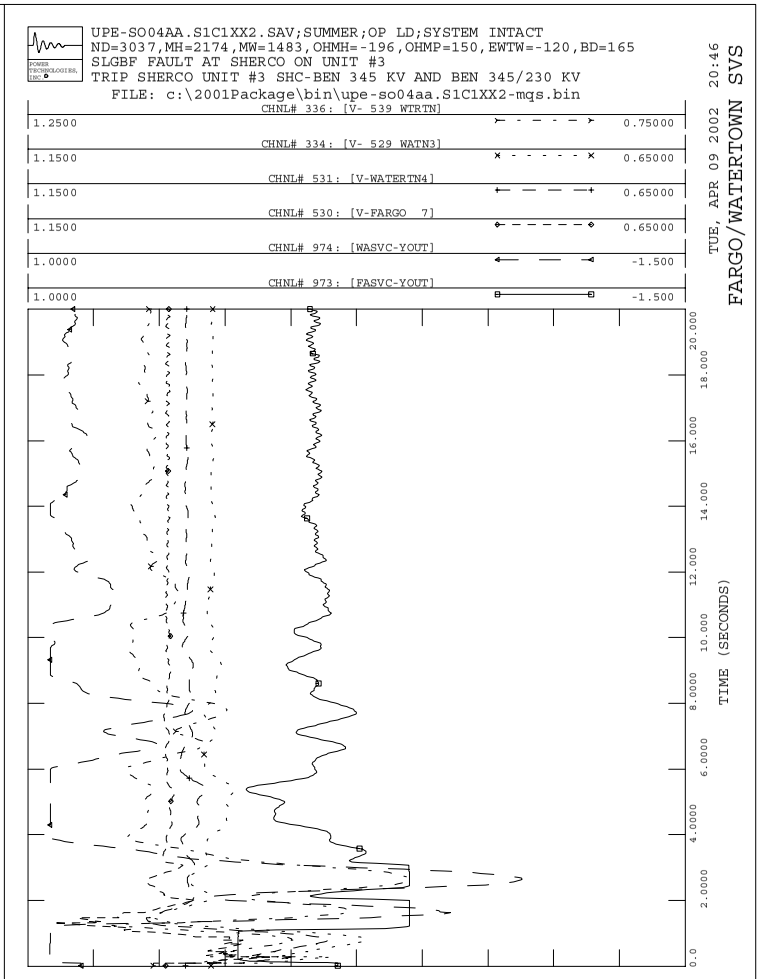
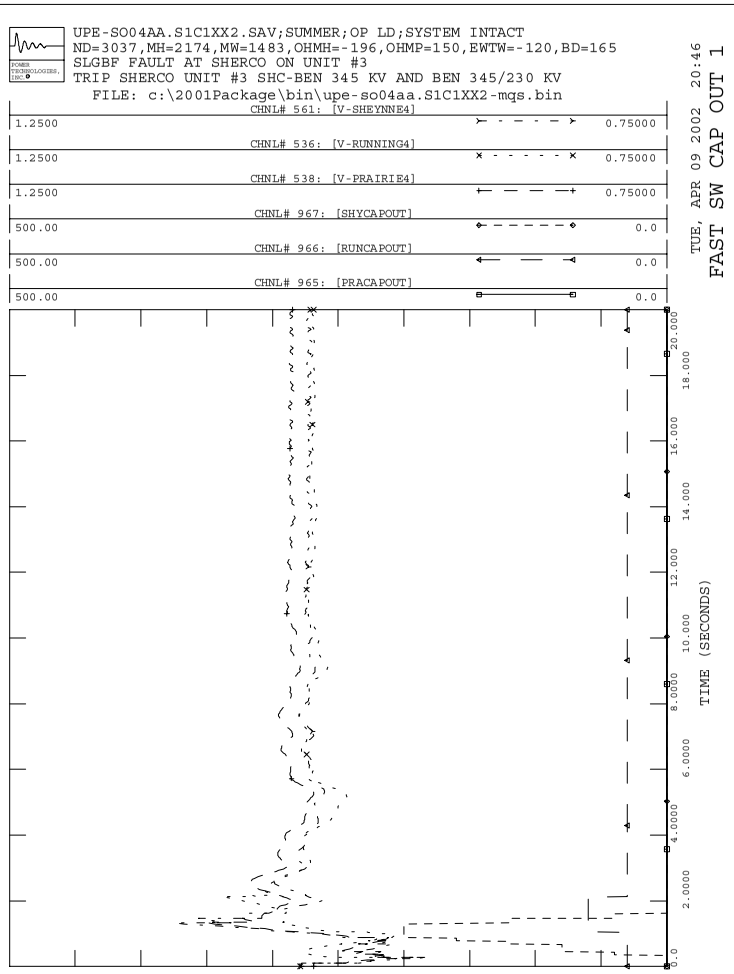
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

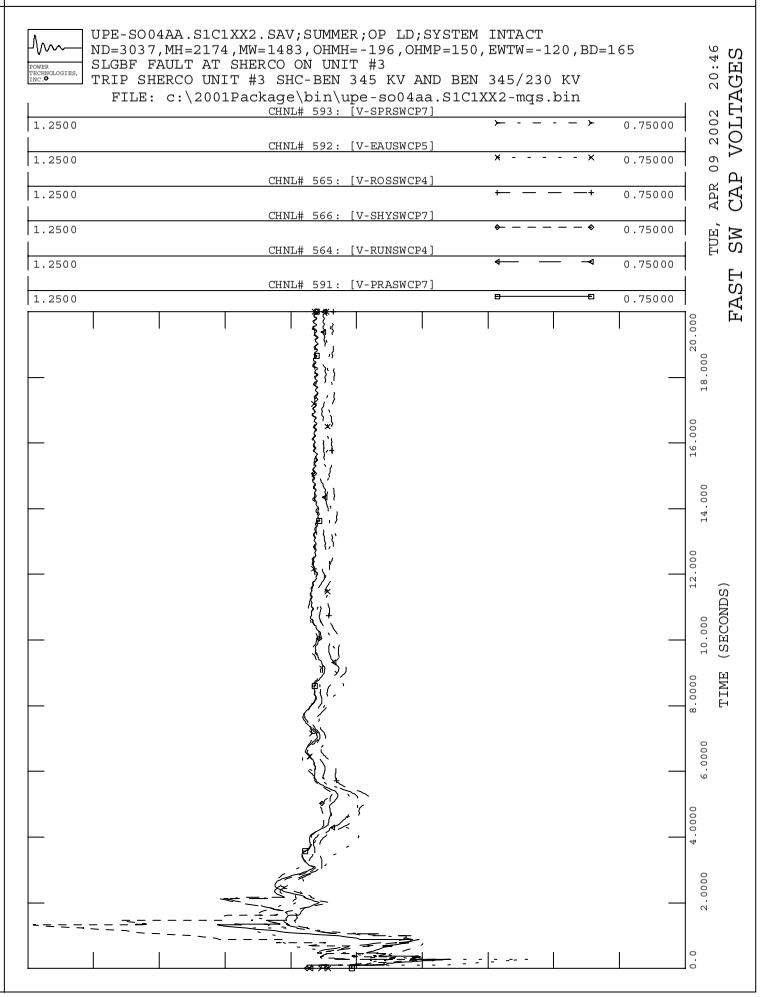
TUE, APR 09 2002 20:46
VOLTAGES NB



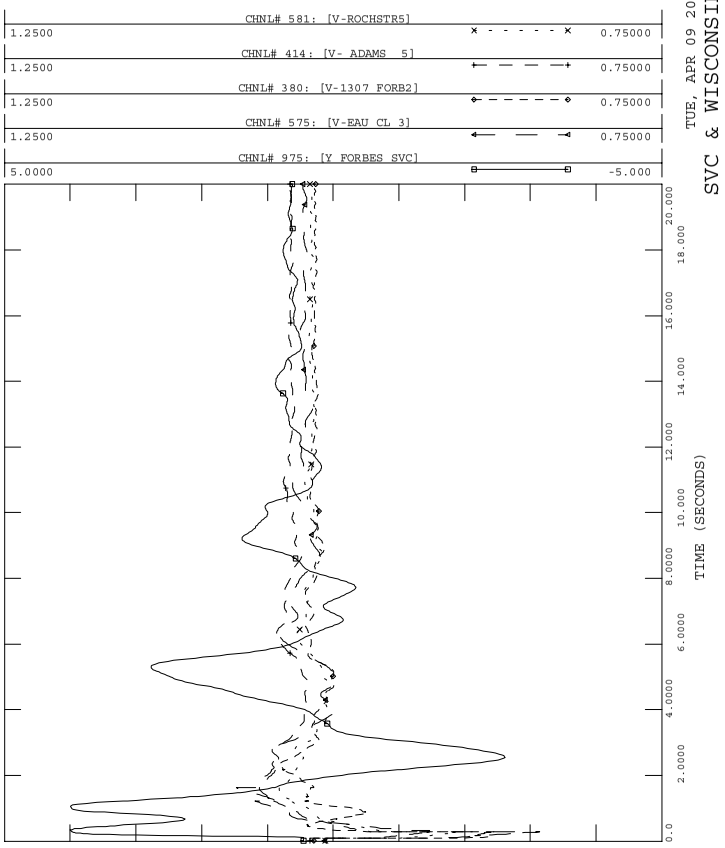

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
TUE, APR 09 2002 20:46
FAST SW CAP OUT 2


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
TUE, APR 09 2002 20:46
FARGO/WATERTOWN SVS


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
TUE, APR 09 2002 20:46
FAST SW CAP OUT 1

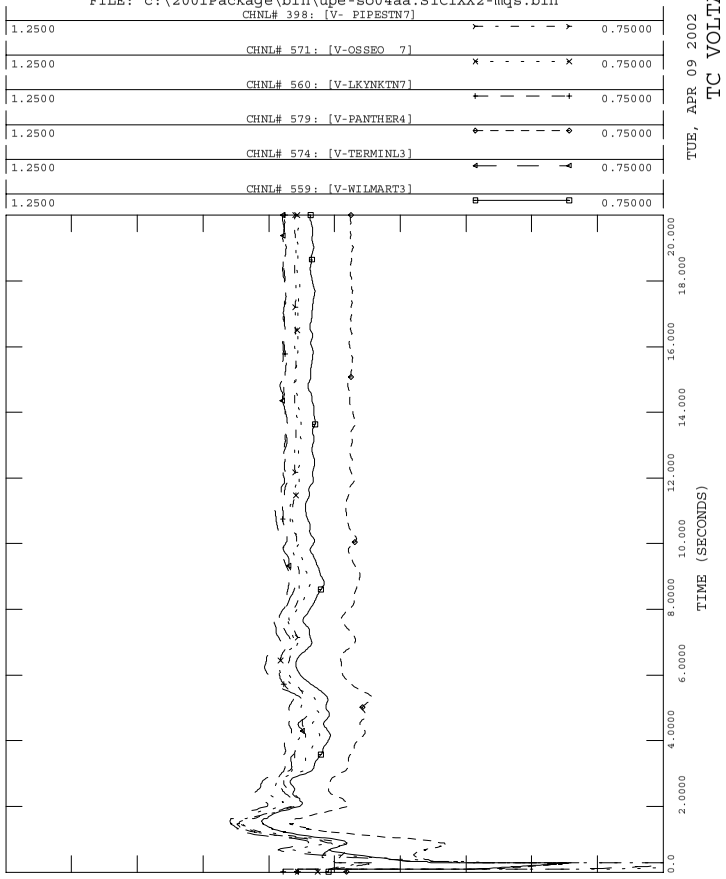

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
TUE, APR 09 2002 20:46
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin



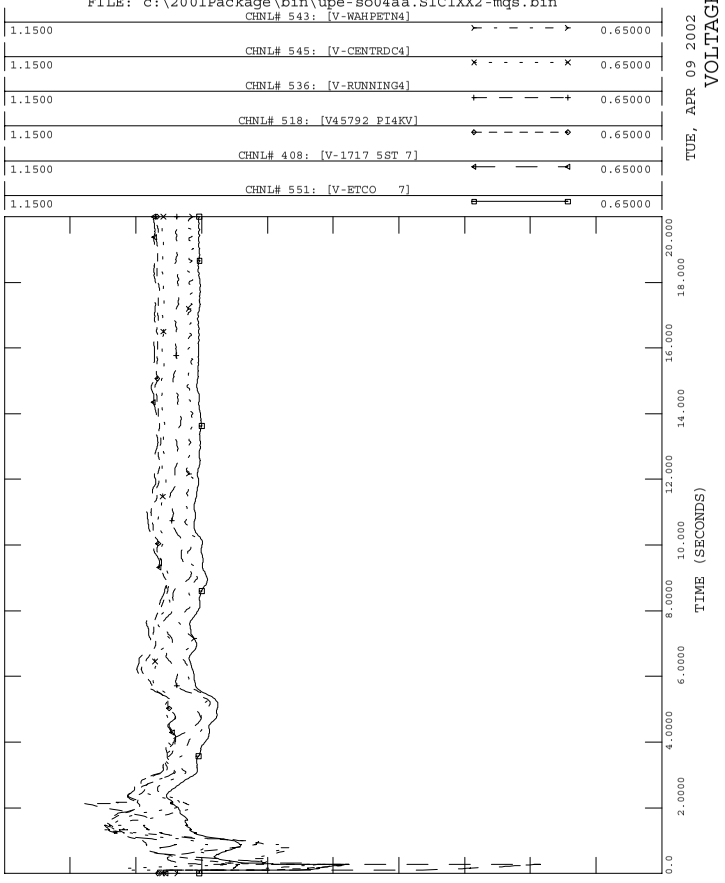
TUE, APR 09 2002 20:46
SVC & WISCONSIN VOLT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin



TUE, APR 09 2002 20:46
TC VOLTAGES

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin



TUE, APR 09 2002 20:46
VOLTAGES 6

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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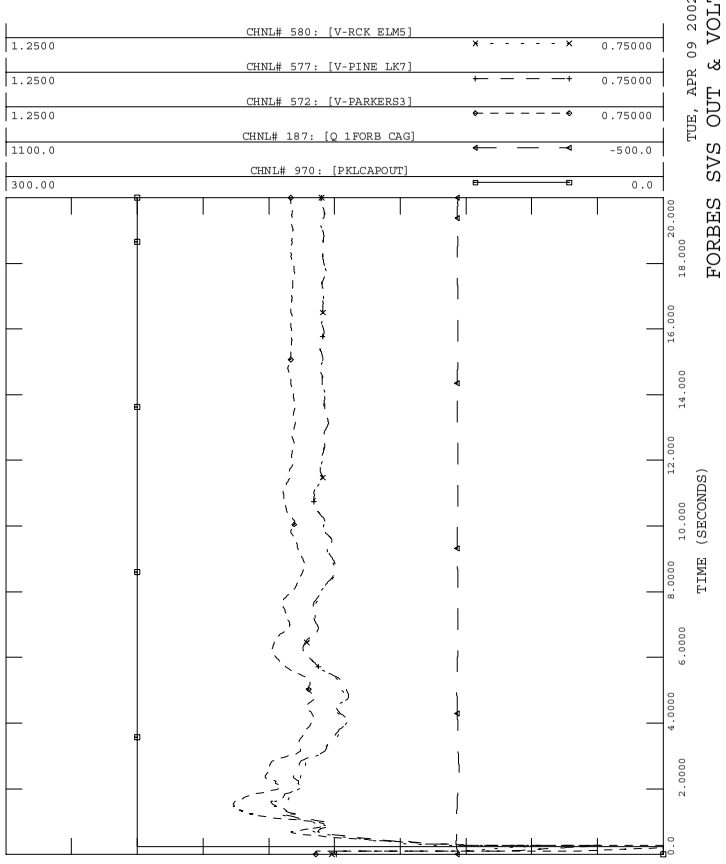
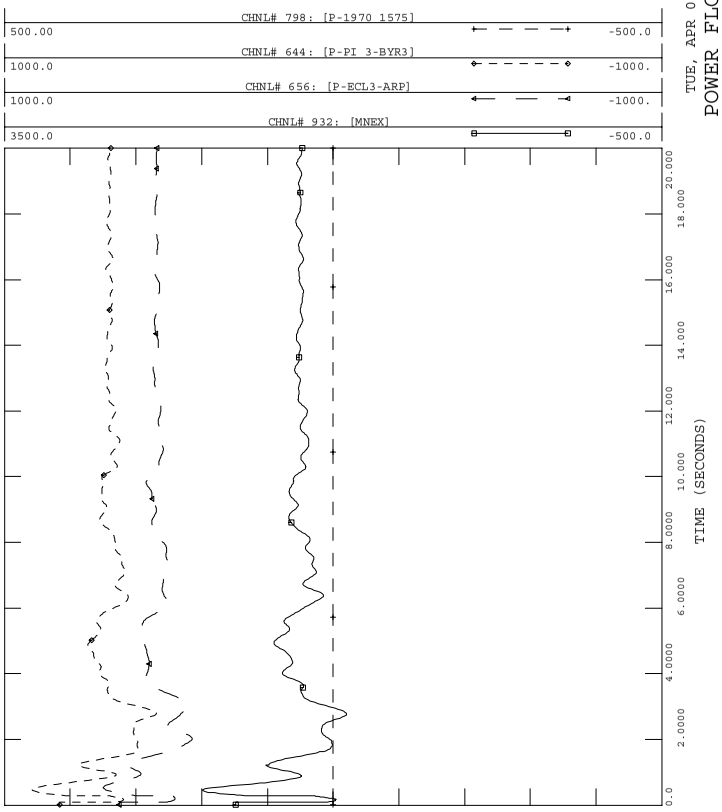
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin



TUE, APR 09 2002 20:46
FORBES SVS OUT & VOLTAGES

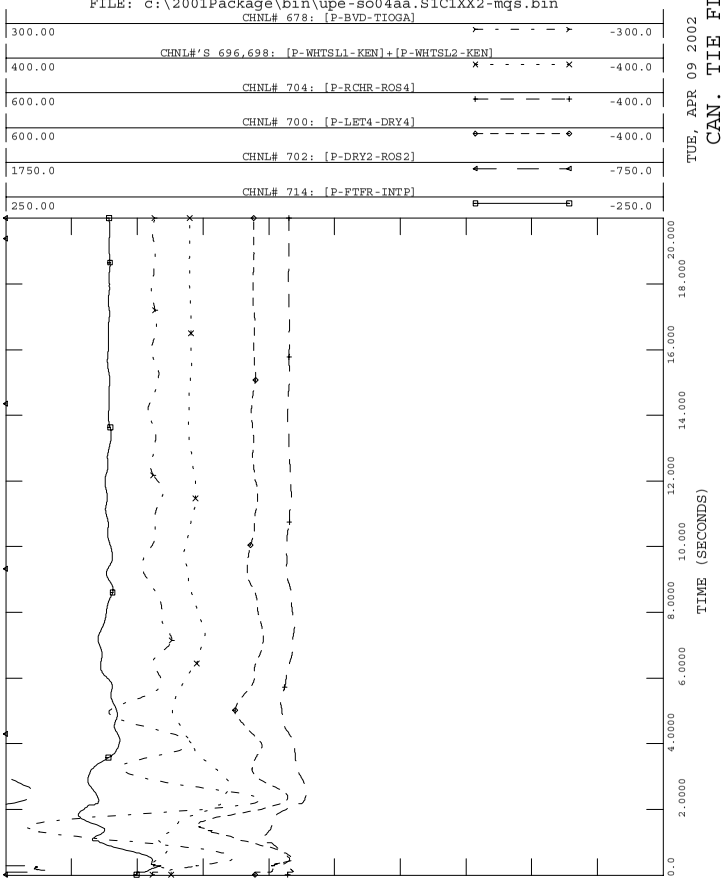
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
POWER FLOW SUMS 2



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
CAN. TIE FLOWS



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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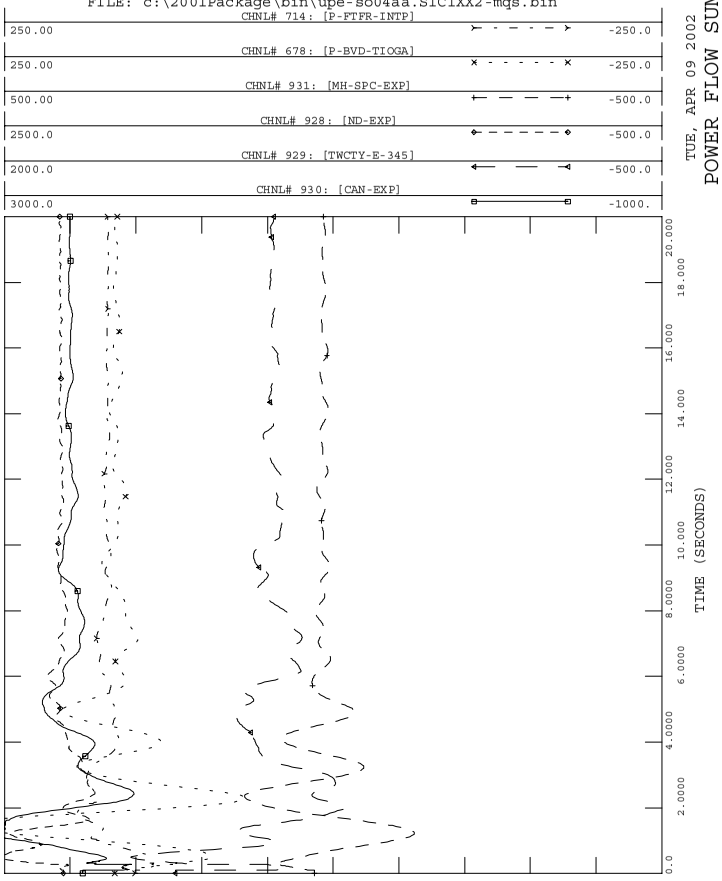
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46
POWER FLOW SUMS 1



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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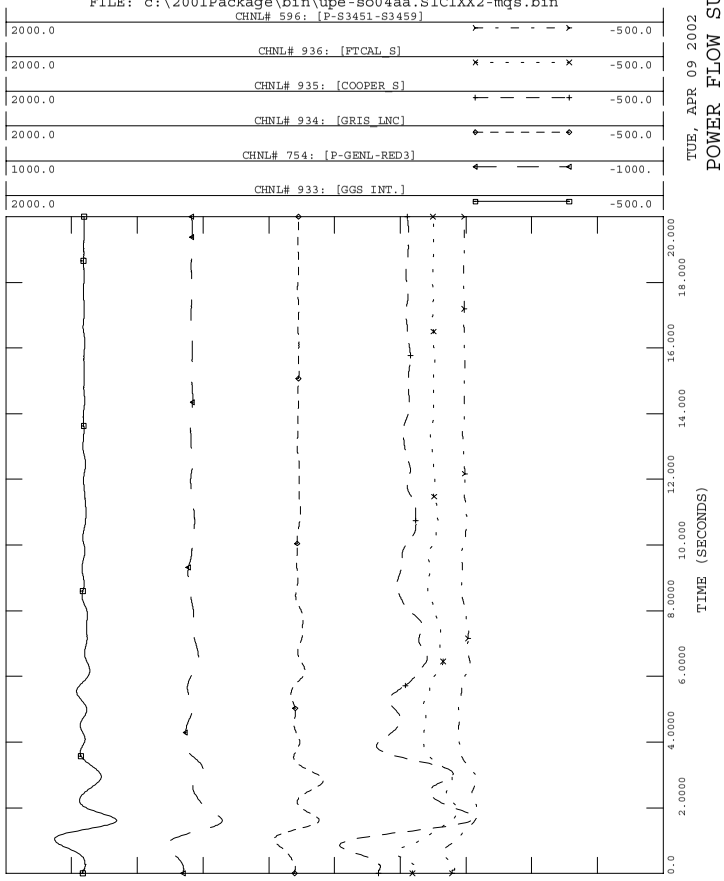
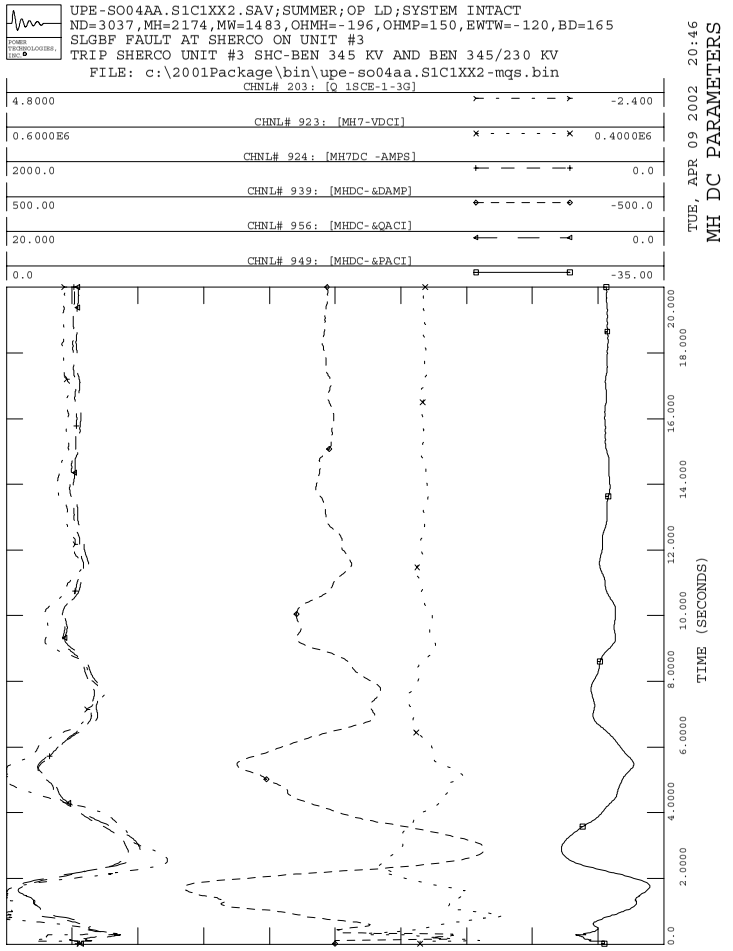
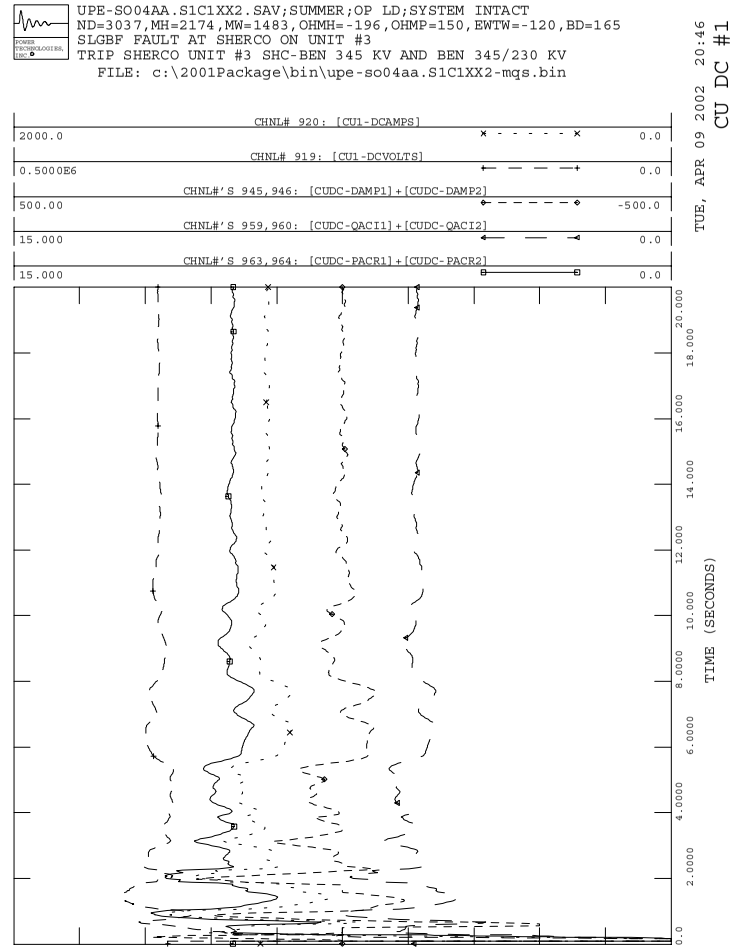
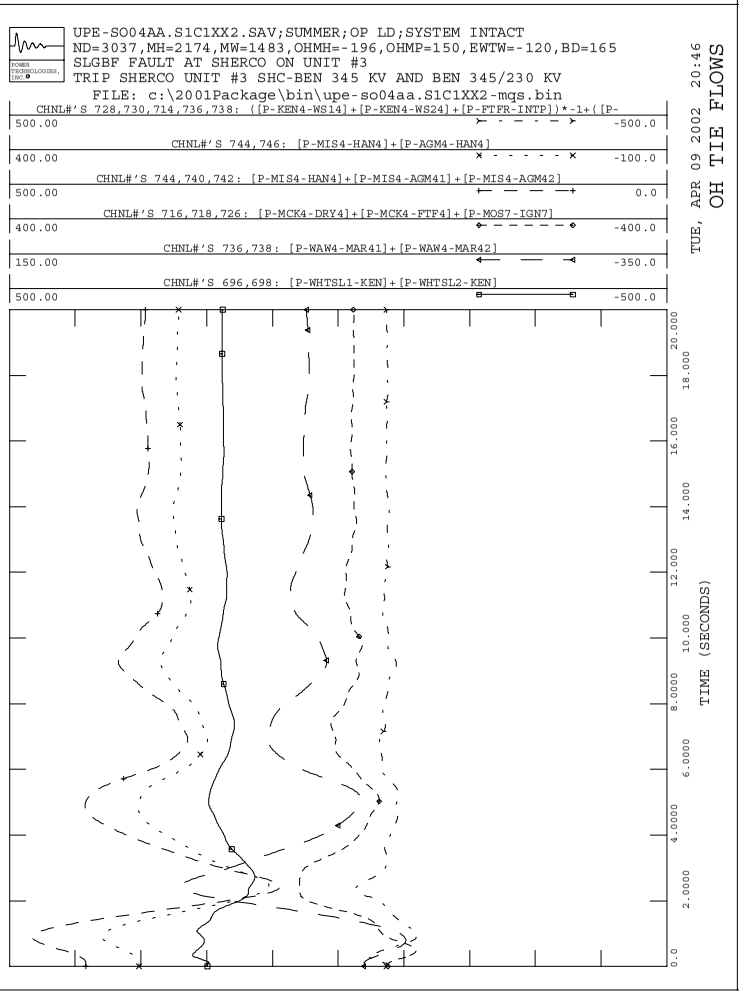
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

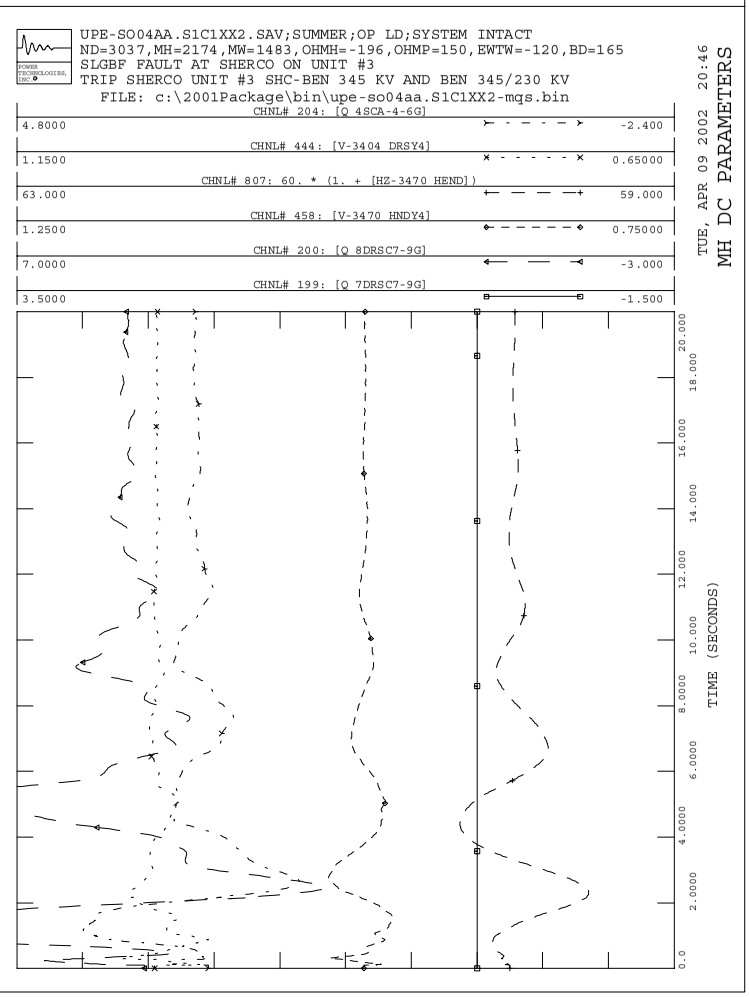
TUE, APR 09 2002 20:46
POWER FLOW SUM 3

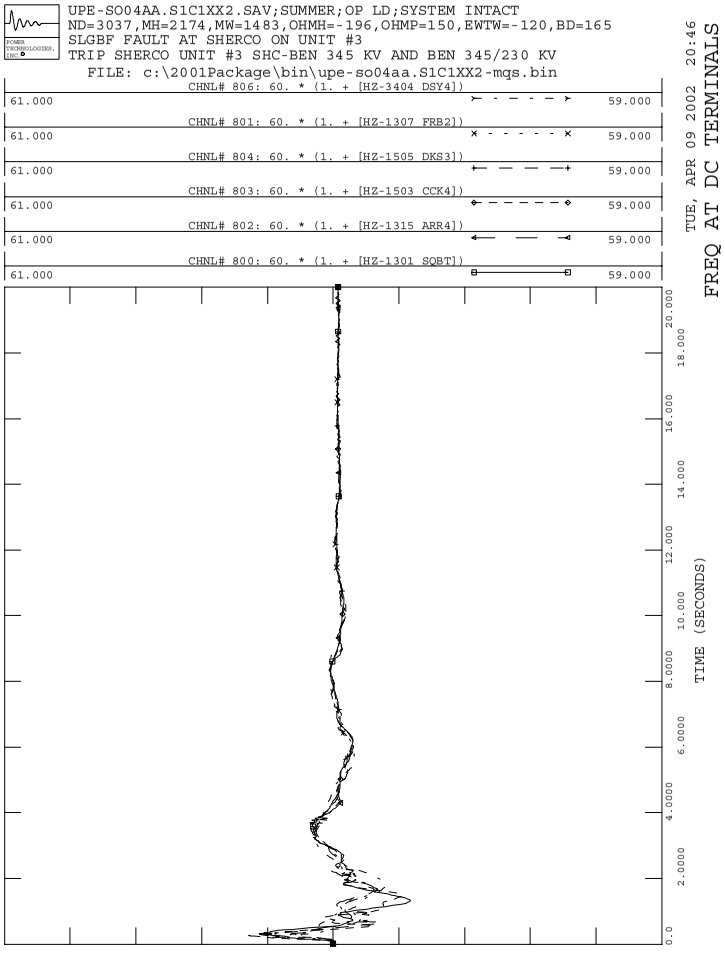


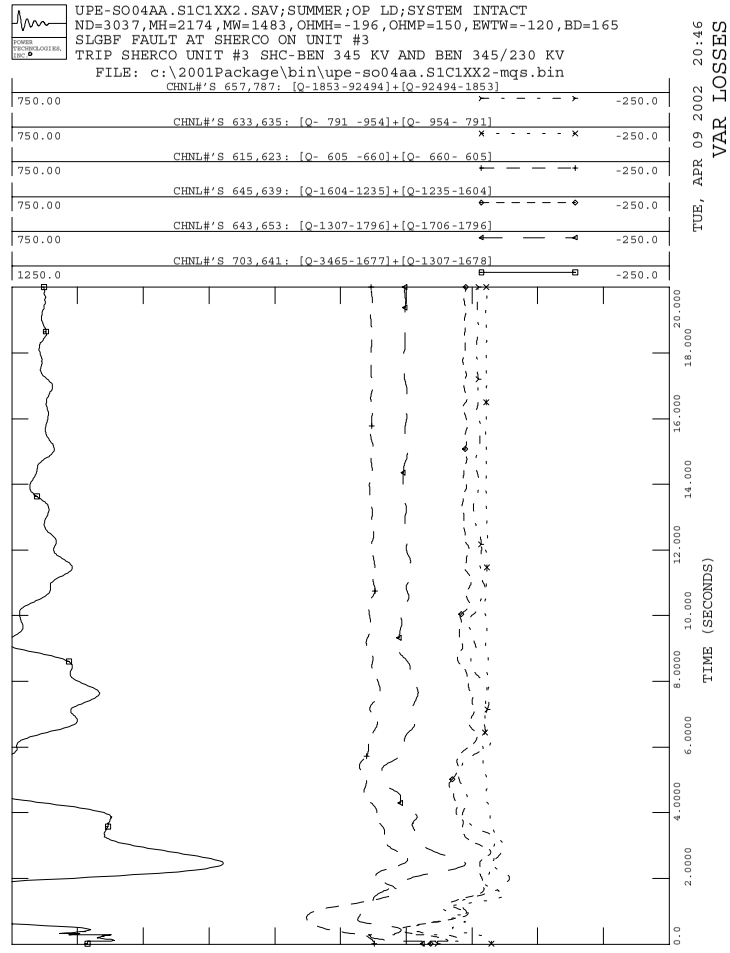

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TUE, APR 09 2002 20:46
MH DC PARAMETERS
TIME (SECONDS)

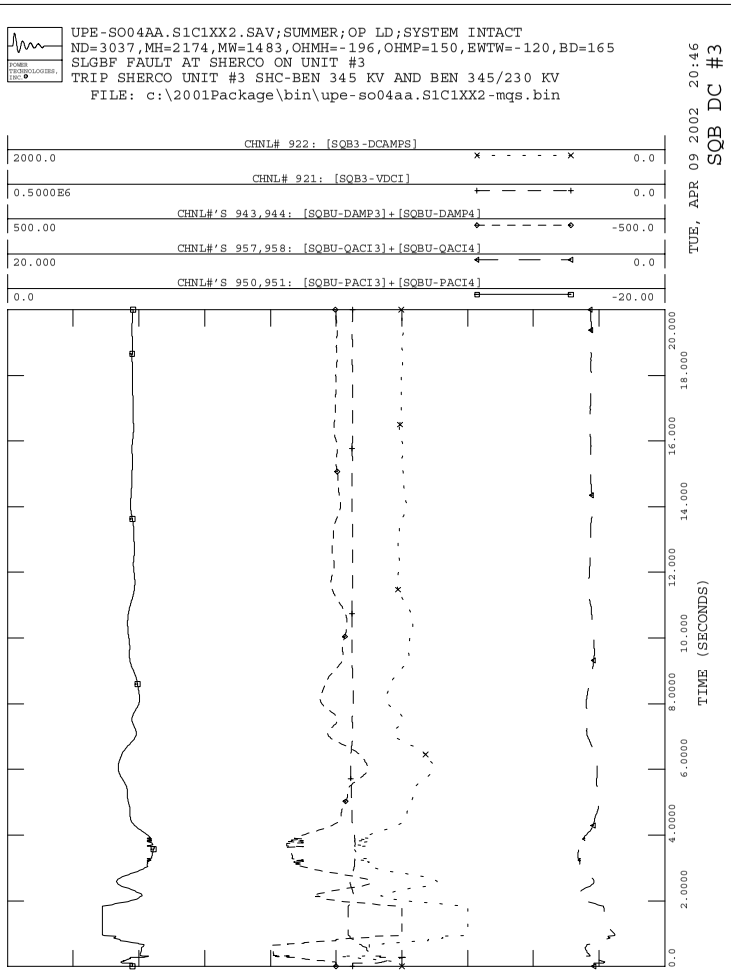

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TUE, APR 09 2002 20:46
CU DC #1
TIME (SECONDS)

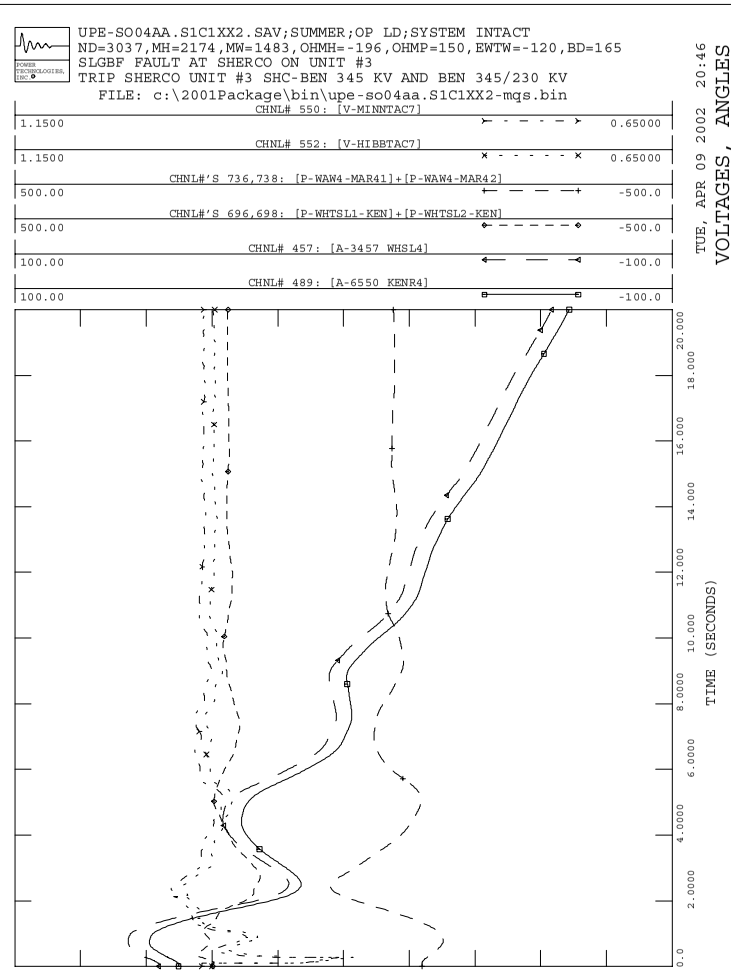

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TUE, APR 09 2002 20:46
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TUE, APR 09 2002 20:46
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
TUE, APR 09 2002 20:46
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
TUE, APR 09 2002 20:46
VAR LOSSES
TIME (SECONDS)

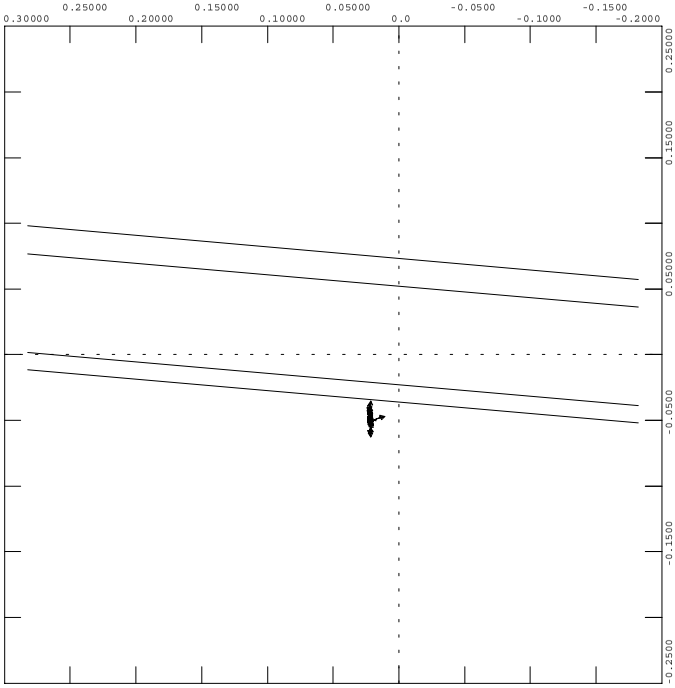

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
TUE, APR 09 2002 20:46
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
TUE, APR 09 2002 20:46
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

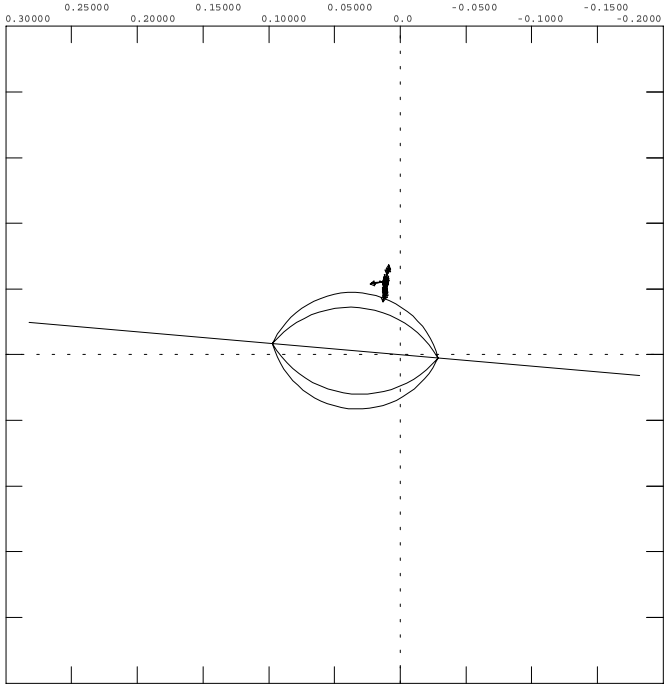


TUE, APR 09 2002 20:46
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

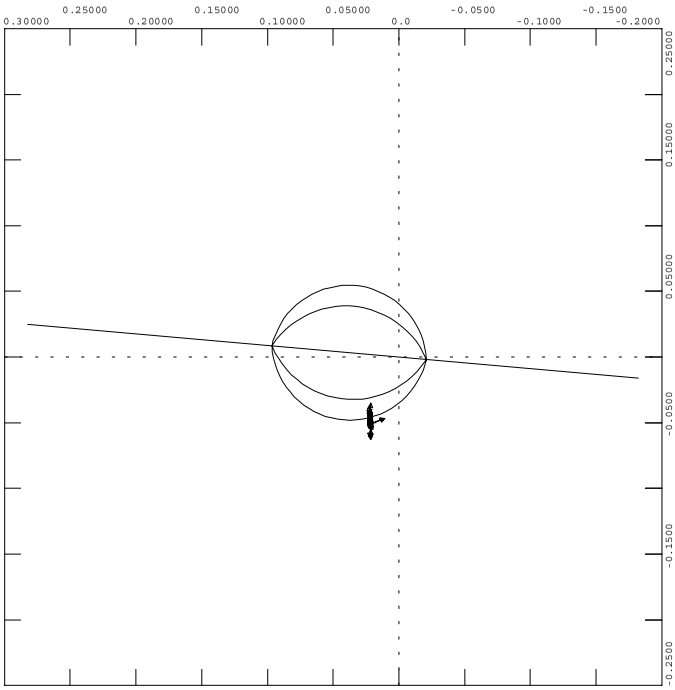


TUE, APR 09 2002 20:46
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

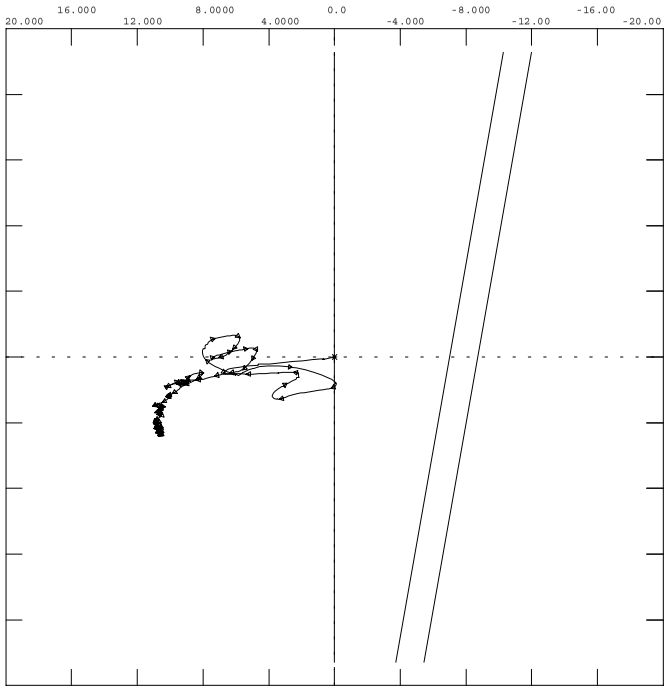


TUE, APR 09 2002 20:46
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

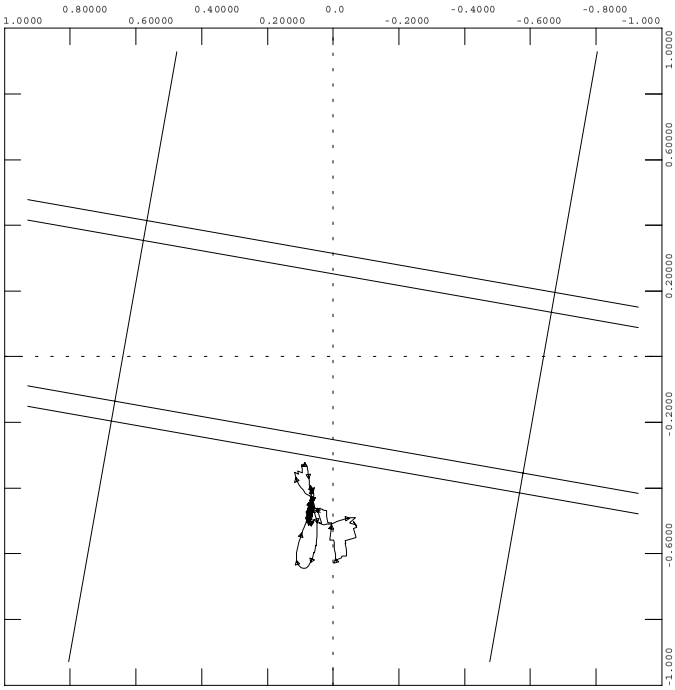


TUE, APR 09 2002 20:46
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

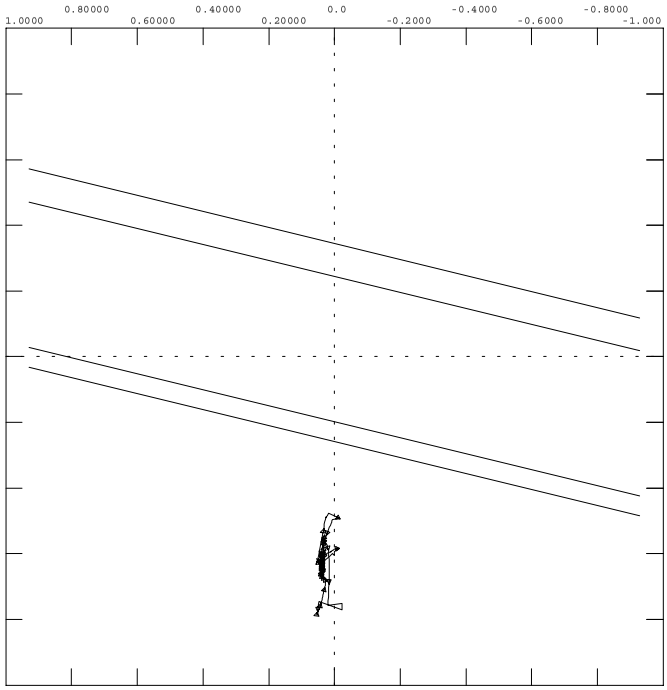
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

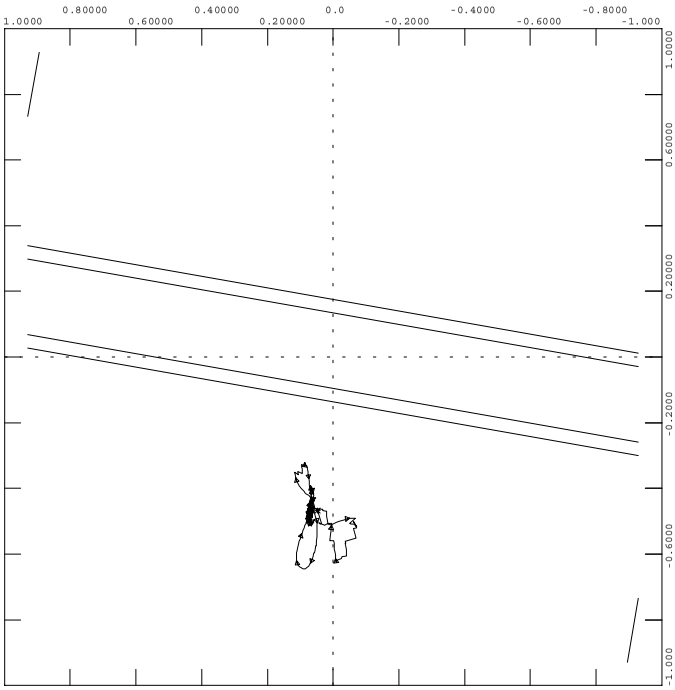
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

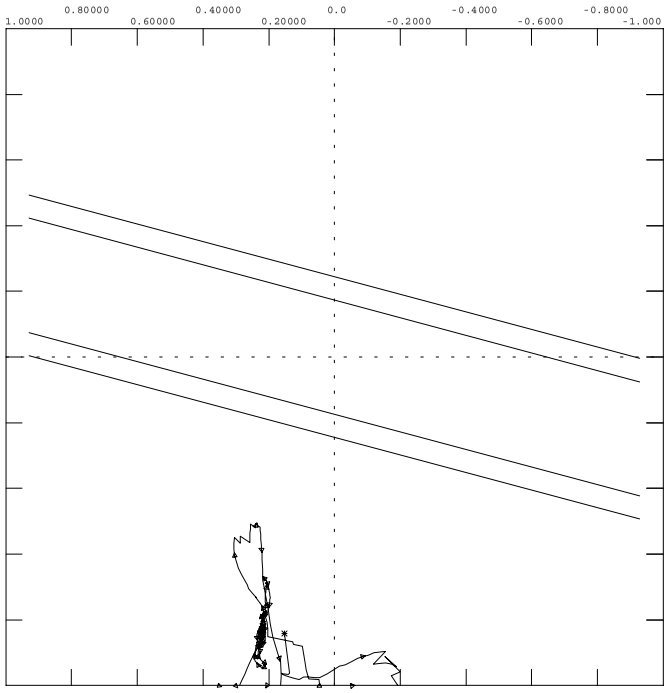
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

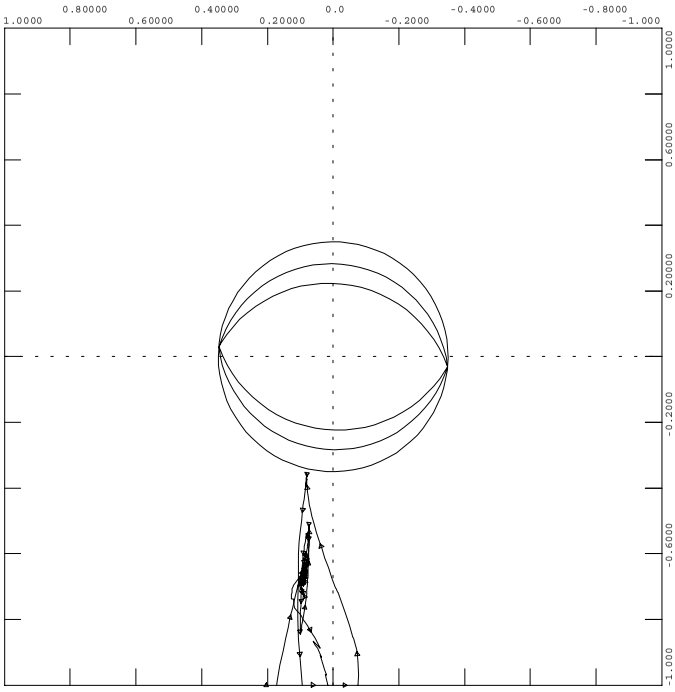
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

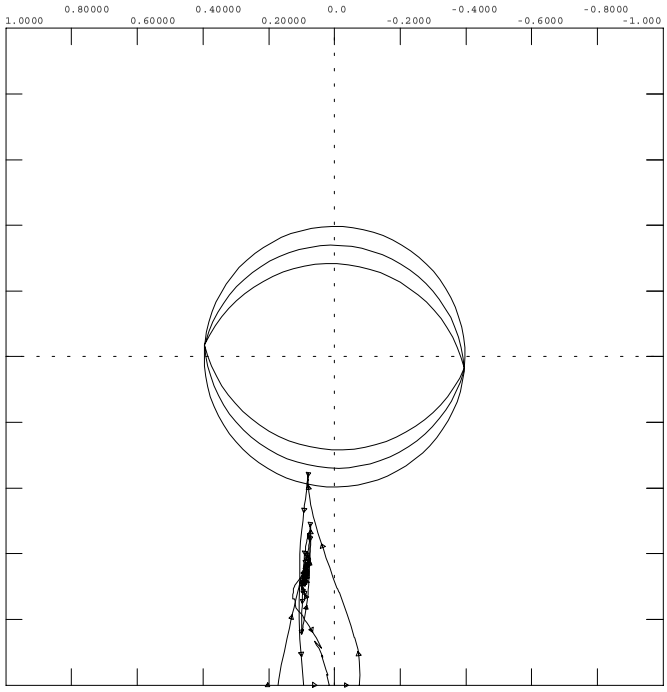
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

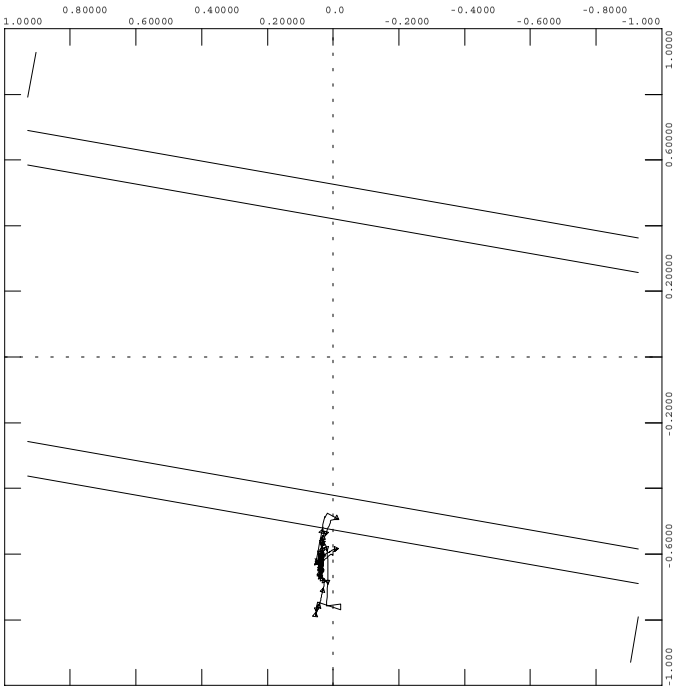
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

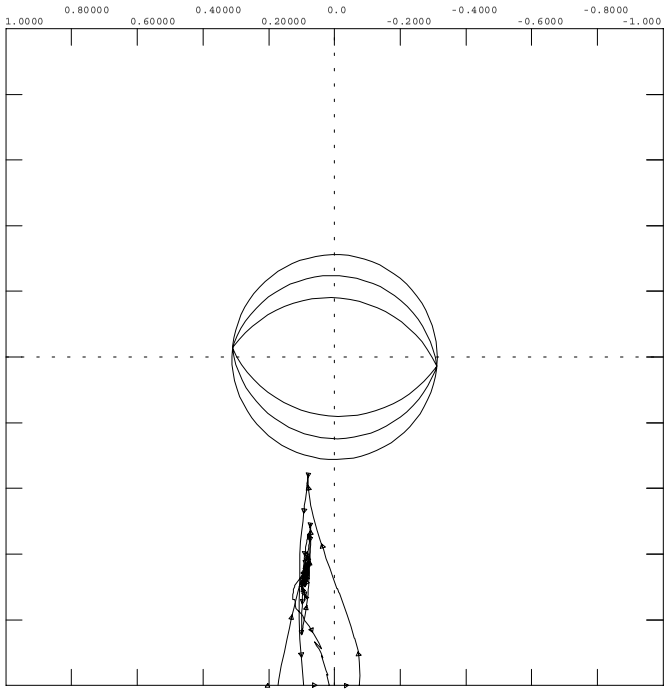
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



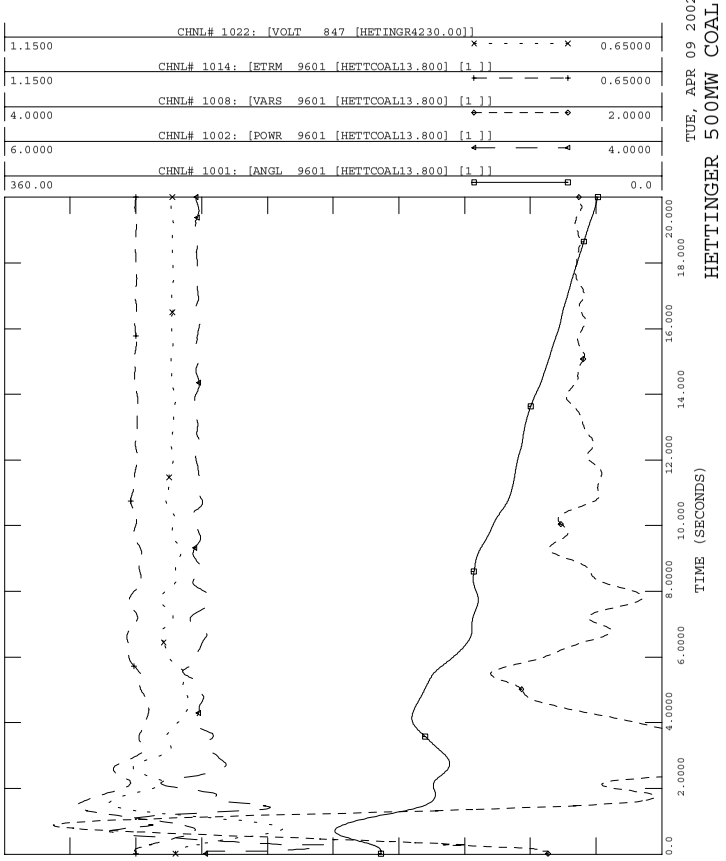
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

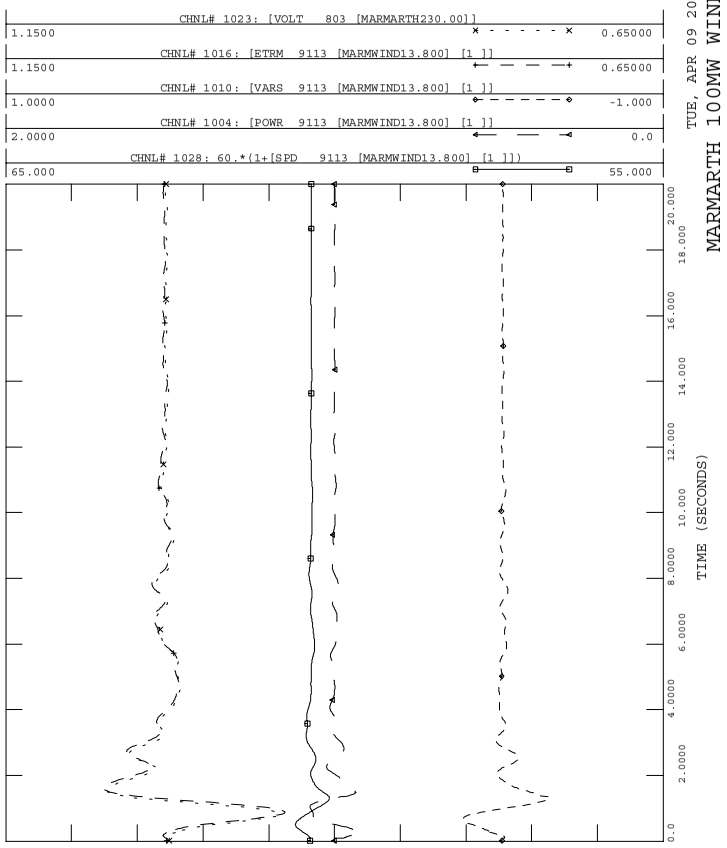


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin



TUE, APR 09 2002 20:46
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

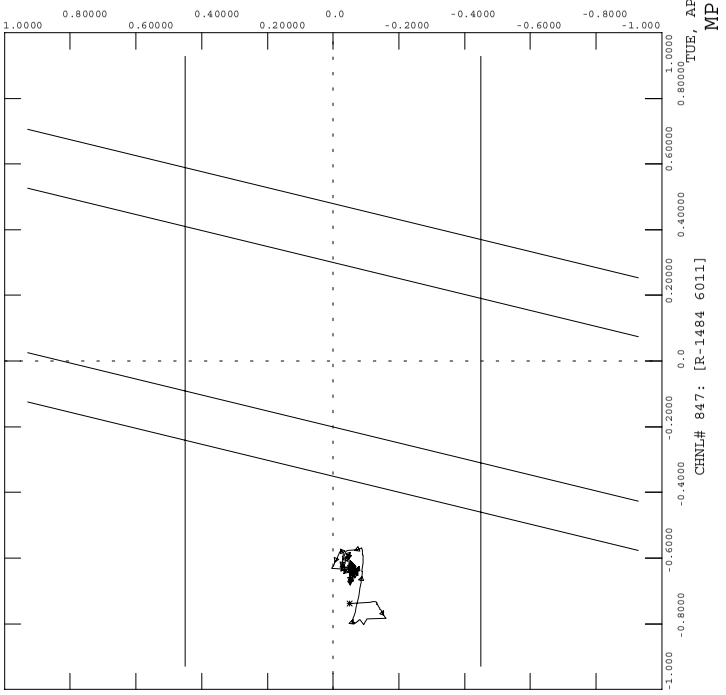


TUE, APR 09 2002 20:46
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

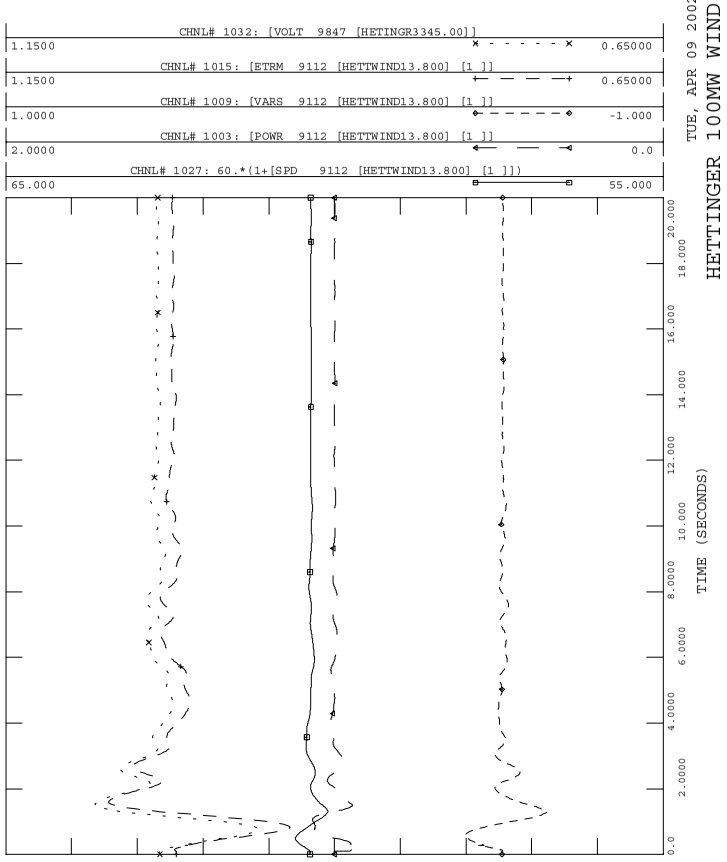
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



TUE, APR 09 2002 20:46
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

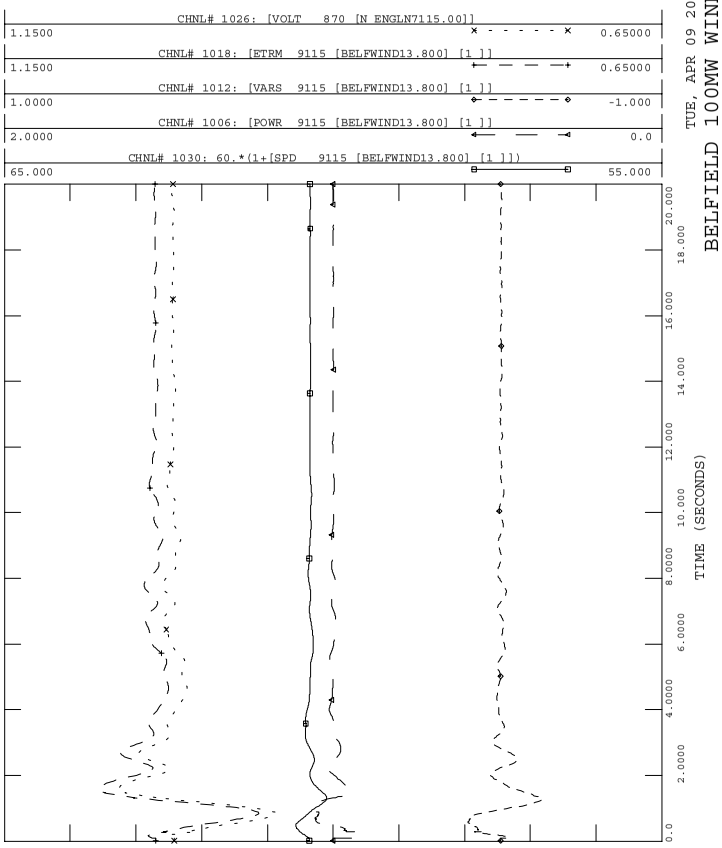


TUE, APR 09 2002 20:46
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46

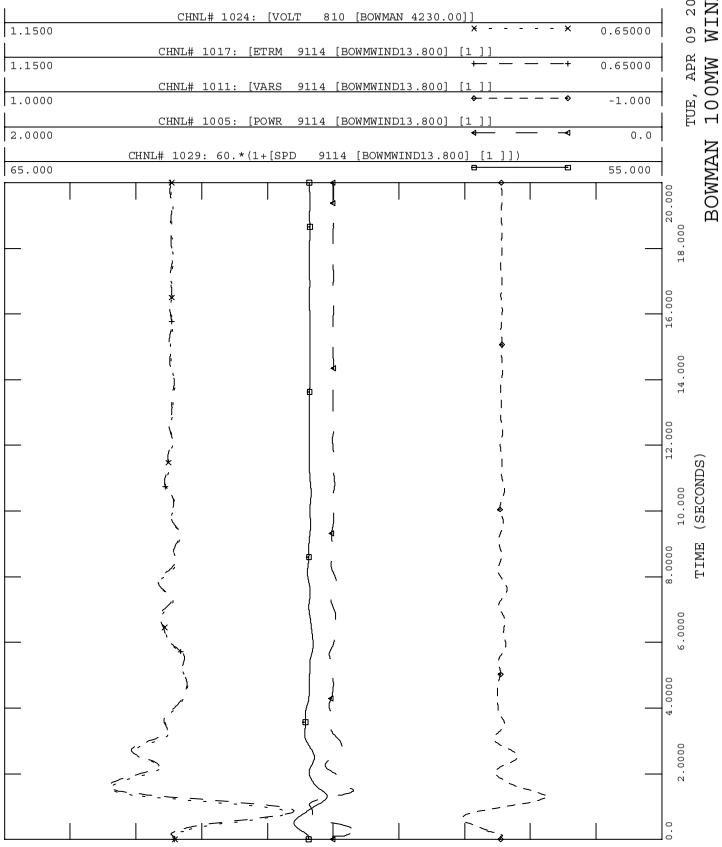
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46

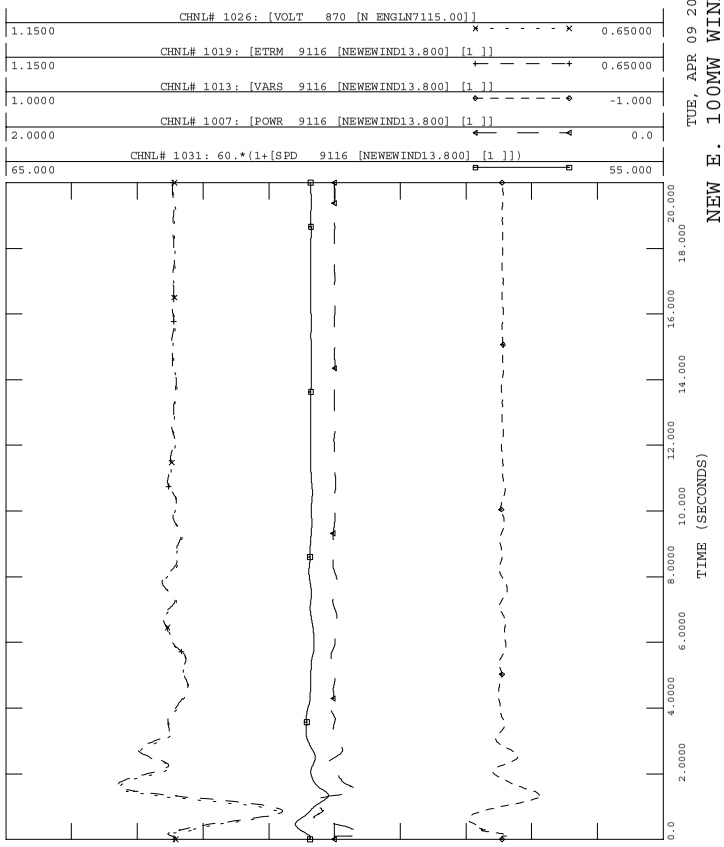
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-mqs.bin

TUE, APR 09 2002 20:46

NEW E. 100MW WIND UNIT

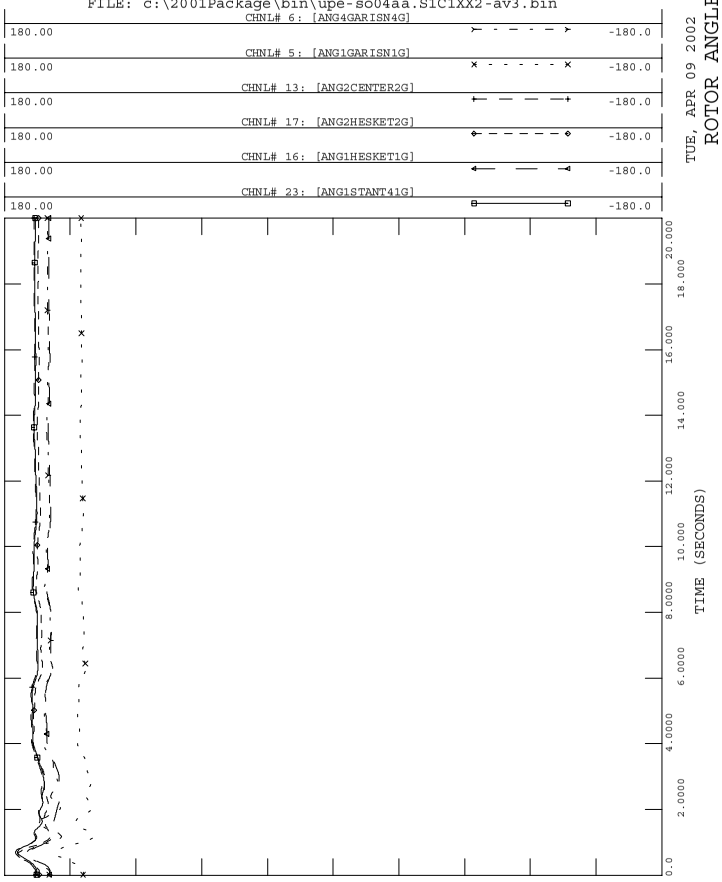


CONTINGENCY AV3

4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Belfield 345 kV line

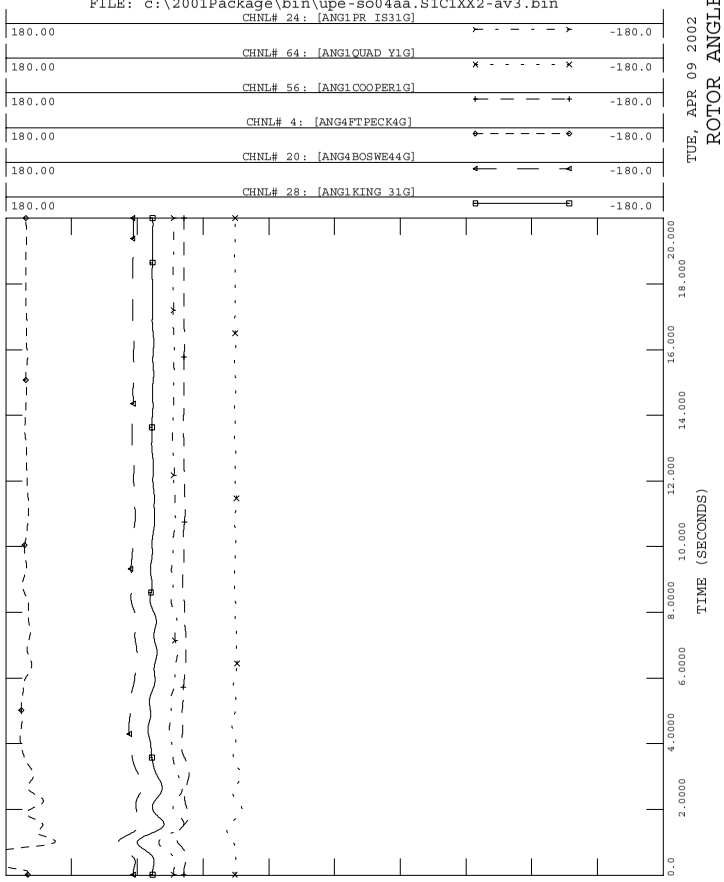
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:02
ROTOR ANGLES 2



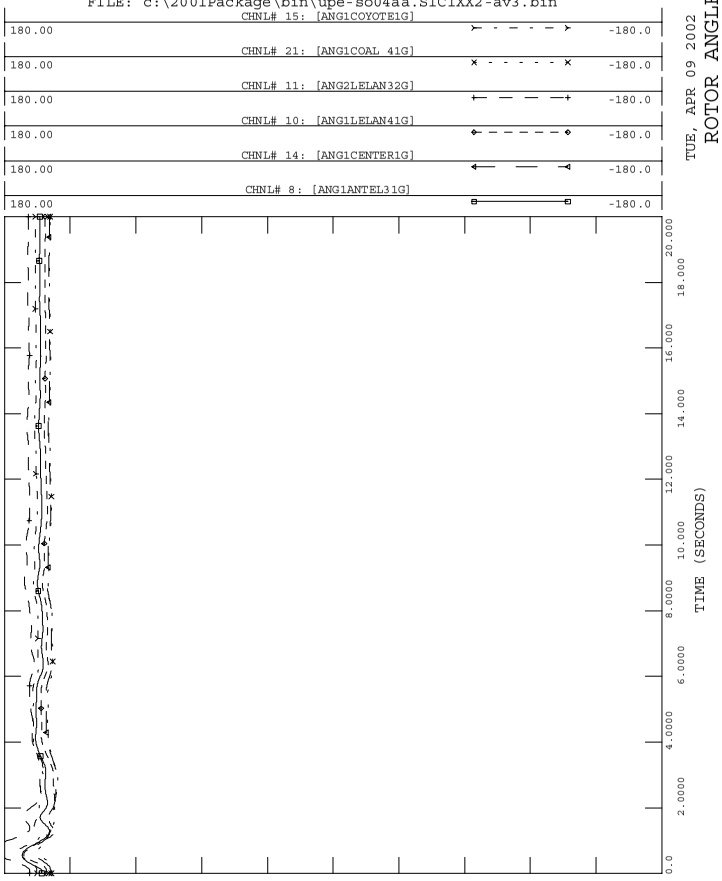
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:02
ROTOR ANGLES 4



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:02
ROTOR ANGLES 1



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

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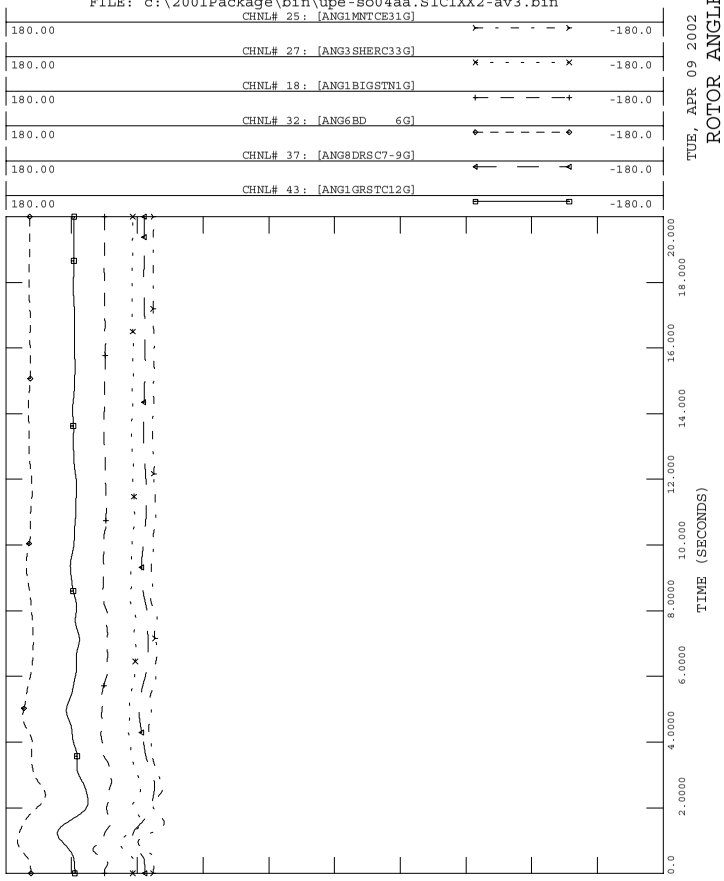
ROTOR ANGLES 3



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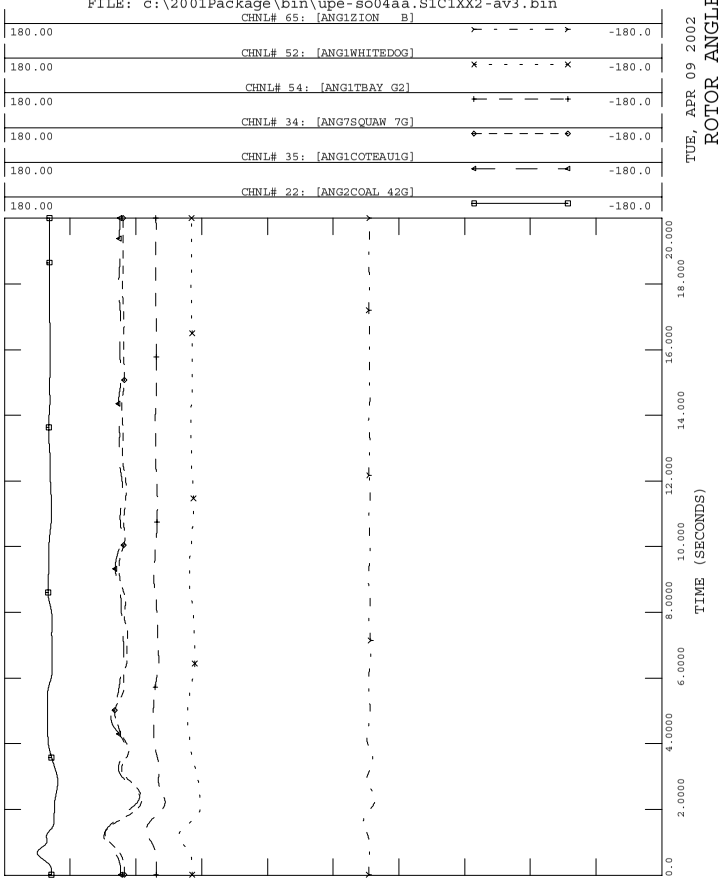
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:02
ROTOR ANGLES 6



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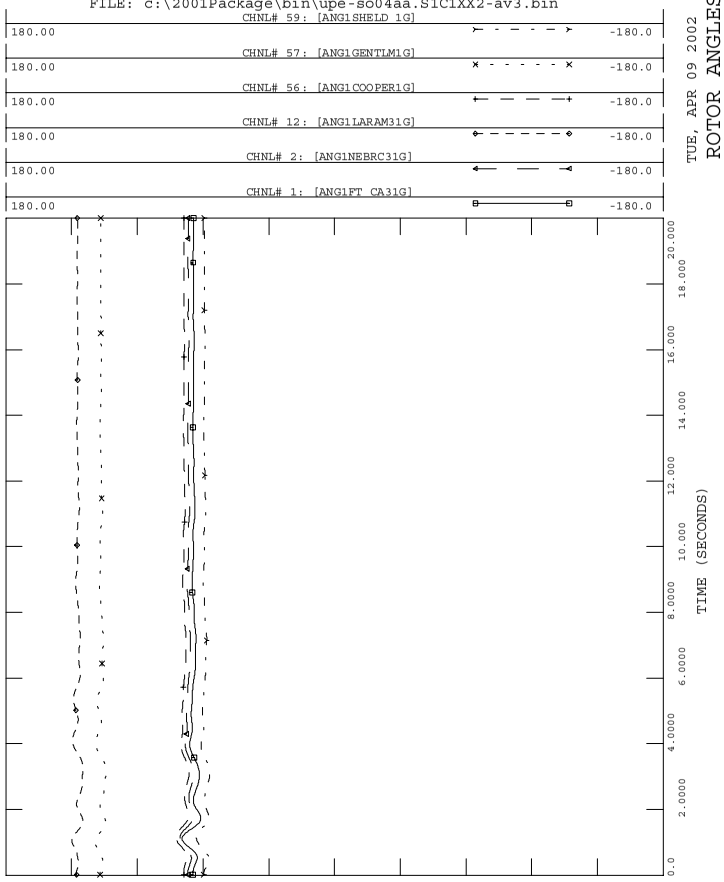
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:02
ROTOR ANGLES NB



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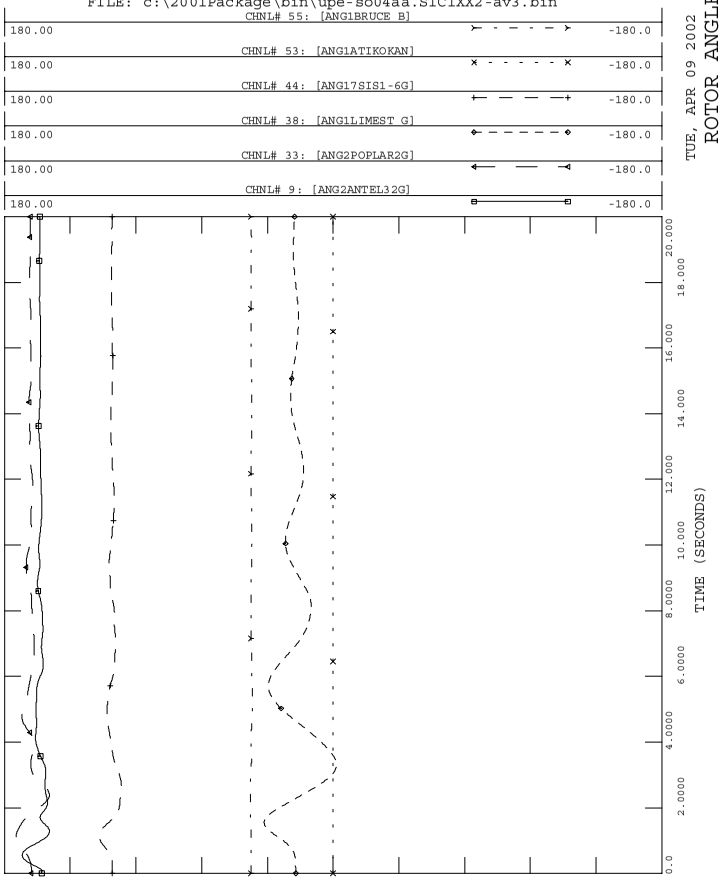
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:02
ROTOR ANGLES 5



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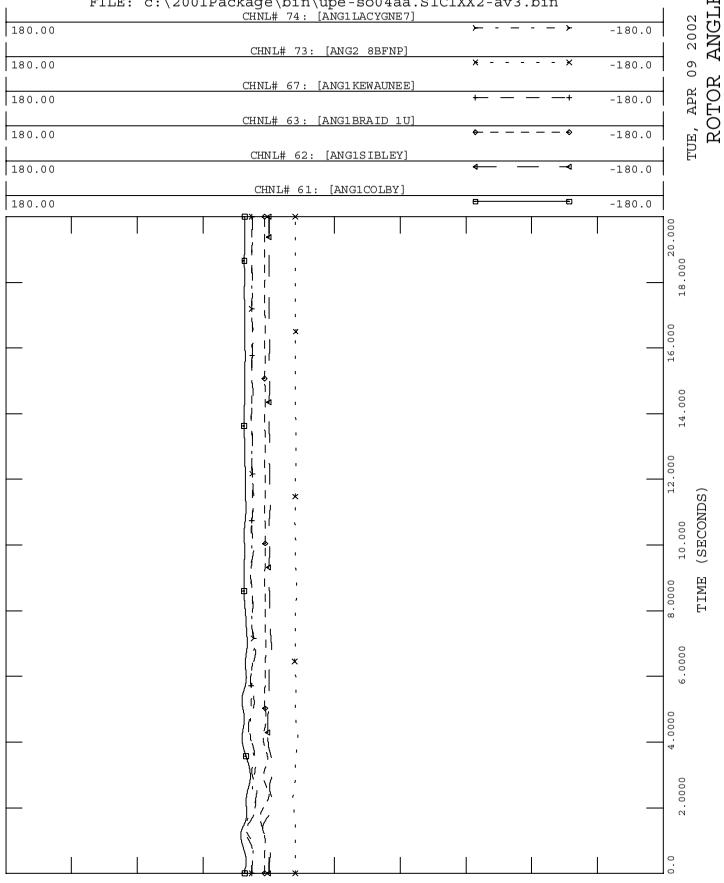
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:02
ROTOR ANGLES 7



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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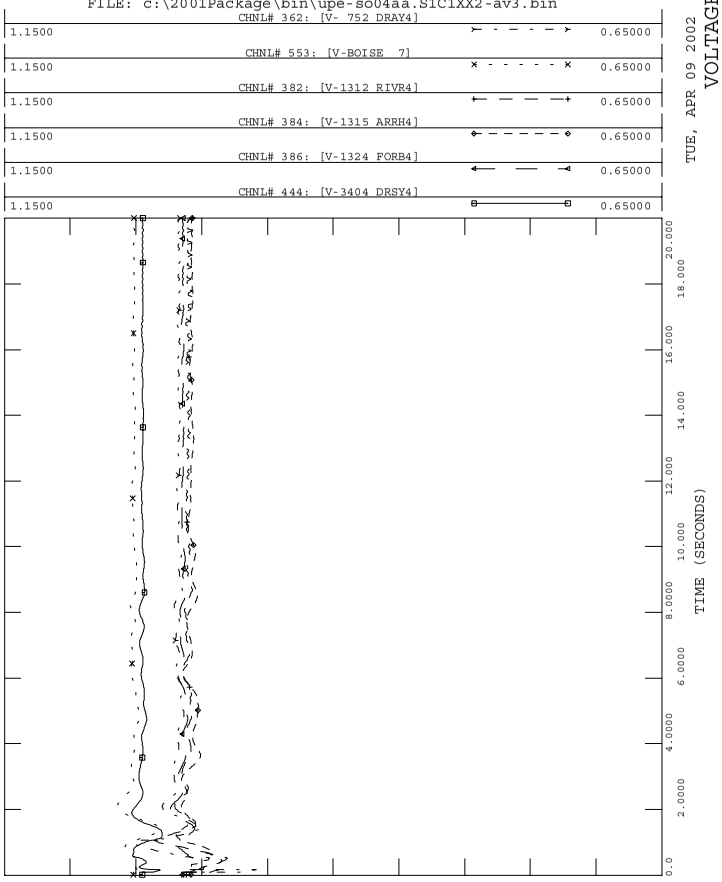
TUE, APR 09 2002 21:02
VOLTAGES 1



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
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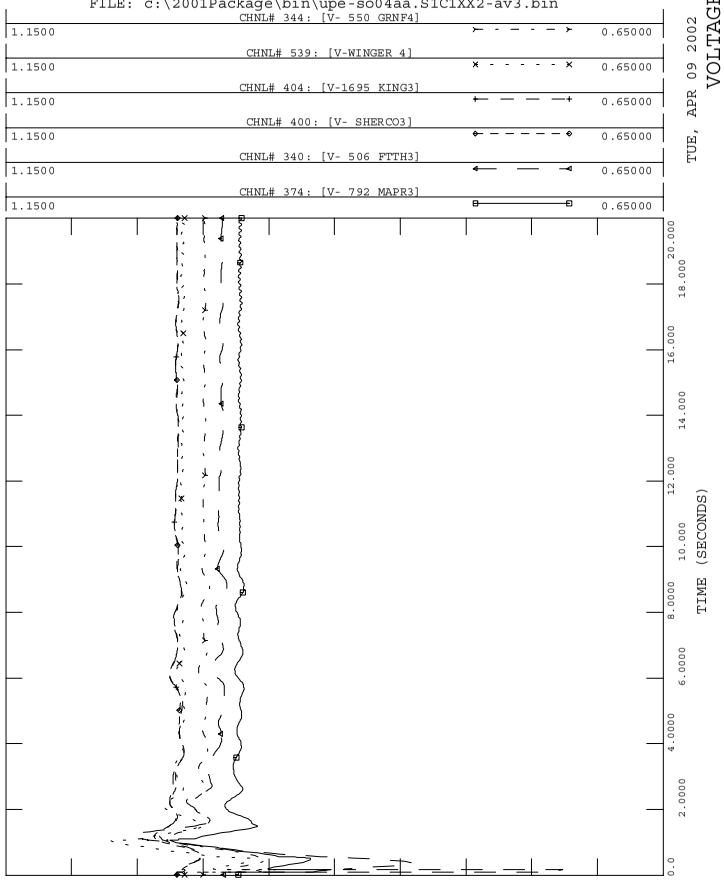
VOLTAGES 3



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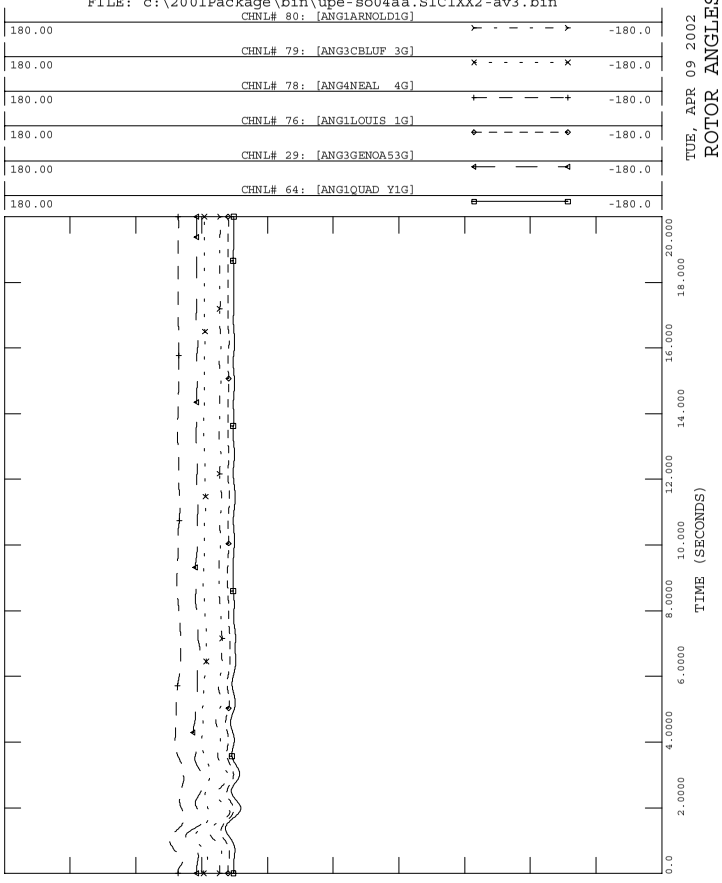
TUE, APR 09 2002 21:02
ROTOR ANGLES IA



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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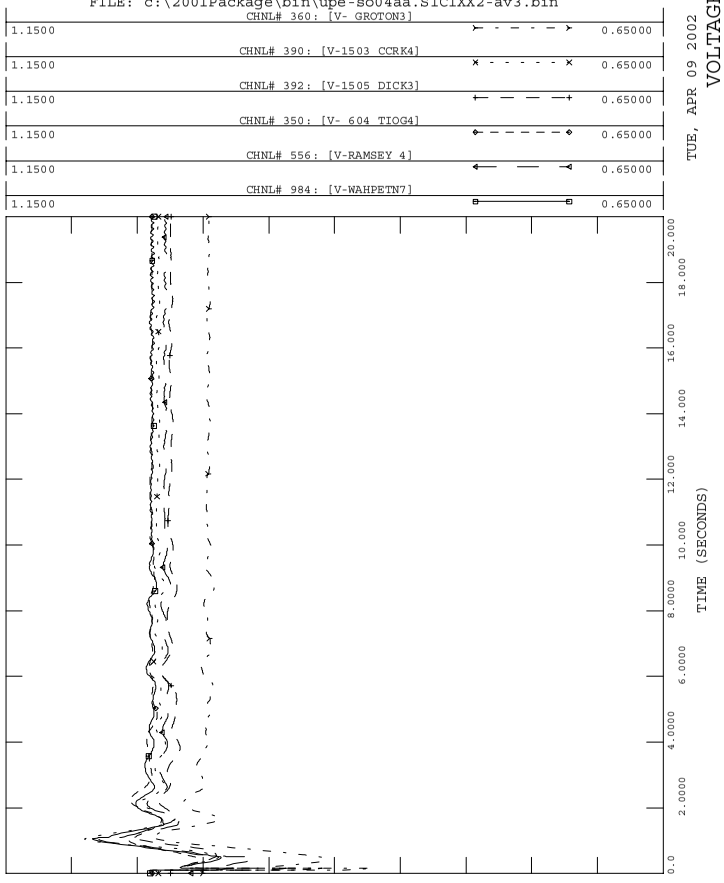
TUE, APR 09 2002 21:02
VOLTAGES 2



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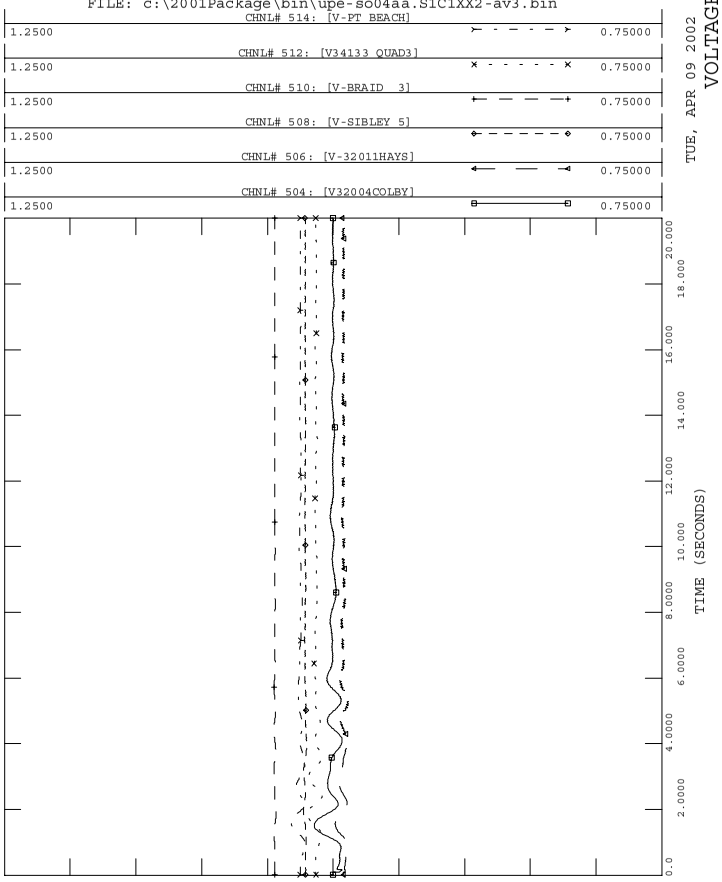
TUE, APR 09 2002 21:02
VOLTAGES 5



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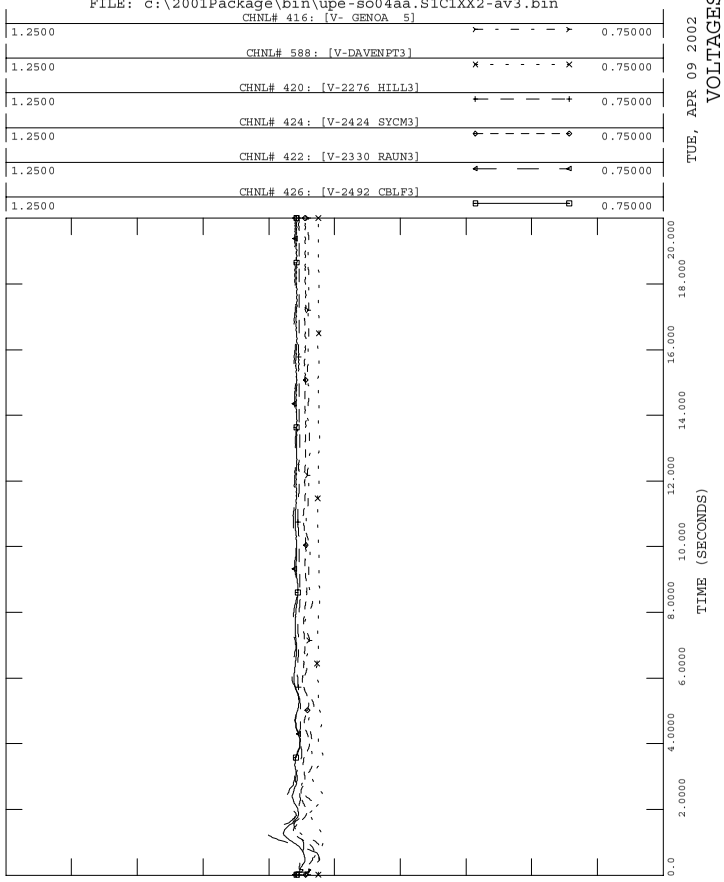
VOLTAGES IA



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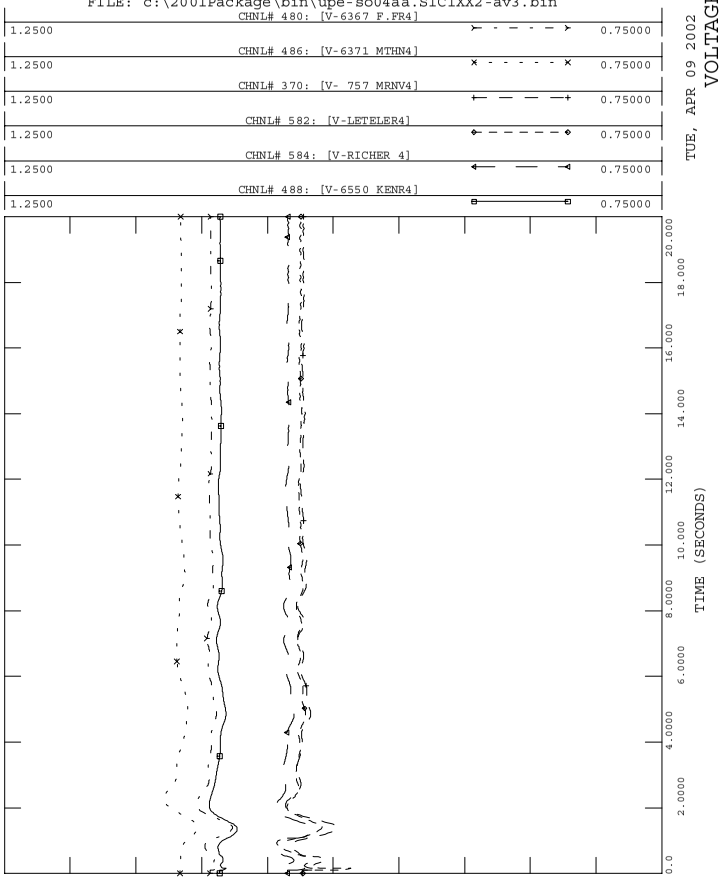
TUE, APR 09 2002 21:02
VOLTAGES 4



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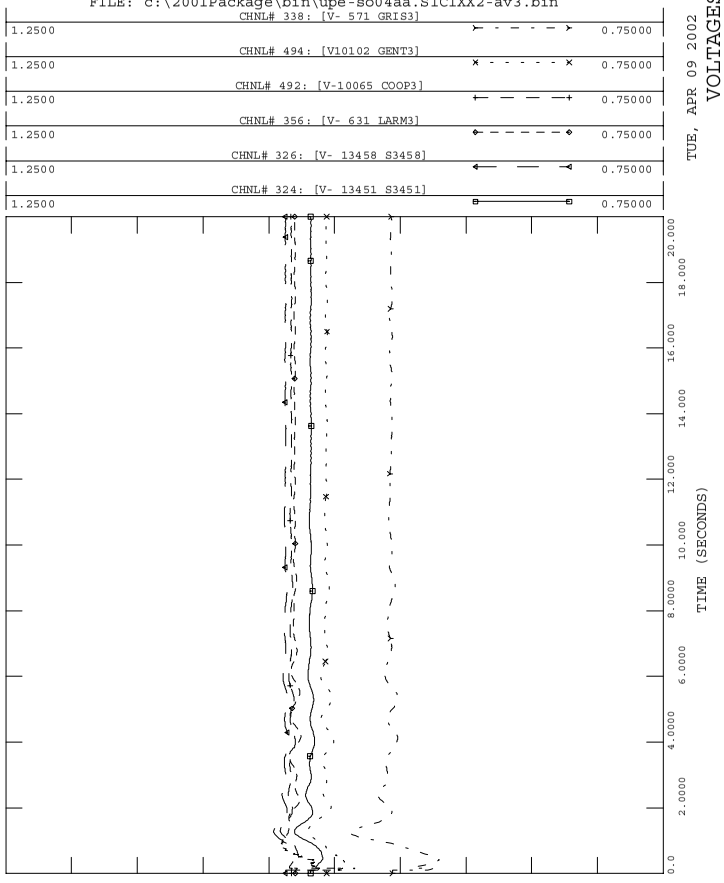
TUE, APR 09 2002 21:02
VOLTAGES NB



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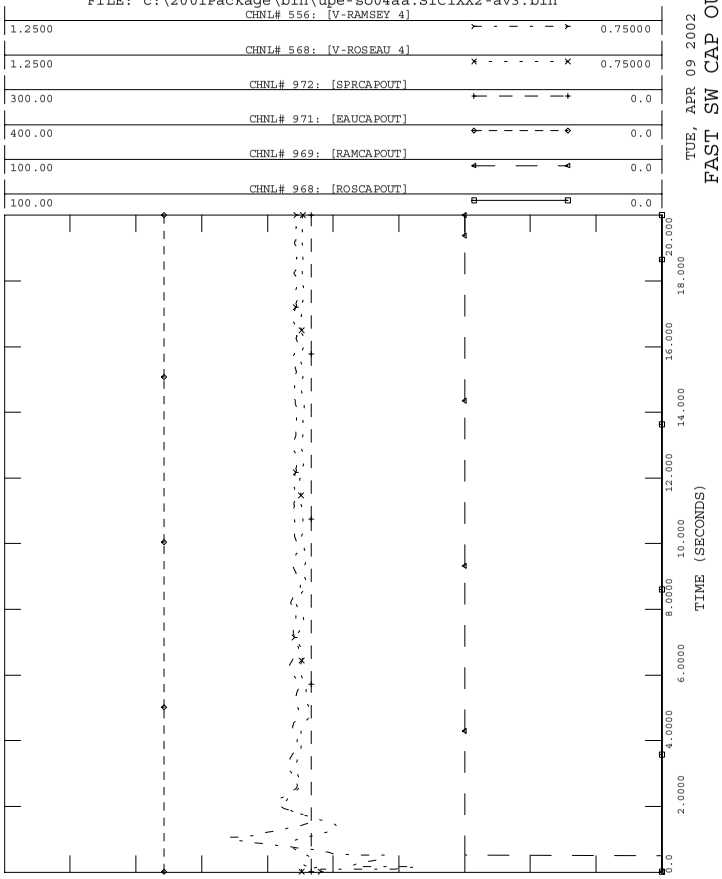

TUE, APR 09 2002 21:03
FAST SW CAP OUT 2

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CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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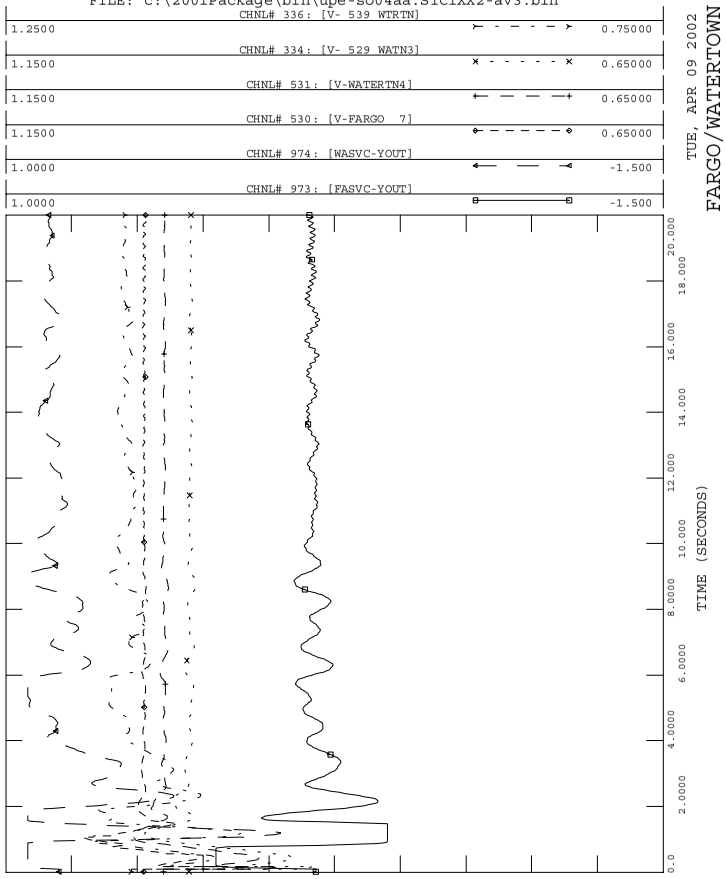

TUE, APR 09 2002 21:03
FARGO/WATERTOWN SVS

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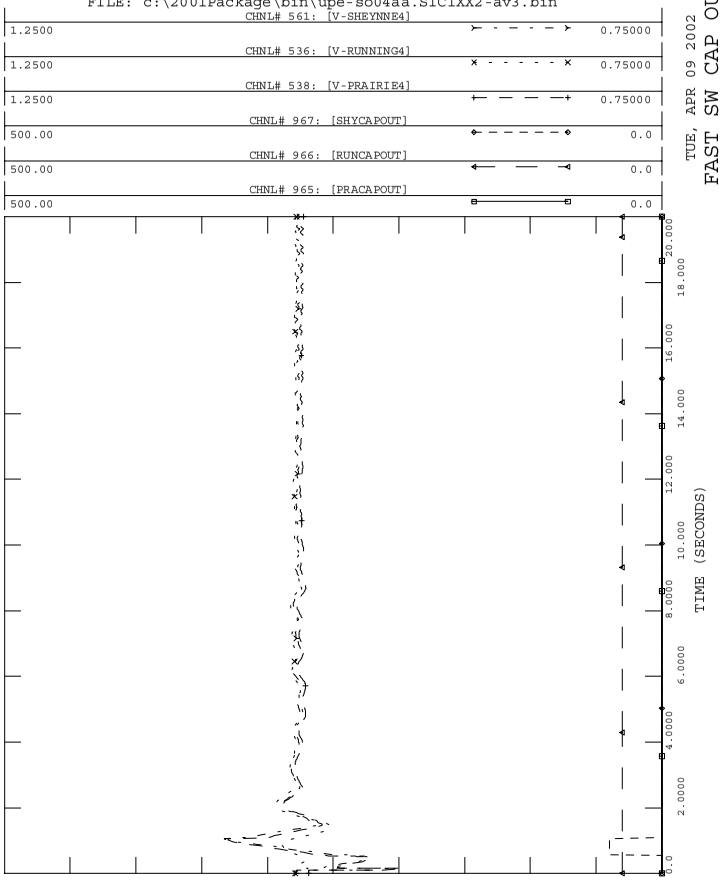
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin



TUE, APR 09 2002 21:02
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CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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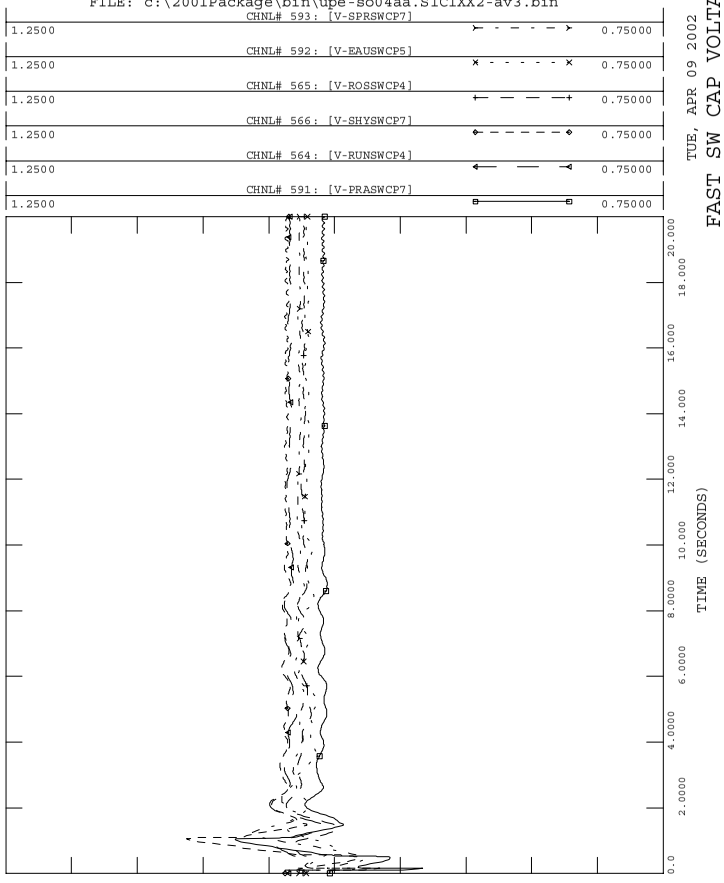

TUE, APR 09 2002 21:03
FAST SW CAP VOLTAGES

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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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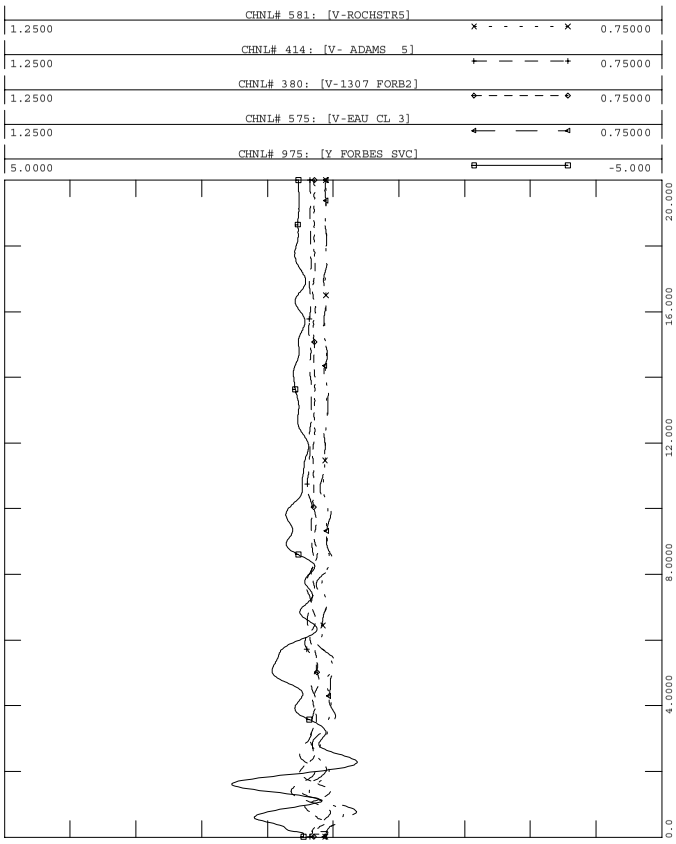
TUE, APR 09 2002 21:03

SVC & WISCONSIN VOLT



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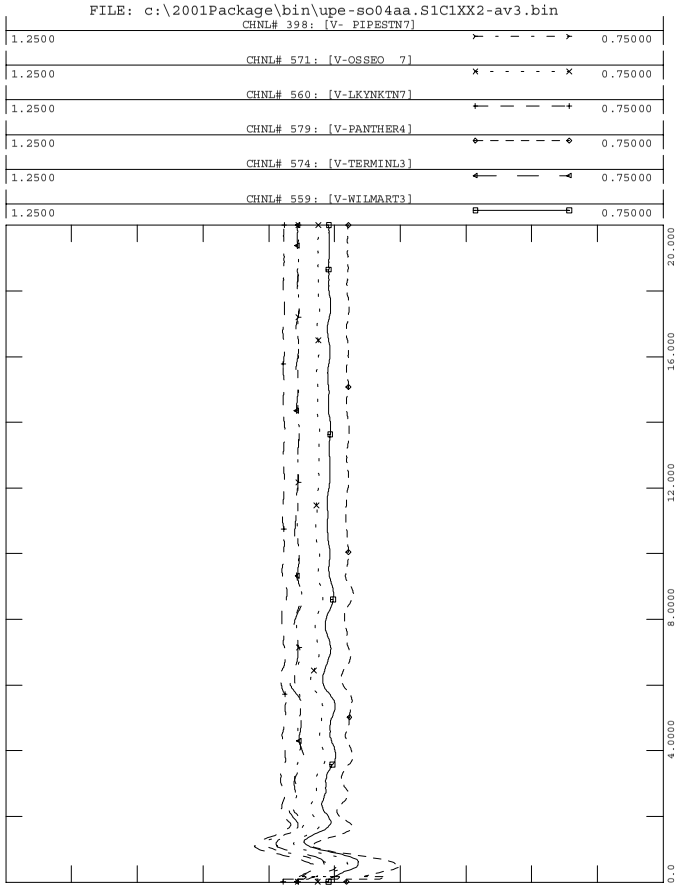
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:03

TC VOLTAGES



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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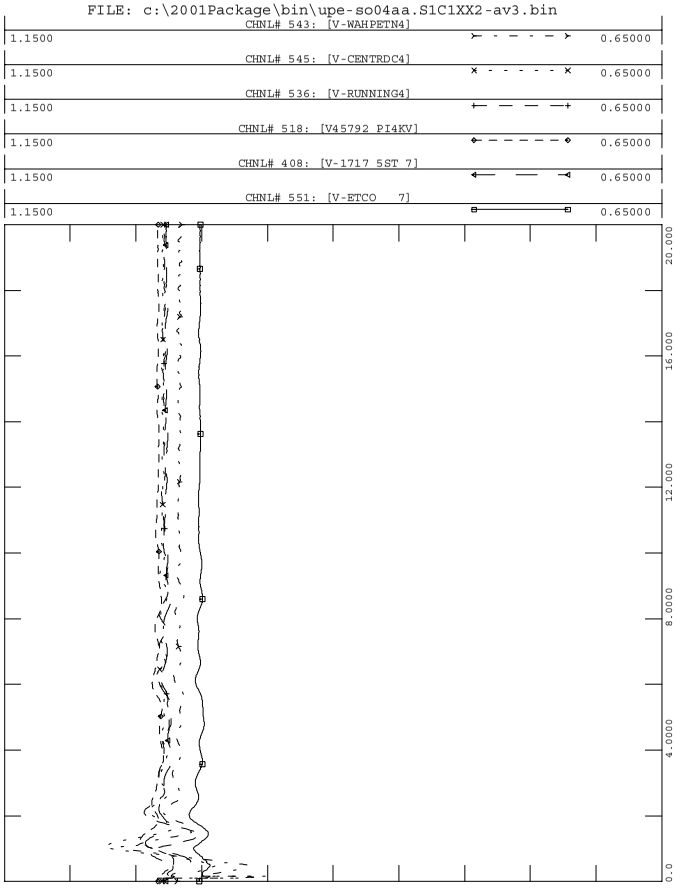
TUE, APR 09 2002 21:03

VOLTAGES 6



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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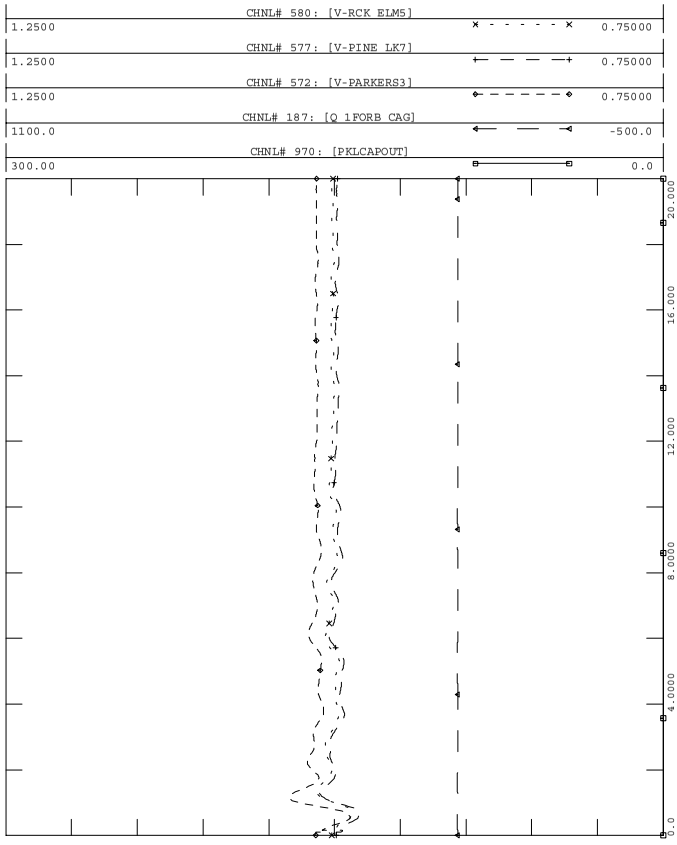
TUE, APR 09 2002 21:03

FORBES SVS OUT & VOLTAGES



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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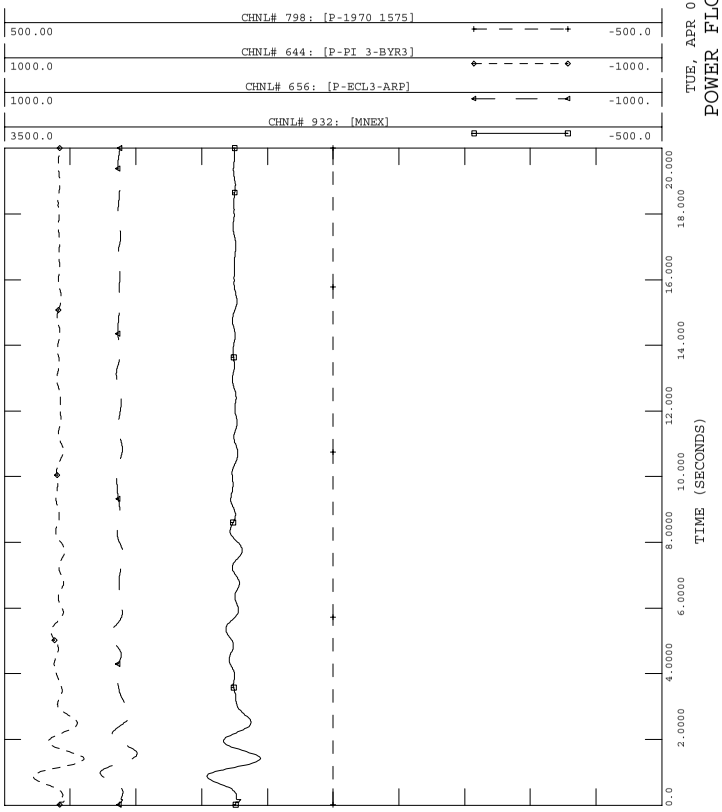
TUE, APR 09 2002 21:03
POWER FLOW SUMS 2



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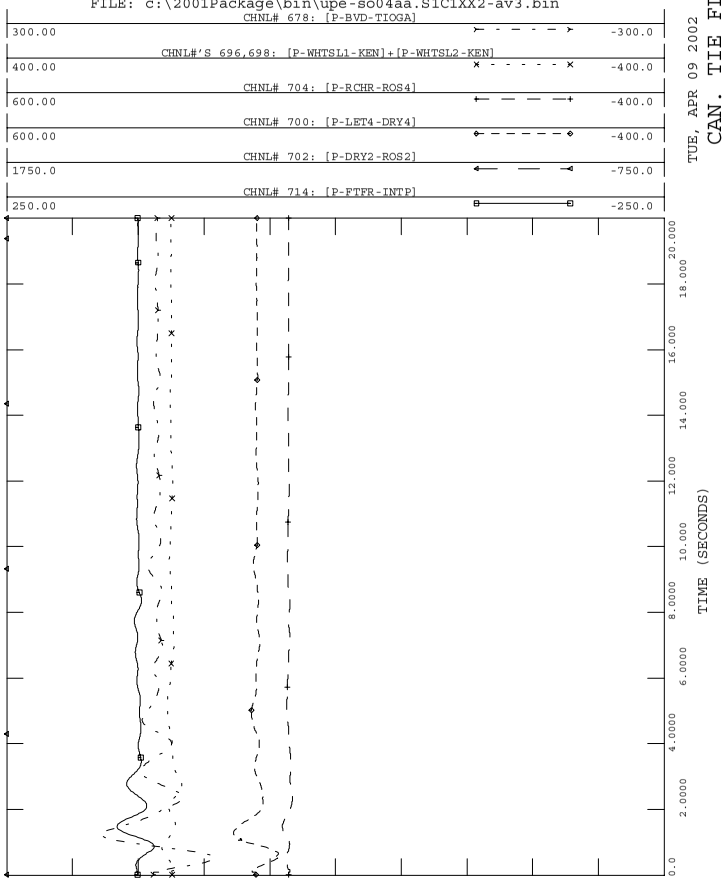
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:03
CAN. TIE FLOWS



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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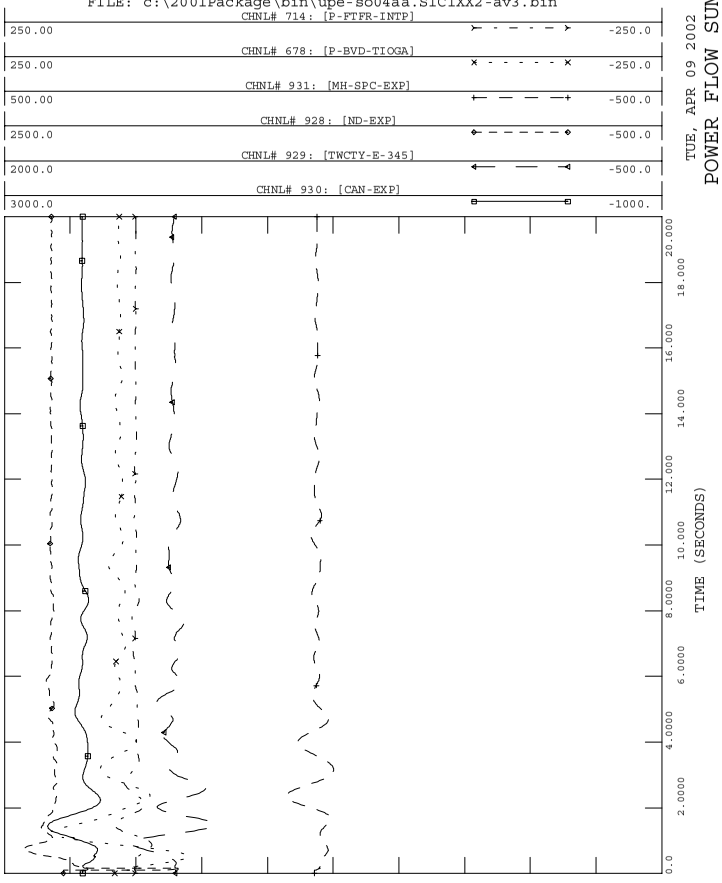
TUE, APR 09 2002 21:03
POWER FLOW SUMS 1



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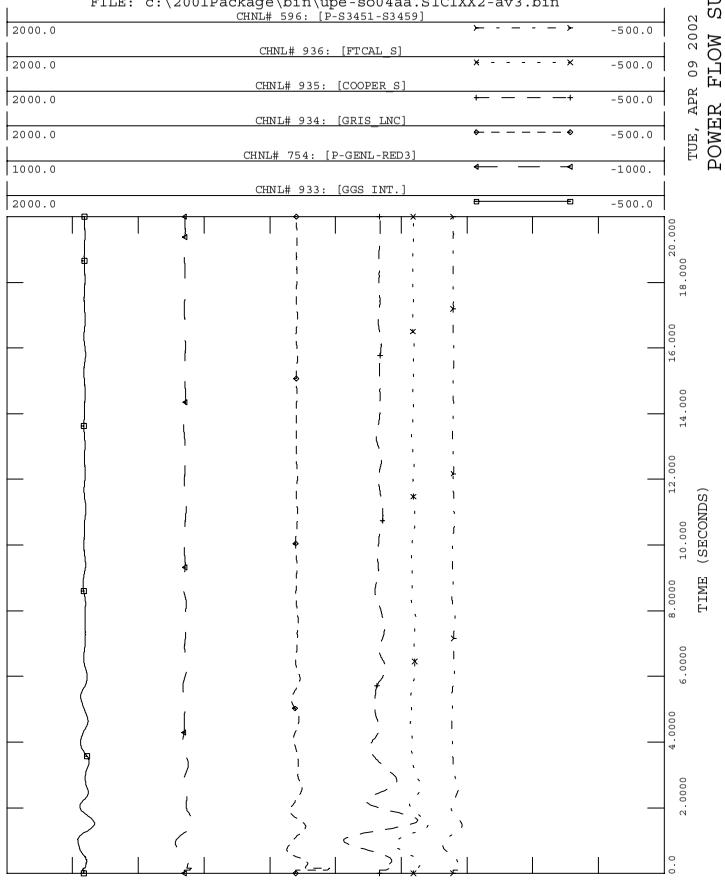
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:03
POWER FLOW SUM 3



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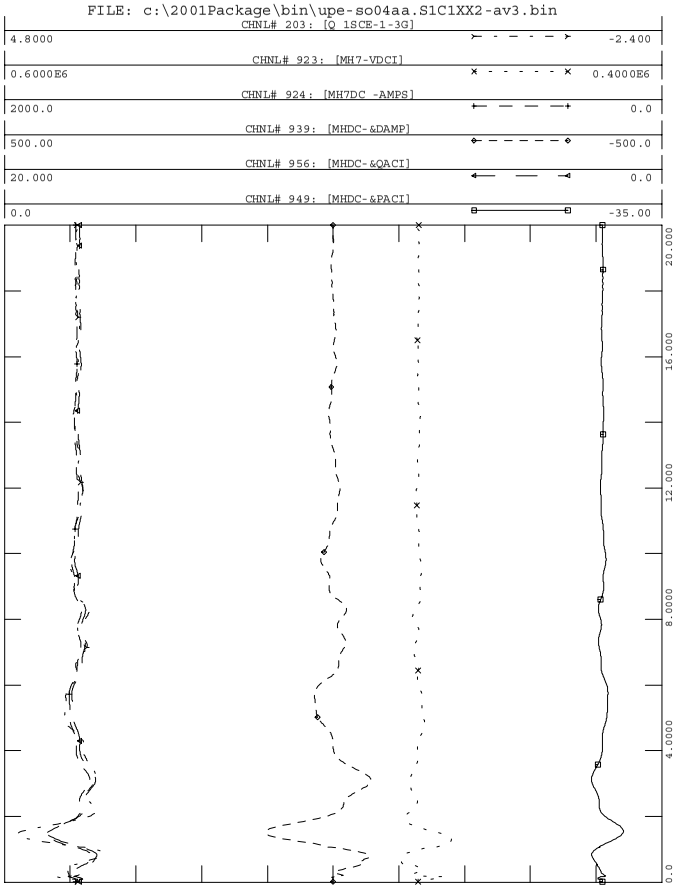
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:03
MH DC PARAMETERS



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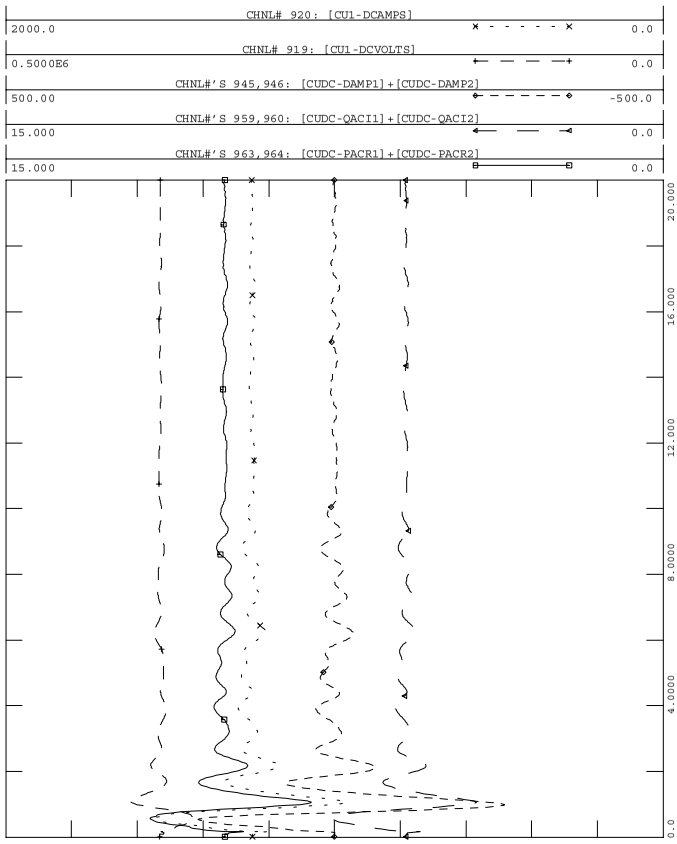
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:03
CU DC #1



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
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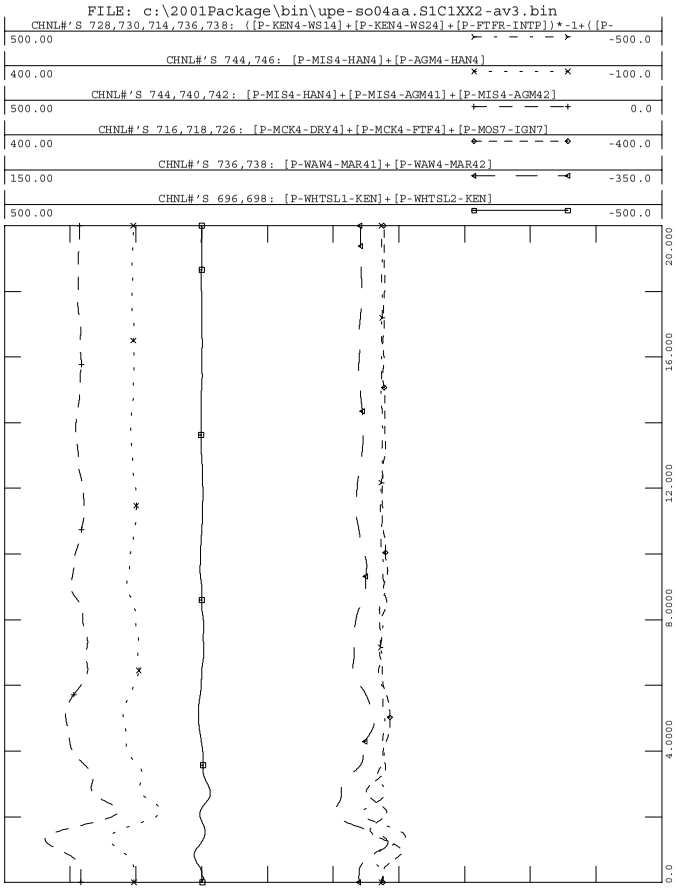
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:03
OH TIE FLOWS



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ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

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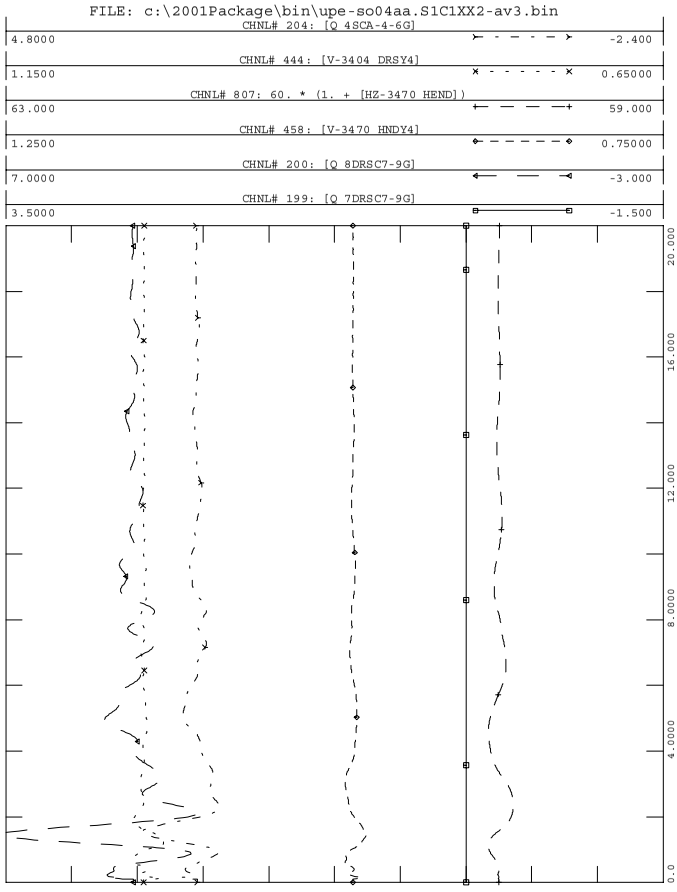
MH DC PARAMETERS



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

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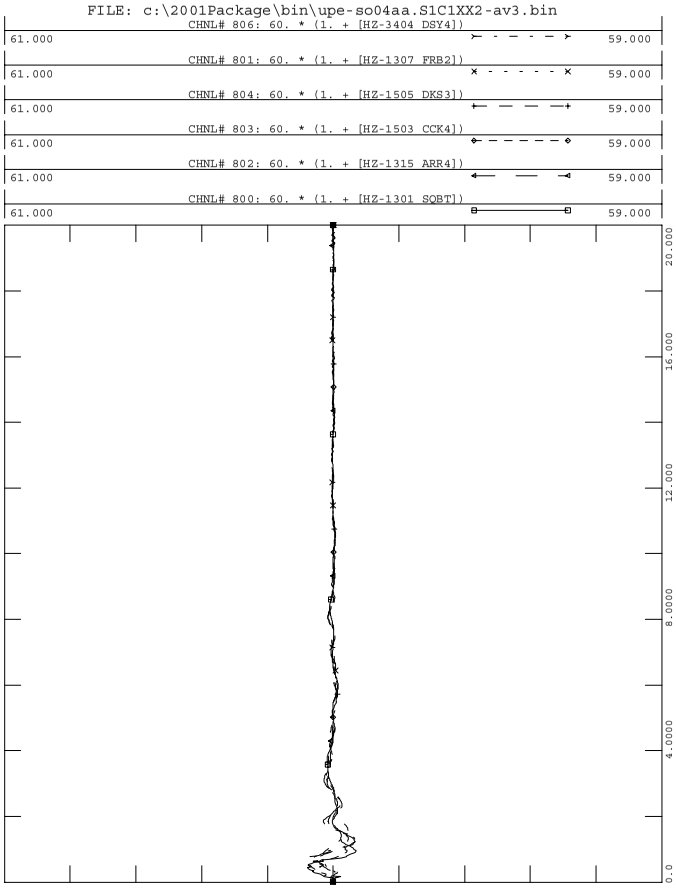
FREQ AT DC TERMINALS



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

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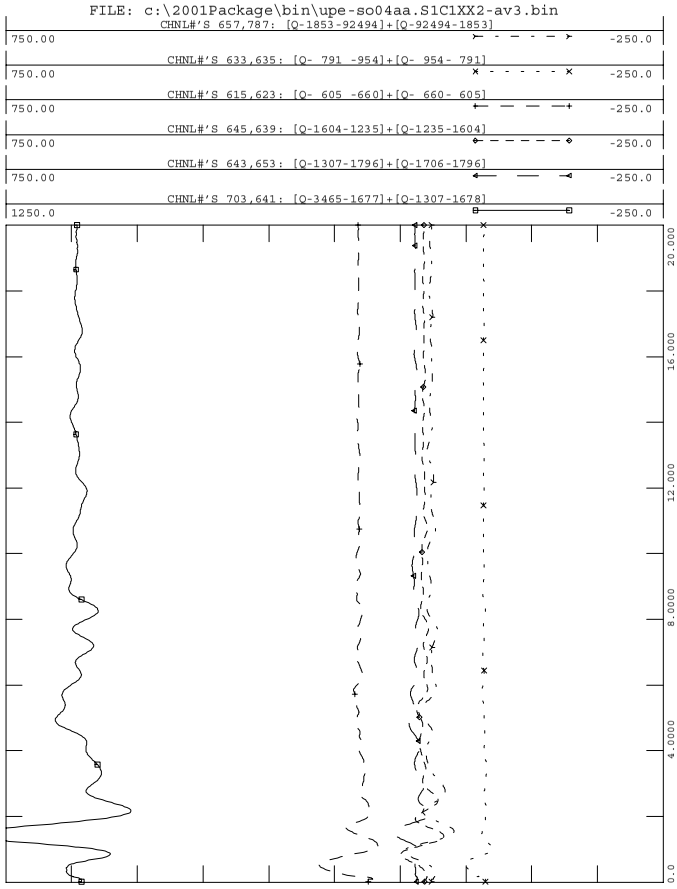
VAR LOSSES



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

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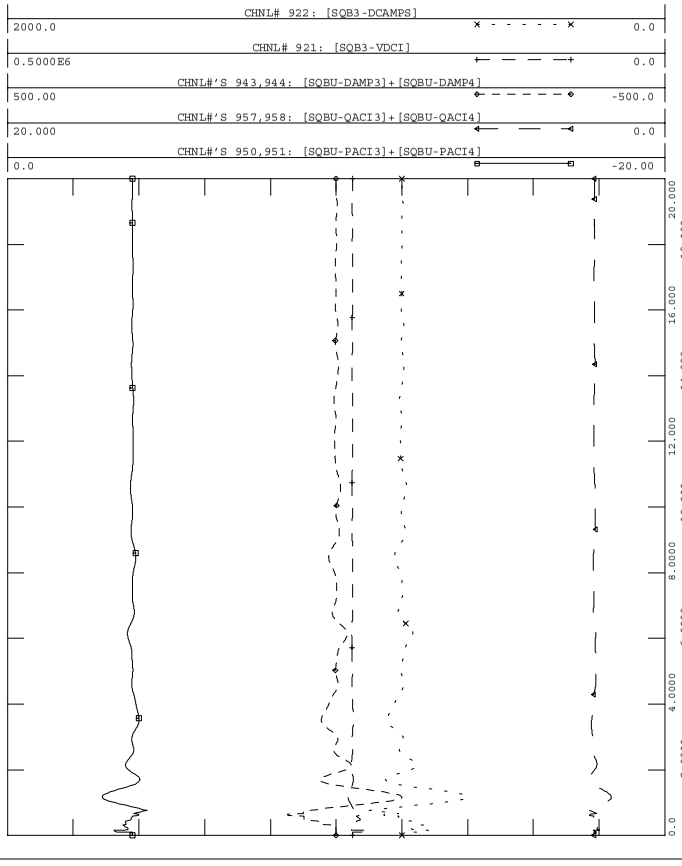
SQB DC #3



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

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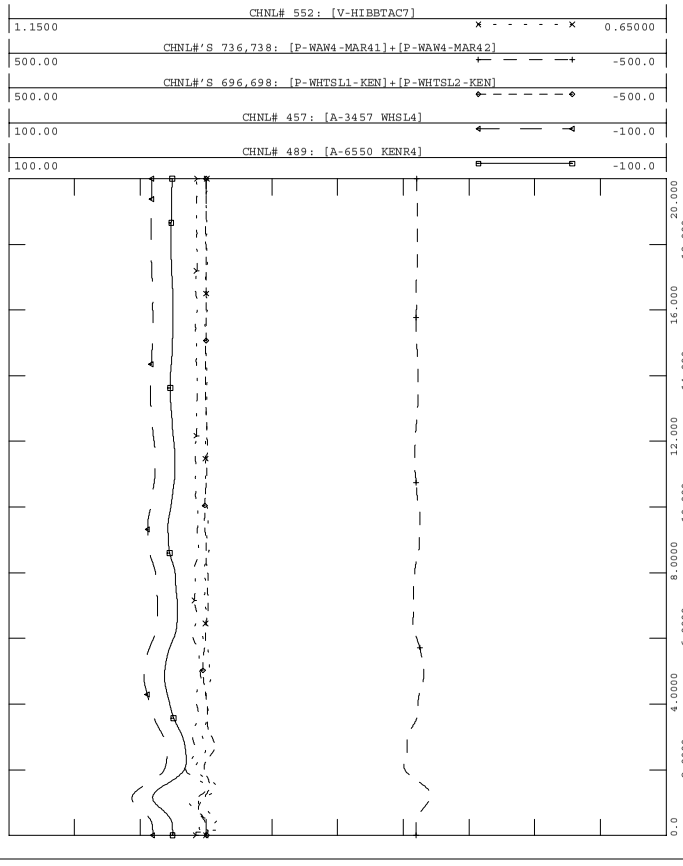
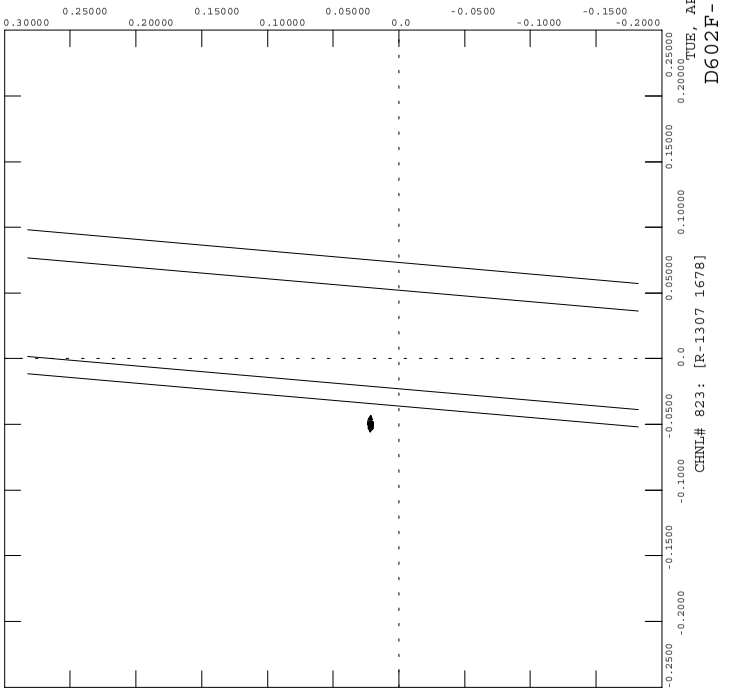
VOLTAGES, ANGLES



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

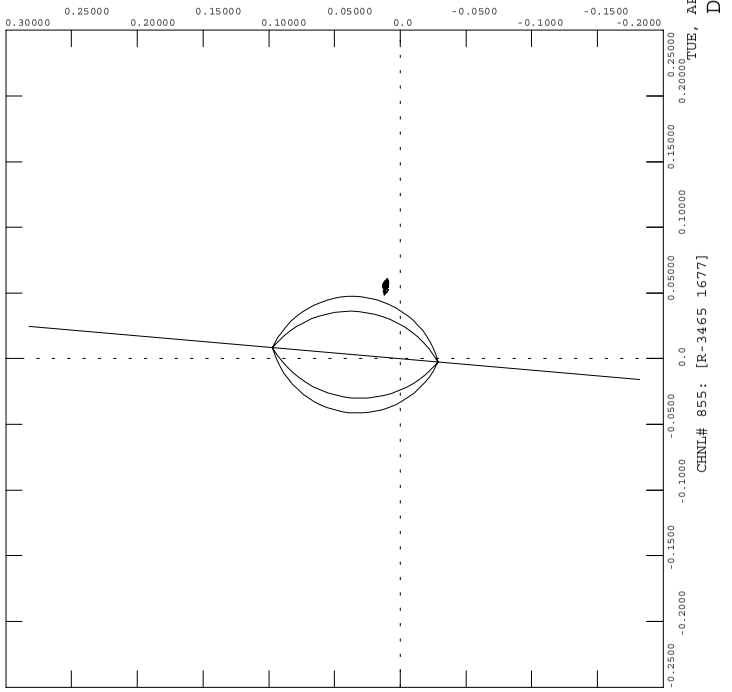


TUE, APR 09 2002 21:03
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

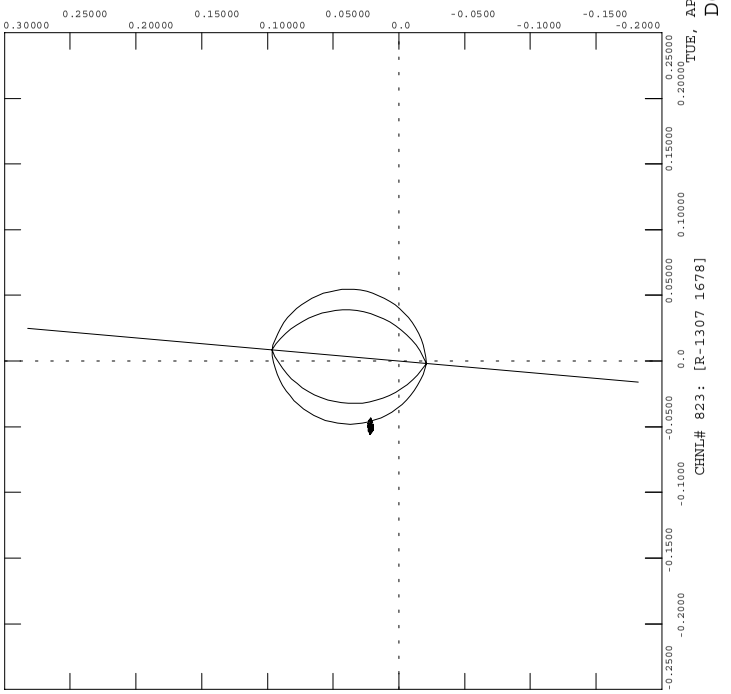


TUE, APR 09 2002 21:03
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

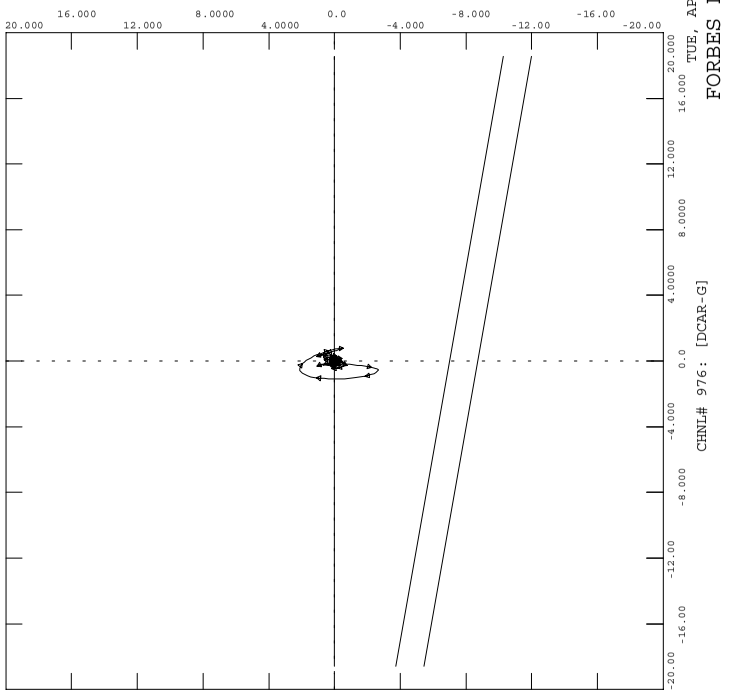


TUE, APR 09 2002 21:03
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

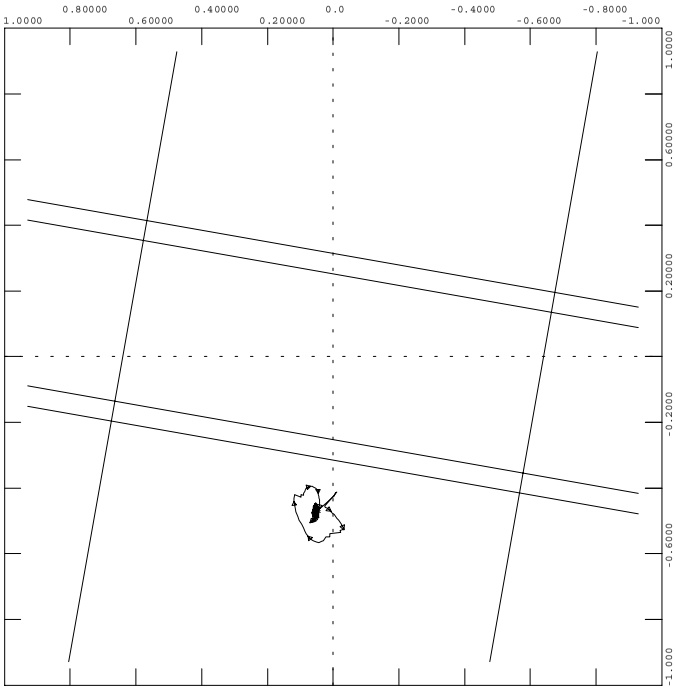


TUE, APR 09 2002 21:03
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

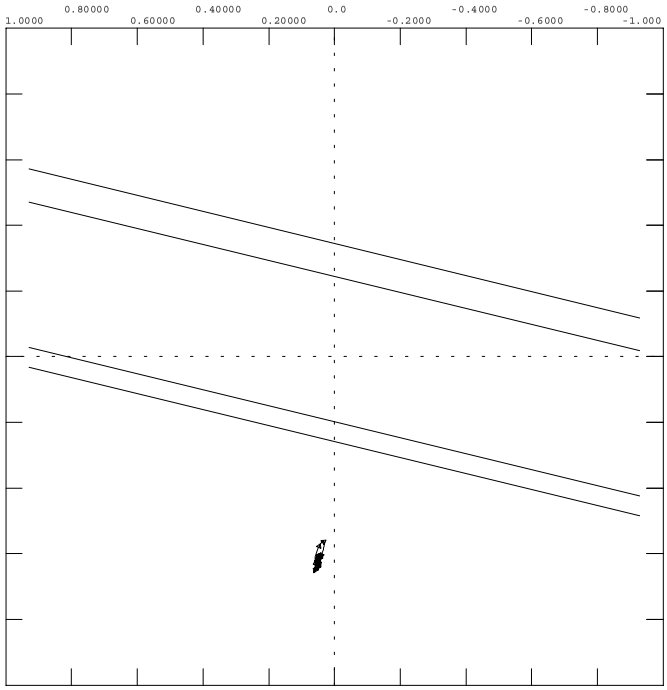
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

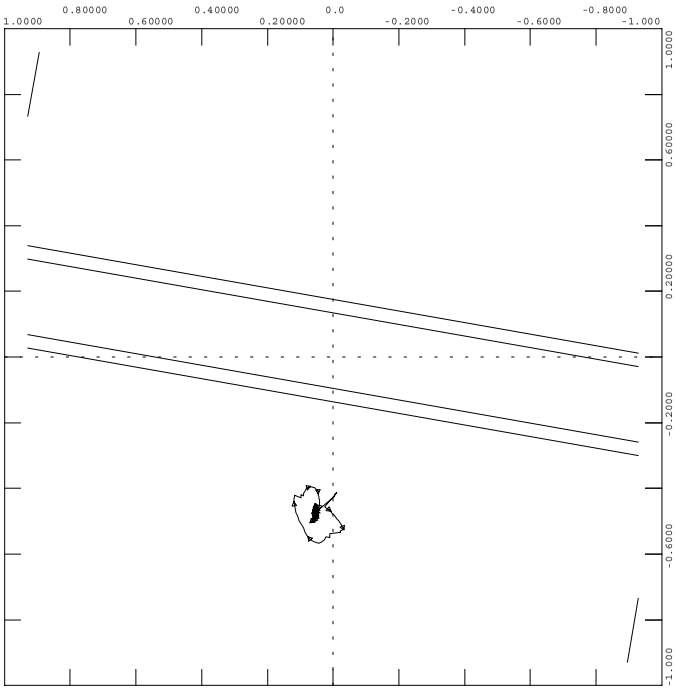
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

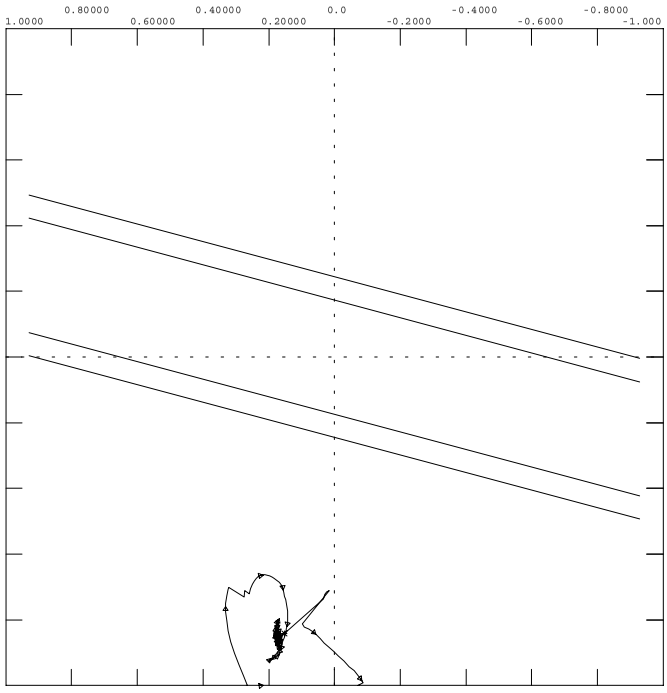
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

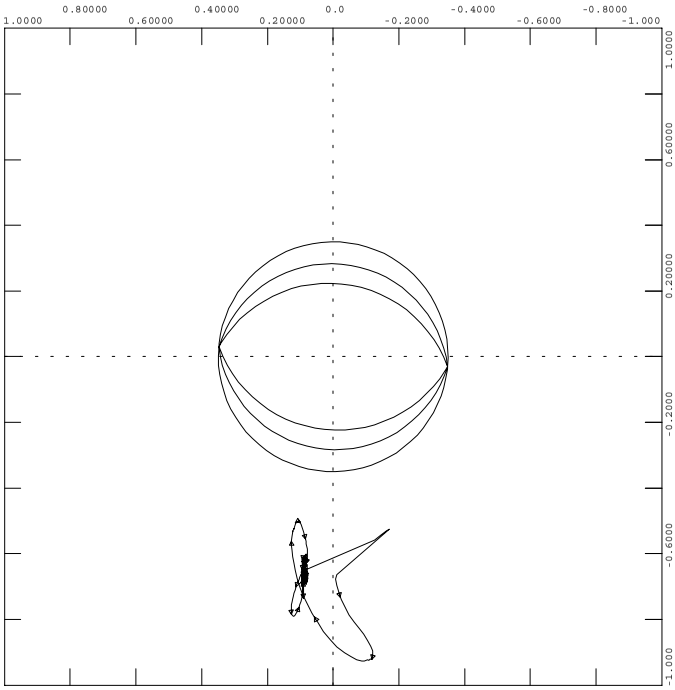
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

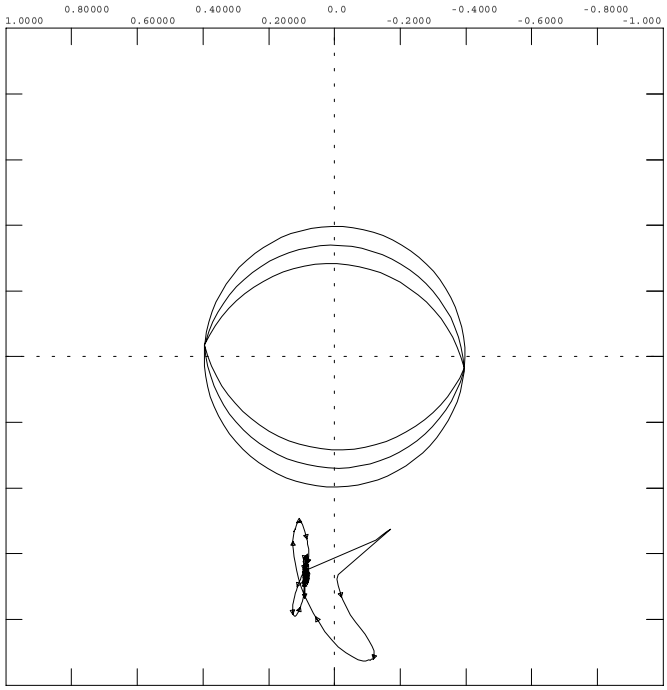
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

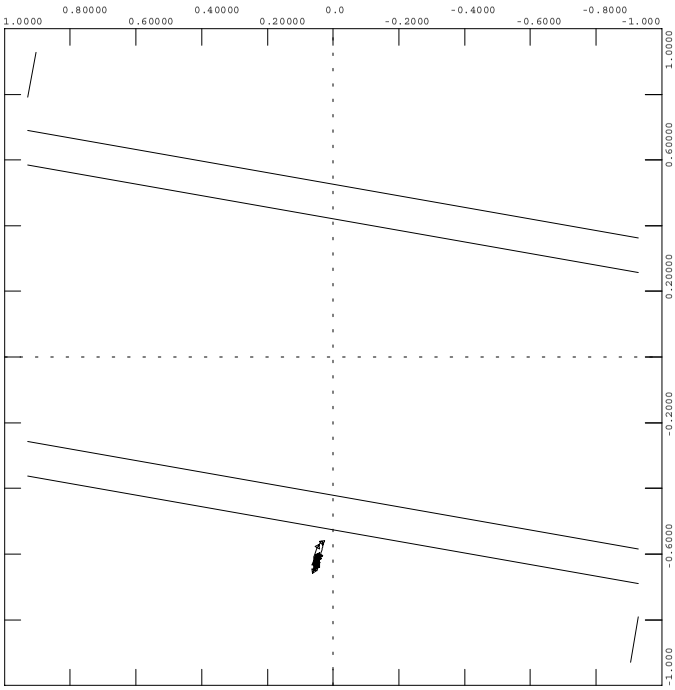
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

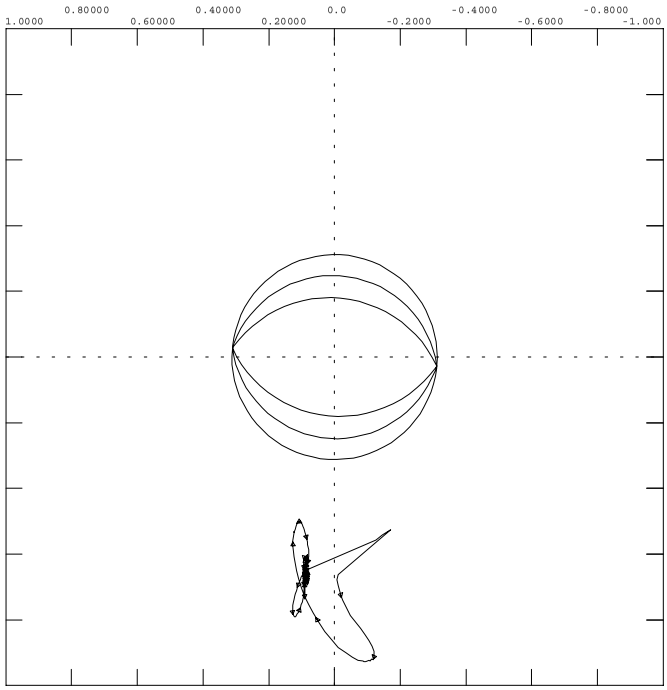
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



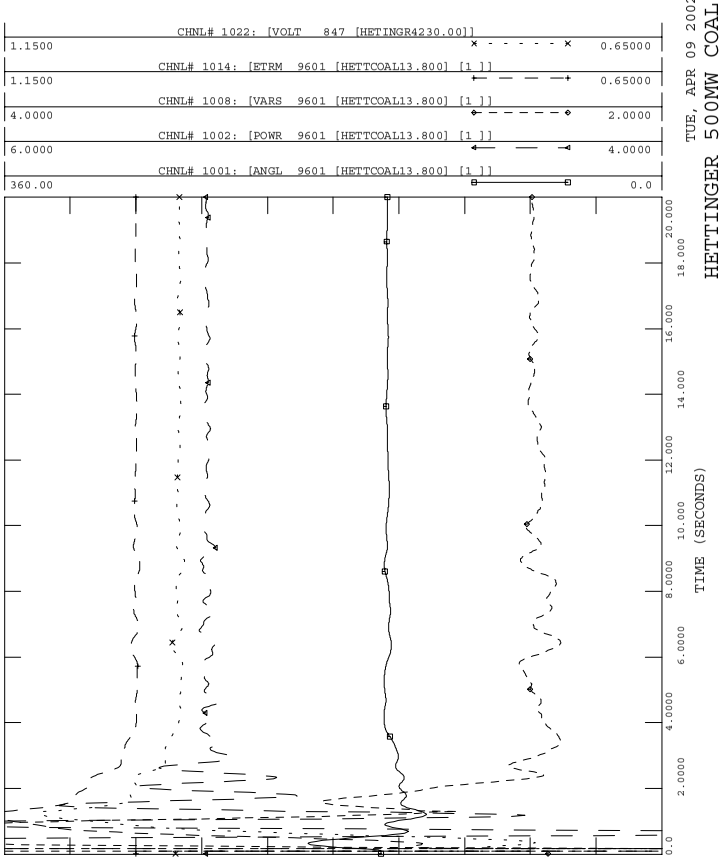
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

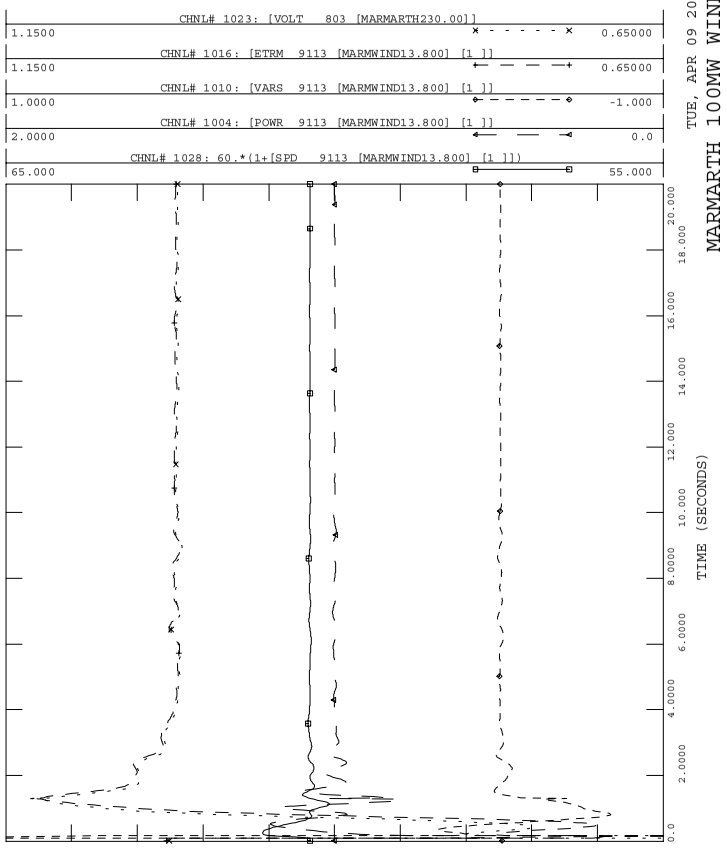


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin



TUE, APR 09 2002 21:03
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

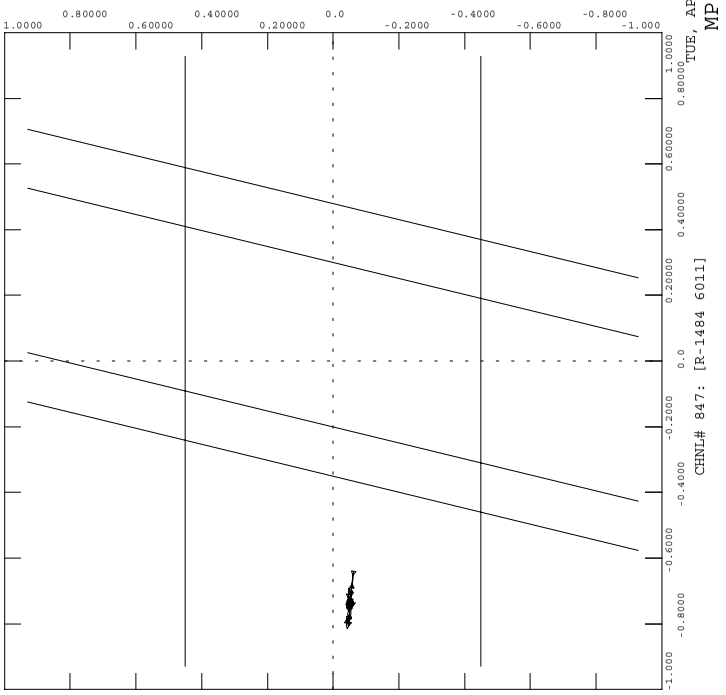


TUE, APR 09 2002 21:03
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

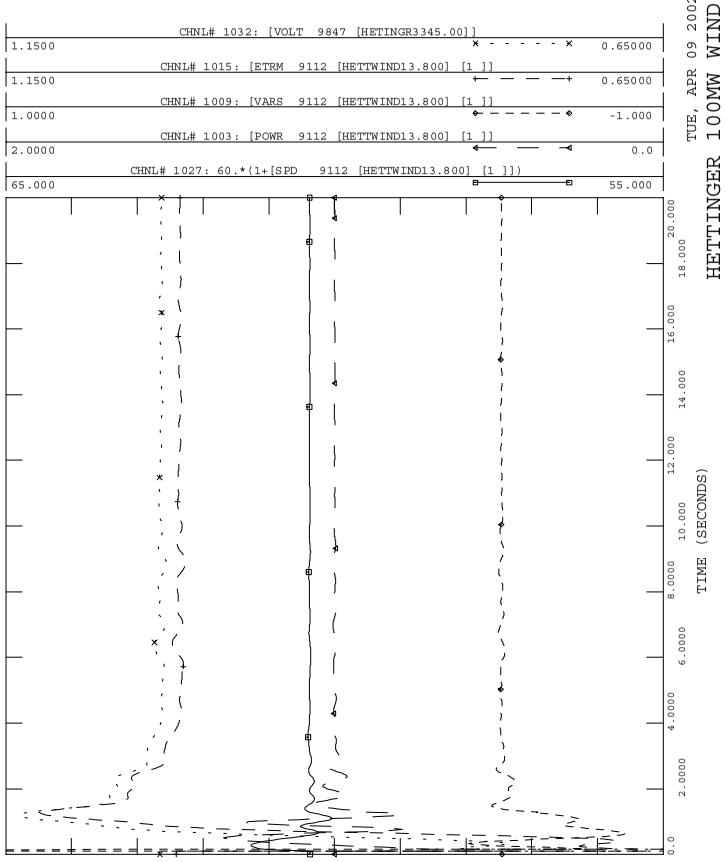
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



TUE, APR 09 2002 21:03
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin



TUE, APR 09 2002 21:03
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

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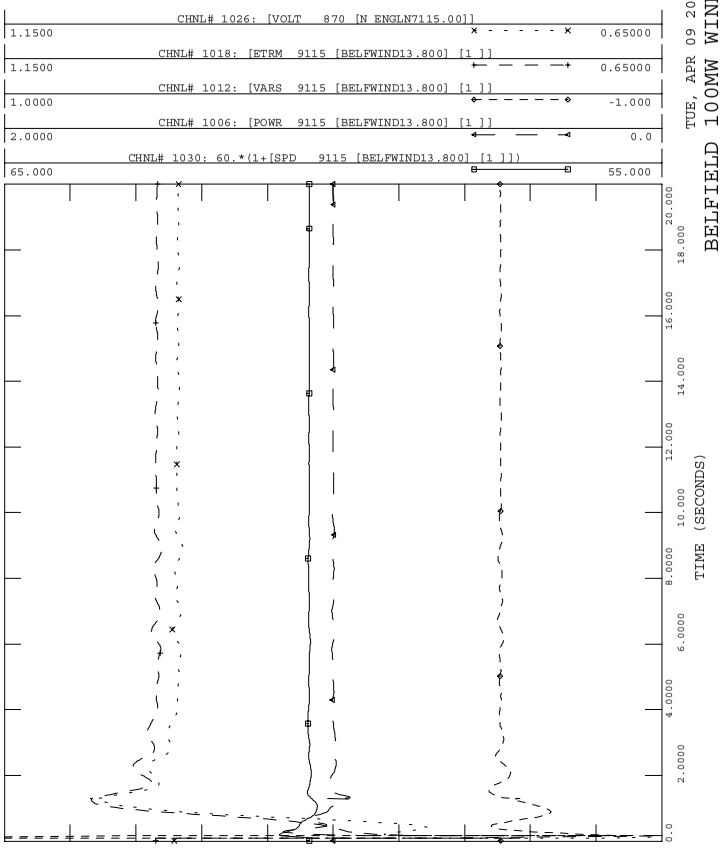
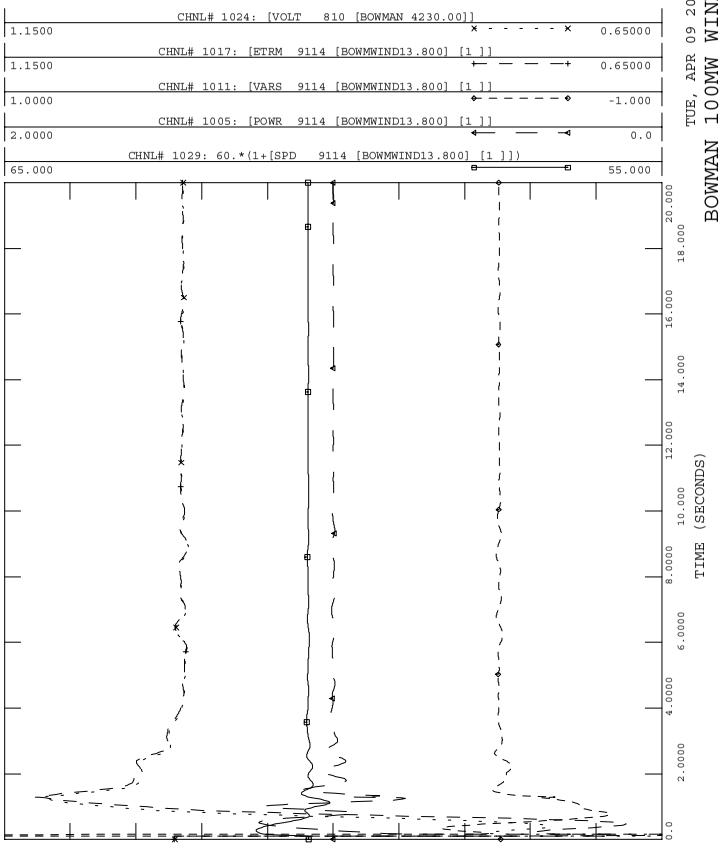
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:03

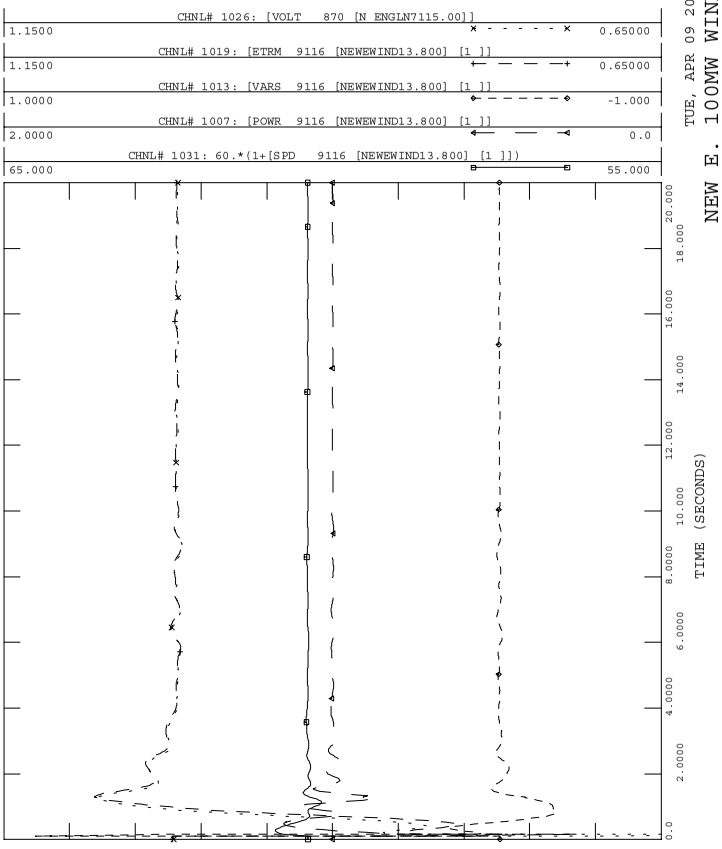
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-av3.bin

TUE, APR 09 2002 21:03

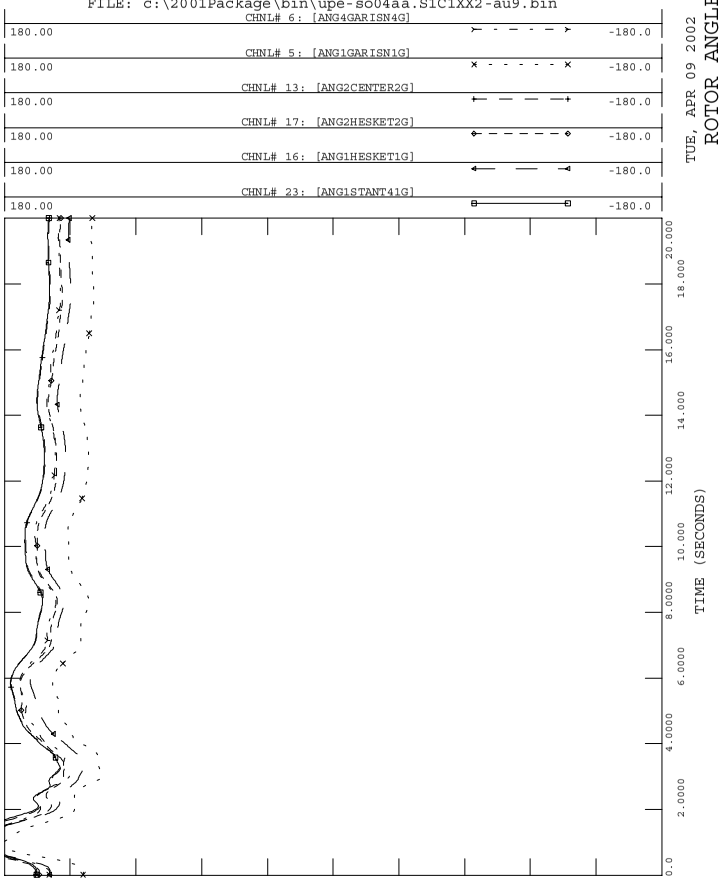
NEW E. 100MW WIND UNIT



CONTINGENCY AU9

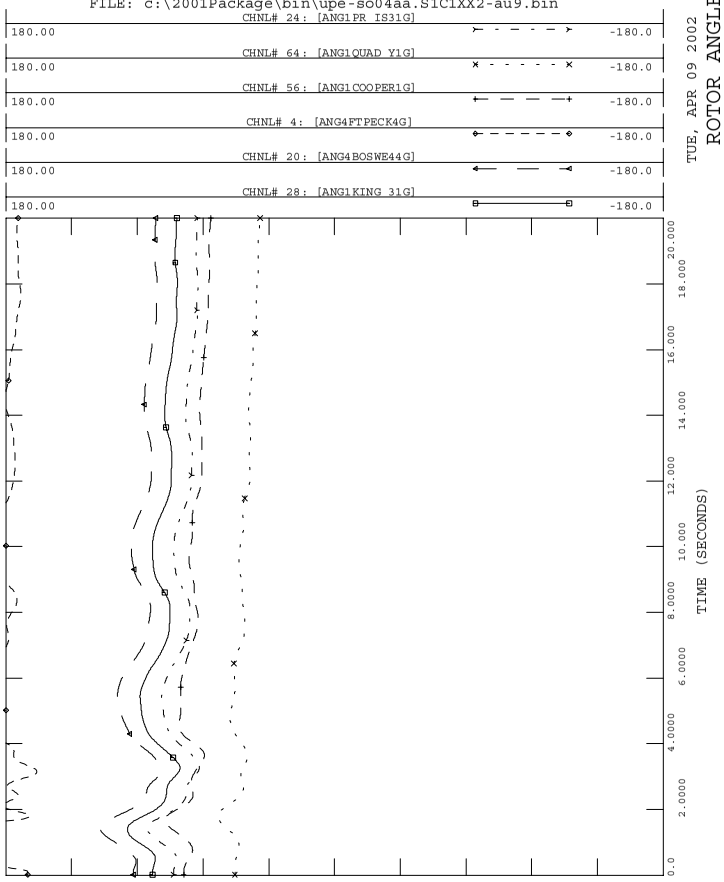
4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Ft. Thompson 345 kV line

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



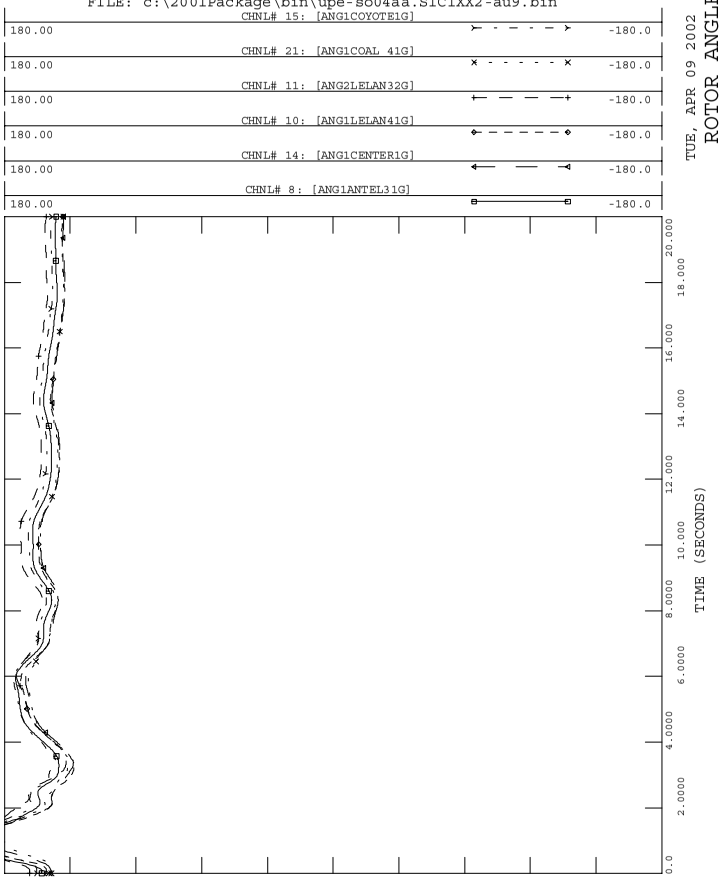
TUE, APR 09 2002 21:21
ROTOR ANGLES 2

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



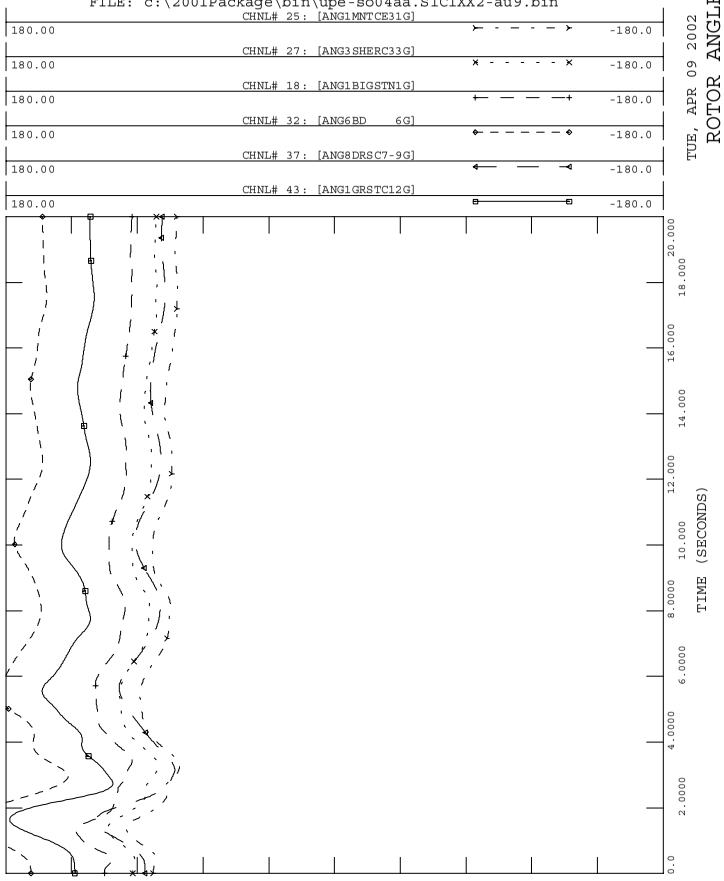
TUE, APR 09 2002 21:21
ROTOR ANGLES 4

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

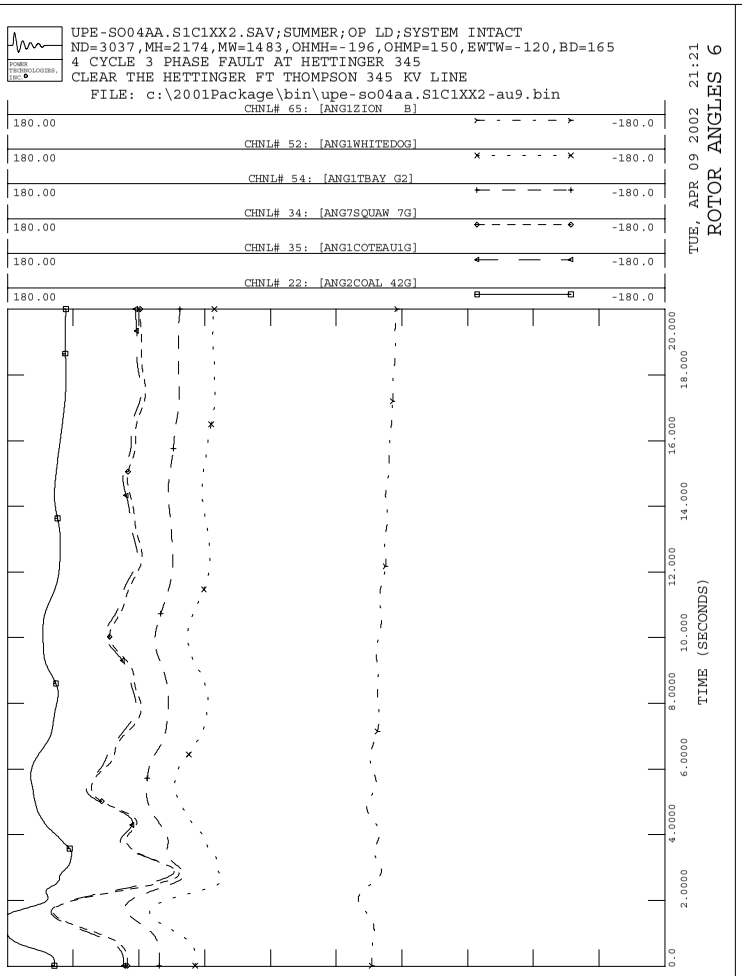


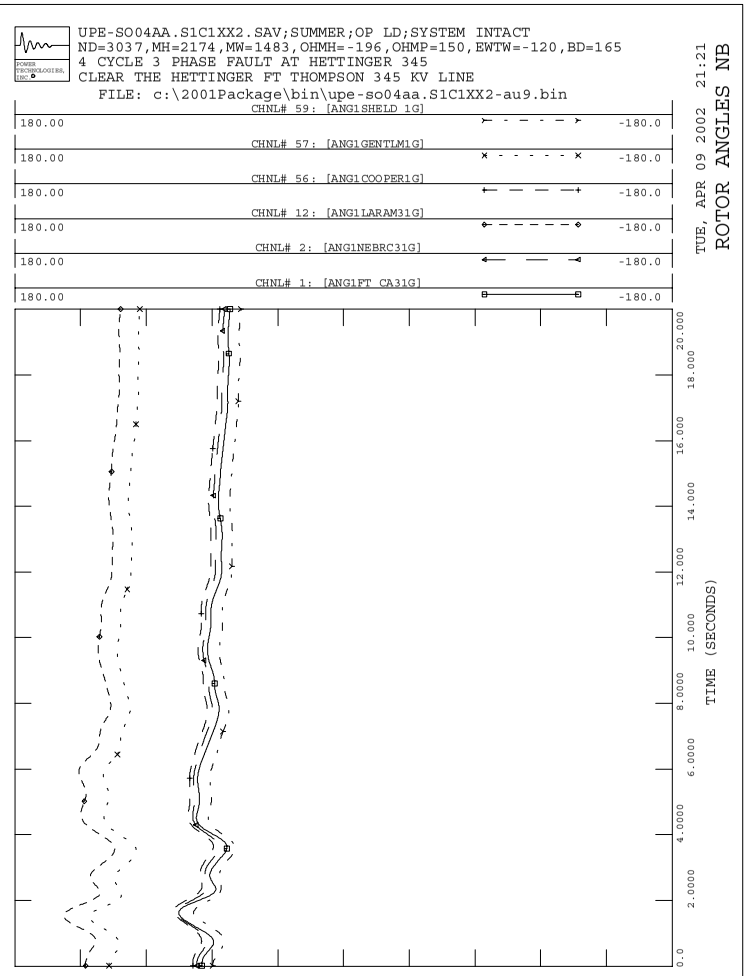
TUE, APR 09 2002 21:21
ROTOR ANGLES 1

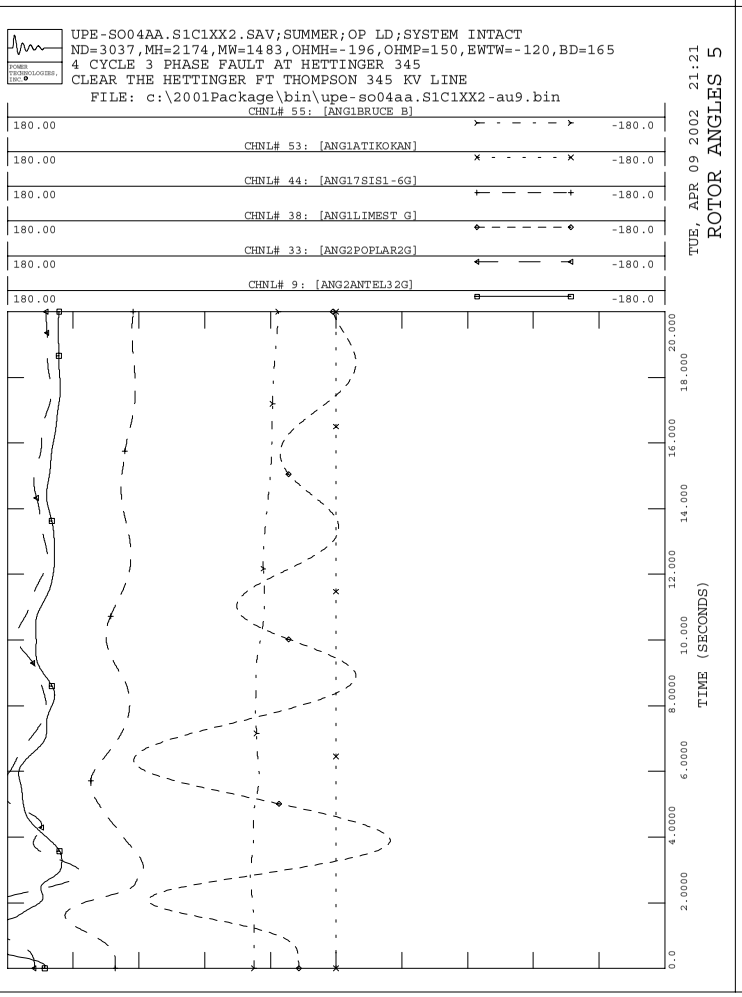
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



TUE, APR 09 2002 21:21
ROTOR ANGLES 3


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 21:21
ROTOR ANGLES 6


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 21:21
ROTOR ANGLES NB


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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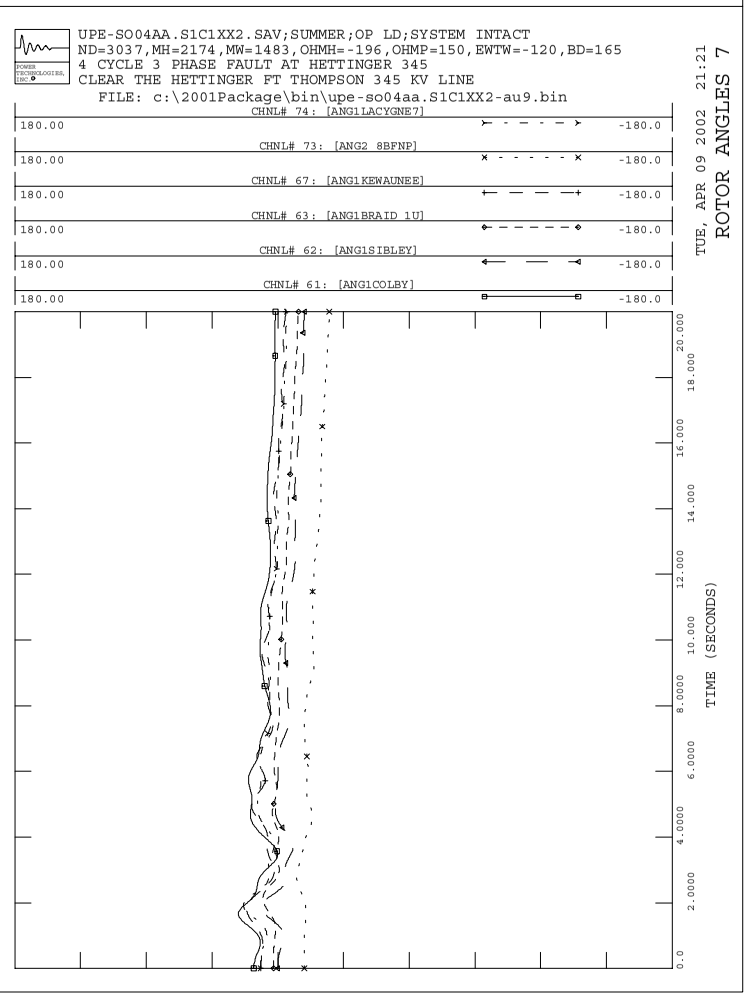
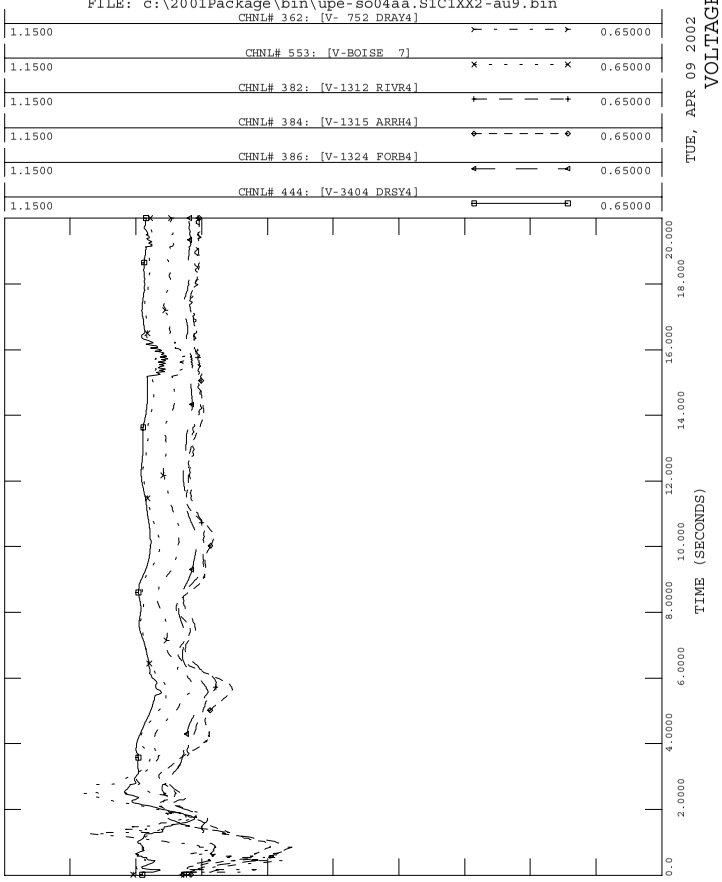
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 21:21
ROTOR ANGLES 5


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 21:21
ROTOR ANGLES 7

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
VOLTAGES 1



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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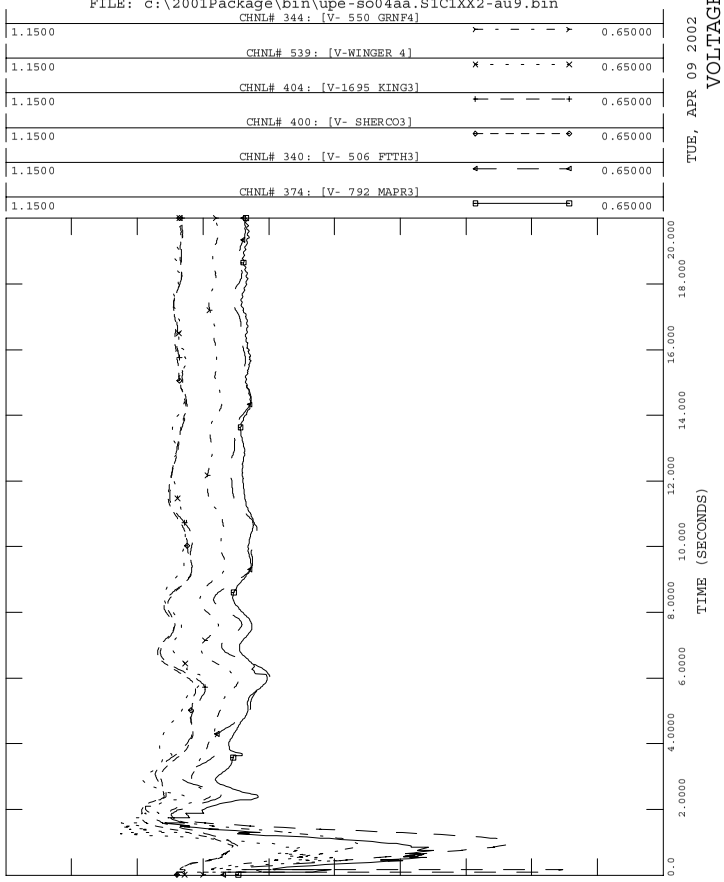
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
VOLTAGES 3



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

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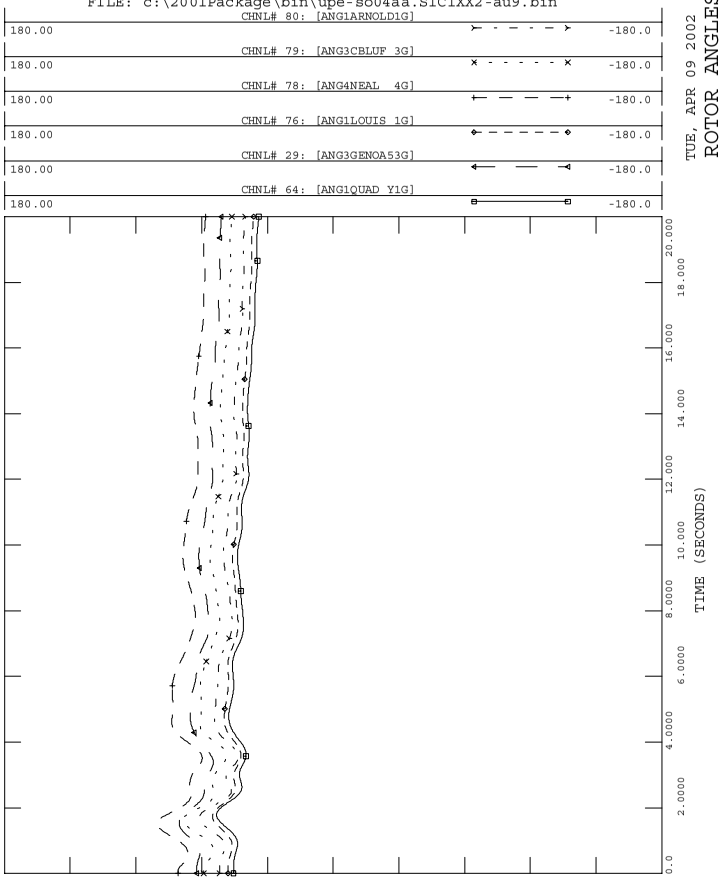
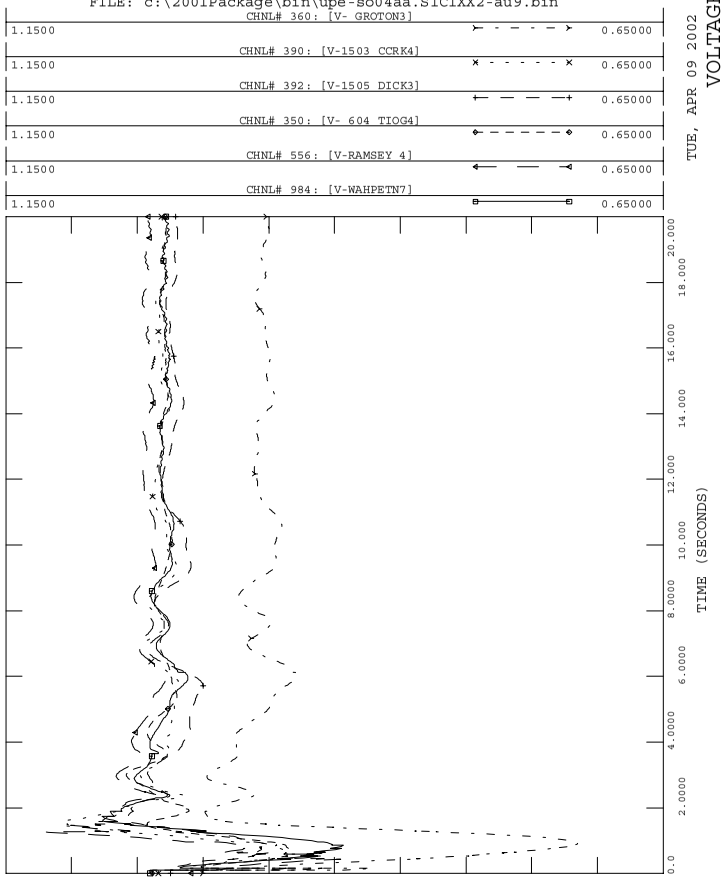
ROTOR ANGLES IA



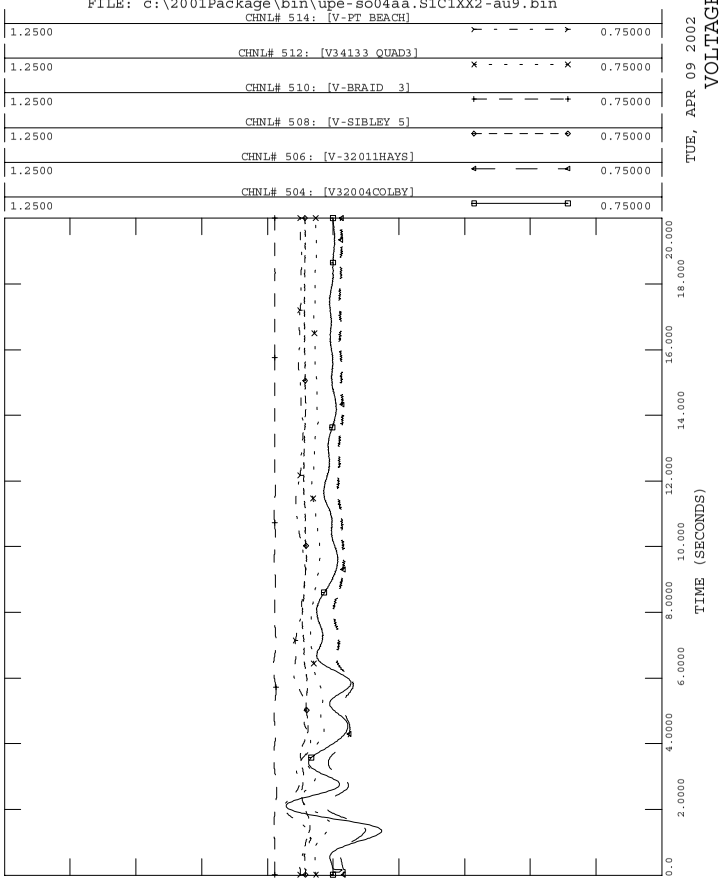
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
VOLTAGES 2



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
VOLTAGES 5



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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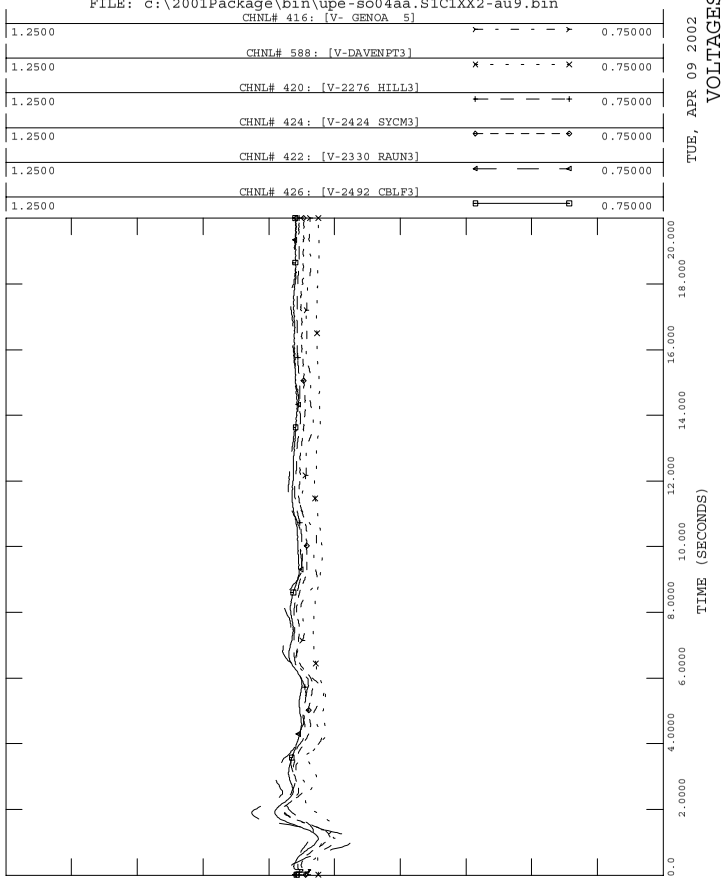
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
VOLTAGES IA



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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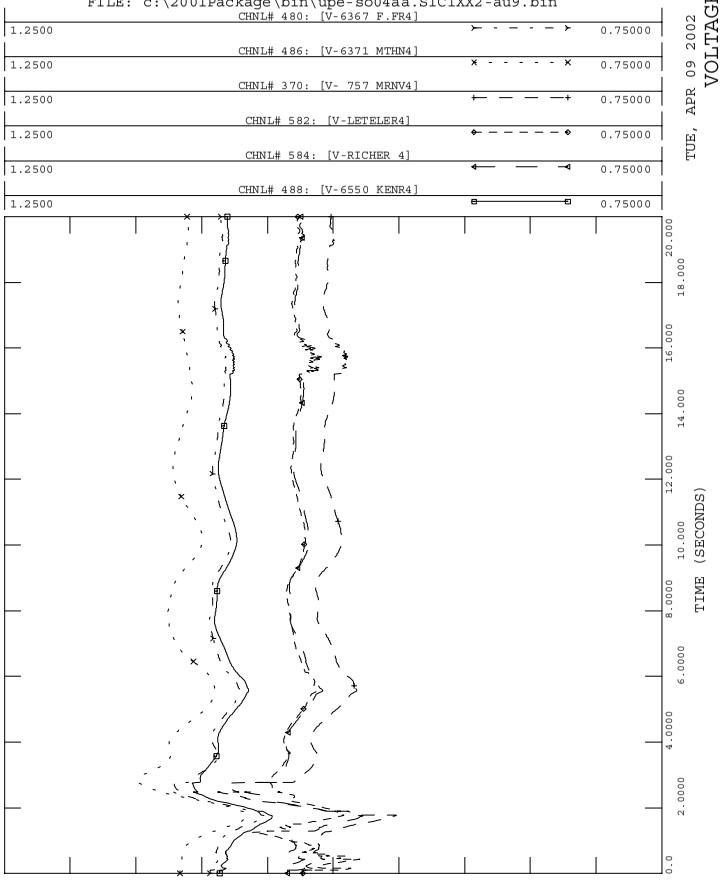
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
VOLTAGES 4



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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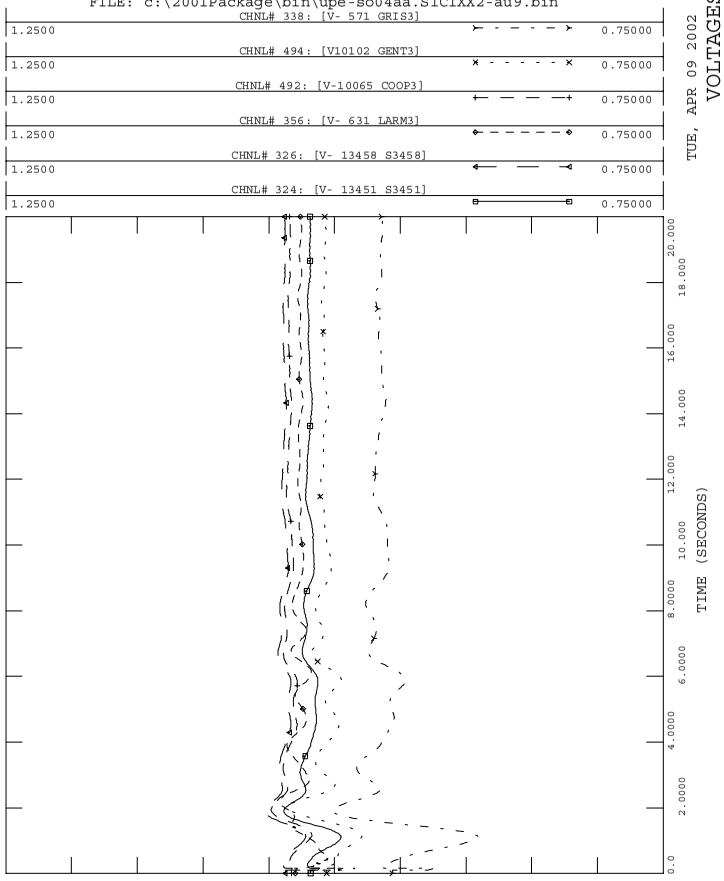
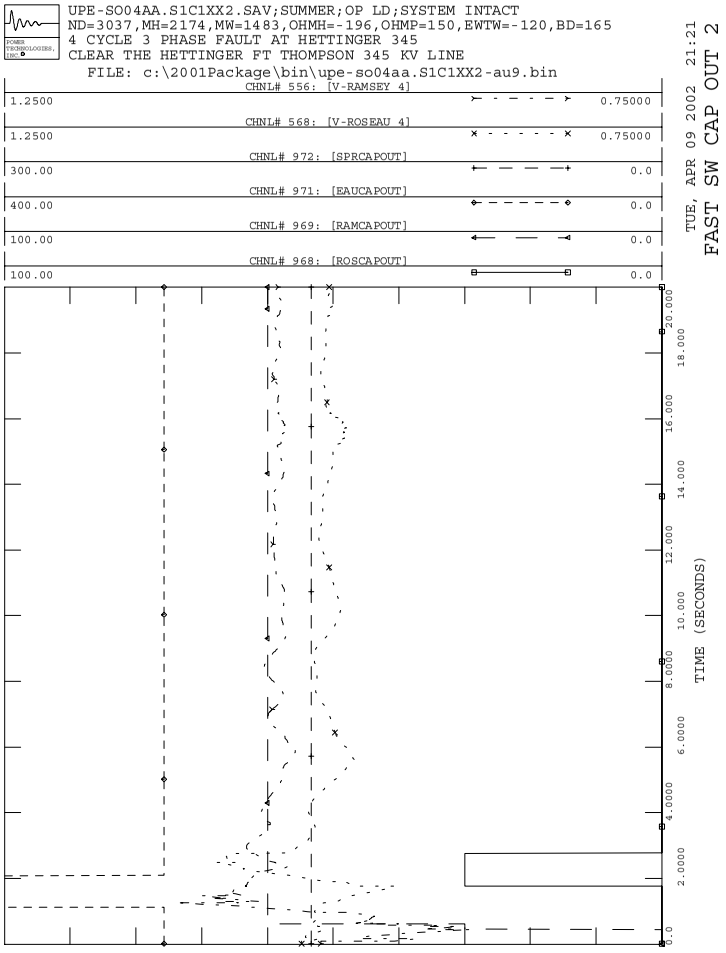
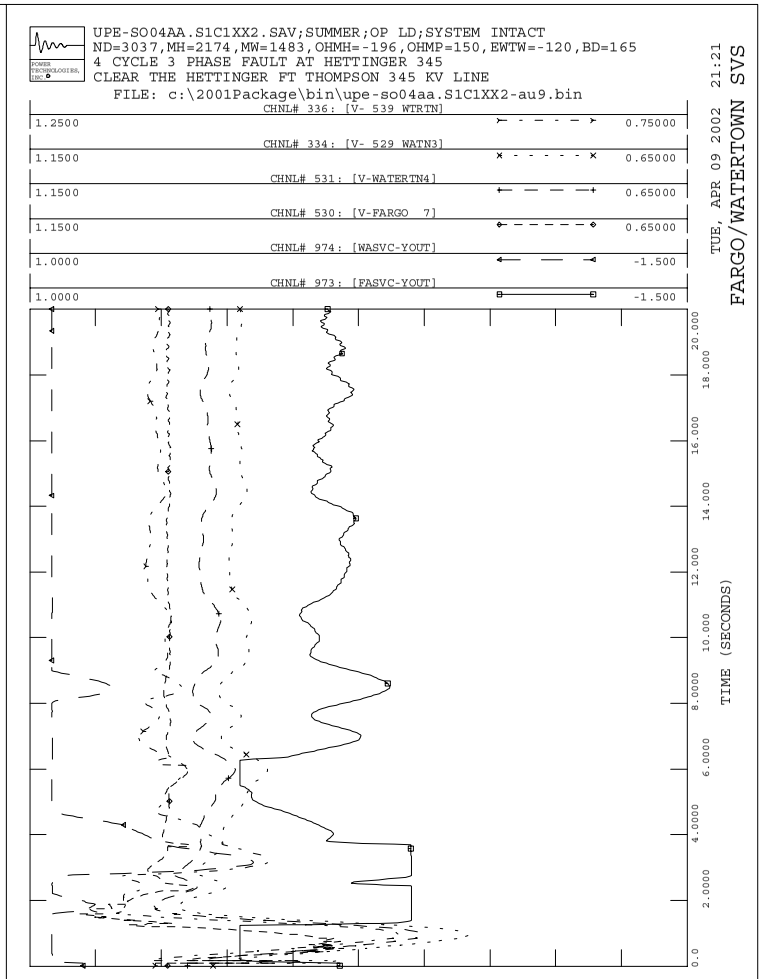
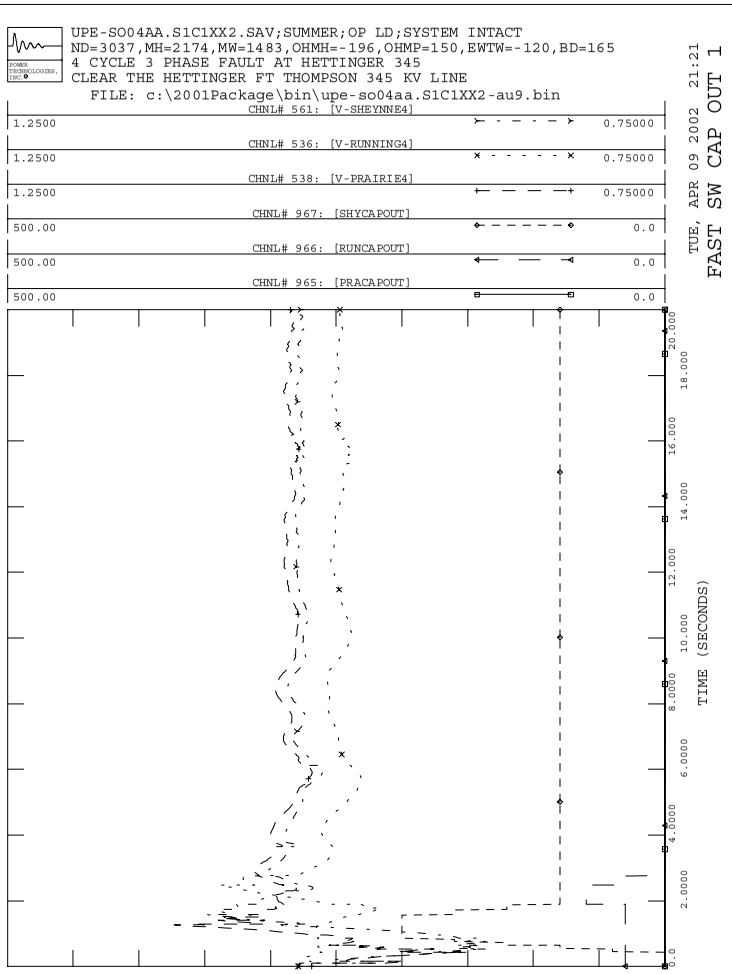
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

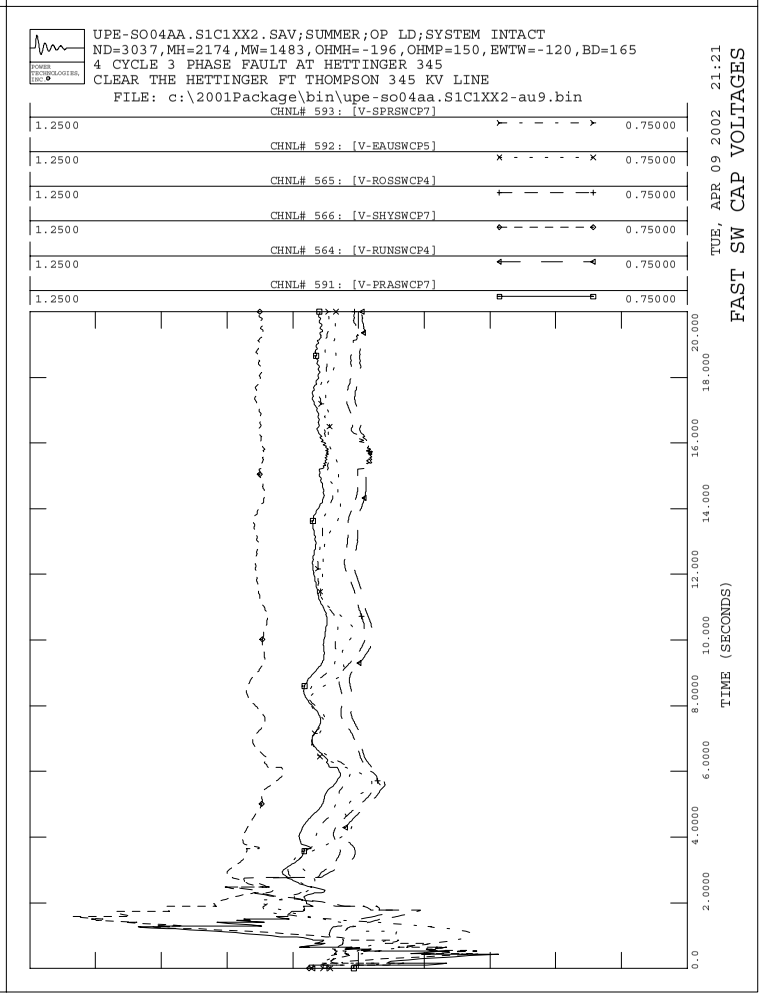
TUE, APR 09 2002 21:21
VOLTAGES NB



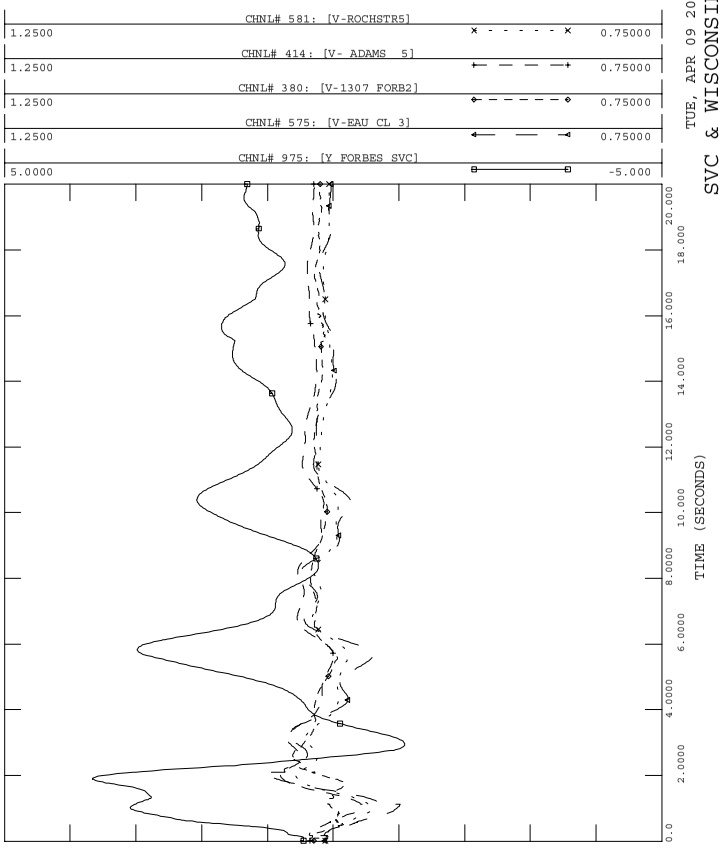

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TUE, APR 09 2002 21:21
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TUE, APR 09 2002 21:21
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TUE, APR 09 2002 21:21
FAST SW CAP OUT 1
TIME (SECONDS)

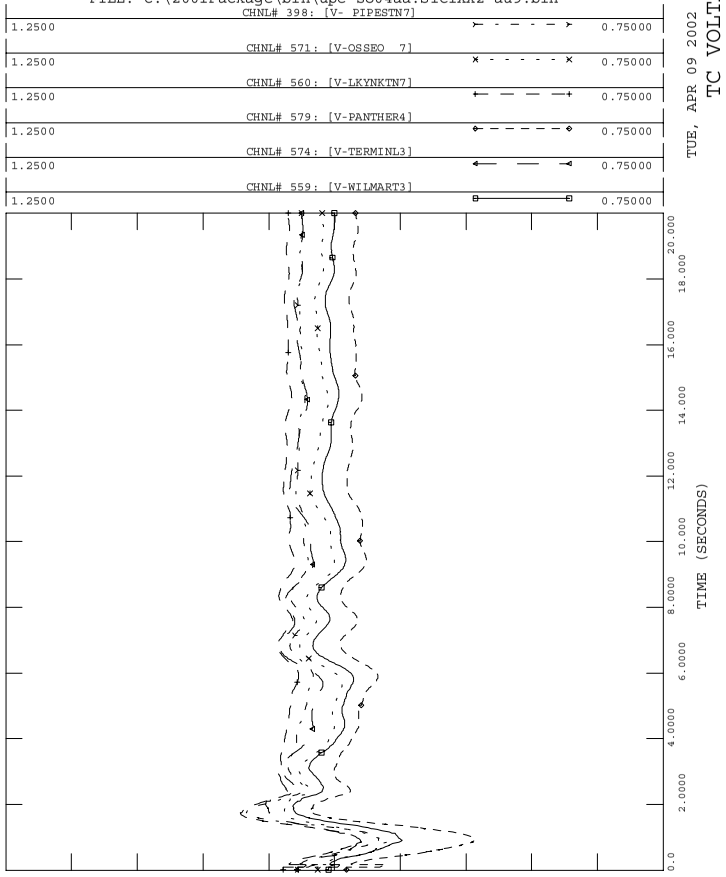

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TUE, APR 09 2002 21:21
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



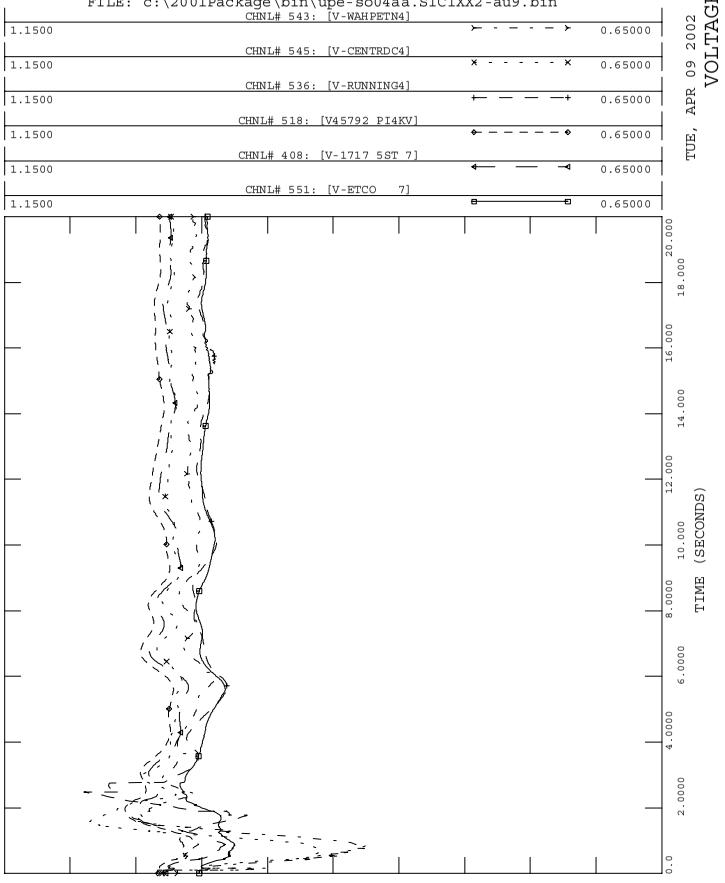
TUE, APR 09 2002 21:21
SVC & WISCONSIN VOLT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



TUE, APR 09 2002 21:21
TC VOLTAGES

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



TUE, APR 09 2002 21:21
VOLTAGES 6

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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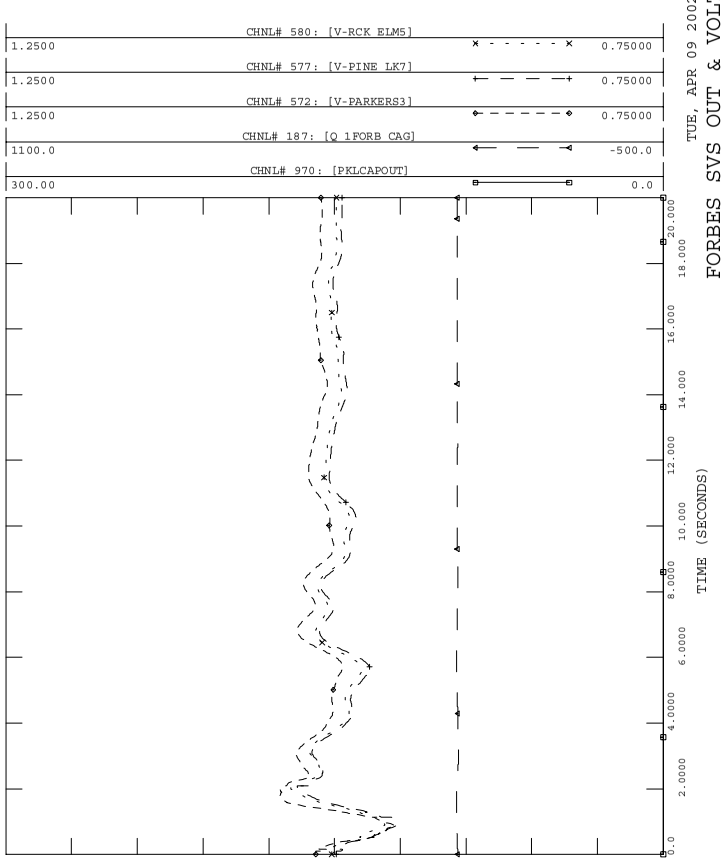
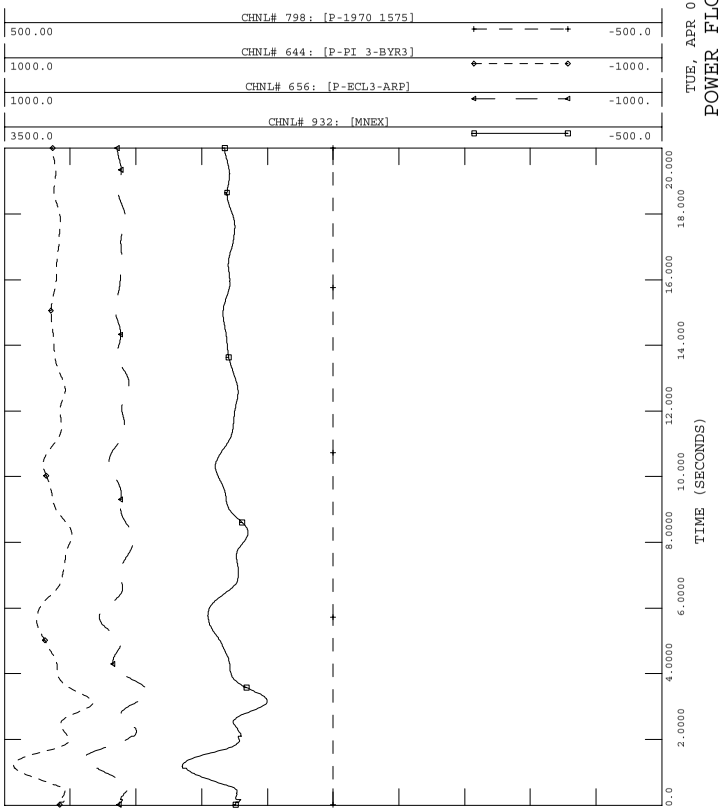
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



TUE, APR 09 2002 21:21
FORBES SVS OUT & VOLTAGES

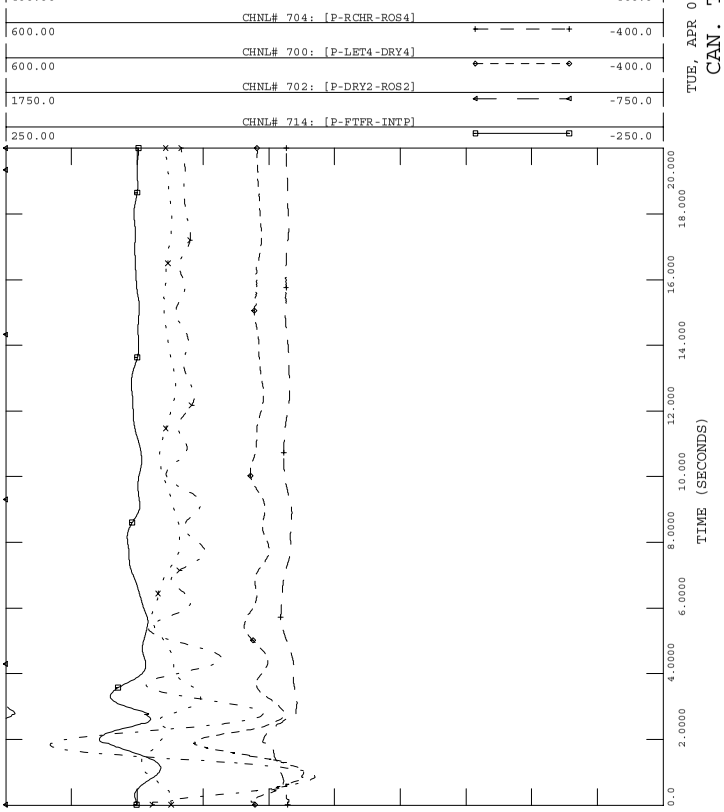
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
POWER FLOW SUMS 2



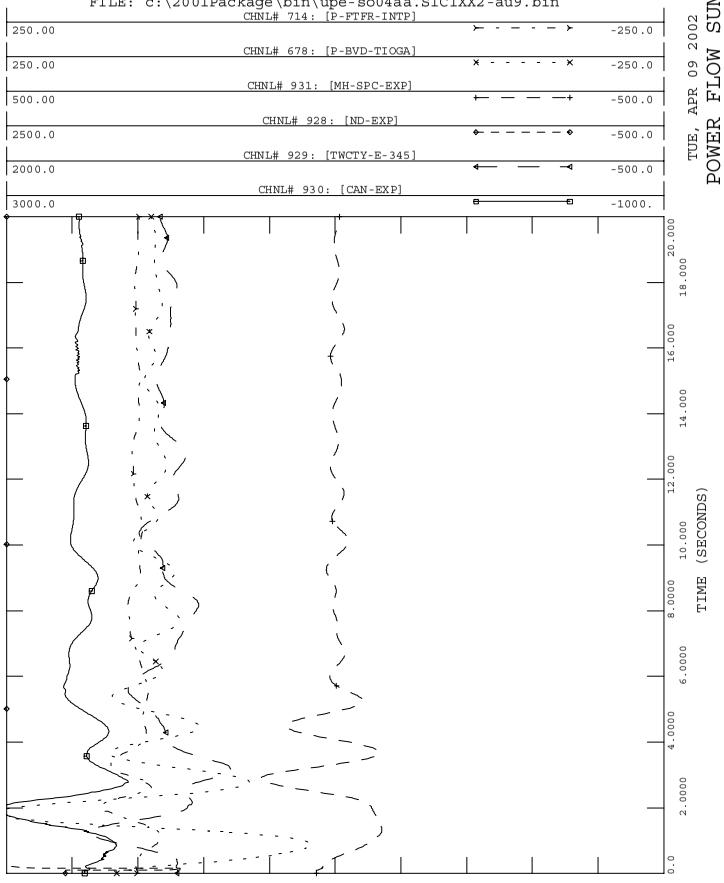
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
CAN. TIE FLOWS



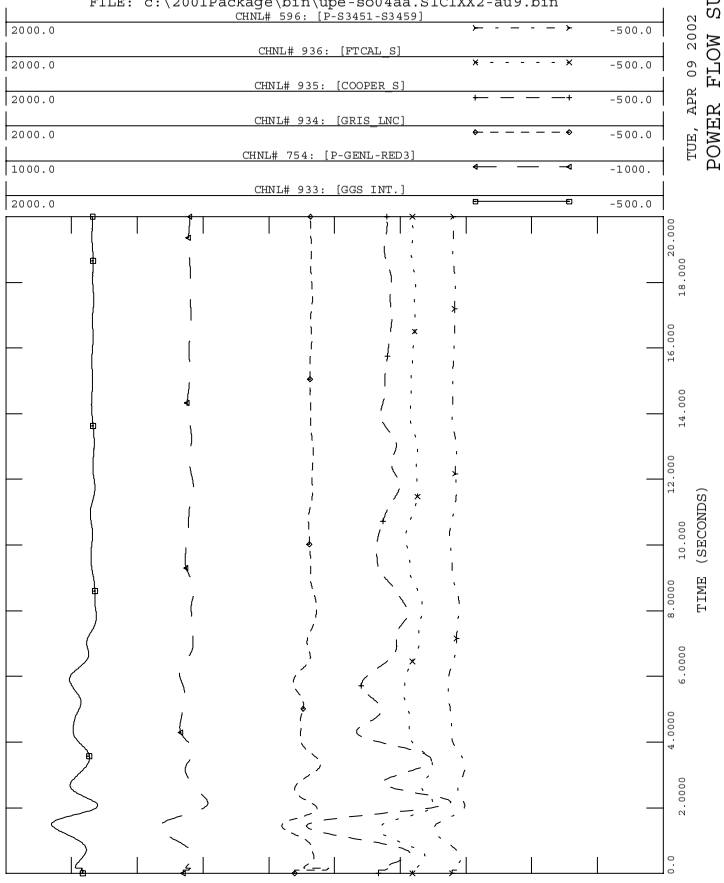
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
POWER FLOW SUMS 1



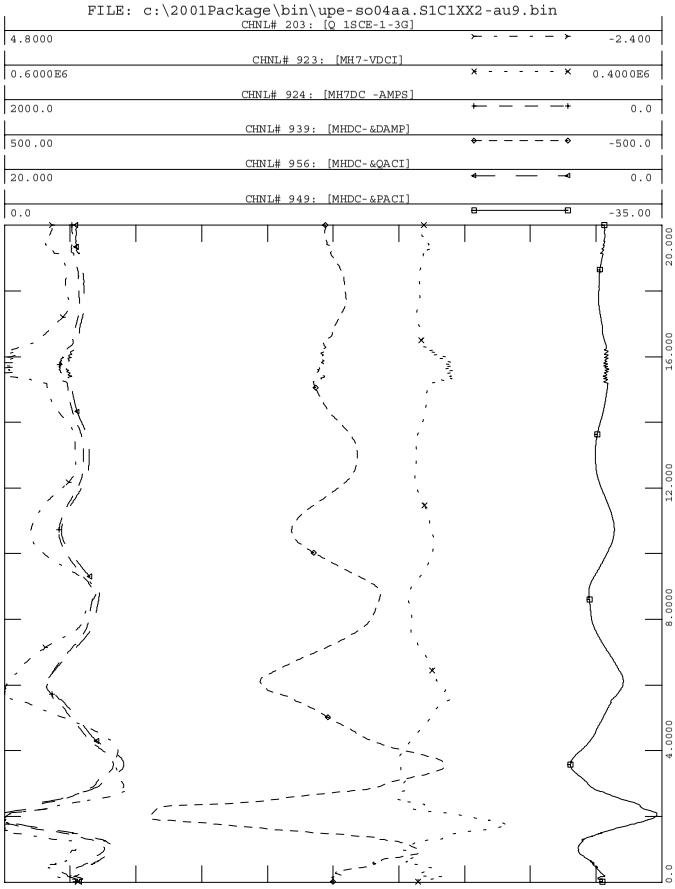
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
POWER FLOW SUM 3



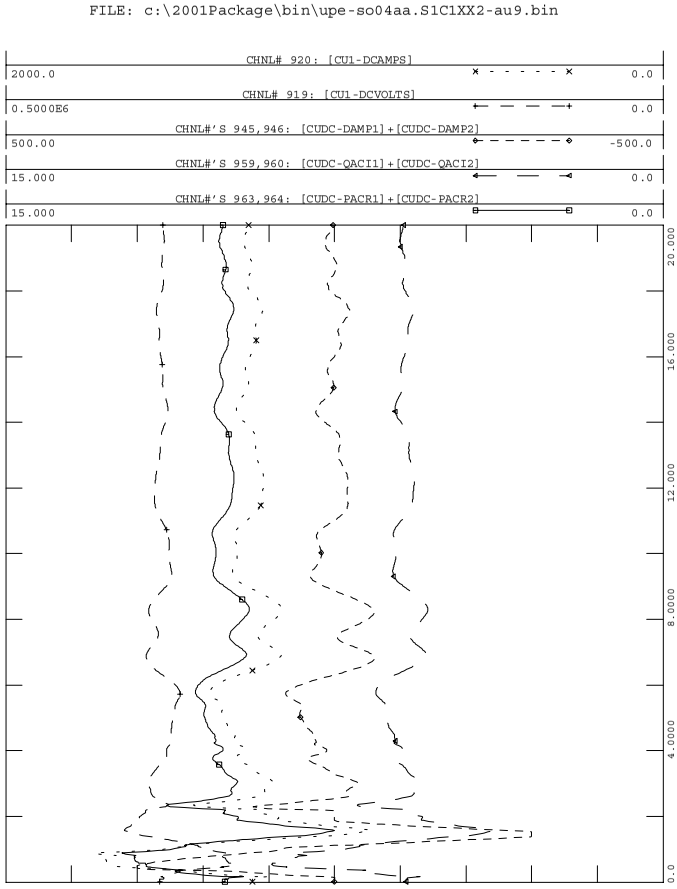
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
MH DC PARAMETERS



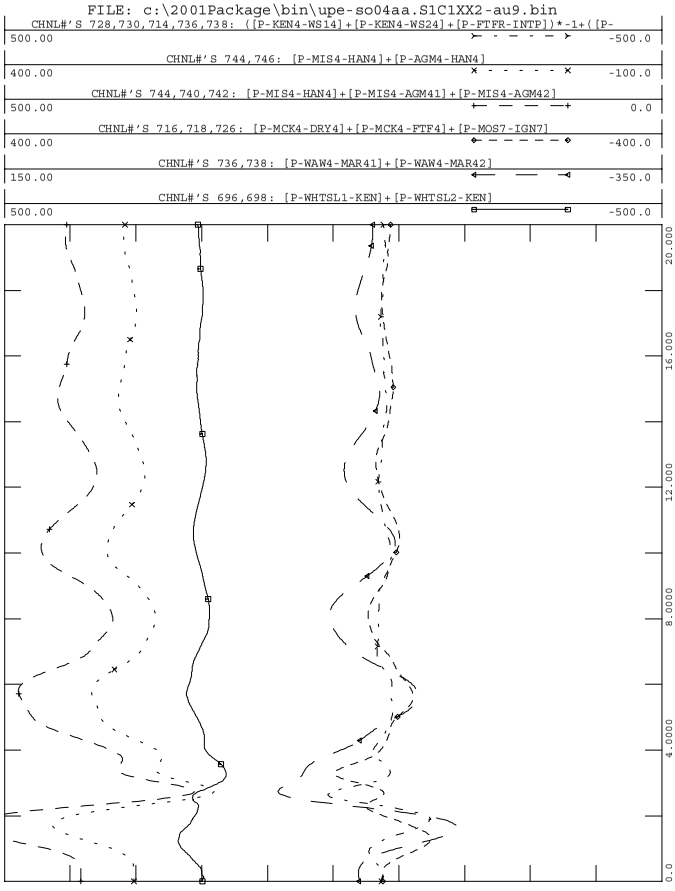
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
CU DC #1



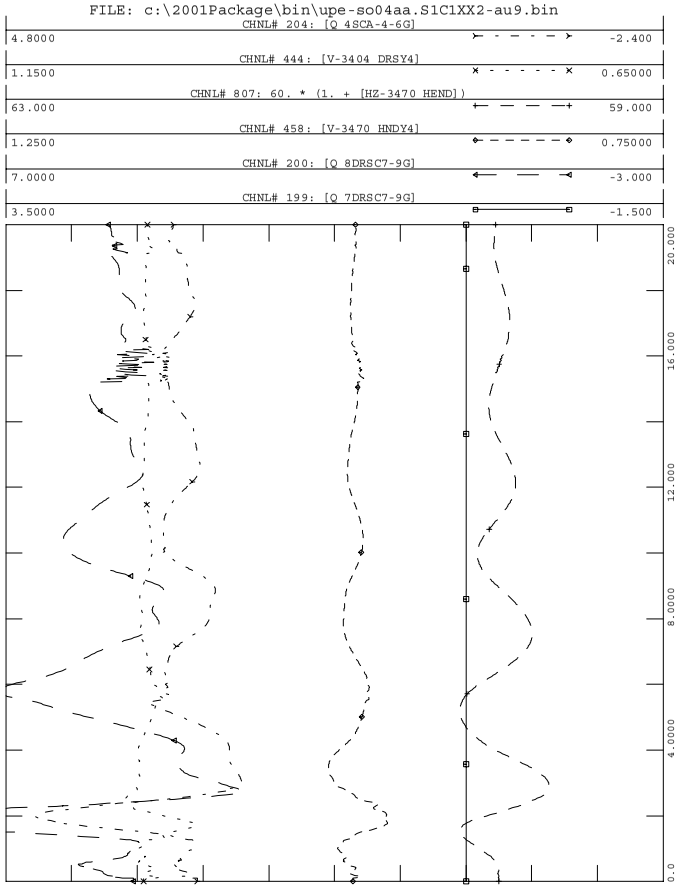
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
OH TIE FLOWS



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

TUE, APR 09 2002 21:21
MH DC PARAMETERS



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

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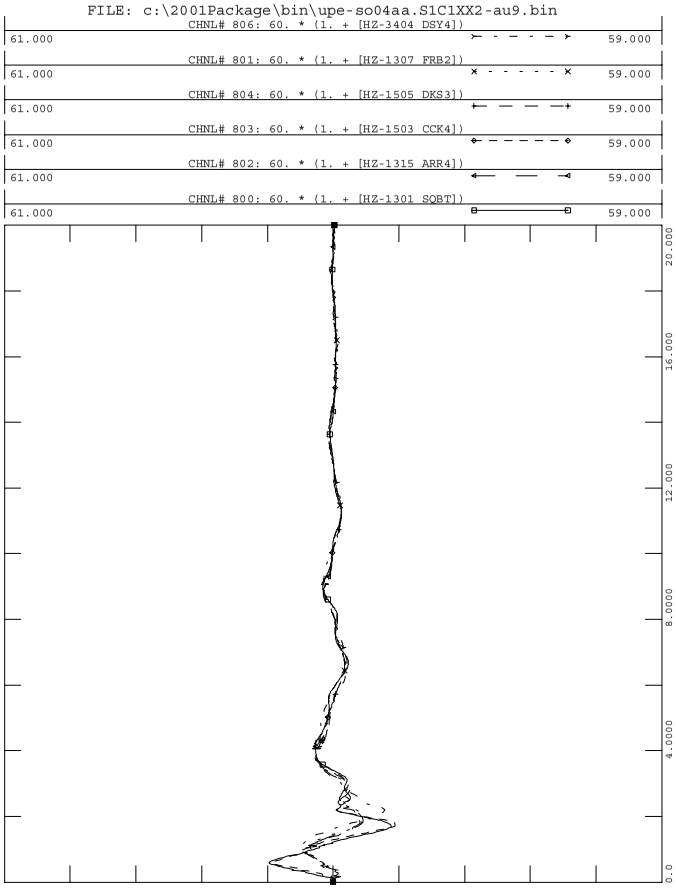
FREQ AT DC TERMINALS



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

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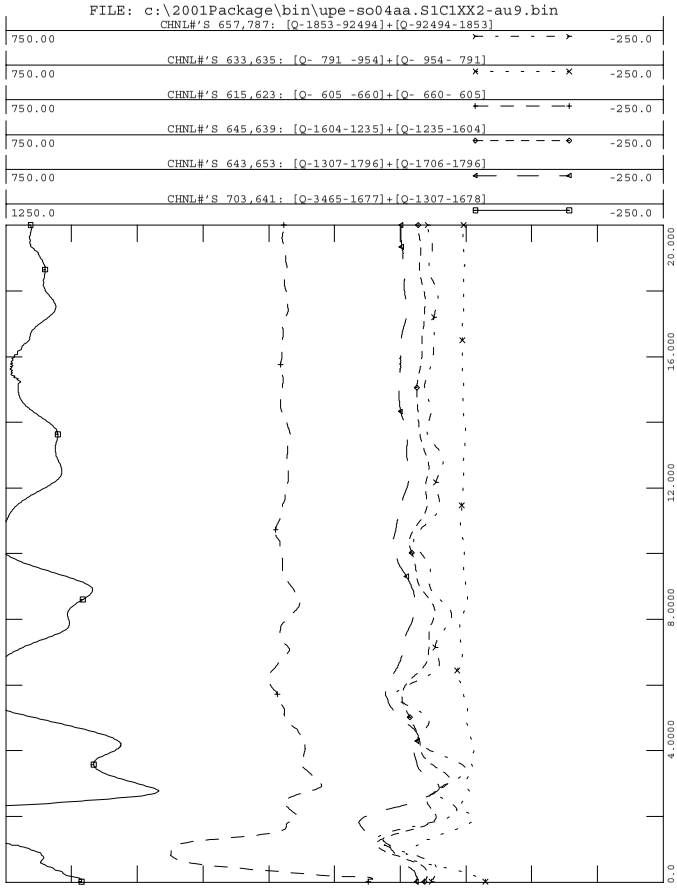
VAR LOSSES



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

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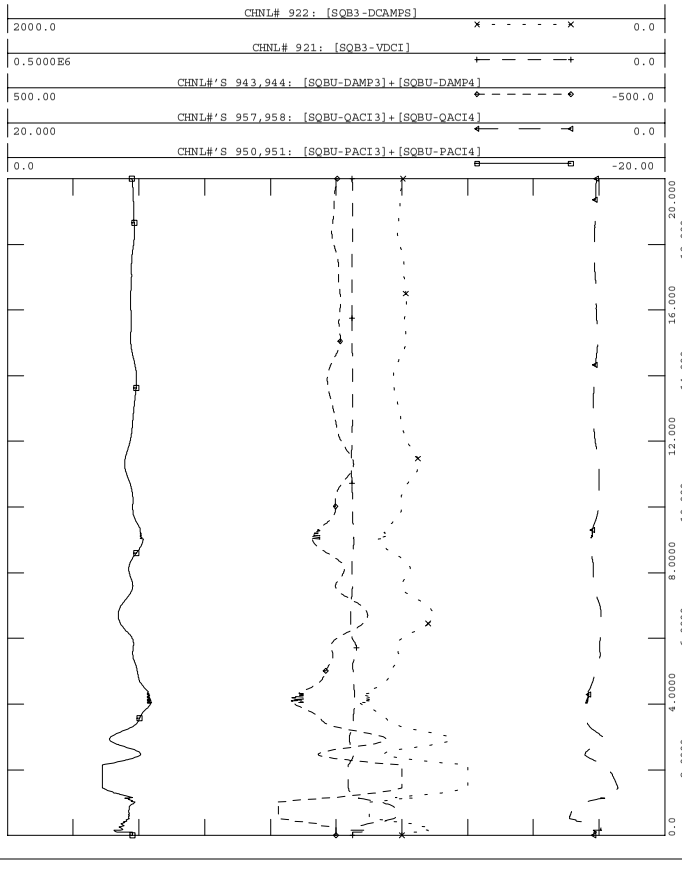
SQB DC #3



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

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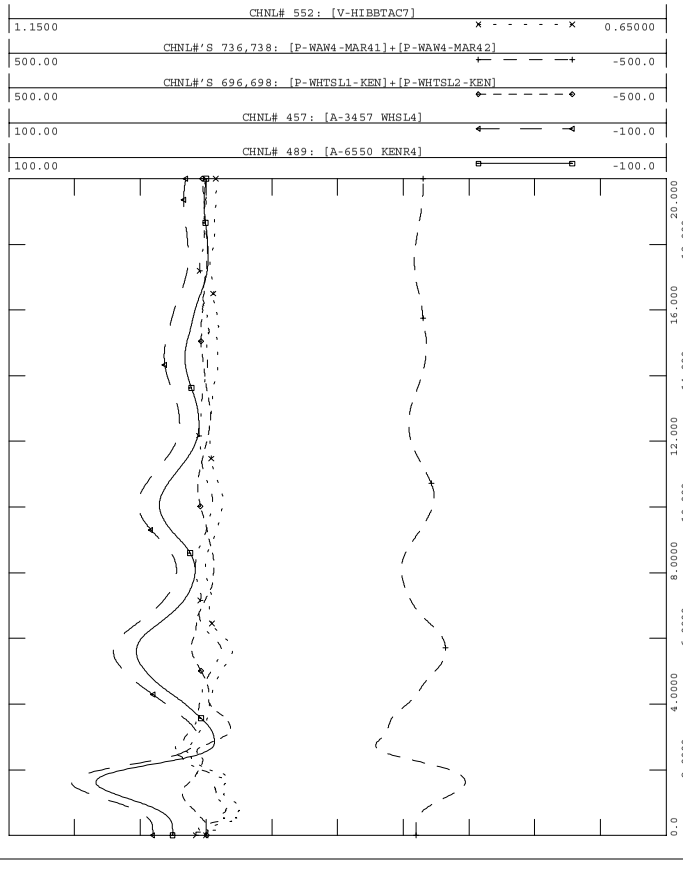
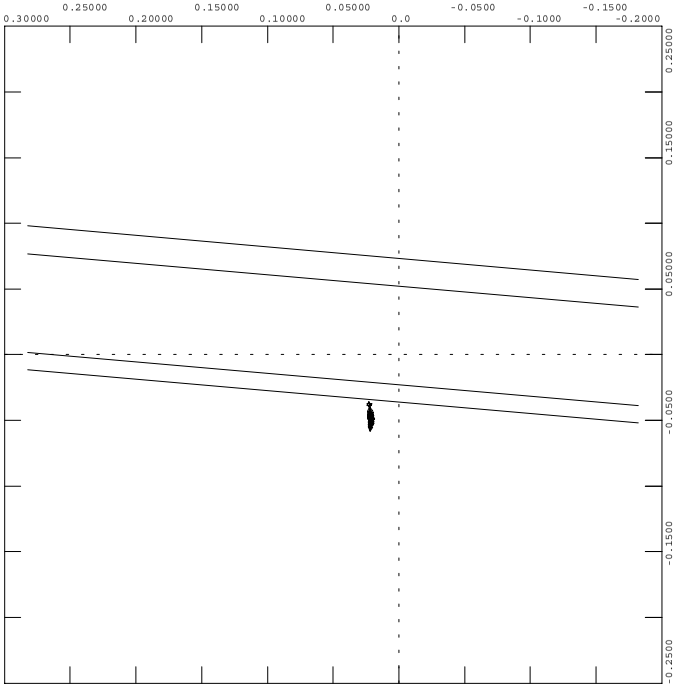
VOLTAGES, ANGLES



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

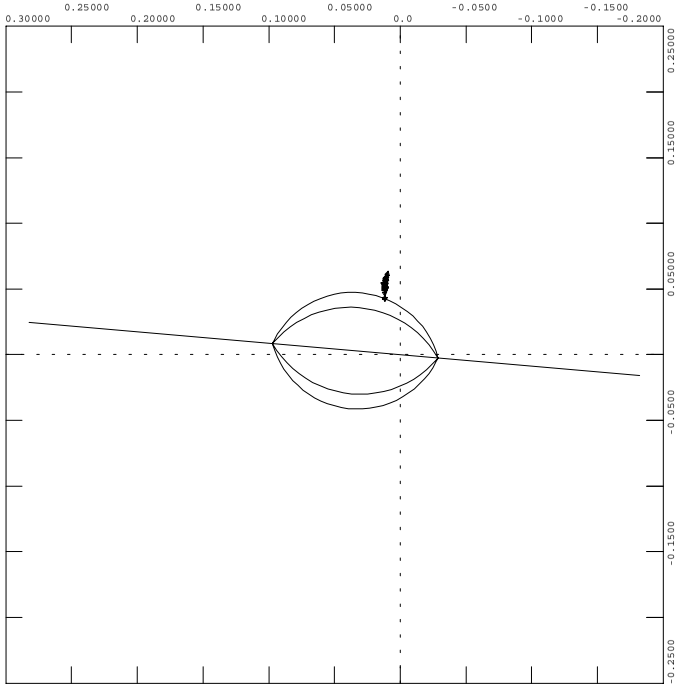


TUE, APR 09 2002 21:21
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

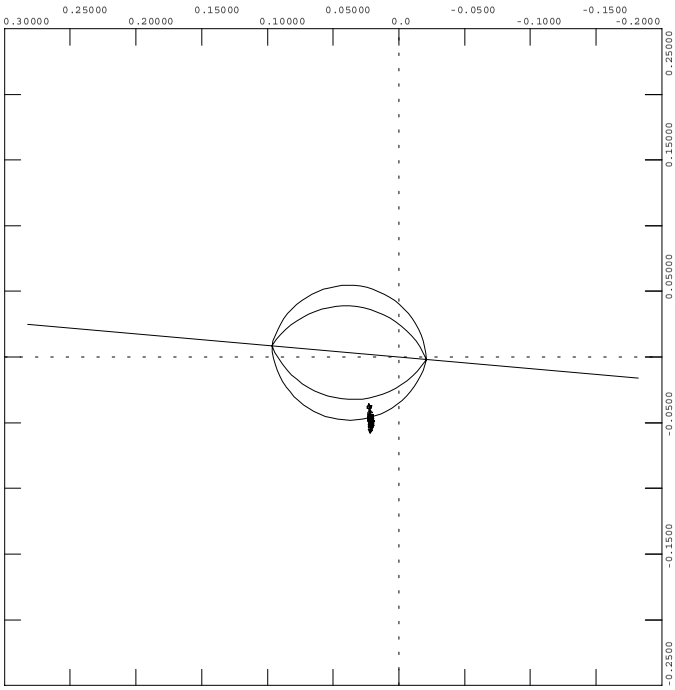


TUE, APR 09 2002 21:21
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

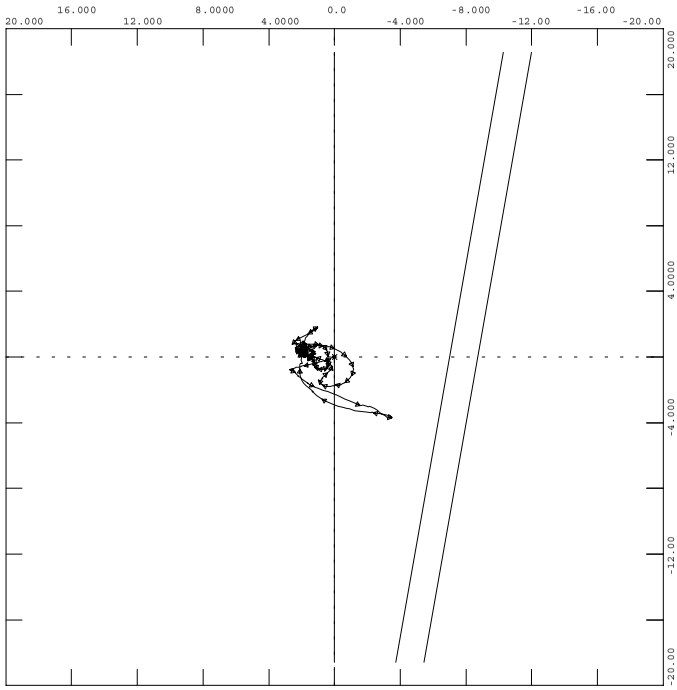


TUE, APR 09 2002 21:21
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

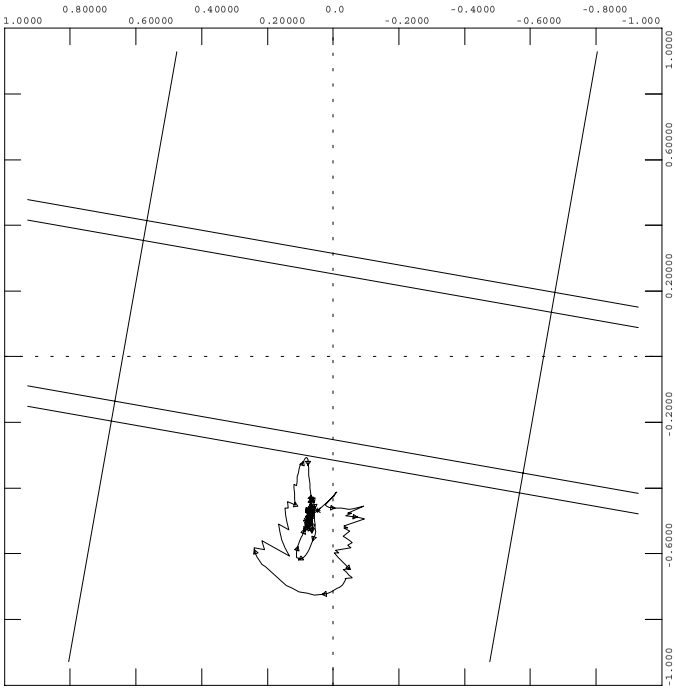


TUE, APR 09 2002 21:21
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

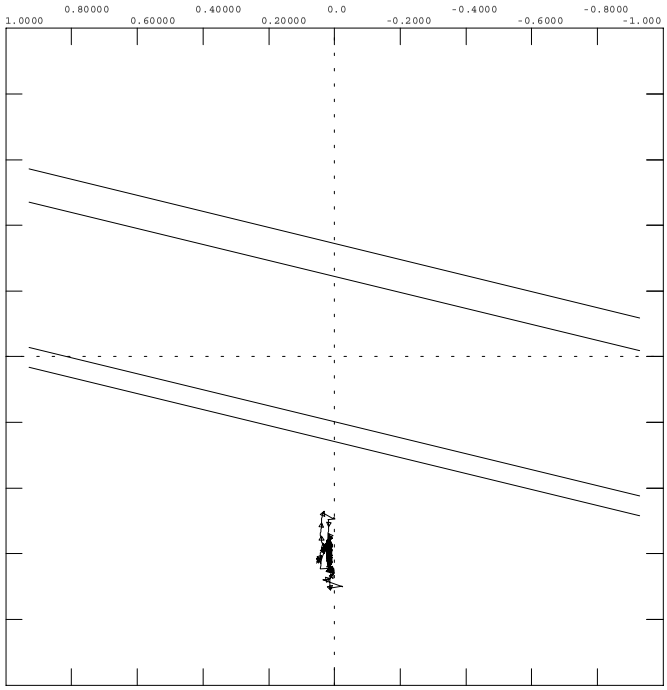
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

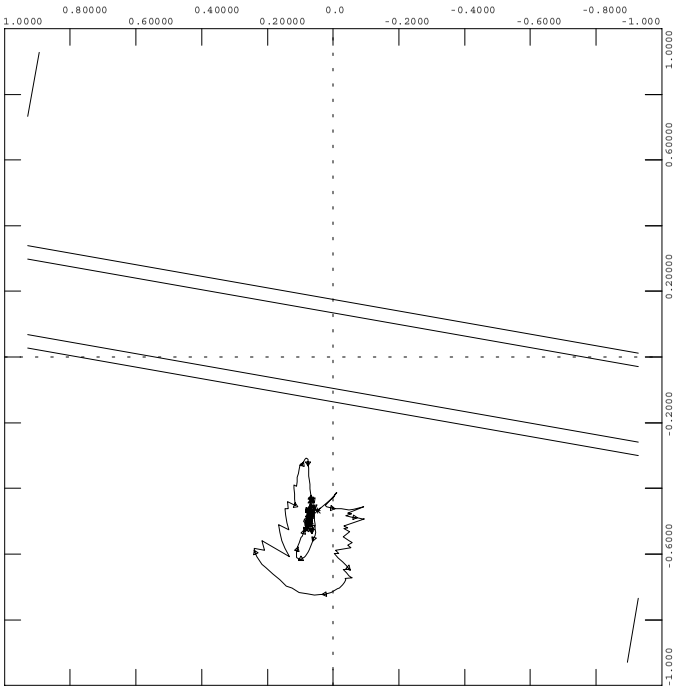
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

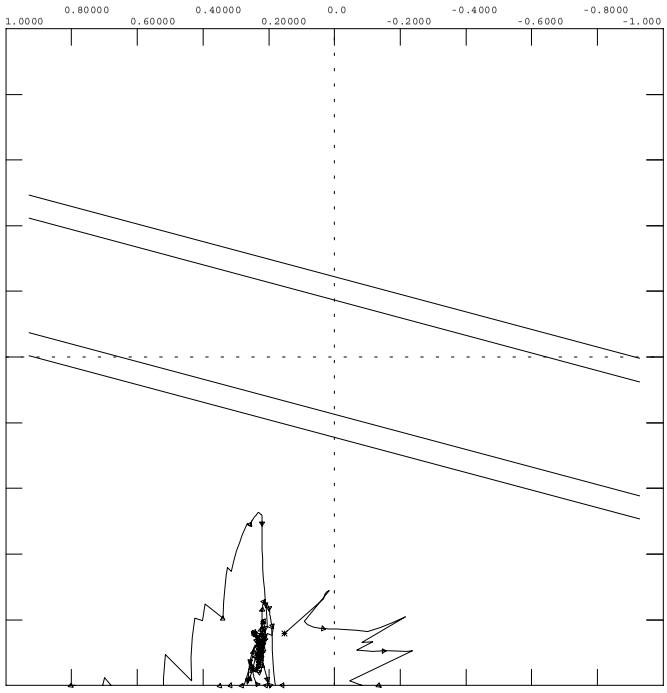
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

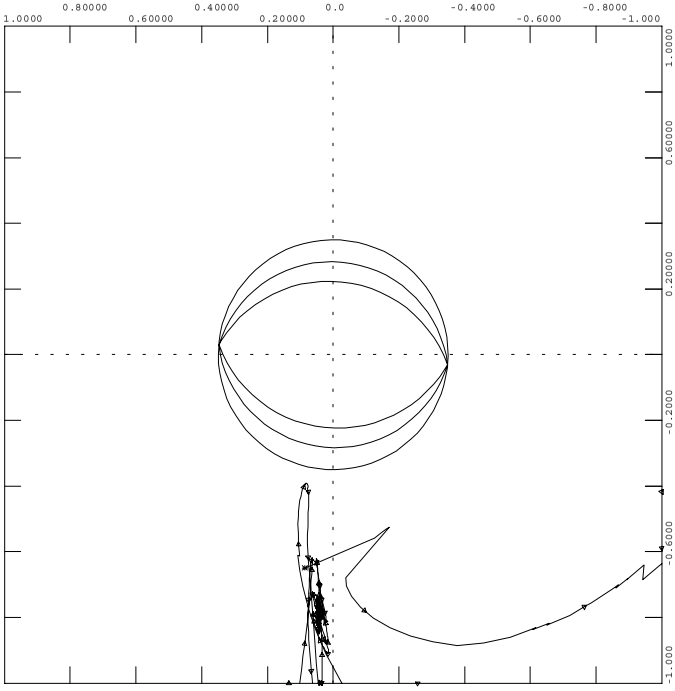
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

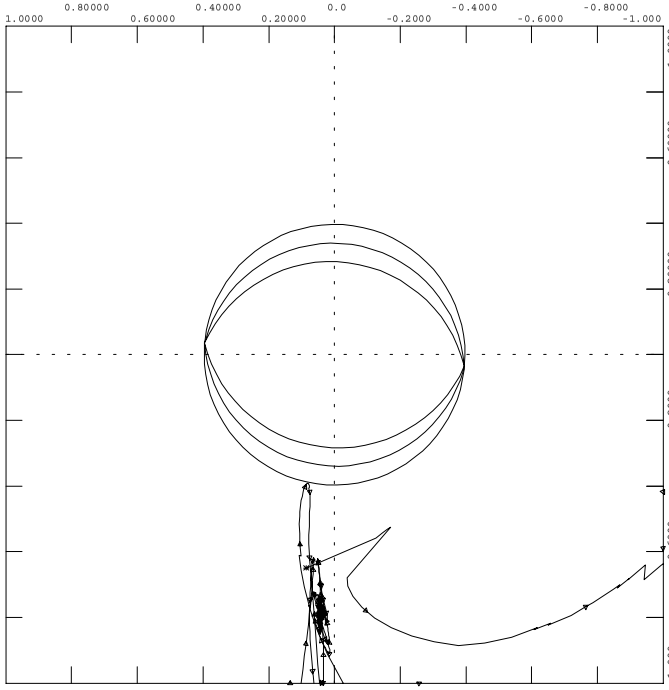
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

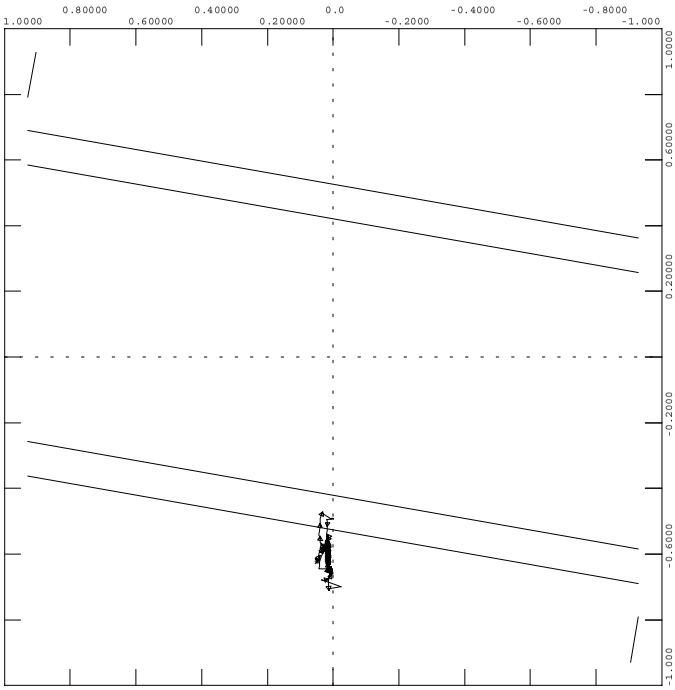
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

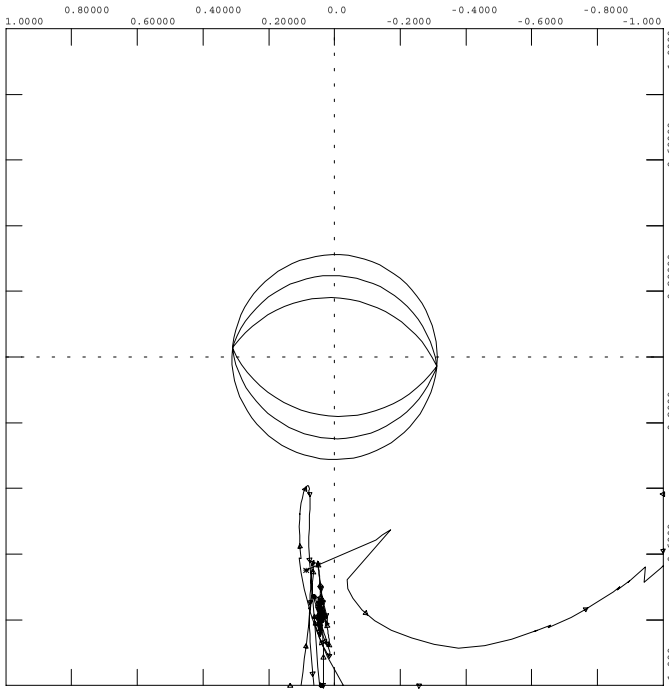
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



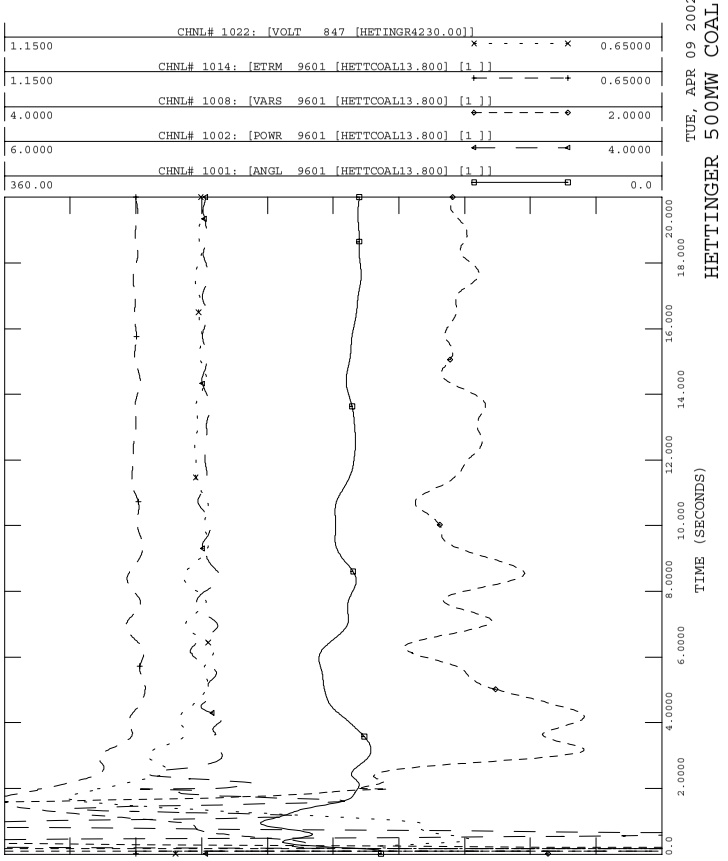
UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

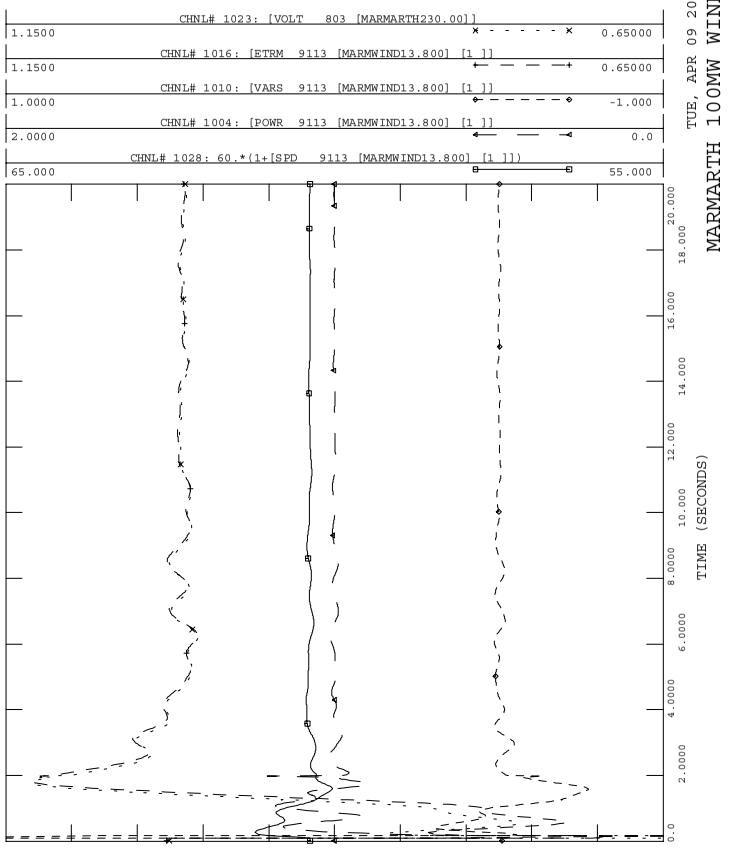


UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



TUE, APR 09 2002 21:21
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

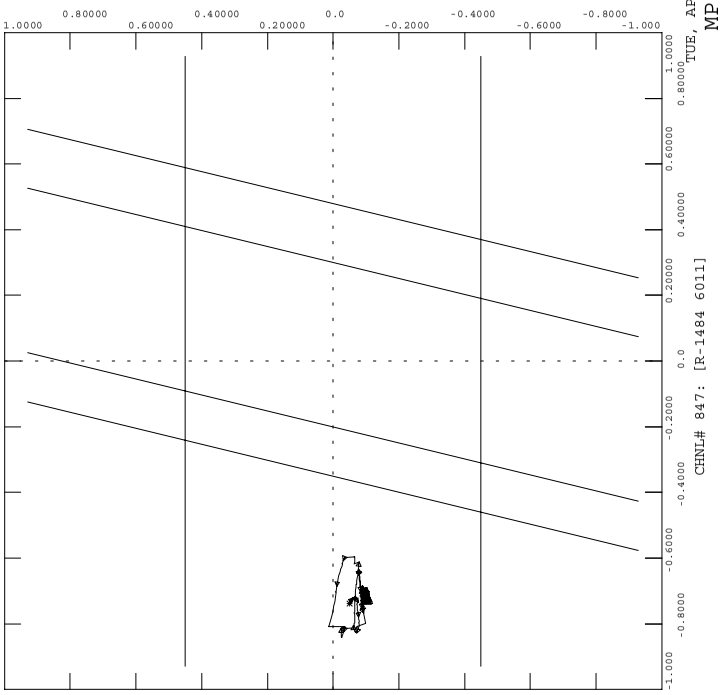


TUE, APR 09 2002 21:21
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

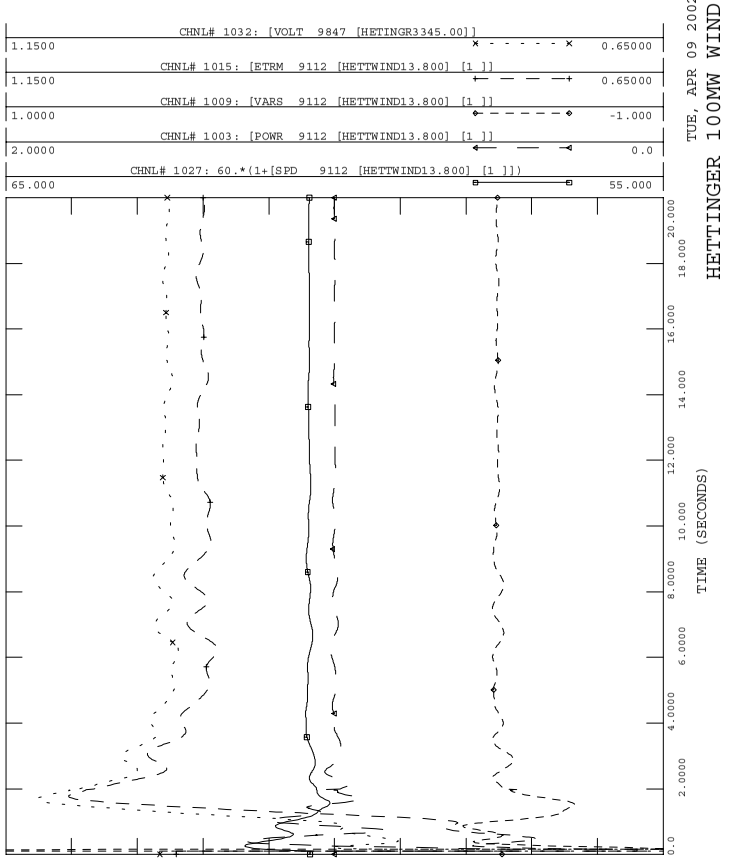
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



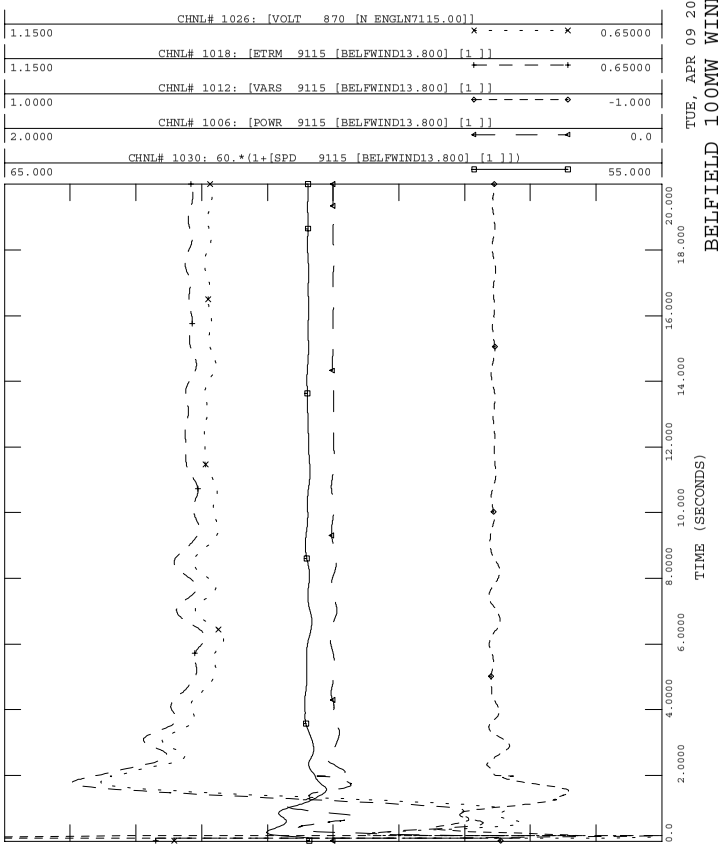
TUE, APR 09 2002 21:21
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



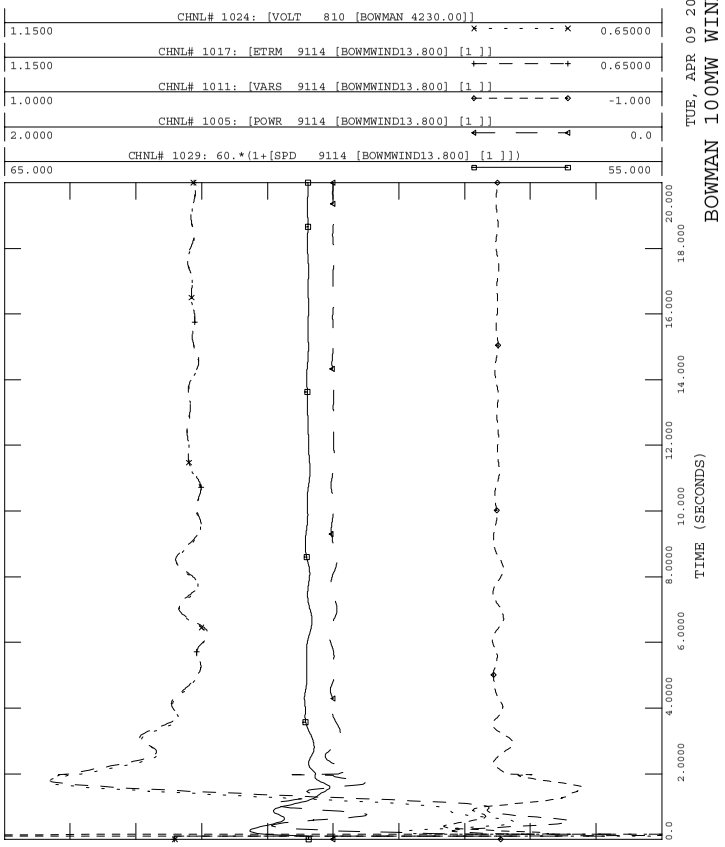
TUE, APR 09 2002 21:21
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



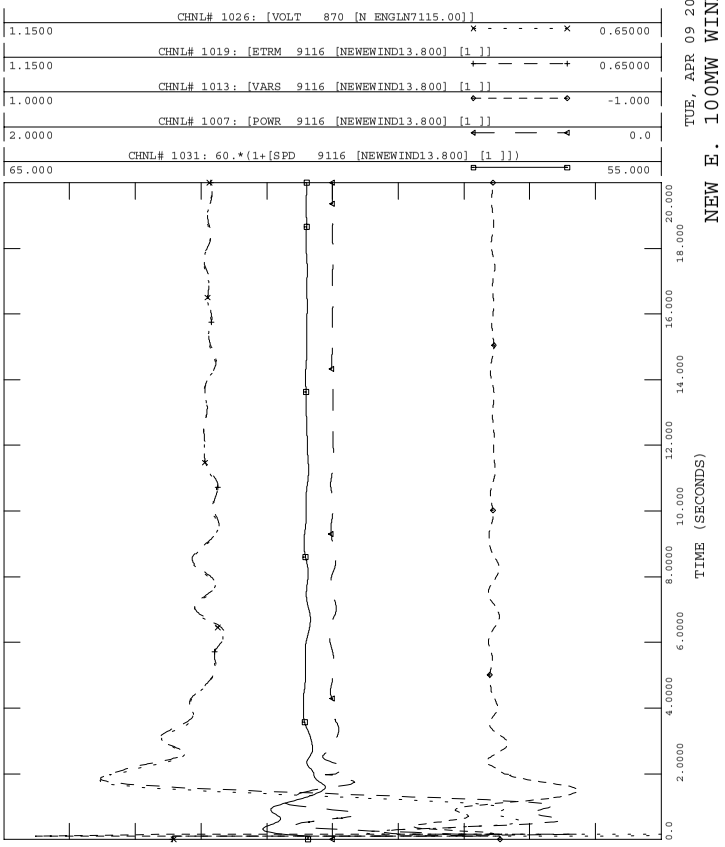
TUE, APR 09 2002 21:21
BELFIELD 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



TUE, APR 09 2002 21:21
BOWMAN 100MW WIND UNIT

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX2-au9.bin



TUE, APR 09 2002 21:21
NEW E. 100MW WIND UNIT

APPENDIX 6

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 1 (HETTINGER)

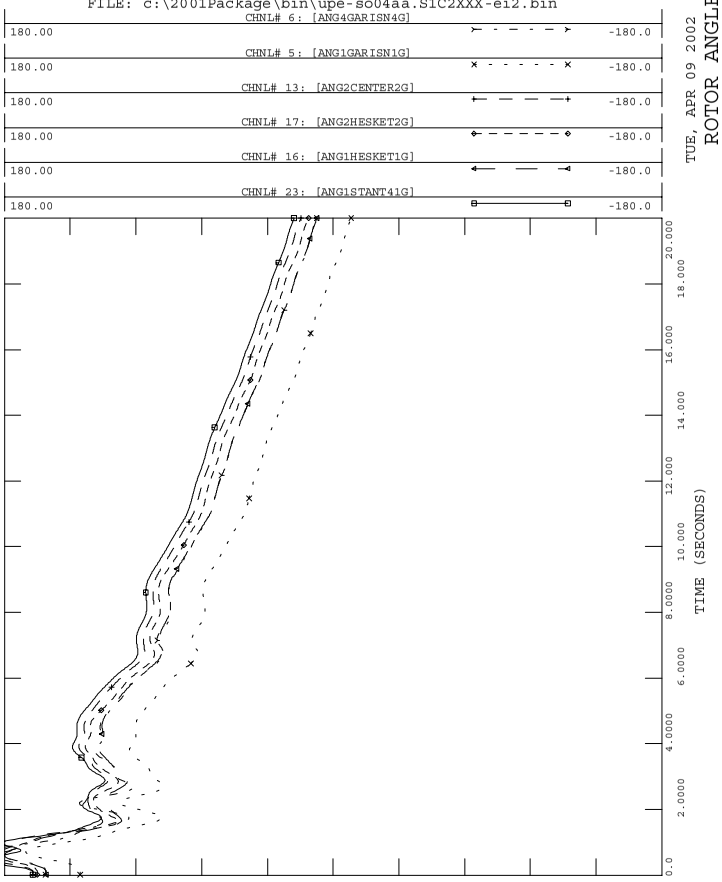
CASE S1C2XXX

CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

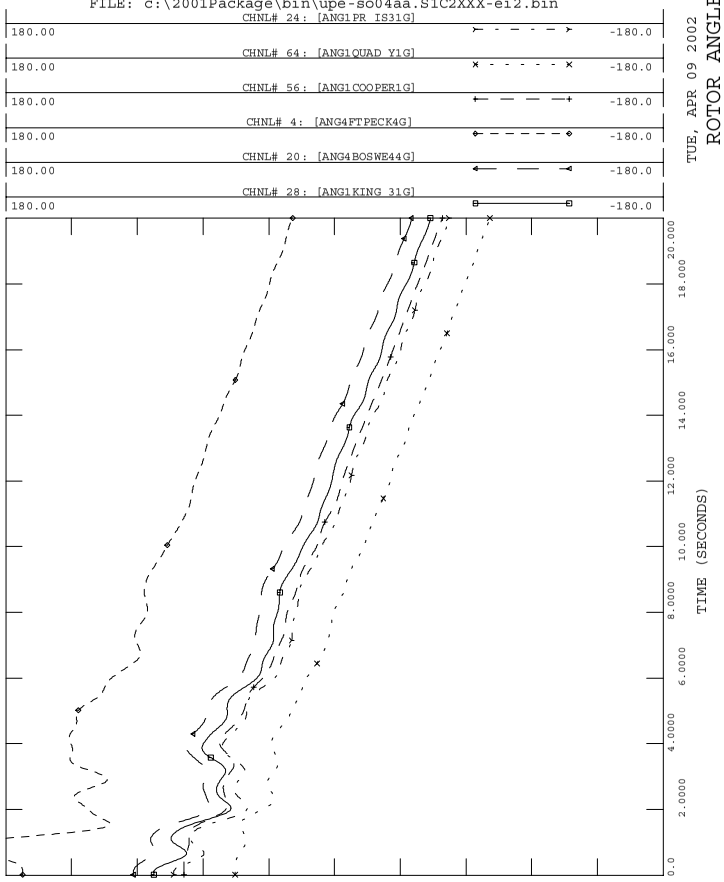
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

TUE, APR 09 2002 21:36
ROTOR ANGLES 2



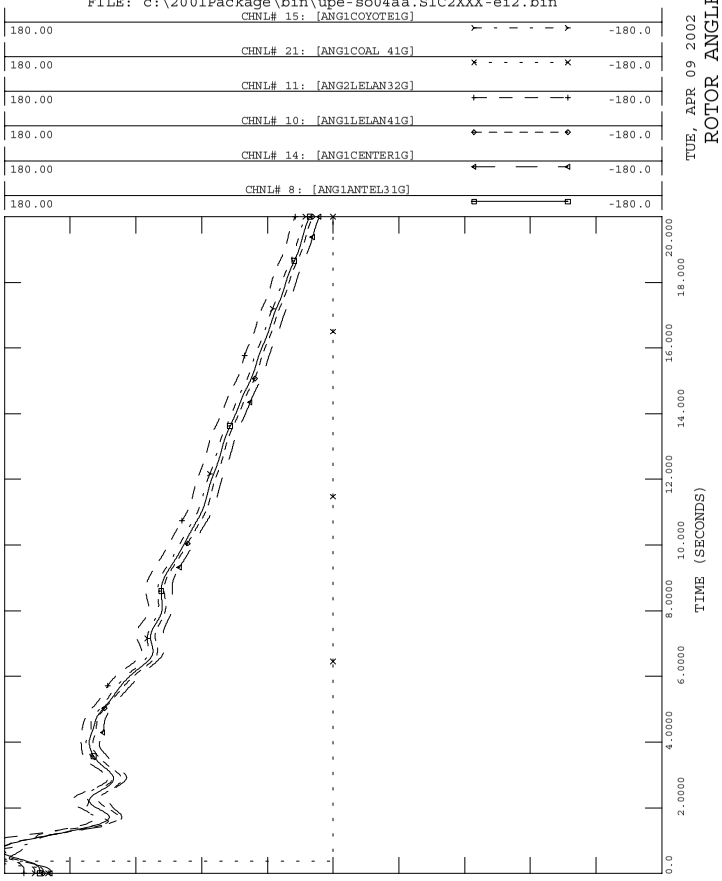
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

TUE, APR 09 2002 21:36
ROTOR ANGLES 4



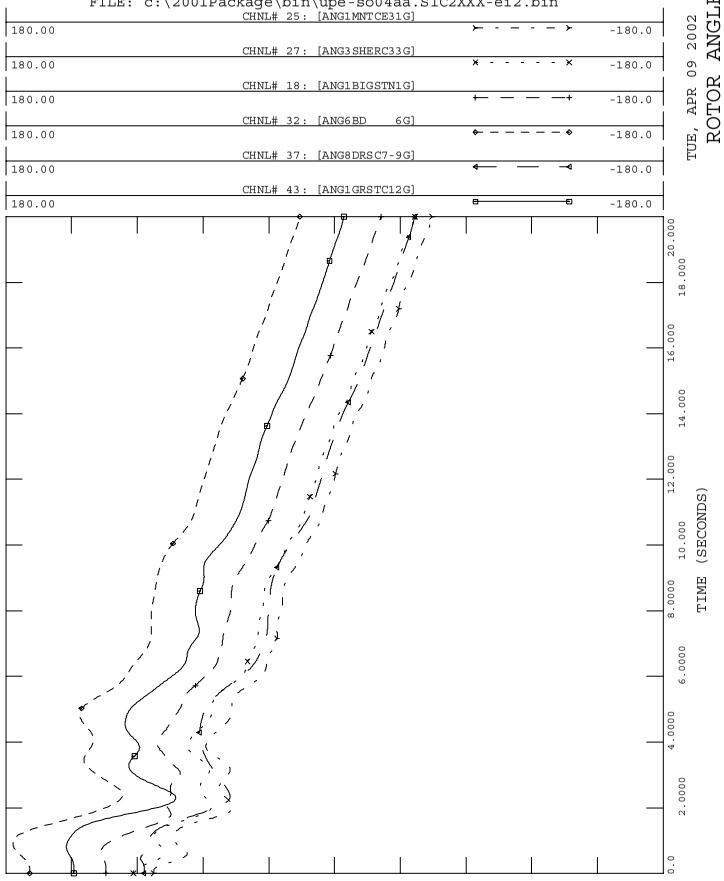
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

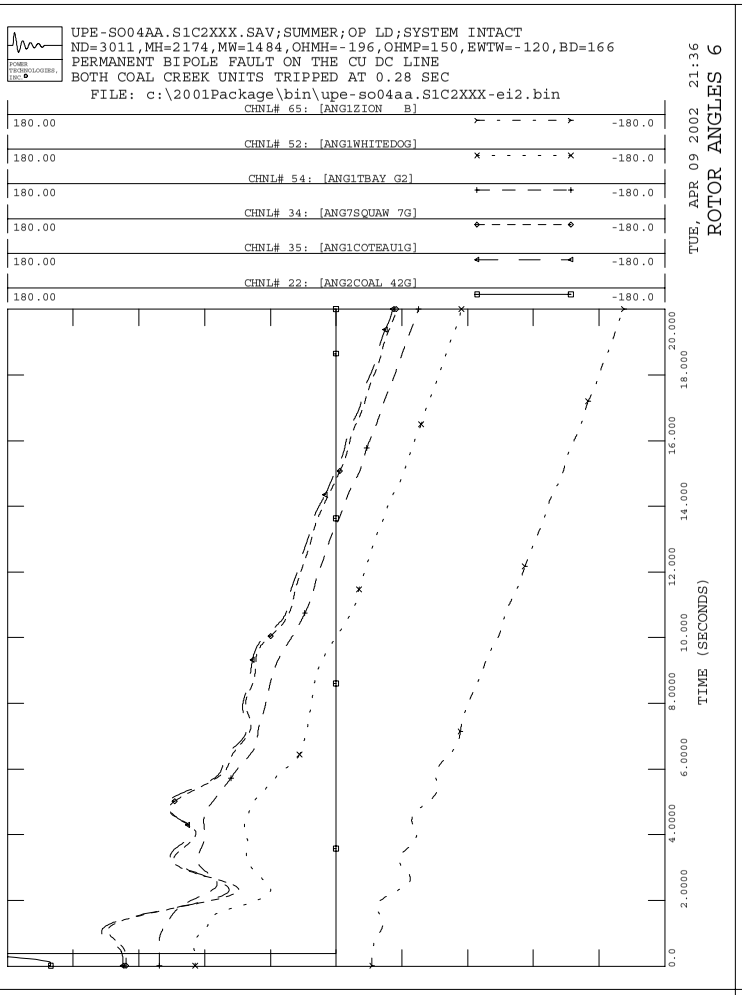
TUE, APR 09 2002 21:36
ROTOR ANGLES 1

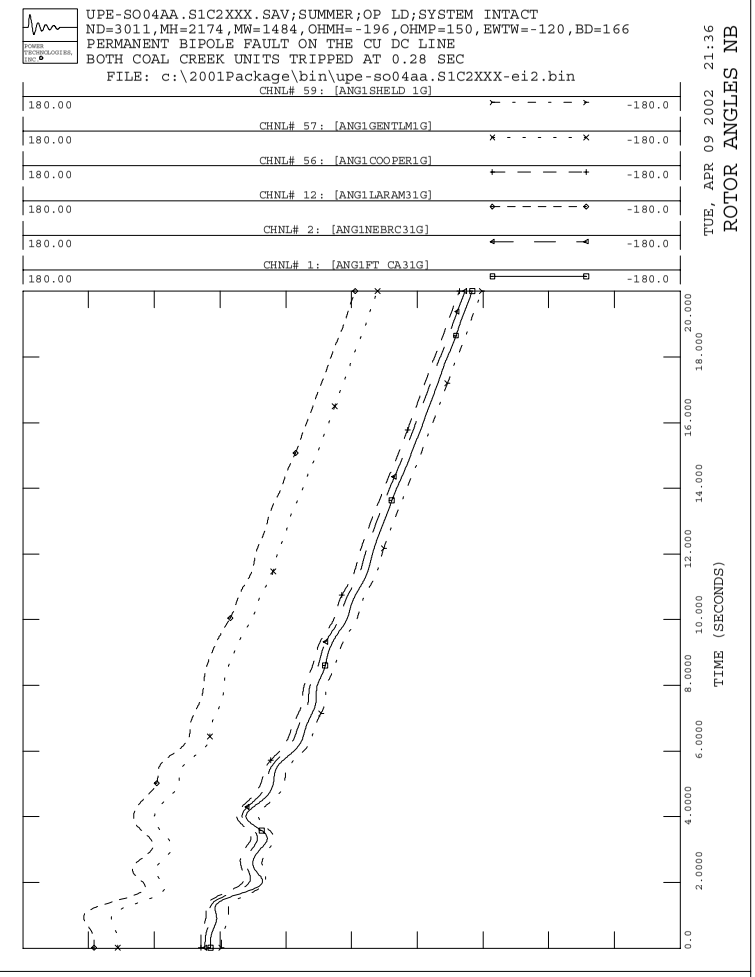


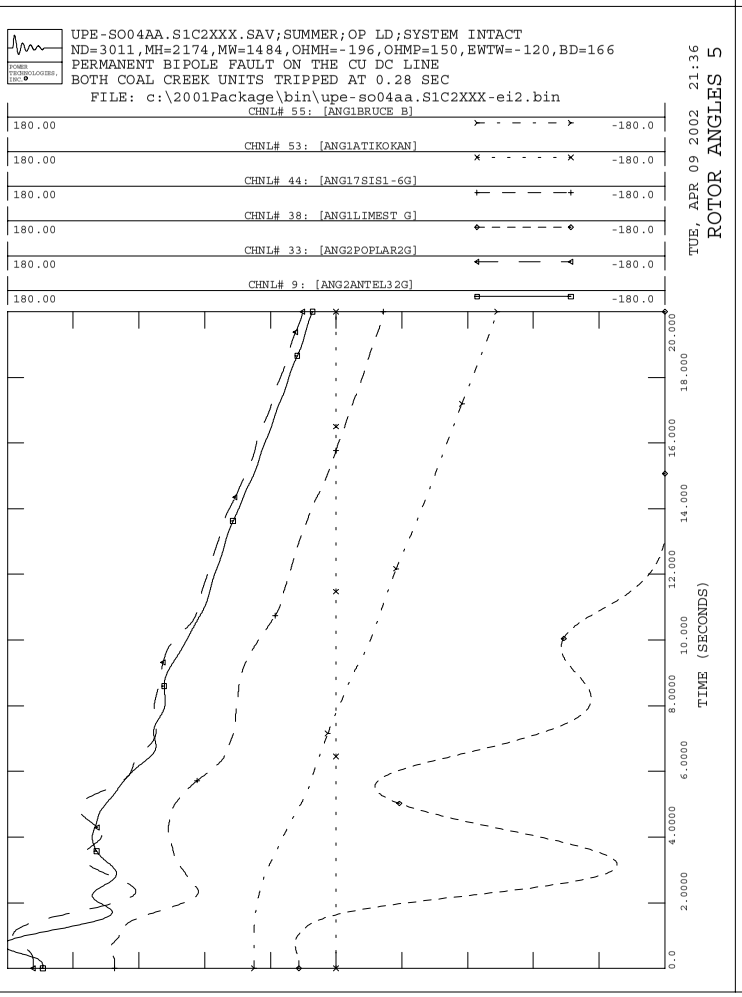
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

TUE, APR 09 2002 21:36
ROTOR ANGLES 3




UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 21:36
ROTOR ANGLES 6


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 21:36
ROTOR ANGLES NB


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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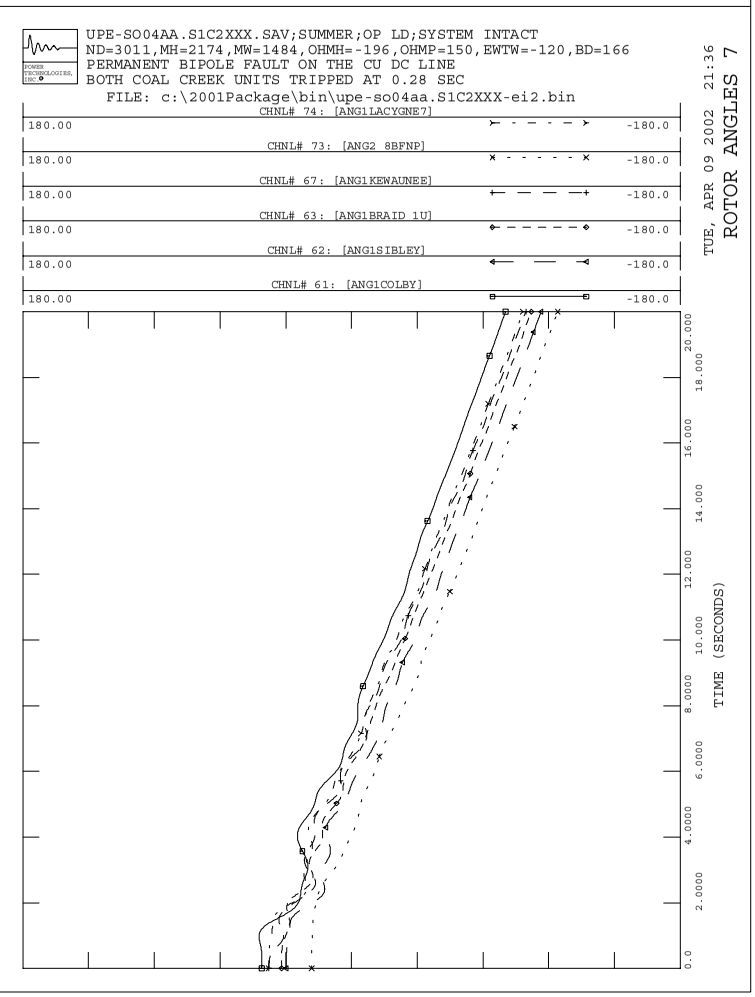
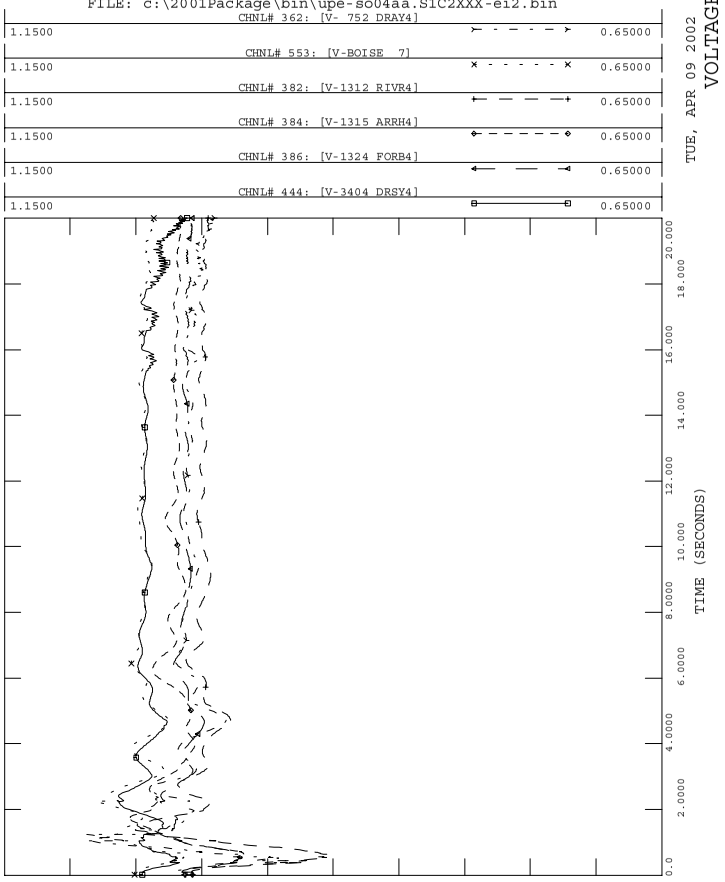
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 21:36
ROTOR ANGLES 5


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
TUE, APR 09 2002 21:36
ROTOR ANGLES 7

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin



TUE, APR 09 2002 21:36
VOLTAGES 1

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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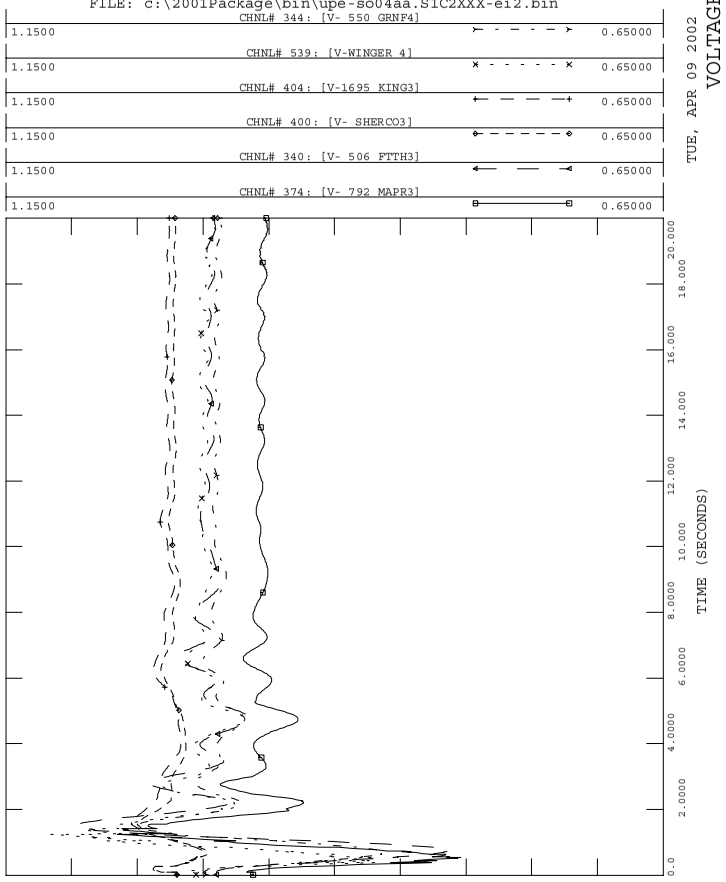
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin



TUE, APR 09 2002 21:36
VOLTAGES 3

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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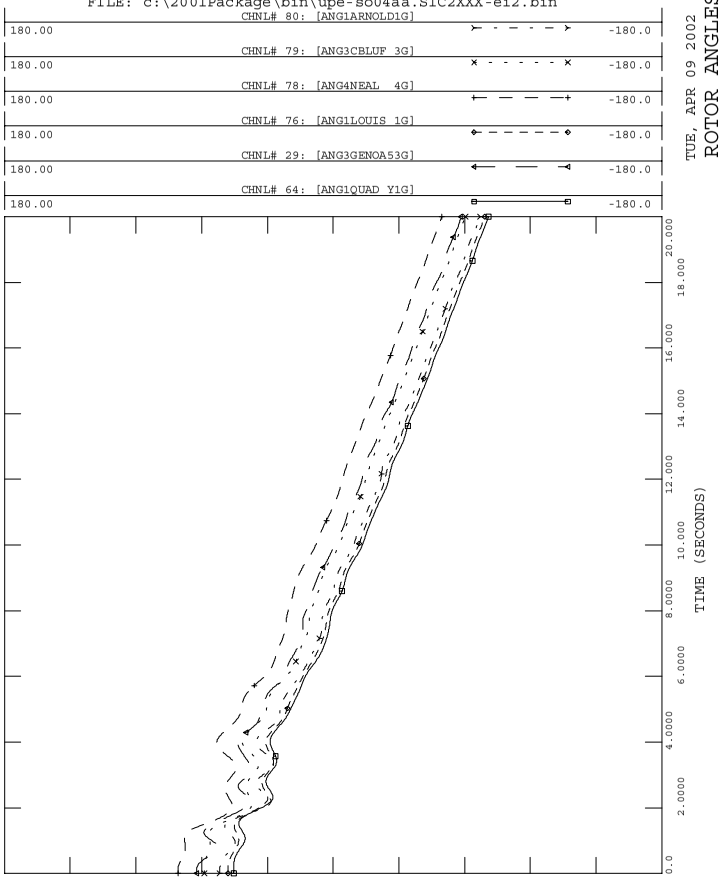
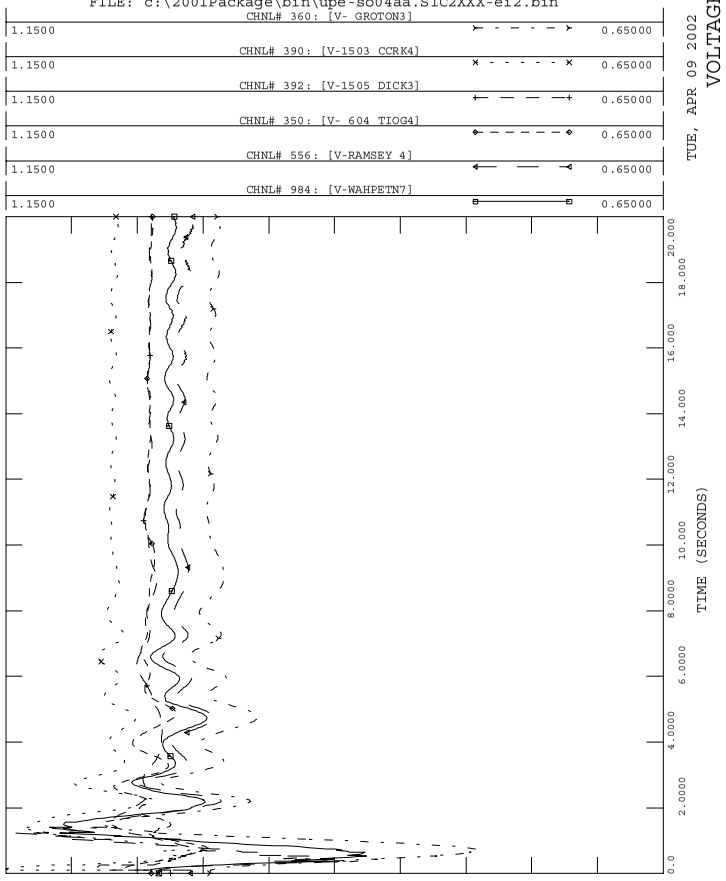
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin



TUE, APR 09 2002 21:36
ROTOR ANGLES IA

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin



TUE, APR 09 2002 21:36
VOLTAGES 2

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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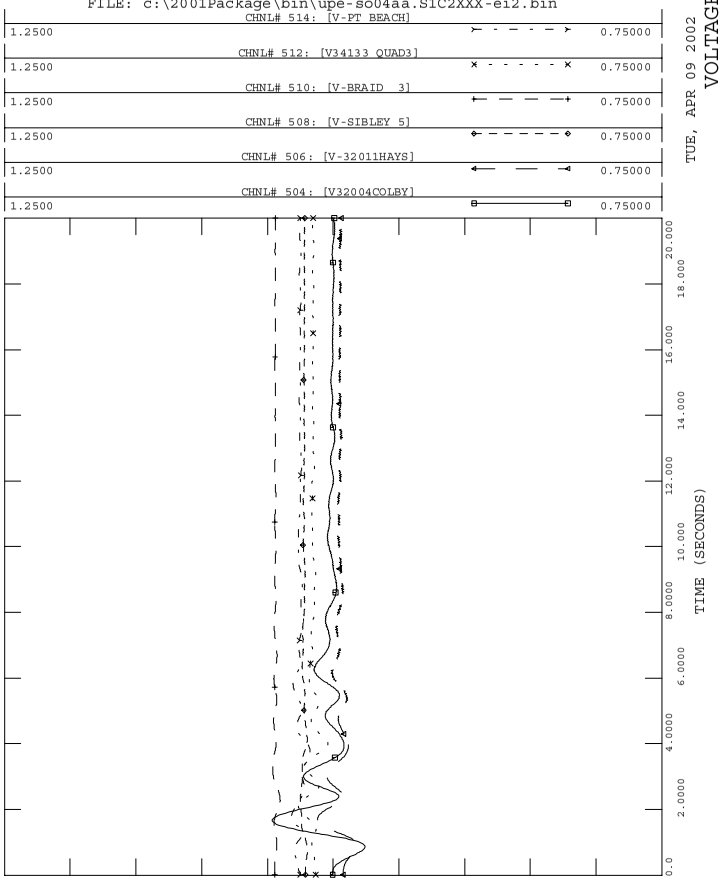
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin



TUE, APR 09 2002 21:36
VOLTAGES 5

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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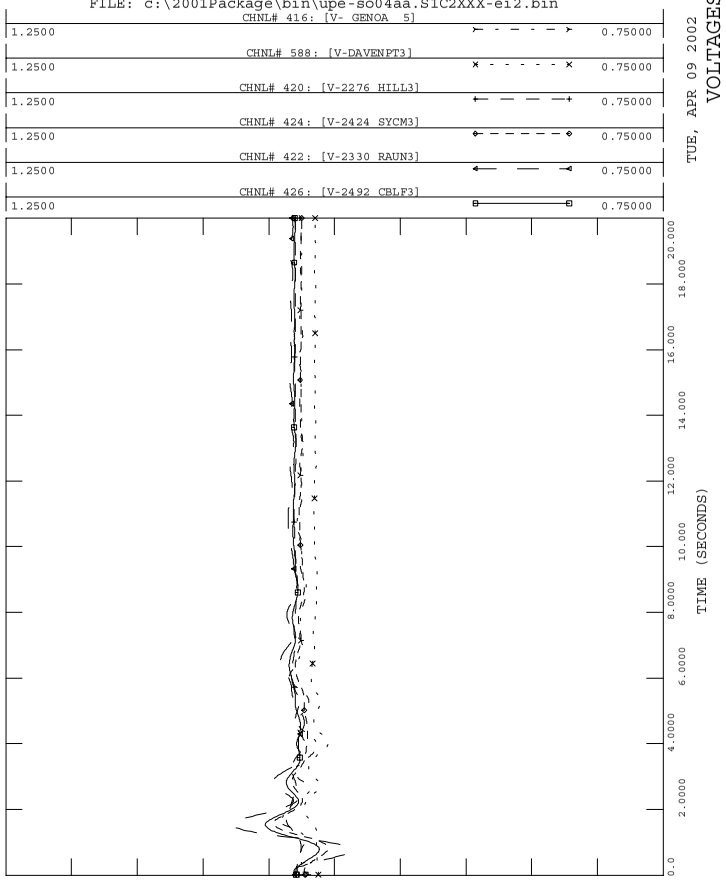
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin



TUE, APR 09 2002 21:36
VOLTAGES IA

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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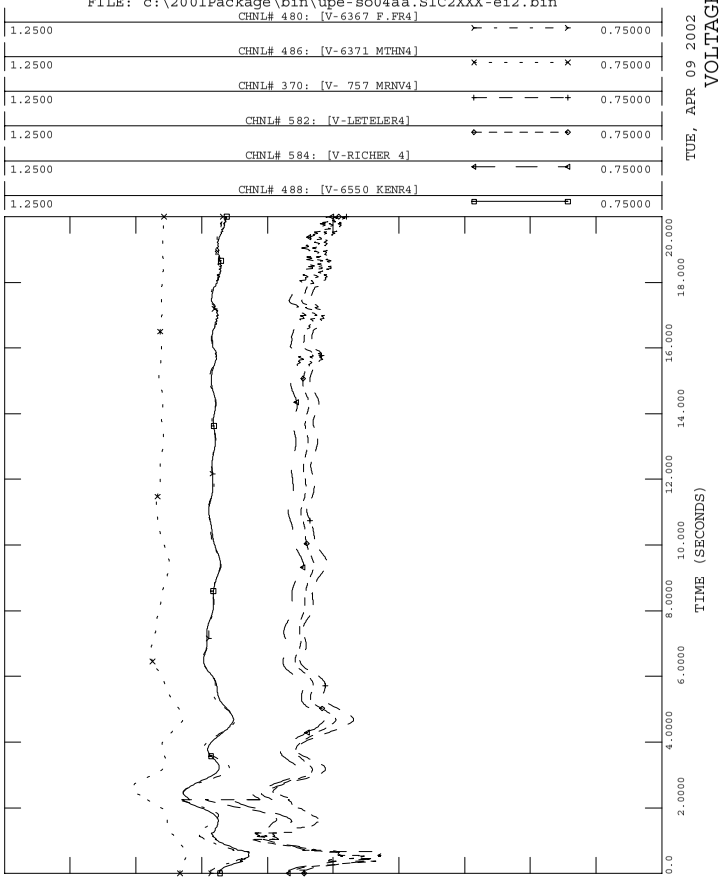
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin



TUE, APR 09 2002 21:36
VOLTAGES 4

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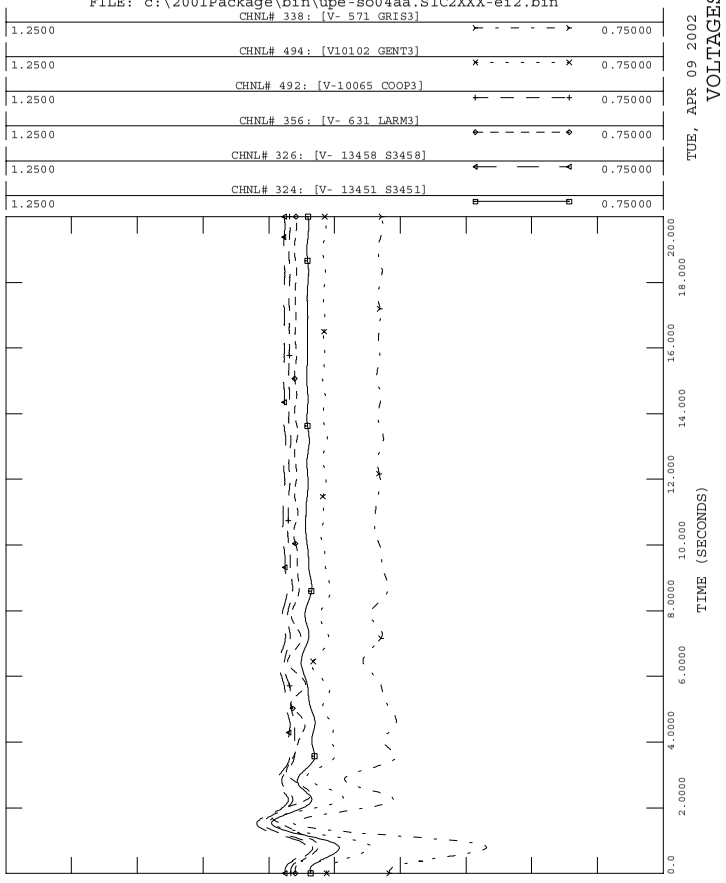
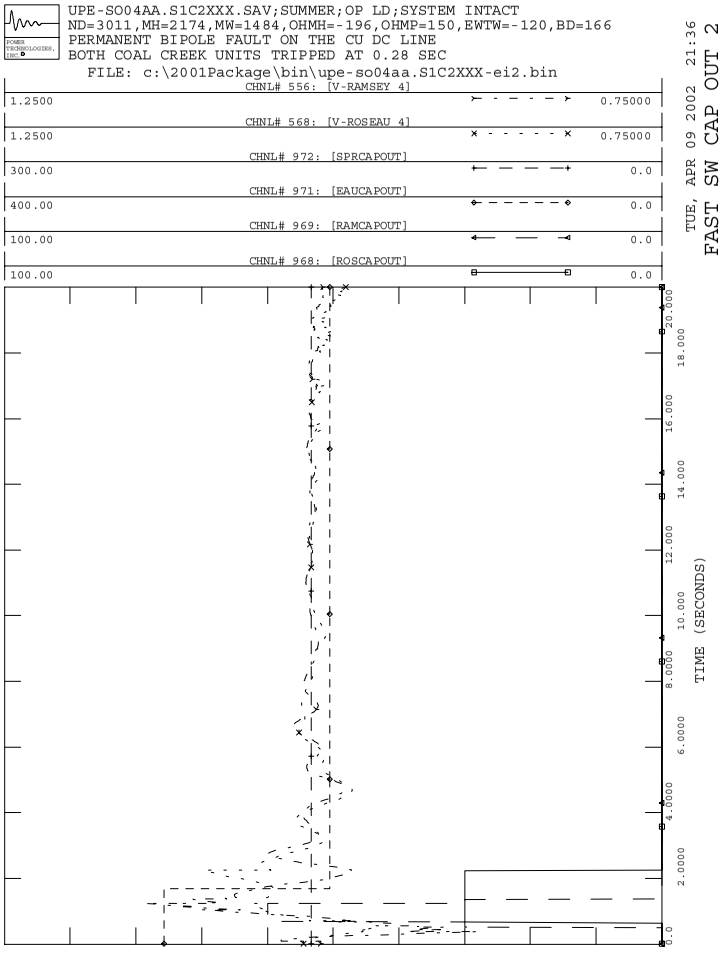
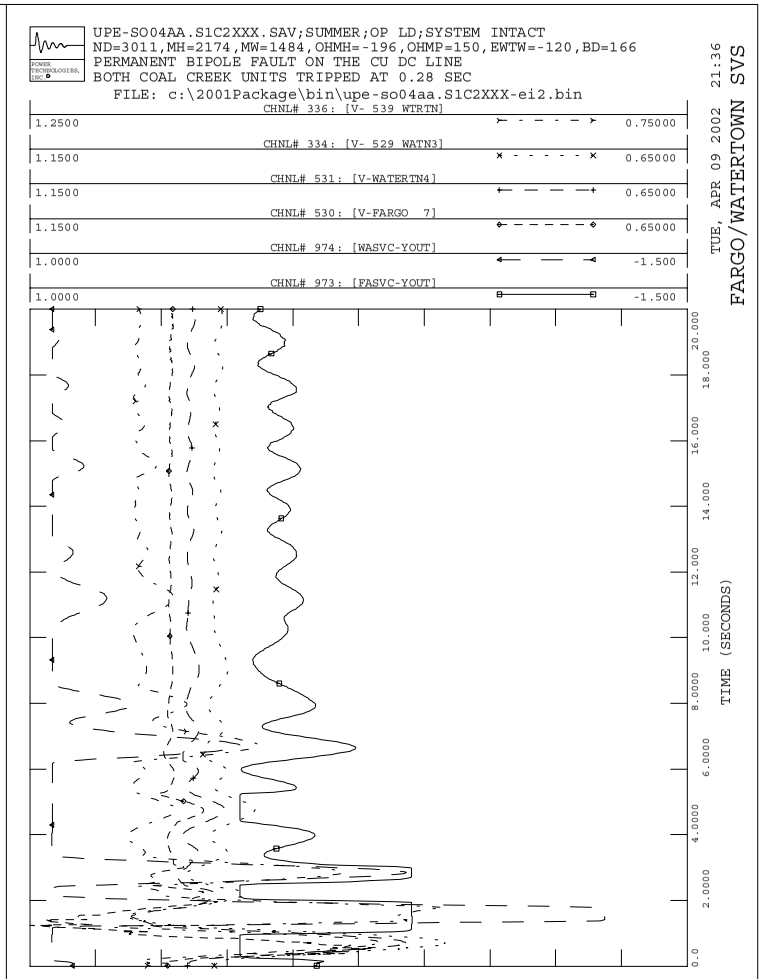
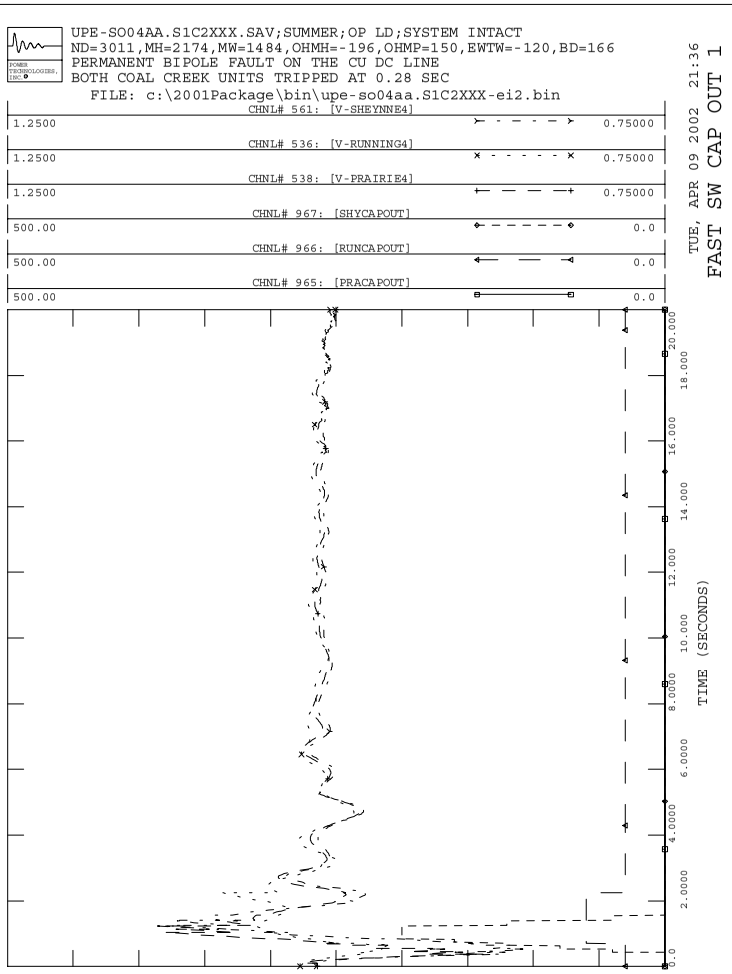
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

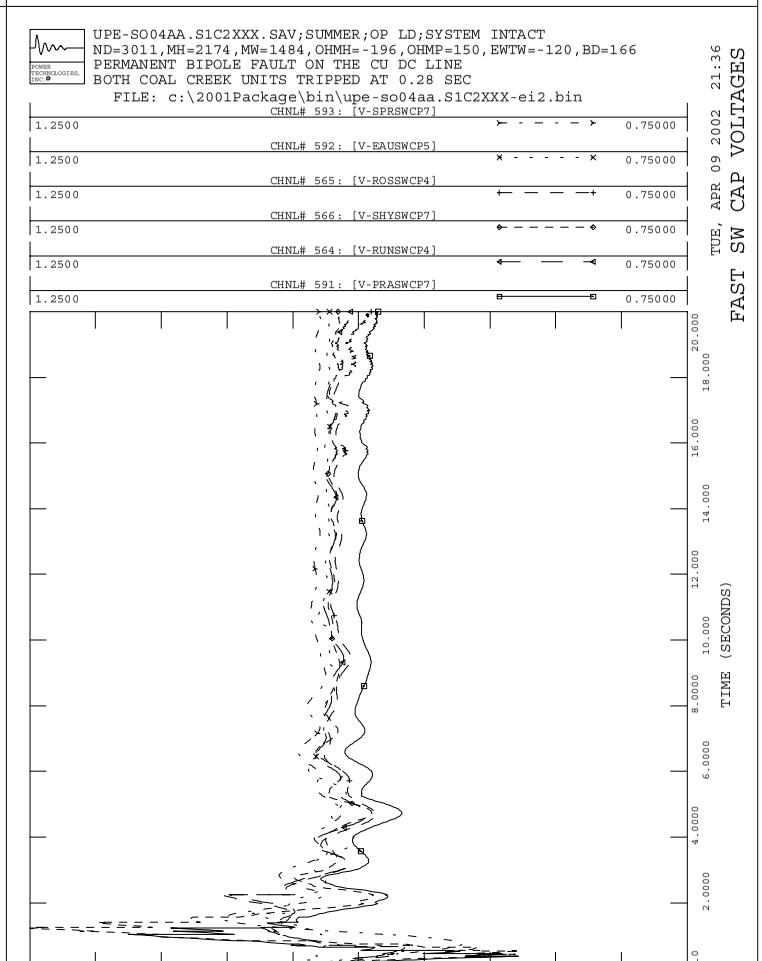


TUE, APR 09 2002 21:36
VOLTAGES NB


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
TUE, APR 09 2002 21:36
FAST SW CAP OUT 2


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
TUE, APR 09 2002 21:36
FARGO/WATERTOWN SVS


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
TUE, APR 09 2002 21:36
FAST SW CAP OUT 1


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
TUE, APR 09 2002 21:36
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

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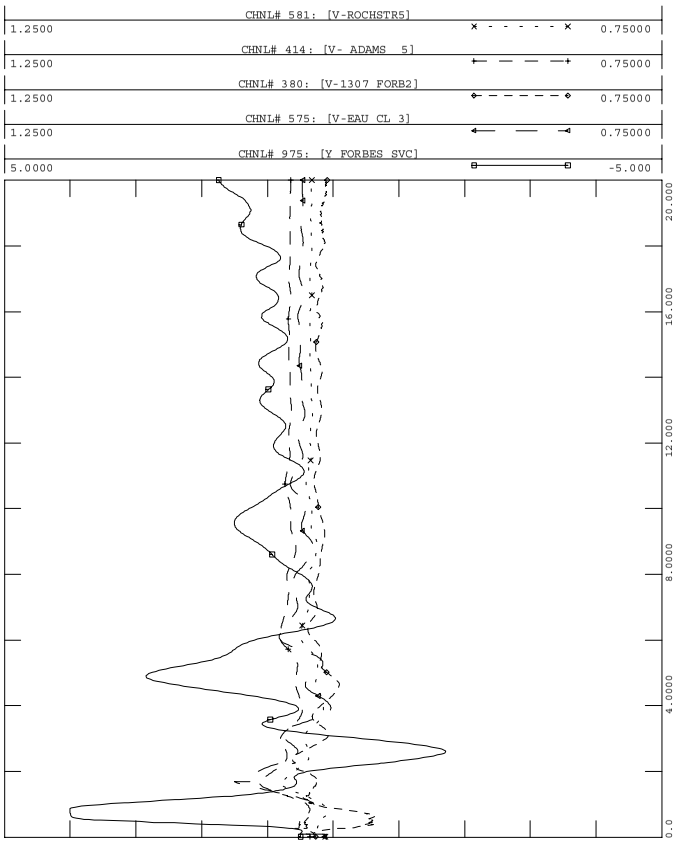
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

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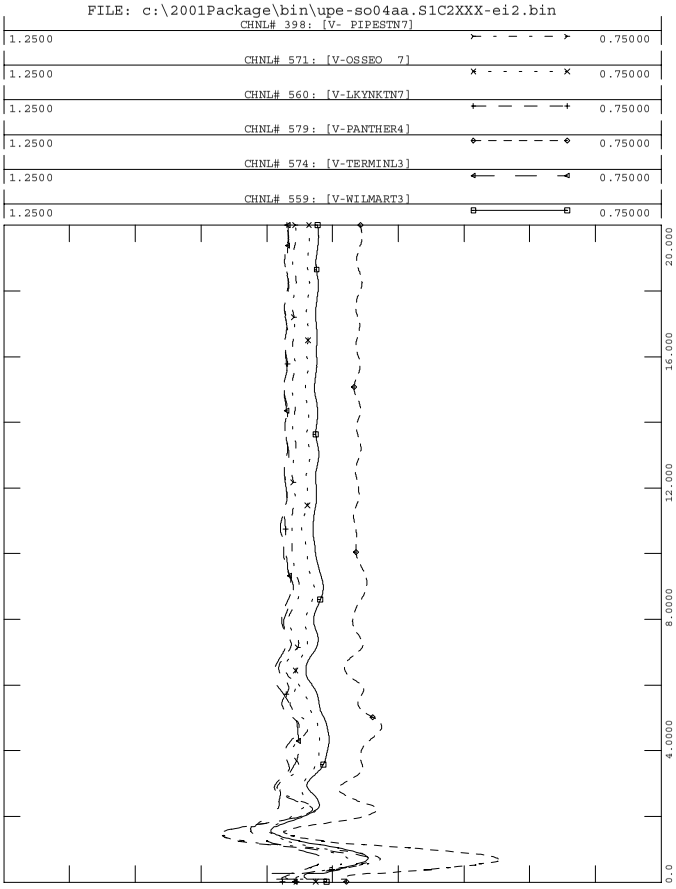
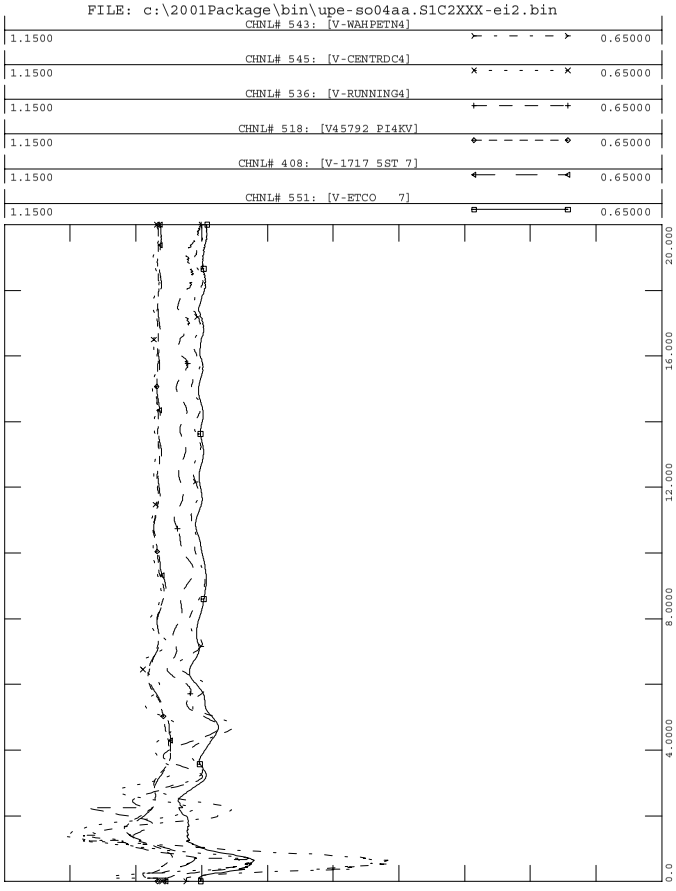
TC VOLTAGES



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

TUE, APR 09 2002 21:36

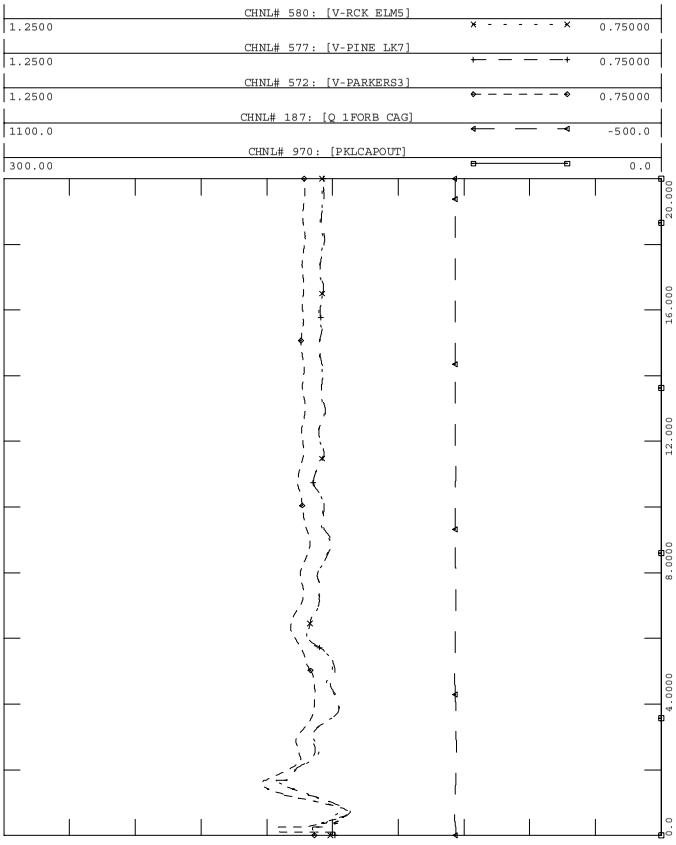
VOLTAGES 6



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

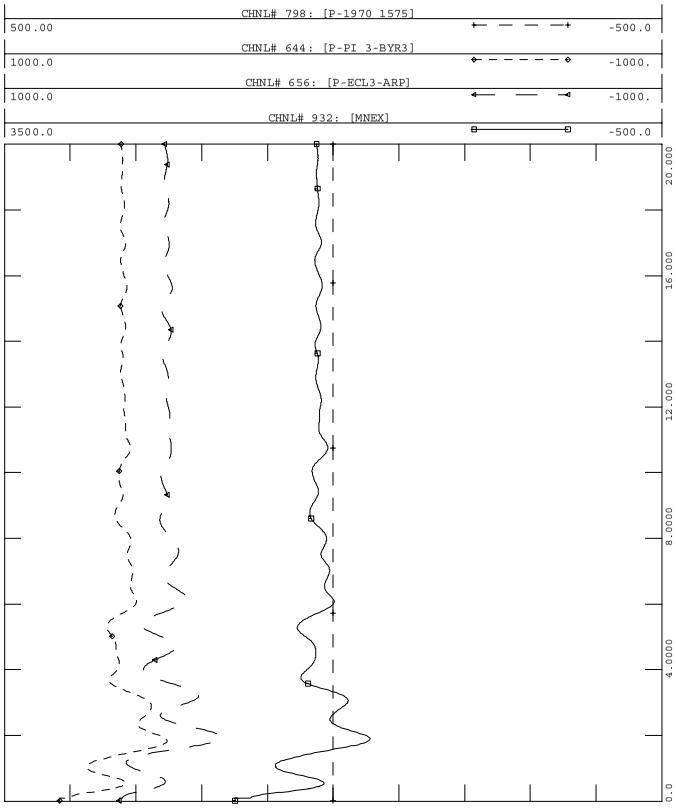
TUE, APR 09 2002 21:36

FORBES SVS OUT & VOLTAGES



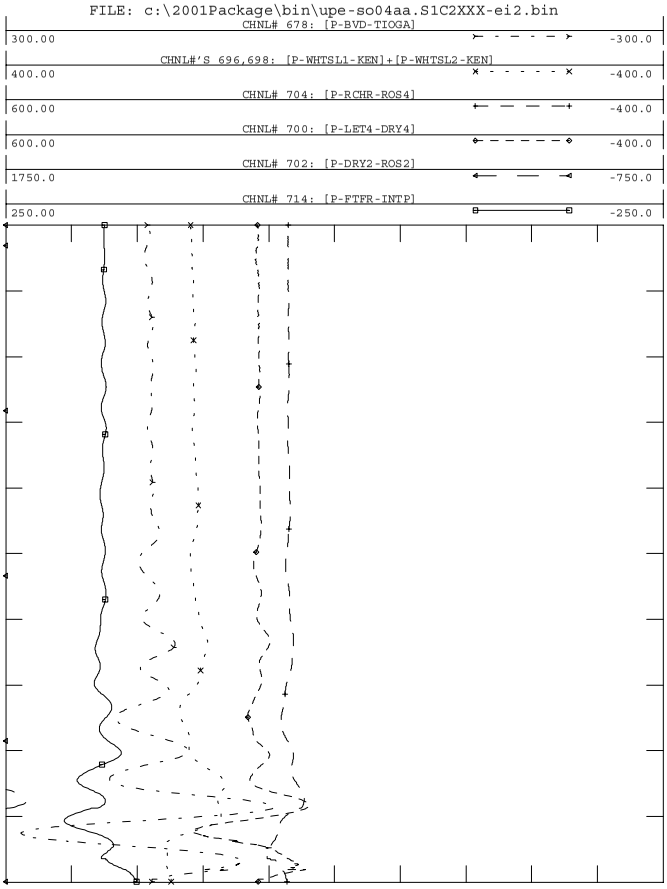
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

TUE, APR 09 2002 21:36
POWER FLOW SUMS 2



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

TUE, APR 09 2002 21:36
CAN. TIE FLOWS



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ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
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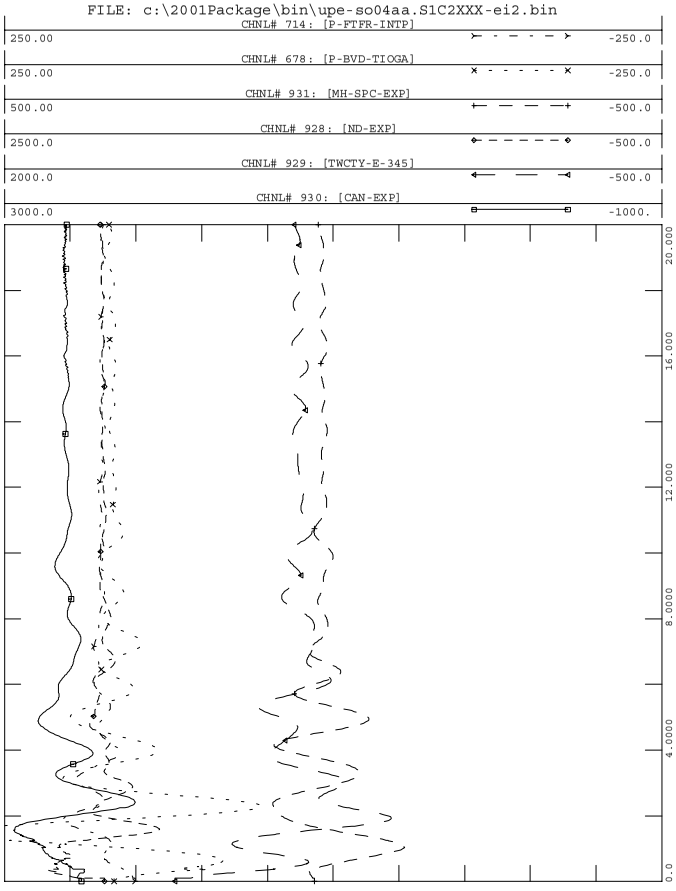
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

TUE, APR 09 2002 21:36
POWER FLOW SUMS 1



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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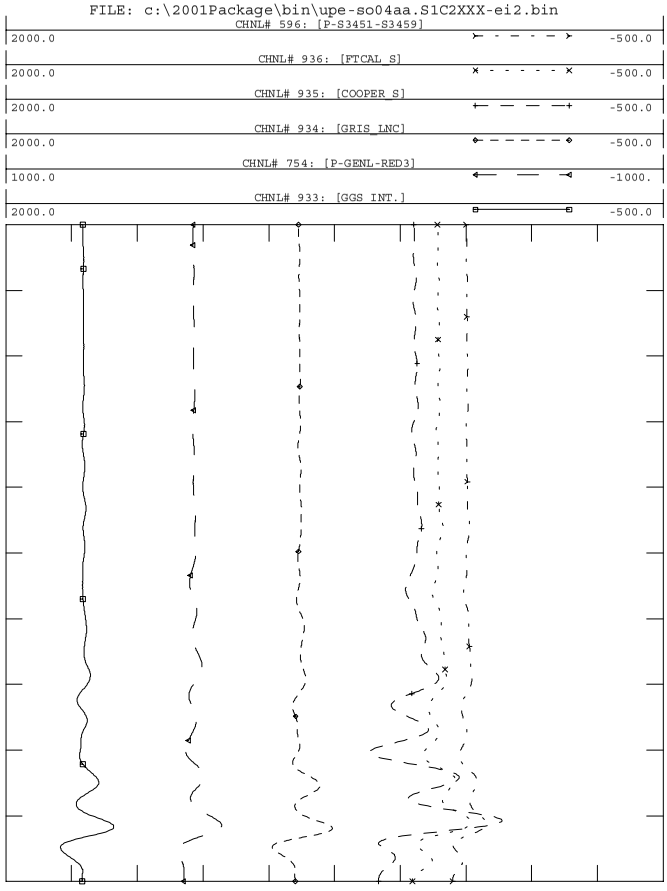
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

TUE, APR 09 2002 21:36
POWER FLOW SUM 3



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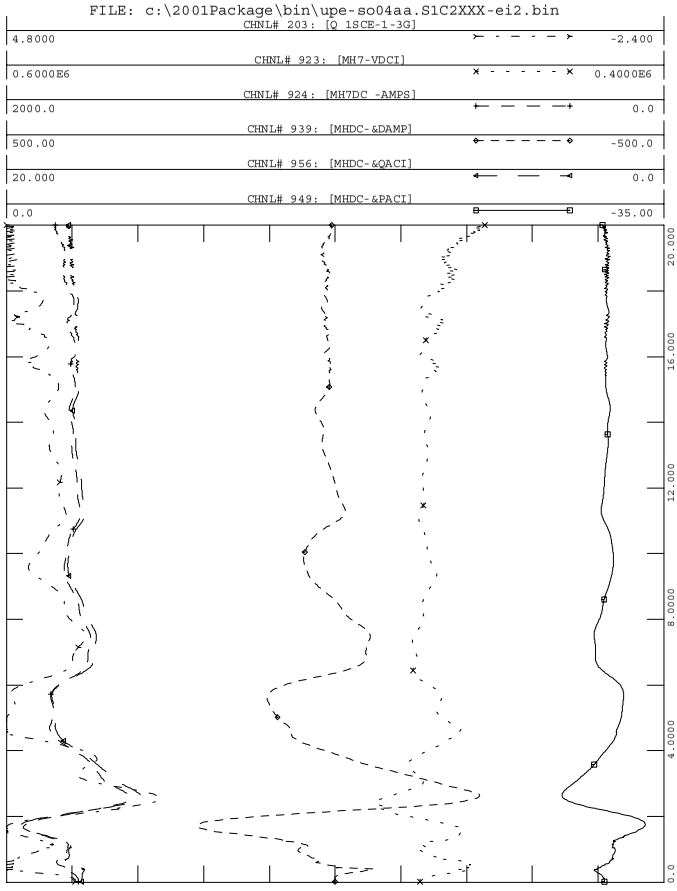
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

TUE, APR 09 2002 21:36
MH DC PARAMETERS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

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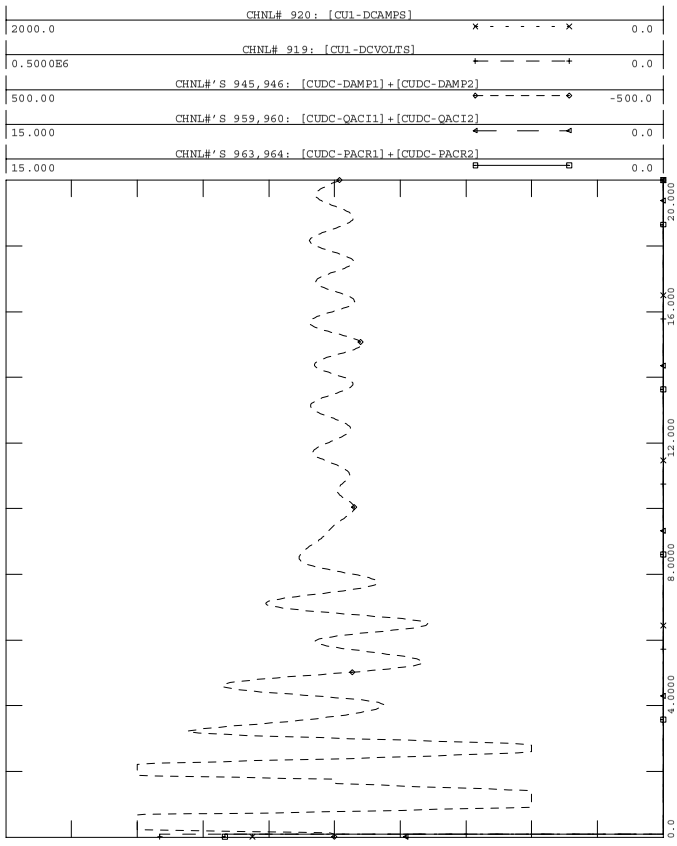
CU DC #1



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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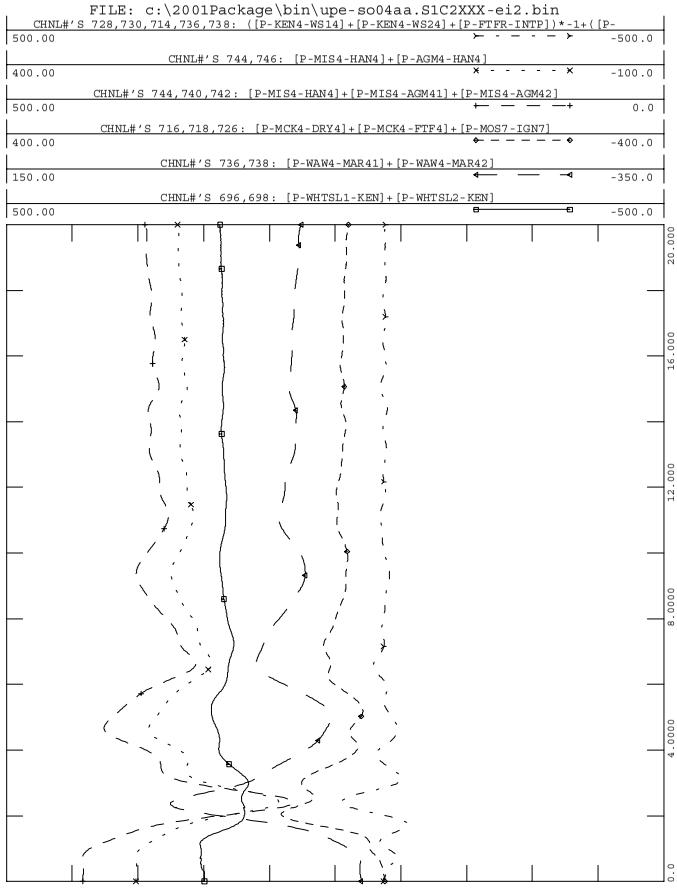
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

TUE, APR 09 2002 21:36
OH TIE FLOWS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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PERMANENT BIPOLE FAULT ON THE CU DC LINE
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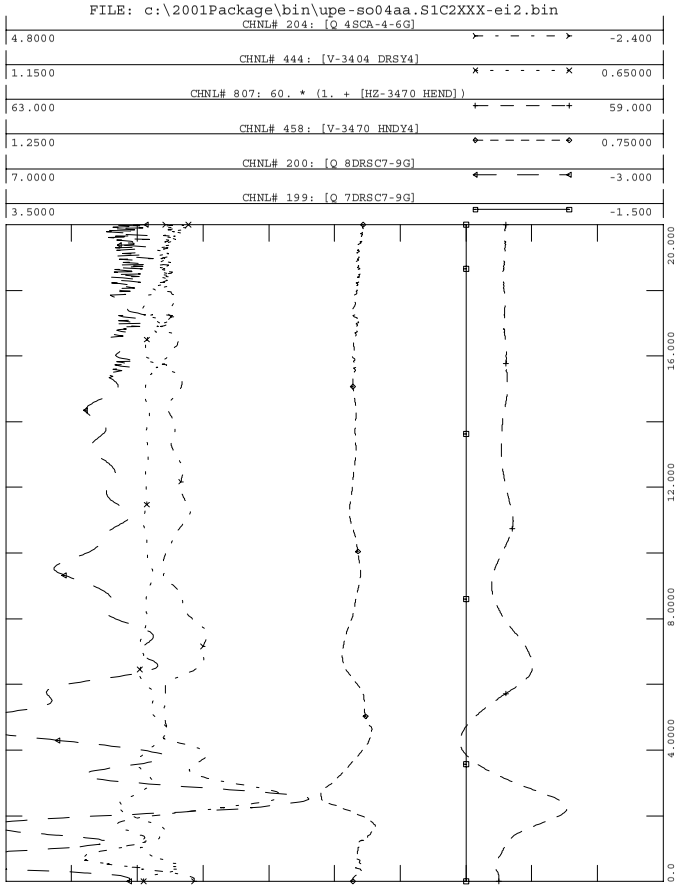
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

TUE, APR 09 2002 21:36
MH DC PARAMETERS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

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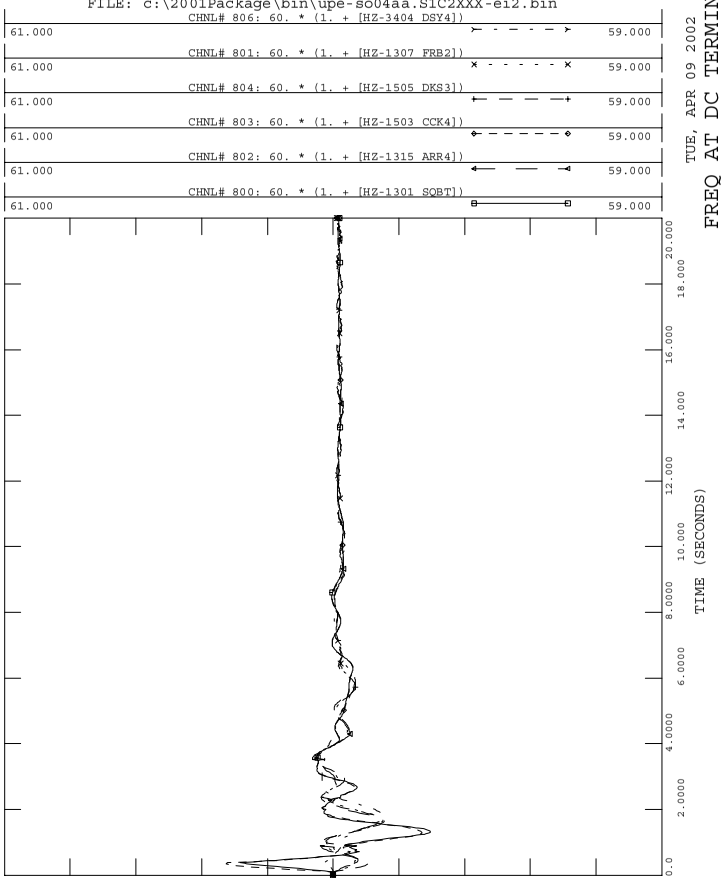
FREQ AT DC TERMINALS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

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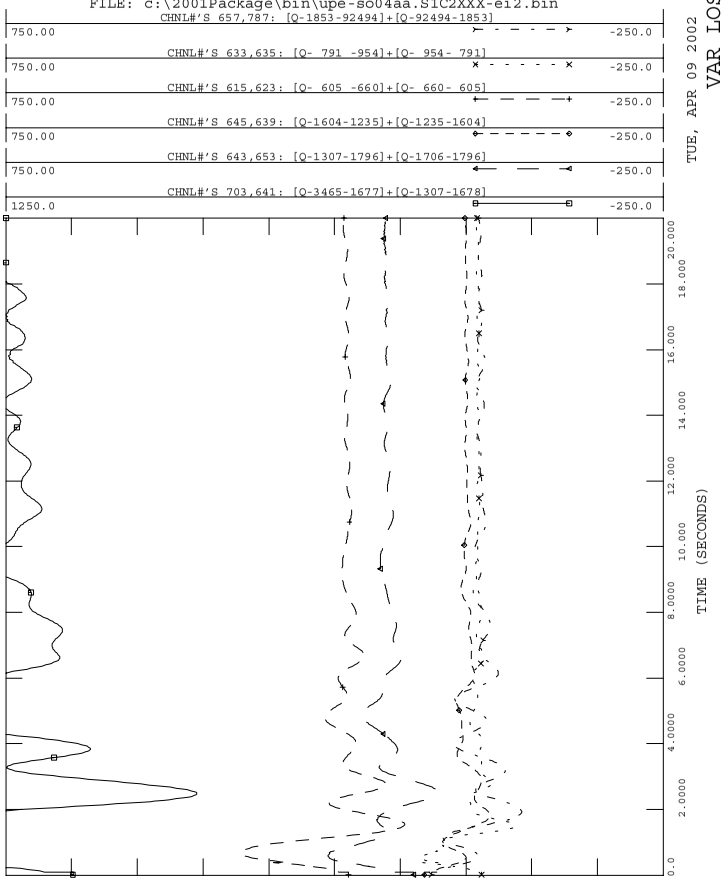
VAR LOSSES



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ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

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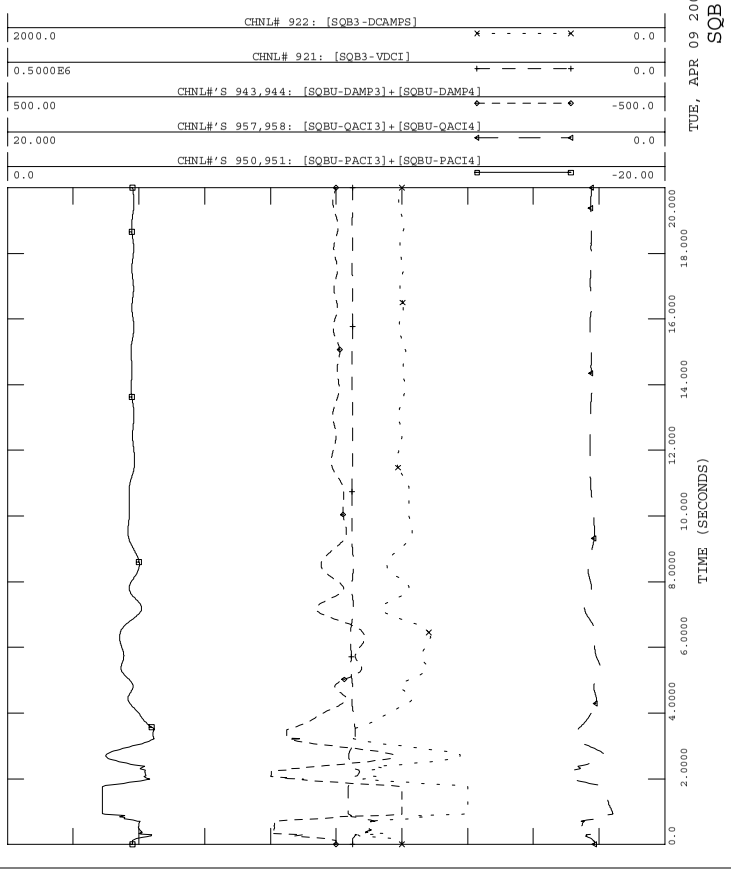
SQB DC #3



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

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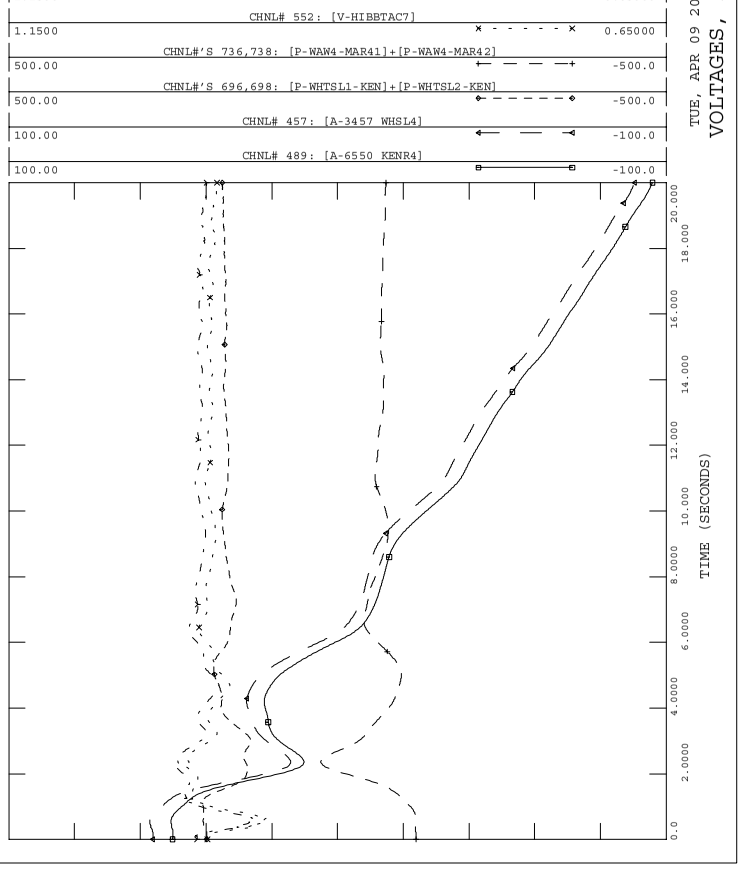
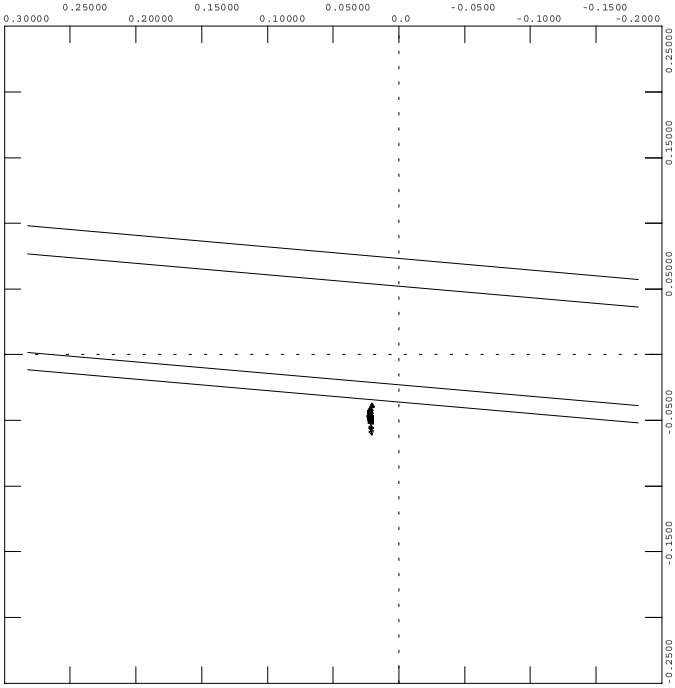
VOLTAGES, ANGLES



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 09 2002 21:36
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

RELAY: RELAYG
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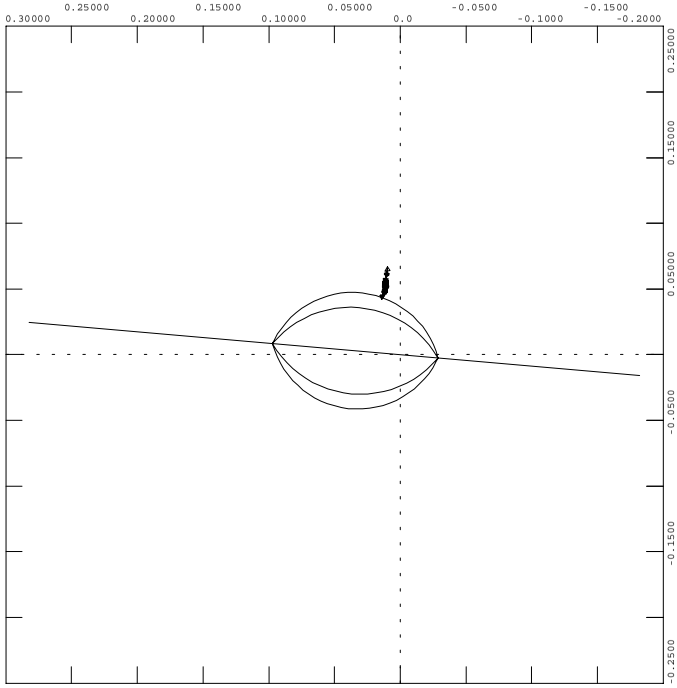
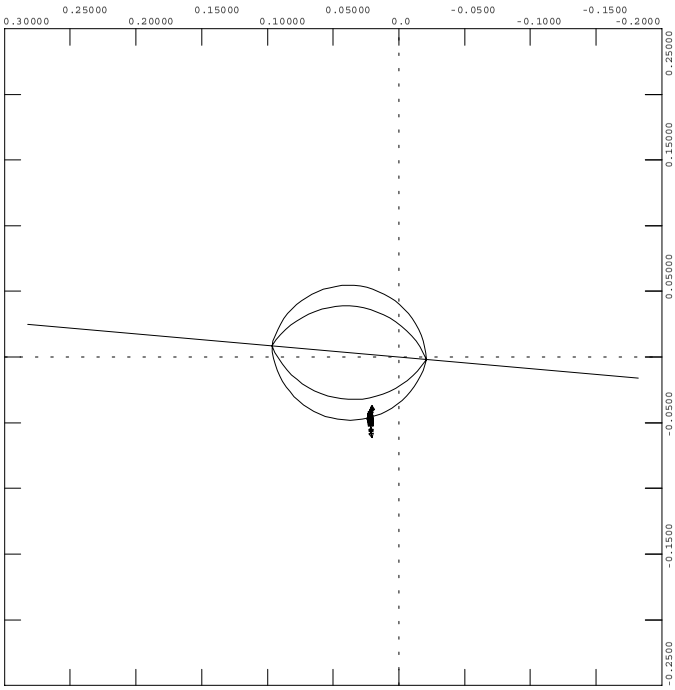


TUE, APR 09 2002 21:36
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

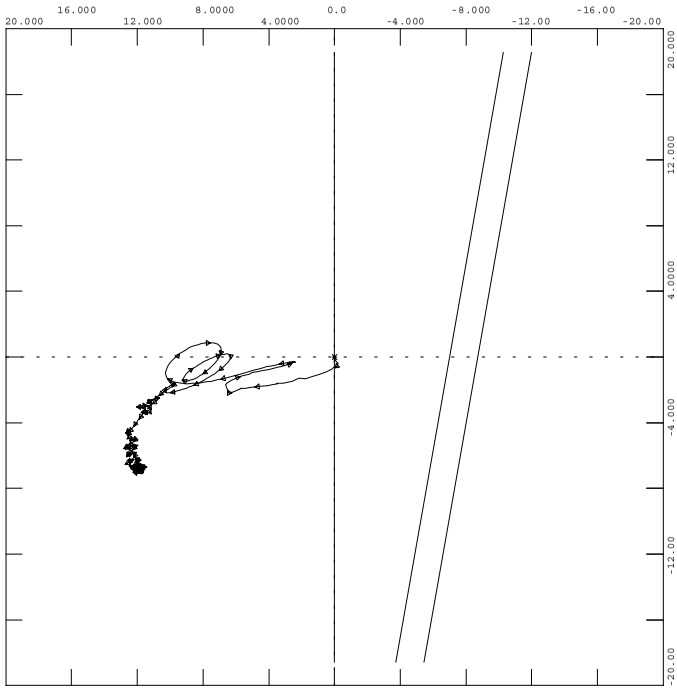


TUE, APR 09 2002 21:36
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

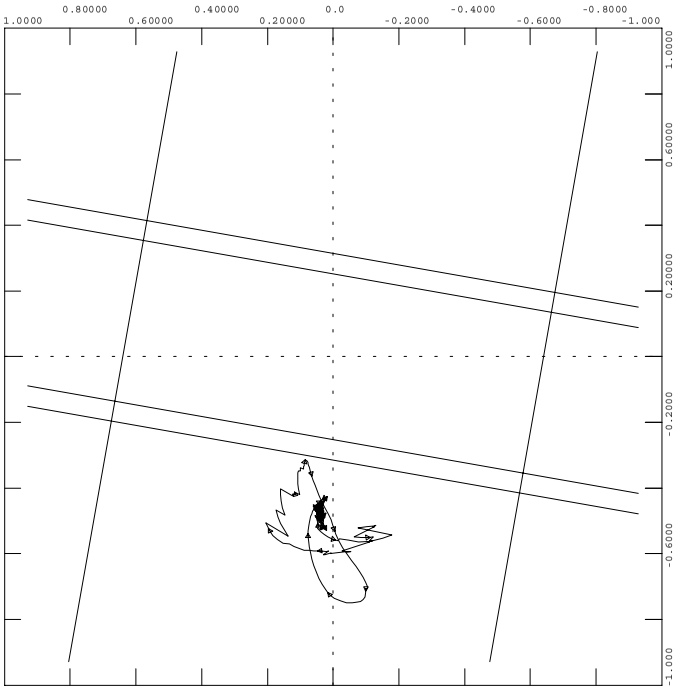


TUE, APR 09 2002 21:36
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

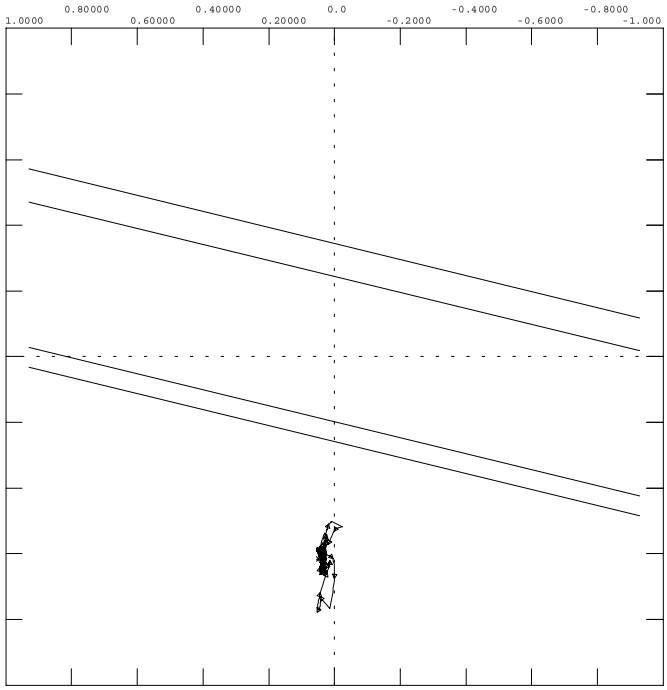


TUE, APR 09 2002 21:36
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



TUE, APR 09 2002 21:36
R50M AT MORANVILLE (520)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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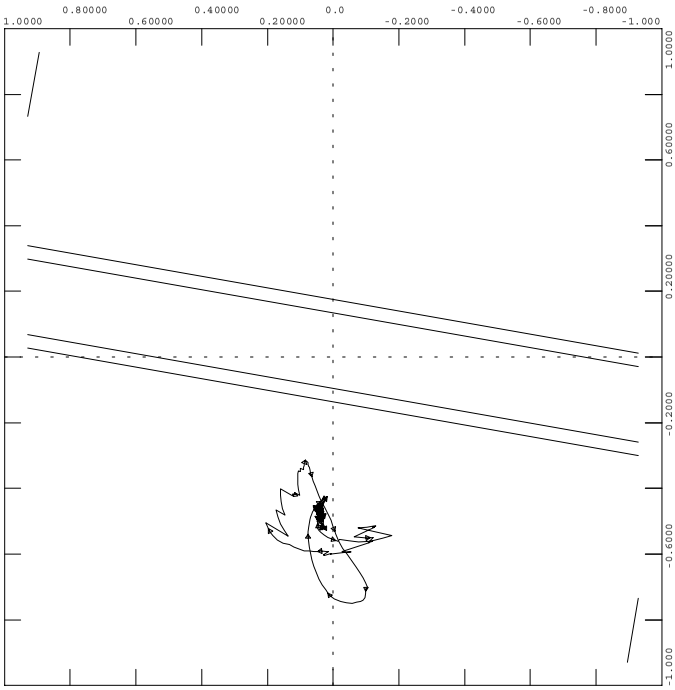
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

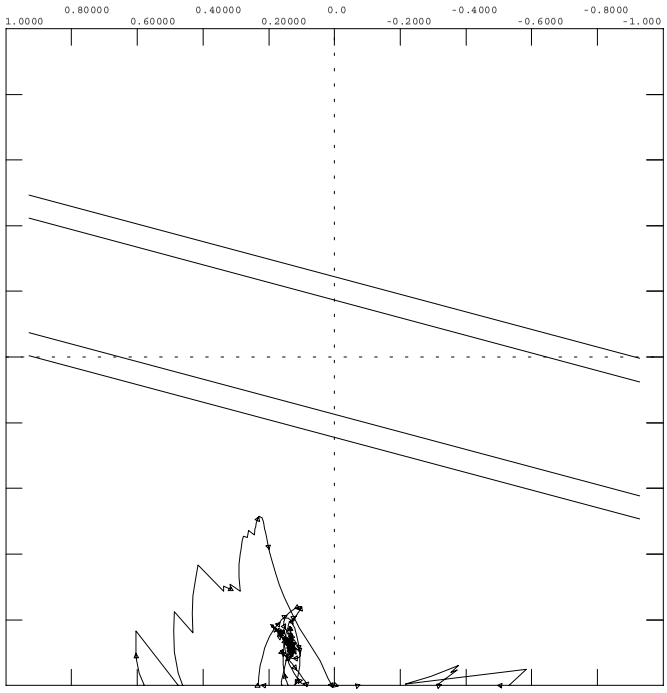


TUE, APR 09 2002 21:36
L20D AT DRAYTON (506)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



TUE, APR 09 2002 21:36
L20D-PRAIRIE (510)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

RELAY: SLLP
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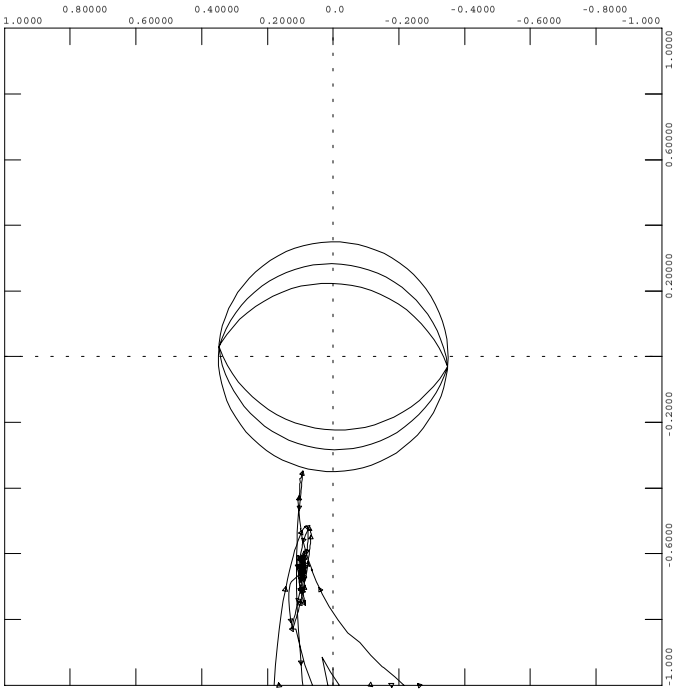
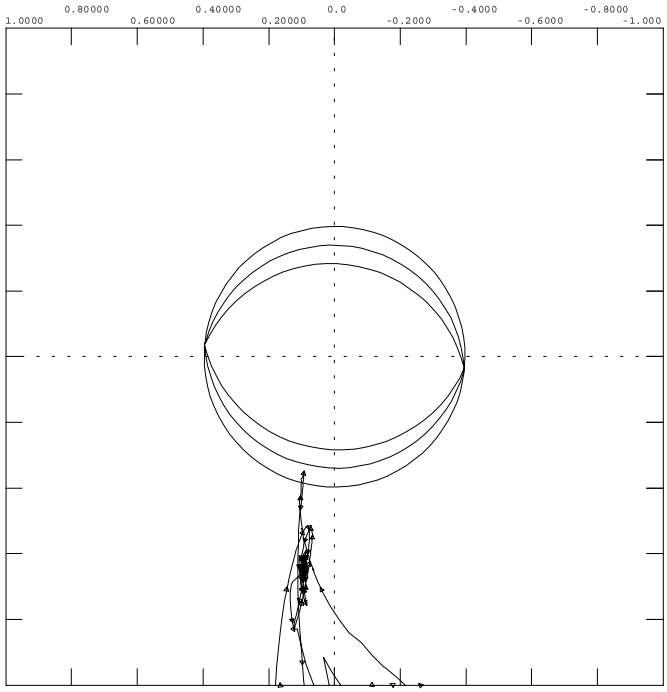
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

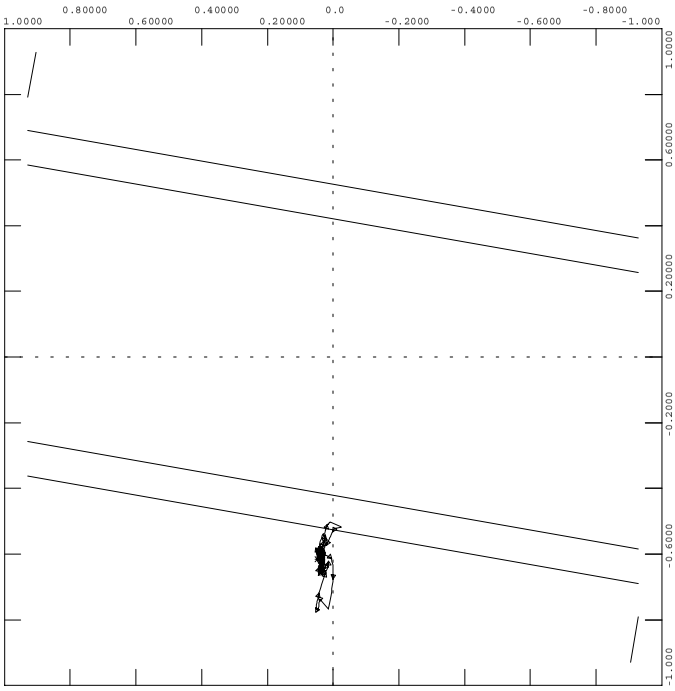
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

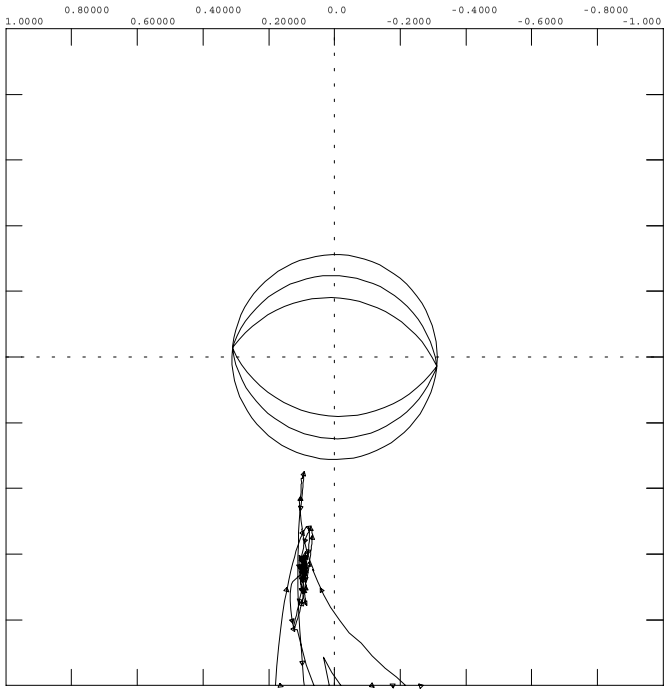
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



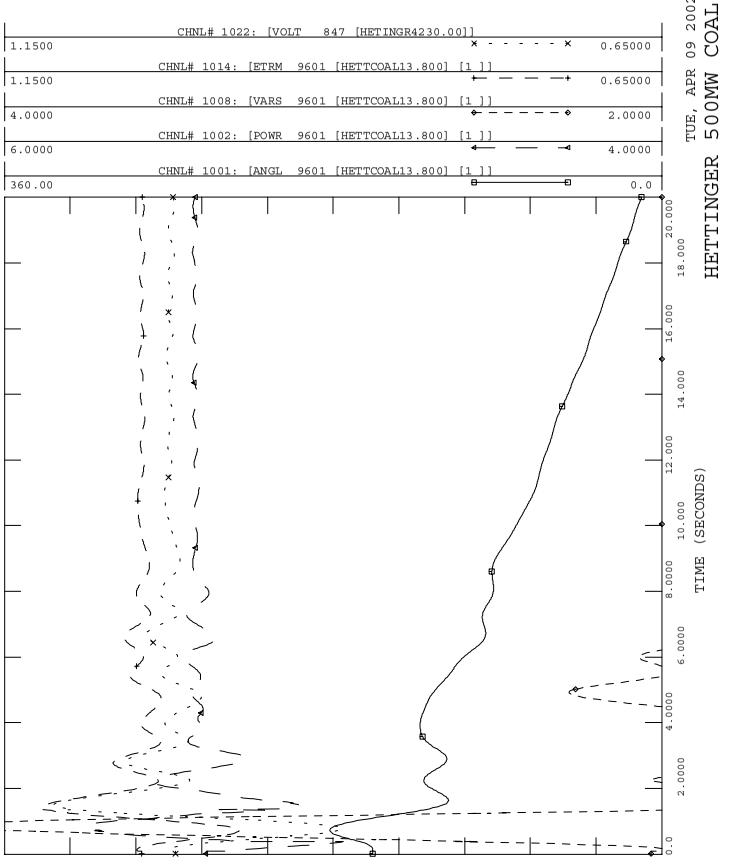
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

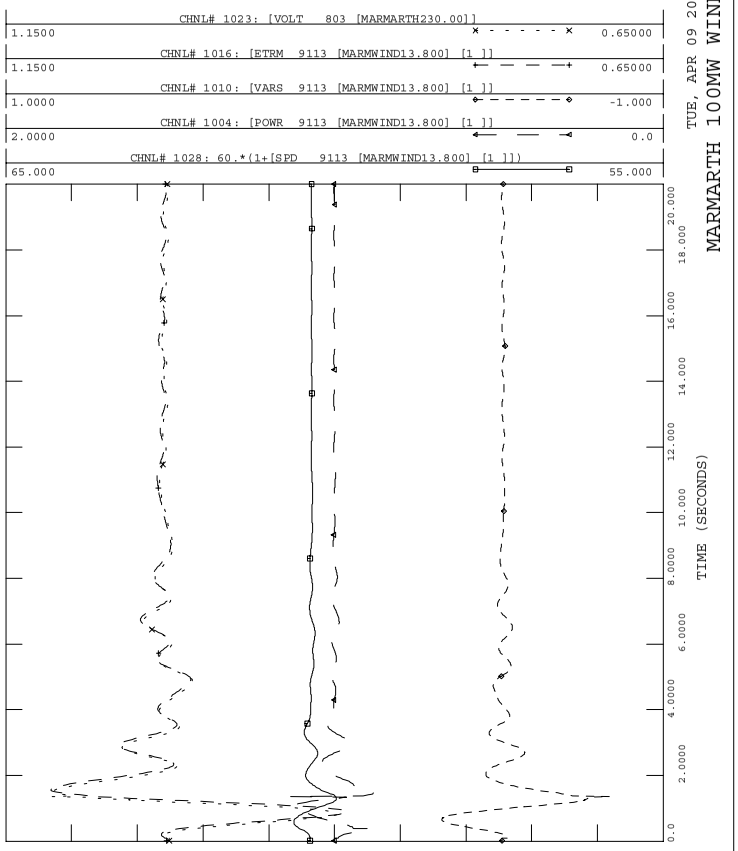


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin



TUE, APR 09 2002 21:36
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

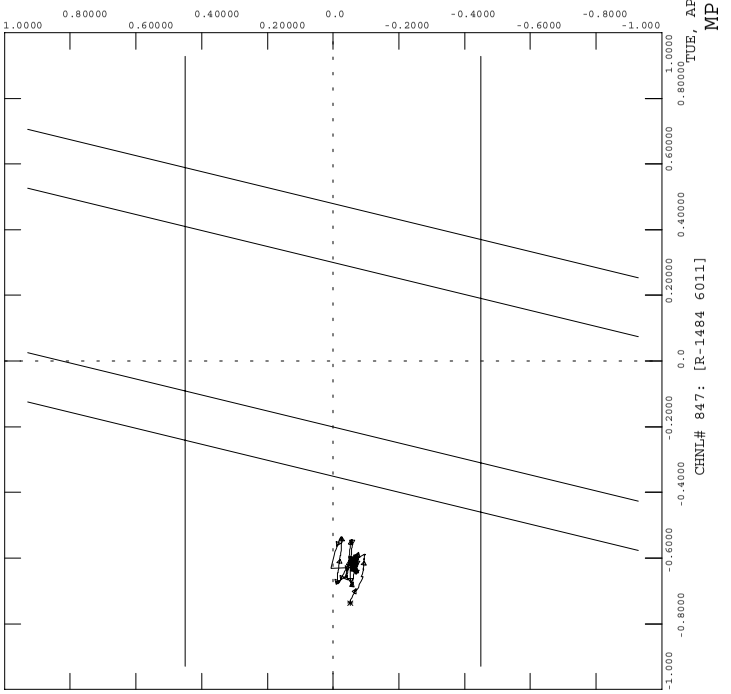


TUE, APR 09 2002 21:36
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

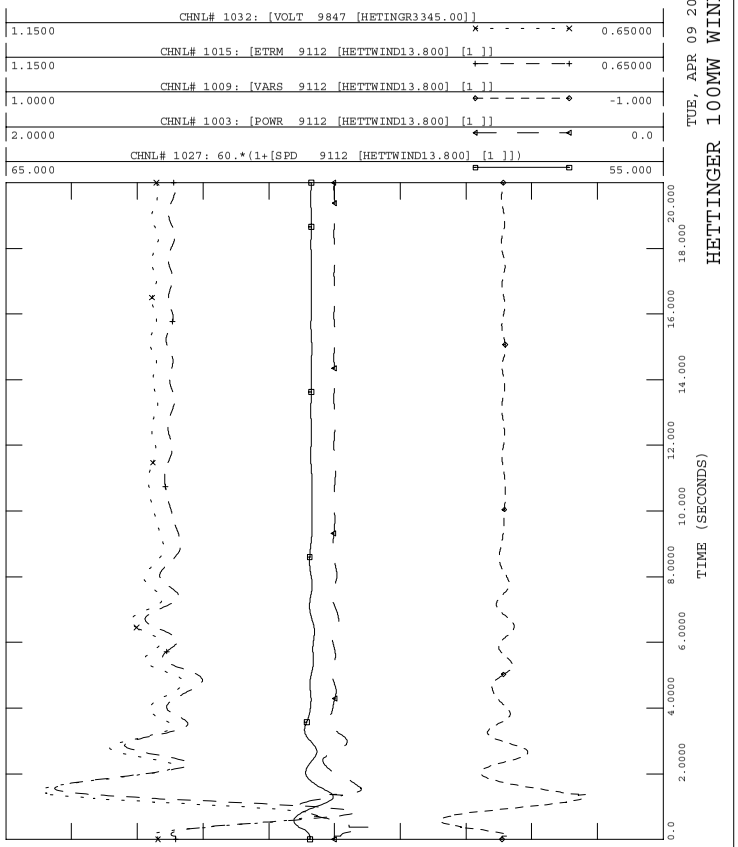
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



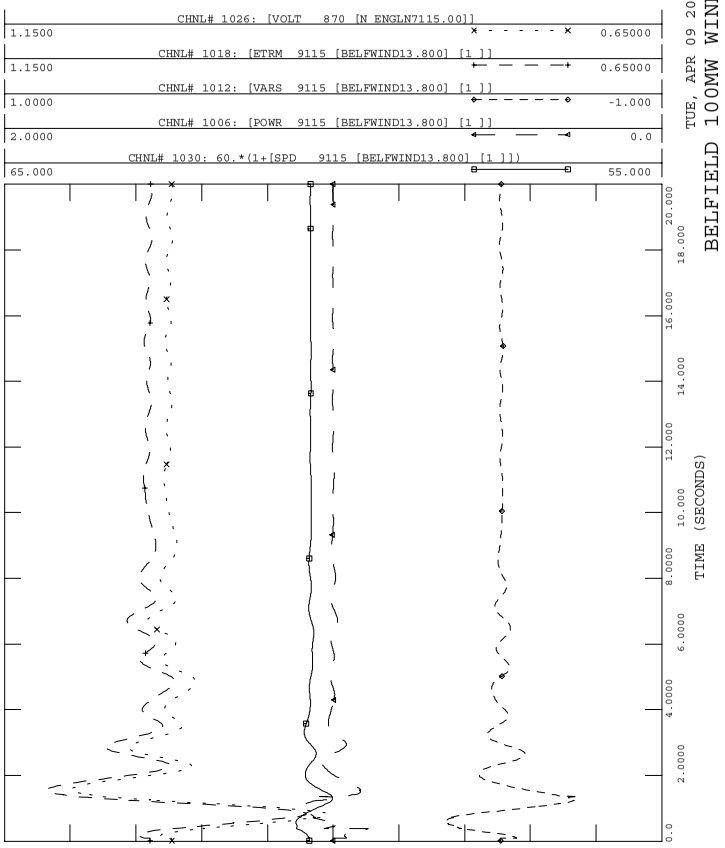
TUE, APR 09 2002 21:36
MP-OH I.FALLS (779)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

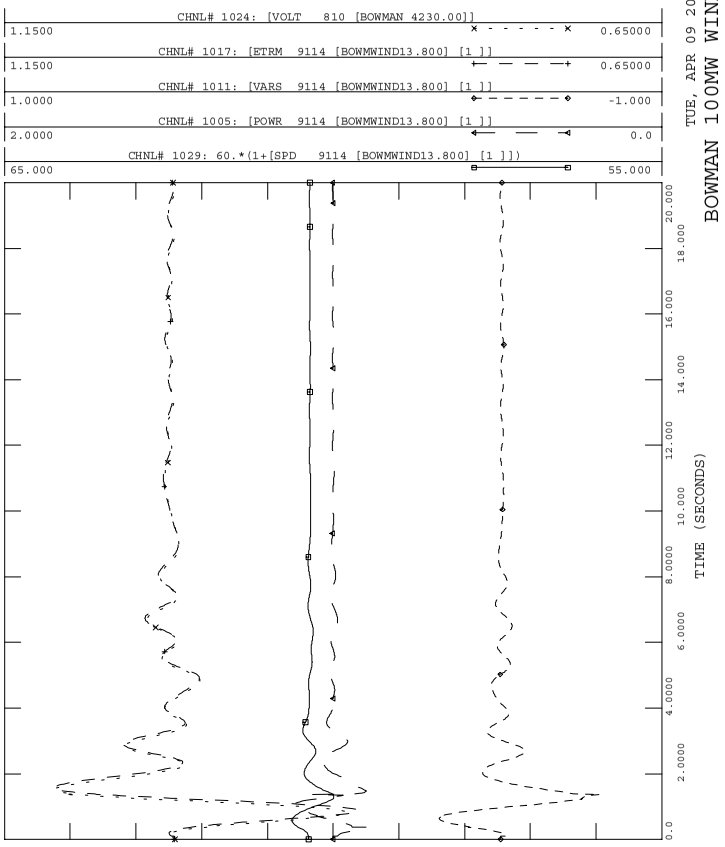


TUE, APR 09 2002 21:36
HETTINGER 100MW WIND UNIT

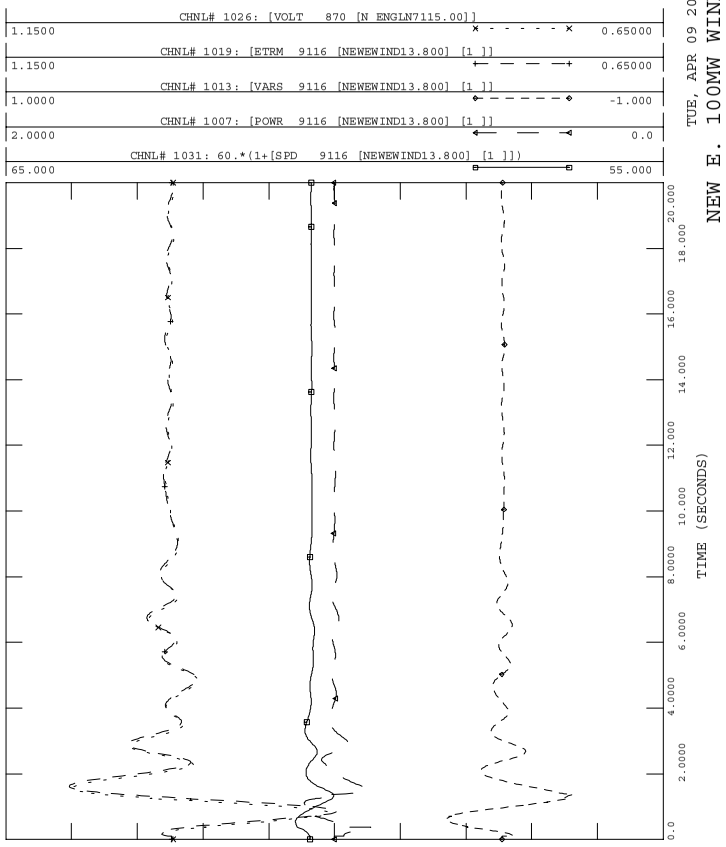
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ei2.bin

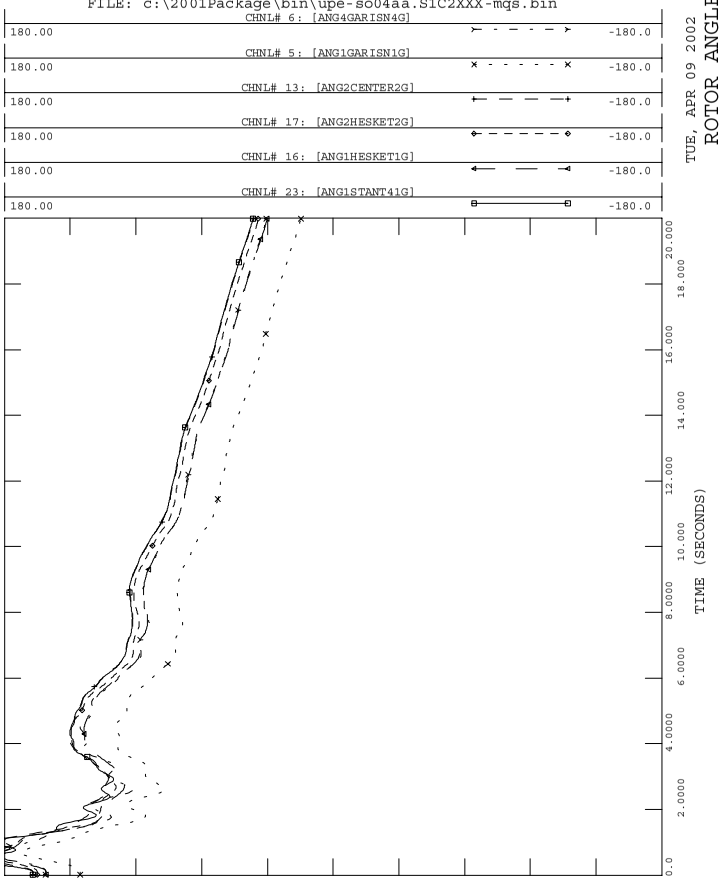


CONTINGENCY MQS

Single line to ground fault with breaker fail at Sherco with 8N28 stuck. Trip Sherco generator 3.

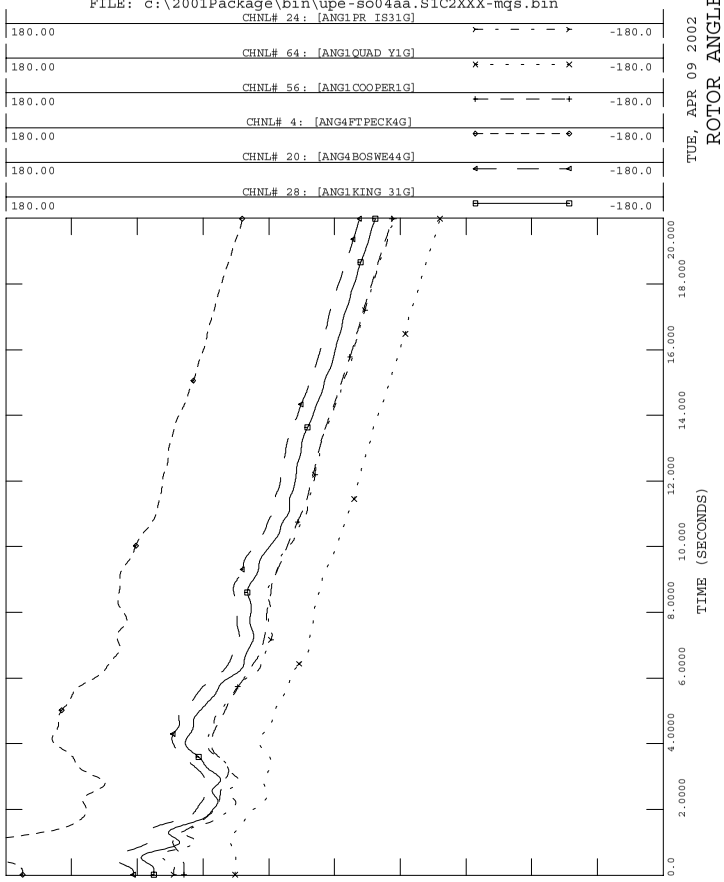
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

TUE, APR 09 2002 21:52
ROTOR ANGLES 2



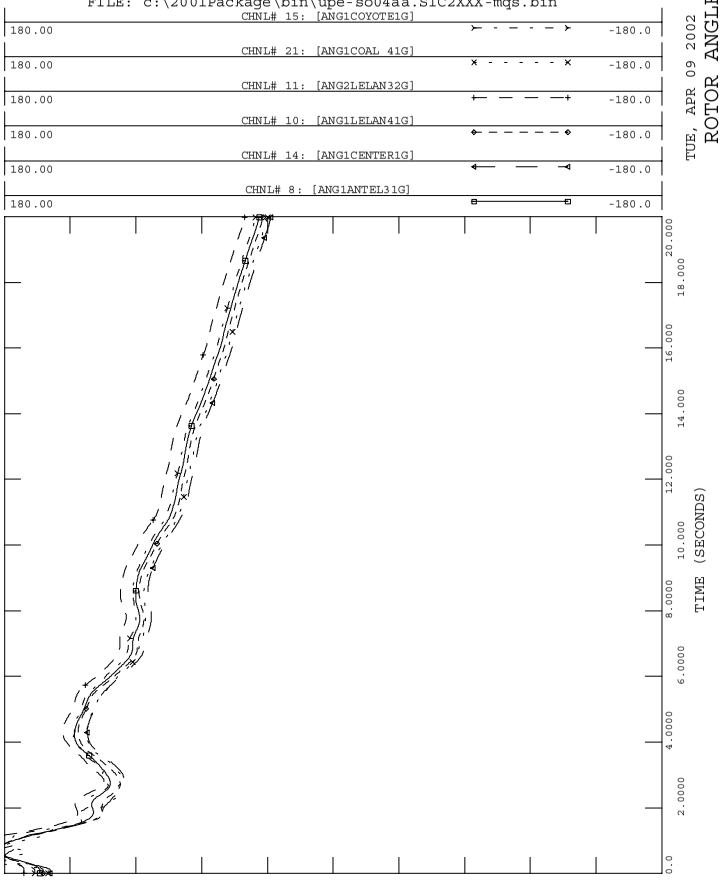
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

TUE, APR 09 2002 21:52
ROTOR ANGLES 4



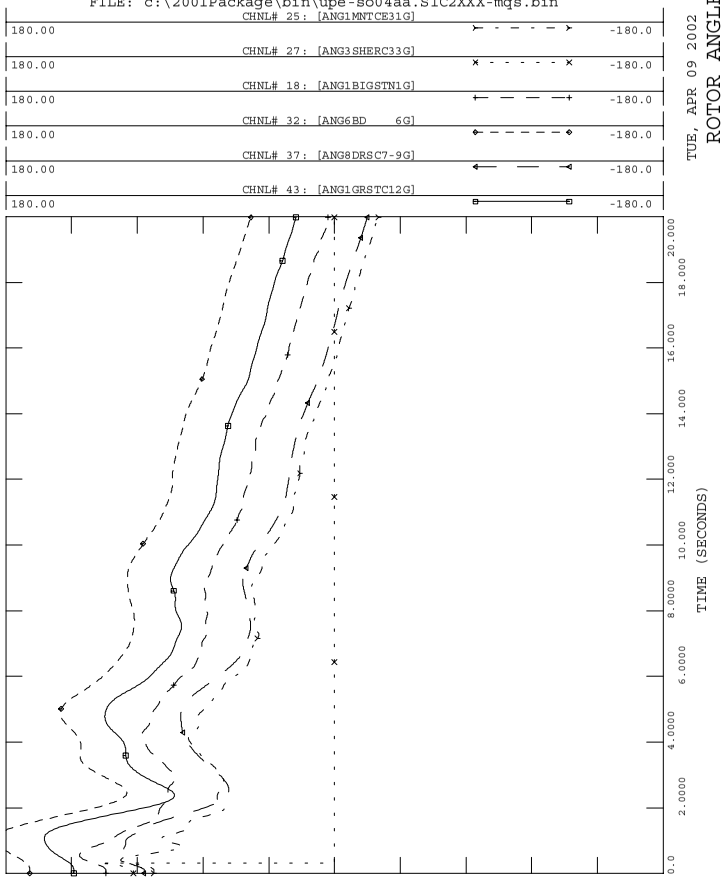
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

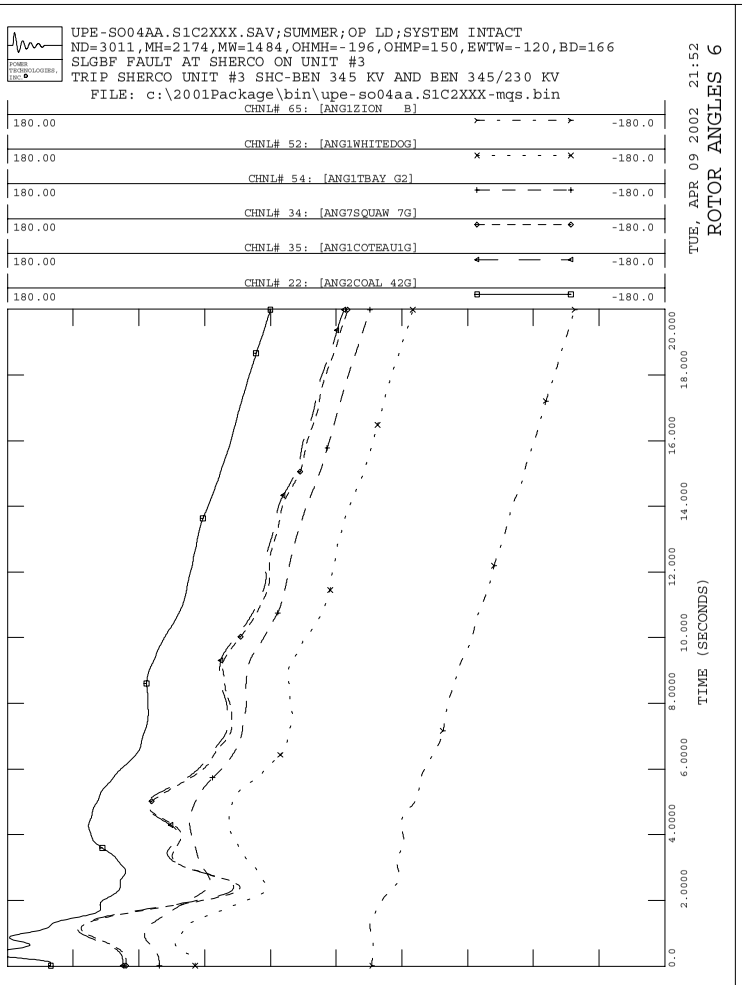
TUE, APR 09 2002 21:52
ROTOR ANGLES 1

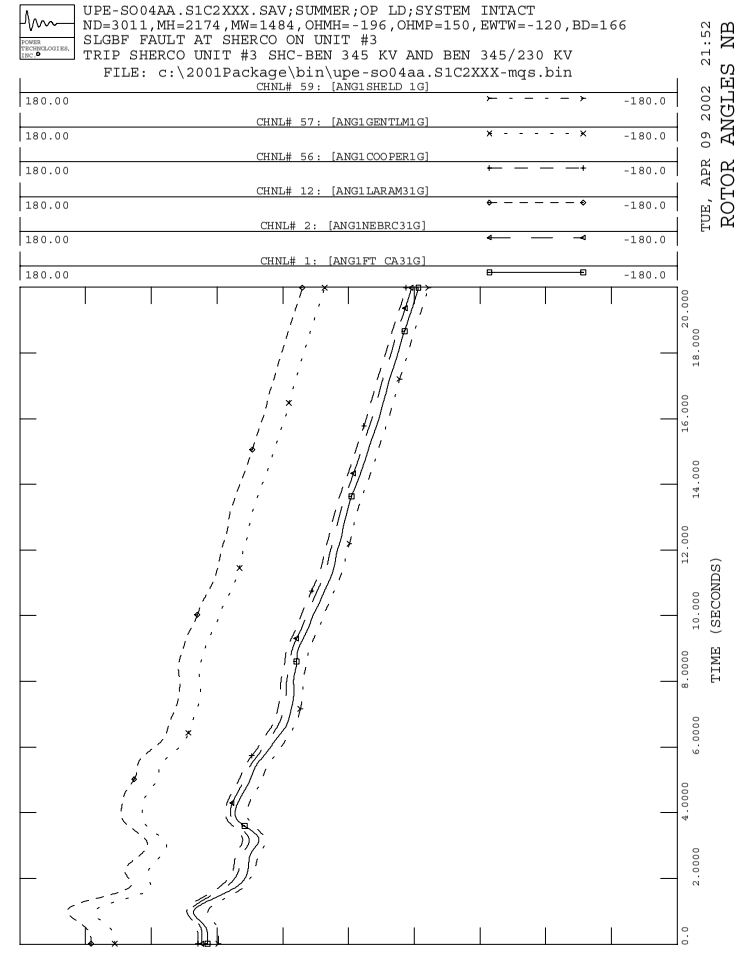


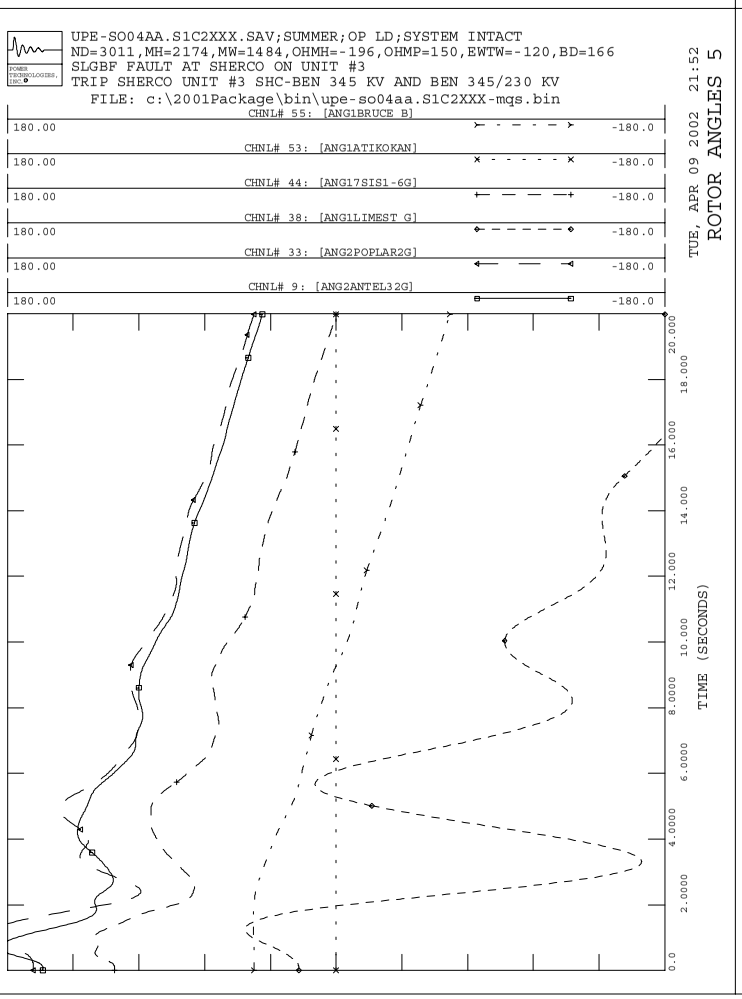
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

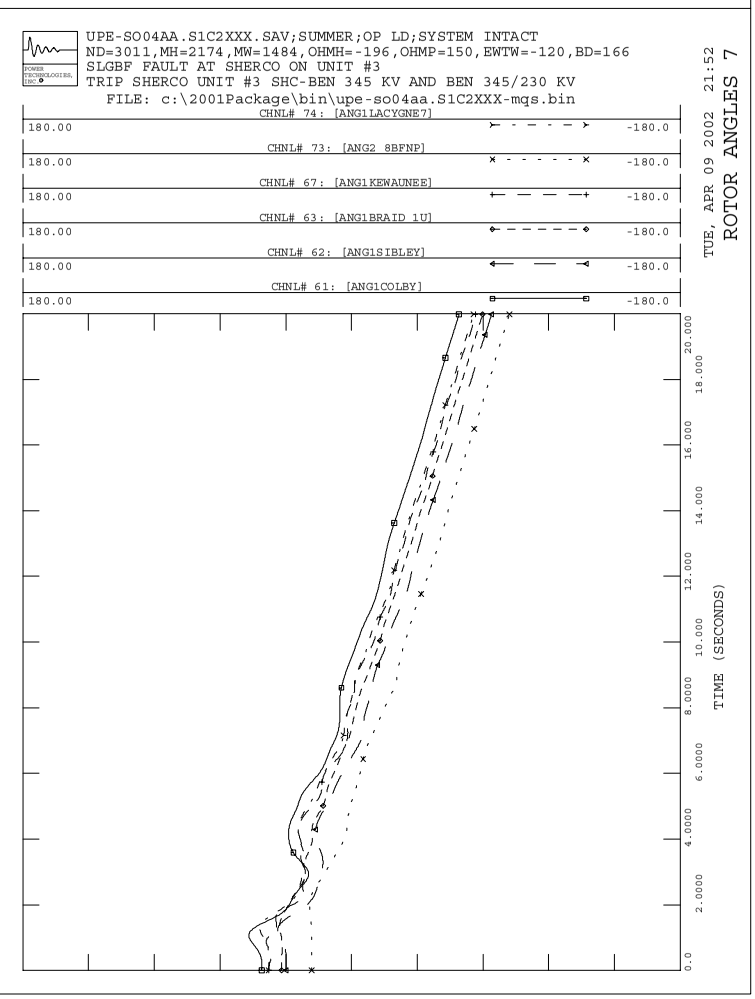
TUE, APR 09 2002 21:52
ROTOR ANGLES 3



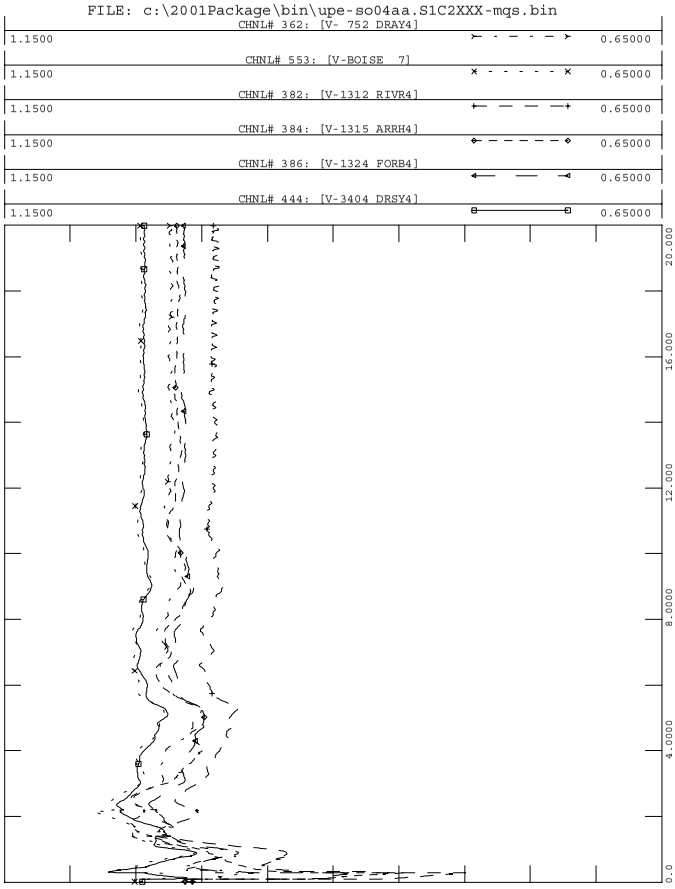

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TUE, APR 09 2002 21:52
ROTOR ANGLES 6
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TUE, APR 09 2002 21:52
ROTOR ANGLES NB
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TUE, APR 09 2002 21:52
ROTOR ANGLES 5
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

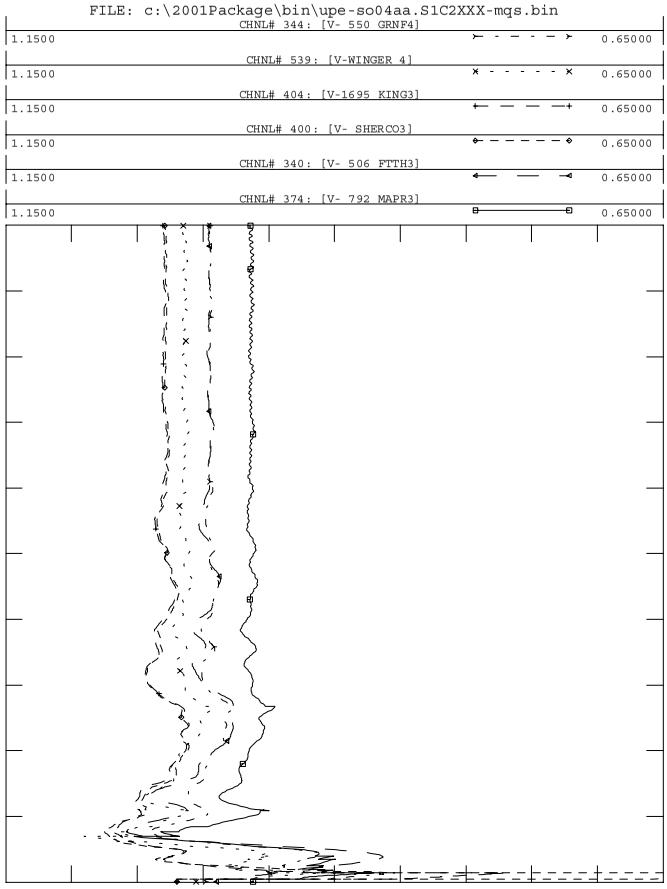

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TUE, APR 09 2002 21:52
ROTOR ANGLES 7
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



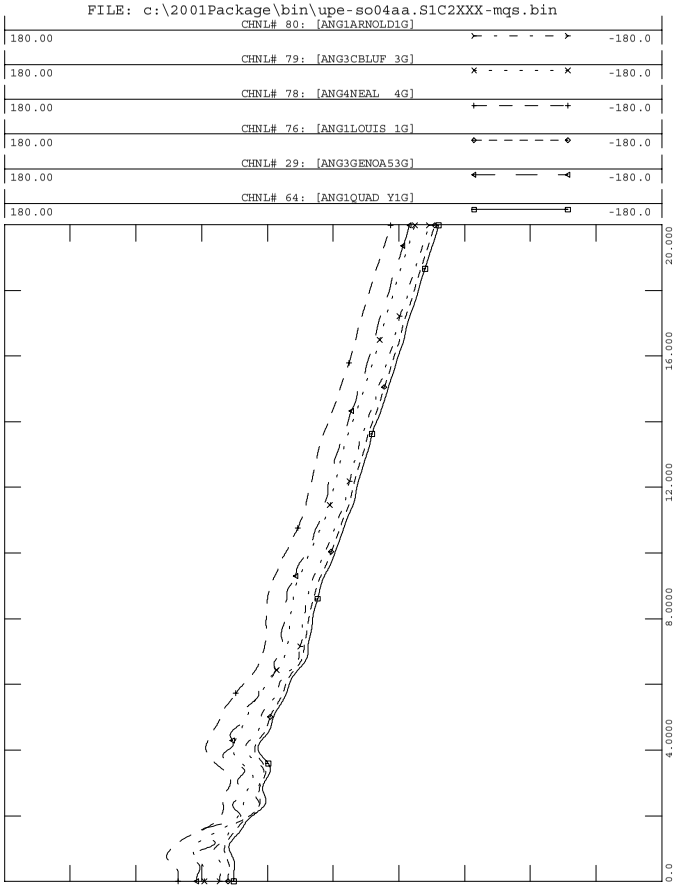
TUE, APR 09 2002 21:52
VOLTAGES 1

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



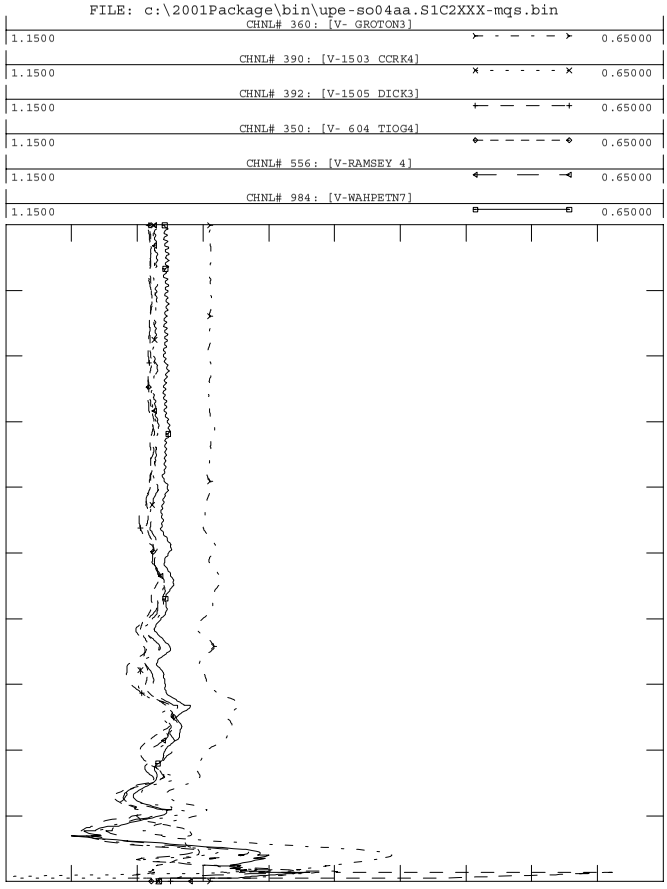
TUE, APR 09 2002 21:52
VOLTAGES 3

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



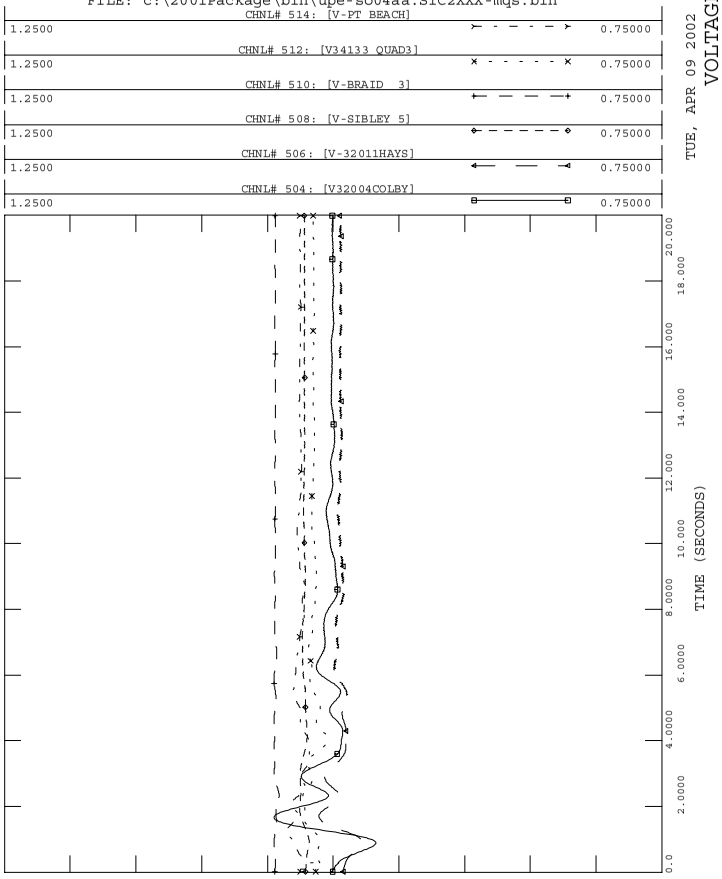
TUE, APR 09 2002 21:52
ROTOR ANGLES IA

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



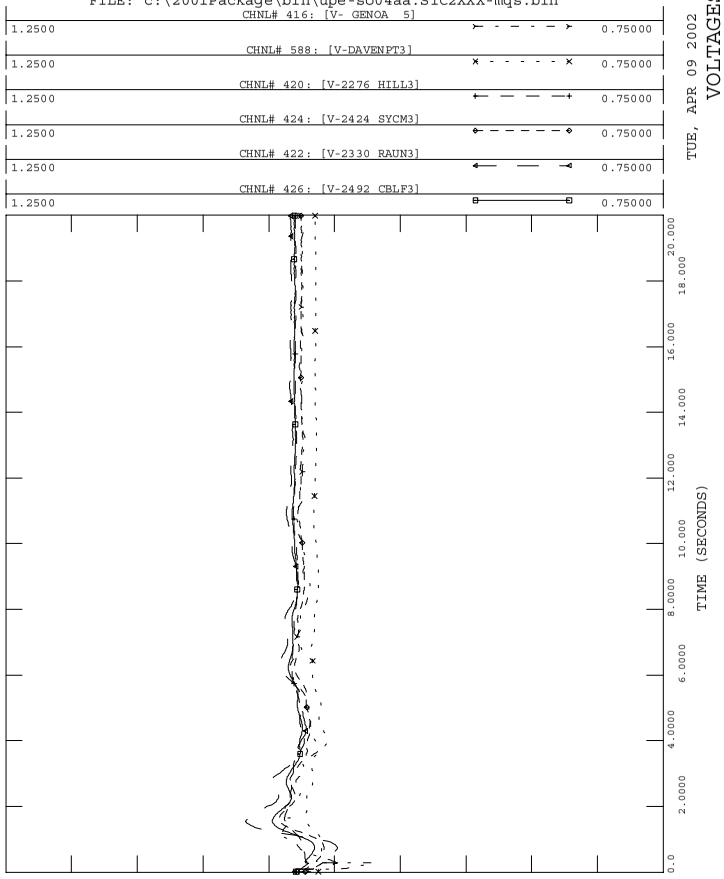
TUE, APR 09 2002 21:52
VOLTAGES 2

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



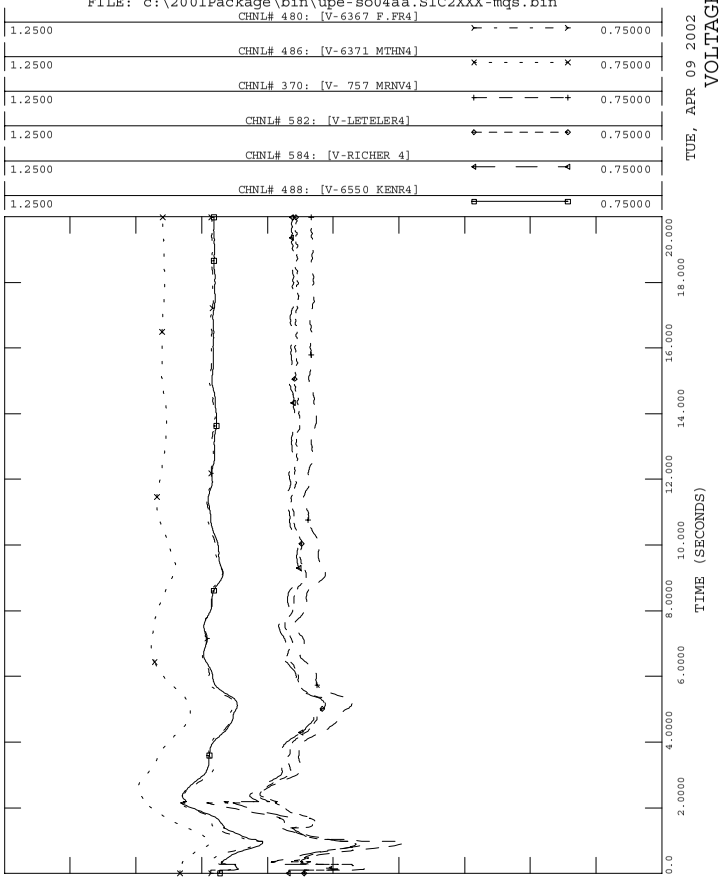
TUE, APR 09 2002 21:52
VOLTAGES 5

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



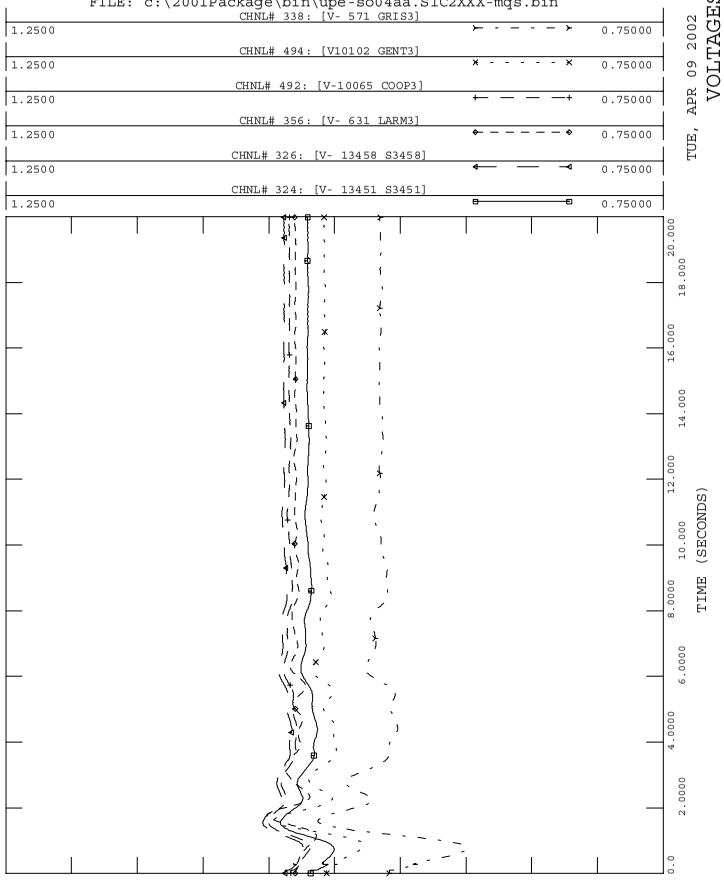
TUE, APR 09 2002 21:52
VOLTAGES IA

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

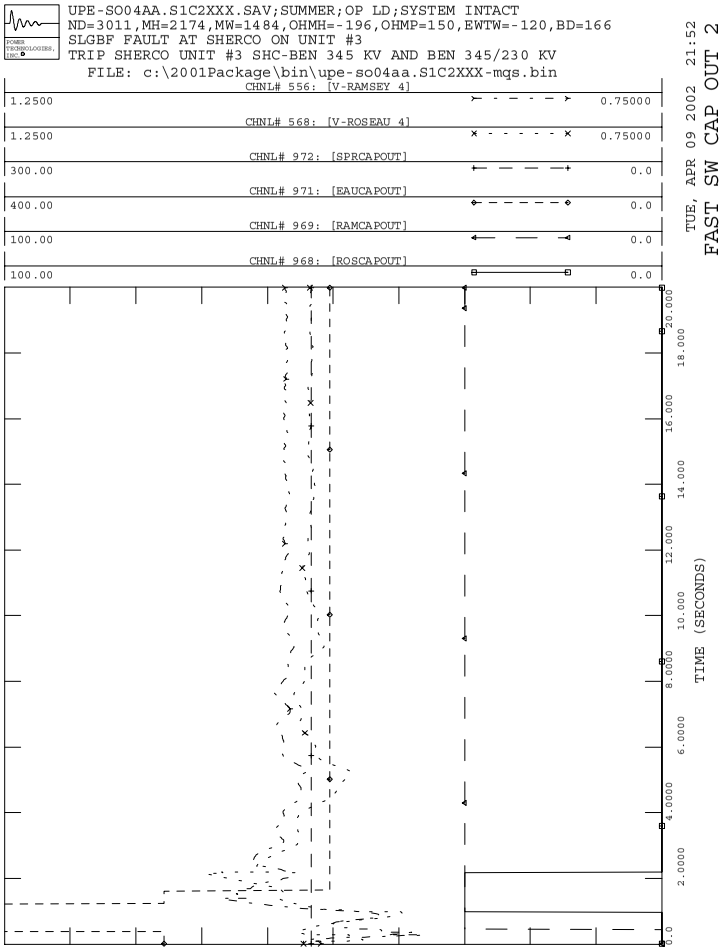


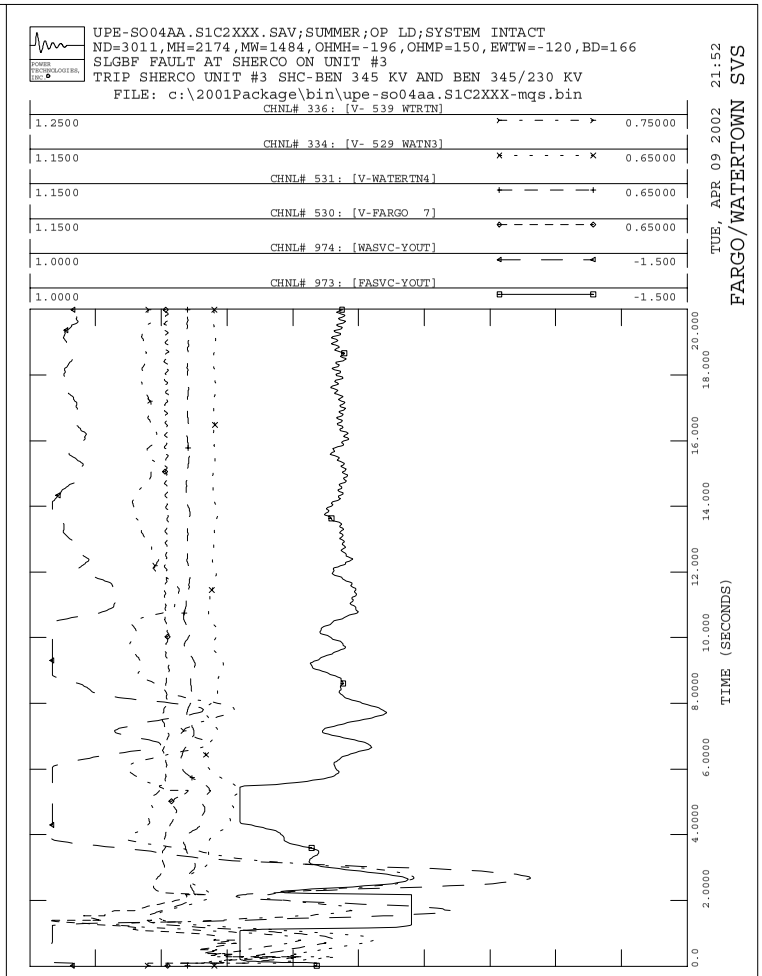
TUE, APR 09 2002 21:52
VOLTAGES 4

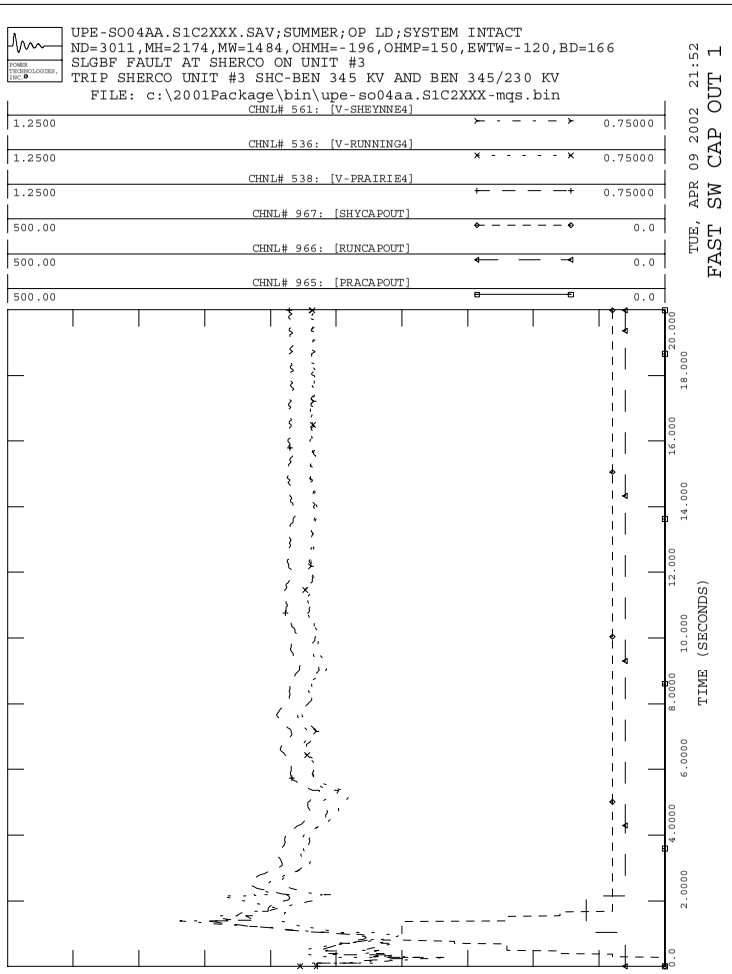
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

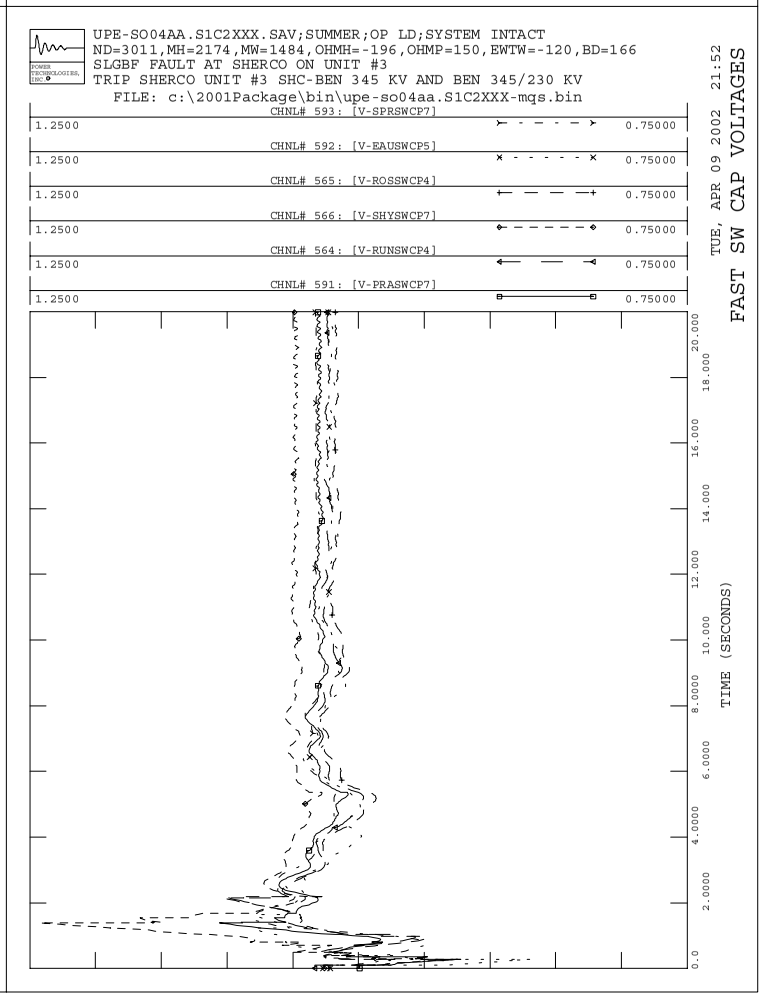


TUE, APR 09 2002 21:52
VOLTAGES NB

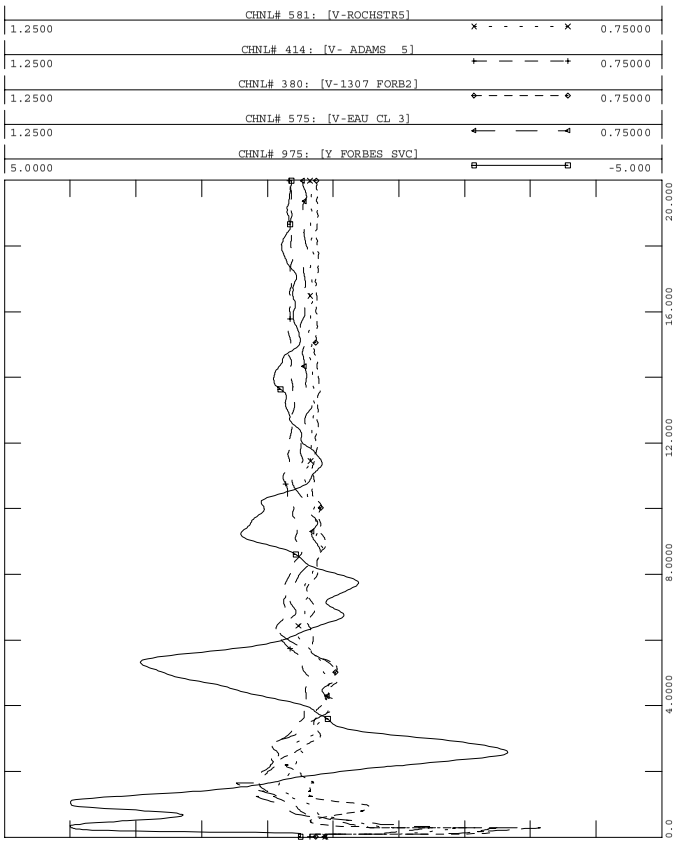

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
TUE, APR 09 2002 21:52
FAST SW CAP OUT 2


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
TUE, APR 09 2002 21:52
FARGO/WATERTOWN SVS


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
TUE, APR 09 2002 21:52
FAST SW CAP OUT 1

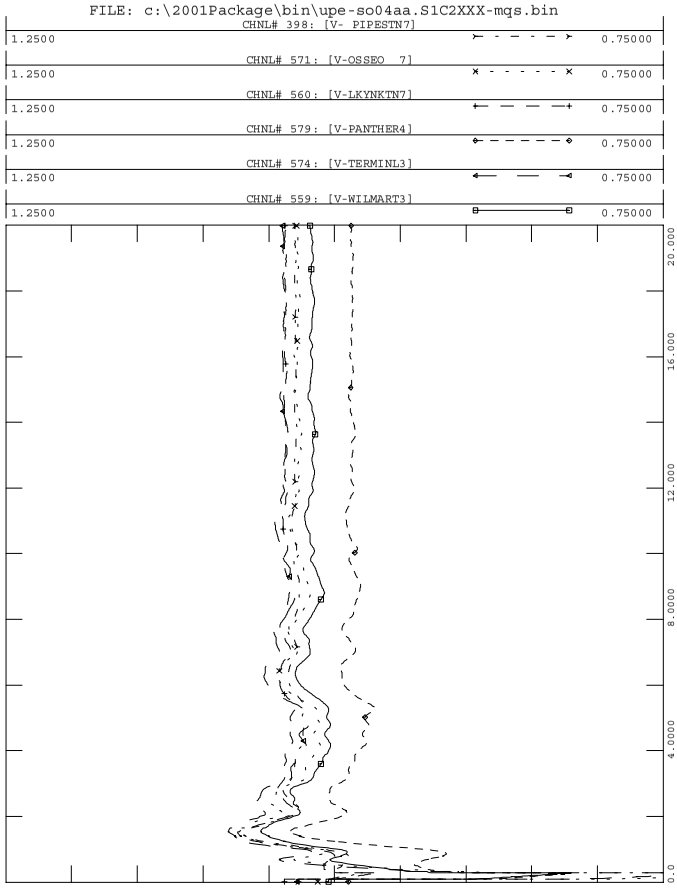

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
TUE, APR 09 2002 21:52
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



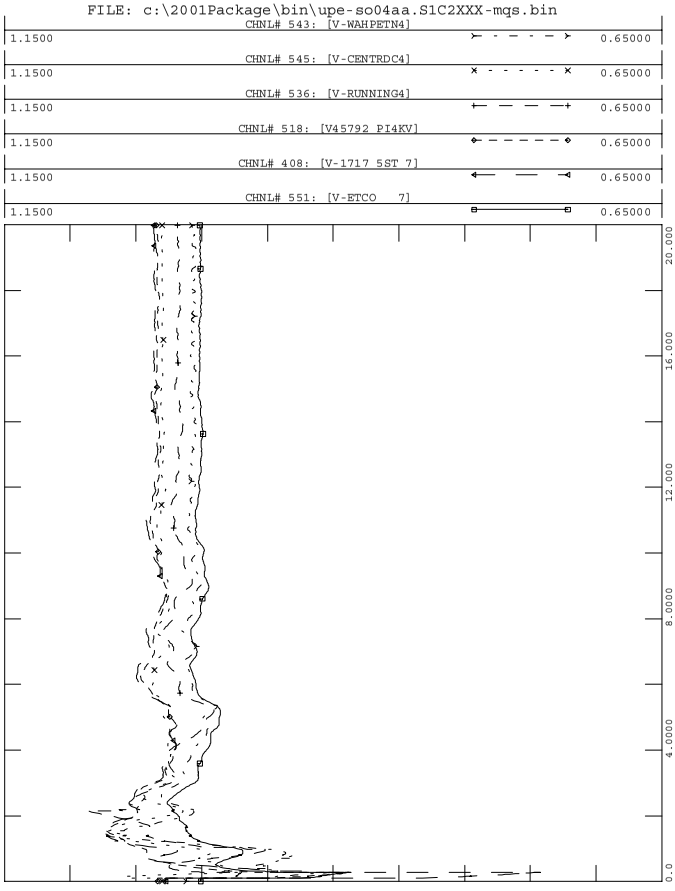
TUE, APR 09 2002 21:52
SVC & WISCONSIN VOLT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



TUE, APR 09 2002 21:52
TC VOLTAGES

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



TUE, APR 09 2002 21:52
VOLTAGES 6

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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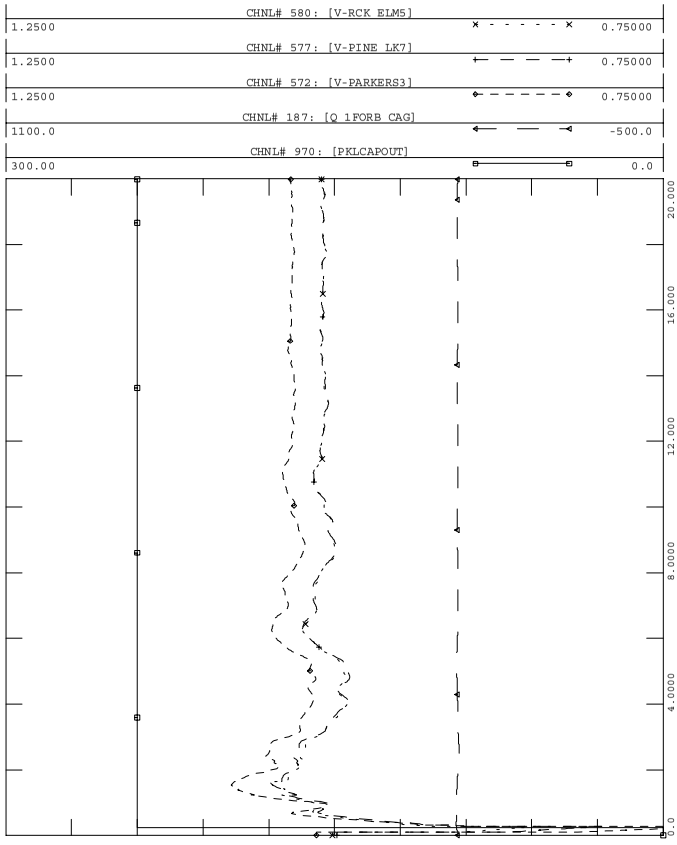
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



TUE, APR 09 2002 21:52
FORBES SVS OUT & VOLTAGES

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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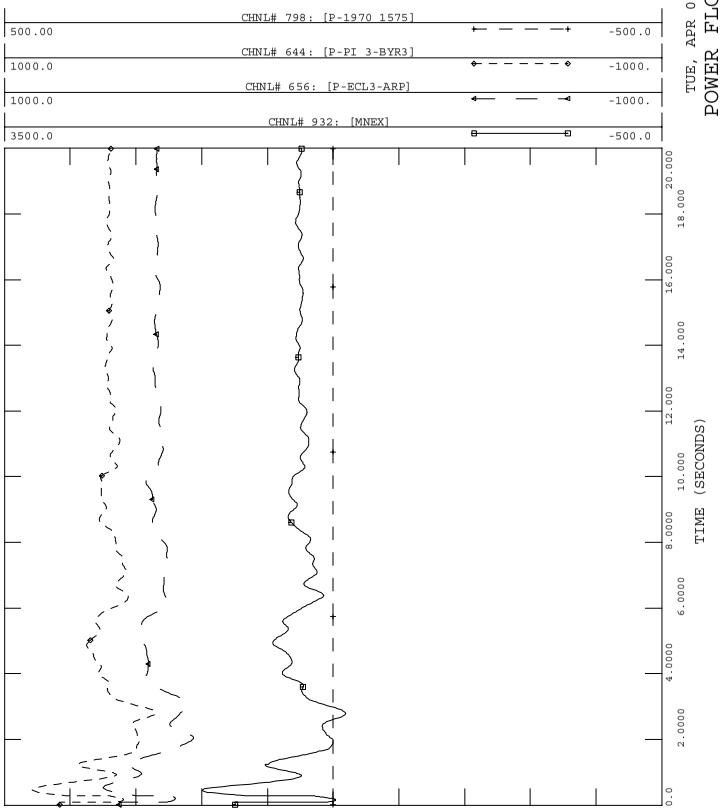
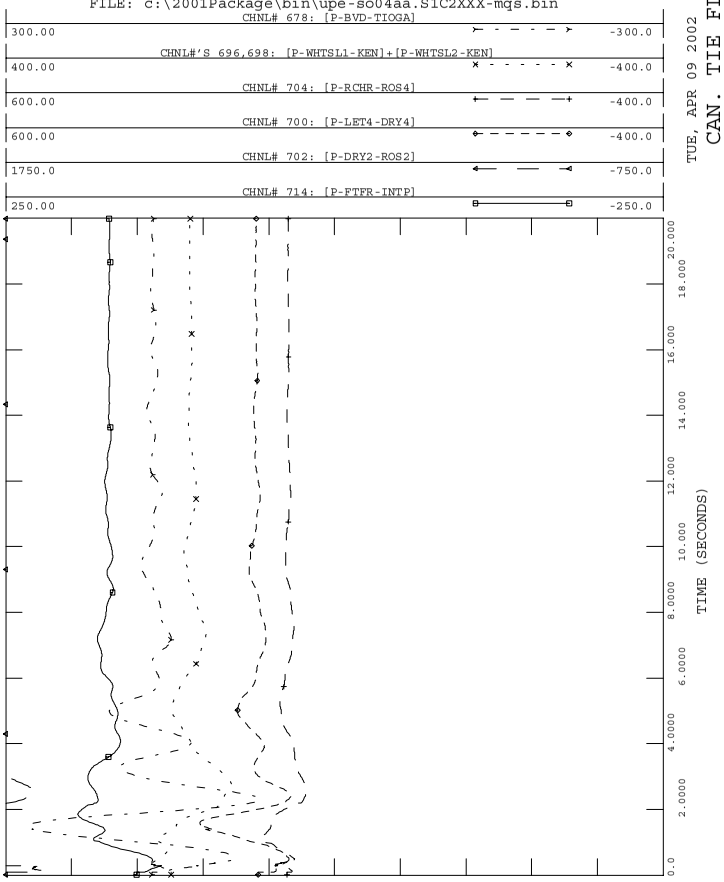
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

TUE, APR 09 2002 21:52
POWER FLOW SUMS 2



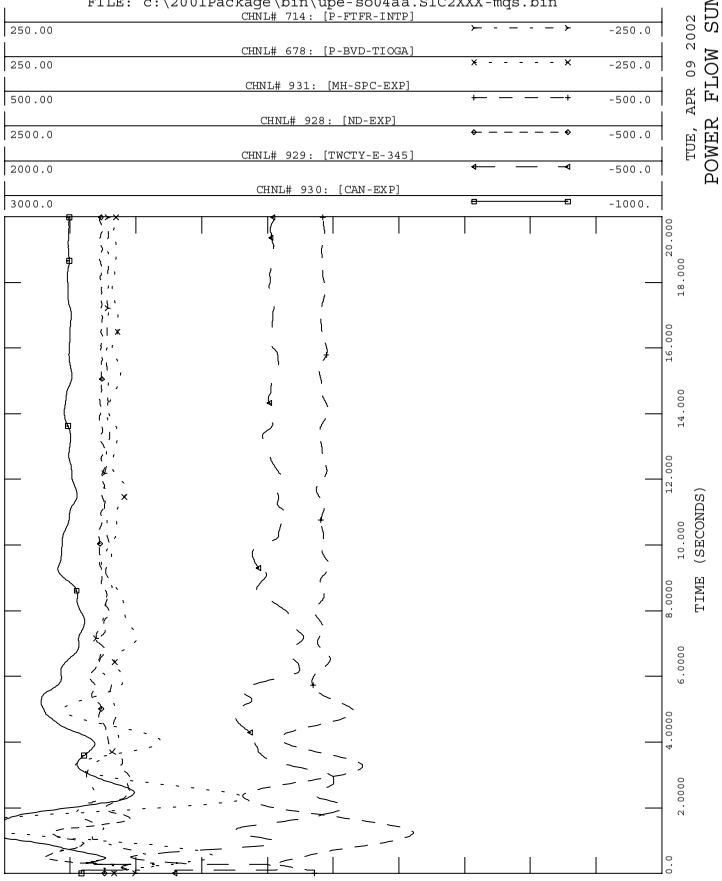
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

TUE, APR 09 2002 21:52
CAN. TIE FLOWS



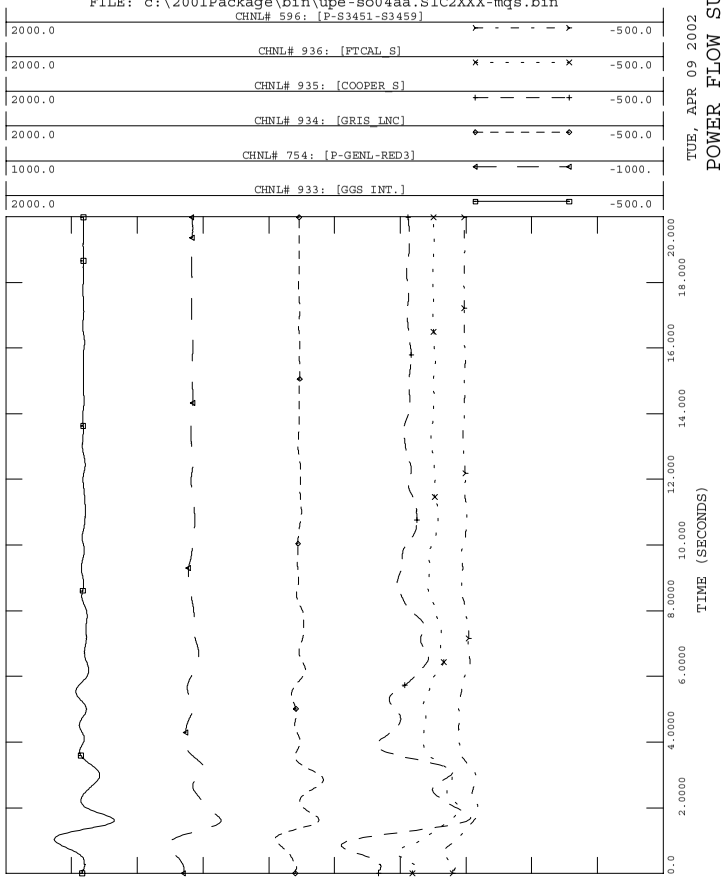
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

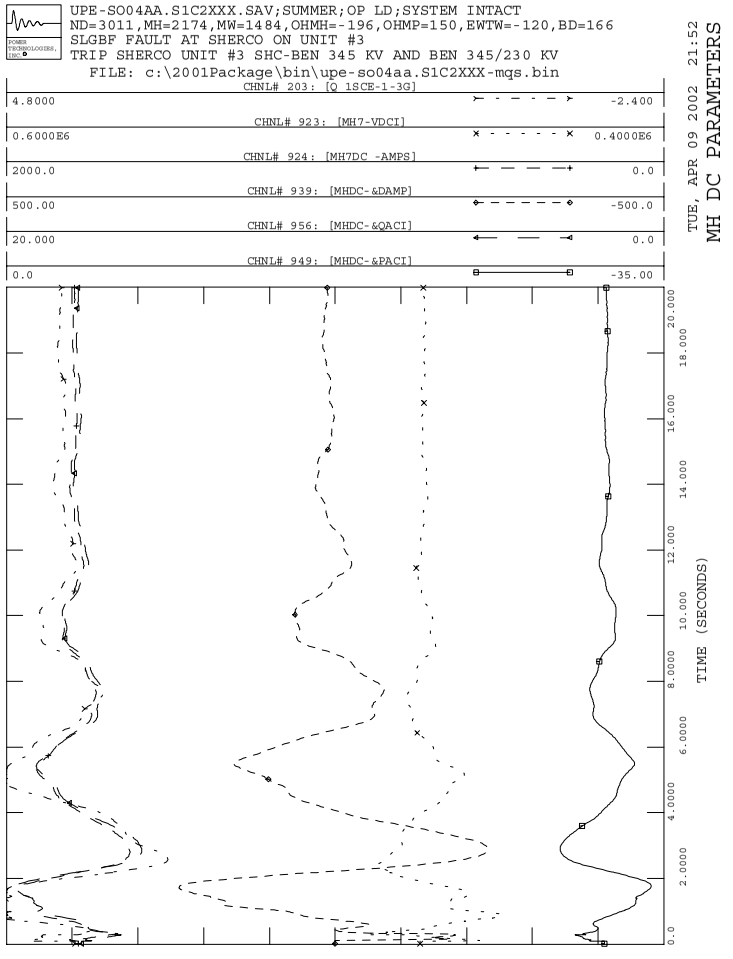
TUE, APR 09 2002 21:52
POWER FLOW SUMS 1

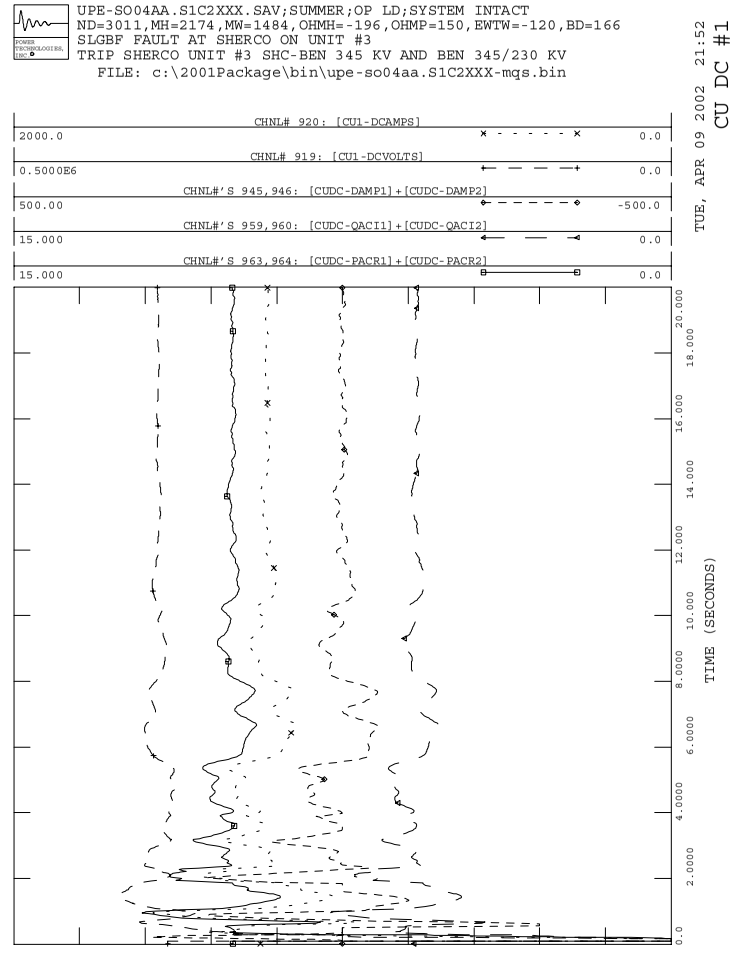


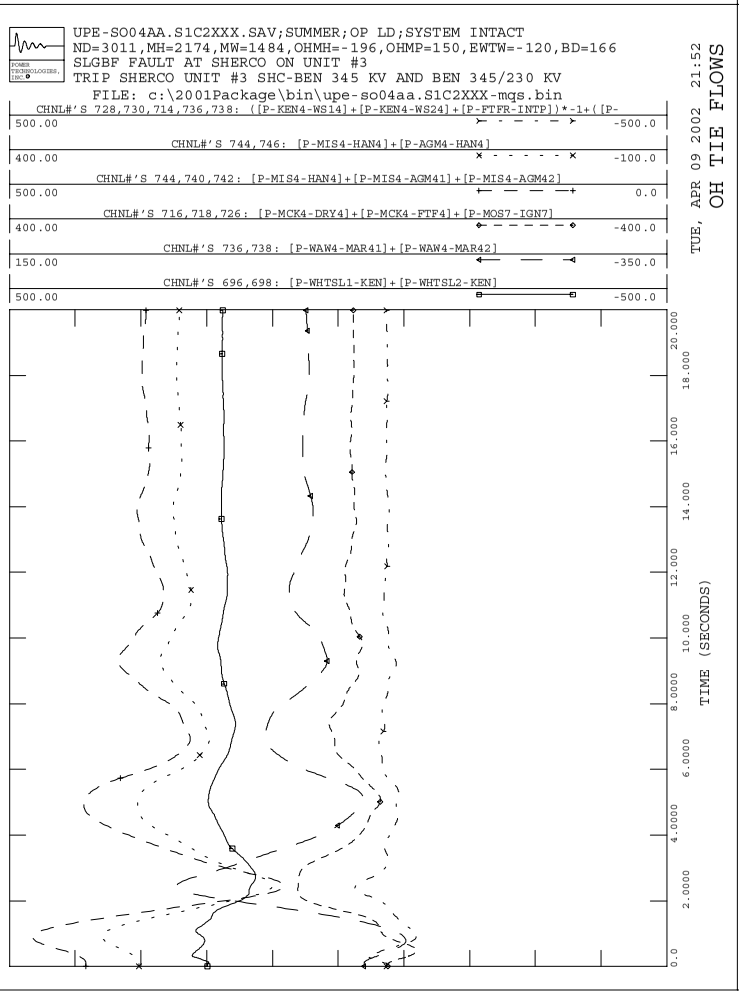
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

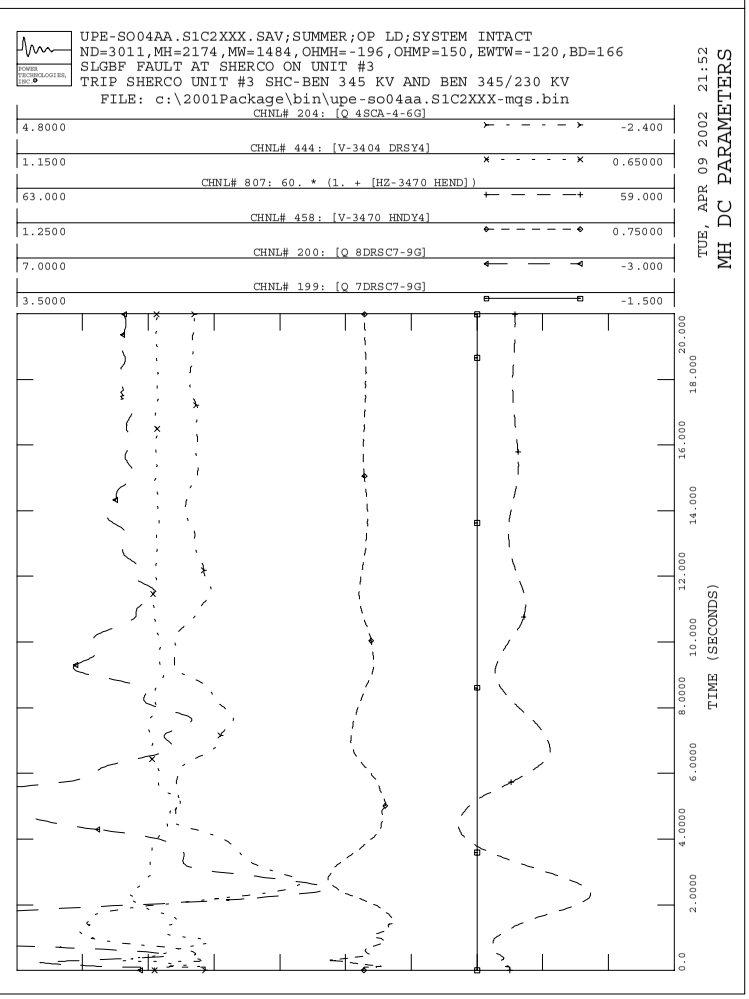
TUE, APR 09 2002 21:52
POWER FLOW SUM 3



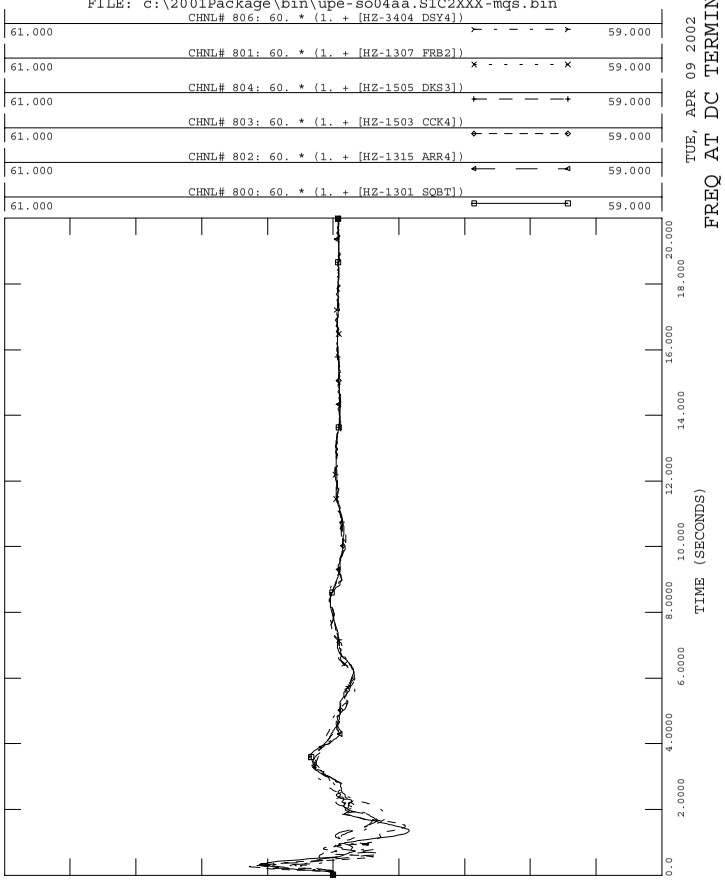

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TUE, APR 09 2002 21:52
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TUE, APR 09 2002 21:52
CU DC #1
TIME (SECONDS)

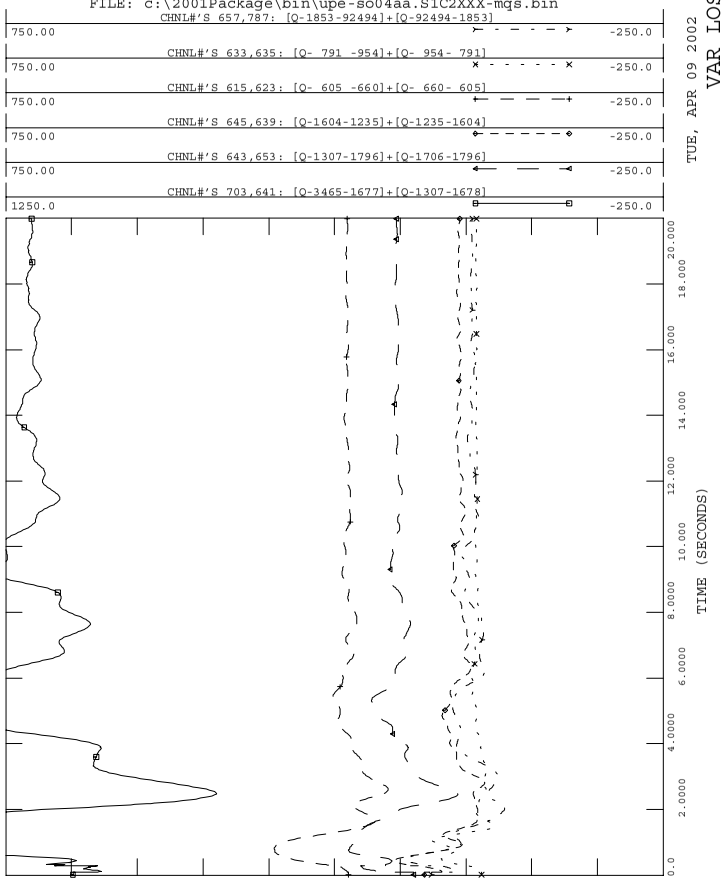

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TUE, APR 09 2002 21:52
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TUE, APR 09 2002 21:52
MH DC PARAMETERS
TIME (SECONDS)

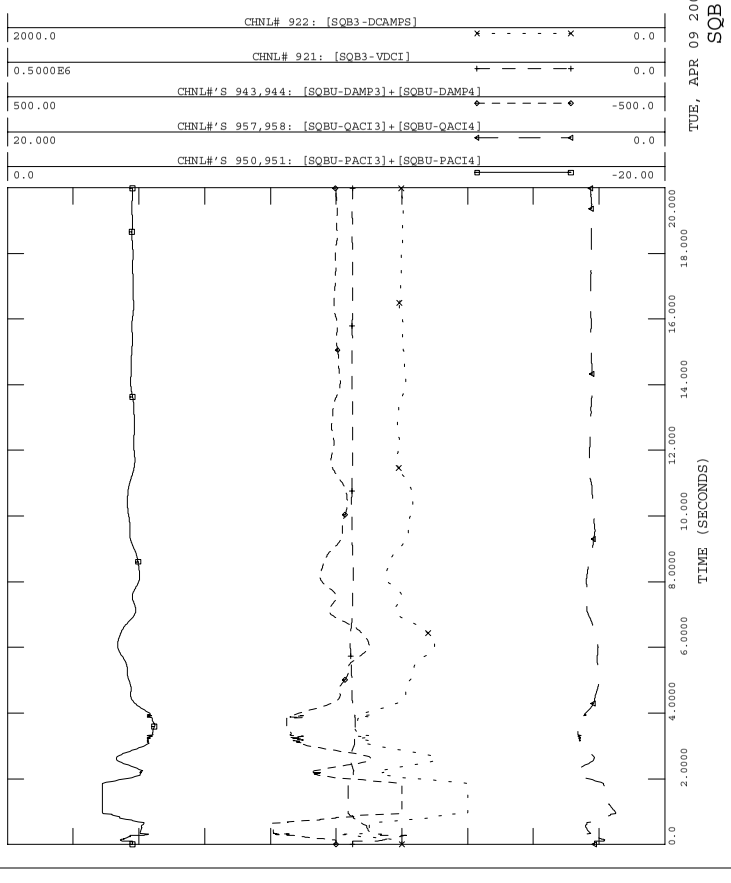
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



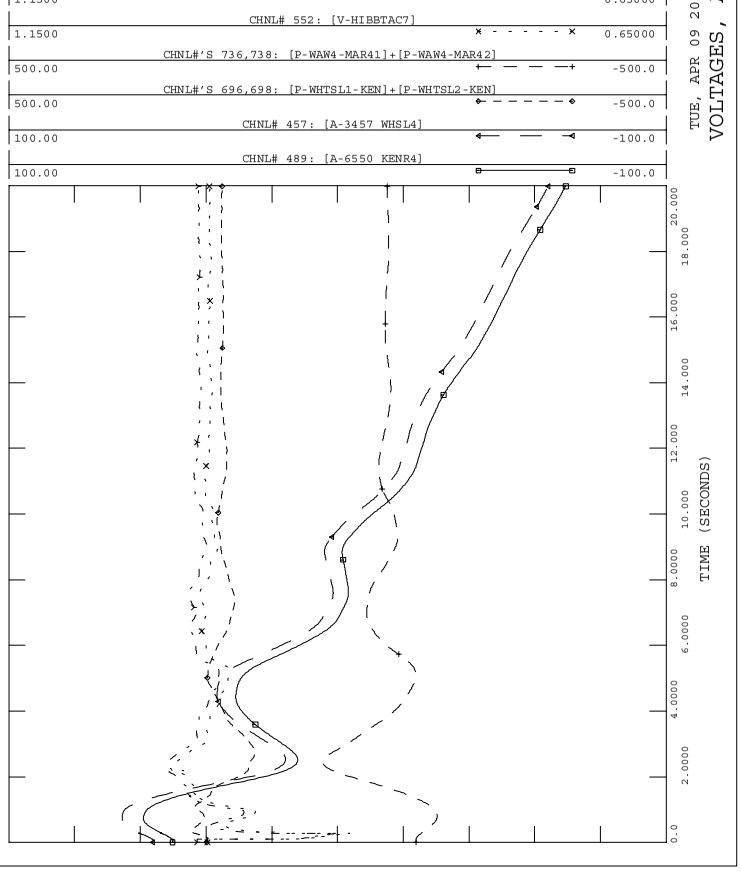
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



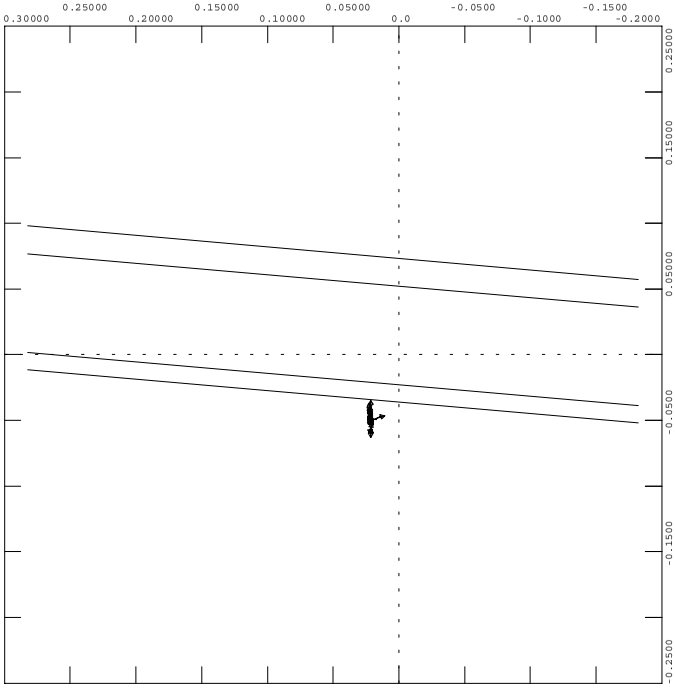
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

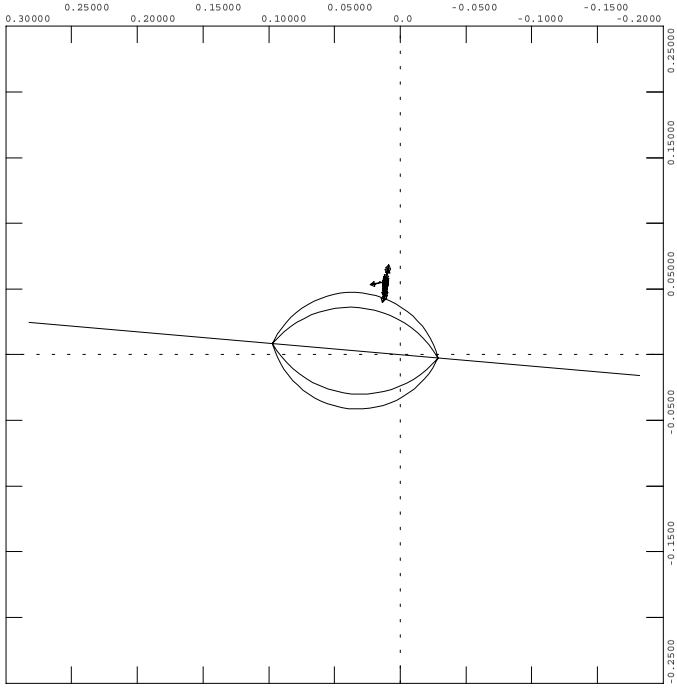


TUE, APR 09 2002 21:52
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

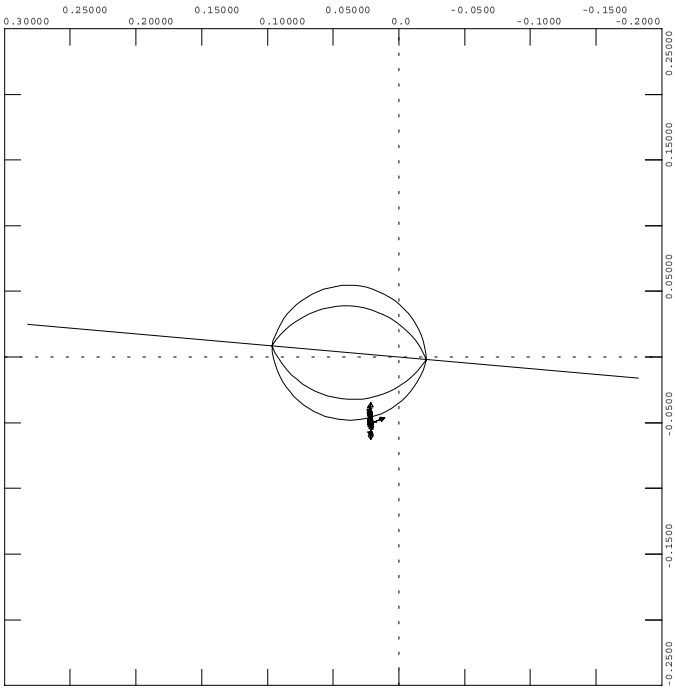


TUE, APR 09 2002 21:52
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

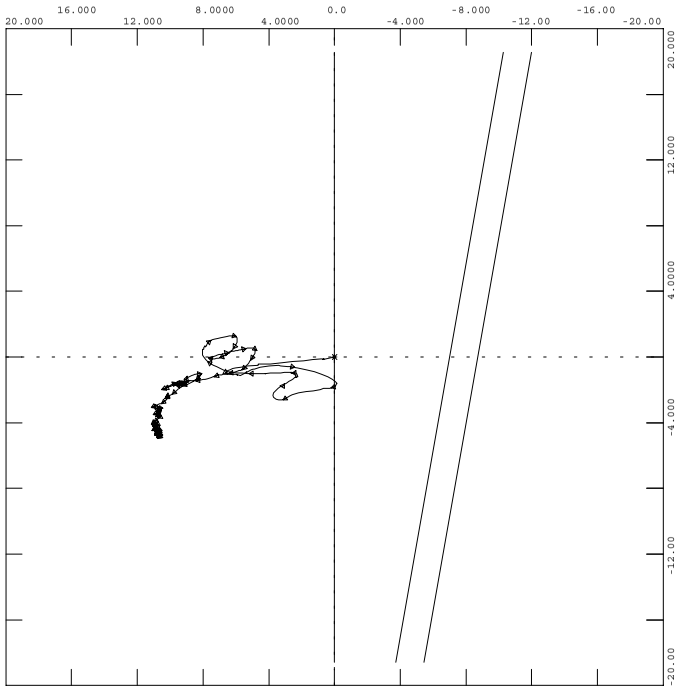


TUE, APR 09 2002 21:52
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

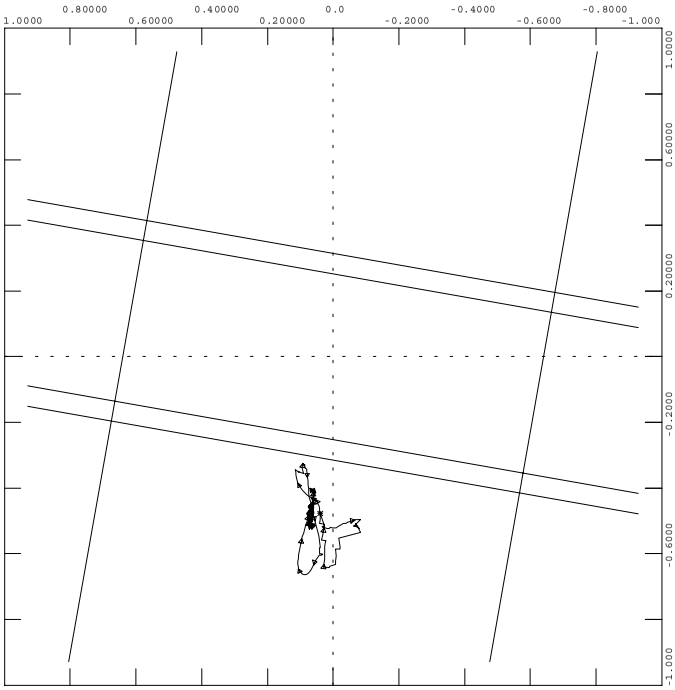


TUE, APR 09 2002 21:52
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

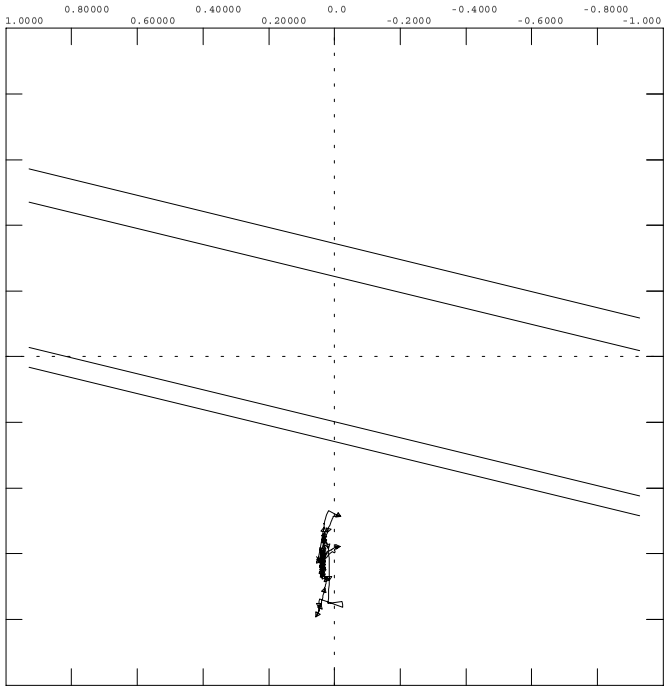
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

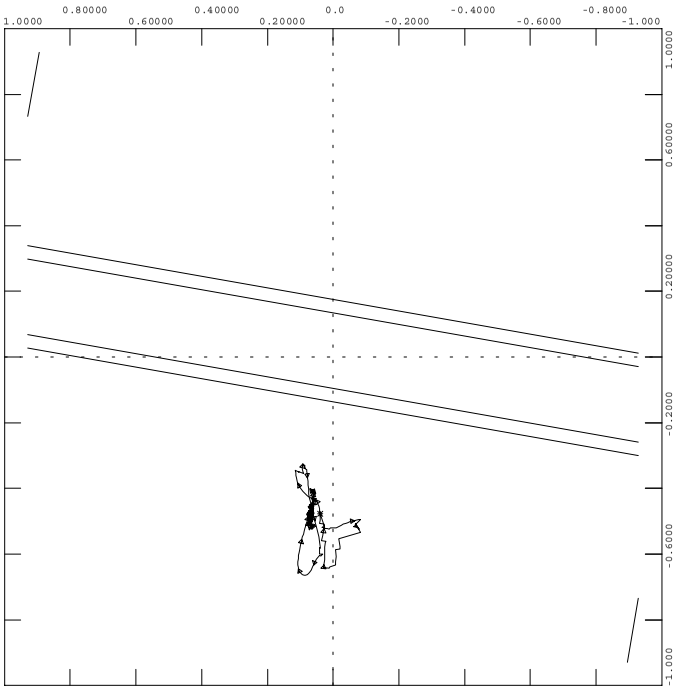
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

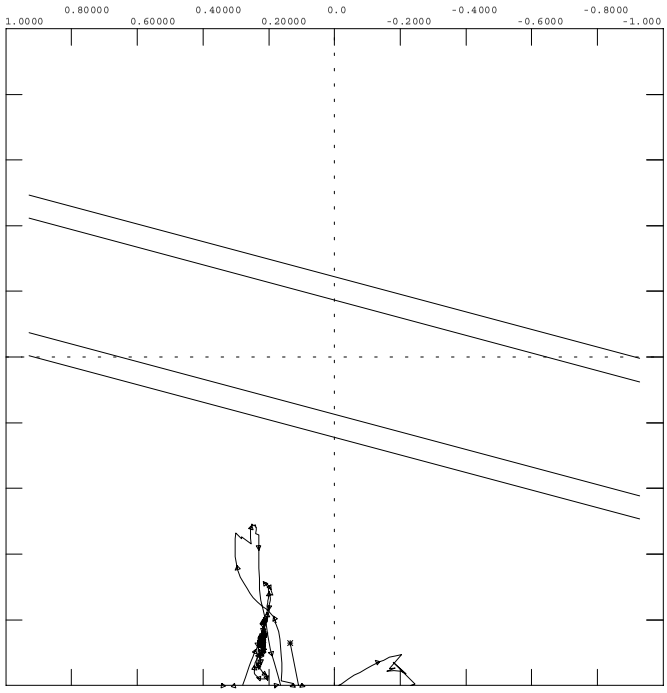
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

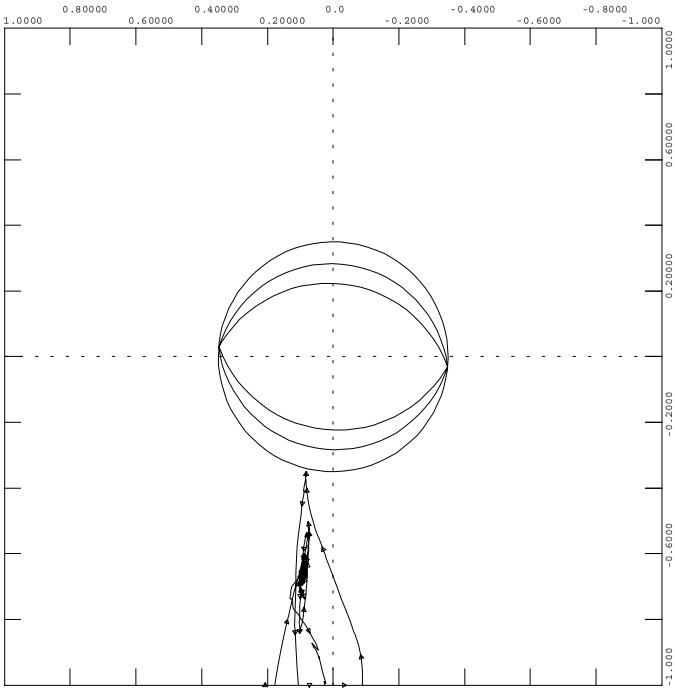
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

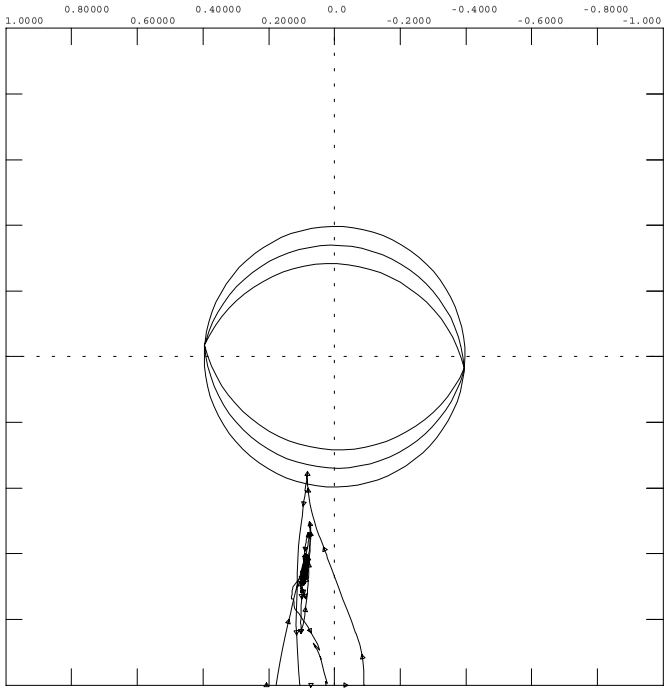
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

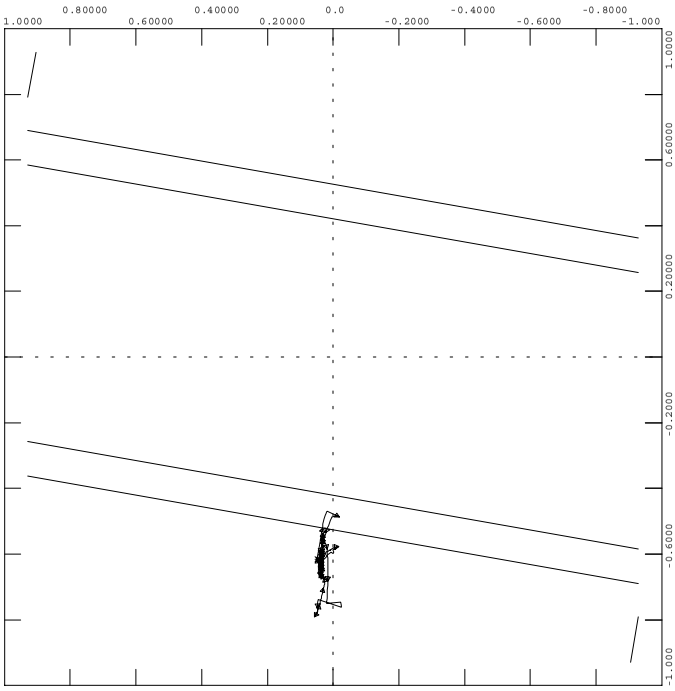
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

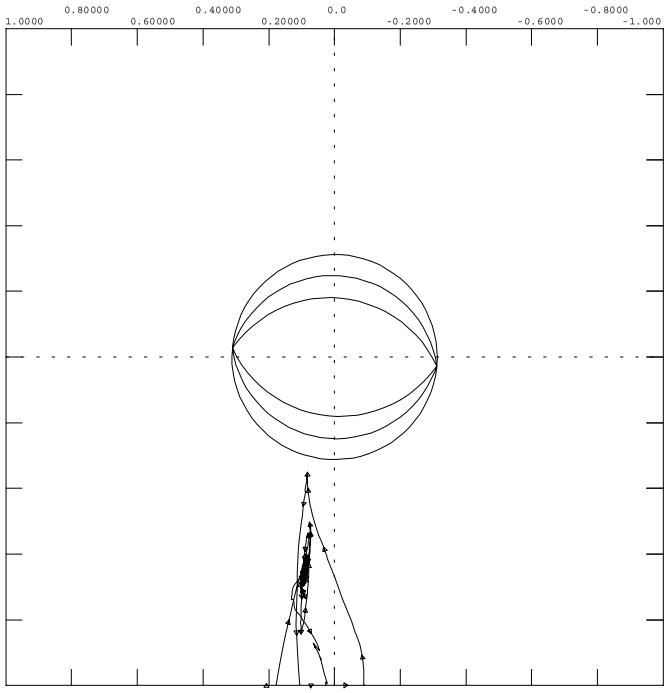
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



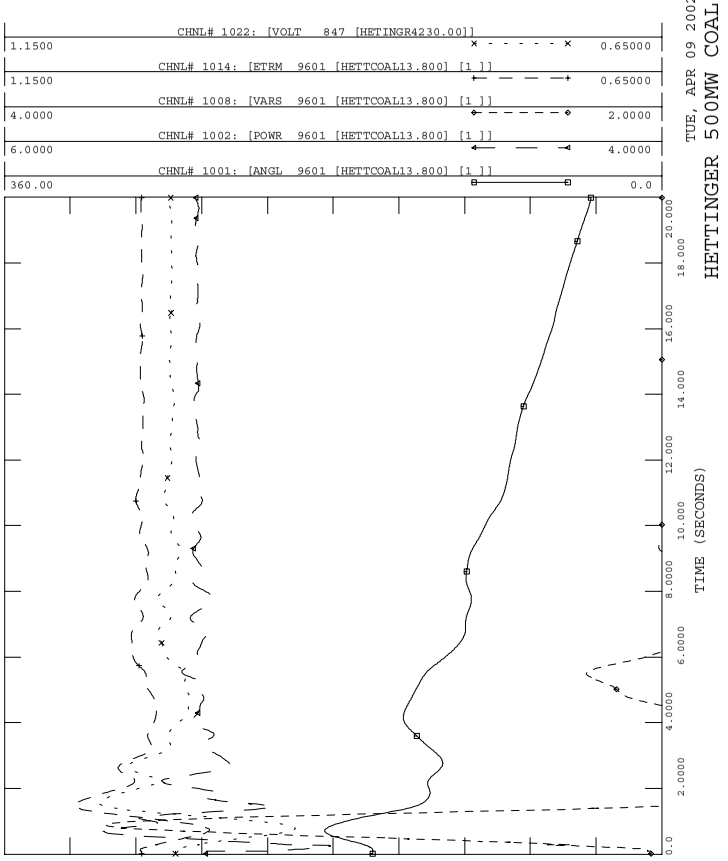
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

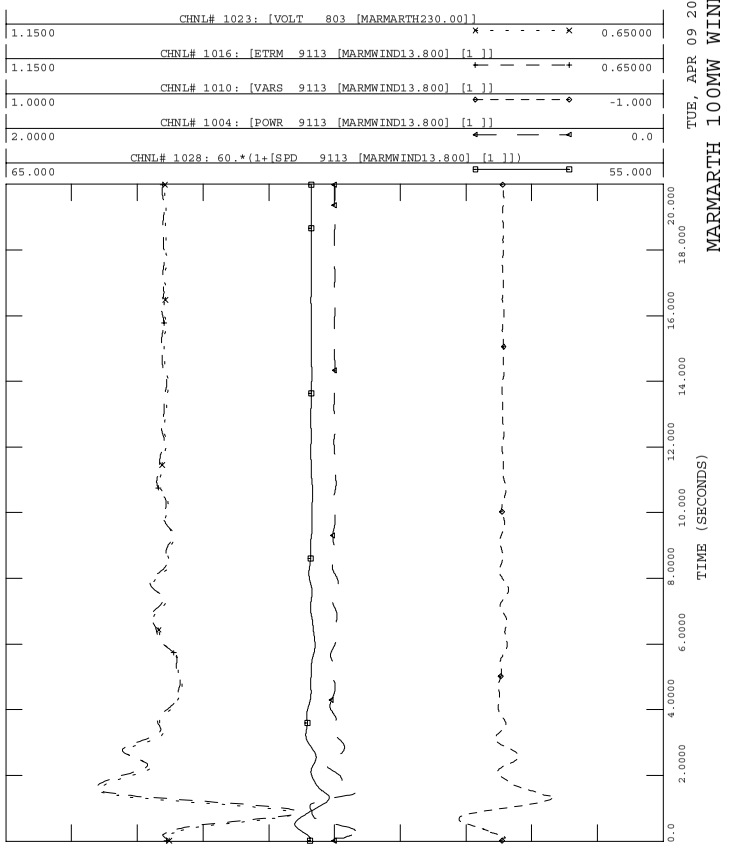


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



TUE, APR 09 2002 21:52
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

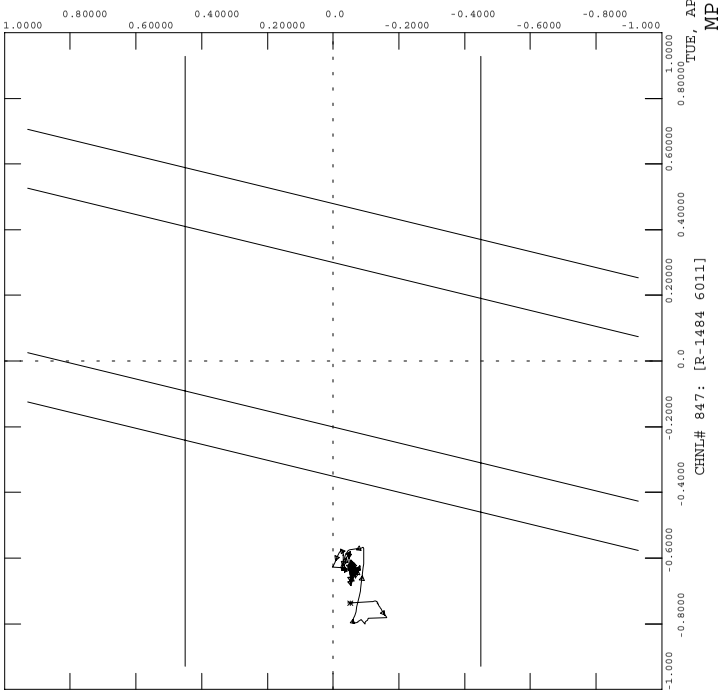


TUE, APR 09 2002 21:52
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV

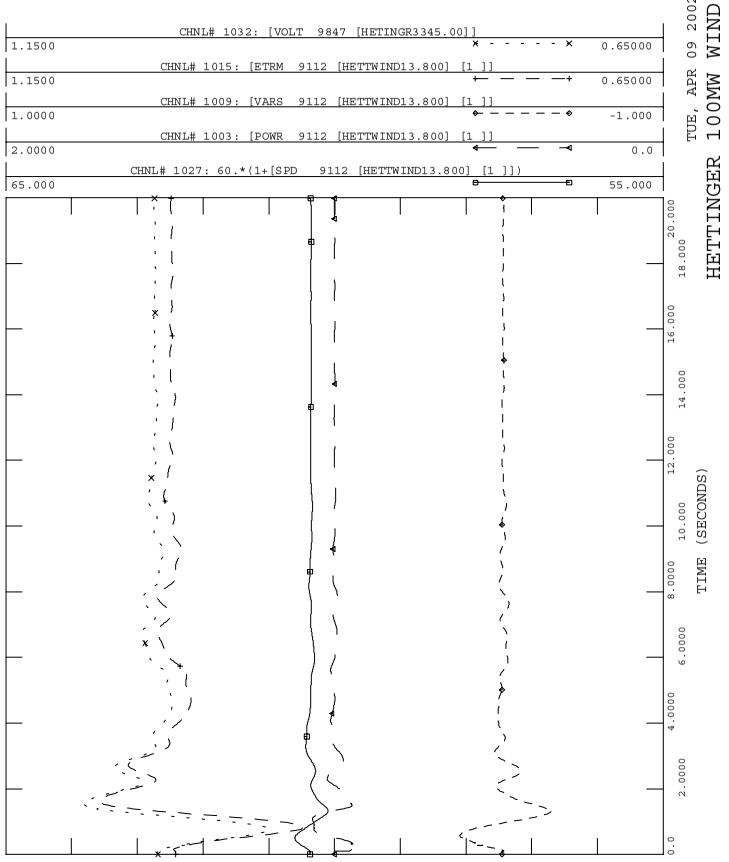
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



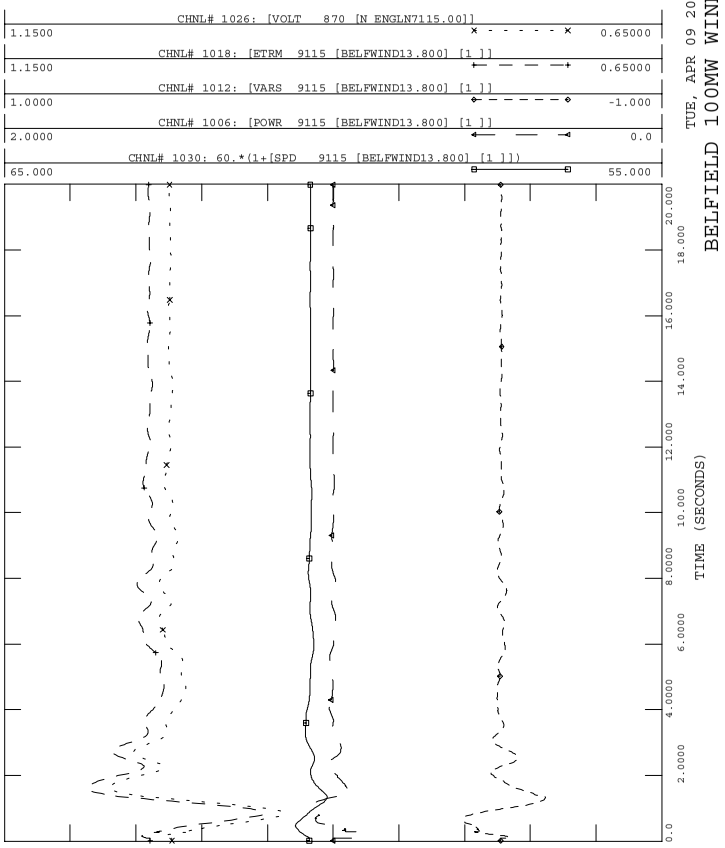
TUE, APR 09 2002 21:52
MP-OH I.FALLS (779)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



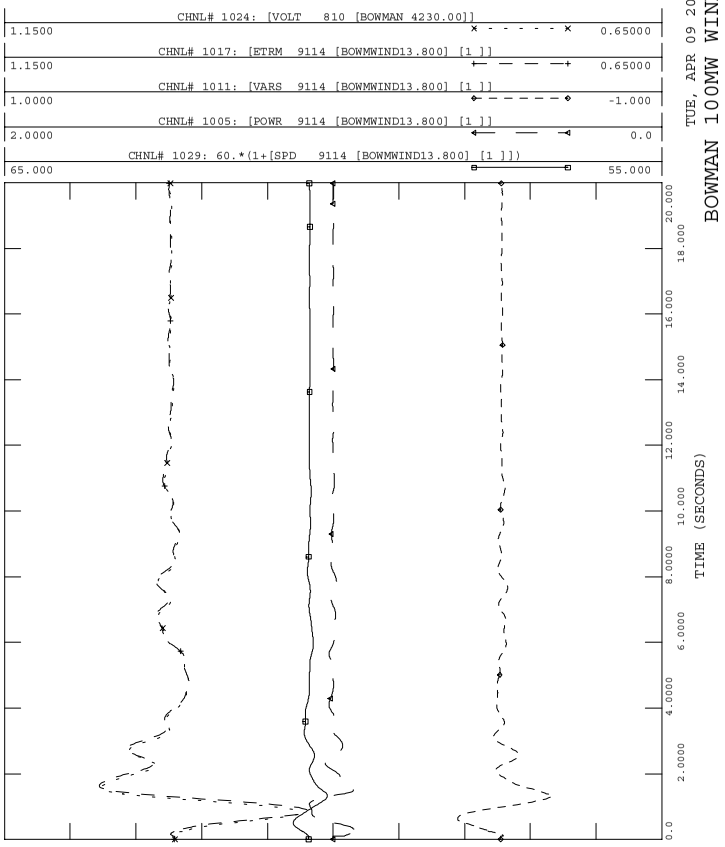
TUE, APR 09 2002 21:52
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



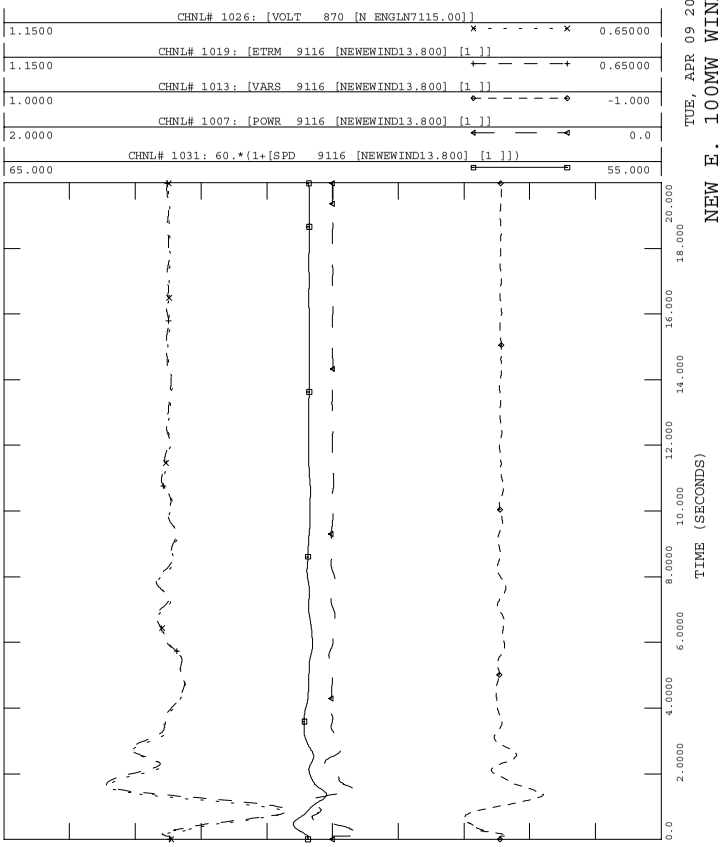
TUE, APR 09 2002 21:52
BELFIELD 100MW WIND UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin



TUE, APR 09 2002 21:52
BOWMAN 100MW WIND UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
SLGBF FAULT AT SHERCO ON UNIT #3
TRIP SHERCO UNIT #3 SHC-BEN 345 KV AND BEN 345/230 KV
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-mqs.bin

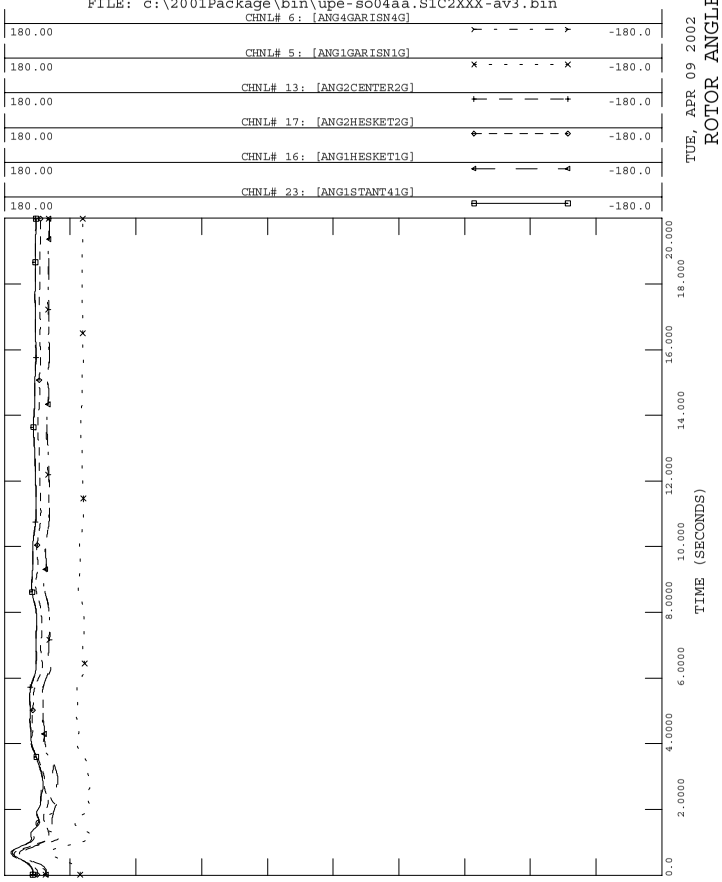


TUE, APR 09 2002 21:52
NEW E. 100MW WIND UNIT

CONTINGENCY AV3

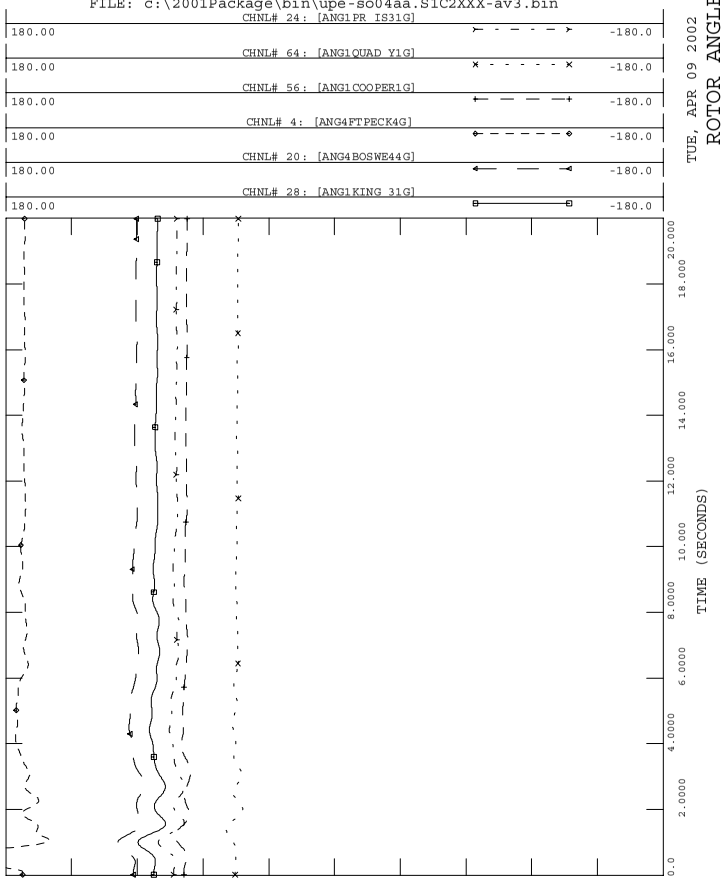
4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Belfield 345 kV line

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin



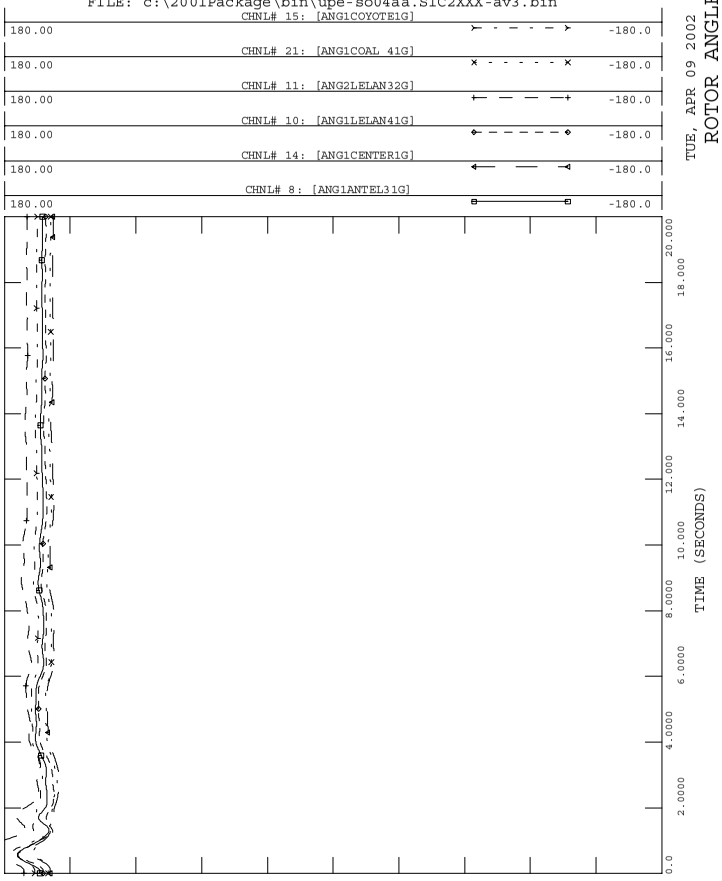
TUE, APR 09 2002 22:08
ROTOR ANGLES 2

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin



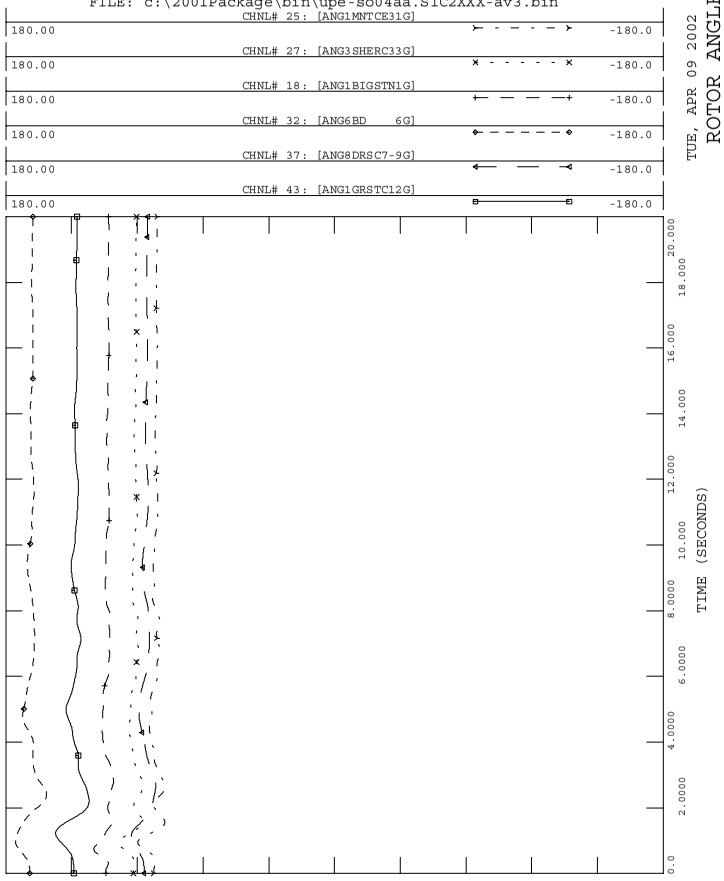
TUE, APR 09 2002 22:08
ROTOR ANGLES 4

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin



TUE, APR 09 2002 22:08
ROTOR ANGLES 1

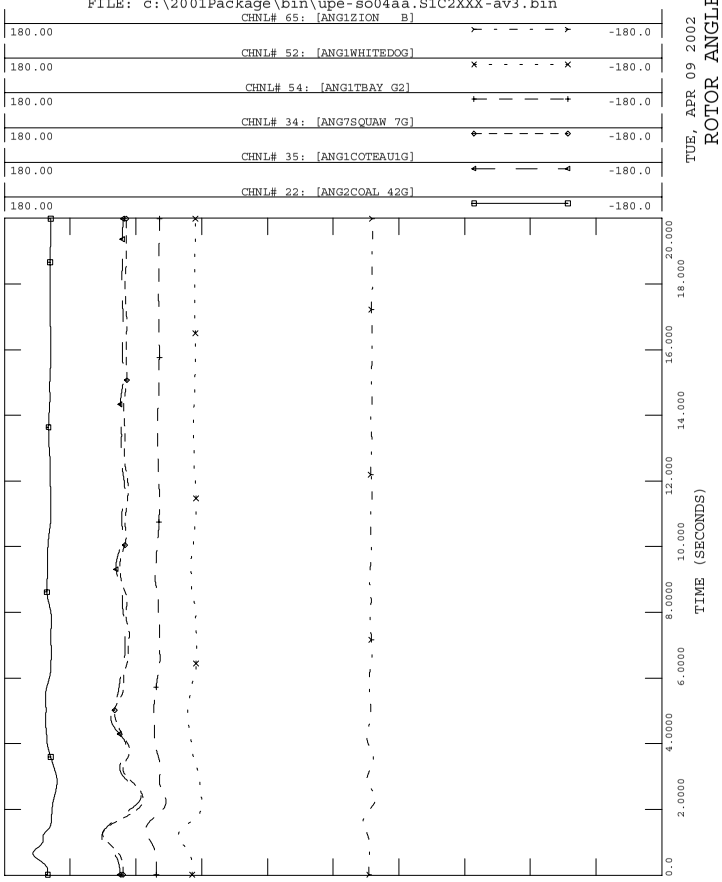
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin



TUE, APR 09 2002 22:08
ROTOR ANGLES 3

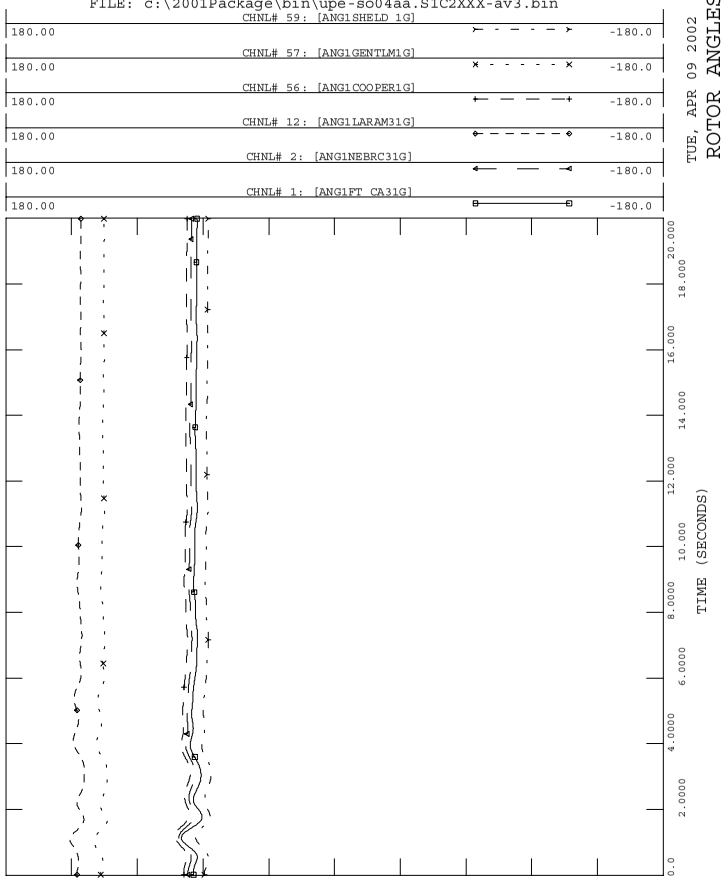
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
ROTOR ANGLES 6



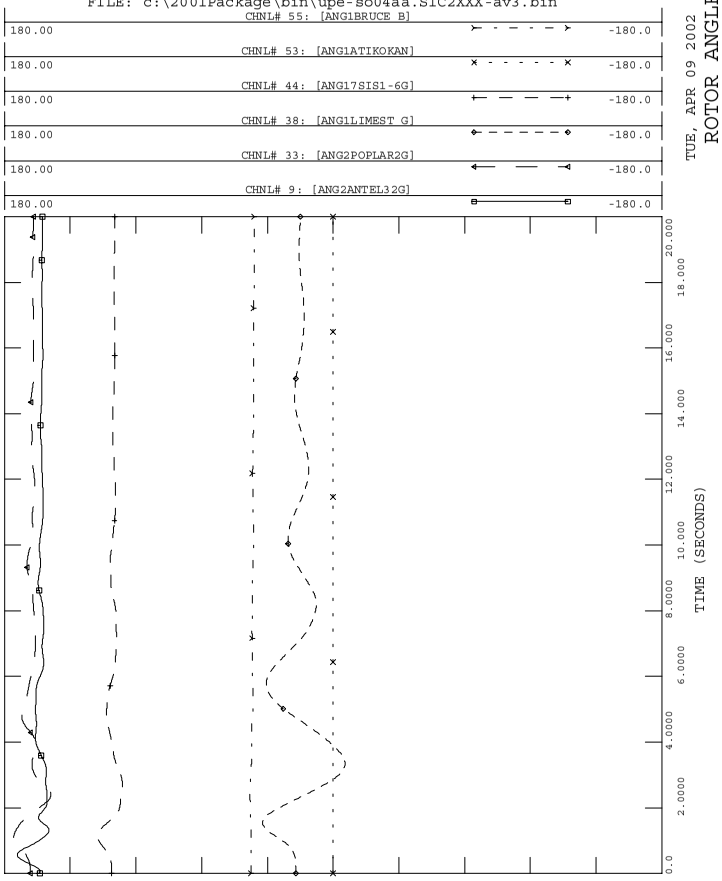
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
ROTOR ANGLES NB



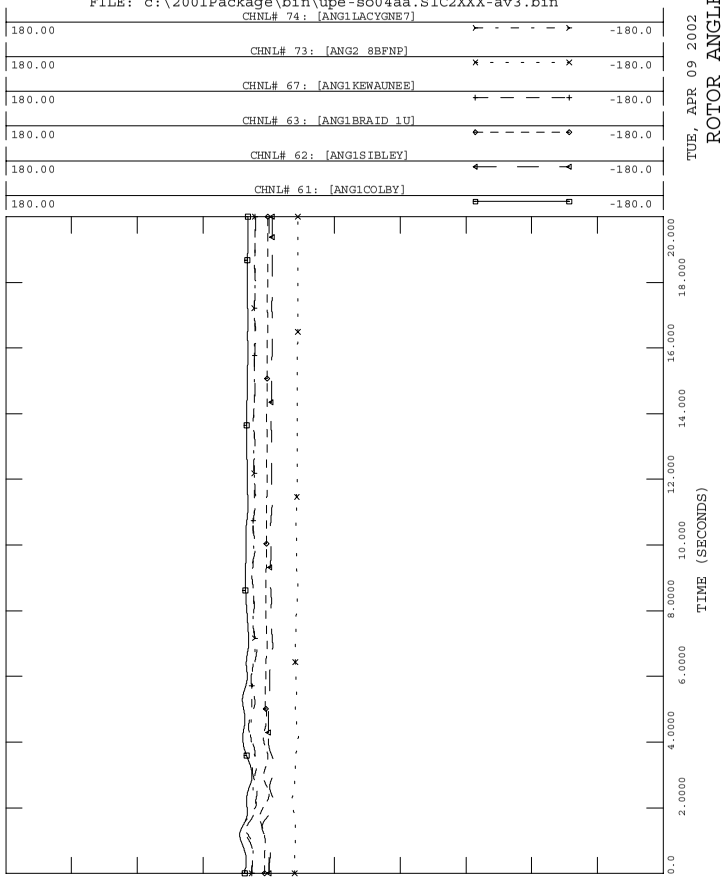
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
ROTOR ANGLES 5



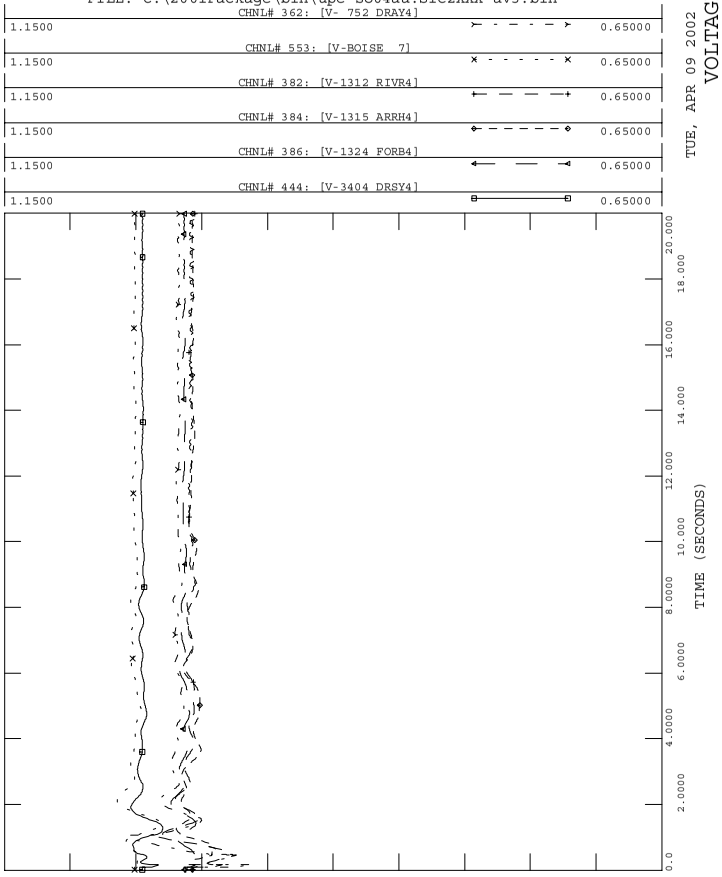
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
ROTOR ANGLES 7



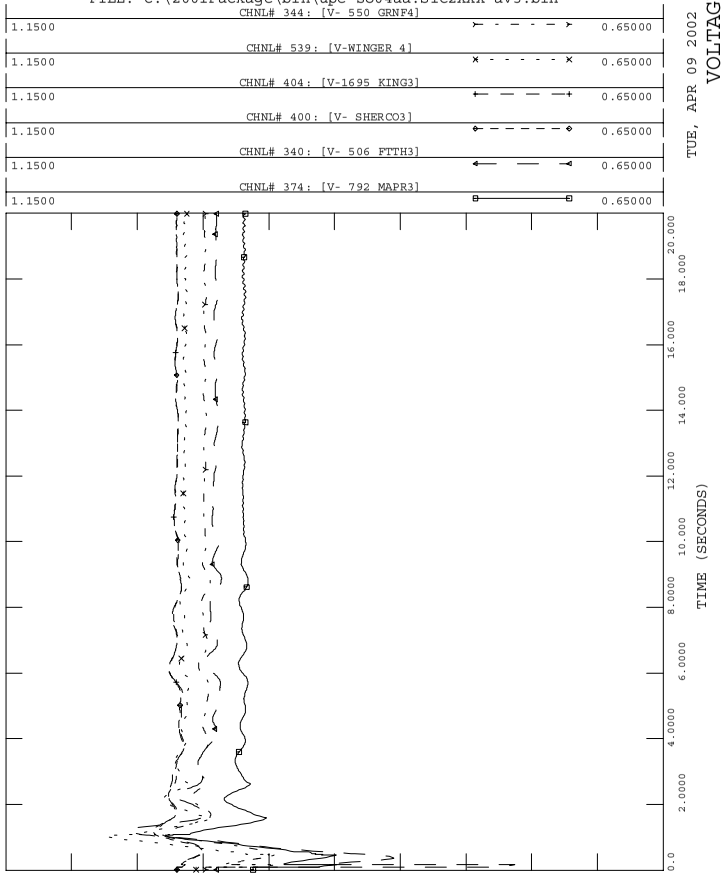
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
VOLTAGES 1



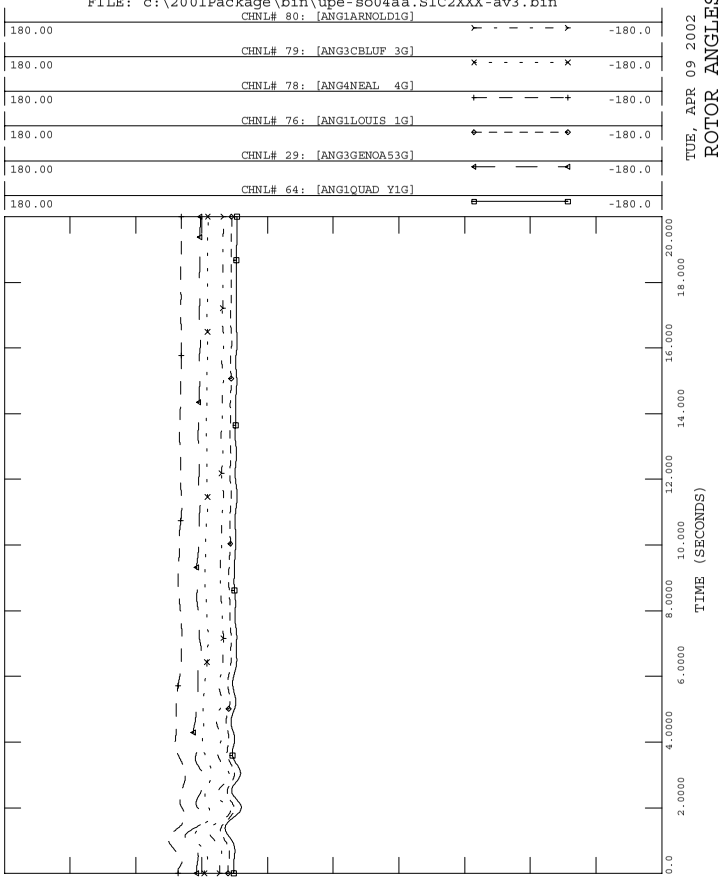
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
VOLTAGES 3



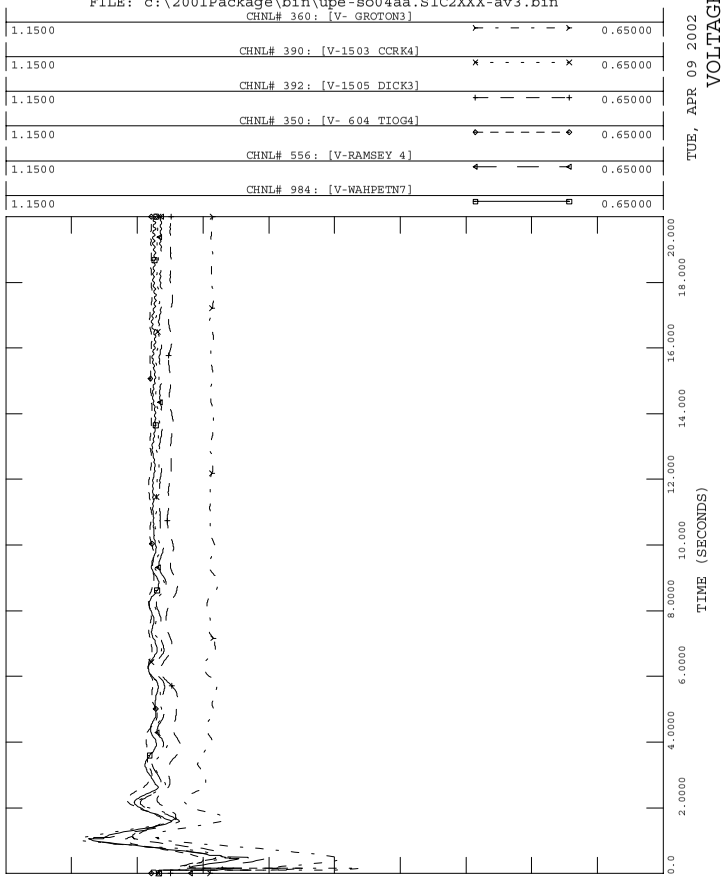
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
ROTOR ANGLES IA



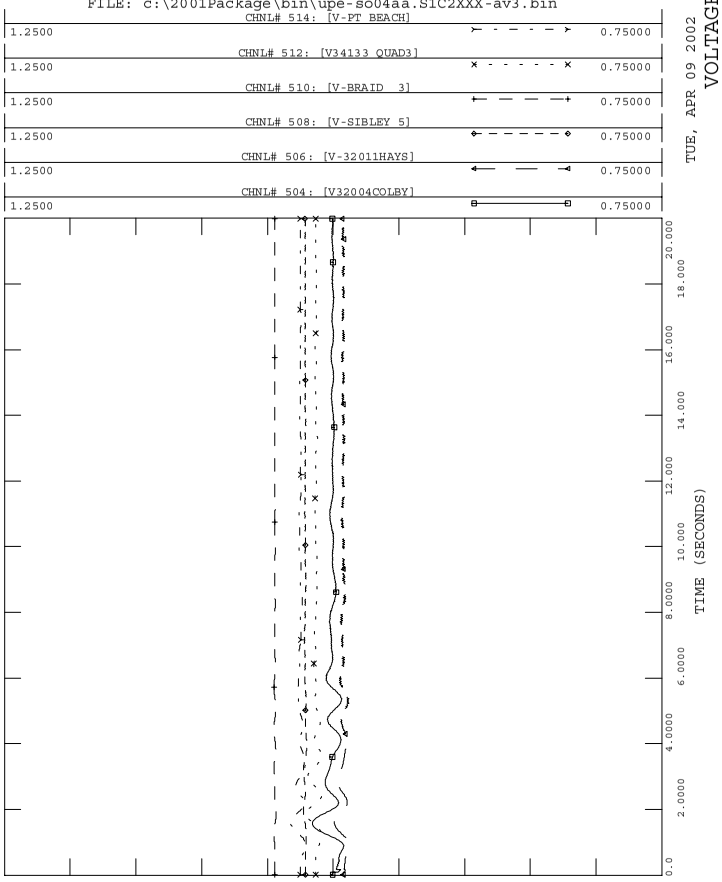
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
VOLTAGES 2



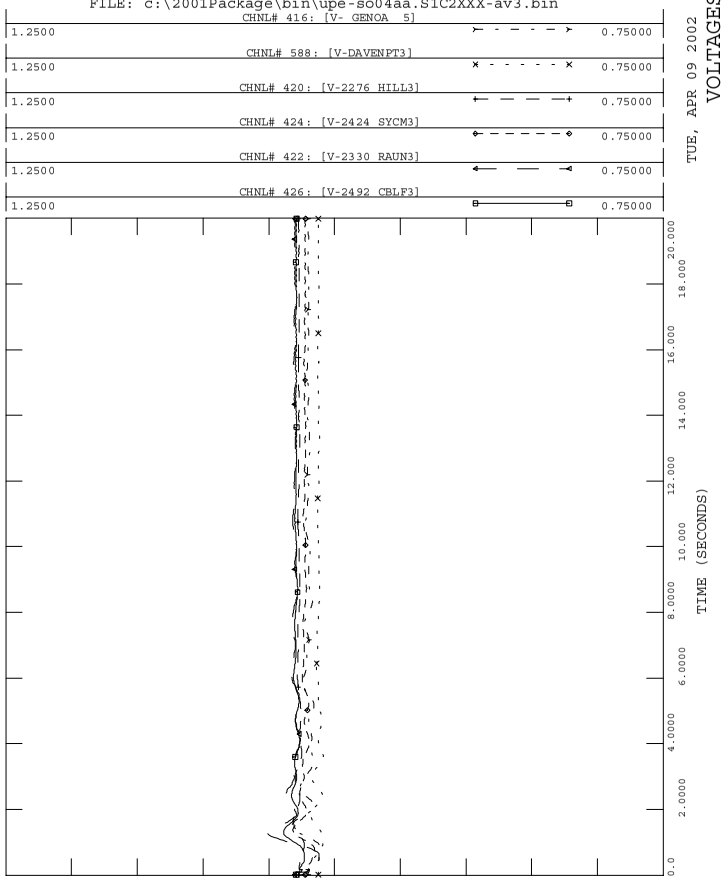
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
VOLTAGES 5



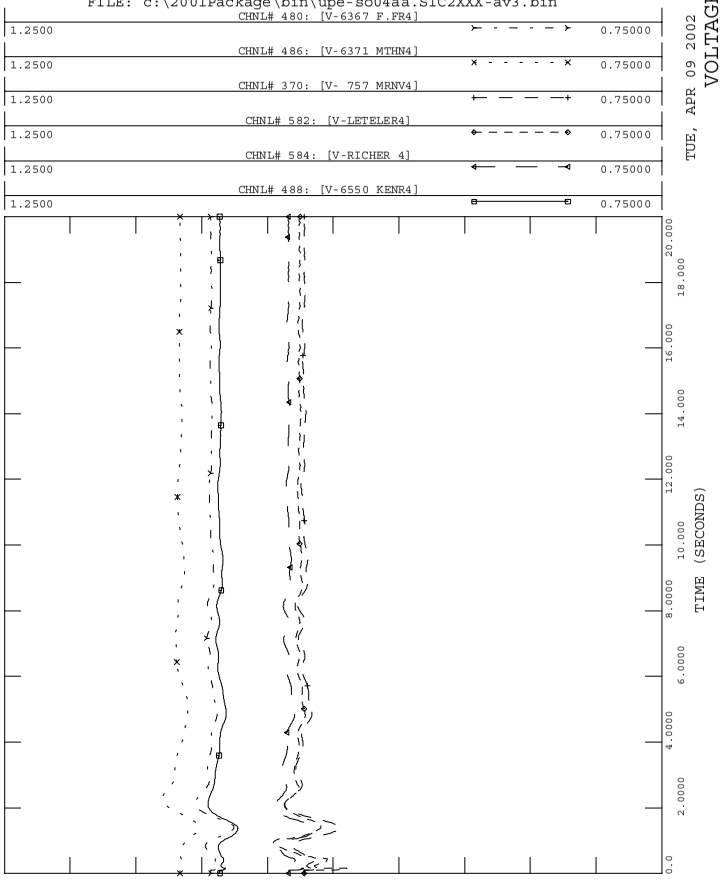
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
VOLTAGES IA



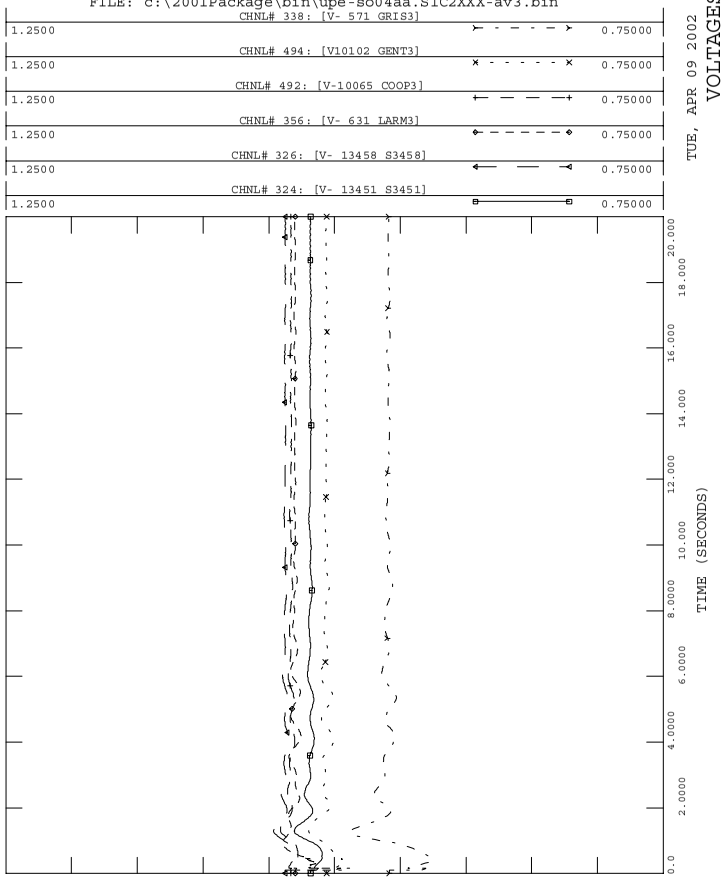
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
VOLTAGES 4

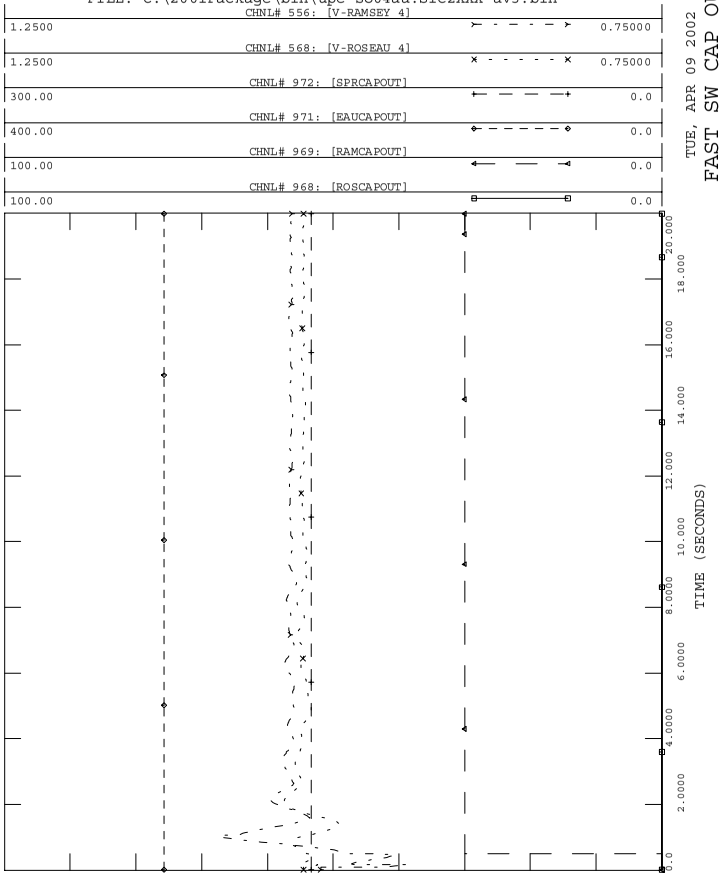


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
VOLTAGES NB

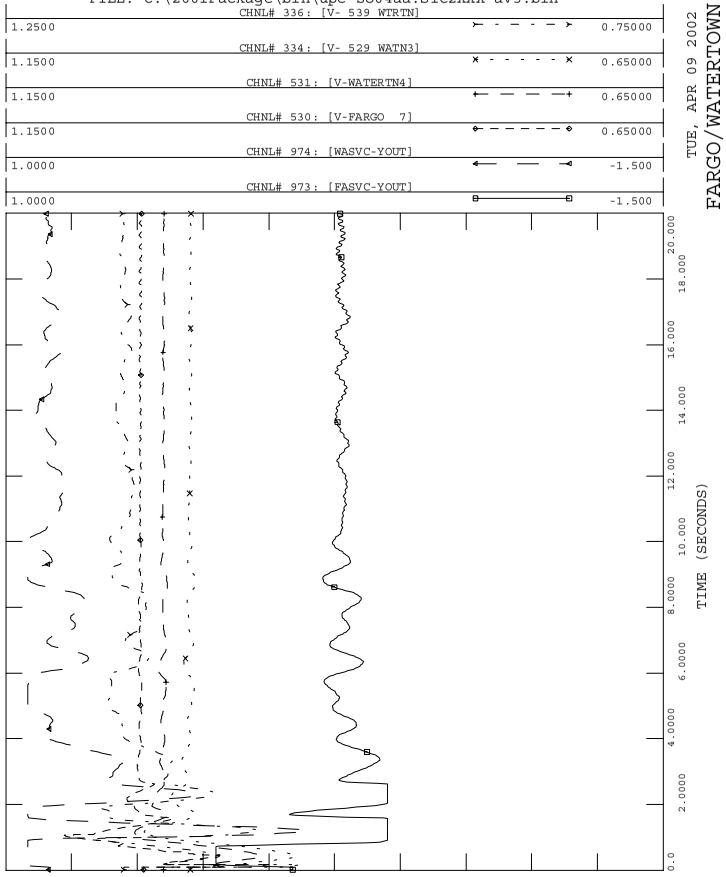


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin



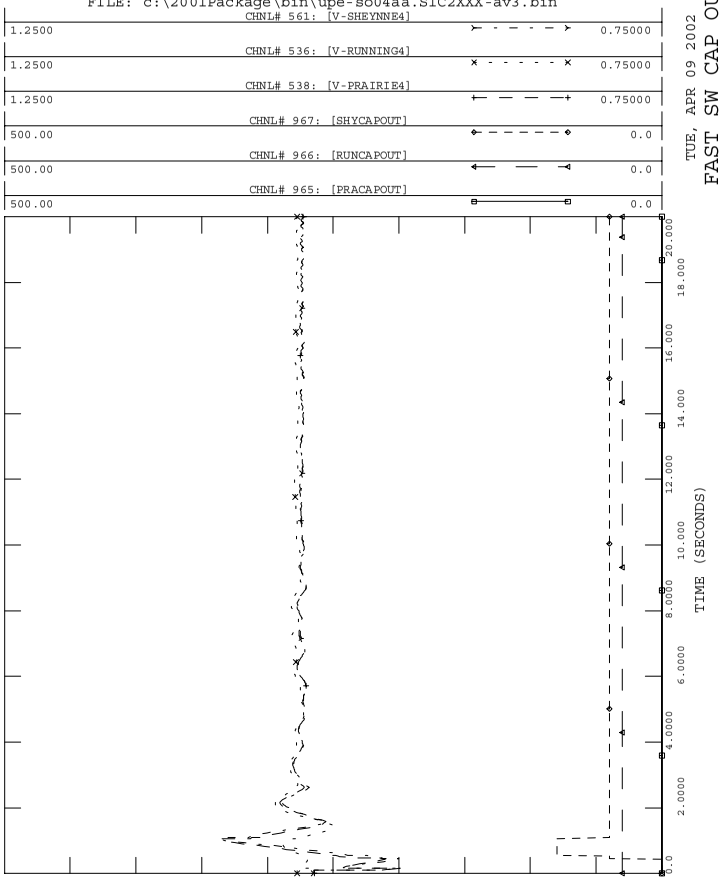
TUE, APR 09 2002 22:08
FAST SW CAP OUT 2

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin



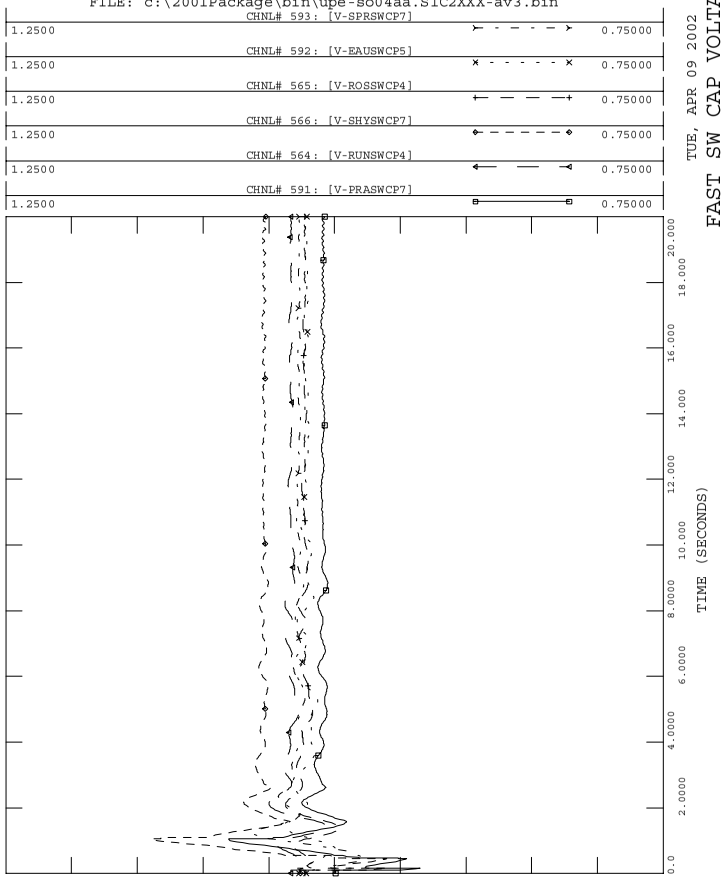
TUE, APR 09 2002 22:08
FARGO/WATERTOWN SVS

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin



TUE, APR 09 2002 22:08
FAST SW CAP OUT 1

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

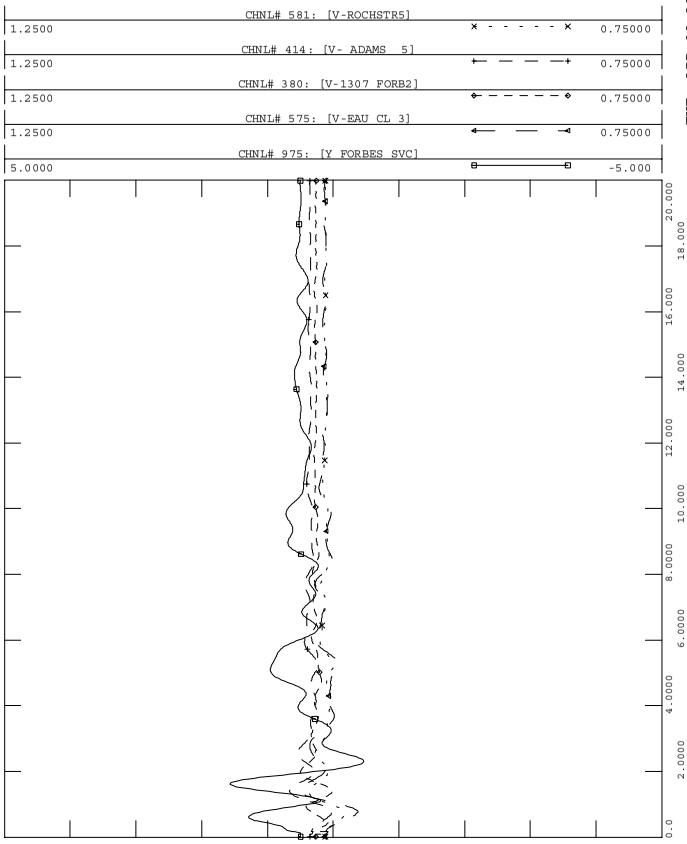


TUE, APR 09 2002 22:08
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08

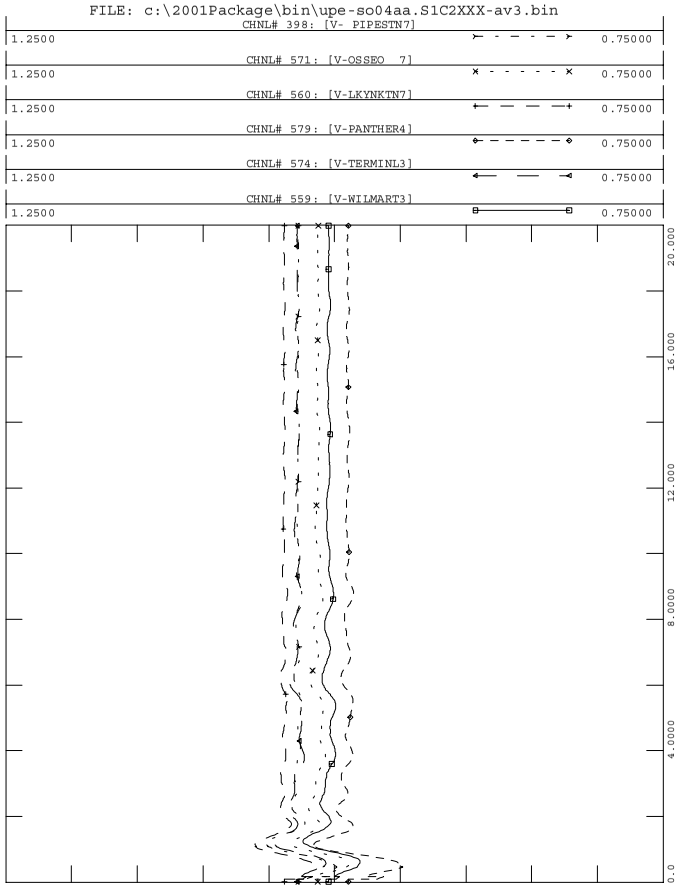
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08

TC VOLTAGES



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

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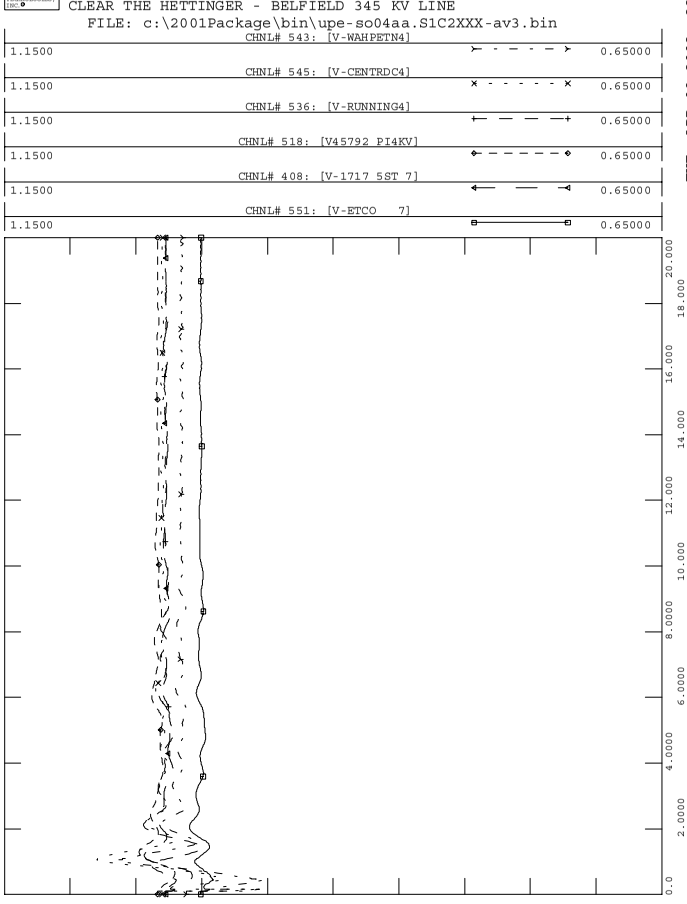
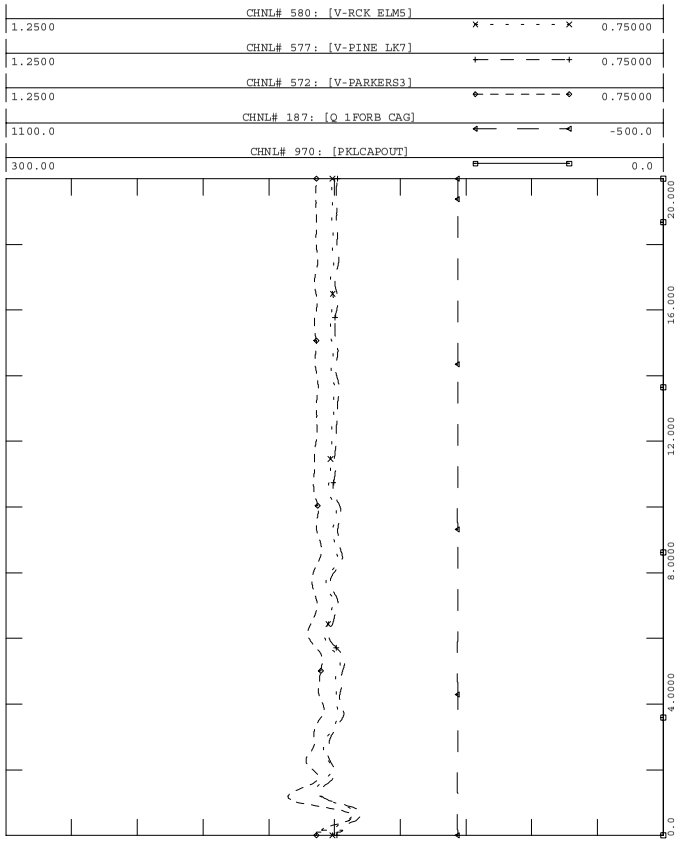
VOLTAGES 6



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

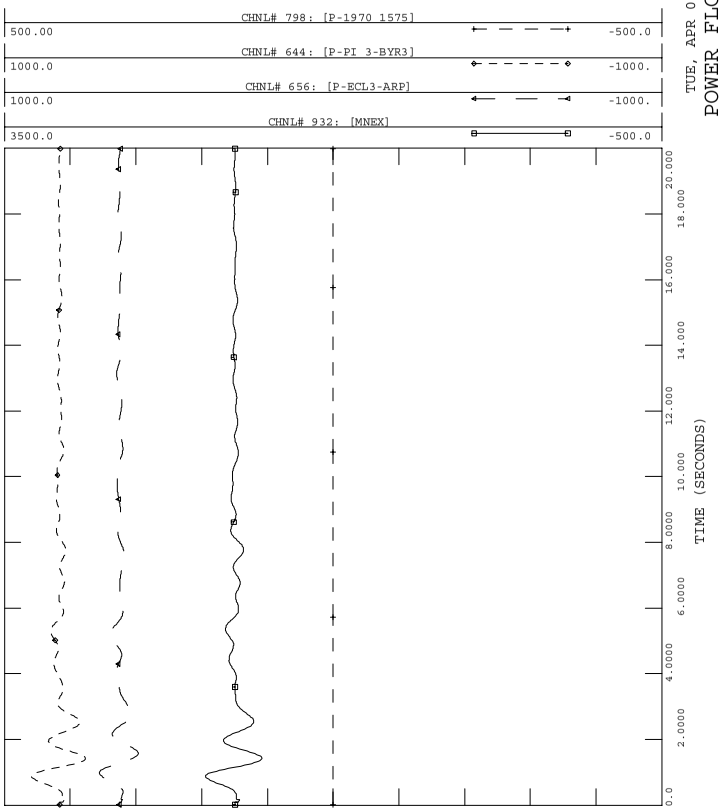
TUE, APR 09 2002 22:08

FORBES SVS OUT & VOLTAGES



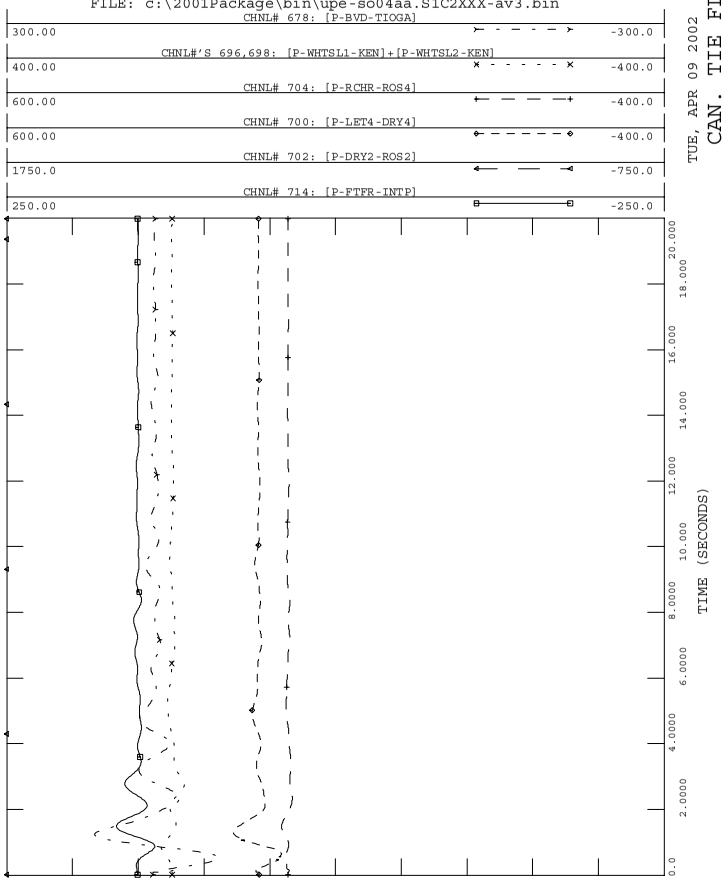
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
POWER FLOW SUMS 2



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
CAN. TIE FLOWS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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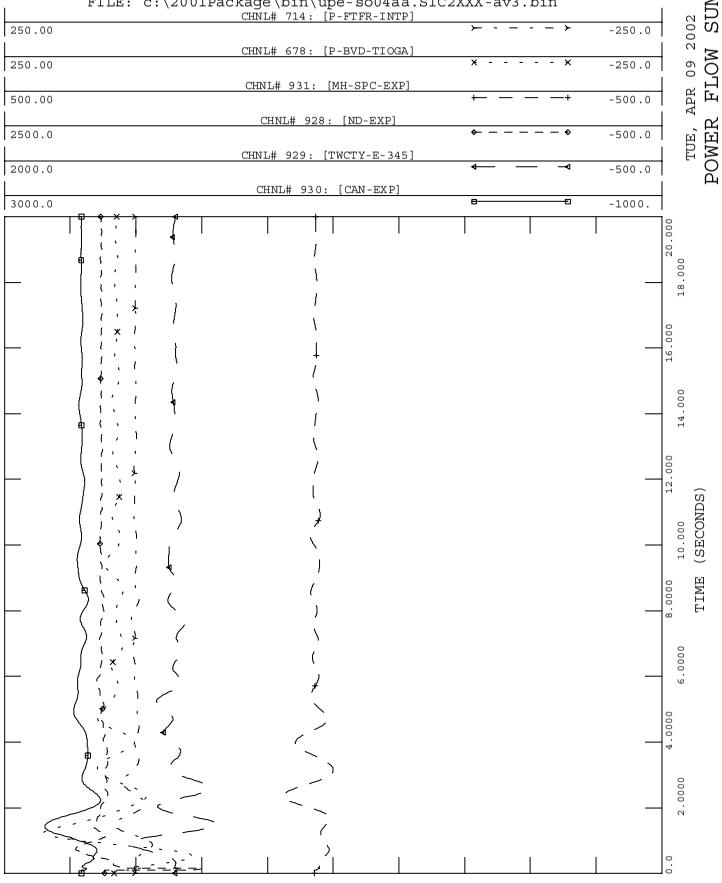
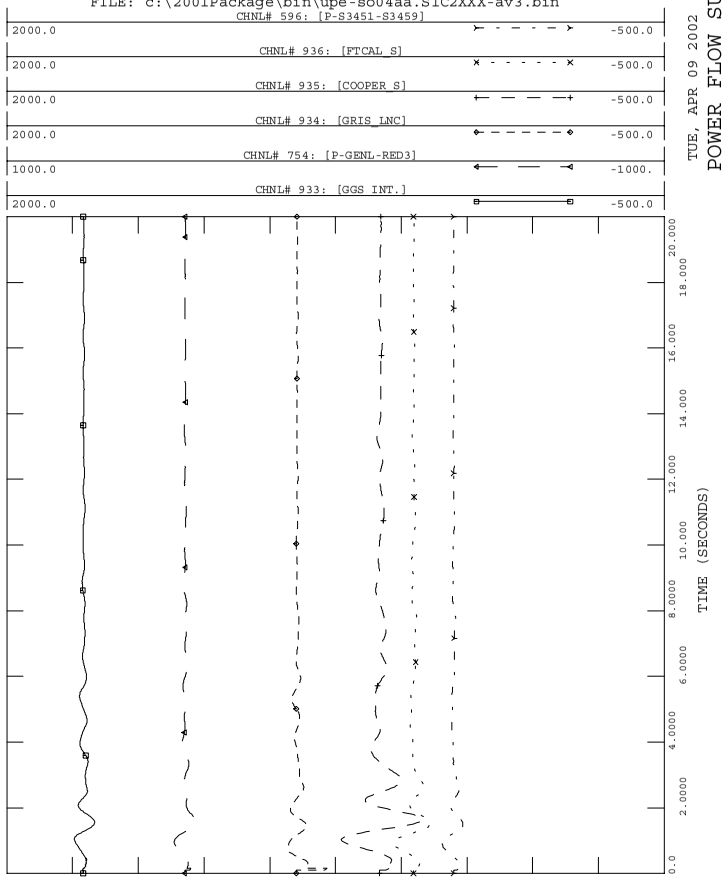
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
POWER FLOW SUMS 1



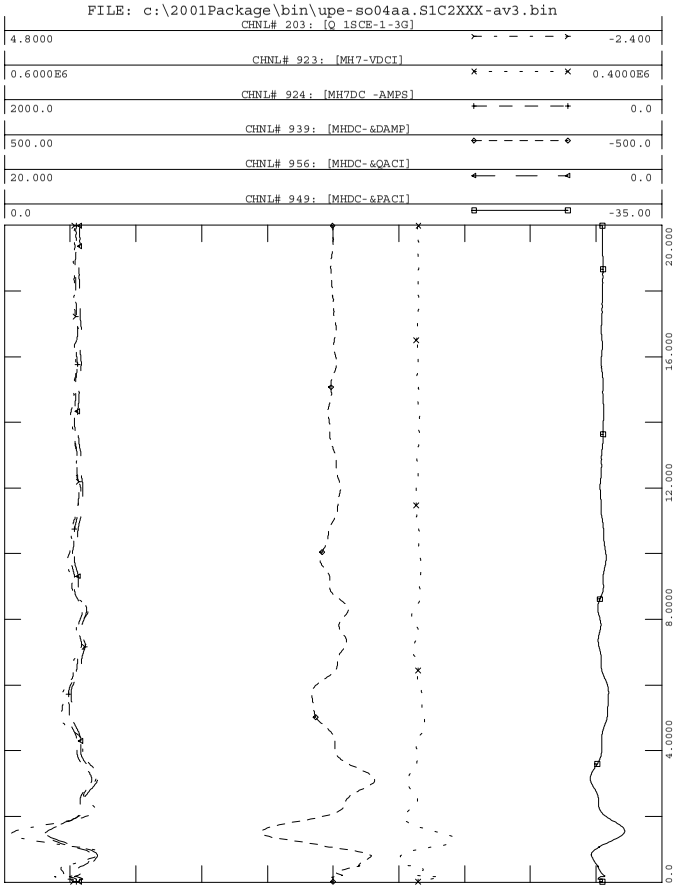
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
POWER FLOW SUM 3



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
MH DC PARAMETERS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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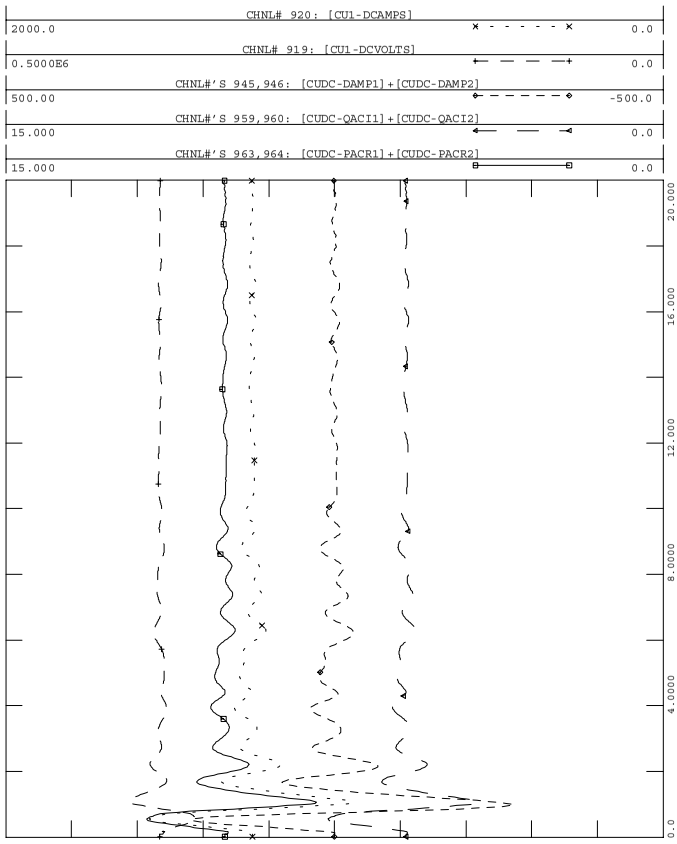
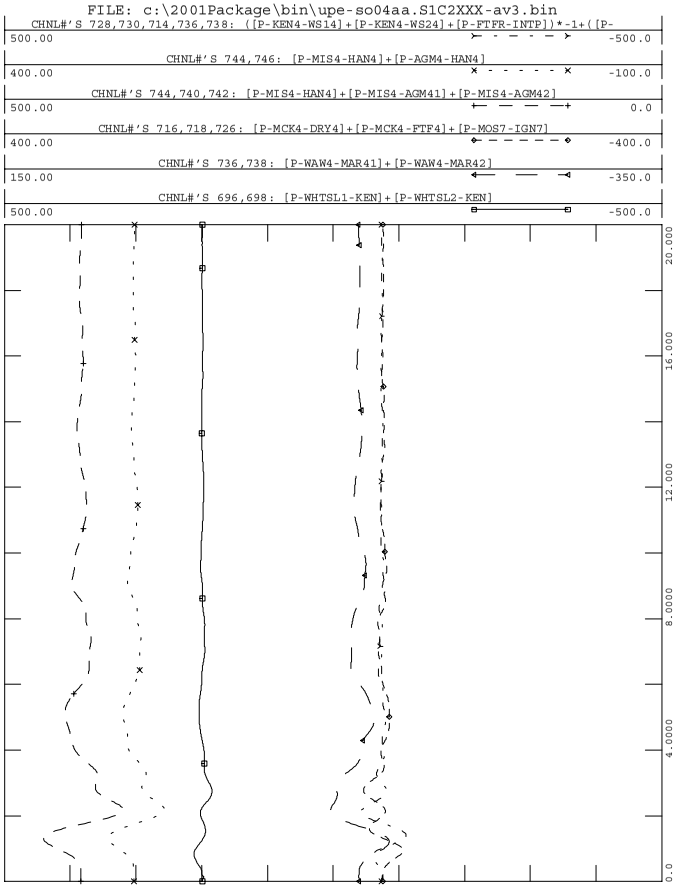
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
CU DC #1



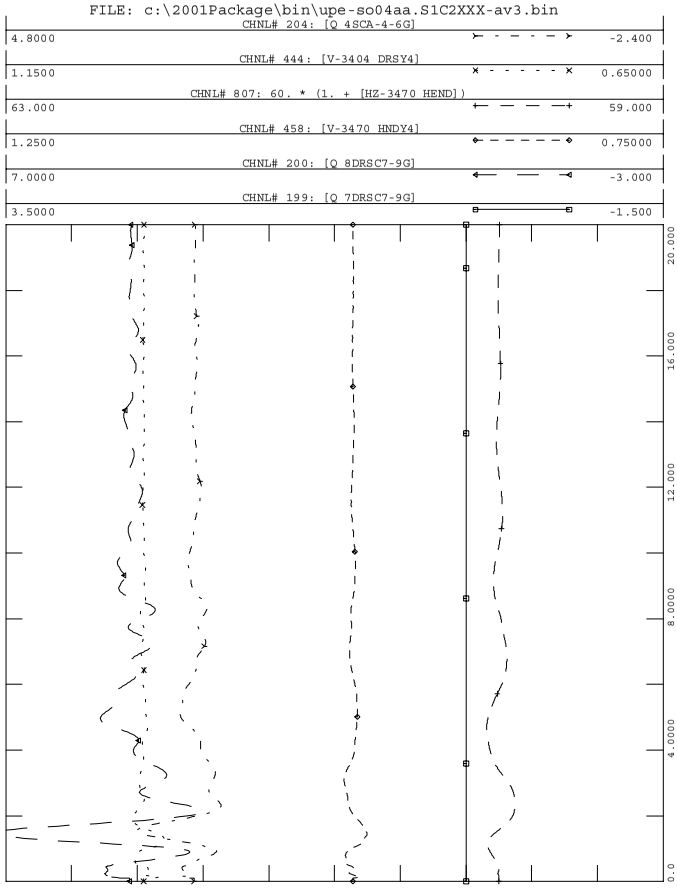
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
OH TIE FLOWS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

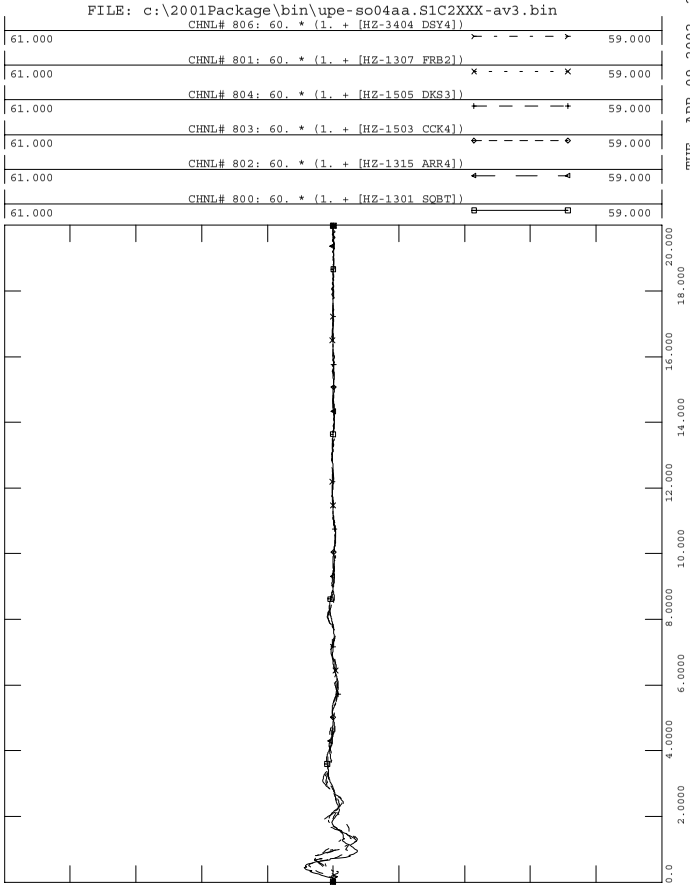
TUE, APR 09 2002 22:08
MH DC PARAMETERS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08

FREQ AT DC TERMINALS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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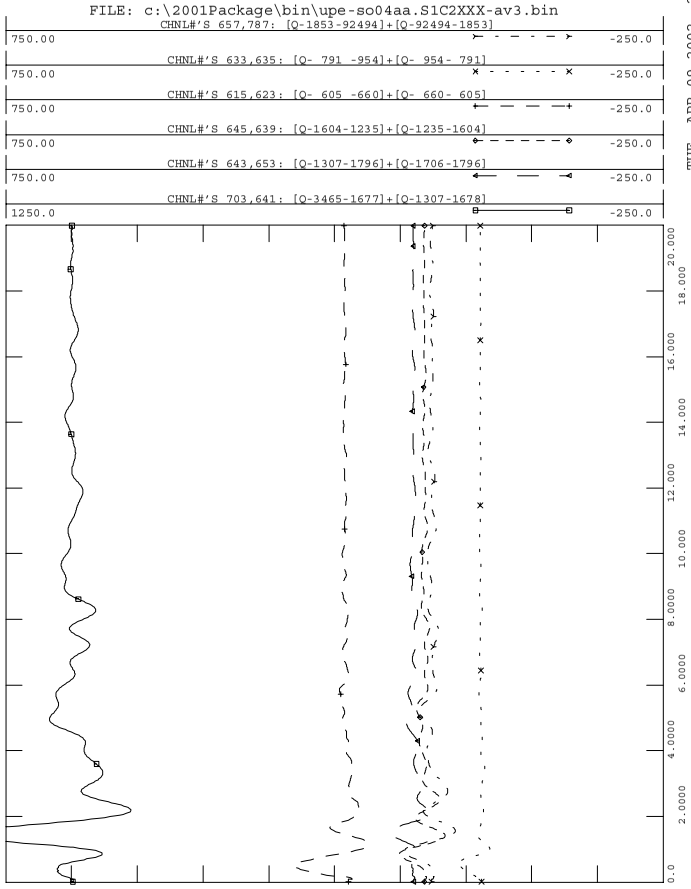
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08

VAR LOSSES



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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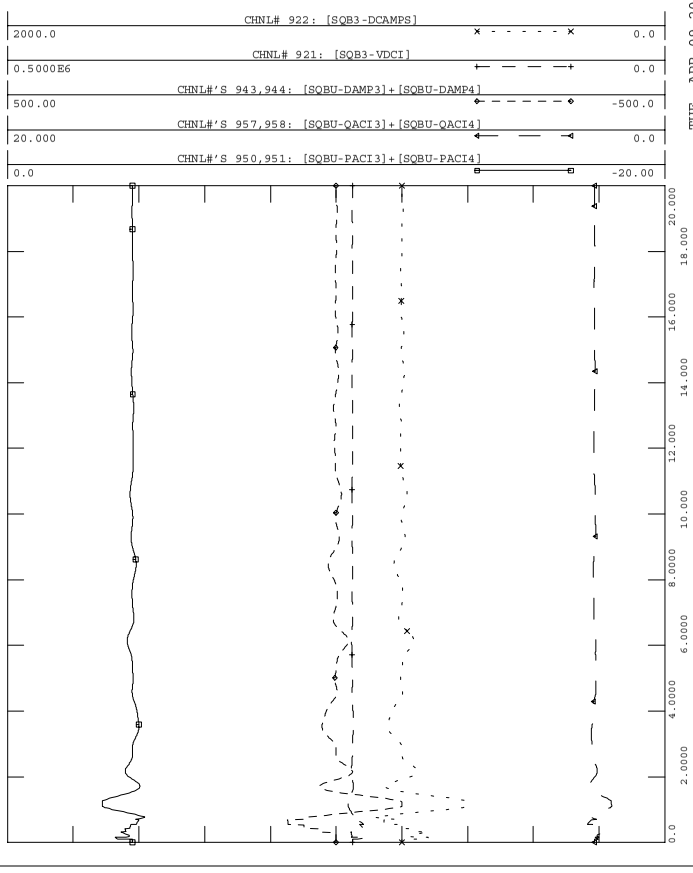
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08

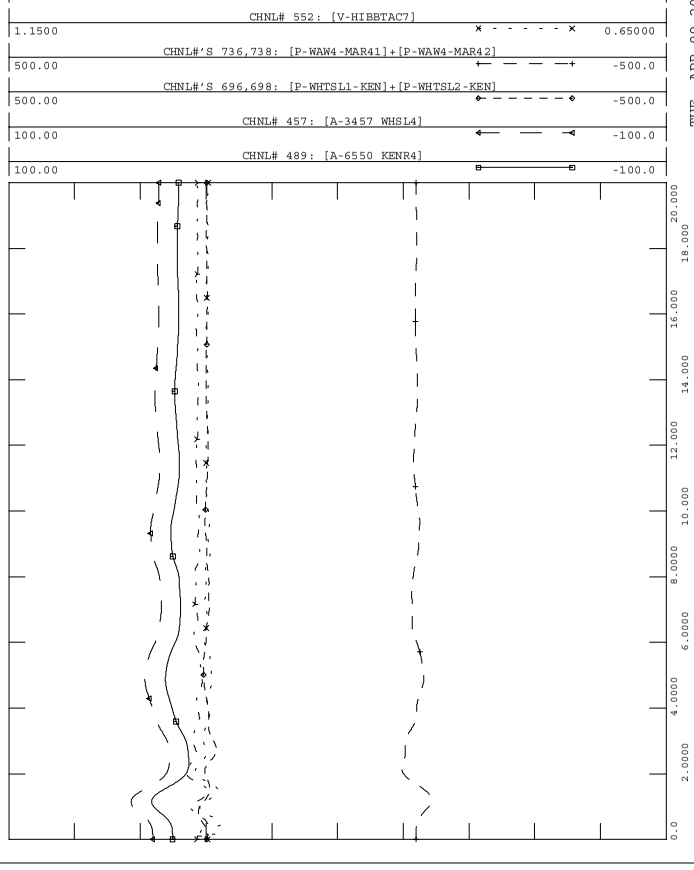
SQB DC #3



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08

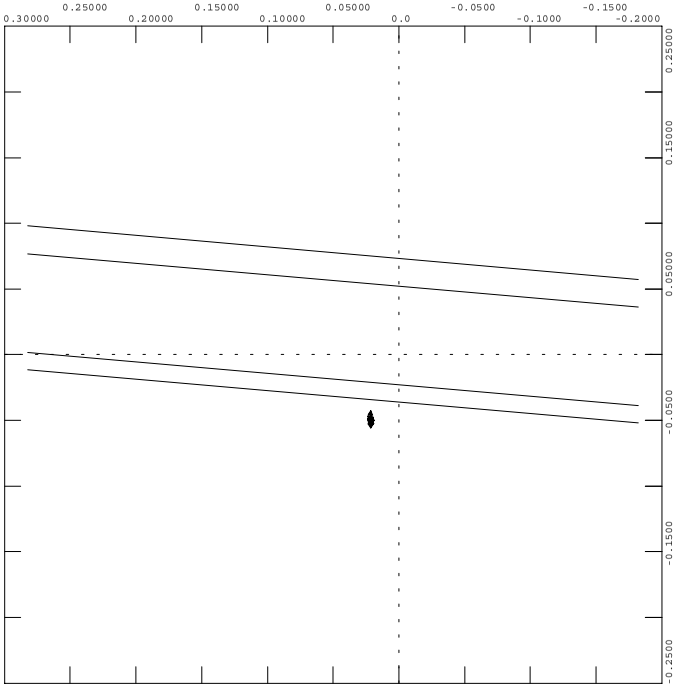
VOLTAGES, ANGLES



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 09 2002 22:08
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

RELAY: RELAYG
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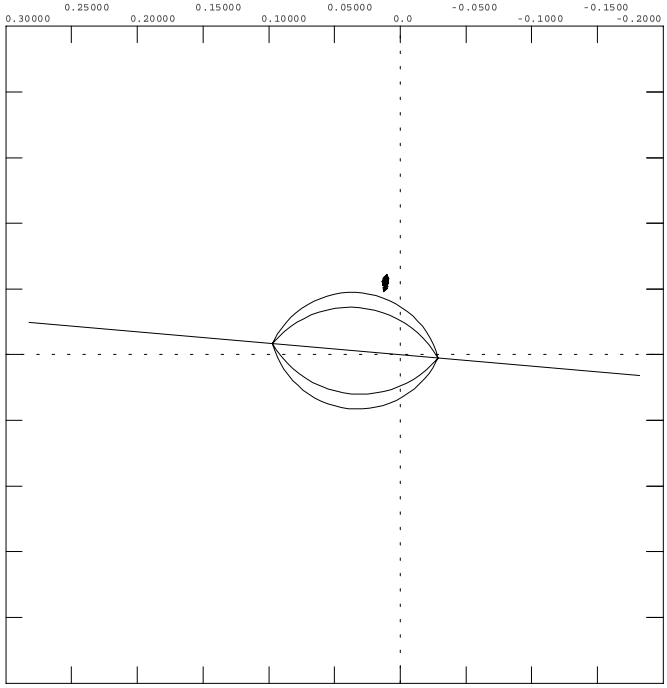
CHNL# 856: [X-DSY2-ROS2]



TUE, APR 09 2002 22:08
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

RELAY: RELAYG
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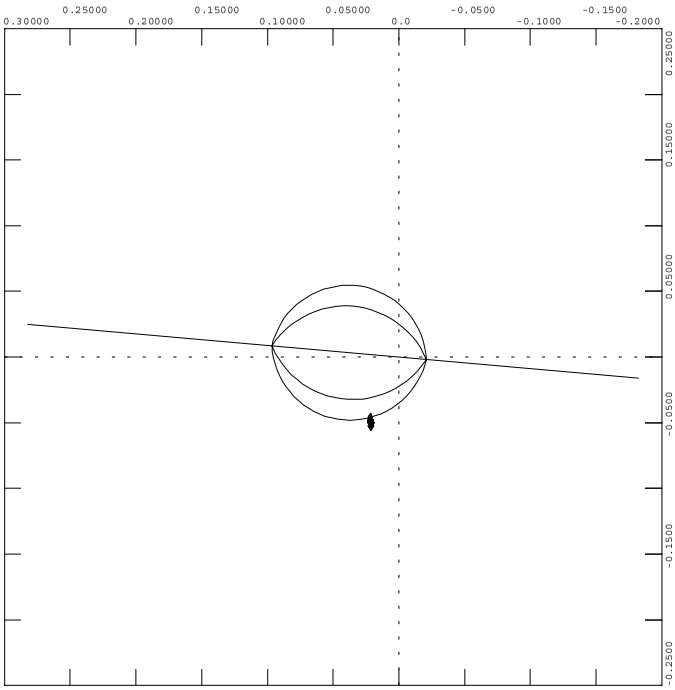
CHNL# 824: [X-FRB2-ROS2]

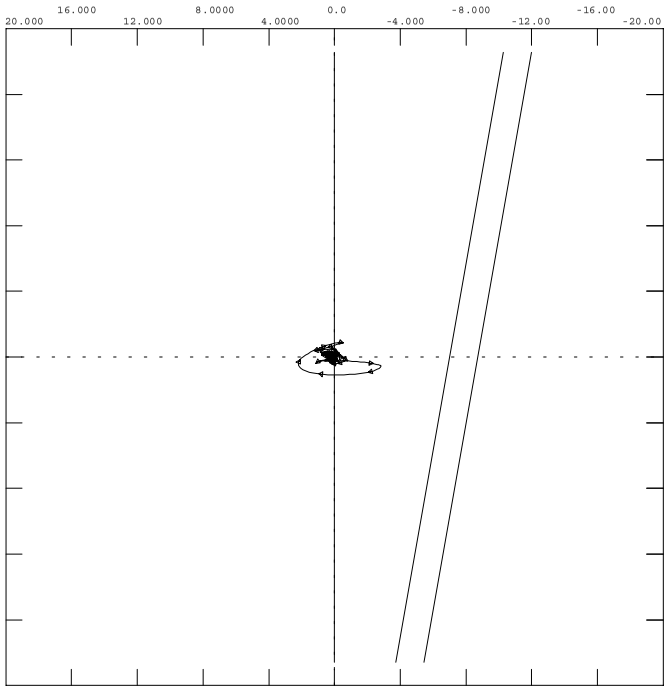


TUE, APR 09 2002 22:08
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]



TUE, APR 09 2002 22:08
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

RELAY: SLINOS
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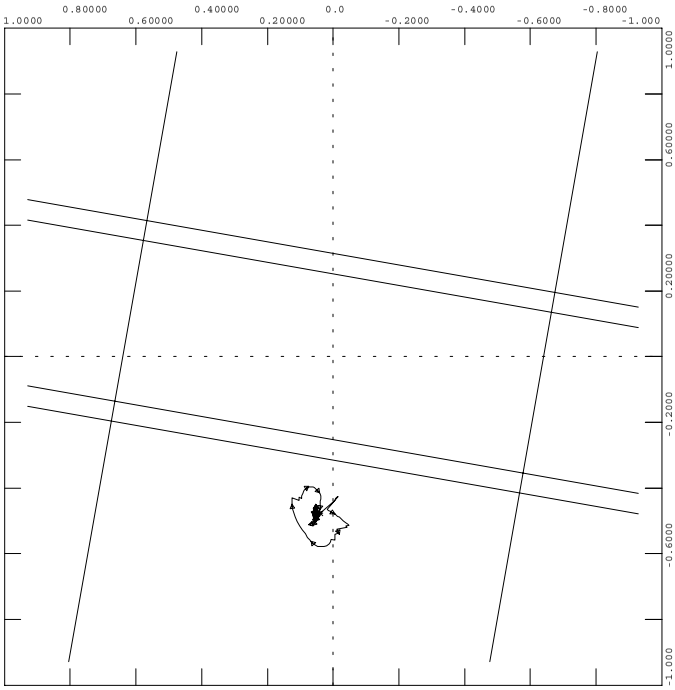
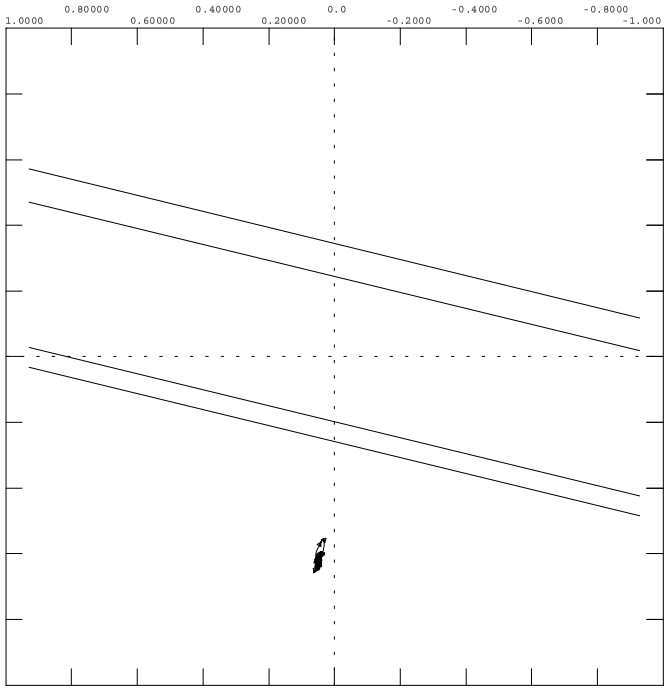
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

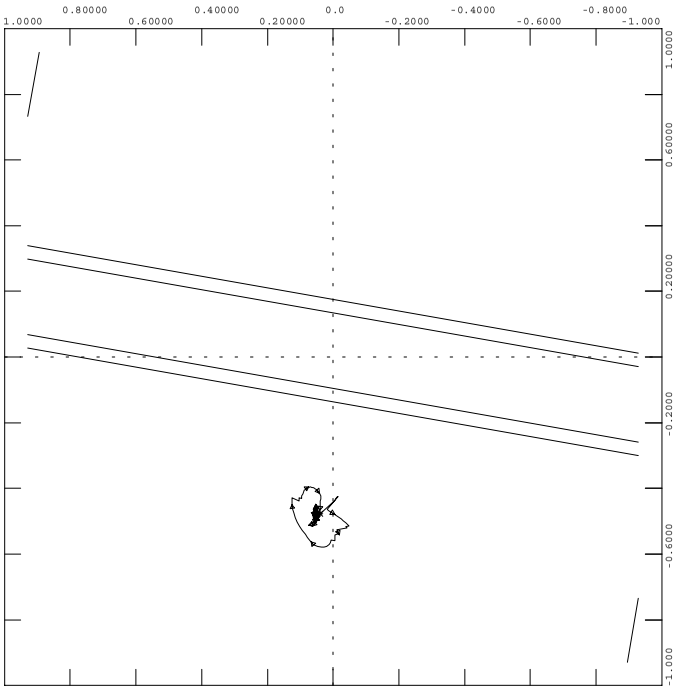
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

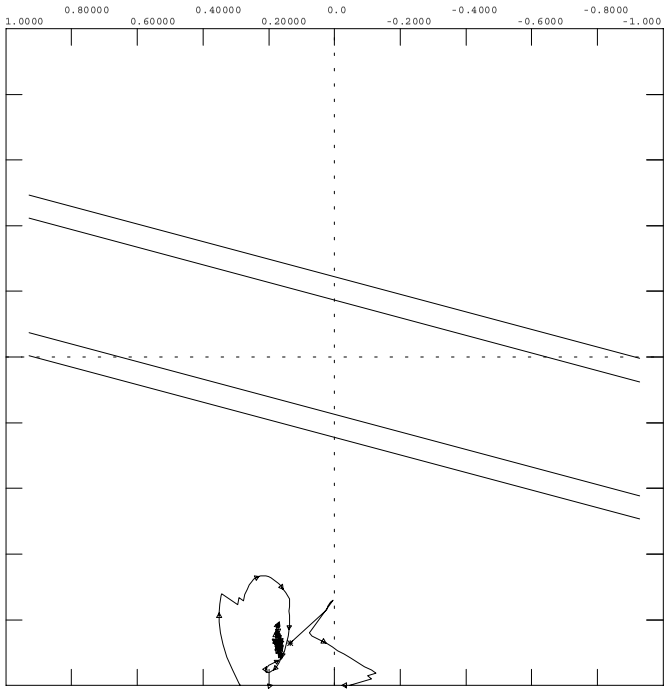
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

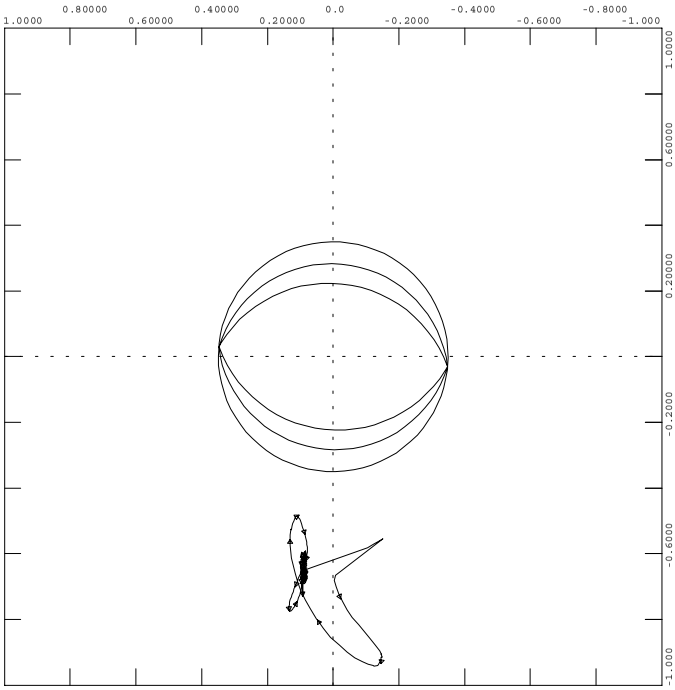
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

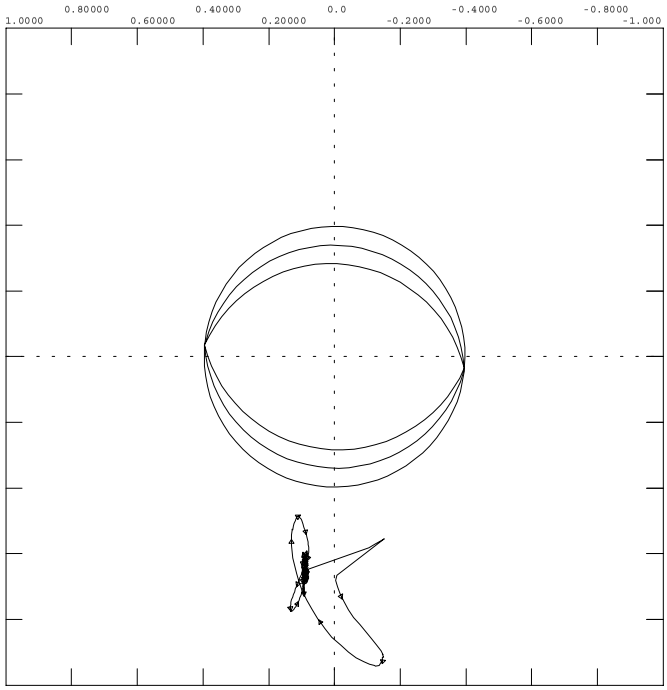
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

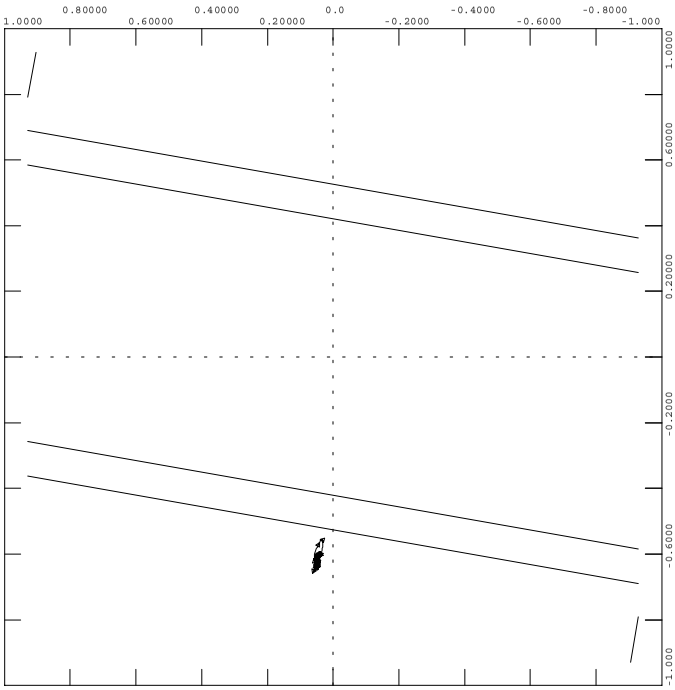
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

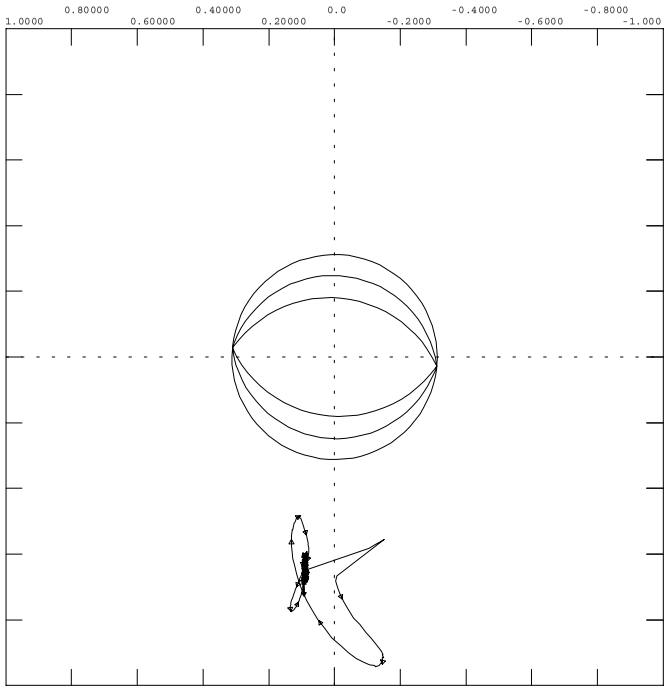
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



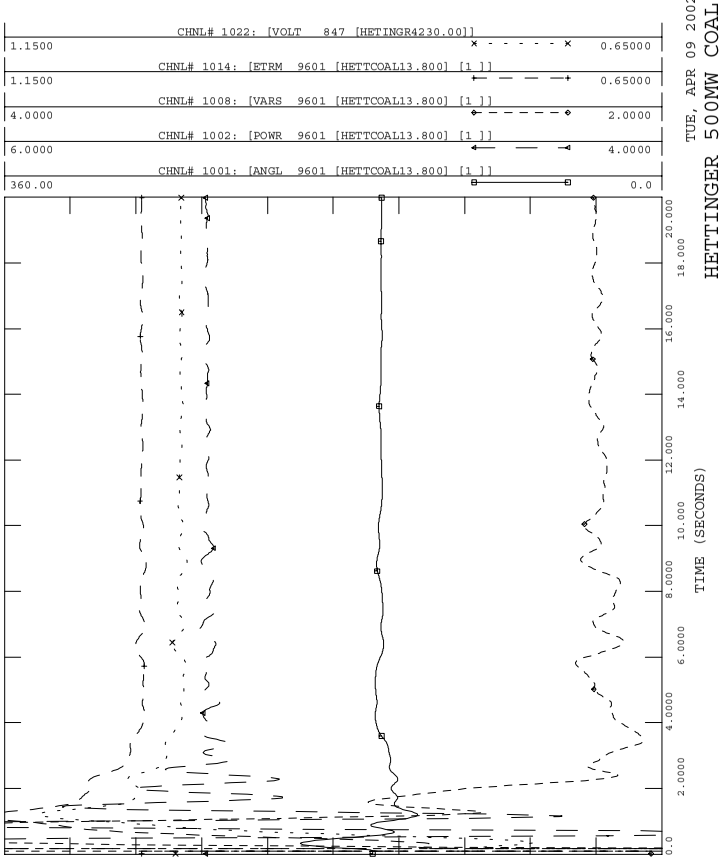
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

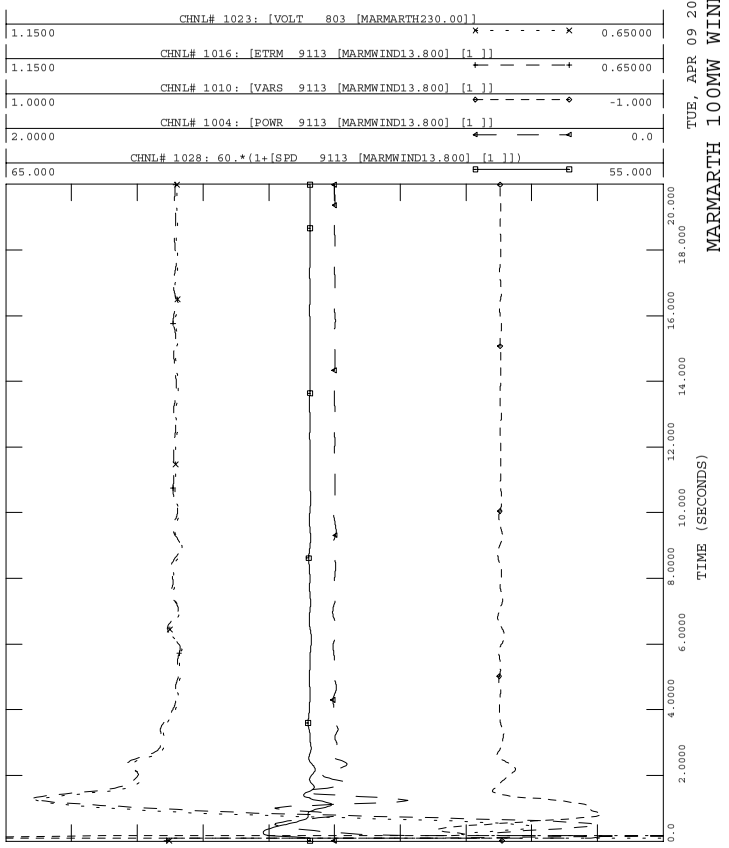
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin



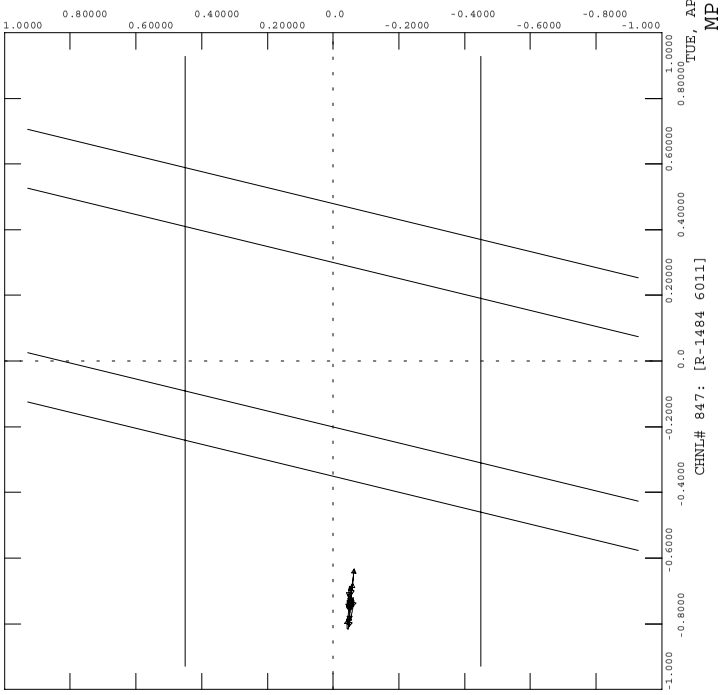
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin



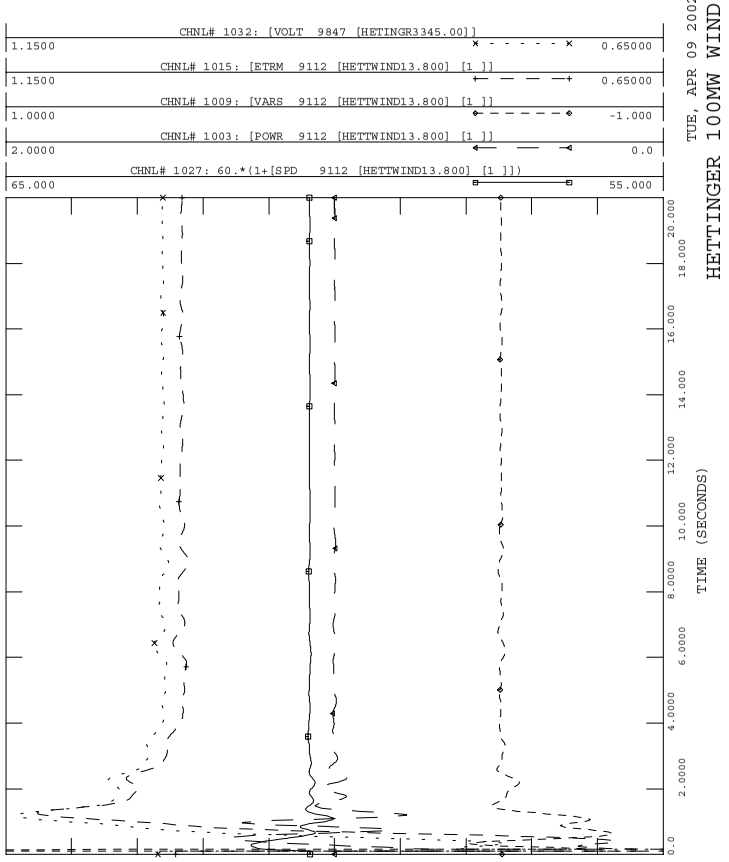
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

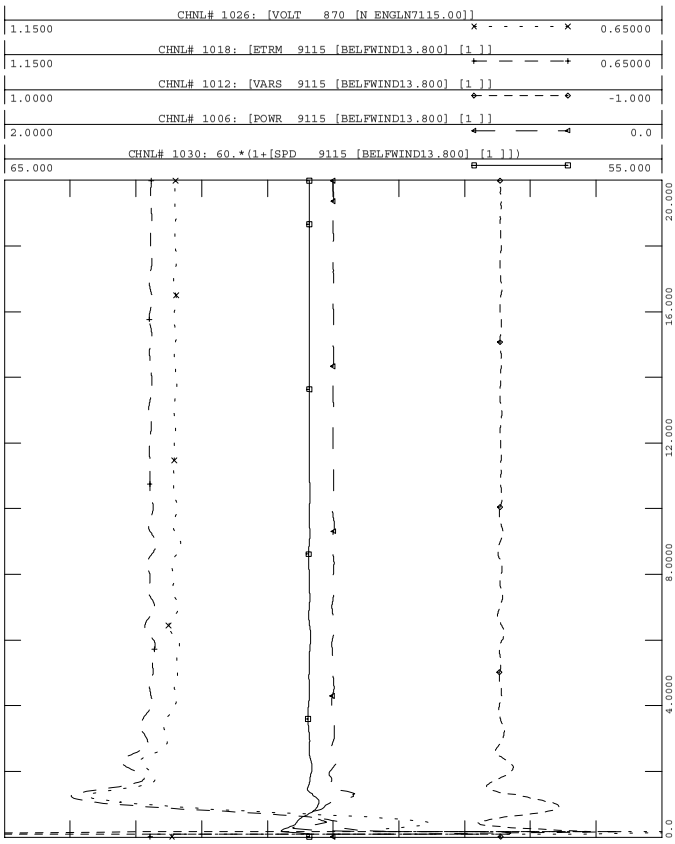


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin



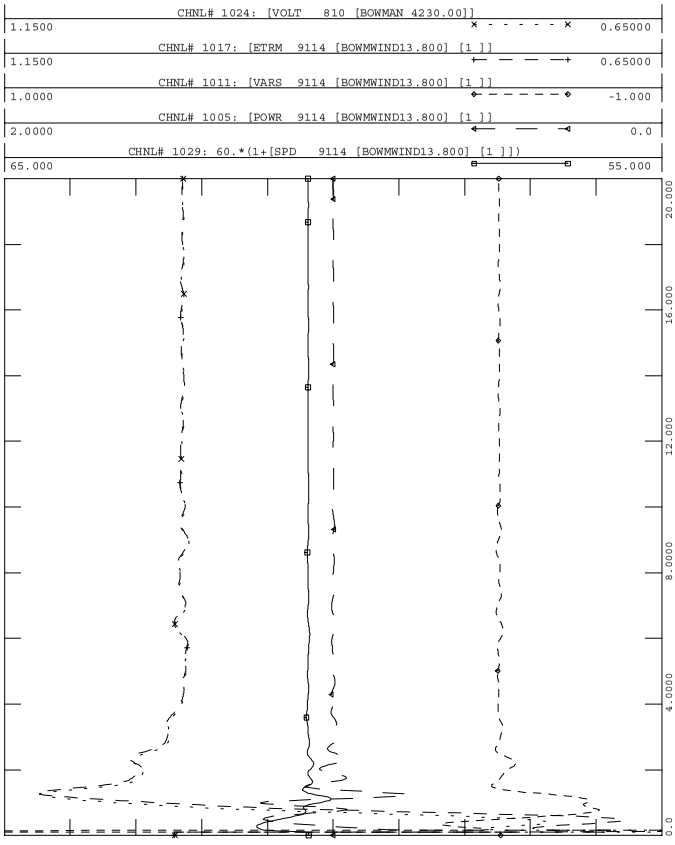
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
BELFIELD 100MW WIND UNIT



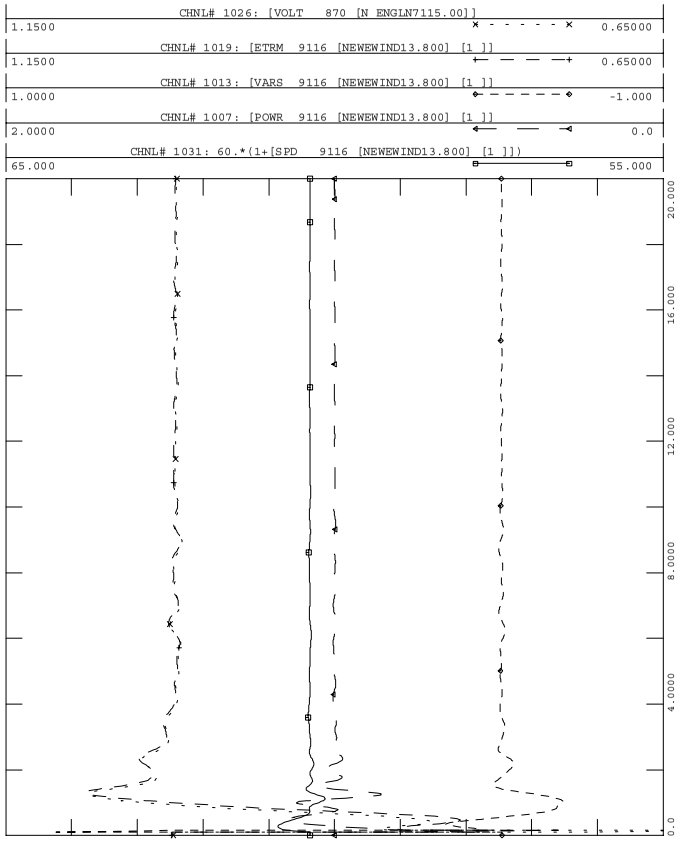
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-av3.bin

TUE, APR 09 2002 22:08
NEW E. 100MW WIND UNIT

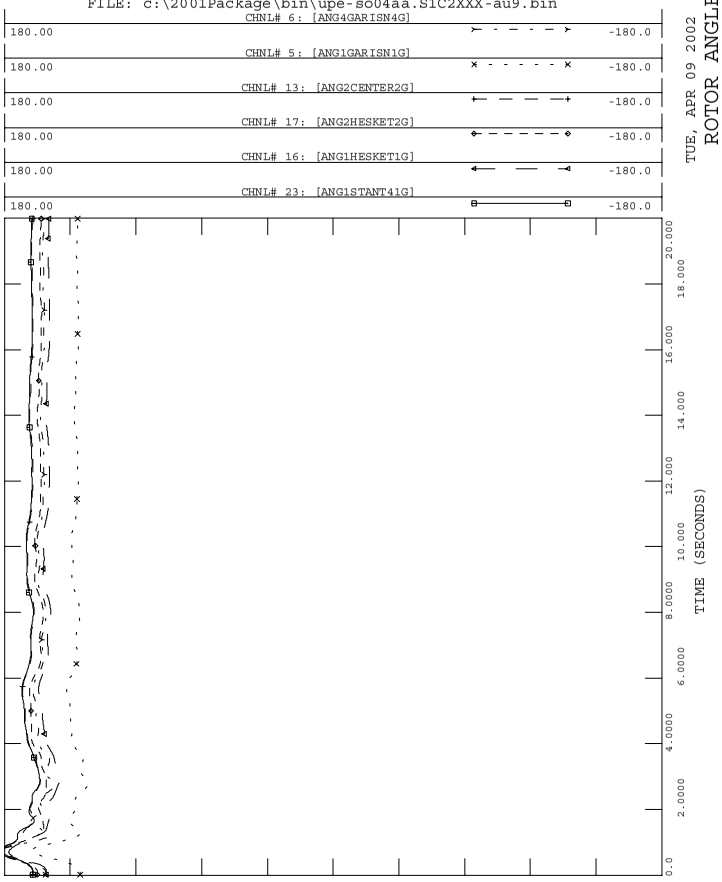


CONTINGENCY AU9

4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Ft. Thompson 345 kV line

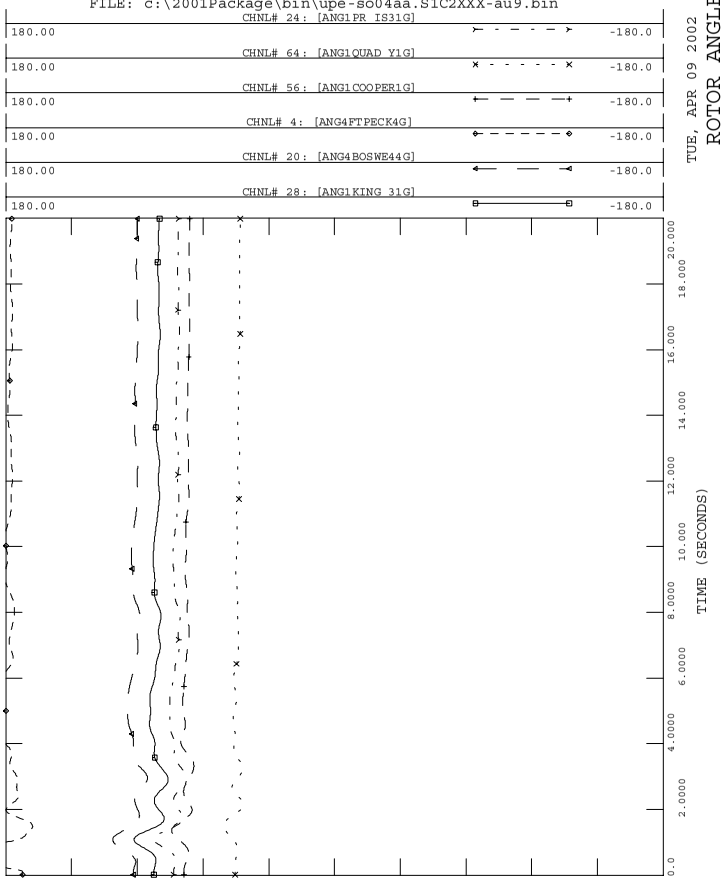
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
ROTOR ANGLES 2



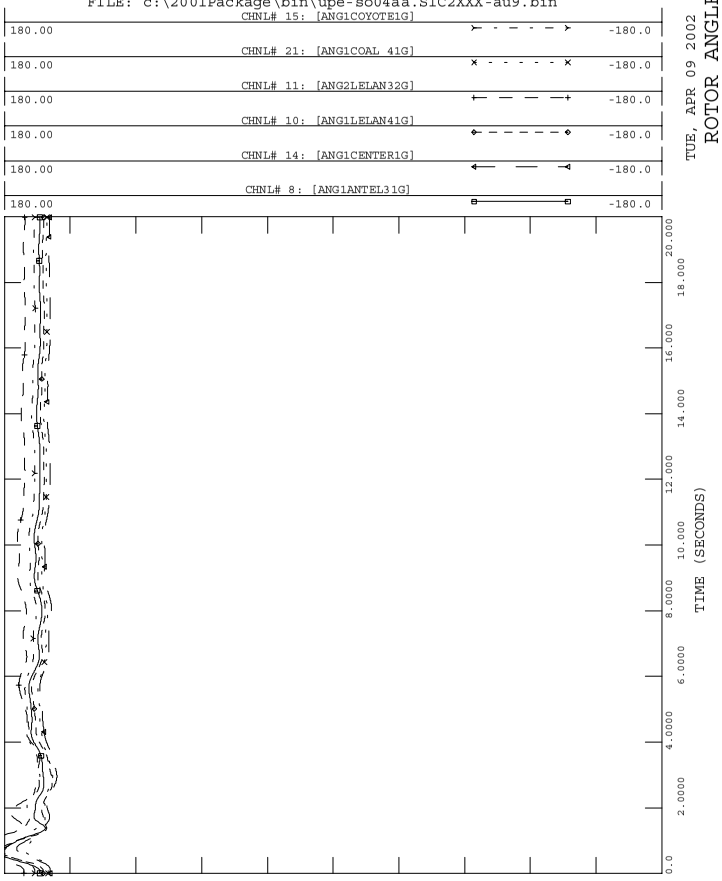
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
ROTOR ANGLES 4



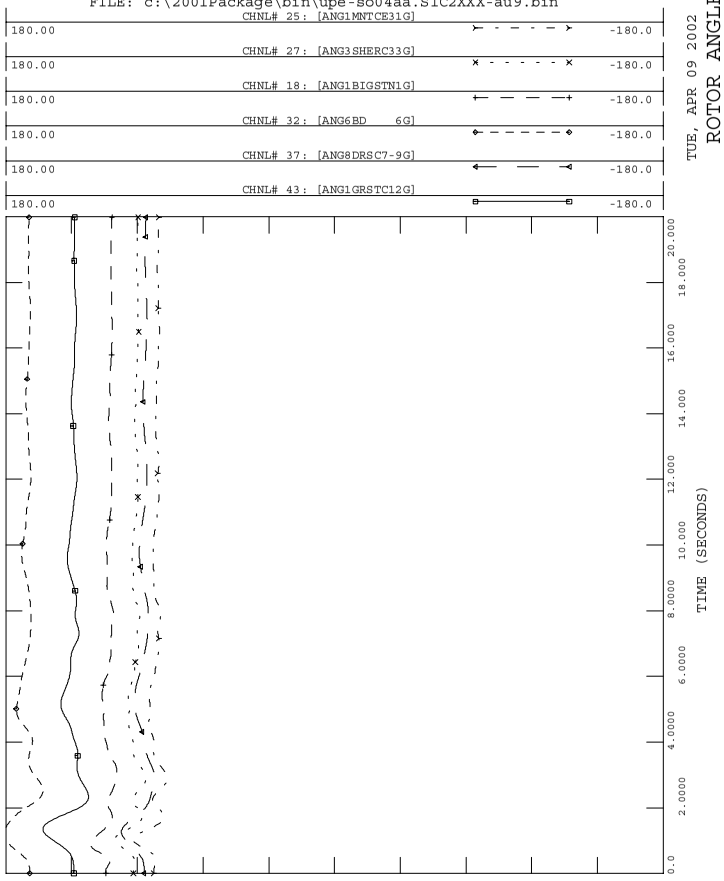
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
ROTOR ANGLES 1

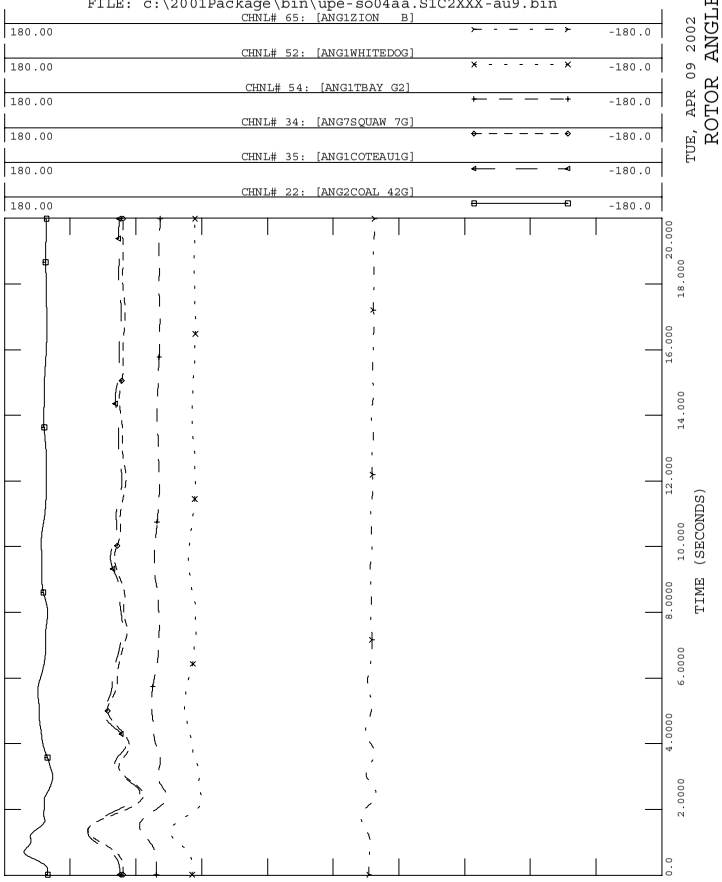


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
ROTOR ANGLES 3

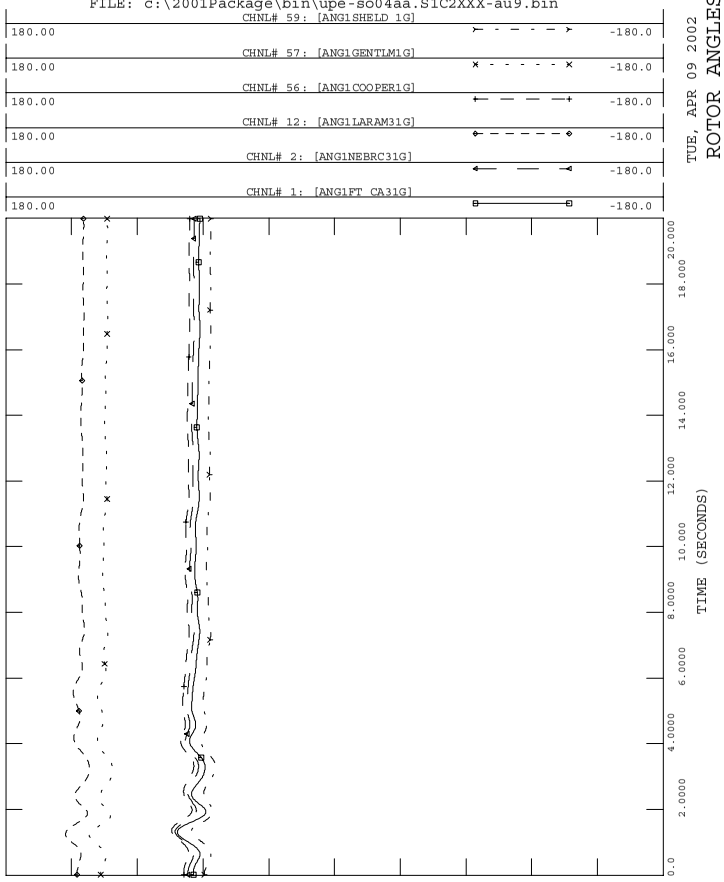


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin



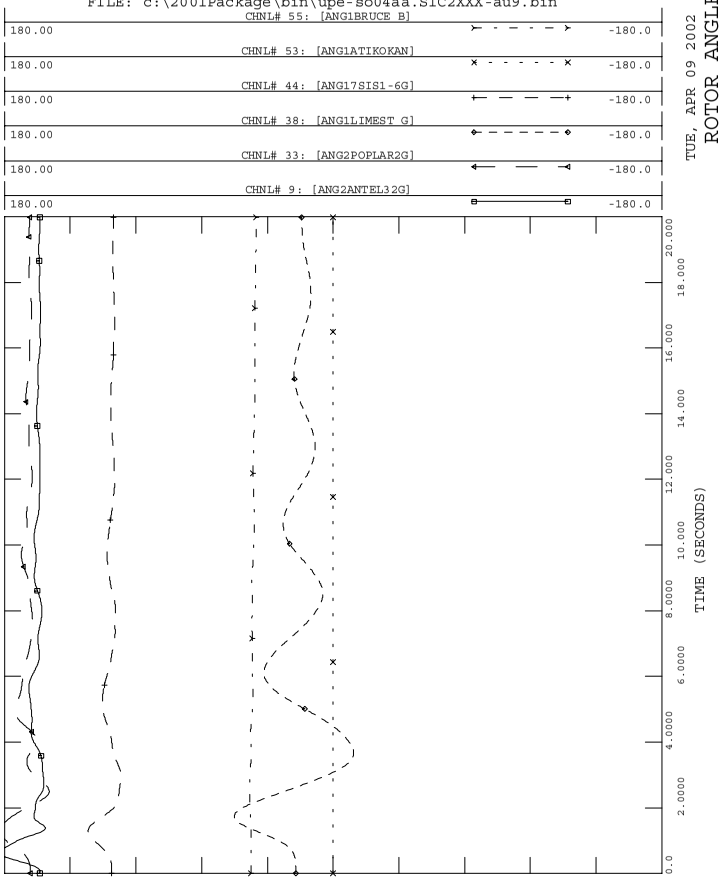
TUE, APR 09 2002 22:25
ROTOR ANGLES 6

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin



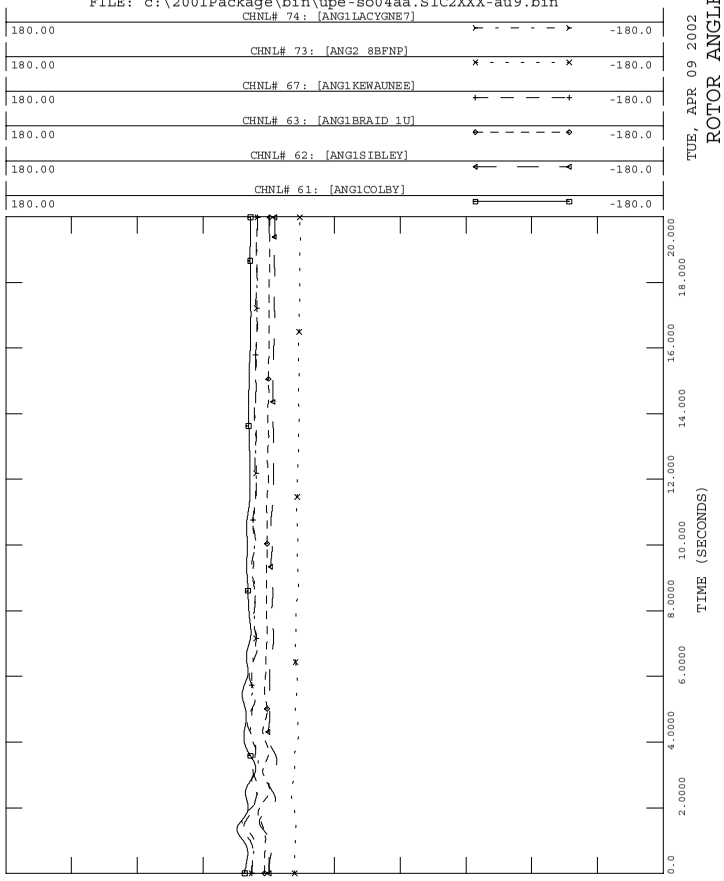
TUE, APR 09 2002 22:25
ROTOR ANGLES NB

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin



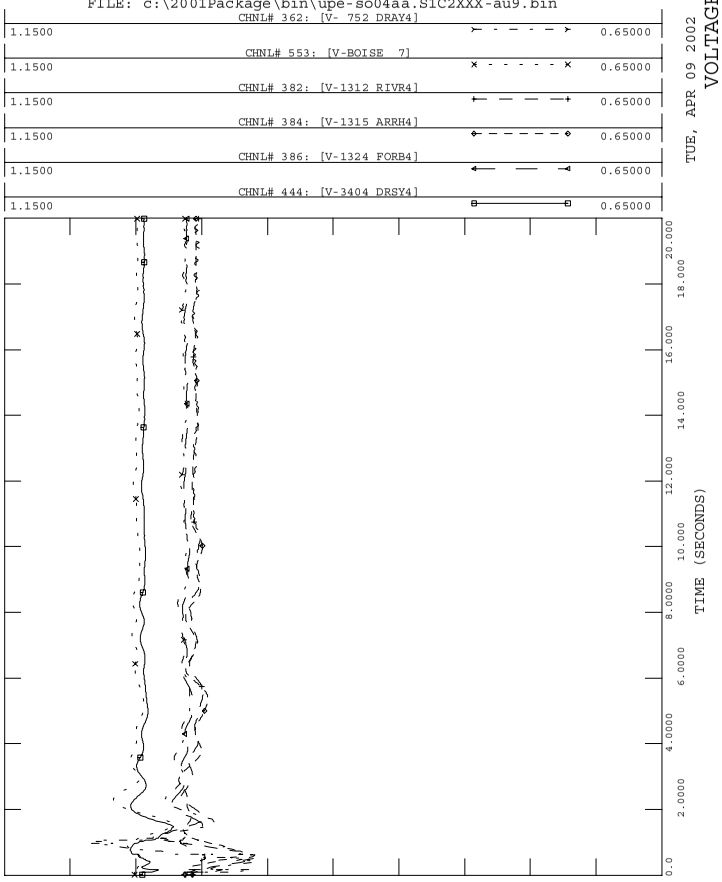
TUE, APR 09 2002 22:25
ROTOR ANGLES 5

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin



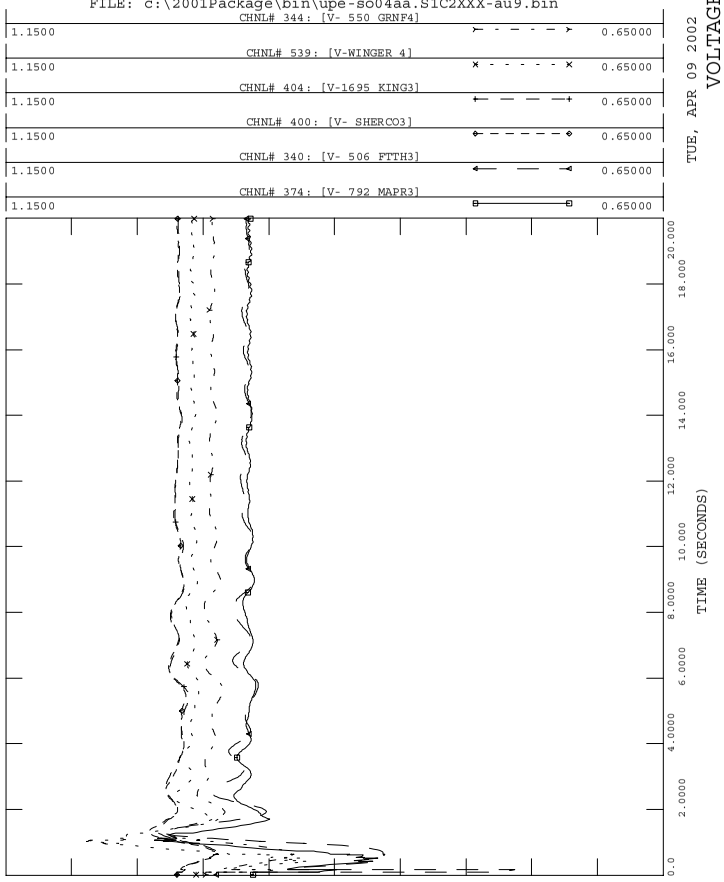
TUE, APR 09 2002 22:25
ROTOR ANGLES 7

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin



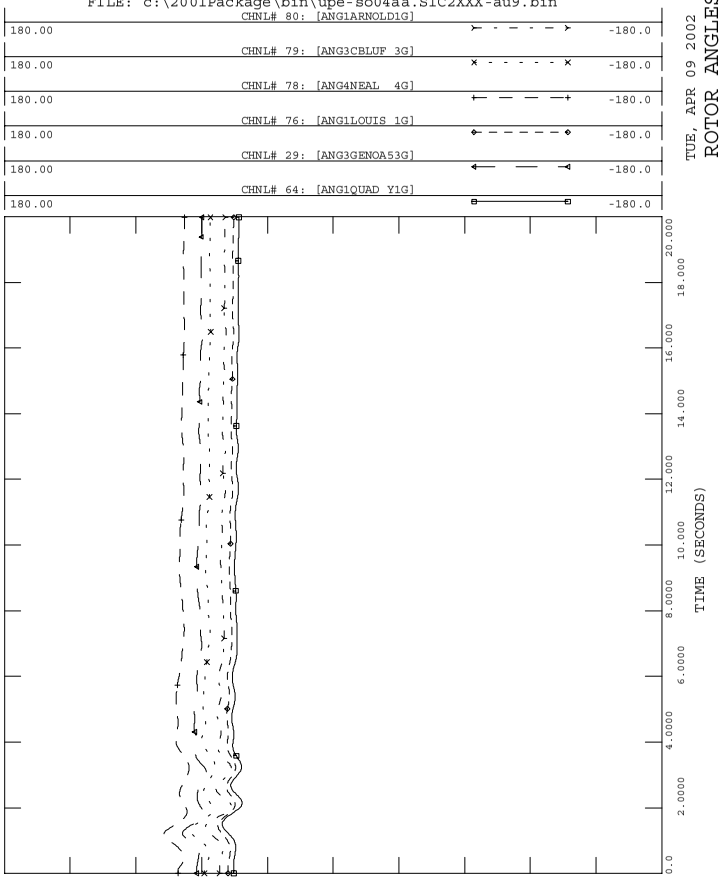
TUE, APR 09 2002 22:25
VOLTAGES 1

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin



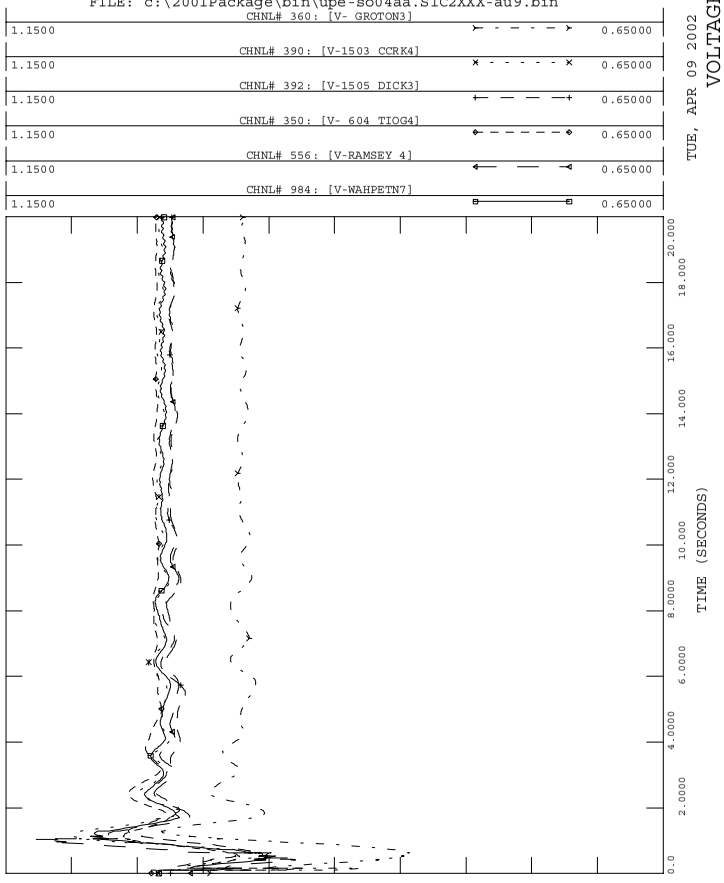
TUE, APR 09 2002 22:25
VOLTAGES 3

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin



TUE, APR 09 2002 22:25
ROTOR ANGLES IA

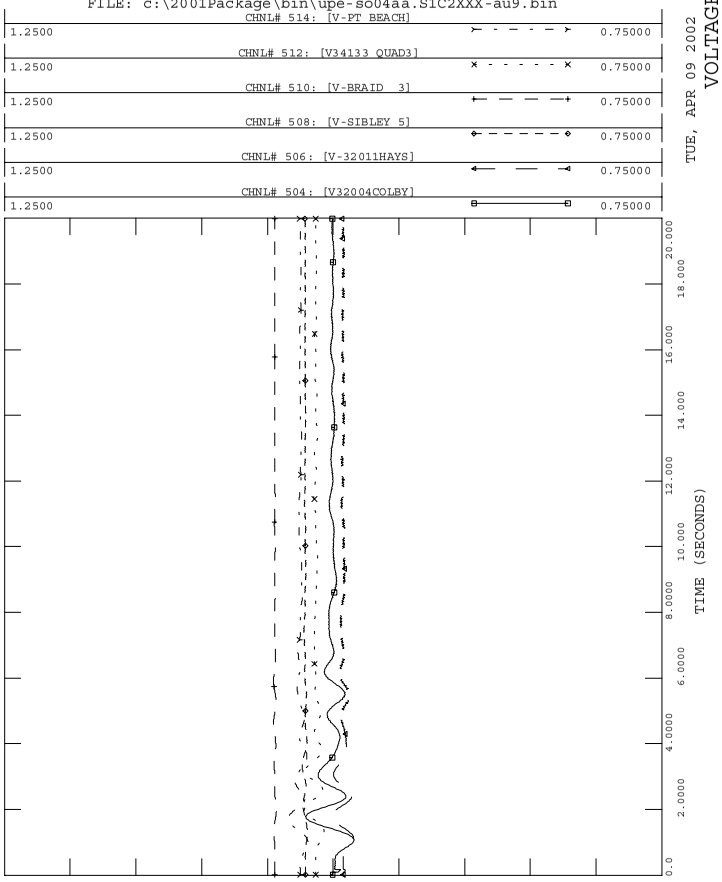
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin



TUE, APR 09 2002 22:25
VOLTAGES 2

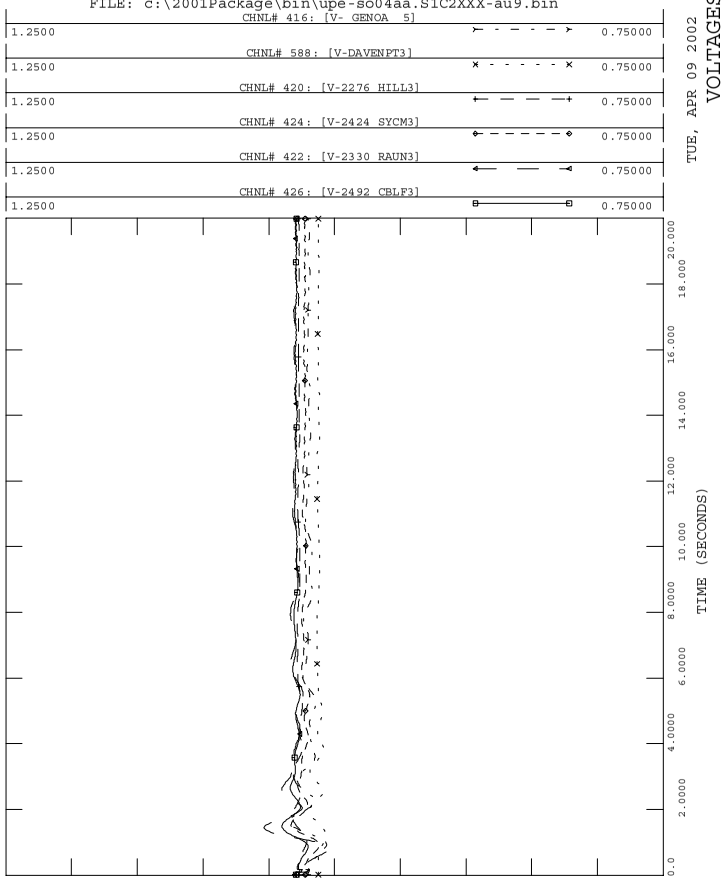
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
VOLTAGES 5



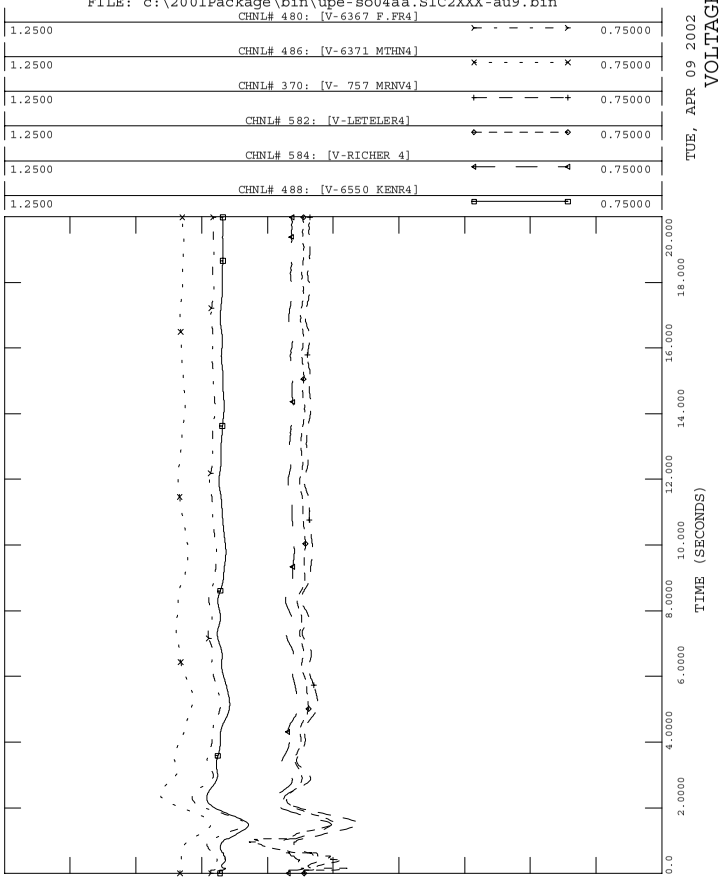
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
VOLTAGES IA



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
VOLTAGES 4



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

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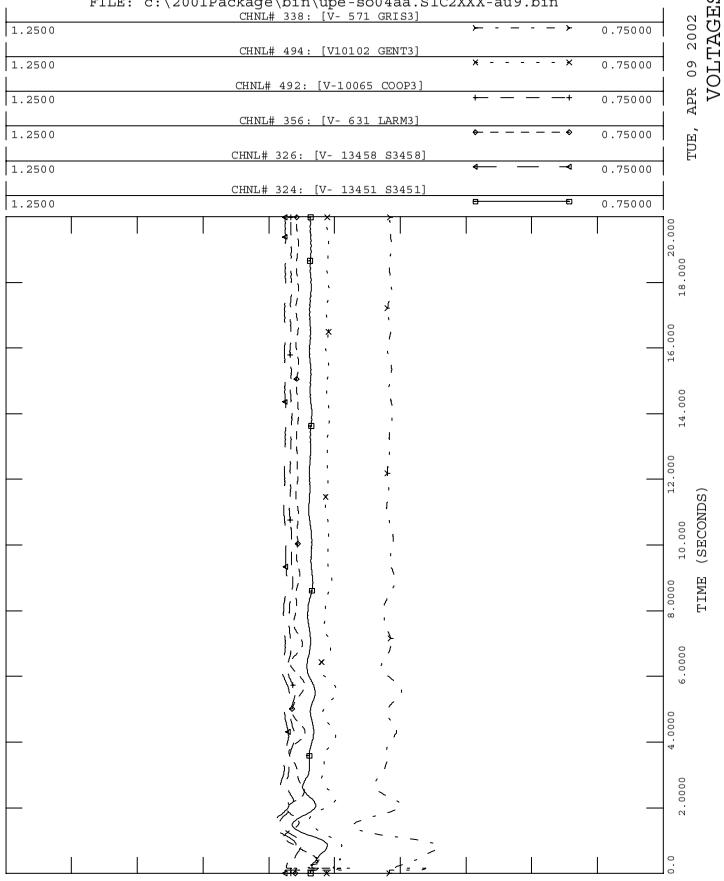
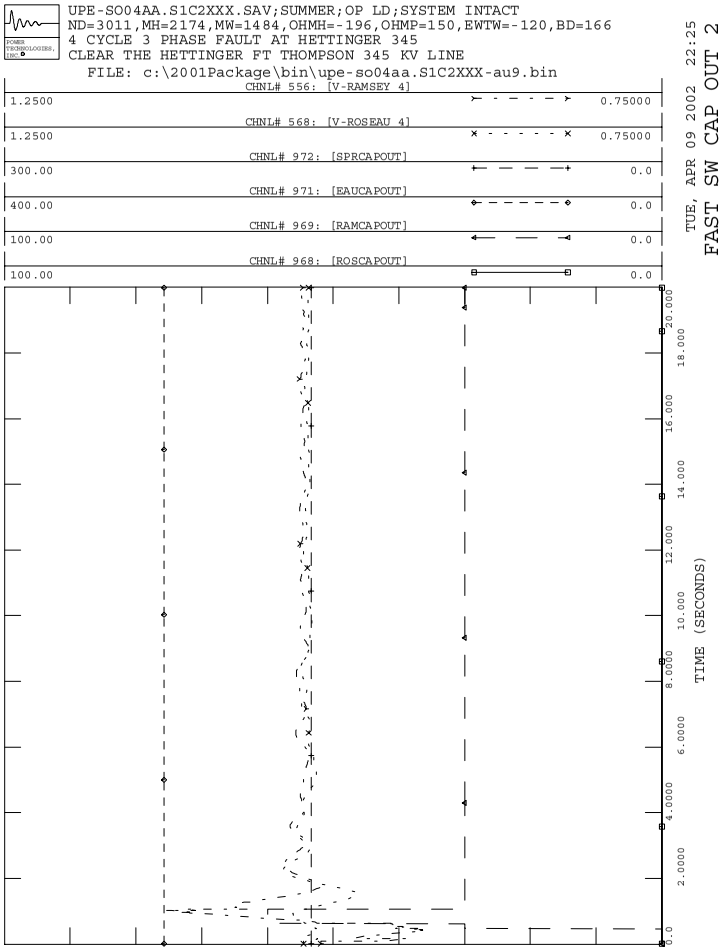
VOLTAGES NB




UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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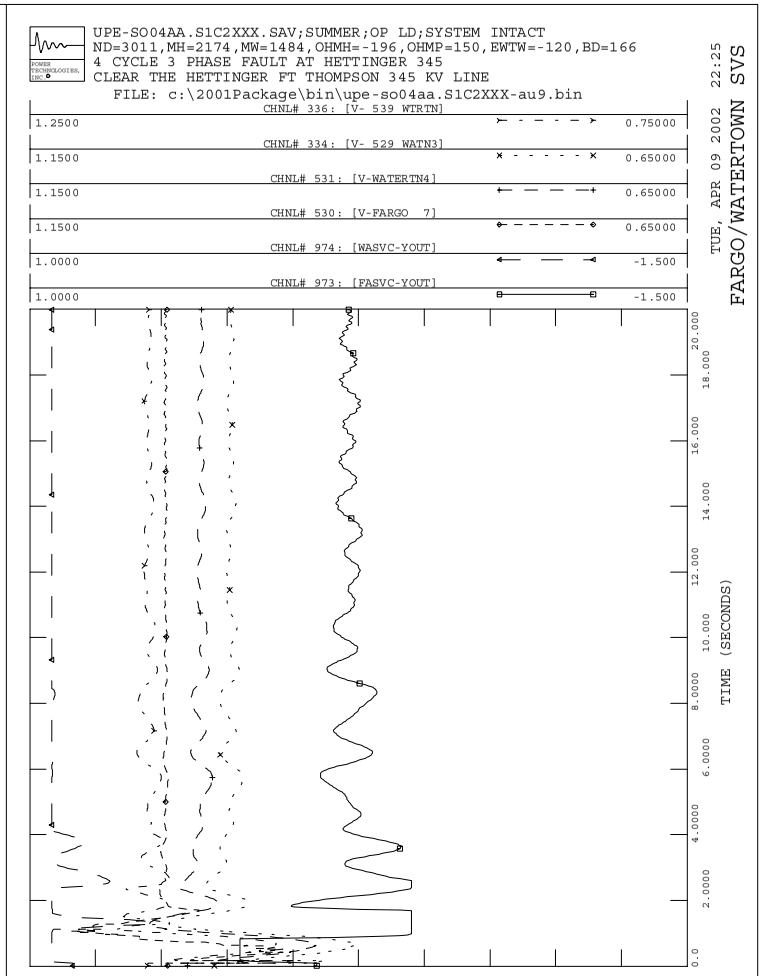
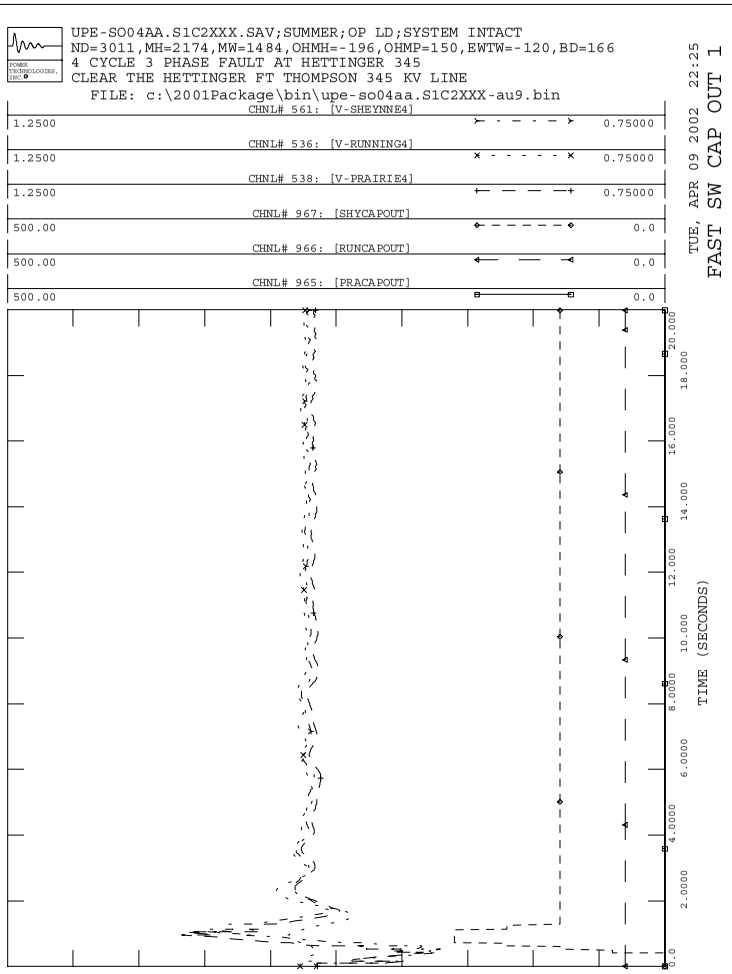
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TUE, APR 09 2002 22:25
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TUE, APR 09 2002 22:25
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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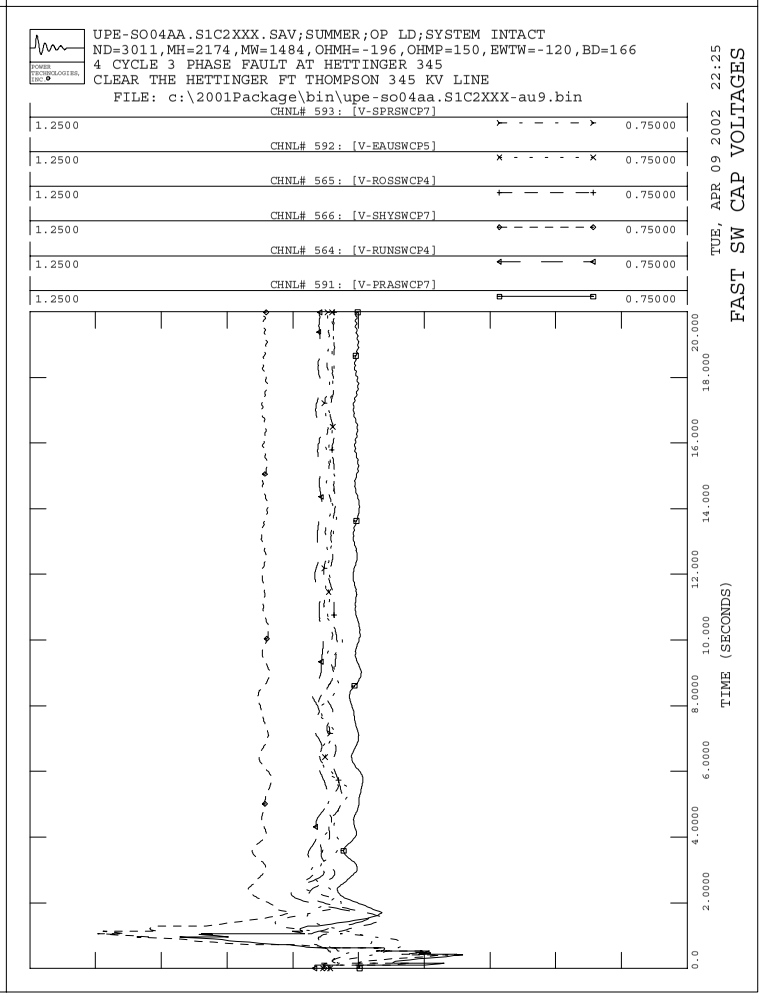
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TUE, APR 09 2002 22:25
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TUE, APR 09 2002 22:25
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

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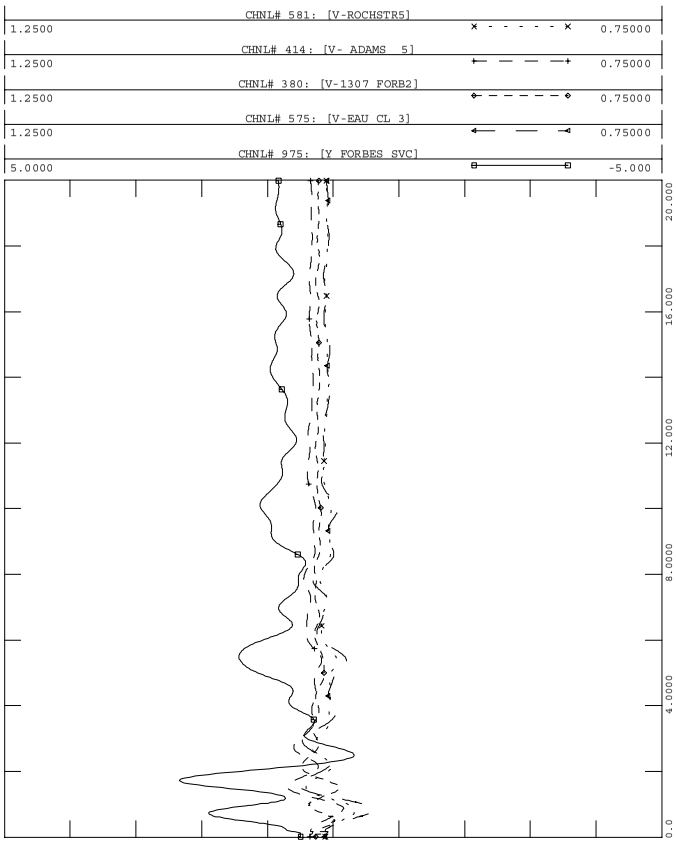
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

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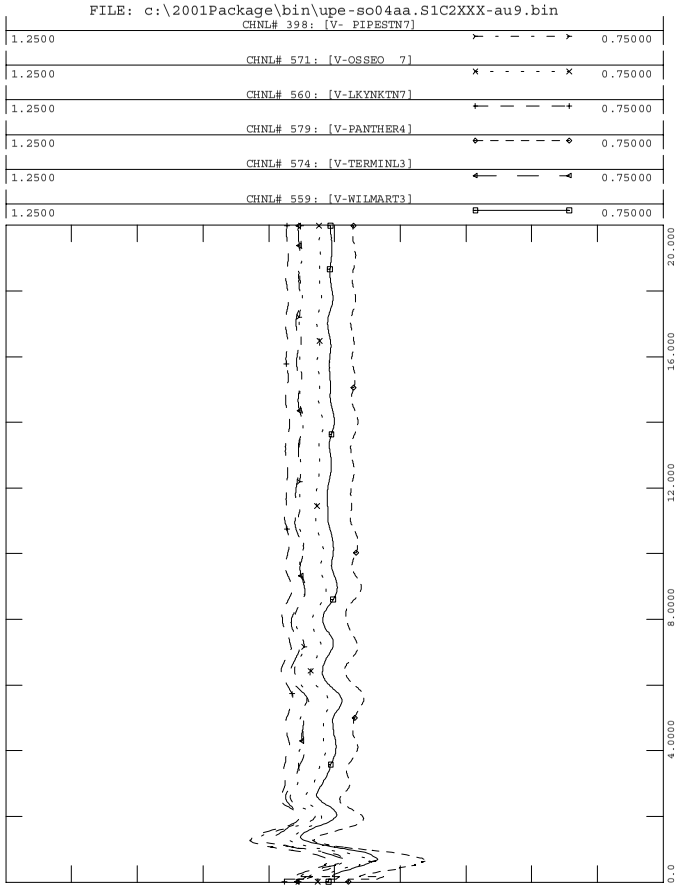
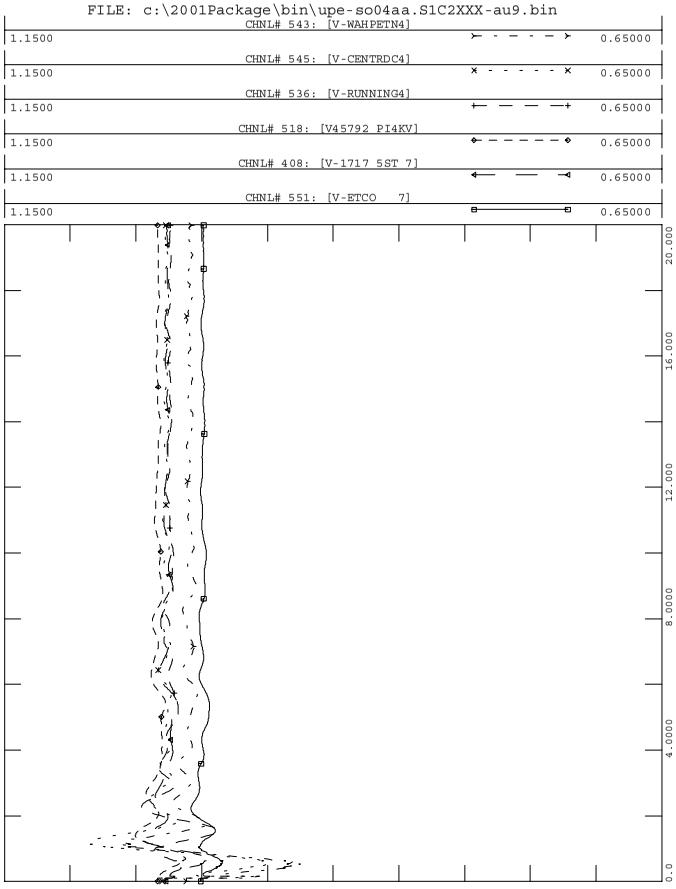
TC VOLTAGES



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25

VOLTAGES 6



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

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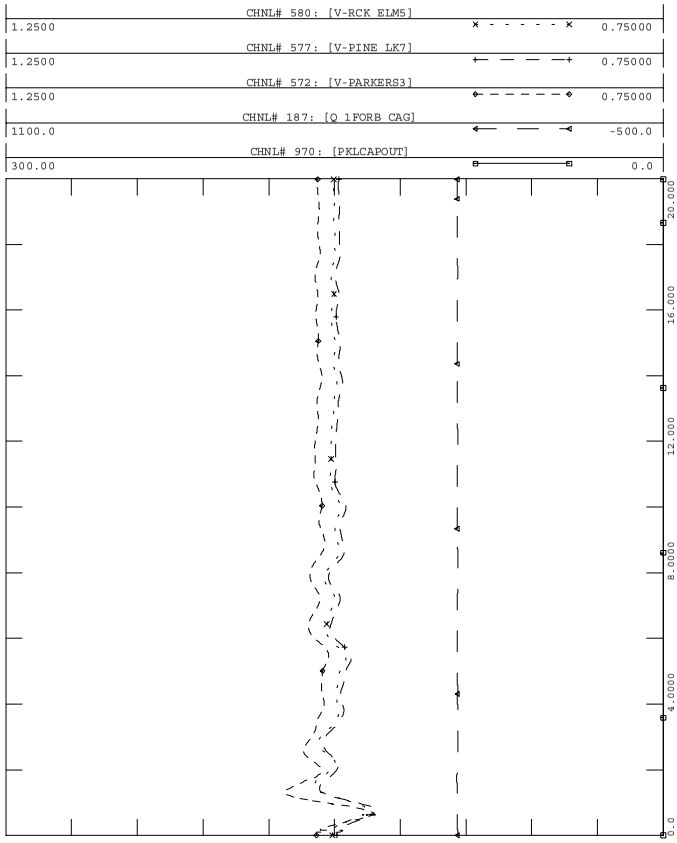
FORBES SVS OUT & VOLTAGES



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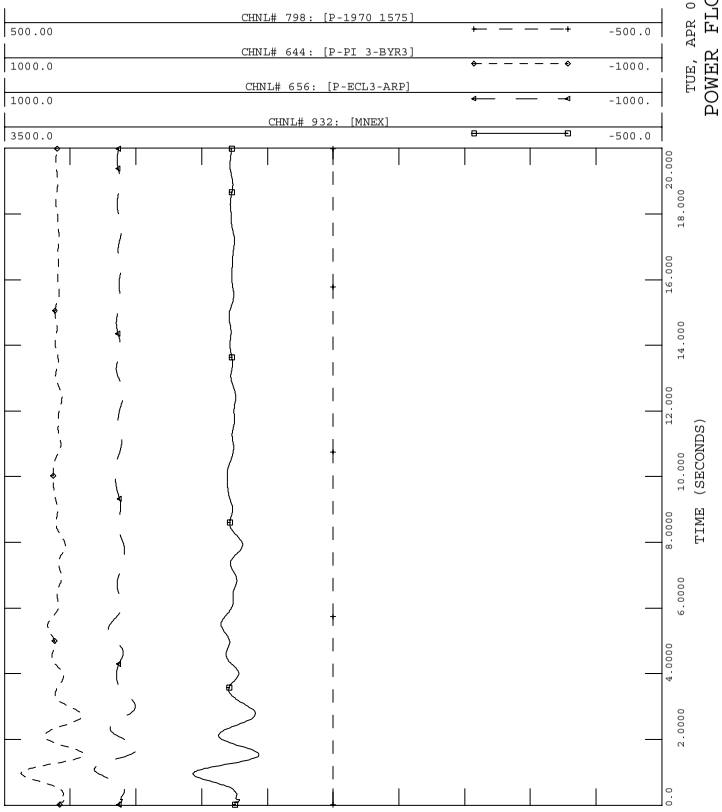
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
POWER FLOW SUMS 2



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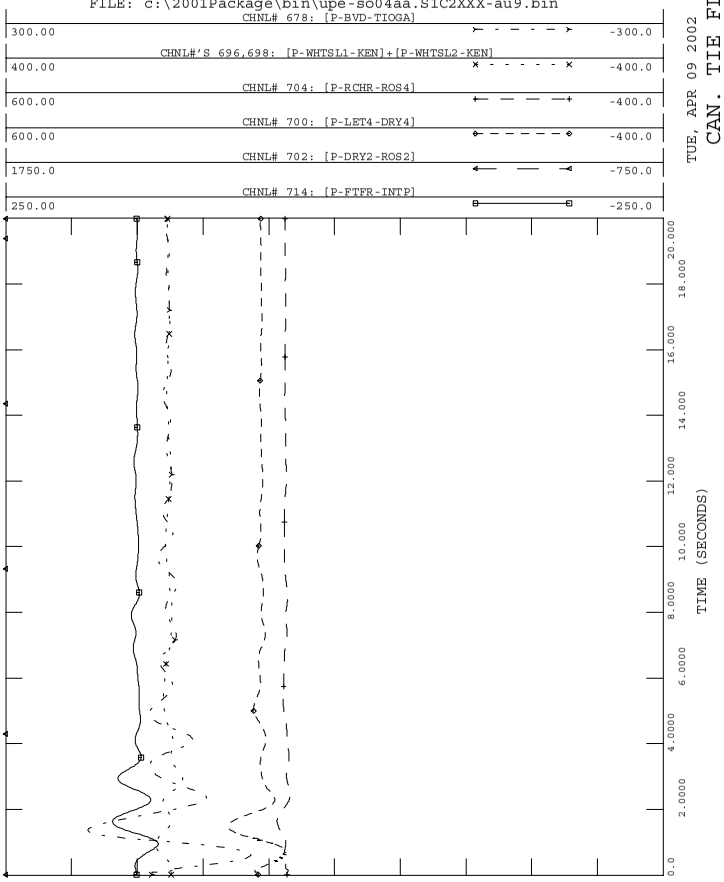
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
CAN. TIE FLOWS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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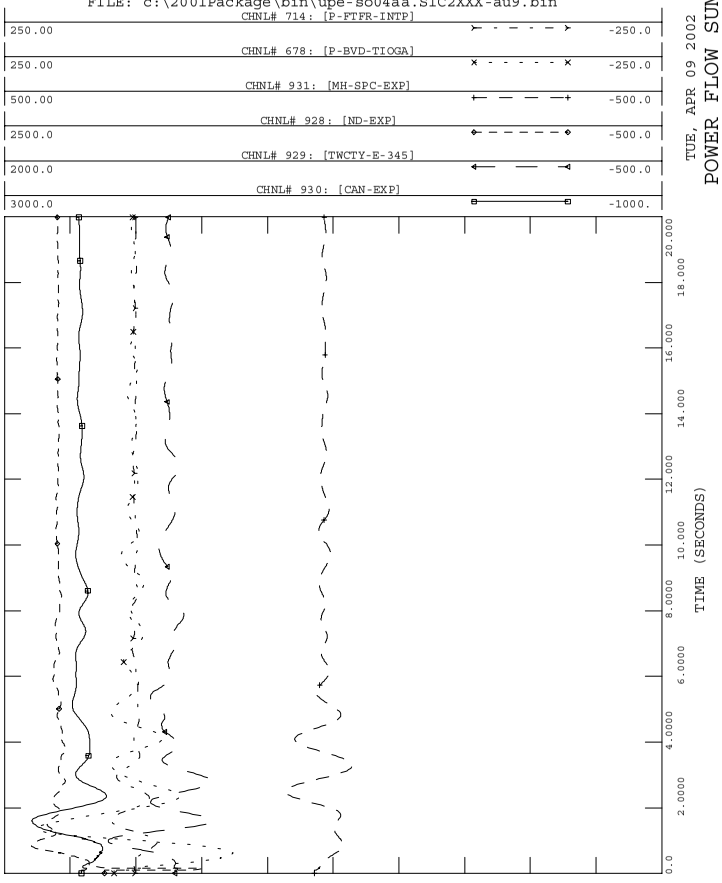
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
POWER FLOW SUMS 1



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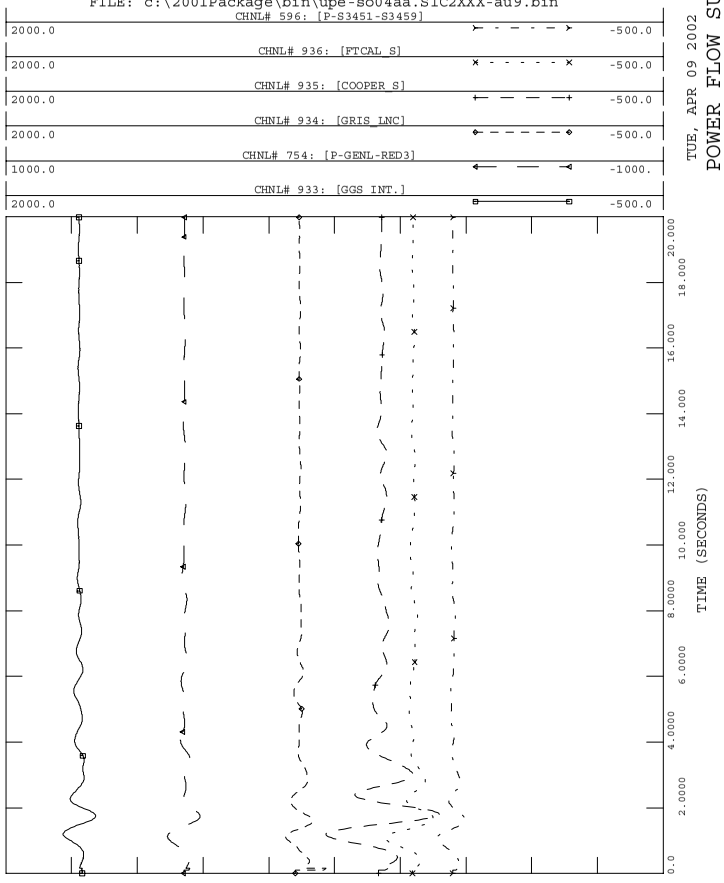
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
POWER FLOW SUM 3



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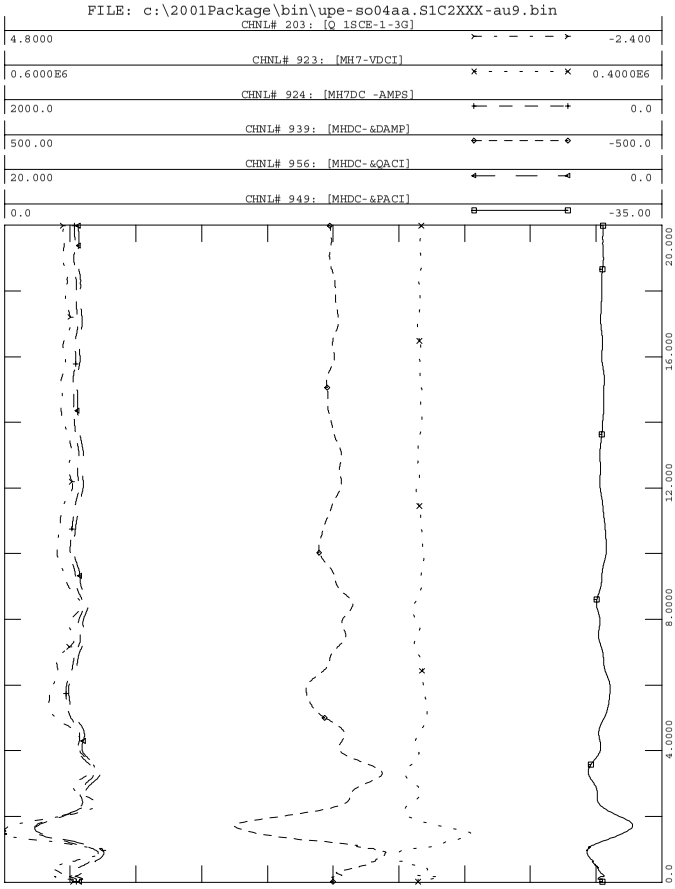
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
MH DC PARAMETERS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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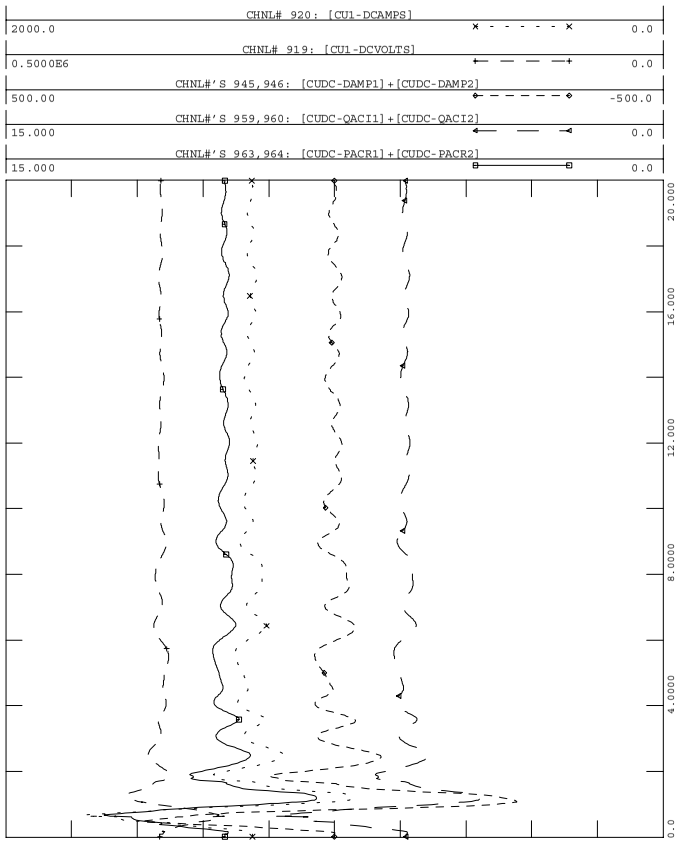
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
CU DC #1



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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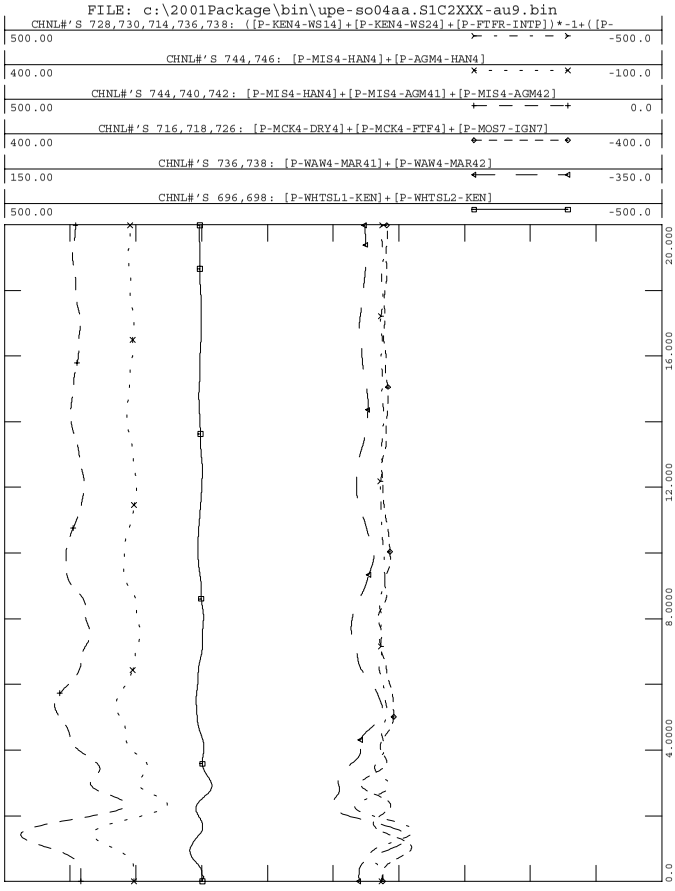
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
OH TIE FLOWS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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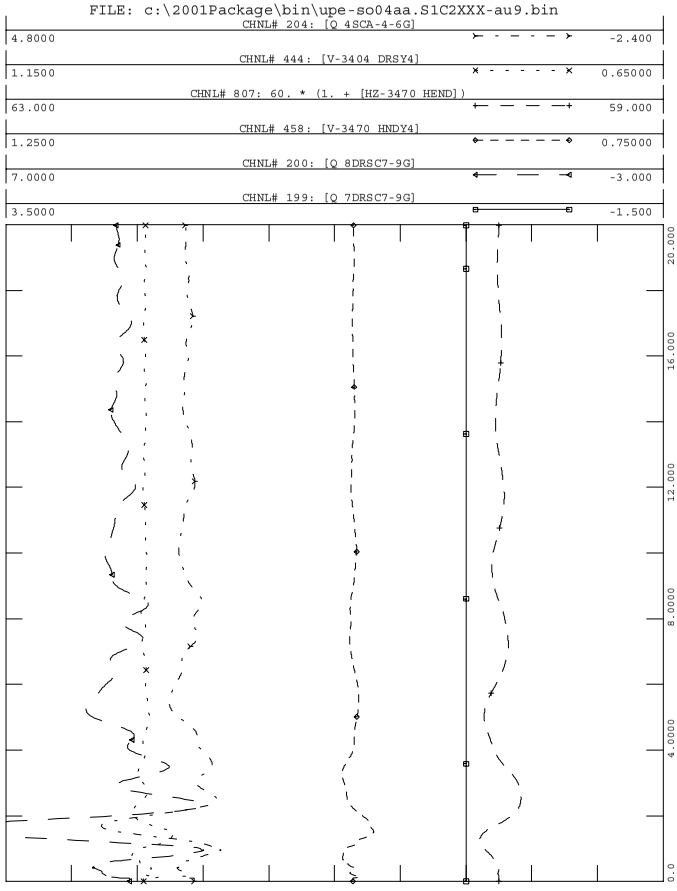
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25
MH DC PARAMETERS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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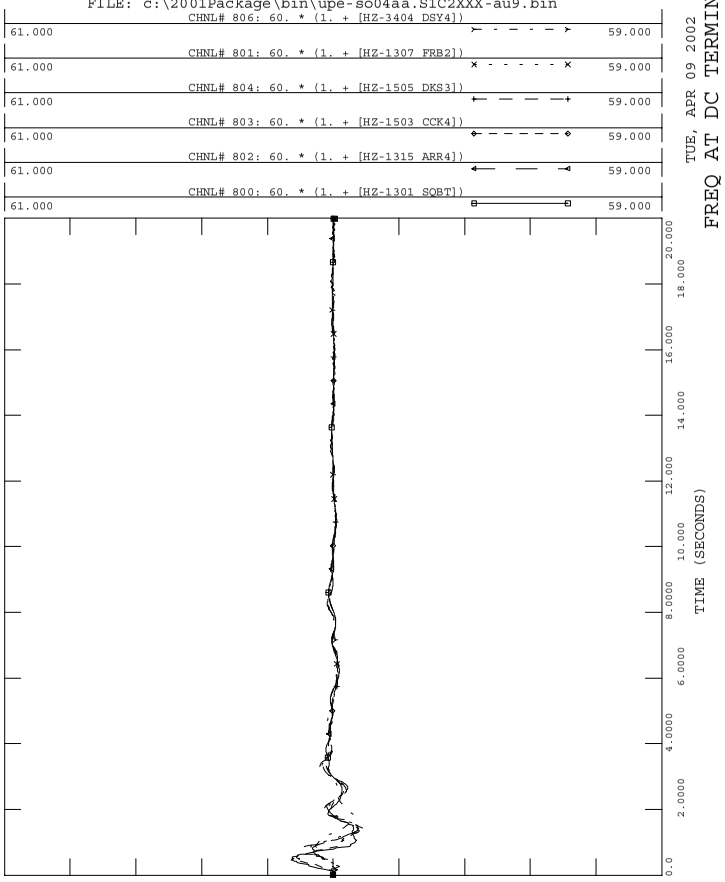
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25

FREQ AT DC TERMINALS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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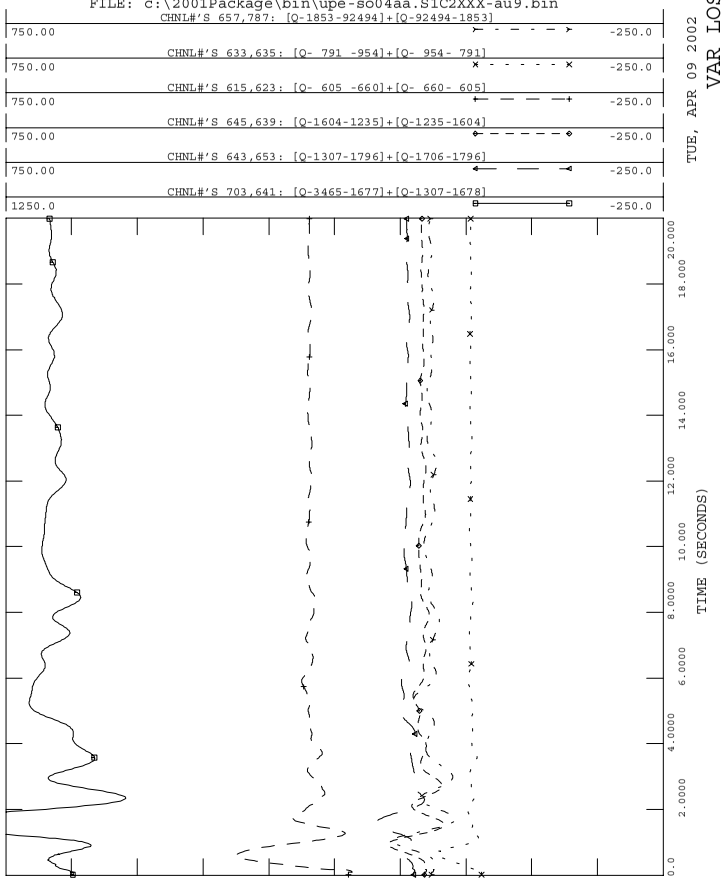
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25

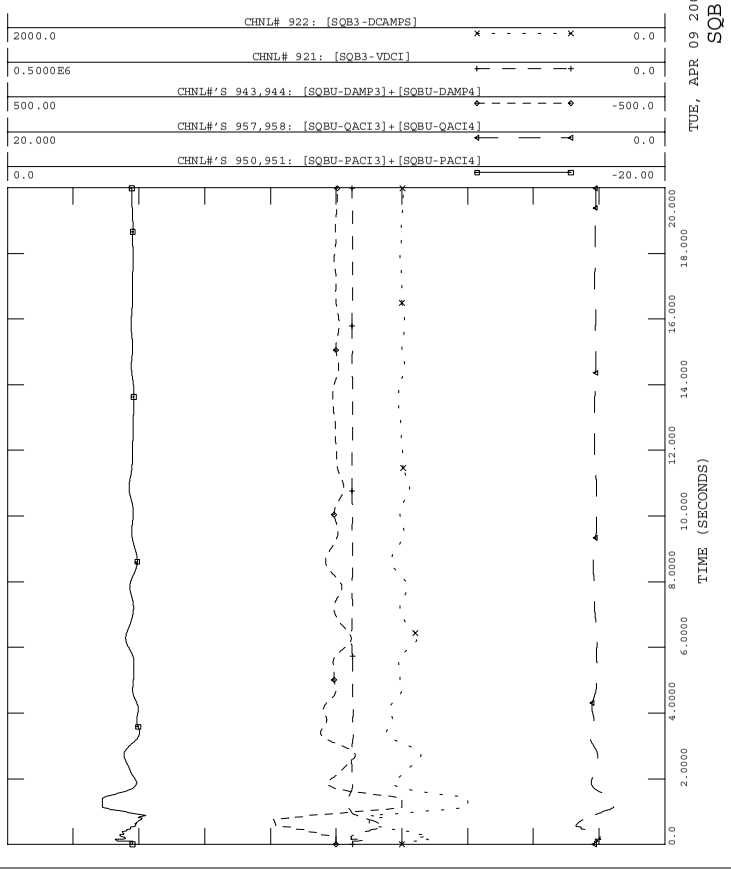
VAR LOSSES



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25

SQB DC #3



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

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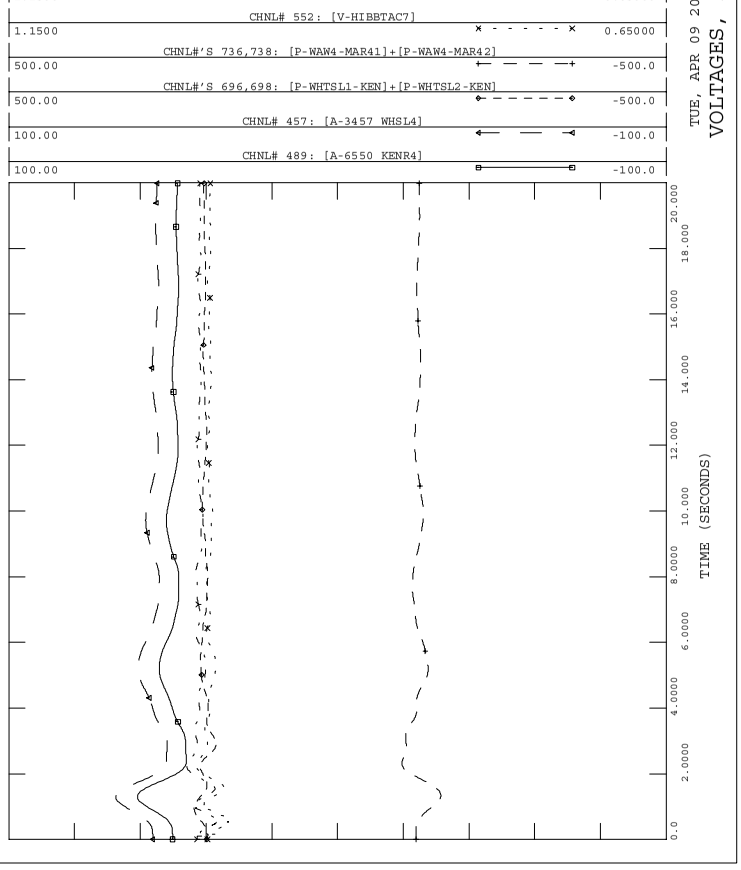
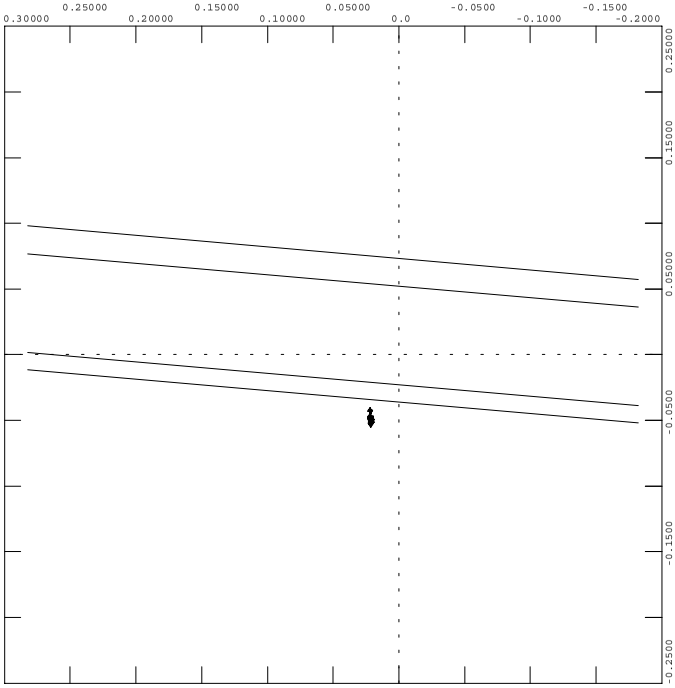
VOLTAGES, ANGLES



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

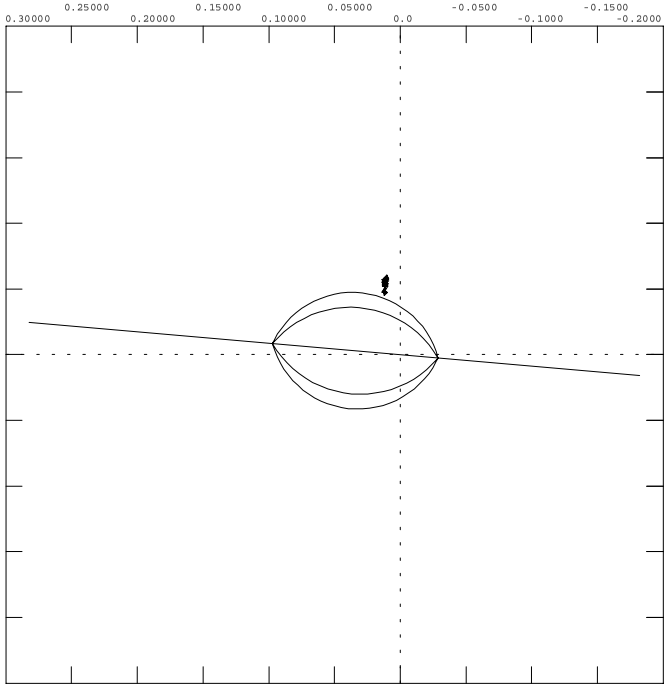


TUE, APR 09 2002 22:25
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]



TUE, APR 09 2002 22:25
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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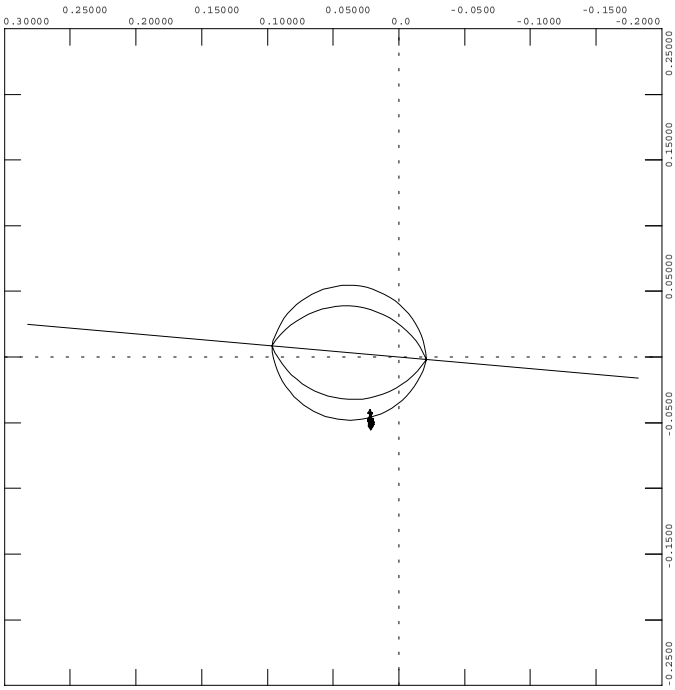
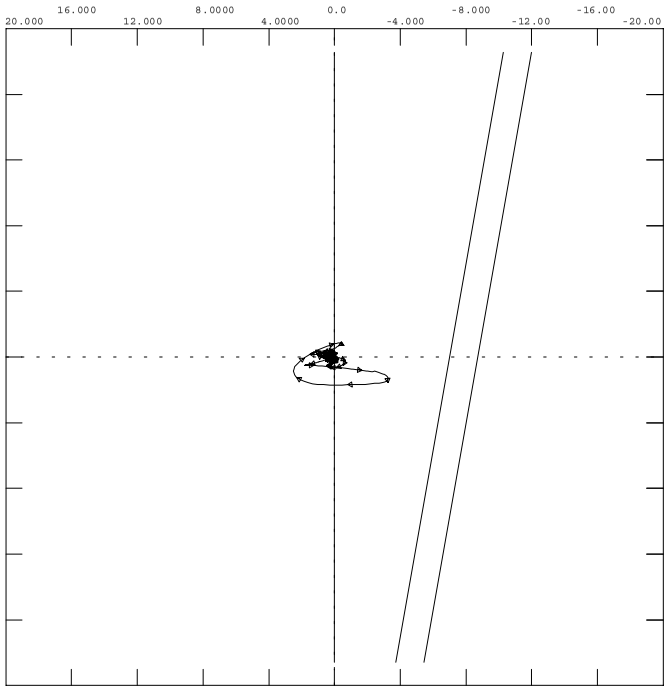


TUE, APR 09 2002 22:25
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

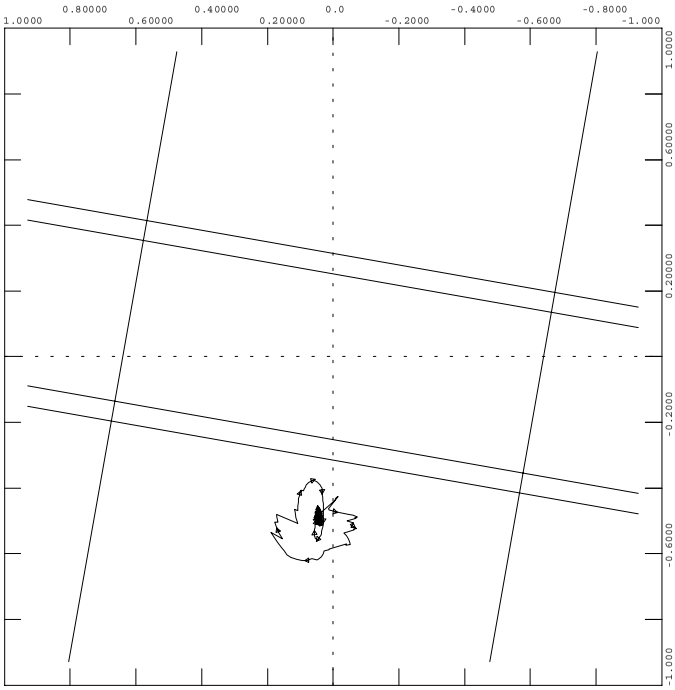


TUE, APR 09 2002 22:25
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

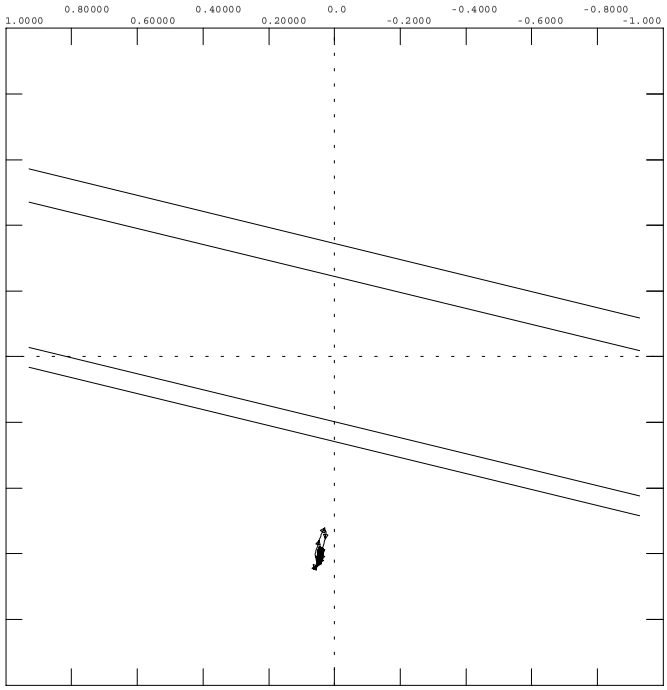
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

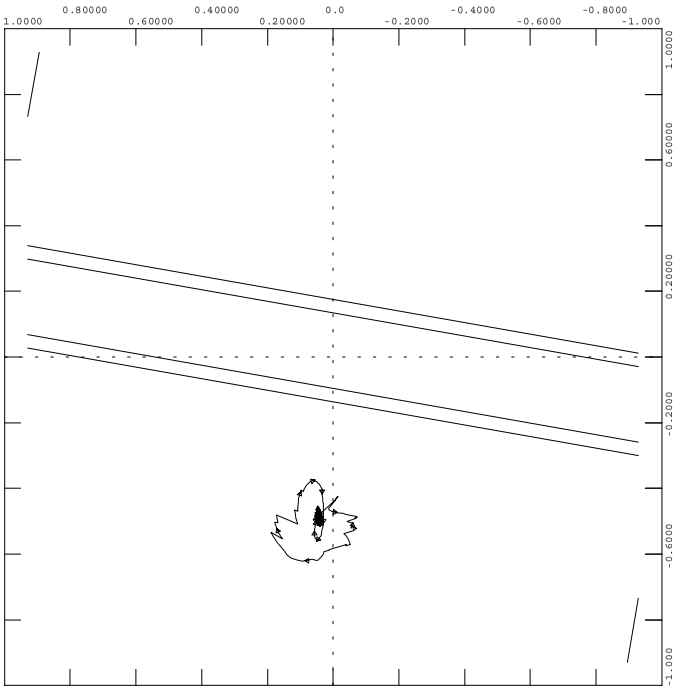
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

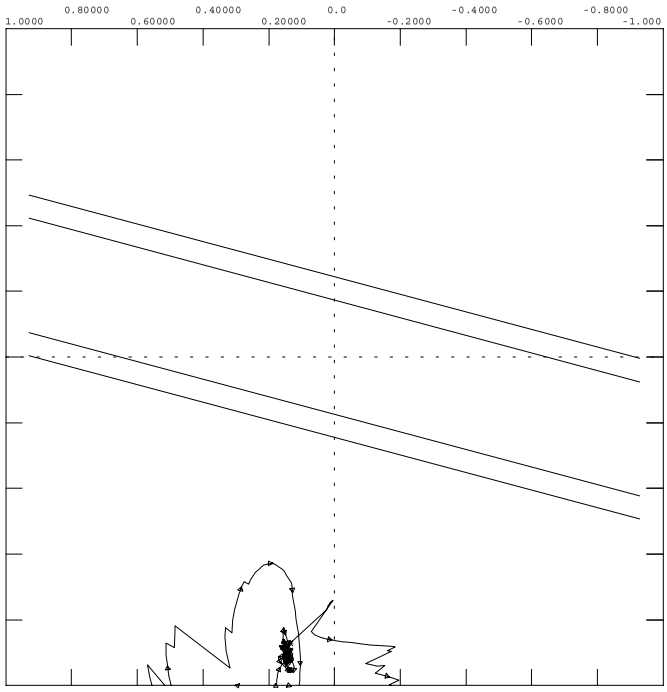
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

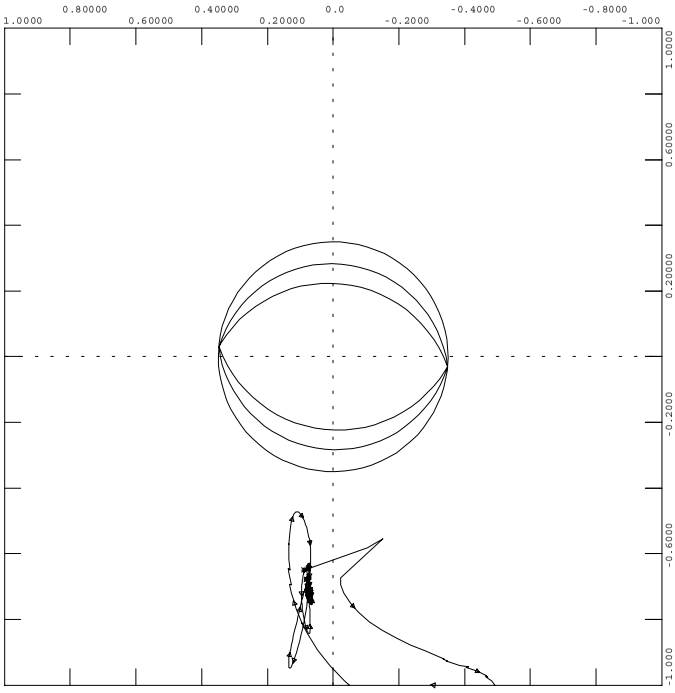
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

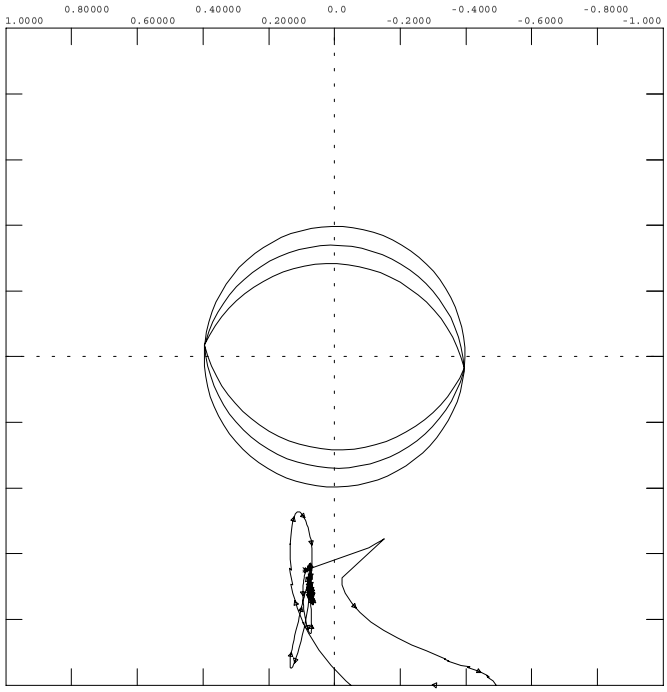
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

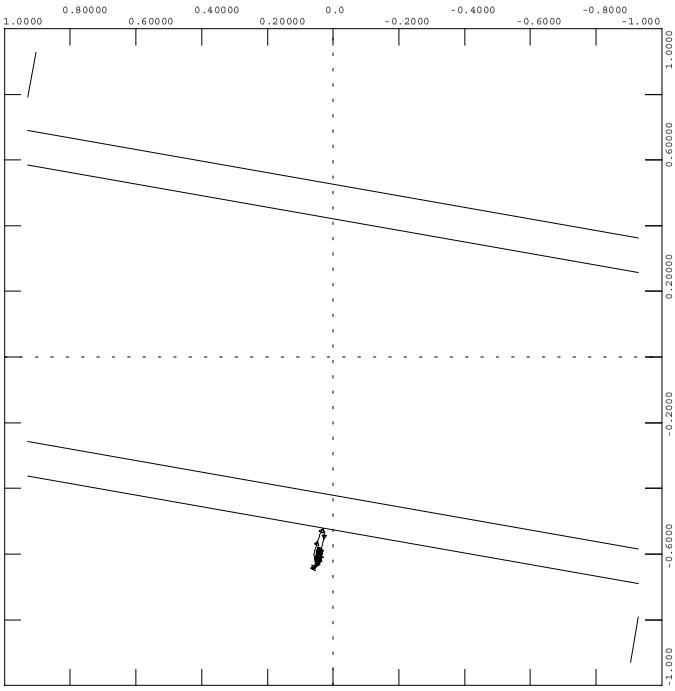
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

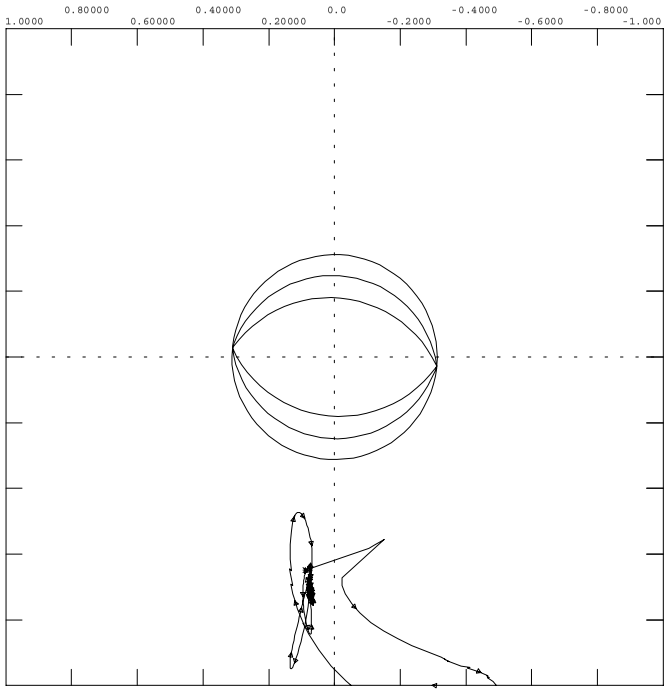
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



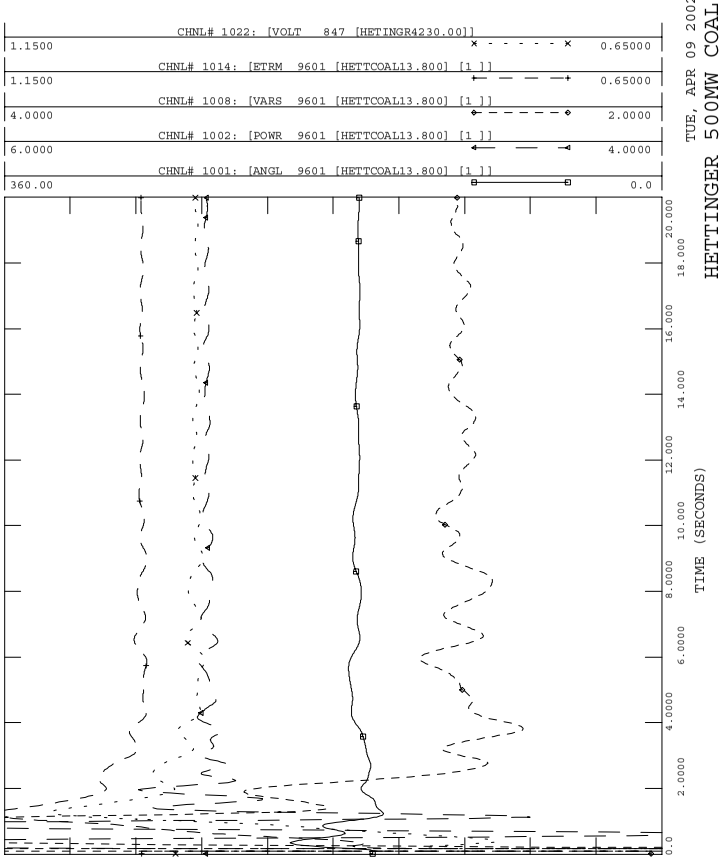
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

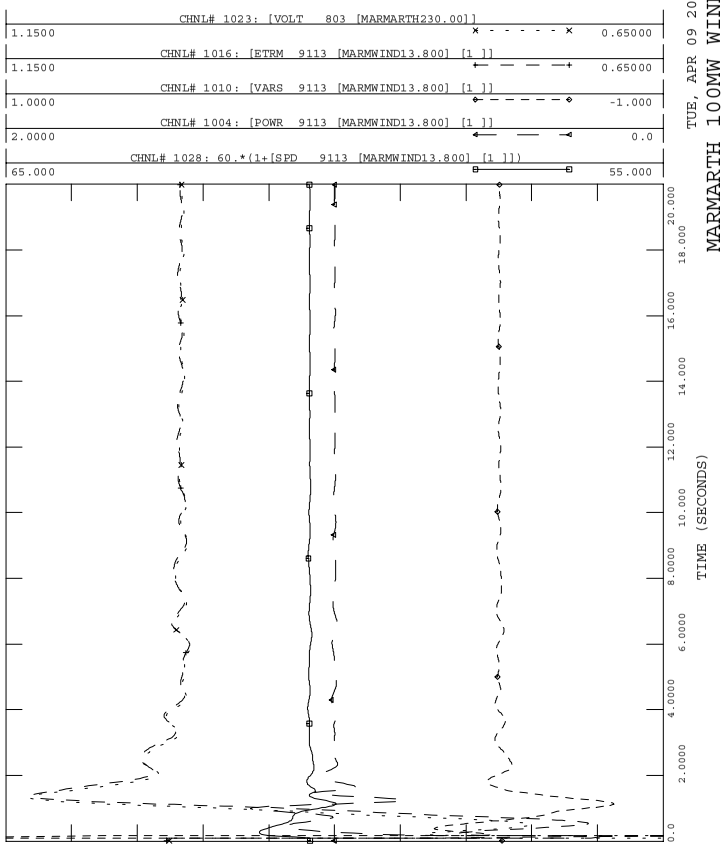


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin



TUE, APR 09 2002 22:25
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

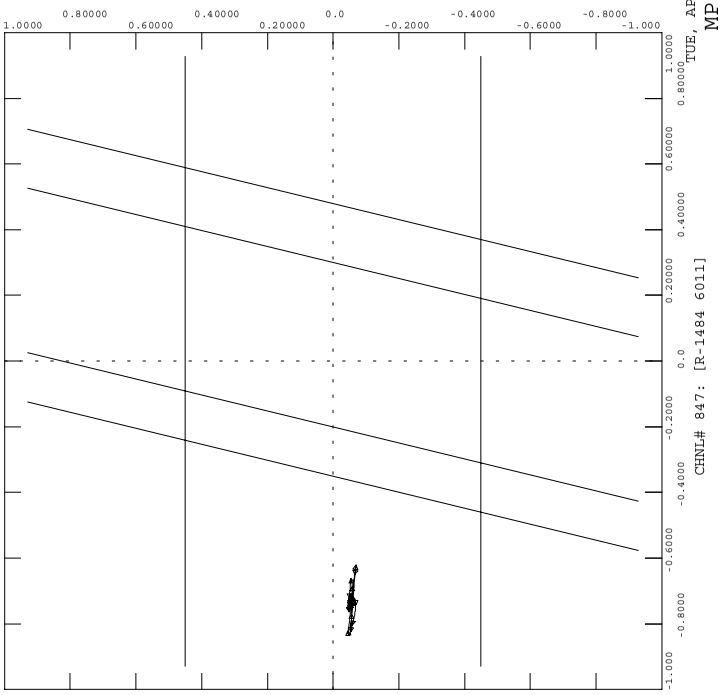


TUE, APR 09 2002 22:25
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

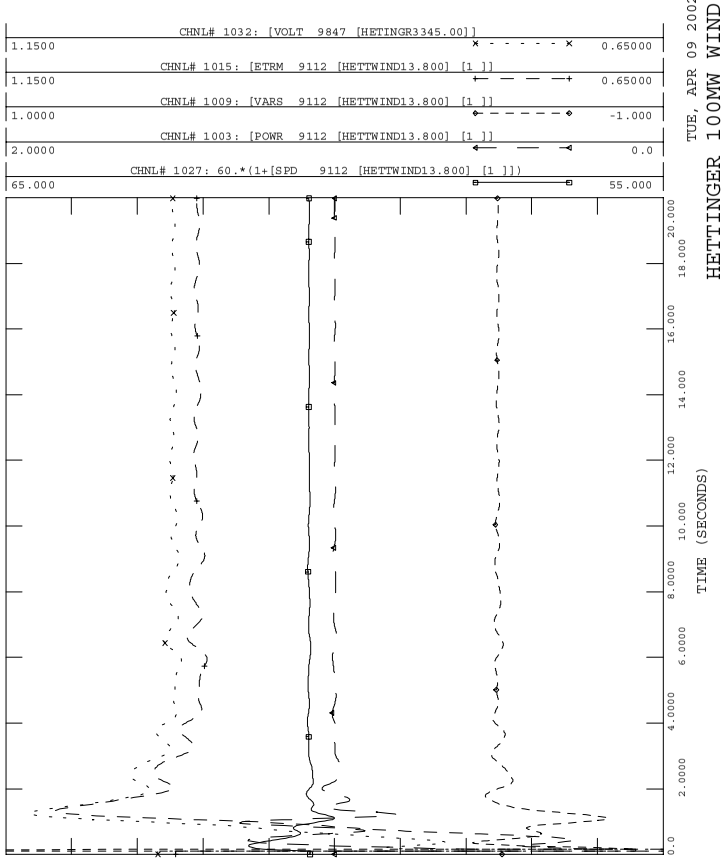
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



TUE, APR 09 2002 22:25
MP-OH I.FALLS (779)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

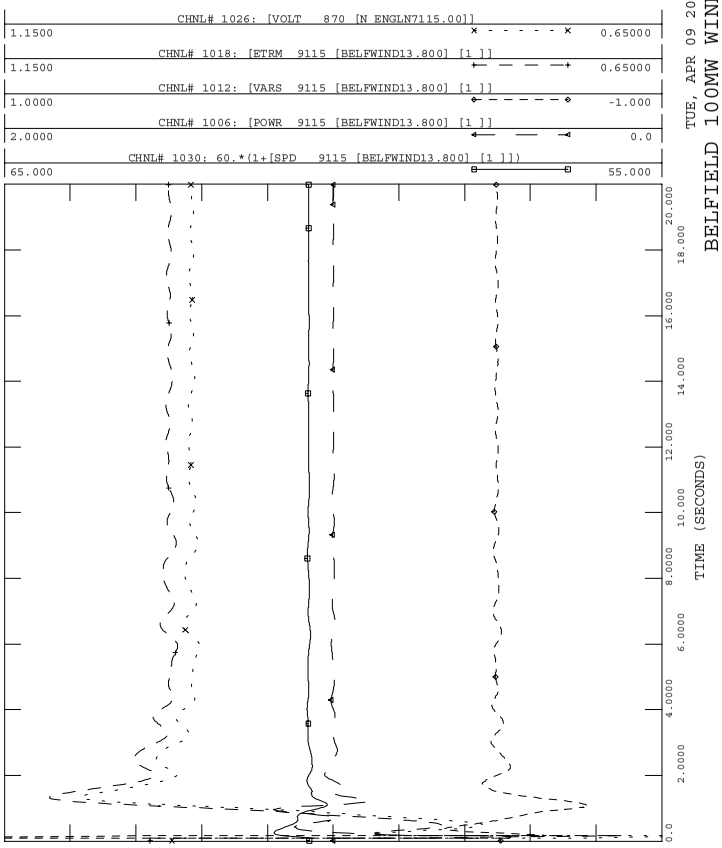


TUE, APR 09 2002 22:25
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25

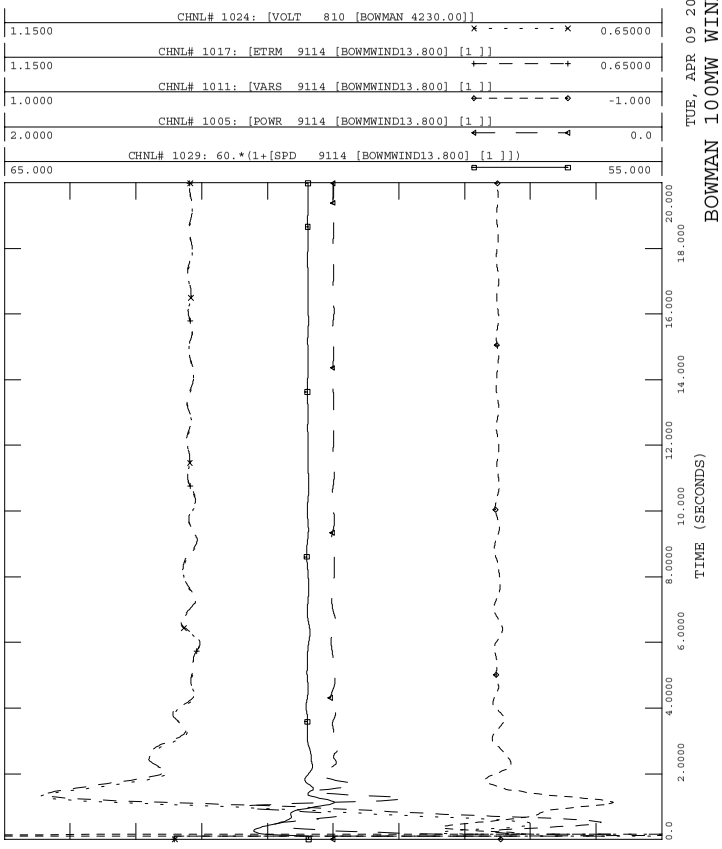
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25

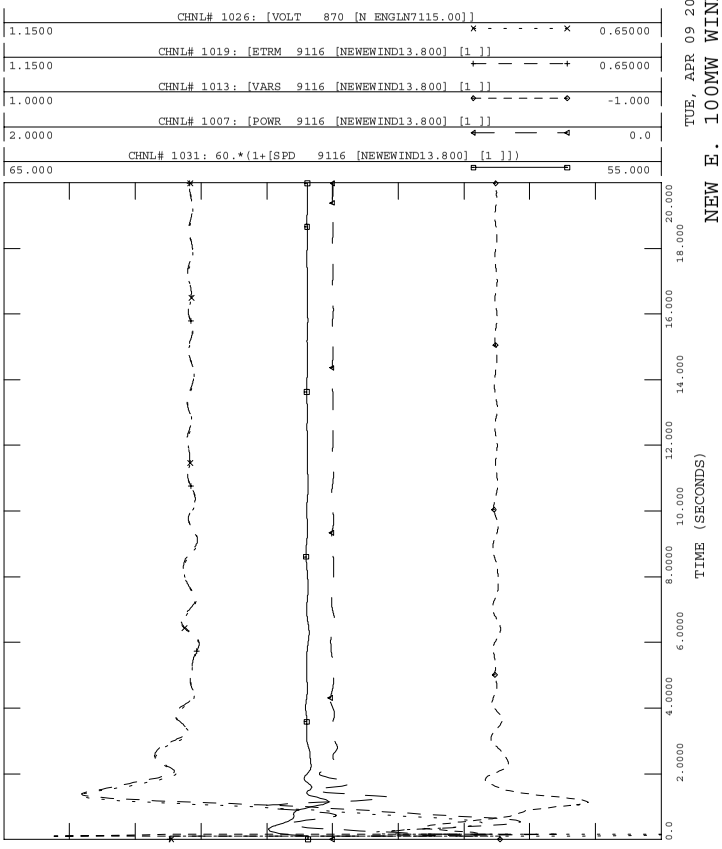
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-au9.bin

TUE, APR 09 2002 22:25

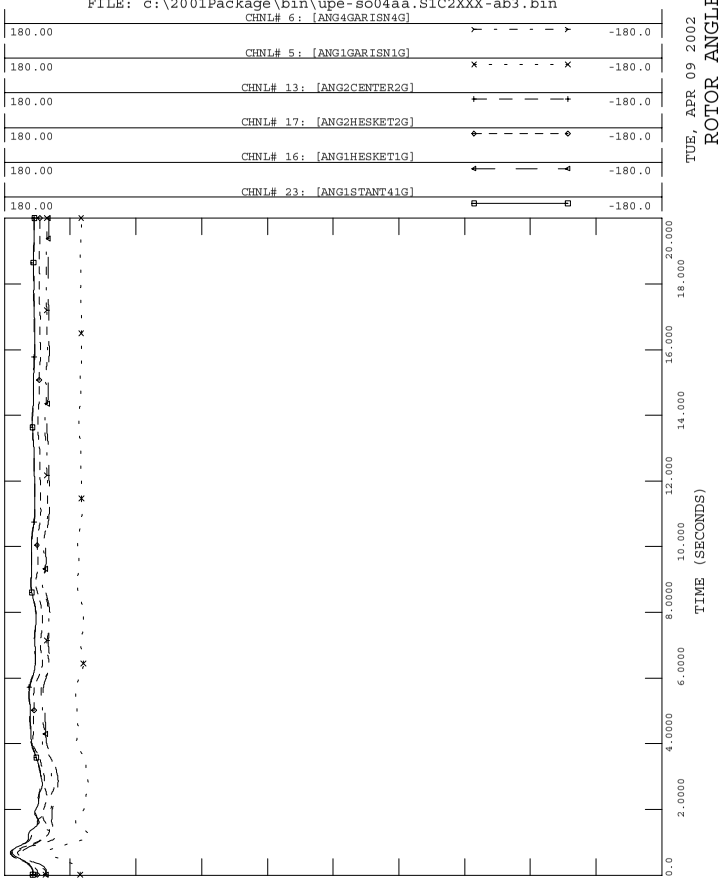
NEW E. 100MW WIND UNIT



CONTINGENCY AB3

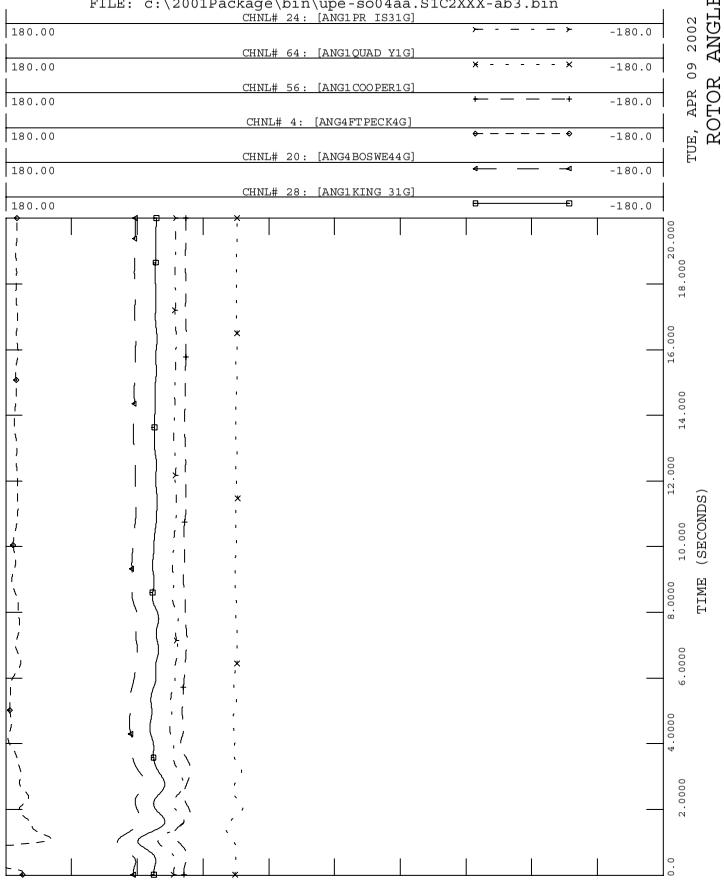
4 cycle 3 phase fault at Hettinger 345 kV. Clear the Hettinger - Glenham 345 kV line

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



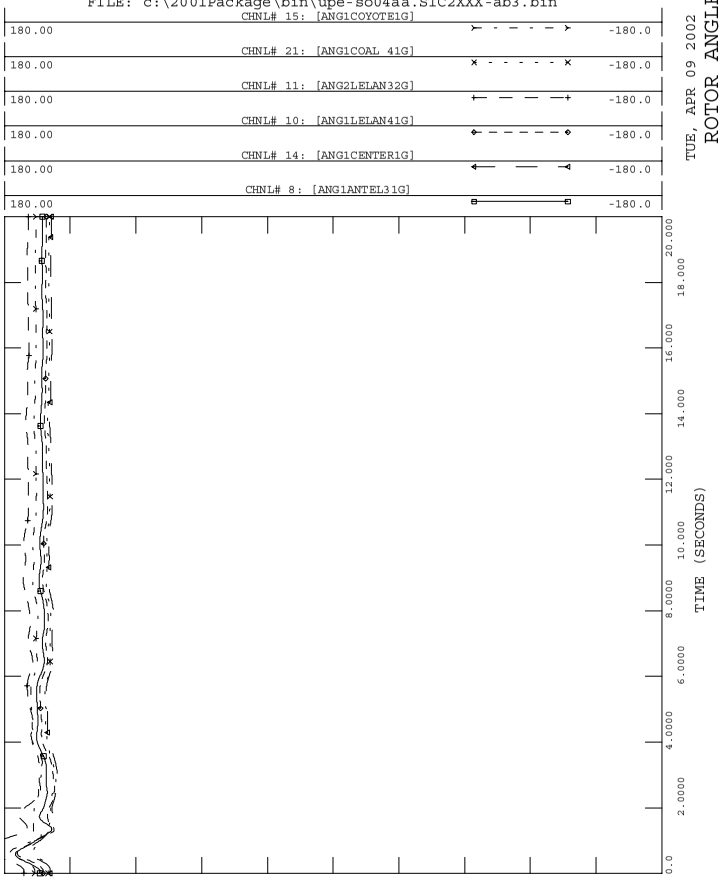
TUE, APR 09 2002 22:41
ROTOR ANGLES 2

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



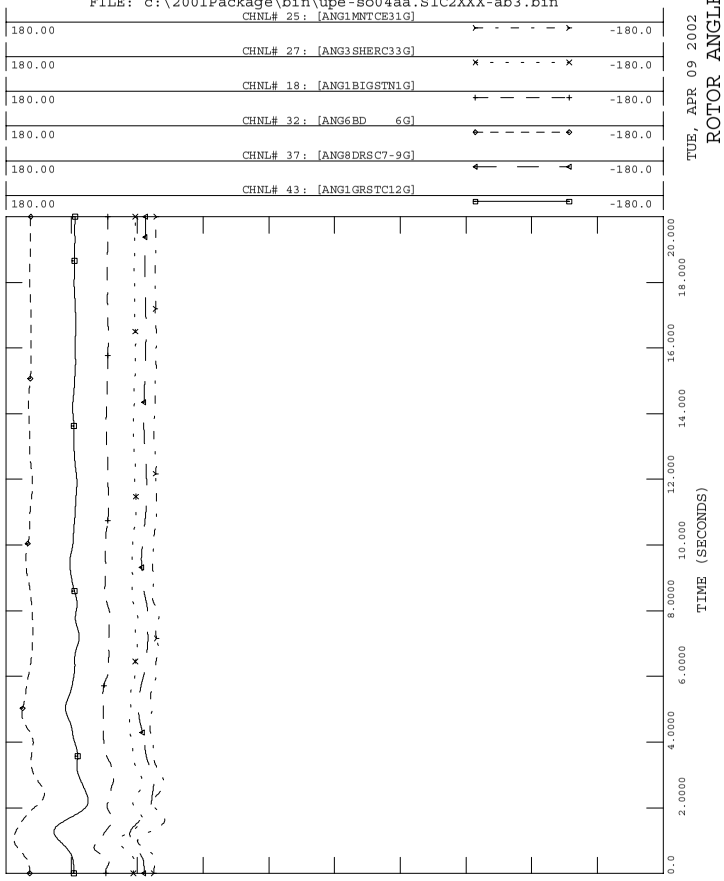
TUE, APR 09 2002 22:41
ROTOR ANGLES 4

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



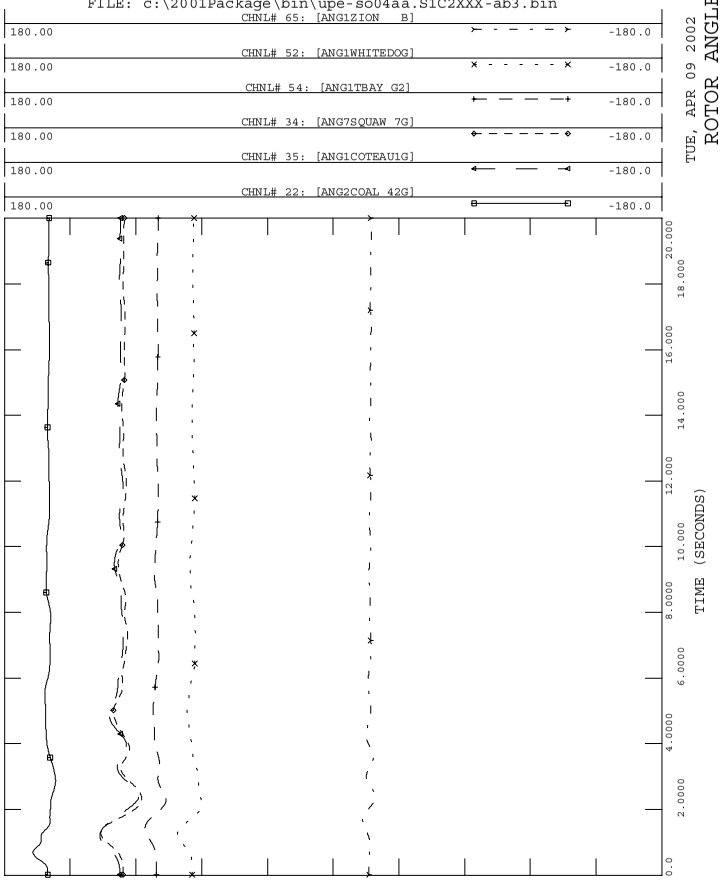
TUE, APR 09 2002 22:41
ROTOR ANGLES 1

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



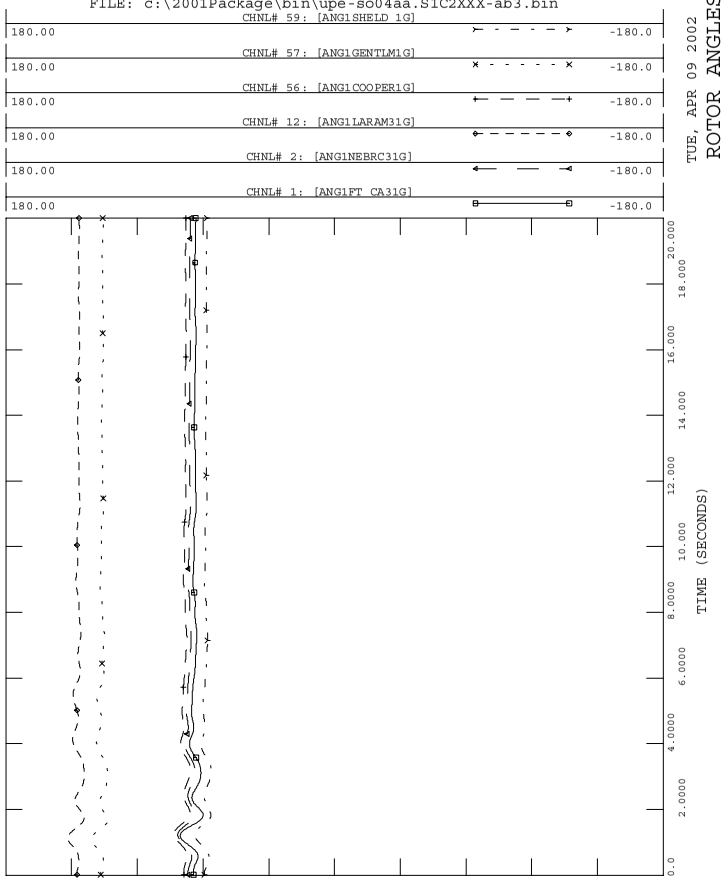
TUE, APR 09 2002 22:41
ROTOR ANGLES 3

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



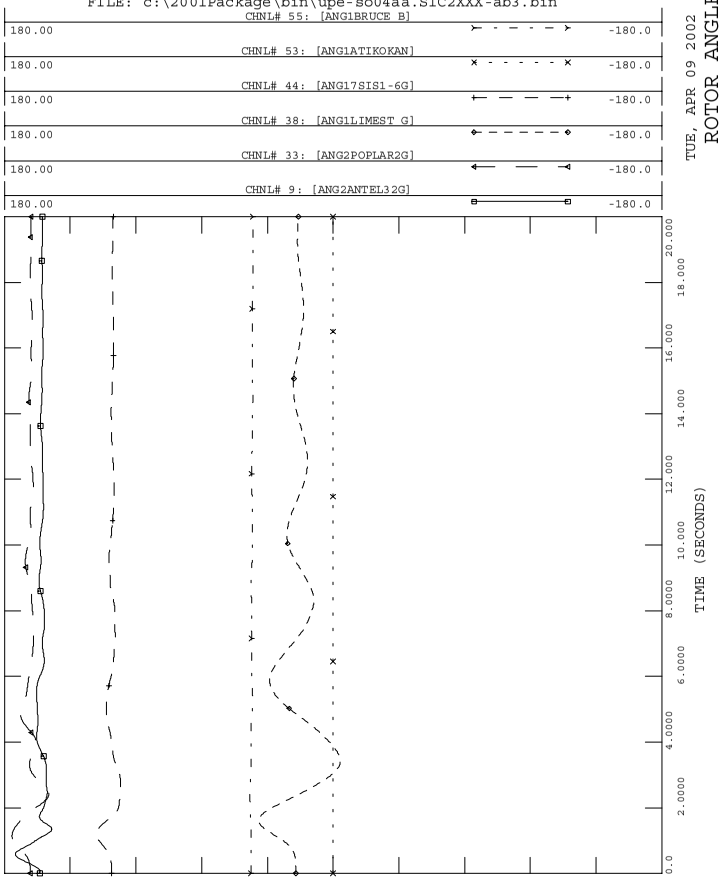
TUE, APR 09 2002 22:41
ROTOR ANGLES 6

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



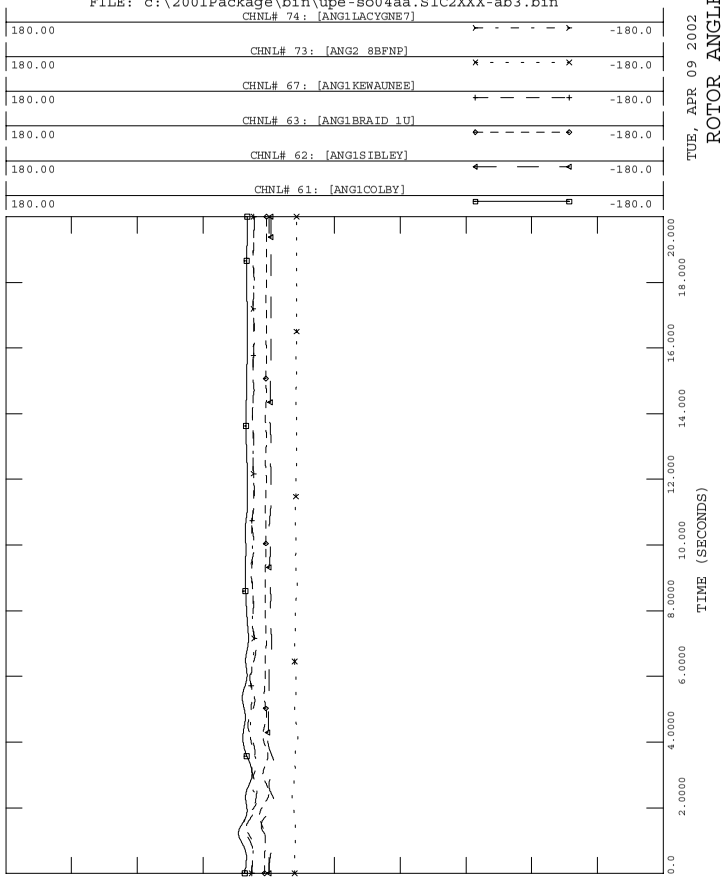
TUE, APR 09 2002 22:41
ROTOR ANGLES NB

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



TUE, APR 09 2002 22:41
ROTOR ANGLES 5

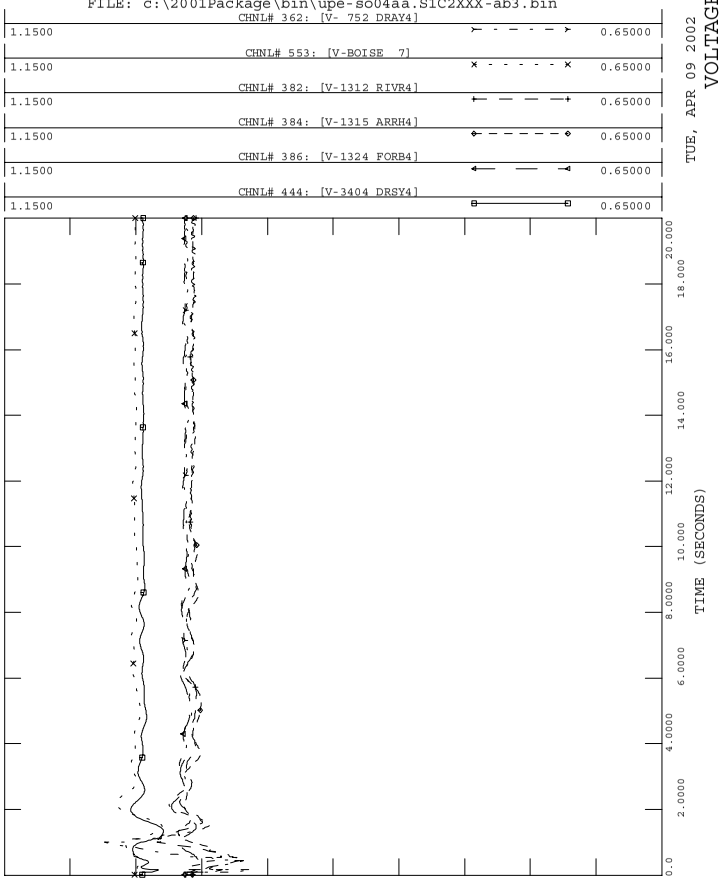
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



TUE, APR 09 2002 22:41
ROTOR ANGLES 7

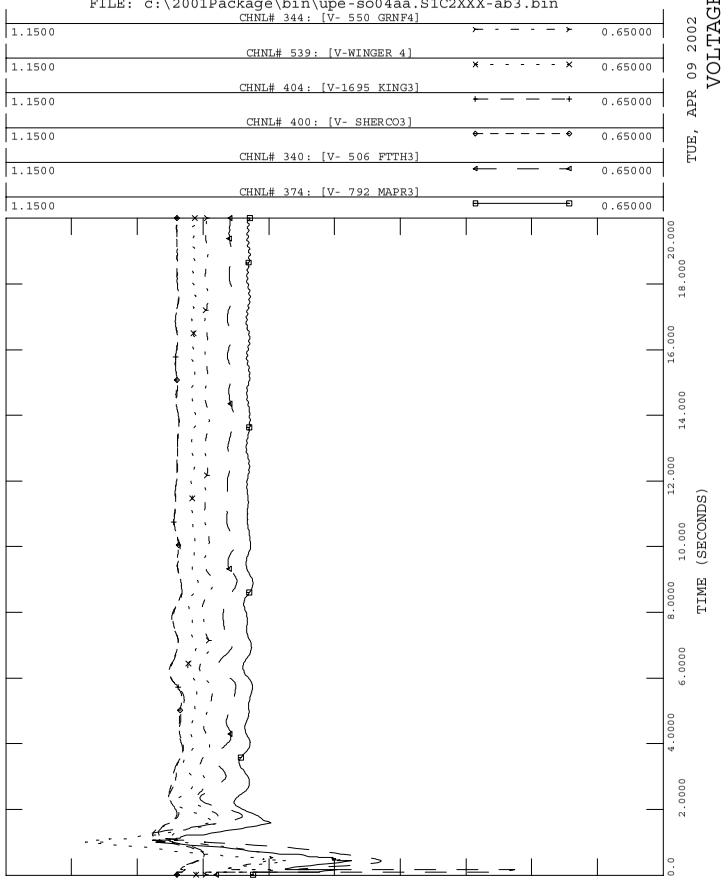
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
VOLTAGES 1



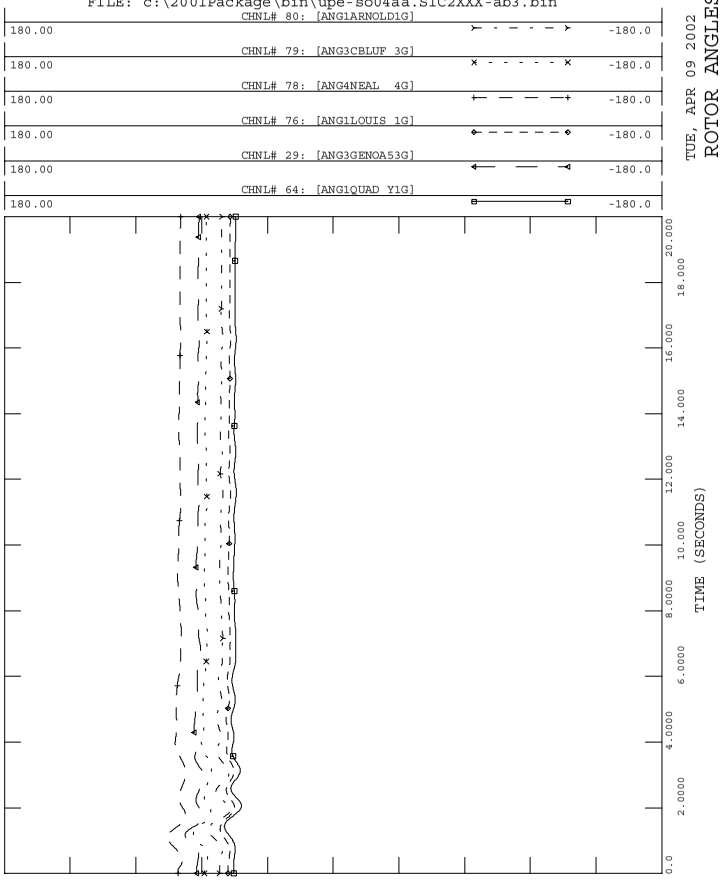
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
VOLTAGES 3



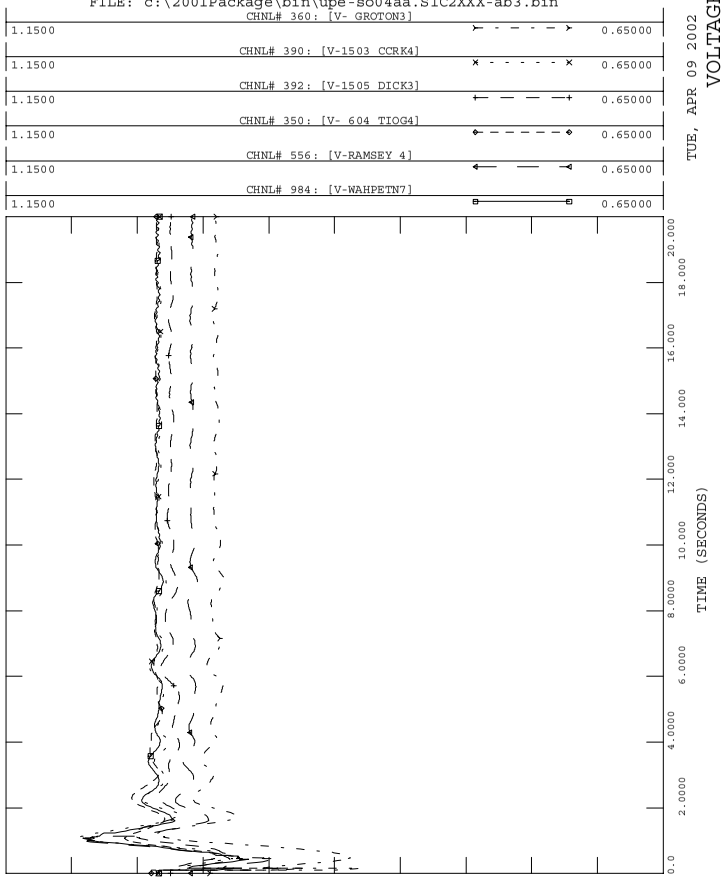
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
ROTOR ANGLES IA



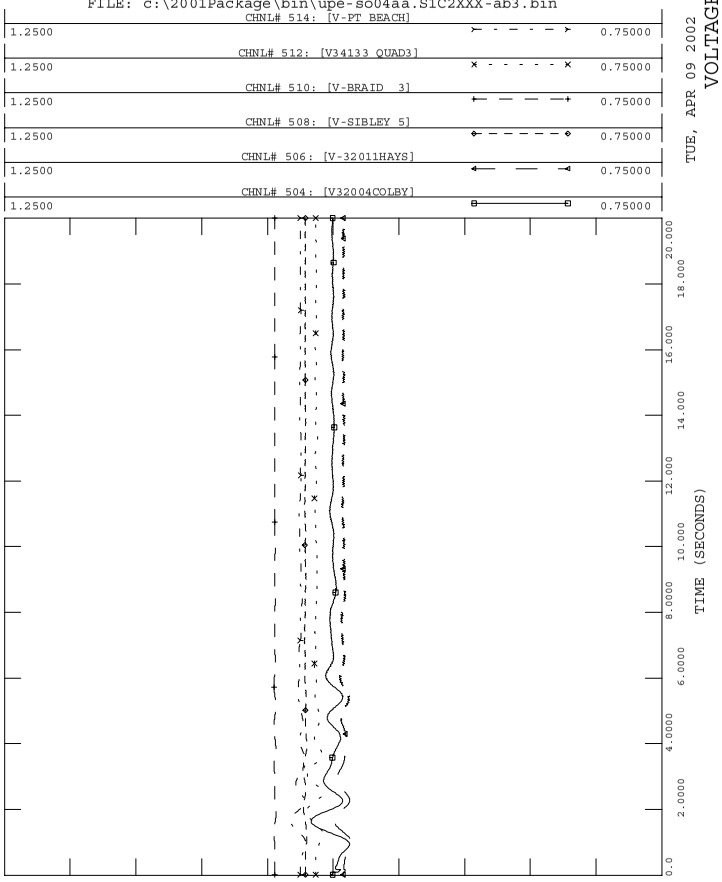
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
VOLTAGES 2



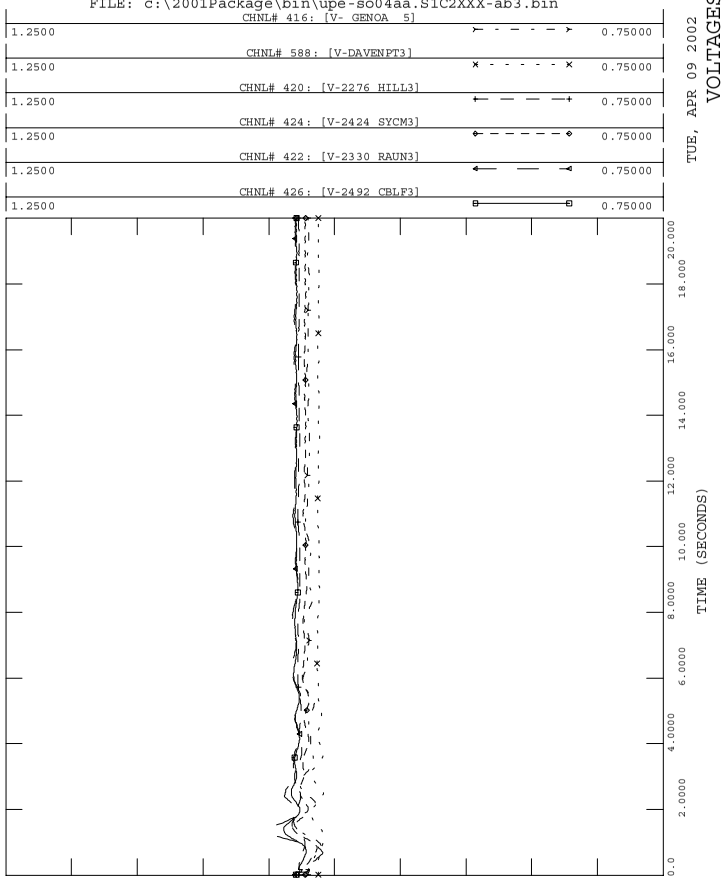
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
VOLTAGES 5



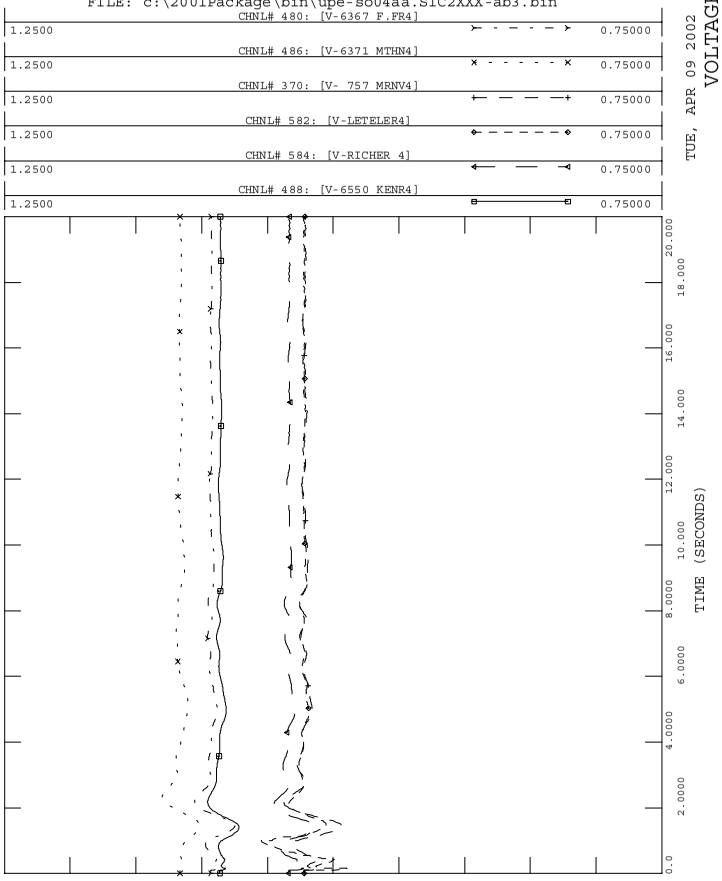
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
VOLTAGES IA



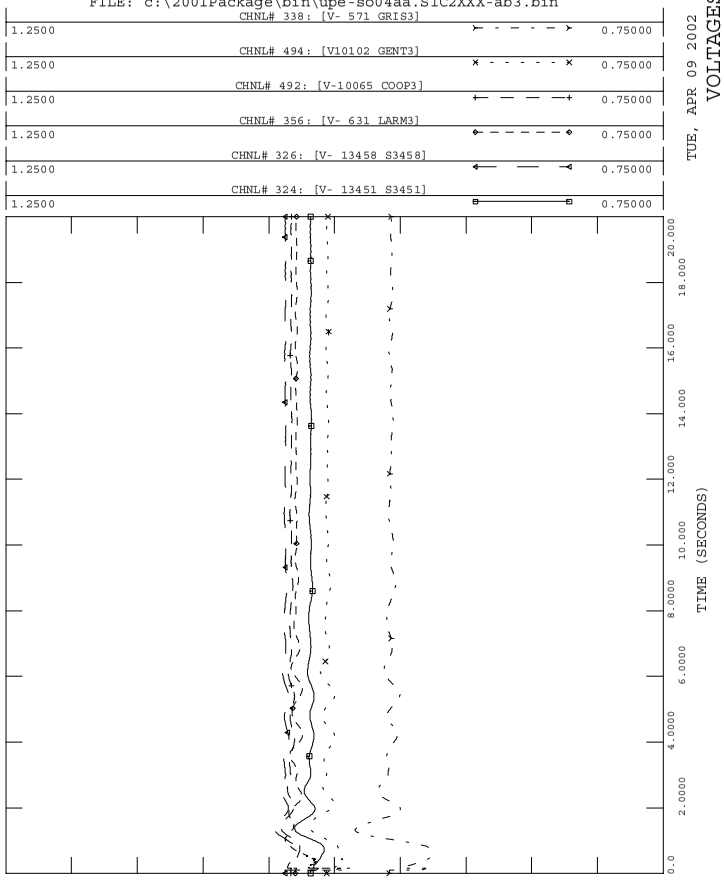
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
VOLTAGES 4

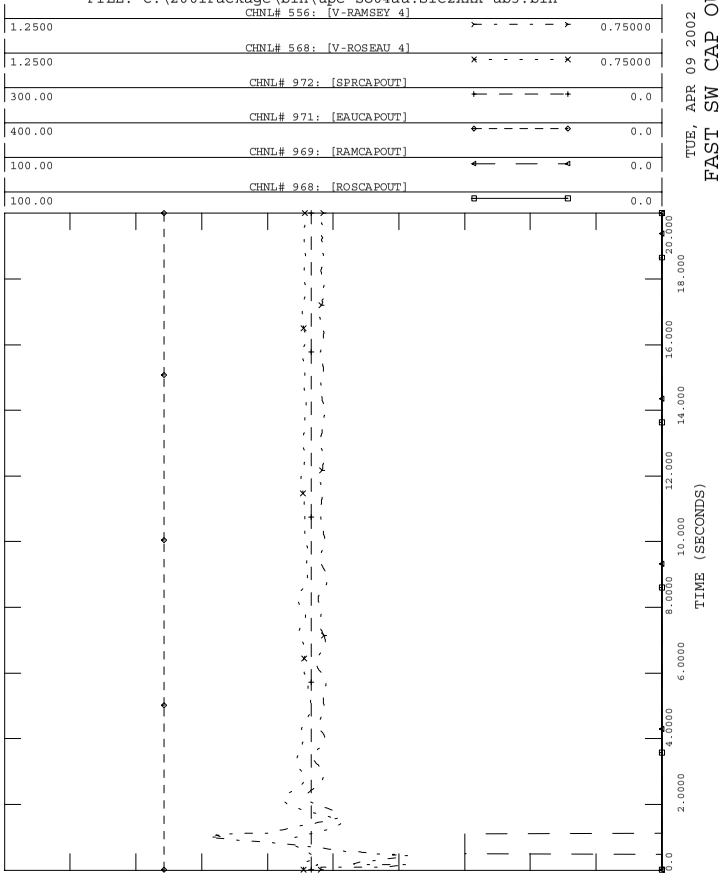


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
VOLTAGES NB

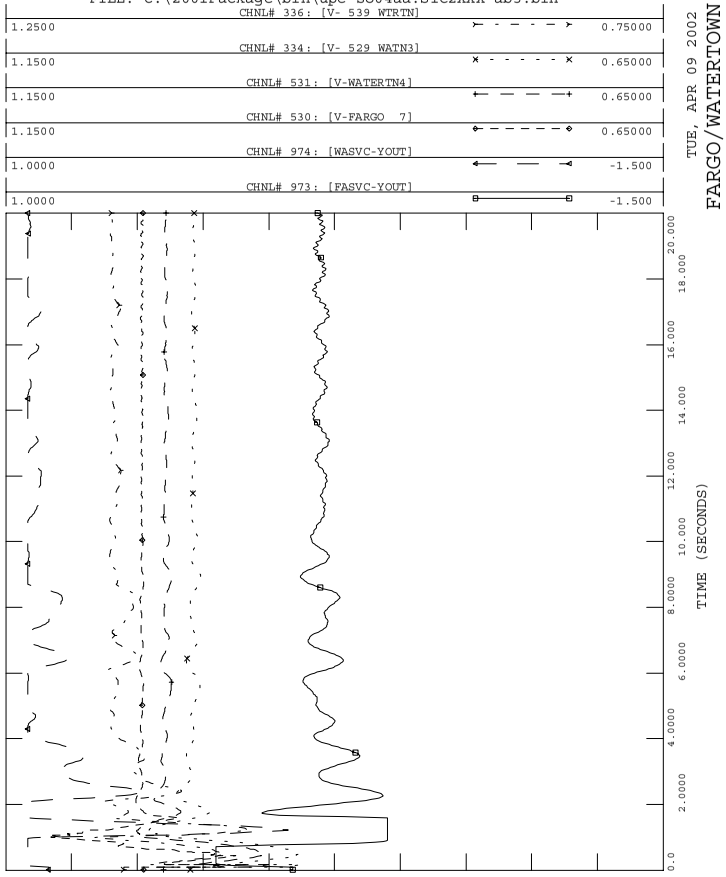


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



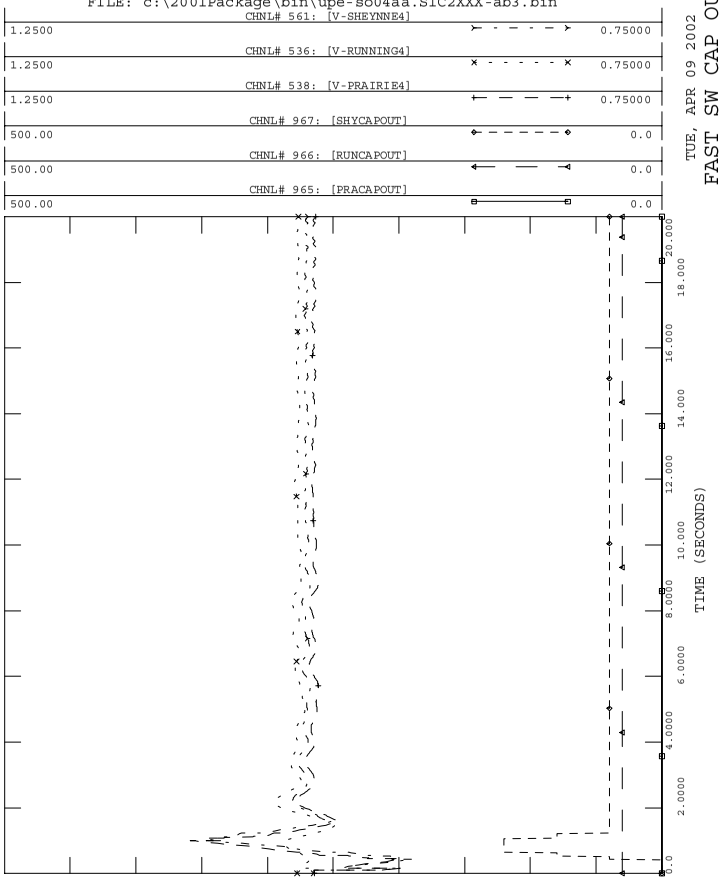
TUE, APR 09 2002 22:41
FAST SW CAP OUT 2

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



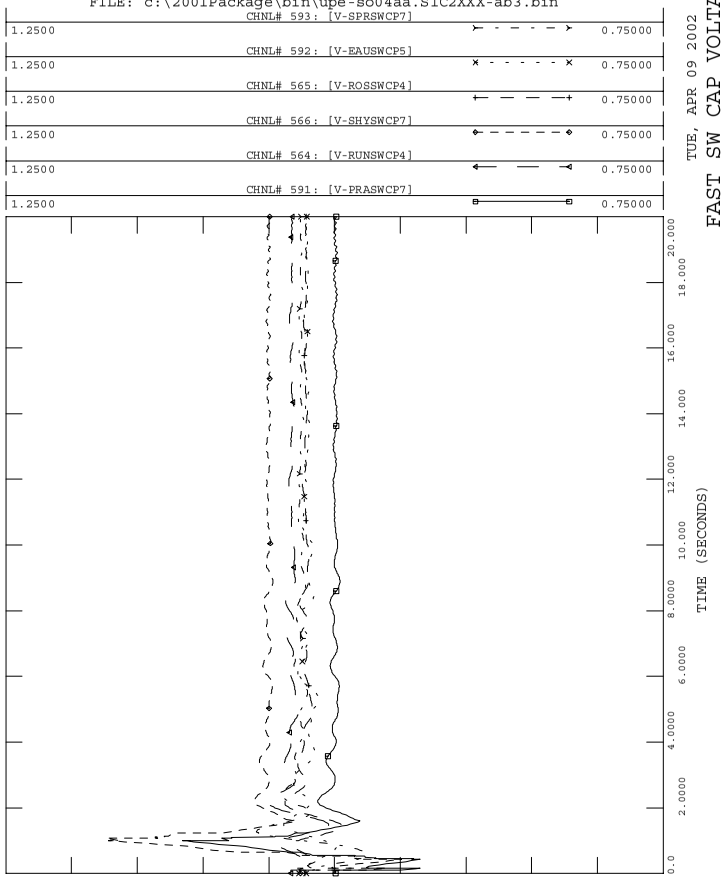
TUE, APR 09 2002 22:41
FARGO/WATERTOWN SVS

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



TUE, APR 09 2002 22:41
FAST SW CAP OUT 1

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

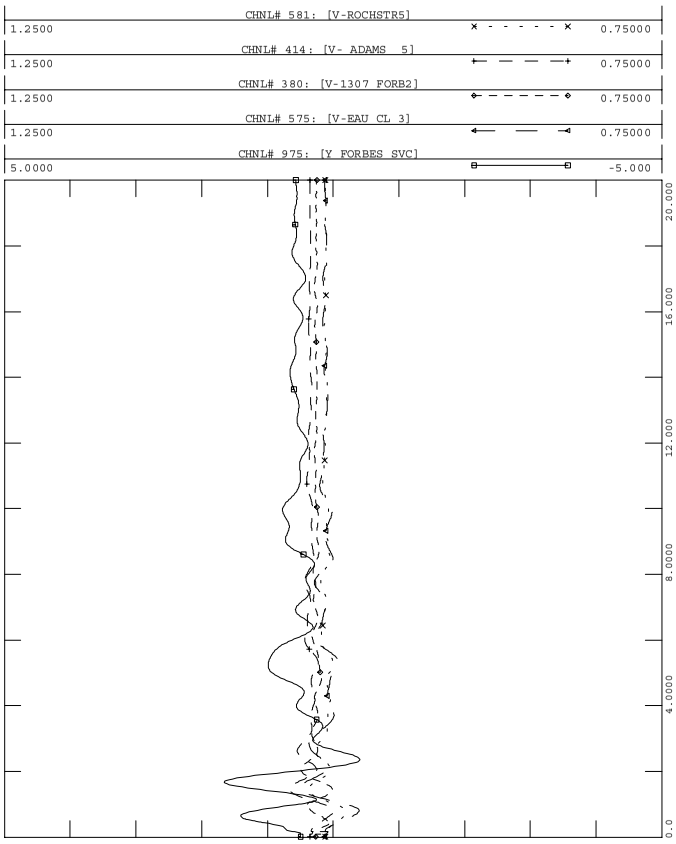


TUE, APR 09 2002 22:41
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41

SVC & WISCONSIN VOLT



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

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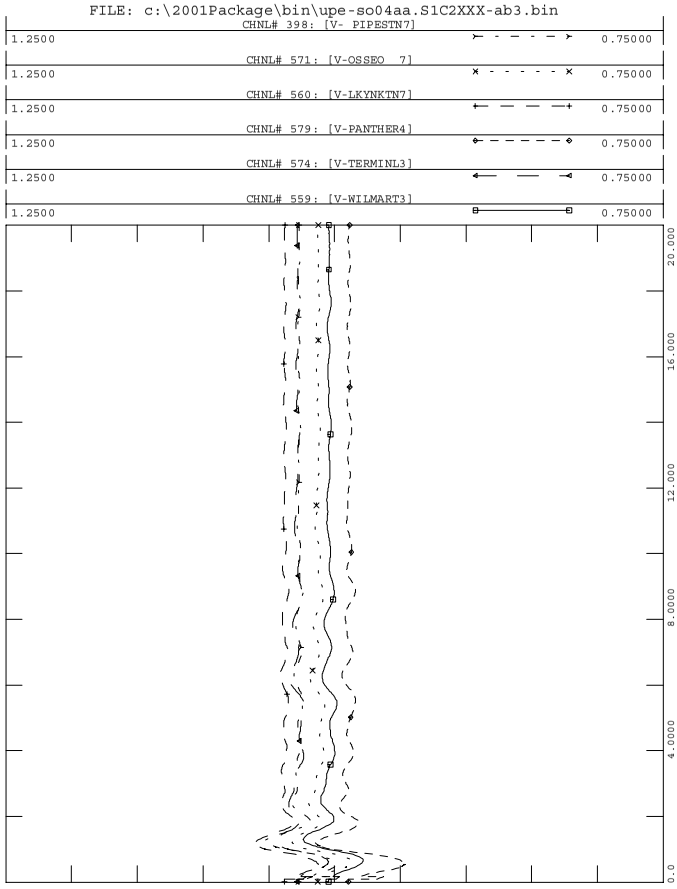
TC VOLTAGES



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

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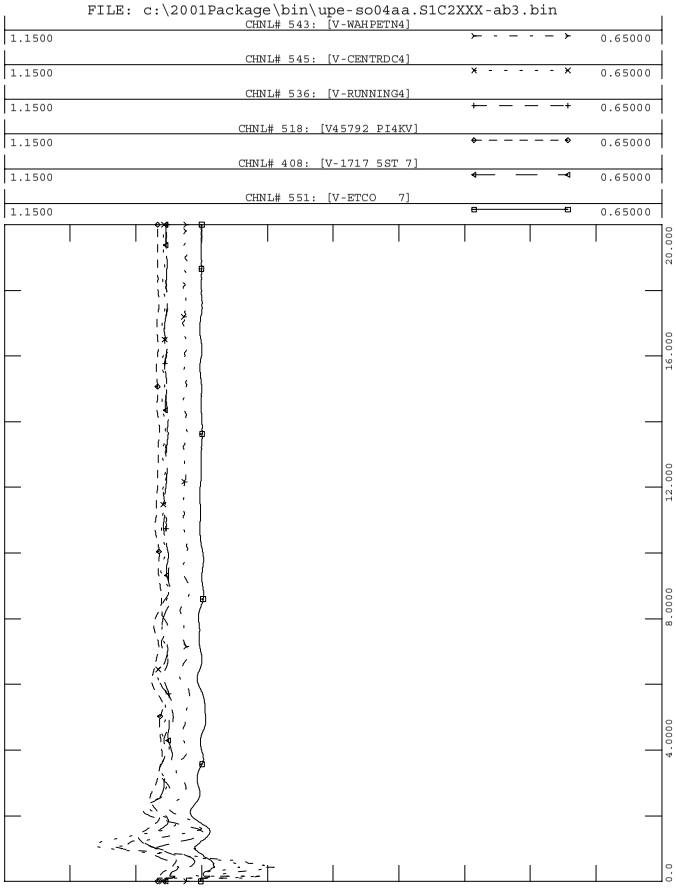
VOLTAGES 6



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

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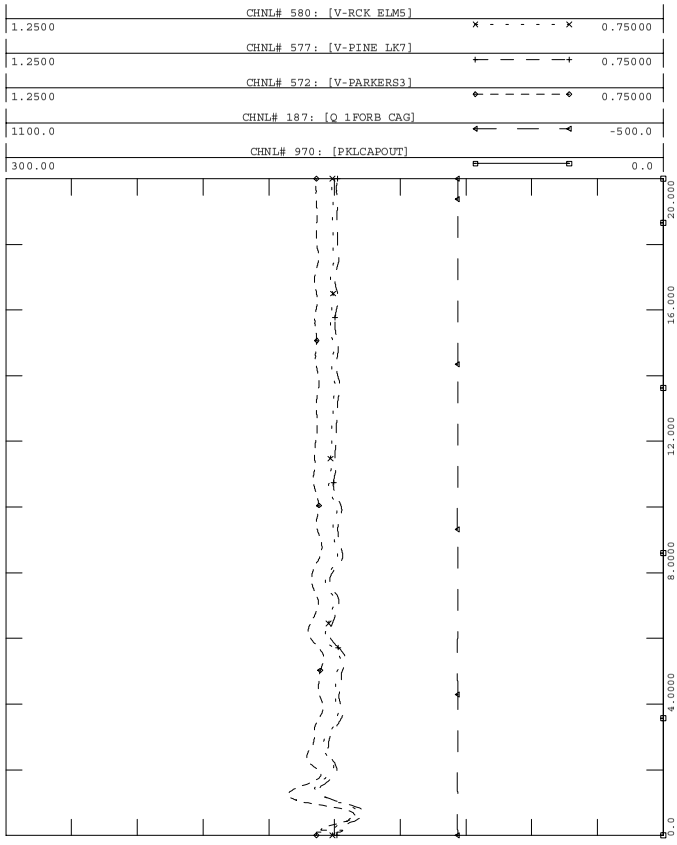
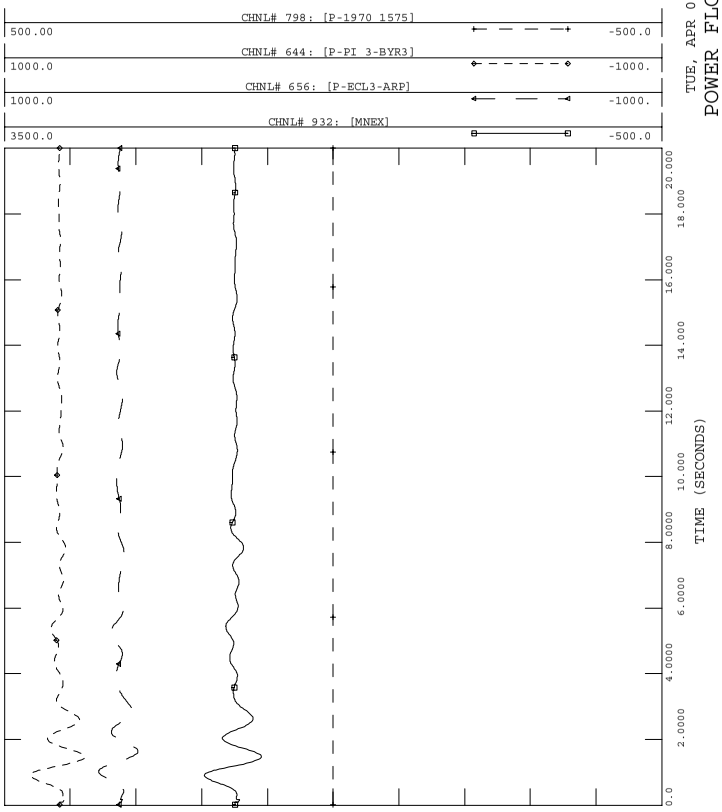
FORBES SVS OUT & VOLTAGES



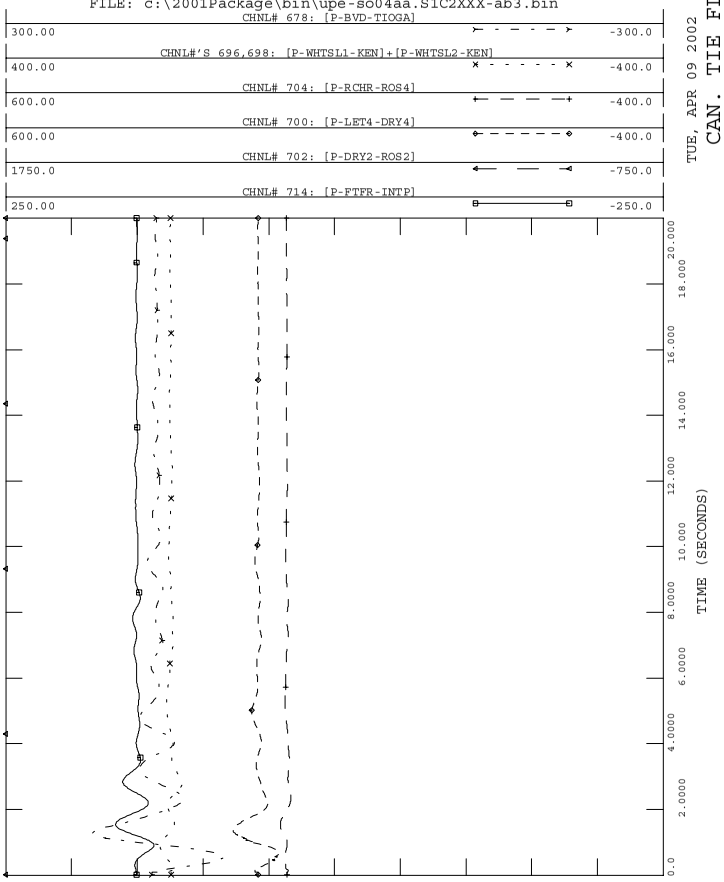
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
POWER FLOW SUMS 2



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
CAN. TIE FLOWS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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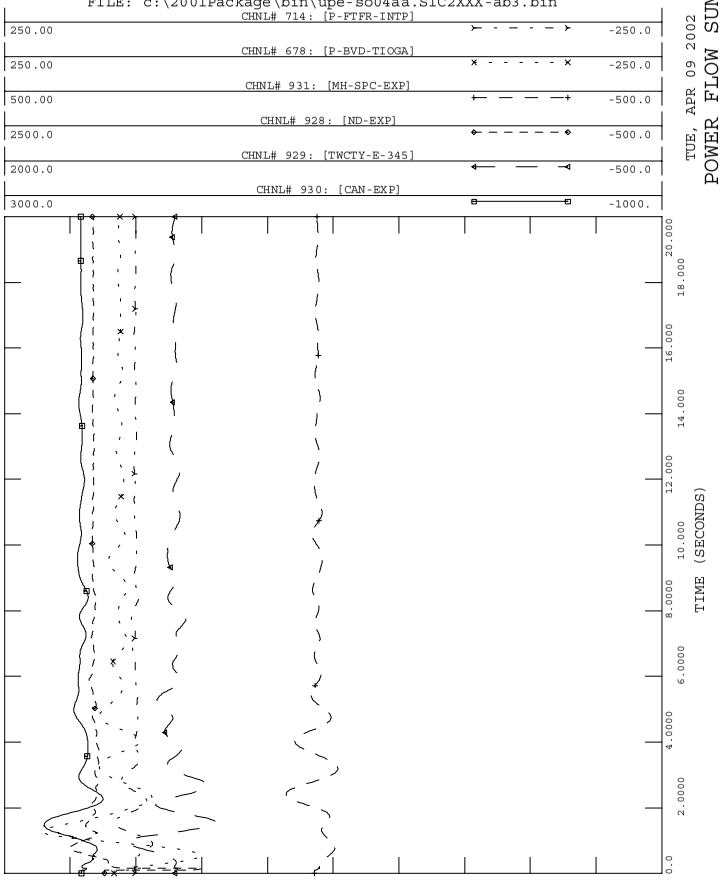
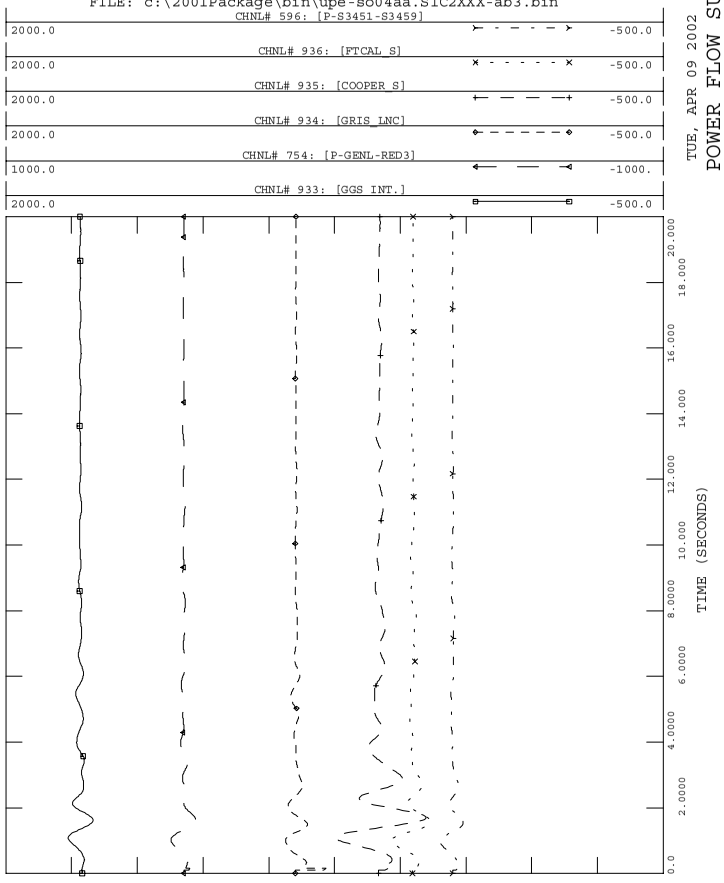
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
POWER FLOW SUMS 1



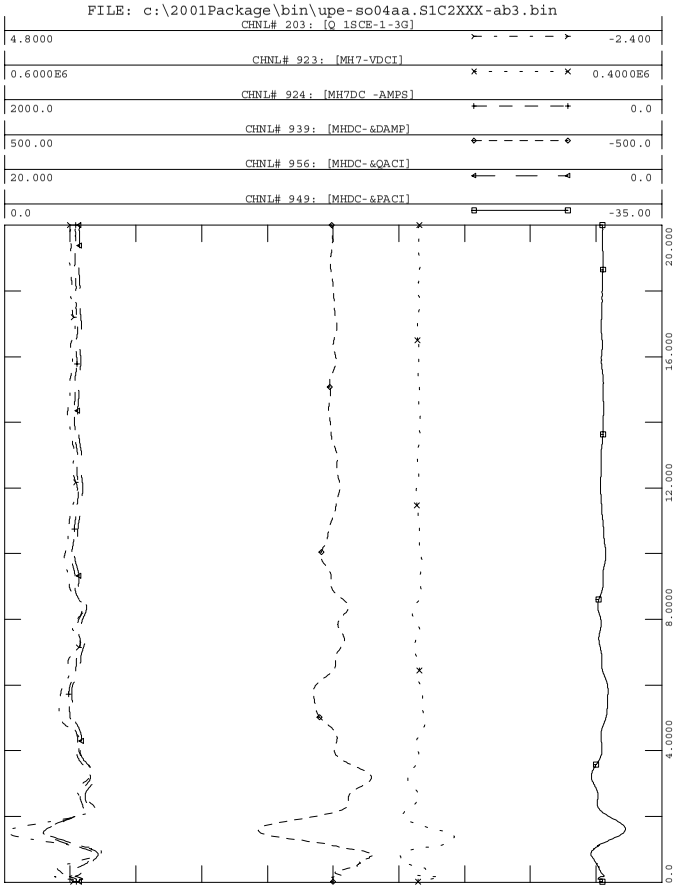
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
POWER FLOW SUM 3



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
MH DC PARAMETERS



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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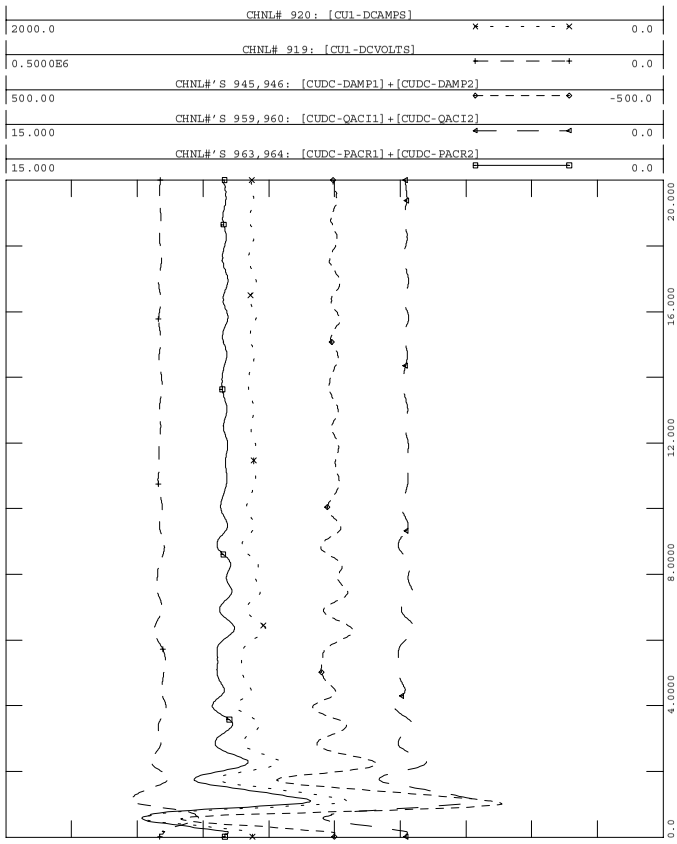
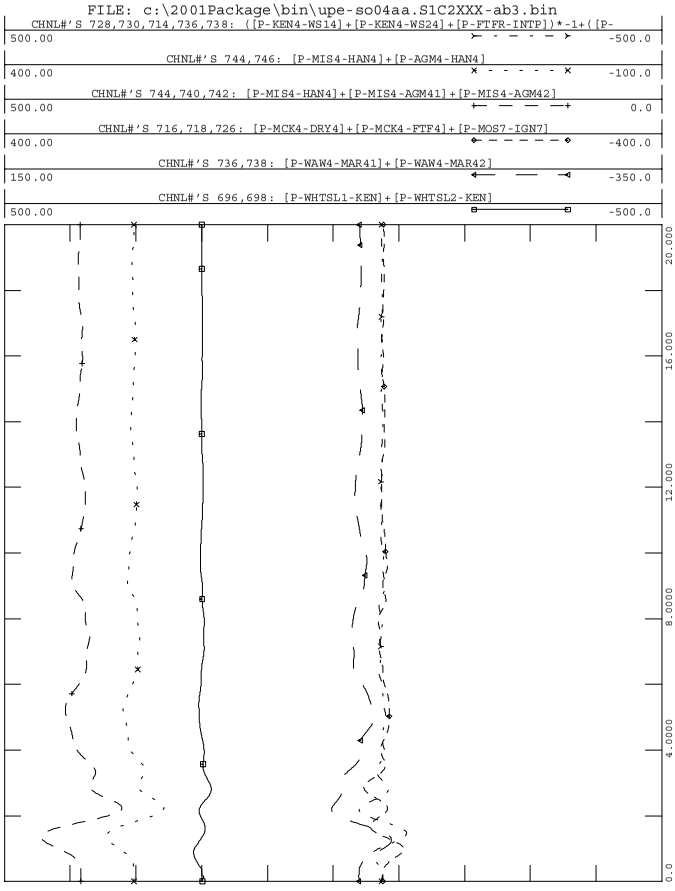
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

TUE, APR 09 2002 22:41
CU DC #1



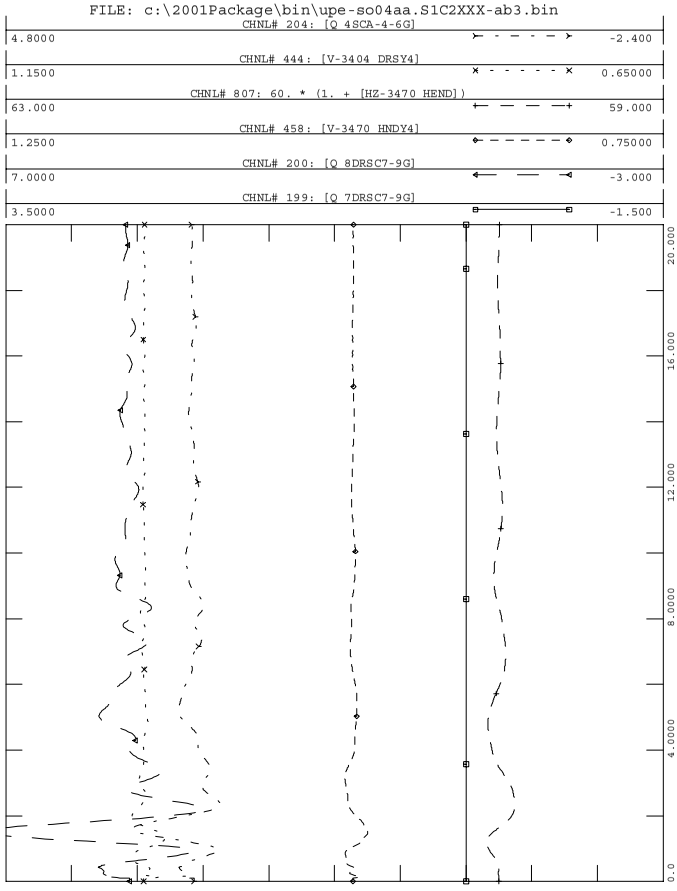
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

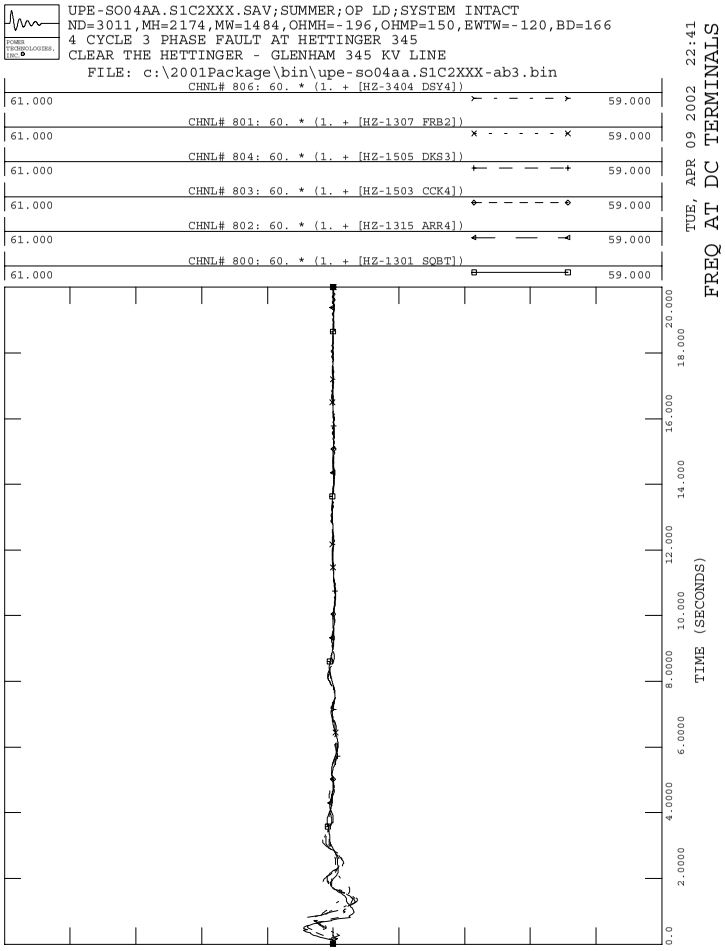
TUE, APR 09 2002 22:41
OH TIE FLOWS

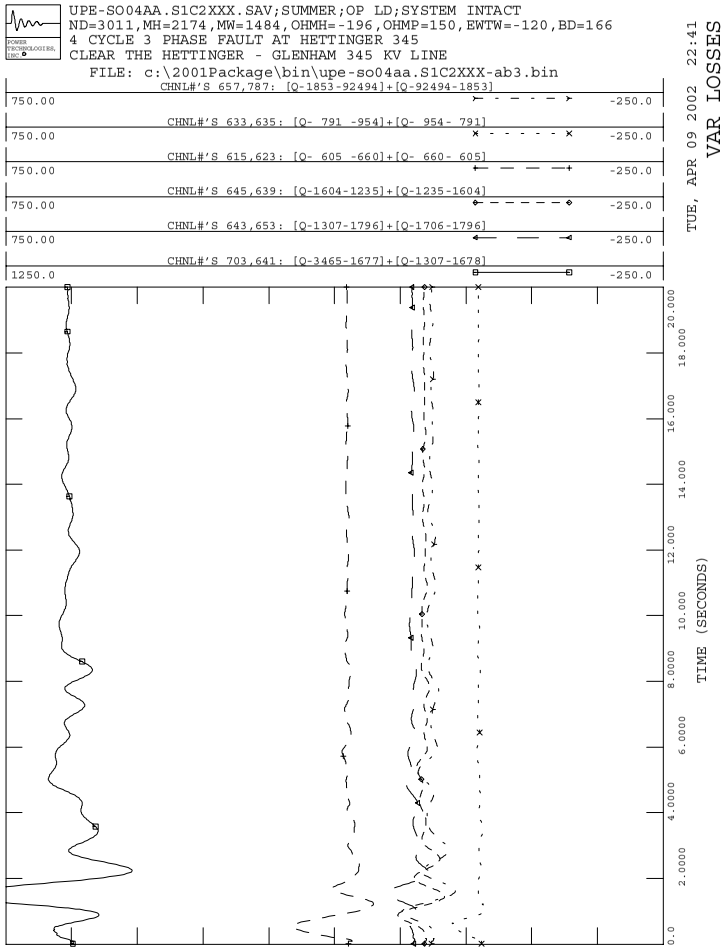


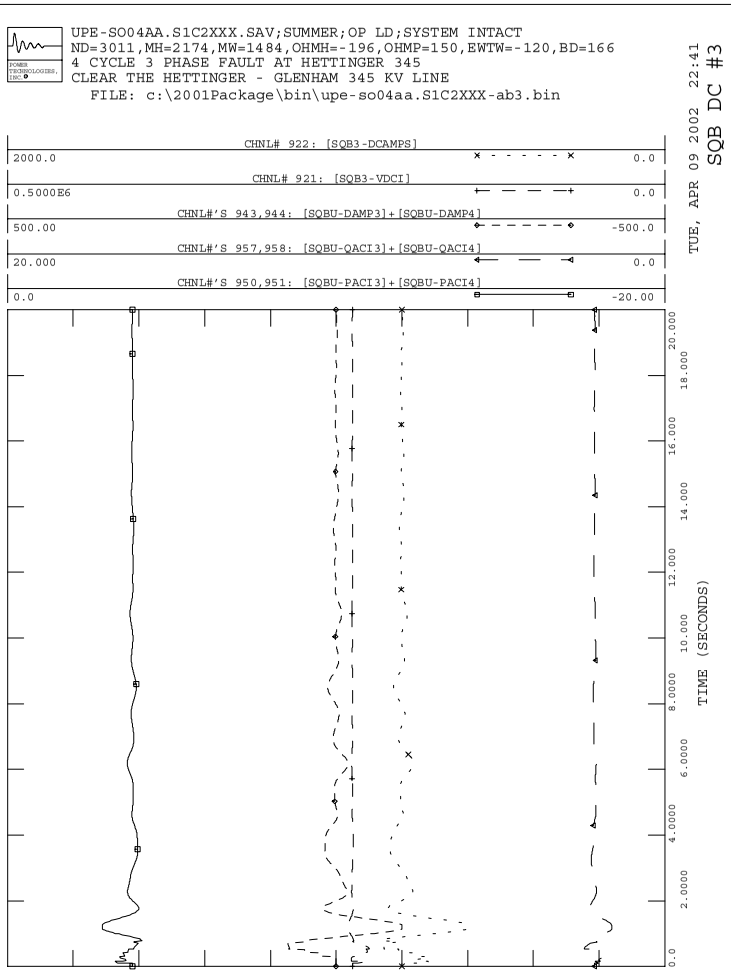
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

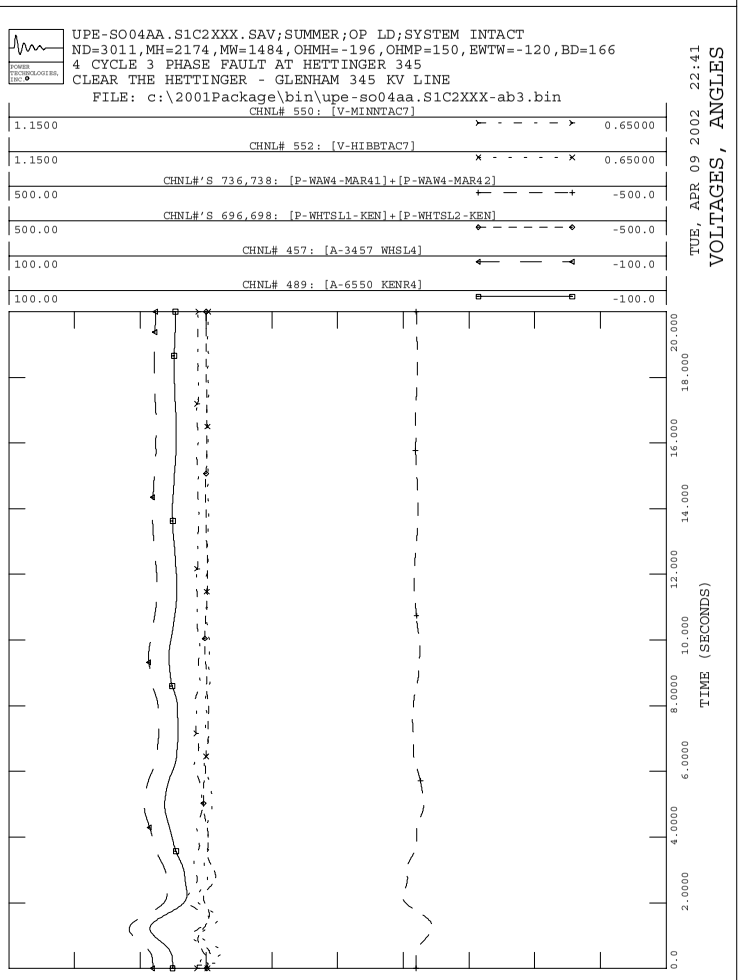
TUE, APR 09 2002 22:41
MH DC PARAMETERS




UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
TUE, APR 09 2002 22:41
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
TUE, APR 09 2002 22:41
VAR LOSSES
TIME (SECONDS)

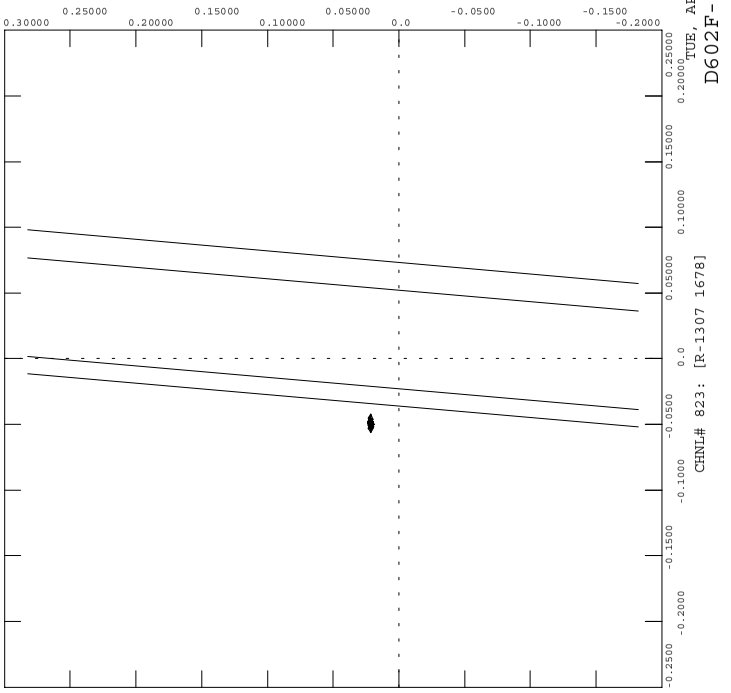

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
TUE, APR 09 2002 22:41
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
TUE, APR 09 2002 22:41
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

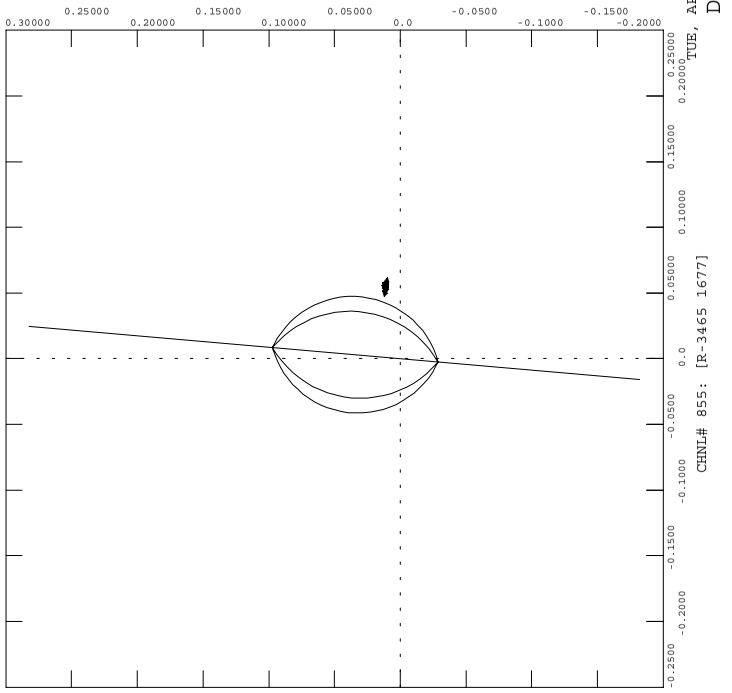
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

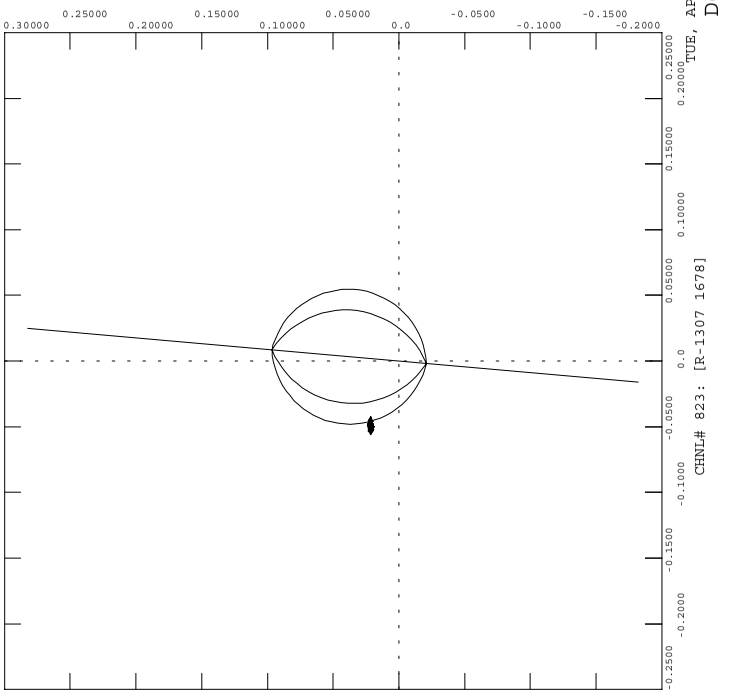
RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

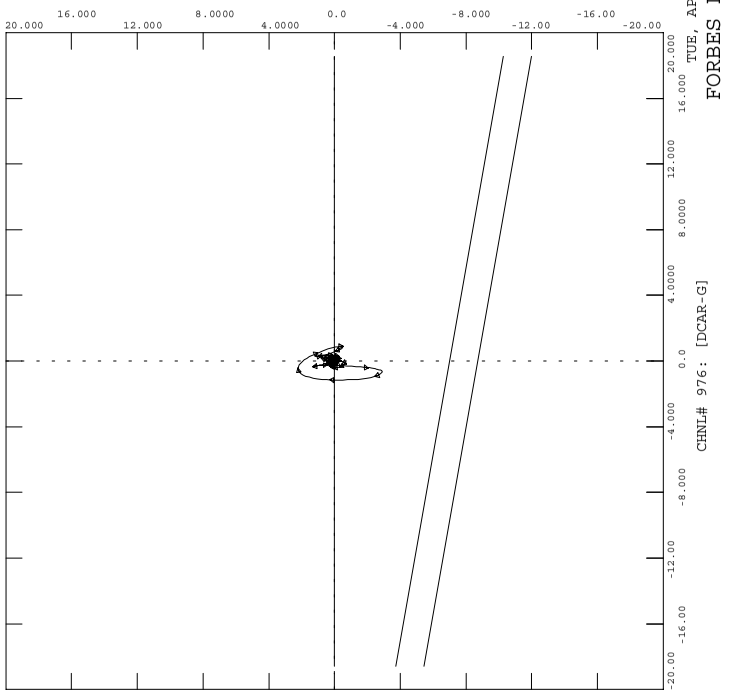
RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

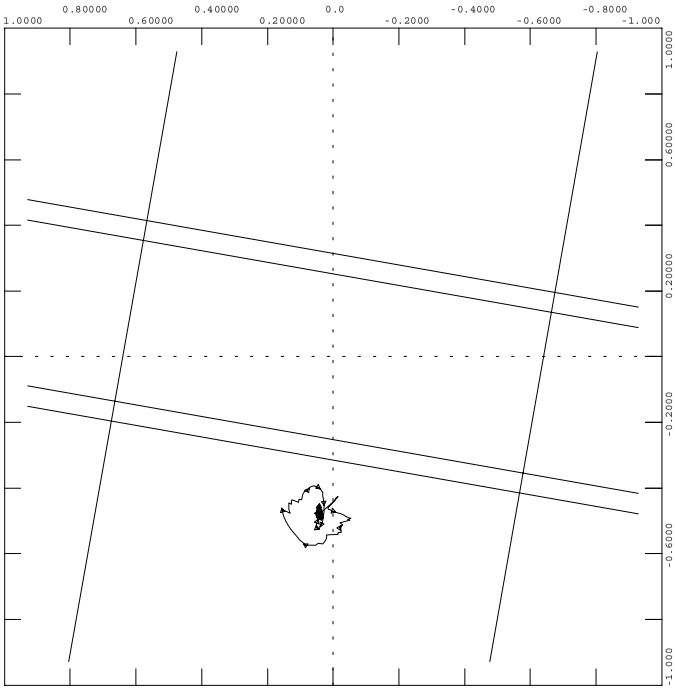
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

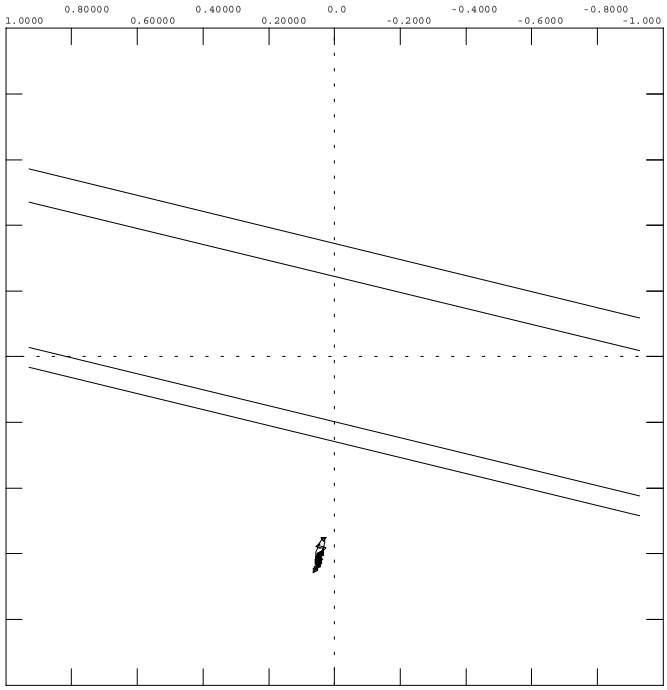
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

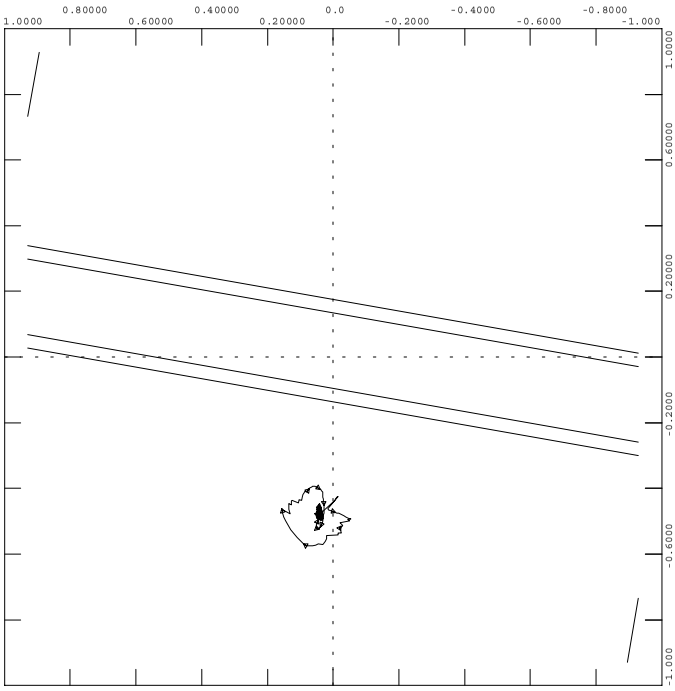
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

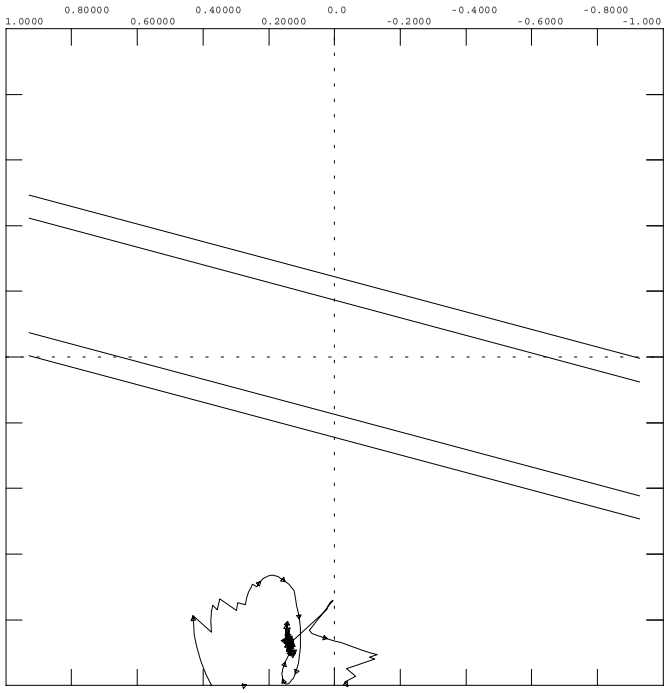
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

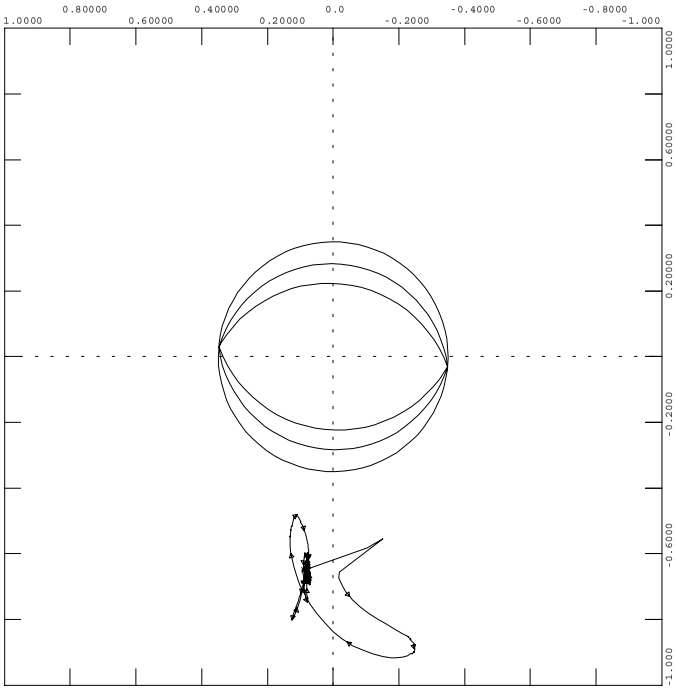
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

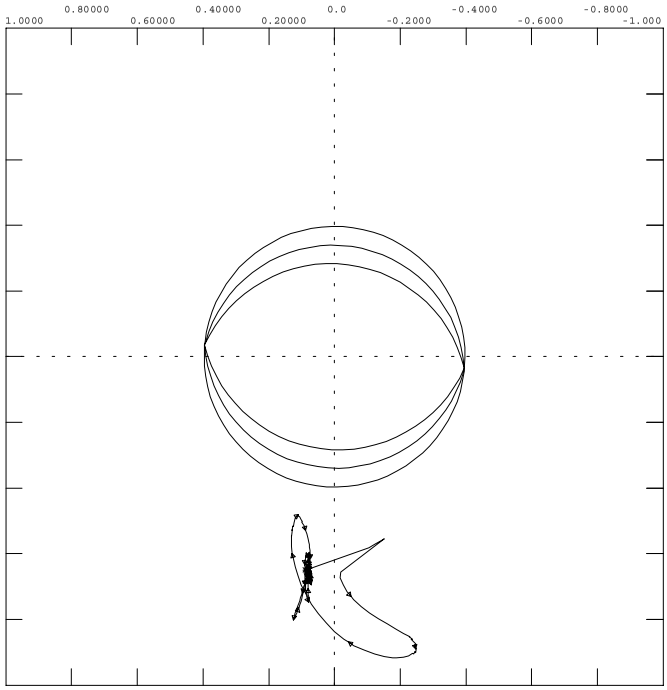


TUE, APR 09 2002 22:41
TIOGA-B.DAM-SOUTH (266)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

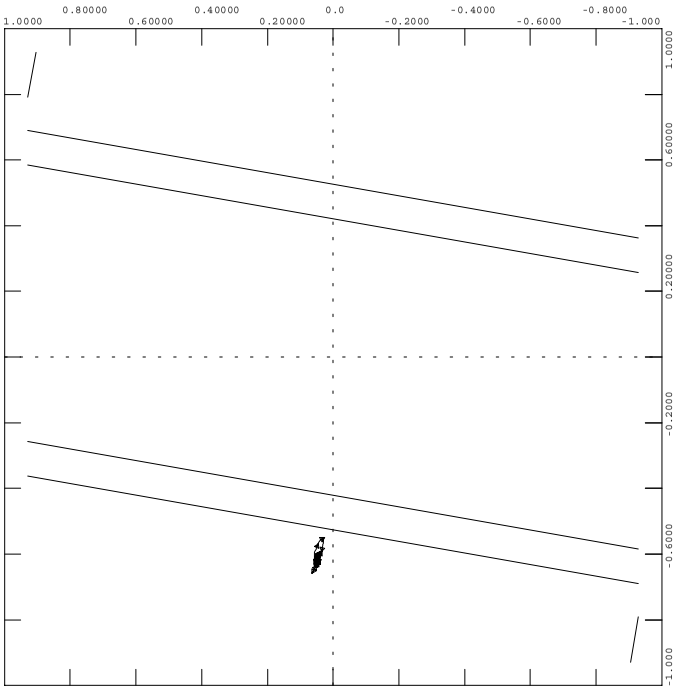


TUE, APR 09 2002 22:41
TIOGA-B.DAM-EMRG (267)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

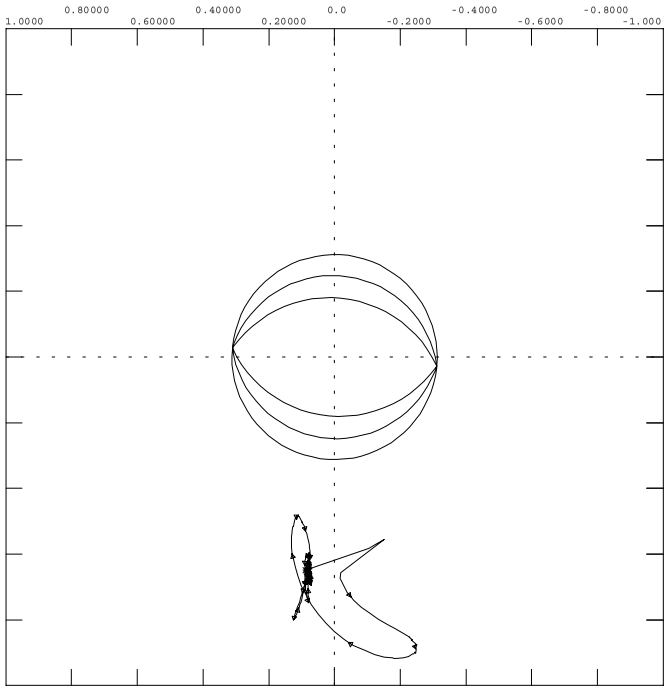


TUE, APR 09 2002 22:41
R50M-MORANVILLE-EMRG (777

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

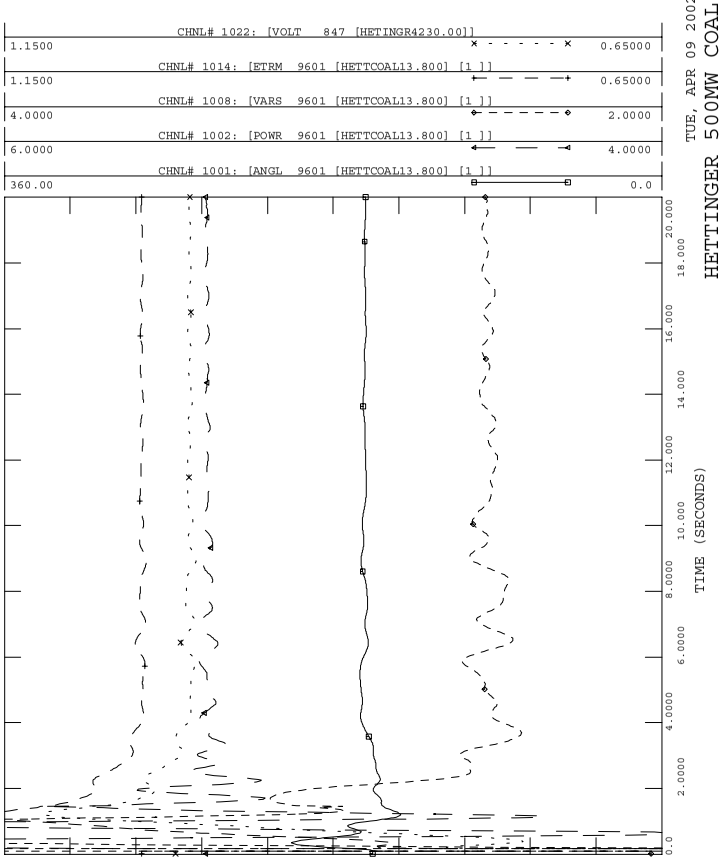
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

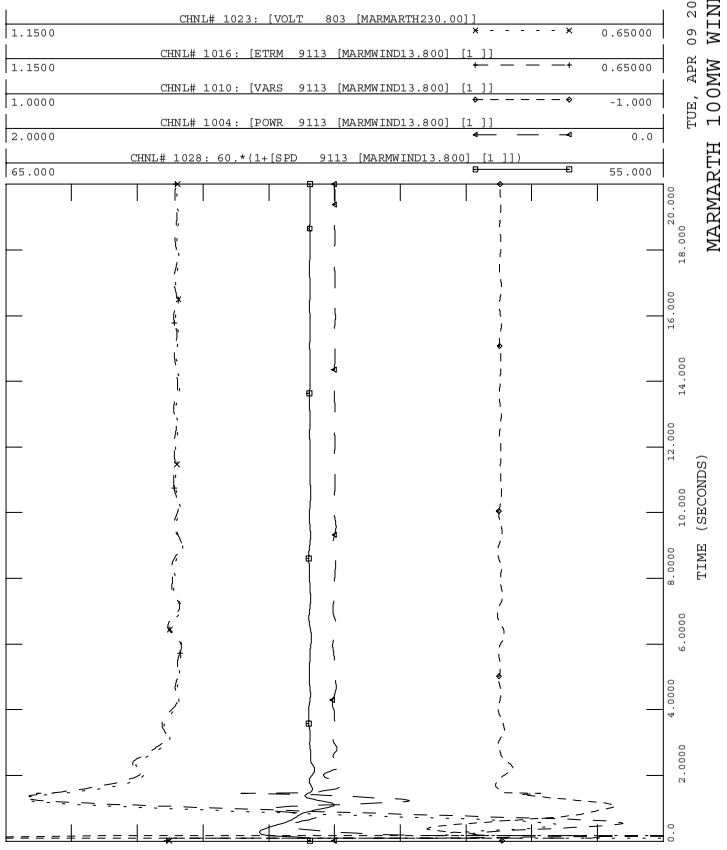


TUE, APR 09 2002 22:41
TIOGA-B.DAM-NORTH (268)

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



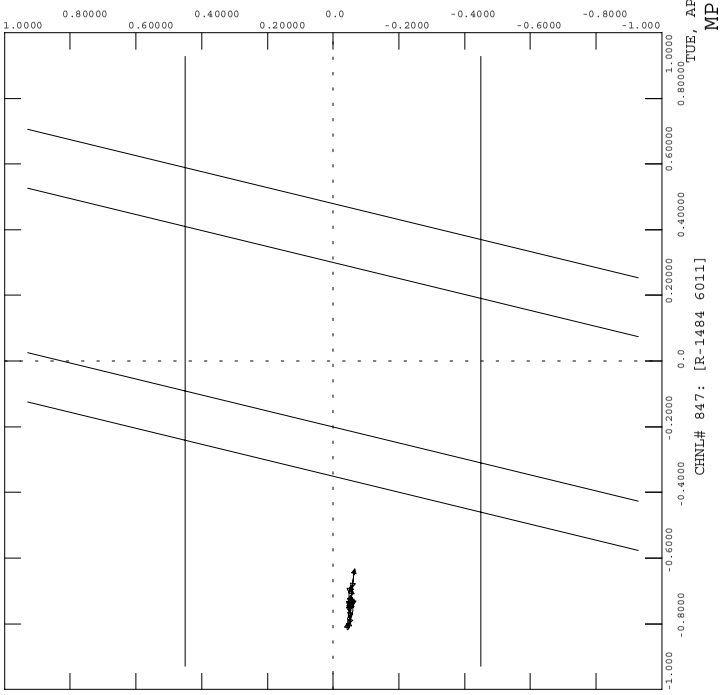
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



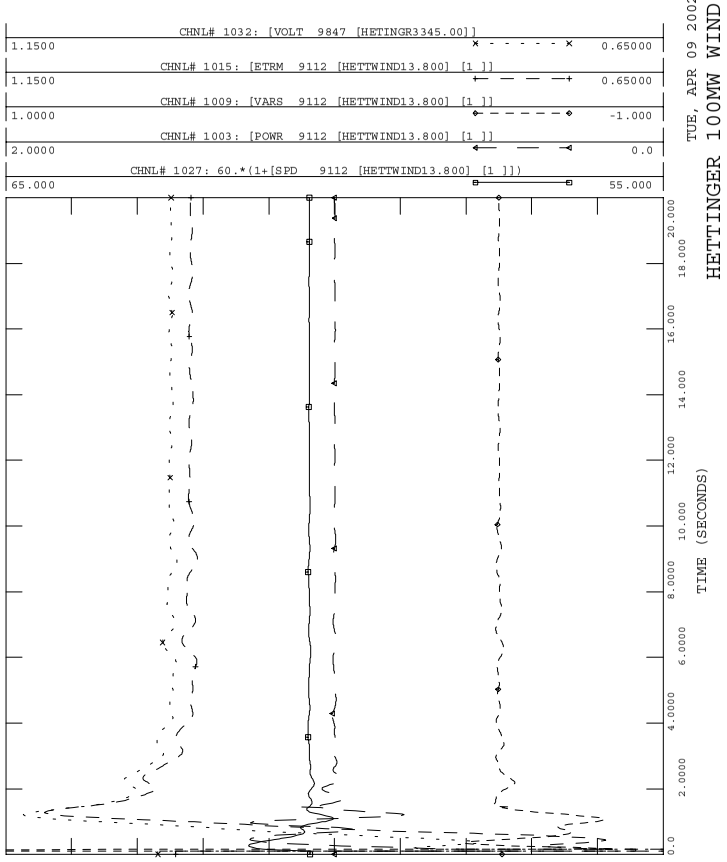
UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

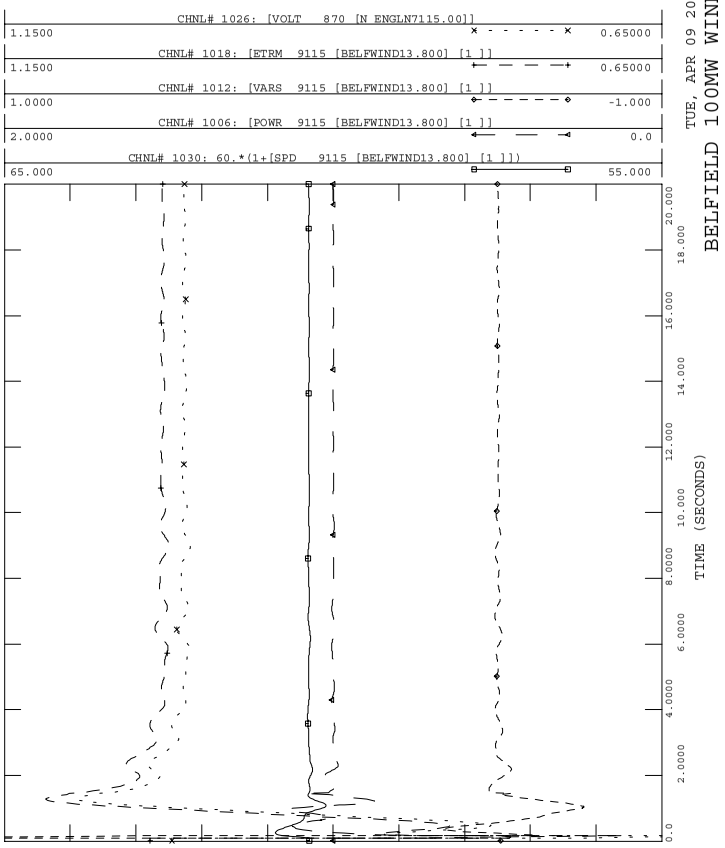
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin

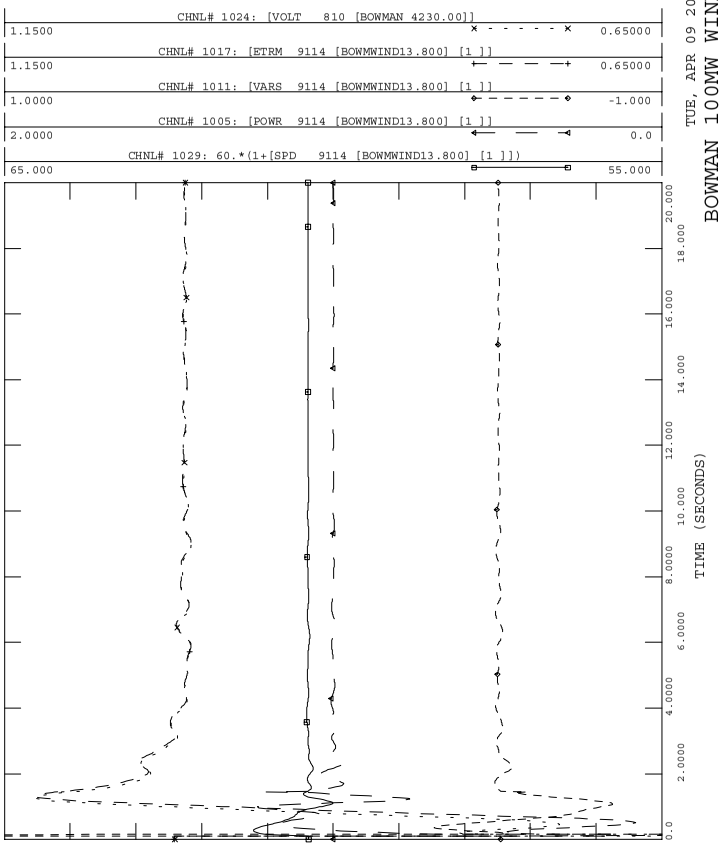


UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



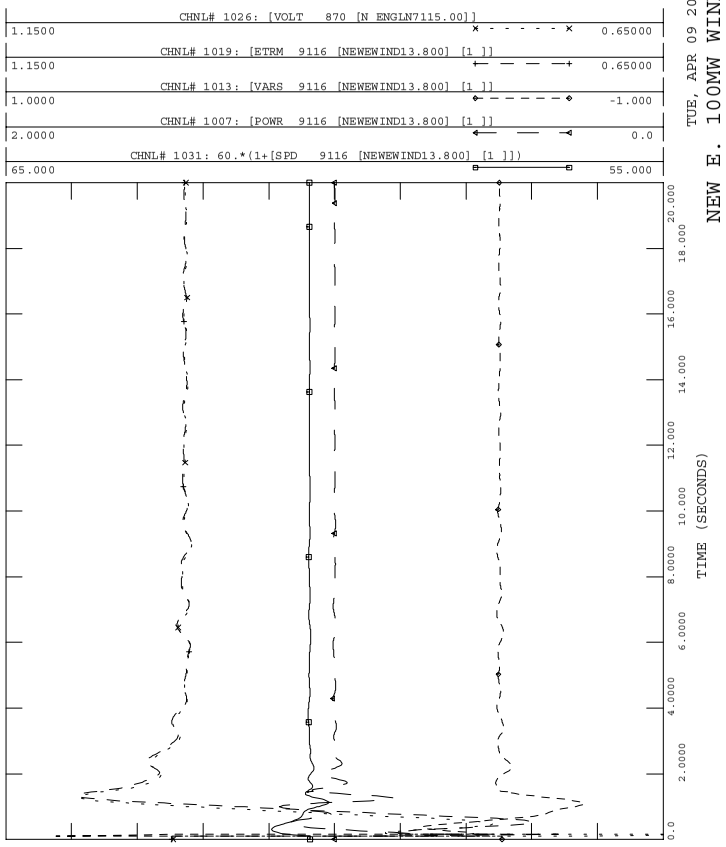
TUE, APR 09 2002 22:41
BELFIELD 100MW WIND UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



TUE, APR 09 2002 22:41
BOWMAN 100MW WIND UNIT

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C2XXX-ab3.bin



TUE, APR 09 2002 22:41
NEW E. 100MW WIND UNIT

APPENDIX 7

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 1 (HETTINGER)

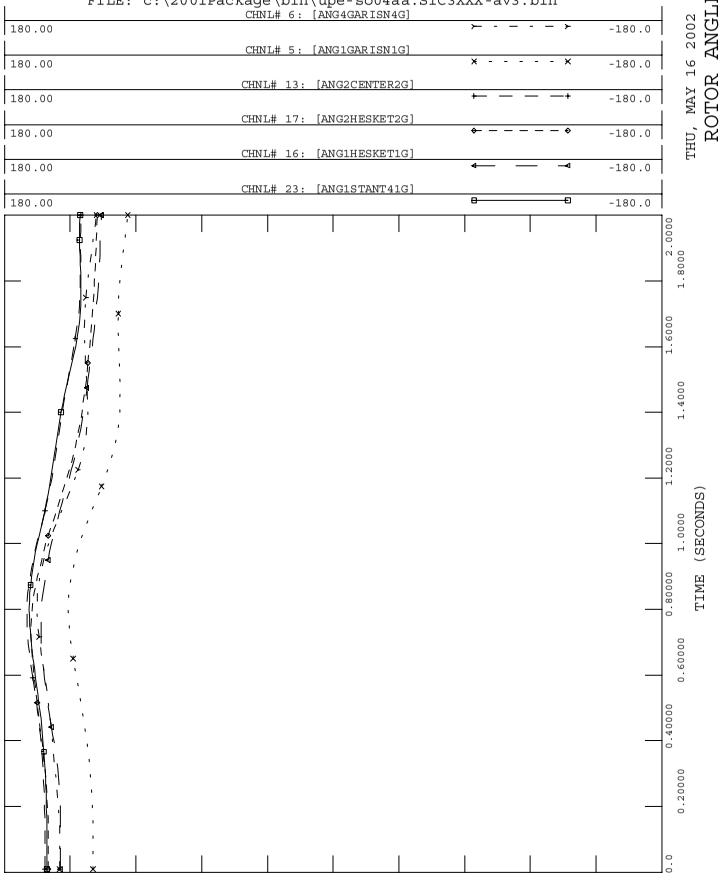
CASE S1C3XXX

CONTINGENCY AV3

4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Belfield 345 kV line

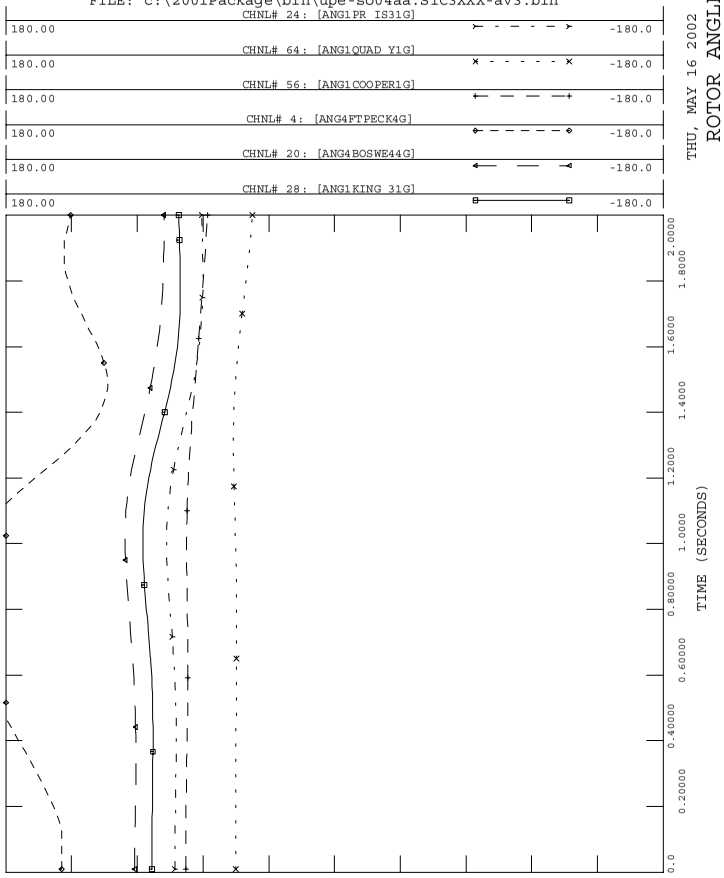
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
ROTOR ANGLES 2



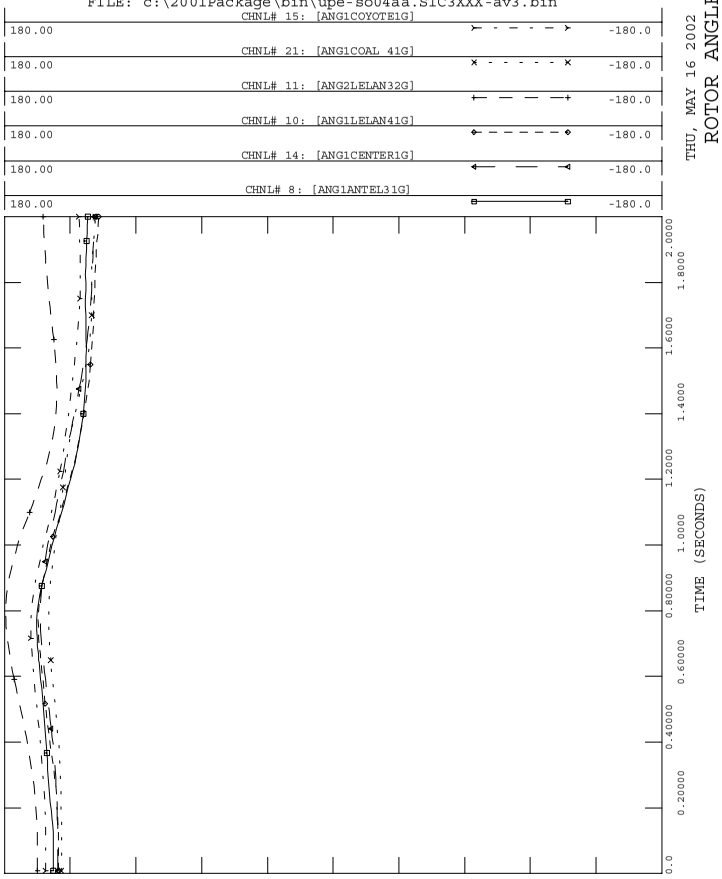
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
ROTOR ANGLES 4



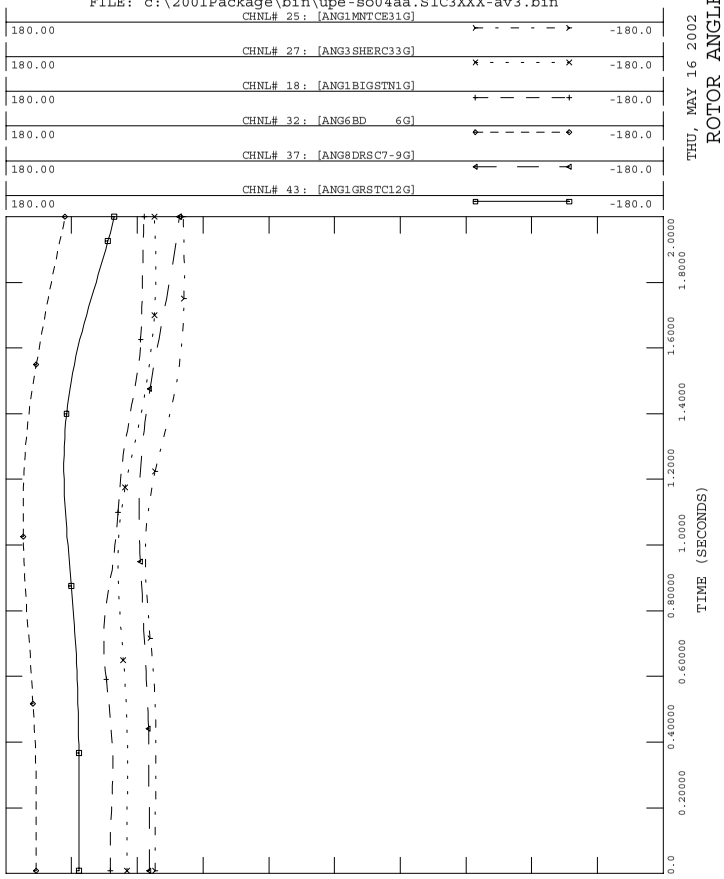
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
ROTOR ANGLES 1



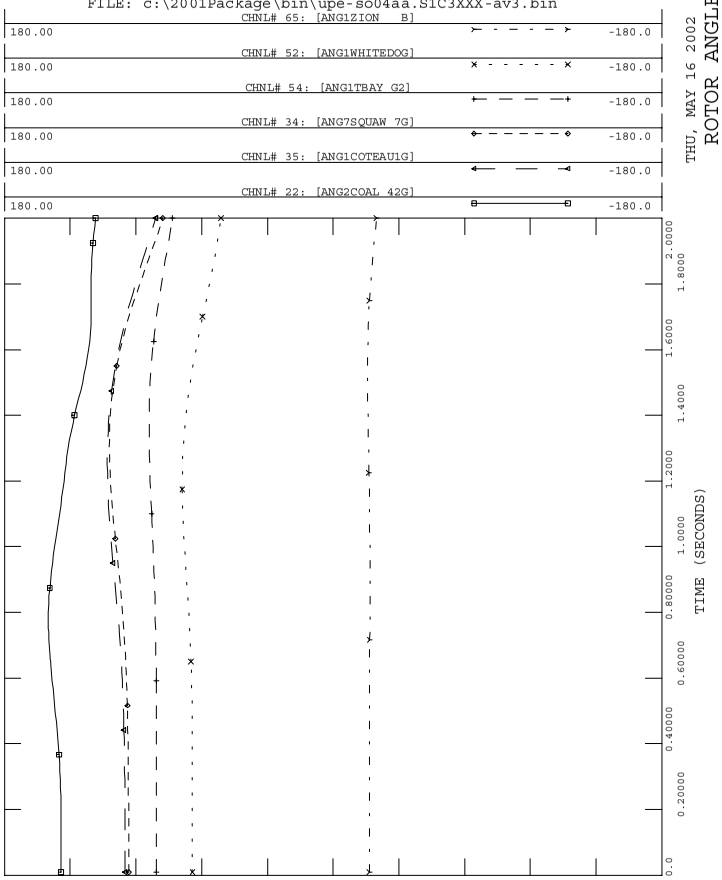
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
ROTOR ANGLES 3



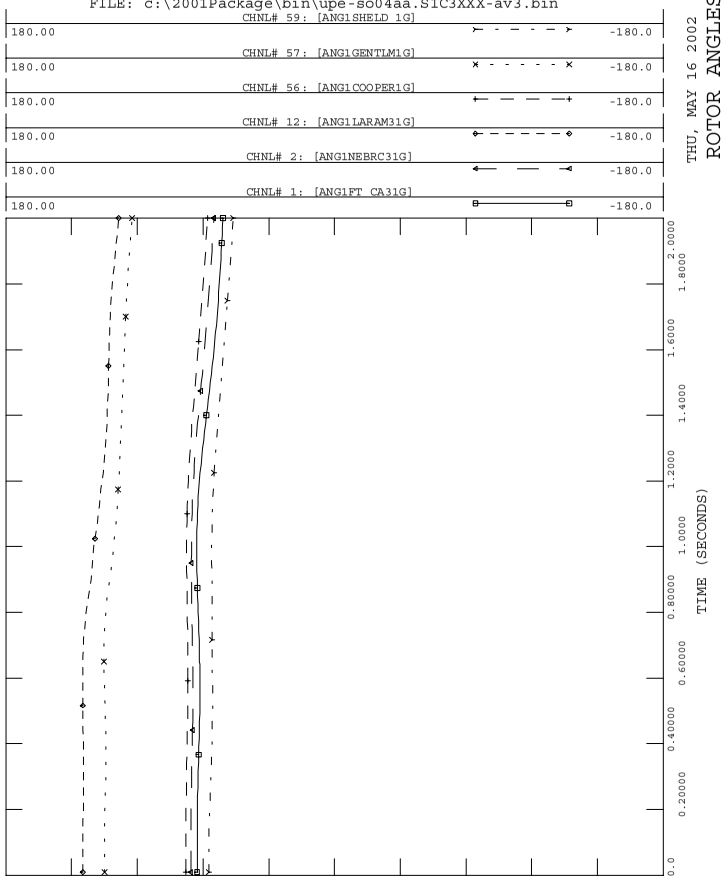
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
ROTOR ANGLES 6



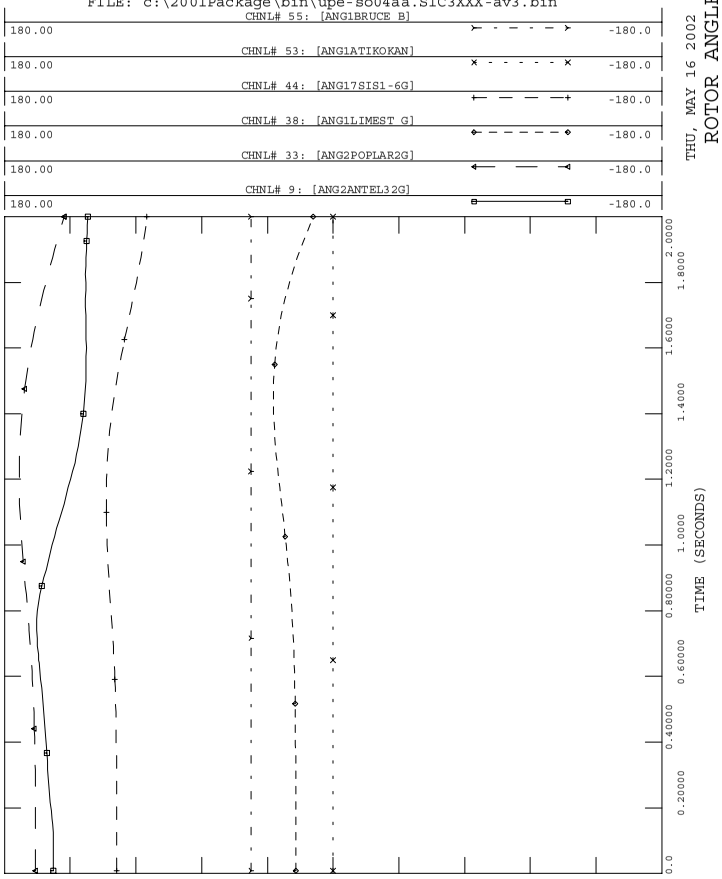
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
ROTOR ANGLES NB



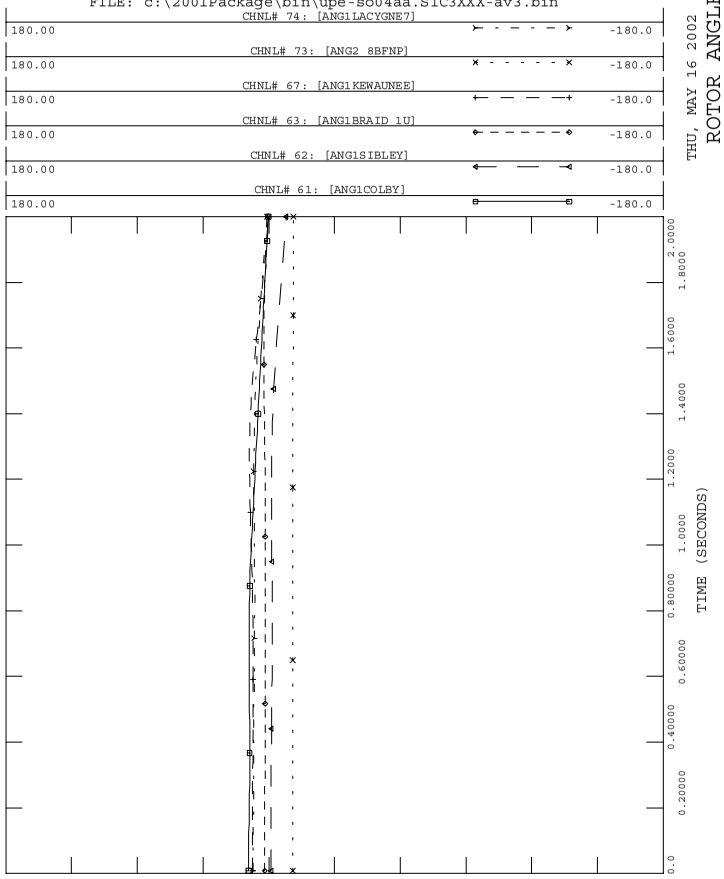
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
ROTOR ANGLES 5

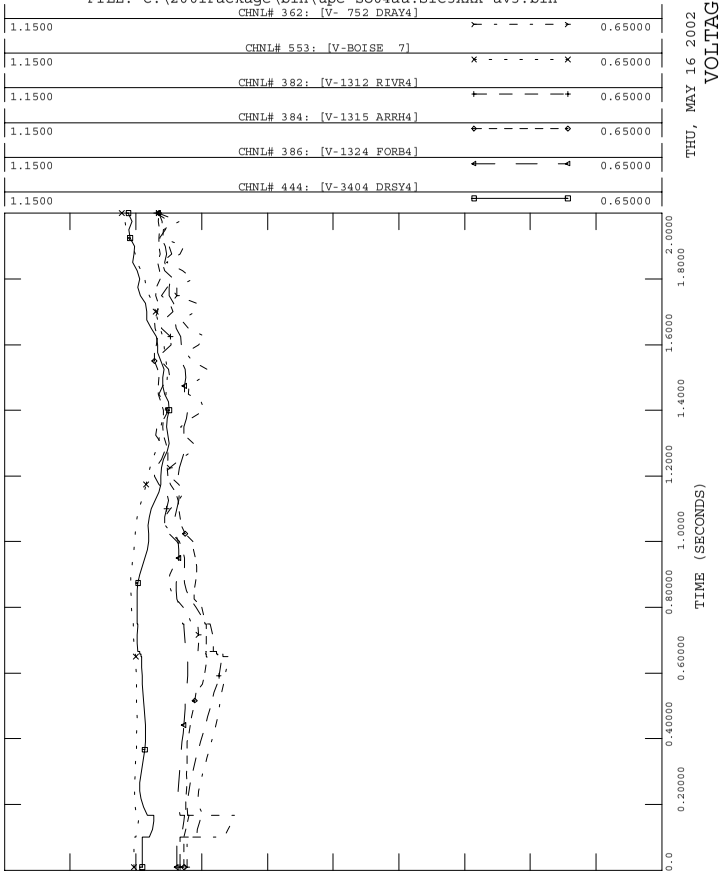


UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
ROTOR ANGLES 7

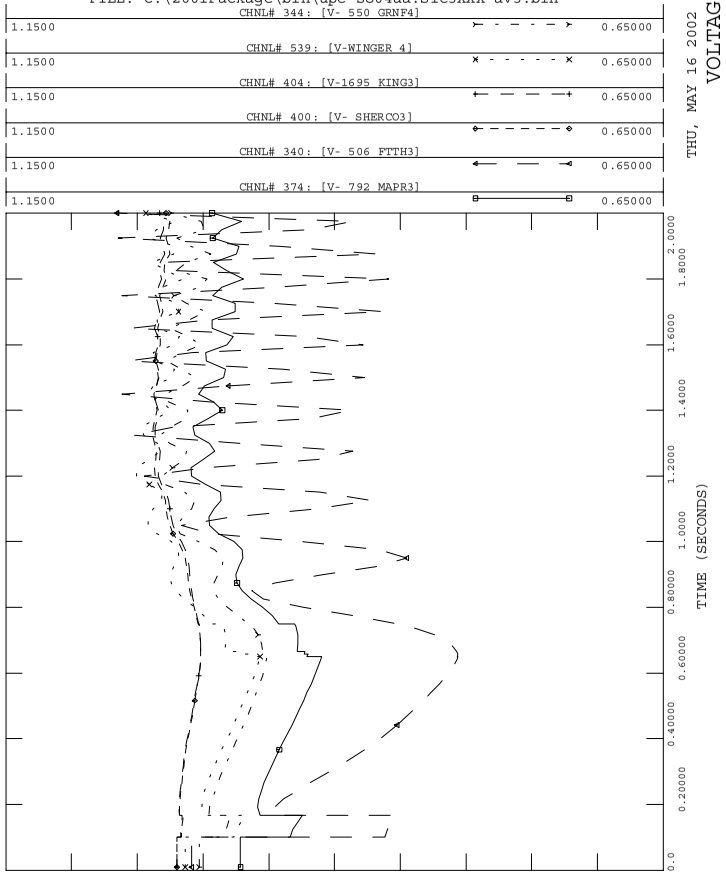


UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin



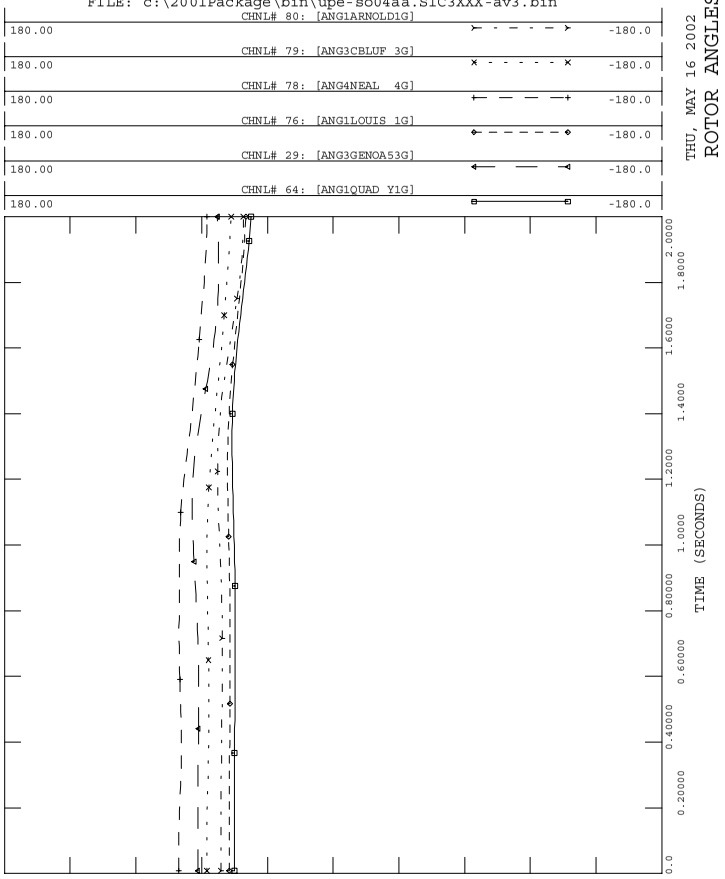
THU, MAY 16 2002 11:05
VOLTAGES 1

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin



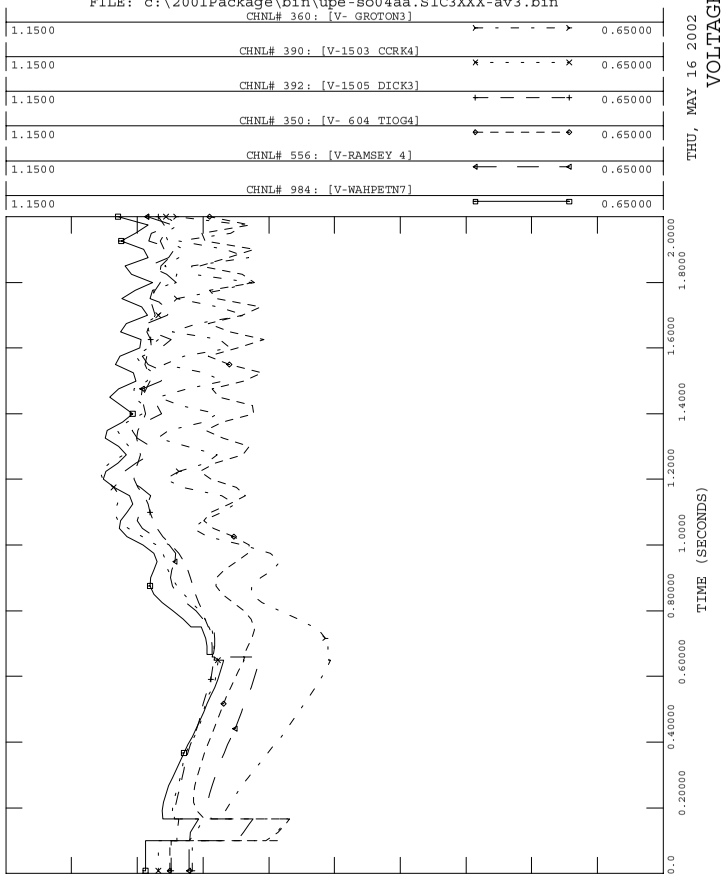
THU, MAY 16 2002 11:05
VOLTAGES 3

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin



THU, MAY 16 2002 11:05
ROTOR ANGLES IA

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin



THU, MAY 16 2002 11:05
VOLTAGES 2

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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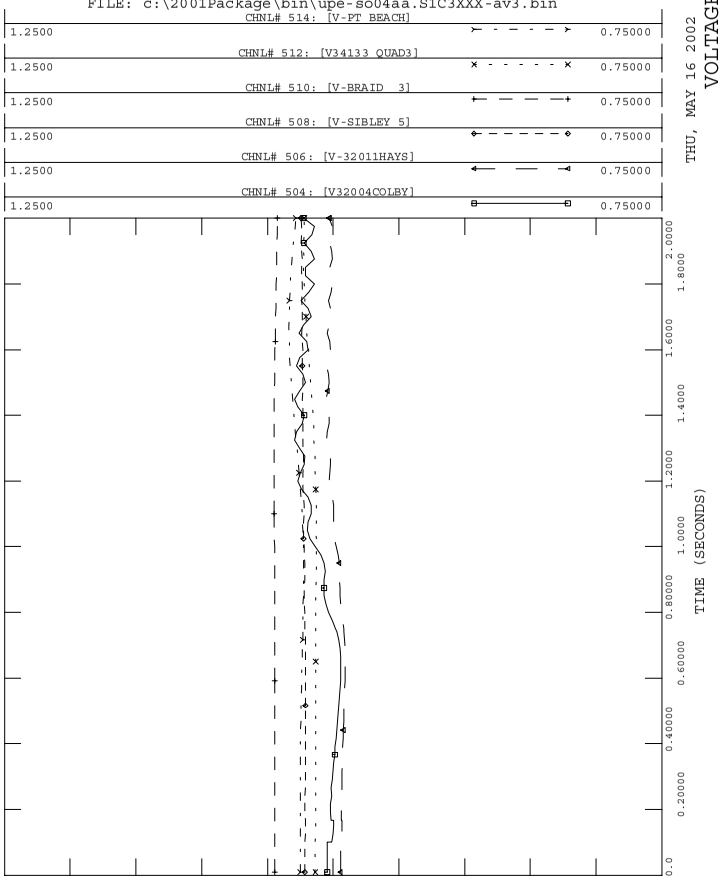
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
VOLTAGES 5



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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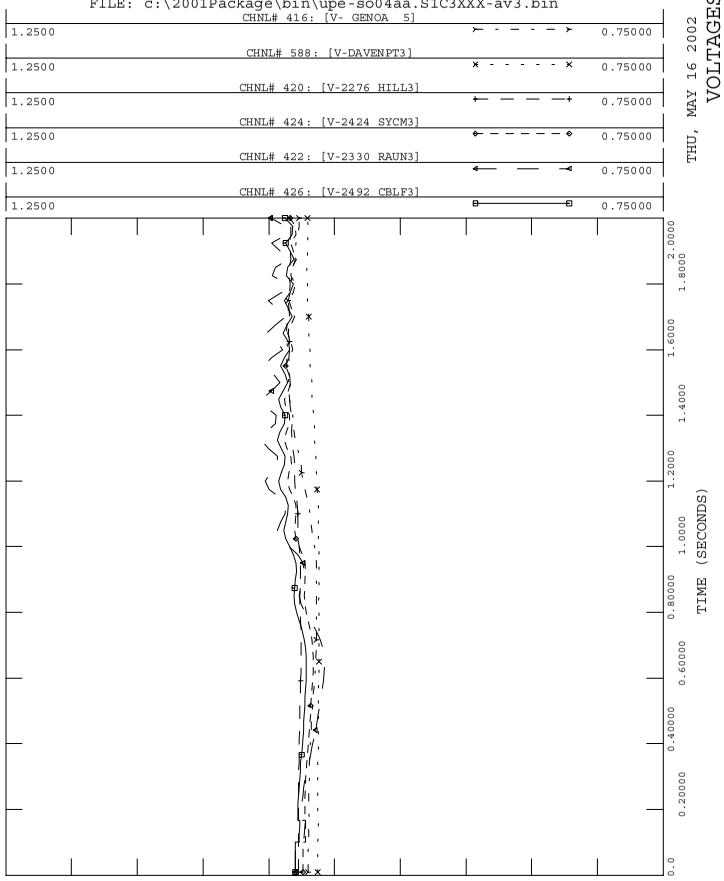
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
VOLTAGES IA



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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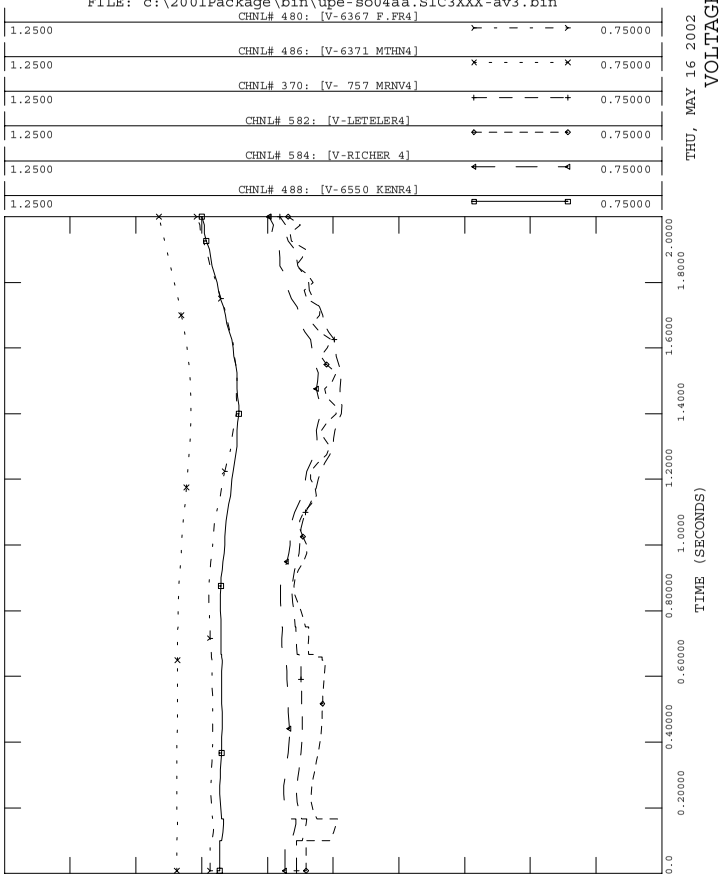
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
VOLTAGES 4



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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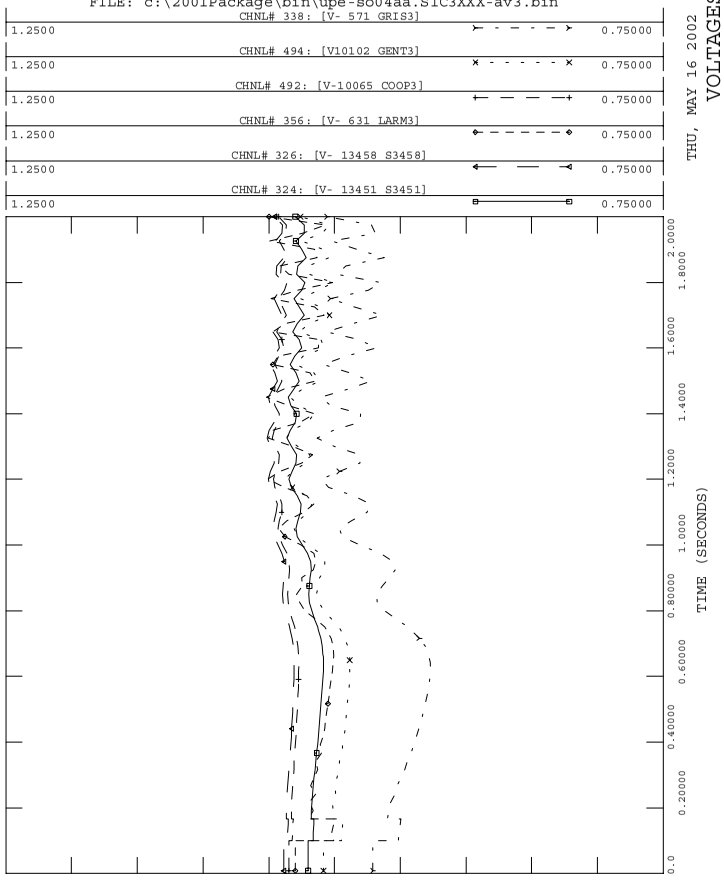
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
VOLTAGES NB



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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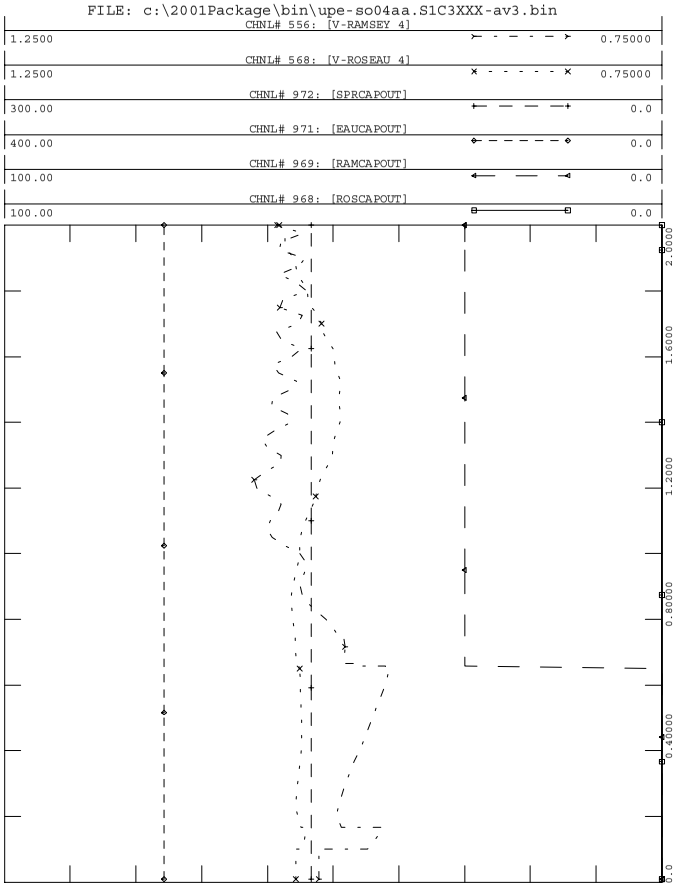
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

FAST SW CAP OUT 2



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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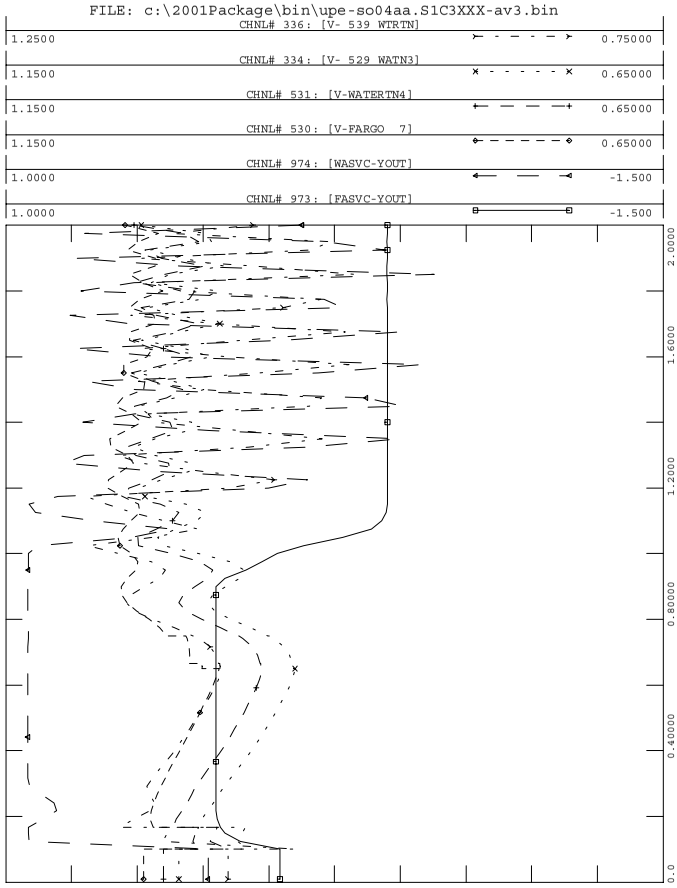
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

FARGO/WATERTOWN SVS



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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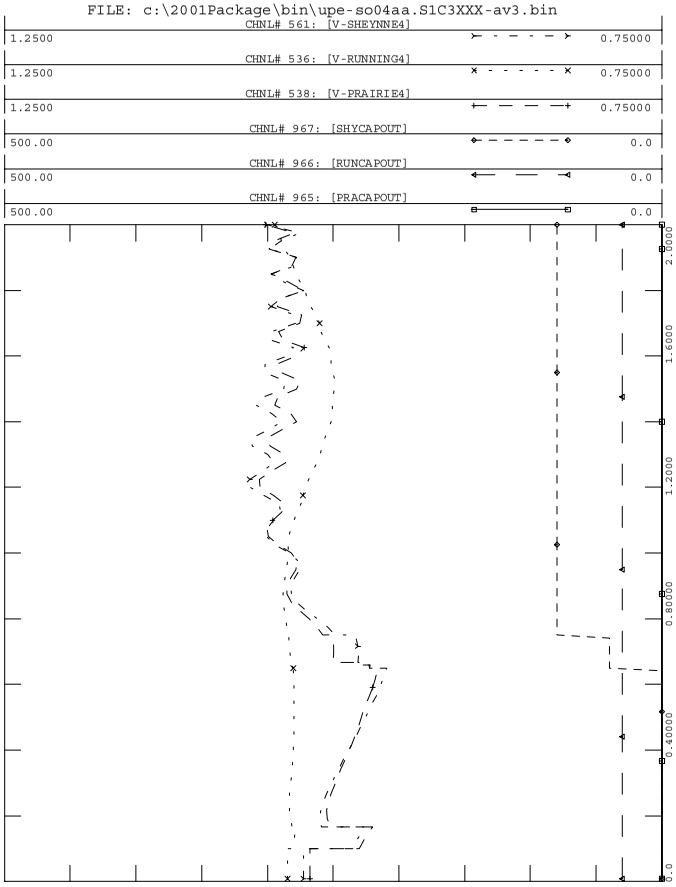
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

FAST SW CAP OUT 1



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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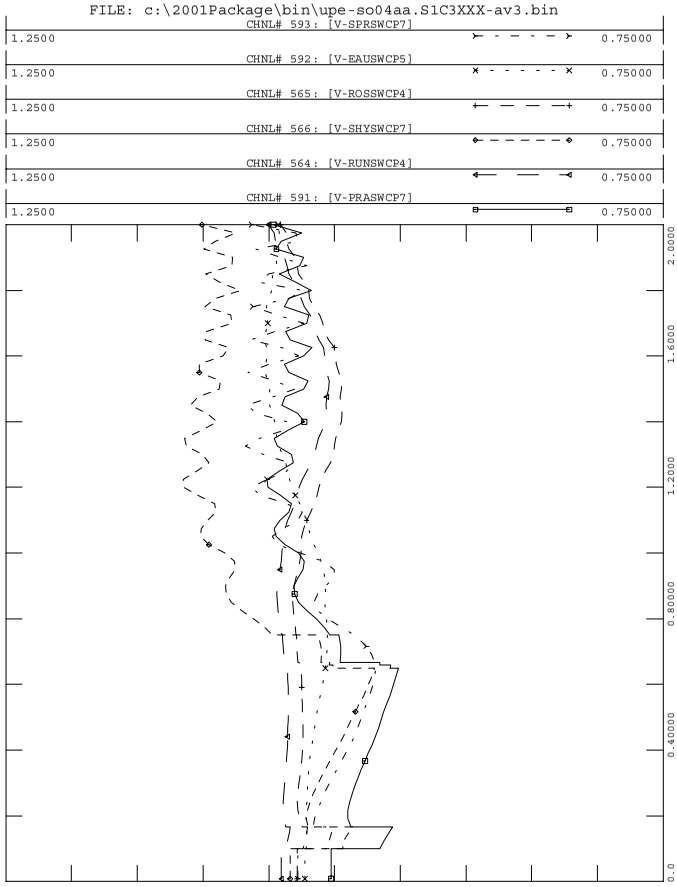
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

FAST SW CAP VOLTAGES



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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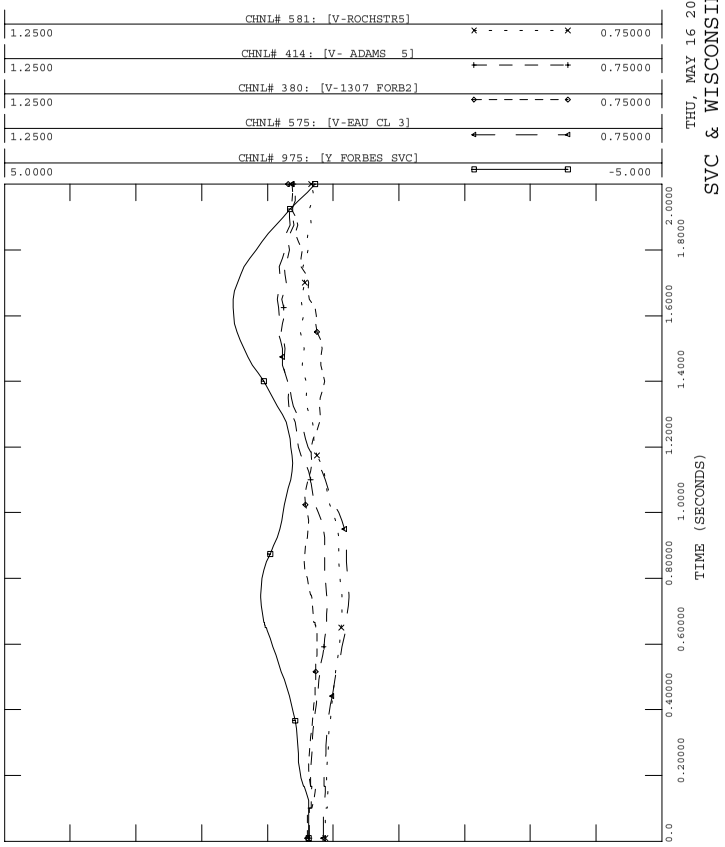
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin



THU, MAY 16 2002 11:05
SVC & WISCONSIN VOLT

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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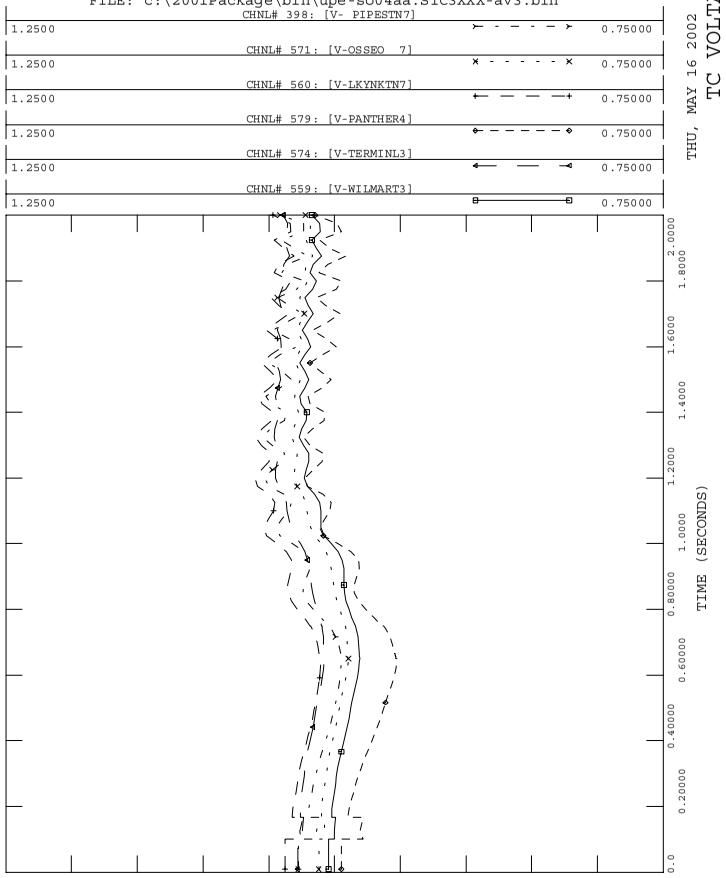
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin



THU, MAY 16 2002 11:05
TC VOLTAGES

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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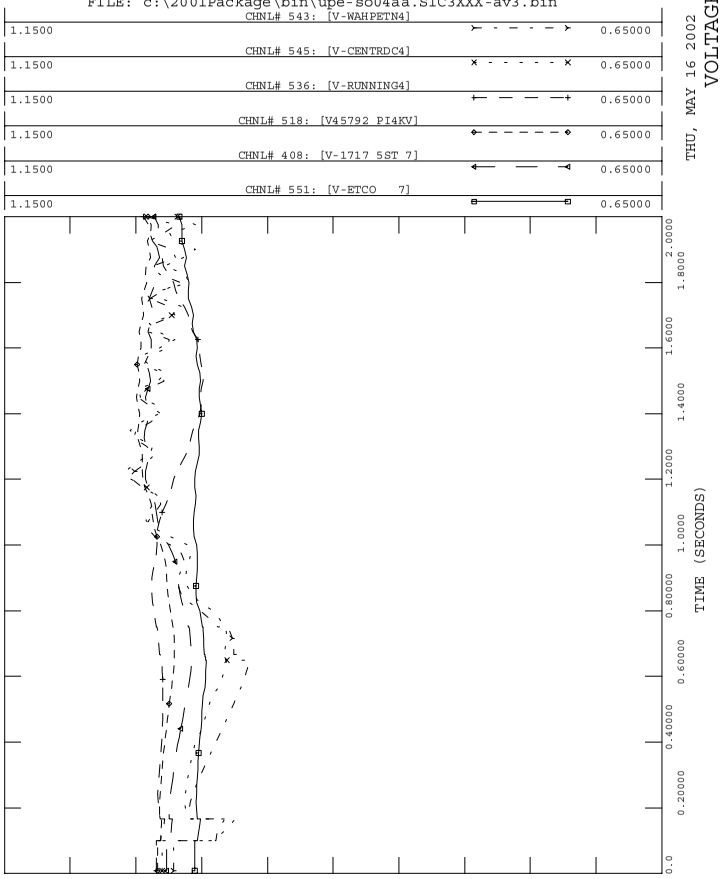
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin



THU, MAY 16 2002 11:05
VOLTAGES 6

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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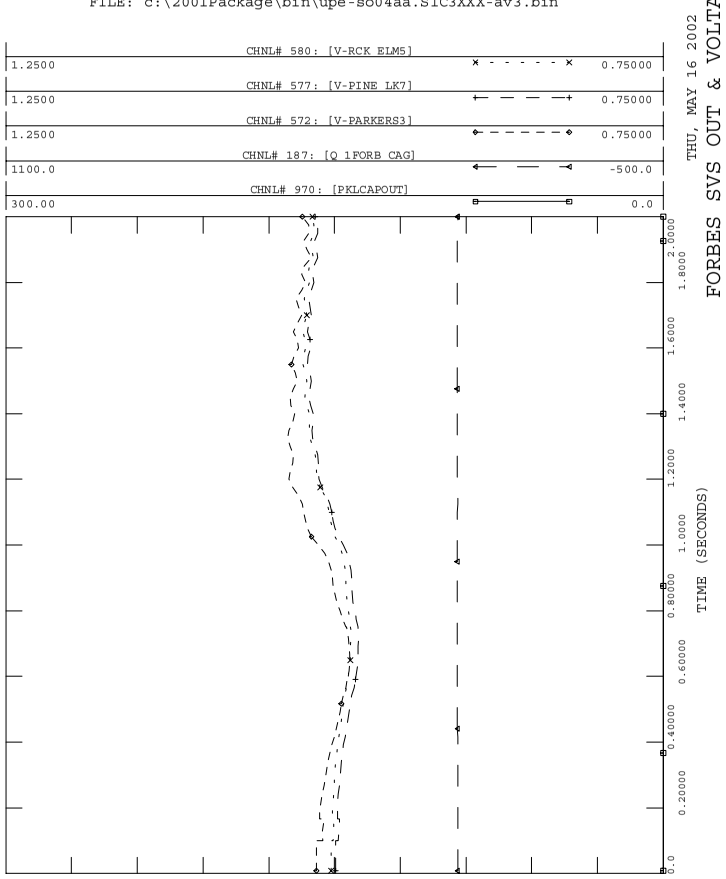
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin



THU, MAY 16 2002 11:05
FORBES SVS OUT & VOLTAGES

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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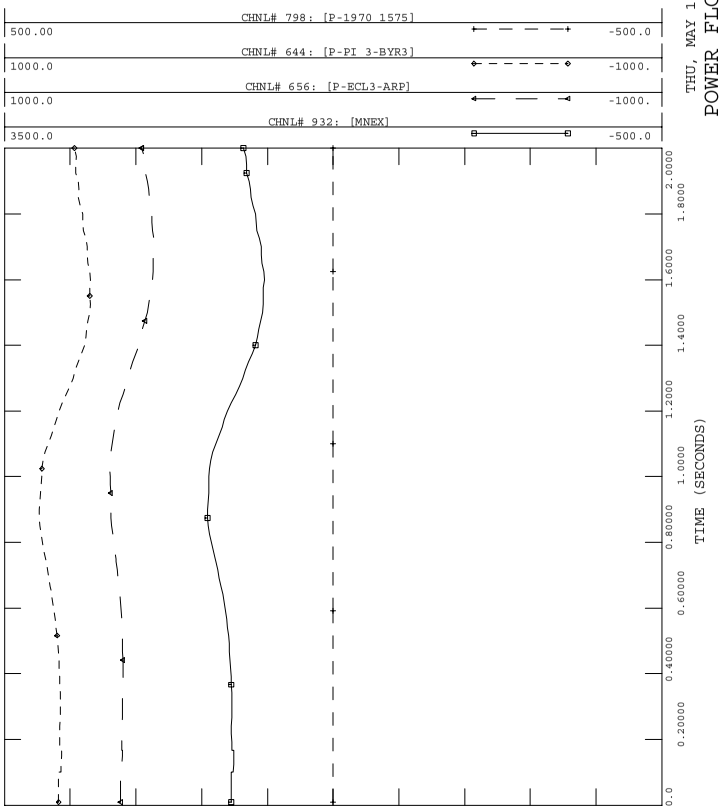
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
POWER FLOW SUMS 2



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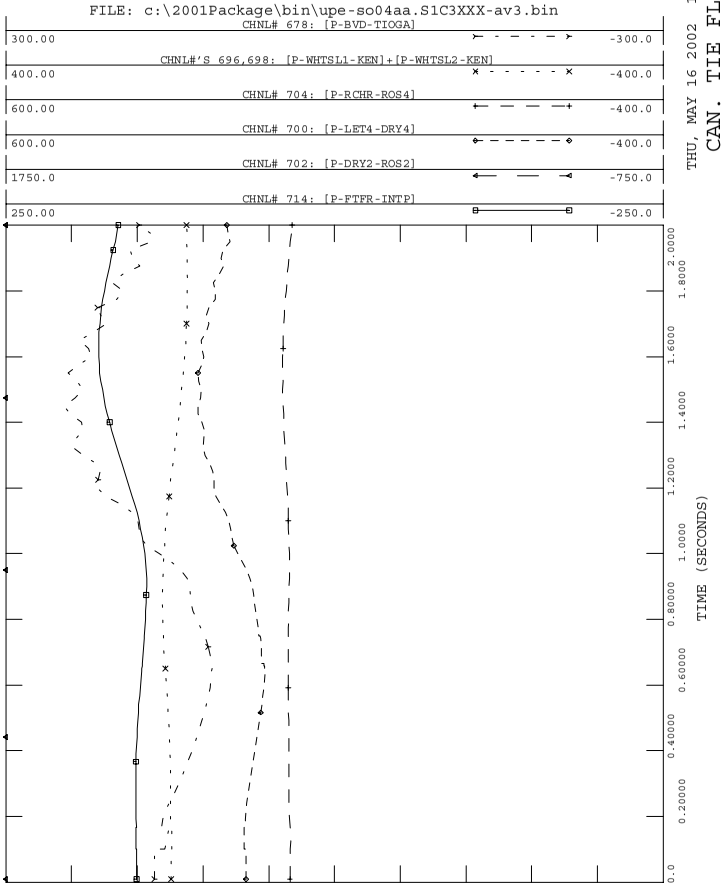
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
CAN. TIE FLOWS



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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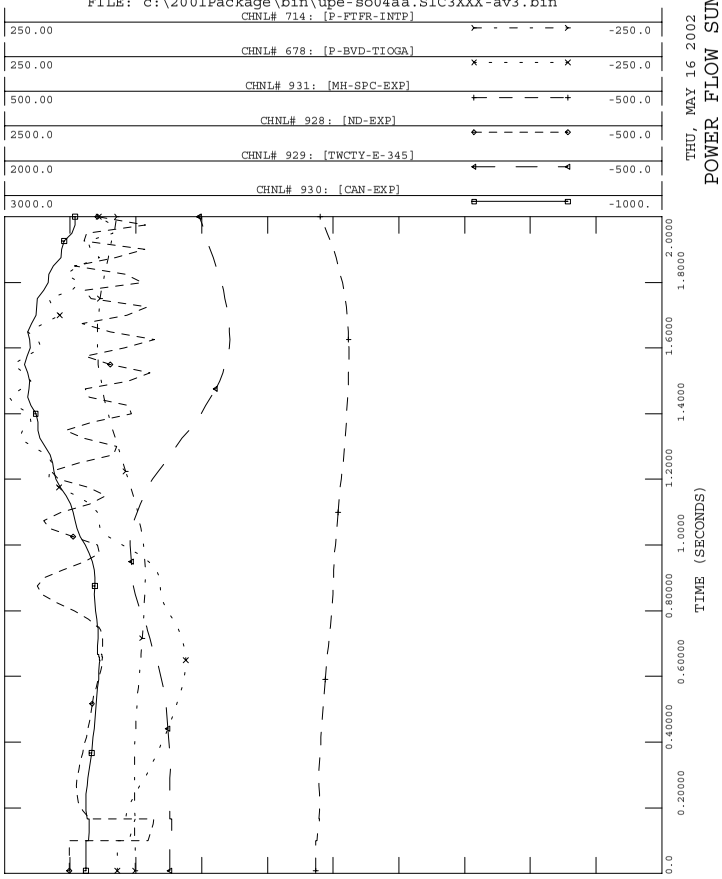
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
POWER FLOW SUMS 1



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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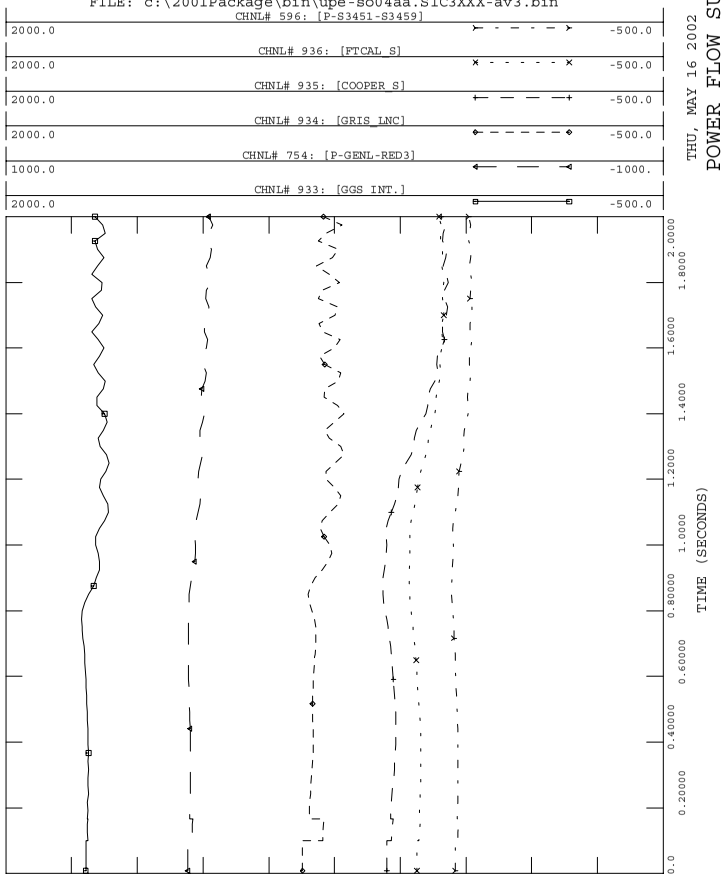
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
POWER FLOW SUM 3



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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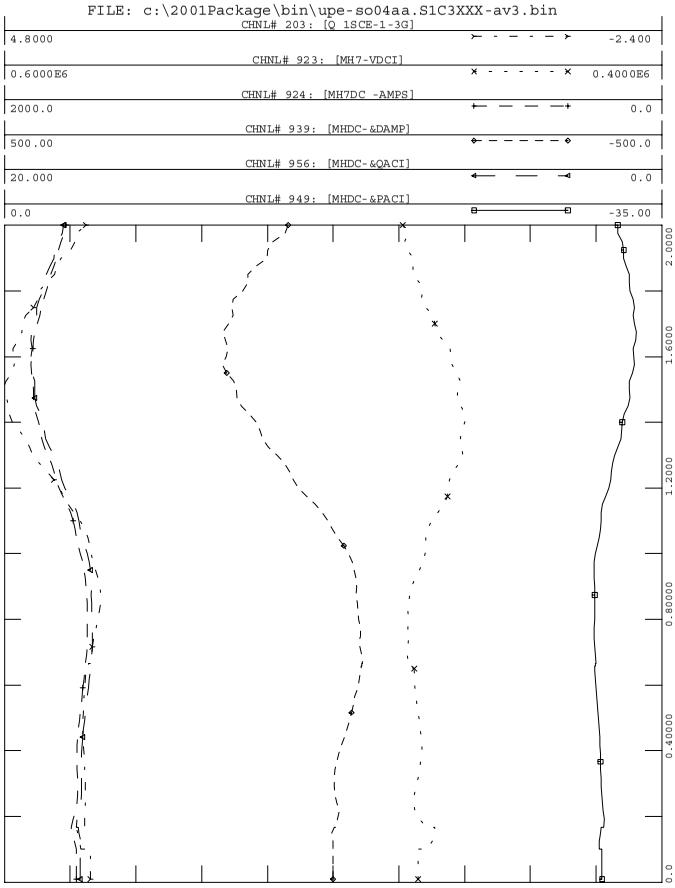
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
MH DC PARAMETERS



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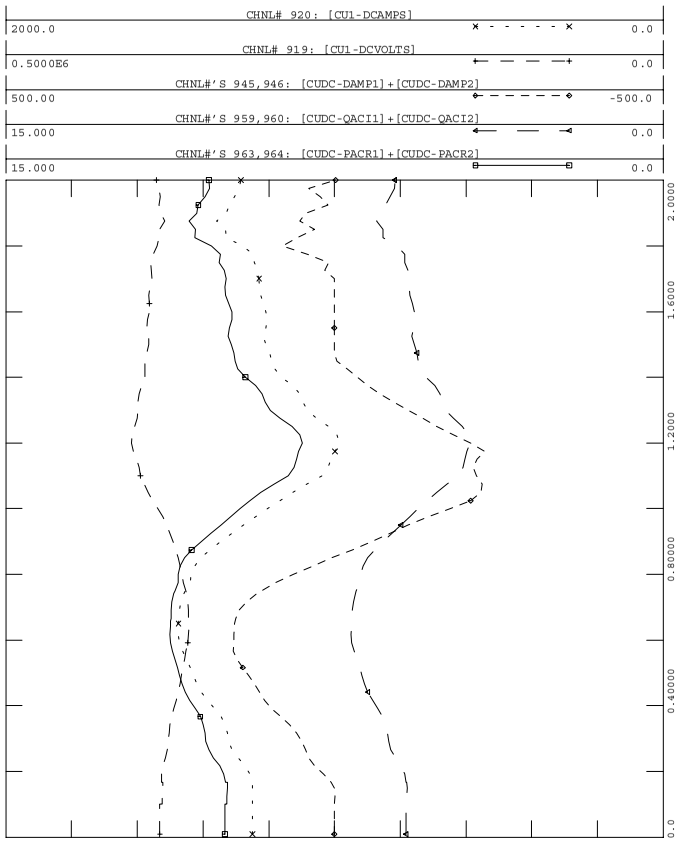
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
CU DC #1



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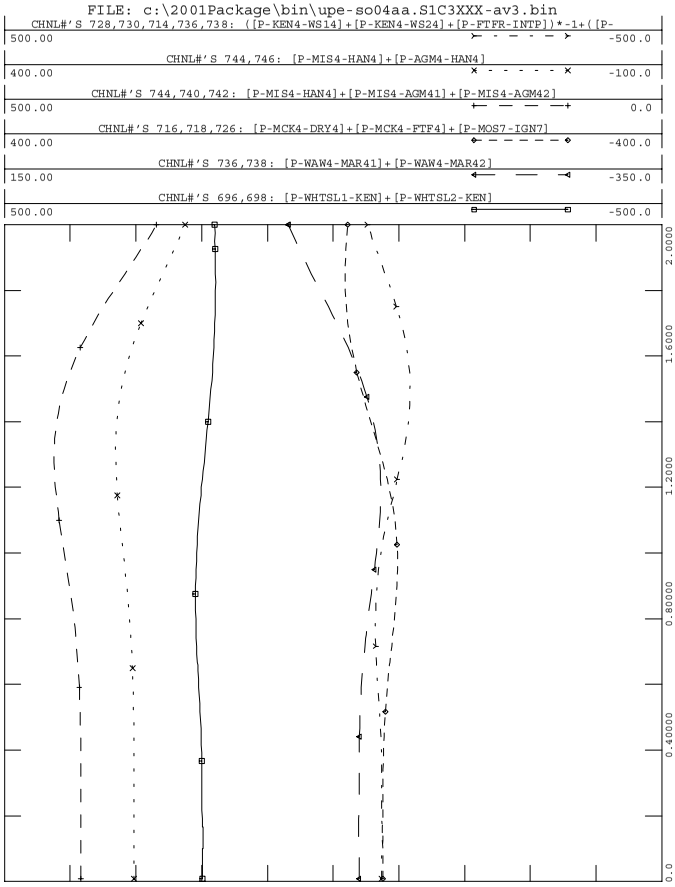
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05
OH TIE FLOWS



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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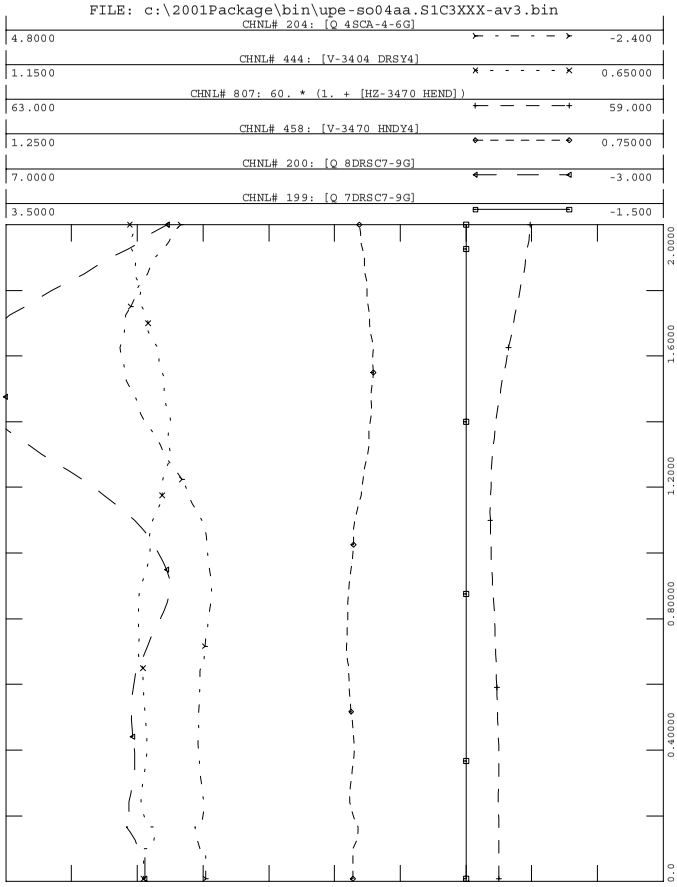
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

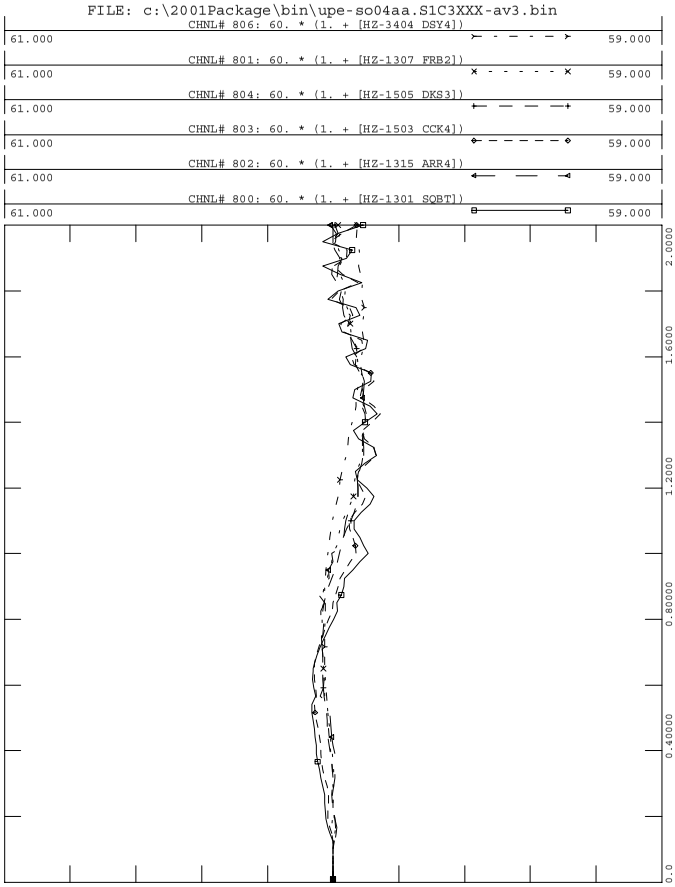
THU, MAY 16 2002 11:05
MH DC PARAMETERS



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

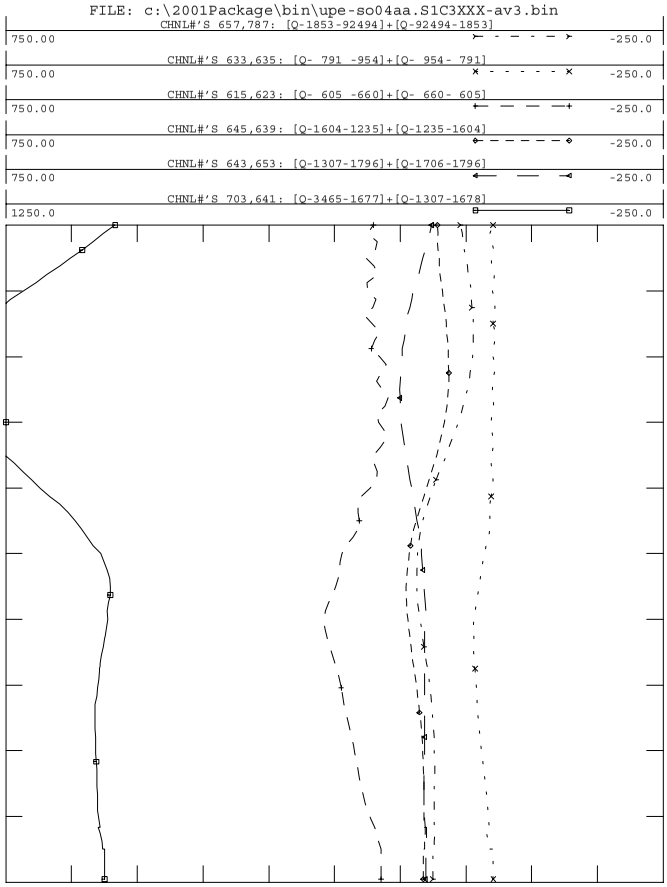
FREQ AT DC TERMINALS



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

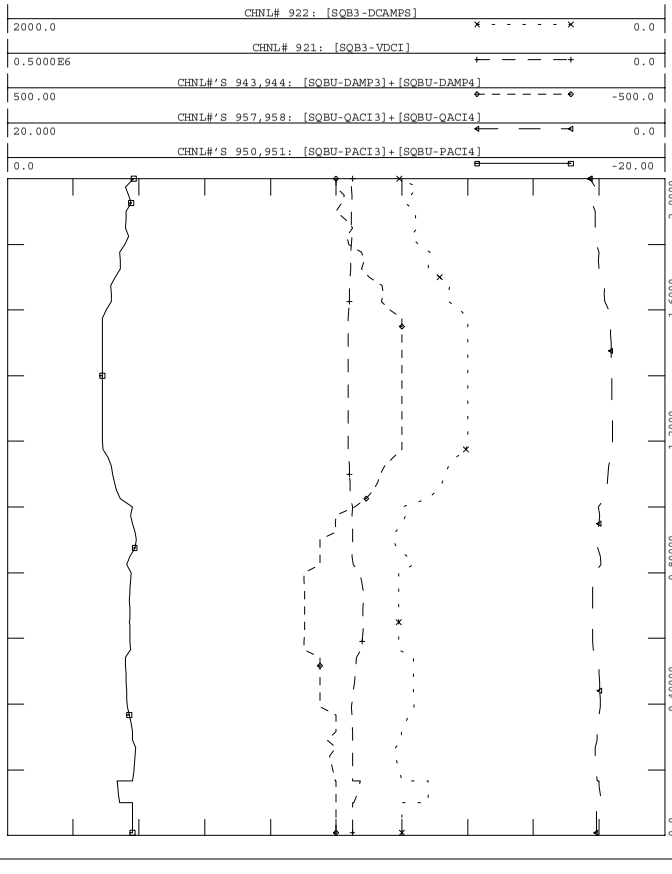
VAR LOSSES



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

SQB DC #3



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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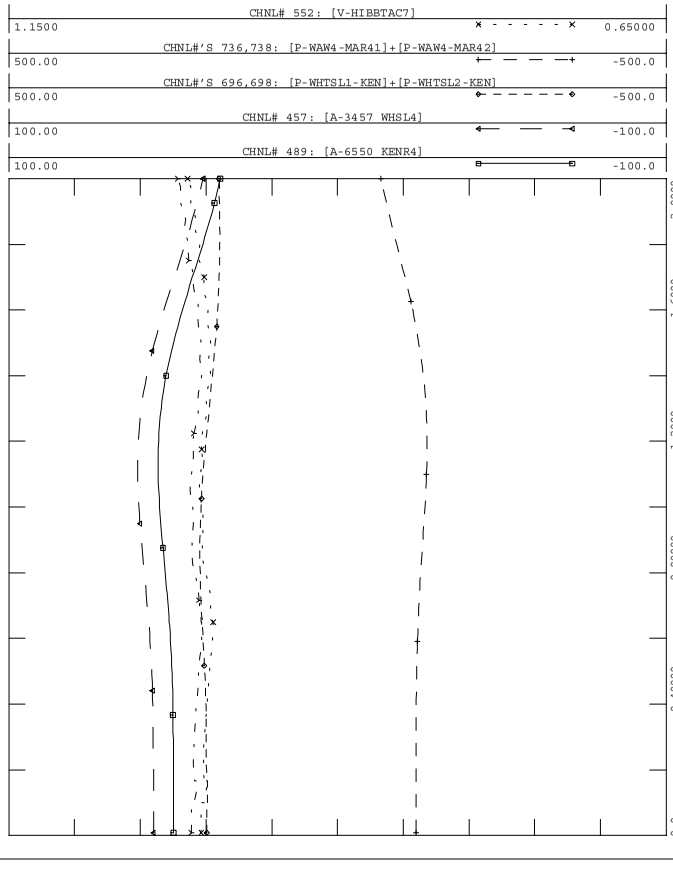
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

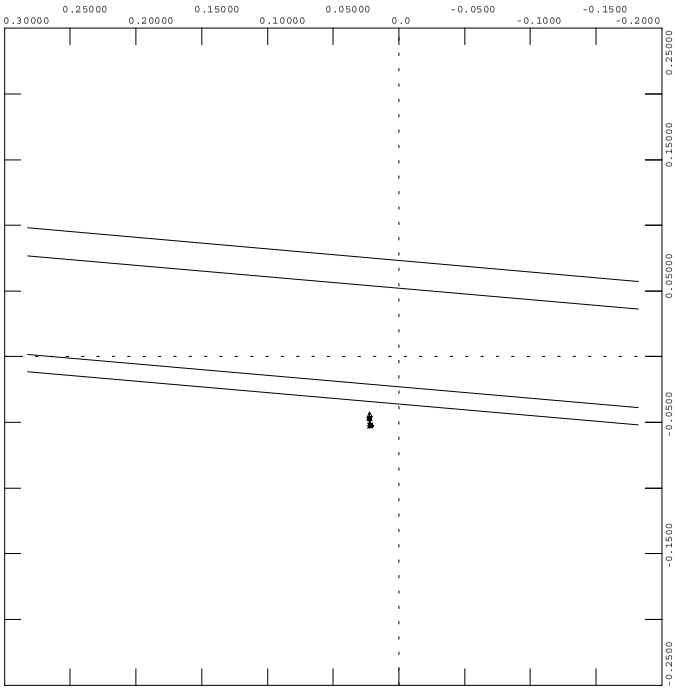
VOLTAGES, ANGLES



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, MAY 16 2002 11:05
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

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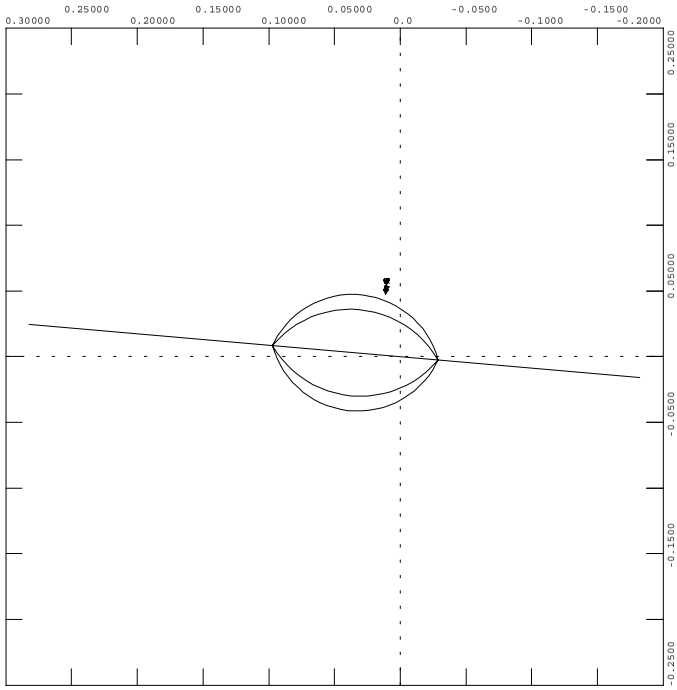

THU, MAY 16 2002 11:05
D602F-DORSEY (606)
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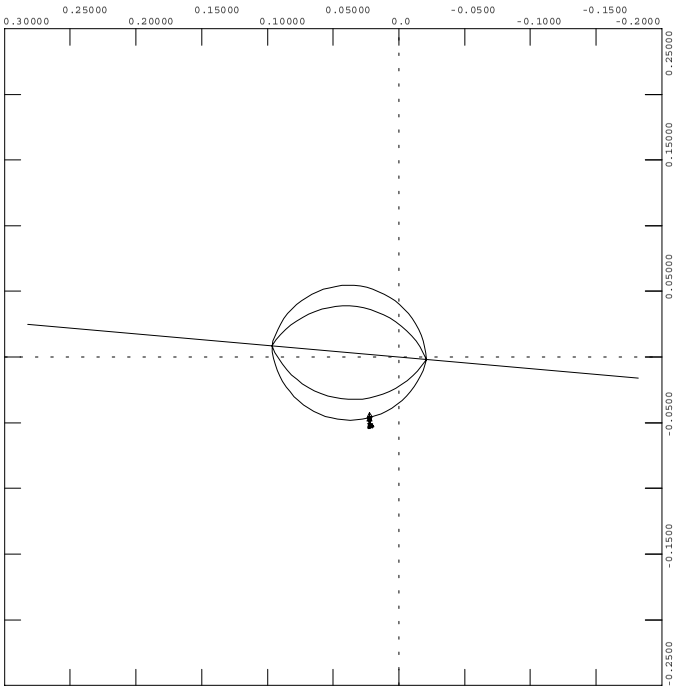
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

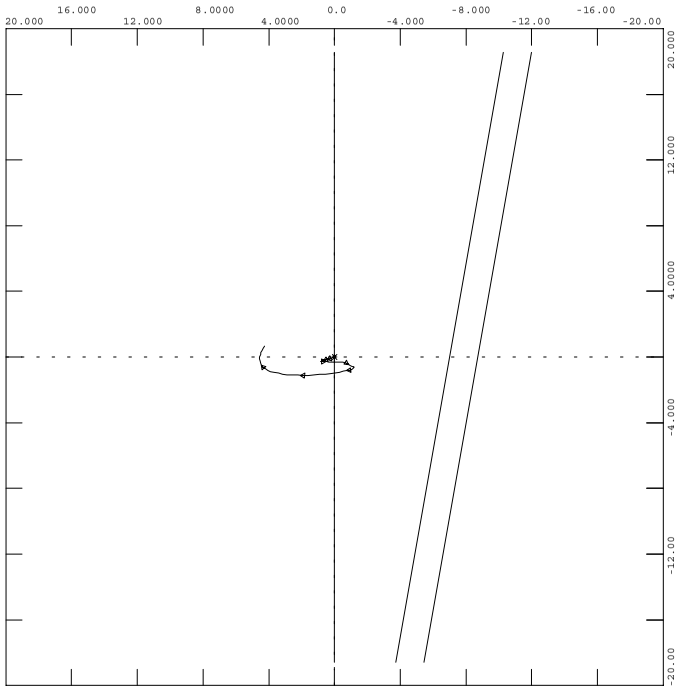


THU, MAY 16 2002 11:05
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

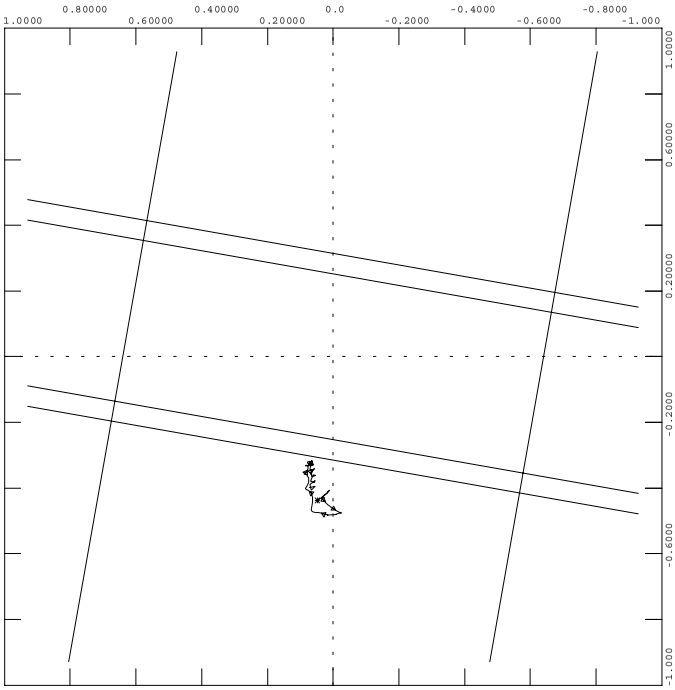


THU, MAY 16 2002 11:05
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

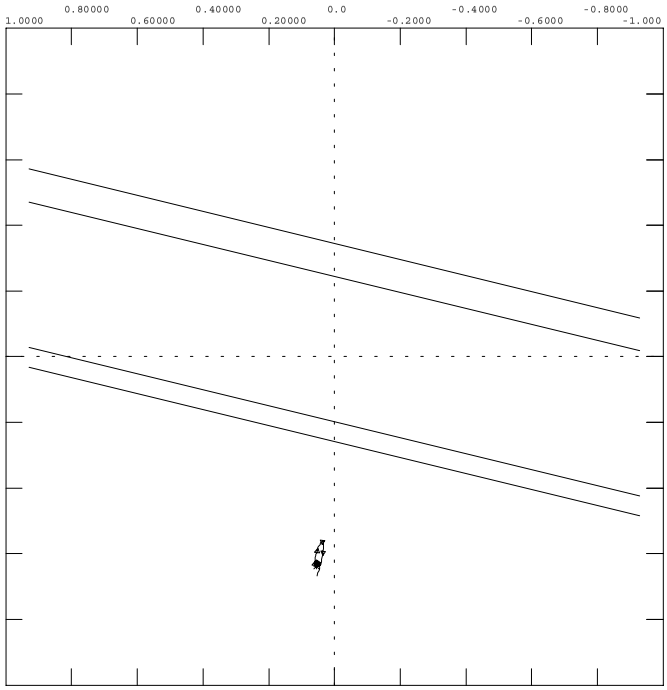
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

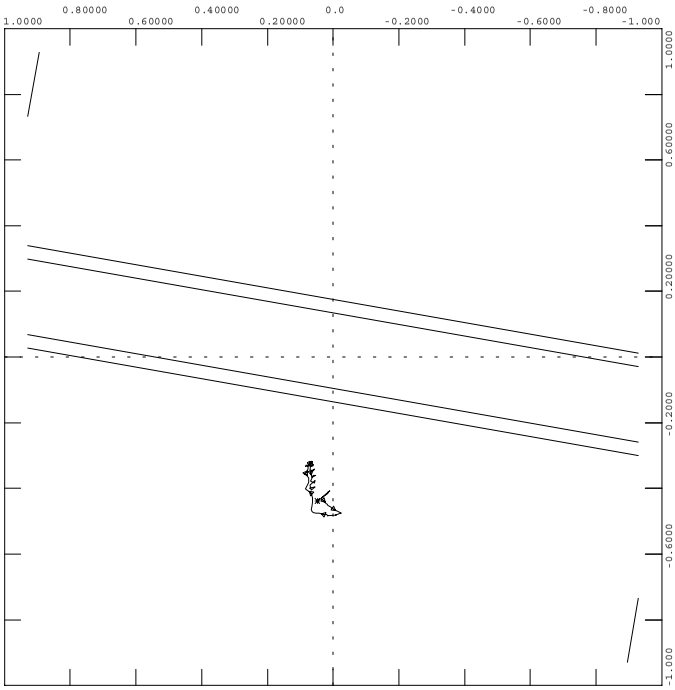
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

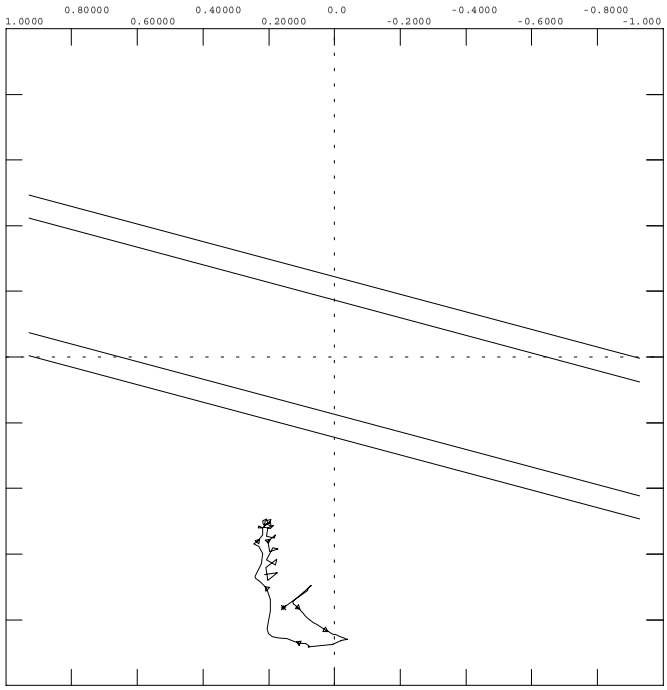
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

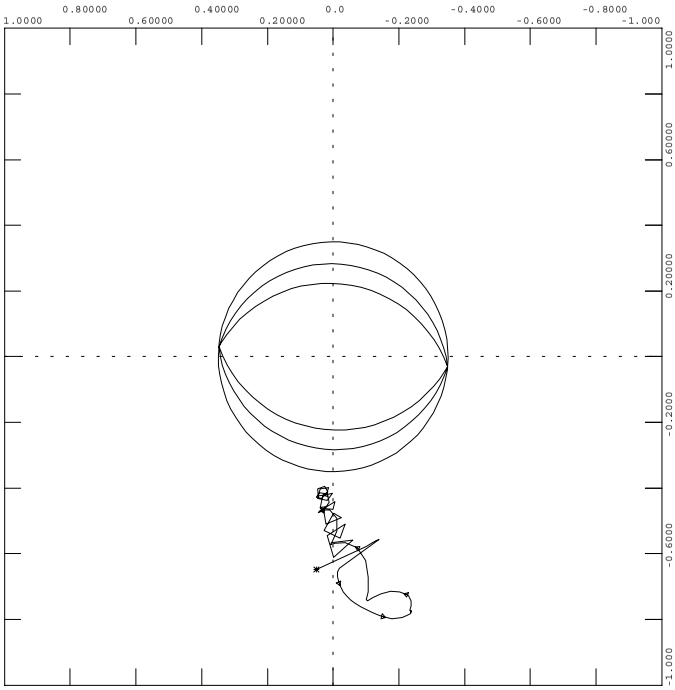
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

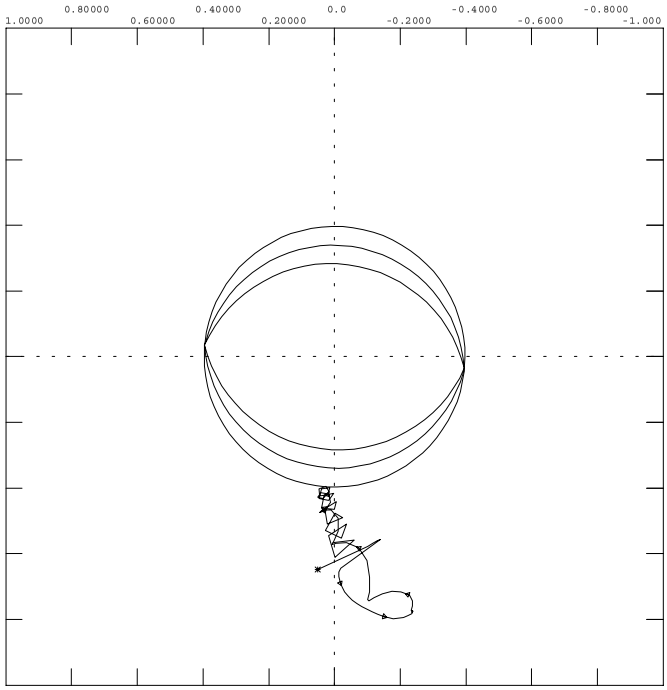
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

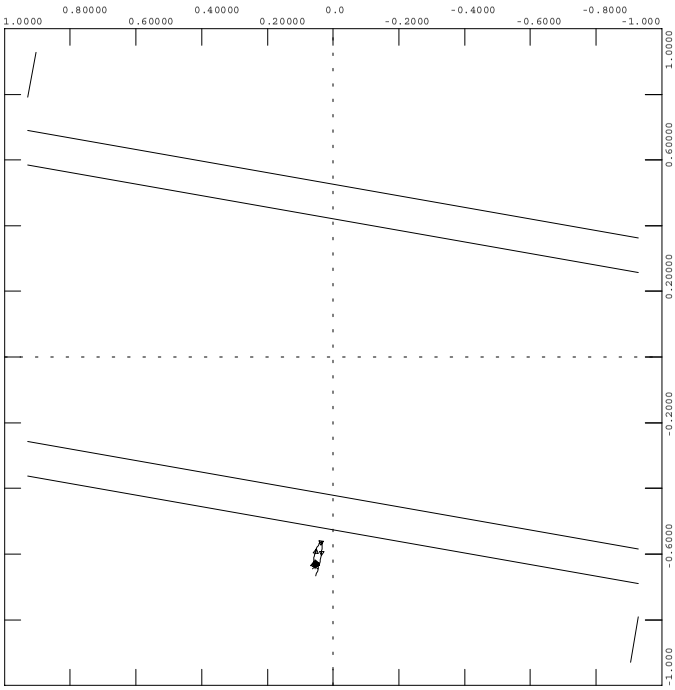
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

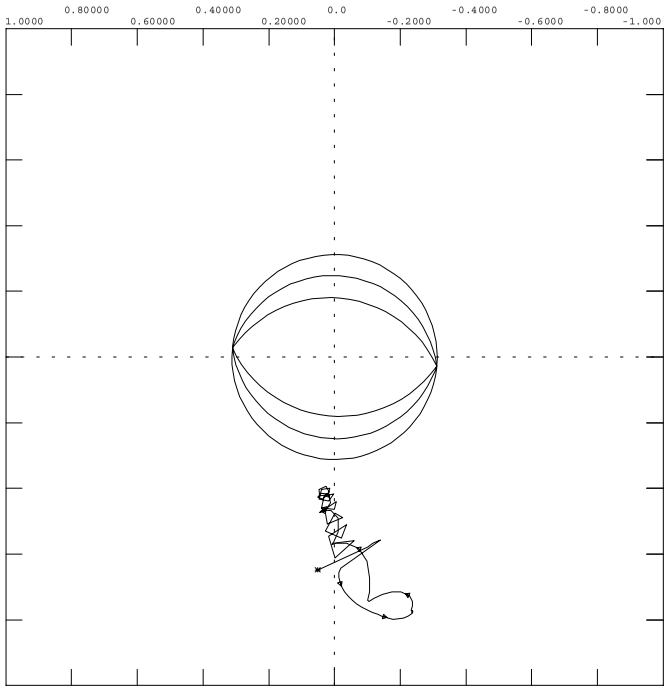
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



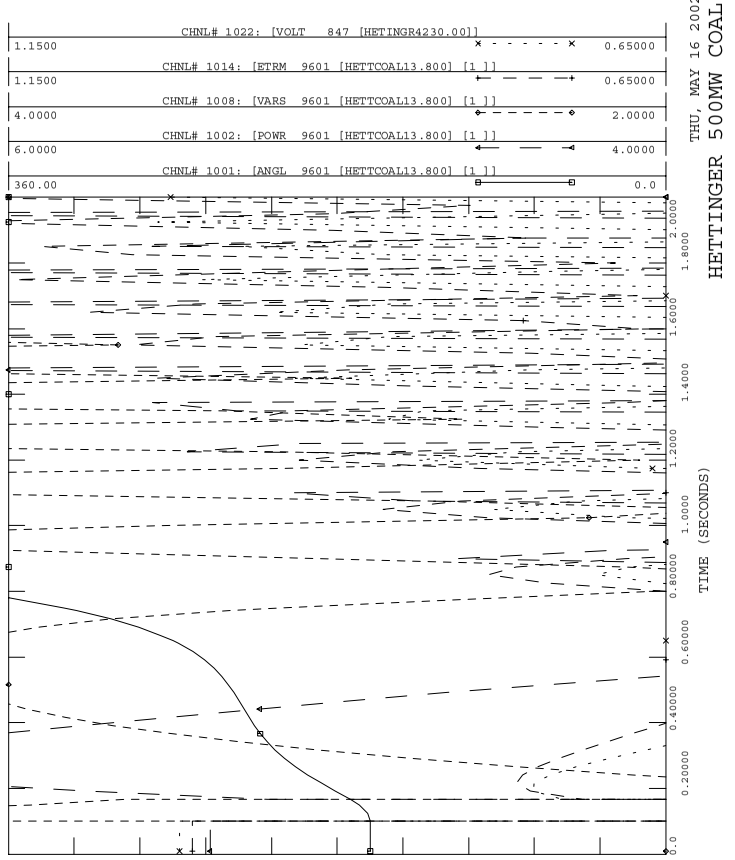
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

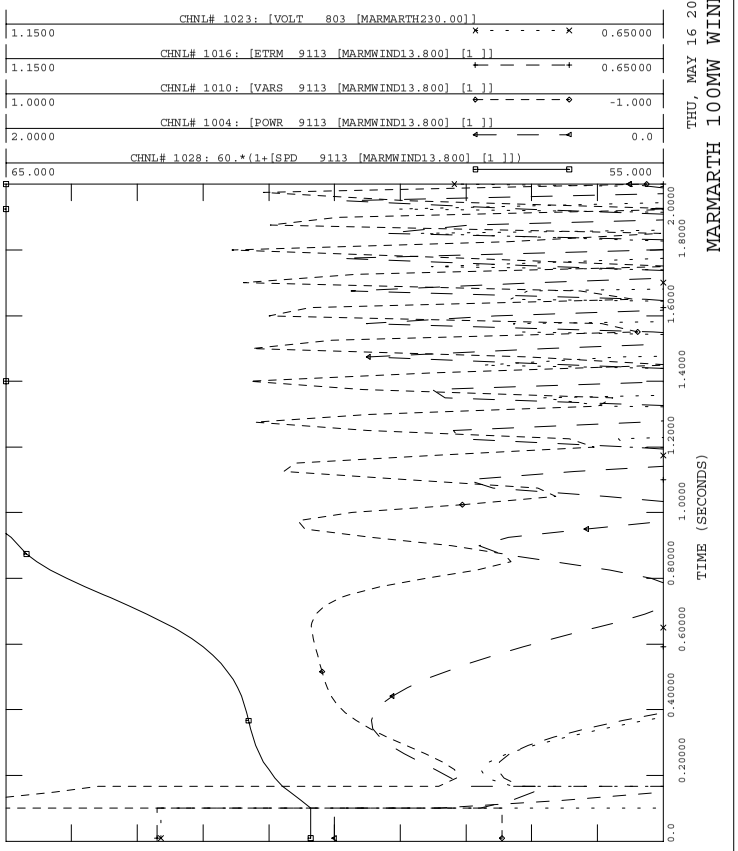


UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin



THU, MAY 16 2002 11:05
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

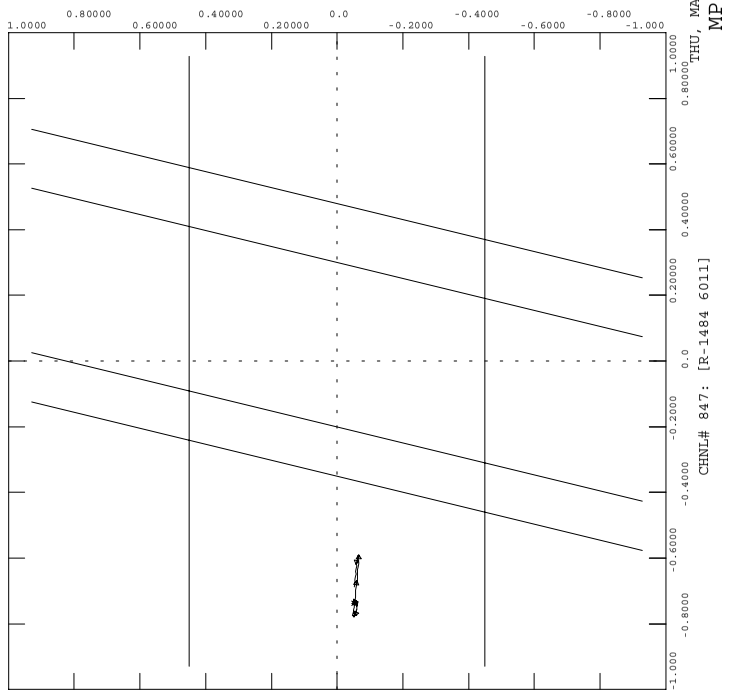


THU, MAY 16 2002 11:05
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

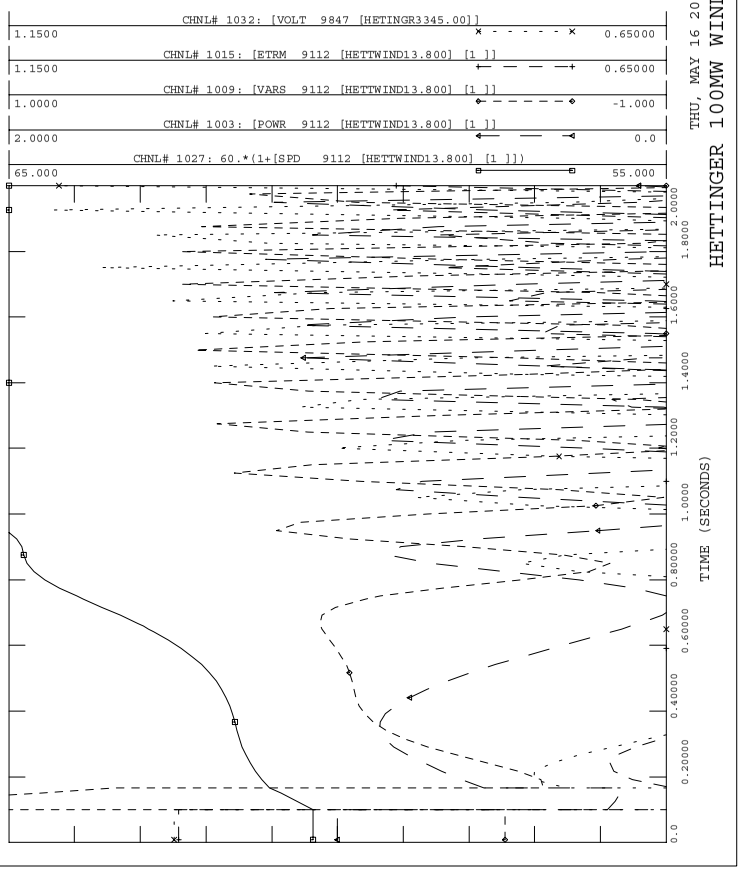
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



THU, MAY 16 2002 11:05
MP-OH I.FALLS (779)

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

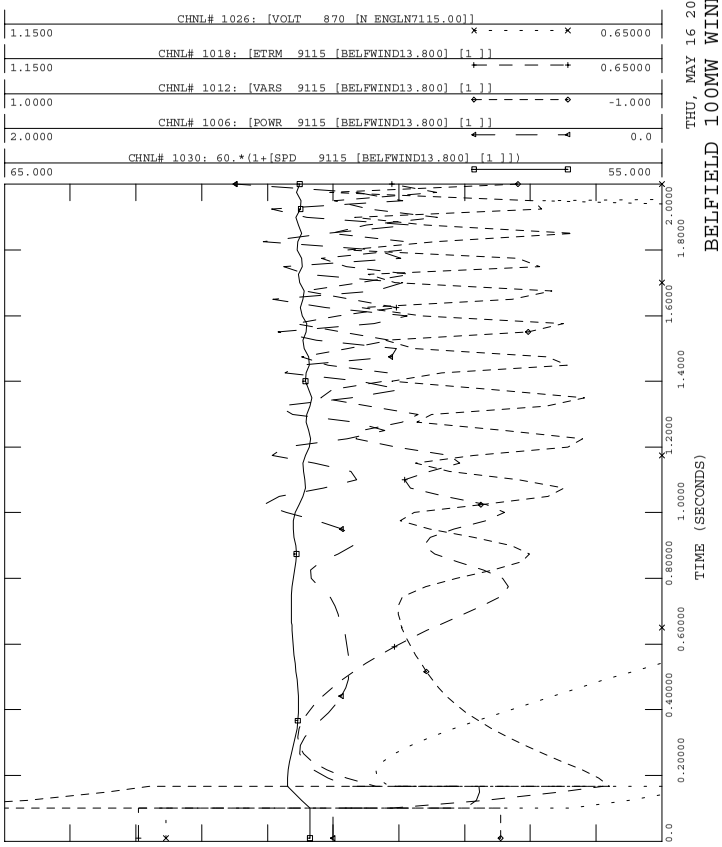


THU, MAY 16 2002 11:05
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

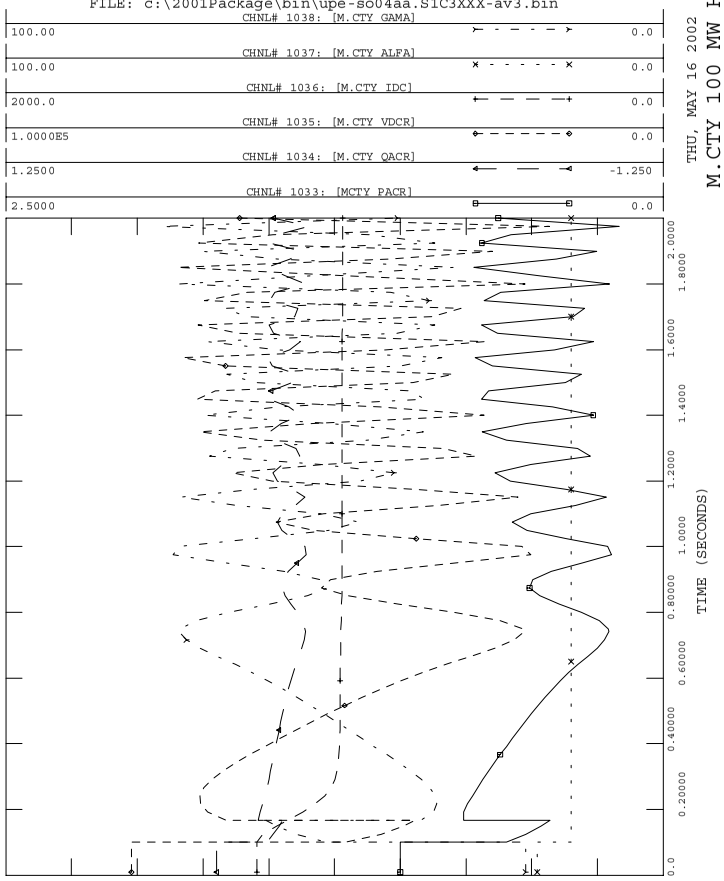
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

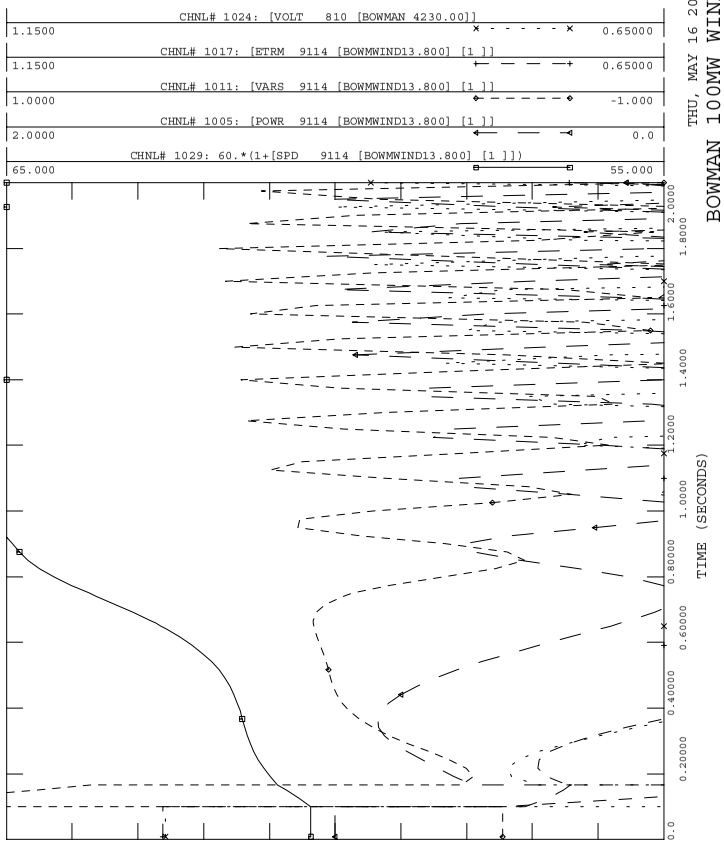
M.CTY 100 MW HVDC



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

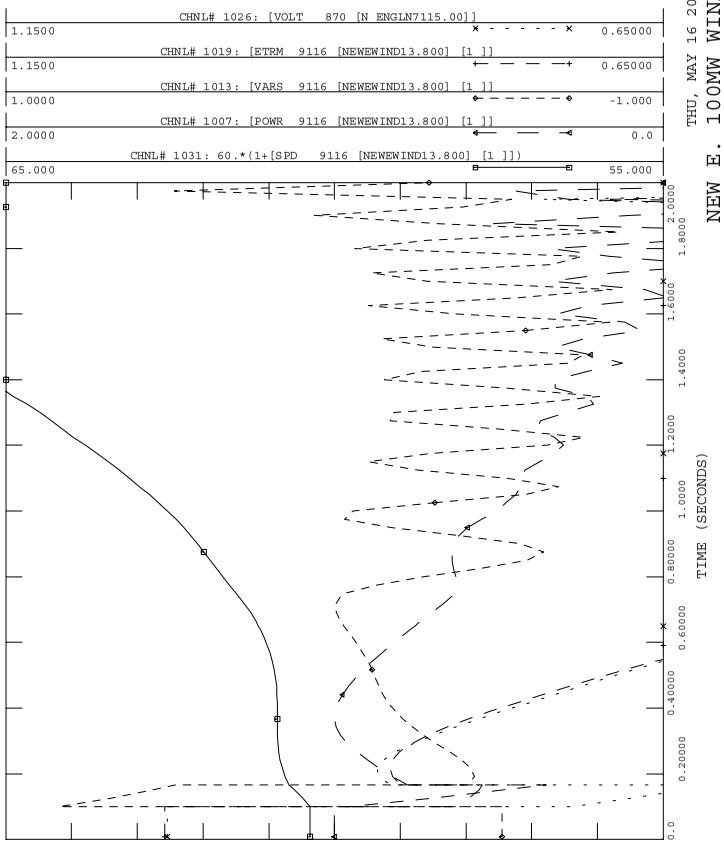
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-av3.bin

THU, MAY 16 2002 11:05

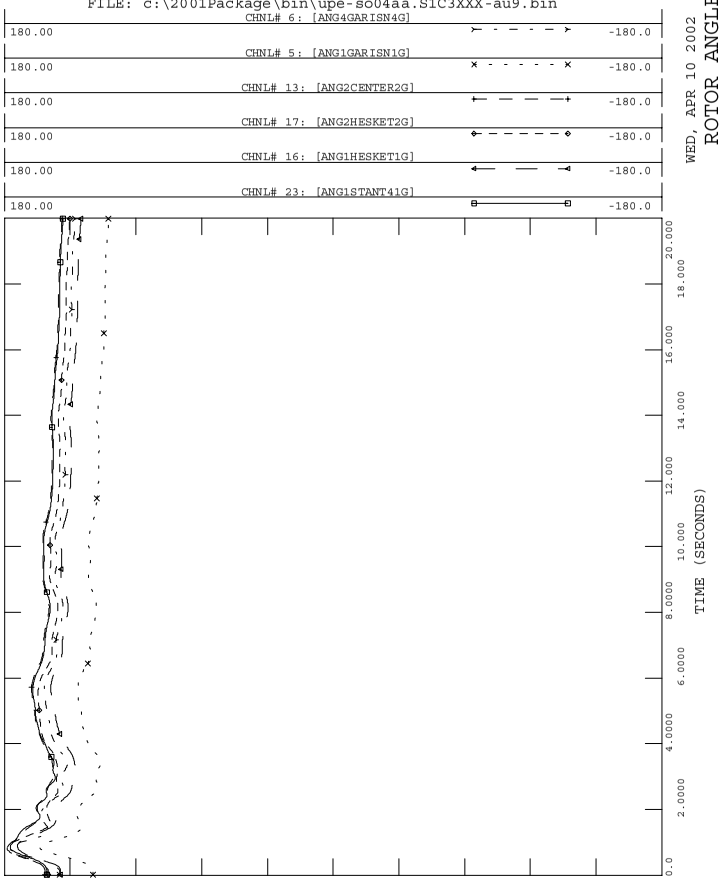
NEW E. 100MW WIND UNIT



CONTINGENCY AU9

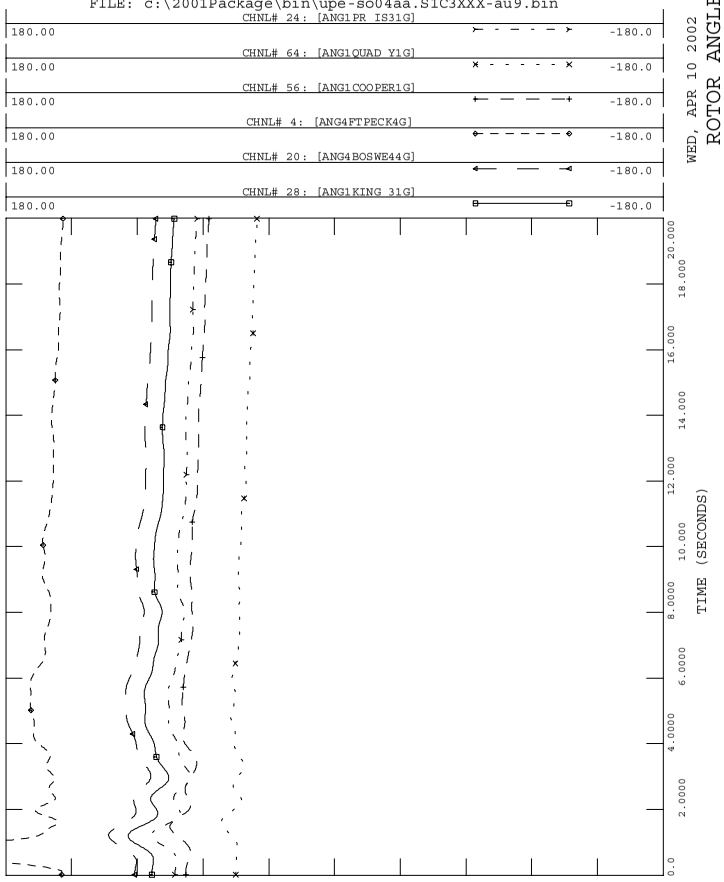
4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Ft. Thompson 345 kV line

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



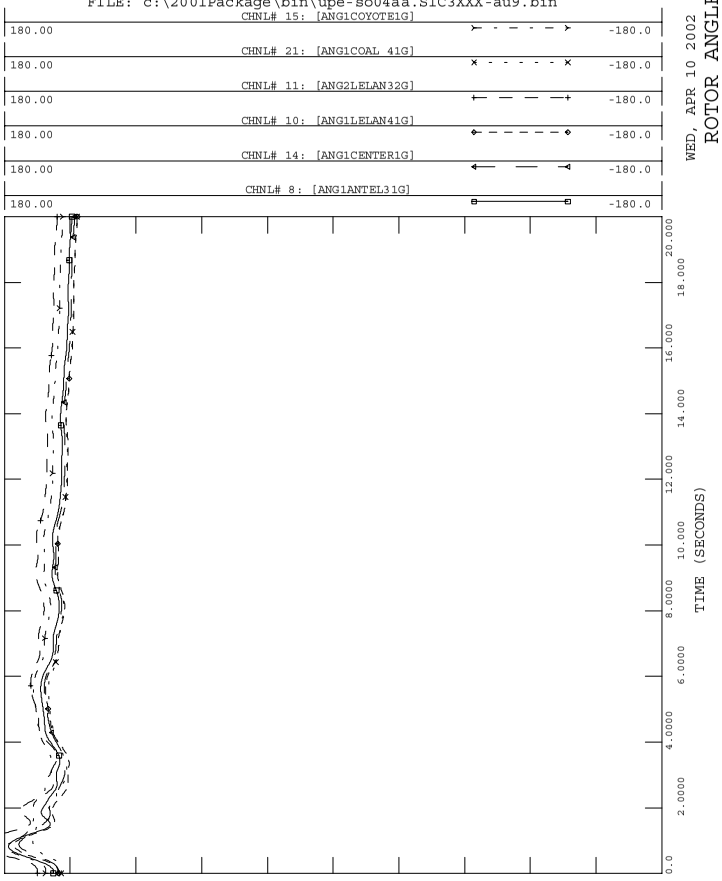
WED, APR 10 2002 15:40
ROTOR ANGLES 2

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



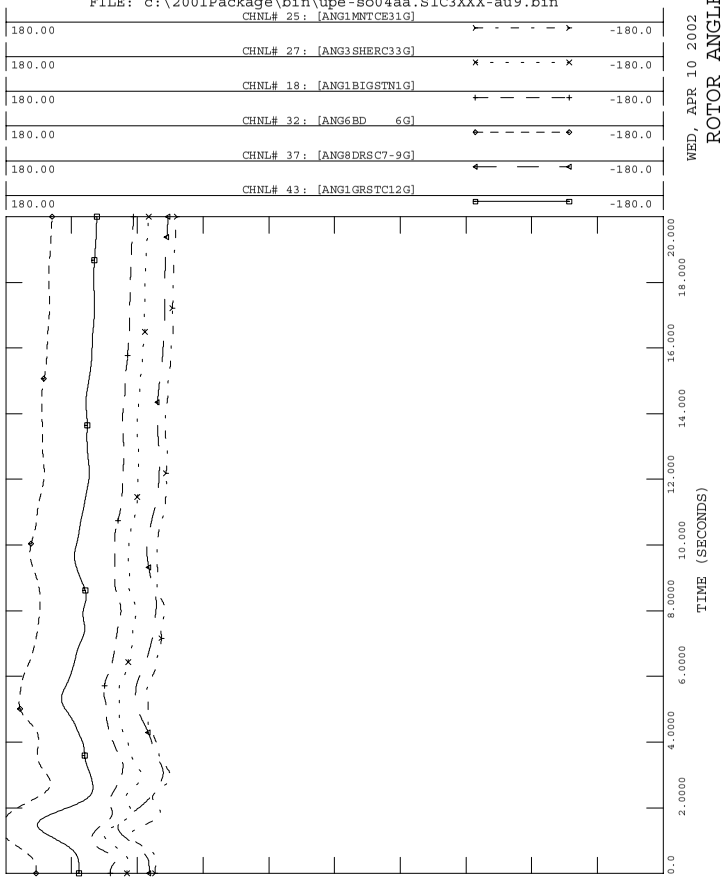
WED, APR 10 2002 15:40
ROTOR ANGLES 4

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



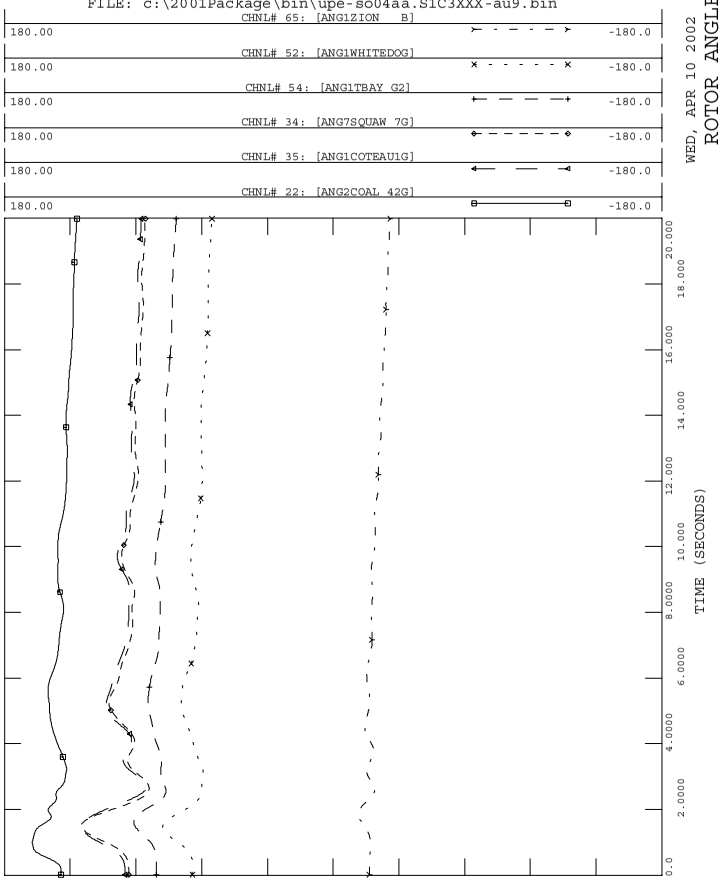
WED, APR 10 2002 15:40
ROTOR ANGLES 1

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



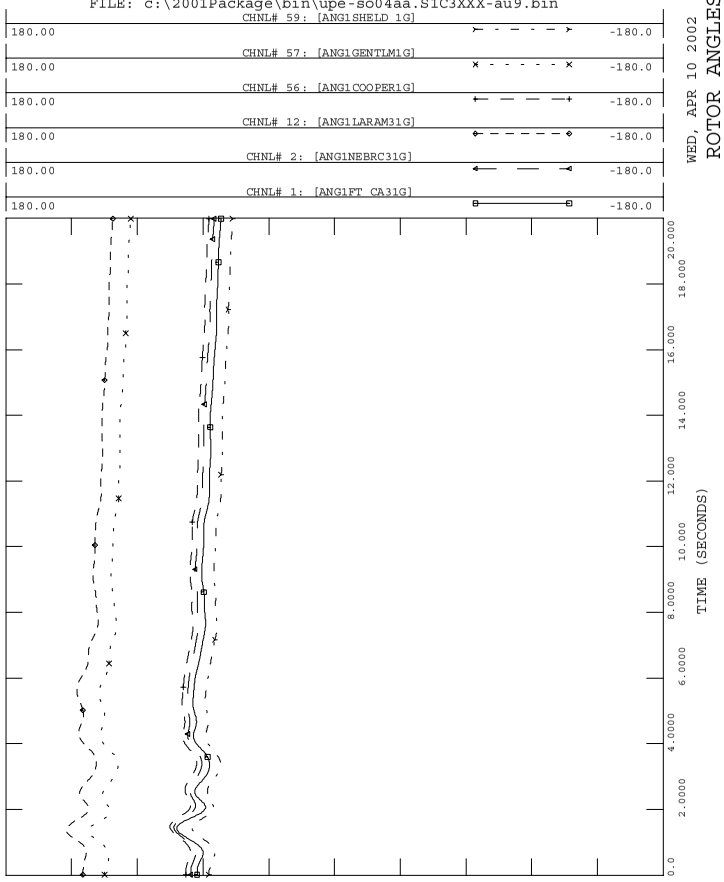
WED, APR 10 2002 15:40
ROTOR ANGLES 3

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



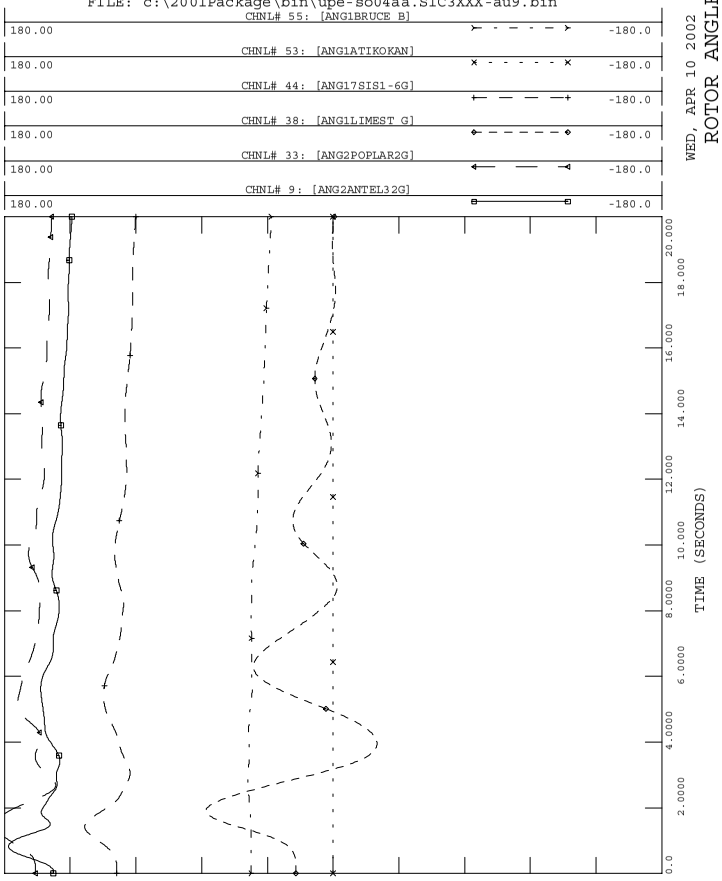
WED, APR 10 2002 15:40
ROTOR ANGLES 6

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



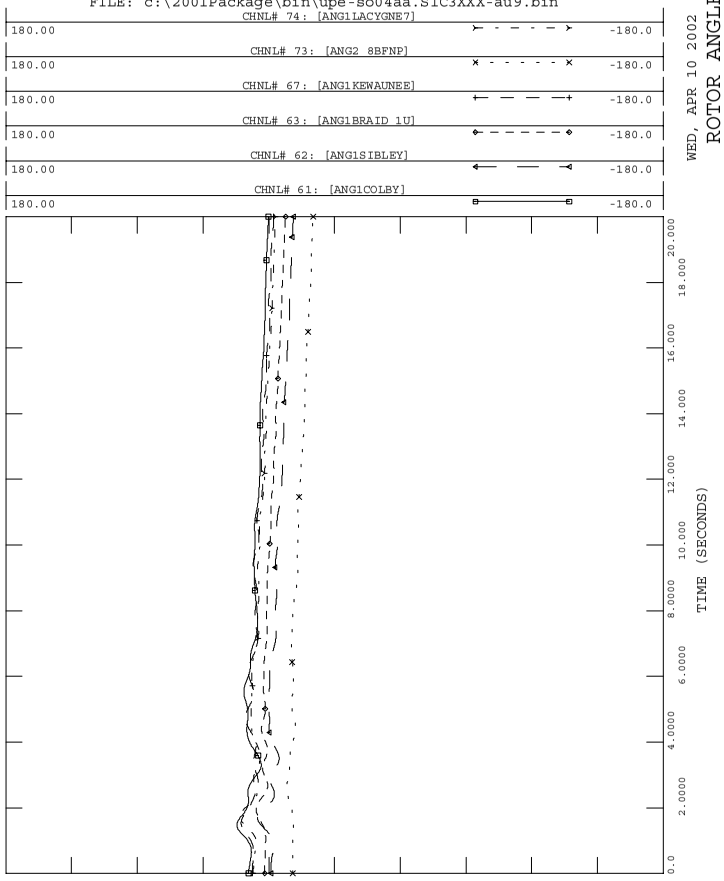
WED, APR 10 2002 15:40
ROTOR ANGLES NB

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



WED, APR 10 2002 15:40
ROTOR ANGLES 5

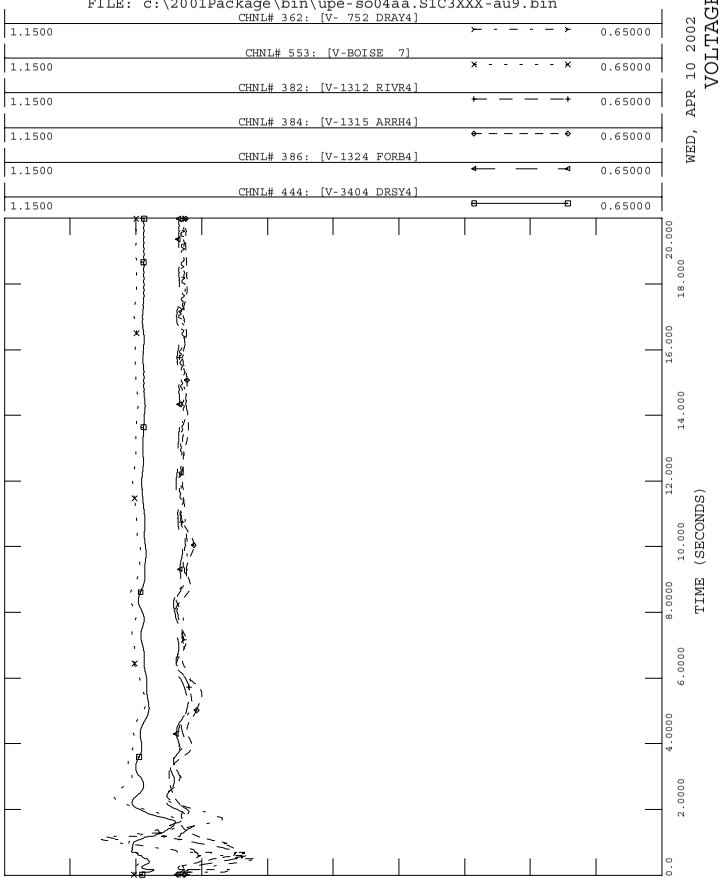
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



WED, APR 10 2002 15:40
ROTOR ANGLES 7

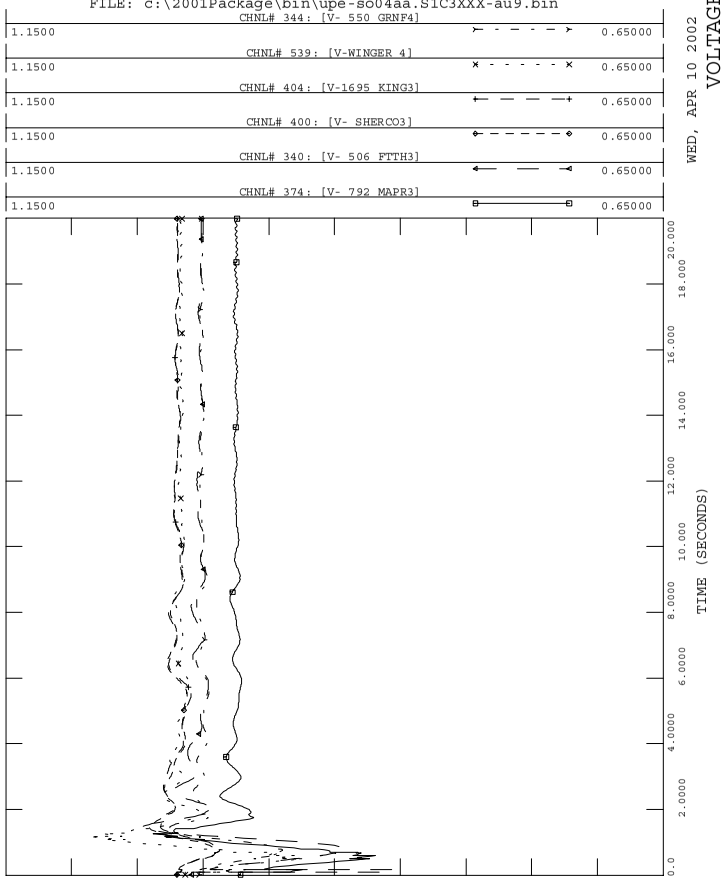
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
VOLTAGES 1



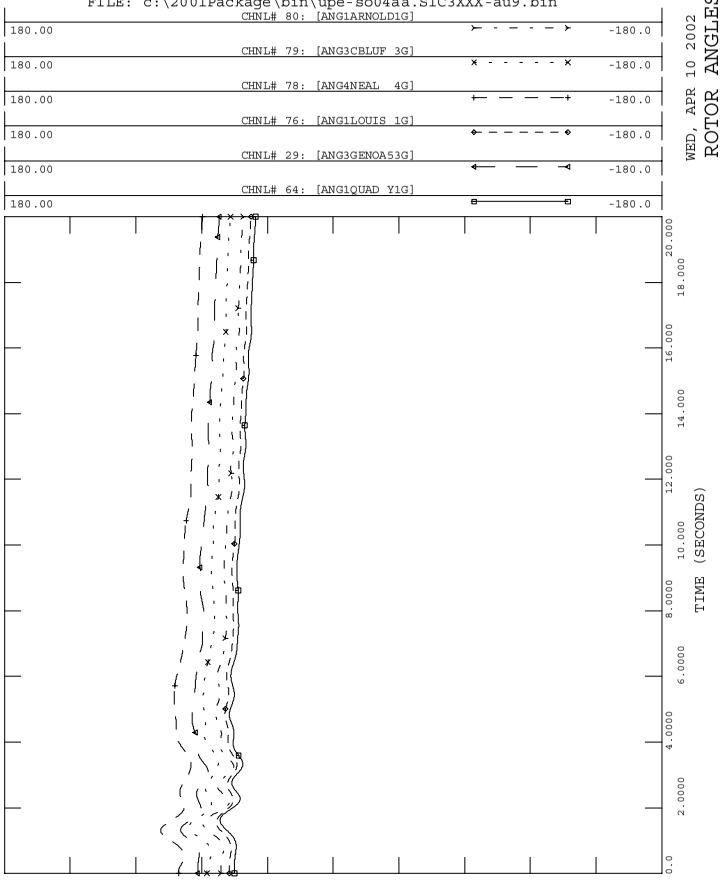
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
VOLTAGES 3



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
ROTOR ANGLES IA



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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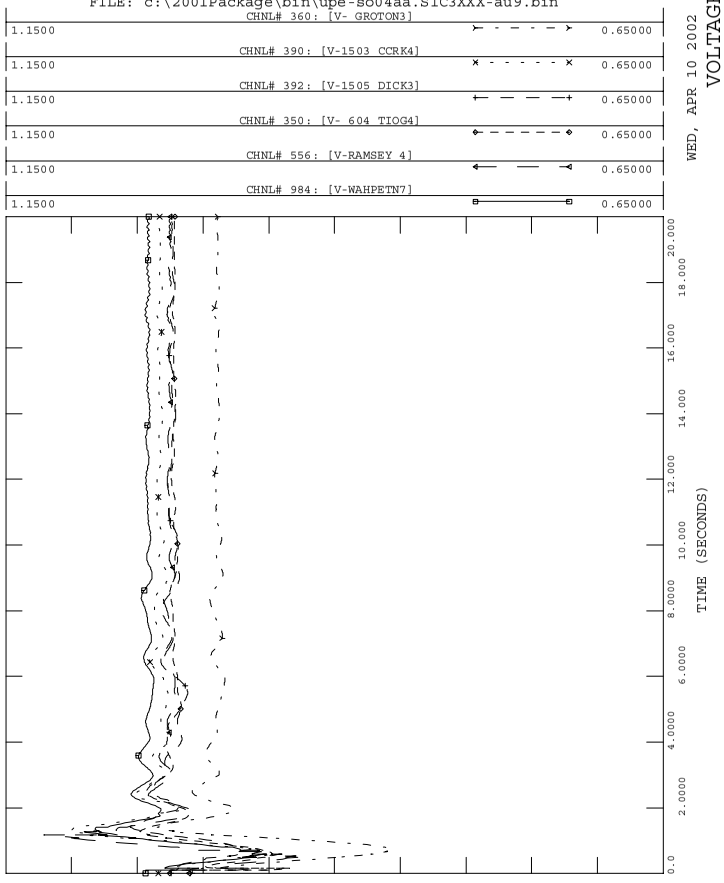
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
VOLTAGES 2



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
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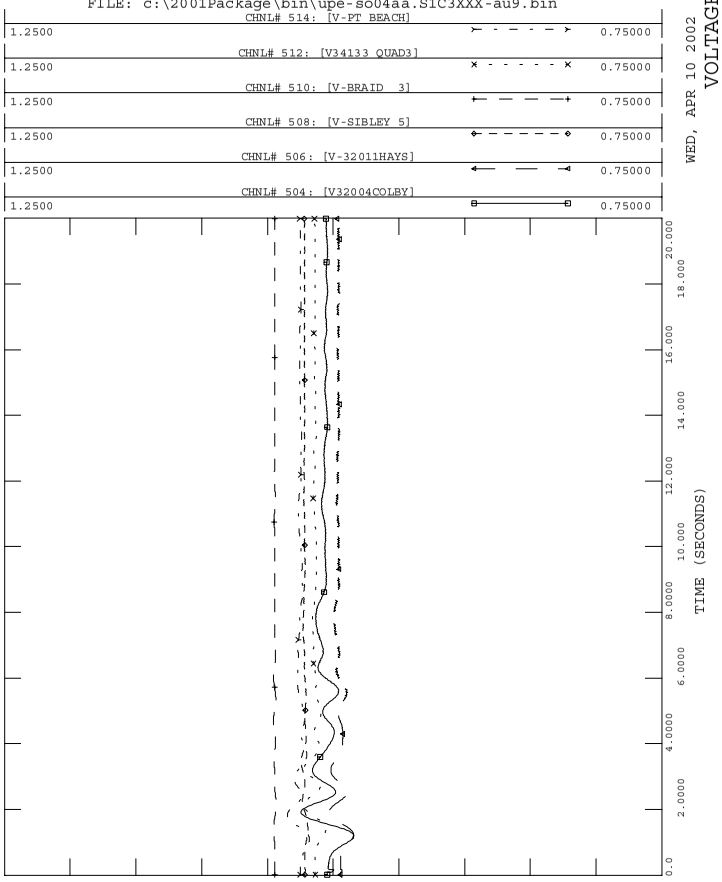
WED, APR 10 2002 15:40
VOLTAGES 5



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

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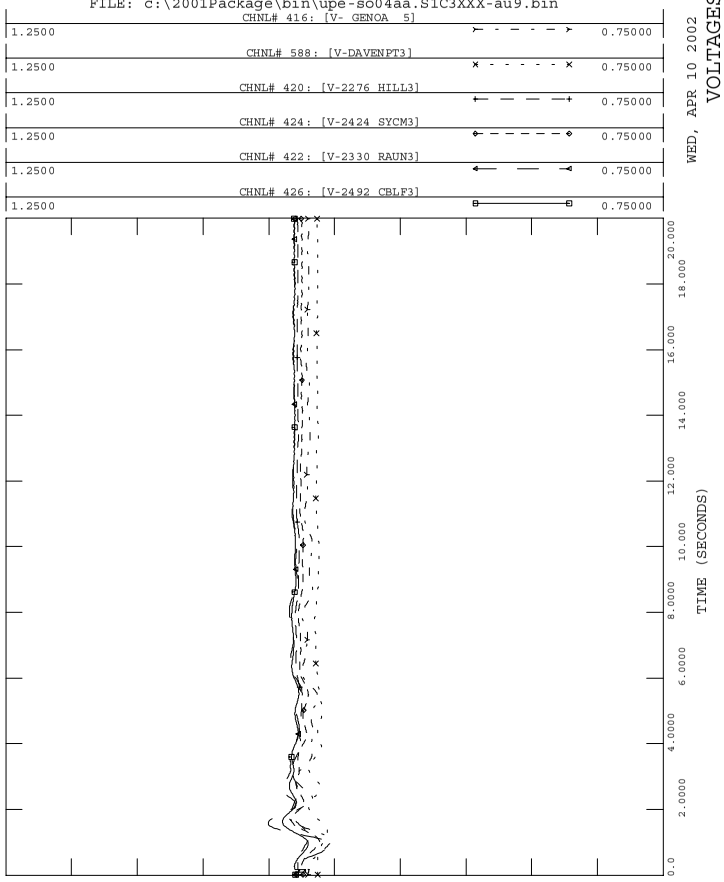
VOLTAGES IA



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

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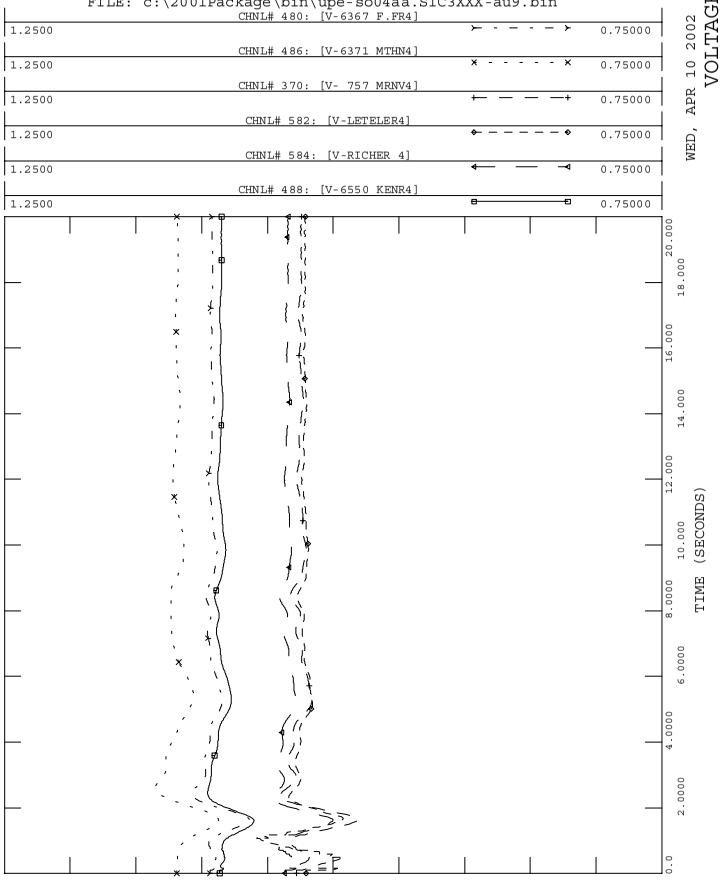
VOLTAGES 4



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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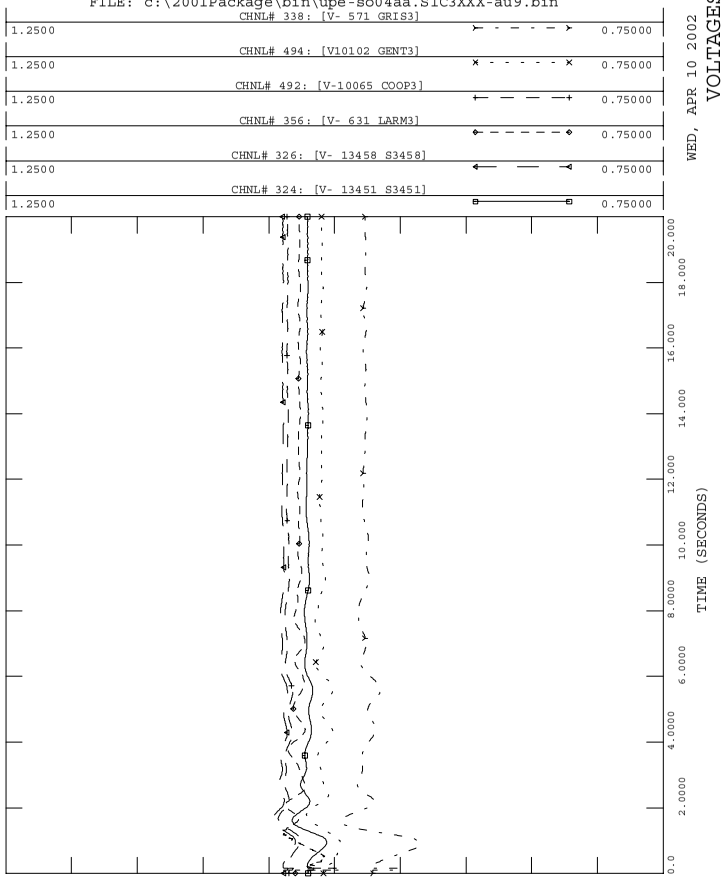
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
VOLTAGES NB



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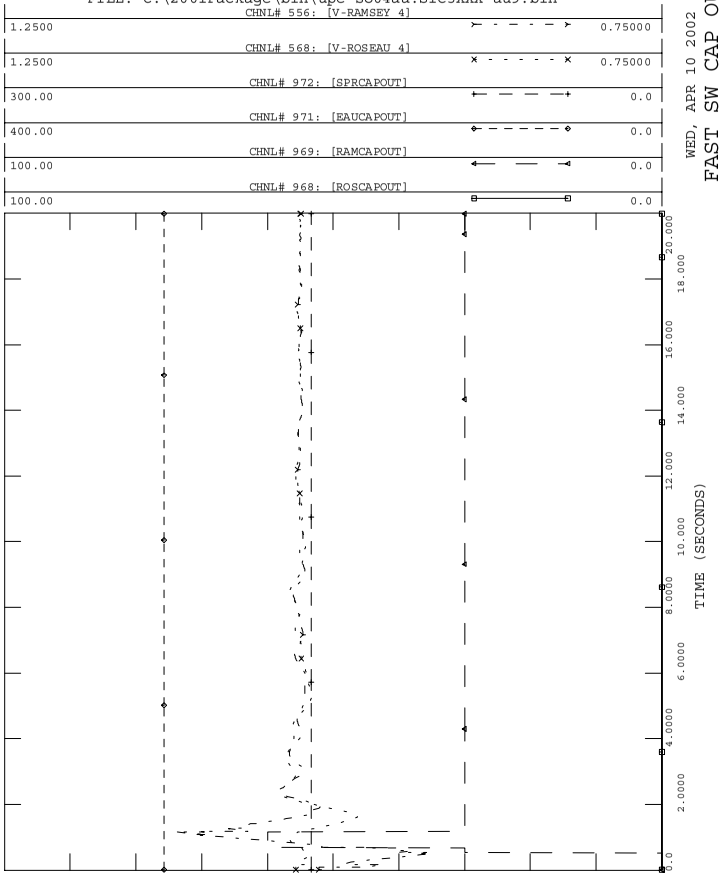
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



WED, APR 10 2002 15:40
FAST SW CAP OUT 2

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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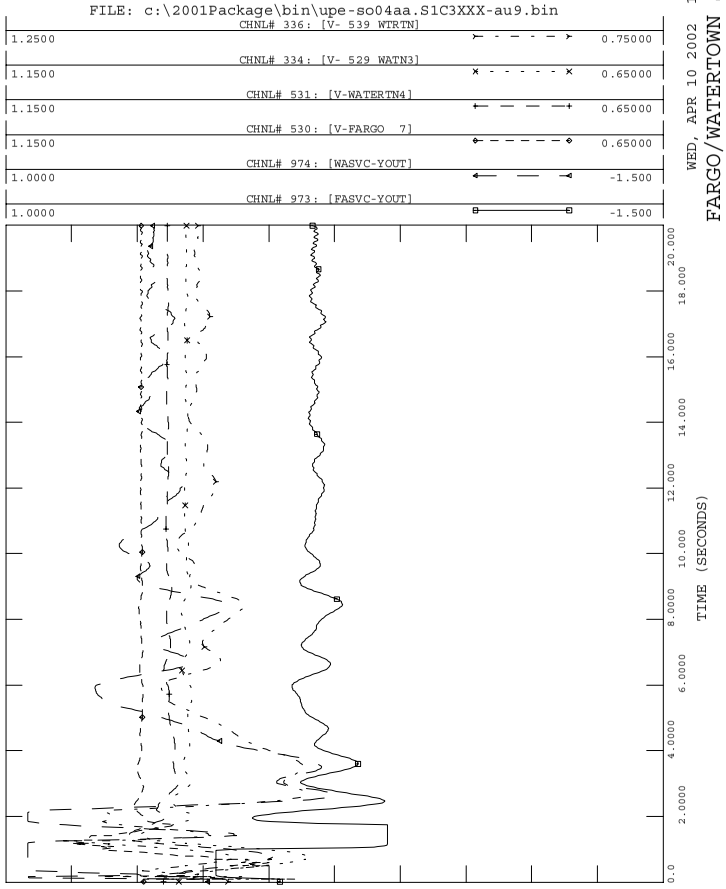
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



WED, APR 10 2002 15:40
FARGO/WATERTOWN SVS

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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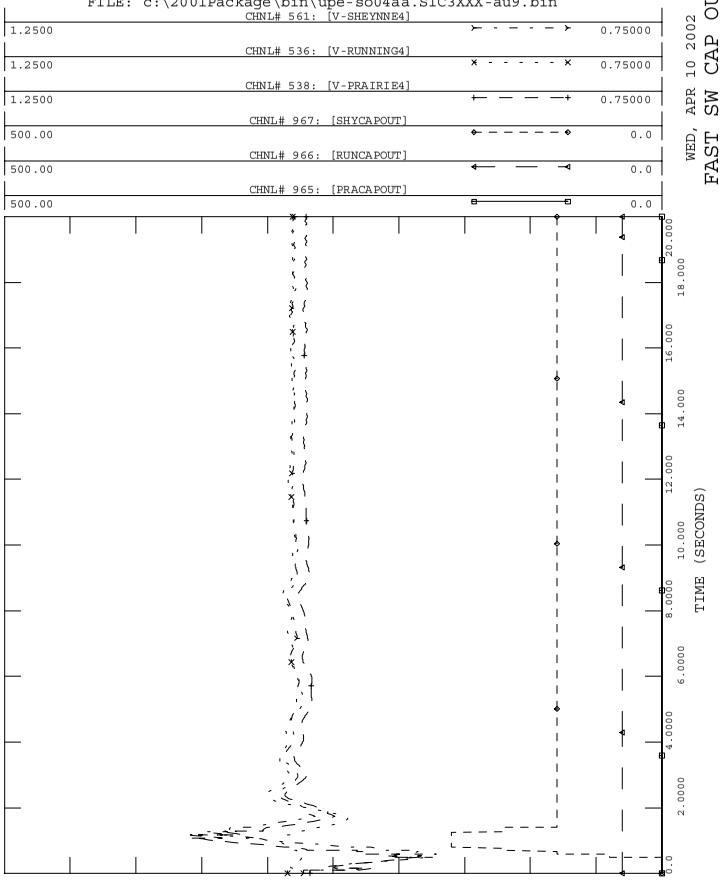
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



WED, APR 10 2002 15:40
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UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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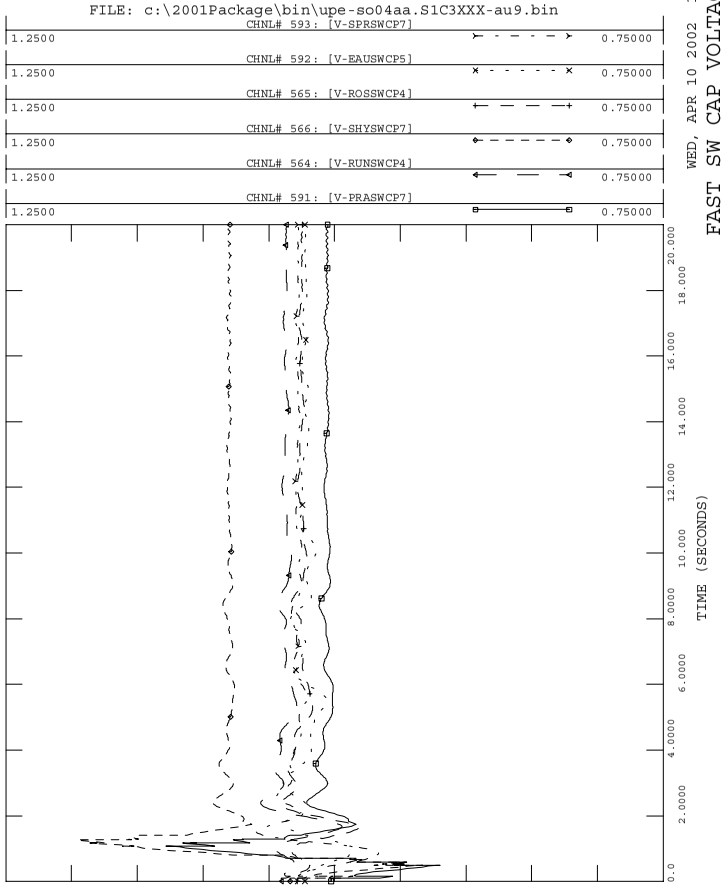
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



WED, APR 10 2002 15:40
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
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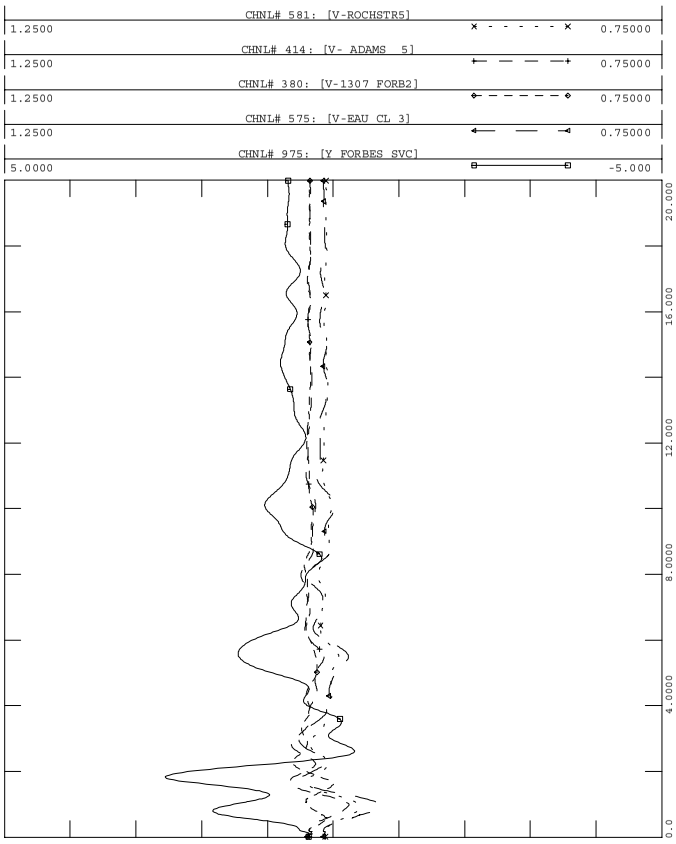
WED, APR 10 2002 15:40

SVC & WISCONSIN VOLT



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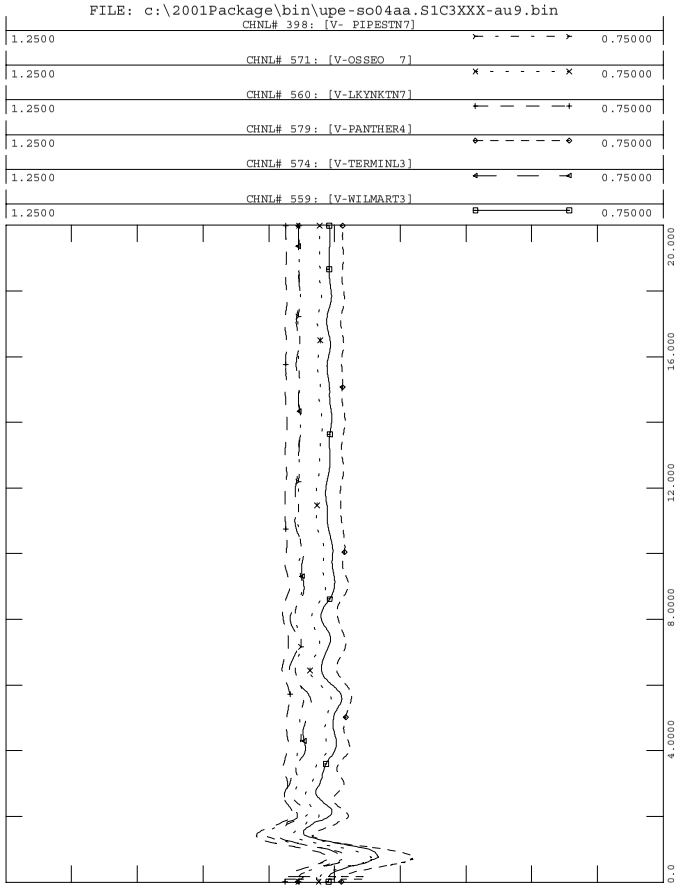
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40

TC VOLTAGES



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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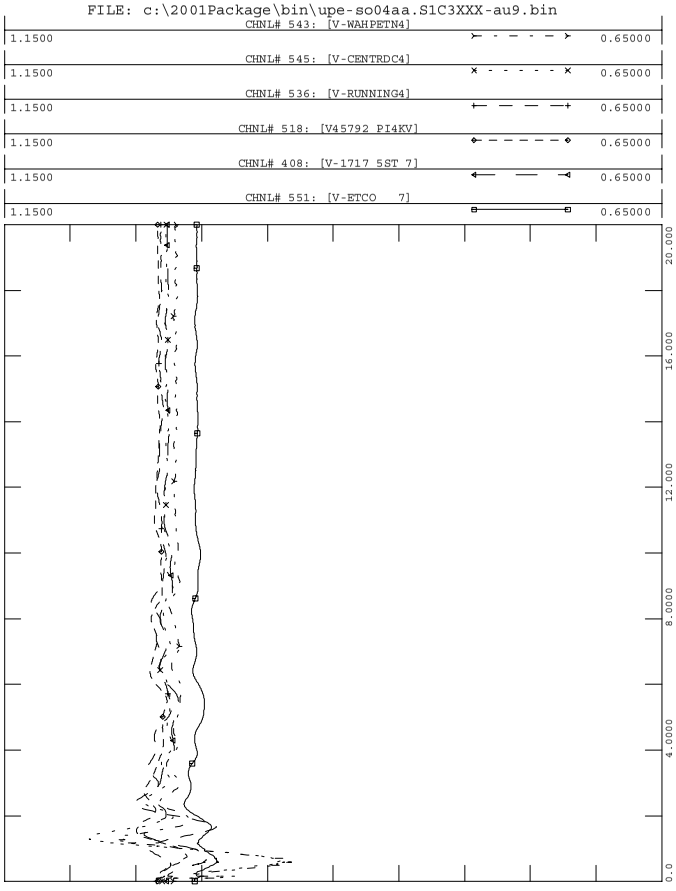
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40

VOLTAGES 6



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
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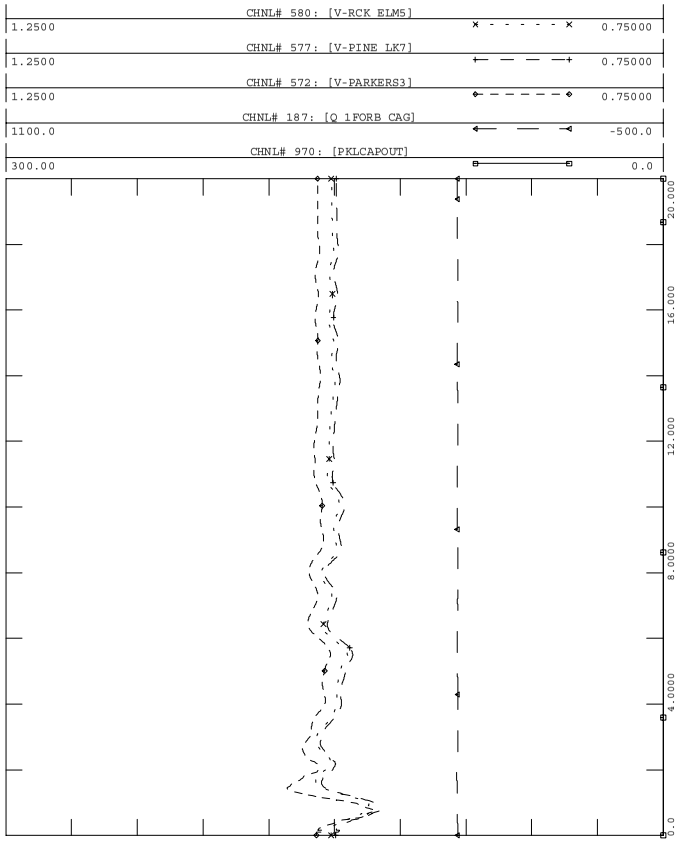
FORBES SVS OUT & VOLTAGES



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CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
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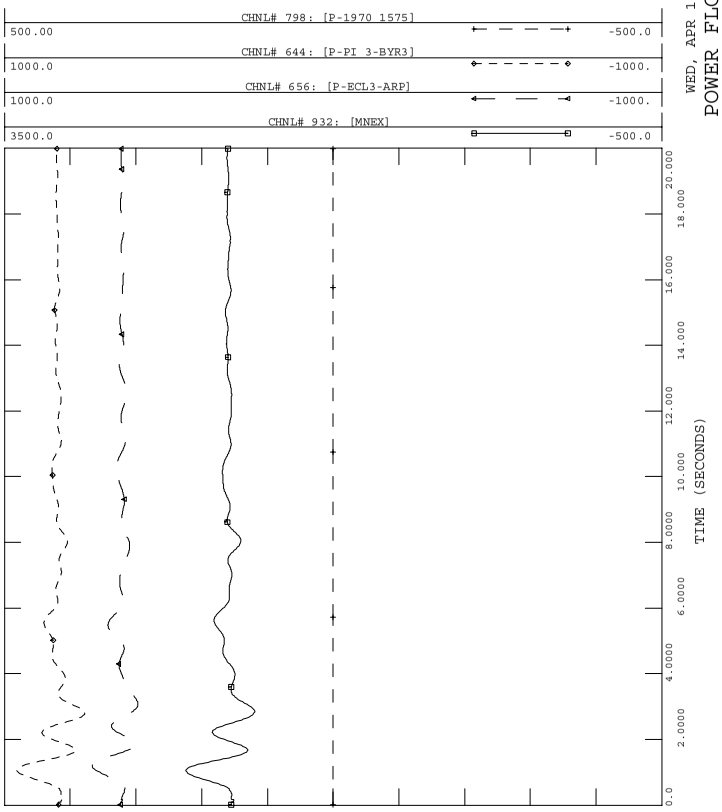
WED, APR 10 2002 15:40
POWER FLOW SUMS 2



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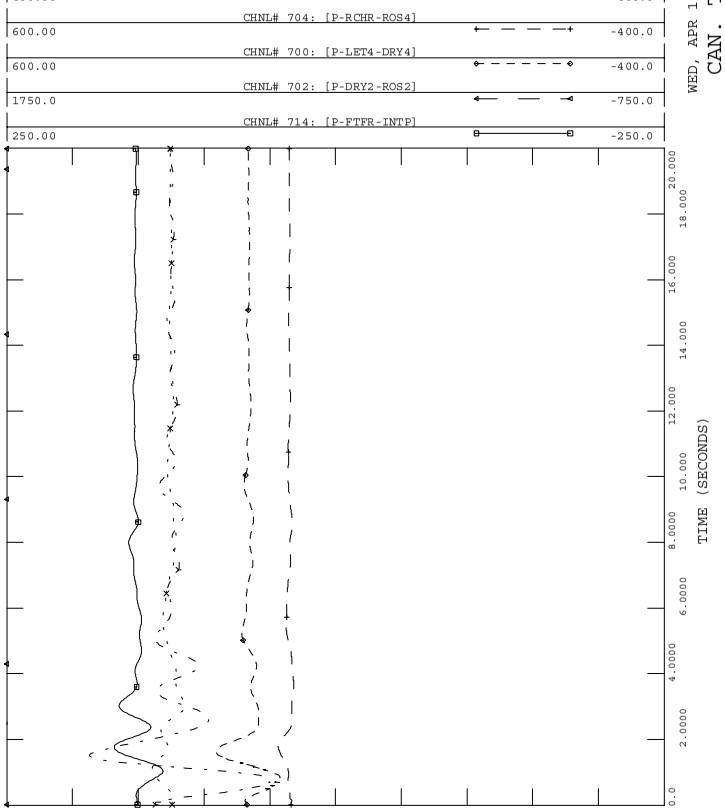
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
CAN. TIE FLOWS



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
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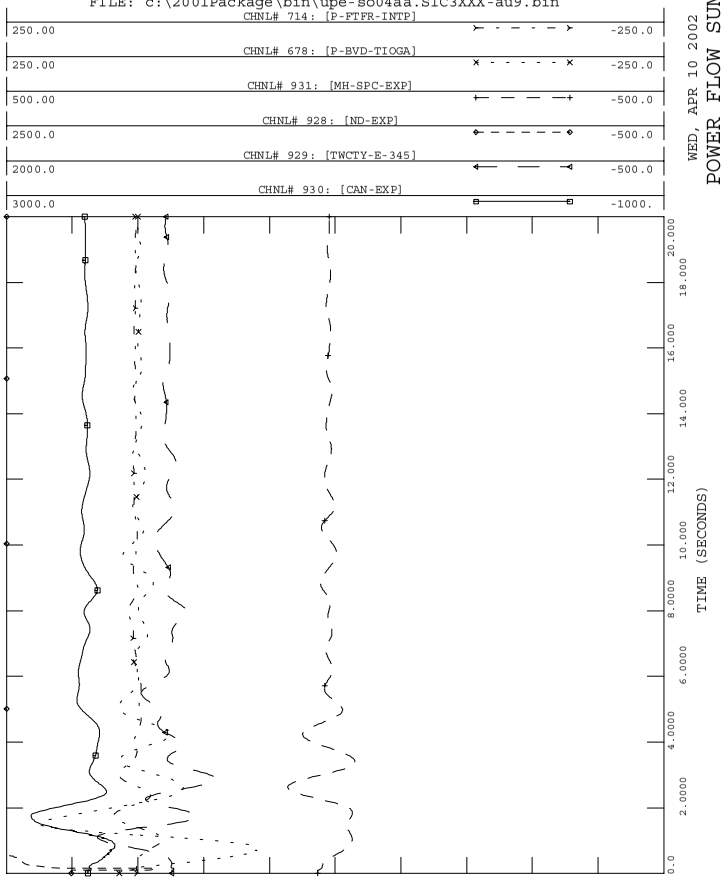
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
POWER FLOW SUMS 1



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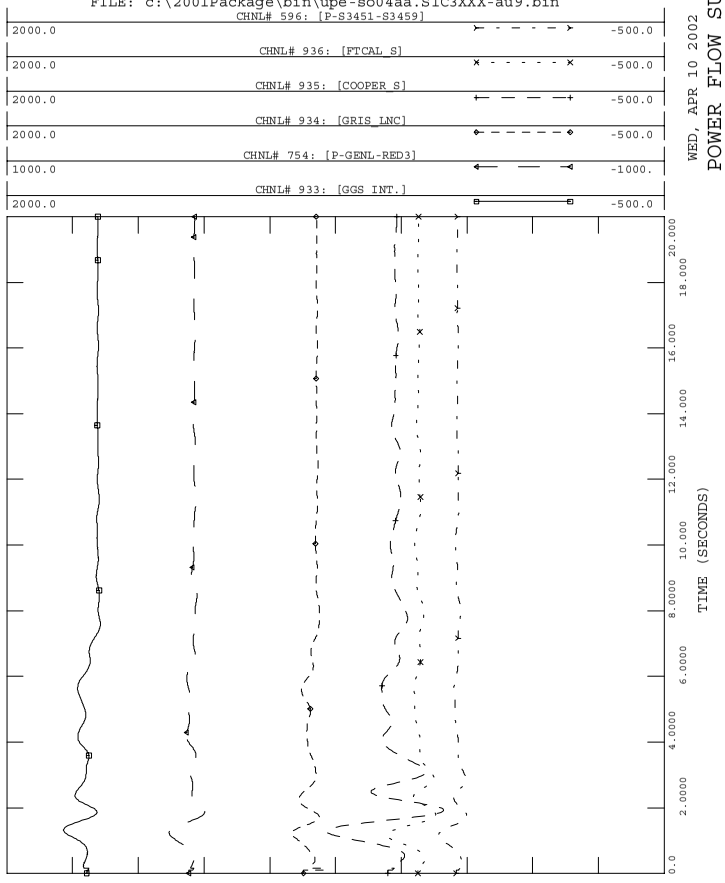
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
POWER FLOW SUM 3



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
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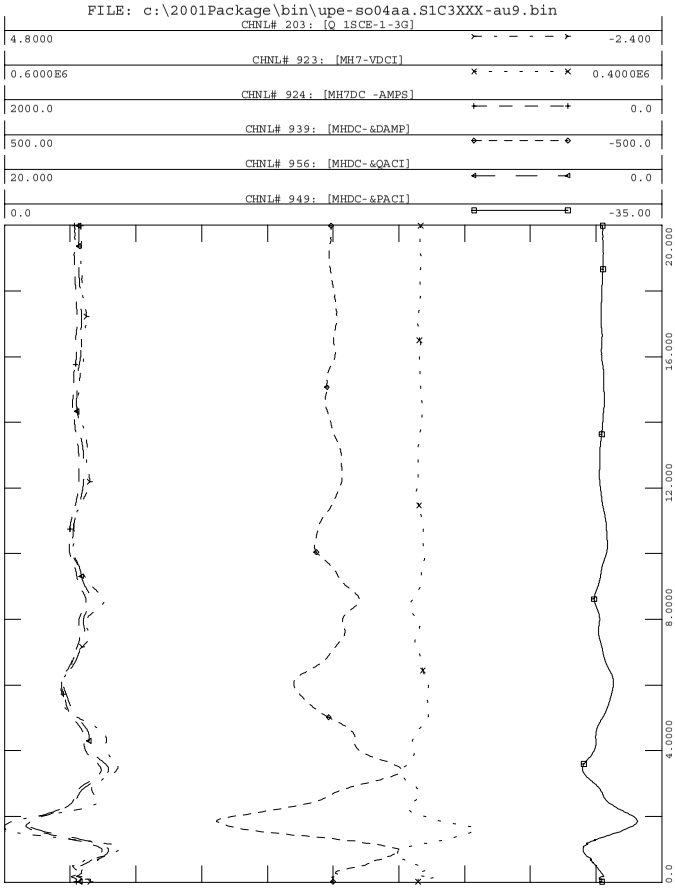
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
MH DC PARAMETERS



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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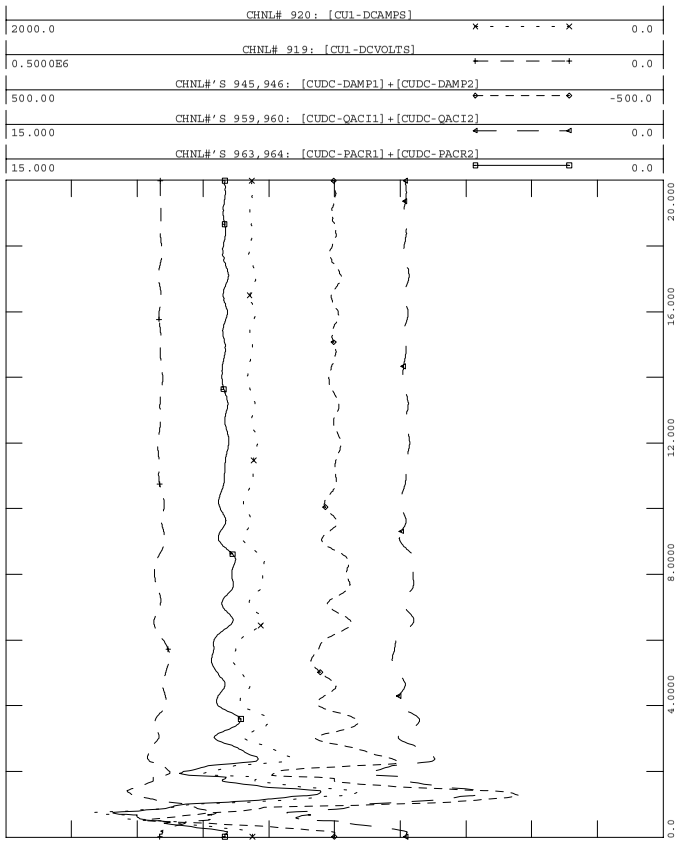
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
CU DC #1



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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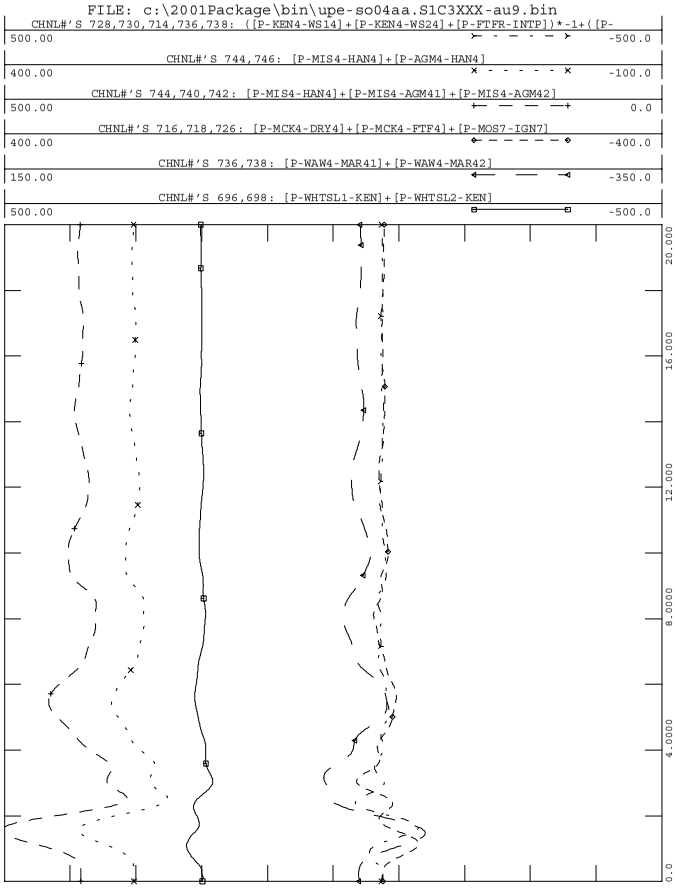
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
OH TIE FLOWS



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
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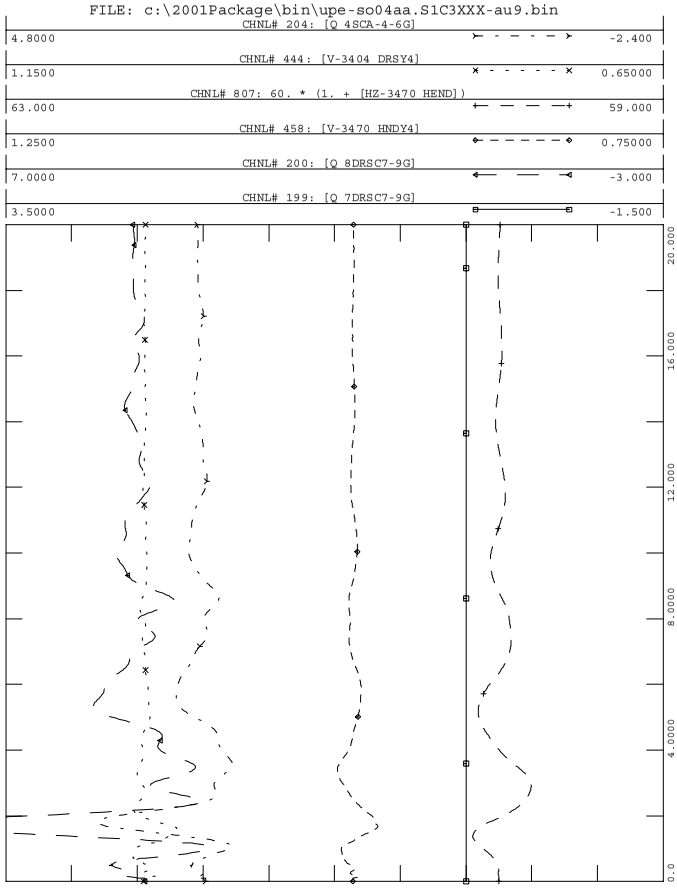
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40
MH DC PARAMETERS



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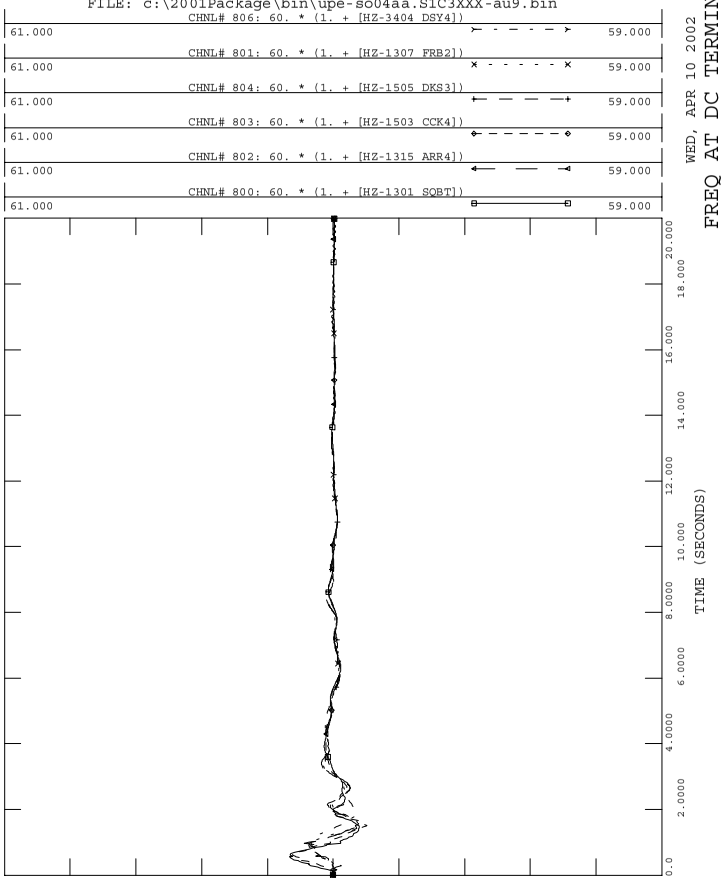
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



WED, APR 10 2002 15:40
FREQ AT DC TERMINALS

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
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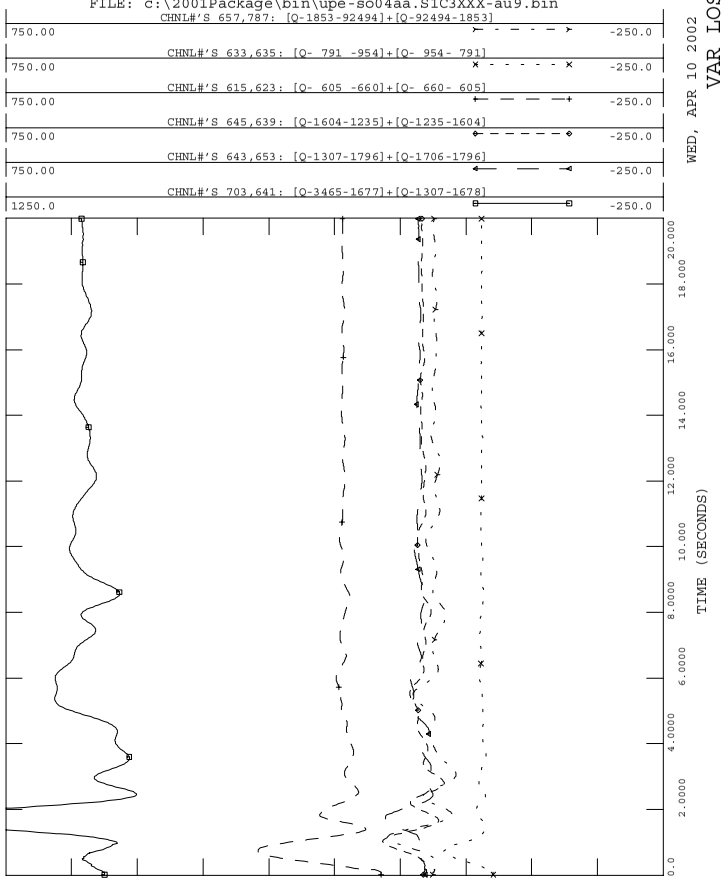
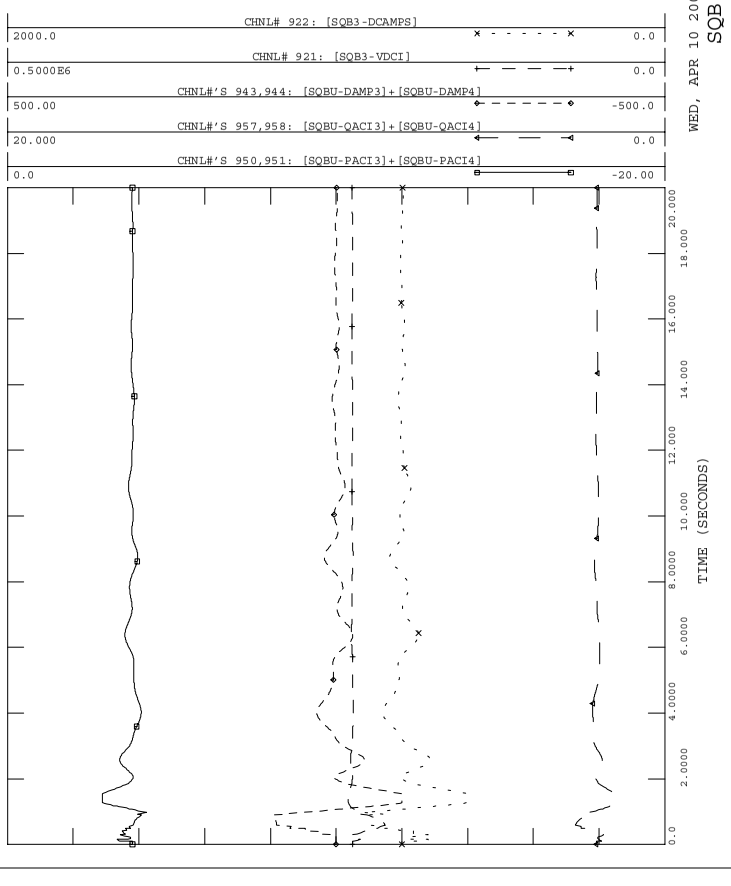
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



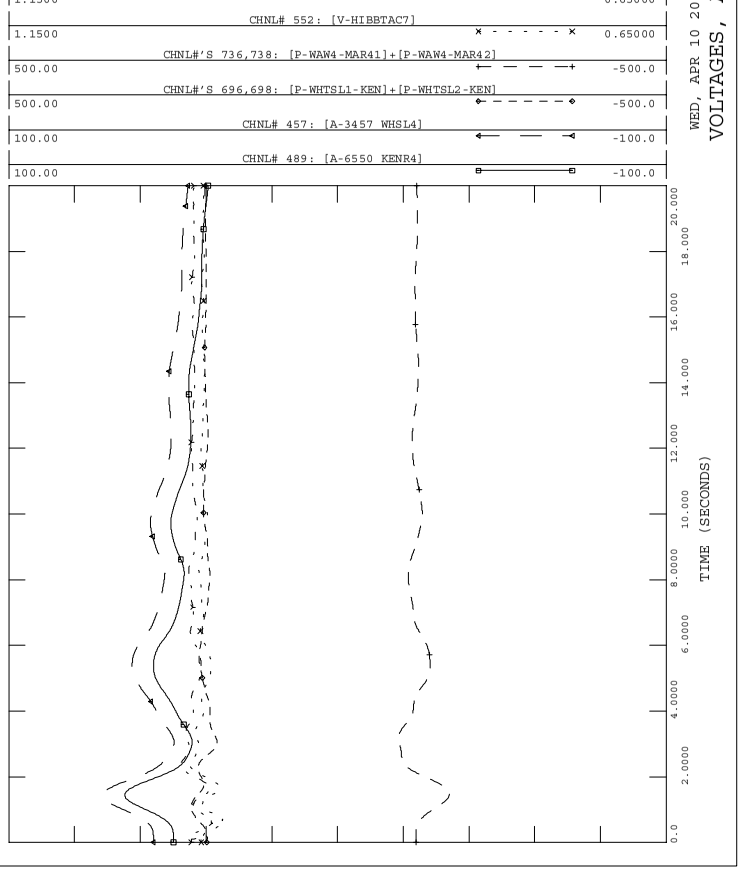
WED, APR 10 2002 15:40
VAR LOSSES

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



WED, APR 10 2002 15:40
SQB DC #3

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



WED, APR 10 2002 15:40
VOLTAGES, ANGLES

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

RELAY: SLINOS
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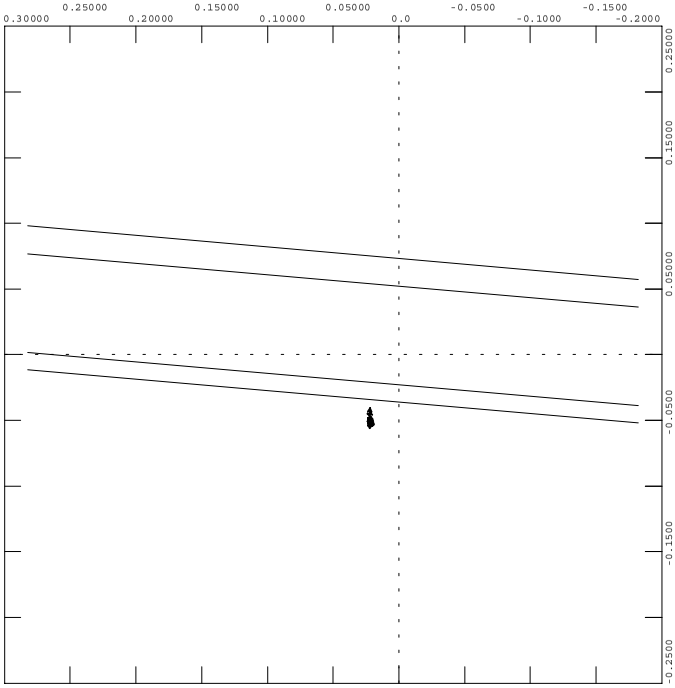
CHNL# 824: [X-FRB2-ROS2]



WED, APR 10 2002 15:40
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

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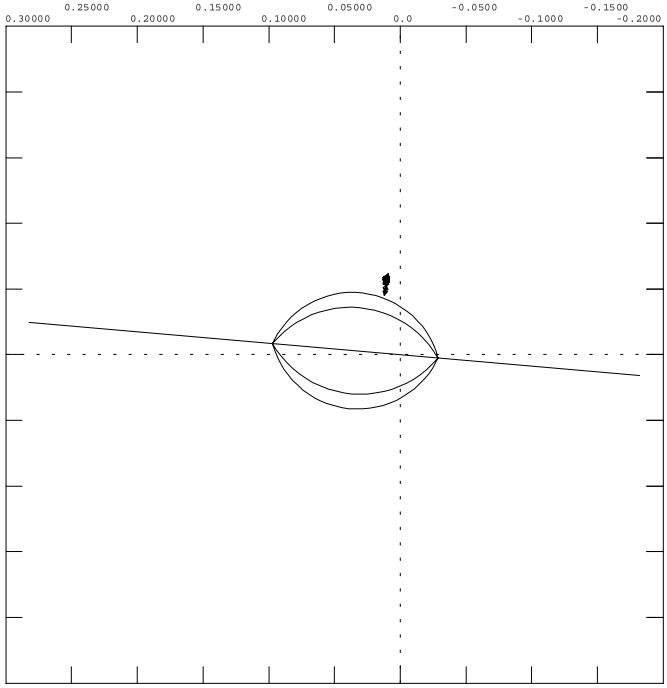
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

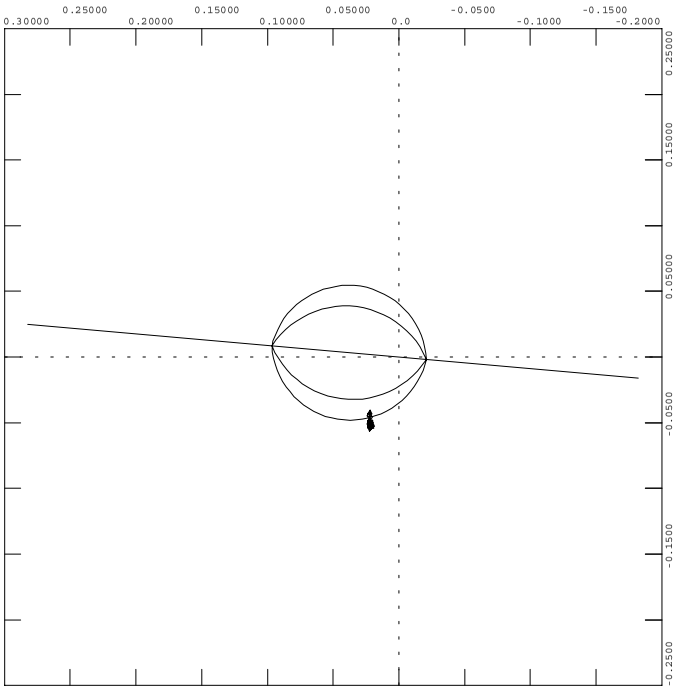


WED, APR 10 2002 15:40
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

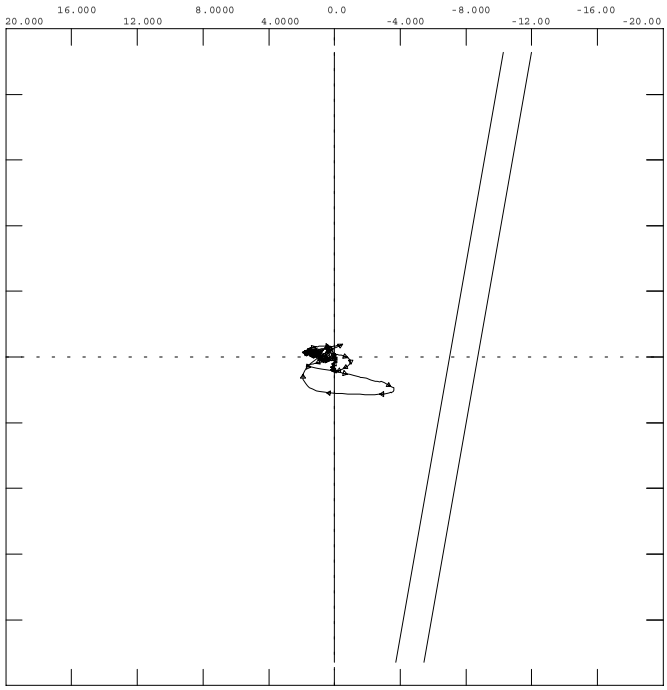


WED, APR 10 2002 15:40
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

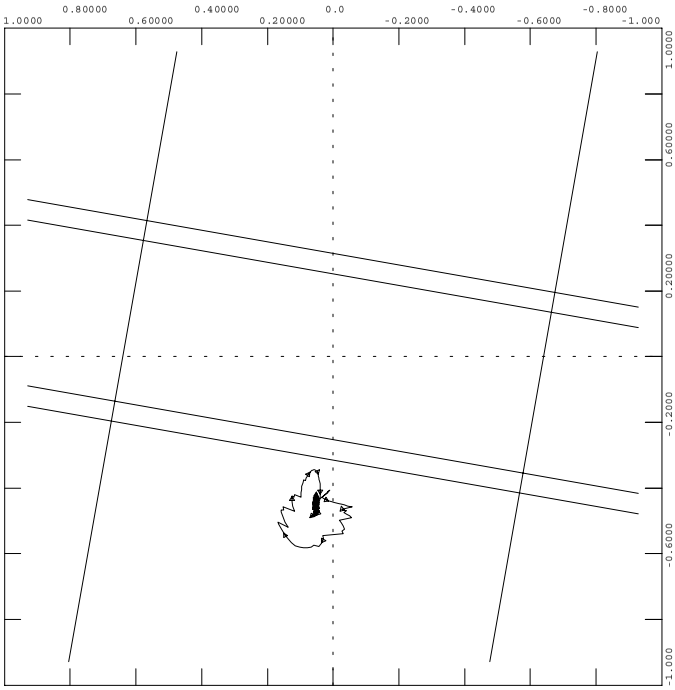


WED, APR 10 2002 15:40
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

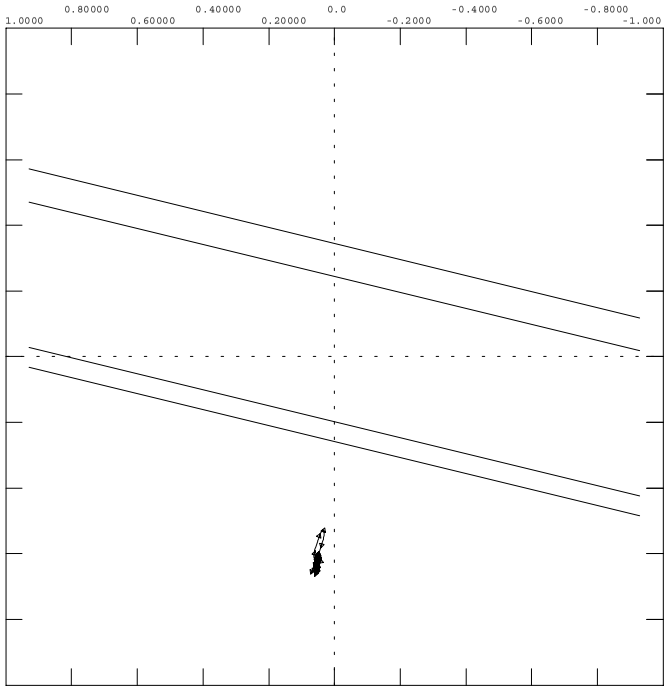
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

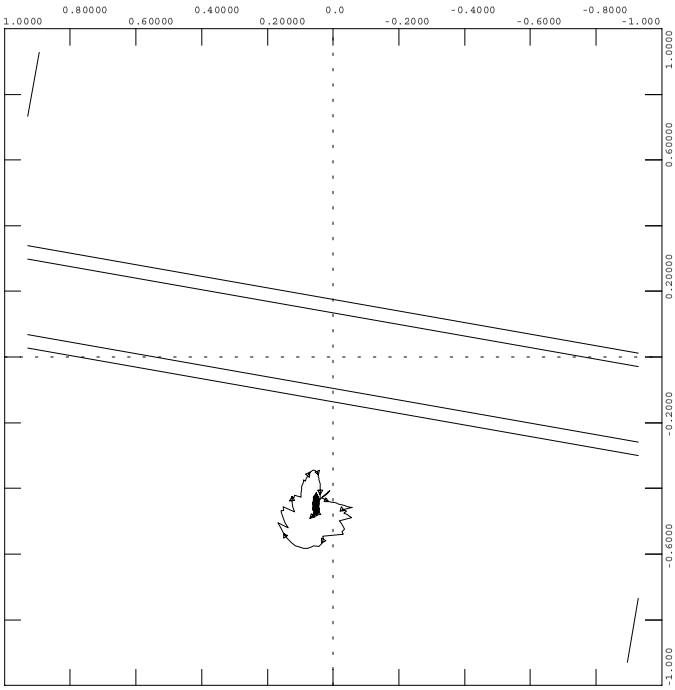
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

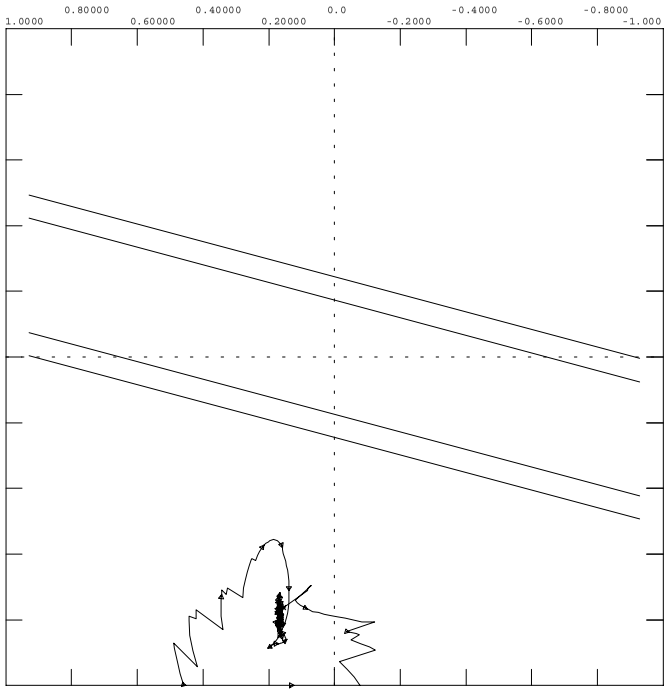
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

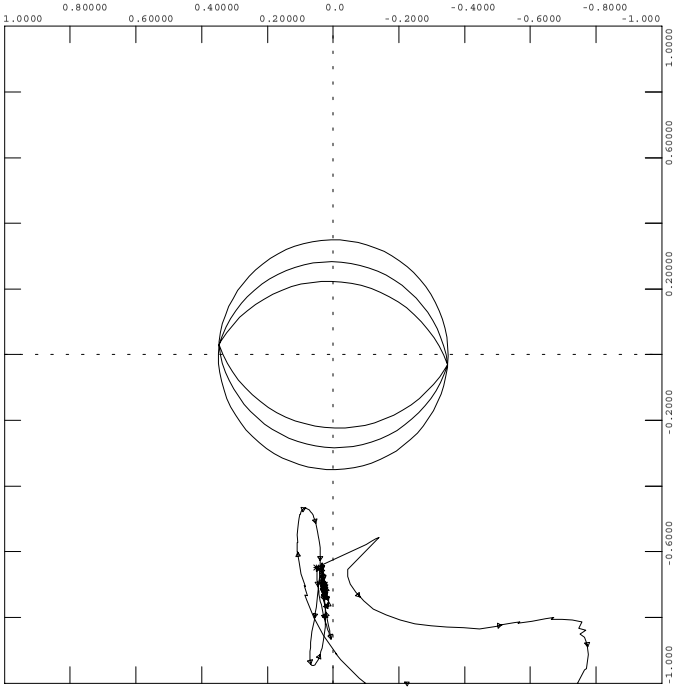
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

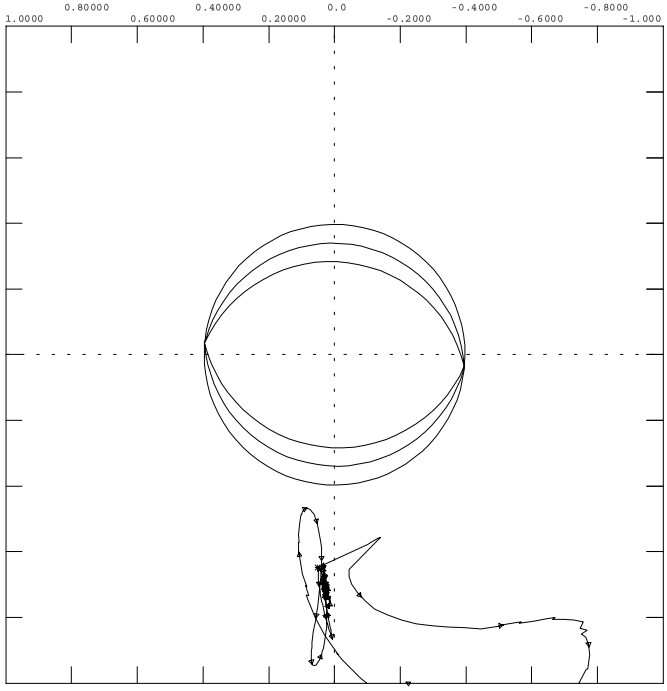
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

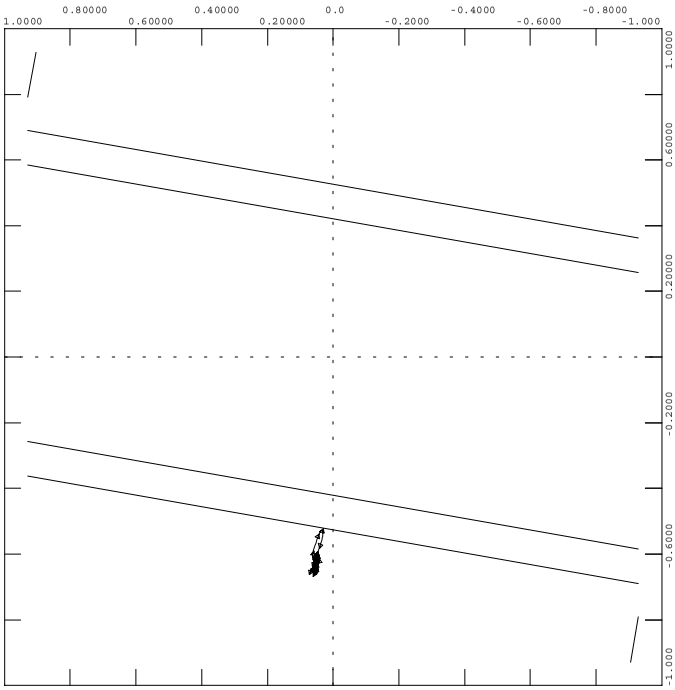
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

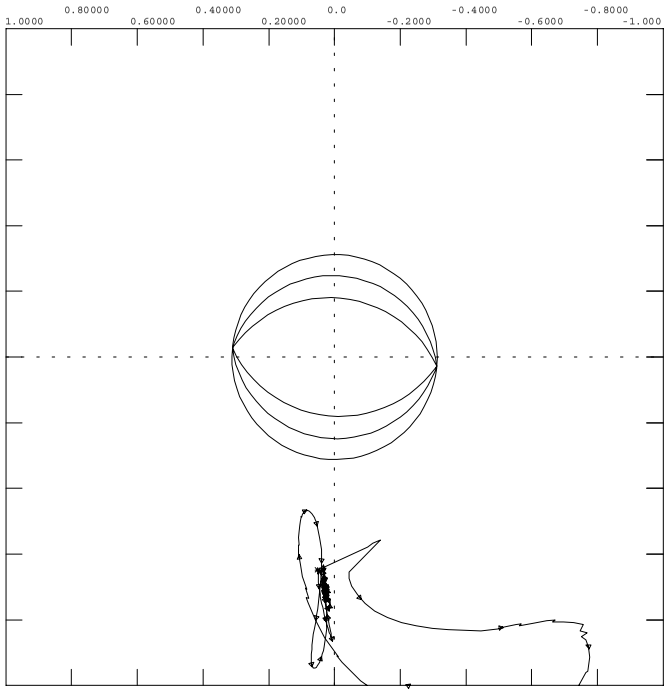
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



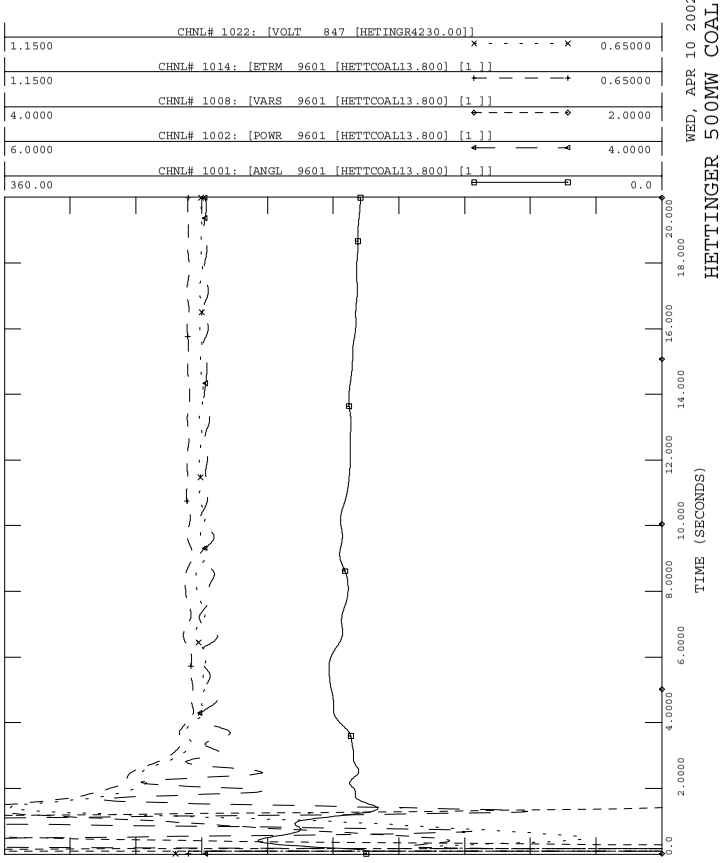
UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

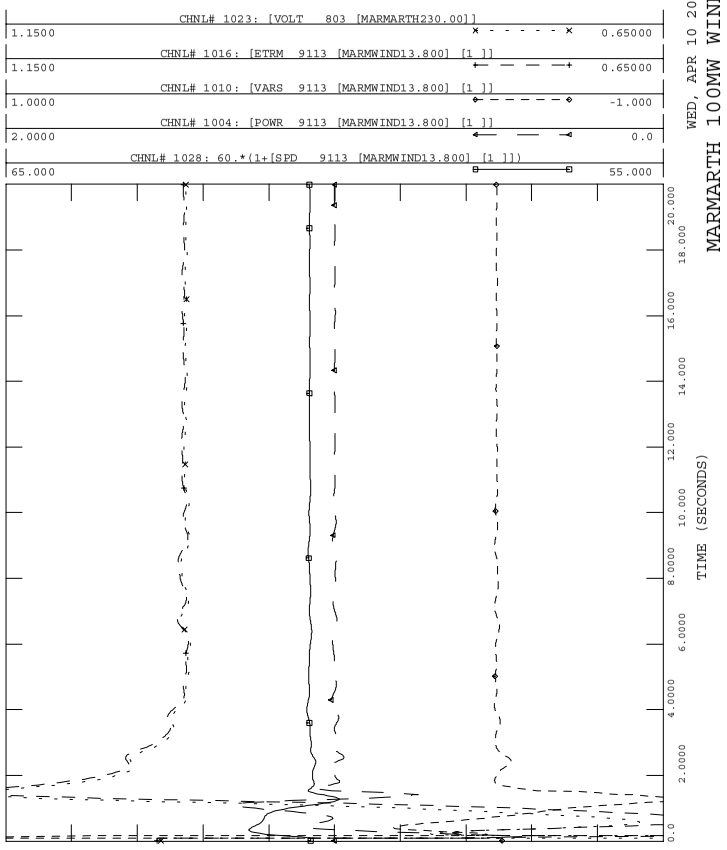


UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin



WED, APR 10 2002 15:40
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

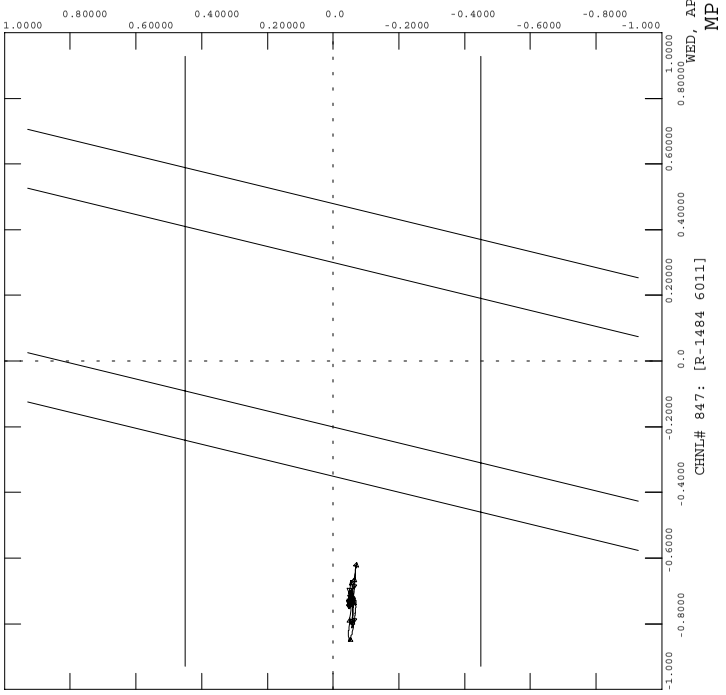


WED, APR 10 2002 15:40
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

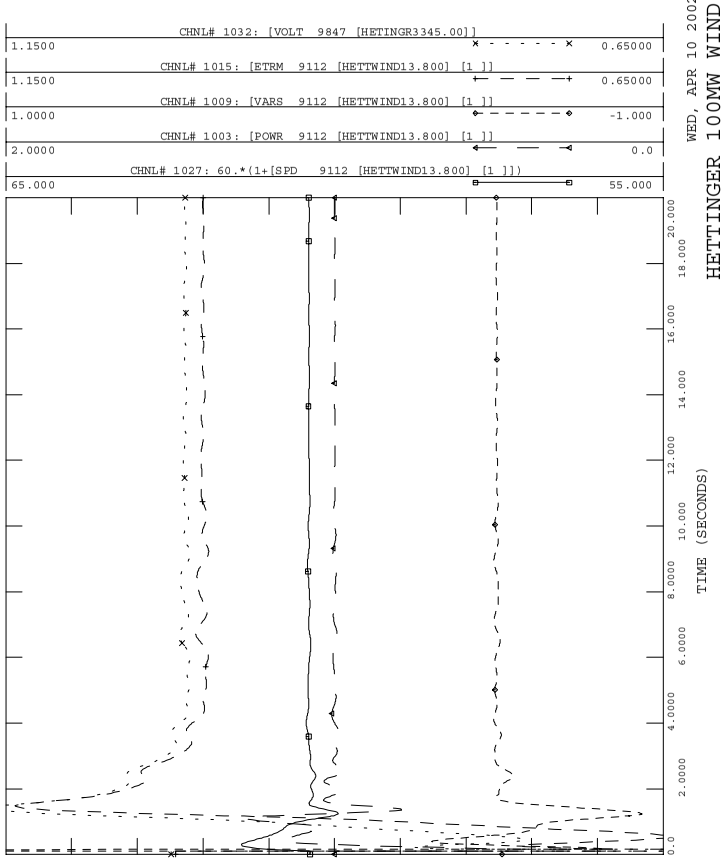
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



WED, APR 10 2002 15:40
MP-OH I.FALLS (779)

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

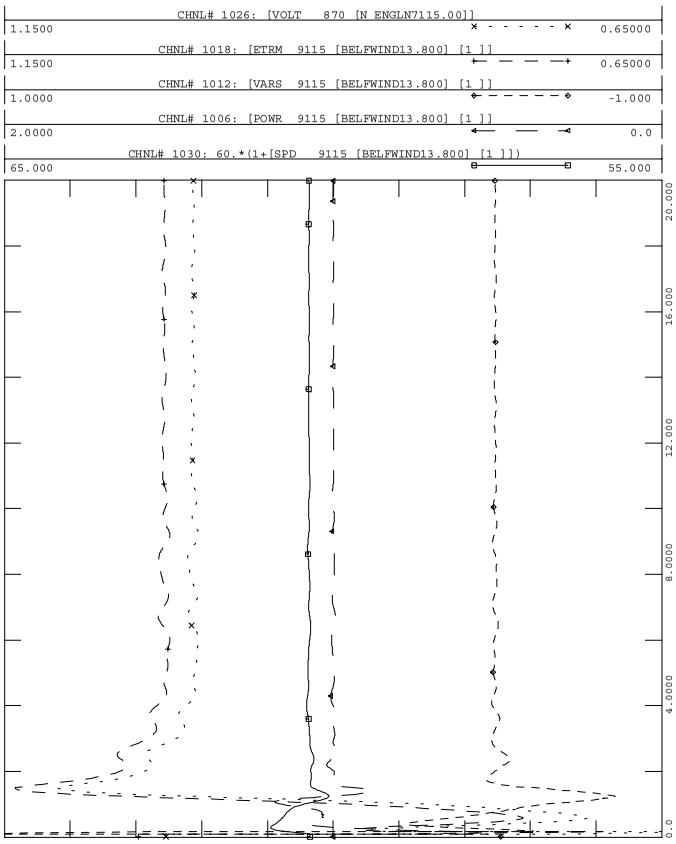


WED, APR 10 2002 15:40
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40

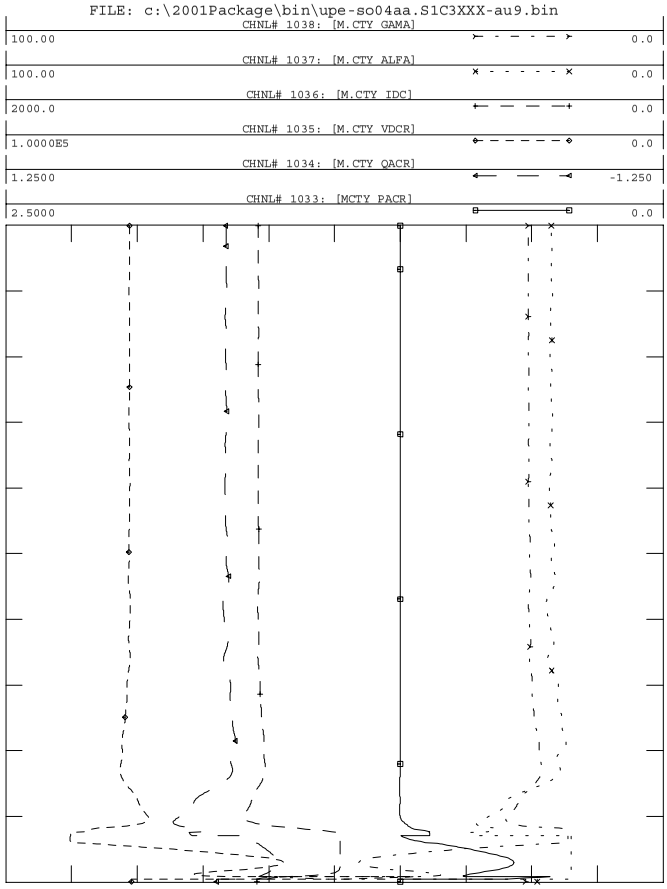
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40

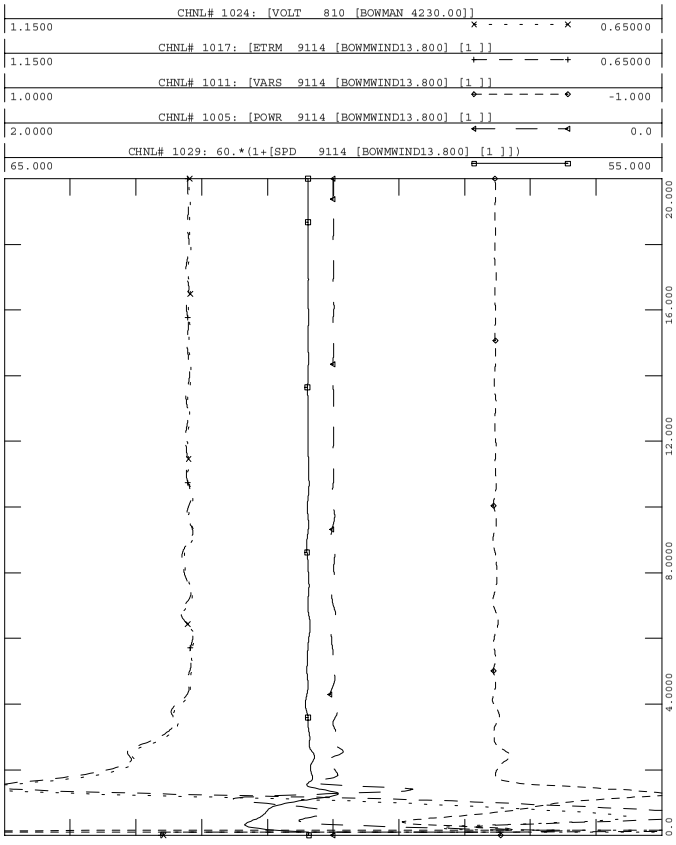
M.CTY 100 MW HVDC



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40

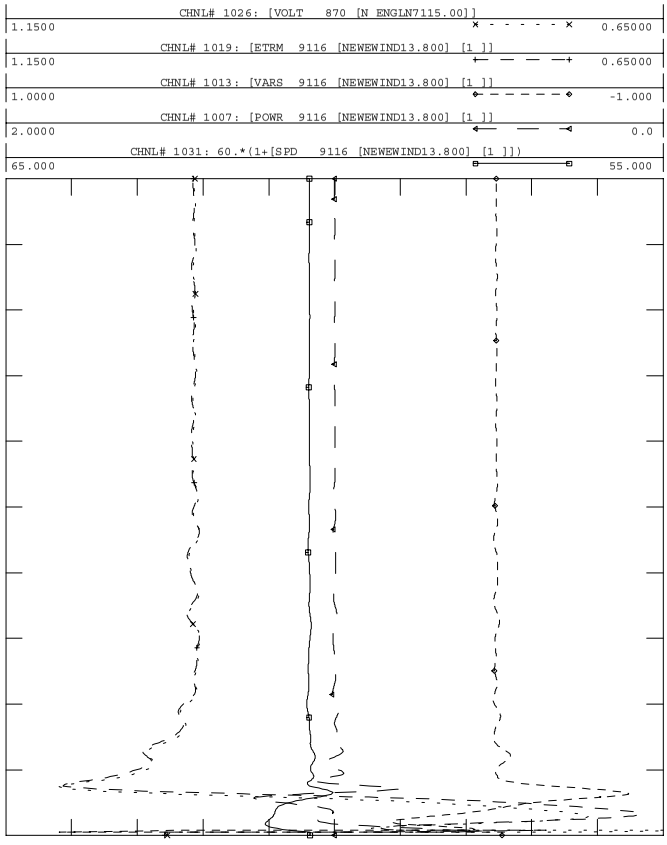
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXX-au9.bin

WED, APR 10 2002 15:40

NEW E. 100MW WIND UNIT



APPENDIX 8

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 1 (HETTINGER)

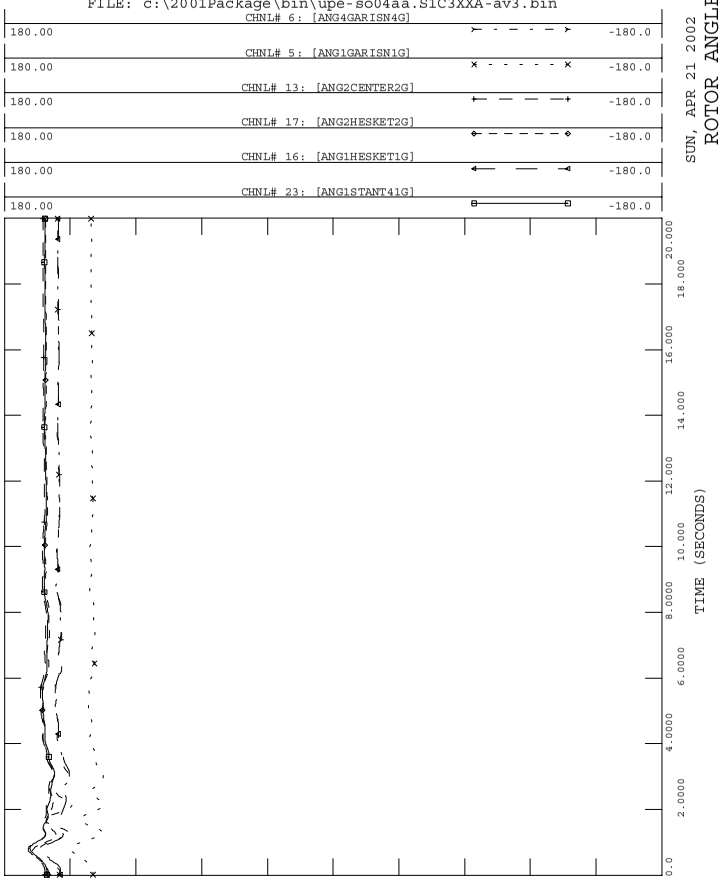
CASE S1C3XXA

CONTINGENCY AV3

4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Belfield 345 kV line

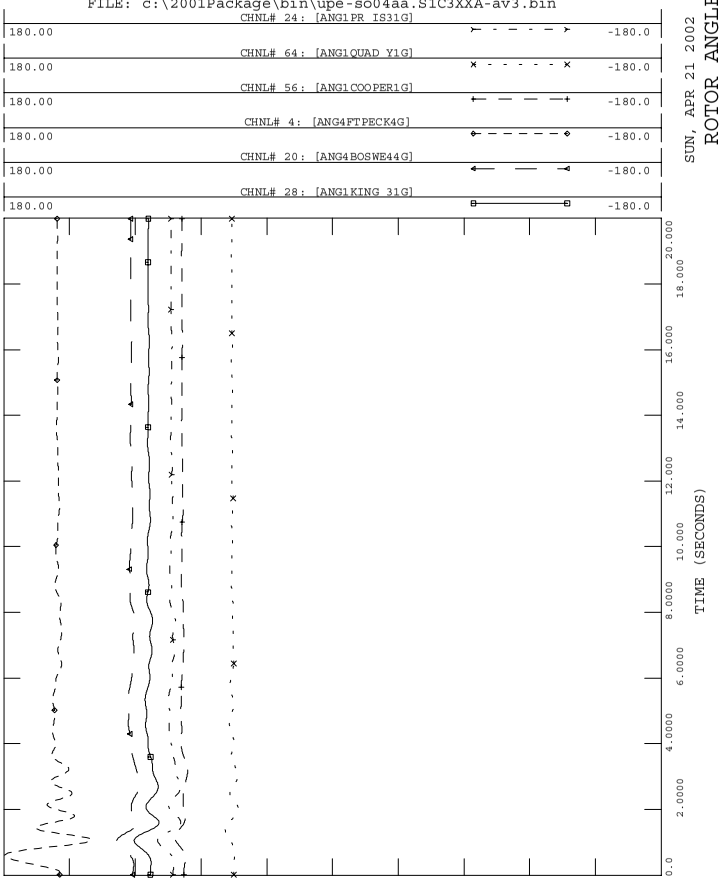
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
ROTOR ANGLES 2



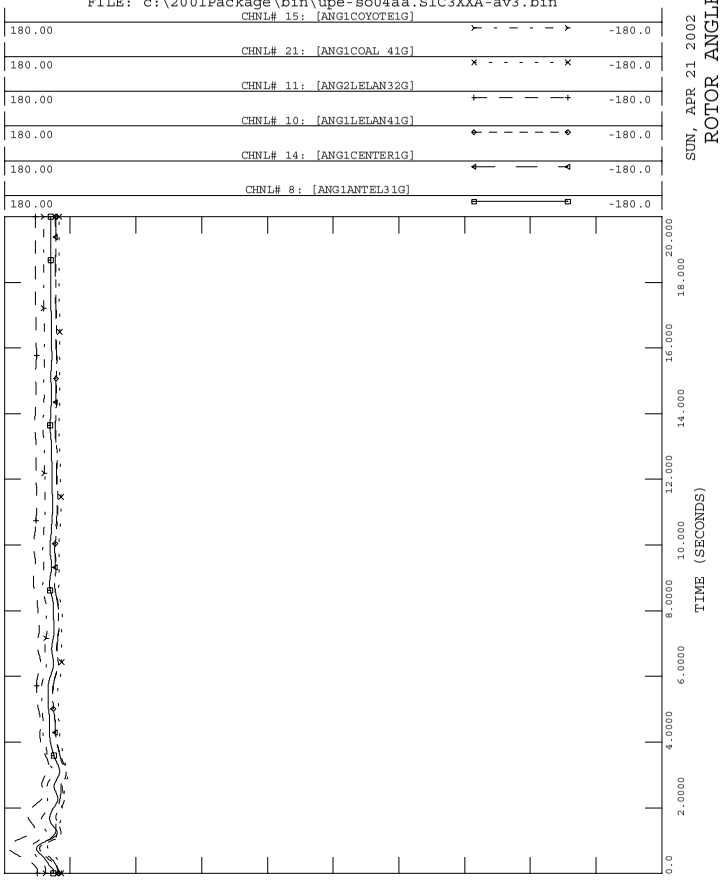
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
ROTOR ANGLES 4



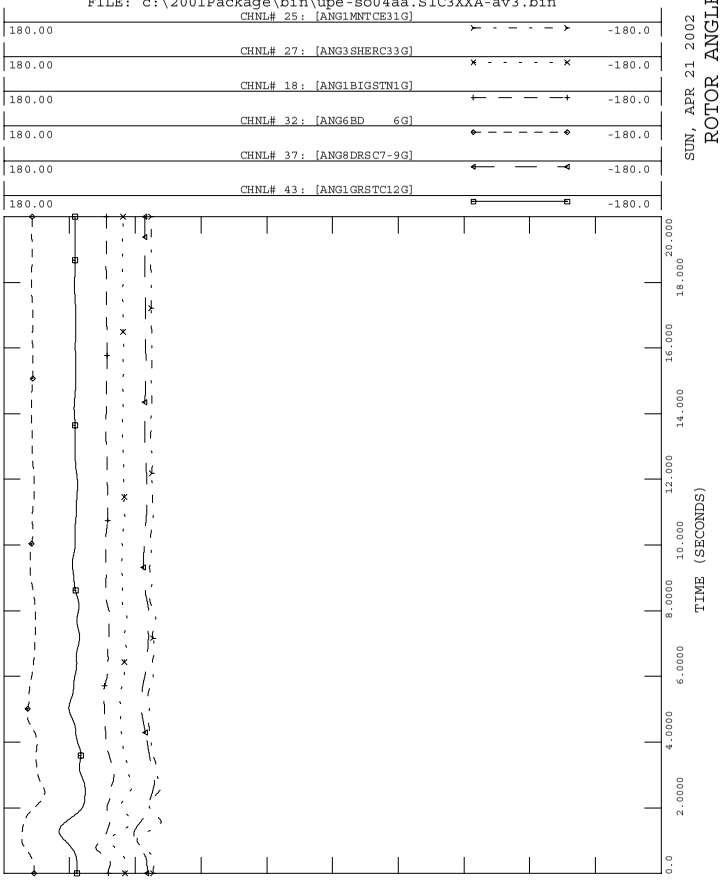
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
ROTOR ANGLES 1



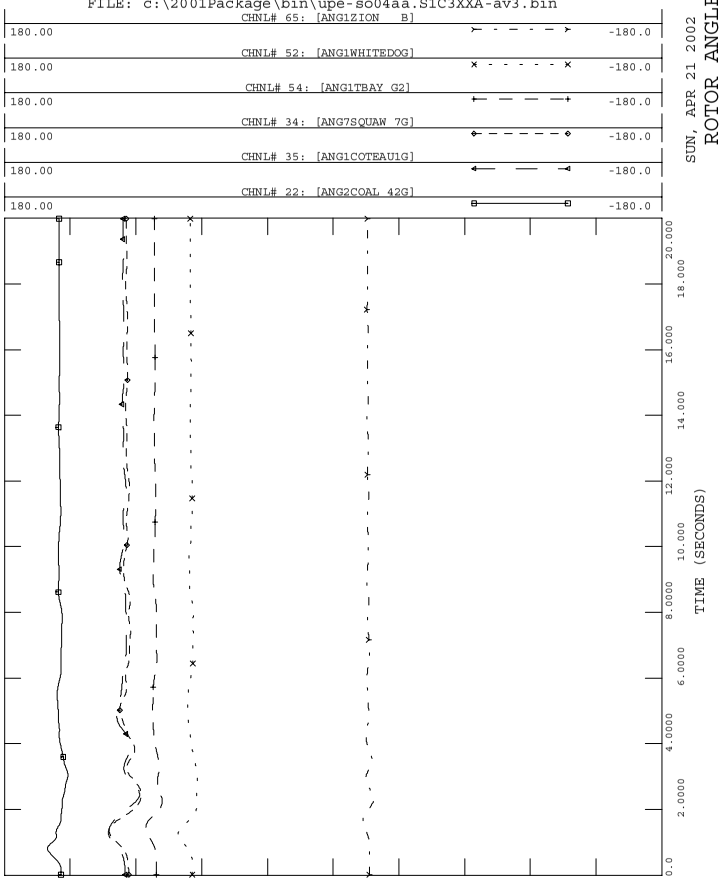
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
ROTOR ANGLES 3



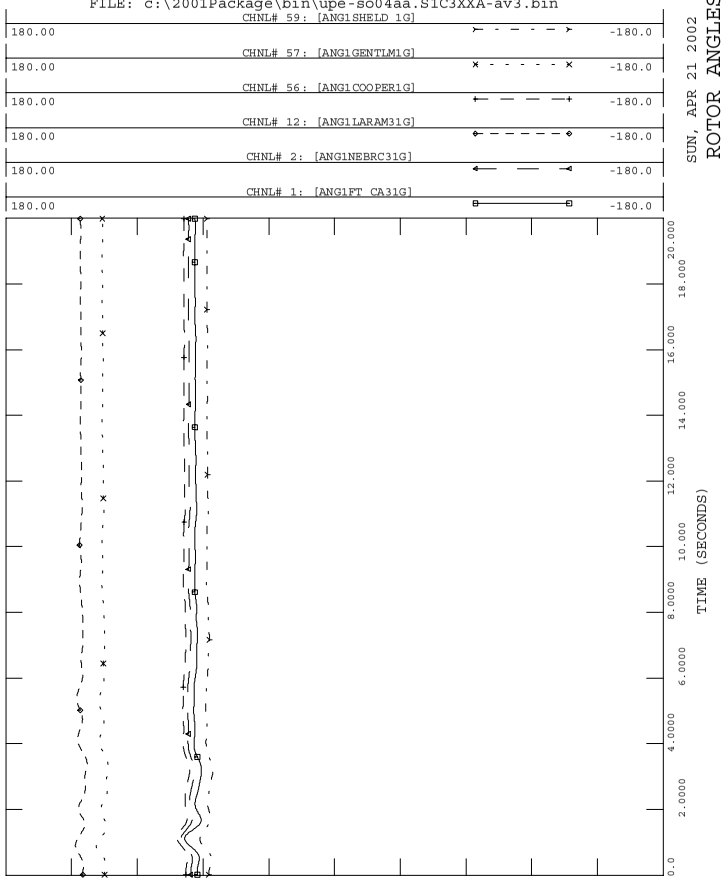
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
ROTOR ANGLES 6



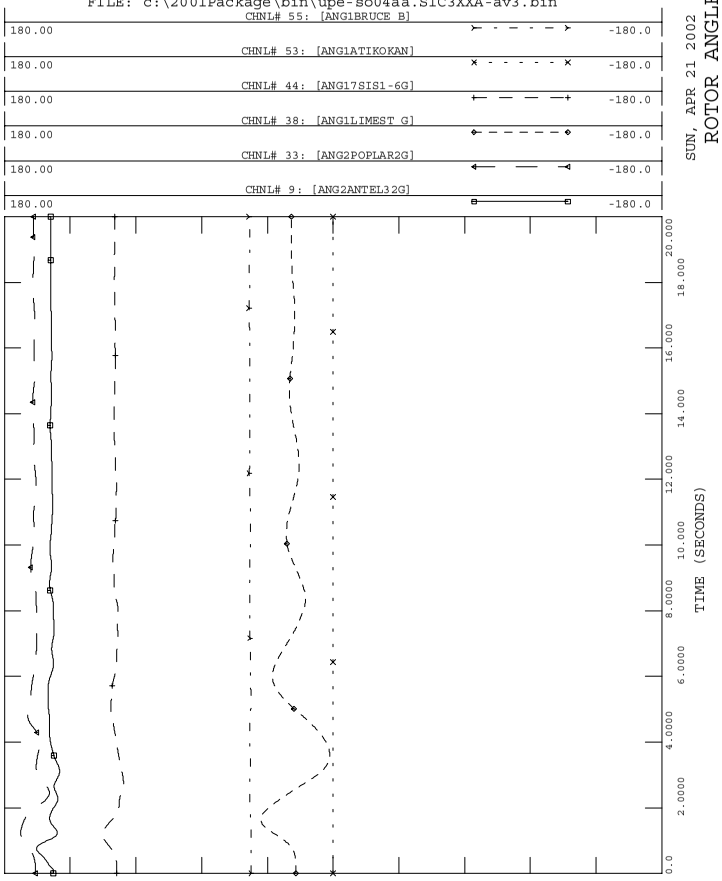
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
ROTOR ANGLES NB



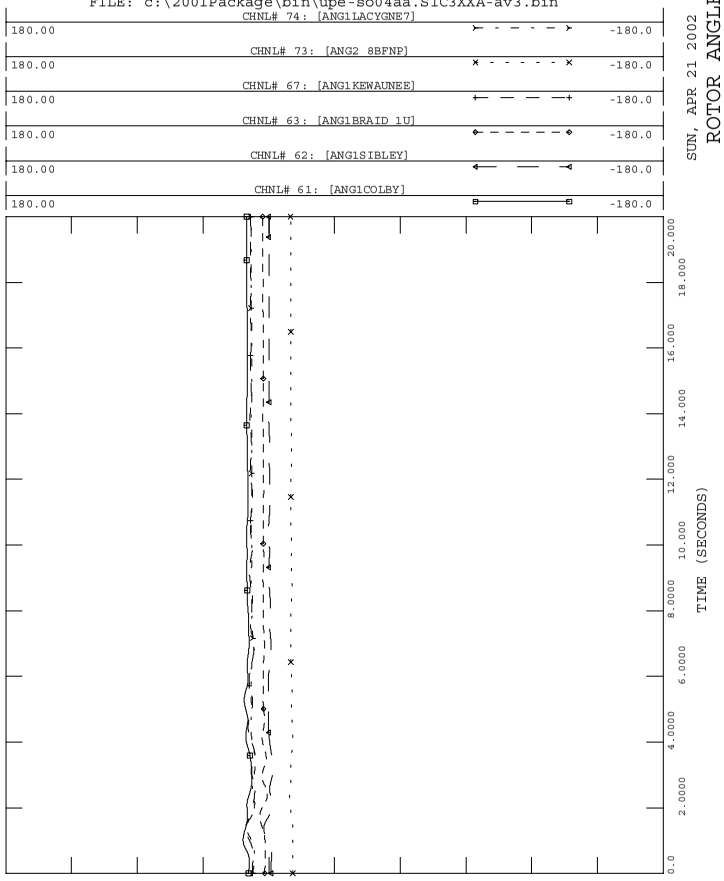
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
ROTOR ANGLES 5



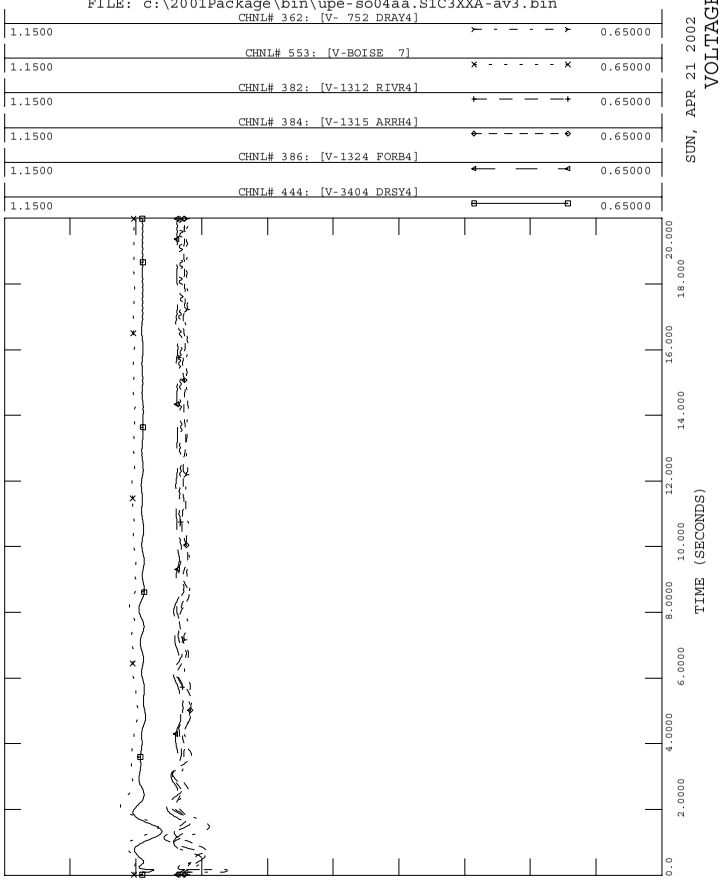
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
ROTOR ANGLES 7



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
VOLTAGES 1



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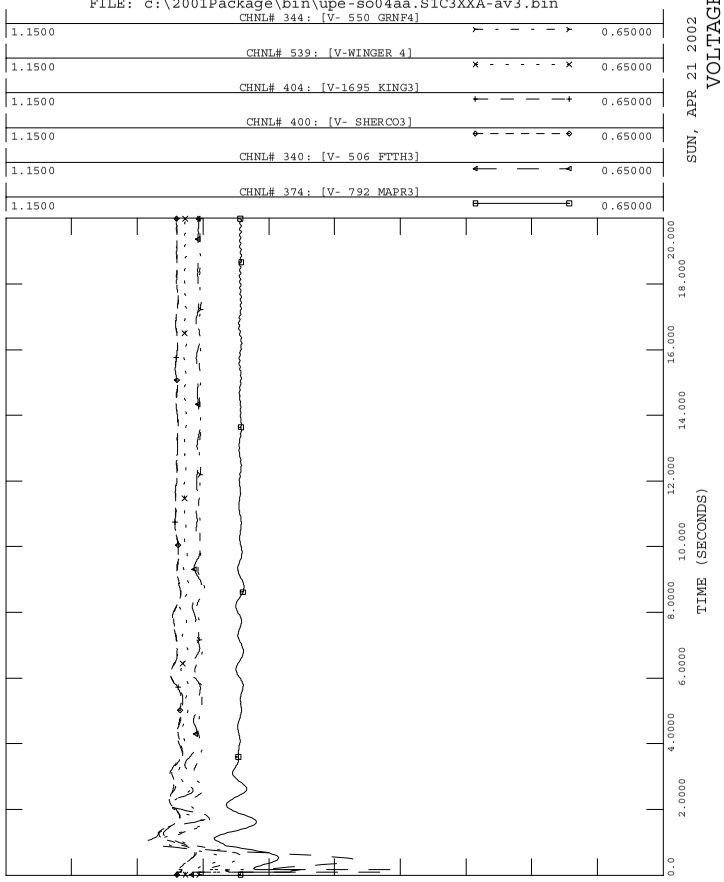
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
VOLTAGES 3



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
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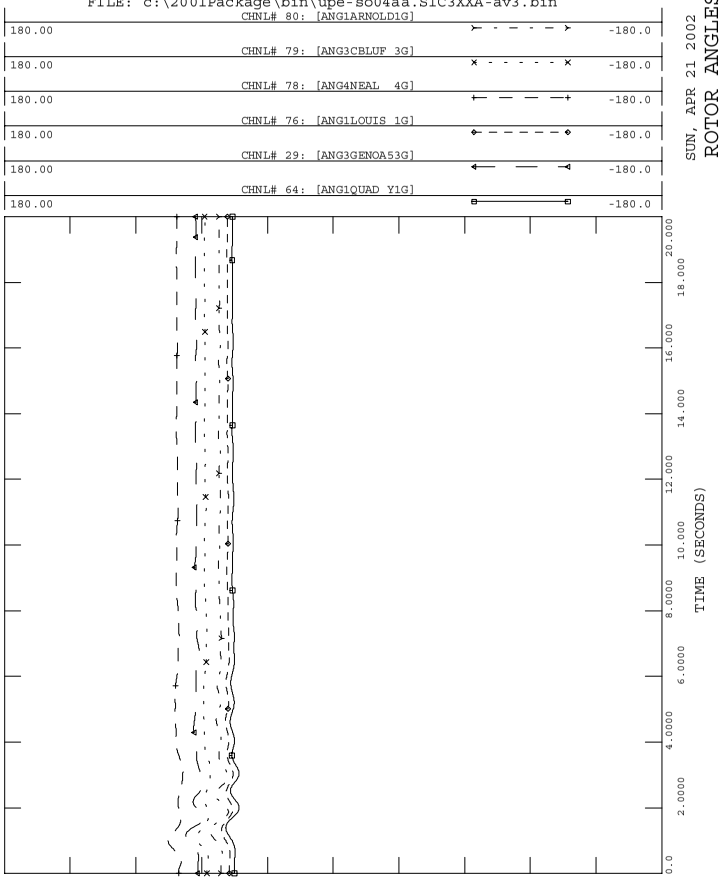
SUN, APR 21 2002 10:48
ROTOR ANGLES IA



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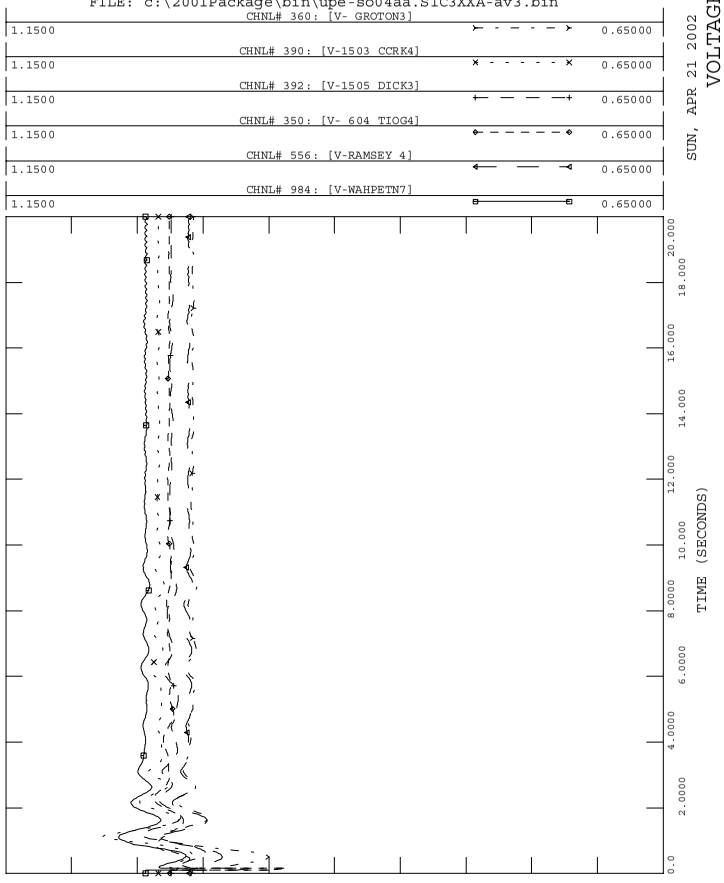
VOLTAGES 2



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CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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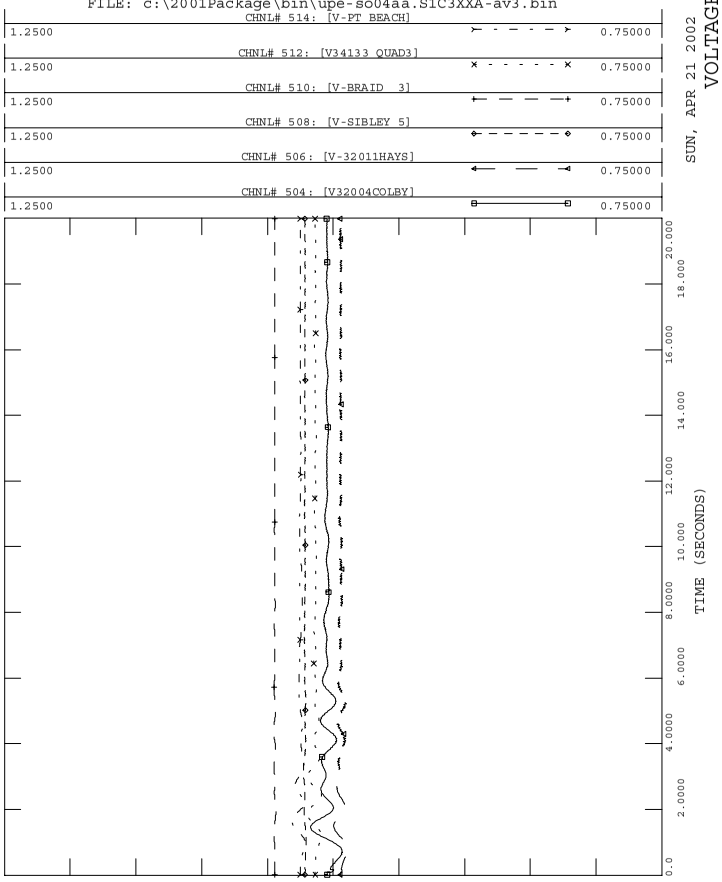
SUN, APR 21 2002 10:48
VOLTAGES 5



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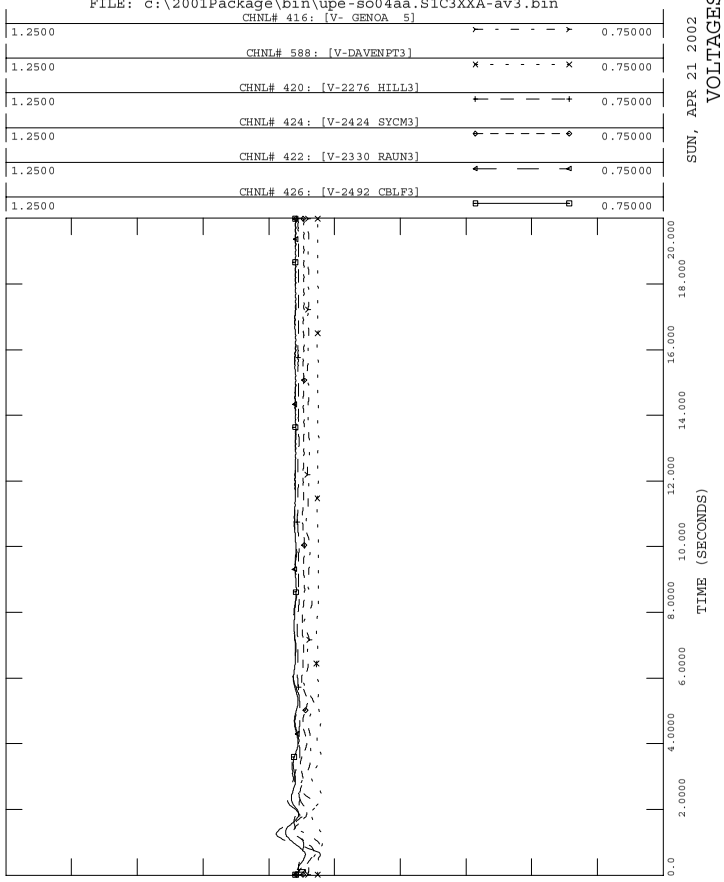
VOLTAGES IA



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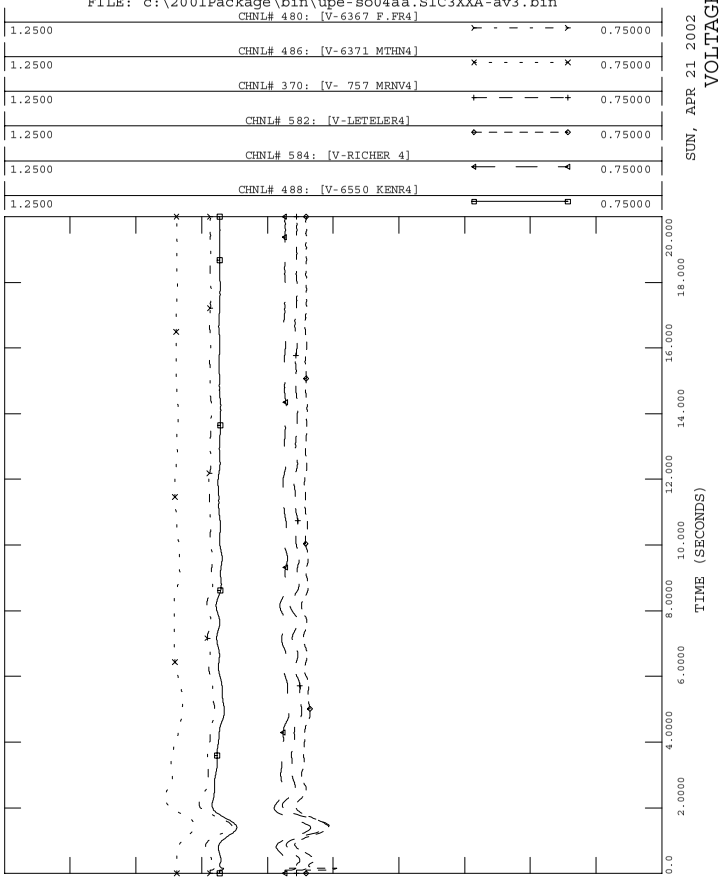
VOLTAGES 4



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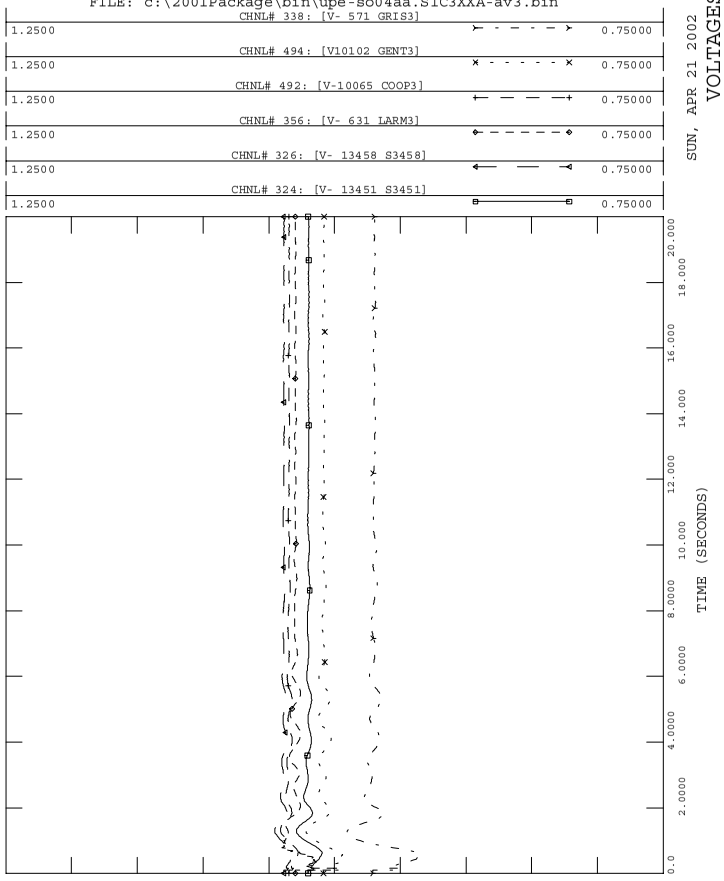
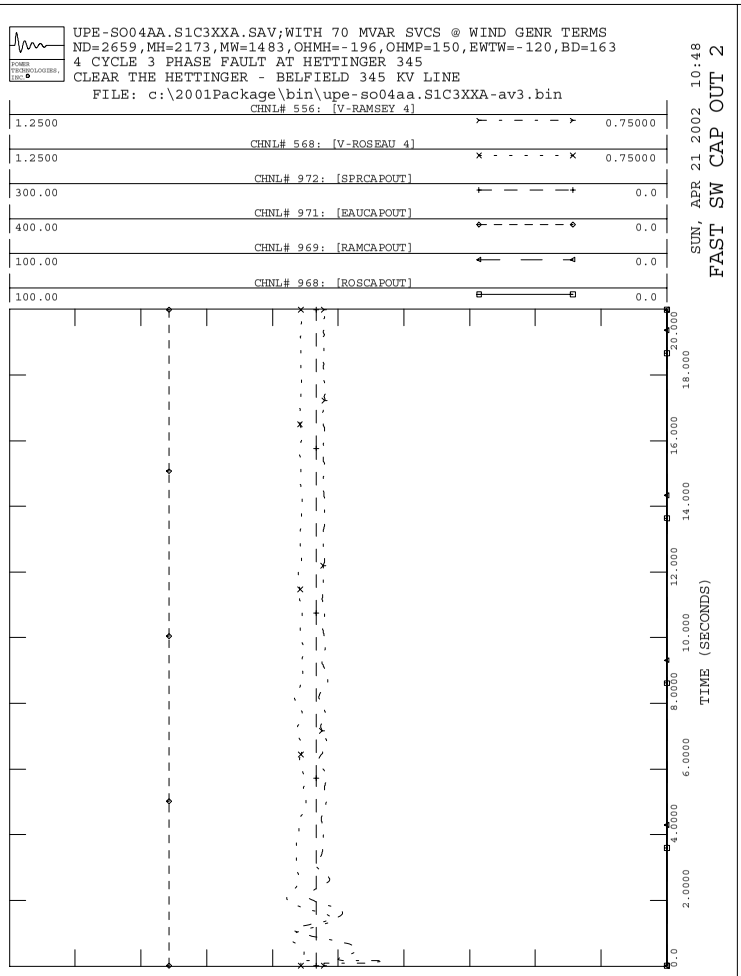
VOLTAGES NB

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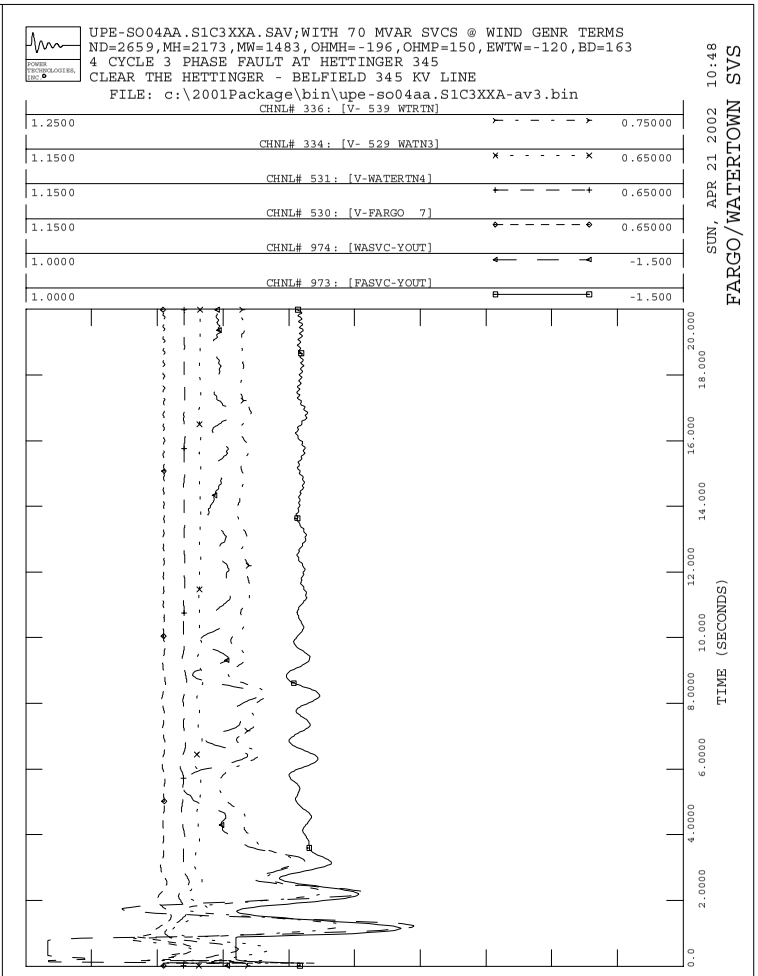
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
SUN, APR 21 2002 10:48
FAST SW CAP OUT 2
TIME (SECONDS)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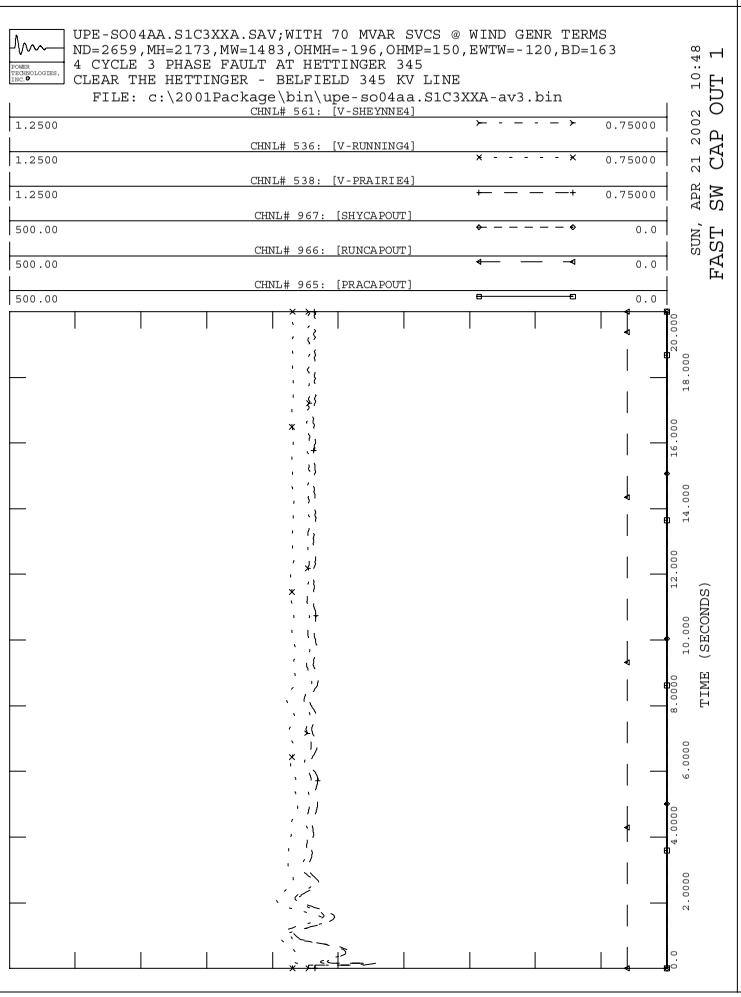
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
SUN, APR 21 2002 10:48
FARGO/WATERTOWN SVS
TIME (SECONDS)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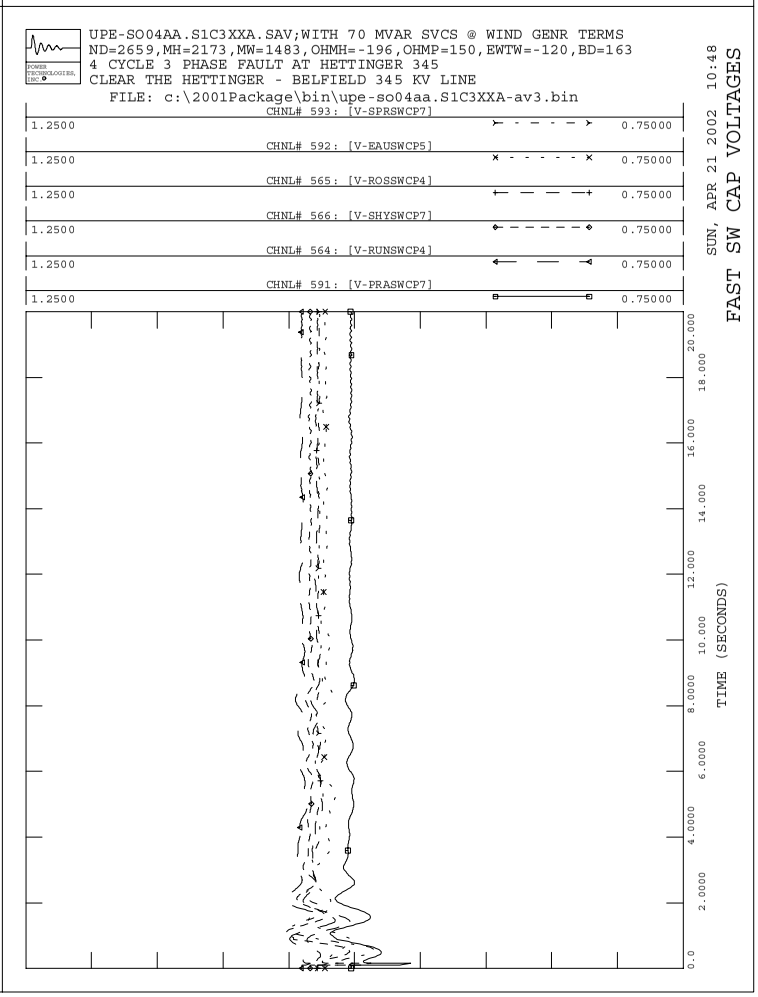
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
SUN, APR 21 2002 10:48
FAST SW CAP OUT 1
TIME (SECONDS)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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
SUN, APR 21 2002 10:48
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

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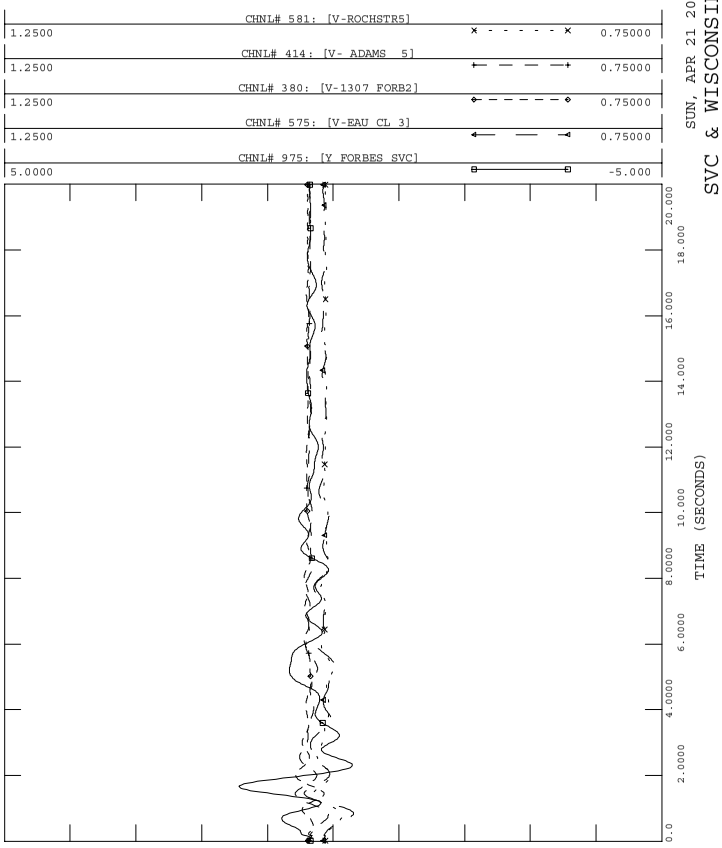
SVC & WISCONSIN VOLT



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

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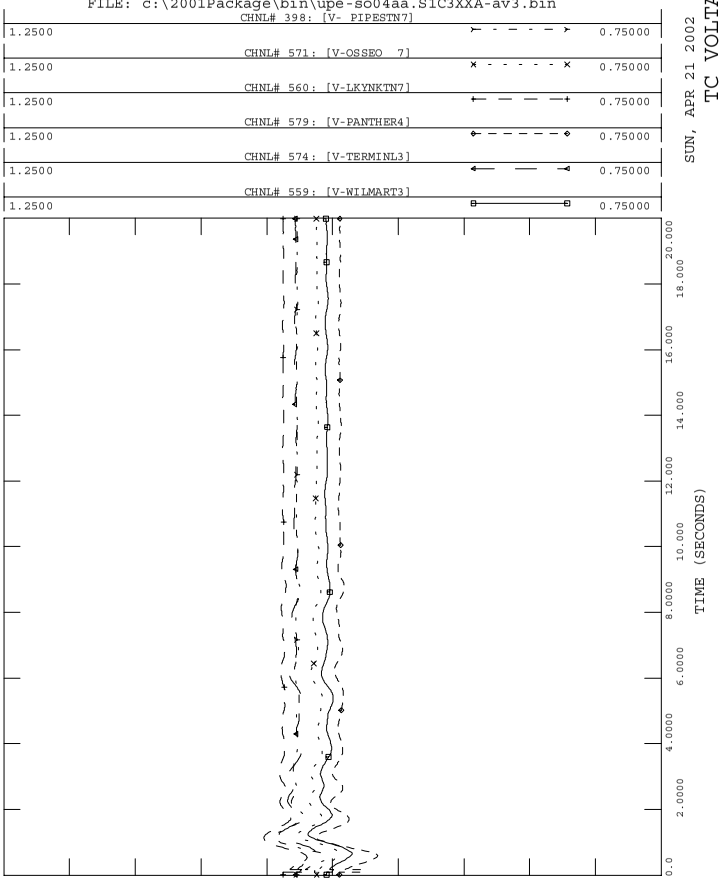
TC VOLTAGES



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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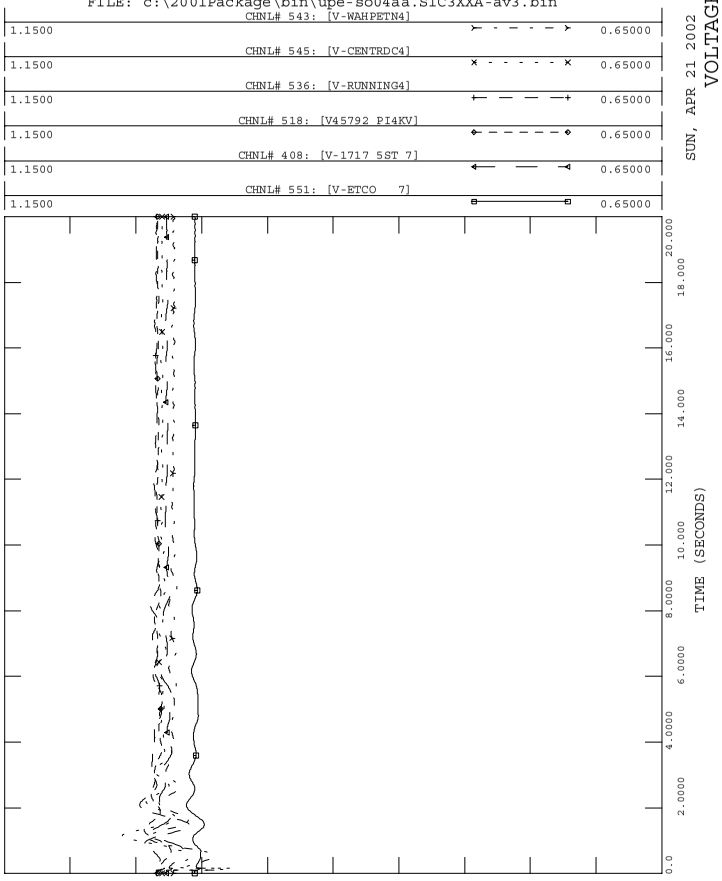
VOLTAGES 6



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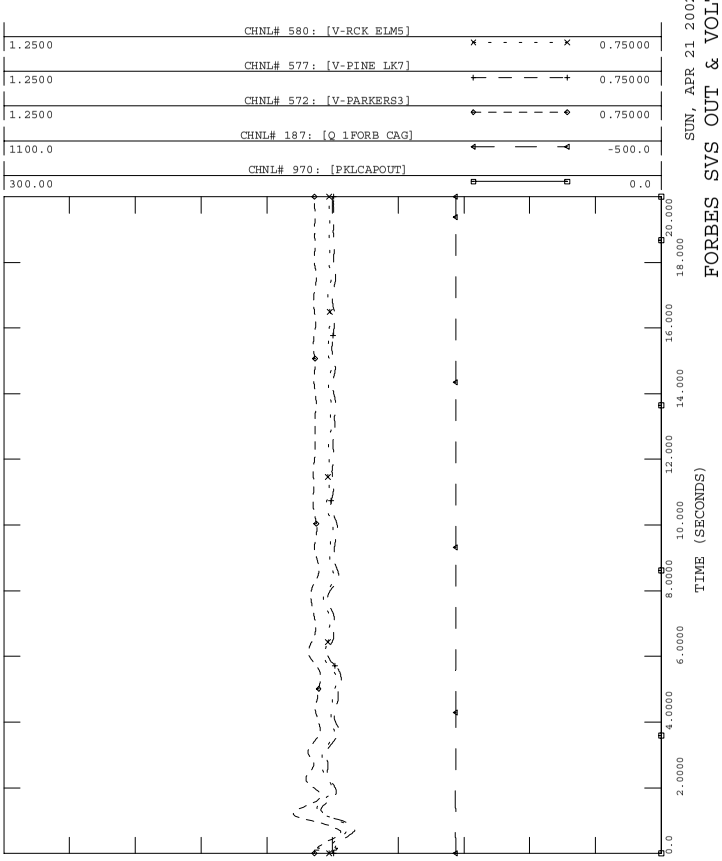
FORBES SVS OUT & VOLTAGES



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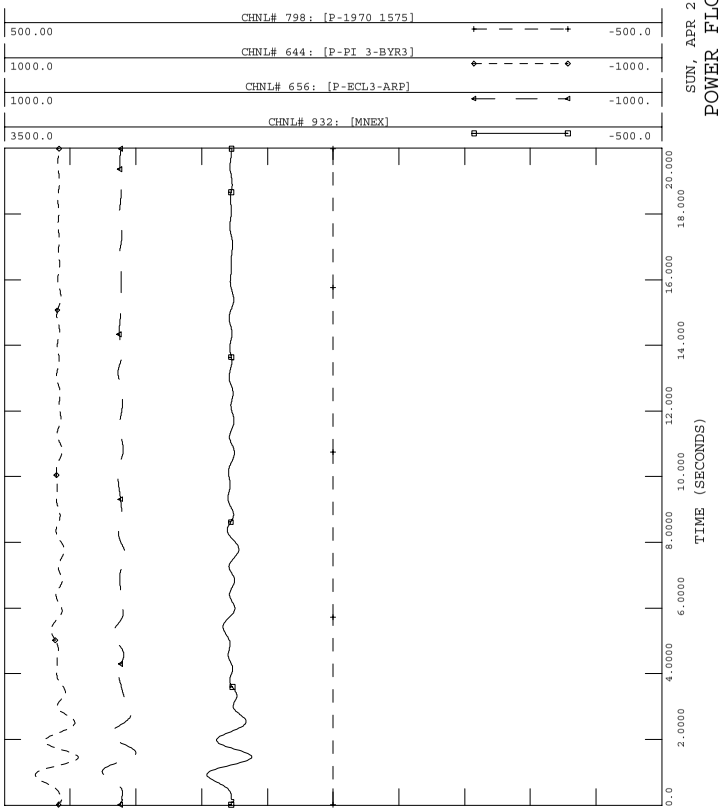
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
POWER FLOW SUMS 2



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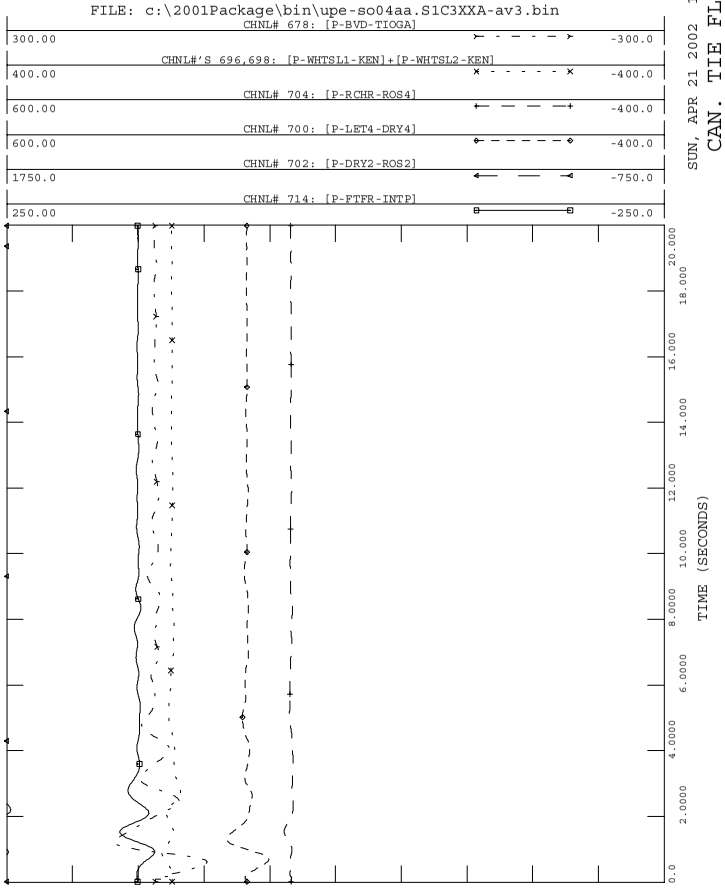
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
CAN. TIE FLOWS



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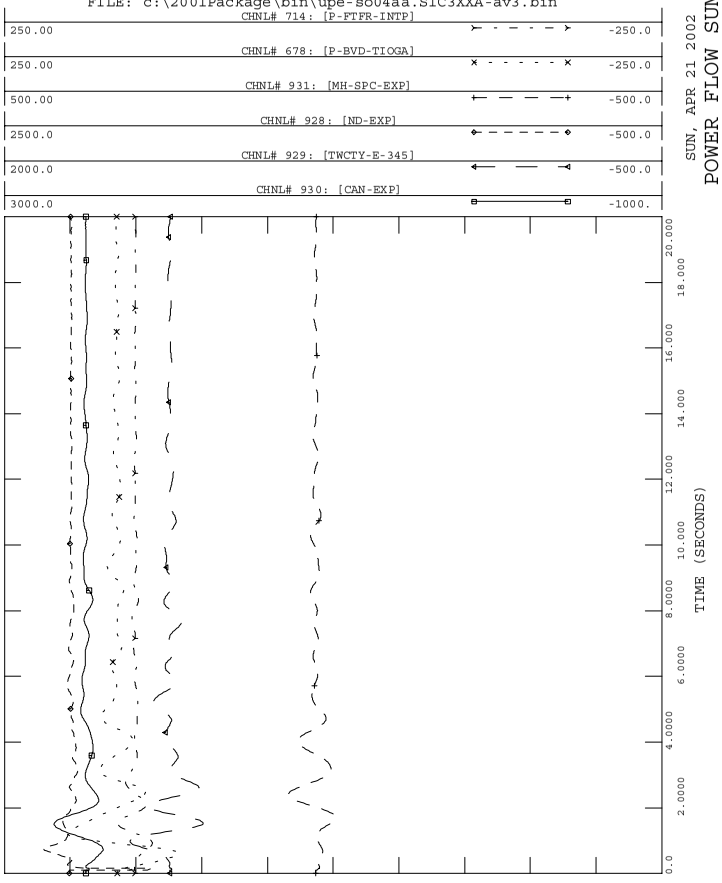
SUN, APR 21 2002 10:48
POWER FLOW SUMS 1



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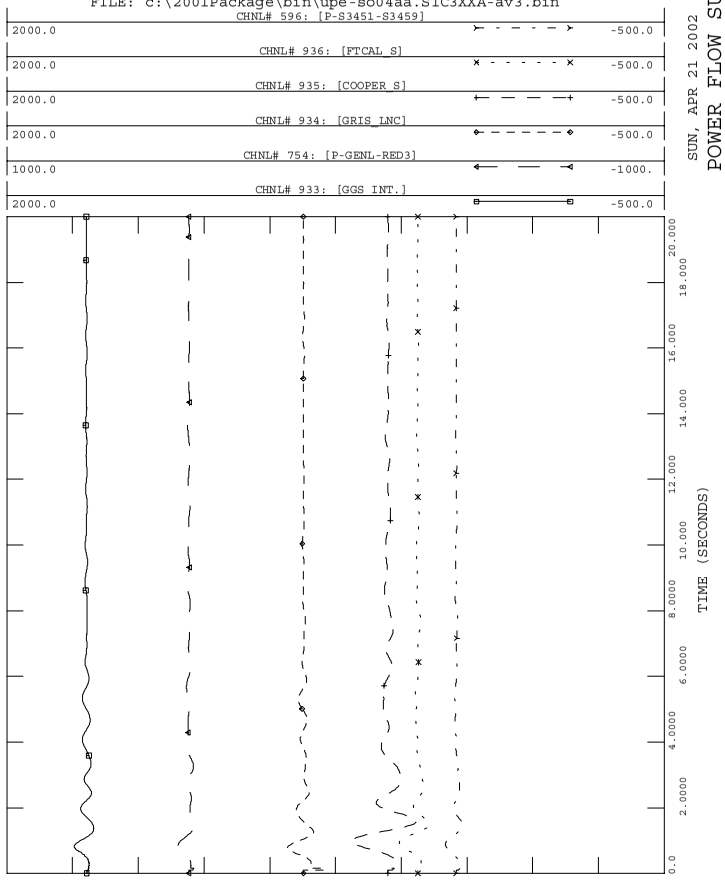
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
POWER FLOW SUM 3



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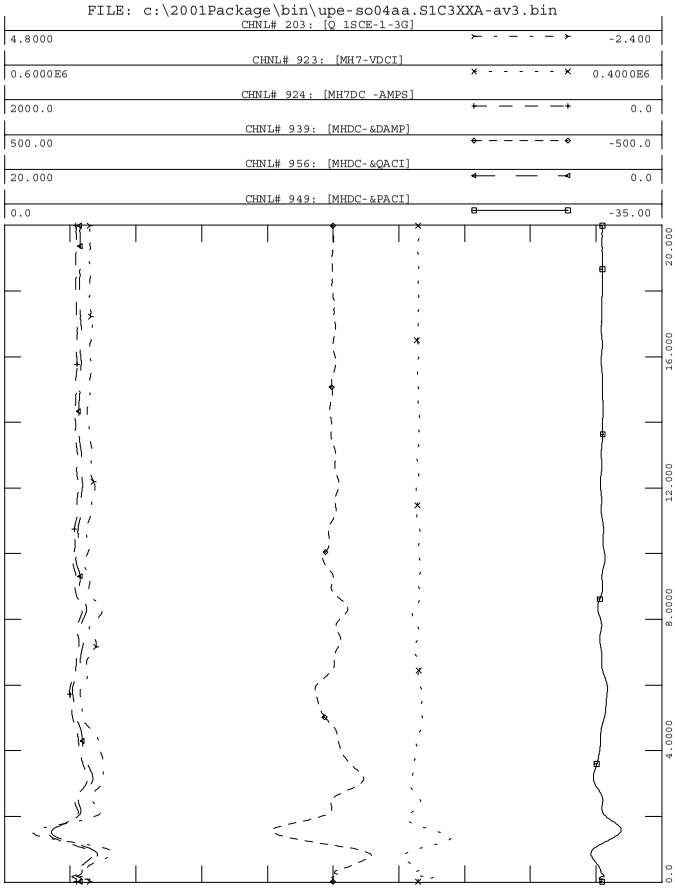
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
MH DC PARAMETERS



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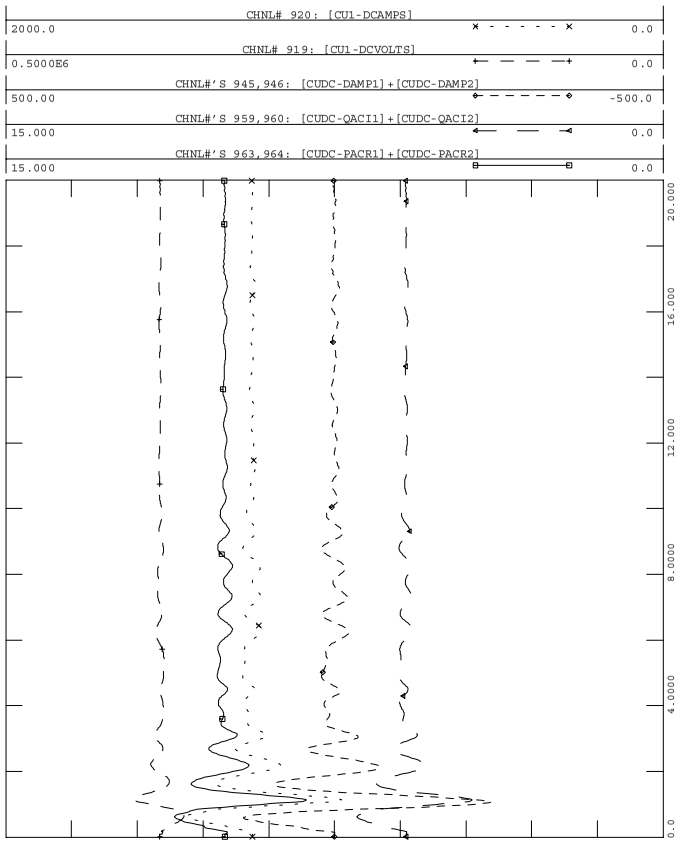
SUN, APR 21 2002 10:48
CU DC #1



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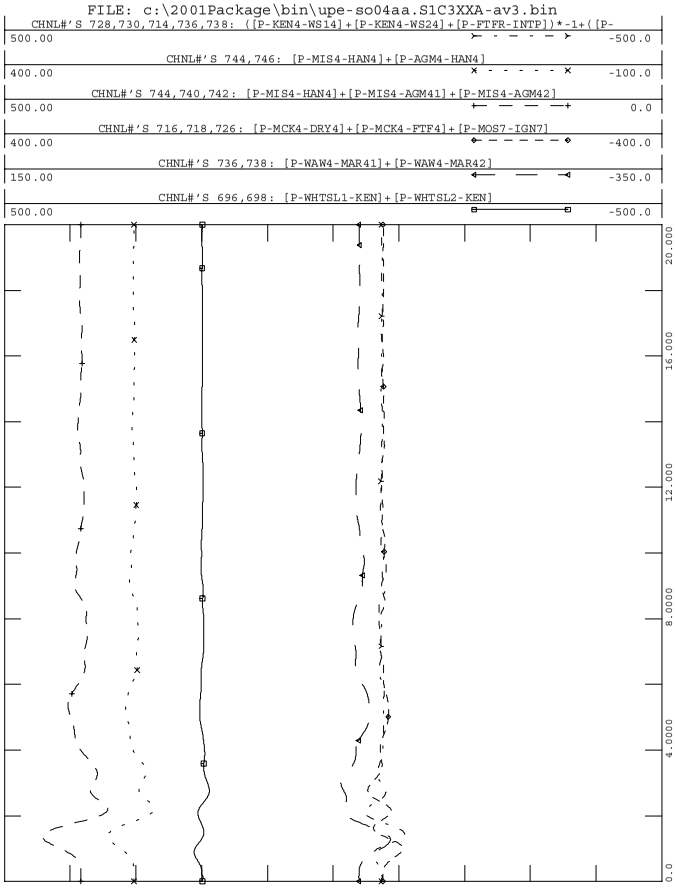
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48
OH TIE FLOWS



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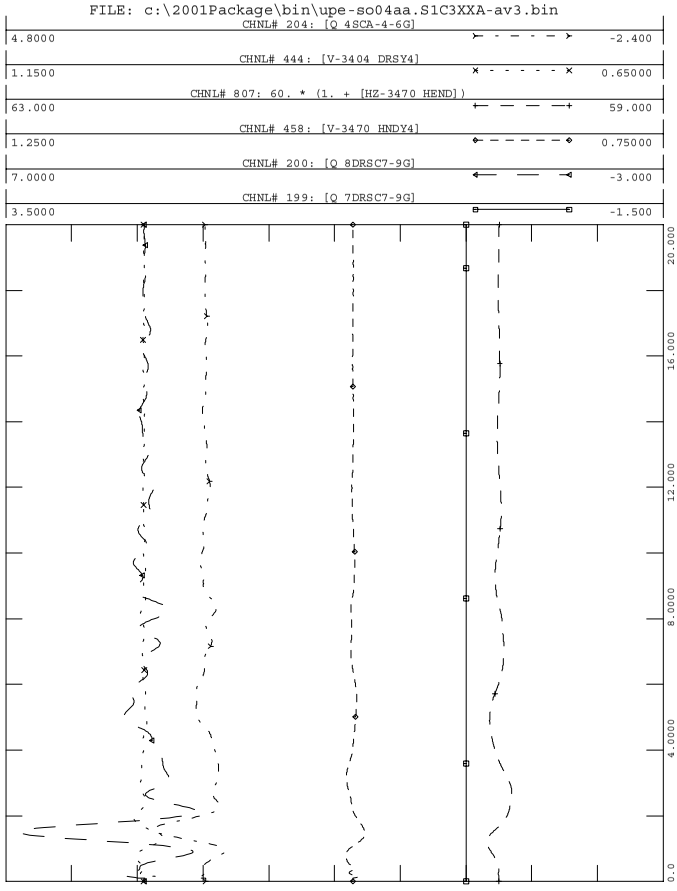
MH DC PARAMETERS



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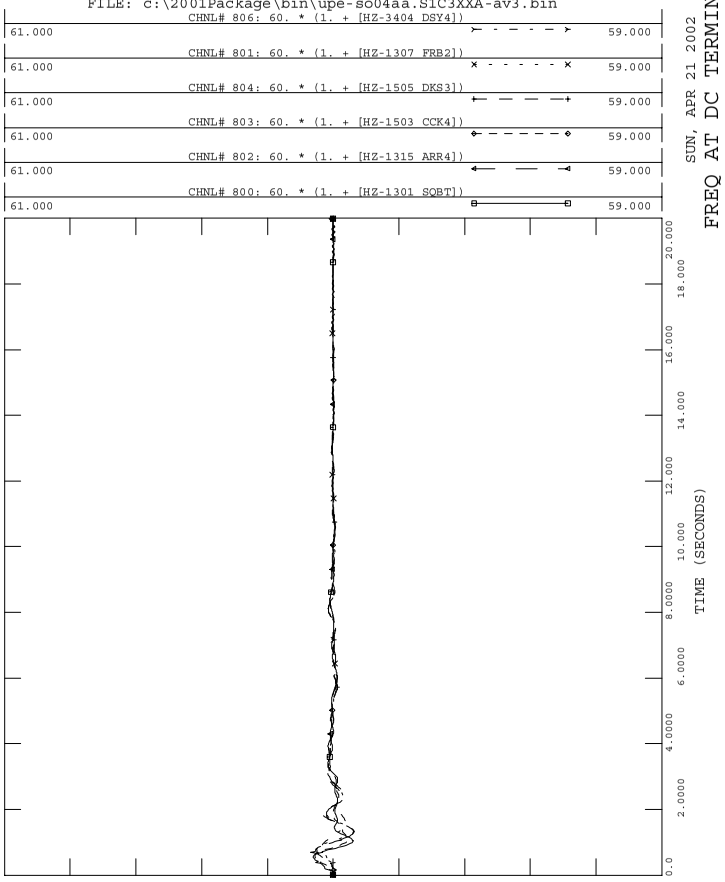
SUN, APR 21 2002 10:48

FREQ AT DC TERMINALS



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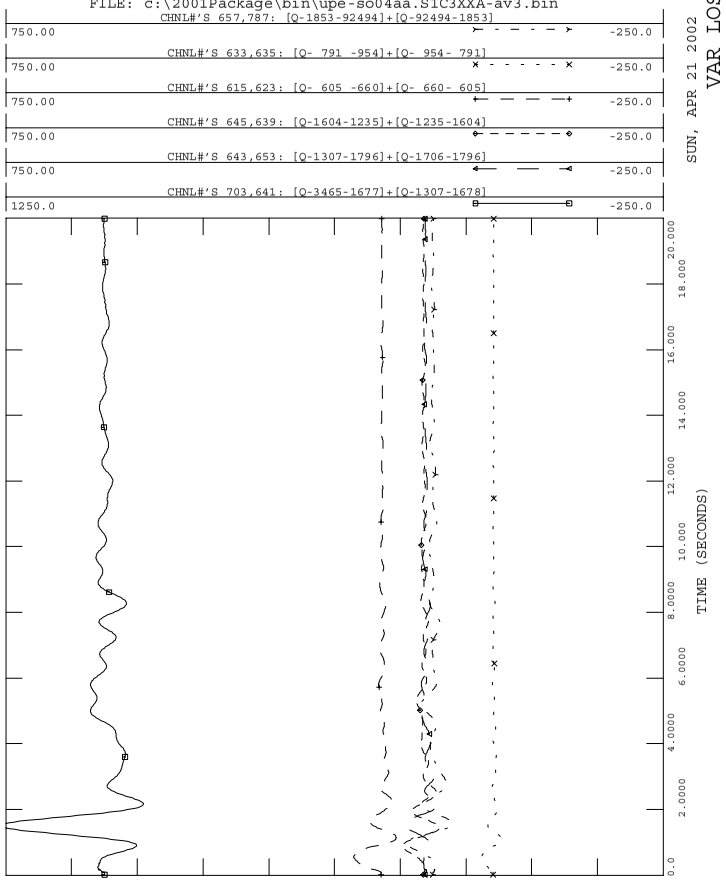
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48

VAR LOSSES



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FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

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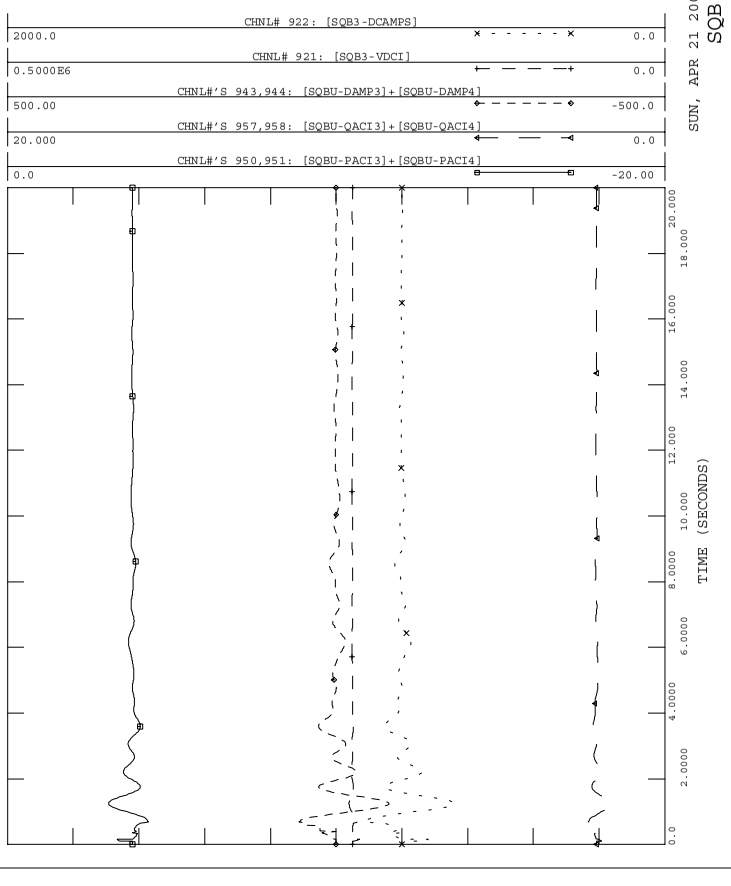
SQB DC #3



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

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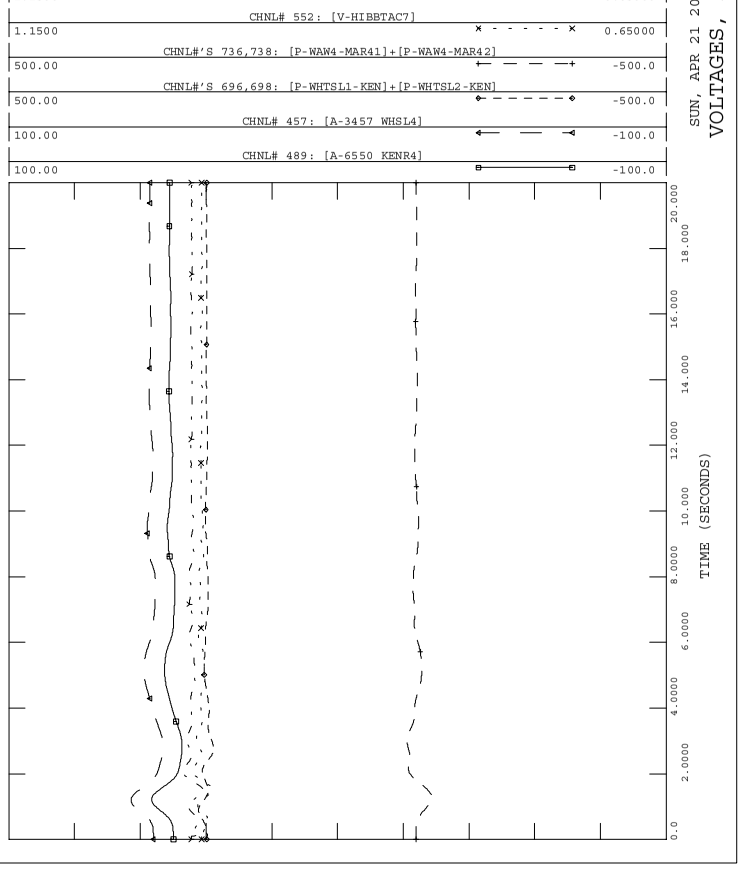
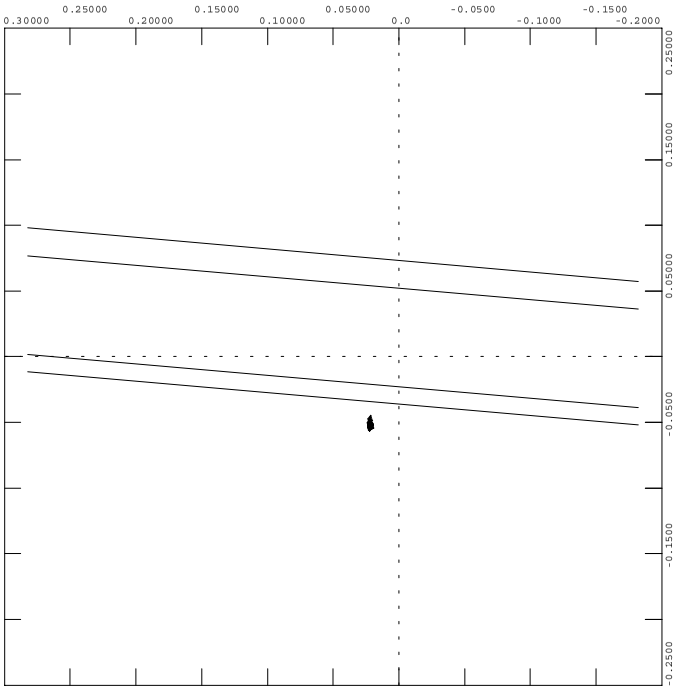
VOLTAGES, ANGLES



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

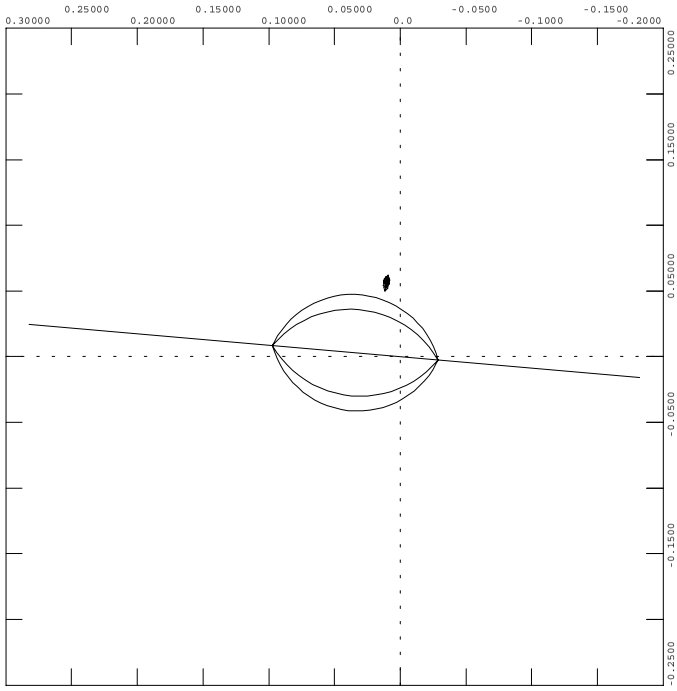


SUN, APR 21 2002 10:48
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]



SUN, APR 21 2002 10:48
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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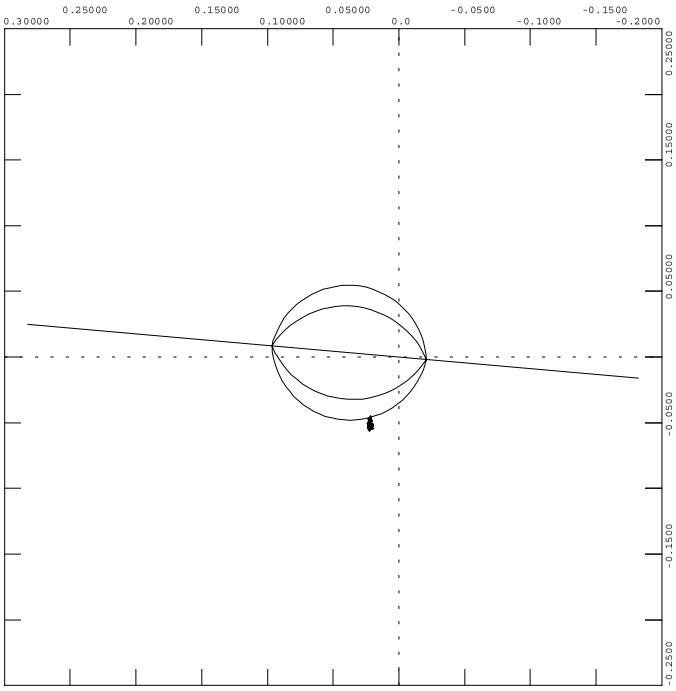
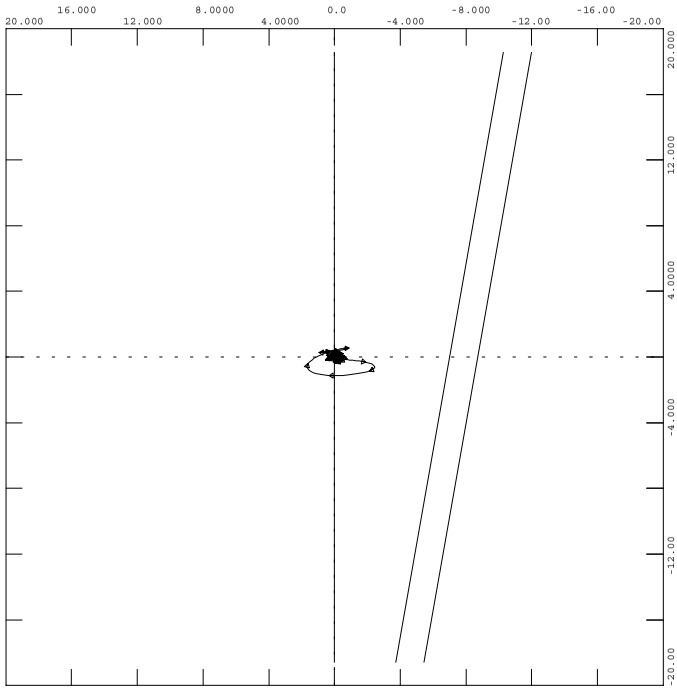


SUN, APR 21 2002 10:48
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

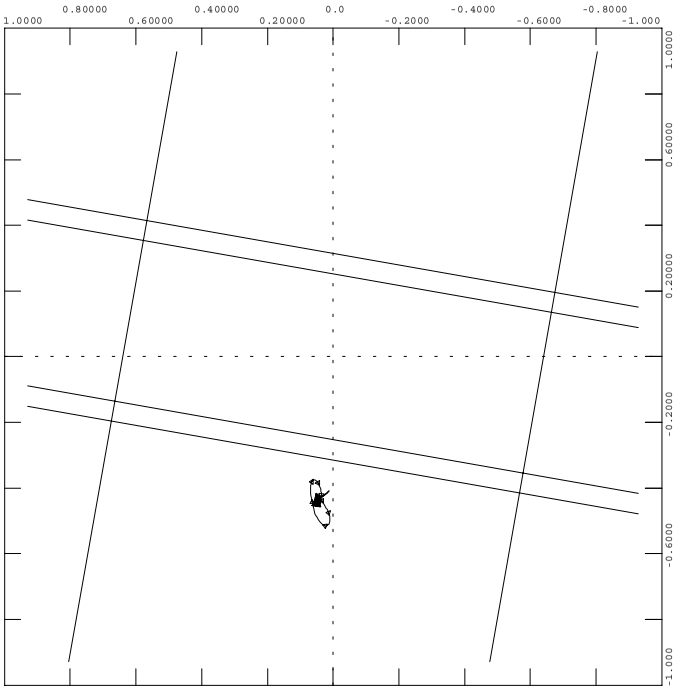


SUN, APR 21 2002 10:48
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

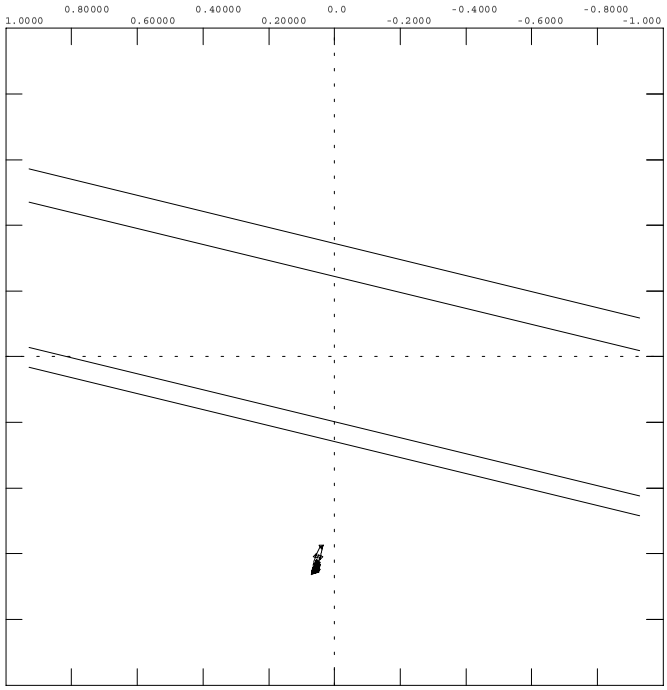
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

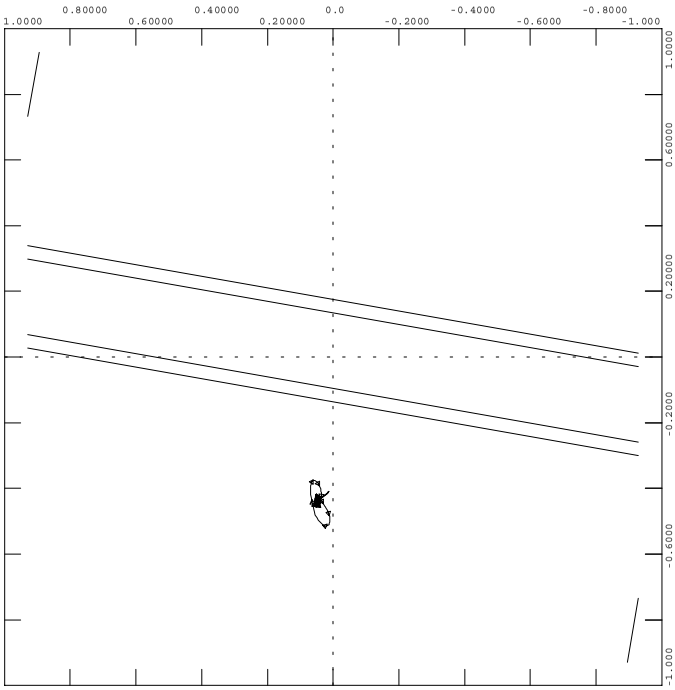
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

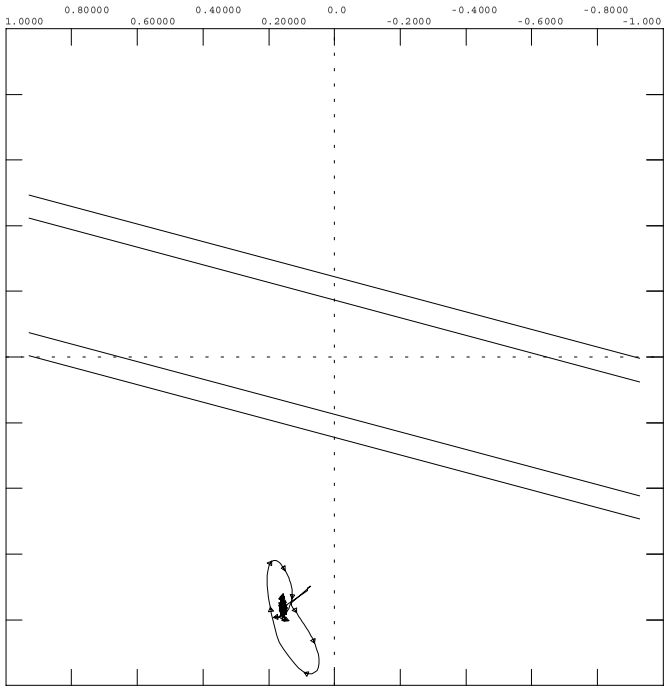
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

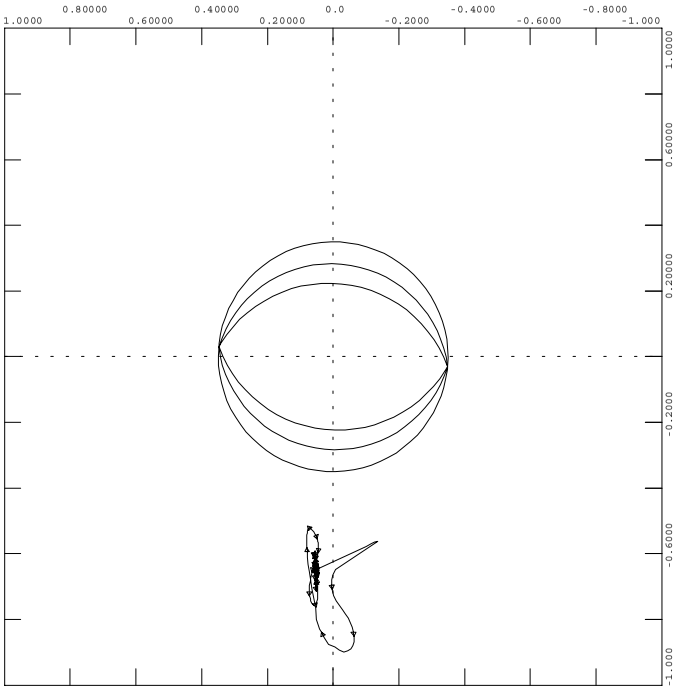
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

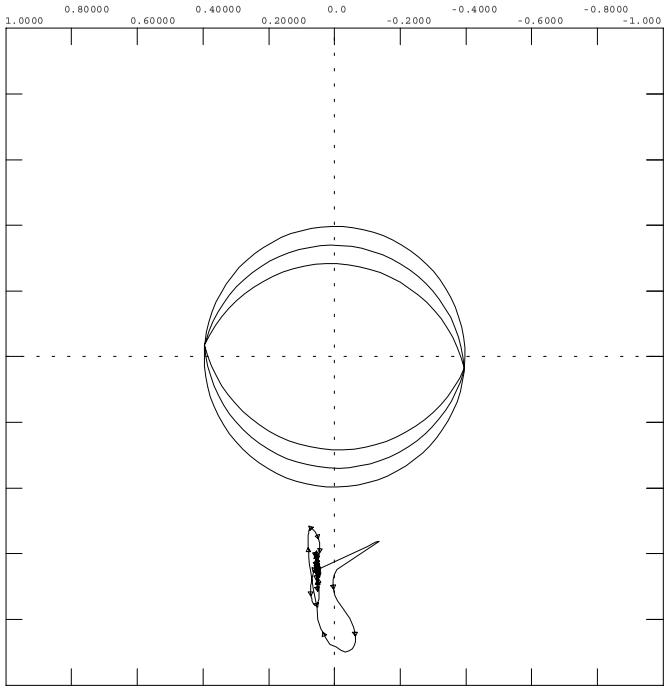
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

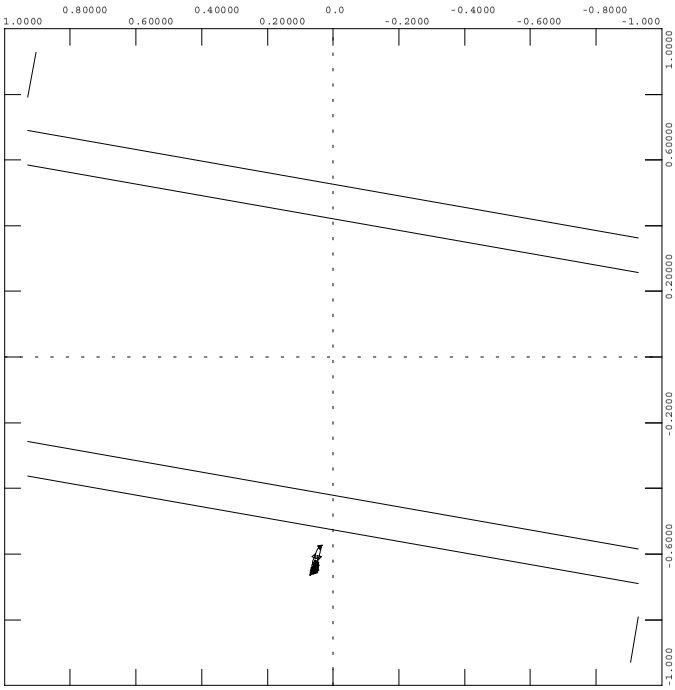
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

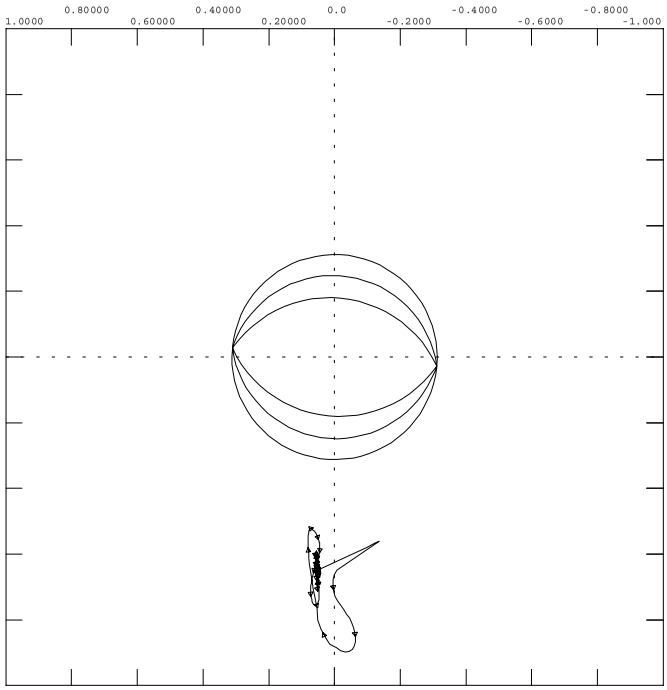
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



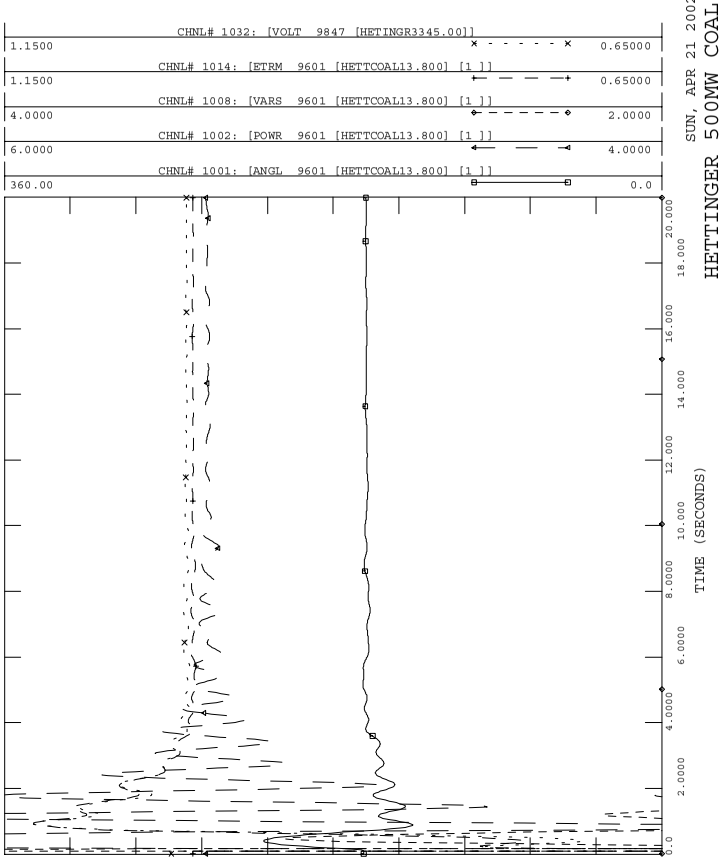
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

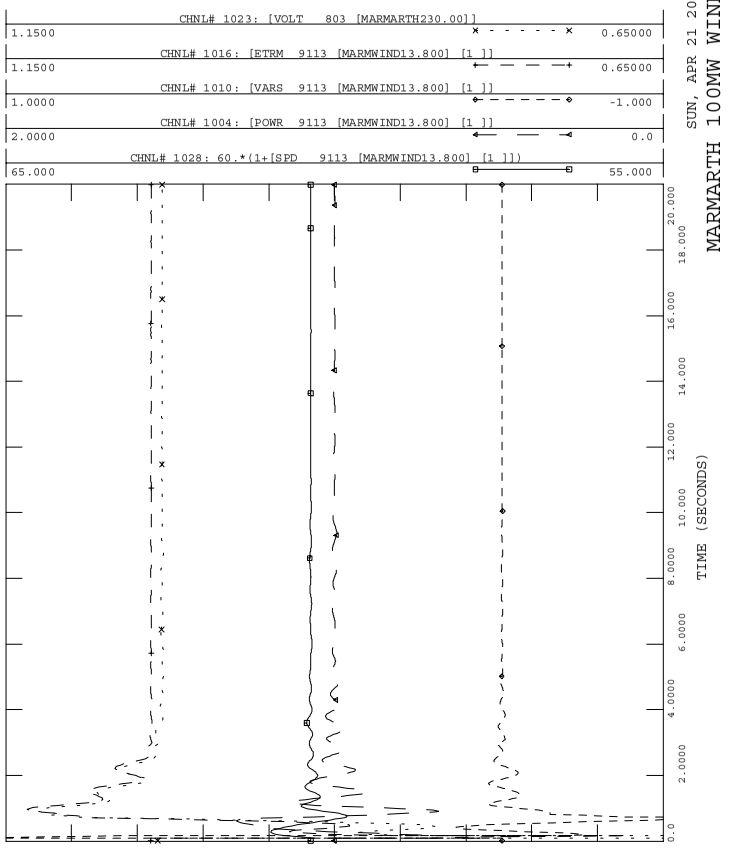


UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin



SUN, APR 21 2002 10:48
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

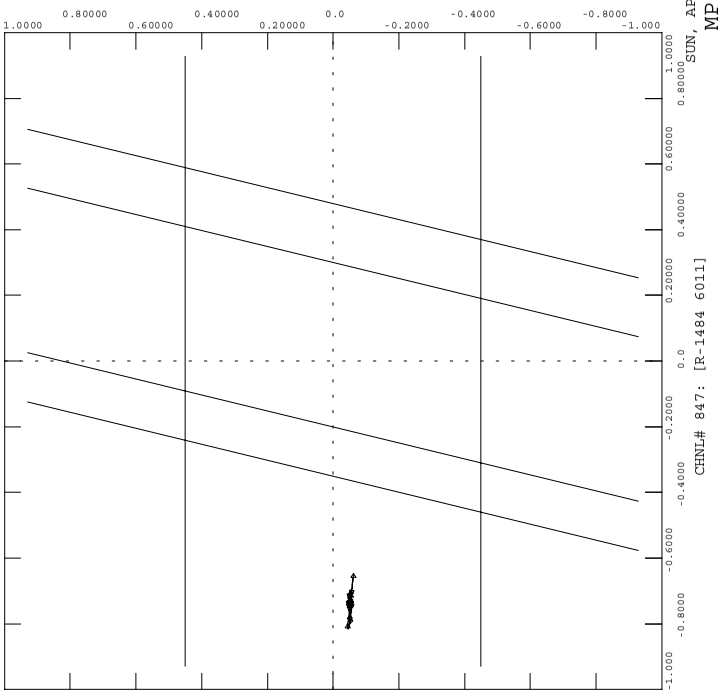


SUN, APR 21 2002 10:48
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

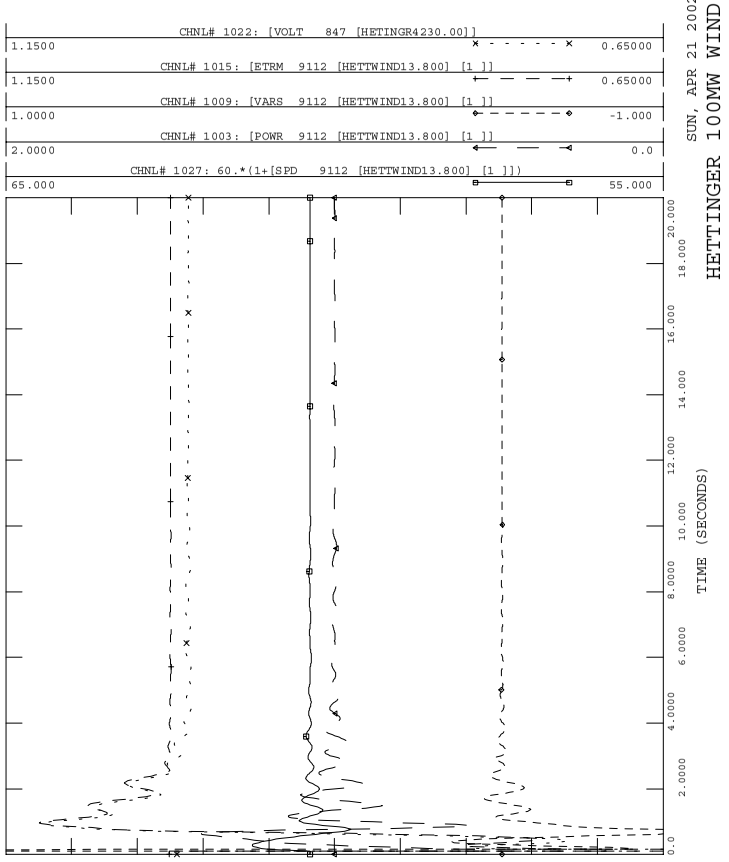
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



SUN, APR 21 2002 10:48
MP-OH I.FALLS (779)

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin



SUN, APR 21 2002 10:48
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

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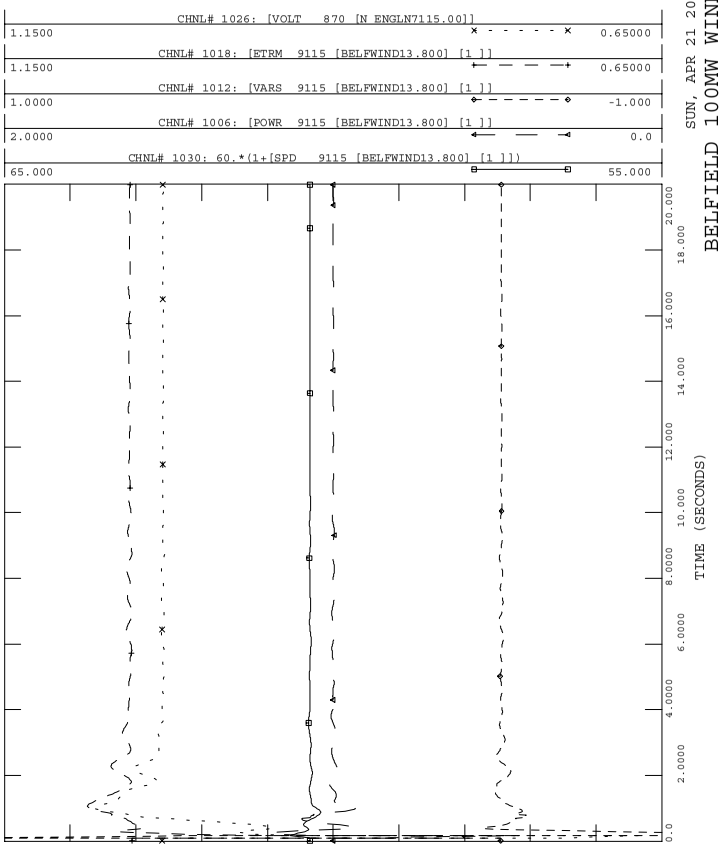
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

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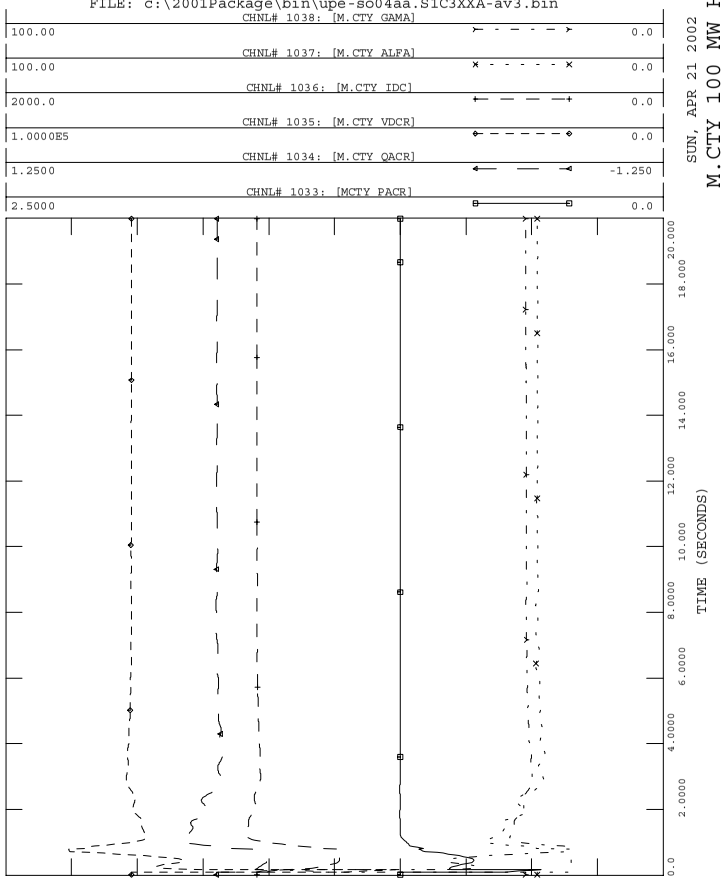
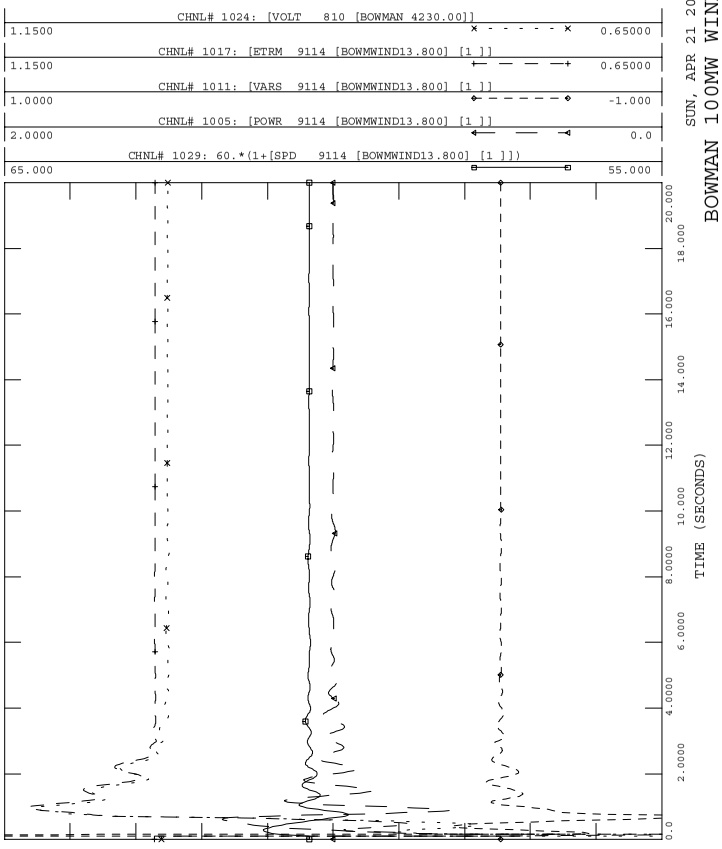
M.CTY 100 MW HVDC



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:48

BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

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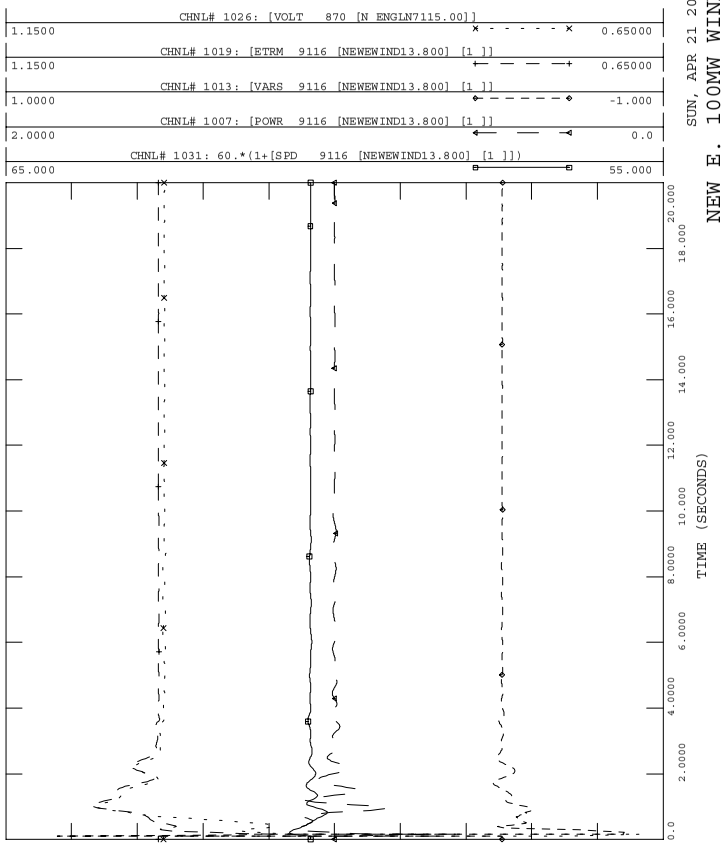
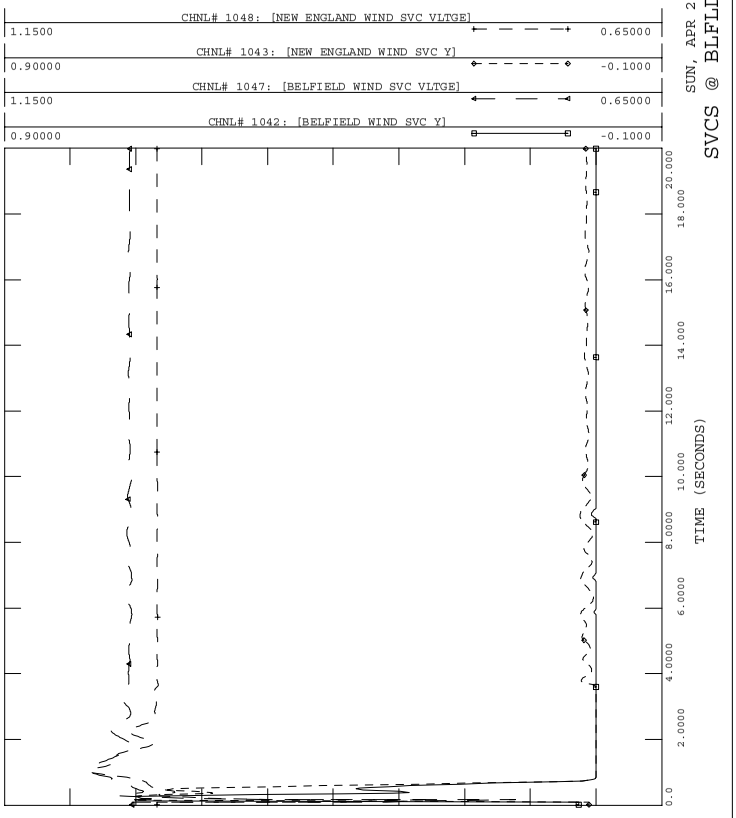
NEW E. 100MW WIND UNIT



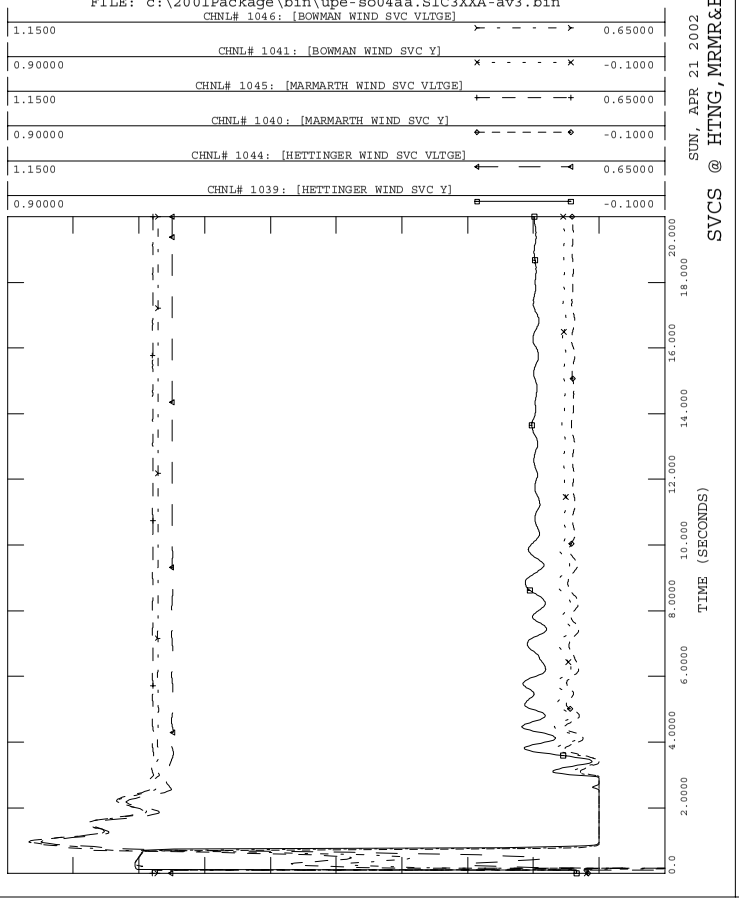
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin



SUN, APR 21 2002 10:48

SVCS @ BLFLD & NWENG

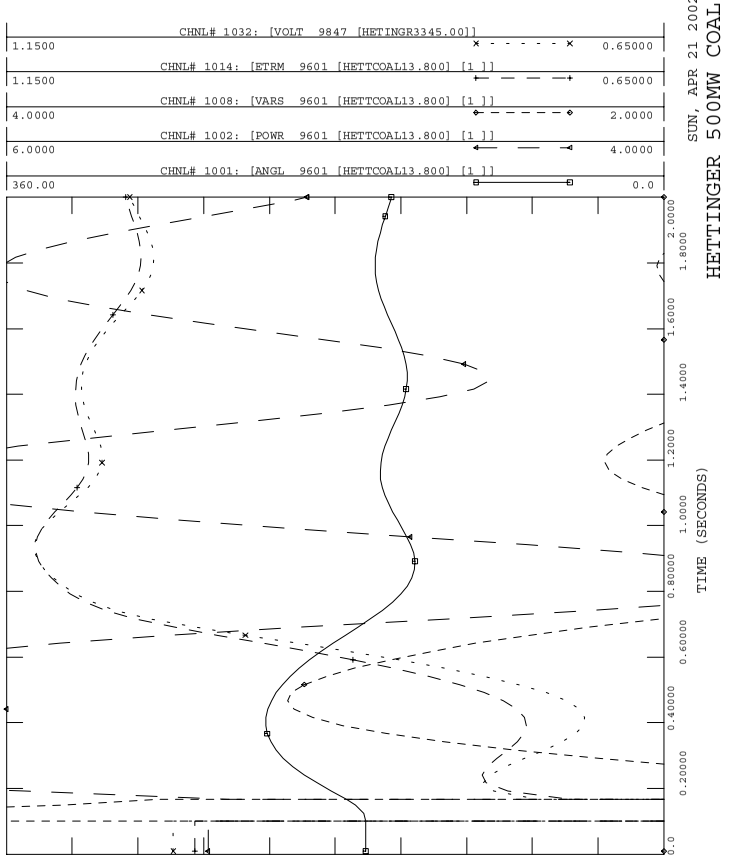
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin



SUN, APR 21 2002 10:48

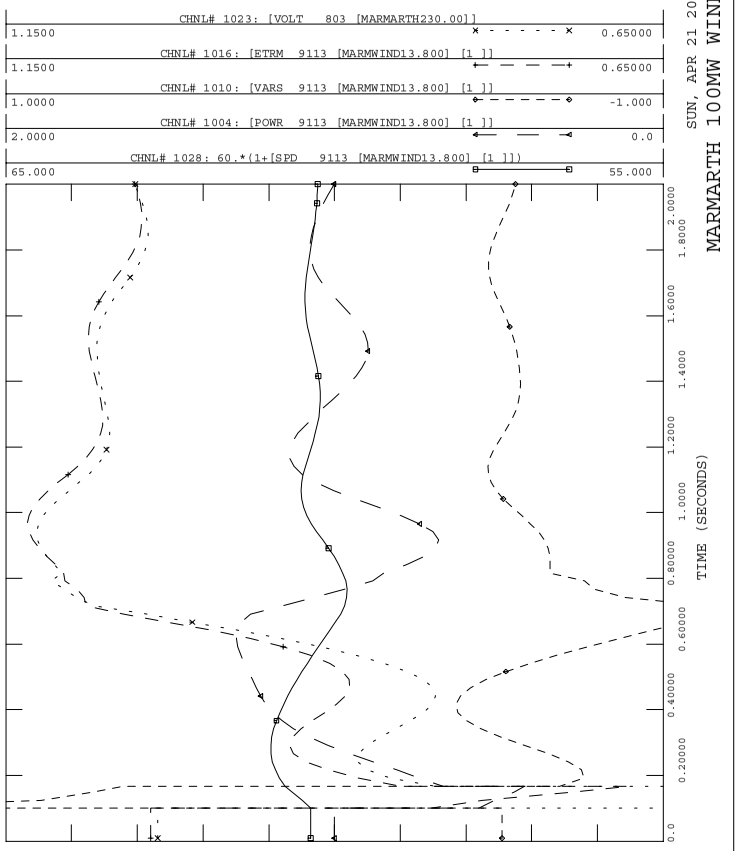
SVCS @ HTNG,MRMR&BWMN

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin



SUN, APR 21 2002 10:14
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

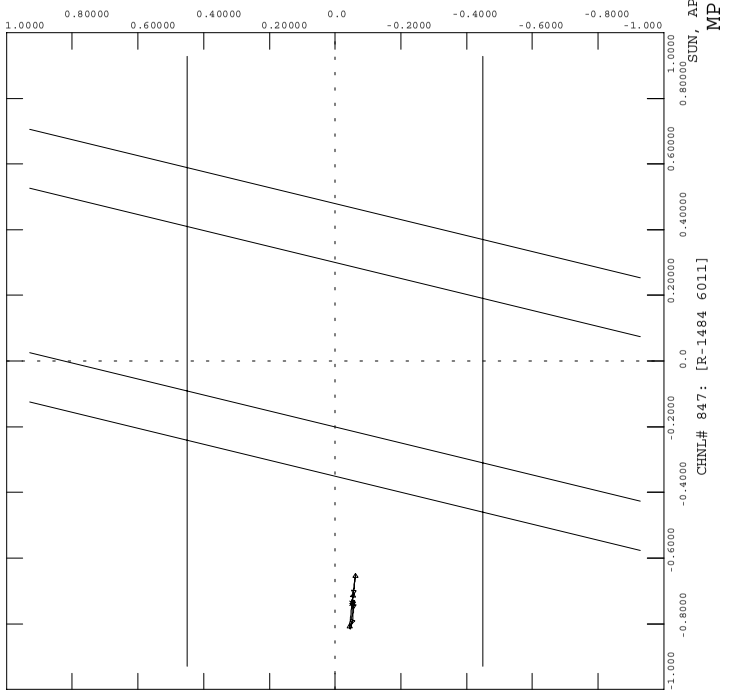


SUN, APR 21 2002 10:14
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

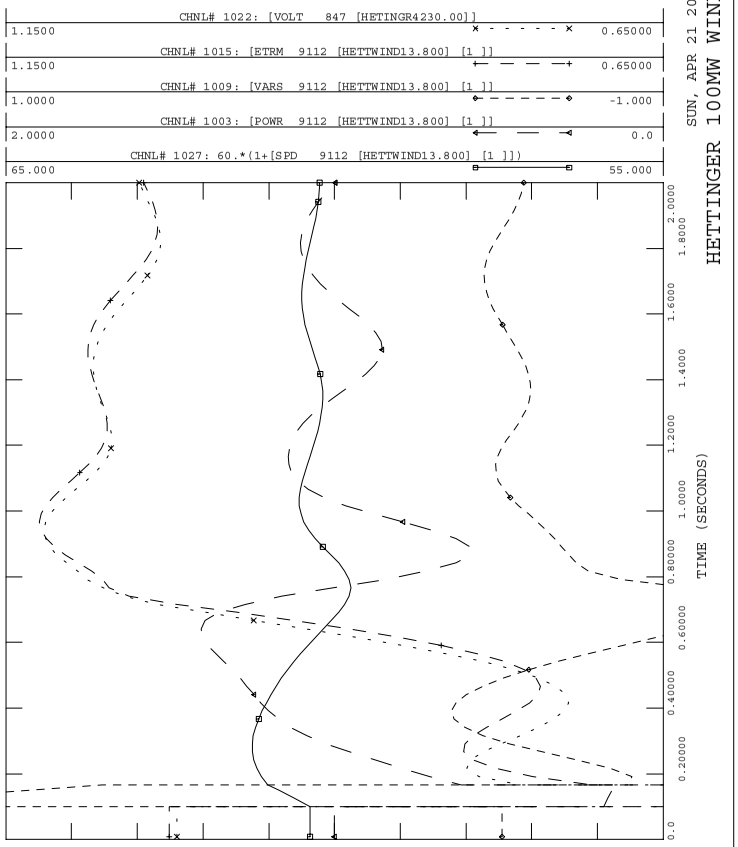
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



SUN, APR 21 2002 10:14
MP-OH I.FALLS (779)

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

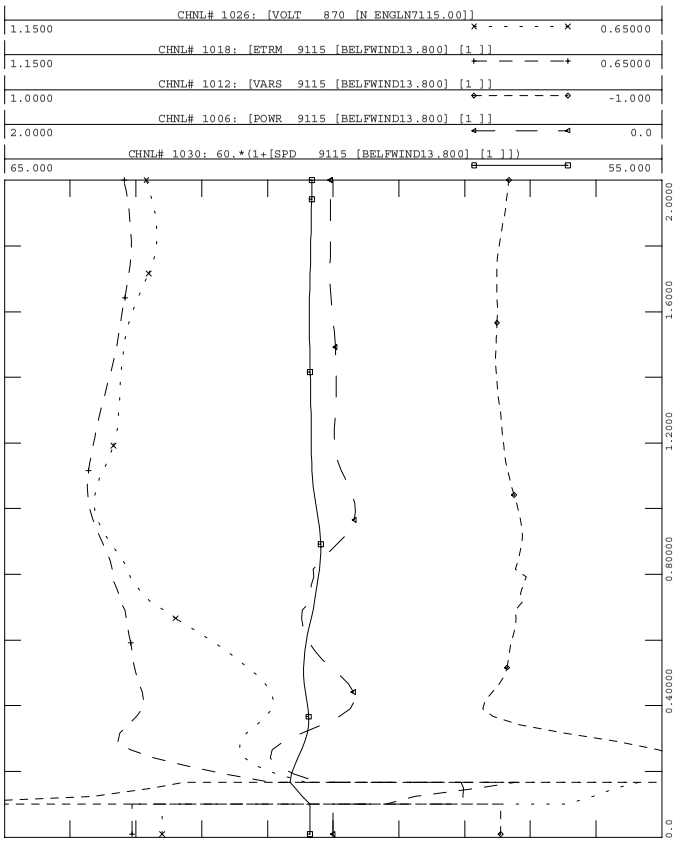


SUN, APR 21 2002 10:14
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:14

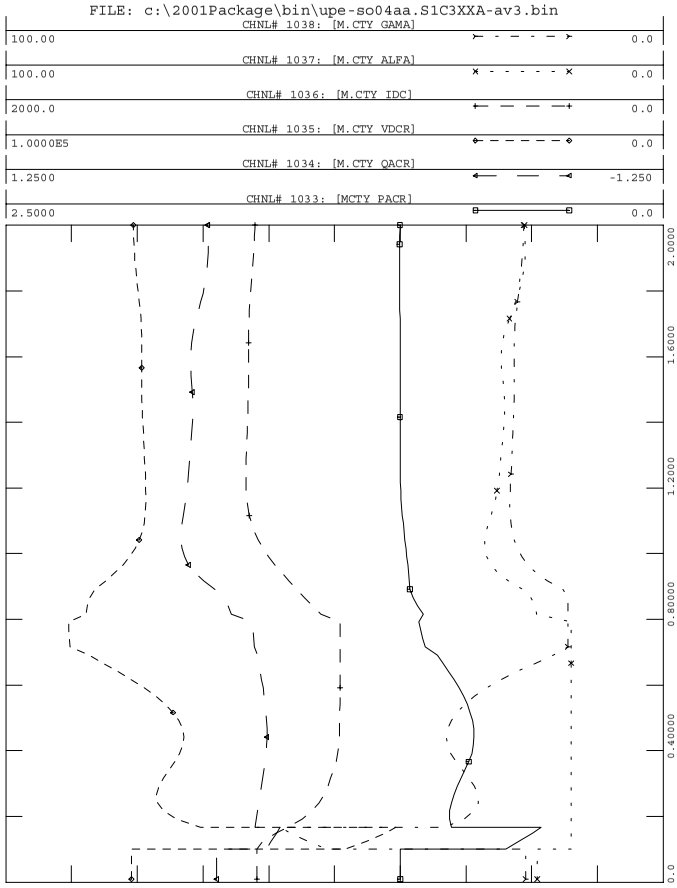
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:14

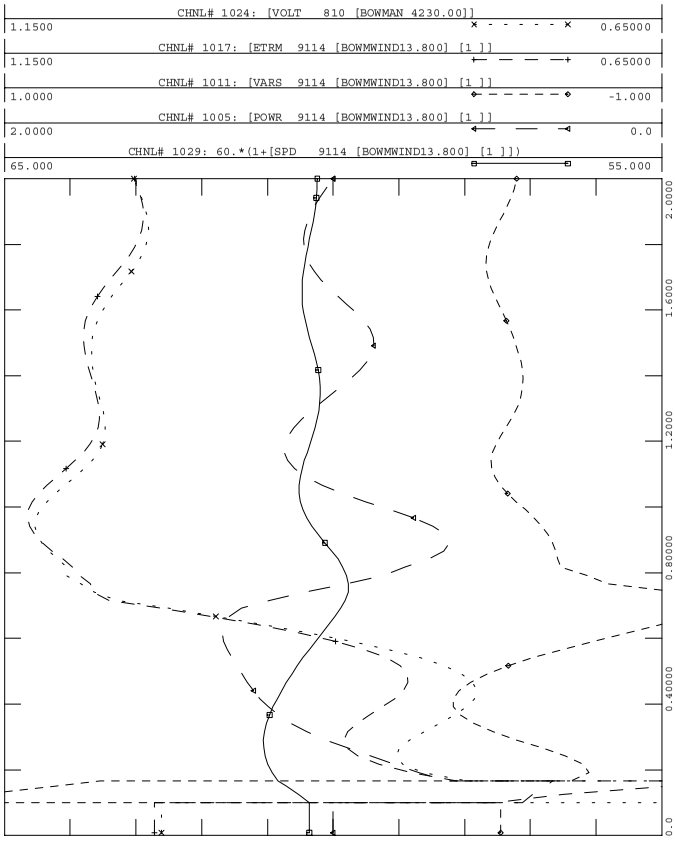
M.CTY 100 MW HVDC



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:14

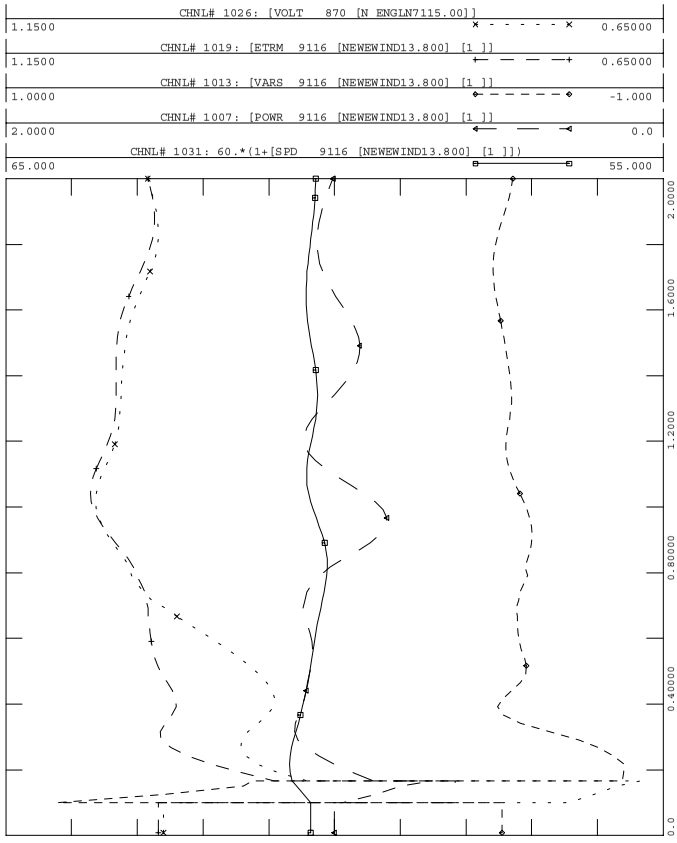
BOWMAN 100MW WIND UNIT



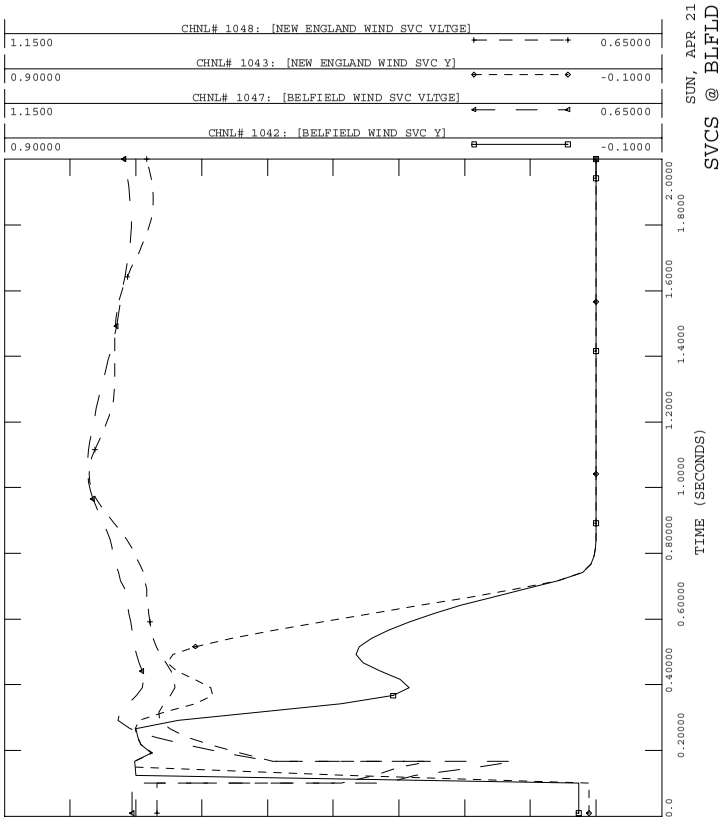
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

SUN, APR 21 2002 10:14

NEW E. 100MW WIND UNIT



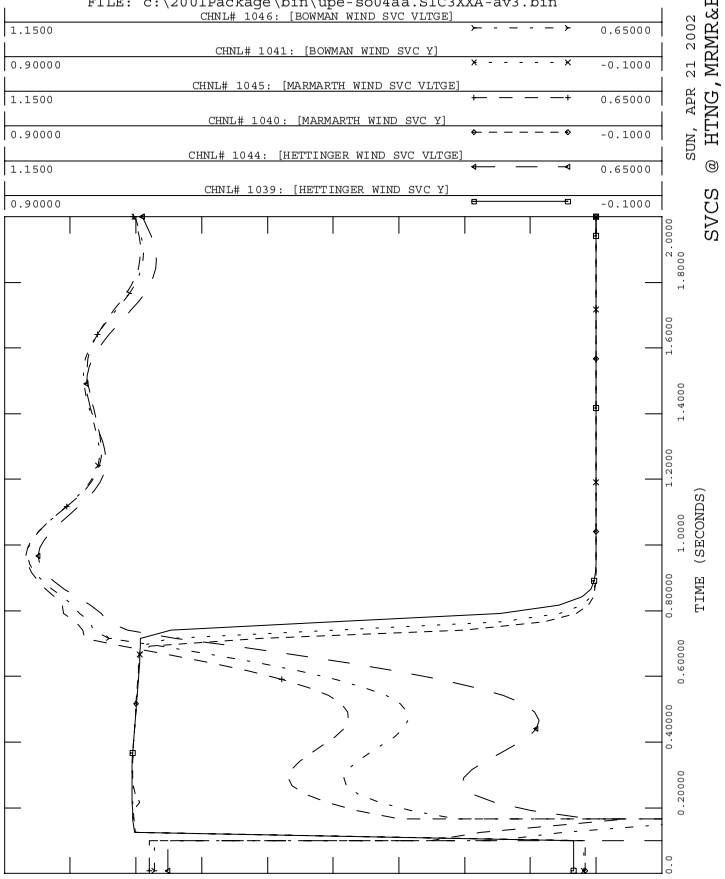
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin



SVCS @ BLFLD & NWENG

SUN, APR 21 2002 10:14

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-av3.bin

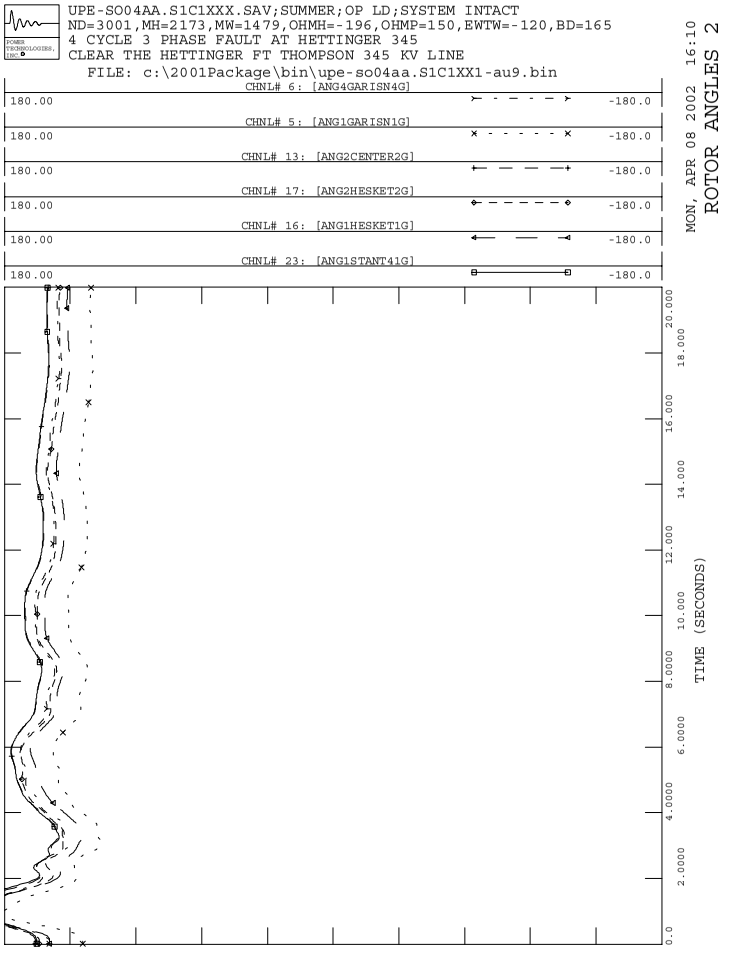


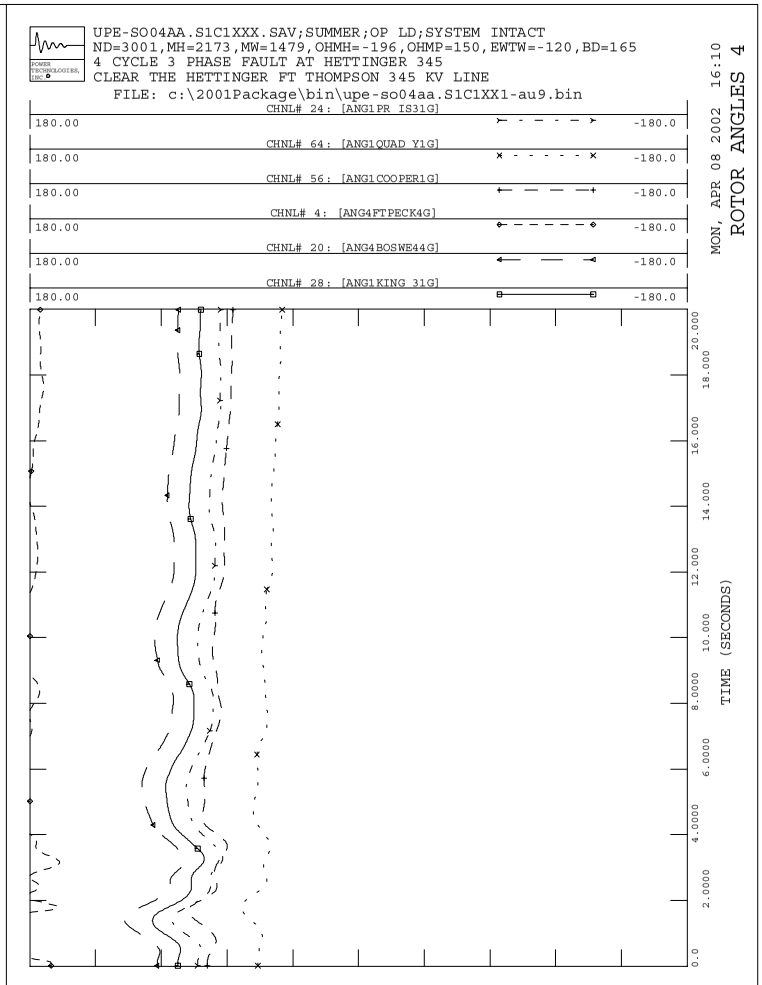
SVCS @ HTNG,MRMR&BWMN

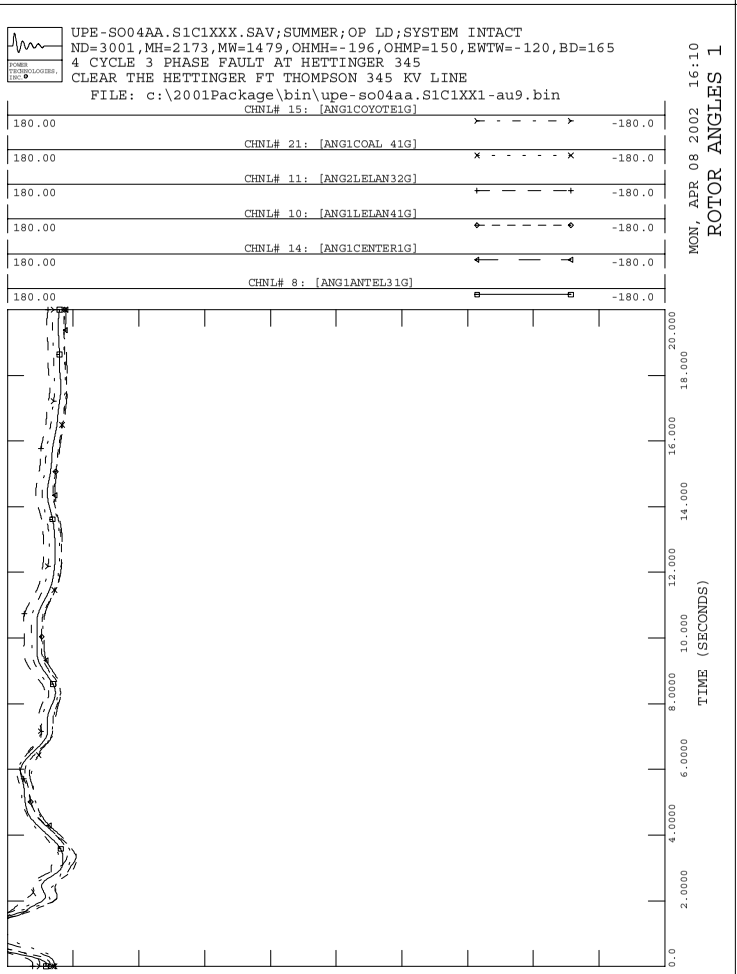
SUN, APR 21 2002 10:14

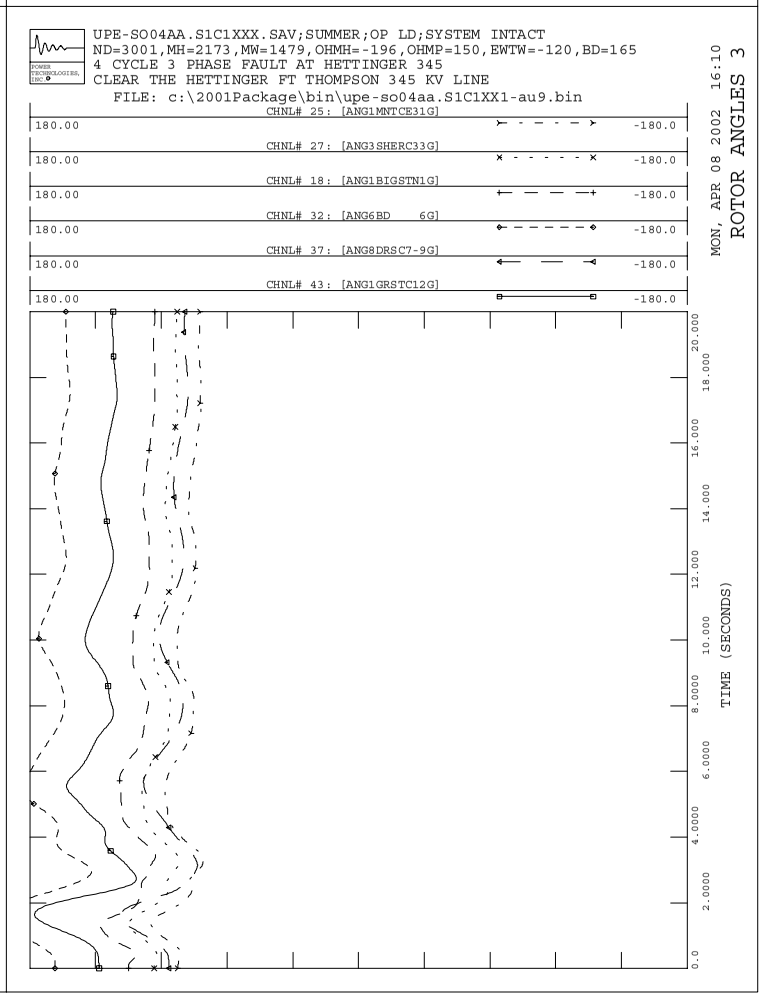
CONTINGENCY AU9

4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Ft. Thompson 345 kV line

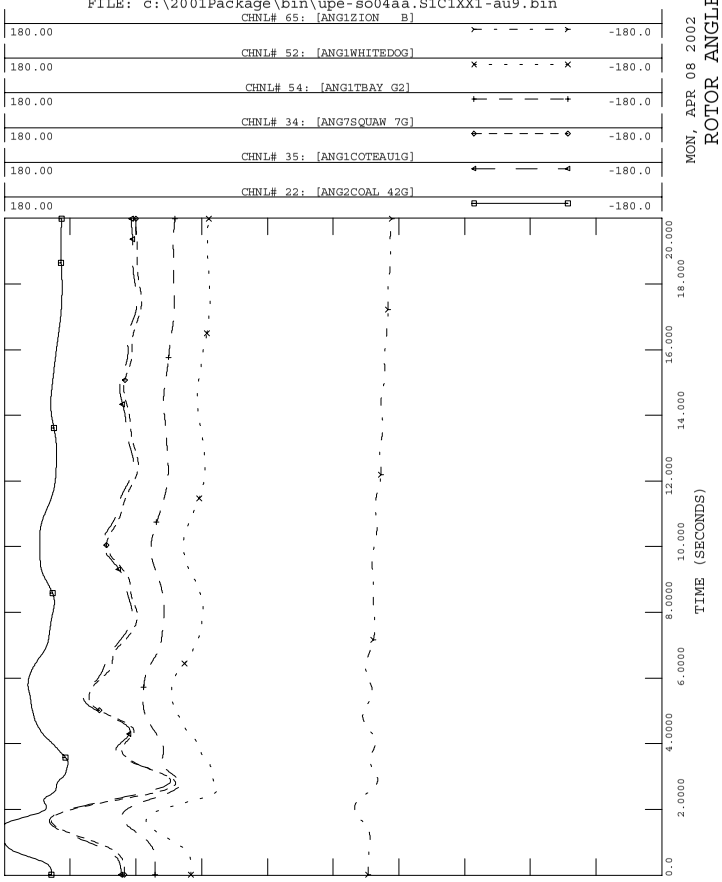

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
MON, APR 08 2002 16:10
ROTOR ANGLES 2
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
MON, APR 08 2002 16:10
ROTOR ANGLES 4
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
MON, APR 08 2002 16:10
ROTOR ANGLES 1
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

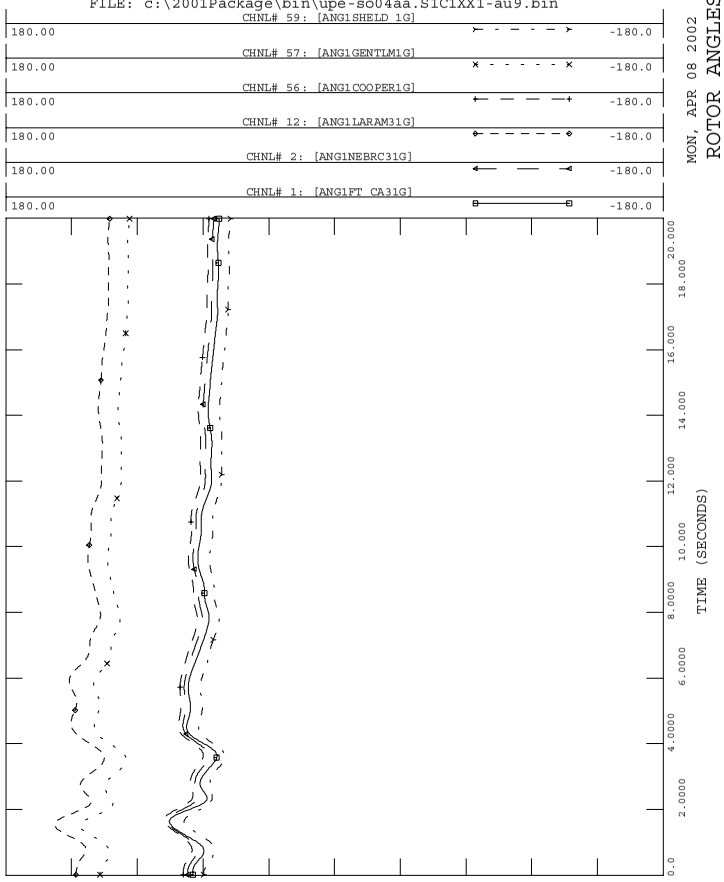

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
MON, APR 08 2002 16:10
ROTOR ANGLES 3
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



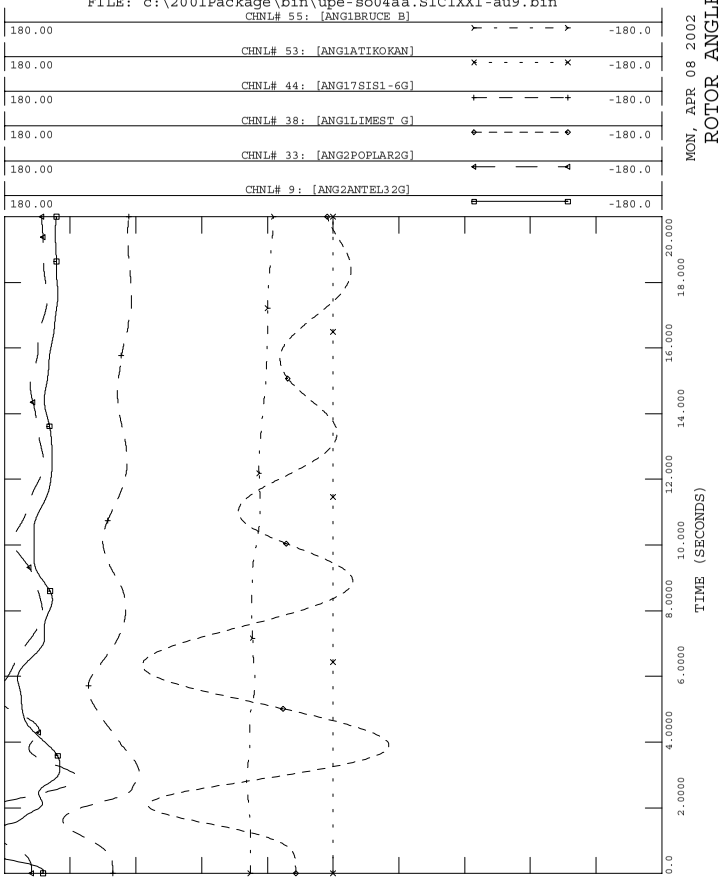
MON, APR 08 2002 16:10
ROTOR ANGLES 6

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



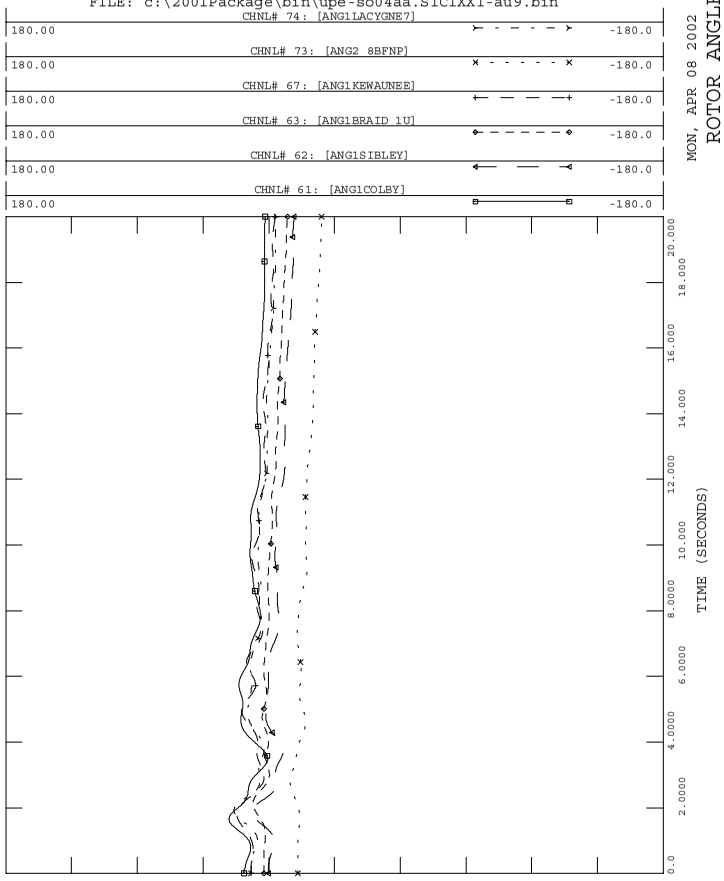
MON, APR 08 2002 16:10
ROTOR ANGLES NB

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



MON, APR 08 2002 16:10
ROTOR ANGLES 5

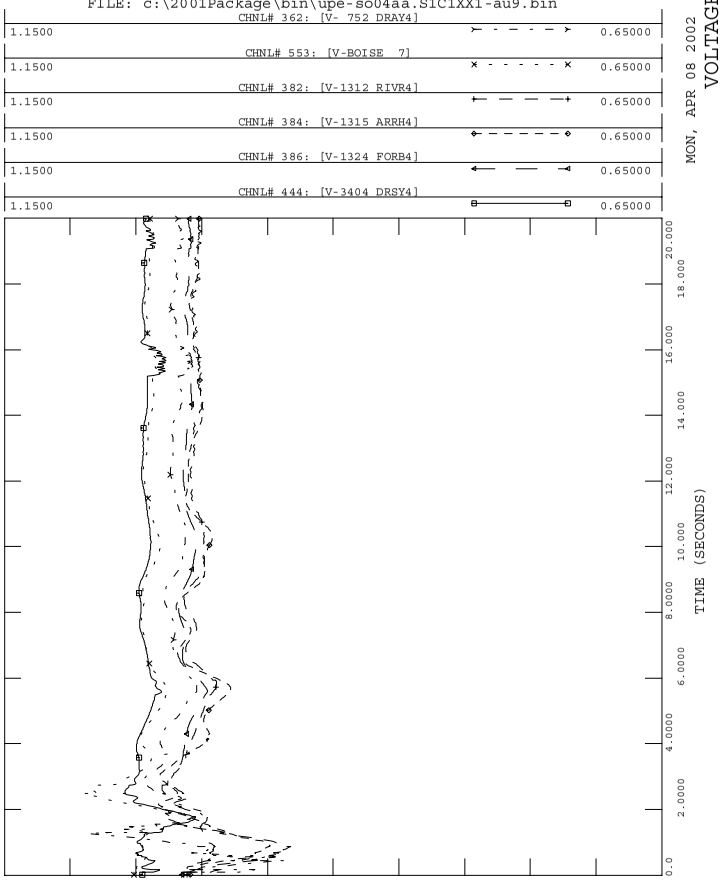
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



MON, APR 08 2002 16:10
ROTOR ANGLES 7

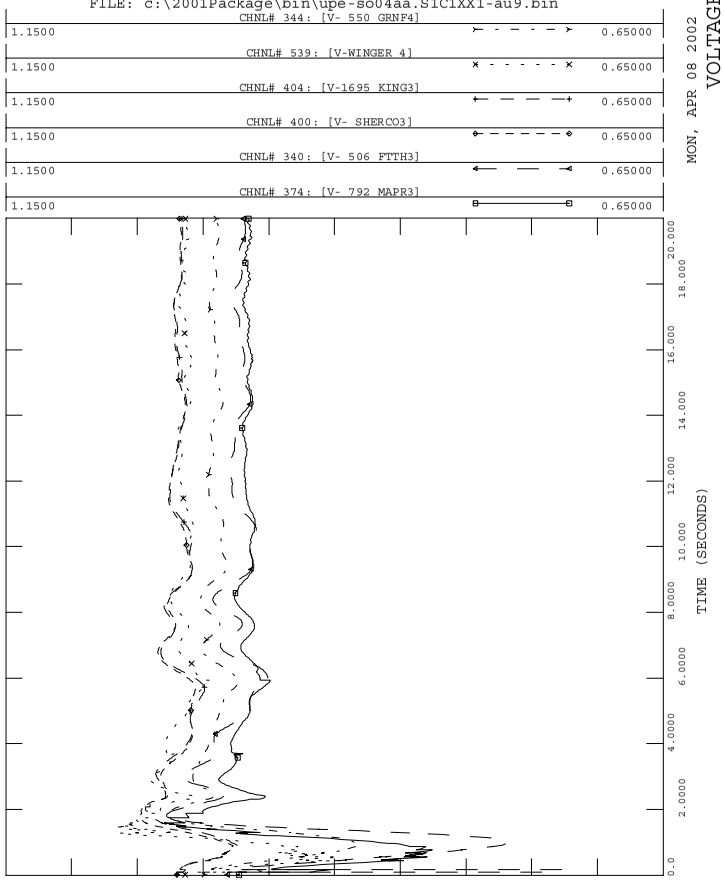
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
VOLTAGES 1



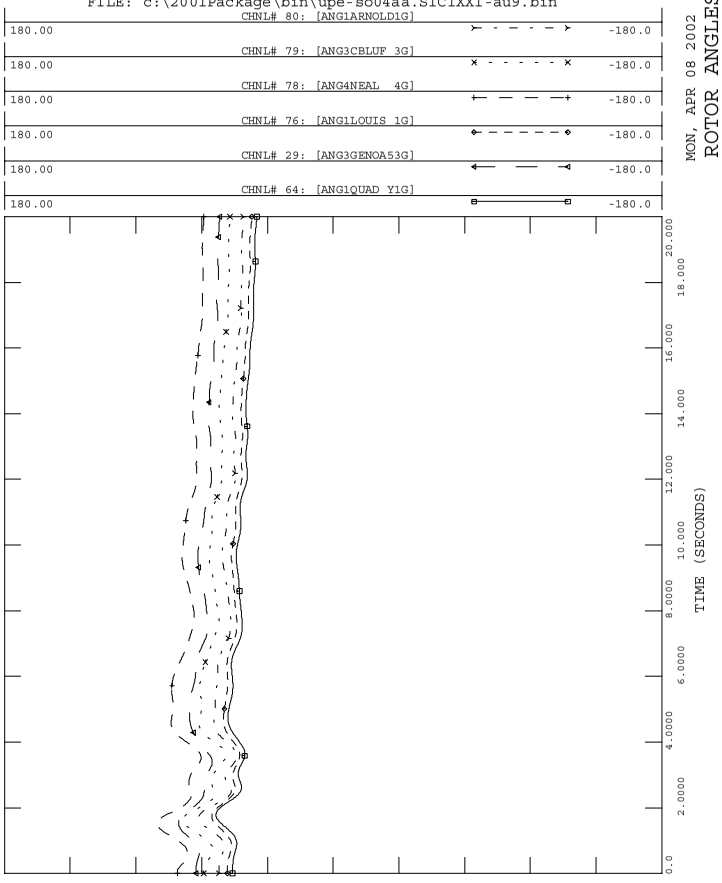
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
VOLTAGES 3



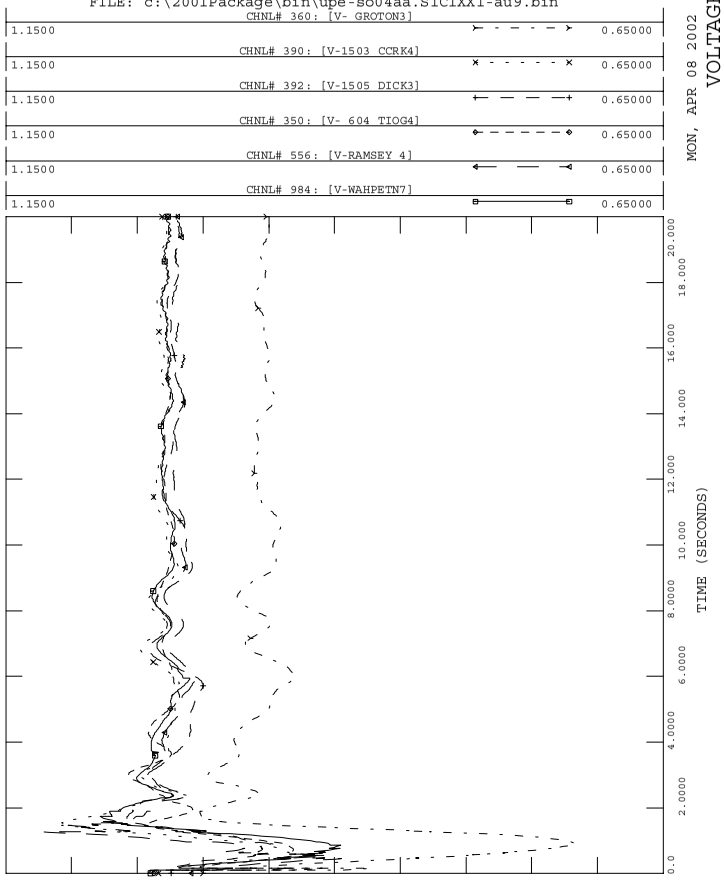
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
ROTOR ANGLES IA

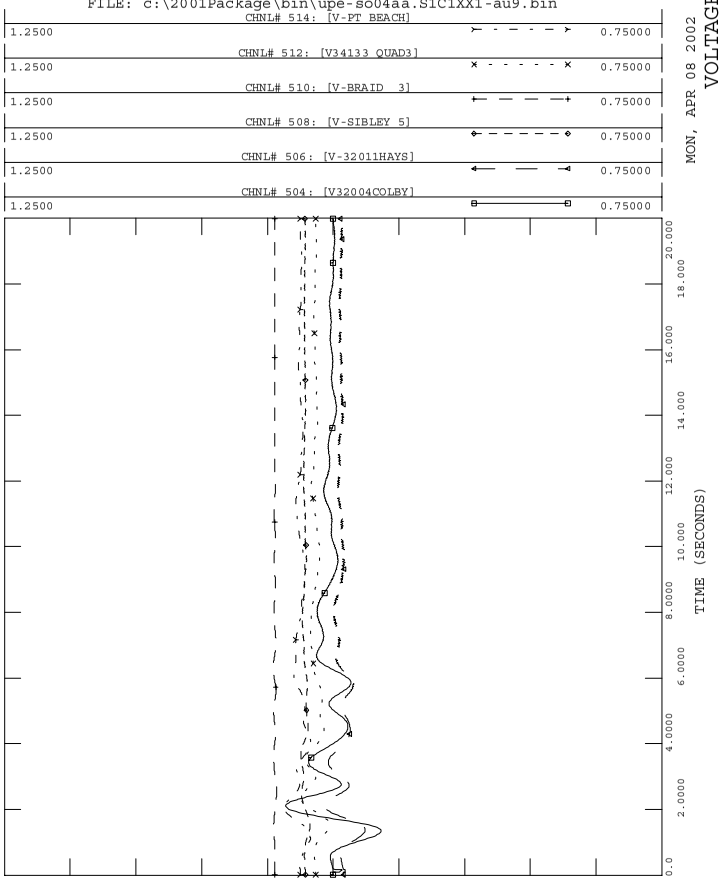


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
VOLTAGES 2

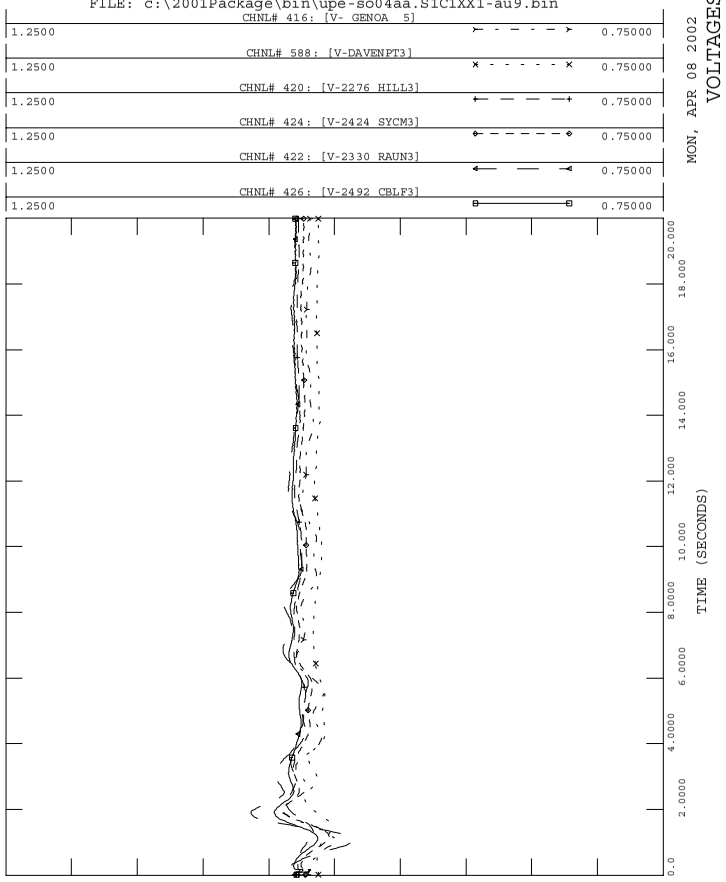


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



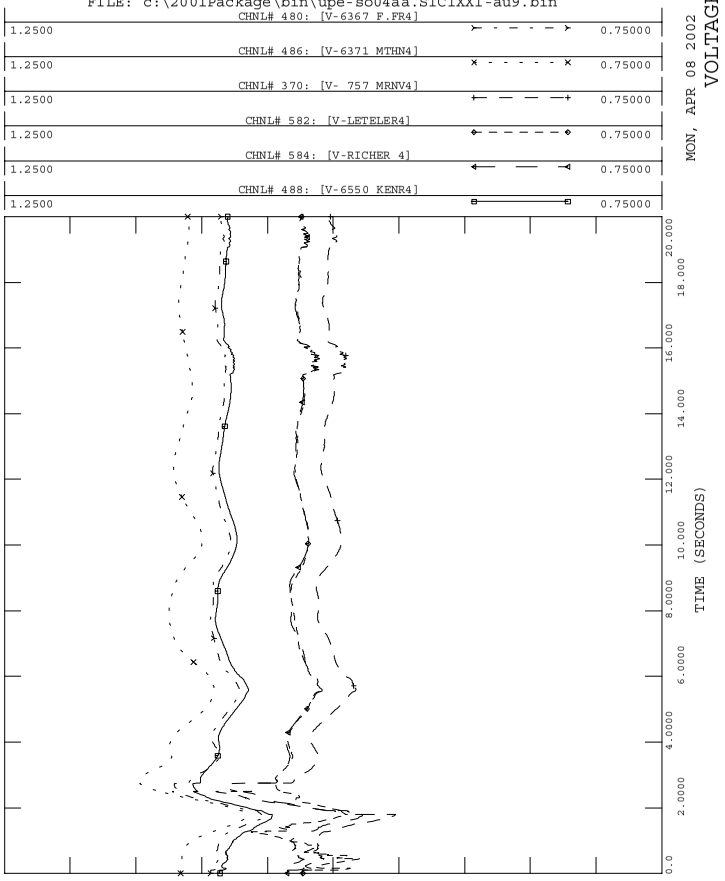
MON, APR 08 2002 16:10
VOLTAGES 5

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



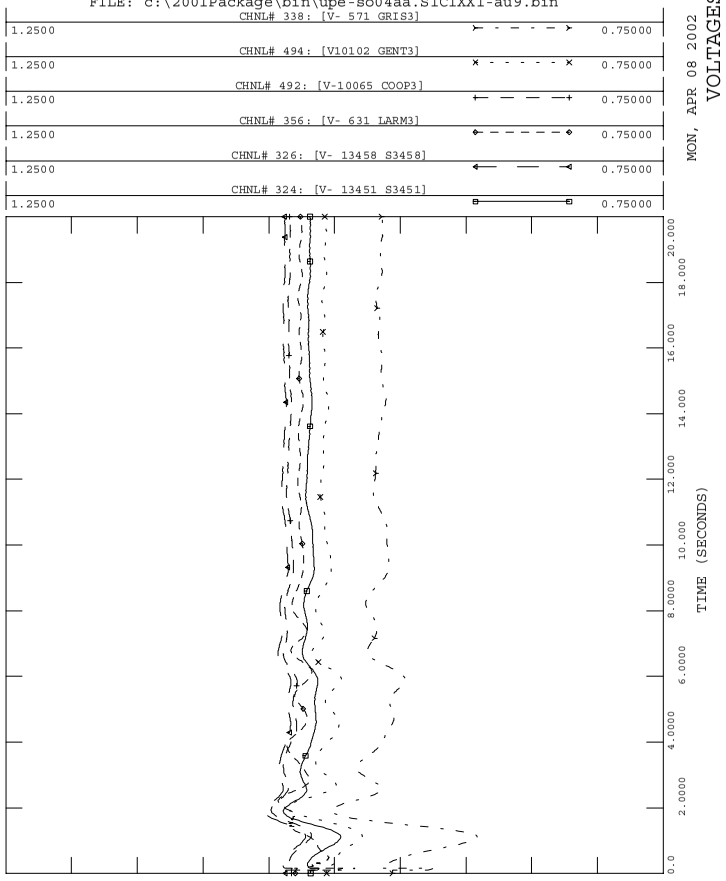
MON, APR 08 2002 16:10
VOLTAGES IA

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



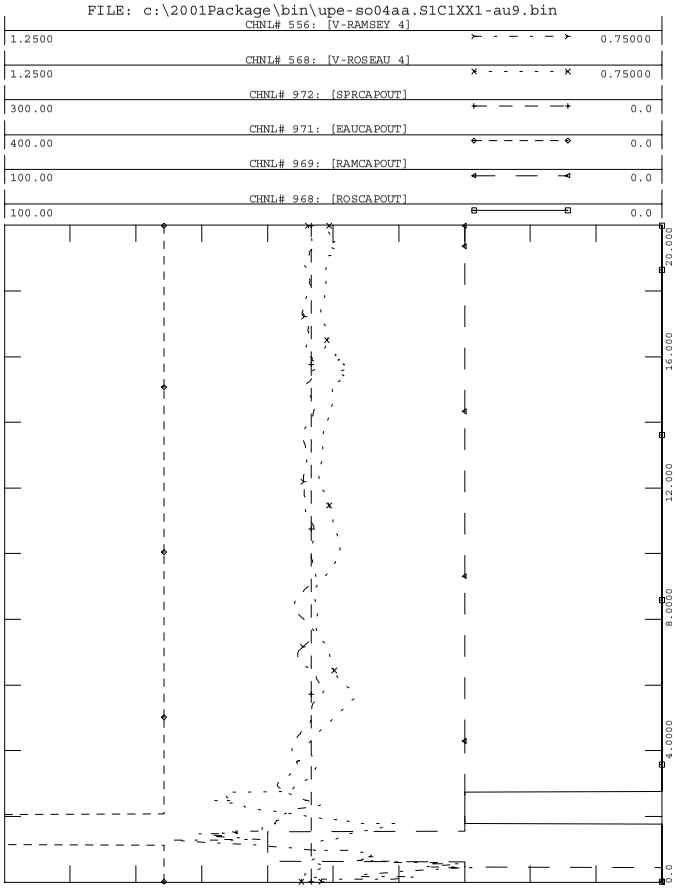
MON, APR 08 2002 16:10
VOLTAGES 4

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



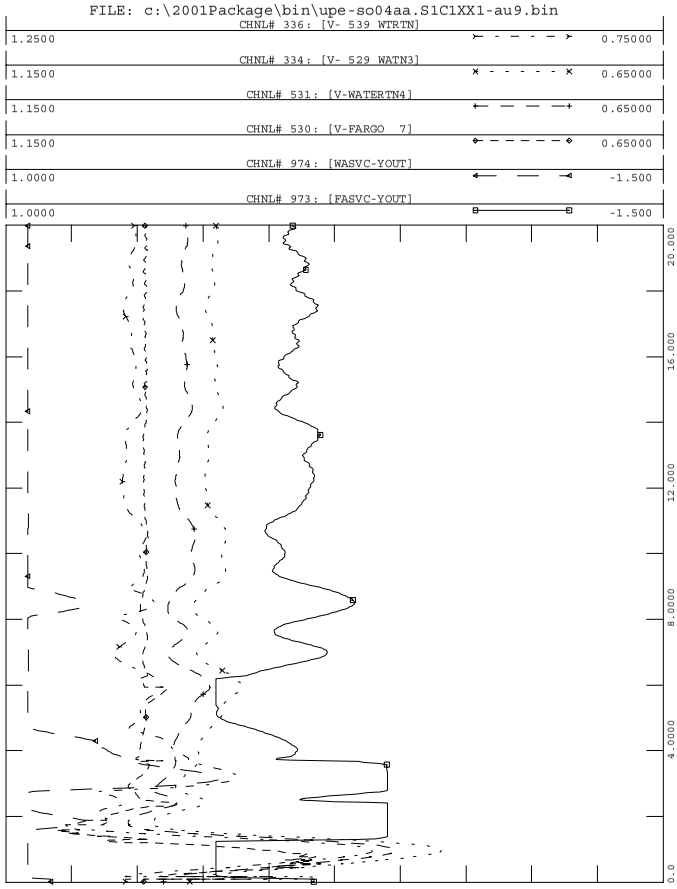
MON, APR 08 2002 16:10
VOLTAGES NB

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



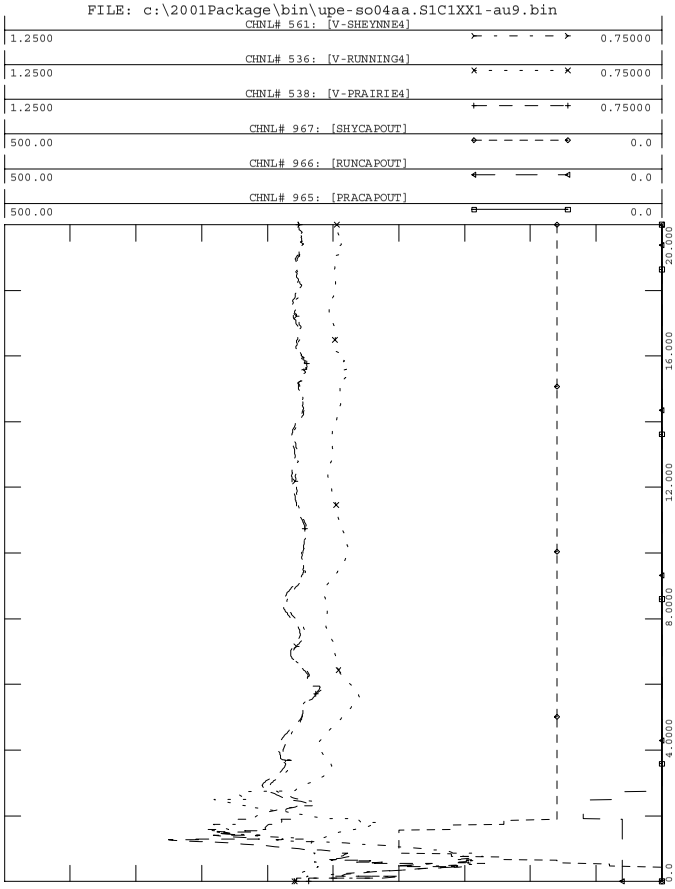
MON, APR 08 2002 16:10
FAST SW CAP OUT 2

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



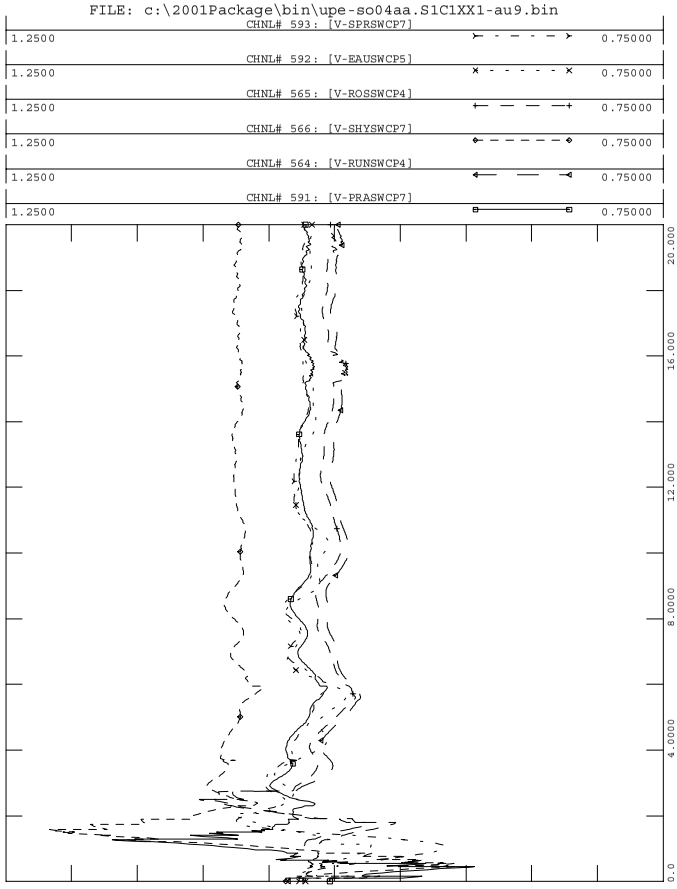
MON, APR 08 2002 16:10
FARGO/WATERTOWN SVS

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



MON, APR 08 2002 16:10
FAST SW CAP OUT 1

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

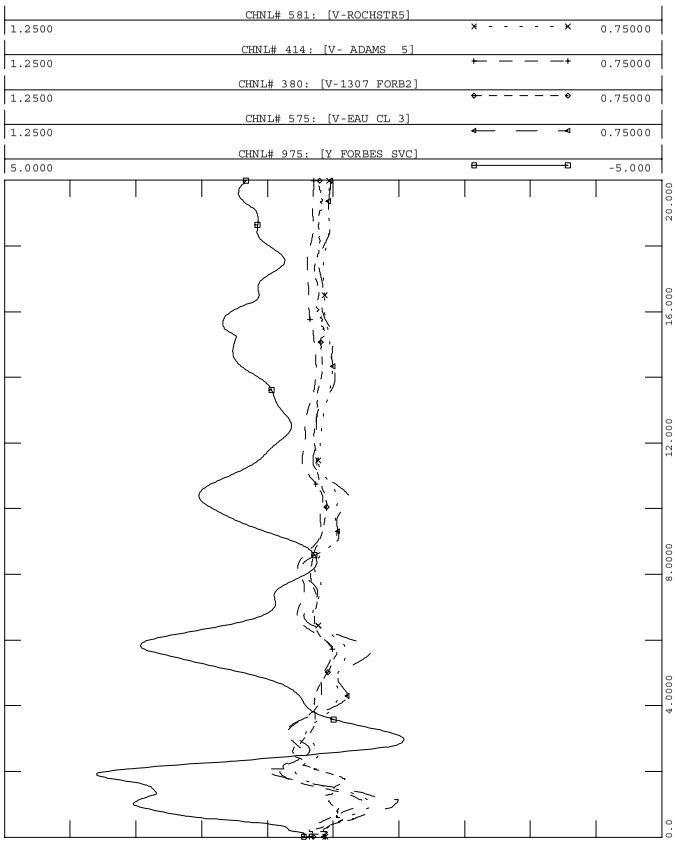


MON, APR 08 2002 16:10
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10

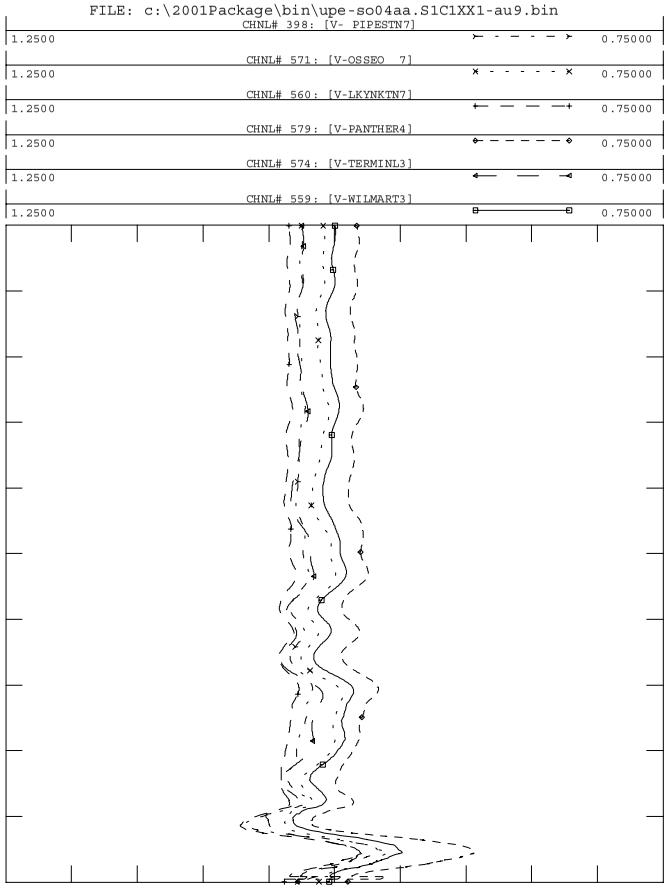
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10

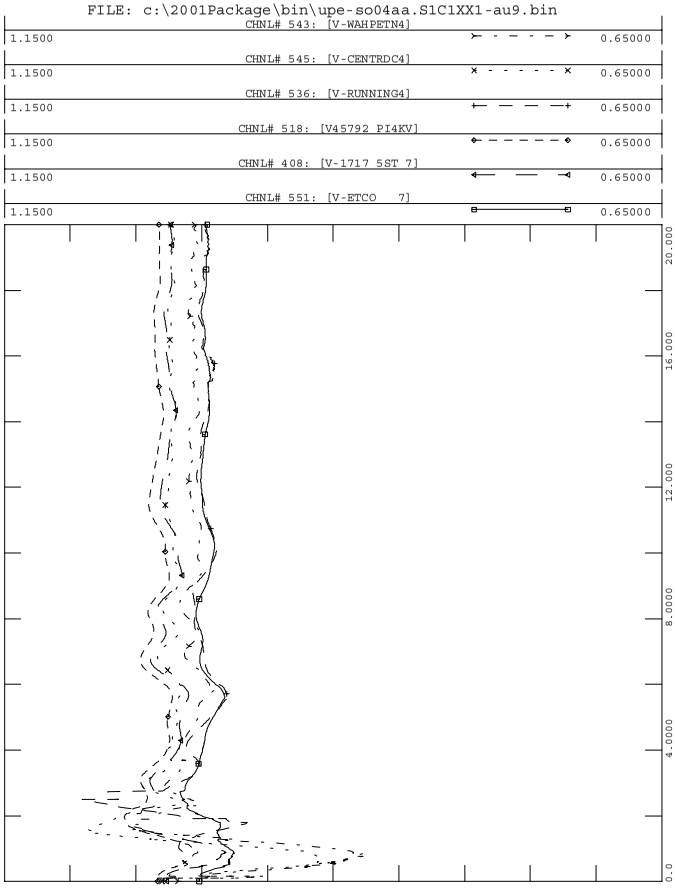
TC VOLTAGES



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10

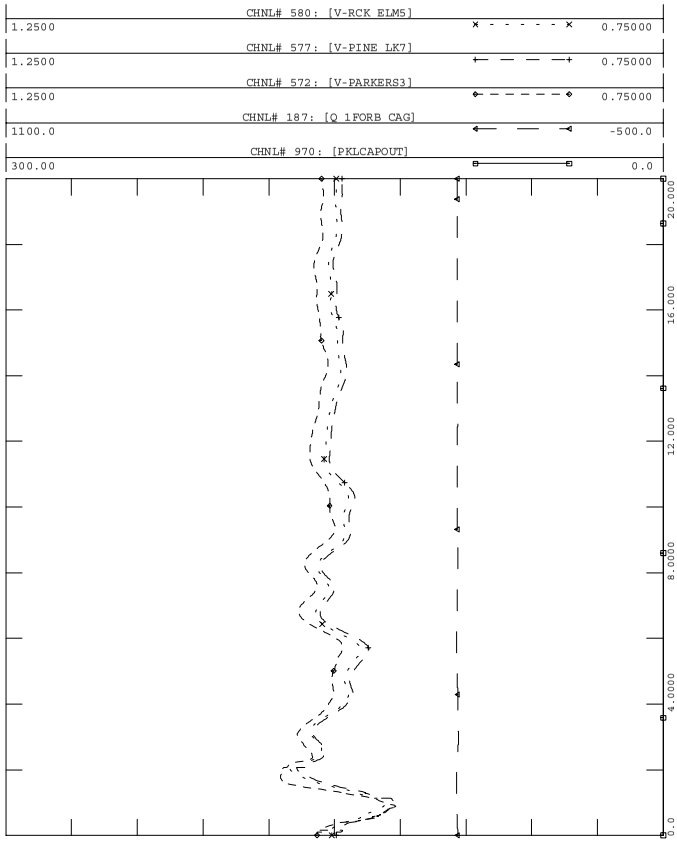
VOLTAGES 6



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

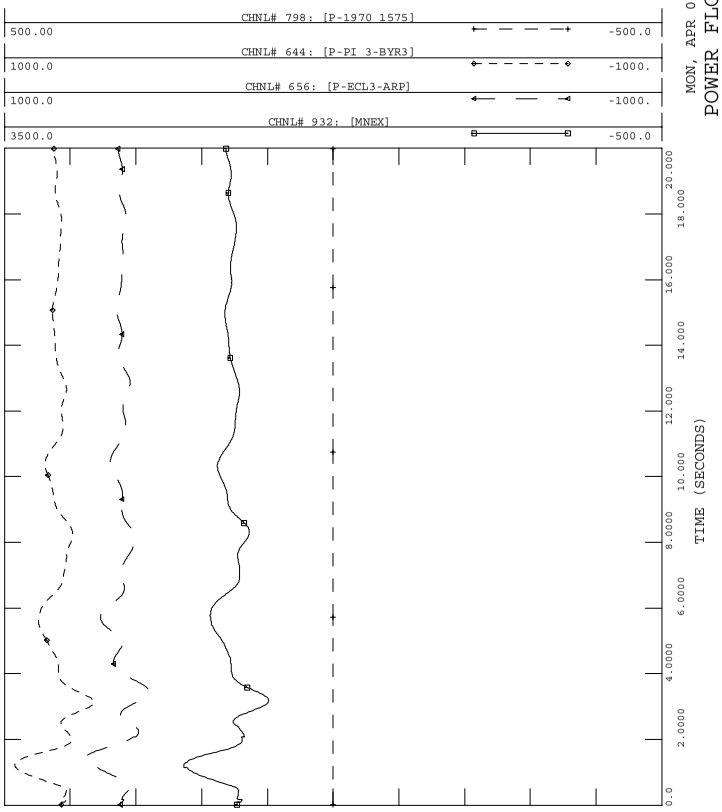
MON, APR 08 2002 16:10

FORBES SVS OUT & VOLTAGES



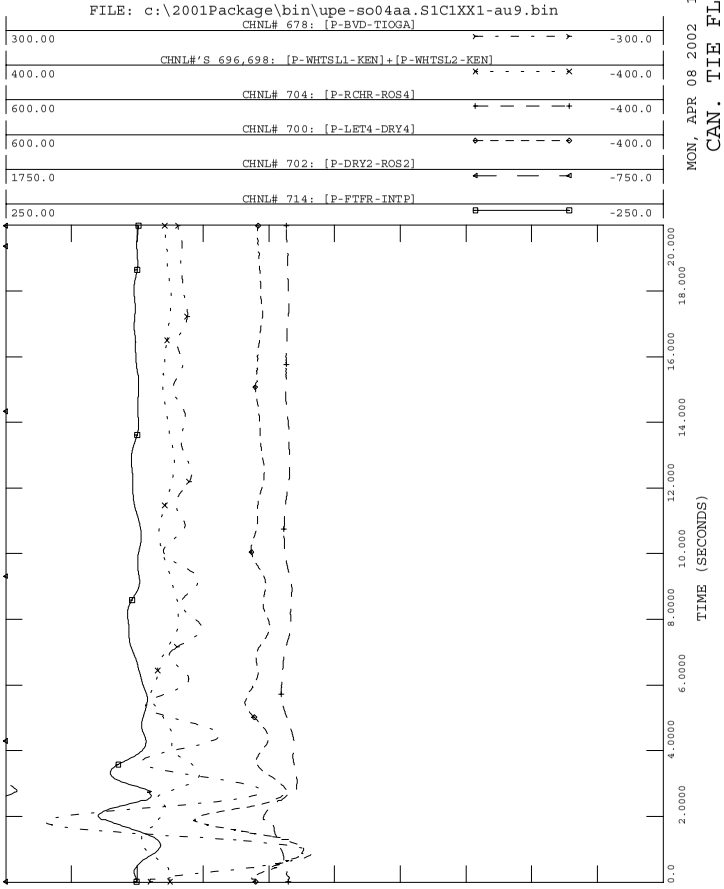
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
POWER FLOW SUMS 2



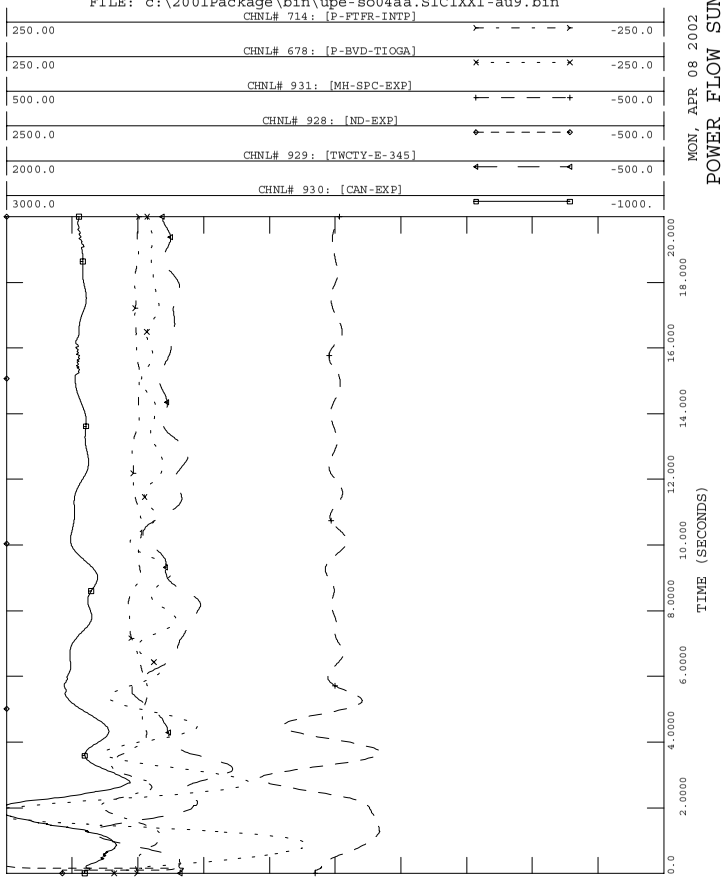
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
CAN. TIE FLOWS



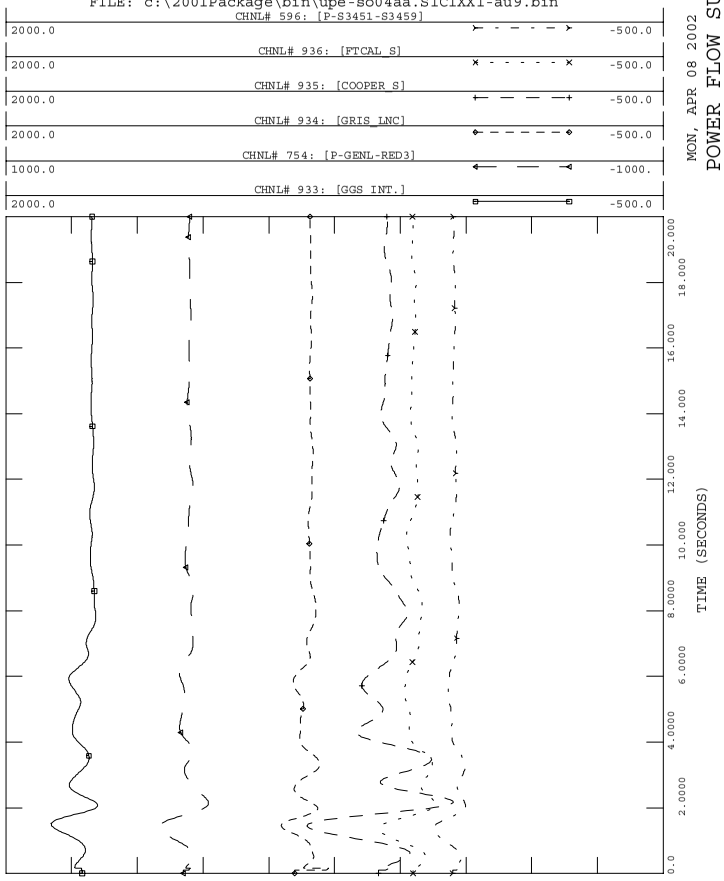
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
POWER FLOW SUMS 1



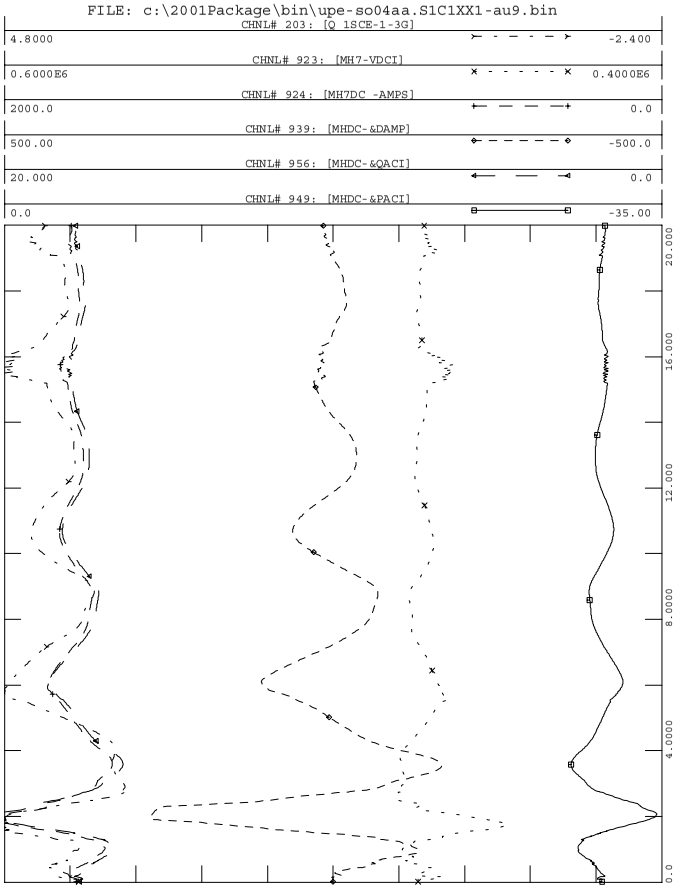
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
POWER FLOW SUM 3



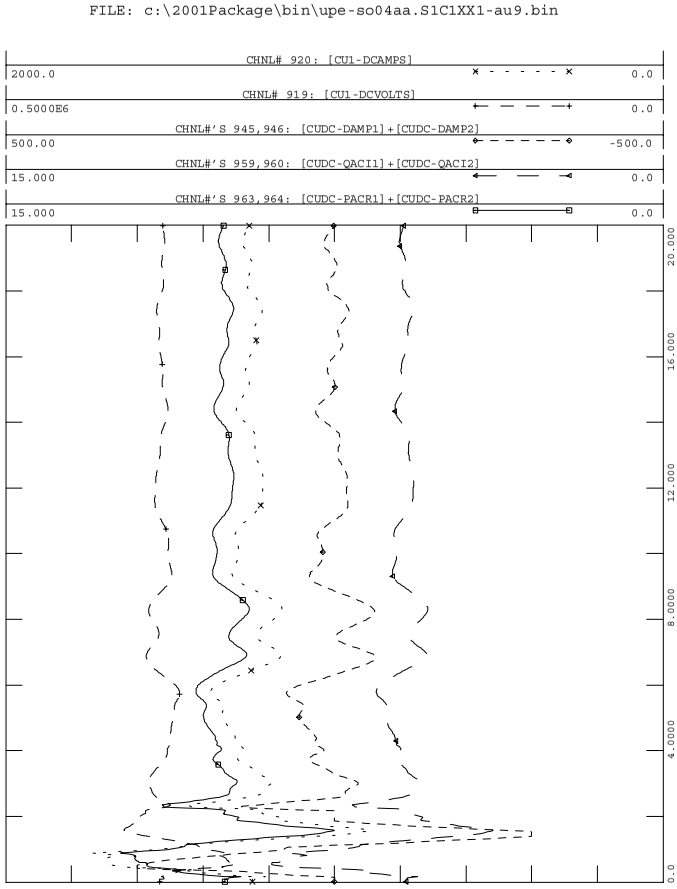
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
MH DC PARAMETERS



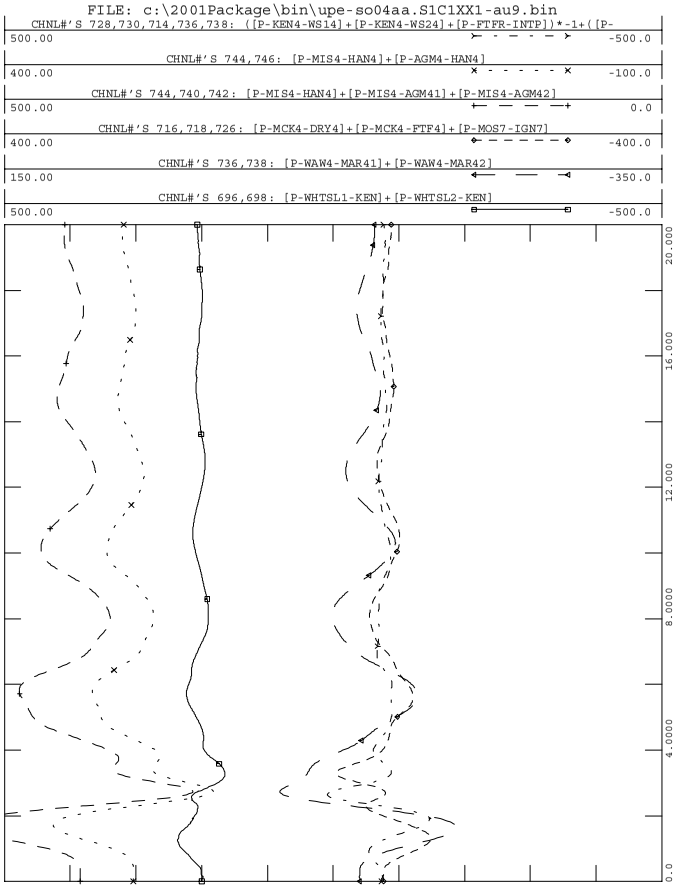
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
CU DC #1



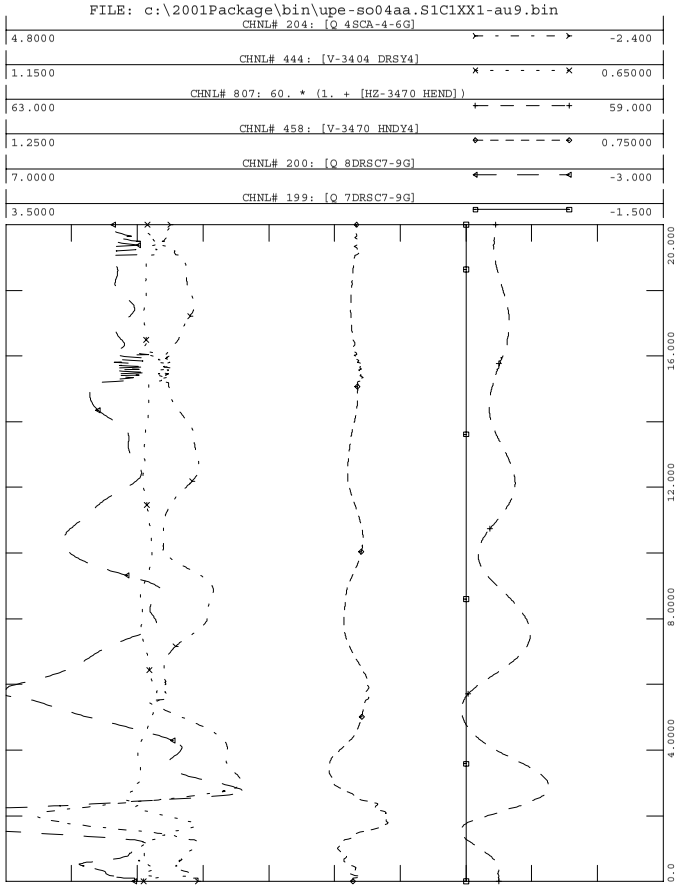
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
OH TIE FLOWS

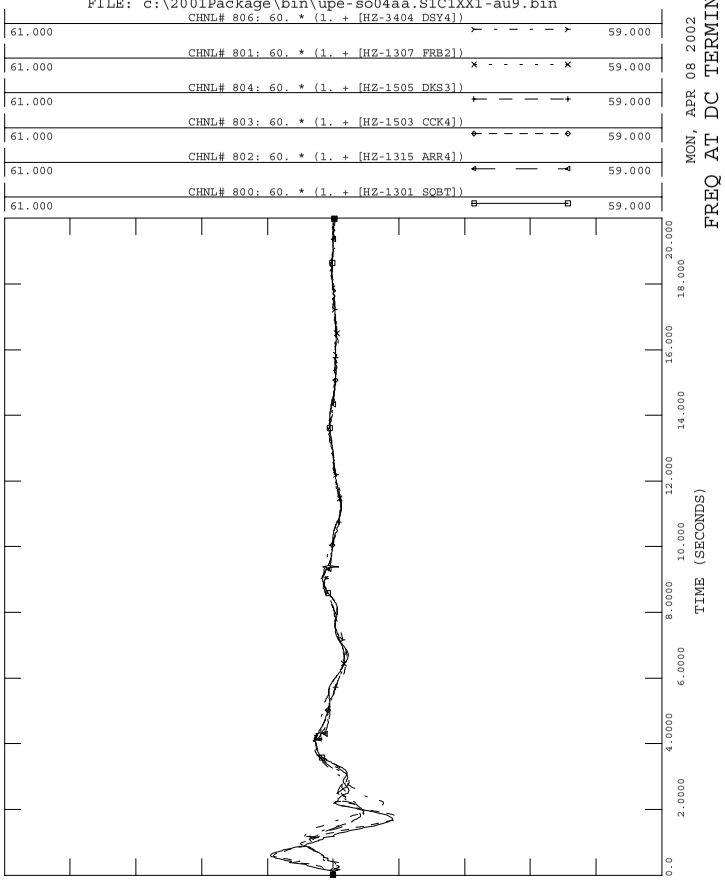


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10
MH DC PARAMETERS

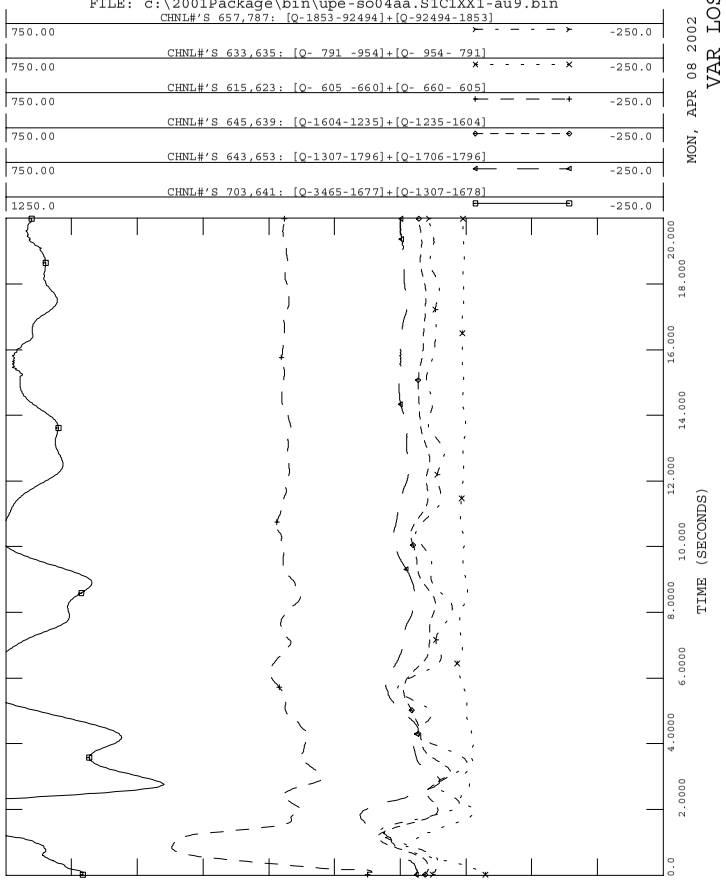


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



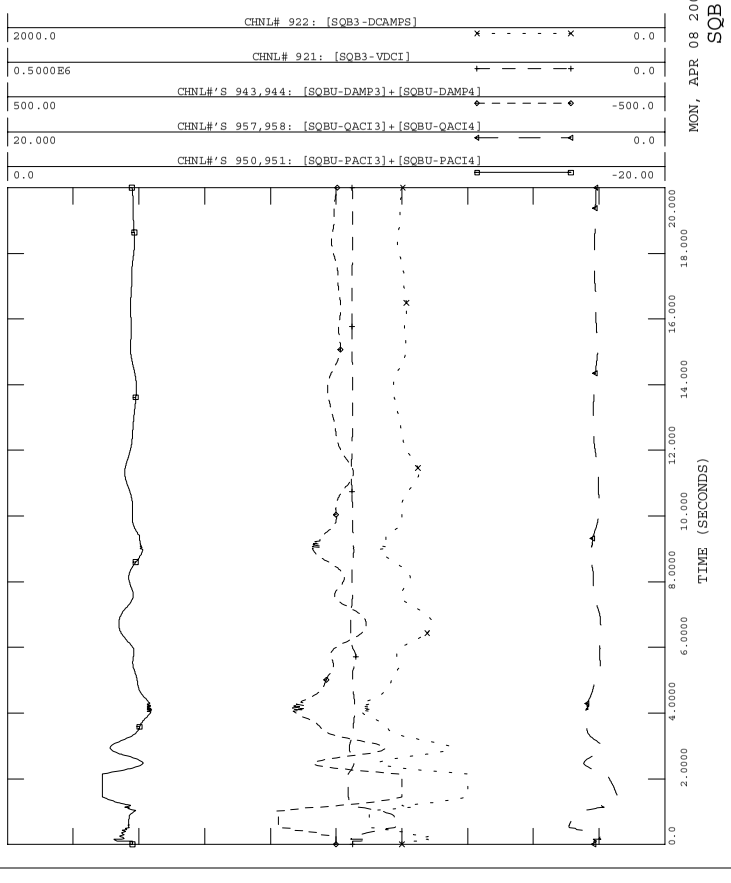
MON, APR 08 2002 16:10
FREQ AT DC TERMINALS

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



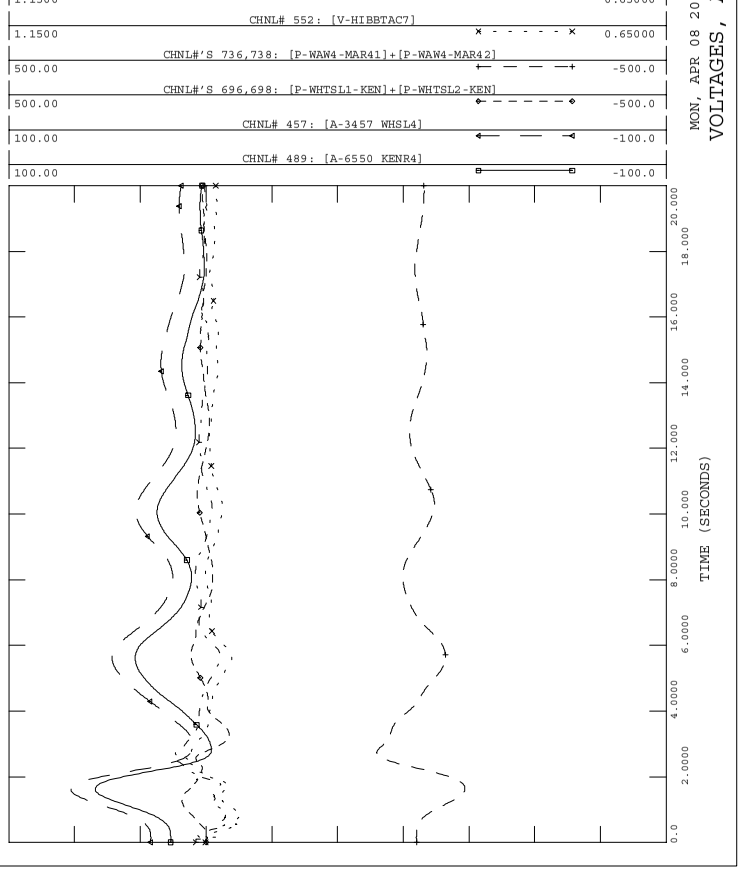
MON, APR 08 2002 16:10
VAR LOSSES

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



MON, APR 08 2002 16:10
SQB DC #3

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

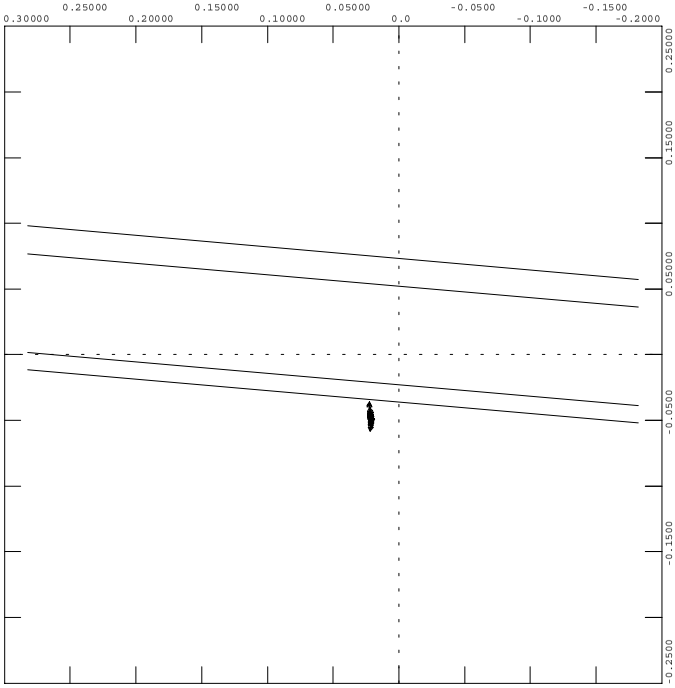


MON, APR 08 2002 16:10
VOLTAGES, ANGLES

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

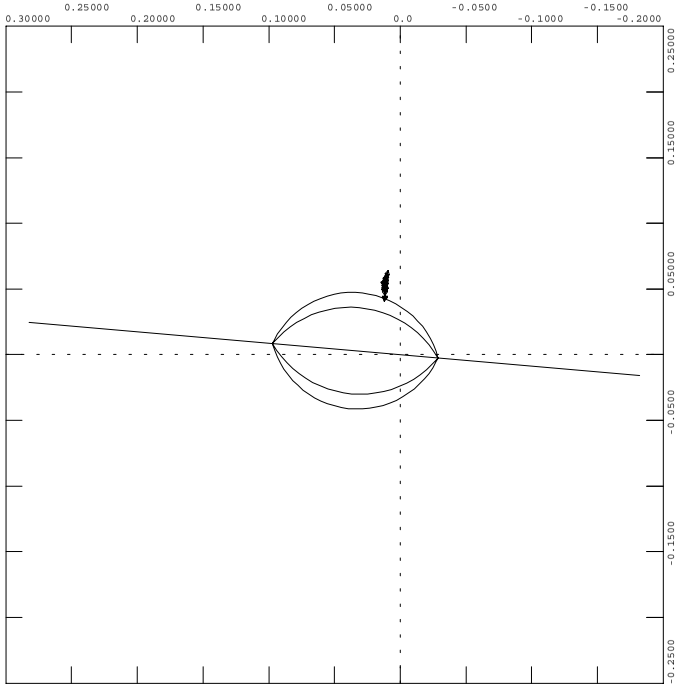


MON, APR 08 2002 16:10
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

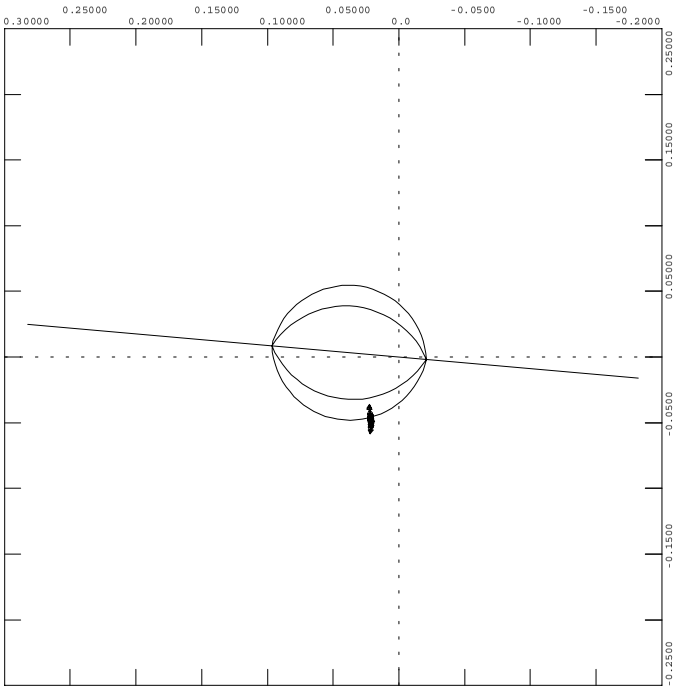


MON, APR 08 2002 16:10
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

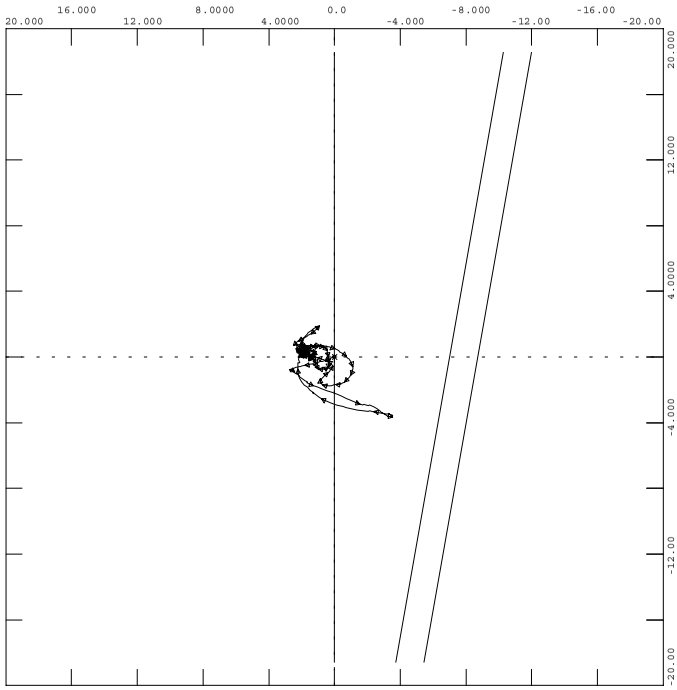


MON, APR 08 2002 16:10
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

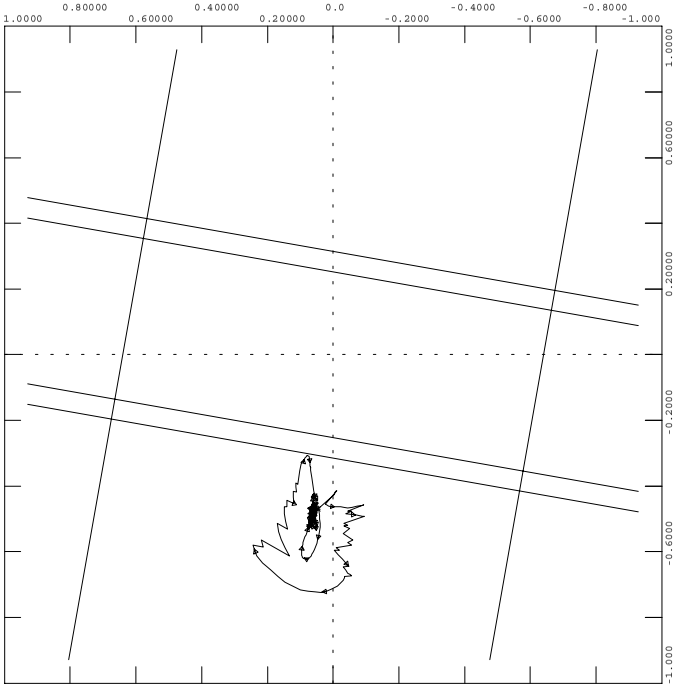


MON, APR 08 2002 16:10
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

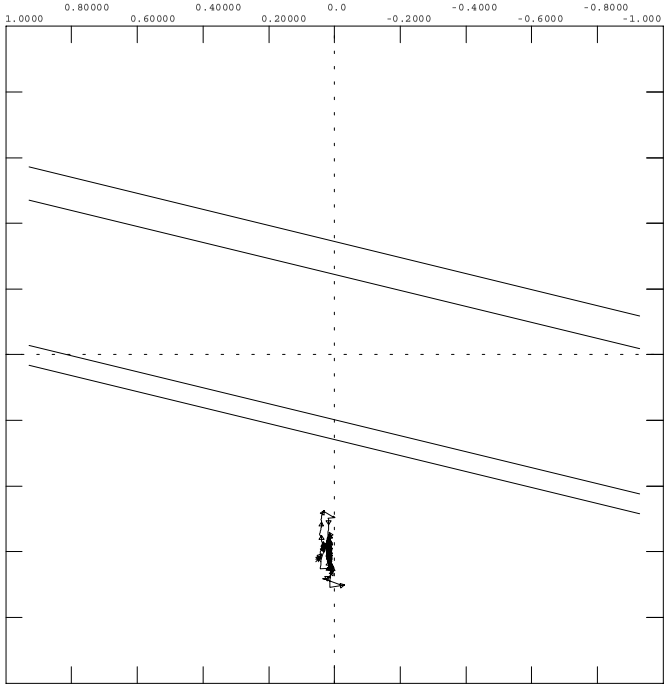
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

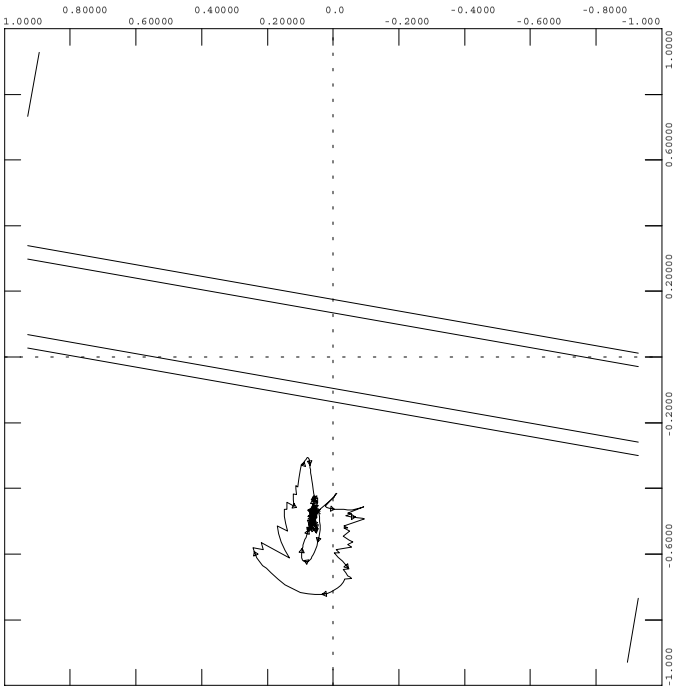
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

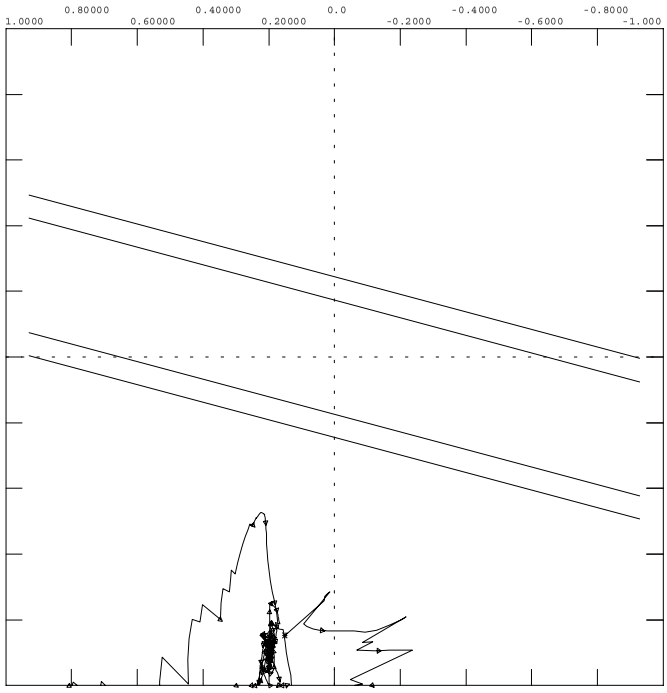
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

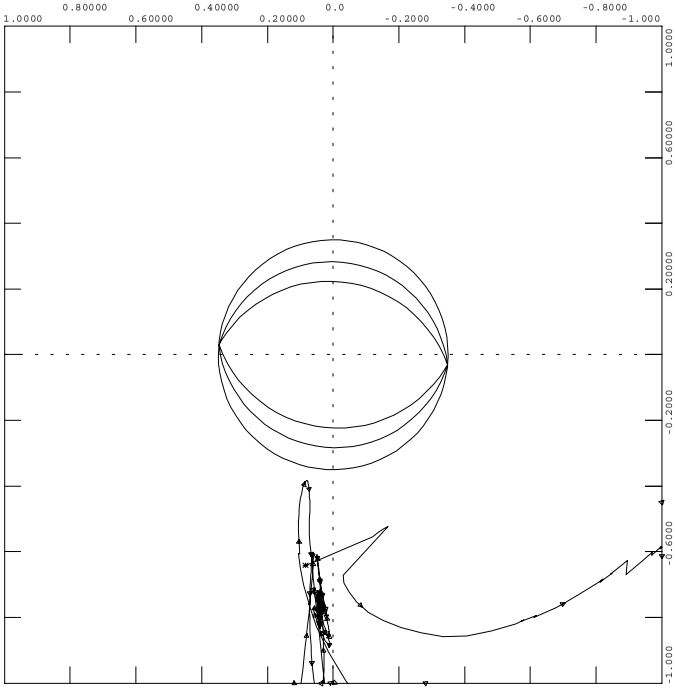
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

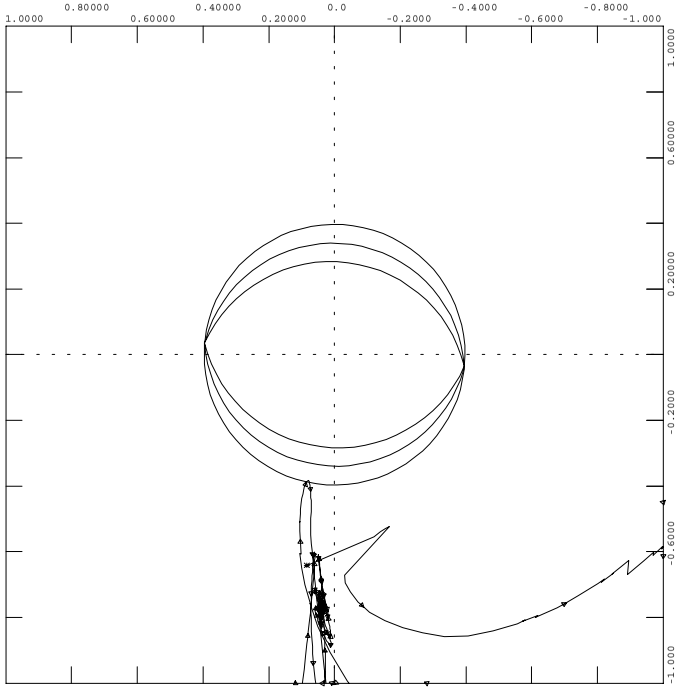
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

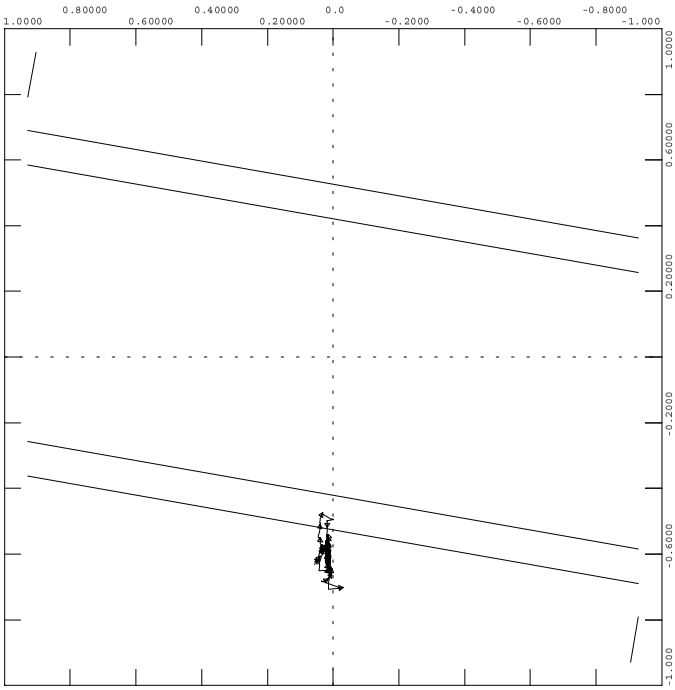
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

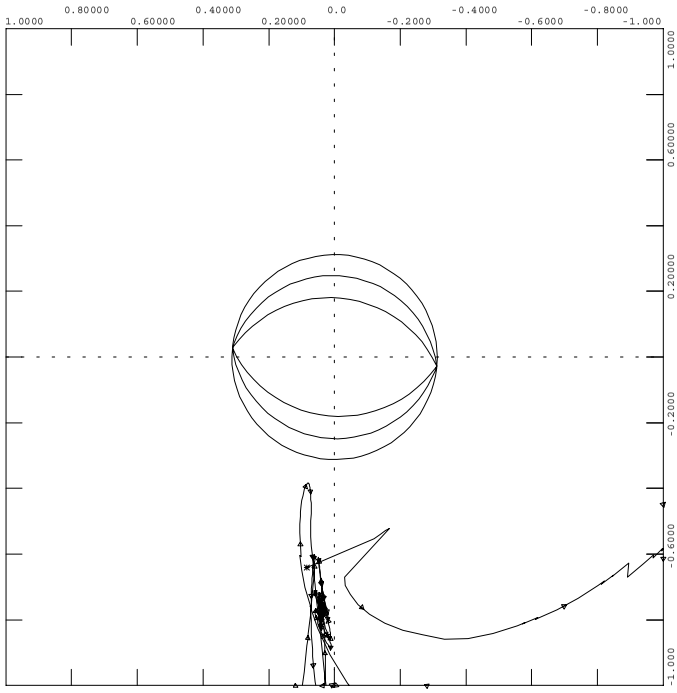
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



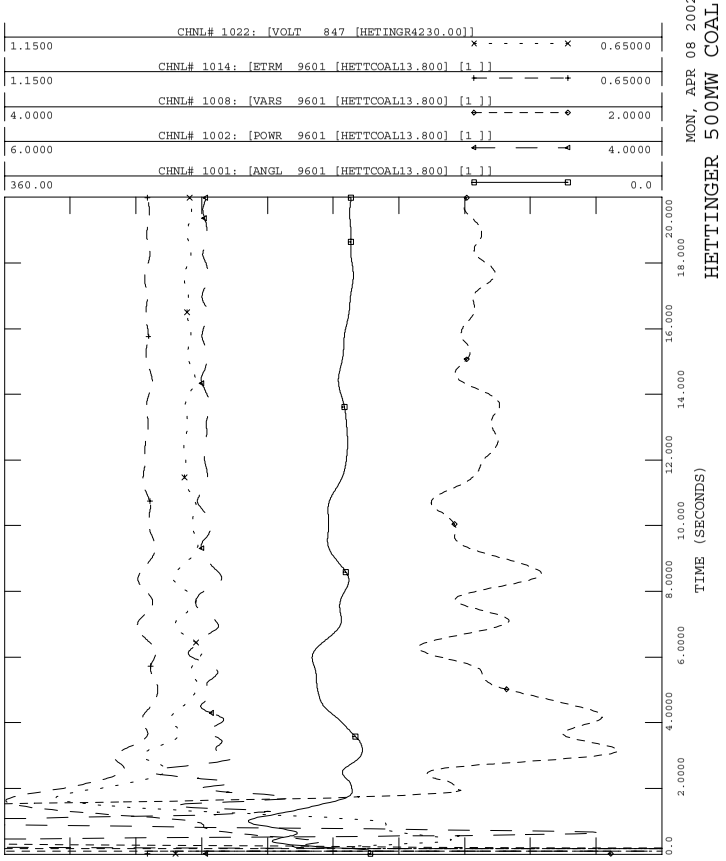
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

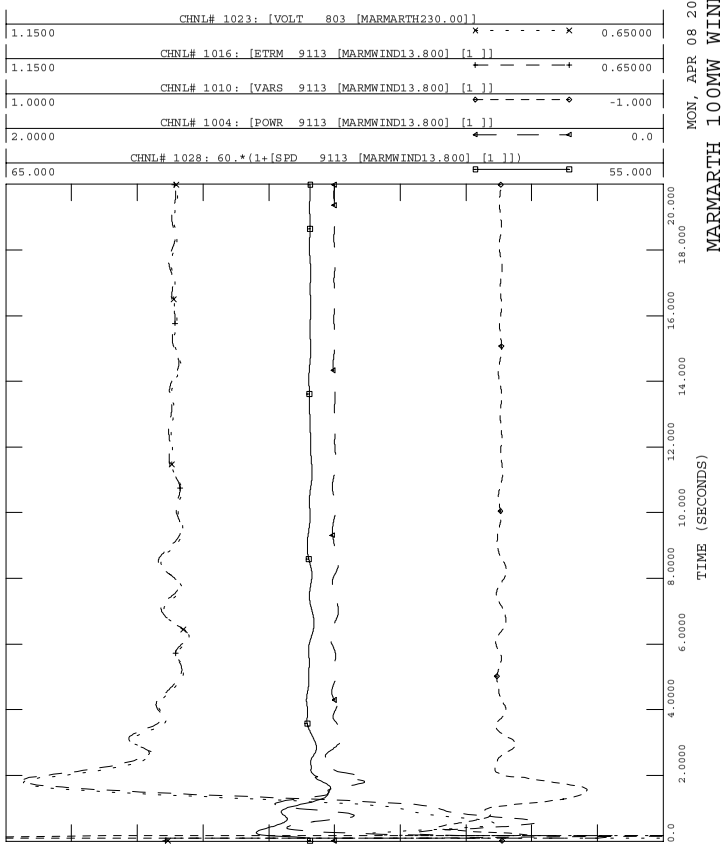


UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin



MON, APR 08 2002 16:10
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

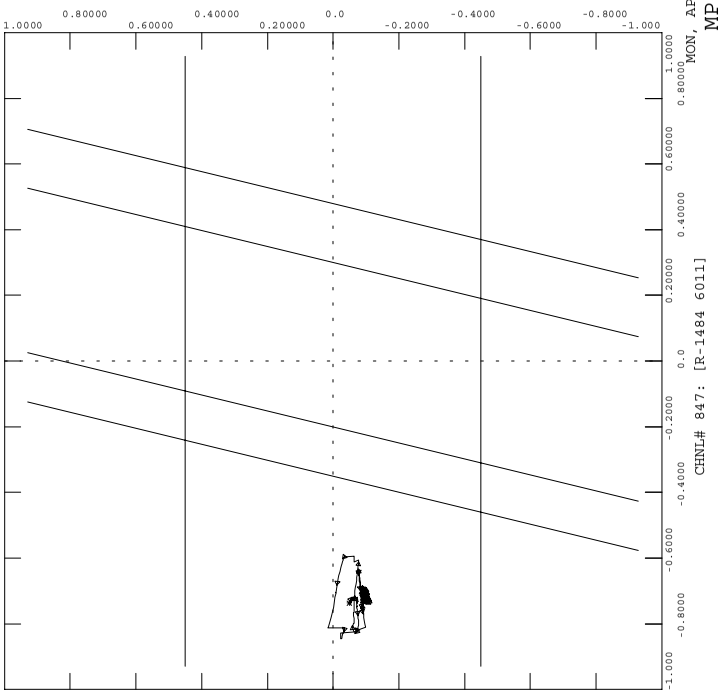


MON, APR 08 2002 16:10
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

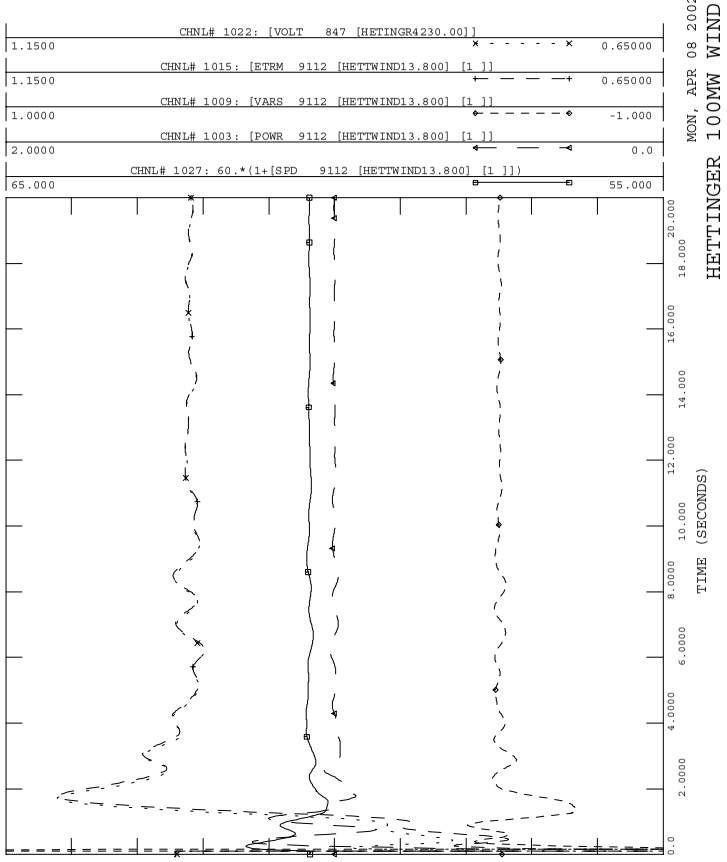
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, APR 08 2002 16:10
MP-OH I.FALLS (779)

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

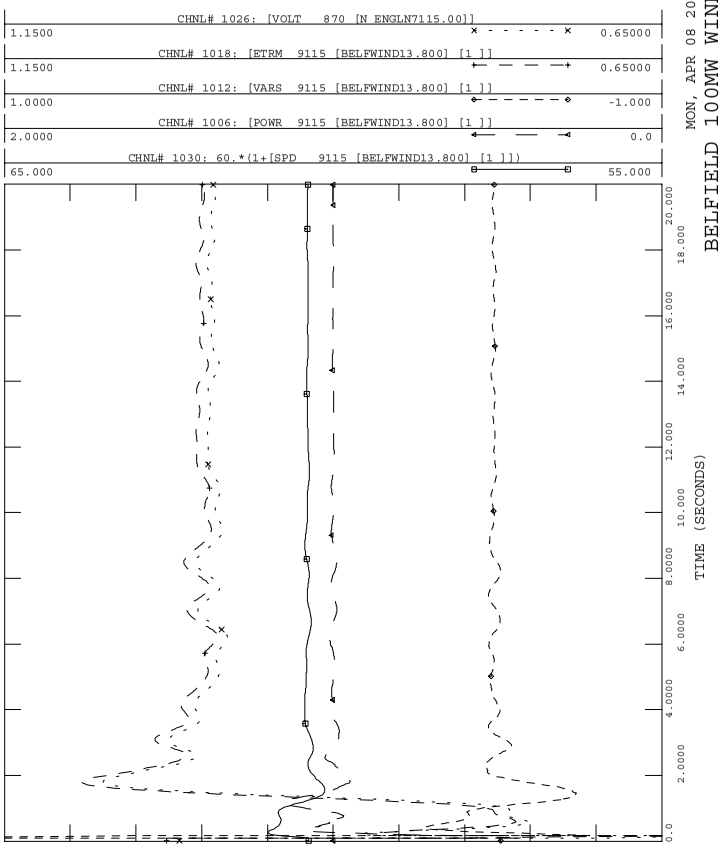


MON, APR 08 2002 16:10
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10

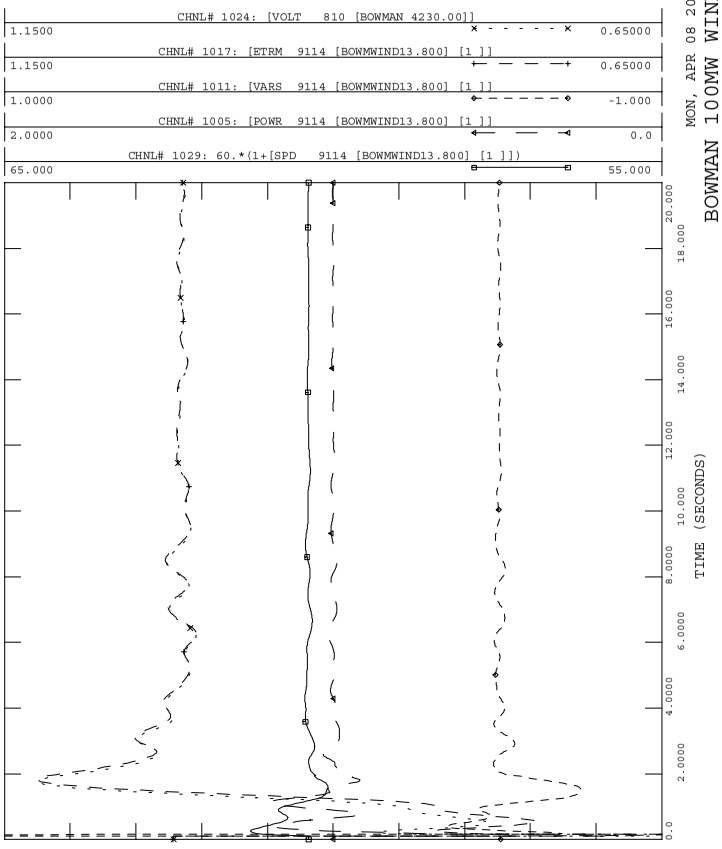
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10

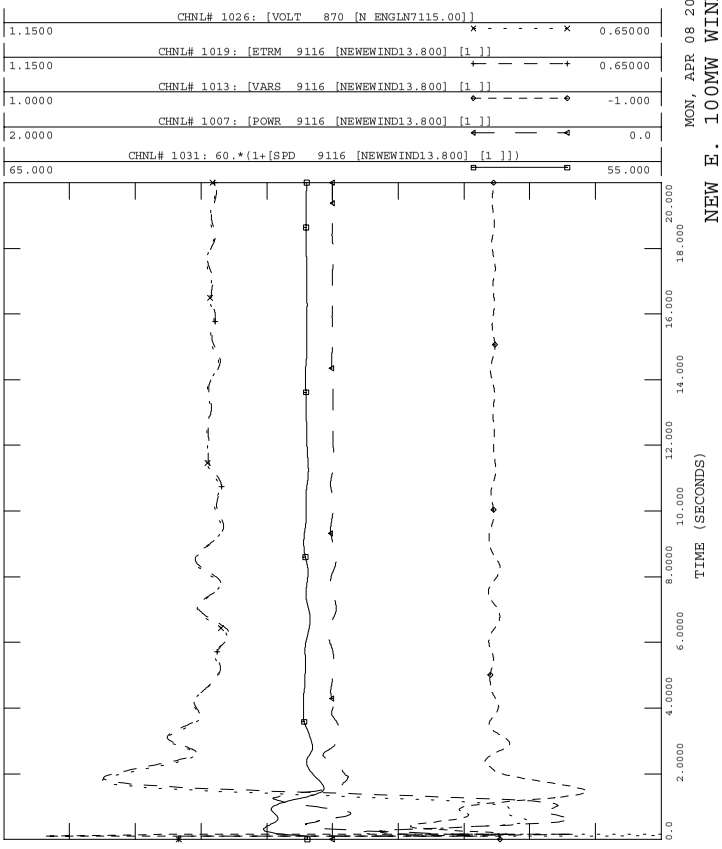
BOWMAN 100MW WIND UNIT



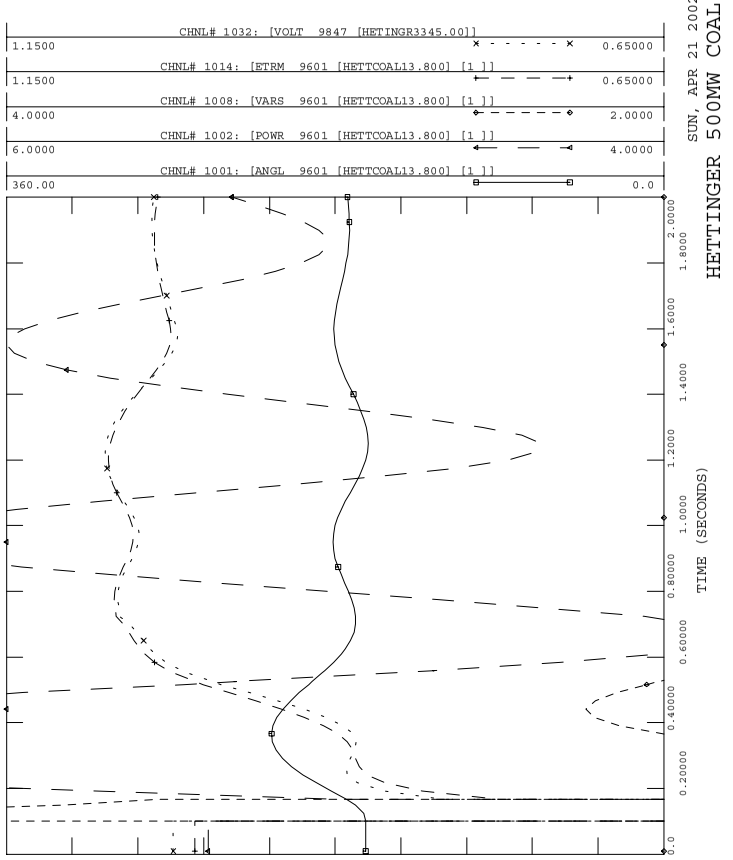
UPE-SO04AA.S1C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3001,MH=2173,MW=1479,OHMH=-196,OHMP=150,EWTW=-120,BD=165
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C1XX1-au9.bin

MON, APR 08 2002 16:10

NEW E. 100MW WIND UNIT

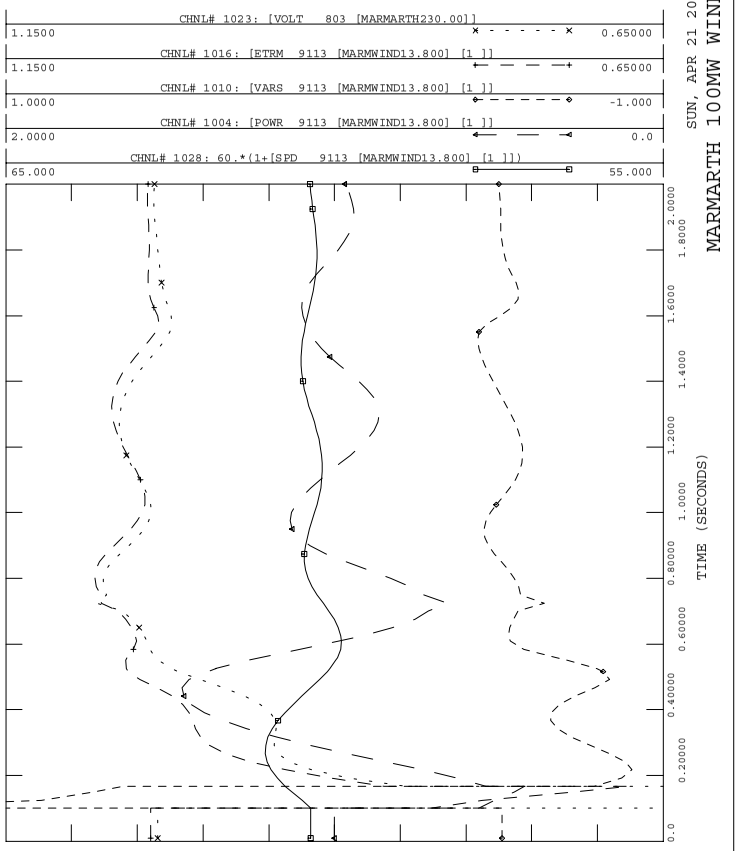


UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-au9.bin



SUN, APR 21 2002 10:18
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-au9.bin

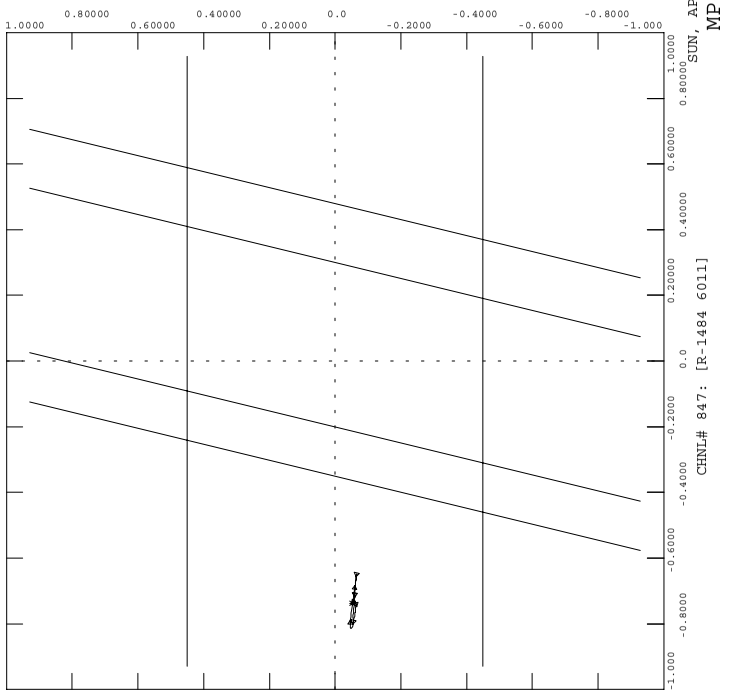


SUN, APR 21 2002 10:18
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE

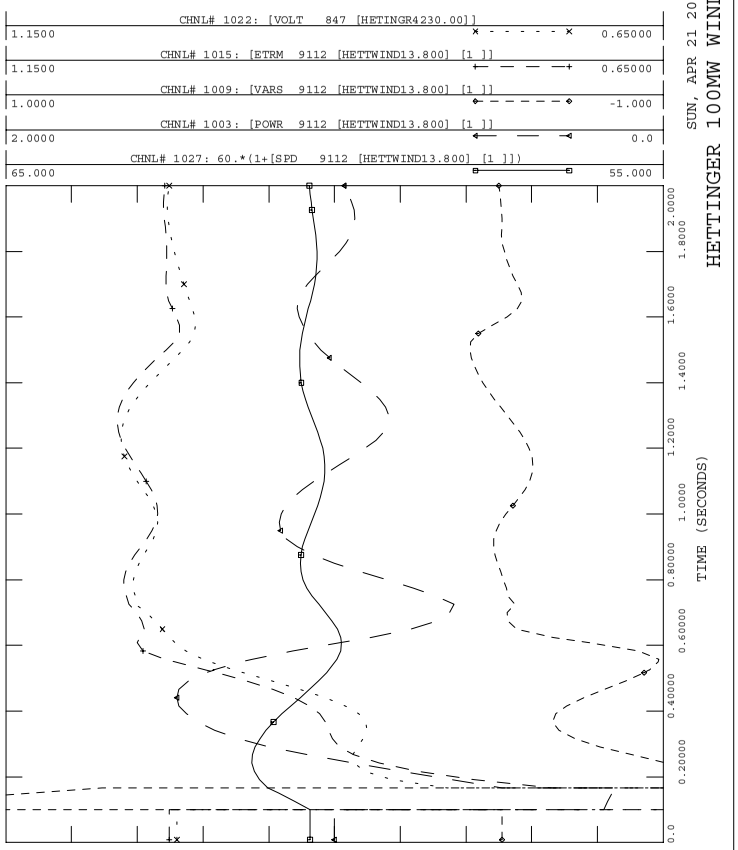
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-au9.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



SUN, APR 21 2002 10:18
MP-OH I.FALLS (779)

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-au9.bin

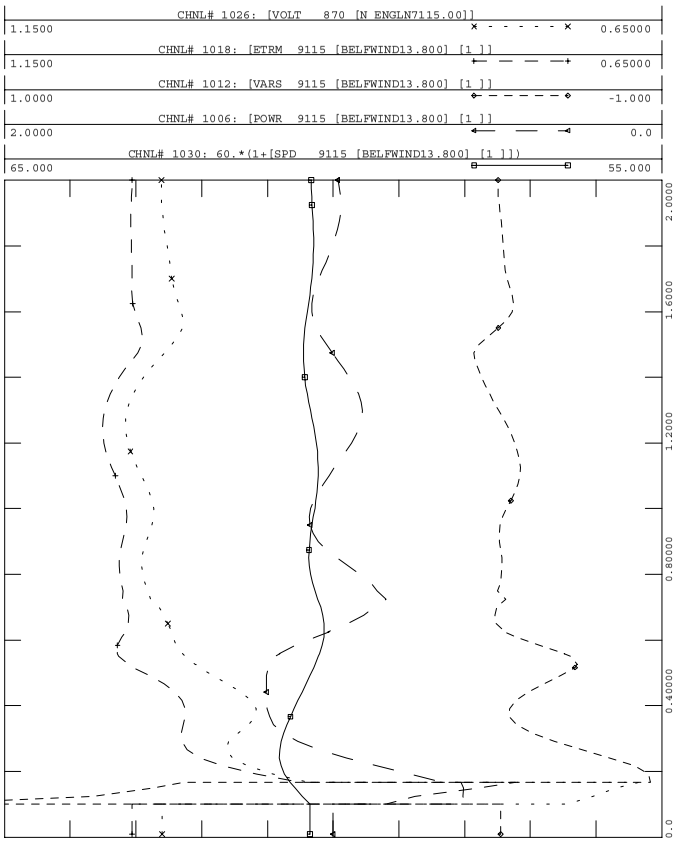


SUN, APR 21 2002 10:18
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-au9.bin

SUN, APR 21 2002 10:18

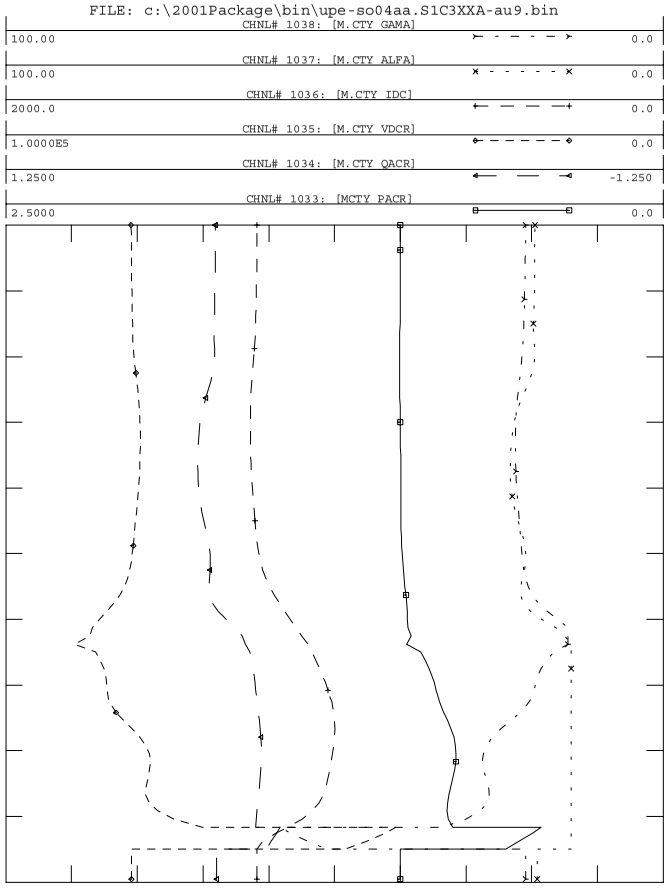
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-au9.bin

SUN, APR 21 2002 10:18

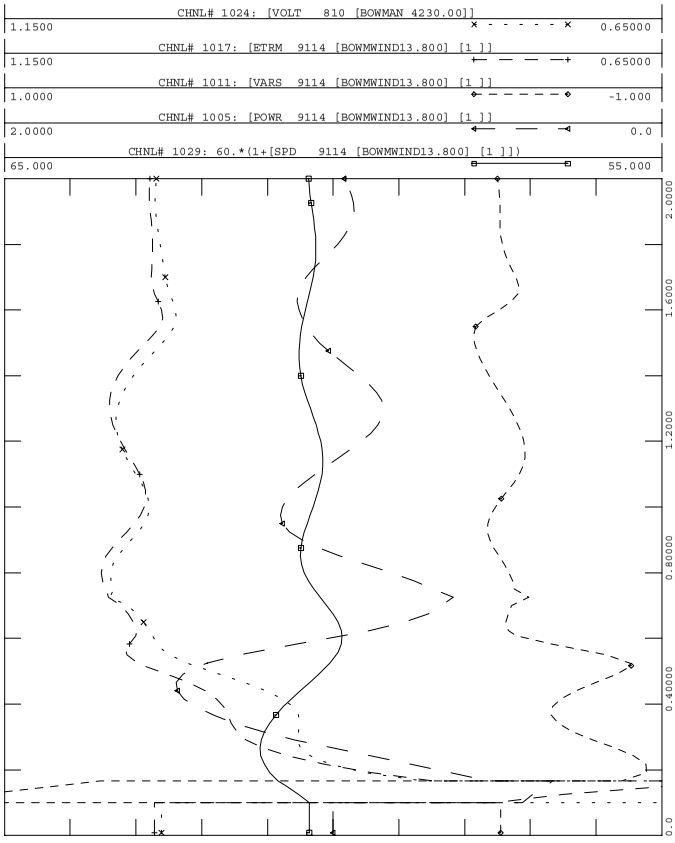
M.CTY 100 MW HVDC



UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-au9.bin

SUN, APR 21 2002 10:18

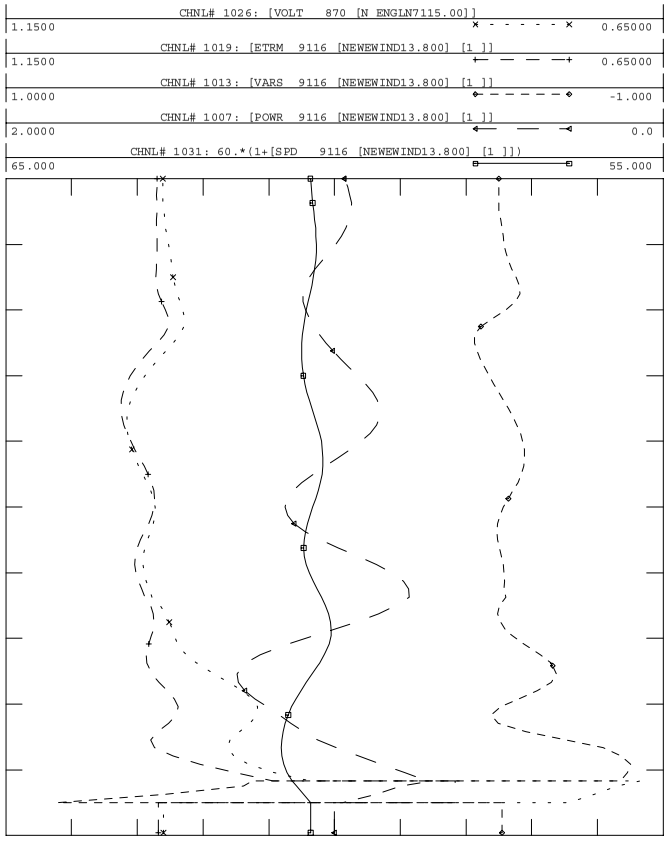
BOWMAN 100MW WIND UNIT



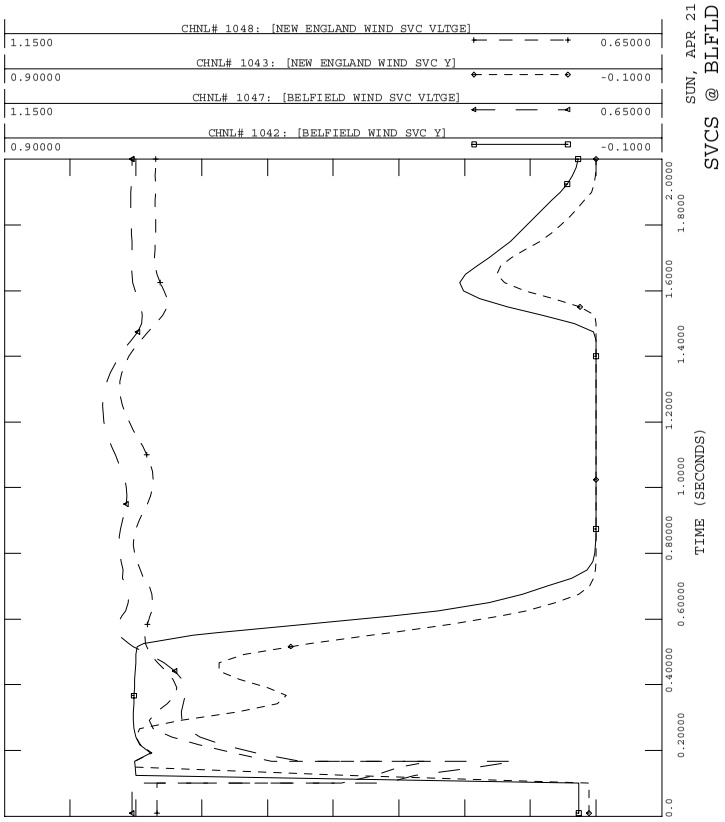
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-au9.bin

SUN, APR 21 2002 10:18

NEW E. 100MW WIND UNIT



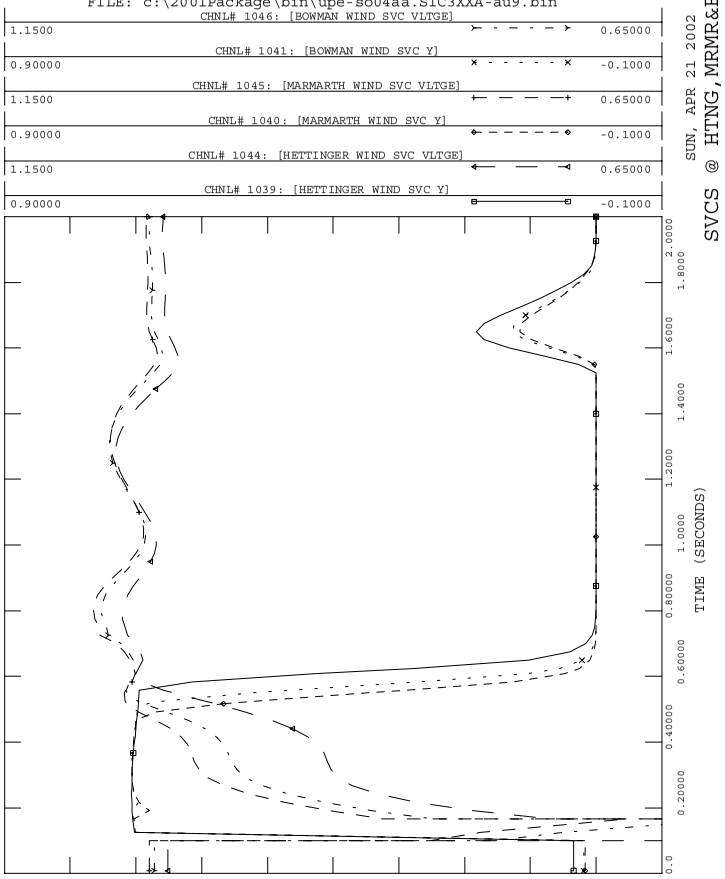
UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-au9.bin



SVCS @ BLFLD & NWENG

SUN, APR 21 2002 10:18

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C3XXA-au9.bin



SVCS @ HTNG,MRMR&BWMN

SUN, APR 21 2002 10:18

APPENDIX 9

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 1 (HETTINGER)

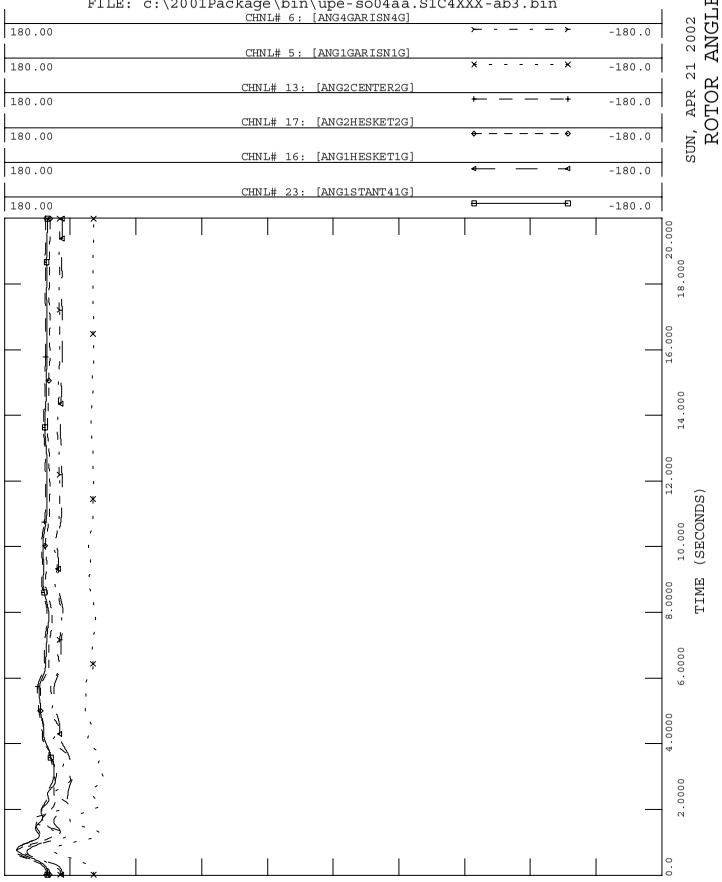
CASE S1C4XXX

CONTINGENCY AB3

4 cycle 3 phase fault at Hettinger 345 kV. Clear the Hettinger - Glenham 345 kV line

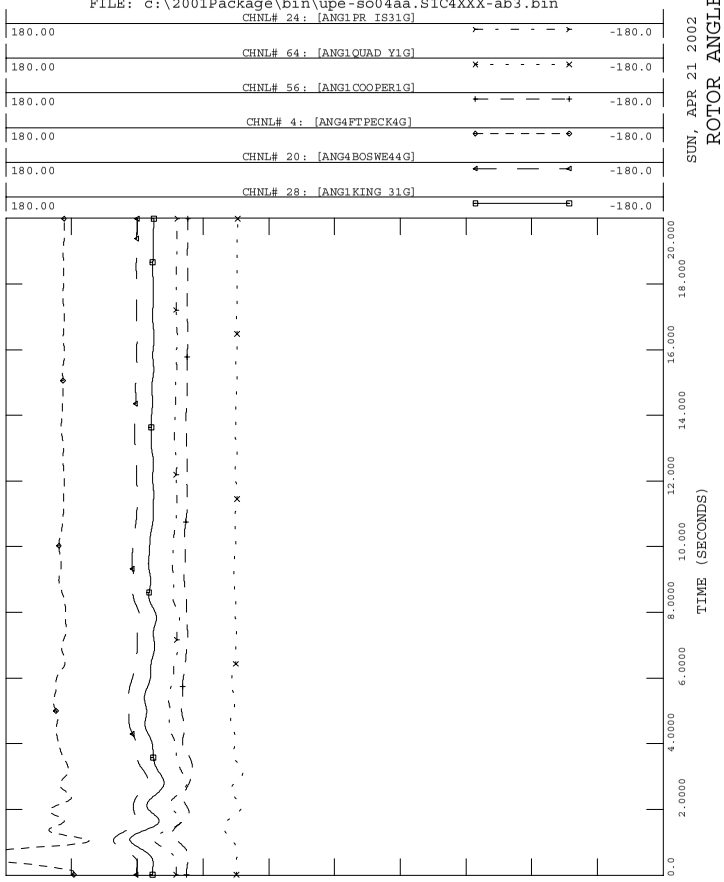
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
ROTOR ANGLES 2



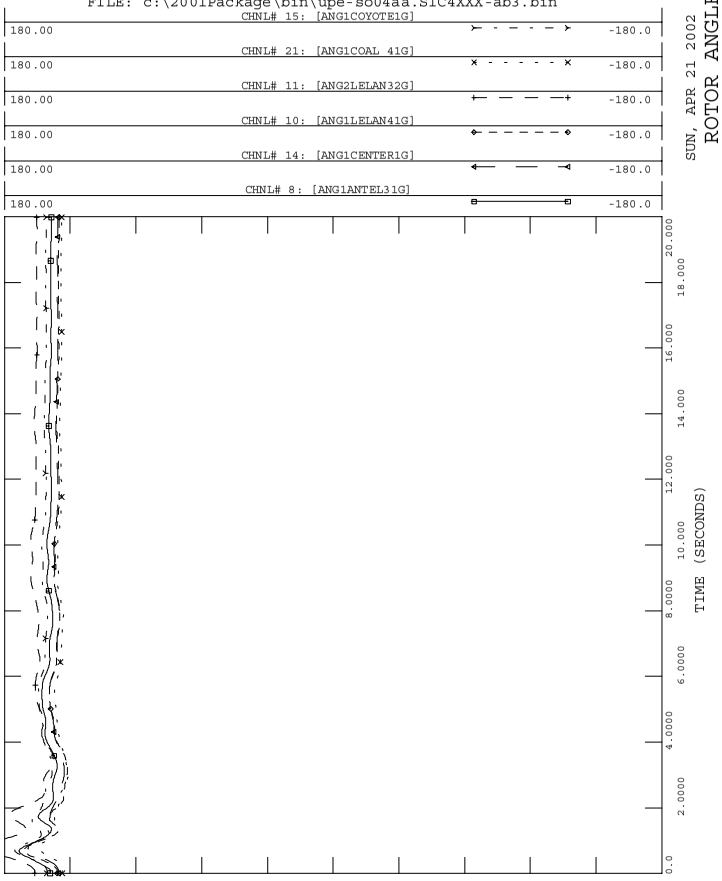
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
ROTOR ANGLES 4



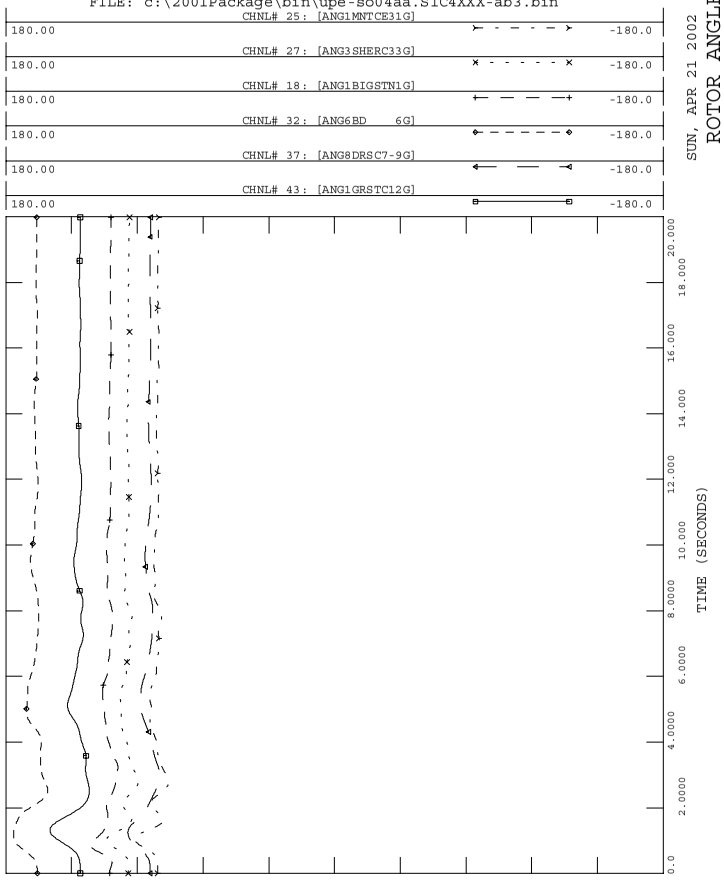
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
ROTOR ANGLES 1



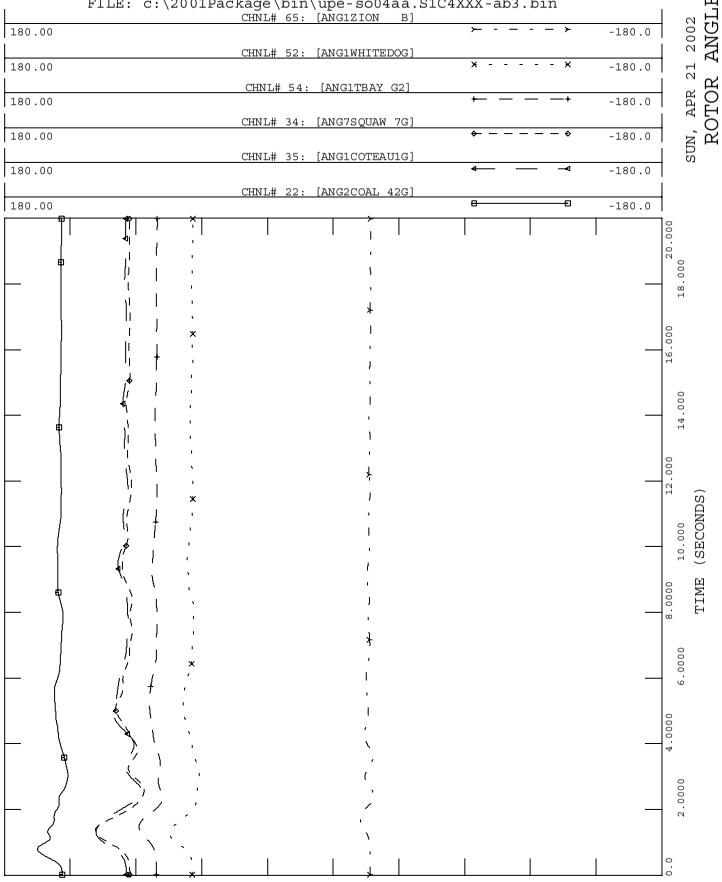
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
ROTOR ANGLES 3



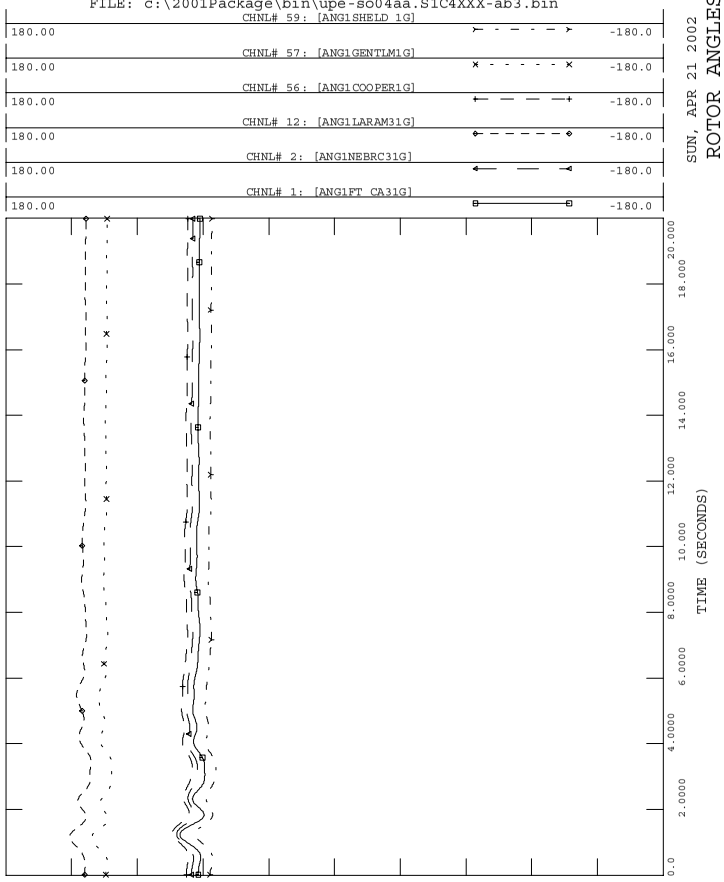
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
ROTOR ANGLES 6



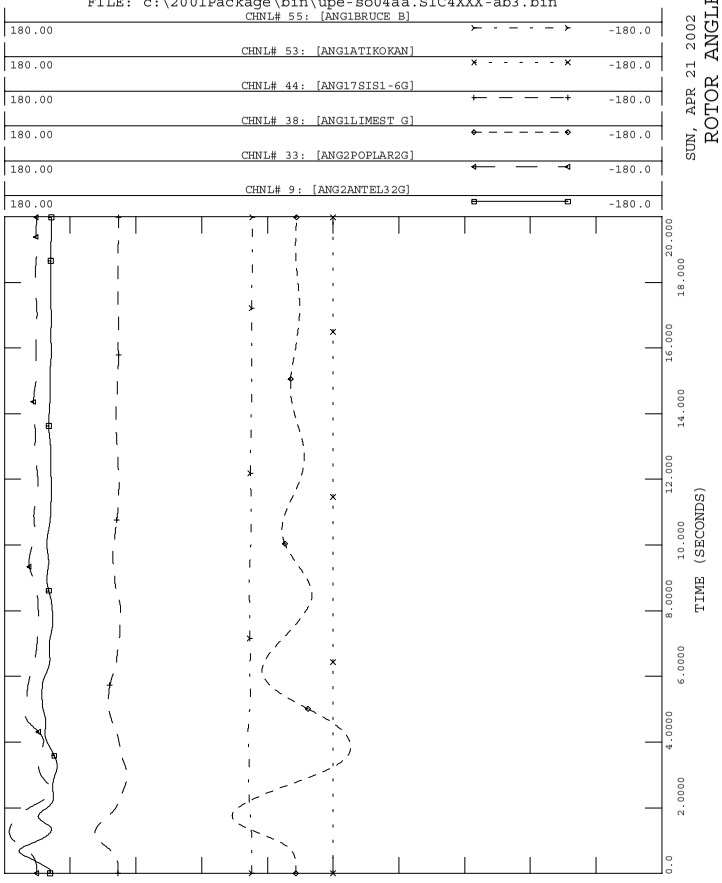
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
ROTOR ANGLES NB



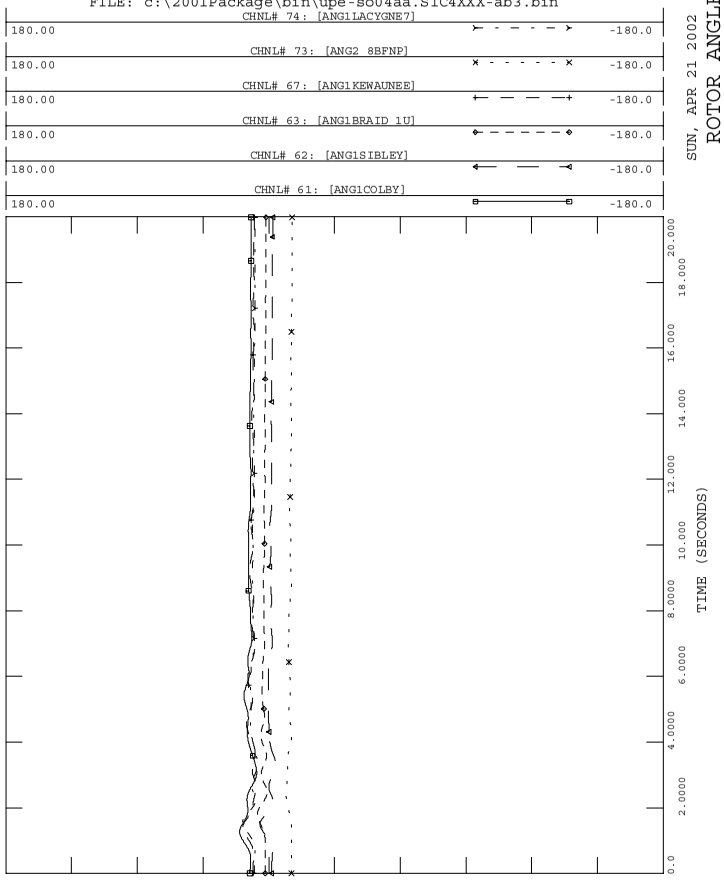
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
ROTOR ANGLES 5



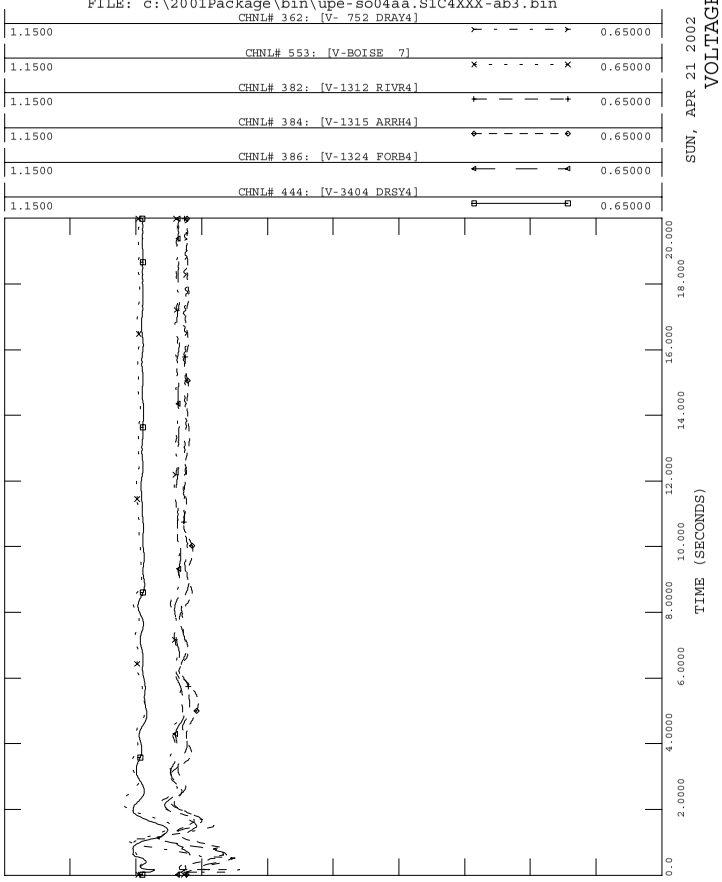
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
ROTOR ANGLES 7



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
VOLTAGES 1



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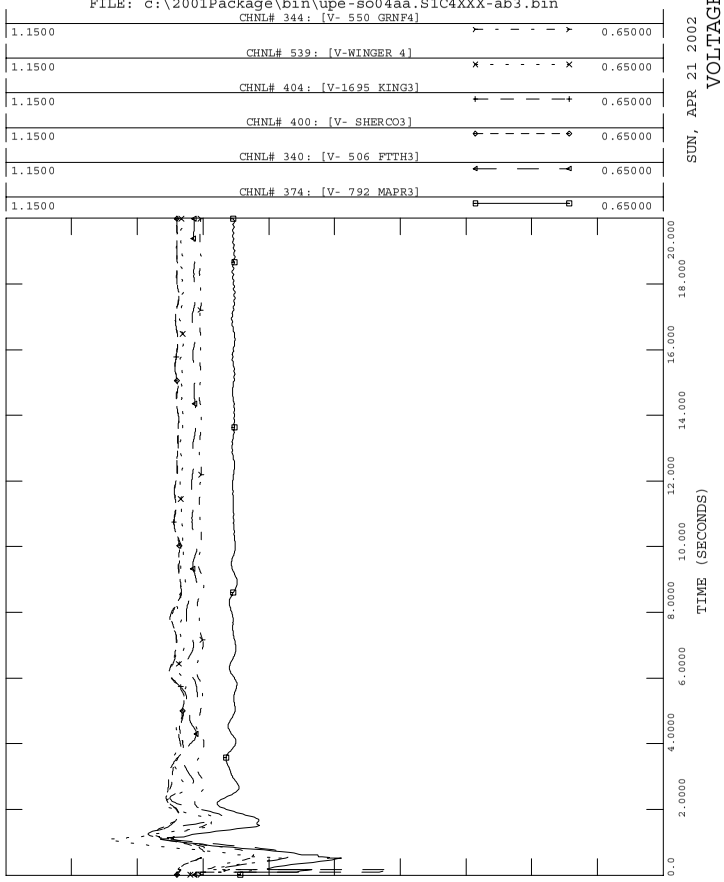
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
VOLTAGES 3



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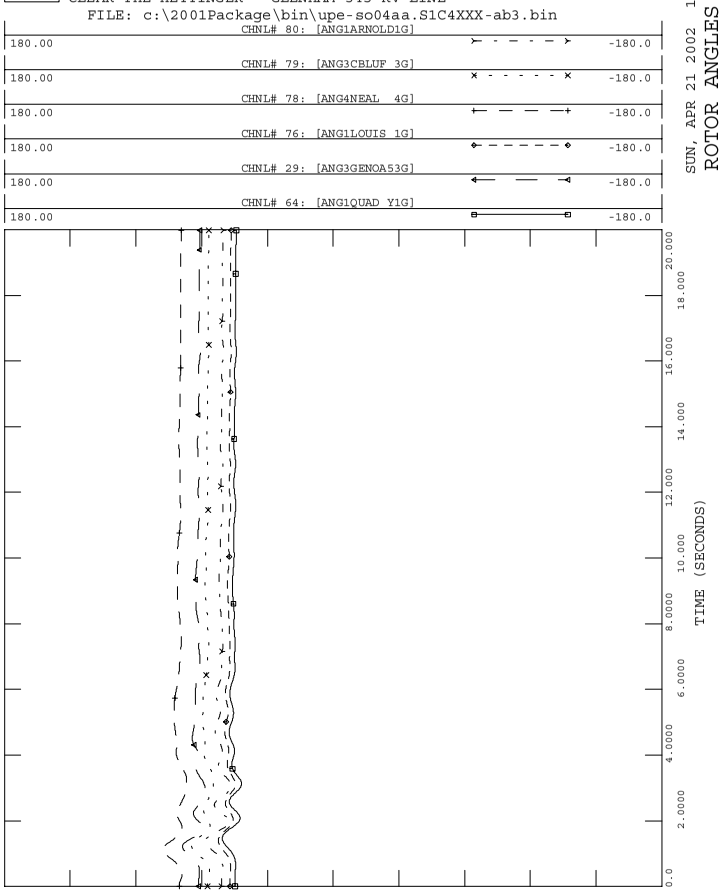
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
ROTOR ANGLES IA



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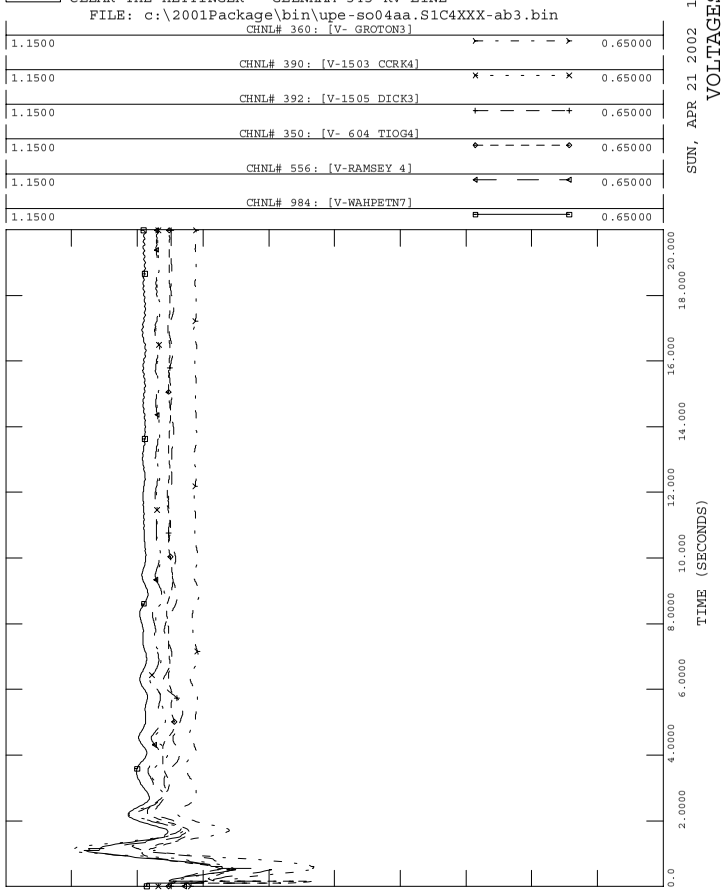
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
VOLTAGES 2



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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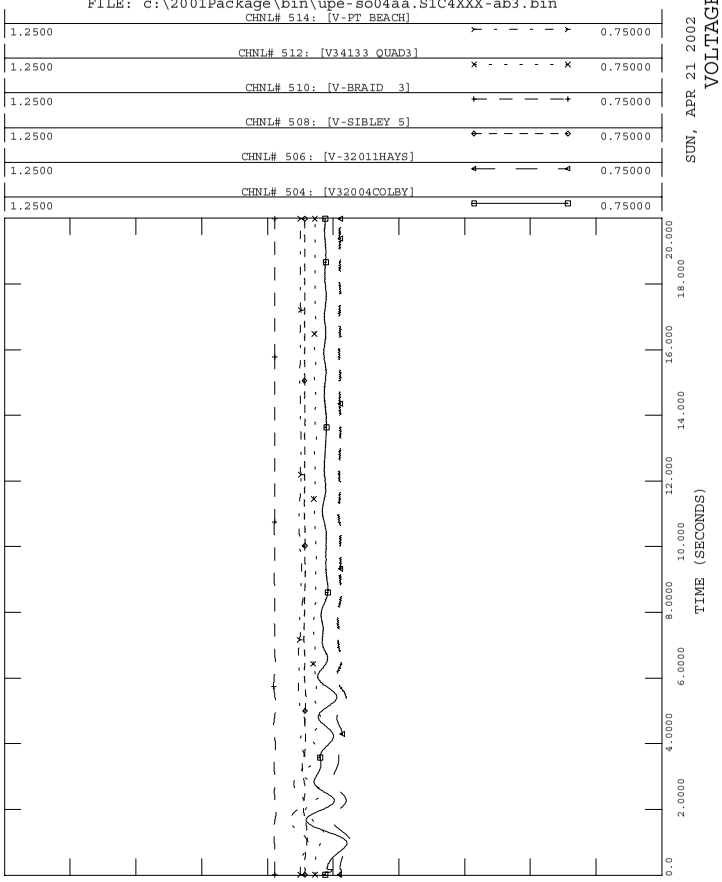
VOLTAGES 5



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
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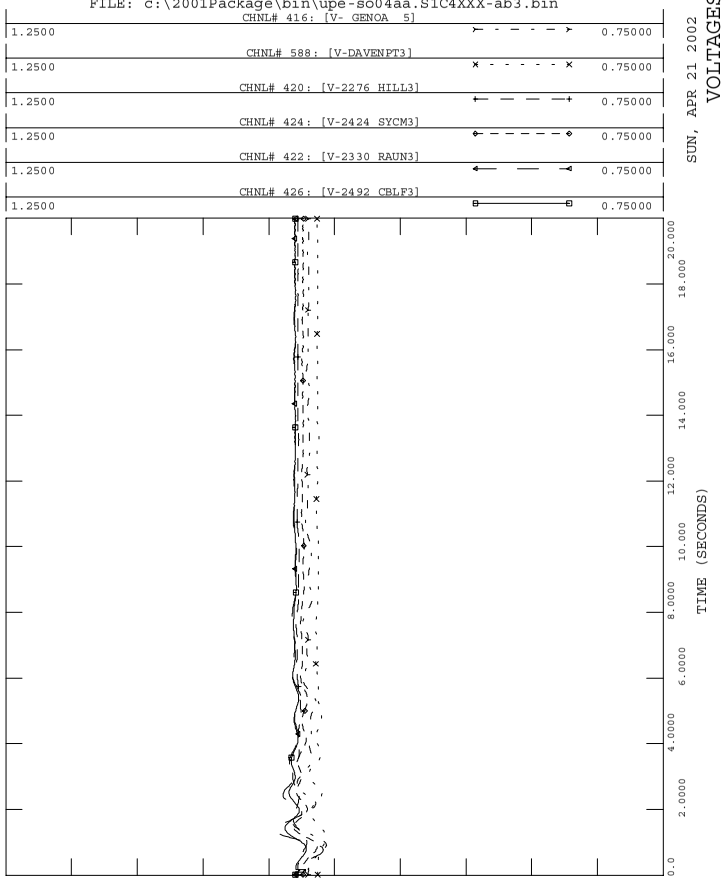
VOLTAGES IA



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CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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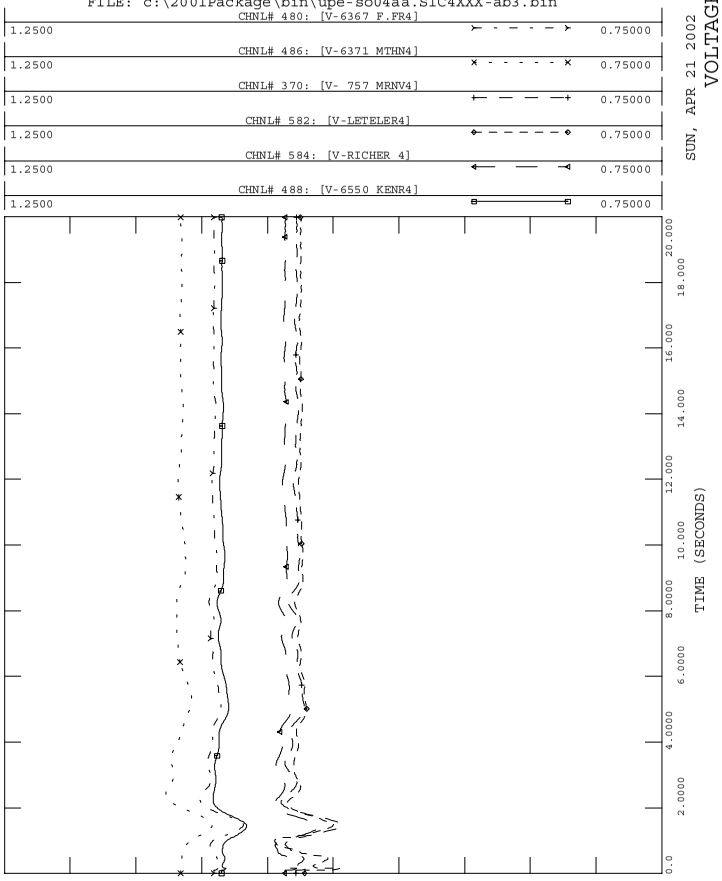
VOLTAGES 4



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
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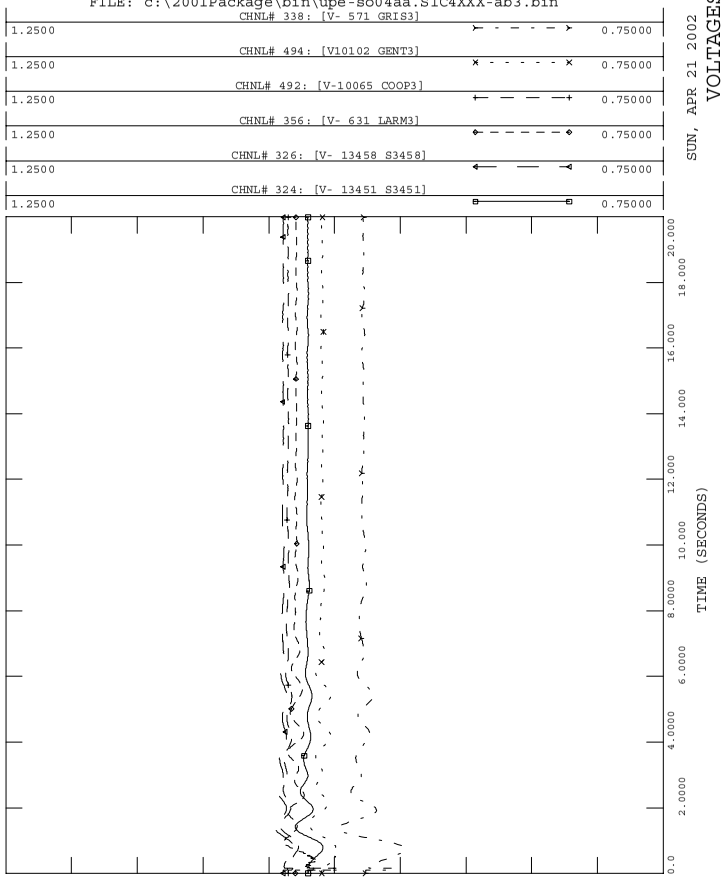
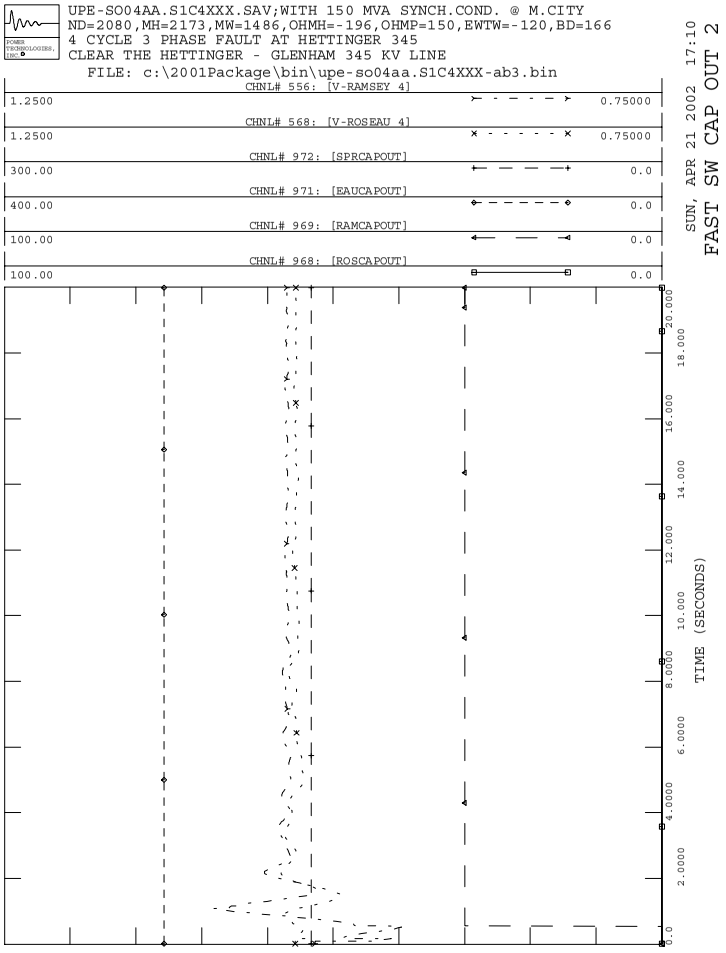
VOLTAGES NB

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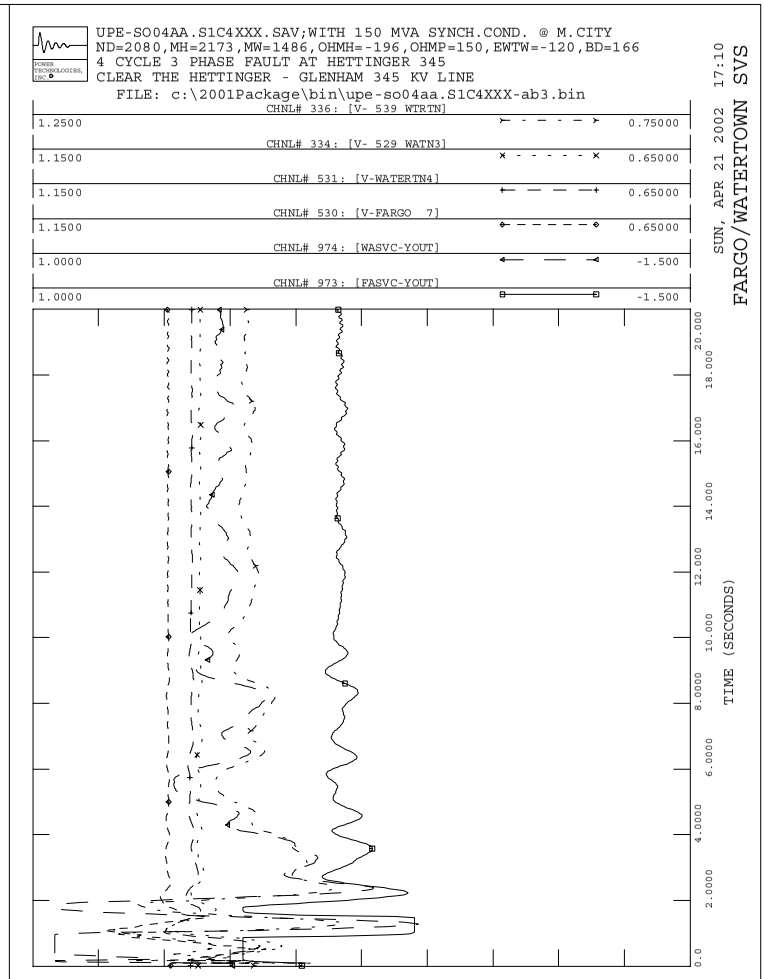
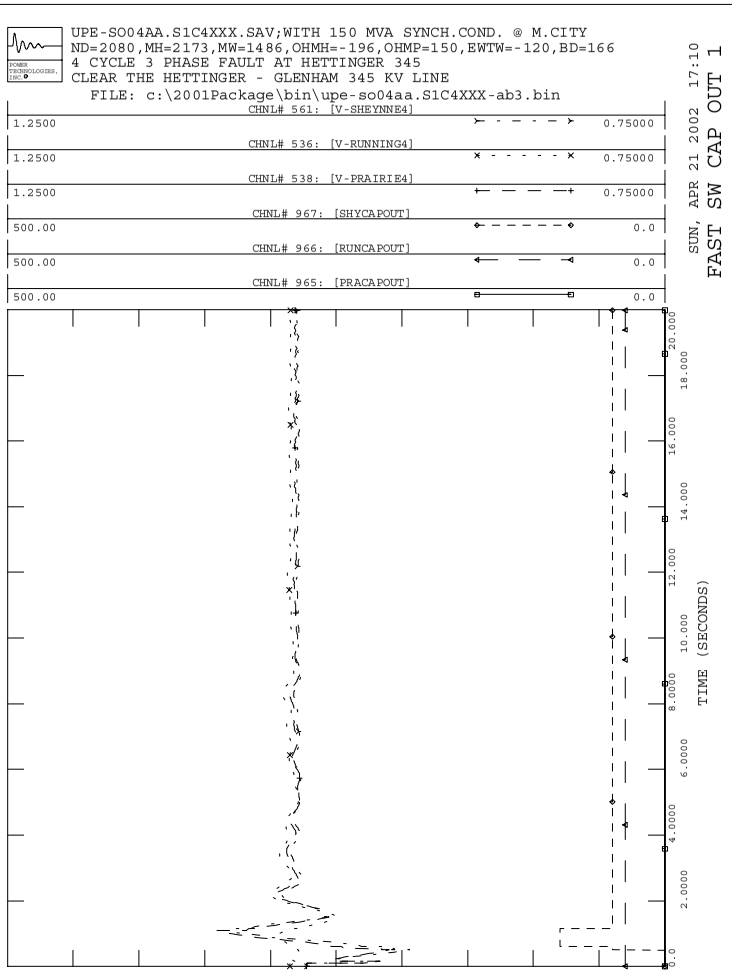
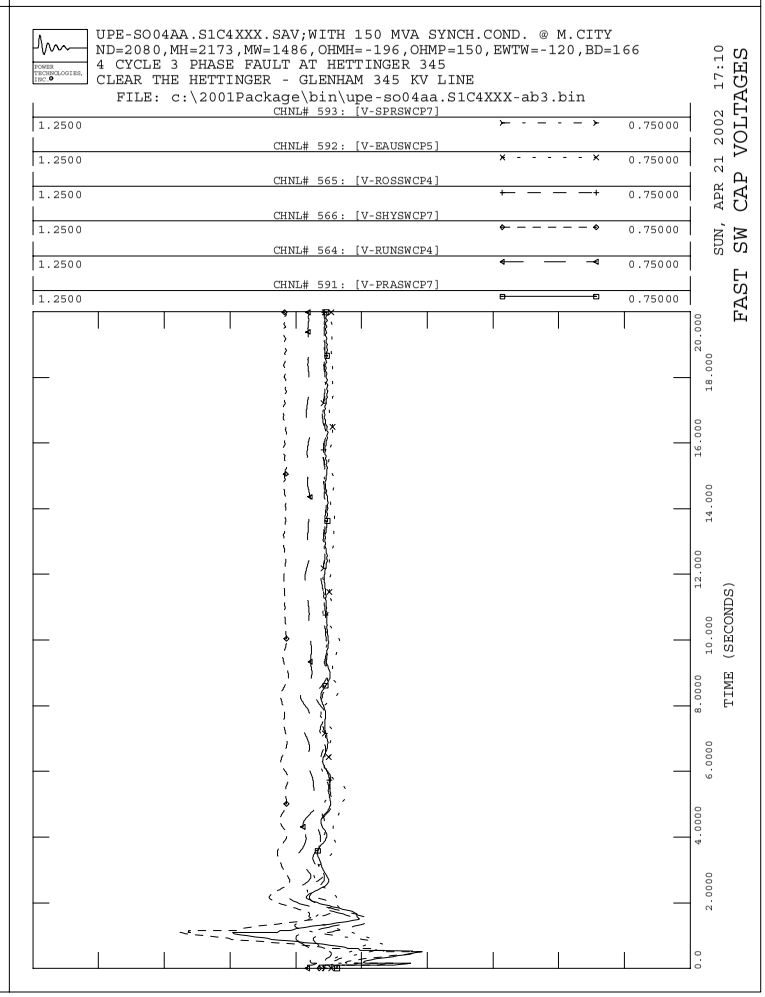
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
SUN, APR 21 2002 17:10
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
SUN, APR 21 2002 17:10
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
SUN, APR 21 2002 17:10
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
SUN, APR 21 2002 17:10
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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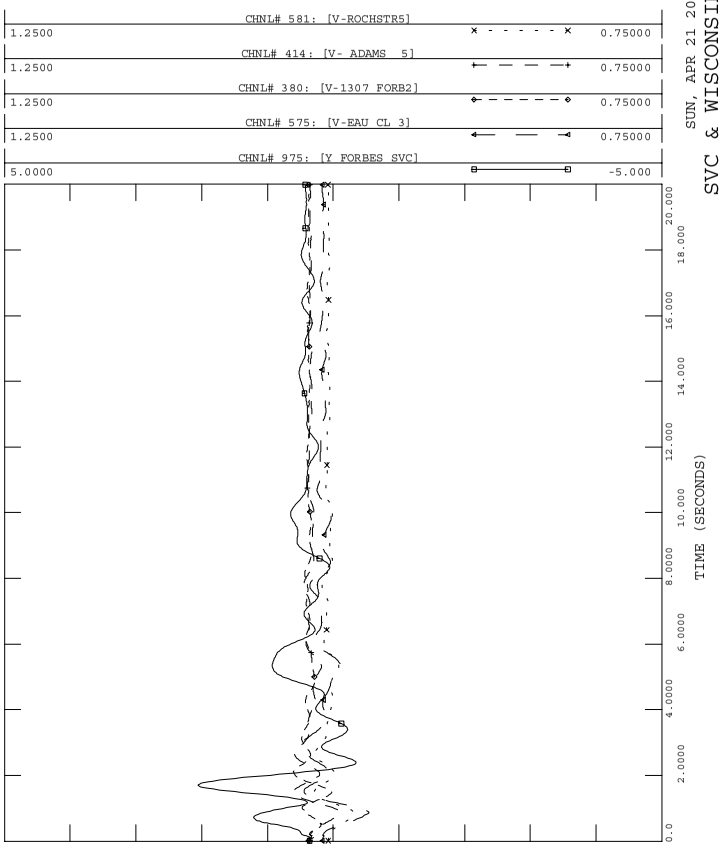
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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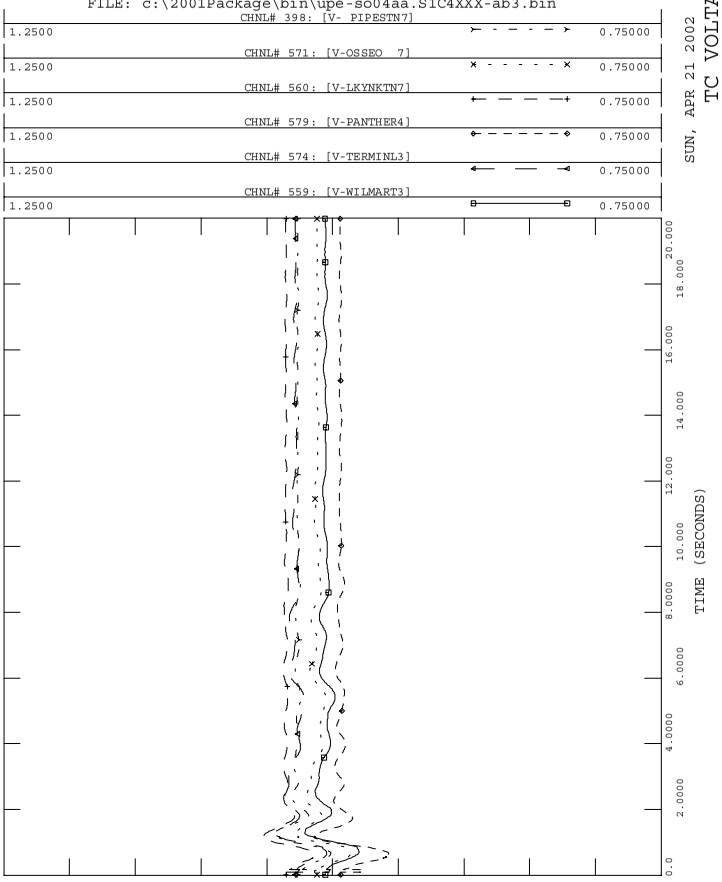
TC VOLTAGES



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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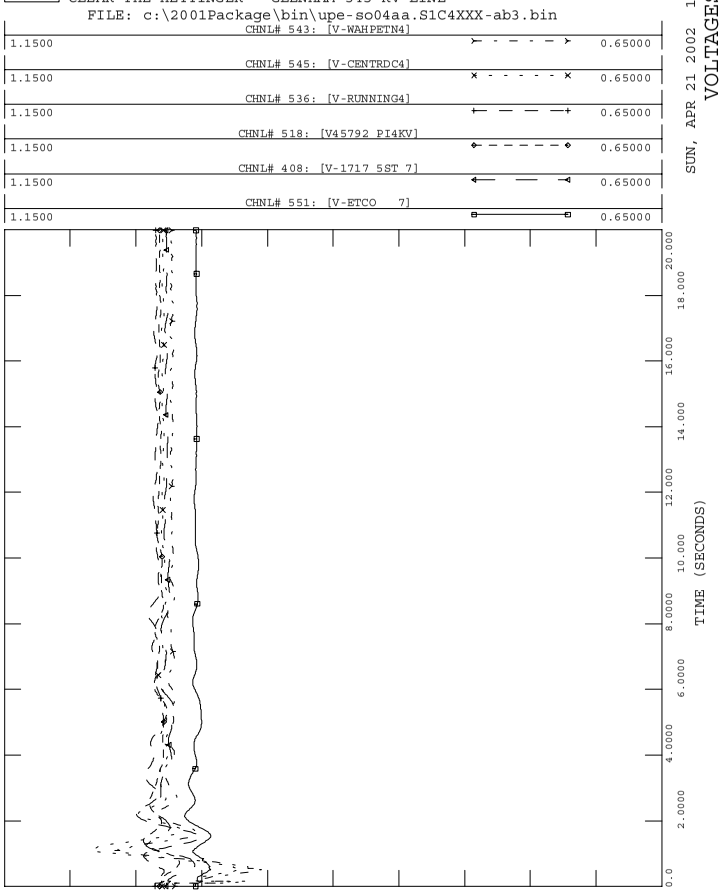
VOLTAGES 6



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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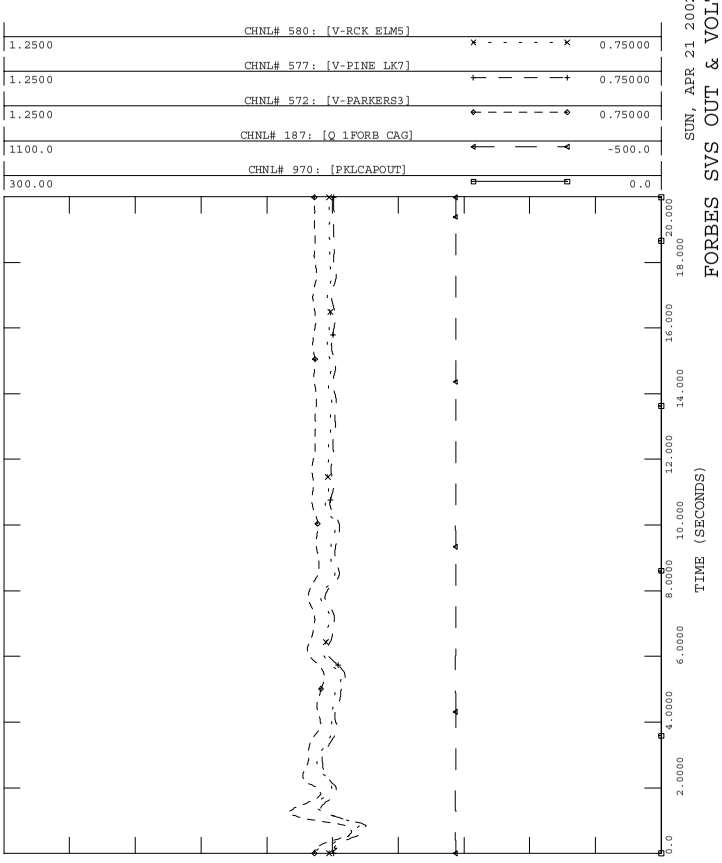
FORBES SVS OUT & VOLTAGES



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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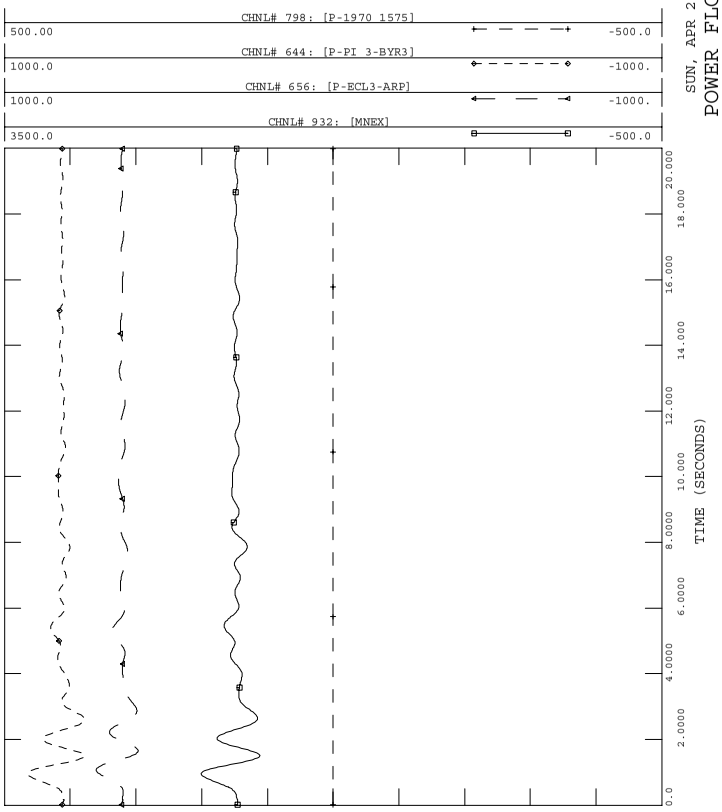
POWER FLOW SUMS 2



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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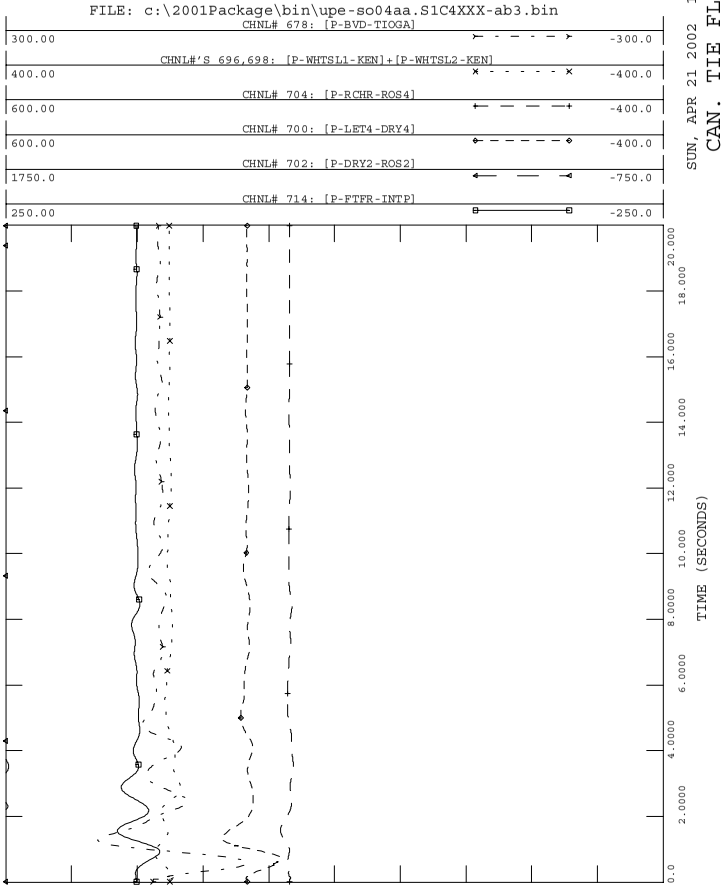
CAN. TIE FLOWS



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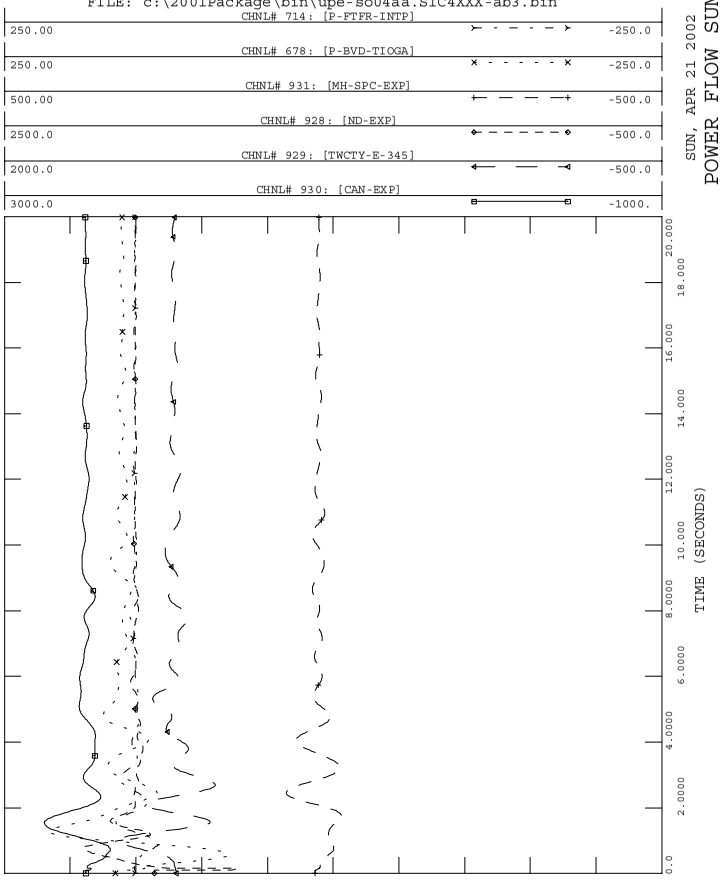
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10
POWER FLOW SUMS 1



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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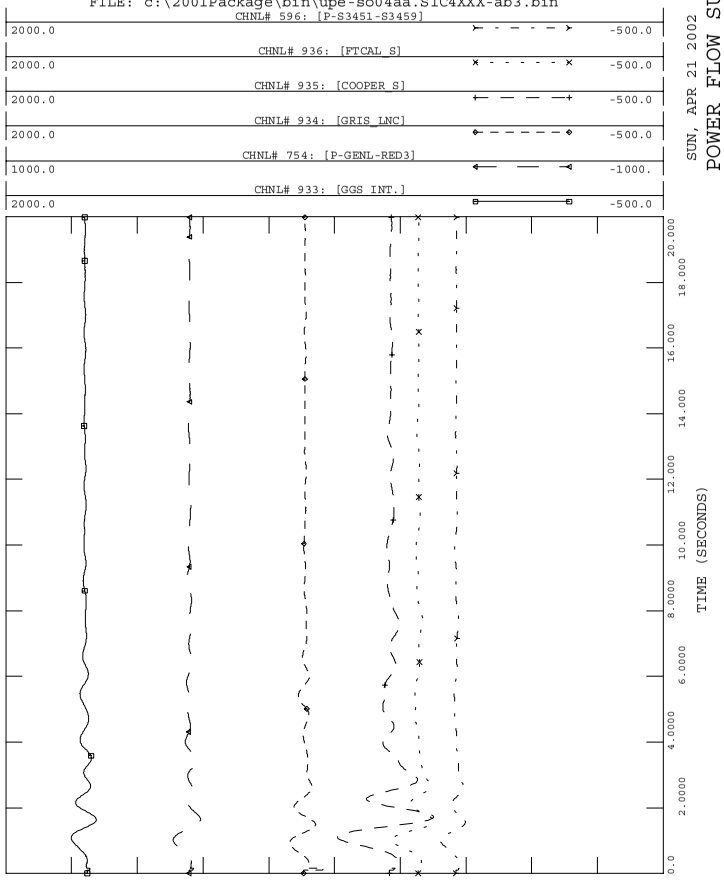
POWER FLOW SUM 3



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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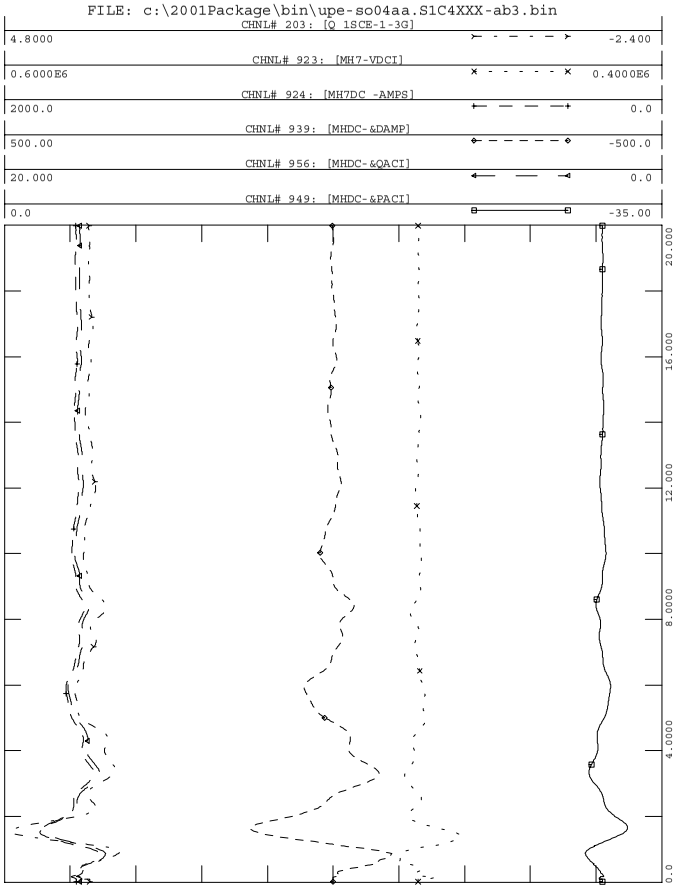
MH DC PARAMETERS



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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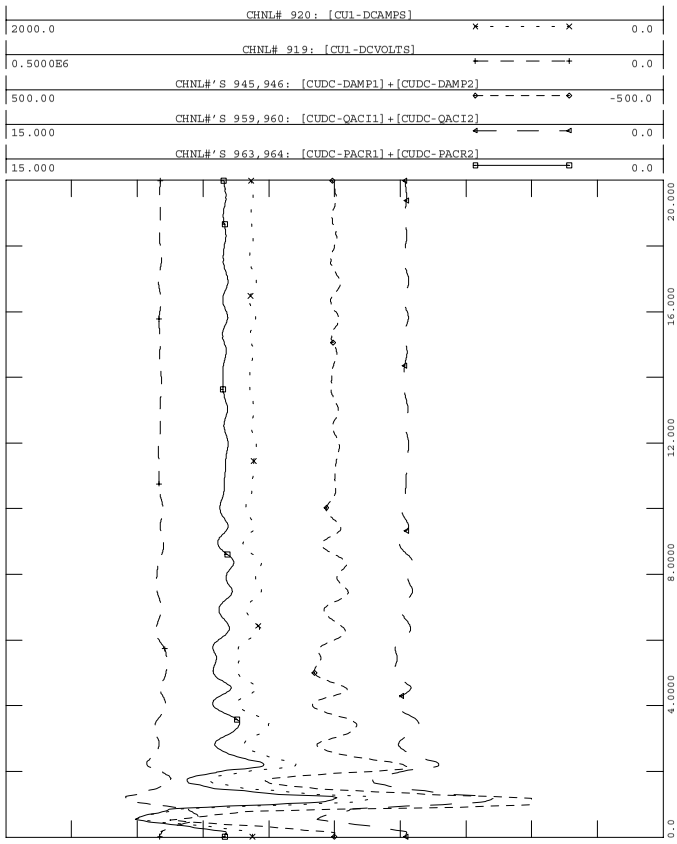
CU DC #1



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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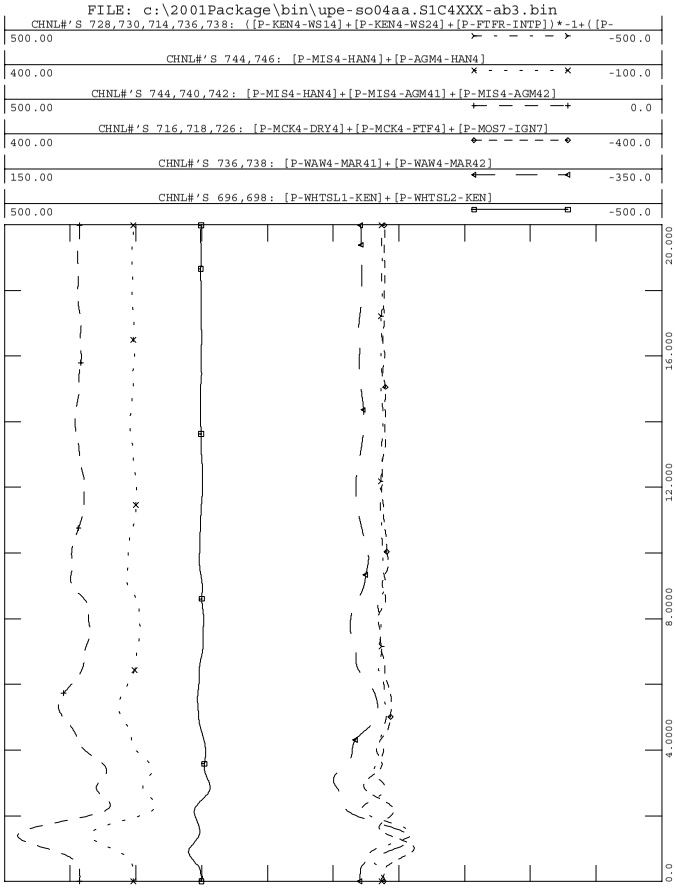
OH TIE FLOWS



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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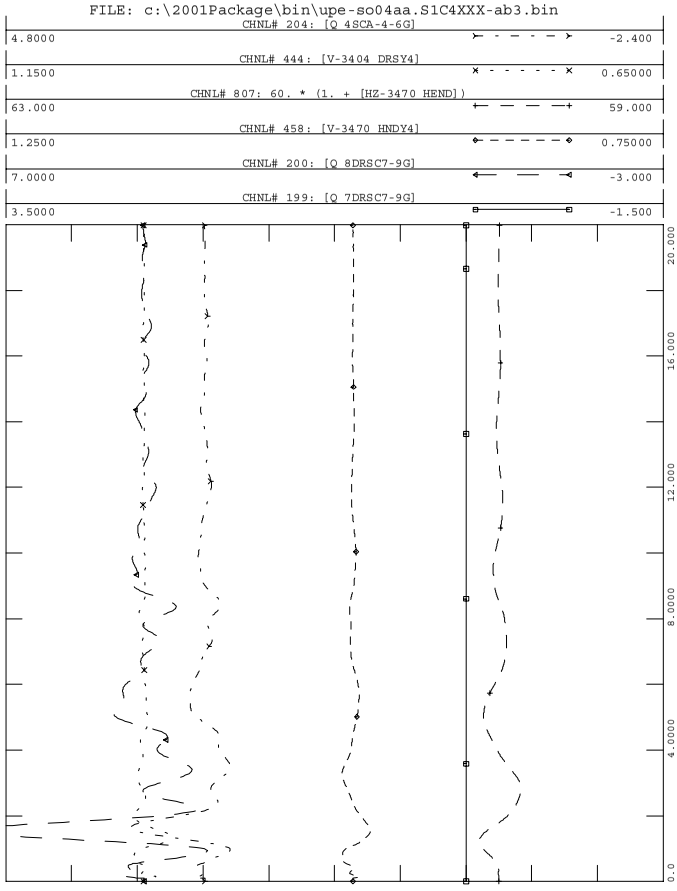
MH DC PARAMETERS



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ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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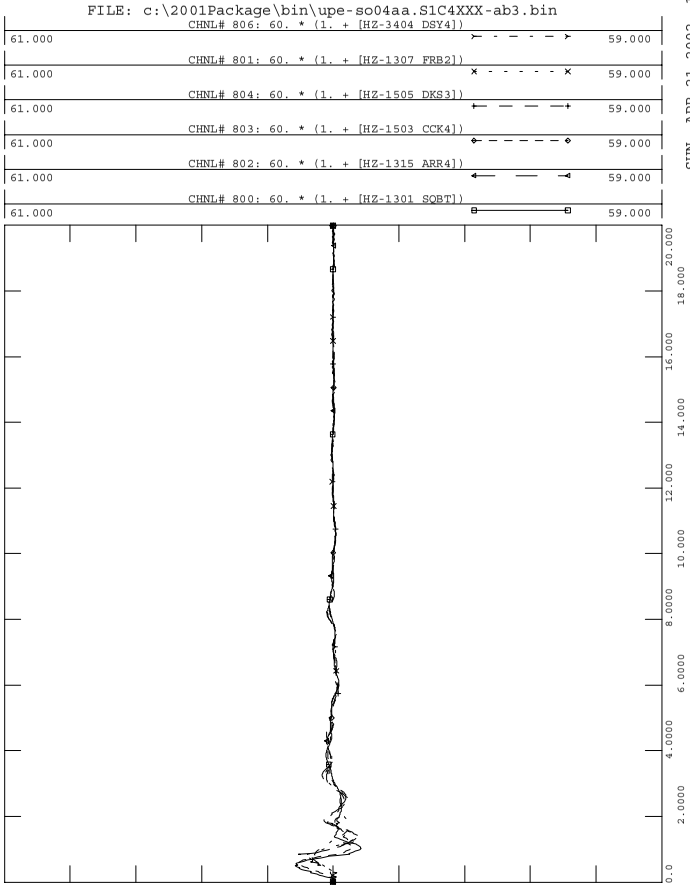
FREQ AT DC TERMINALS



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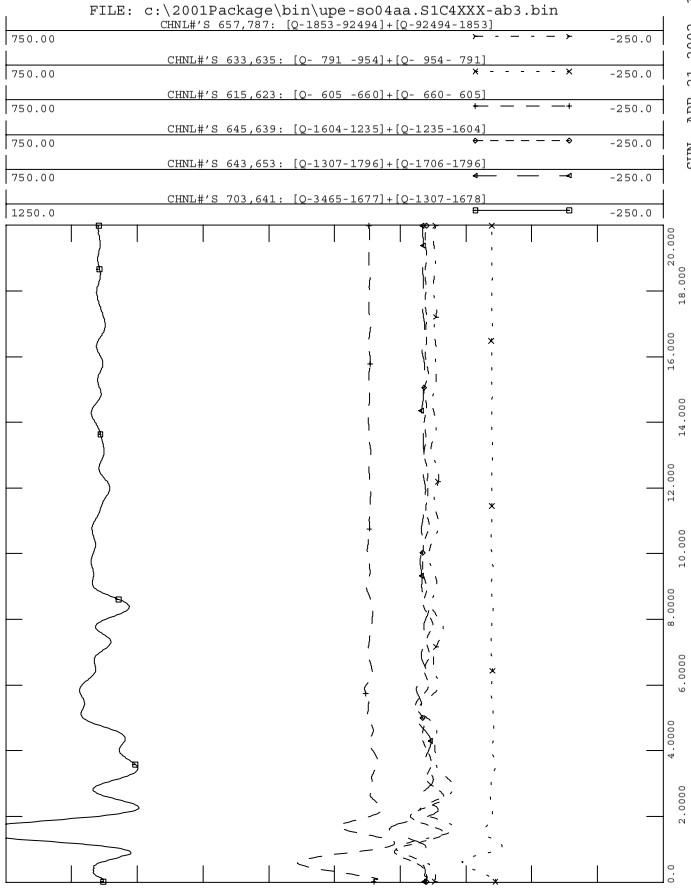
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10

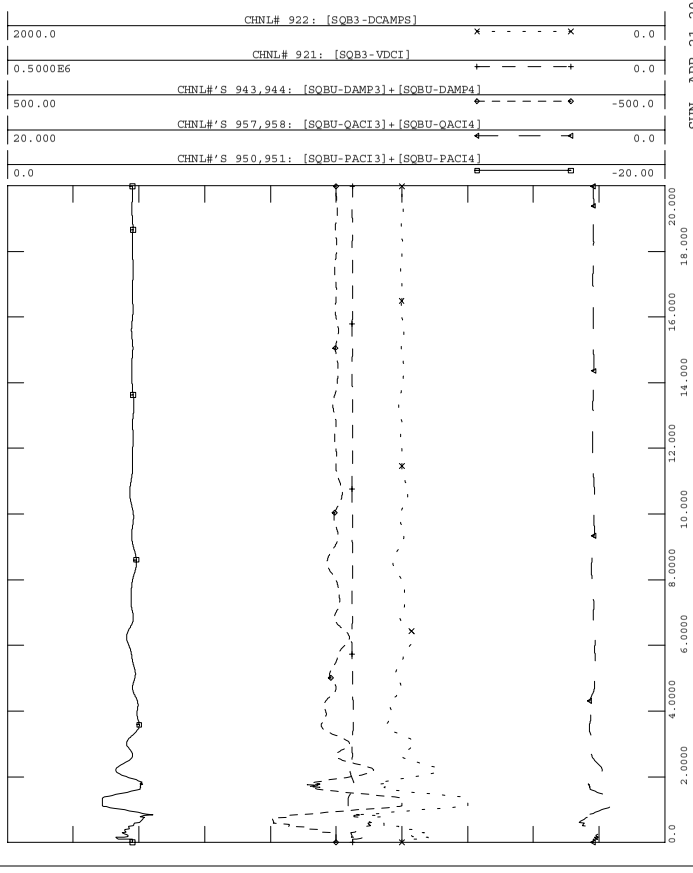
VAR LOSSES



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

SUN, APR 21 2002 17:10

SQB DC #3



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

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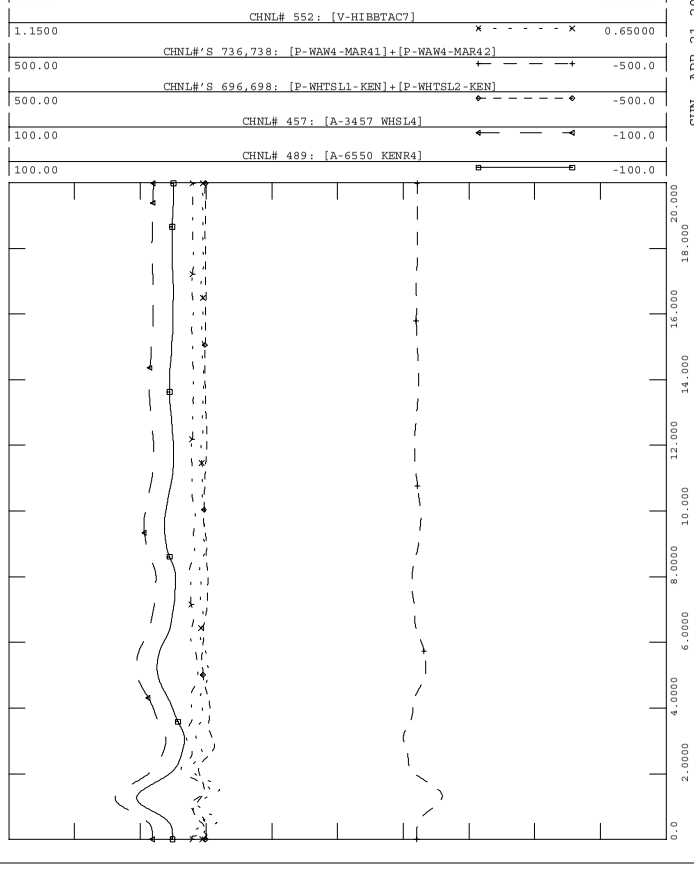
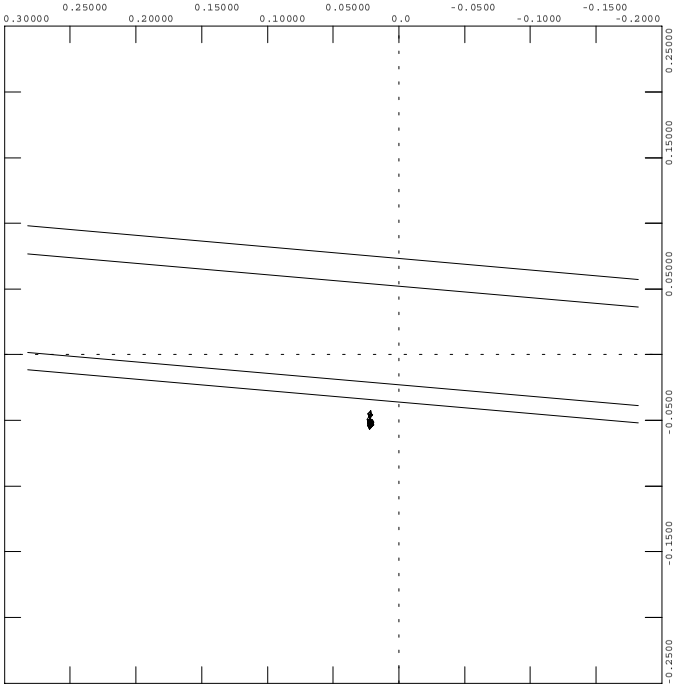
VOLTAGES, ANGLES



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

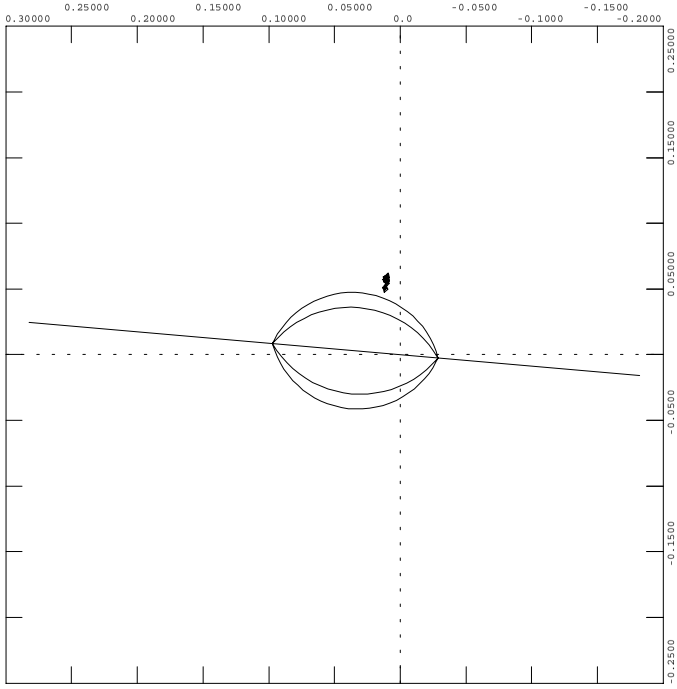


SUN, APR 21 2002 17:10
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

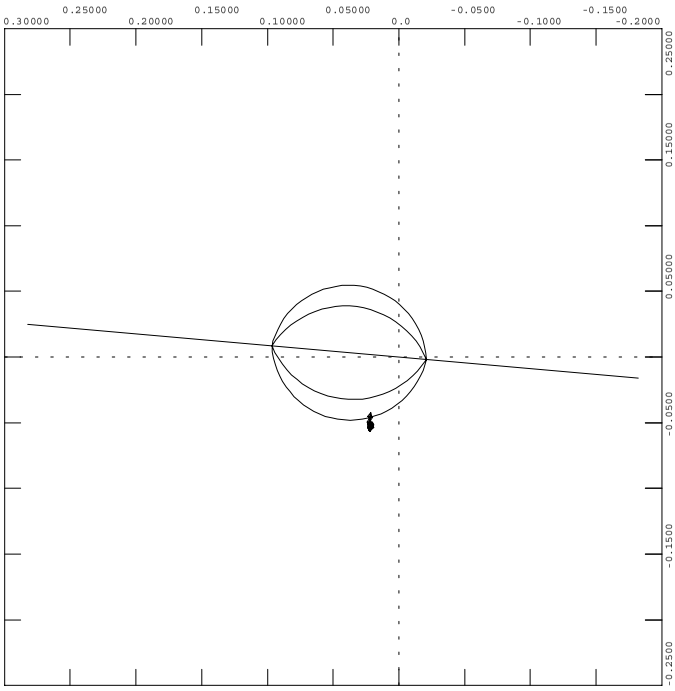


SUN, APR 21 2002 17:10
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

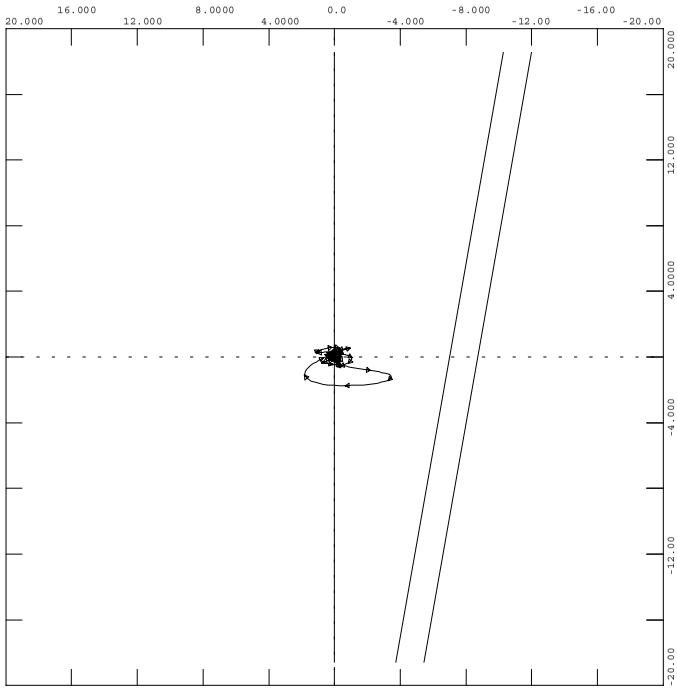


SUN, APR 21 2002 17:10
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

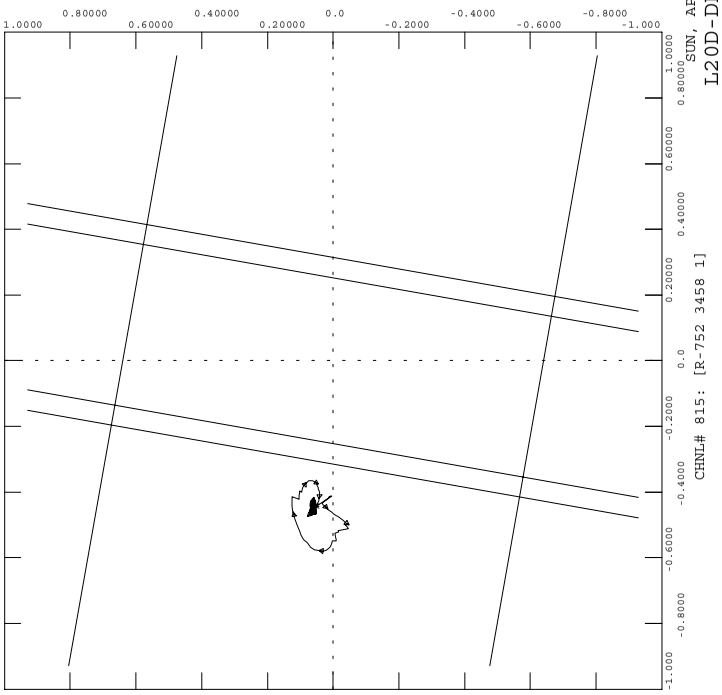


SUN, APR 21 2002 17:10
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

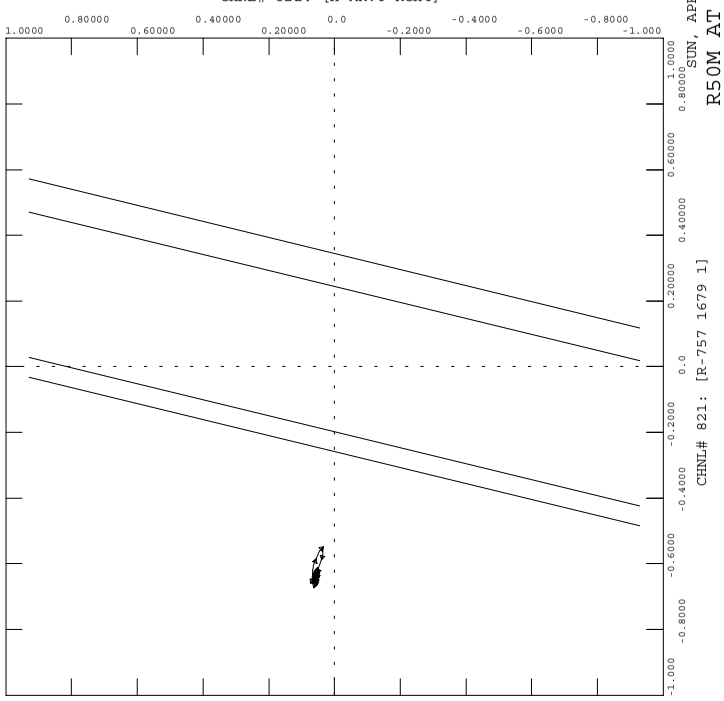
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

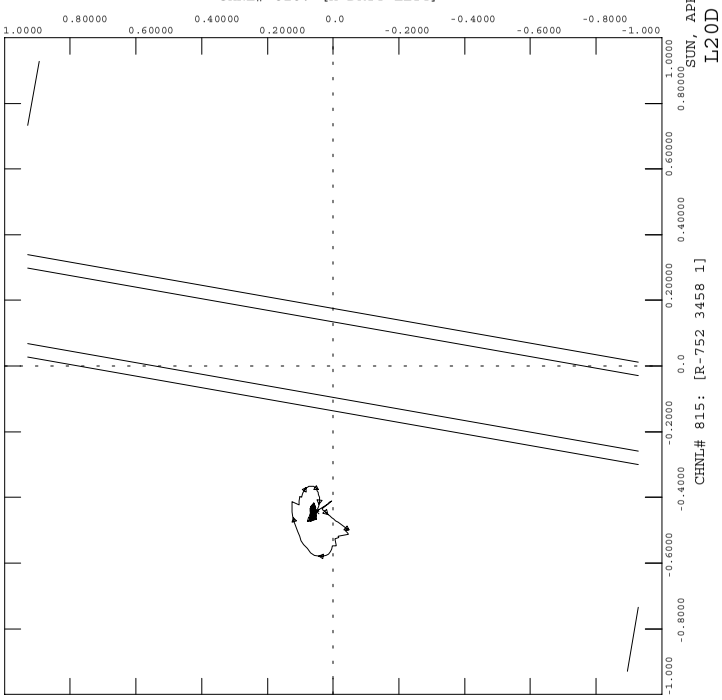
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

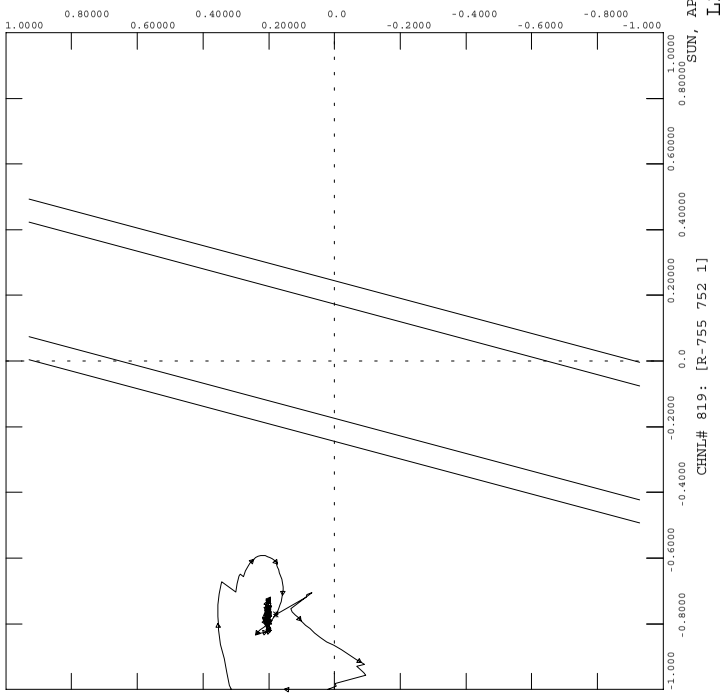
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

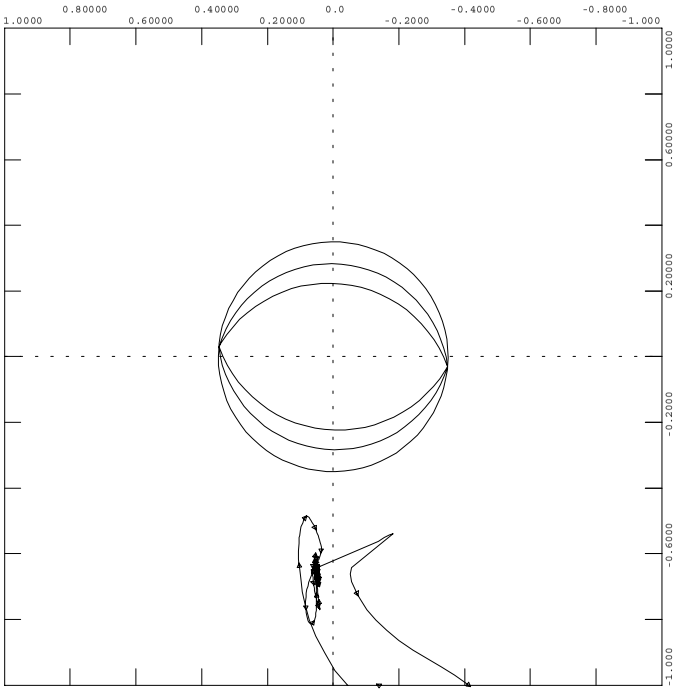
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

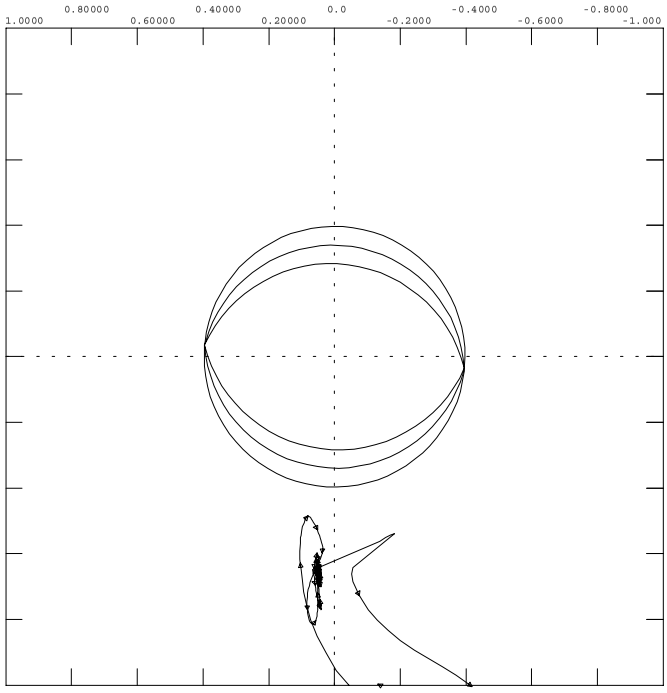
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

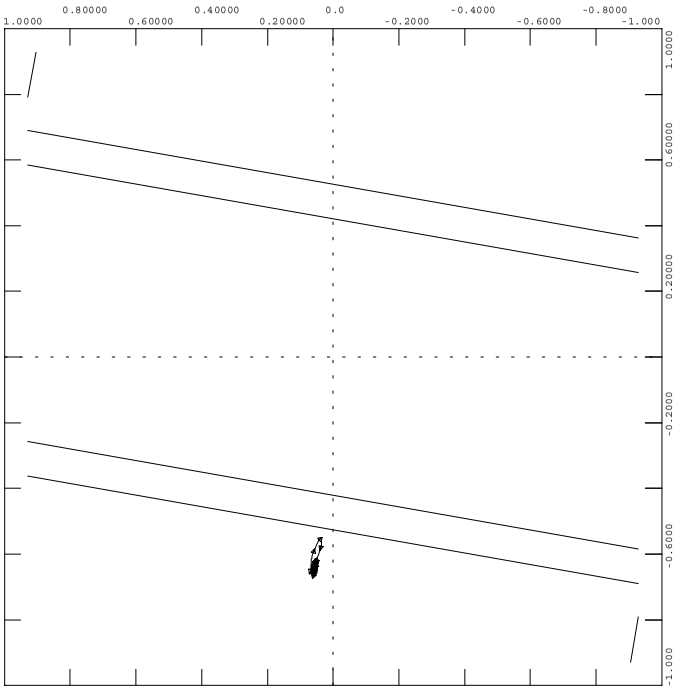
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

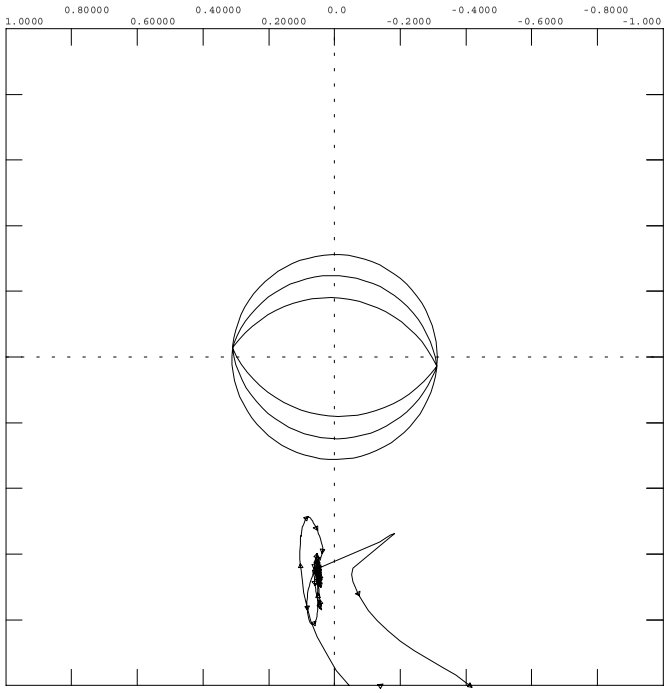
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



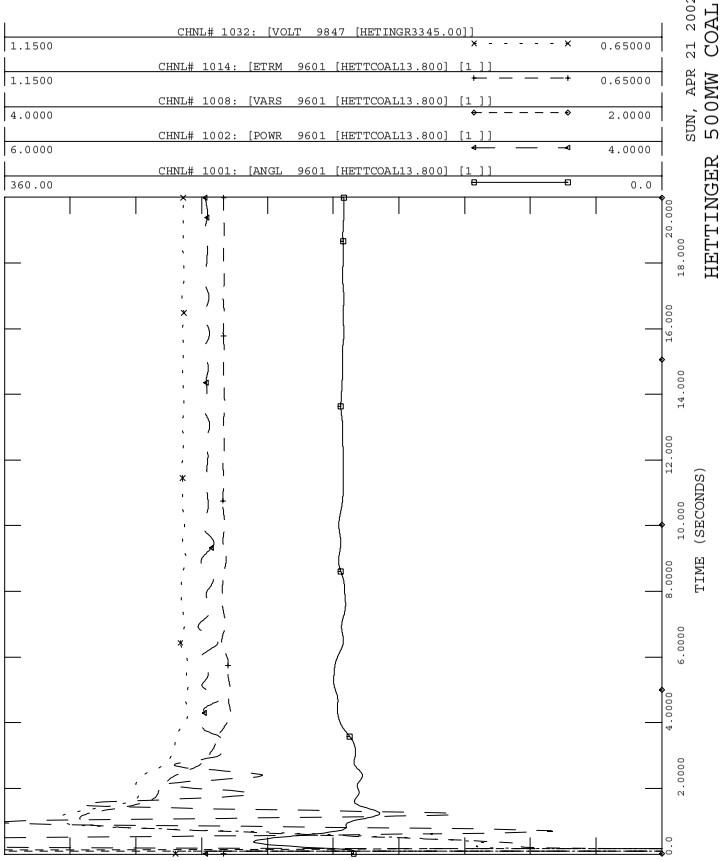
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

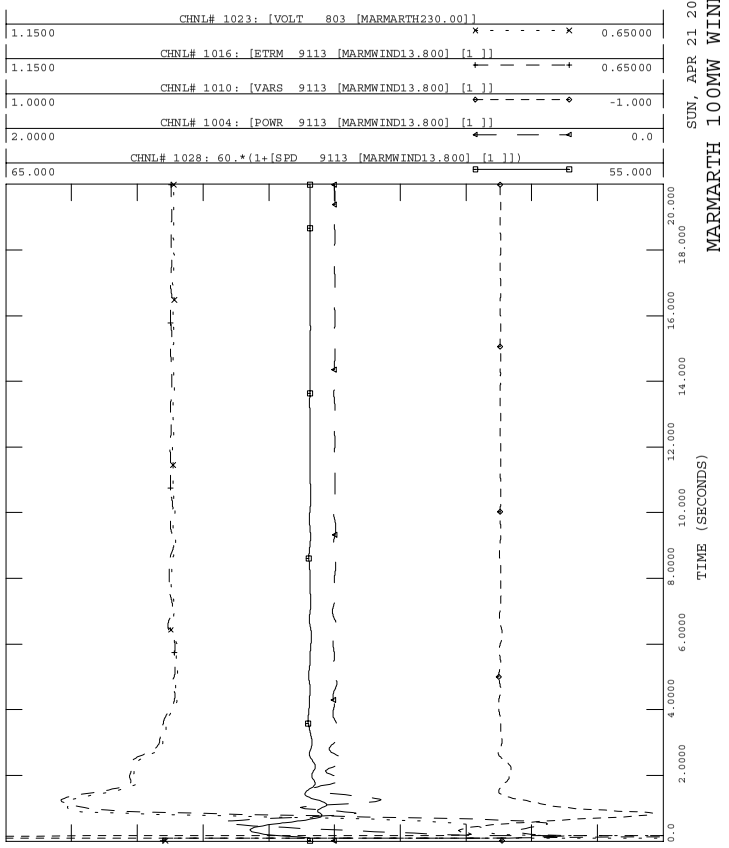


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin



SUN, APR 21 2002 17:10
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

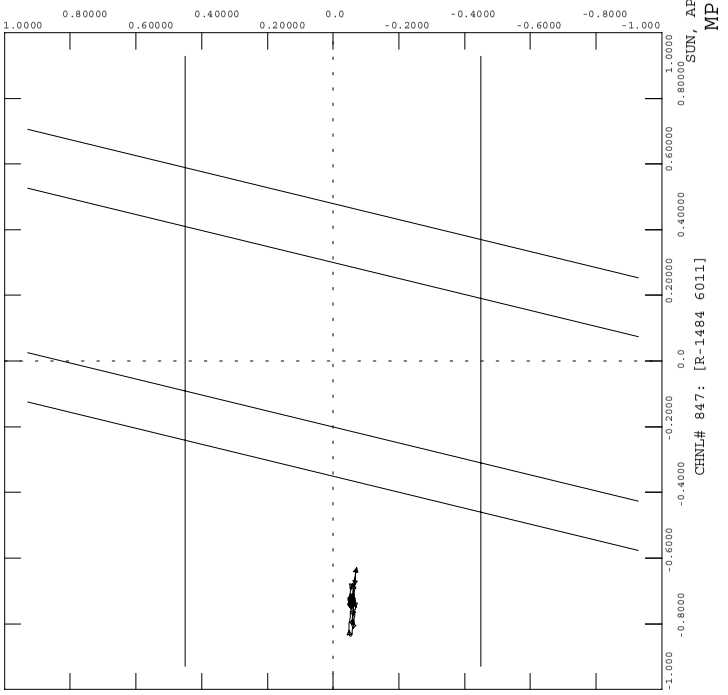


SUN, APR 21 2002 17:10
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE

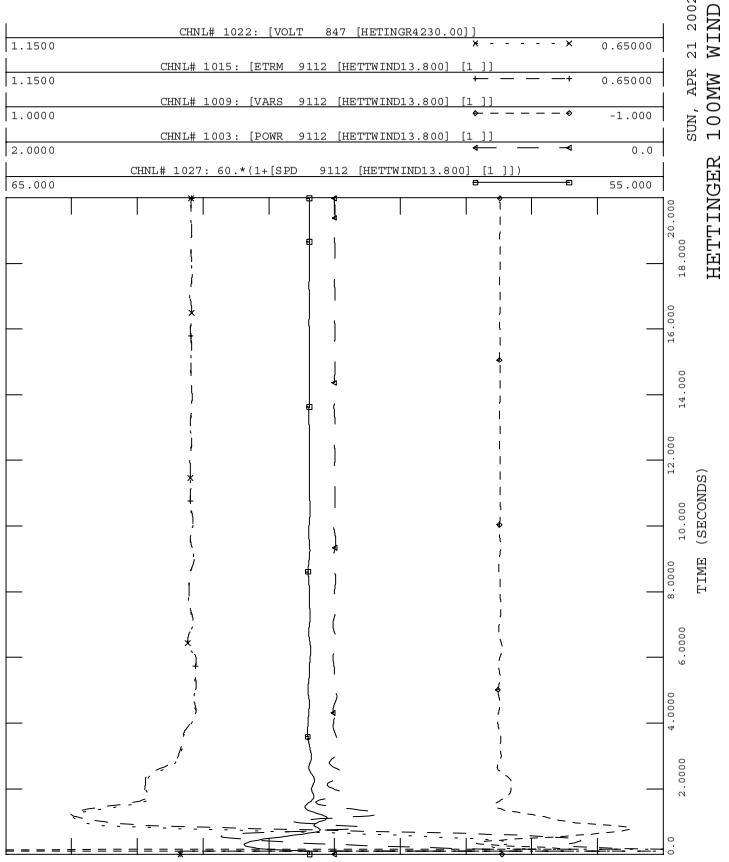
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



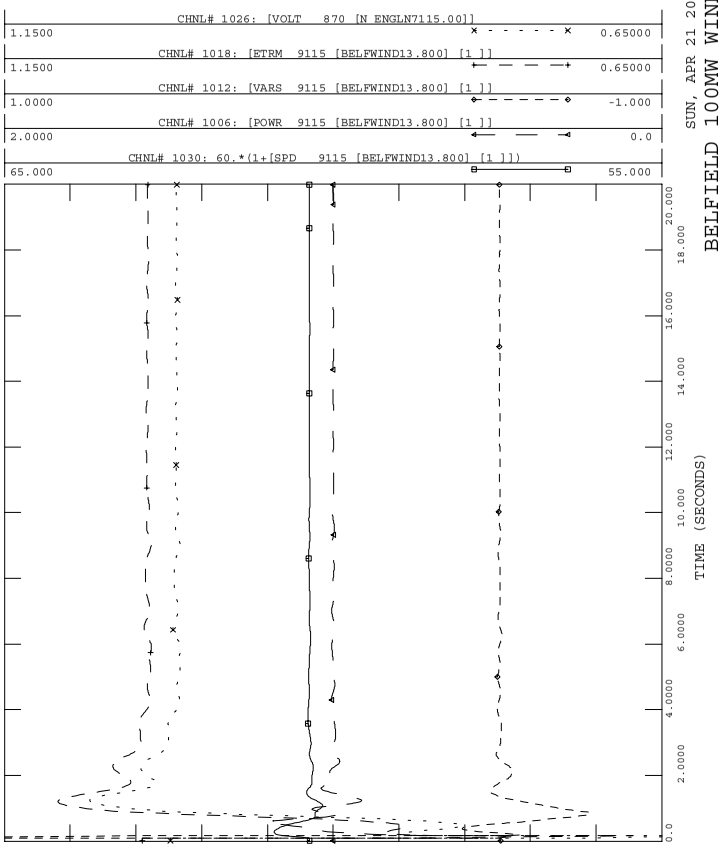
SUN, APR 21 2002 17:10
MP-OH I.FALLS (779)

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin



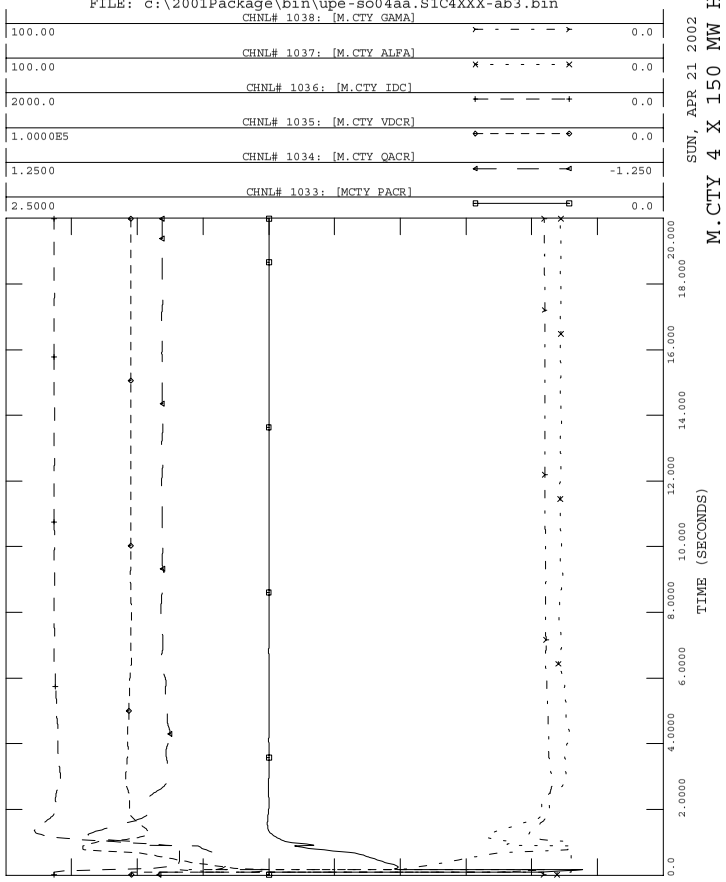
SUN, APR 21 2002 17:10
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin



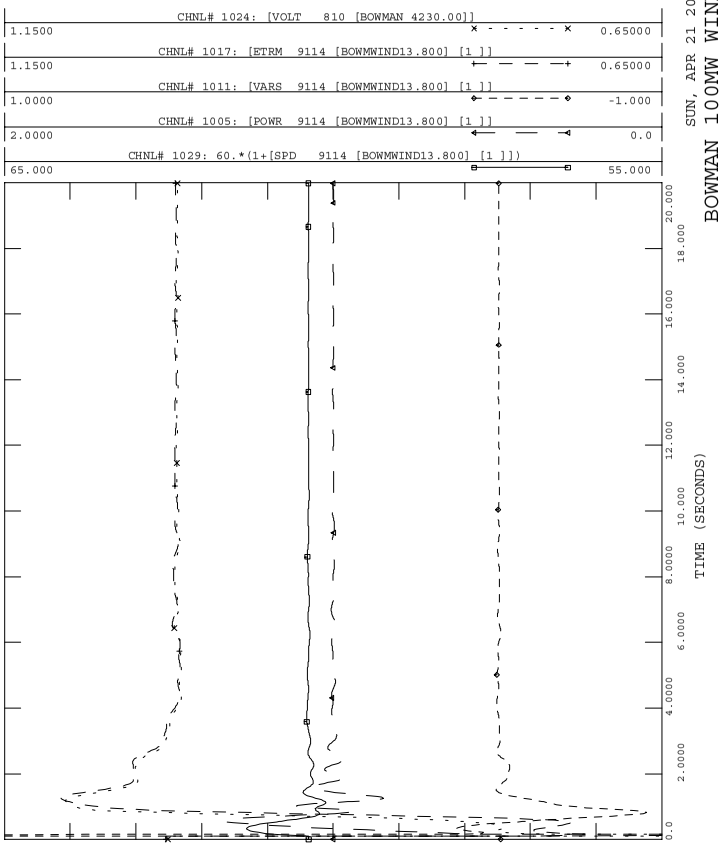
SUN, APR 21 2002 17:10
BELFIELD 100MW WIND UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin



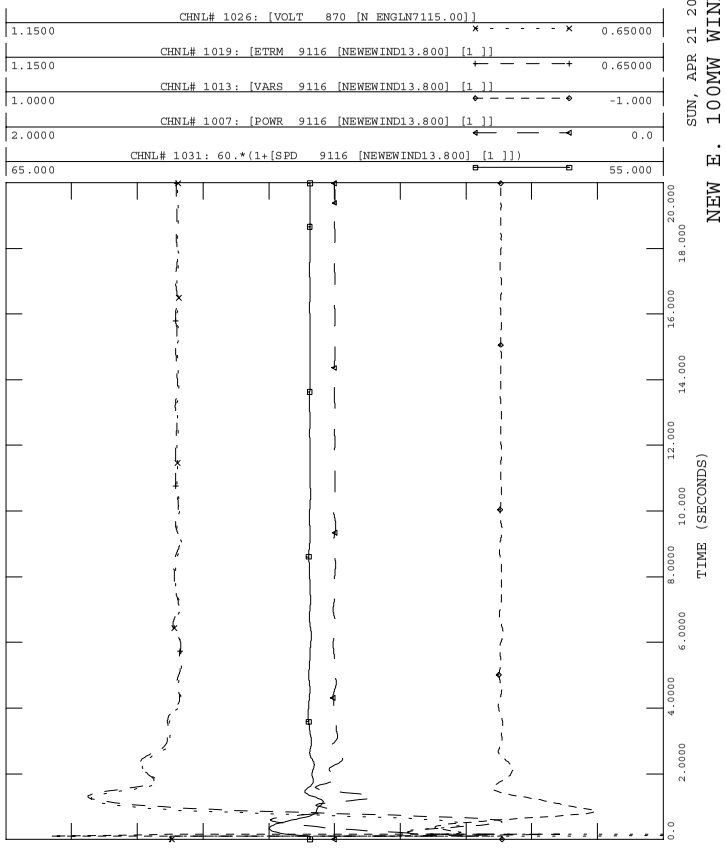
SUN, APR 21 2002 17:10
M.CTY 4 X 150 MW HVDC

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin



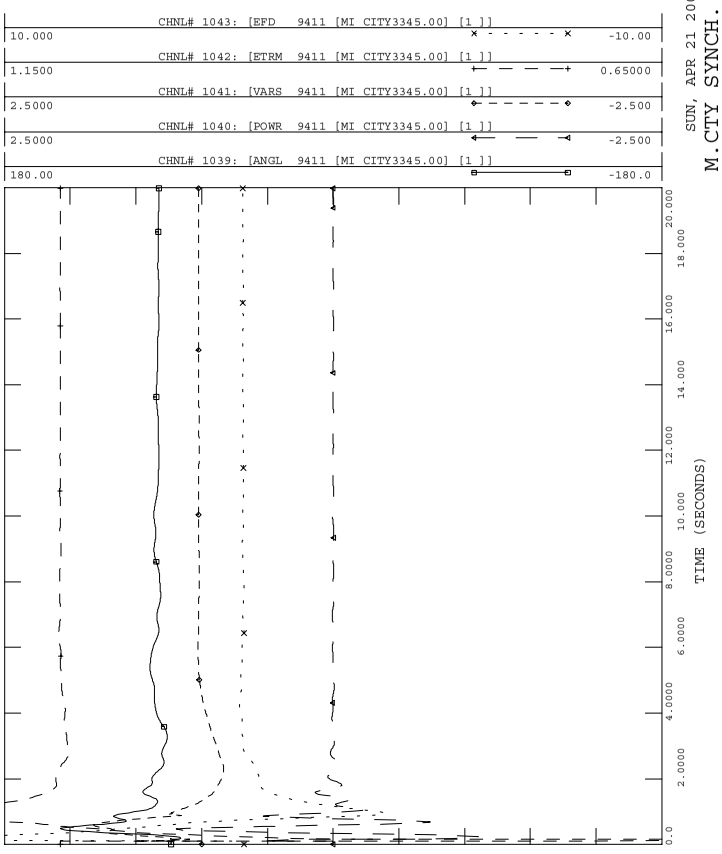
SUN, APR 21 2002 17:10
BOWMAN 100MW WIND UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin



SUN, APR 21 2002 17:10
NEW E. 100MW WIND UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - GLENHAM 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-ab3.bin



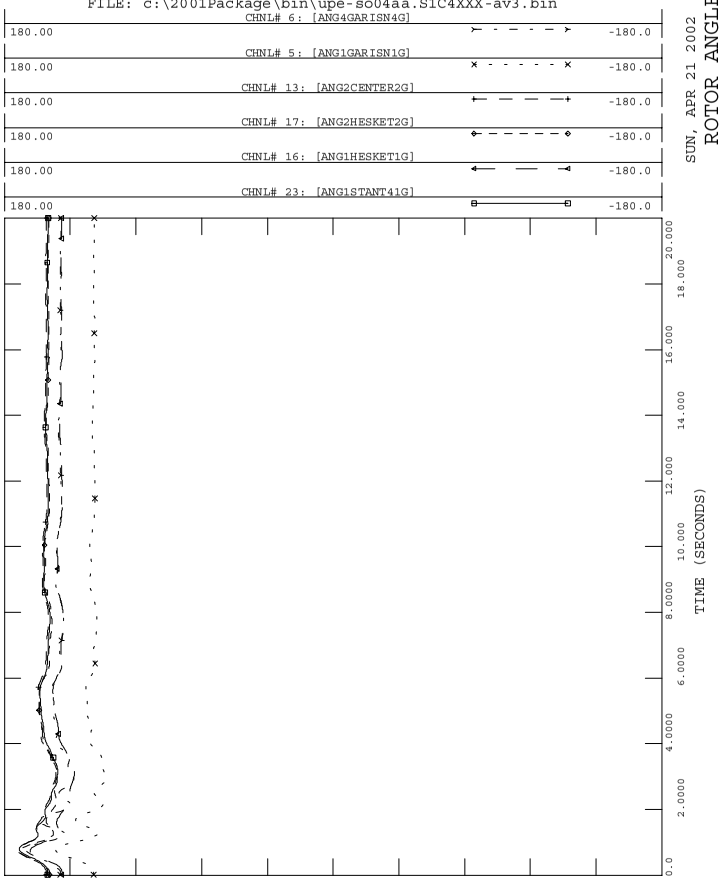
SUN, APR 21 2002 17:10
M.CITY SYNCH. COND.

CONTINGENCY AV3

4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Belfield 345 kV line

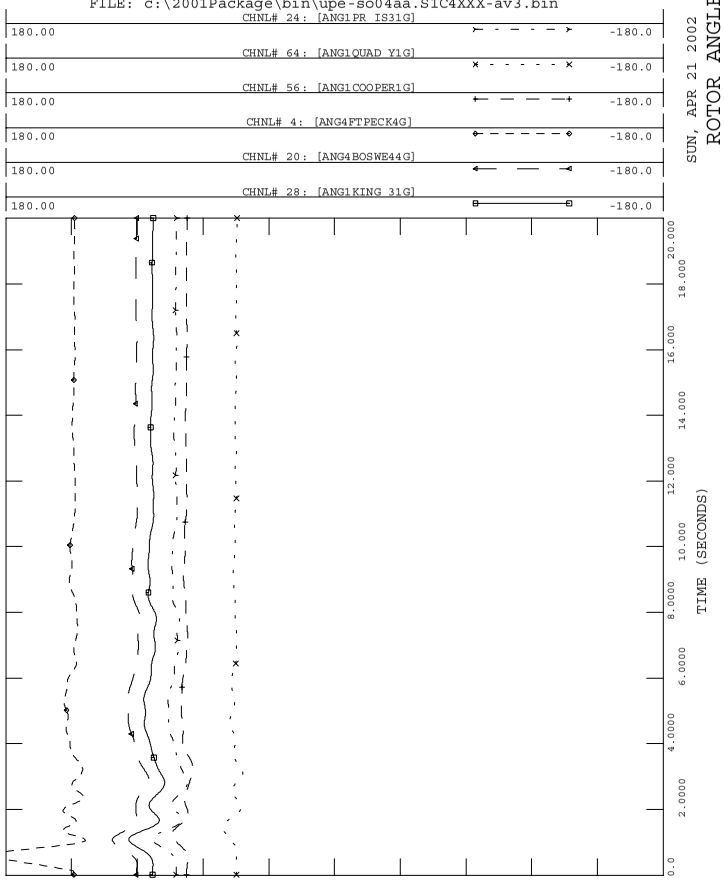
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28
ROTOR ANGLES 2



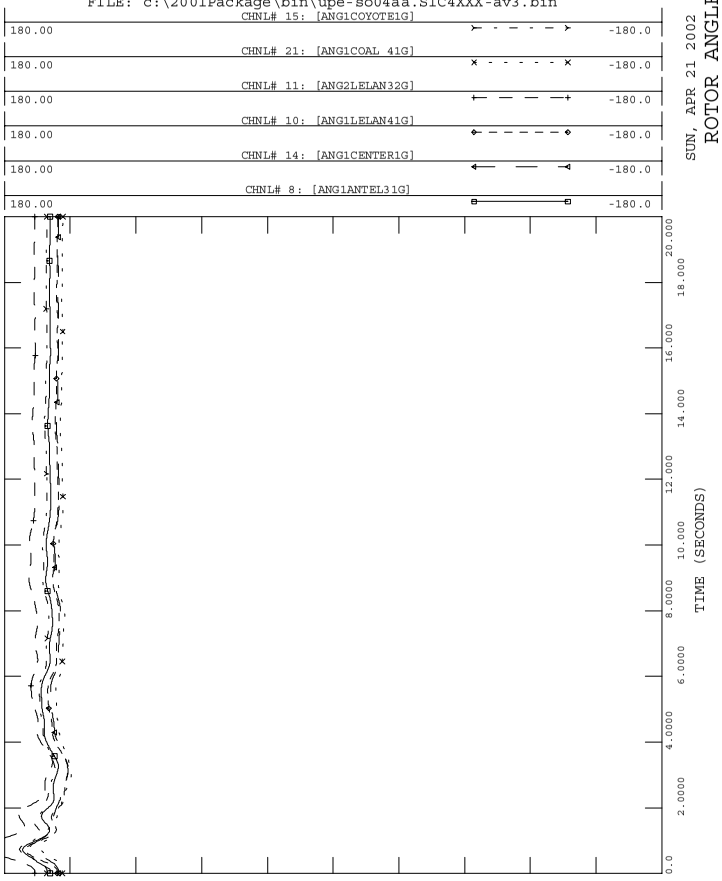
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28
ROTOR ANGLES 4



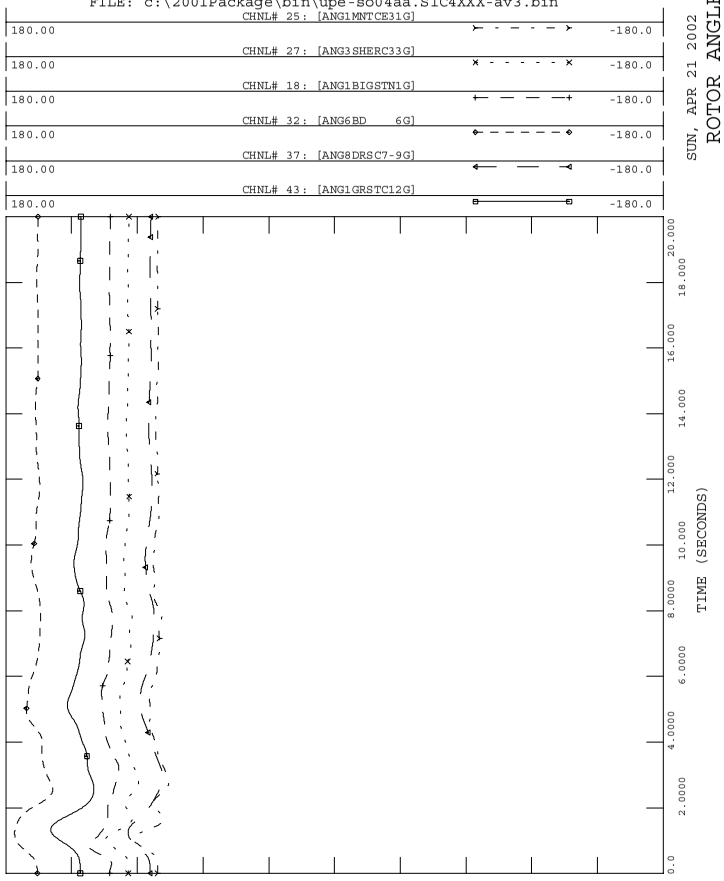
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28
ROTOR ANGLES 1



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28
ROTOR ANGLES 3



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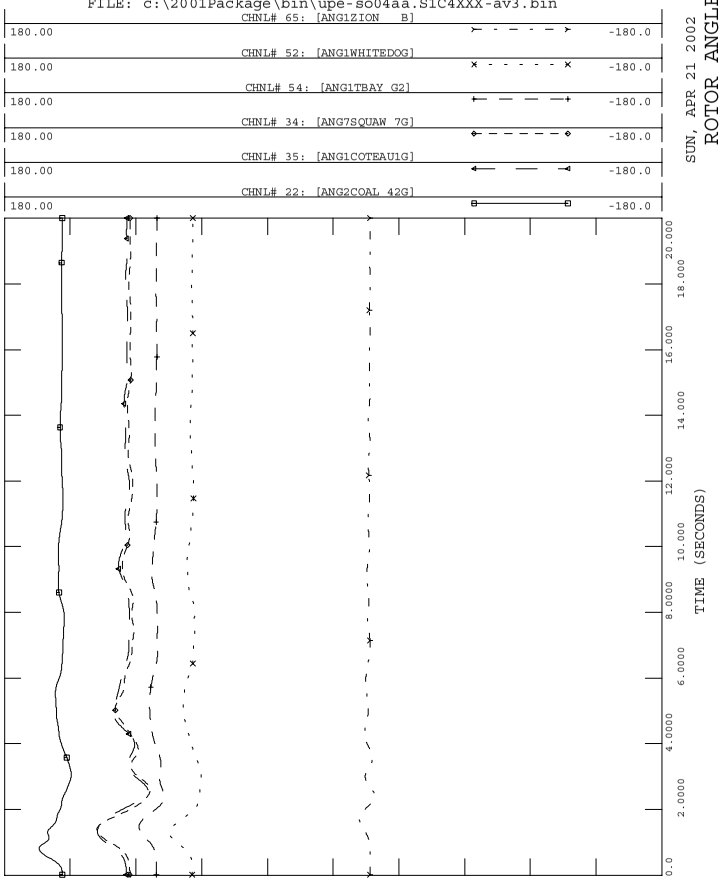
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28
ROTOR ANGLES 6



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
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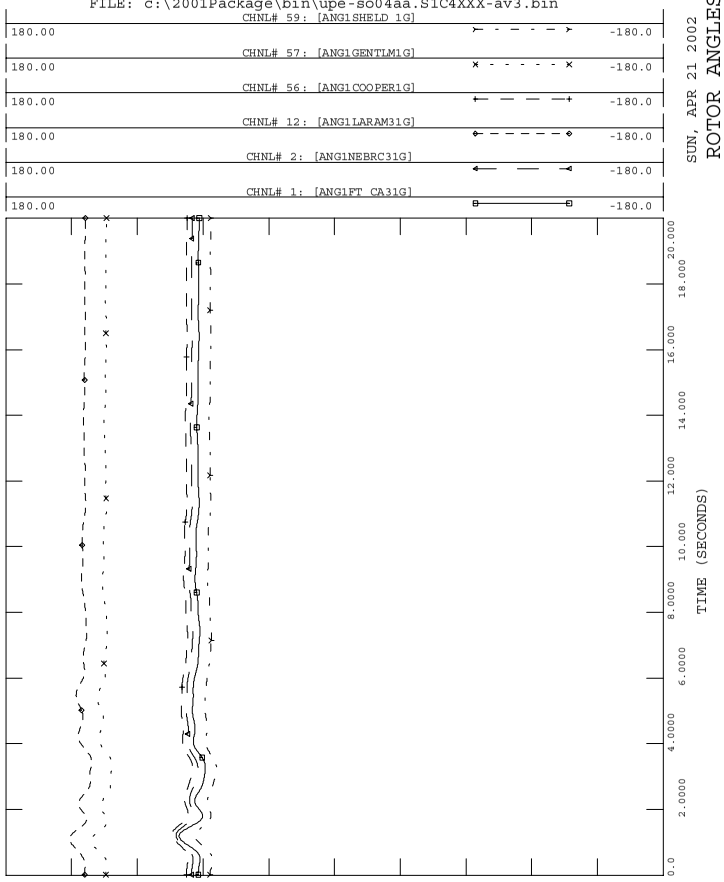
SUN, APR 21 2002 16:28
ROTOR ANGLES NB



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CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

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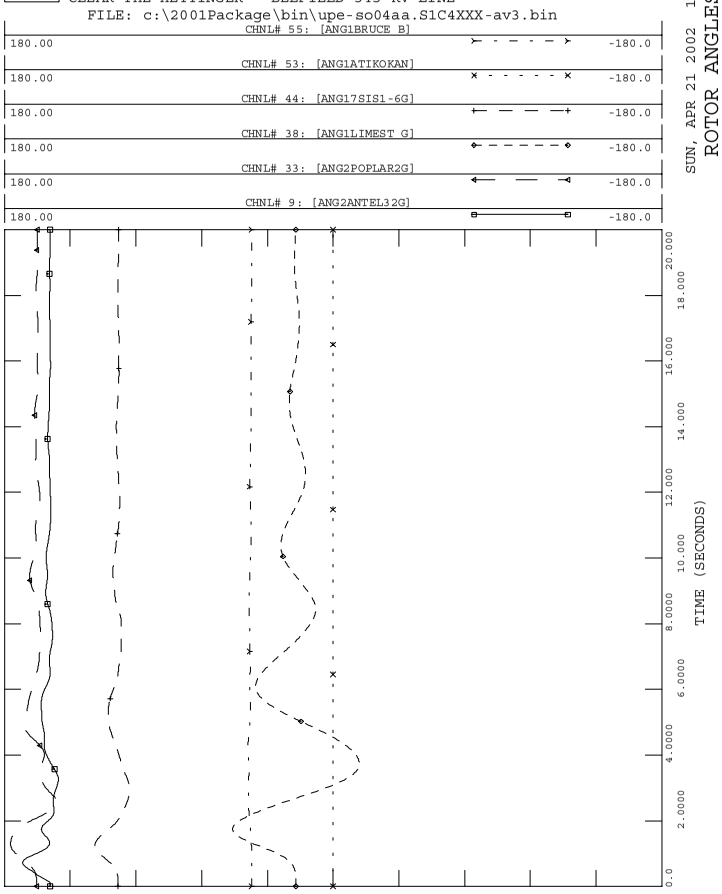
ROTOR ANGLES 5



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

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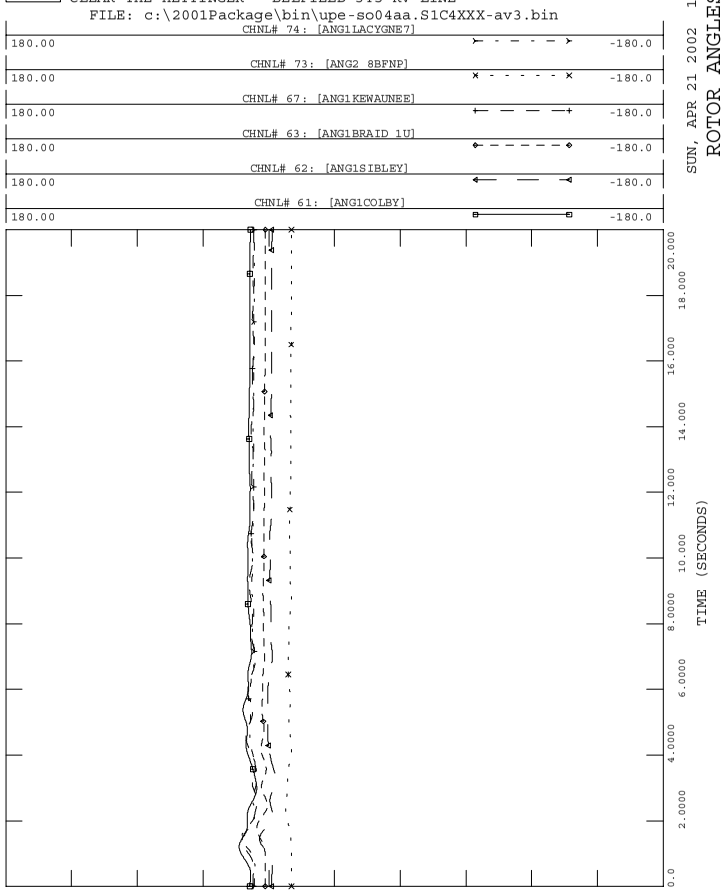
ROTOR ANGLES 7



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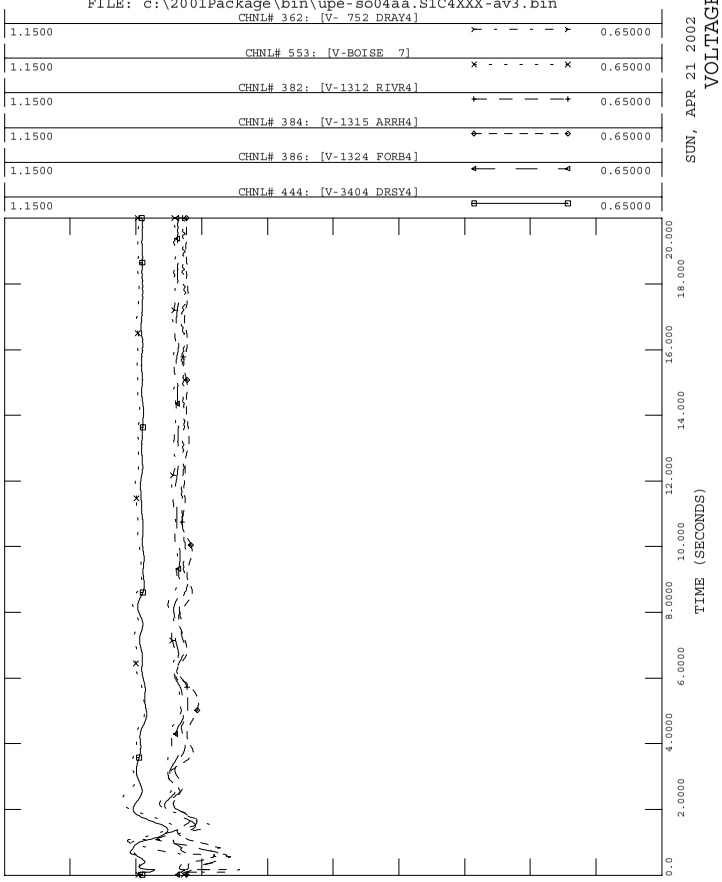
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28
VOLTAGES 1



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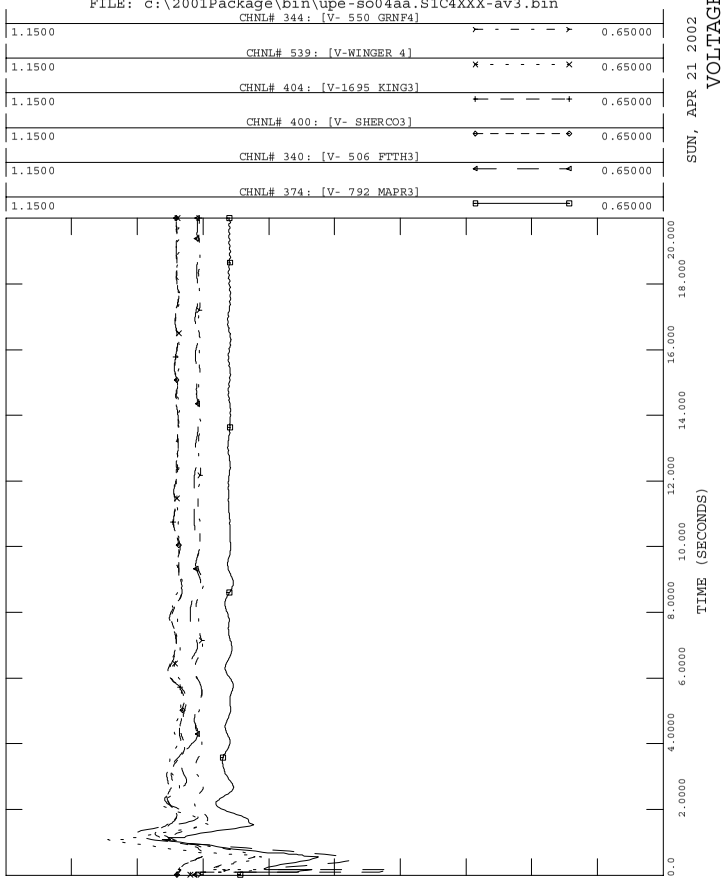
SUN, APR 21 2002 16:28
VOLTAGES 3



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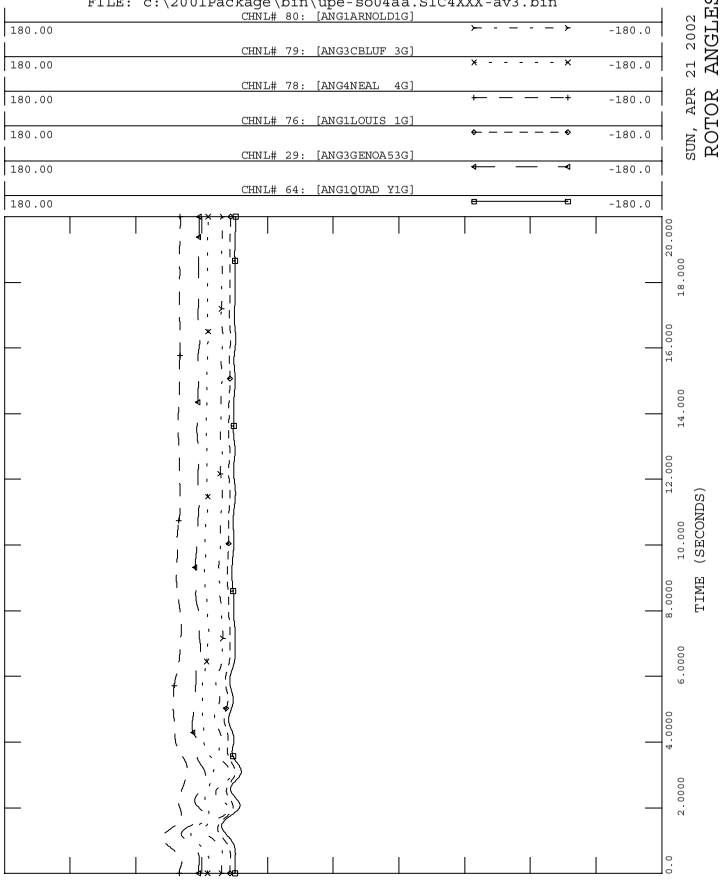
SUN, APR 21 2002 16:28
ROTOR ANGLES IA



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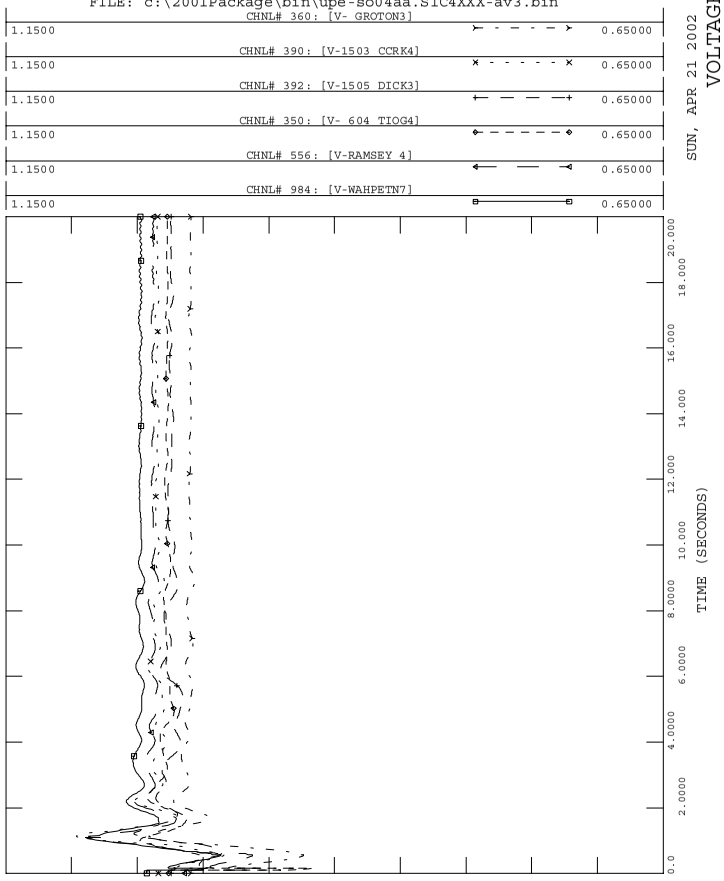
SUN, APR 21 2002 16:28
VOLTAGES 2



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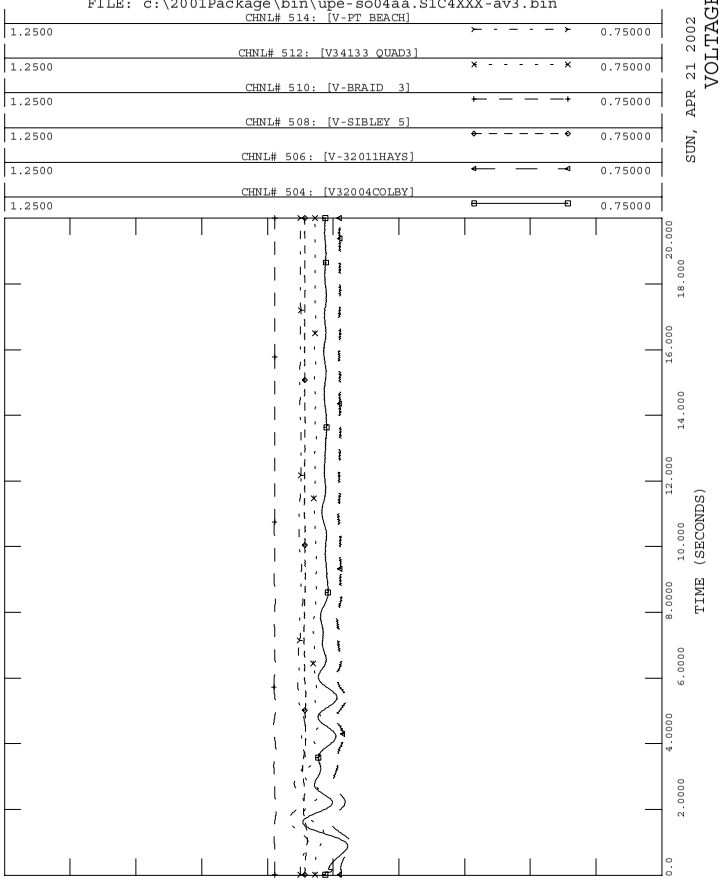
VOLTAGES 5



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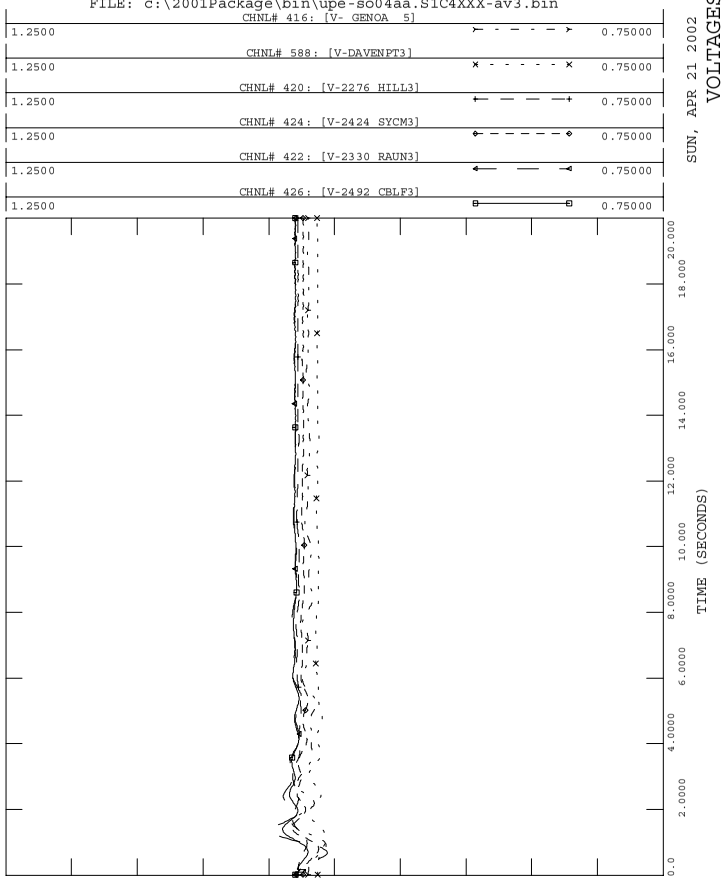
VOLTAGES IA



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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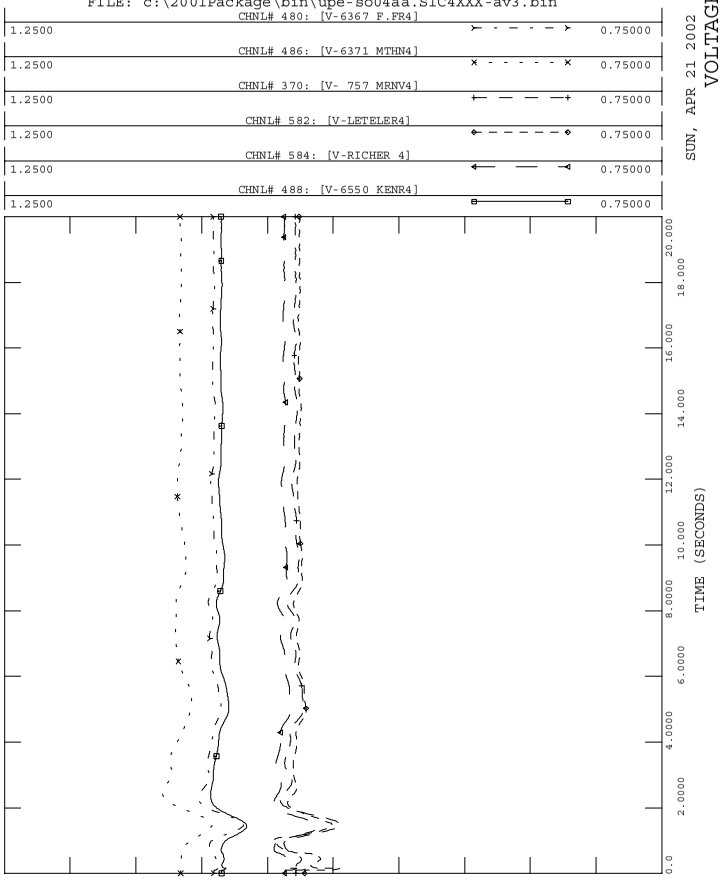
VOLTAGES 4



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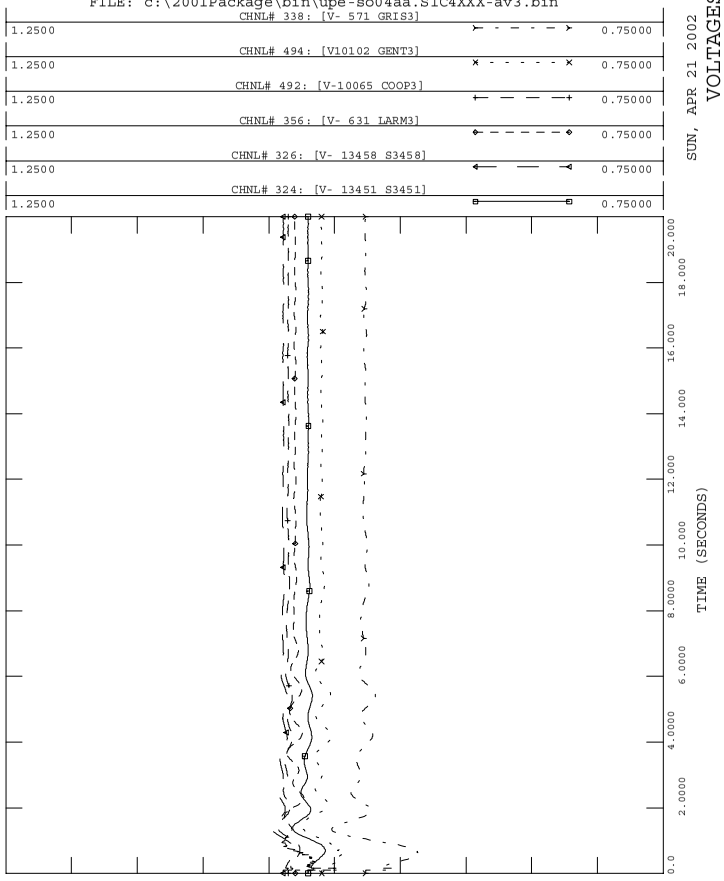
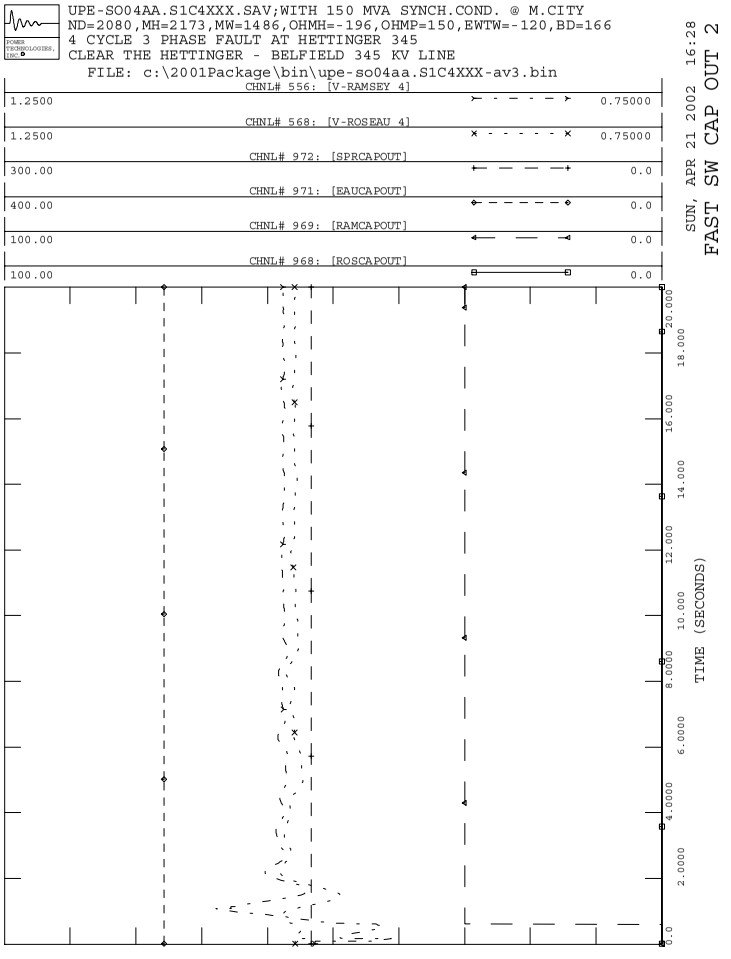
VOLTAGES NB

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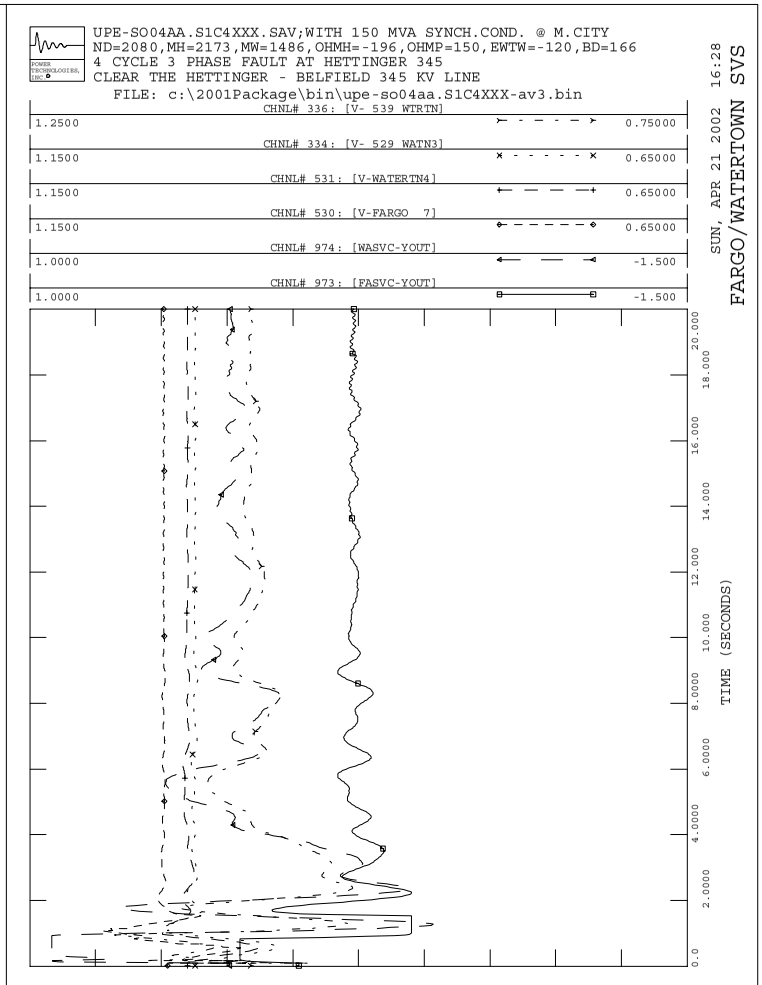
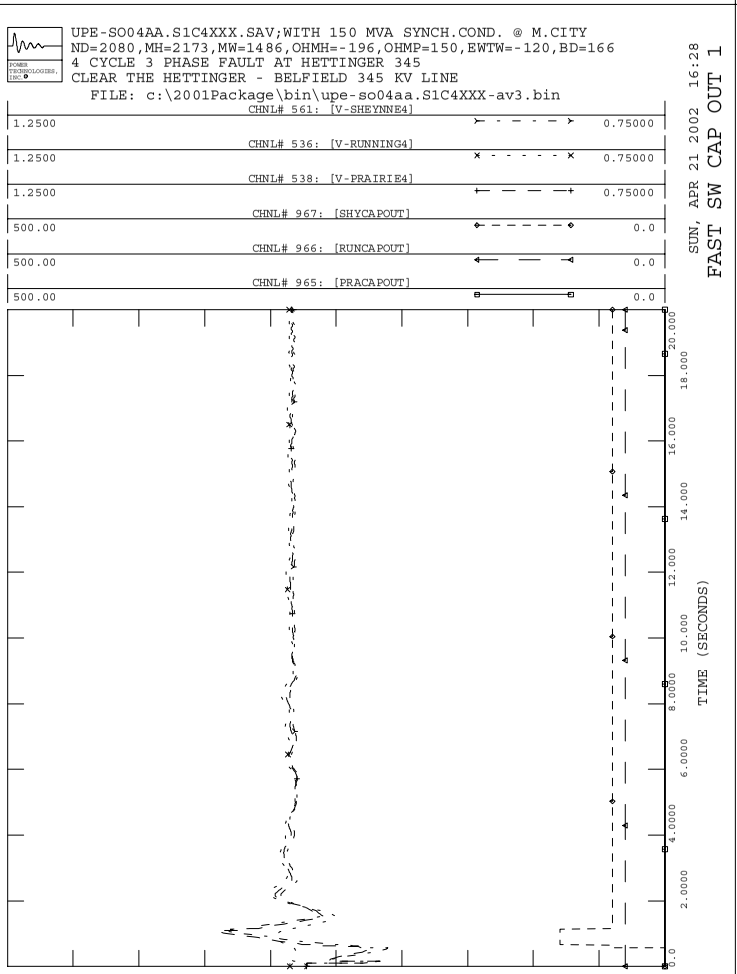
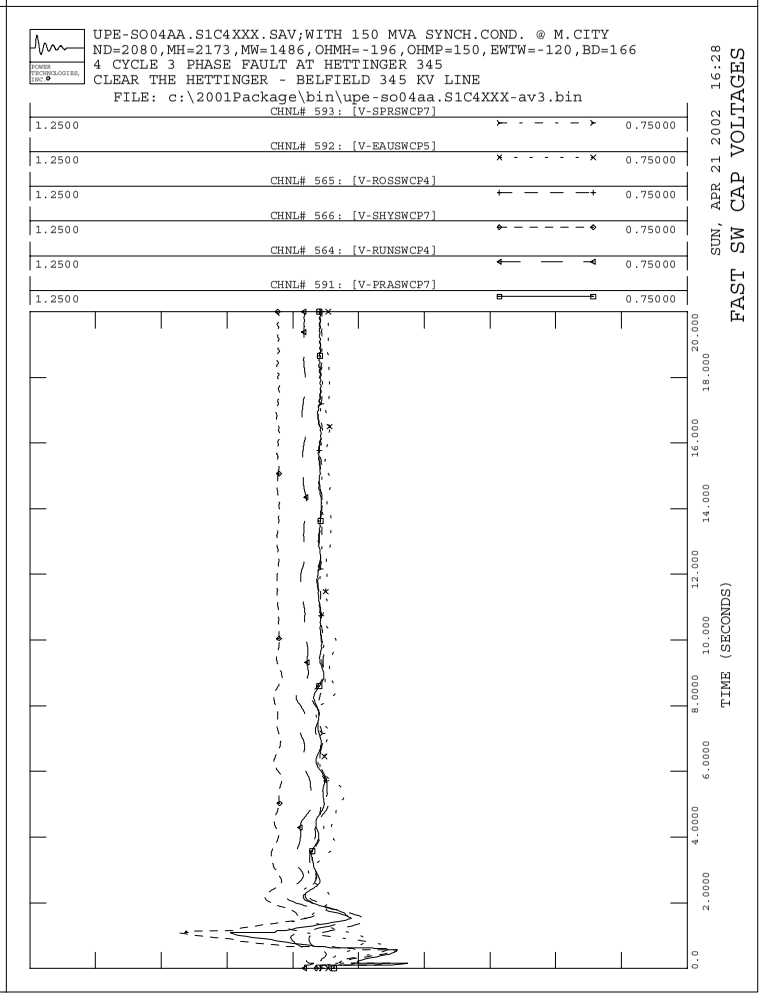
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
SUN, APR 21 2002 16:28
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
SUN, APR 21 2002 16:28
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
SUN, APR 21 2002 16:28
FAST SW CAP OUT 1
TIME (SECONDS)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ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
SUN, APR 21 2002 16:28
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
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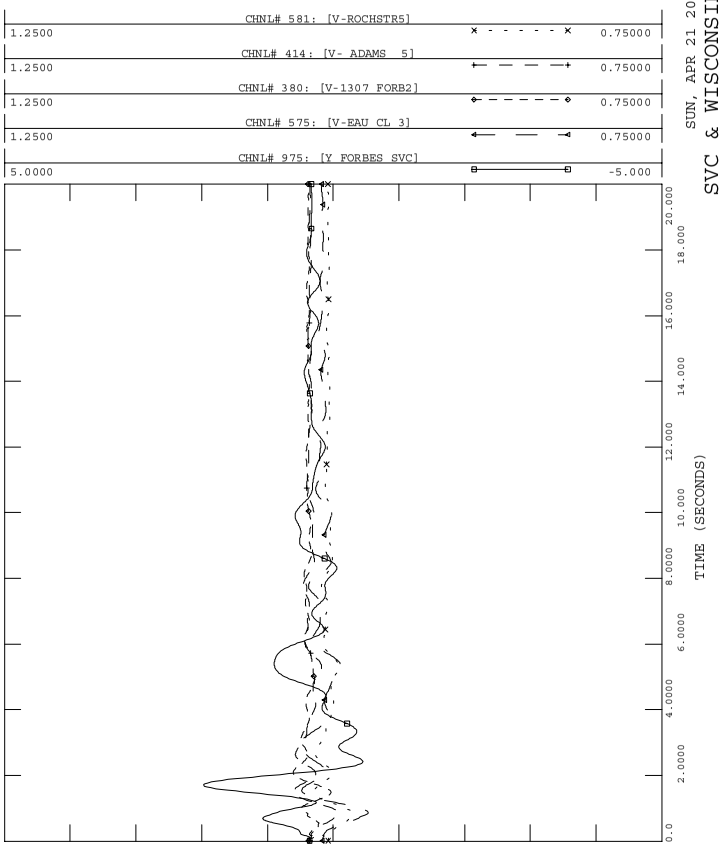
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28

SVC & WISCONSIN VOLT



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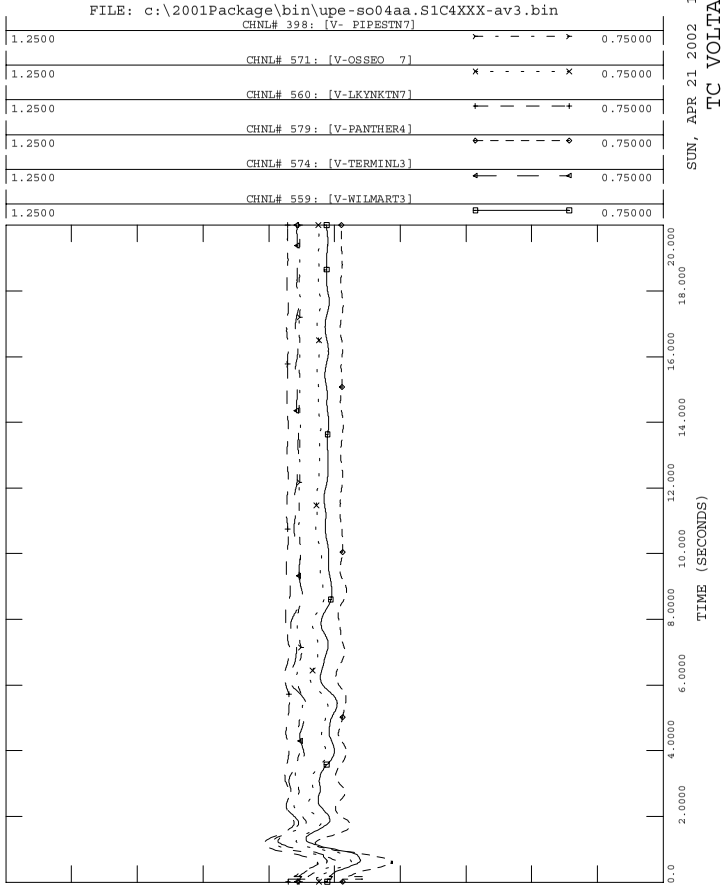
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28

TC VOLTAGES



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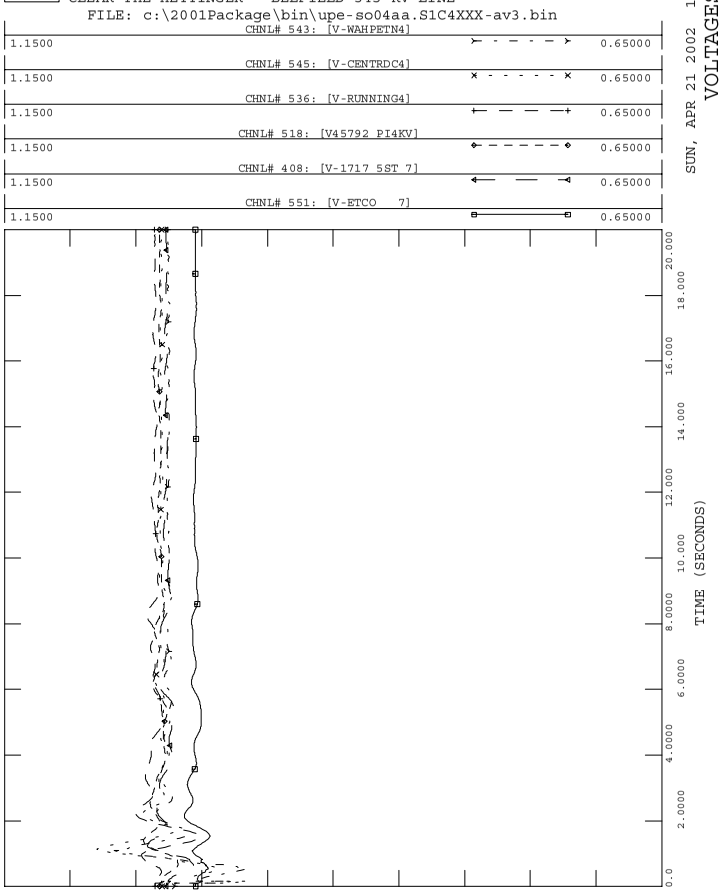
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28

VOLTAGES 6



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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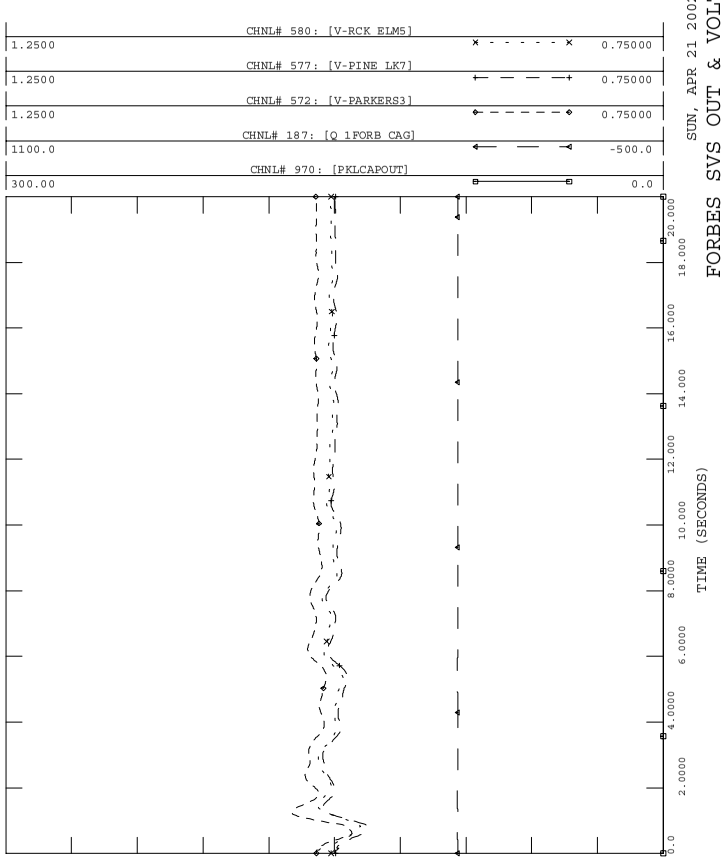
SUN, APR 21 2002 16:28

FORBES SVS OUT & VOLTAGES



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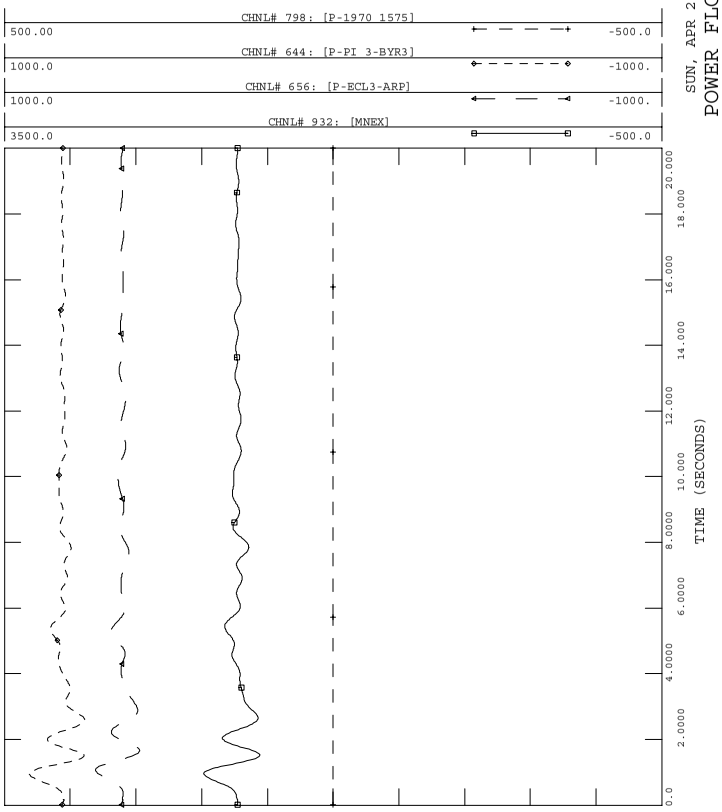
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28
POWER FLOW SUMS 2



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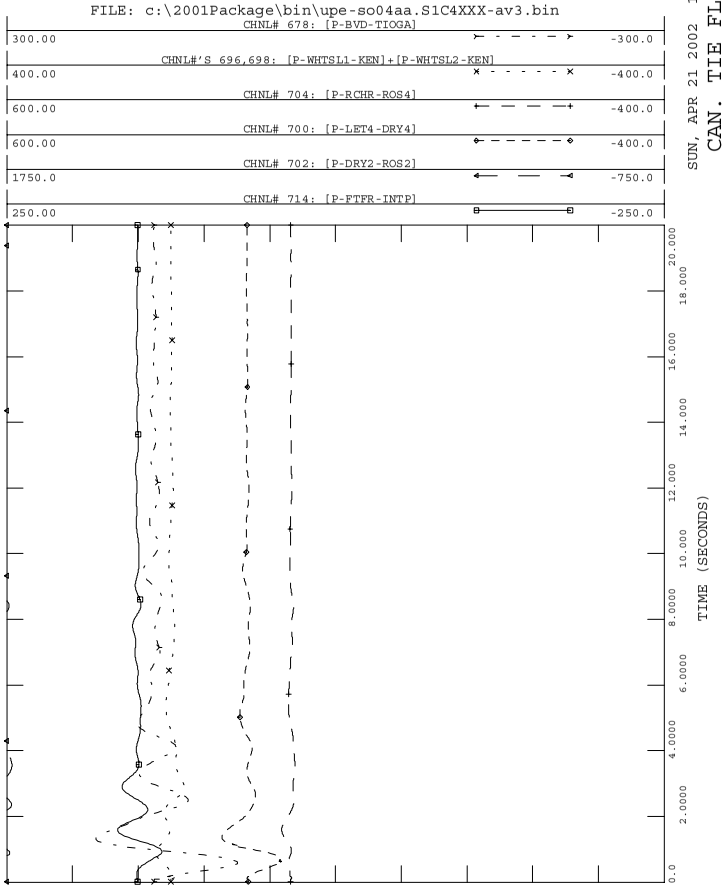
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28
CAN. TIE FLOWS



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
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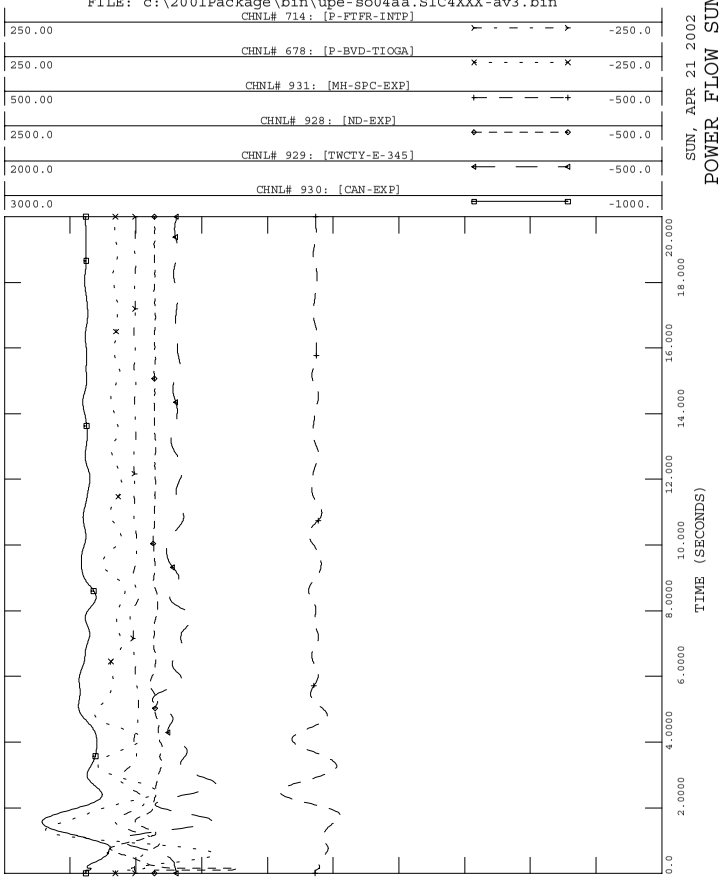
SUN, APR 21 2002 16:28
POWER FLOW SUMS 1



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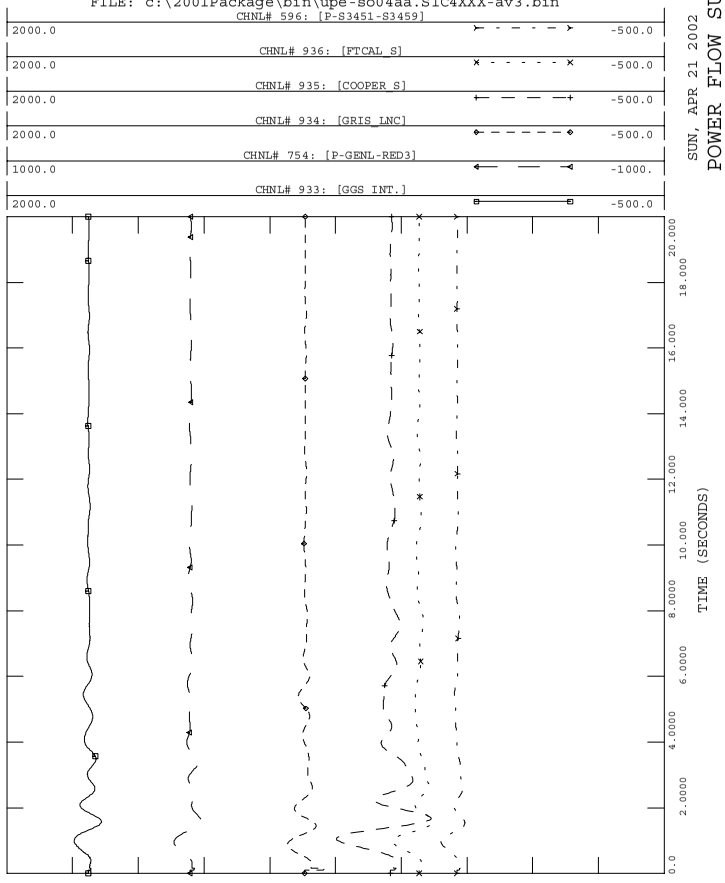
SUN, APR 21 2002 16:28
POWER FLOW SUM 3



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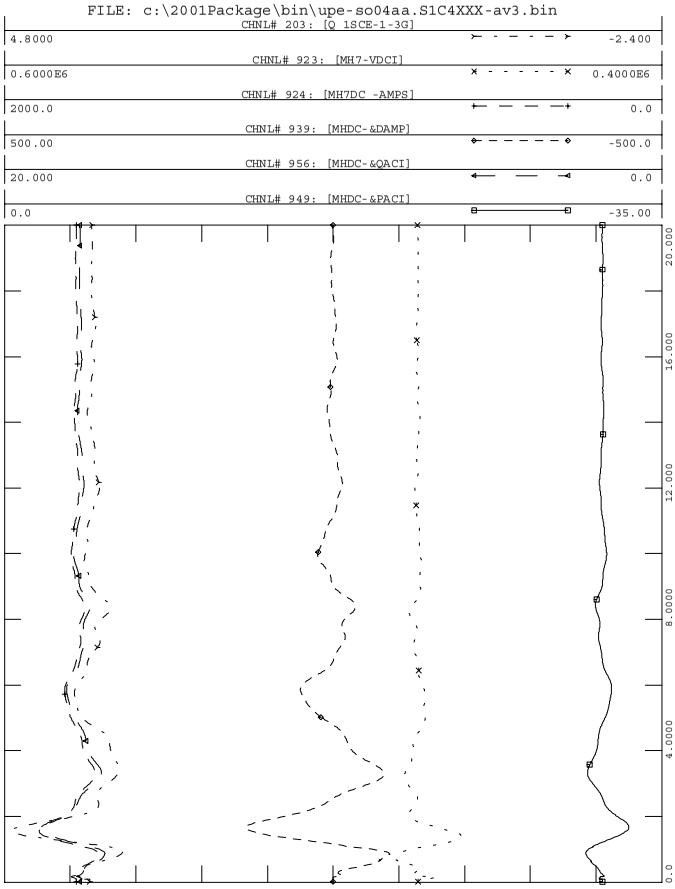
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28
MH DC PARAMETERS



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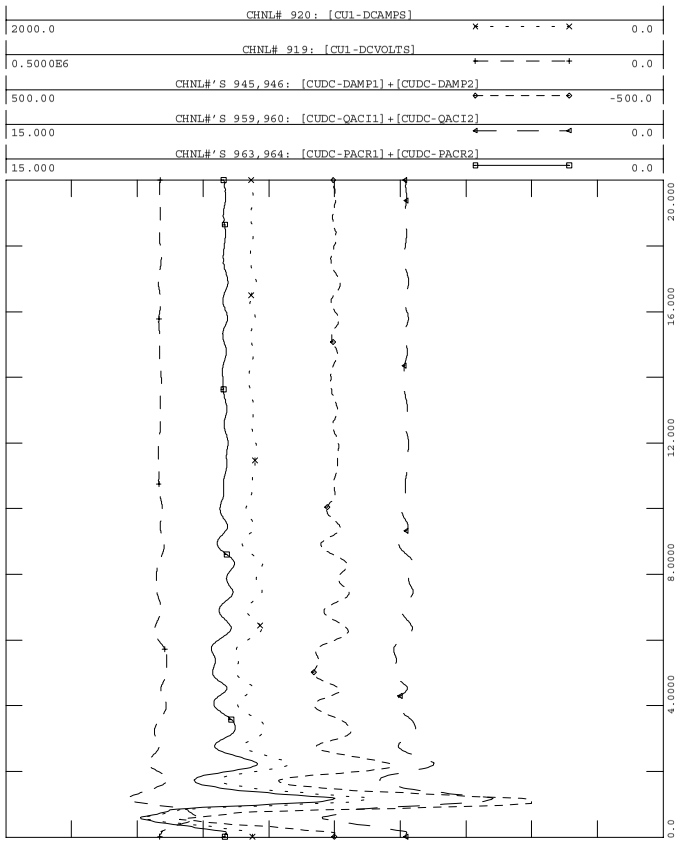
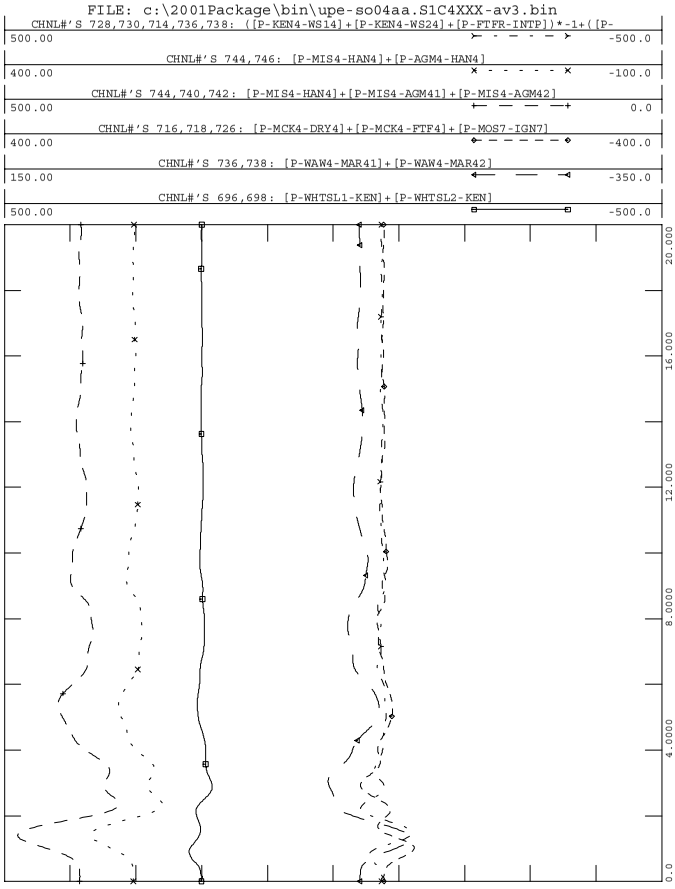
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28
CU DC #1



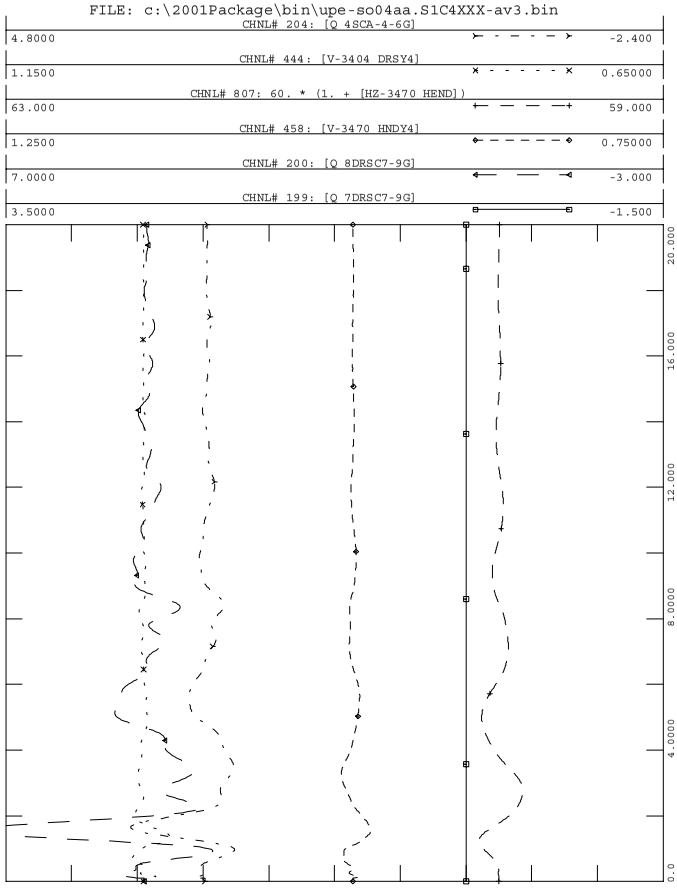
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28
OH TIE FLOWS



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

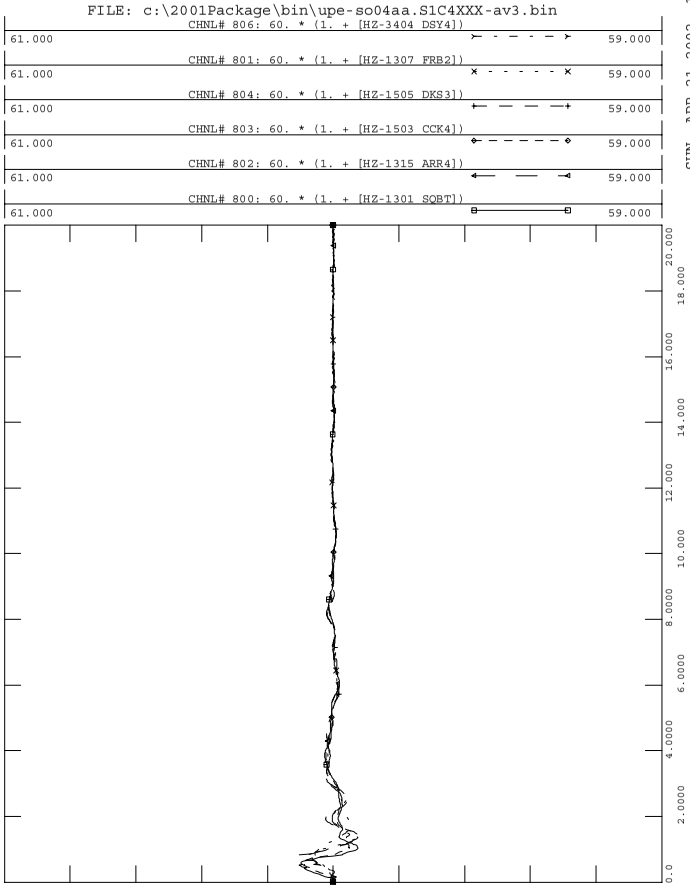
SUN, APR 21 2002 16:28
MH DC PARAMETERS



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28

FREQ AT DC TERMINALS



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

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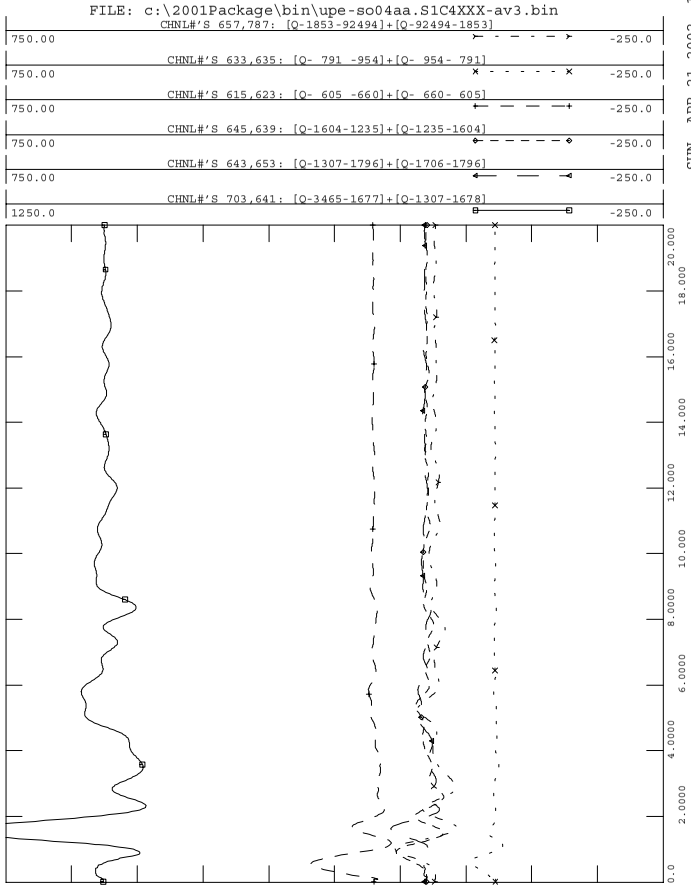
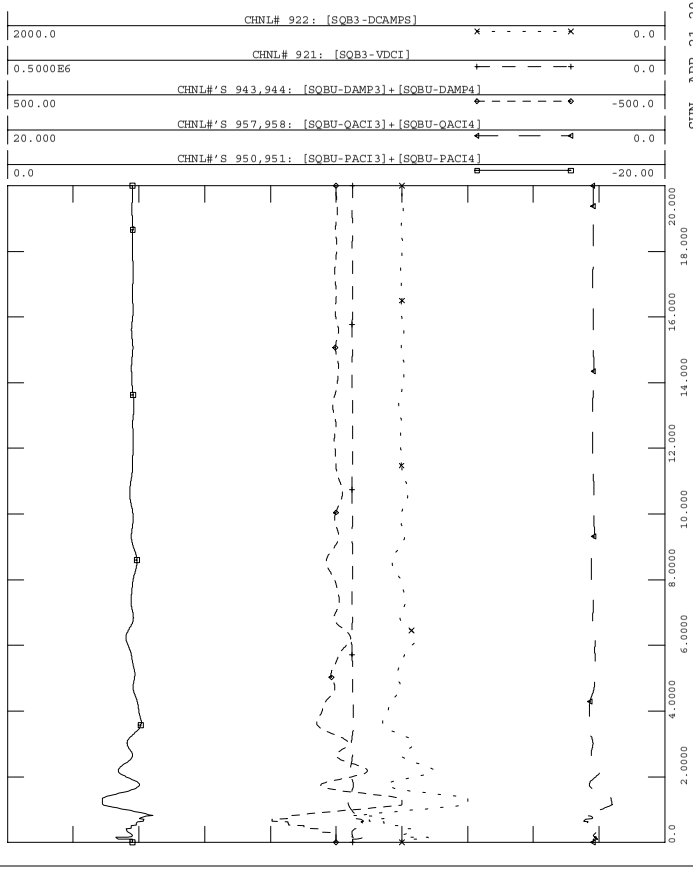
VAR LOSSES



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28

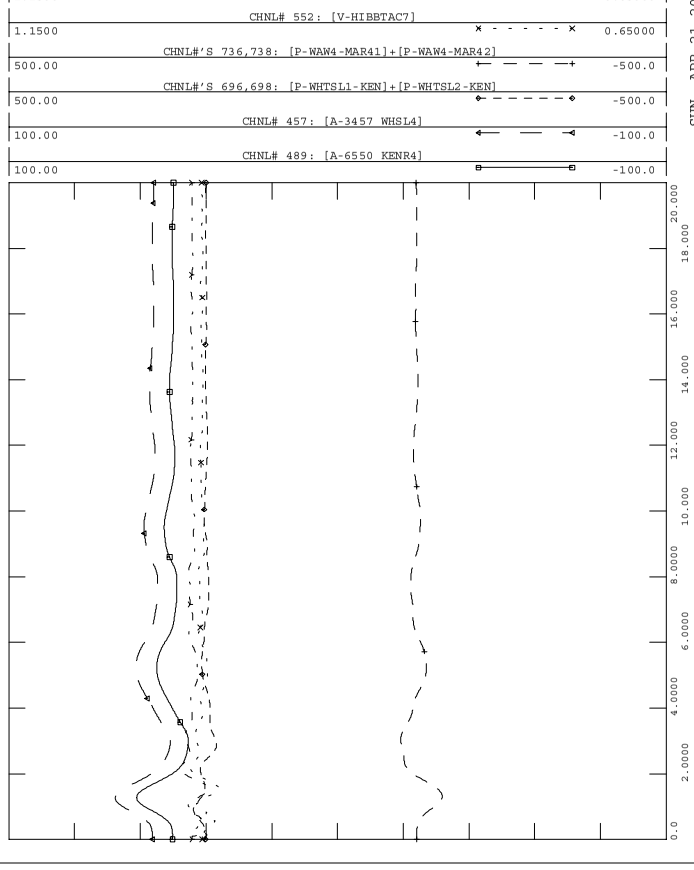
SQB DC #3



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28

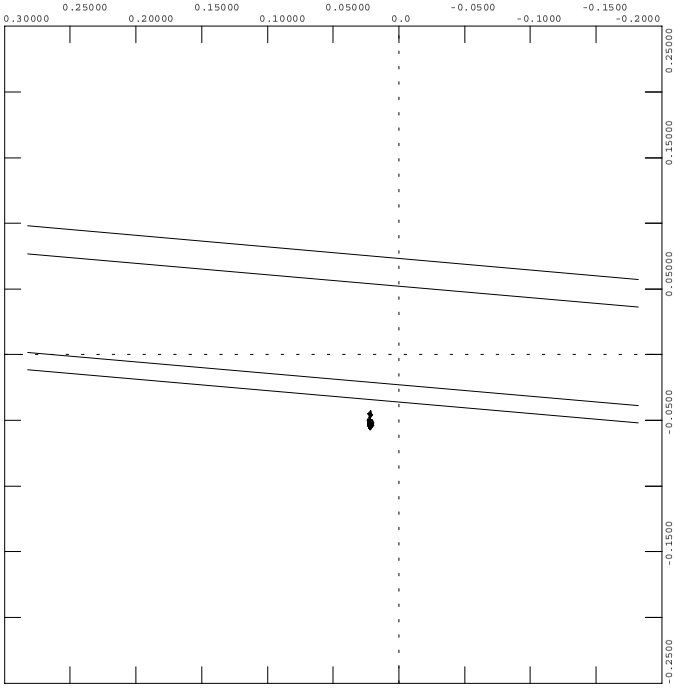
VOLTAGES, ANGLES



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

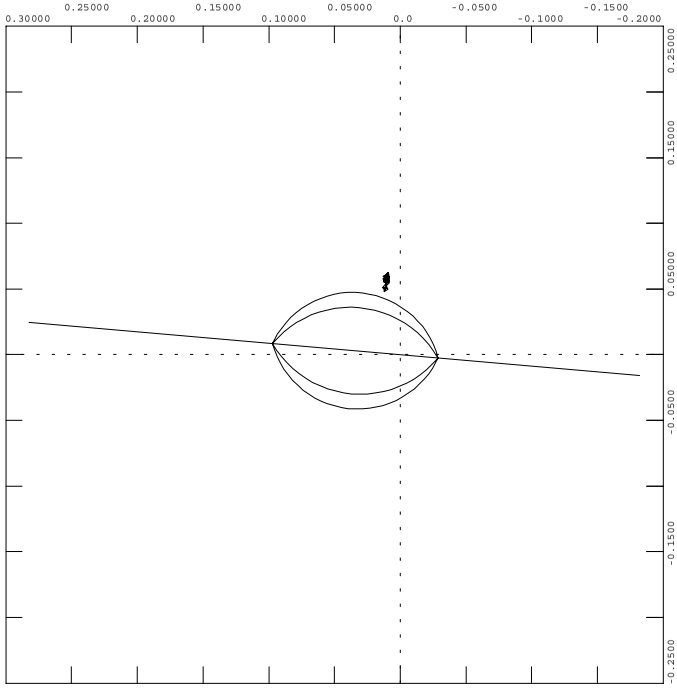


SUN, APR 21 2002 16:28
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

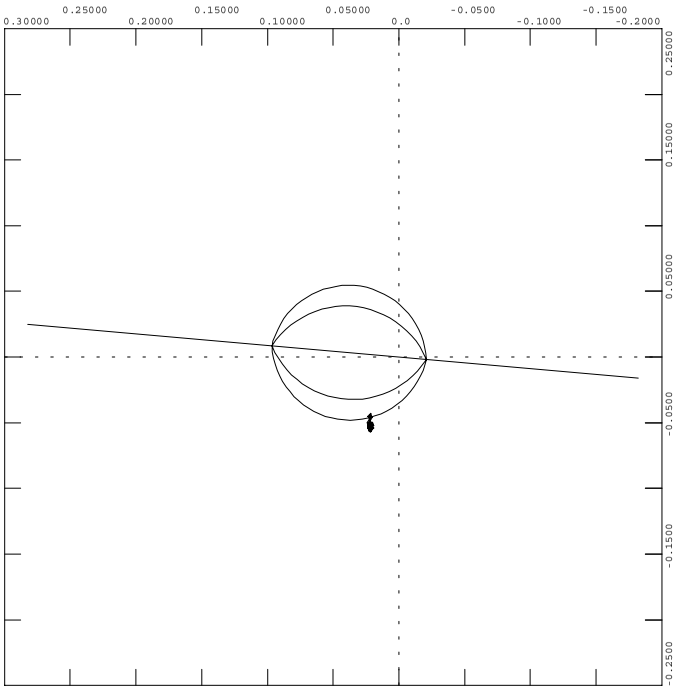


SUN, APR 21 2002 16:28
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

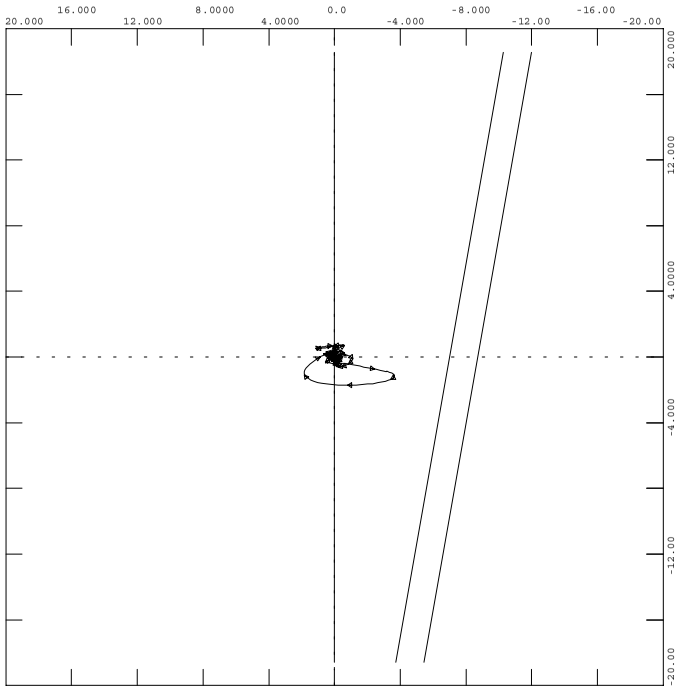


SUN, APR 21 2002 16:28
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

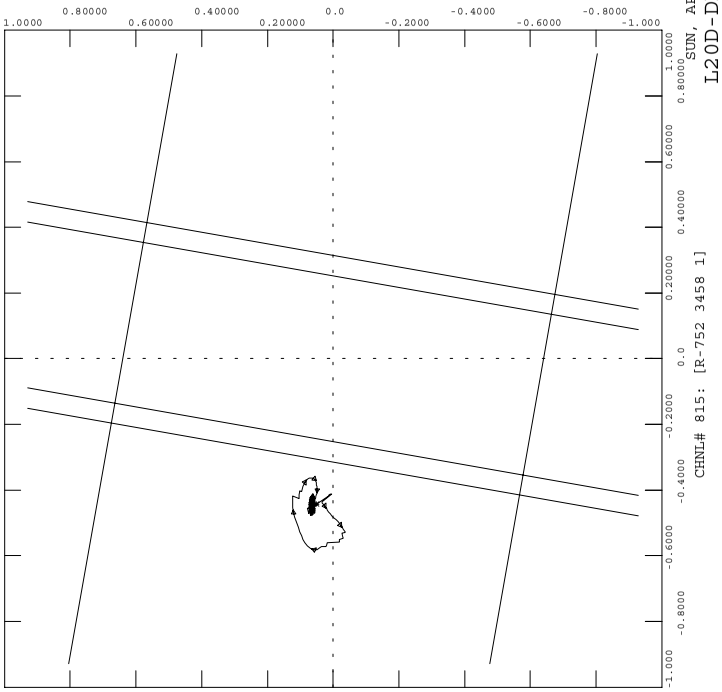


SUN, APR 21 2002 16:28
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

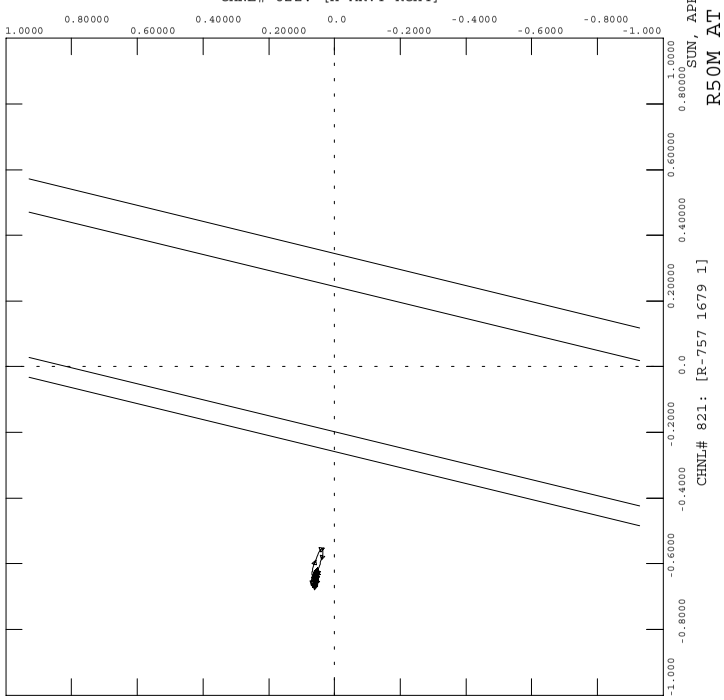
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

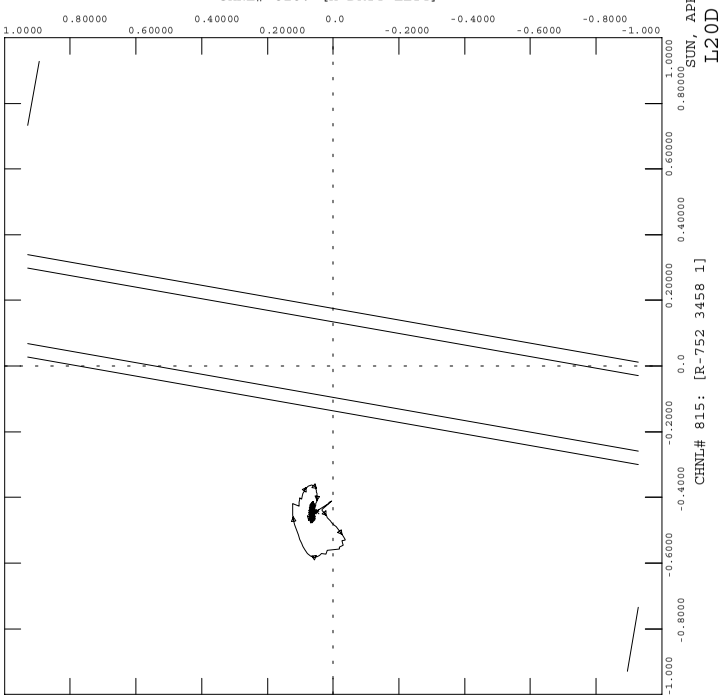
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

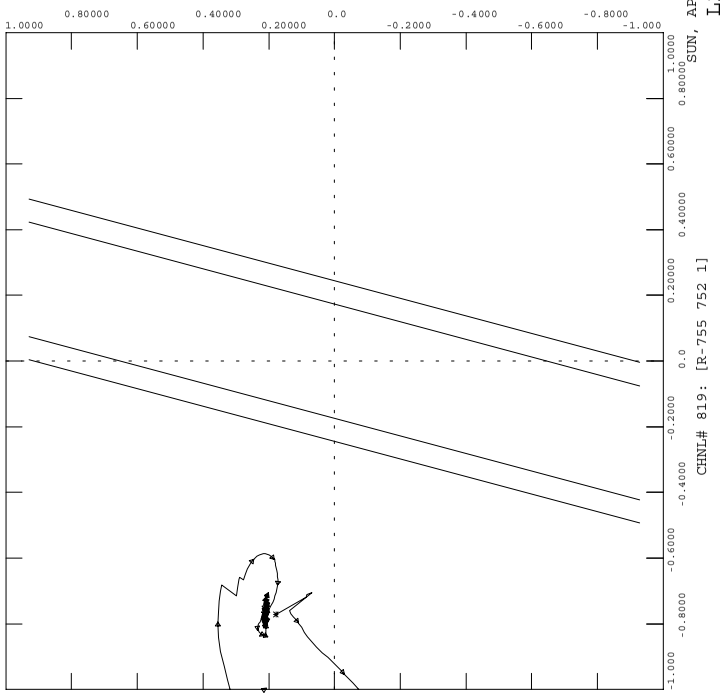
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

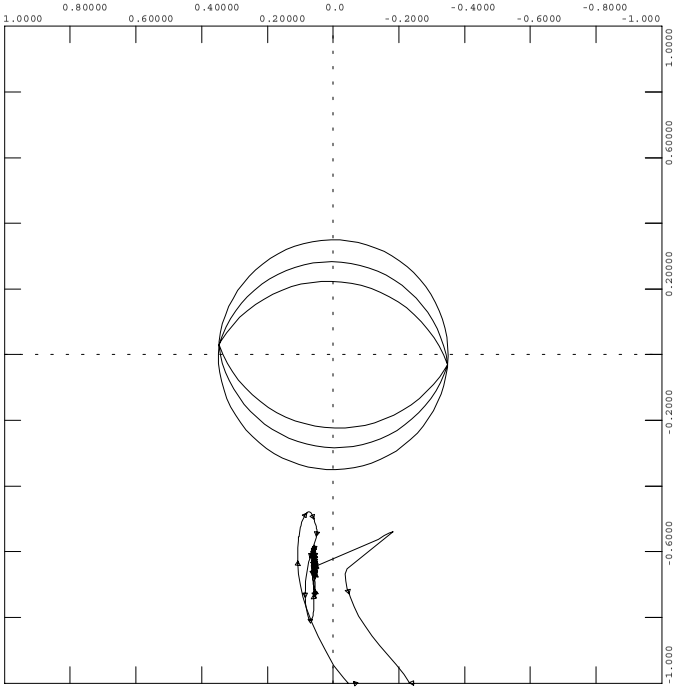
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

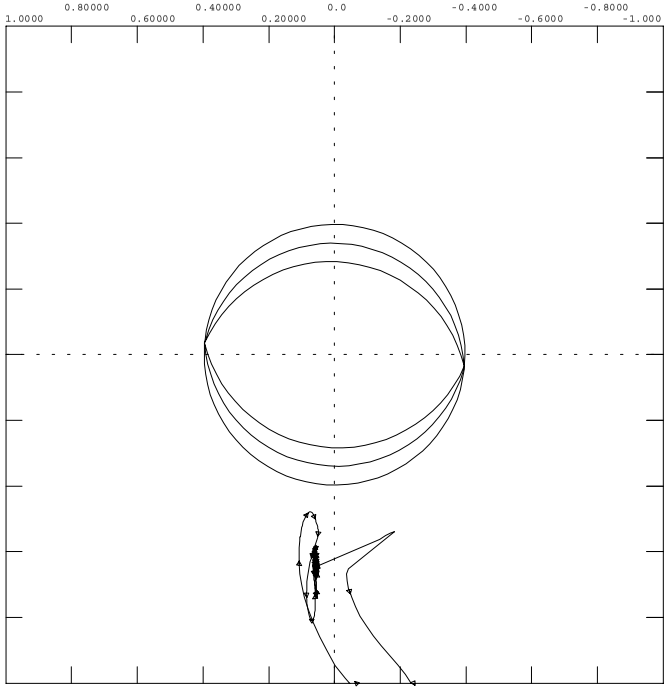
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

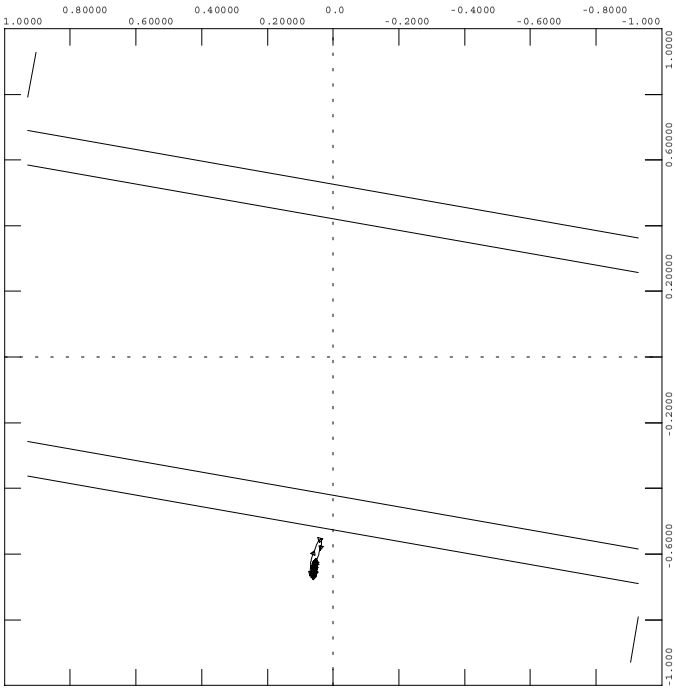
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

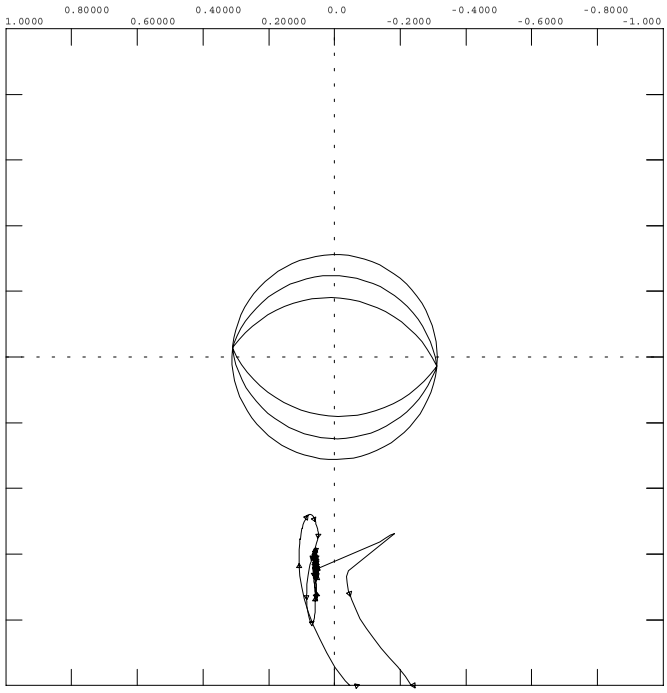
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



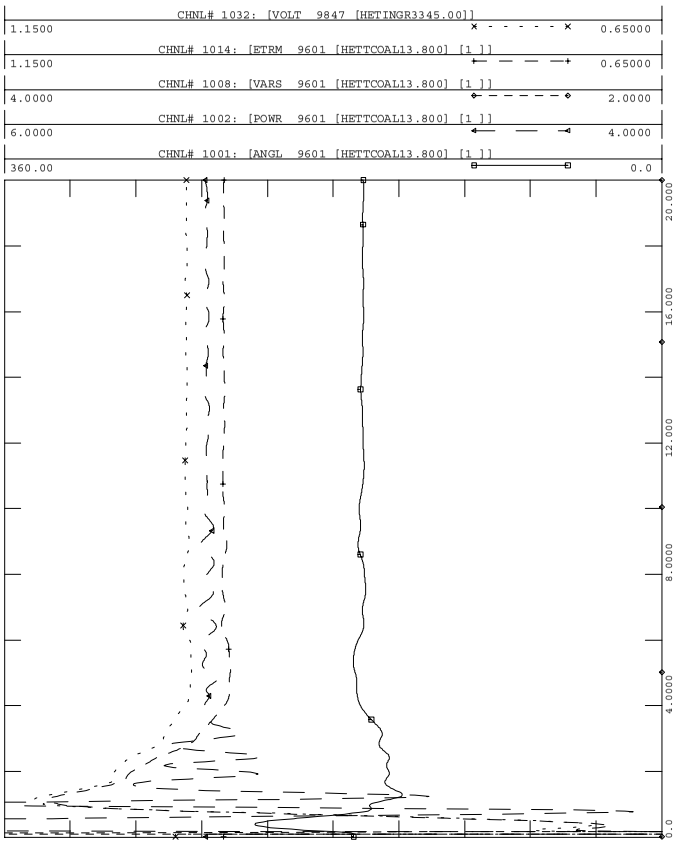
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

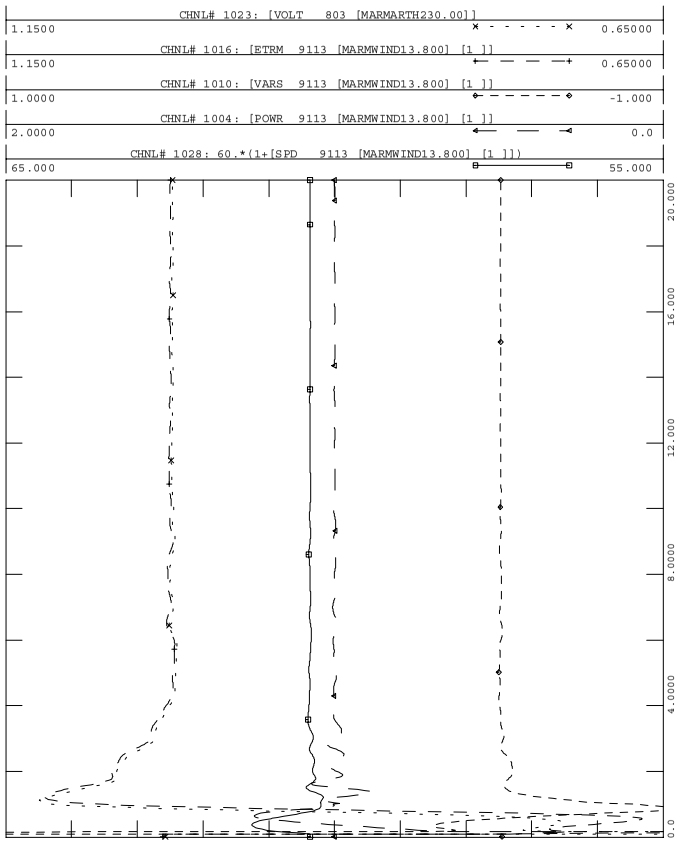


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin



SUN, APR 21 2002 16:28
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

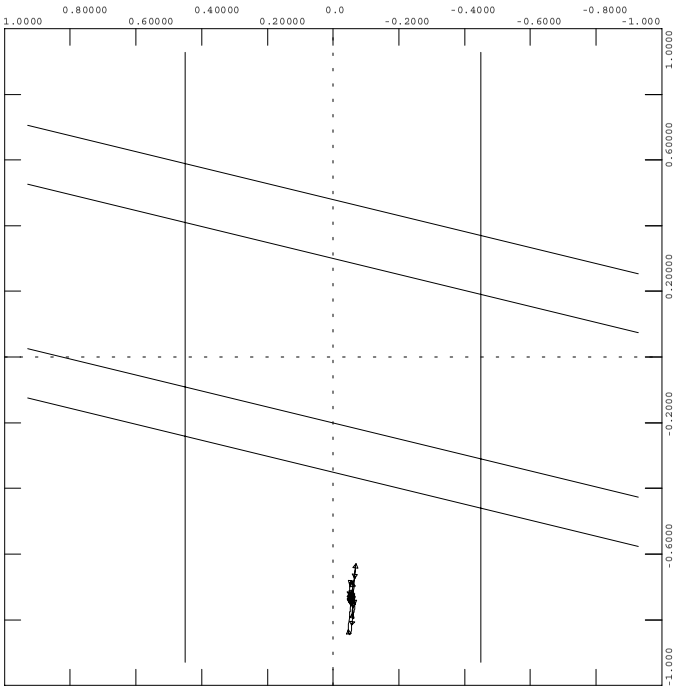


SUN, APR 21 2002 16:28
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

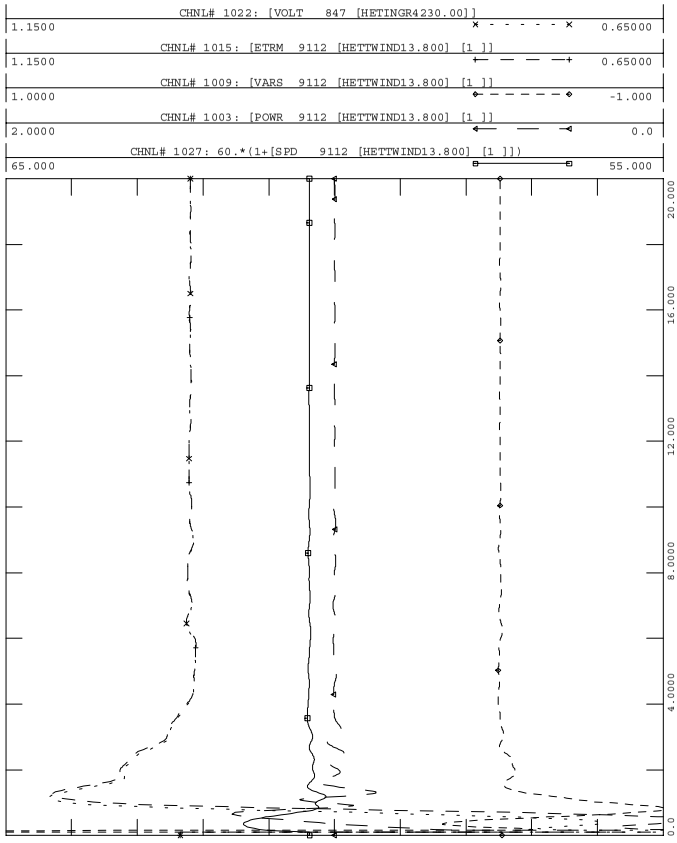
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



SUN, APR 21 2002 16:28
MP-OH I.FALLS (779)

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

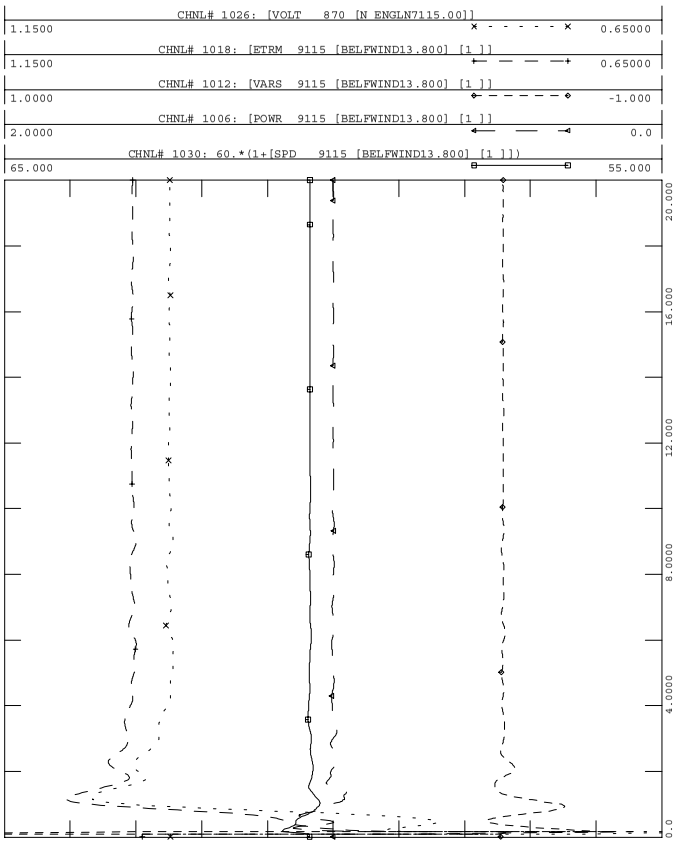


SUN, APR 21 2002 16:28
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28

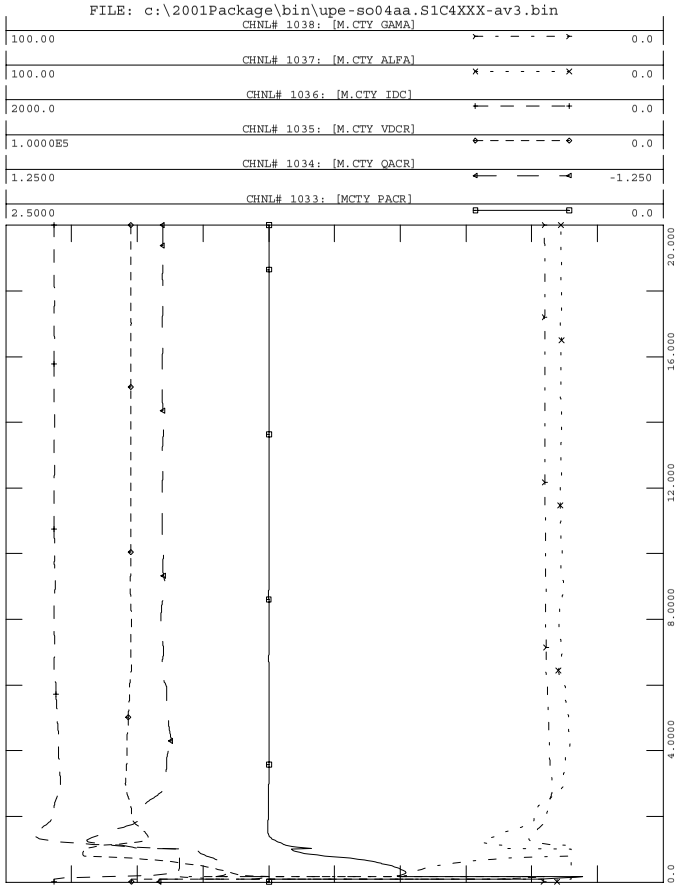
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28

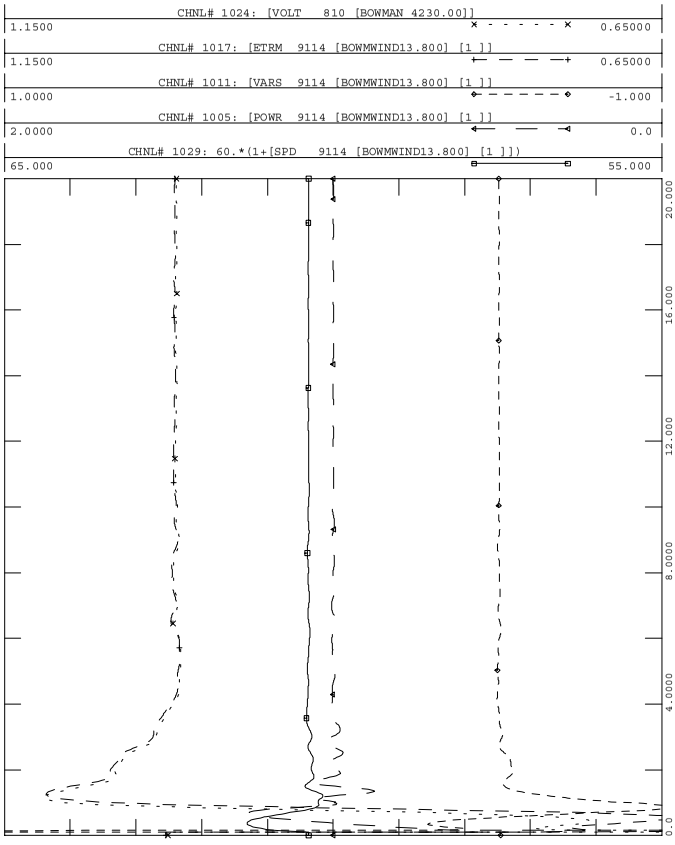
M.CTY 4 X 150 MW HVDC



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28

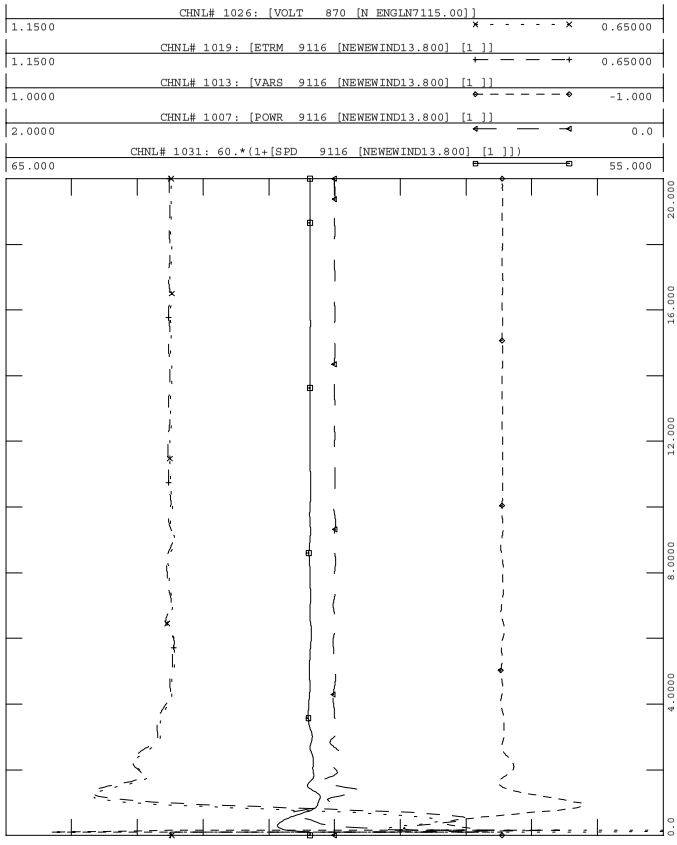
BOWMAN 100MW WIND UNIT



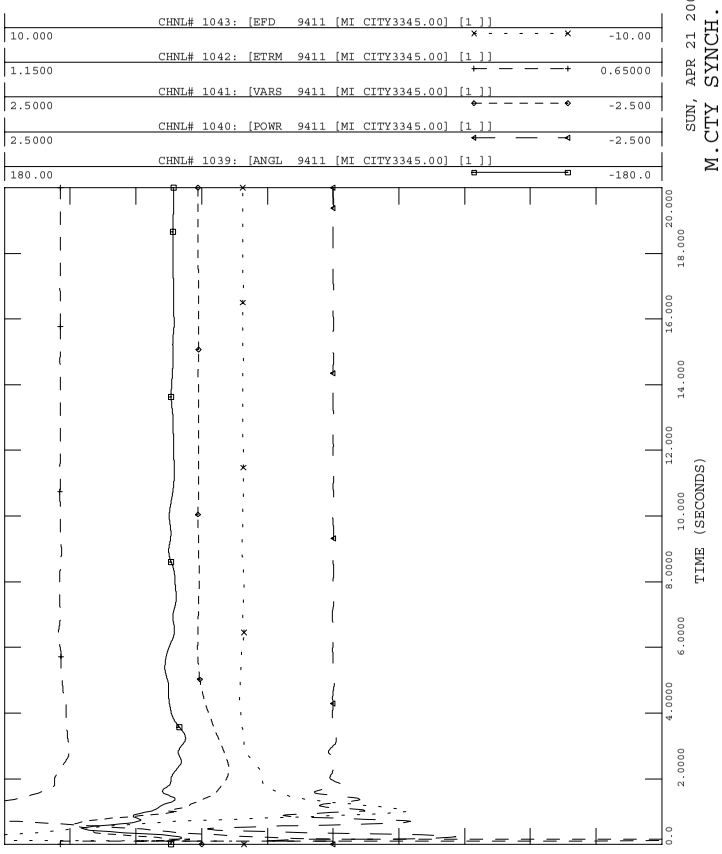
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

SUN, APR 21 2002 16:28

NEW E. 100MW WIND UNIT



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-av3.bin

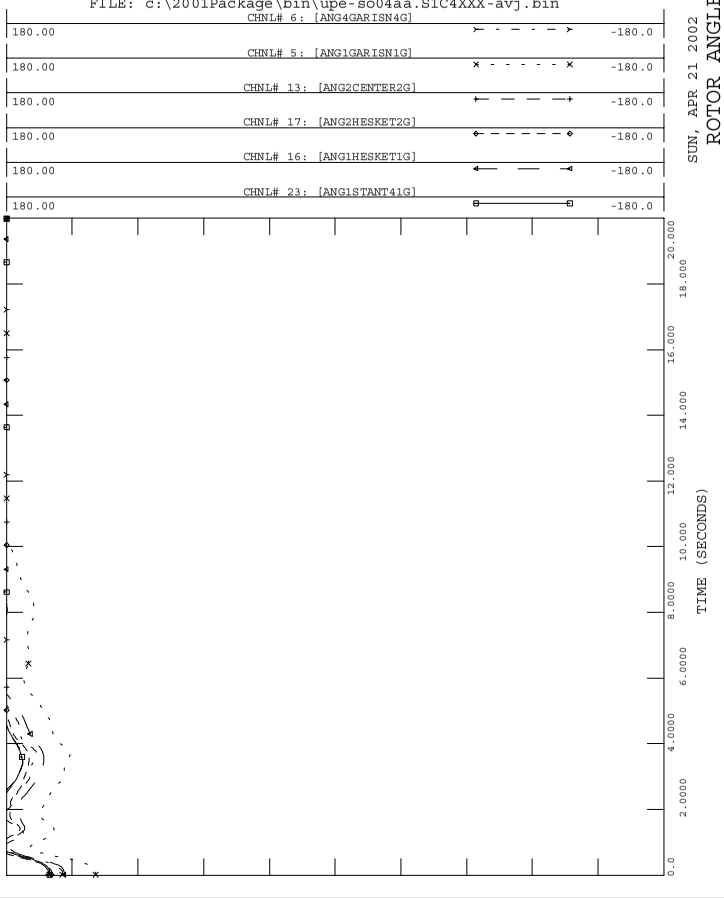


SUN, APR 21 2002 16:28
M.CITY SYNCH. COND.

CONTINGENCY AVJ

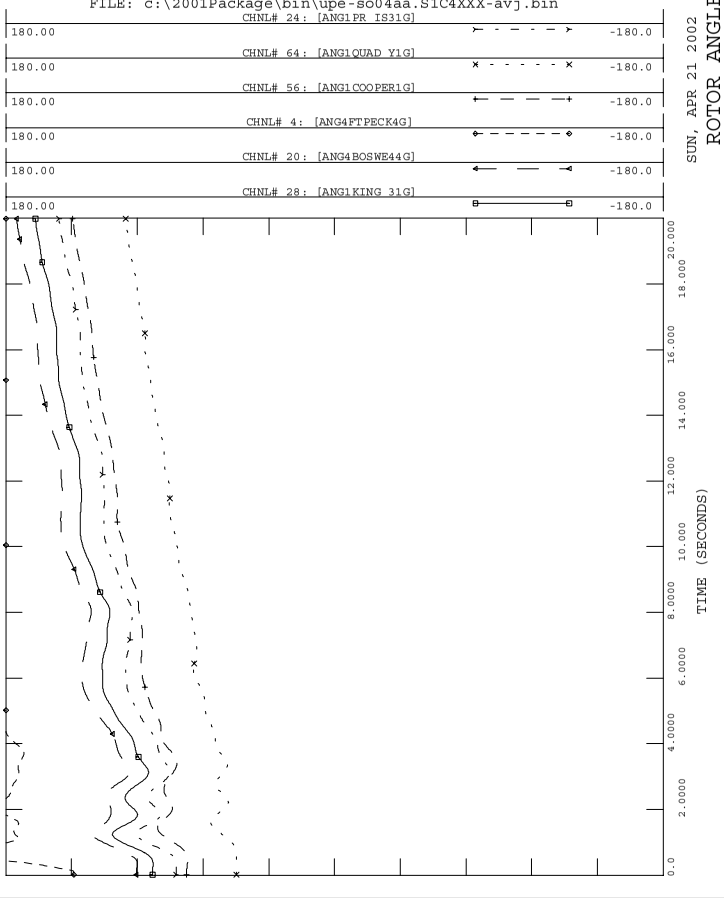
4 cycle 3 phase fault @Hettinger 345 on Hettinger-M.Cty 345 kV.
Trip Miles City 345 kV 12 cyc after fault inception

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin



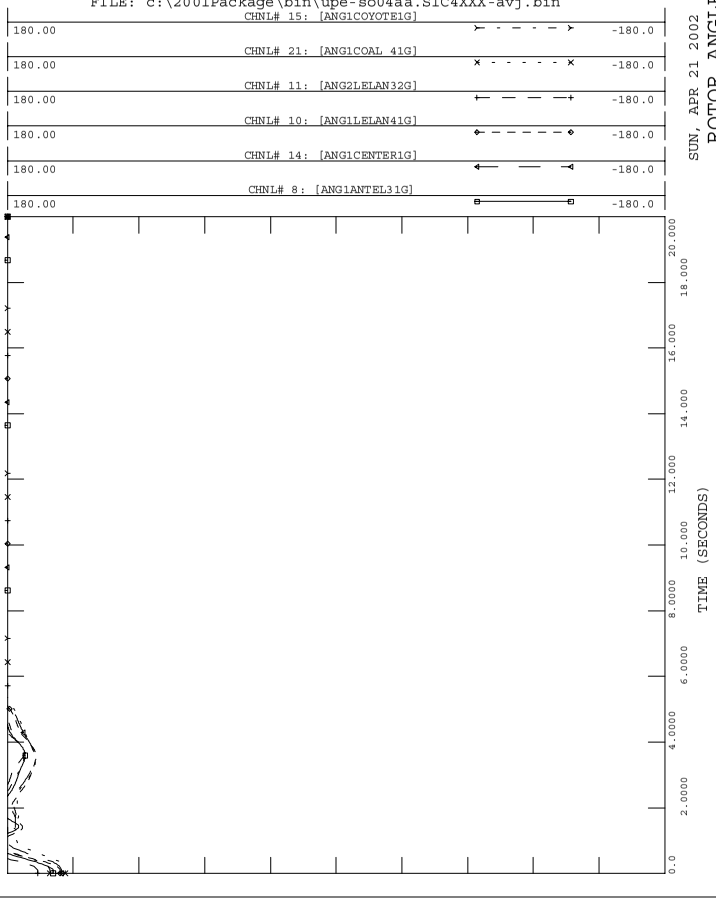
SUN, APR 21 2002 11:51
ROTOR ANGLES 2

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin



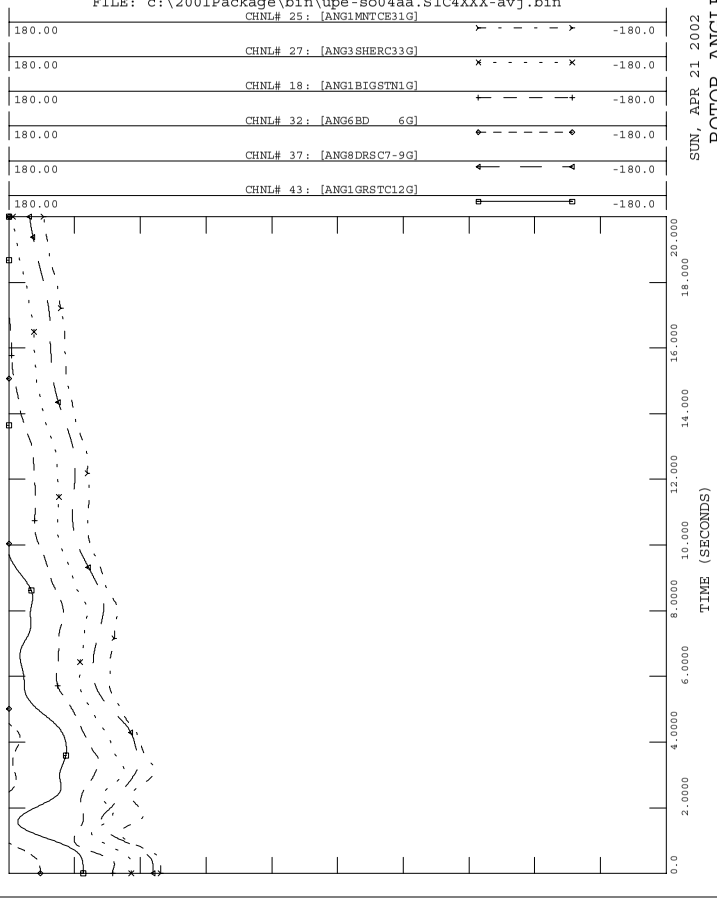
SUN, APR 21 2002 11:51
ROTOR ANGLES 4

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

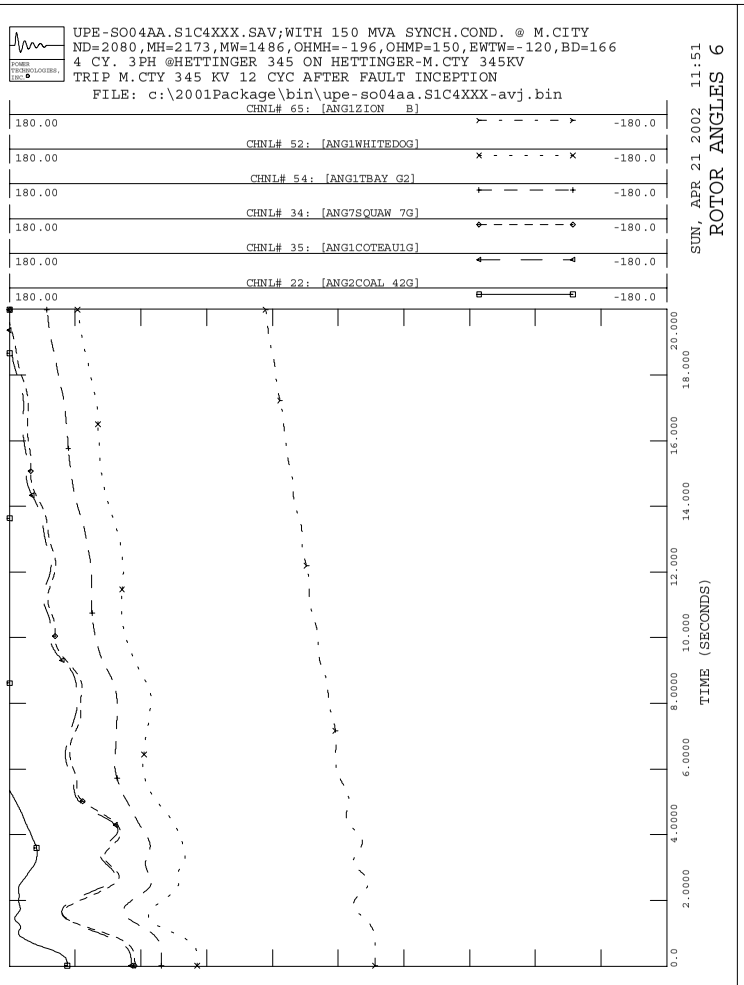


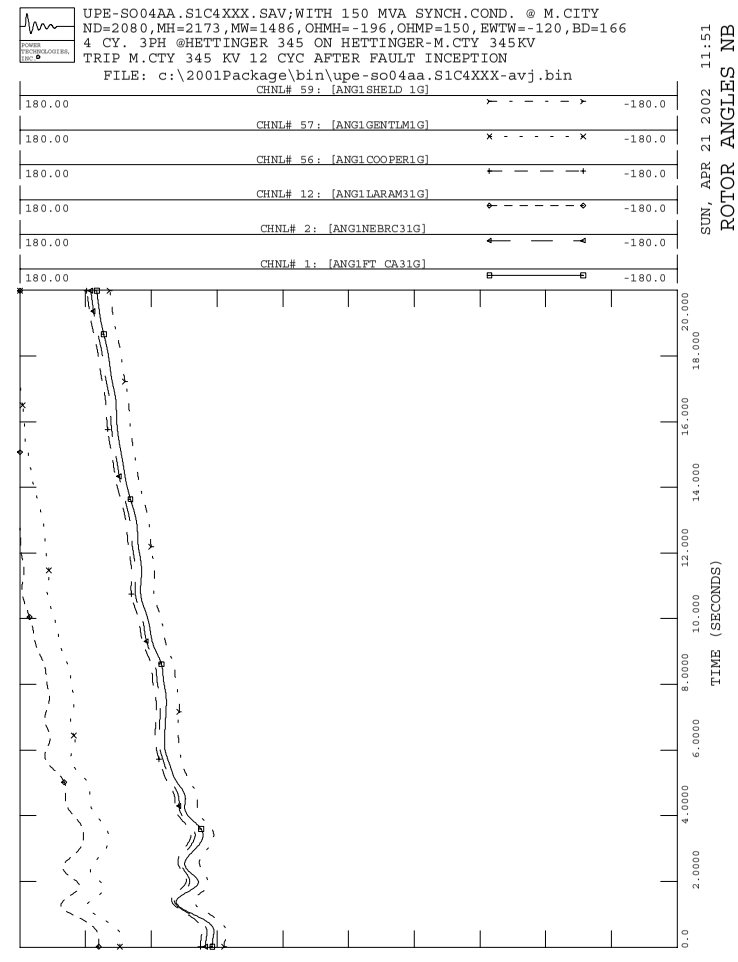
SUN, APR 21 2002 11:51
ROTOR ANGLES 1

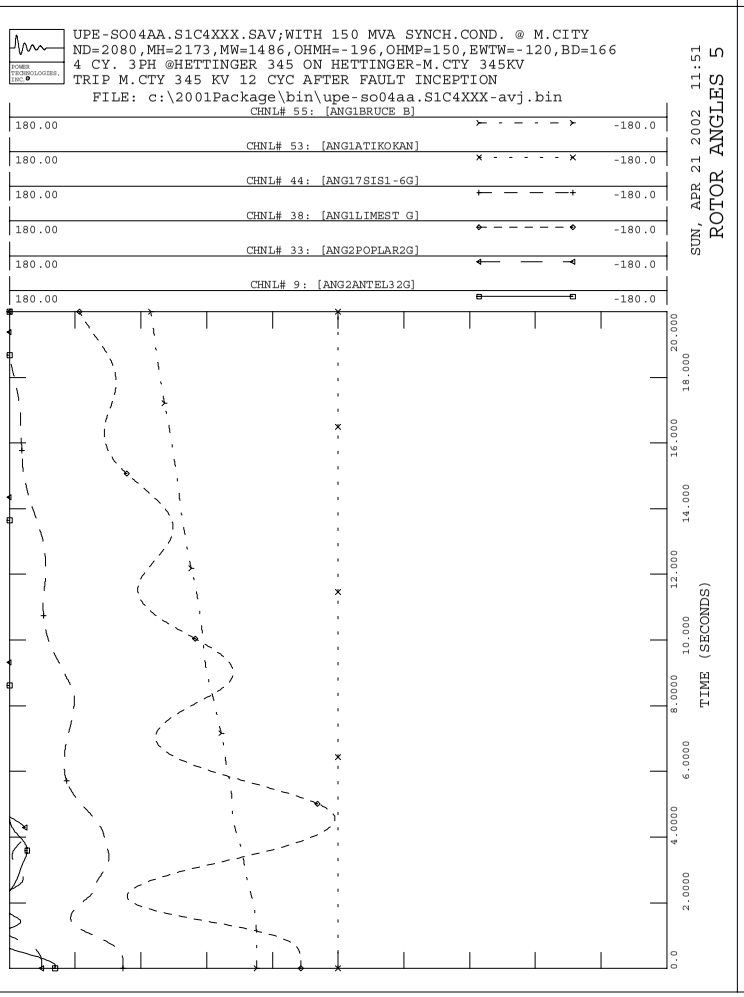
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

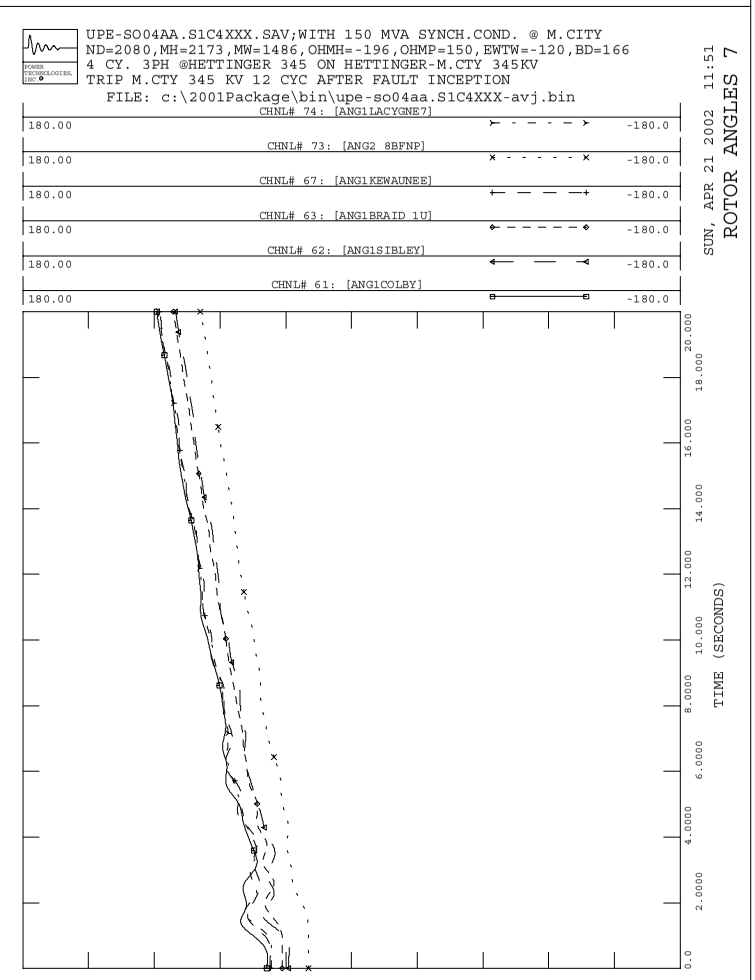


SUN, APR 21 2002 11:51
ROTOR ANGLES 3


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
SUN, APR 21 2002 11:51
ROTOR ANGLES 6

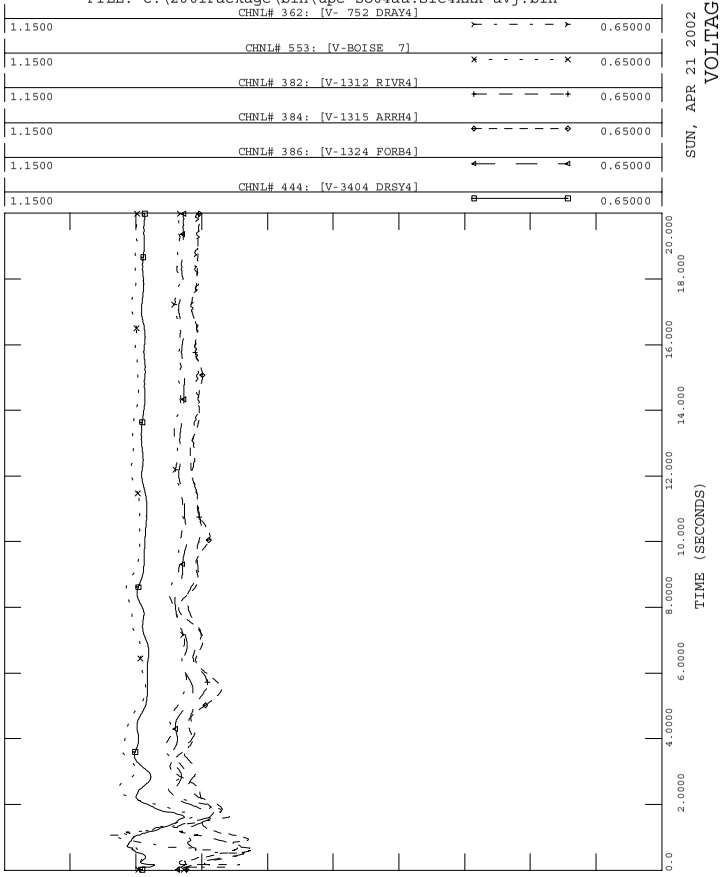

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
SUN, APR 21 2002 11:51
ROTOR ANGLES NB


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
SUN, APR 21 2002 11:51
ROTOR ANGLES 5


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
SUN, APR 21 2002 11:51
ROTOR ANGLES 7

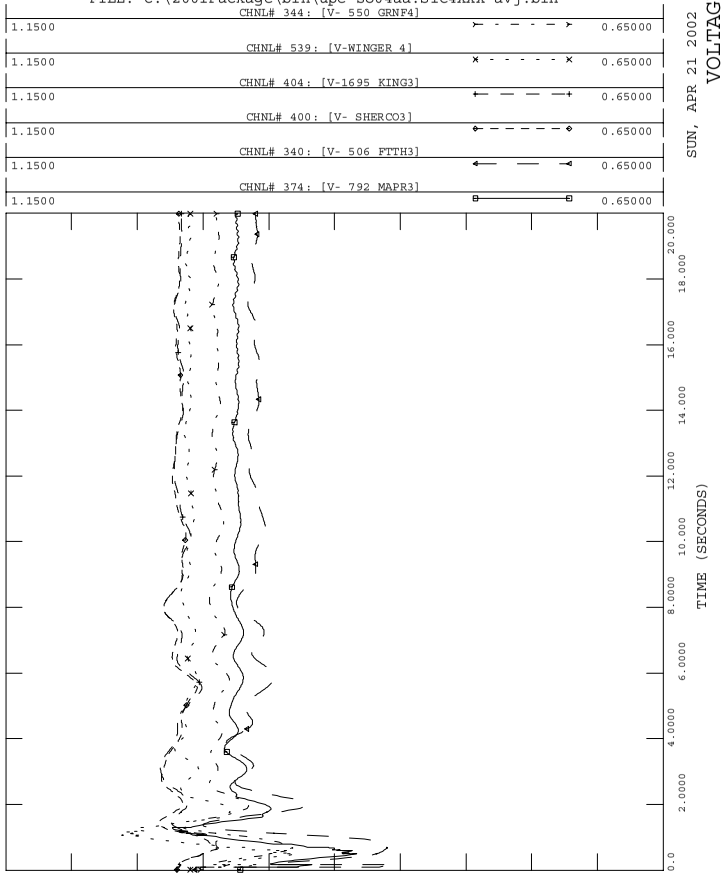
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

SUN, APR 21 2002 11:51
VOLTAGES 1



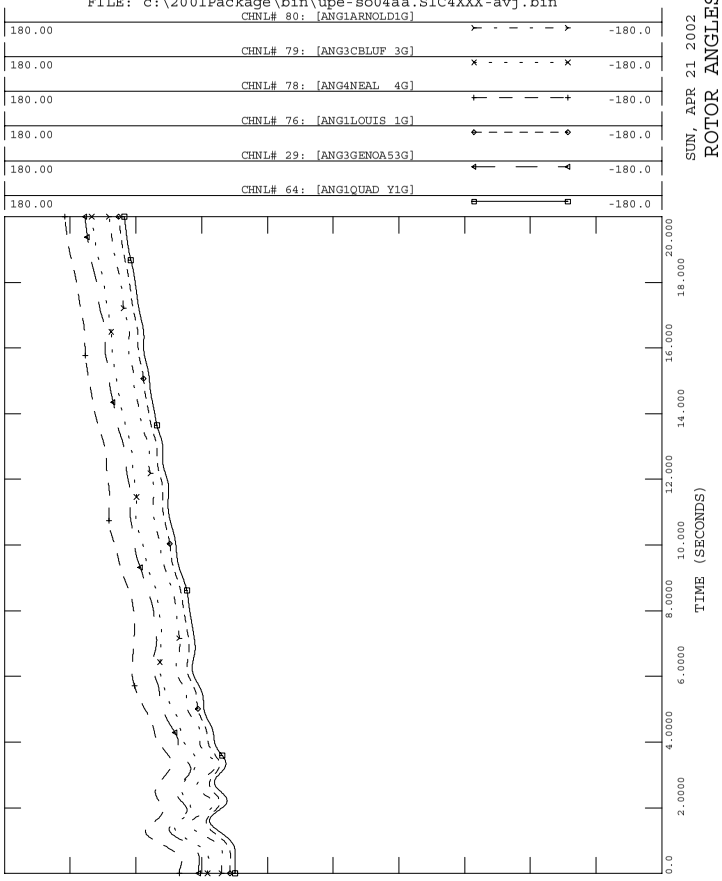
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

SUN, APR 21 2002 11:51
VOLTAGES 3



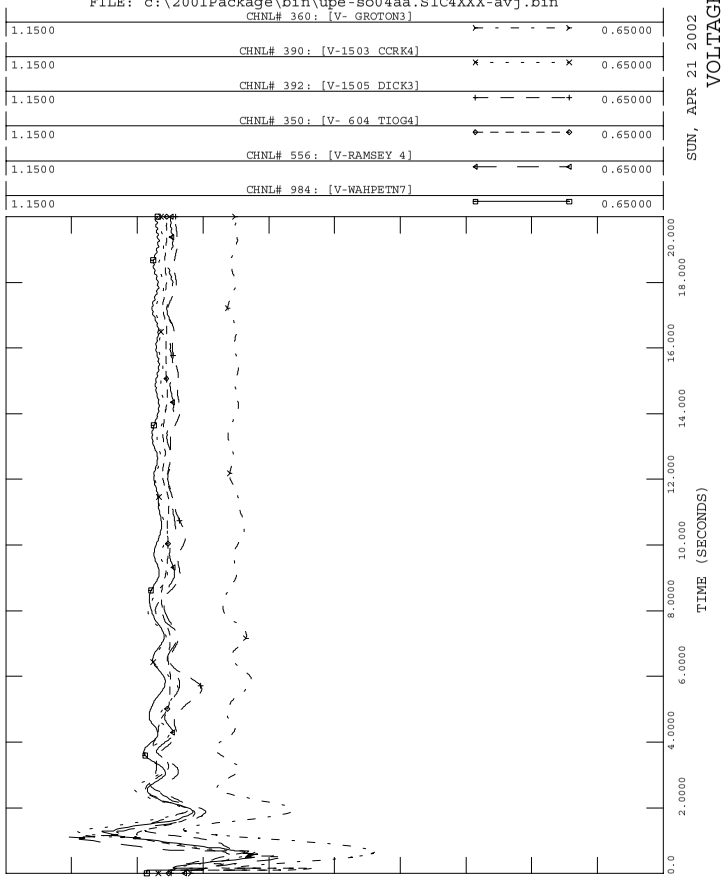
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

SUN, APR 21 2002 11:51
ROTOR ANGLES IA



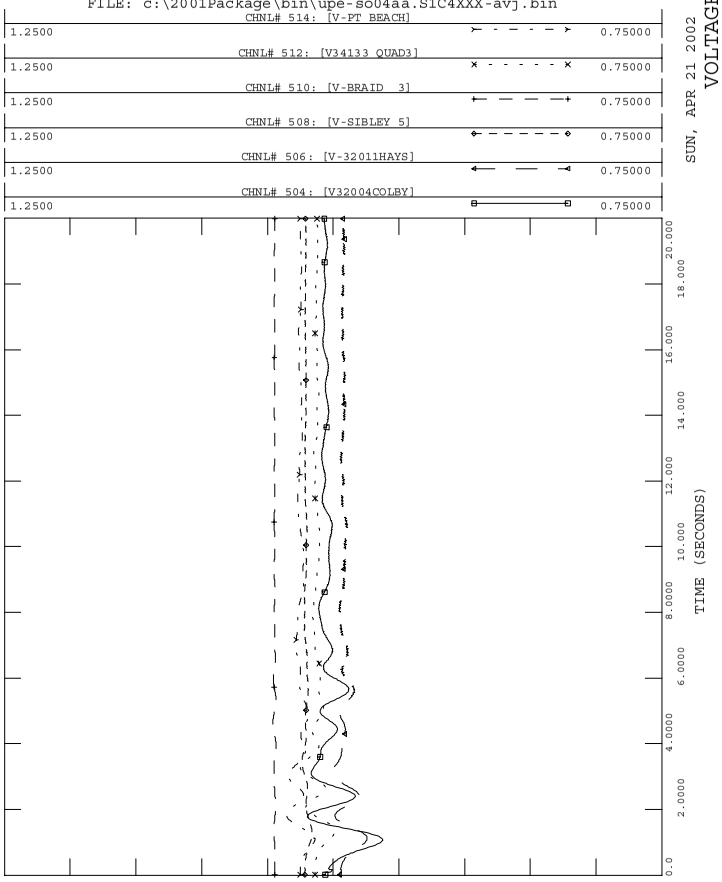
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

SUN, APR 21 2002 11:51
VOLTAGES 2



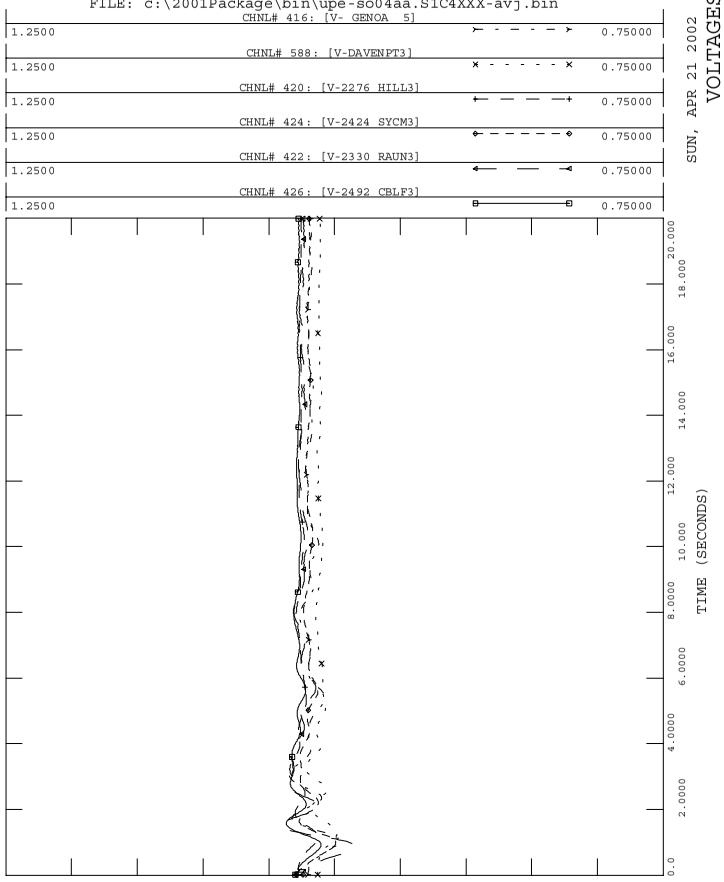
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

SUN, APR 21 2002 11:51
VOLTAGES 5



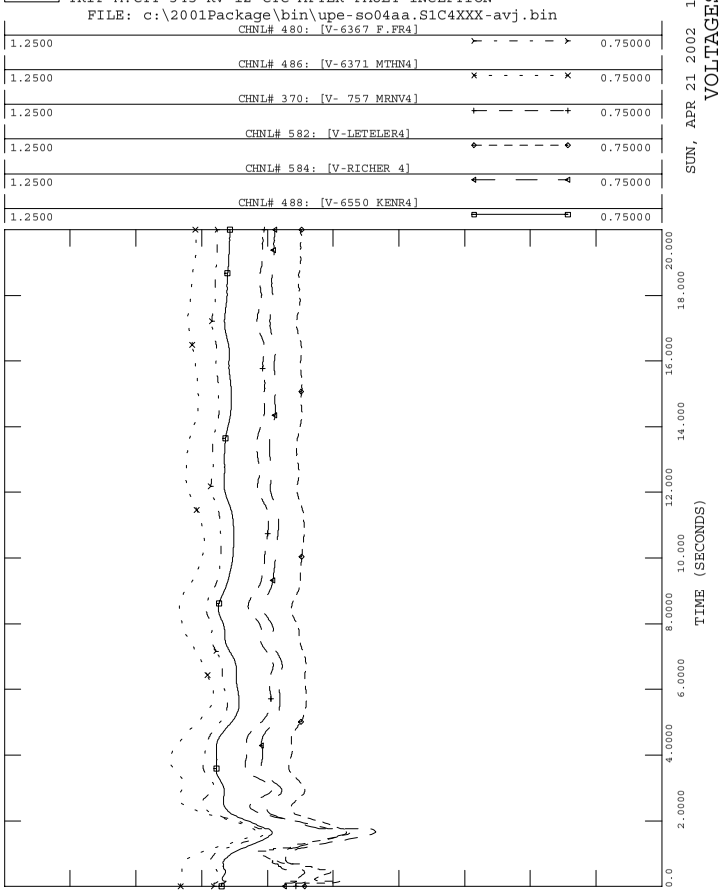
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

SUN, APR 21 2002 11:51
VOLTAGES IA



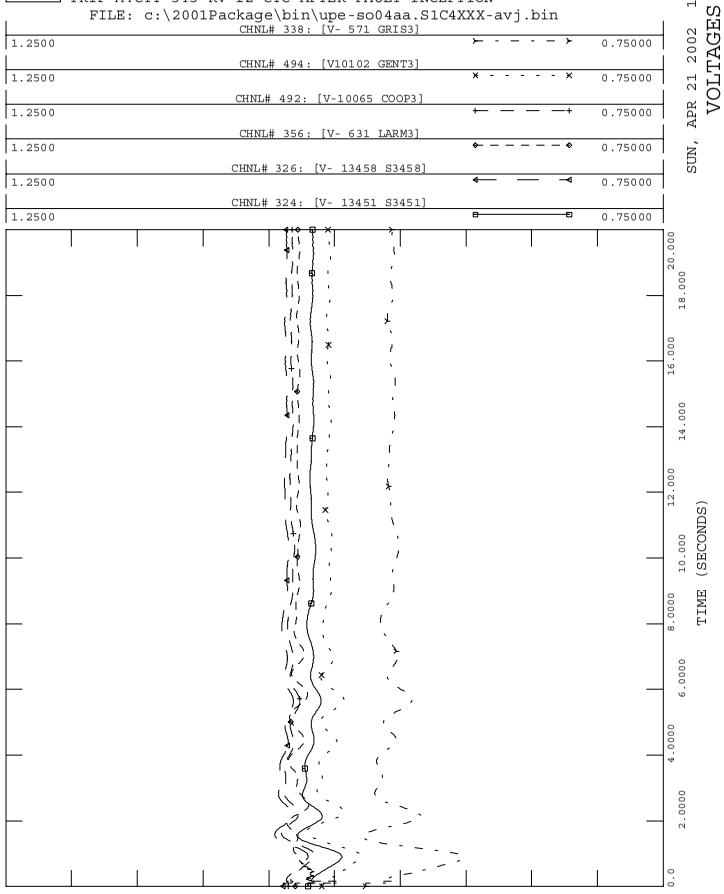
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

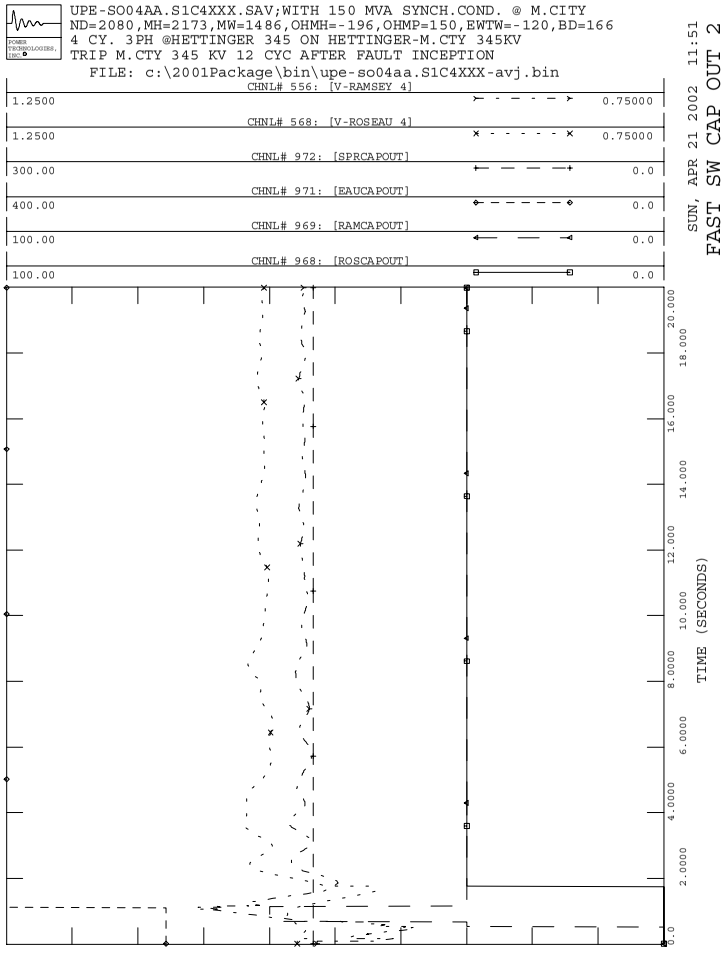
SUN, APR 21 2002 11:51
VOLTAGES 4

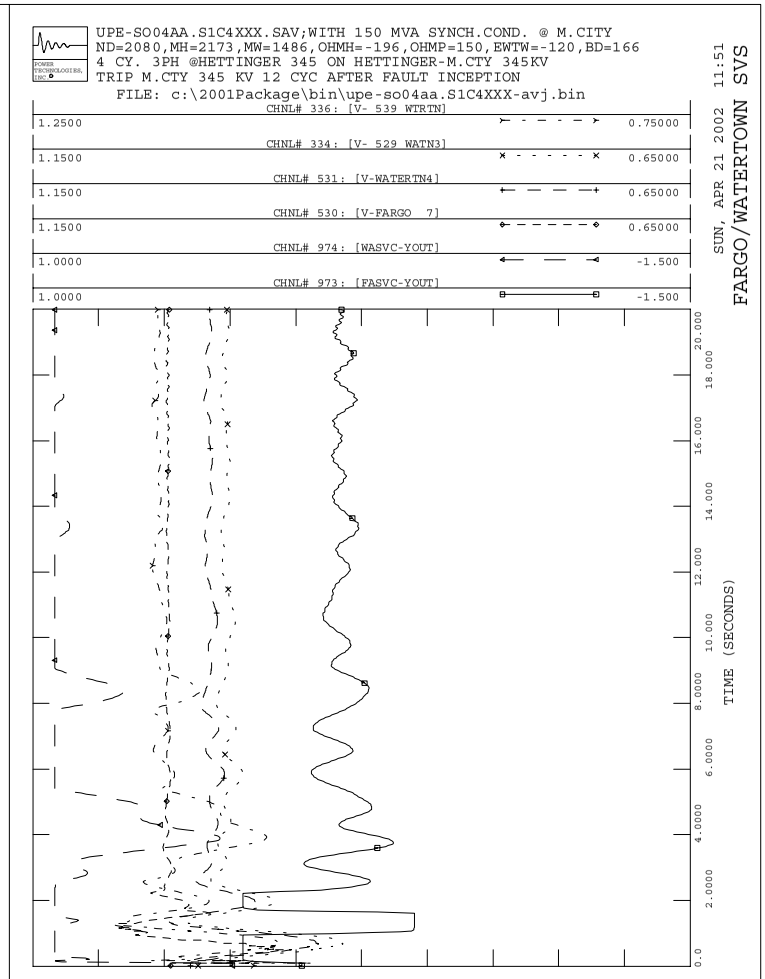


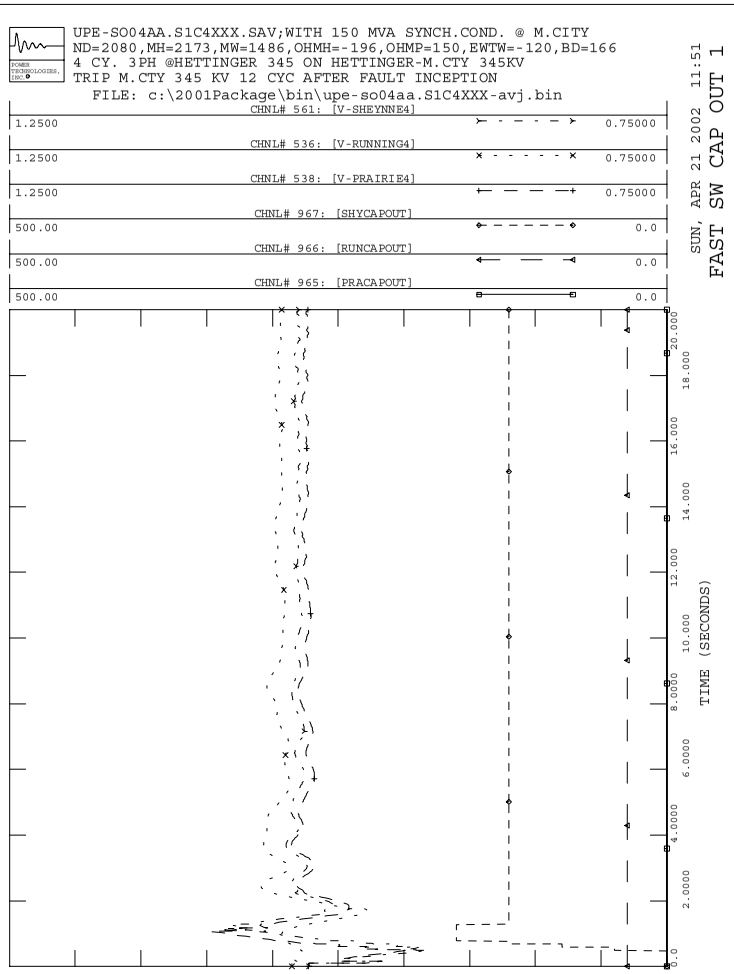
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

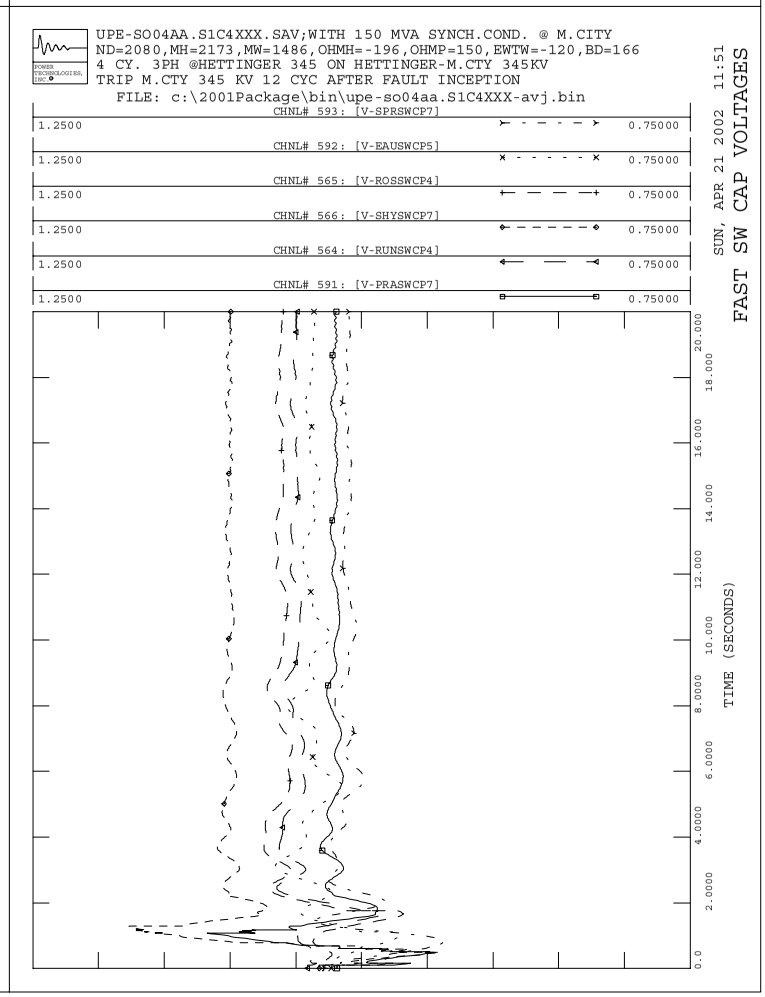
SUN, APR 21 2002 11:51
VOLTAGES NB




UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
SUN, APR 21 2002 11:51
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
SUN, APR 21 2002 11:51
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
SUN, APR 21 2002 11:51
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
SUN, APR 21 2002 11:51
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

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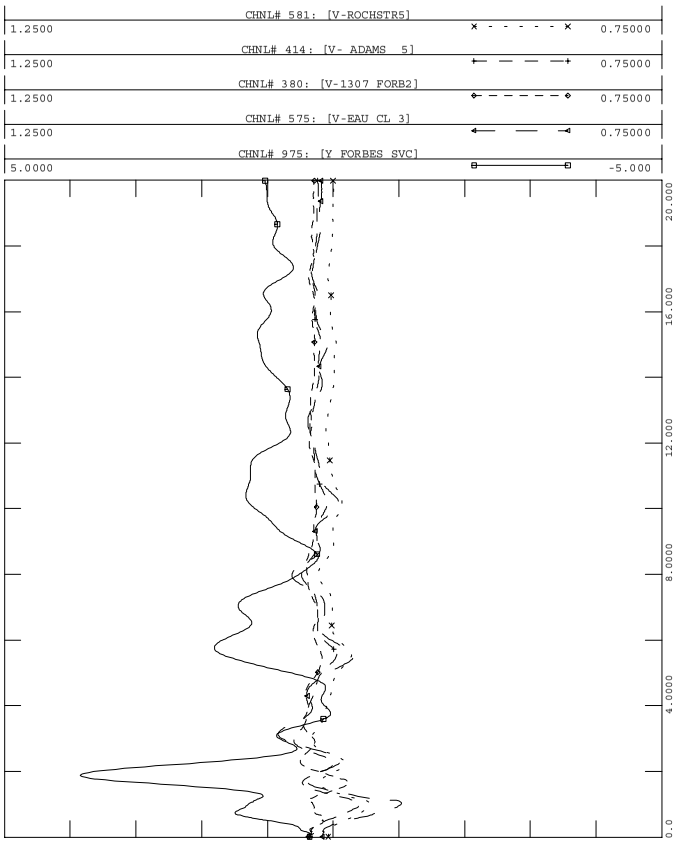
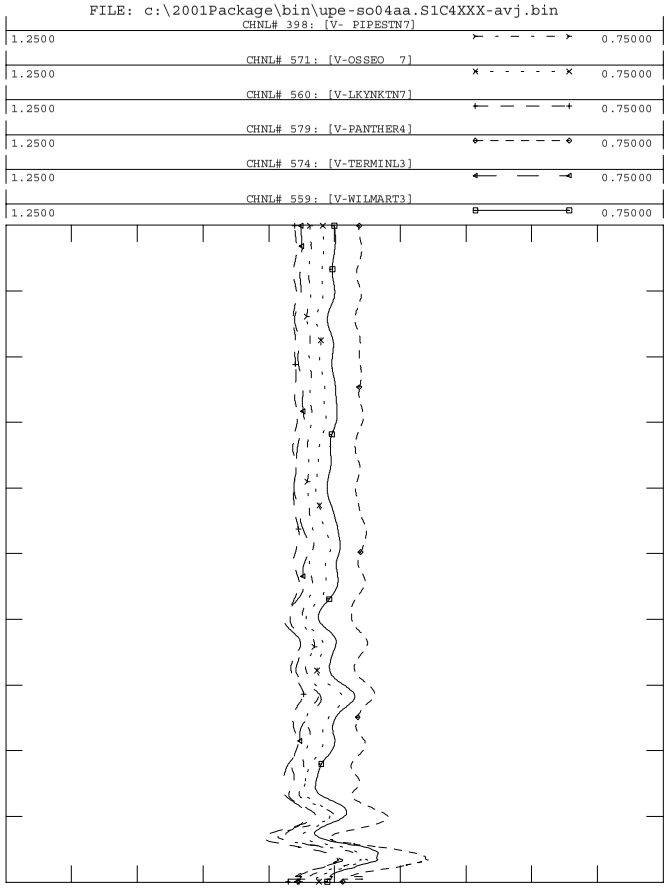
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

SUN, APR 21 2002 11:51

TC VOLTAGES



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

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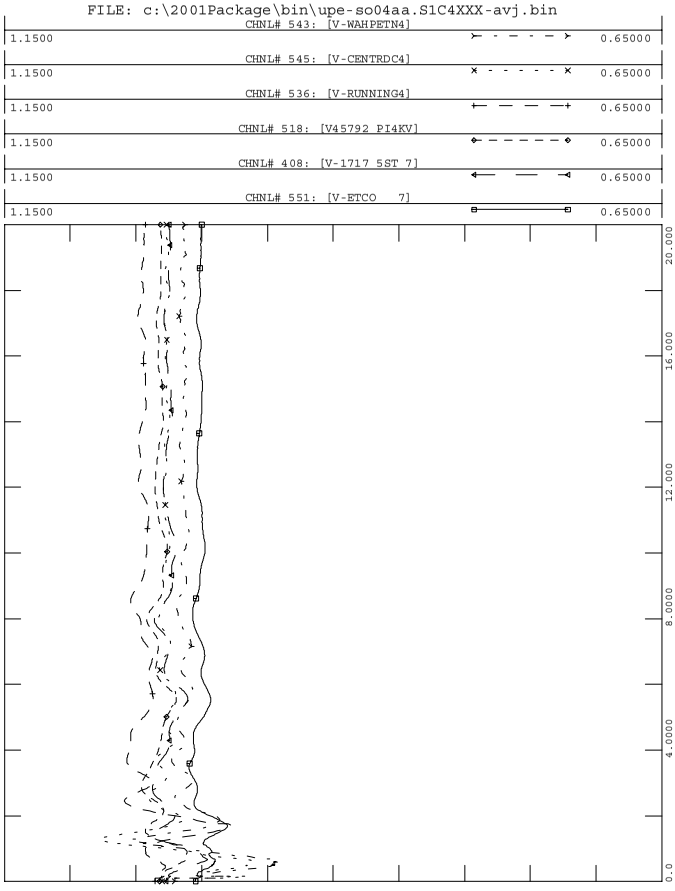
VOLTAGES 6



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

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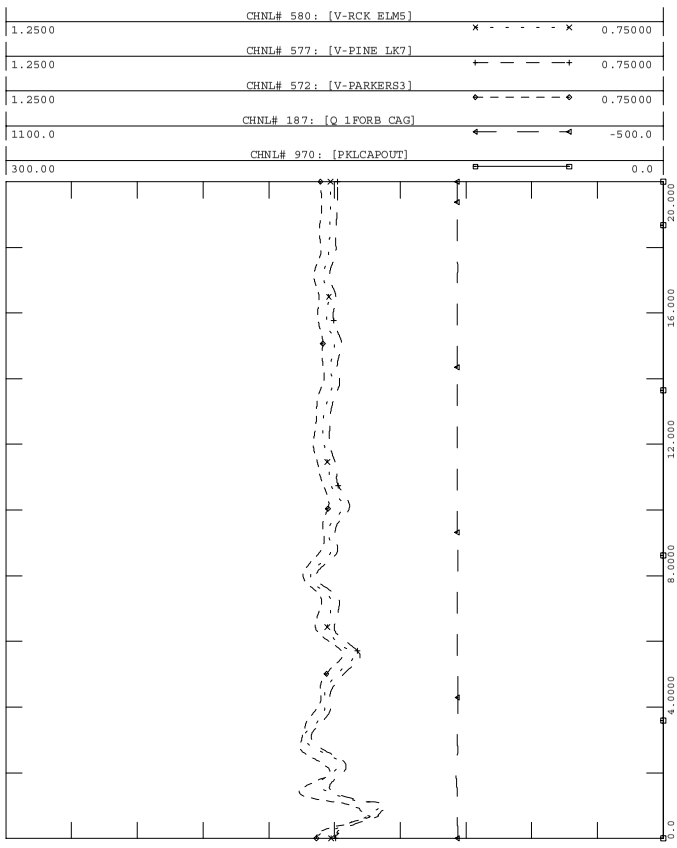
FORBES SVS OUT & VOLTAGES



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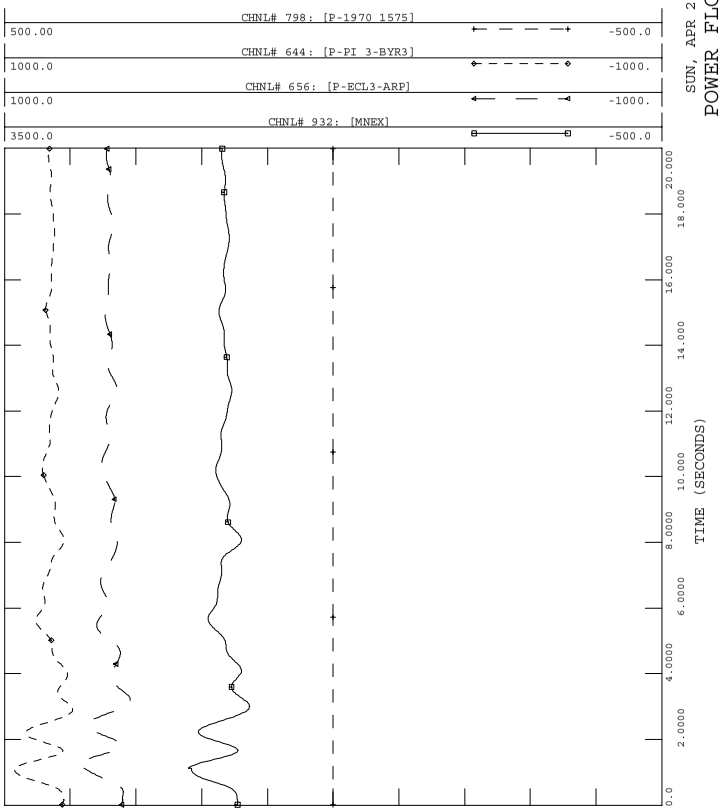
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

SUN, APR 21 2002 11:51
POWER FLOW SUMS 2



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4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

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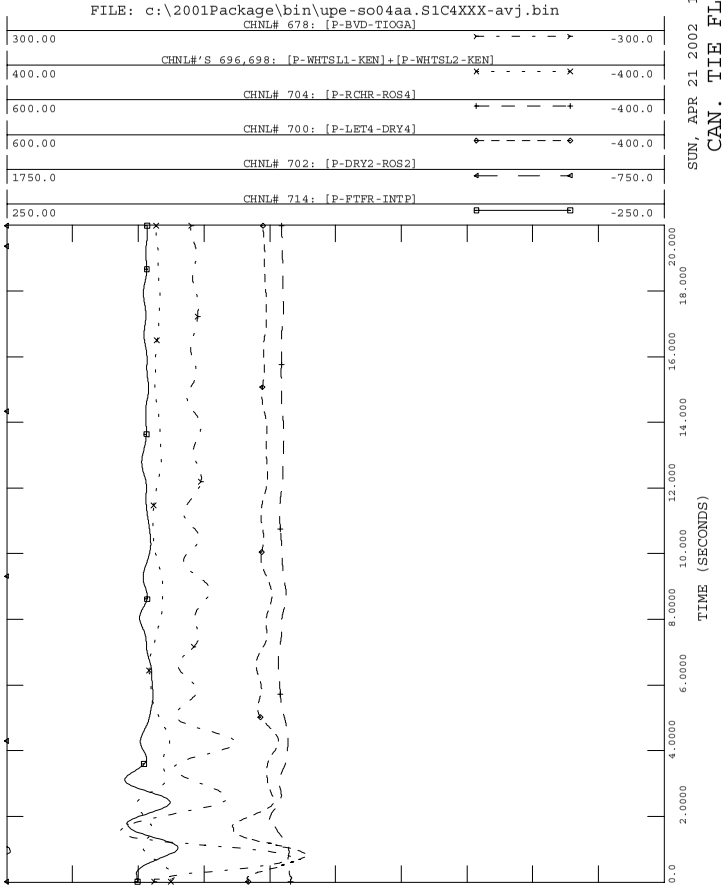
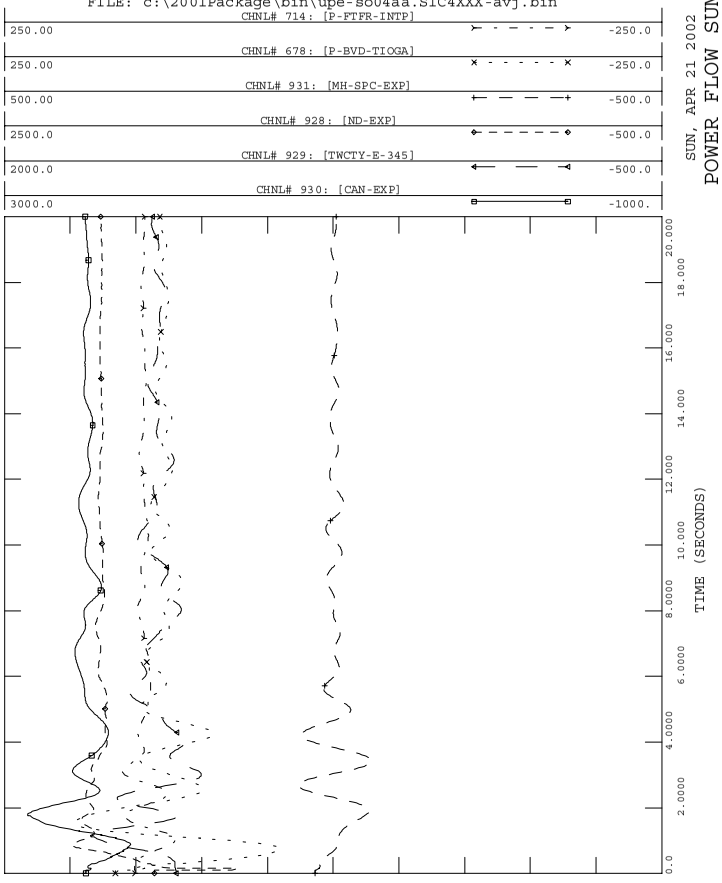
CAN. TIE FLOWS



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

SUN, APR 21 2002 11:51
POWER FLOW SUMS 1



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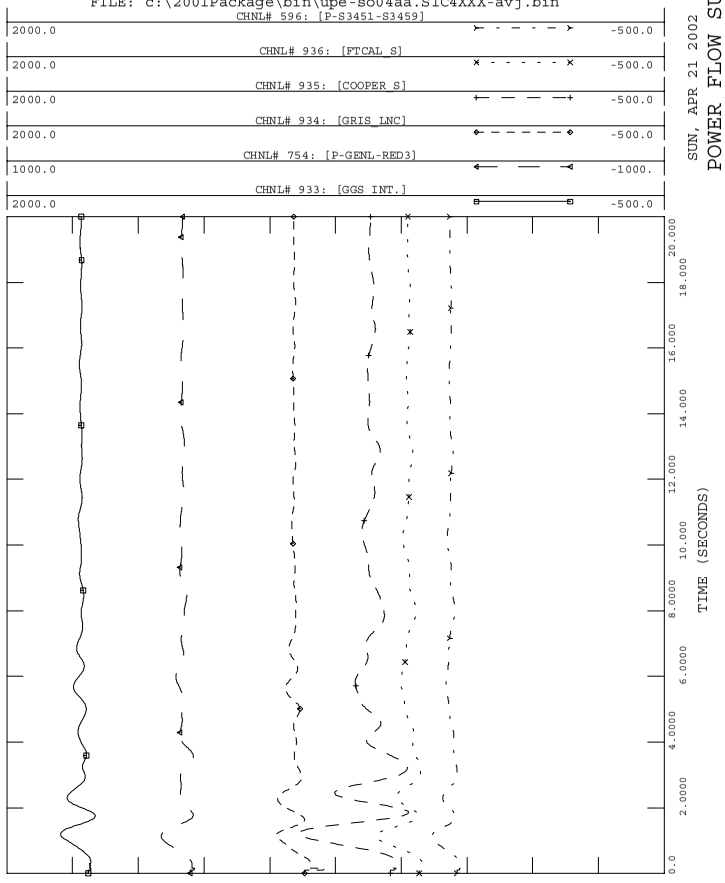
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

SUN, APR 21 2002 11:51
POWER FLOW SUM 3



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4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

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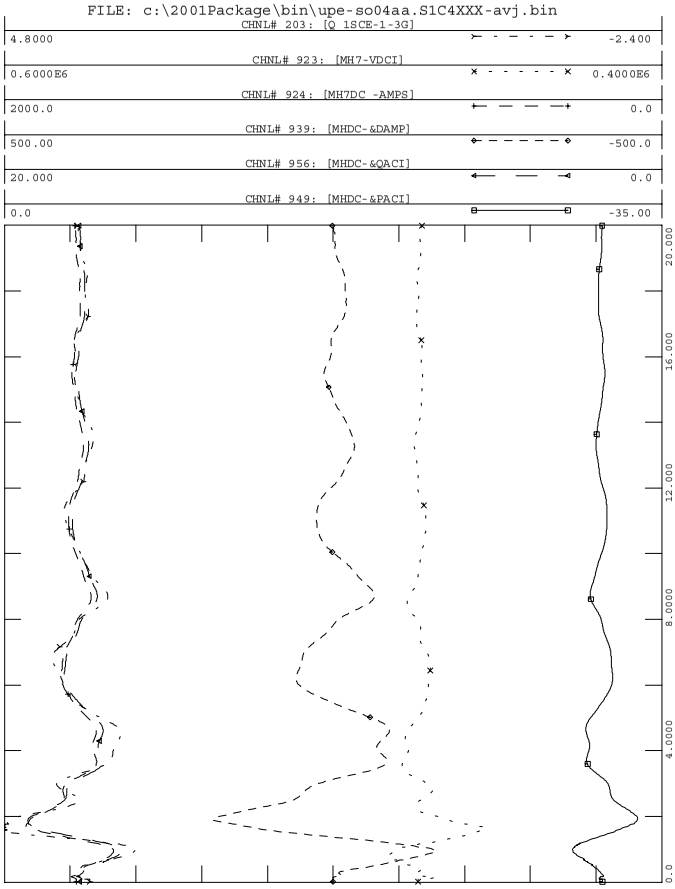
MH DC PARAMETERS



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4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

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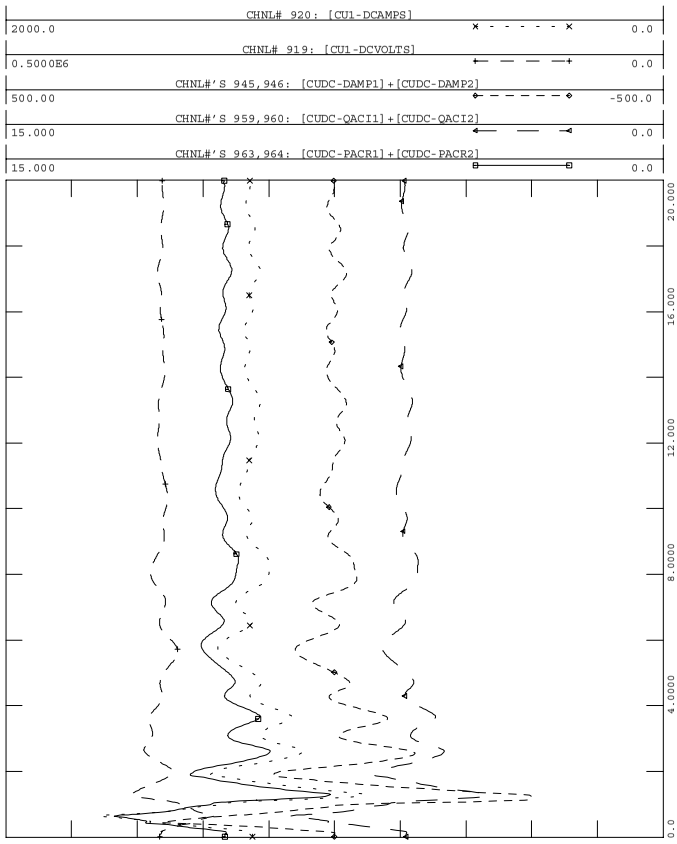
CU DC #1



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
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4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

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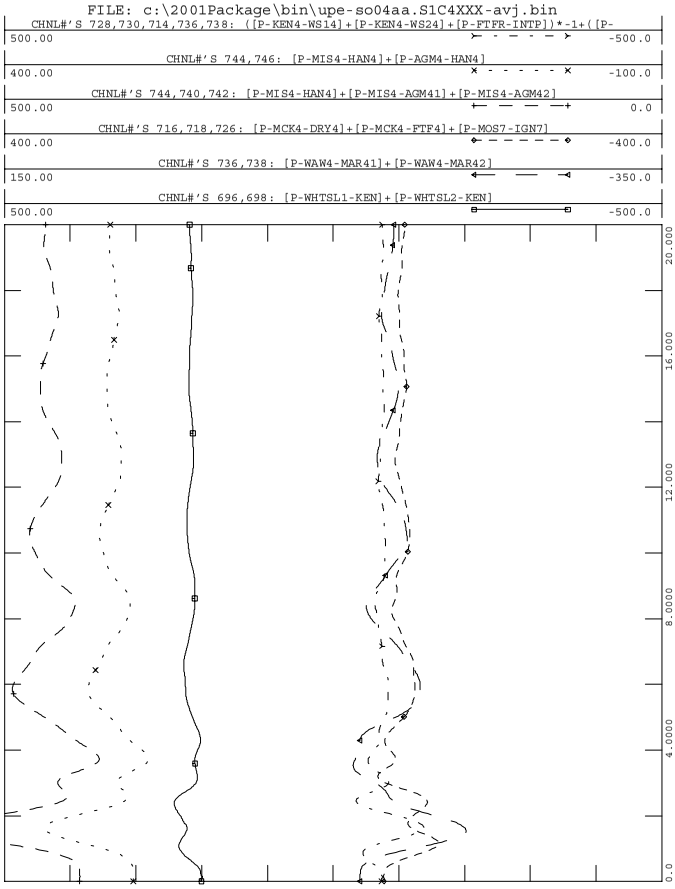
OH TIE FLOWS



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
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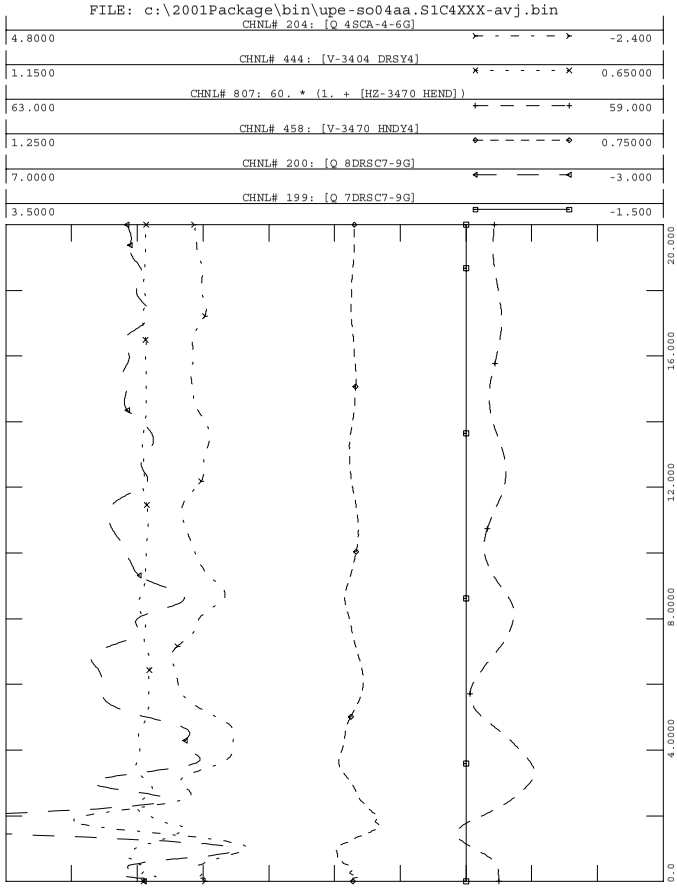
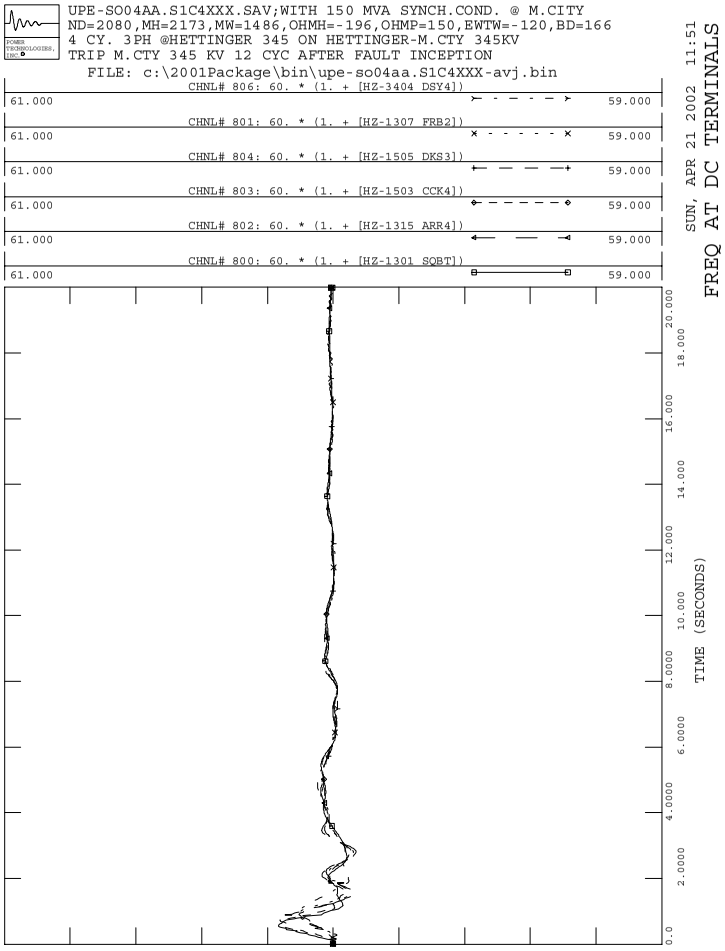
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

SUN, APR 21 2002 11:51
MH DC PARAMETERS

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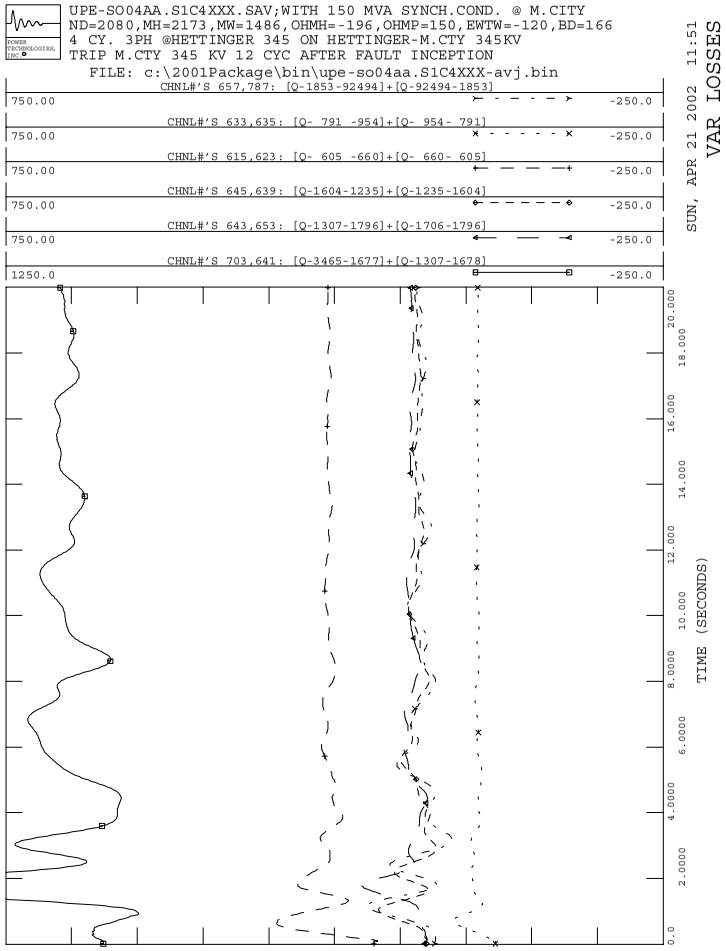
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
SUN, APR 21 2002 11:51
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
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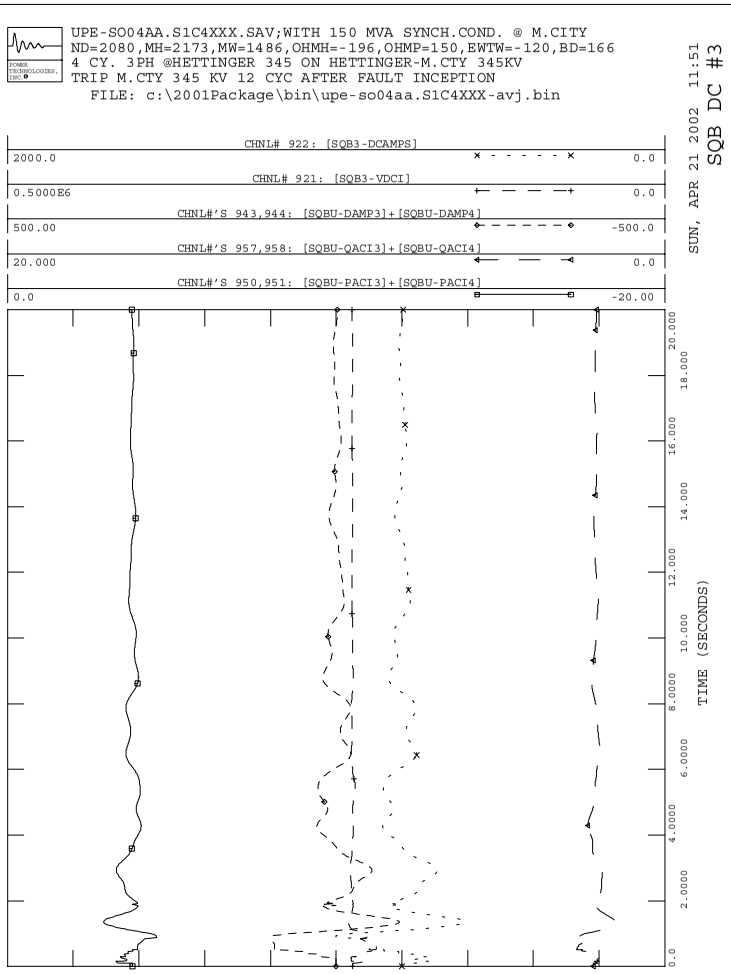
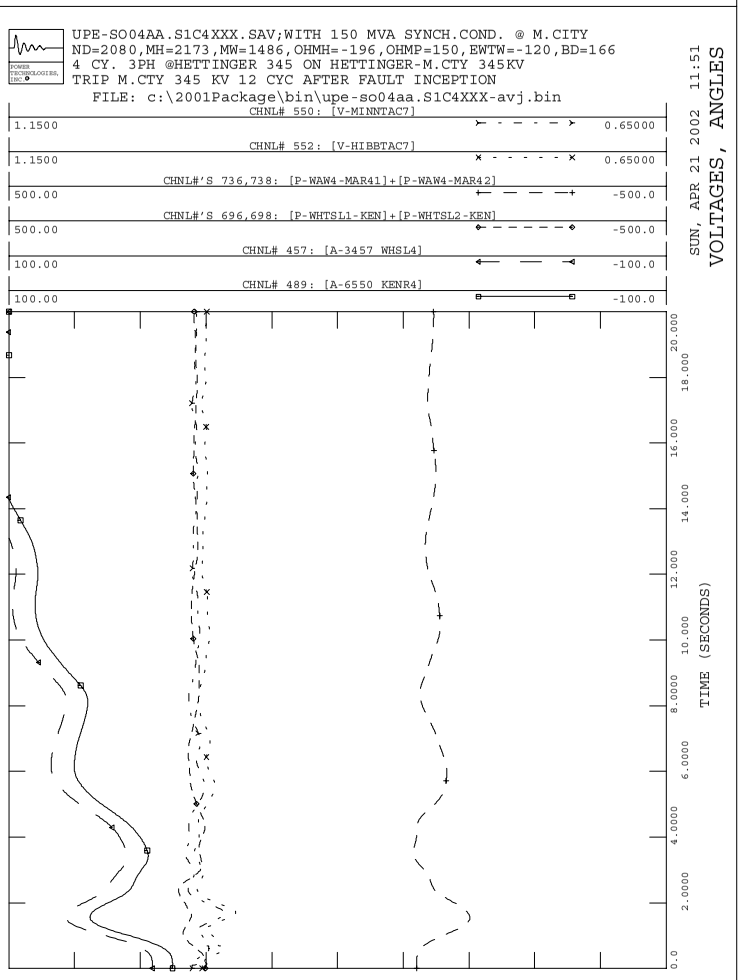
-250.0
1250.0
SUN, APR 21 2002 11:51
VAR LOSSES
TIME (SECONDS)

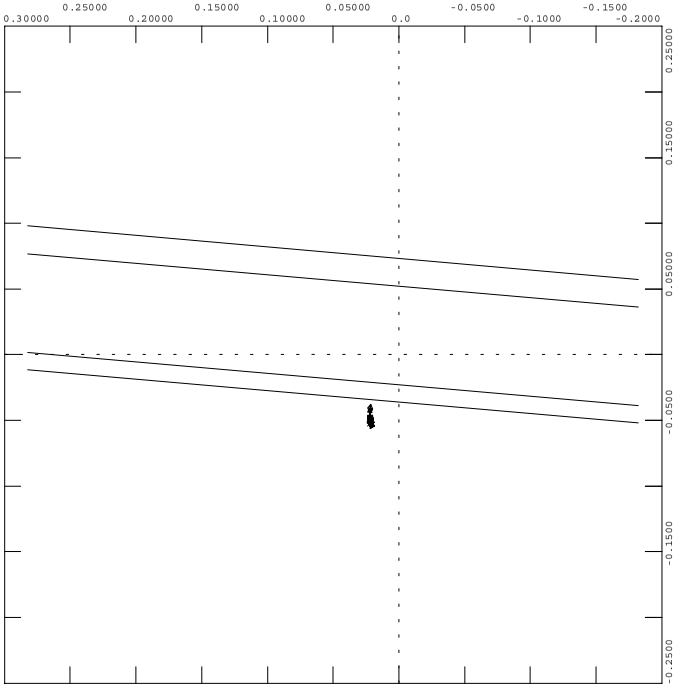

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
SUN, APR 21 2002 11:51
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
SUN, APR 21 2002 11:51
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



SUN, APR 21 2002 11:51
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

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ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

RELAY: RELAYG
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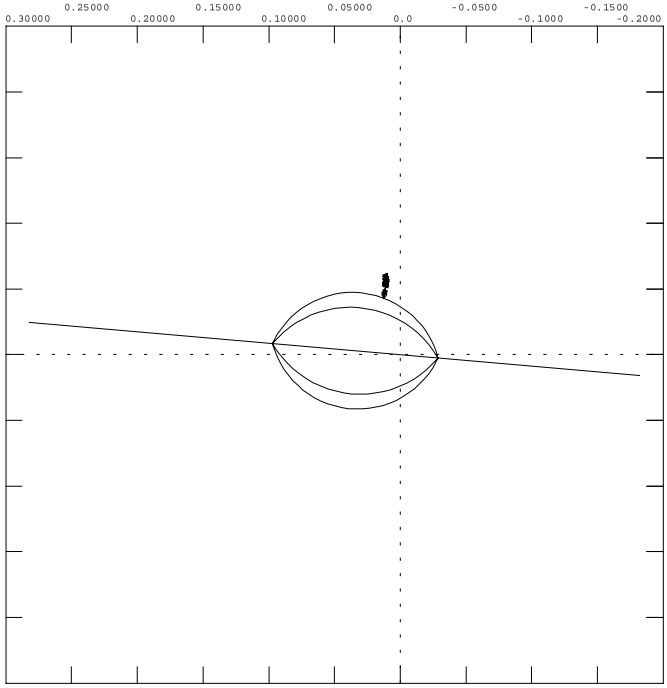
CHNL# 856: [X-DSY2-ROS2]



SUN, APR 21 2002 11:51
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

RELAY: RELAYG
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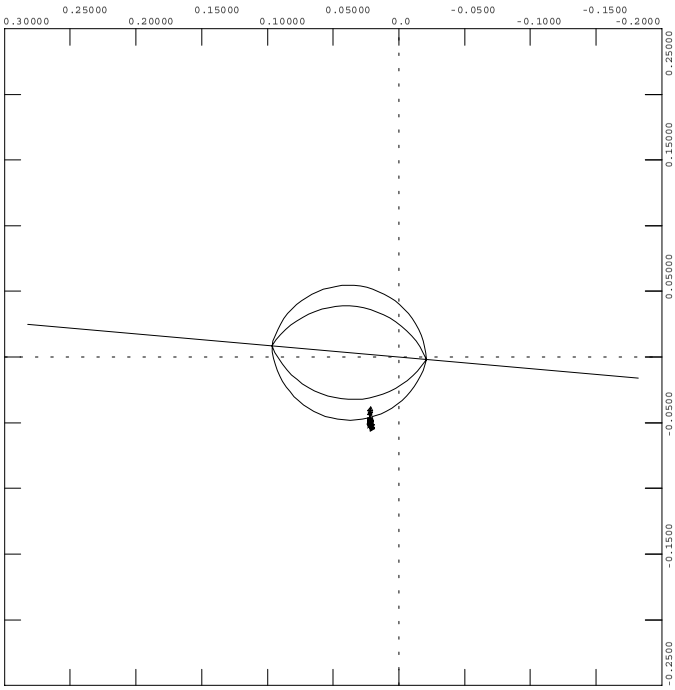
CHNL# 824: [X-FRB2-ROS2]



SUN, APR 21 2002 11:51
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

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4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

RELAY: SLINOS
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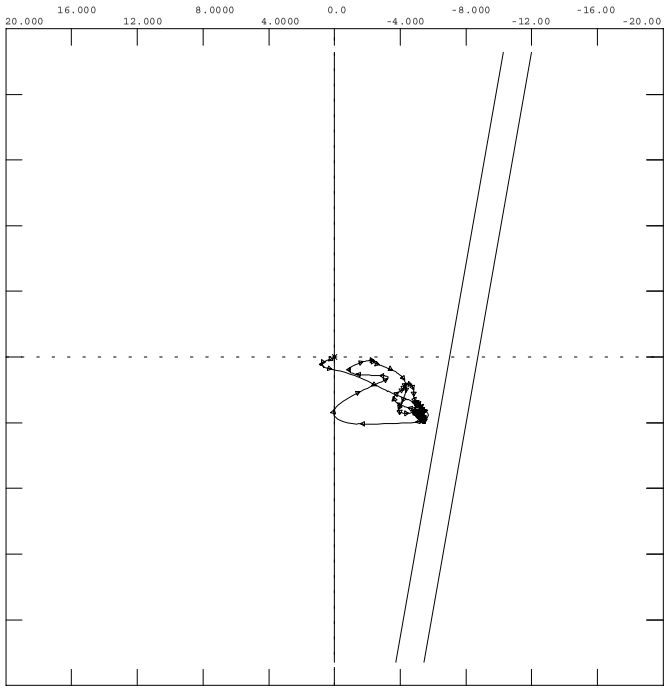
CHNL# 977: [DCAR-B]



SUN, APR 21 2002 11:51
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

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ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

RELAY: SLINOS
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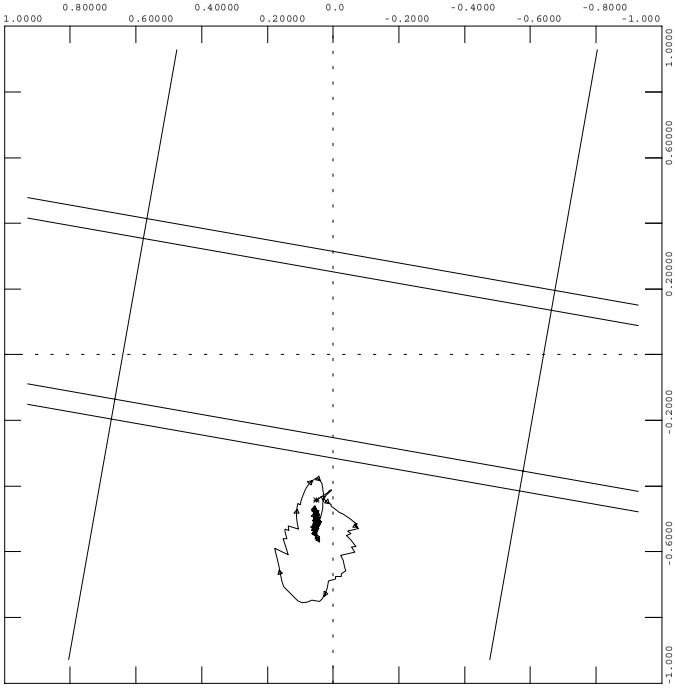
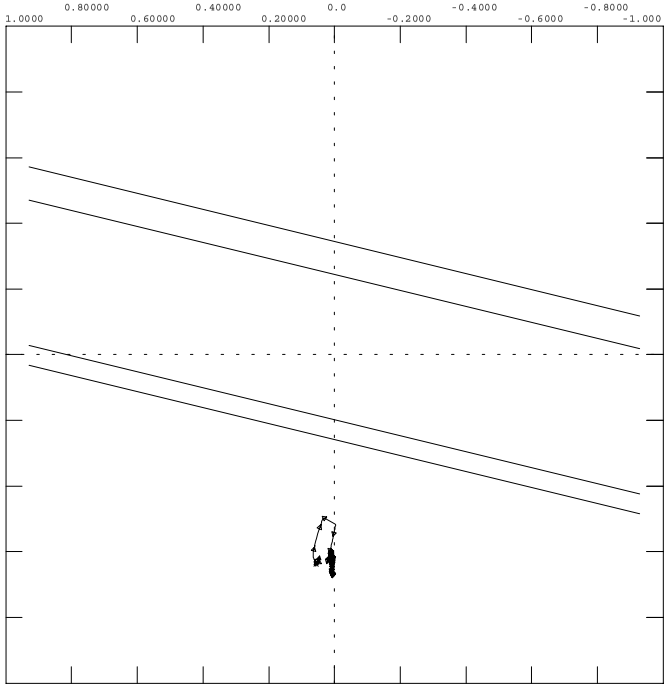
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

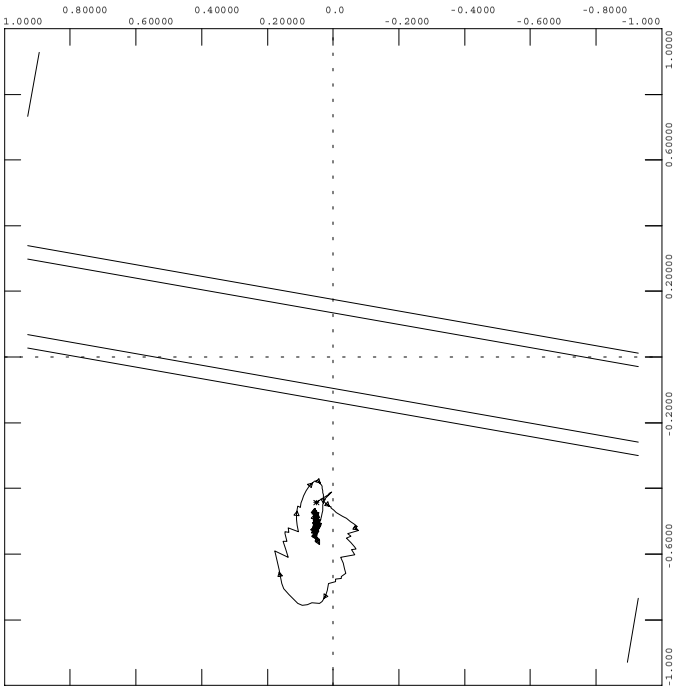
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

RELAY: SLINOS
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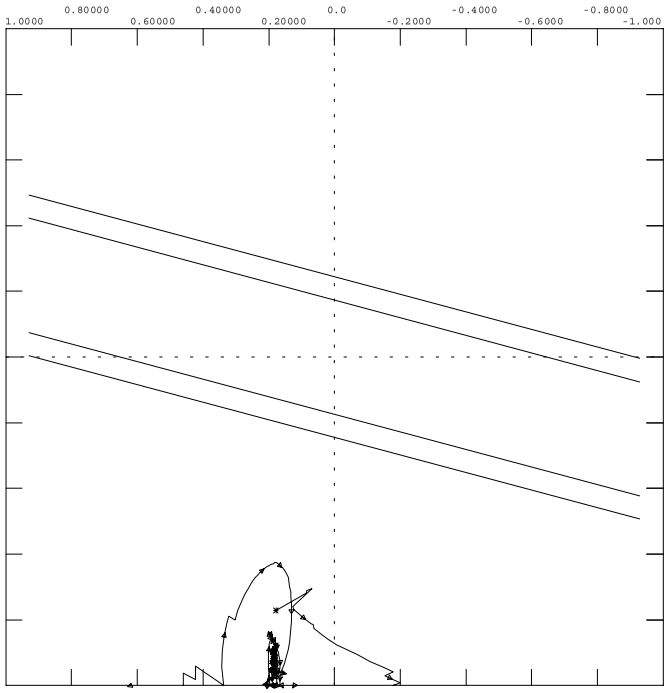
CHNL# 820: [X-PRA4-DRY4]



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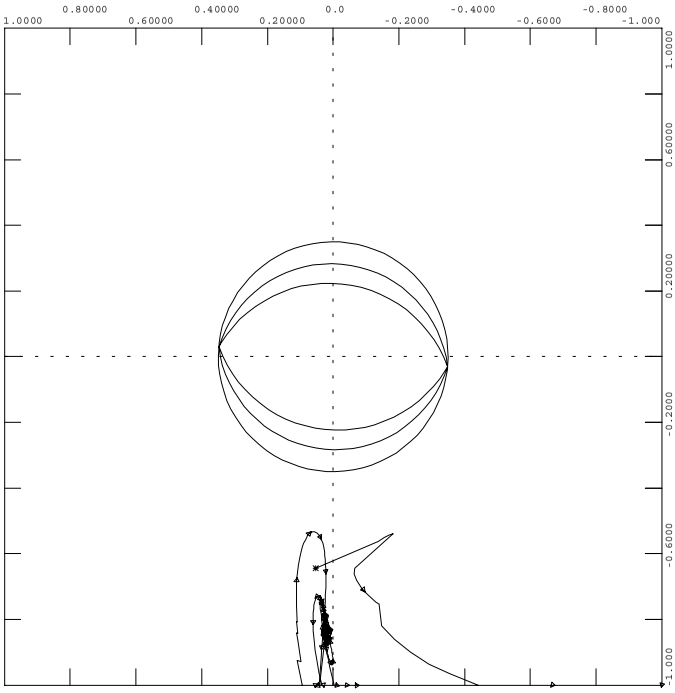
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

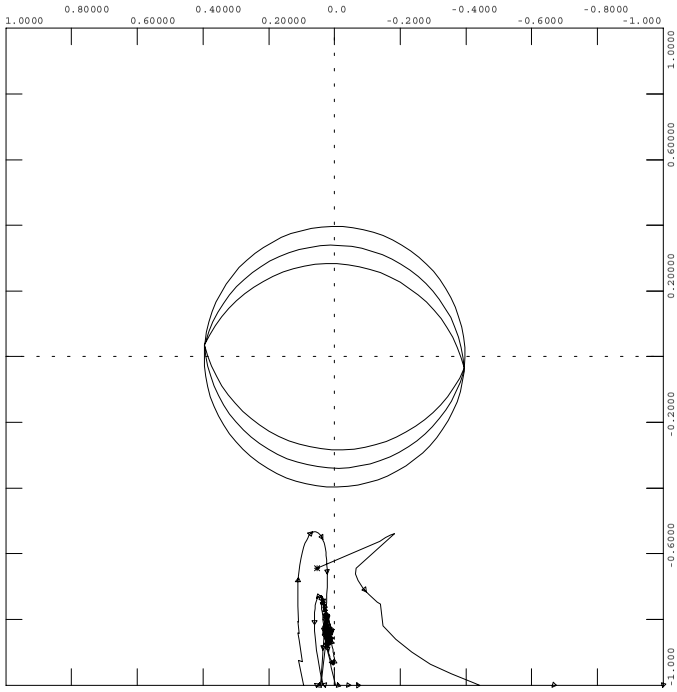
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

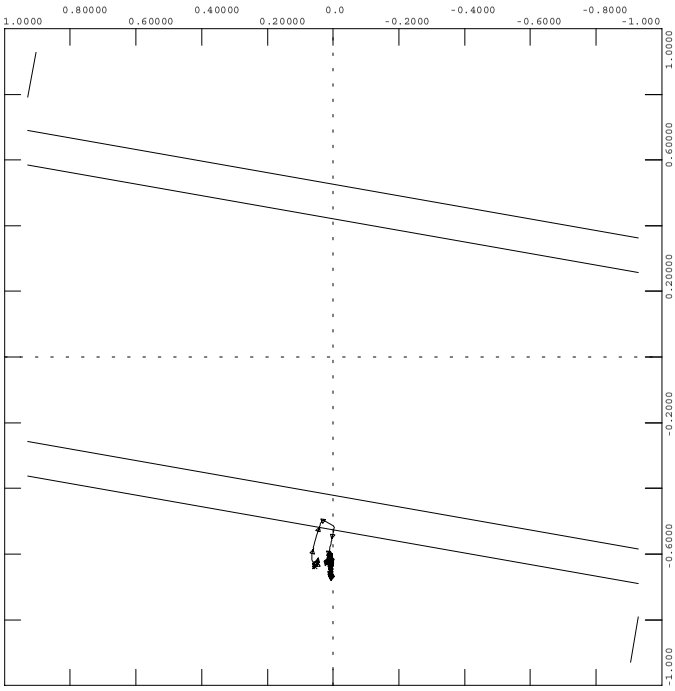
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

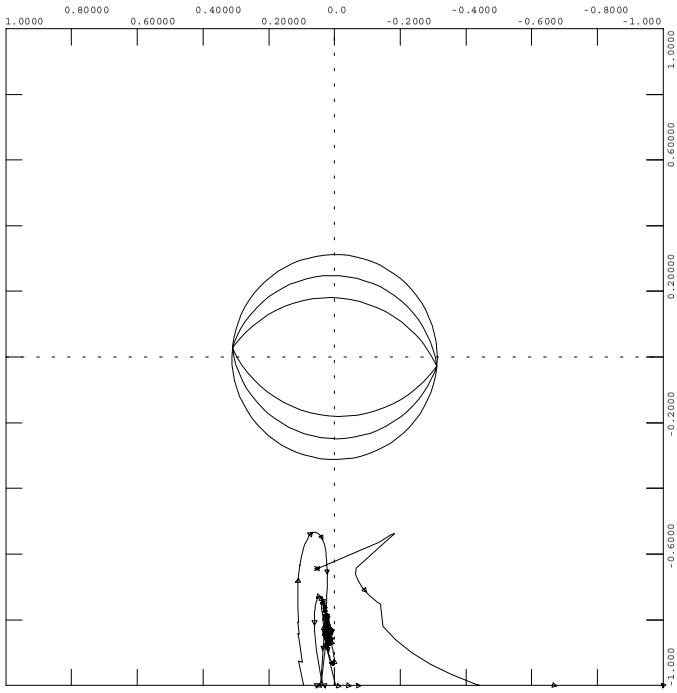
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



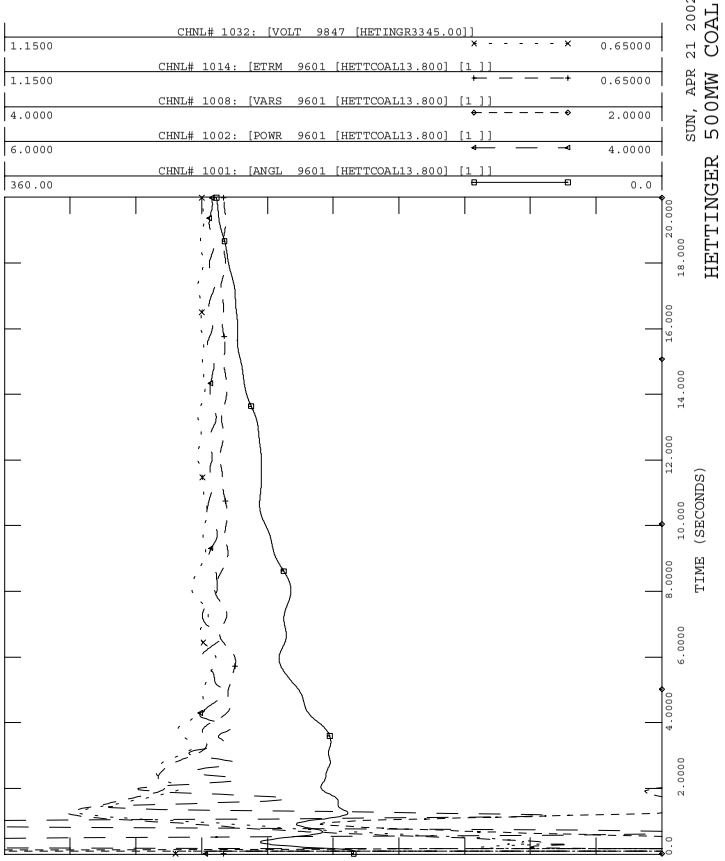
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

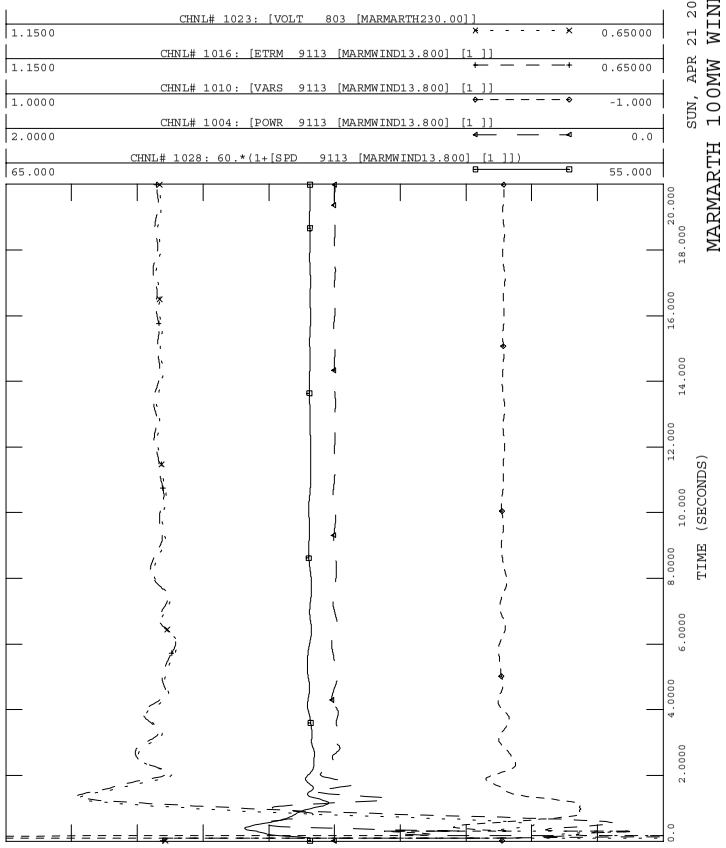


UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin



SUN, APR 21 2002 11:51
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

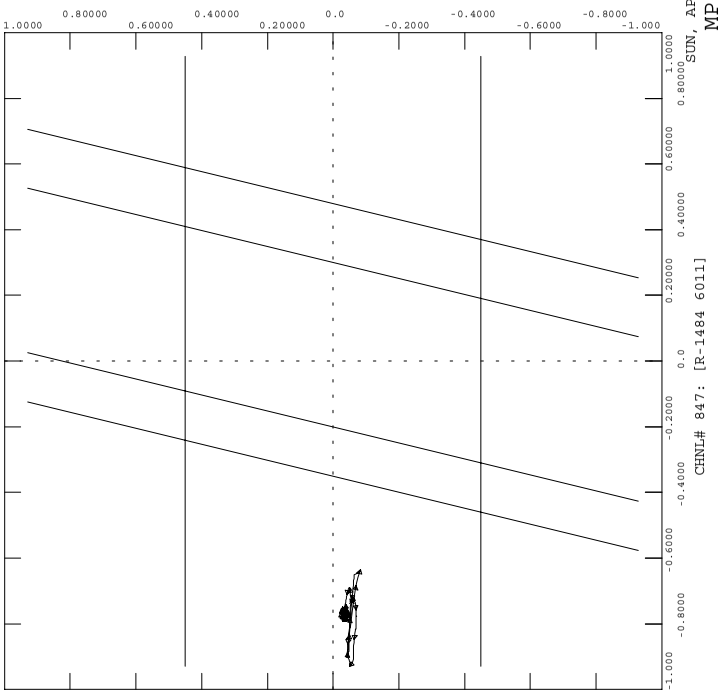


SUN, APR 21 2002 11:51
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION

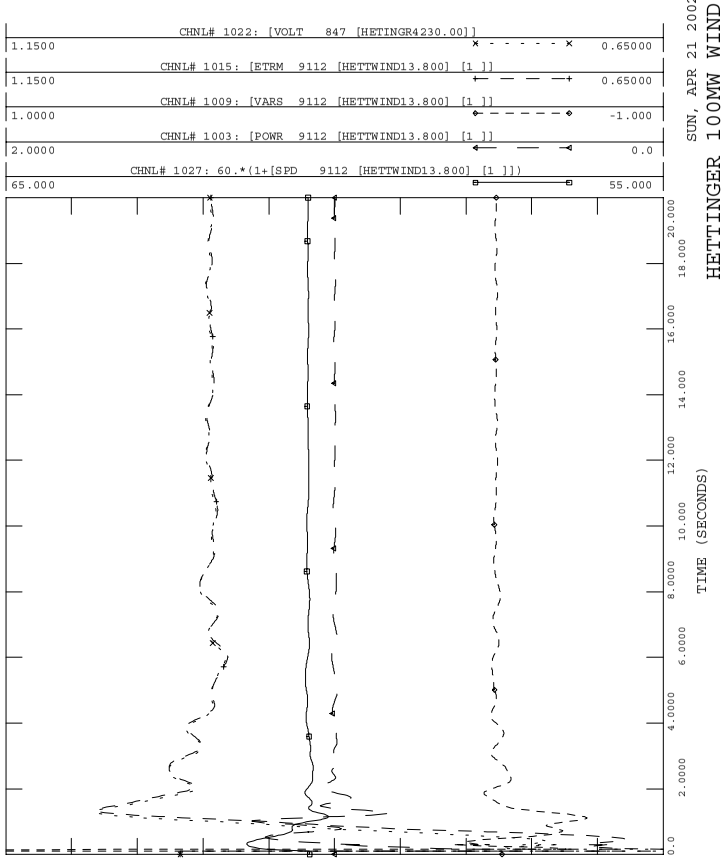
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



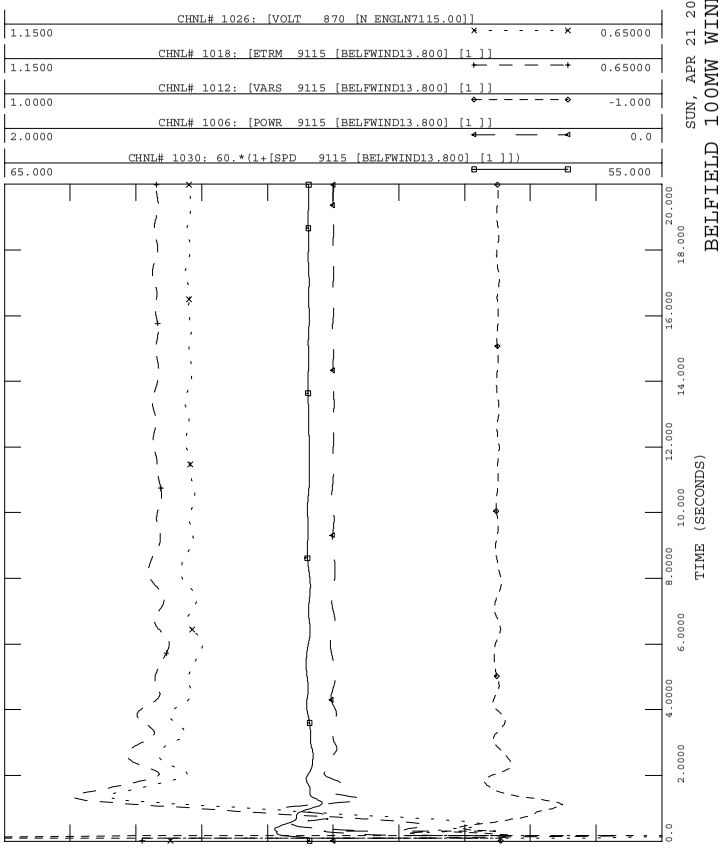
SUN, APR 21 2002 11:51
MP-OH I.FALLS (779)

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin



SUN, APR 21 2002 11:51
HETTINGER 100MW WIND UNIT

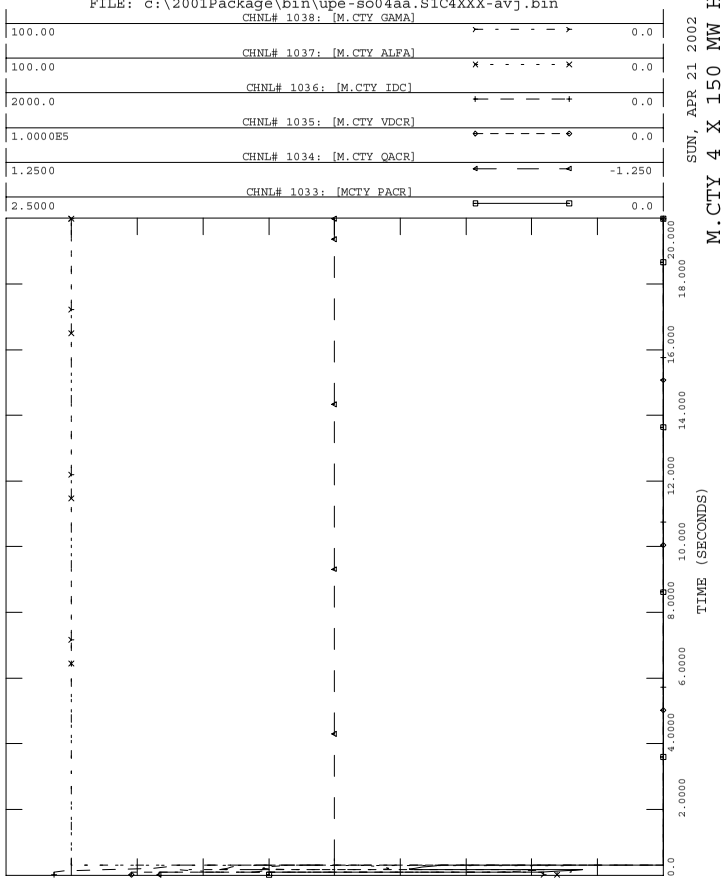
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin



SUN, APR 21 2002 11:51

BELFIELD 100MW WIND UNIT

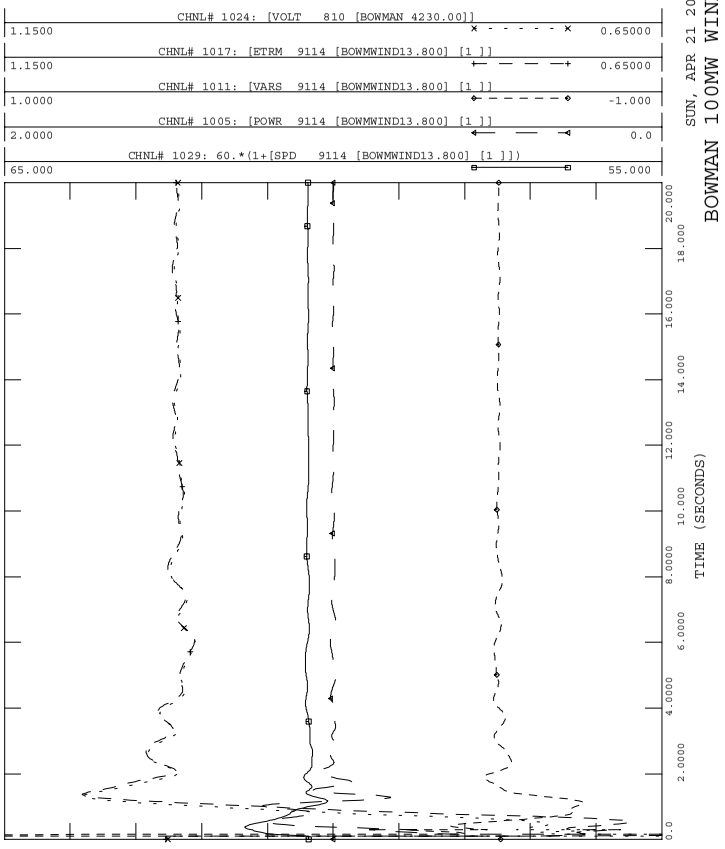
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin



SUN, APR 21 2002 11:51

M.CTY 4 X 150 MW HVDC

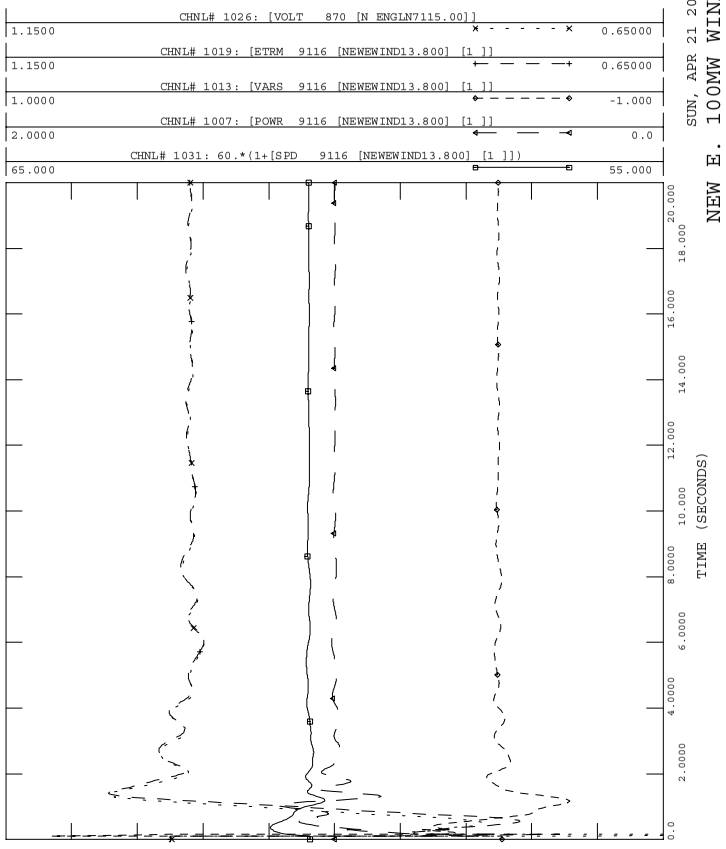
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin



SUN, APR 21 2002 11:51

BOWMAN 100MW WIND UNIT

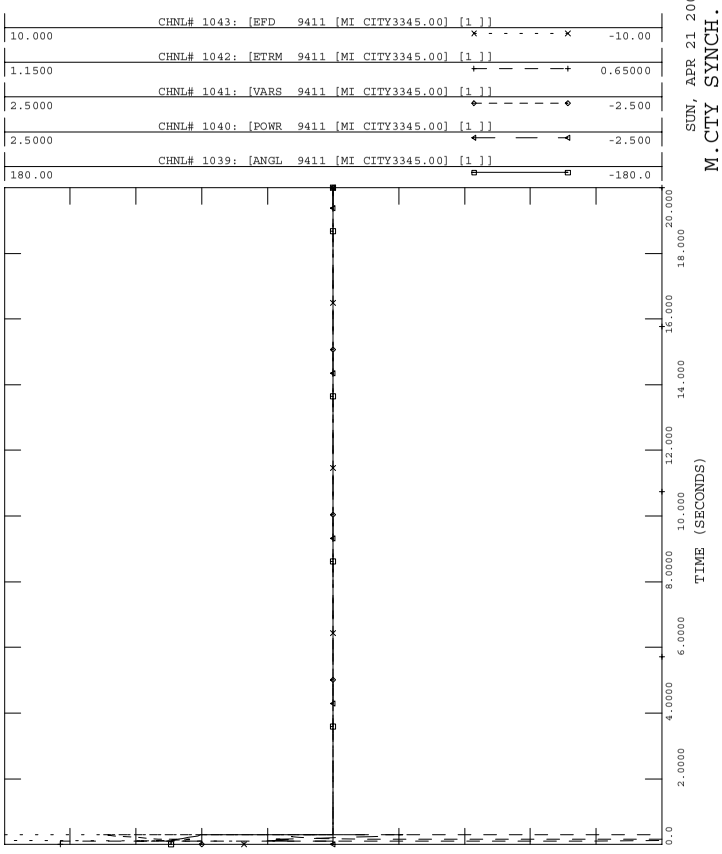
UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin



SUN, APR 21 2002 11:51

NEW E. 100MW WIND UNIT

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 345 ON HETTINGER-M.CTY 345KV
TRIP M.CTY 345 KV 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C4XXX-avj.bin



SUN, APR 21 2002 11:51
M.CTY SYNCH. COND.

APPENDIX 10

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 1 (HETTINGER)

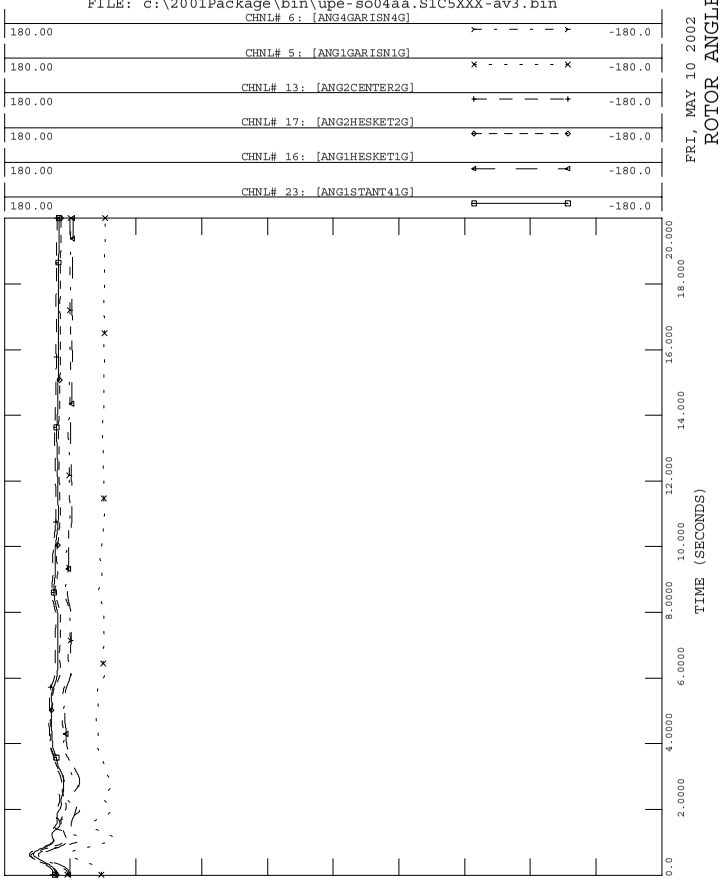
CASE S1C5XXX

CONTINGENCY AV3

4 cycle 3 phase fault at Hettinger 345. Clear the Hettinger - Belfield 345 kV line

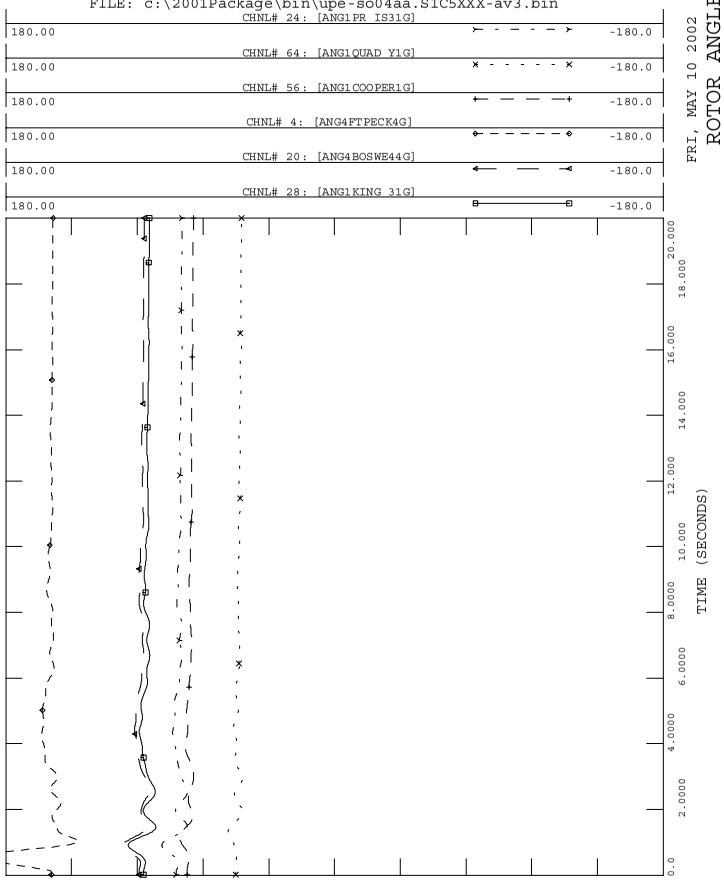
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
ROTOR ANGLES 2



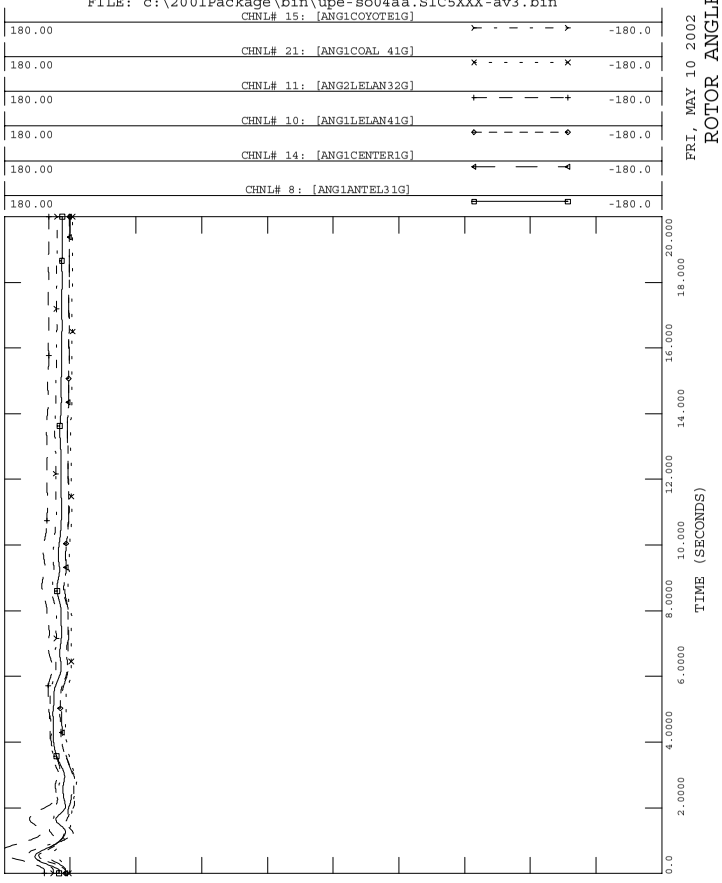
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
ROTOR ANGLES 4



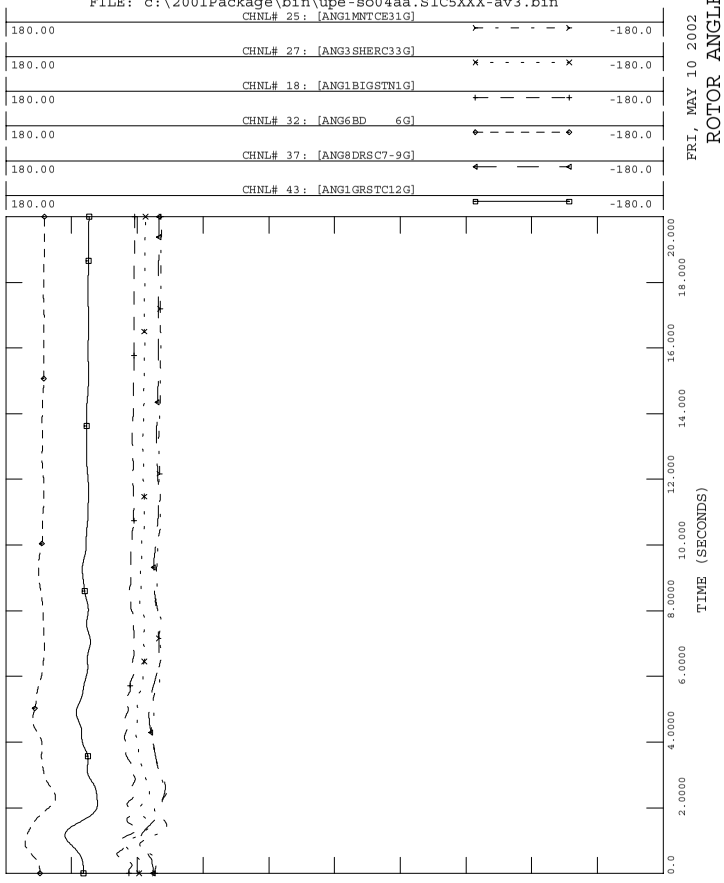
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
ROTOR ANGLES 1

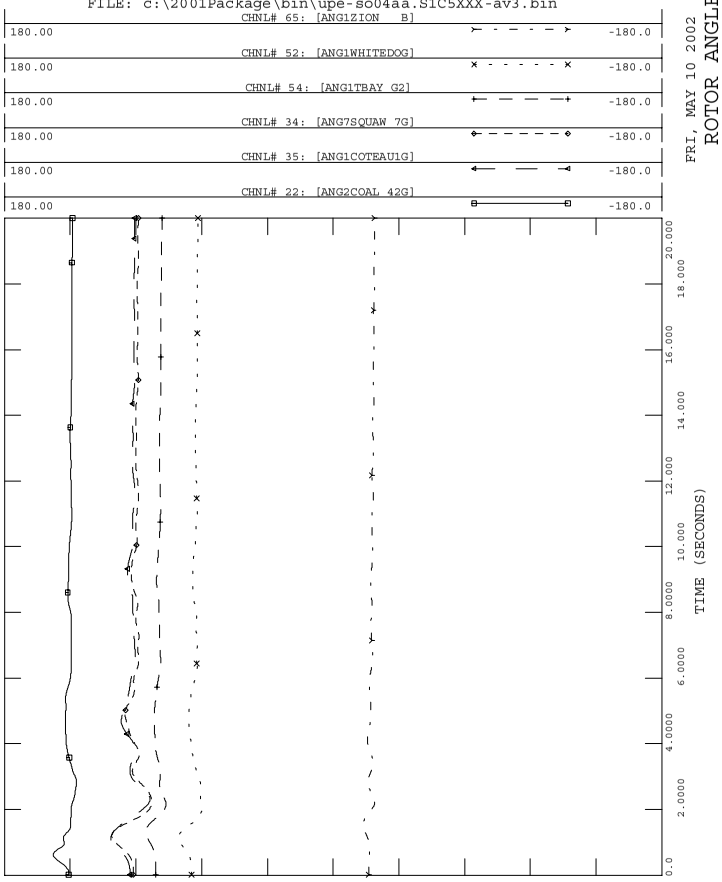


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
ROTOR ANGLES 3

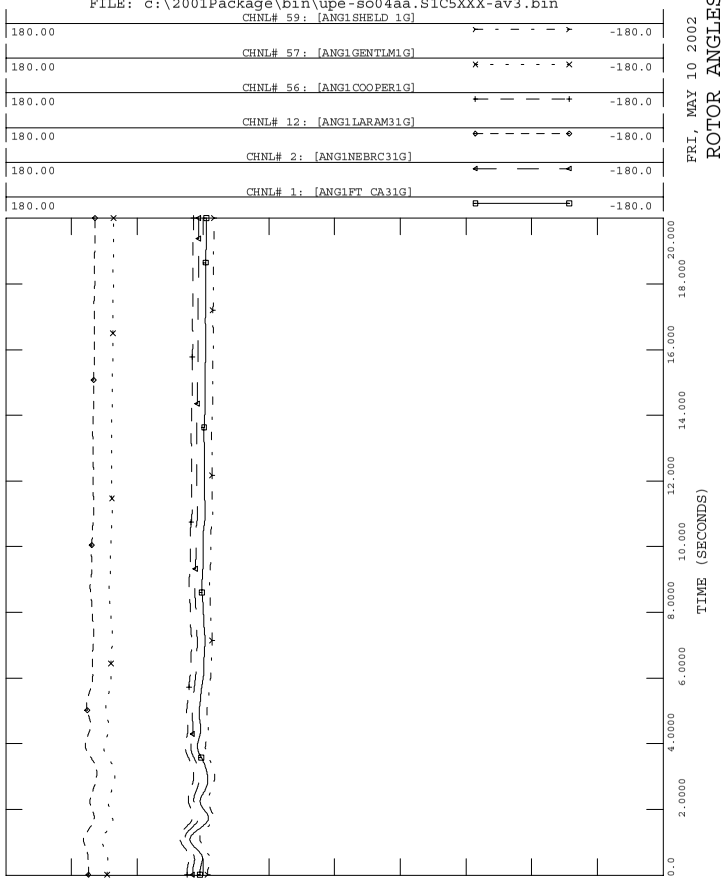


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin



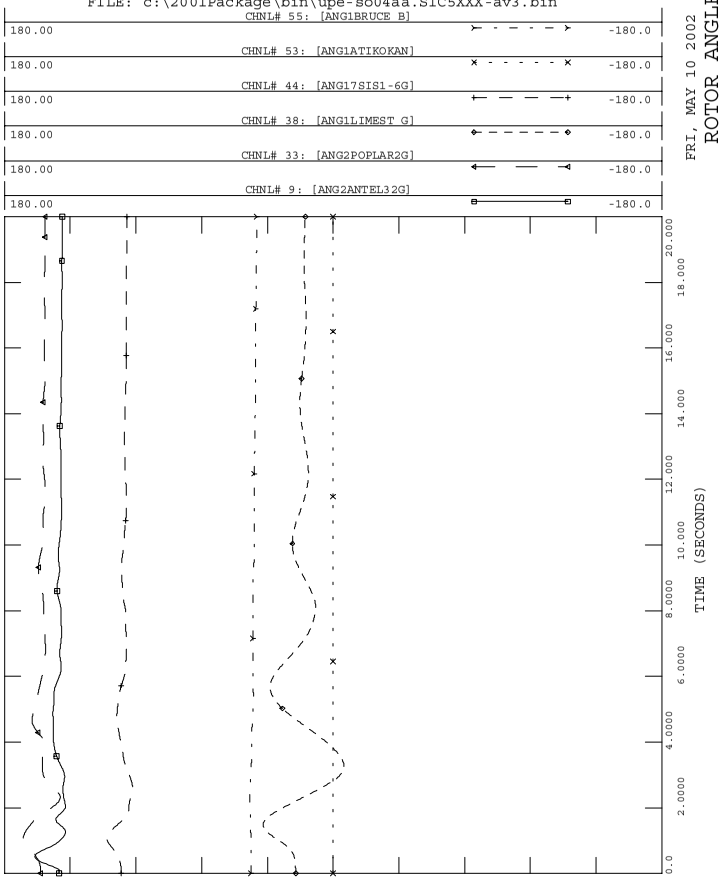
FRI, MAY 10 2002 19:52
ROTOR ANGLES 6

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin



FRI, MAY 10 2002 19:52
ROTOR ANGLES NB

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin



FRI, MAY 10 2002 19:52
ROTOR ANGLES 5

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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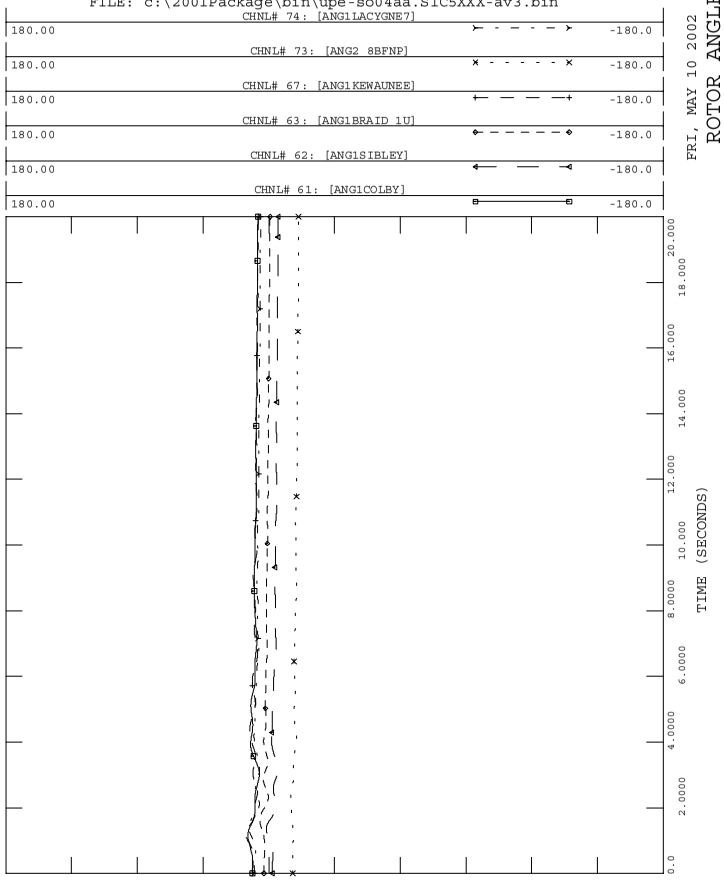
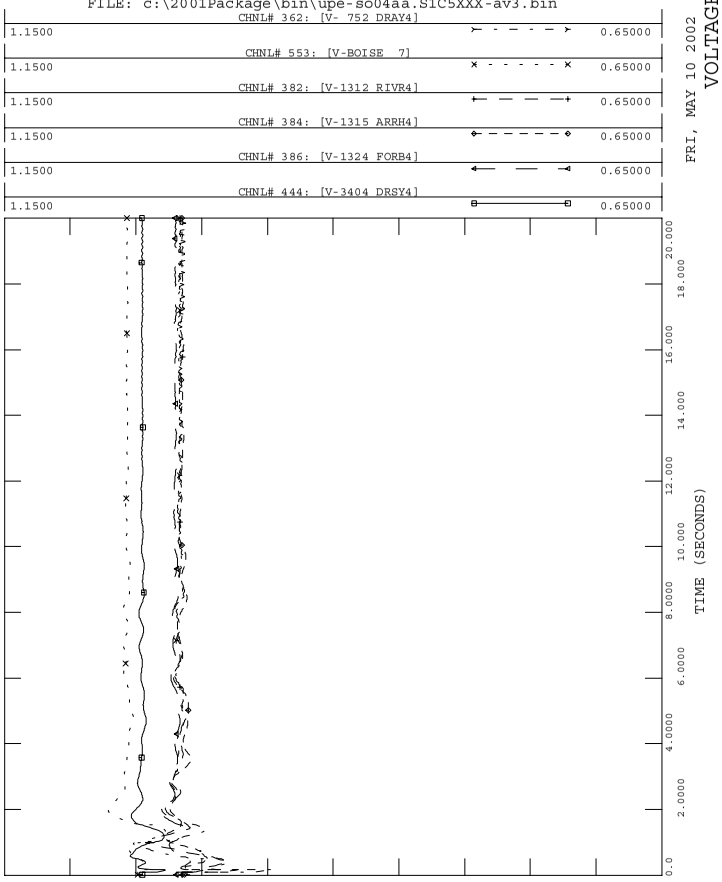
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin



FRI, MAY 10 2002 19:52
ROTOR ANGLES 7

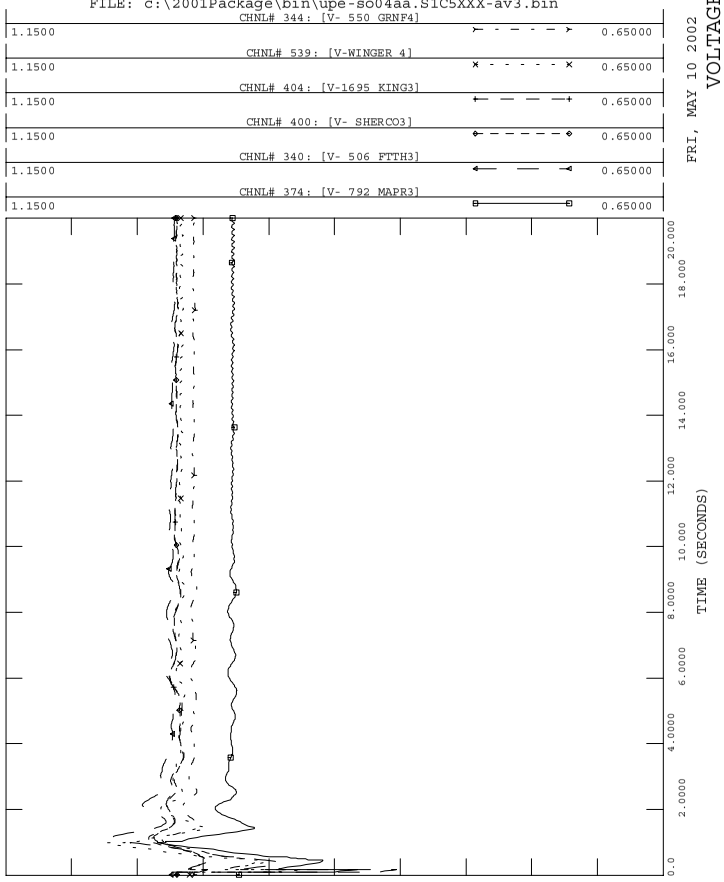
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
VOLTAGES 1



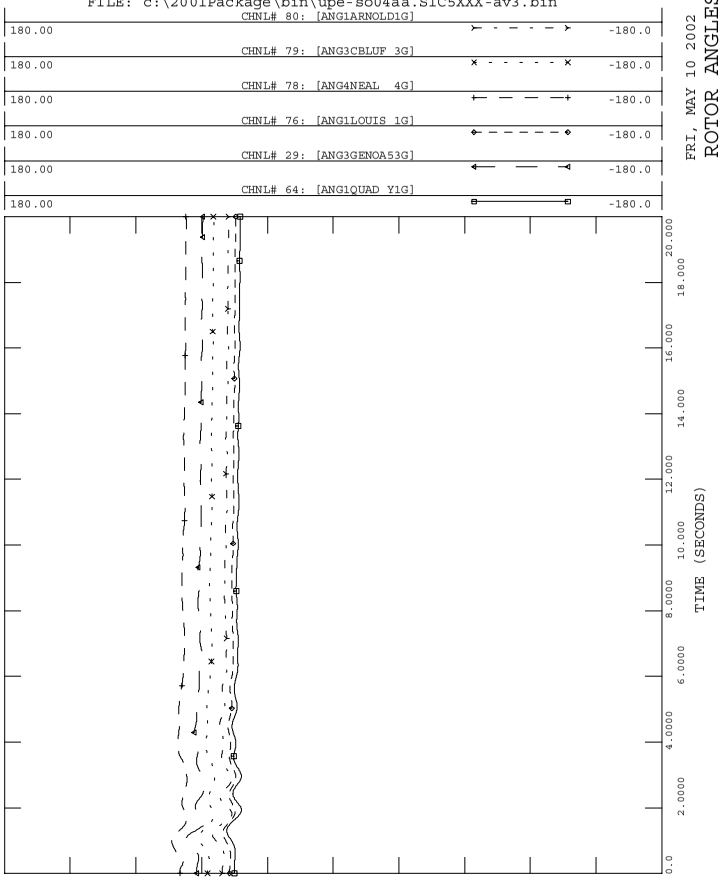
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
VOLTAGES 3



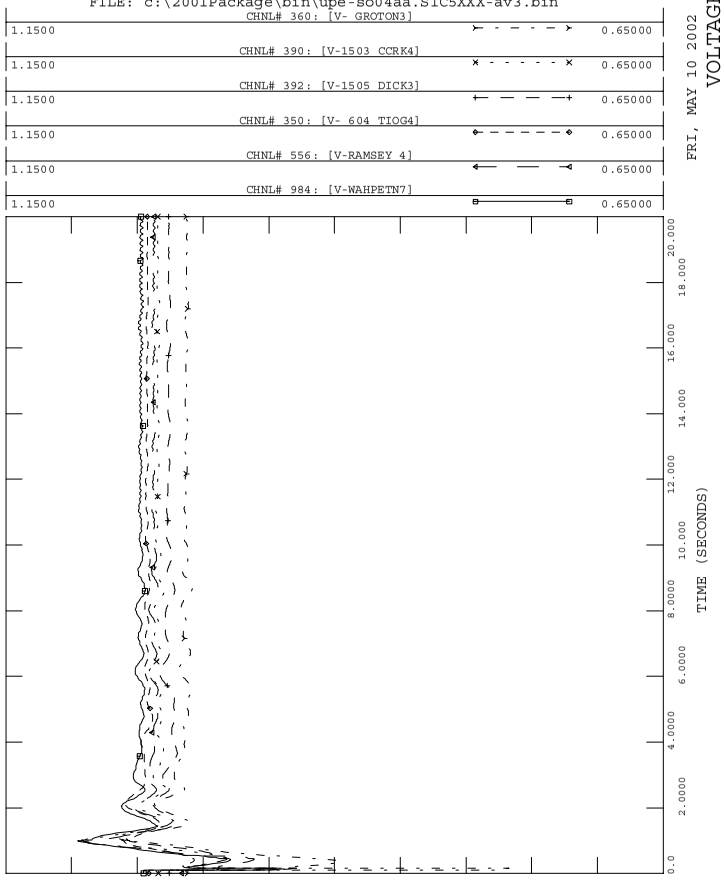
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
ROTOR ANGLES IA



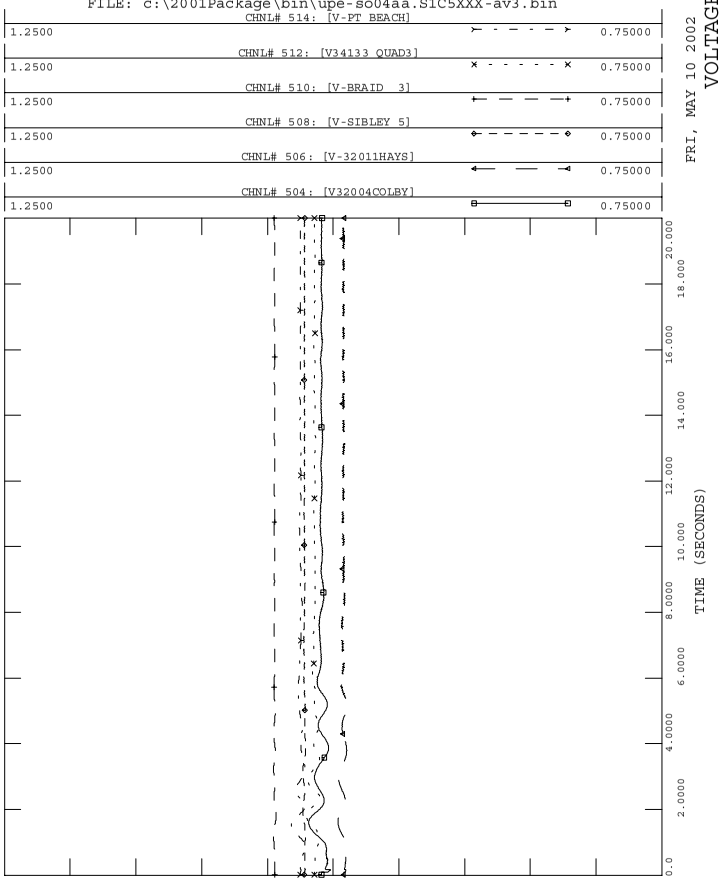
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
VOLTAGES 2



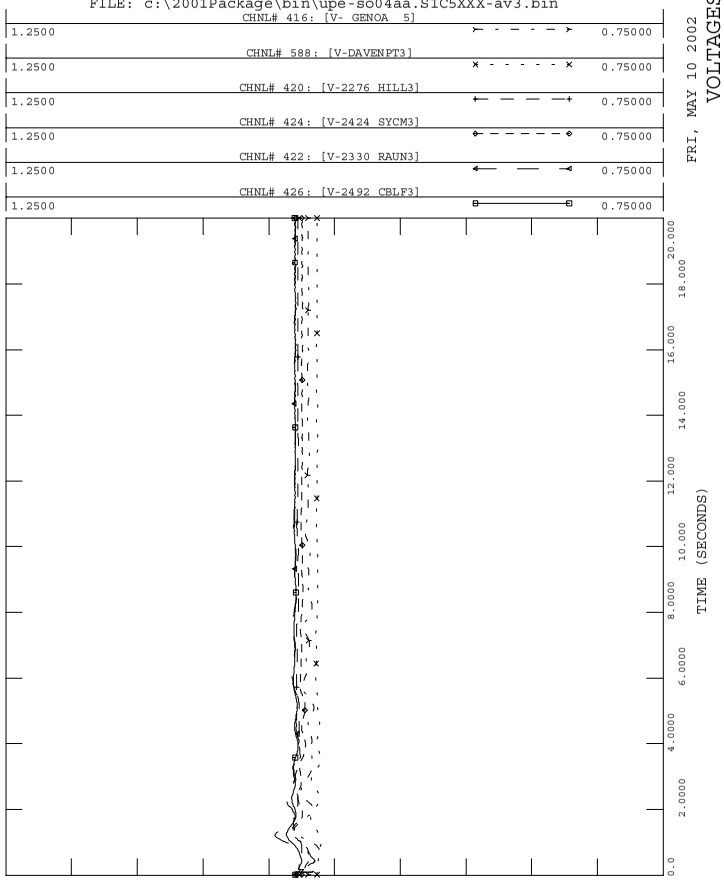
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
VOLTAGES 5



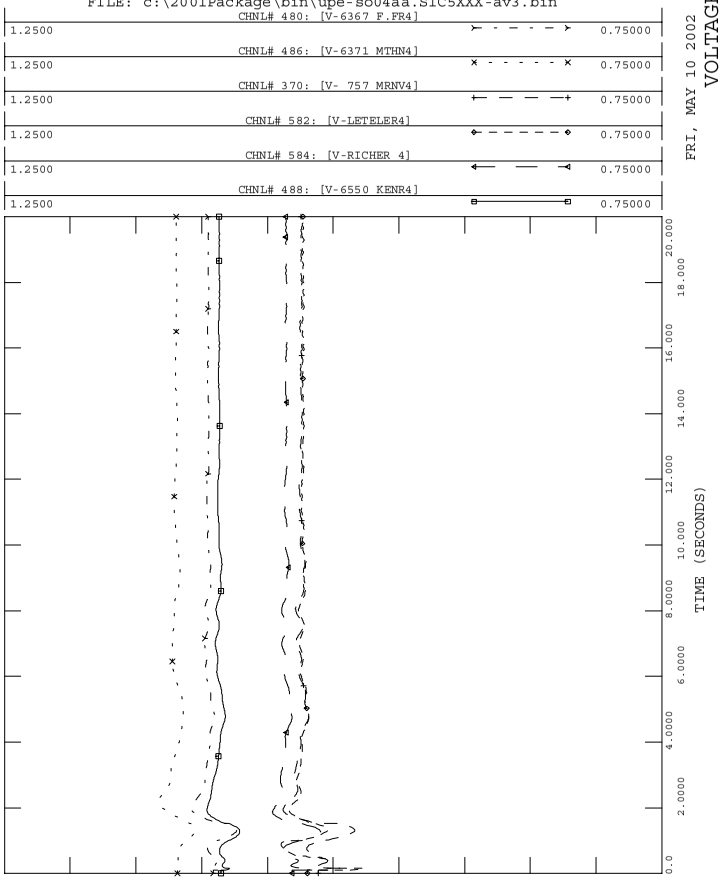
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
VOLTAGES IA



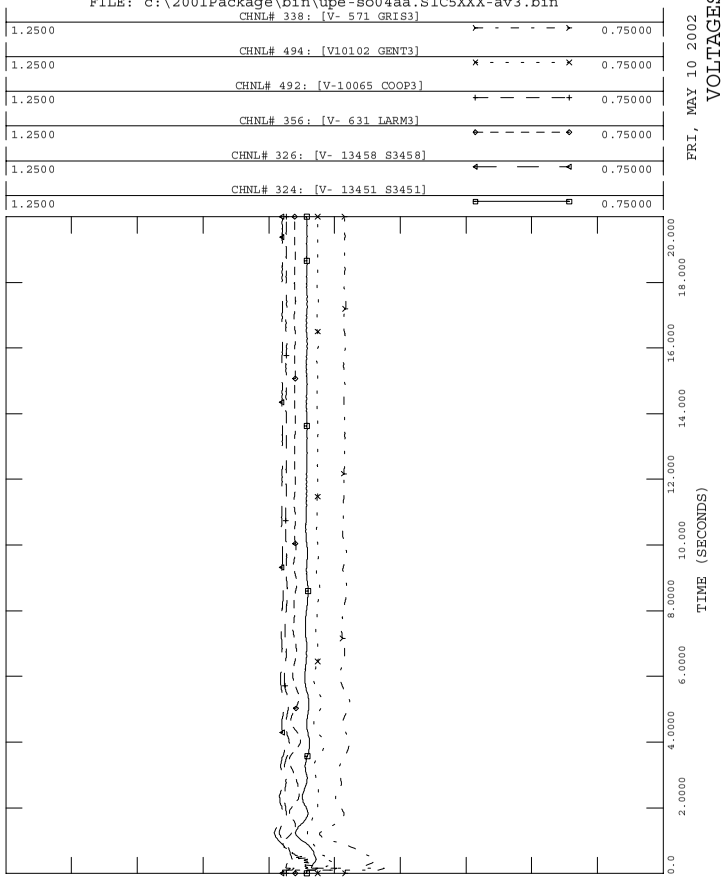
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

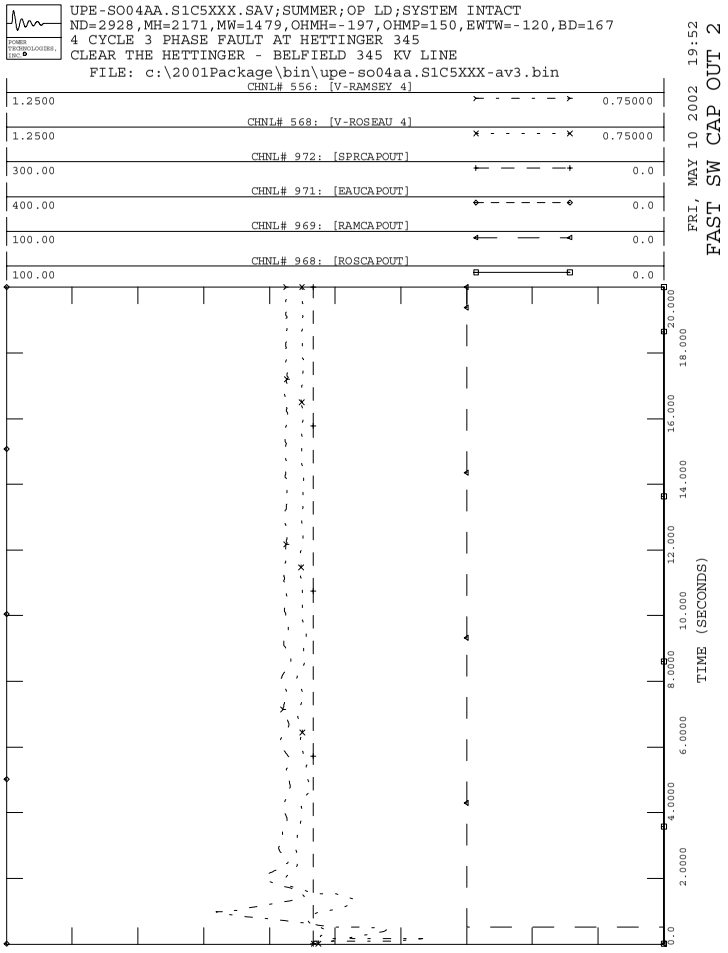
FRI, MAY 10 2002 19:52
VOLTAGES 4

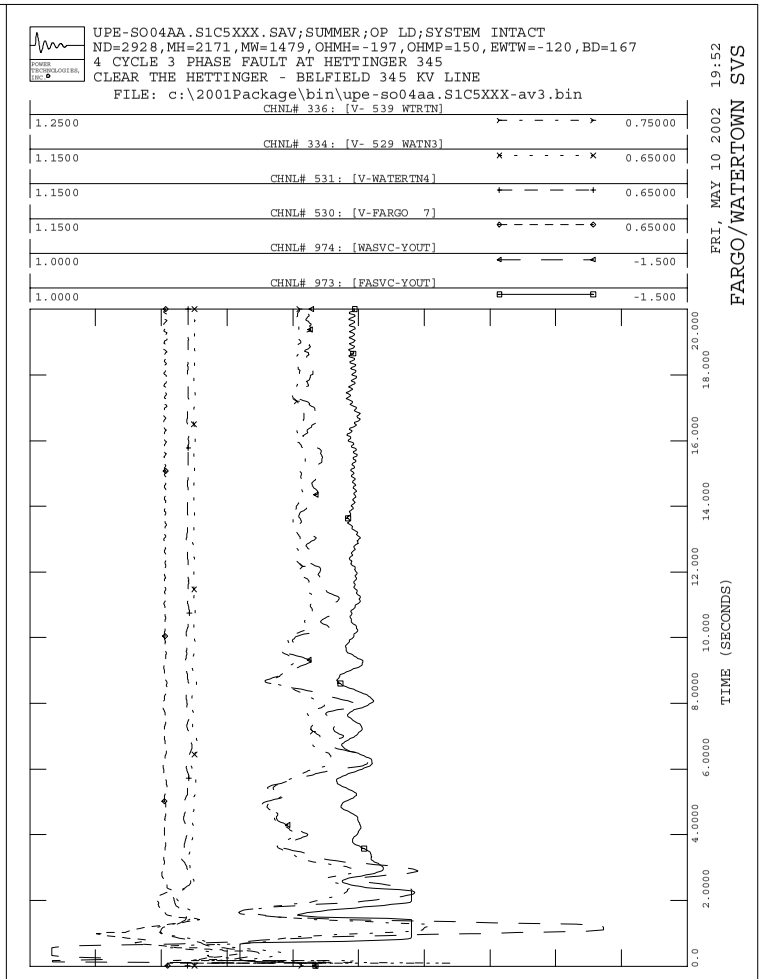


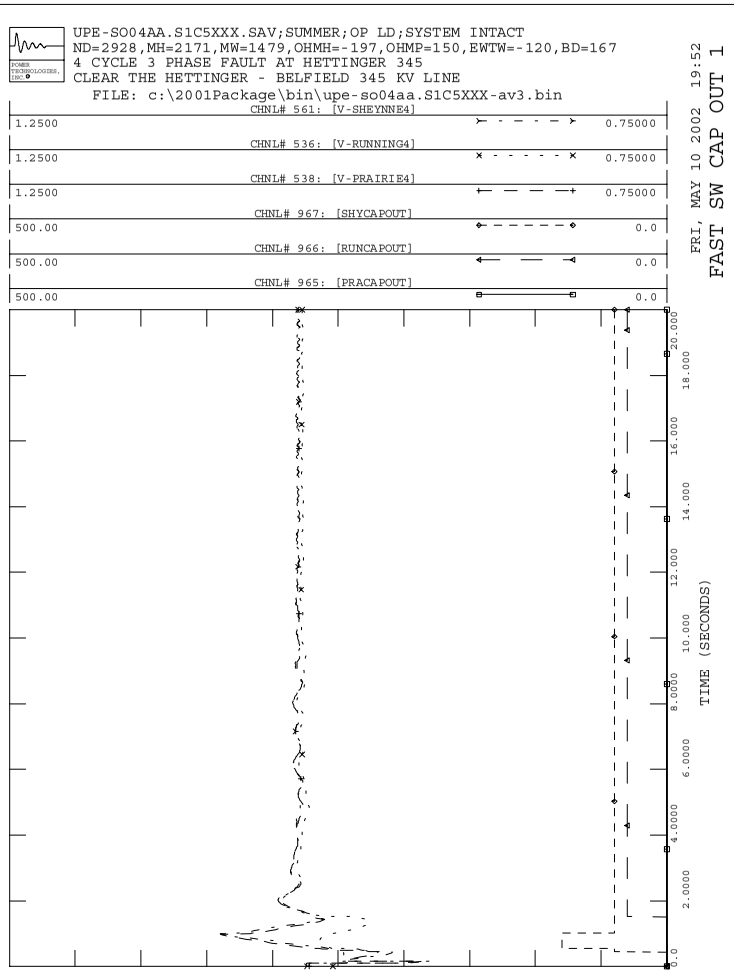
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

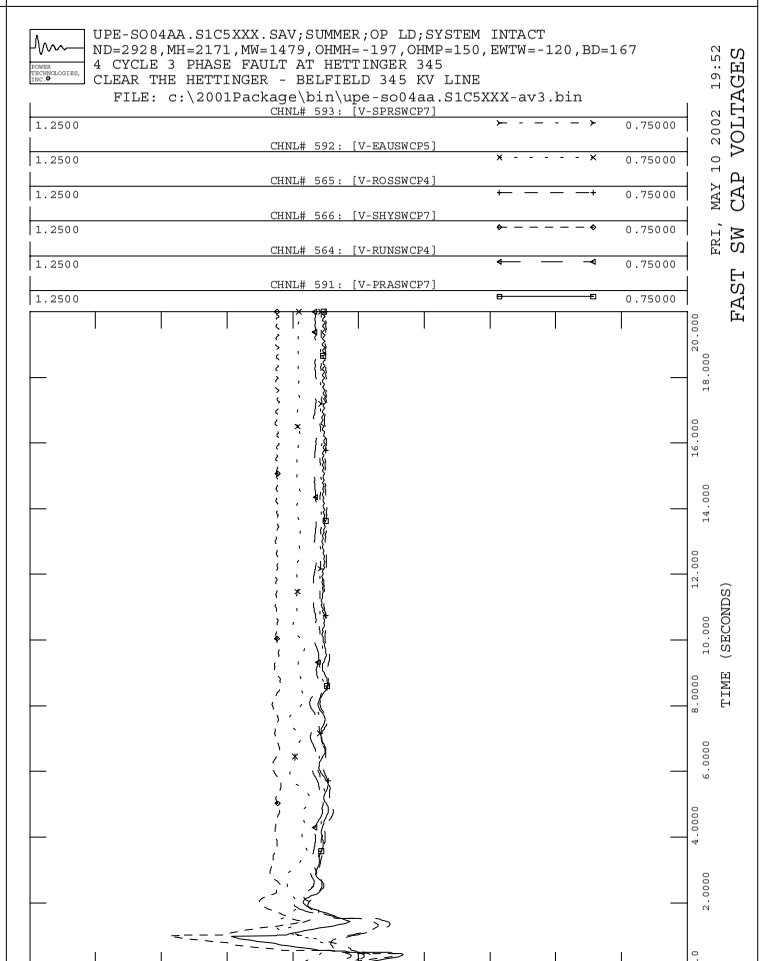
FRI, MAY 10 2002 19:52
VOLTAGES NB




UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
FRI, MAY 10 2002 19:52
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
FRI, MAY 10 2002 19:52
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
FRI, MAY 10 2002 19:52
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
FRI, MAY 10 2002 19:52
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

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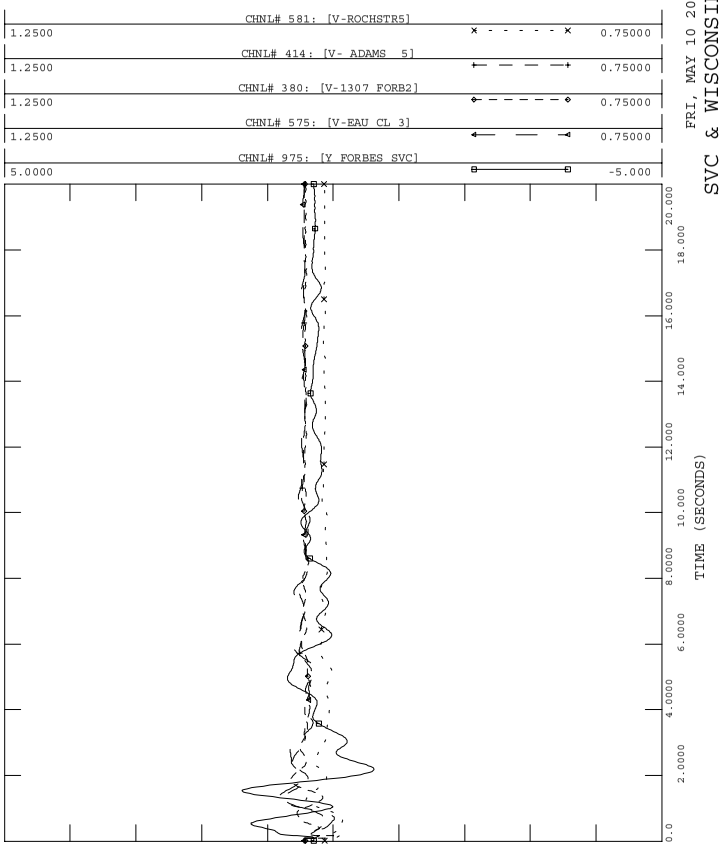
SVC & WISCONSIN VOLT



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

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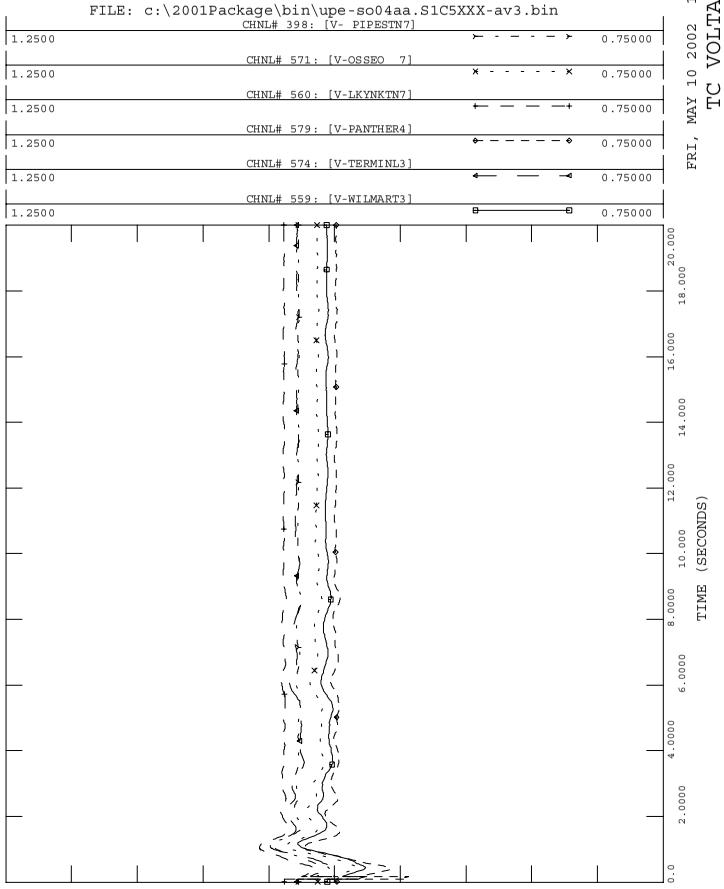
TC VOLTAGES



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

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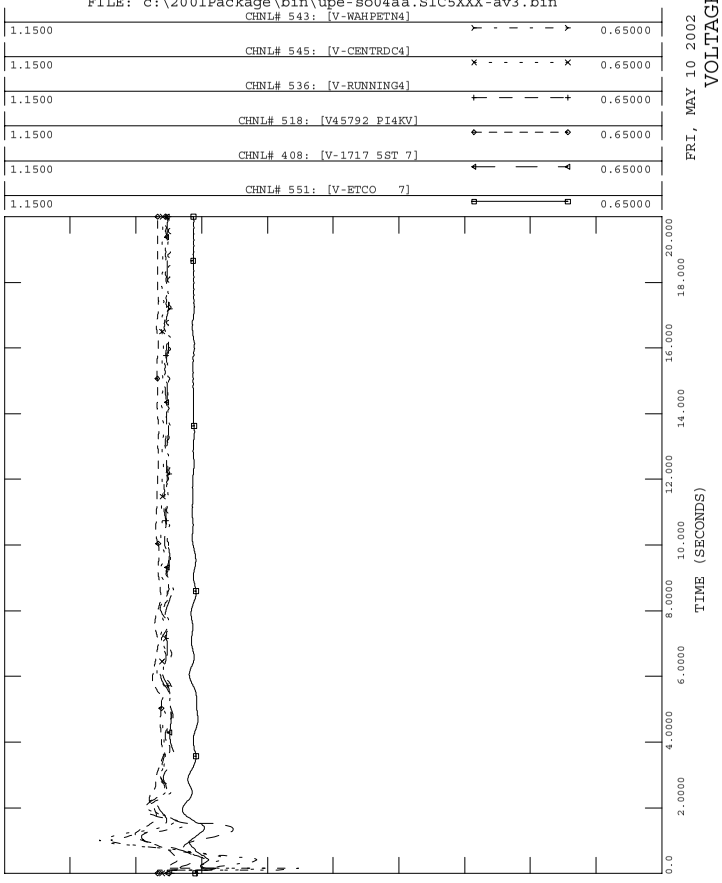
VOLTAGES 6



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

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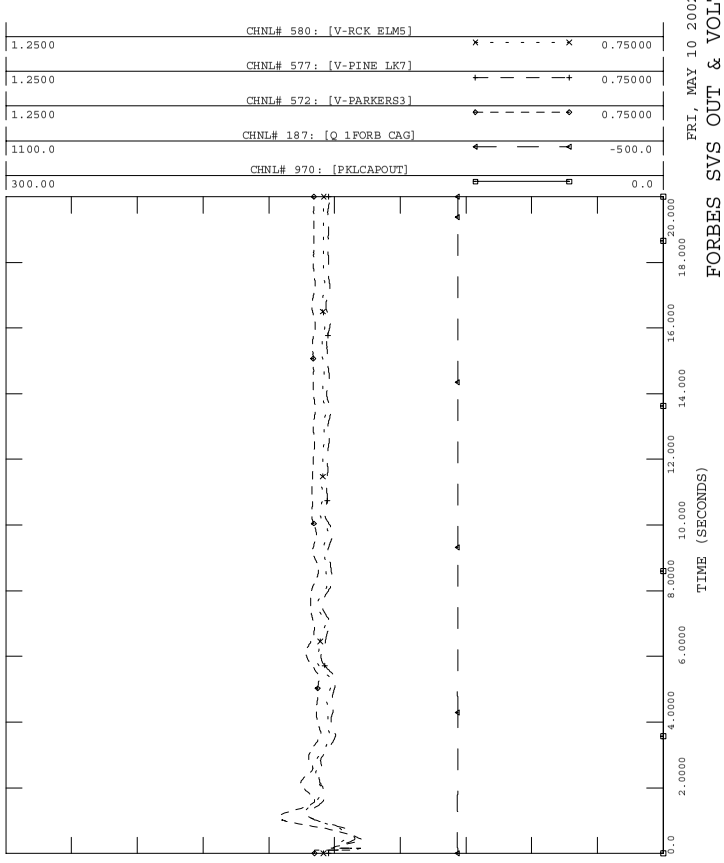
FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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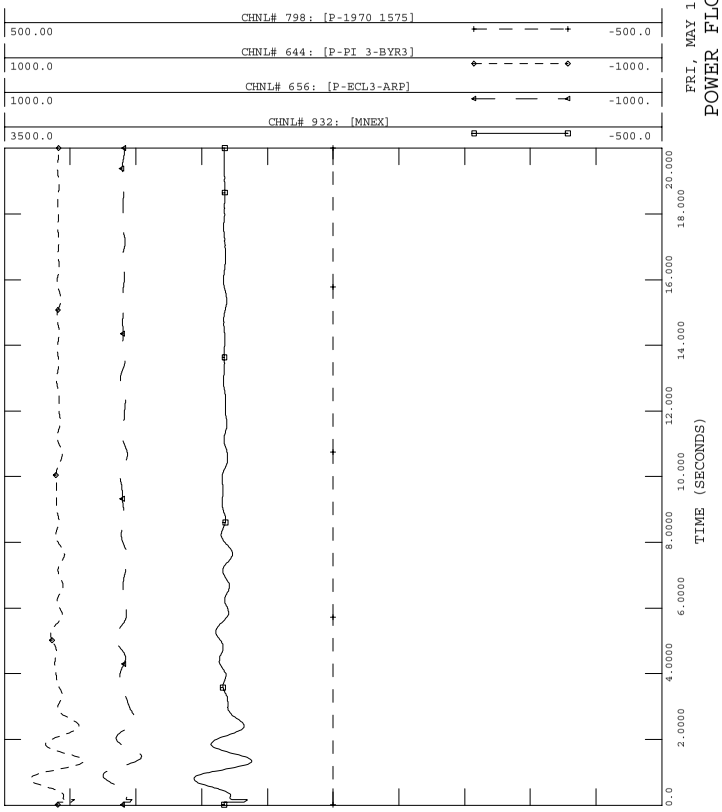
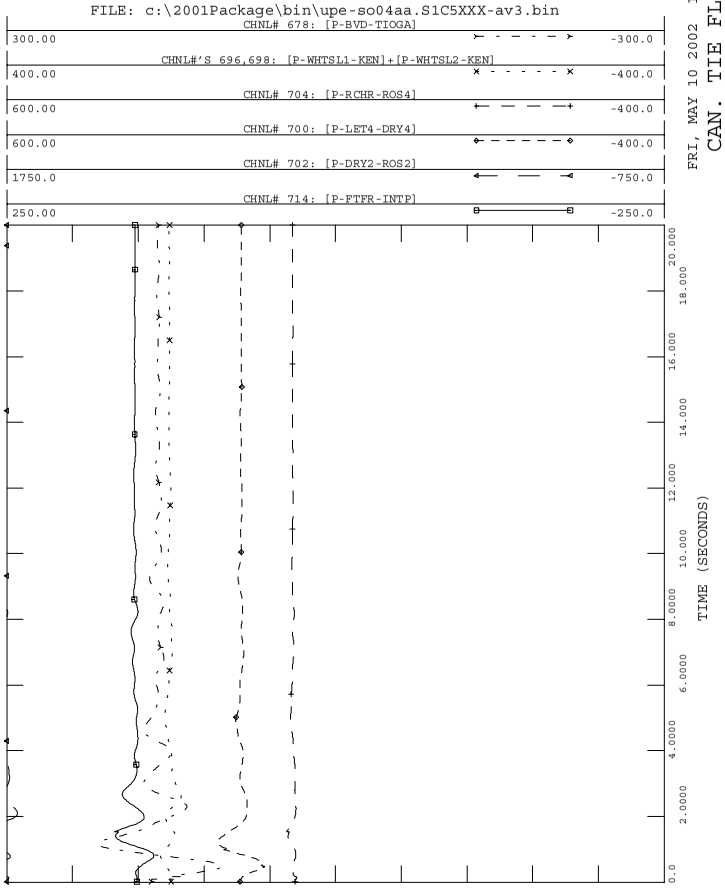
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
POWER FLOW SUMS 2



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
CAN. TIE FLOWS



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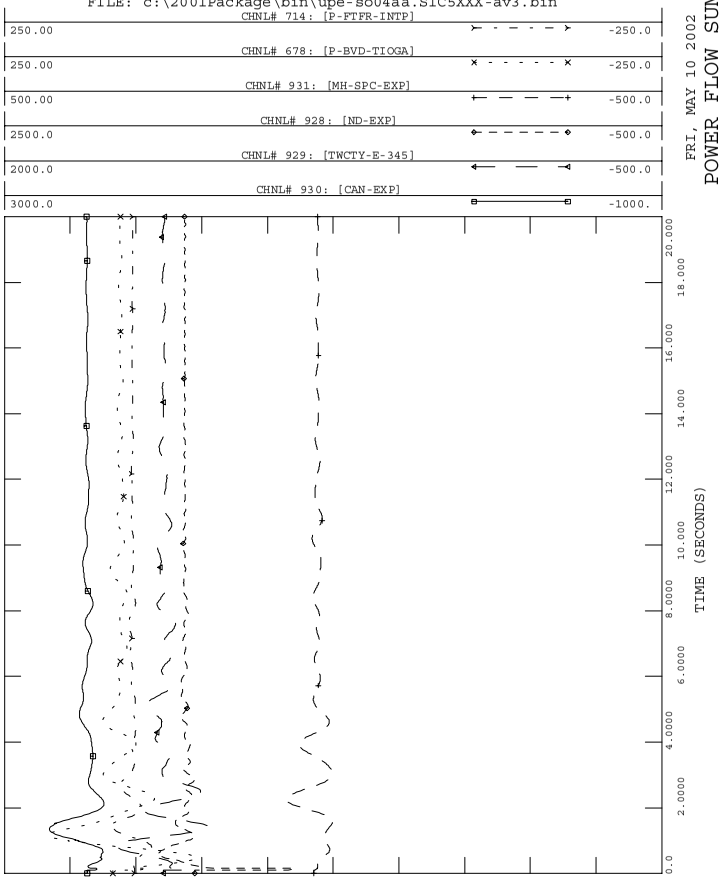
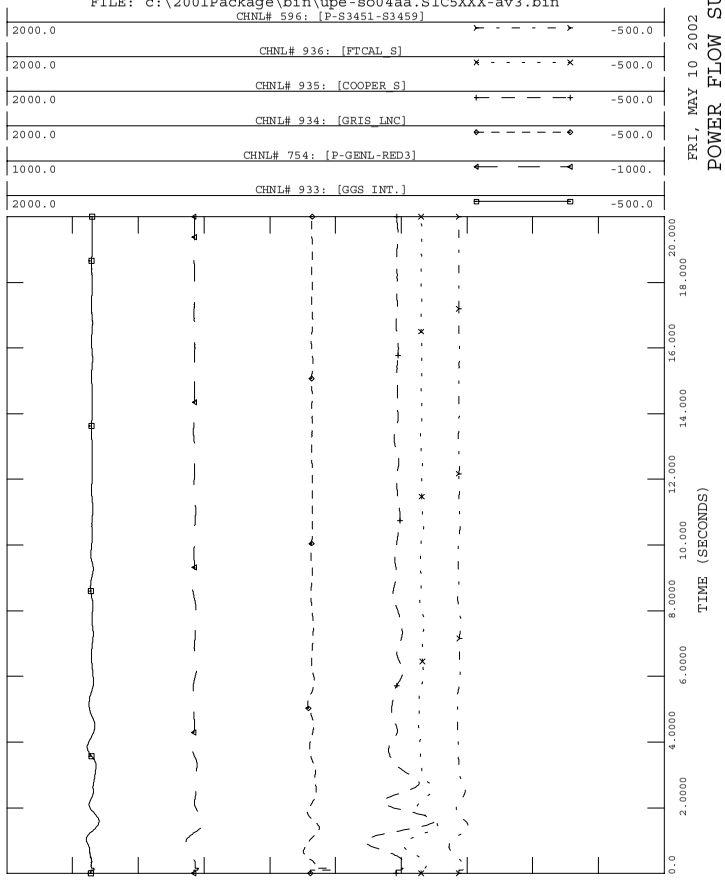
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
POWER FLOW SUMS 1



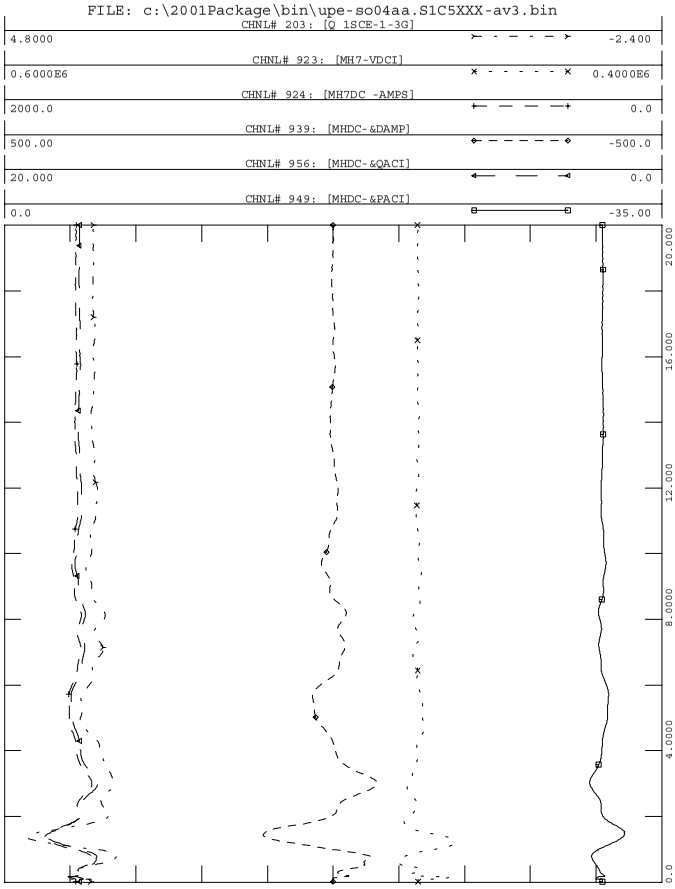
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
POWER FLOW SUM 3



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
MH DC PARAMETERS



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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

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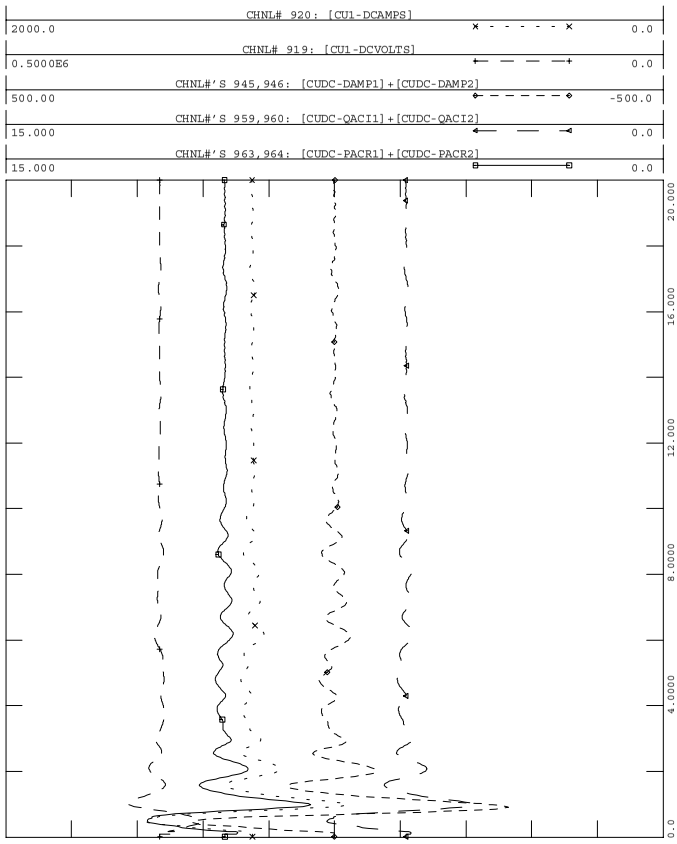
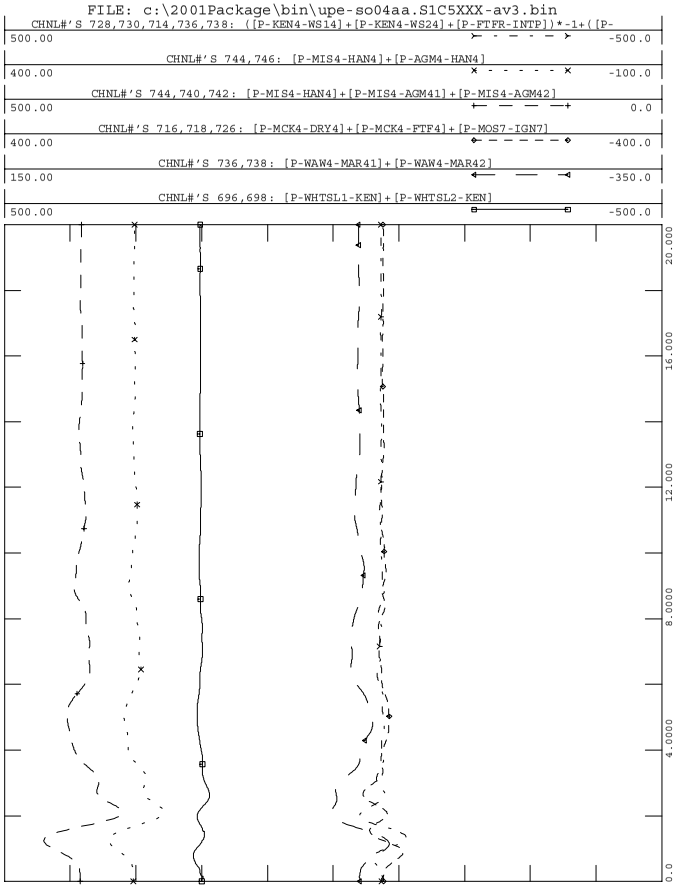
CU DC #1



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
OH TIE FLOWS



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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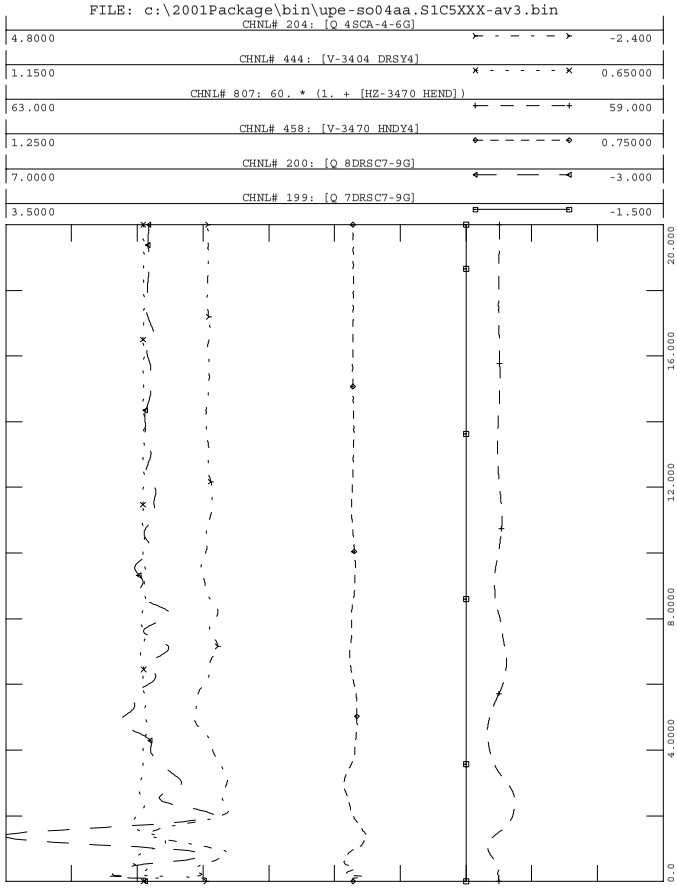
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52
MH DC PARAMETERS



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

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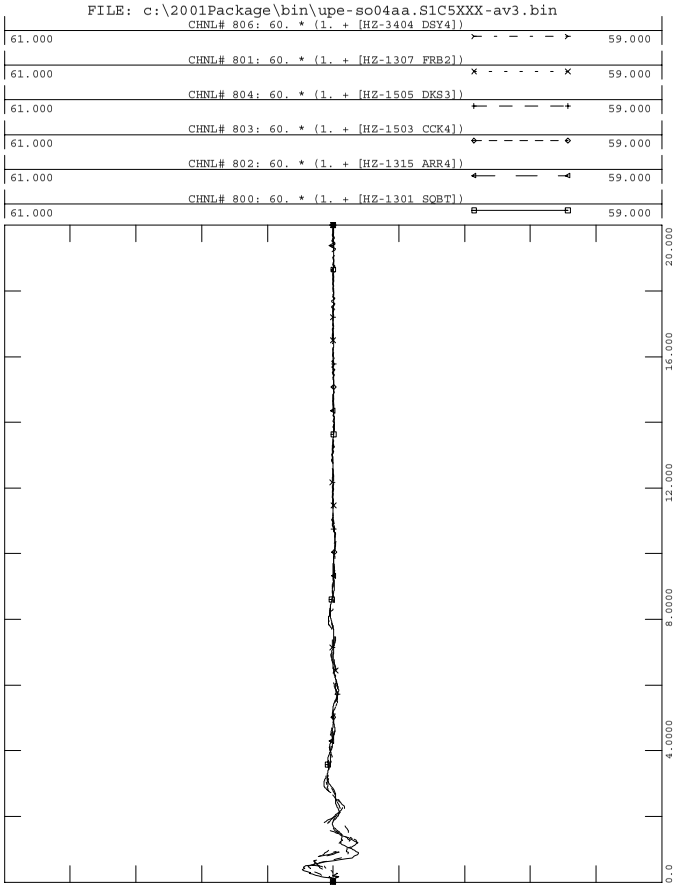
FREQ AT DC TERMINALS



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

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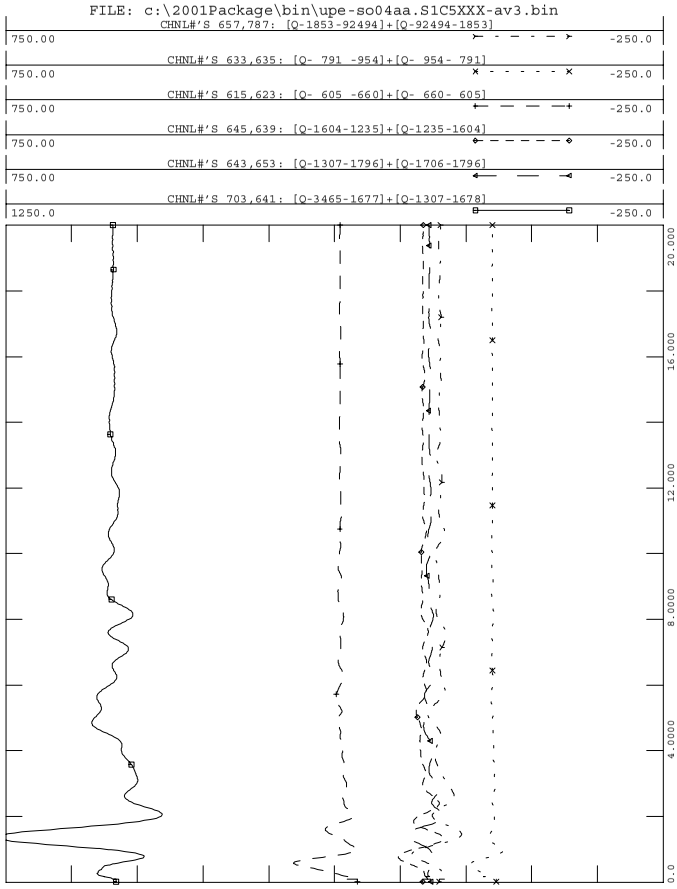
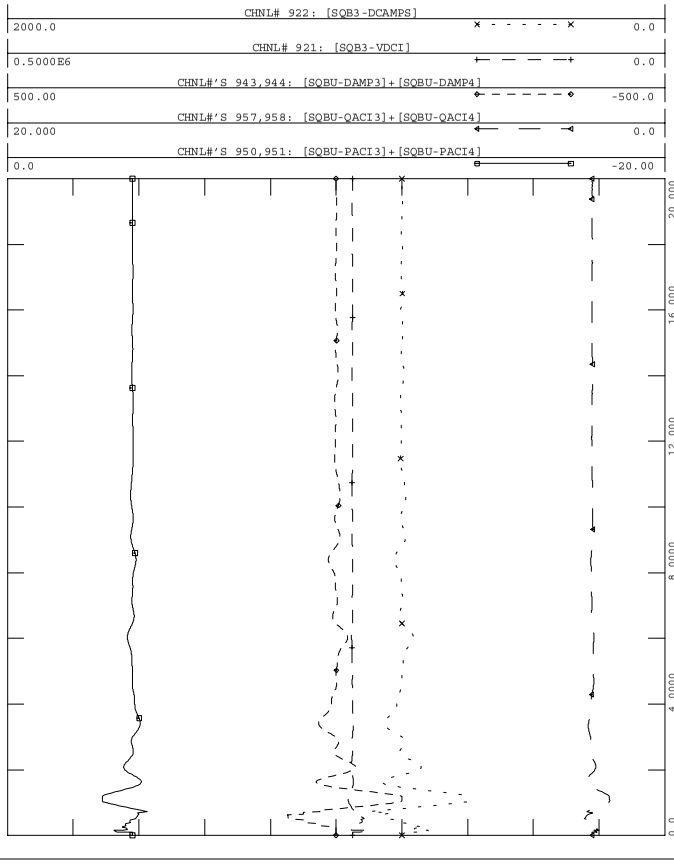
VAR LOSSES



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52

SQB DC #3



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

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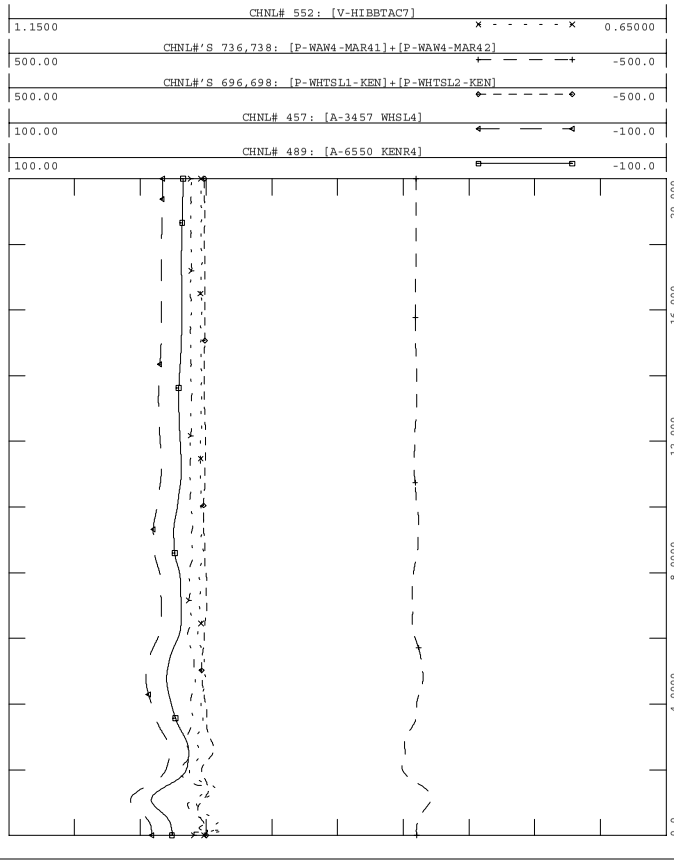
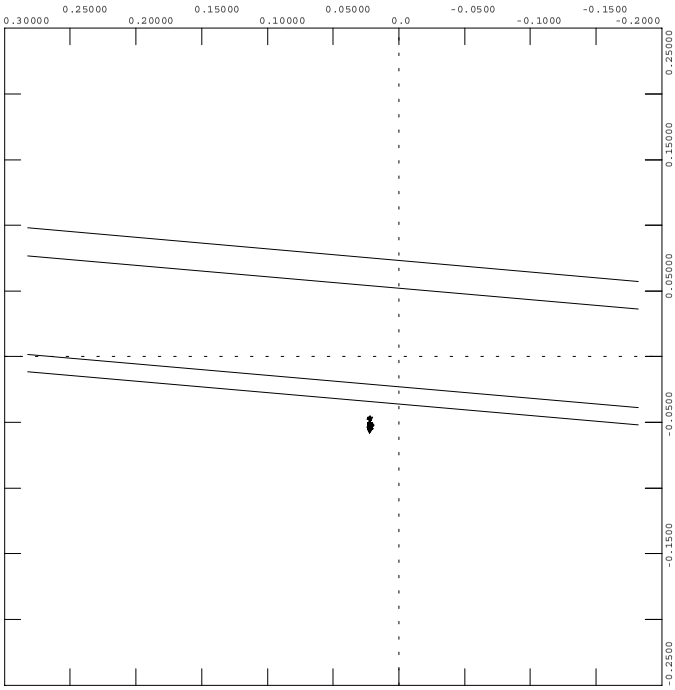
VOLTAGES, ANGLES



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

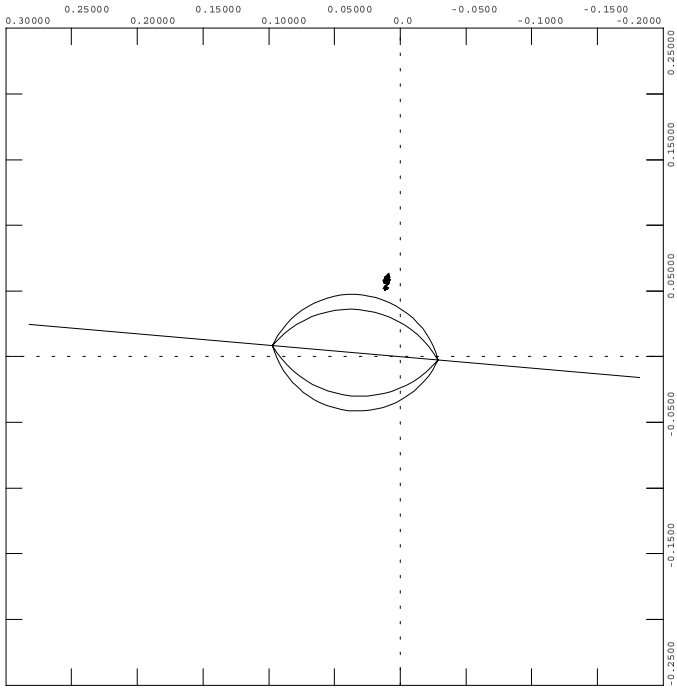


FRI, MAY 10 2002 19:52
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

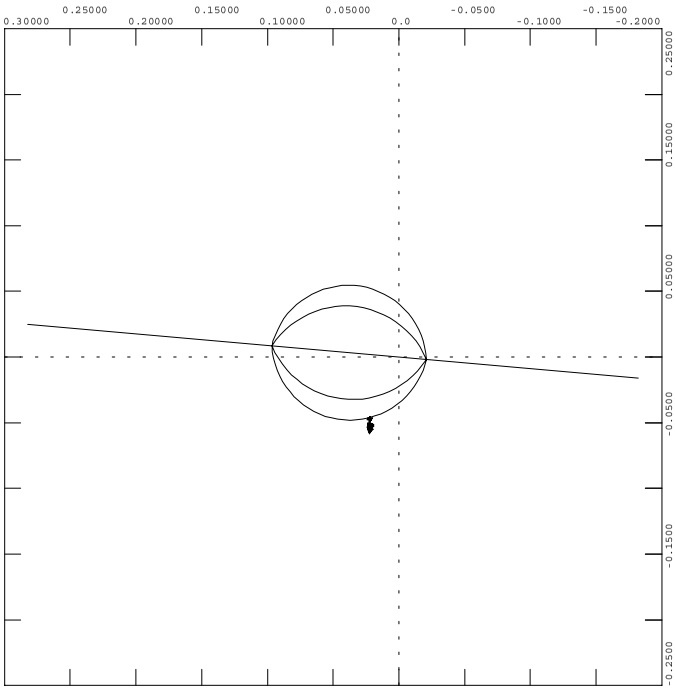


FRI, MAY 10 2002 19:52
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

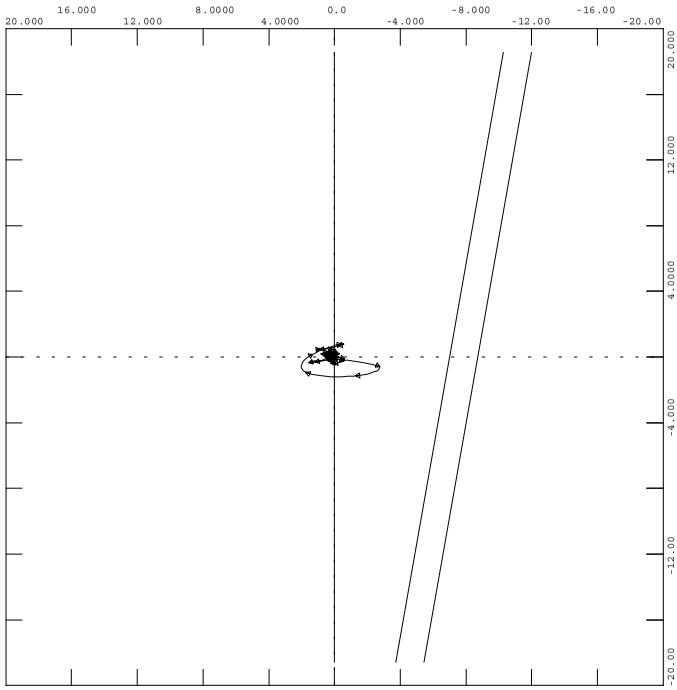


FRI, MAY 10 2002 19:52
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

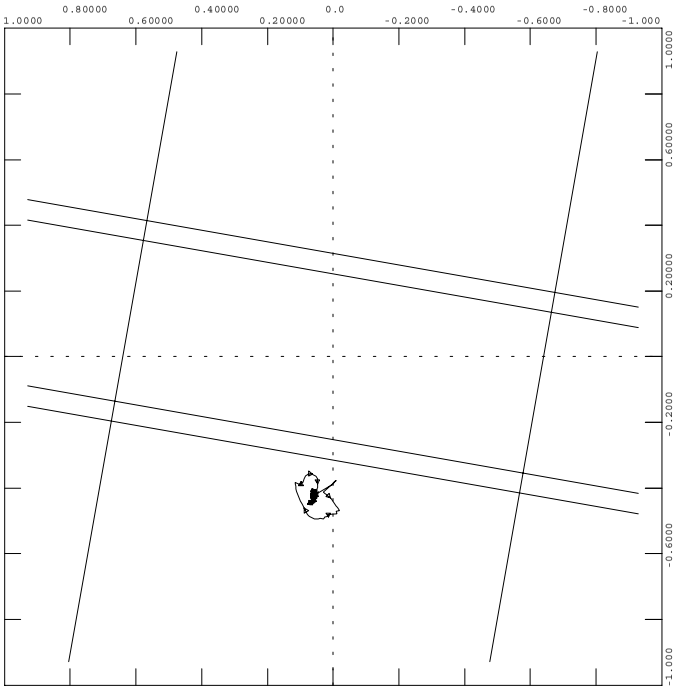


FRI, MAY 10 2002 19:52
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

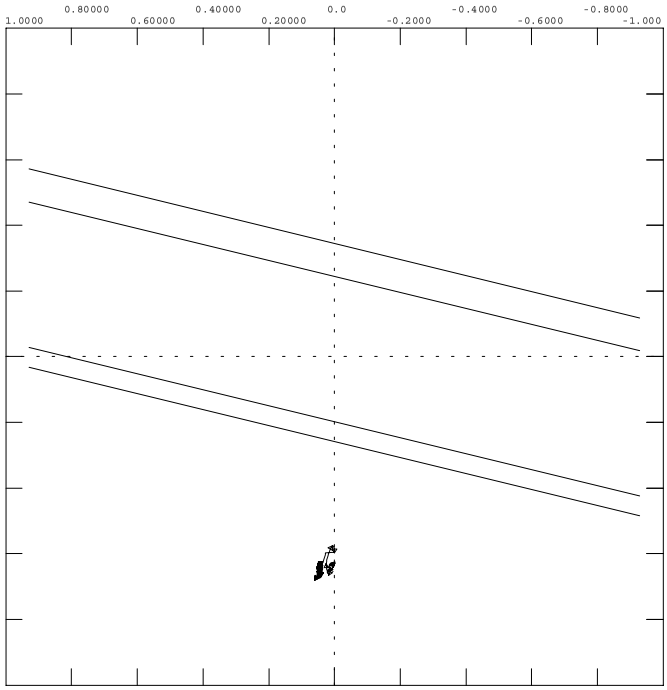
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

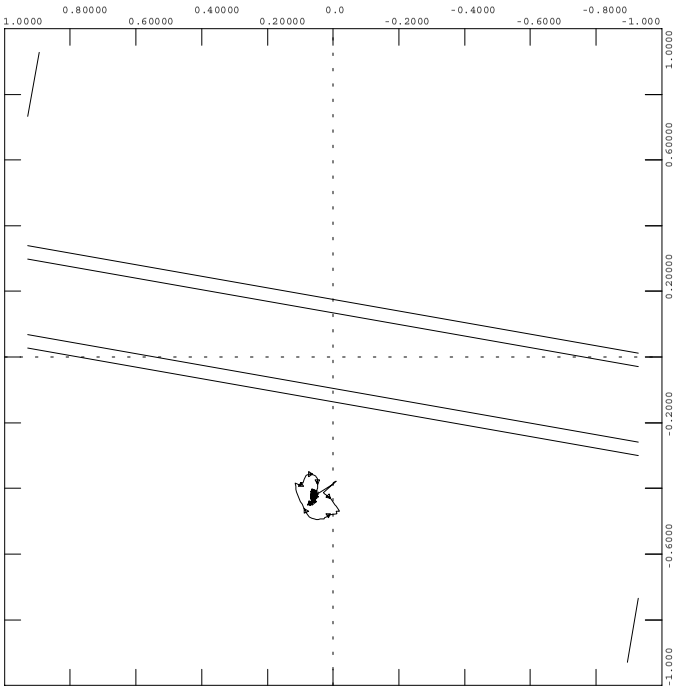
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

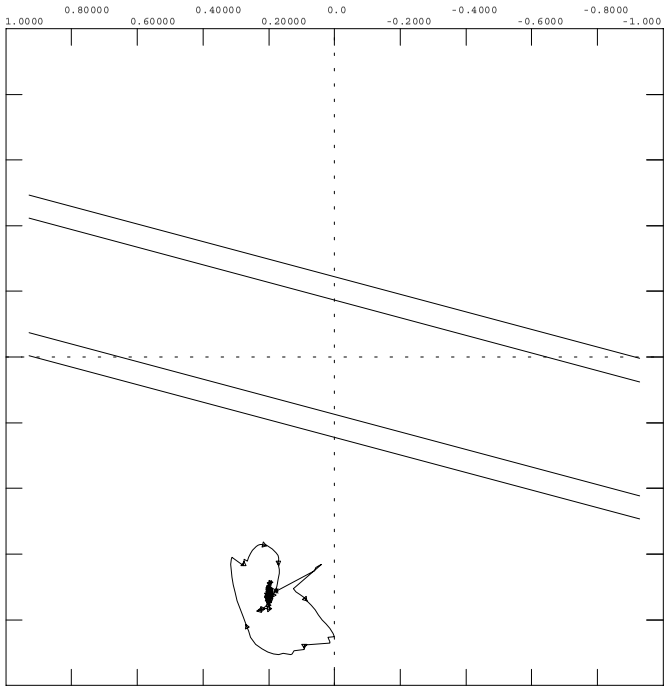
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

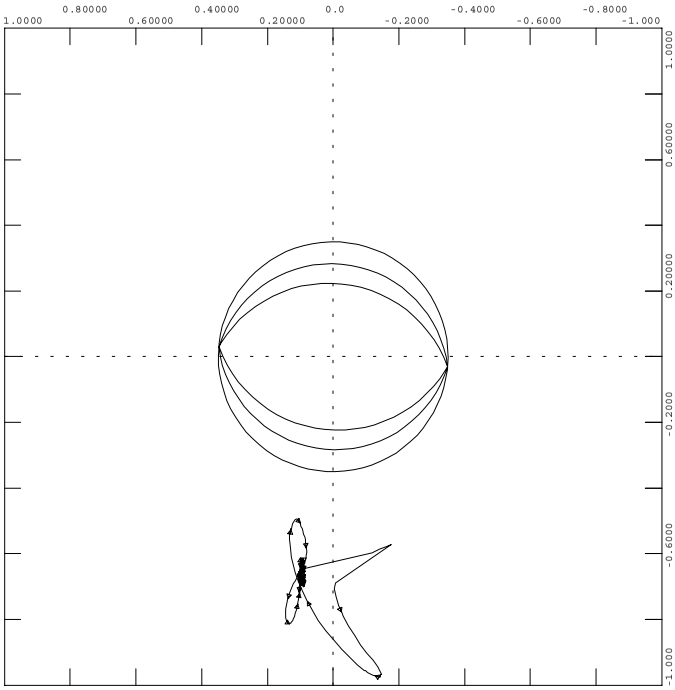
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

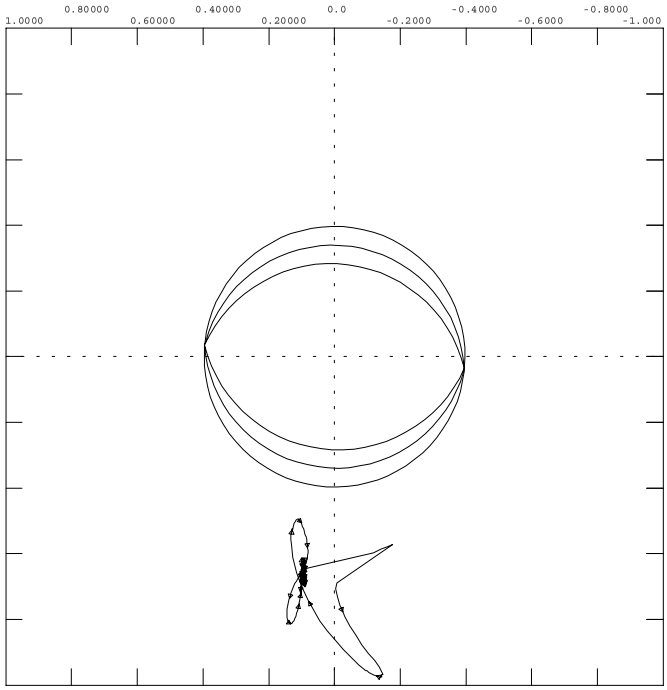
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

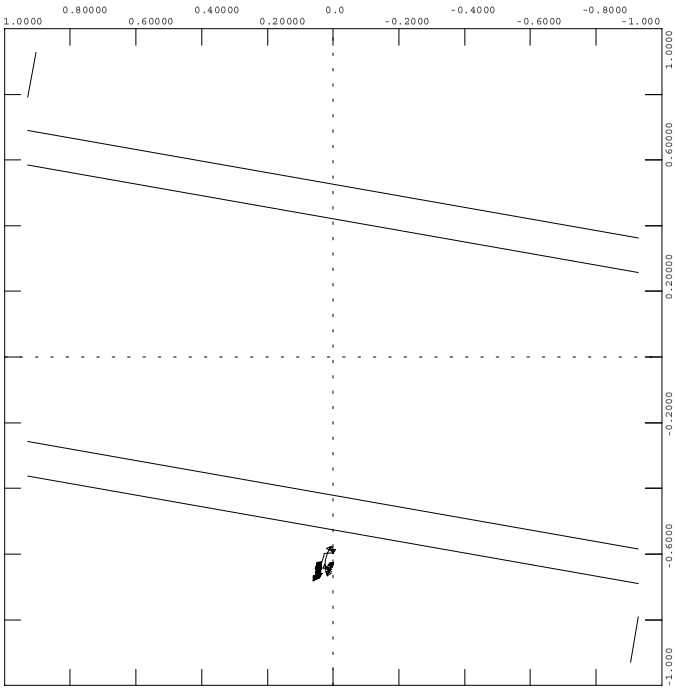
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

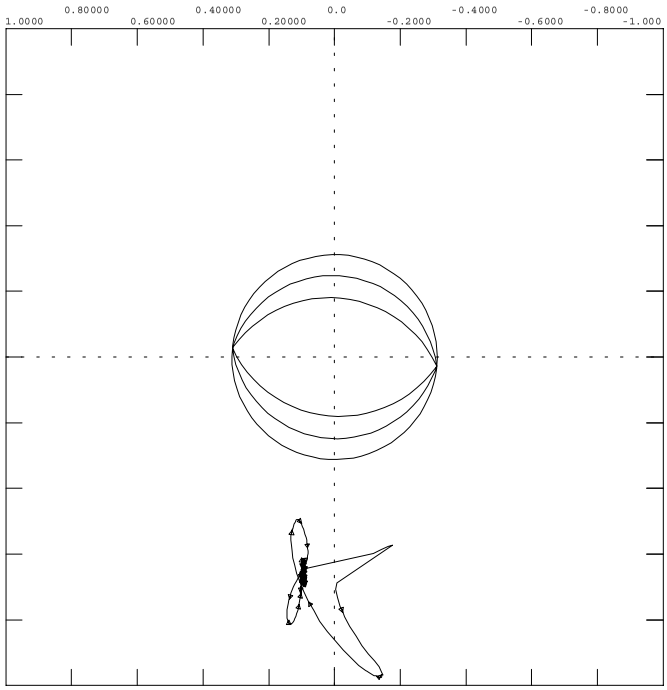
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



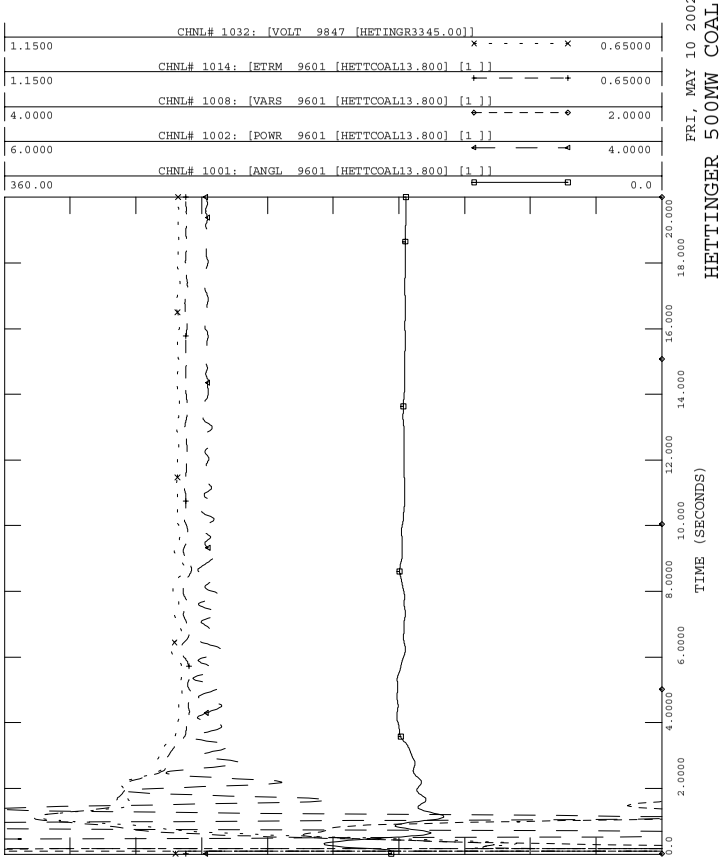
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

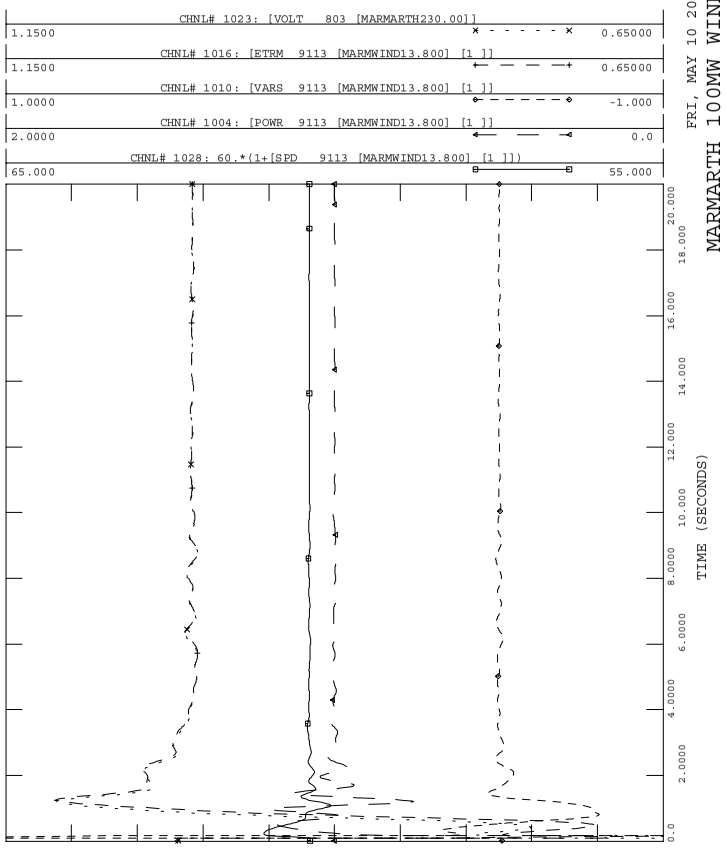


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin



FRI, MAY 10 2002 19:52
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

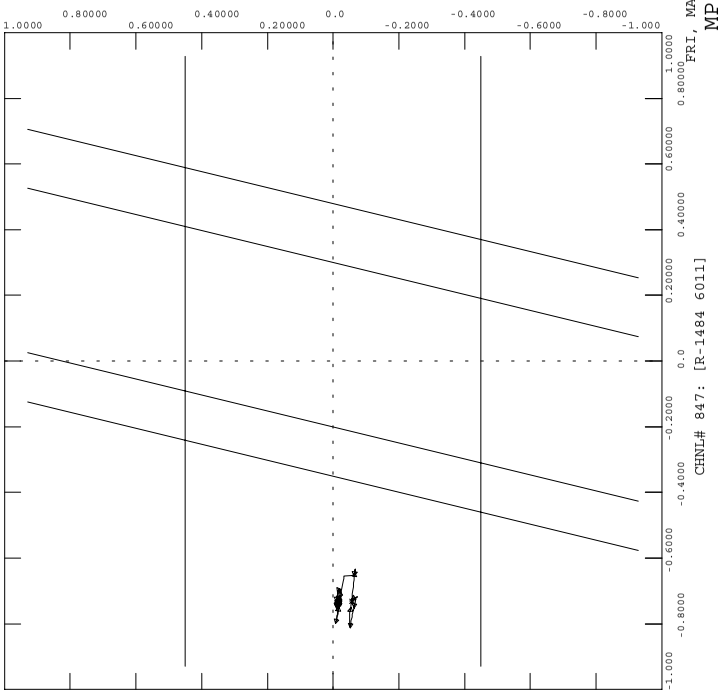


FRI, MAY 10 2002 19:52
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE

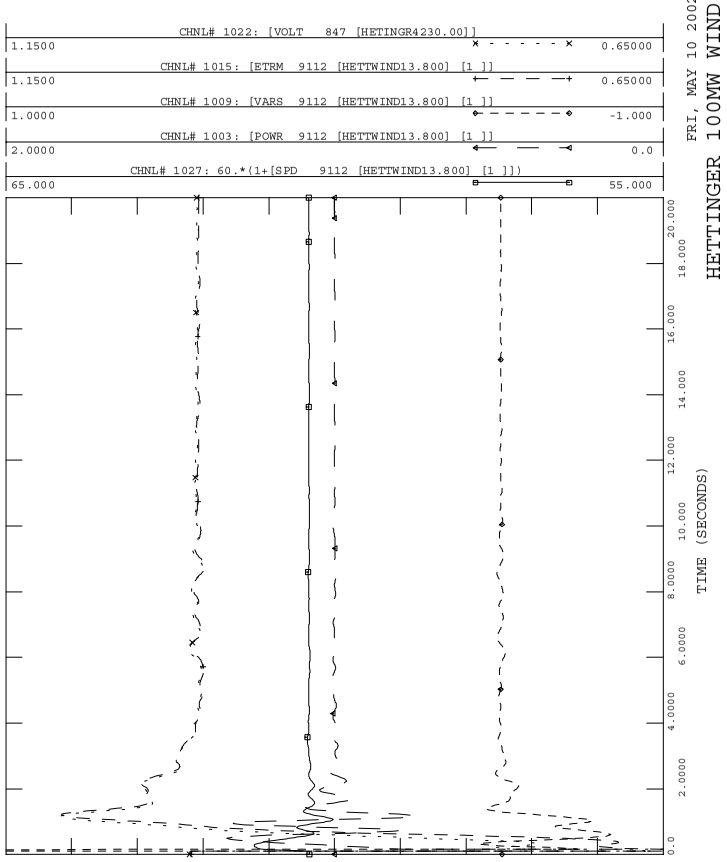
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



FRI, MAY 10 2002 19:52
MP-OH I.FALLS (779)

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

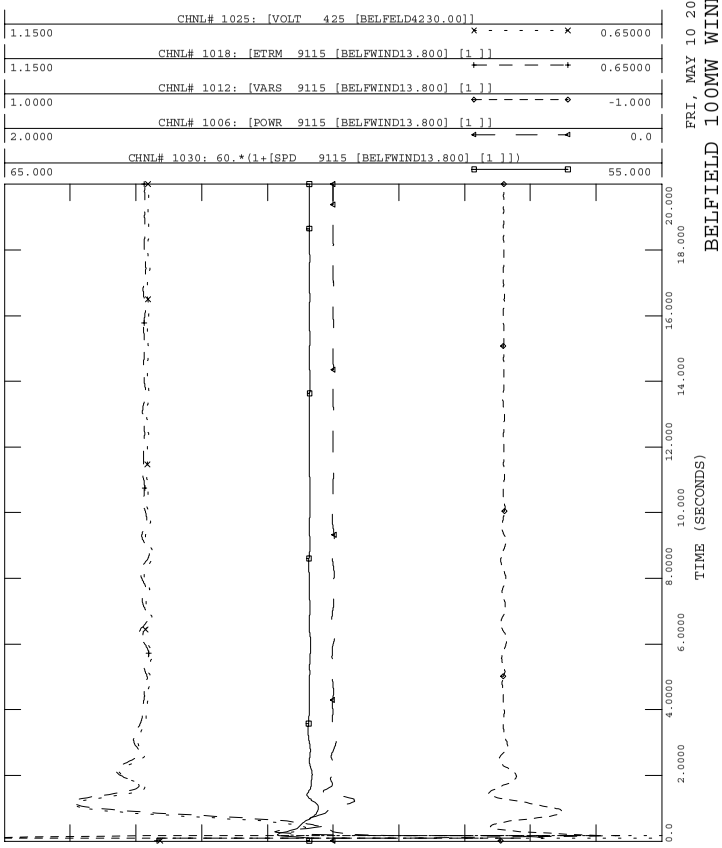


FRI, MAY 10 2002 19:52
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52

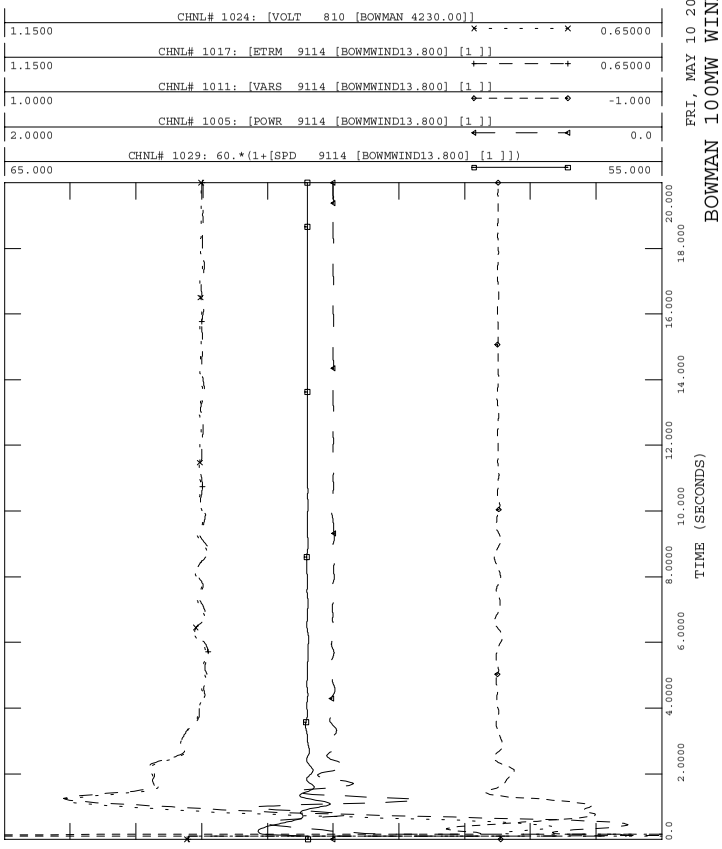
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

FRI, MAY 10 2002 19:52

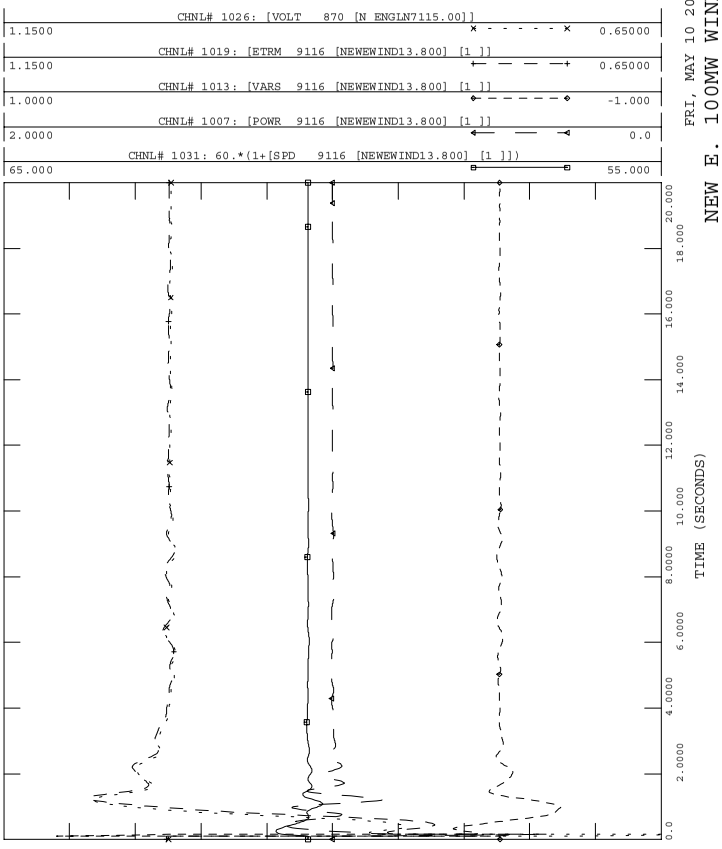
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT HETTINGER 345
CLEAR THE HETTINGER - BELFIELD 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-av3.bin

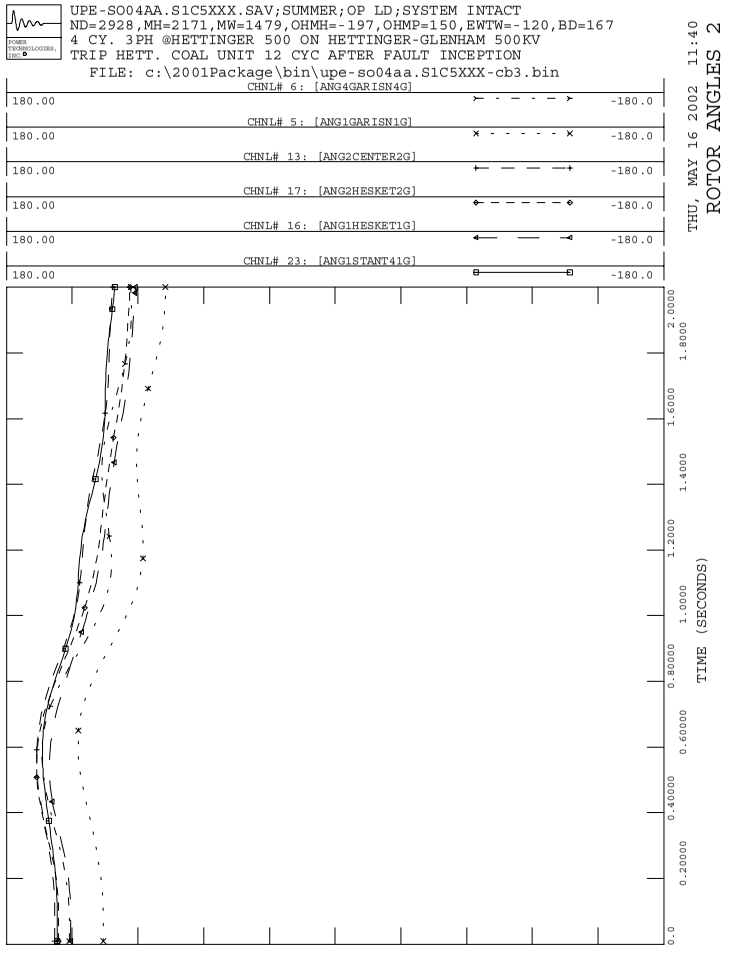
FRI, MAY 10 2002 19:52

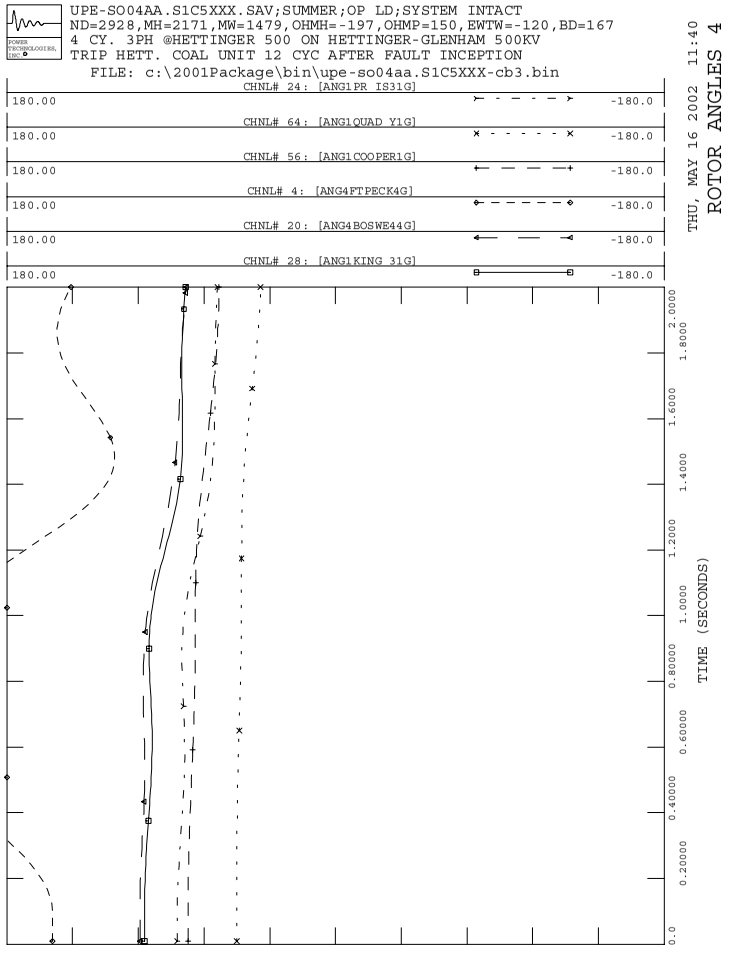
NEW E. 100MW WIND UNIT

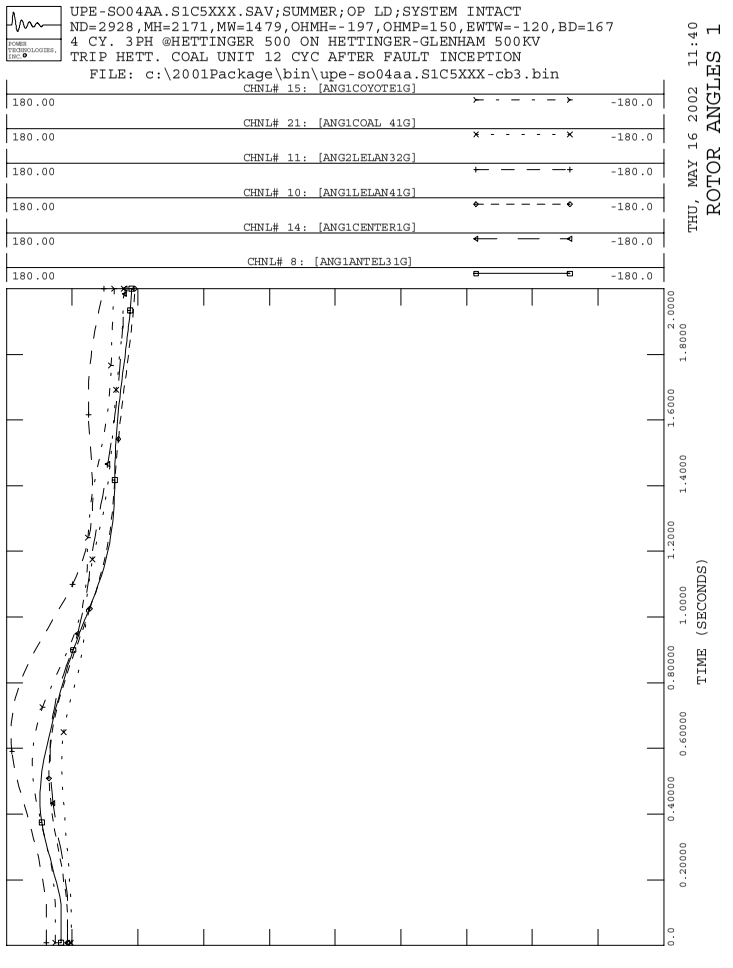


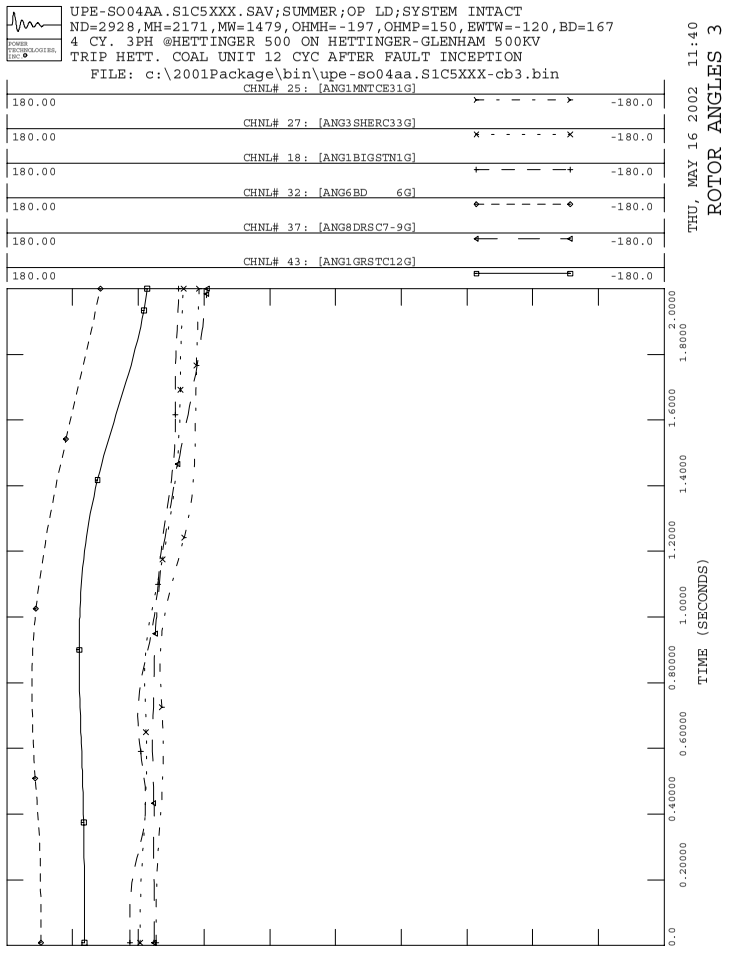
CONTINGENCY CB3

4 cycle 3 phase fault at Hettinger 500 kV on Hettinger-Glenham 500kV. Trip Hettinger coal unit 12 cycles after fault inception.

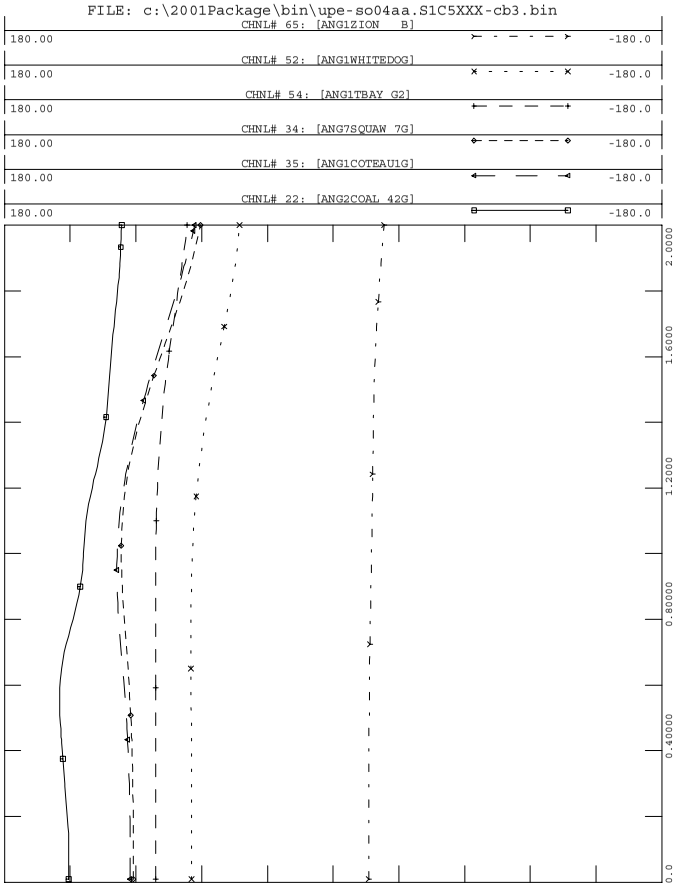

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 11:40
ROTOR ANGLES 2


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 11:40
ROTOR ANGLES 4


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 11:40
ROTOR ANGLES 1

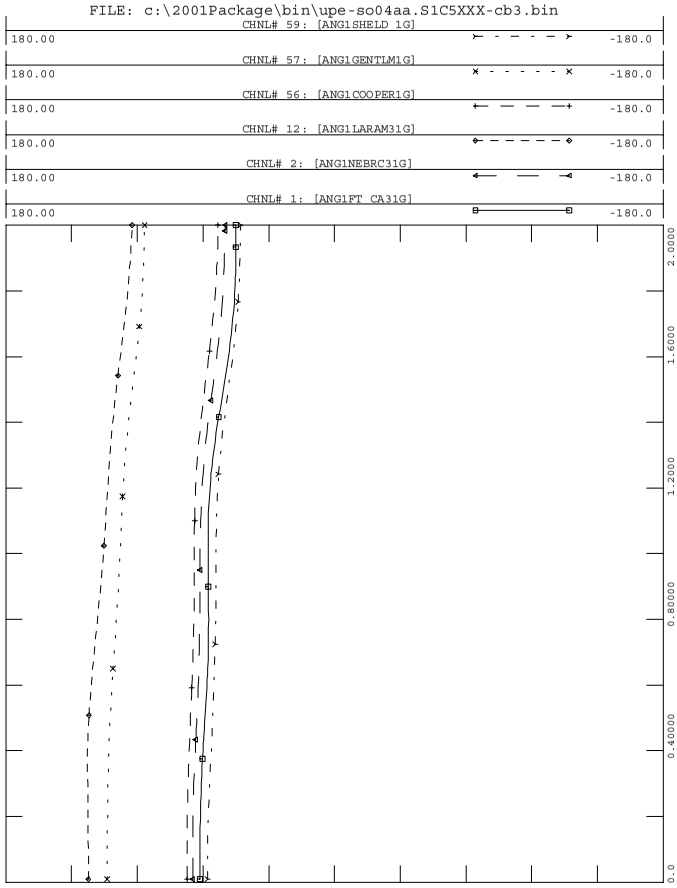

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 11:40
ROTOR ANGLES 3

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin



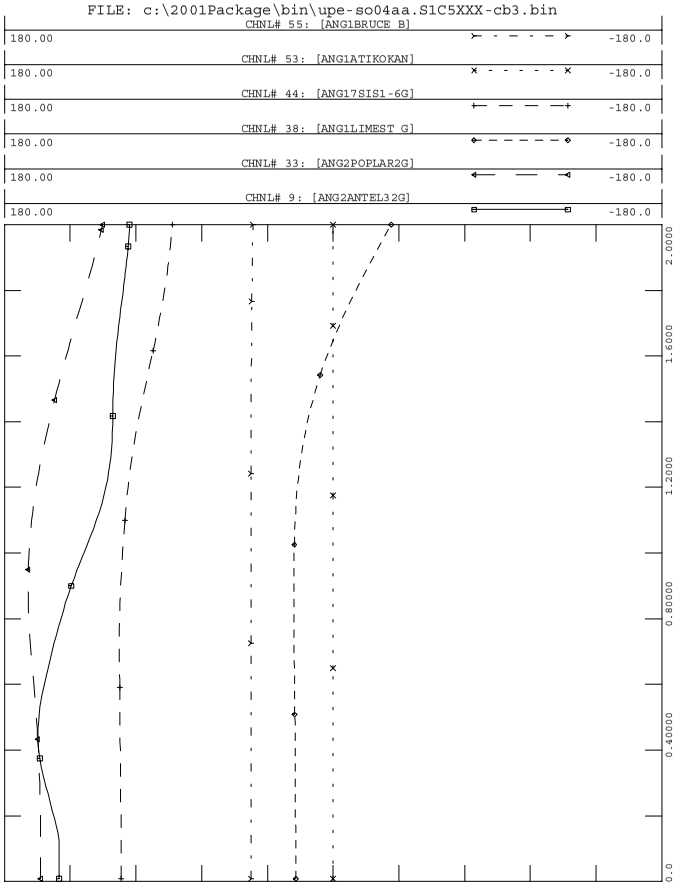
THU, MAY 16 2002 11:40
ROTOR ANGLES 6

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin



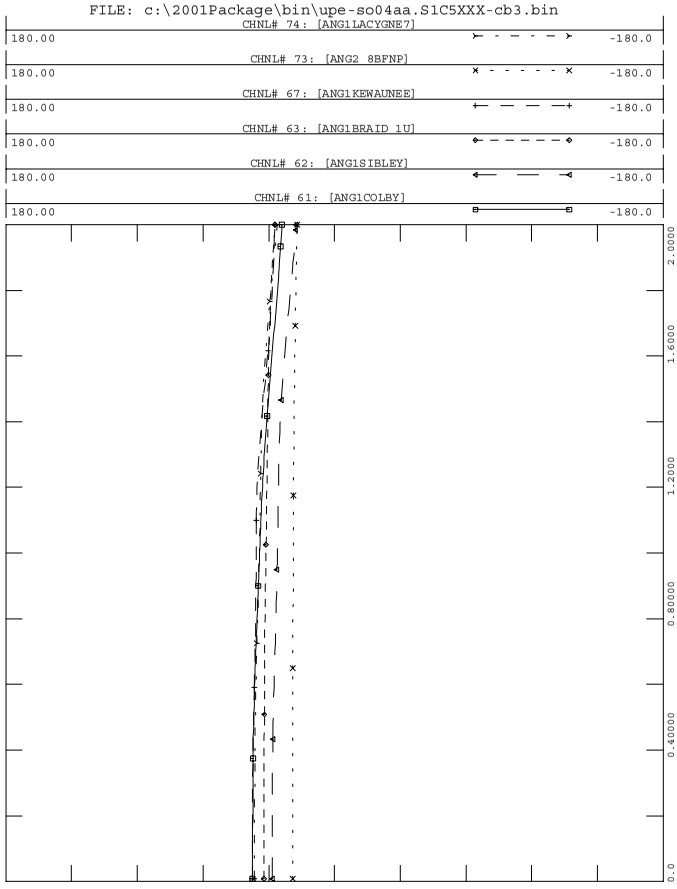
THU, MAY 16 2002 11:40
ROTOR ANGLES NB

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

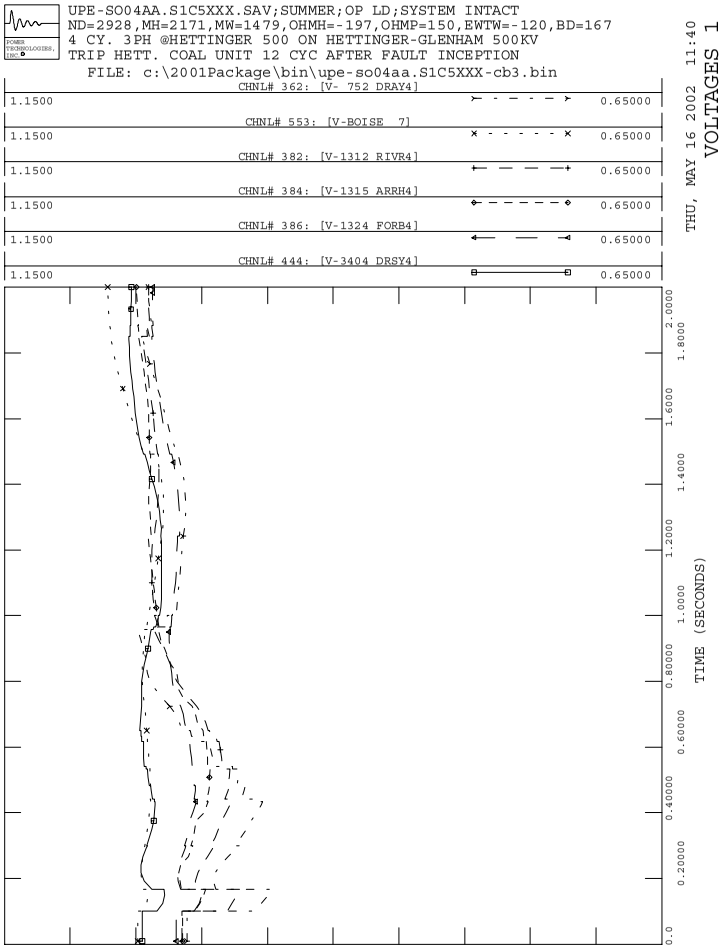


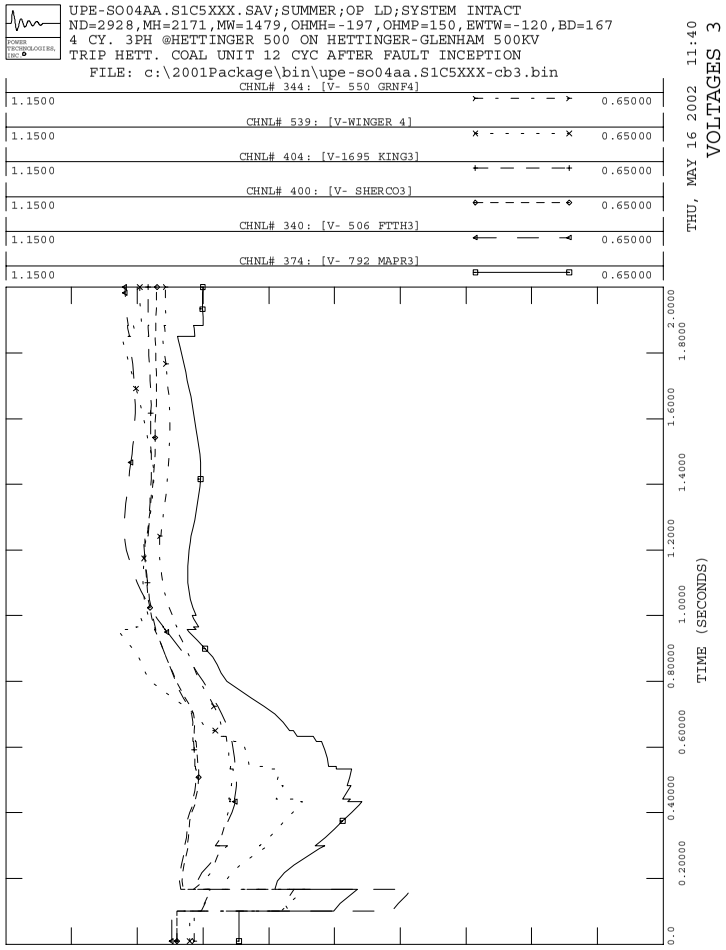
THU, MAY 16 2002 11:40
ROTOR ANGLES 5

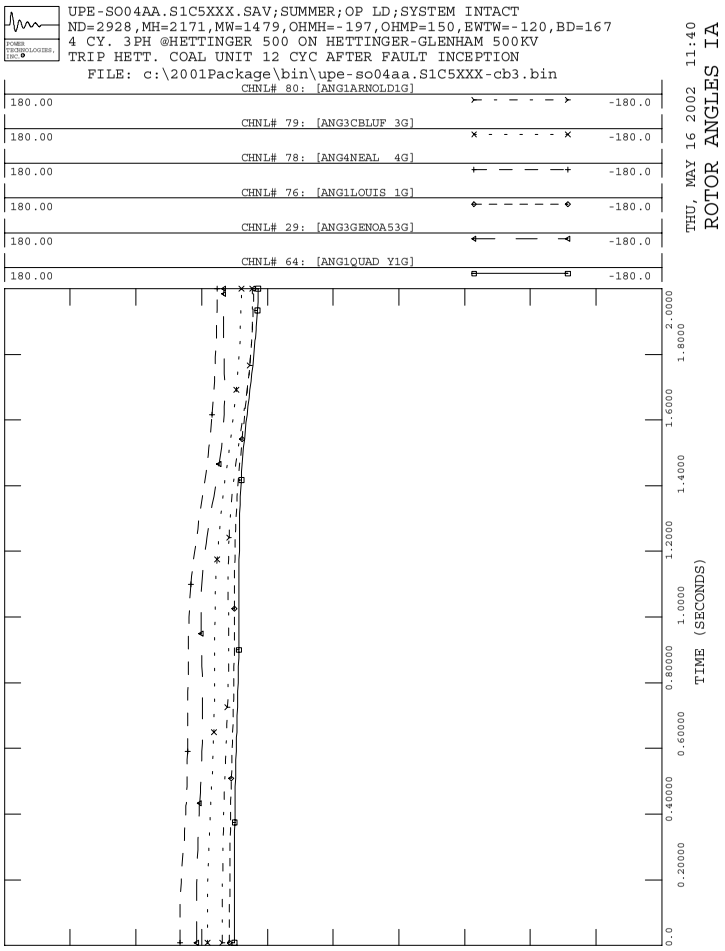
UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

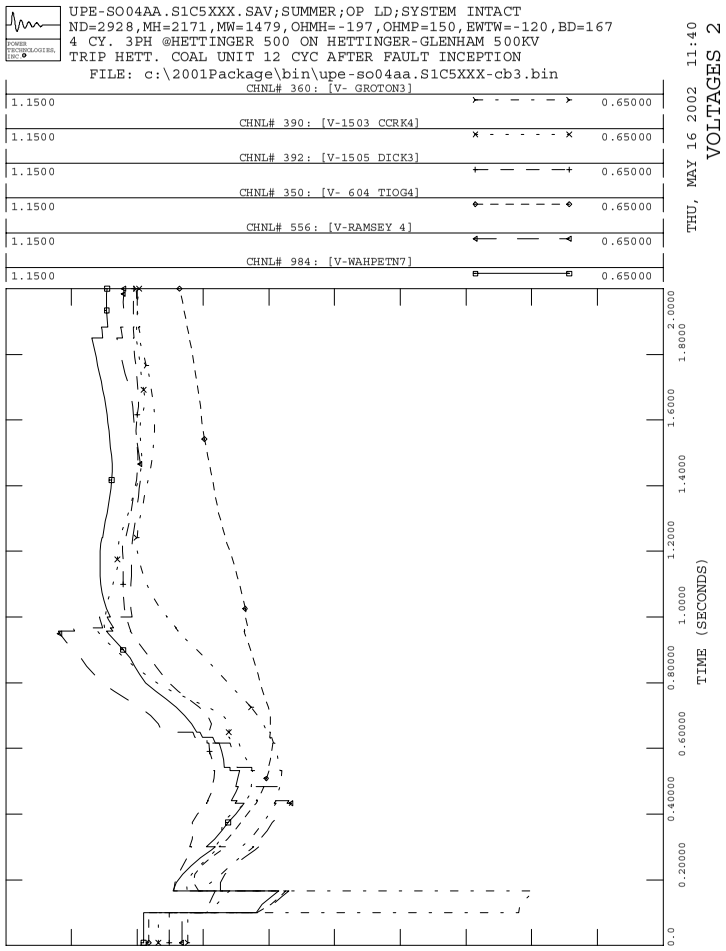


THU, MAY 16 2002 11:40
ROTOR ANGLES 7


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 362: [V- 752 DRAY4]
CHNL# 553: [V-BOISE 7]
CHNL# 382: [V-1312 RIVR4]
CHNL# 384: [V-1315 ARRH4]
CHNL# 386: [V-1324 FORB4]
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
THU, MAY 16 2002 11:40
VOLTAGES 1
TIME (SECONDS)


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 344: [V- 550 GRNF4]
CHNL# 539: [V-WINGER 4]
CHNL# 404: [V-1695 KING3]
CHNL# 400: [V- SHERCO3]
CHNL# 340: [V- 506 FTTH3]
CHNL# 374: [V- 792 MAPR3]
1.1500
0.65000
THU, MAY 16 2002 11:40
VOLTAGES 3
TIME (SECONDS)


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 80: [ANG1ARNOLD1G]
CHNL# 79: [ANG3CBLUF 3G]
CHNL# 78: [ANG4NEAL 4G]
CHNL# 76: [ANG1LOUIS 1G]
CHNL# 29: [ANG3GENOA53G]
CHNL# 64: [ANG1QUAD Y1G]
180.00
-180.0
THU, MAY 16 2002 11:40
ROTOR ANGLES IA
TIME (SECONDS)


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 360: [V- GROTON3]
CHNL# 390: [V-1503 CCRK4]
CHNL# 392: [V-1505 DICK3]
CHNL# 350: [V- 604 TIOG4]
CHNL# 556: [V-RAMSEY 4]
CHNL# 984: [V-WAHPETN7]
1.1500
0.65000
THU, MAY 16 2002 11:40
VOLTAGES 2
TIME (SECONDS)

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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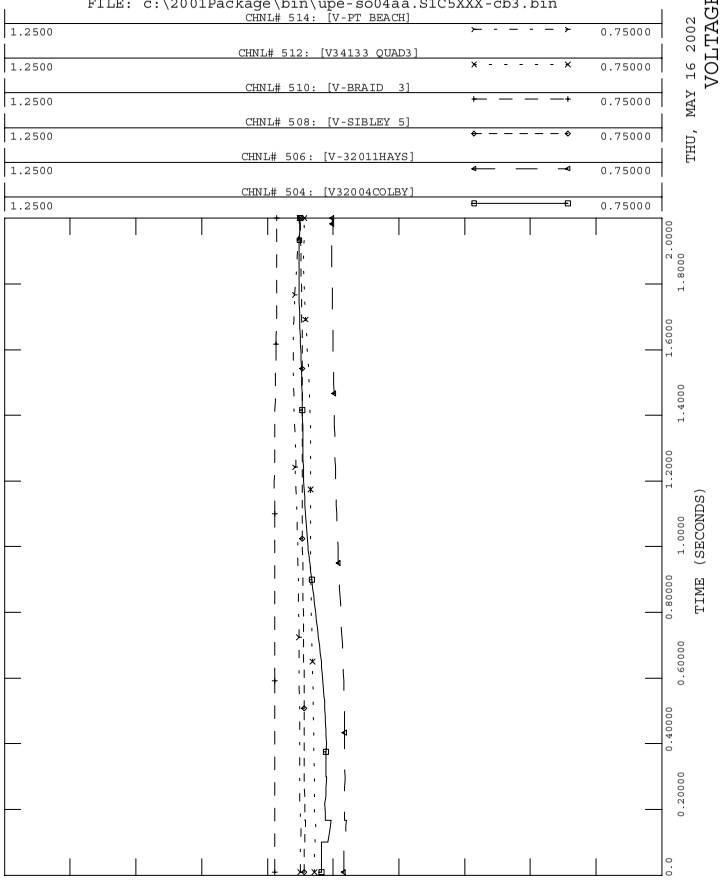
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin



THU, MAY 16 2002 11:40
VOLTAGES 5

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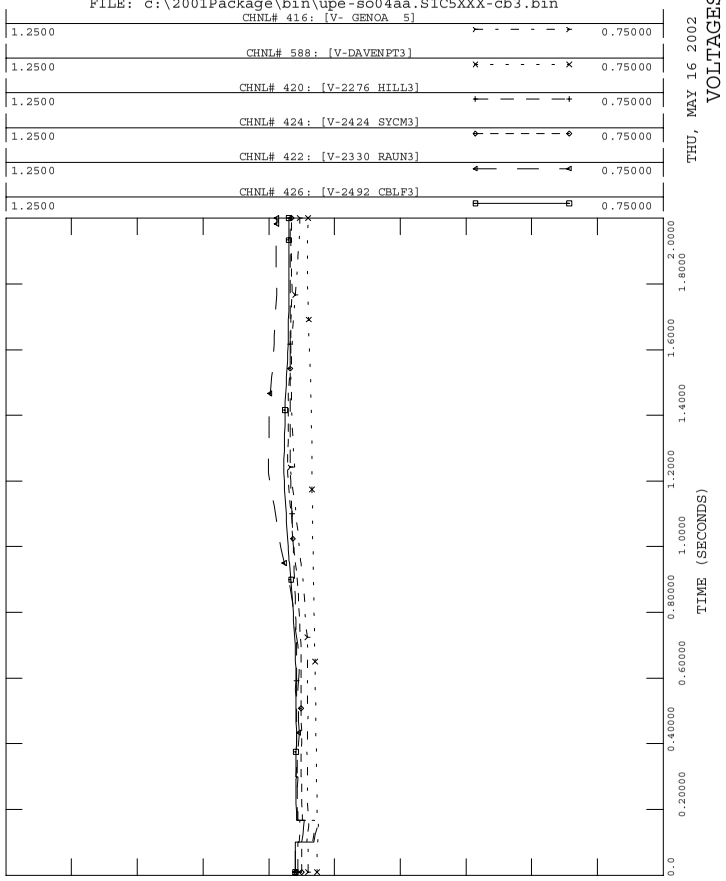
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin



THU, MAY 16 2002 11:40
VOLTAGES IA

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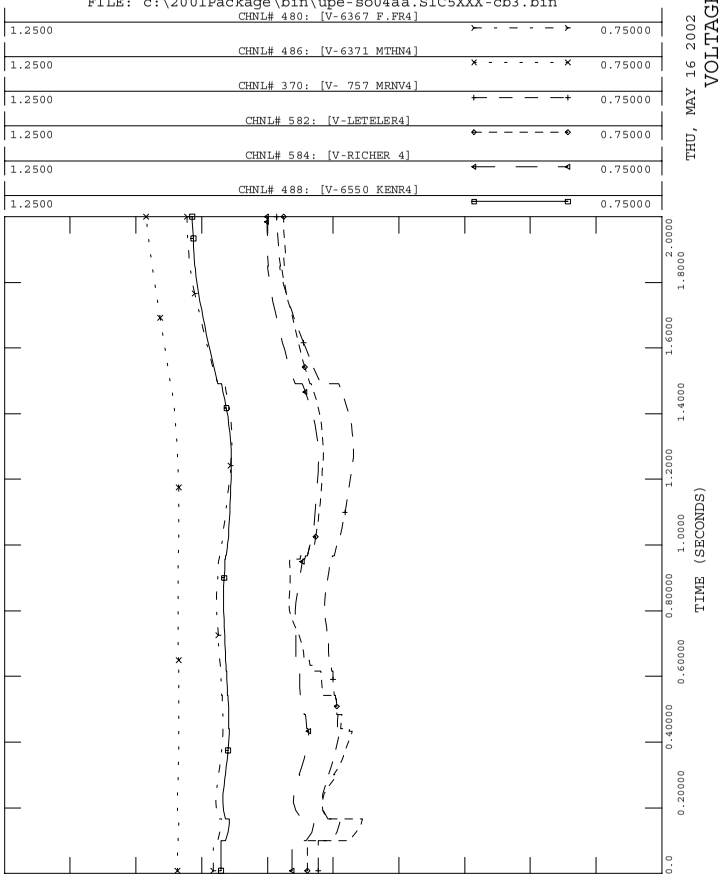
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin



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VOLTAGES 4

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TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
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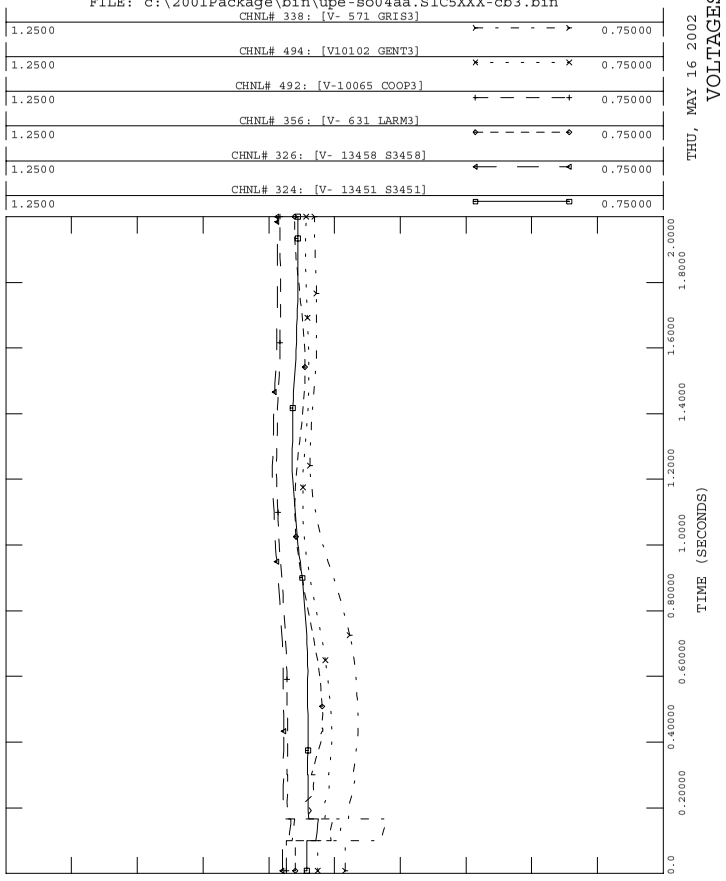
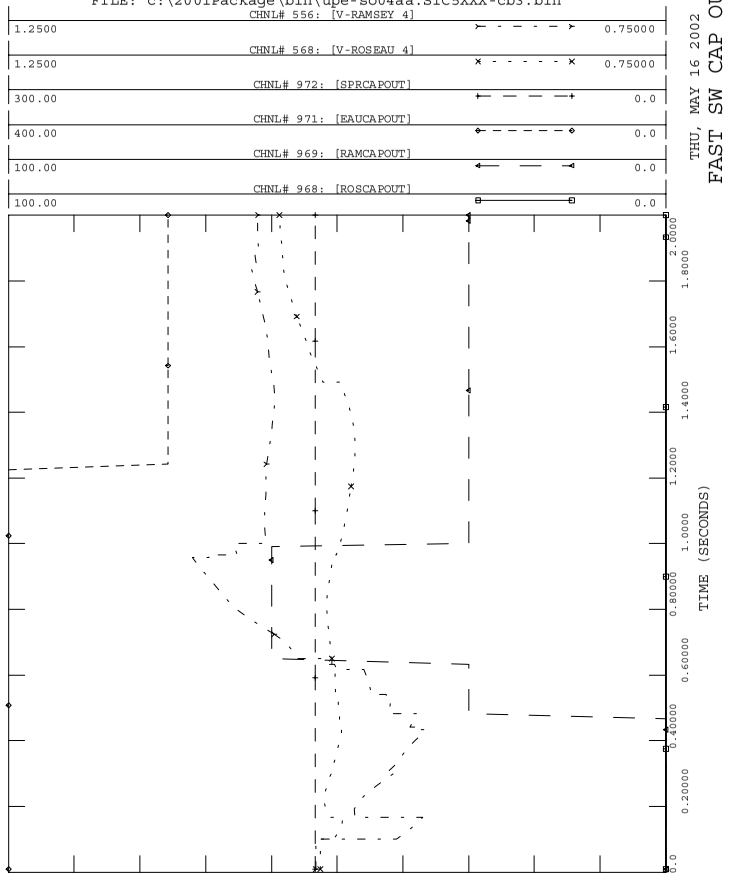


THU, MAY 16 2002 11:40
VOLTAGES NB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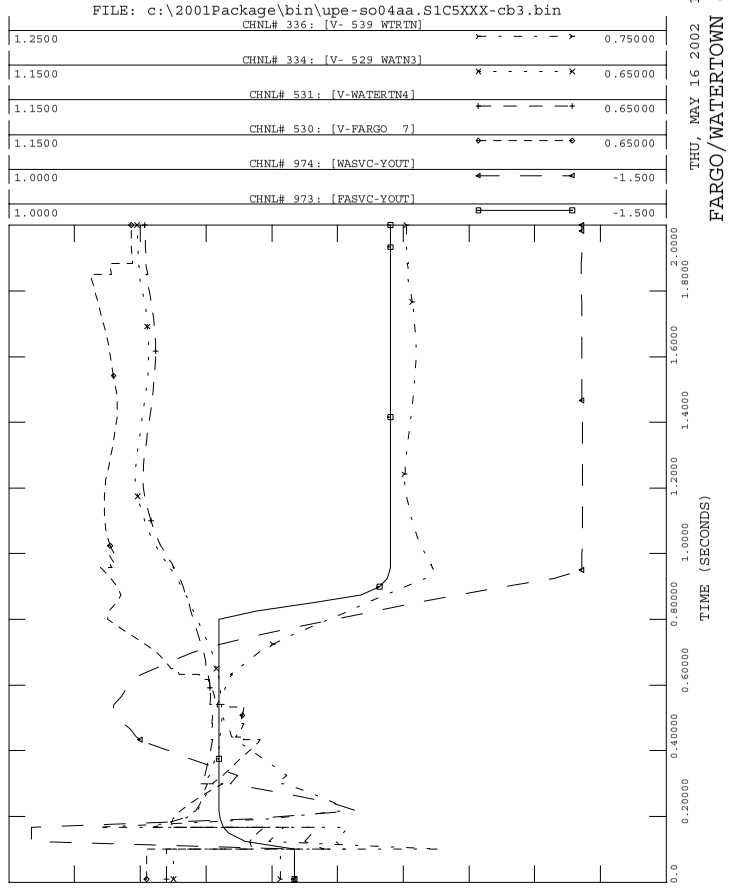
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
THU, MAY 16 2002 11:40
FAST SW CAP OUT 2


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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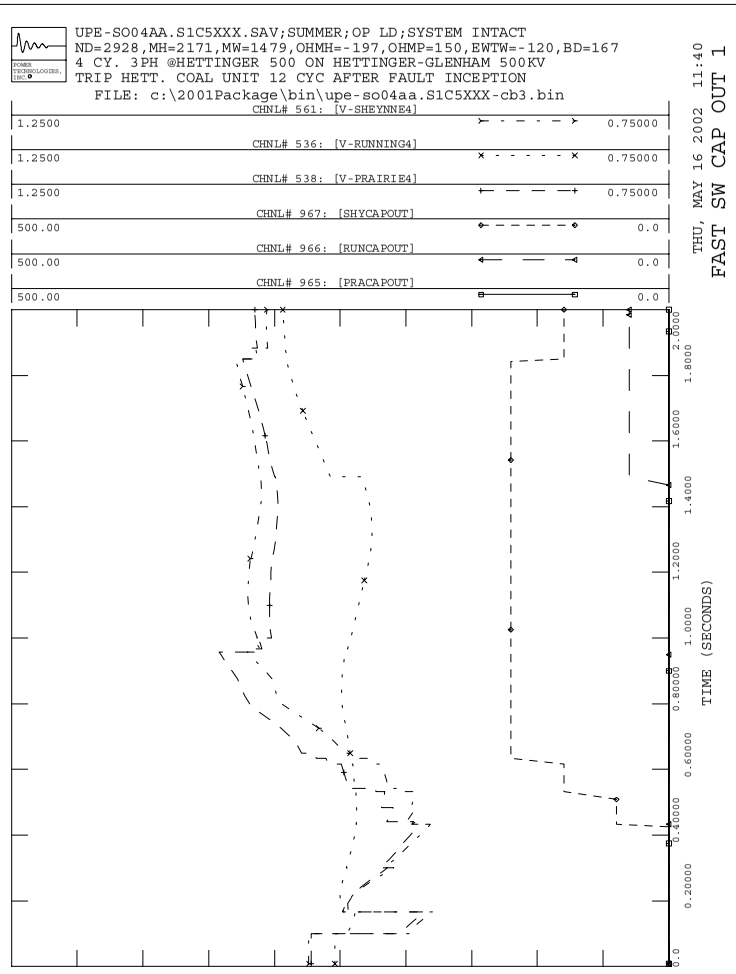
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
THU, MAY 16 2002 11:40
FARGO/WATERTOWN SVS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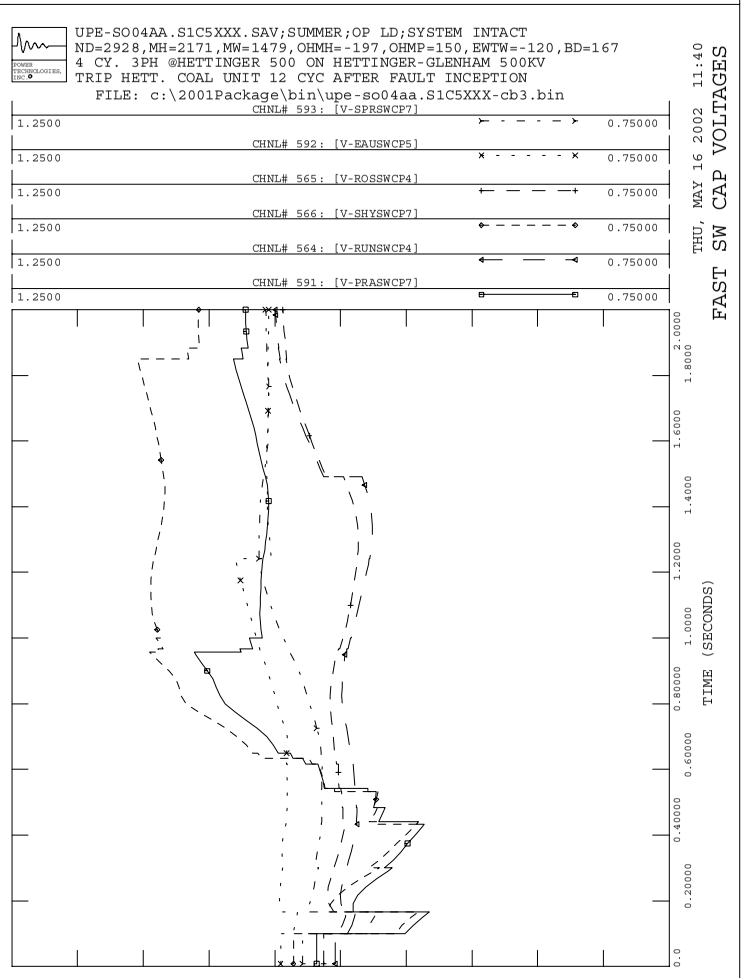
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
THU, MAY 16 2002 11:40
FAST SW CAP OUT 1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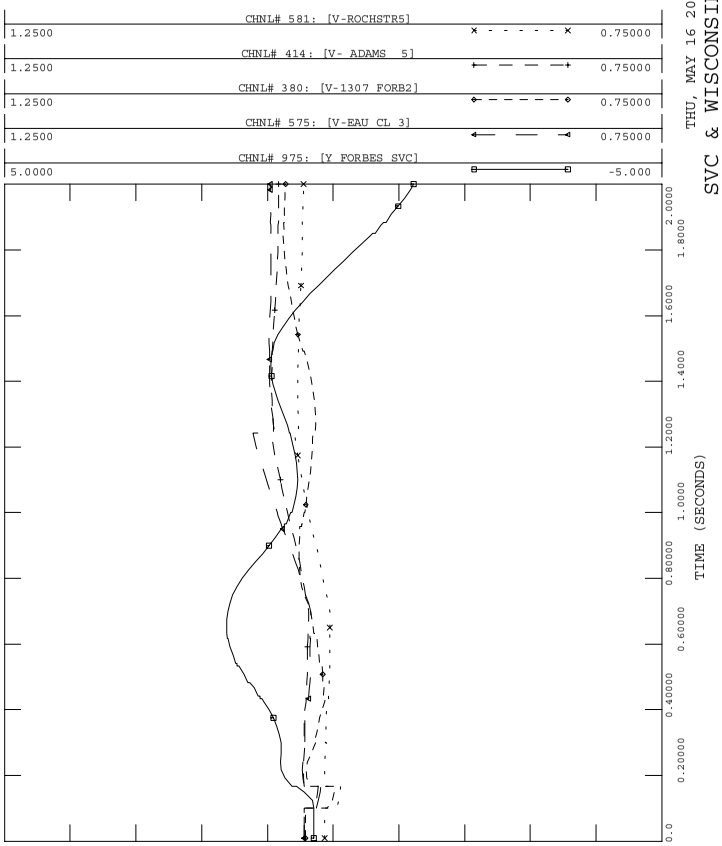
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
THU, MAY 16 2002 11:40
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40

SVC & WISCONSIN VOLT



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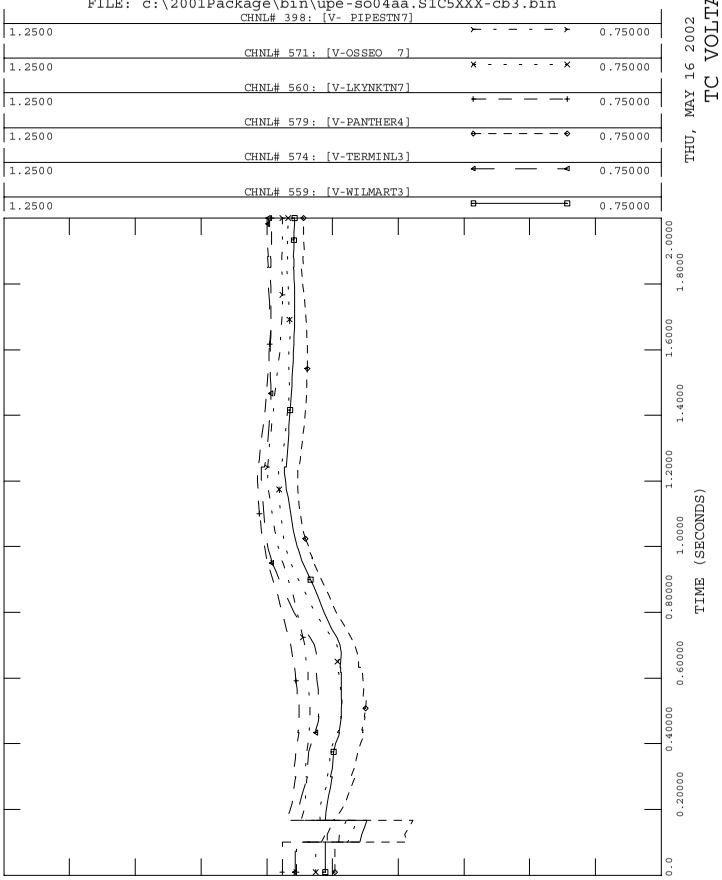
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40

TC VOLTAGES



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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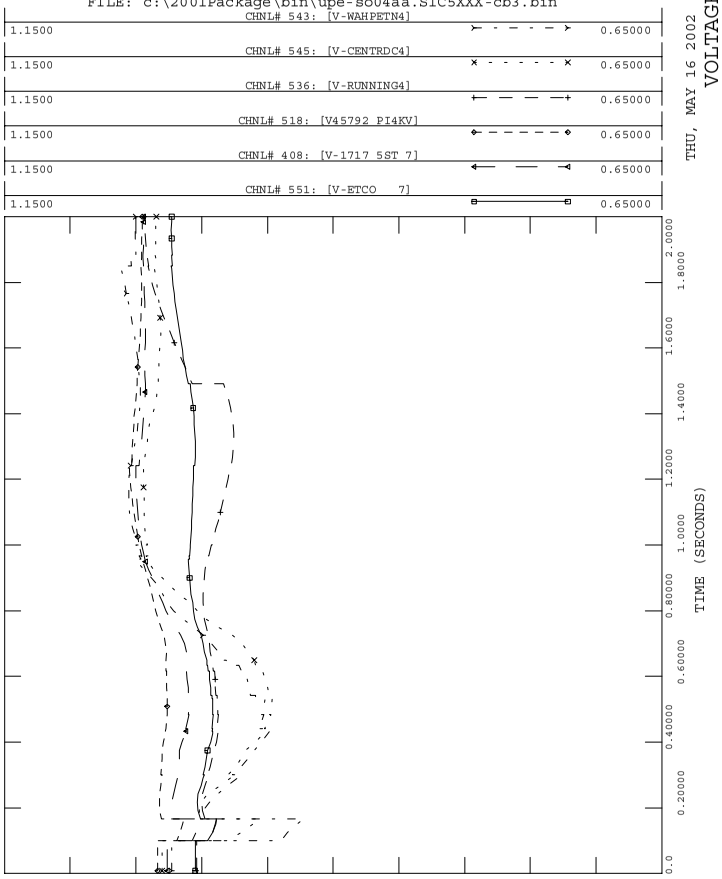
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40

VOLTAGES 6



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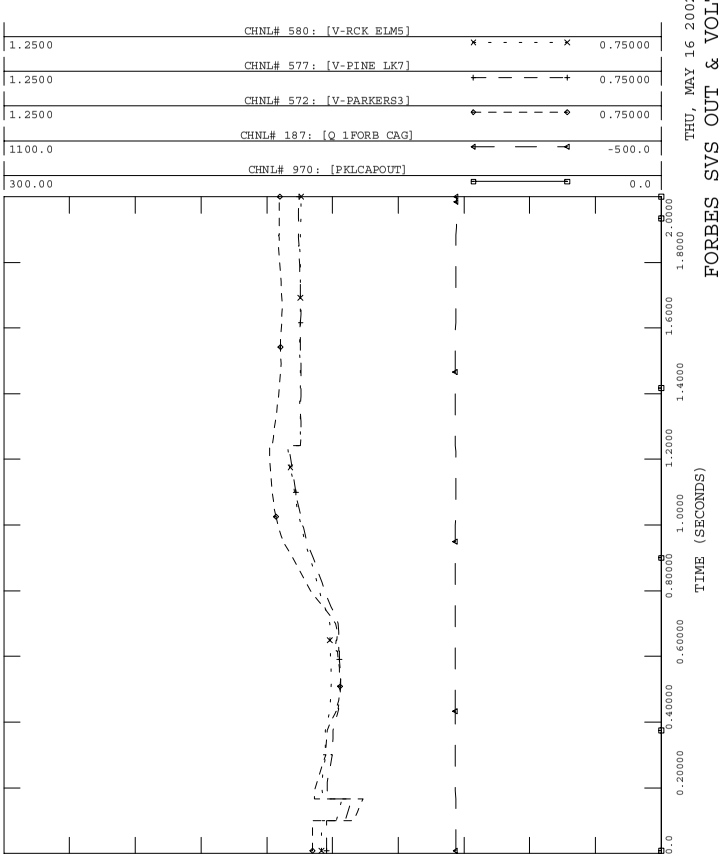
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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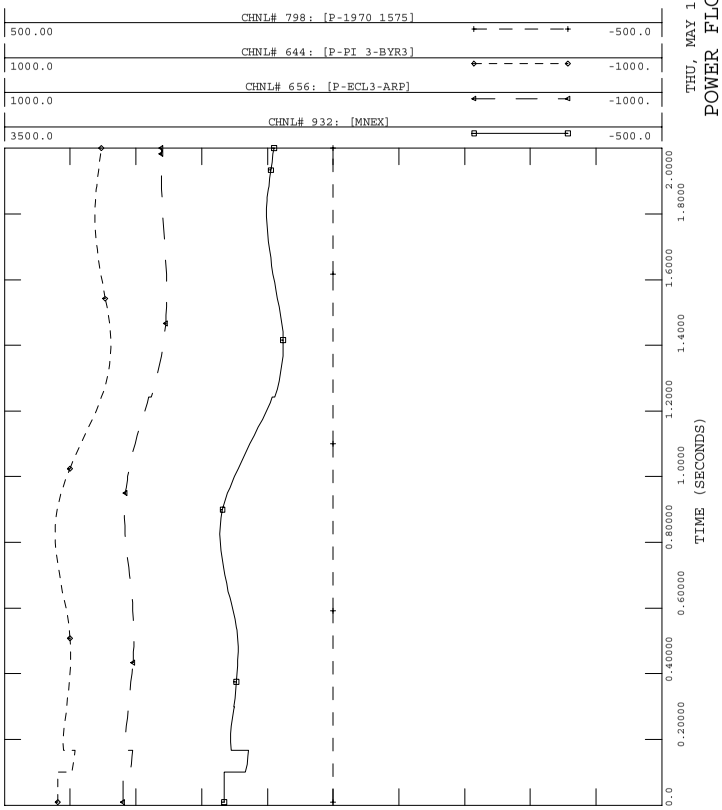
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40
POWER FLOW SUMS 2



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TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
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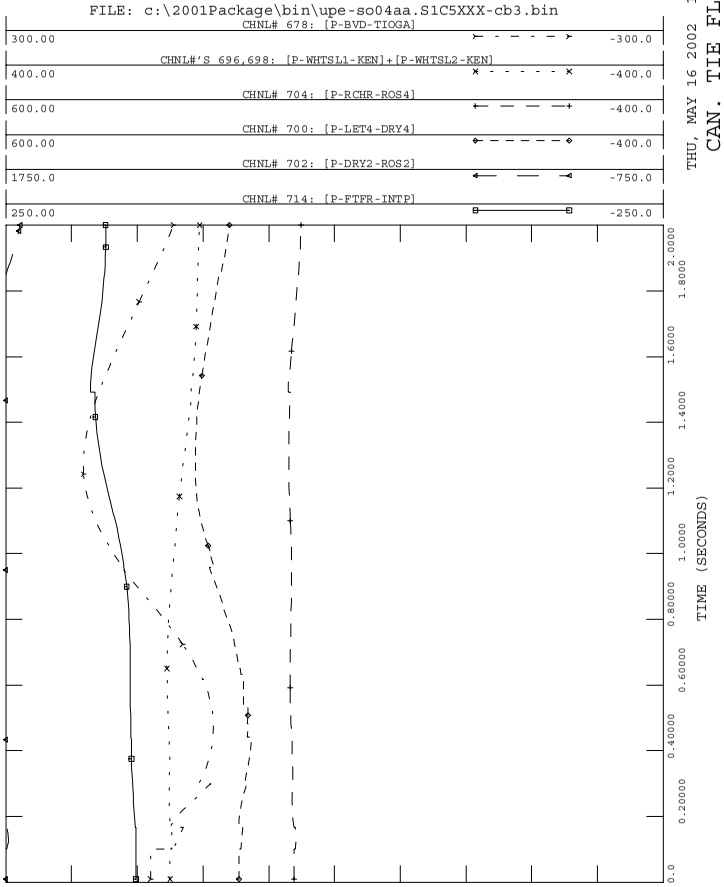
THU, MAY 16 2002 11:40
CAN. TIE FLOWS



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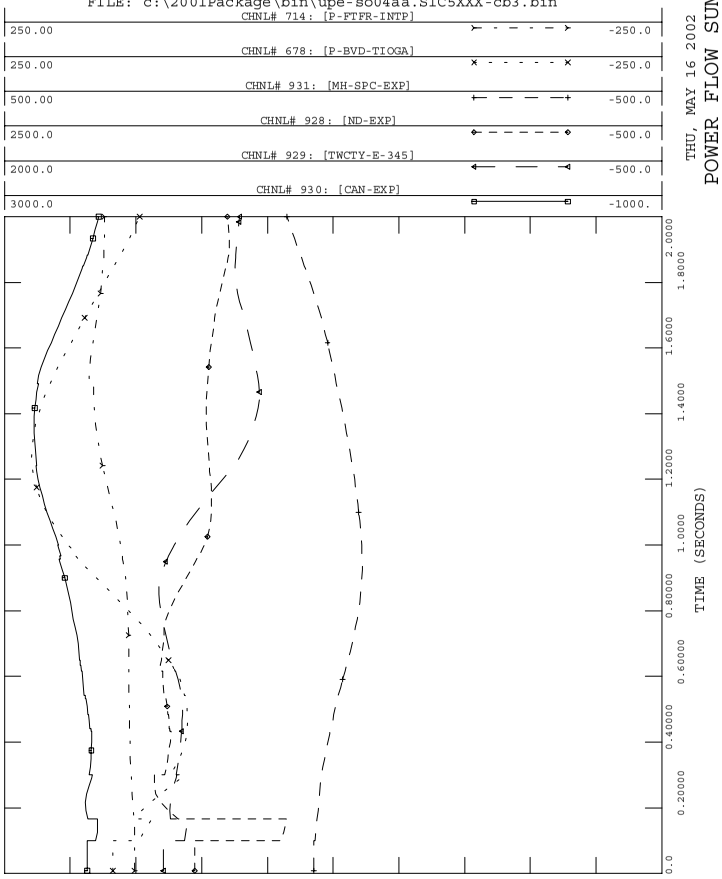
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40
POWER FLOW SUMS 1



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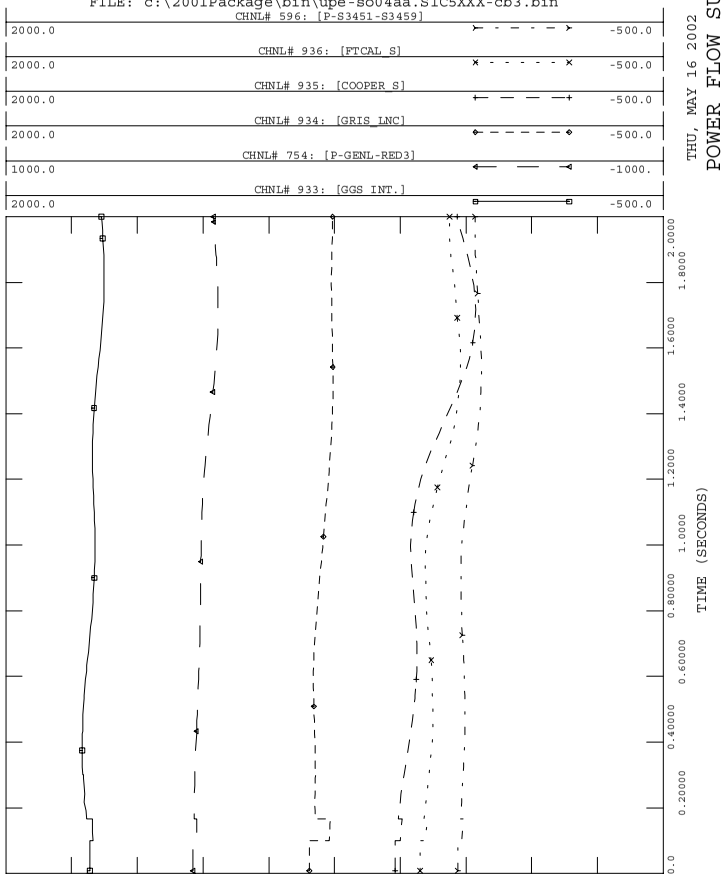
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40
POWER FLOW SUM 3



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TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
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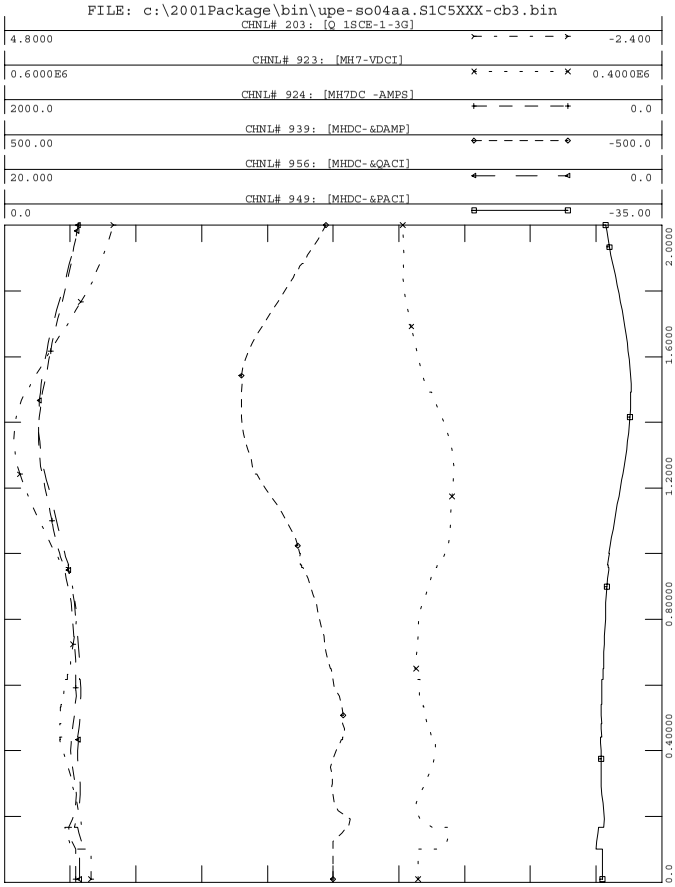
THU, MAY 16 2002 11:40
MH DC PARAMETERS



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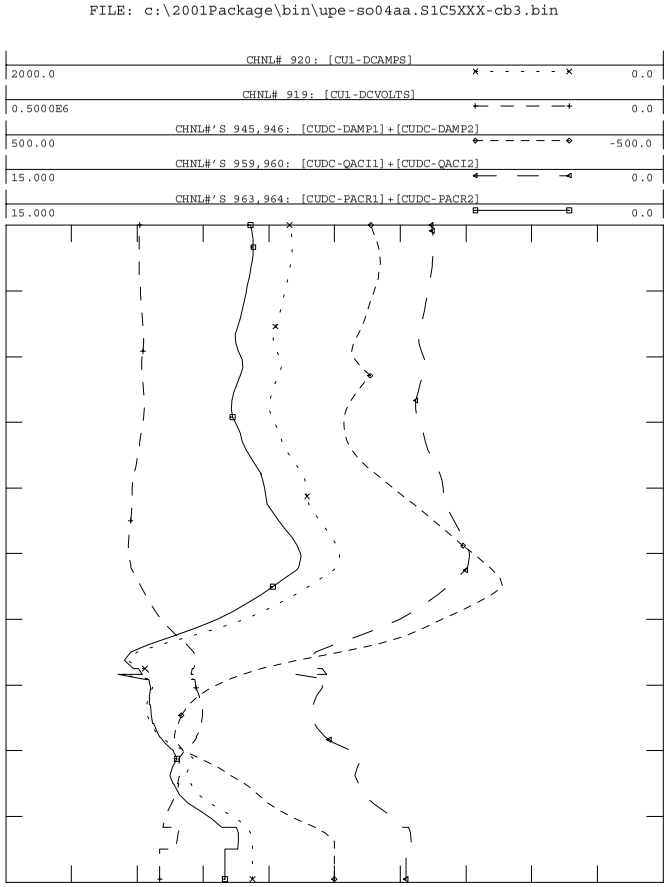
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40
CU DC #1



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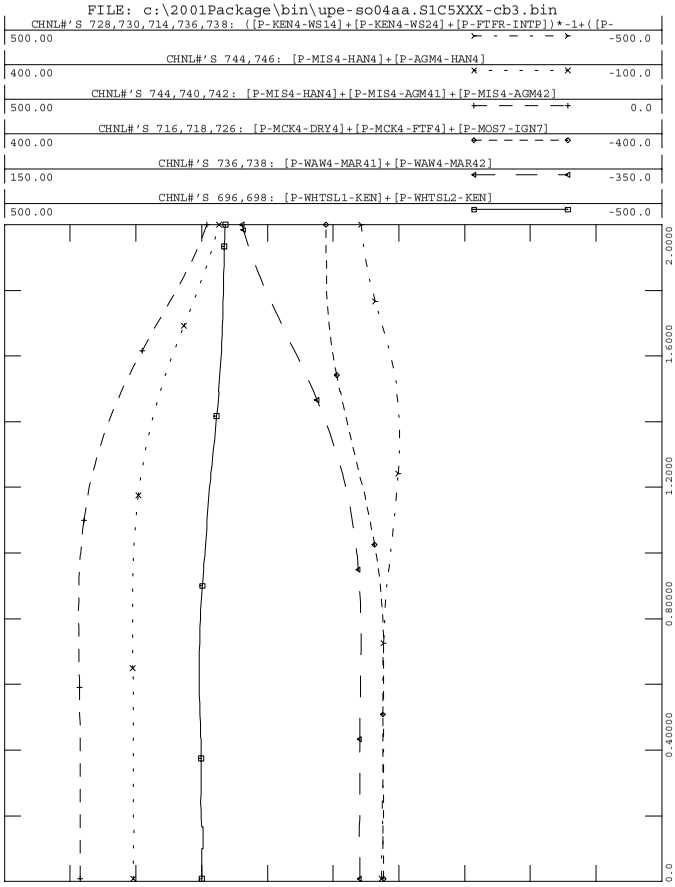
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40
OH TIE FLOWS



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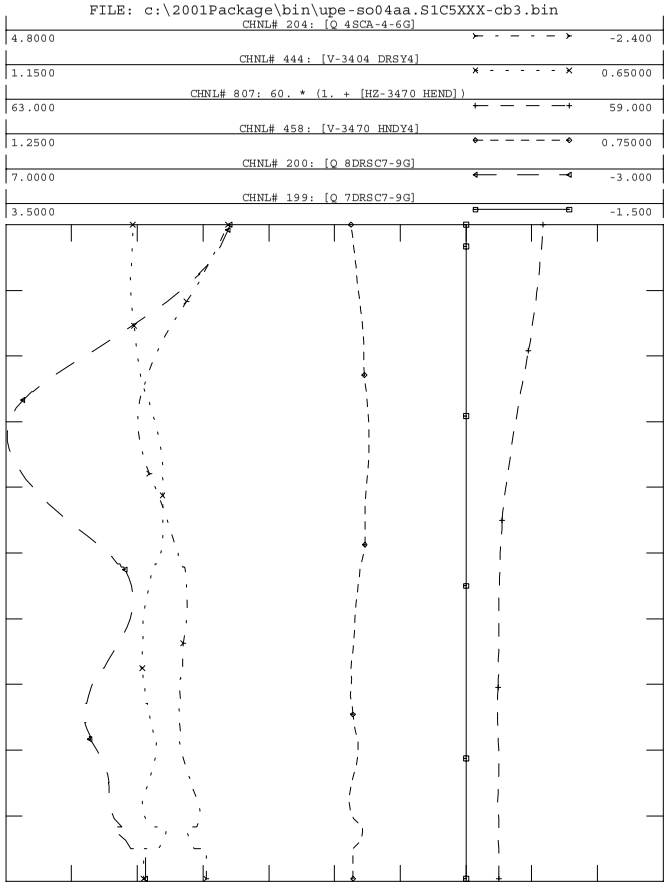
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40
MH DC PARAMETERS



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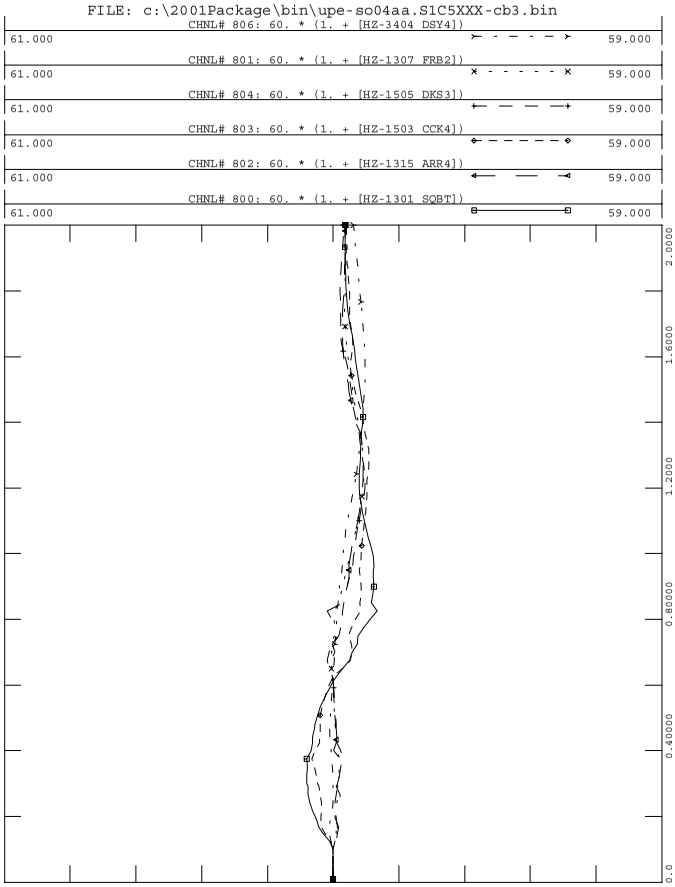
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin



THU, MAY 16 2002 11:40
FREQ AT DC TERMINALS

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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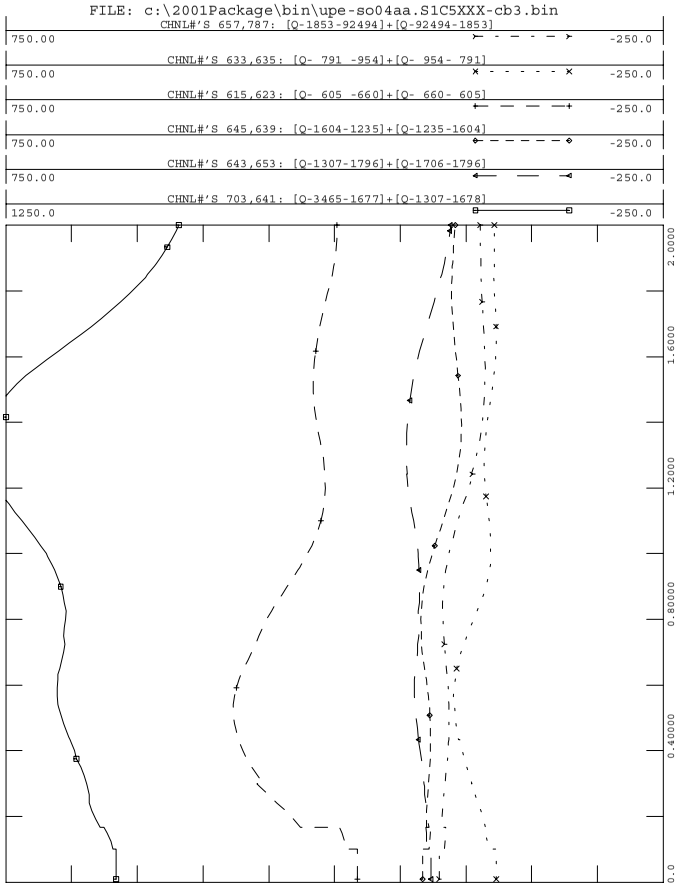
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin



THU, MAY 16 2002 11:40
VAR LOSSES

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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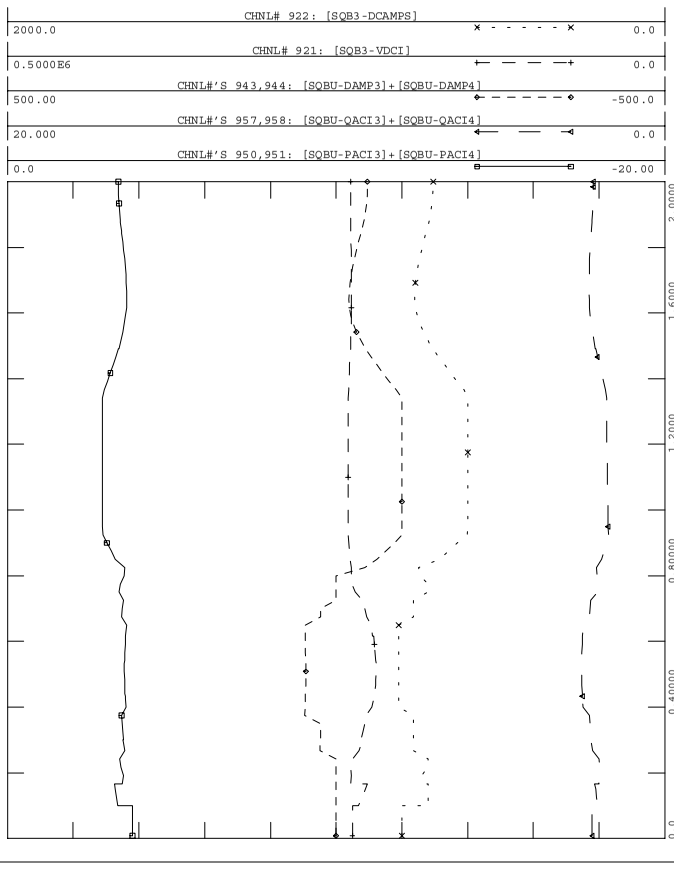
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin



THU, MAY 16 2002 11:40
SQB DC #3

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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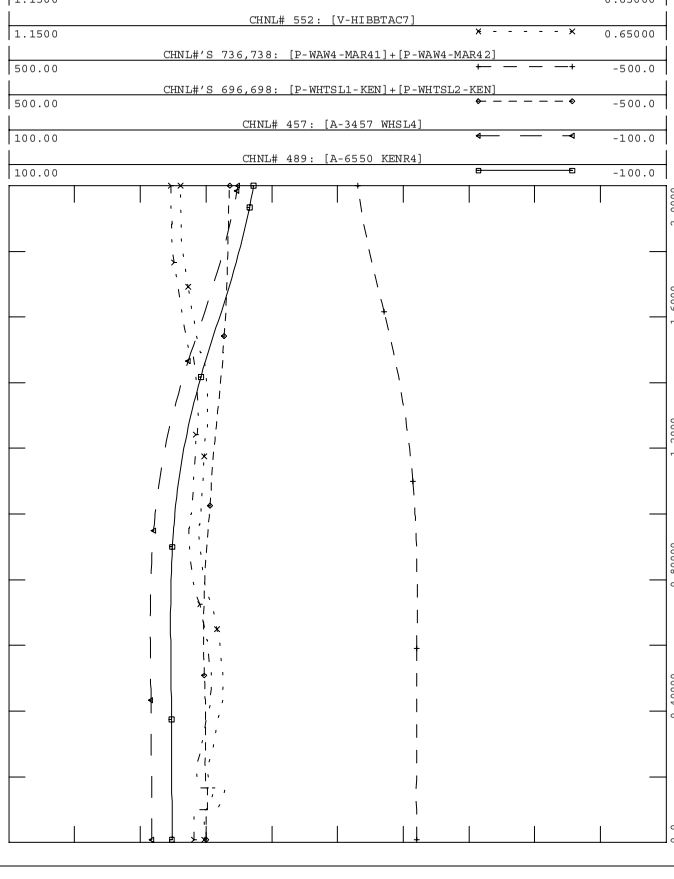
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

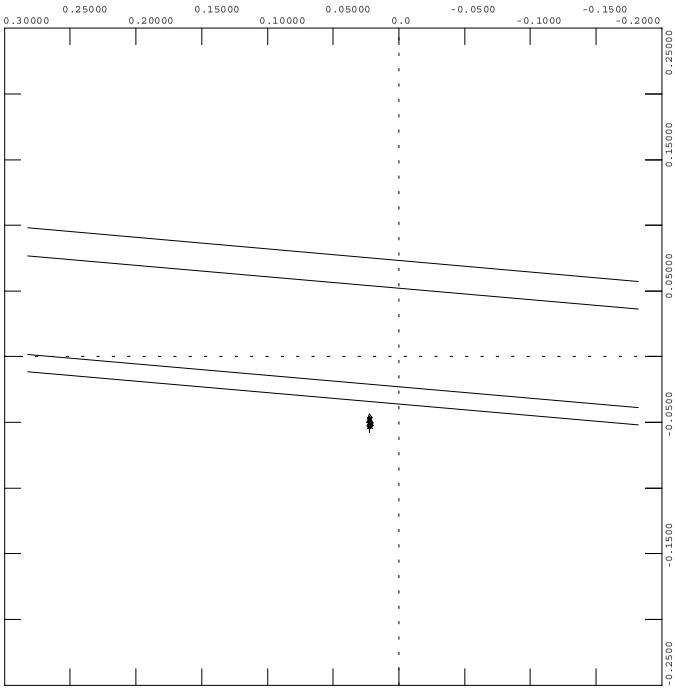


THU, MAY 16 2002 11:40
VOLTAGES, ANGLES

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

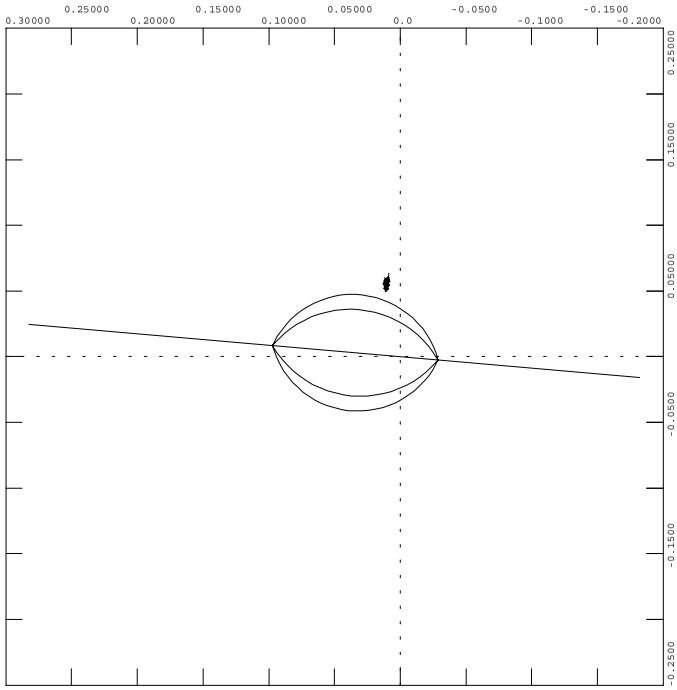


THU, MAY 16 2002 11:40
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

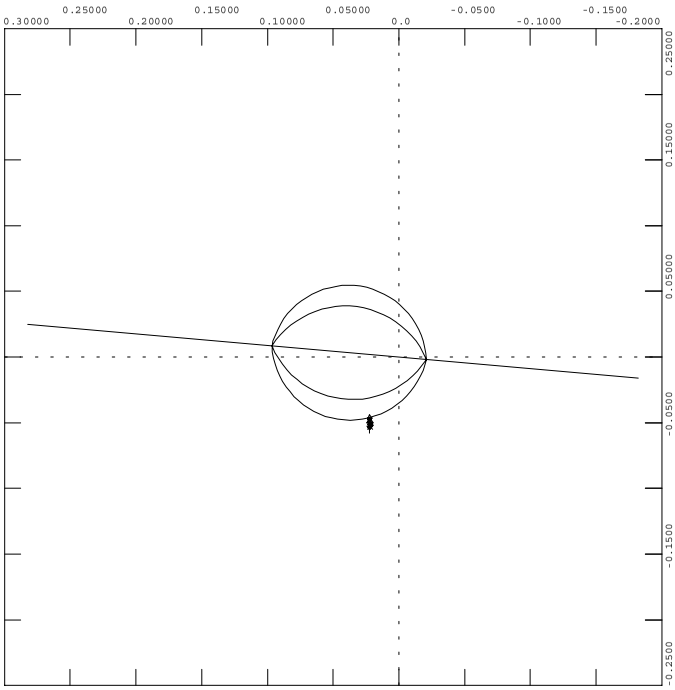


THU, MAY 16 2002 11:40
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, MAY 16 2002 11:40
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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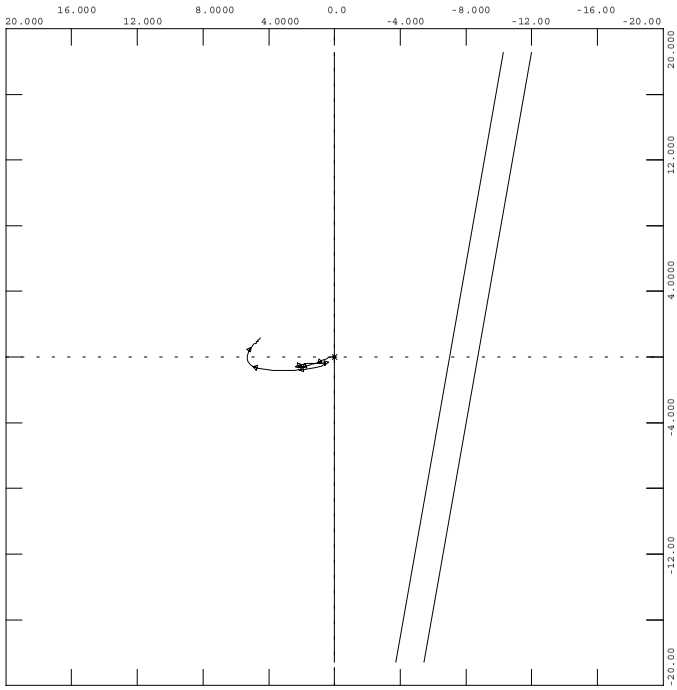
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

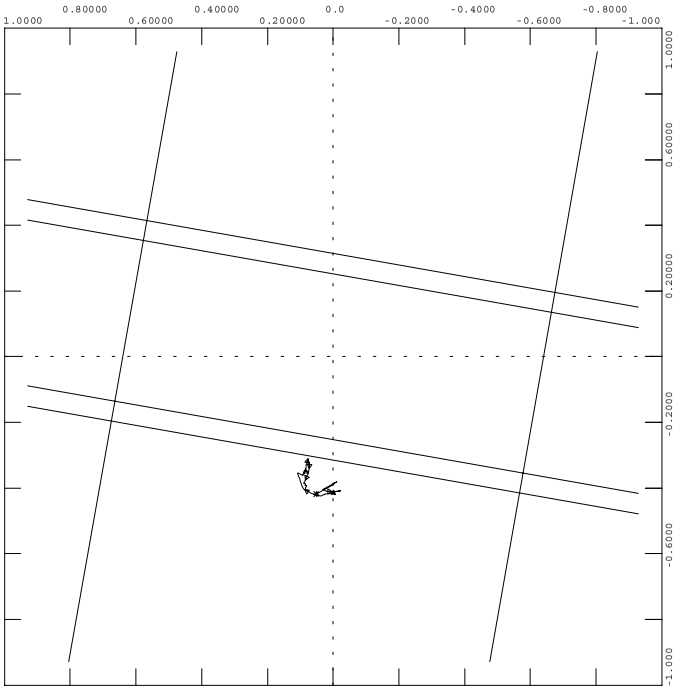


THU, MAY 16 2002 11:40
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

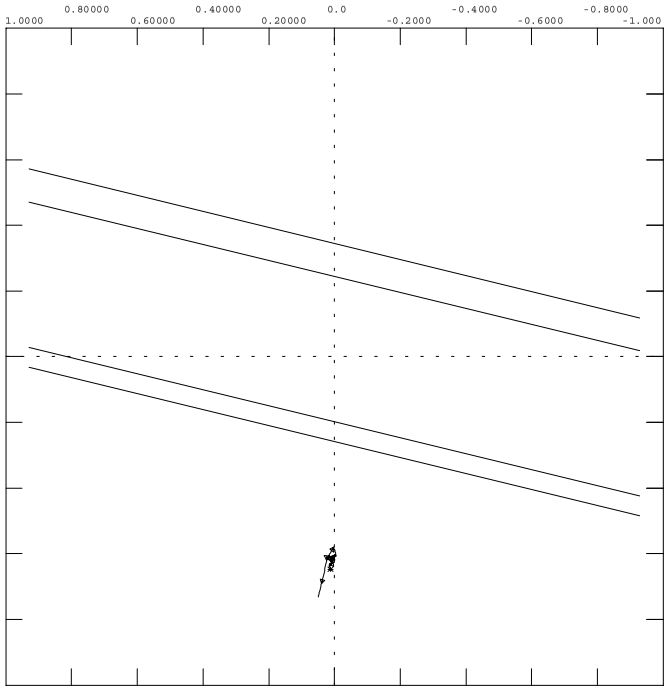
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

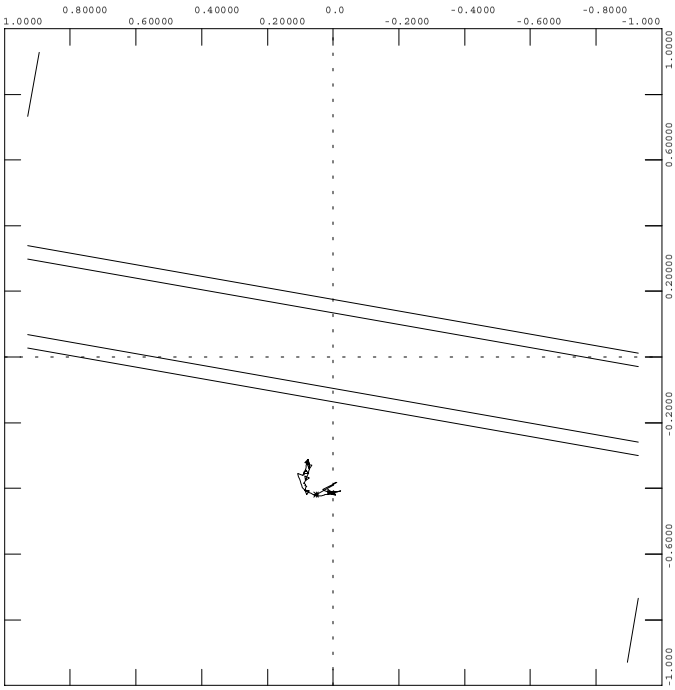
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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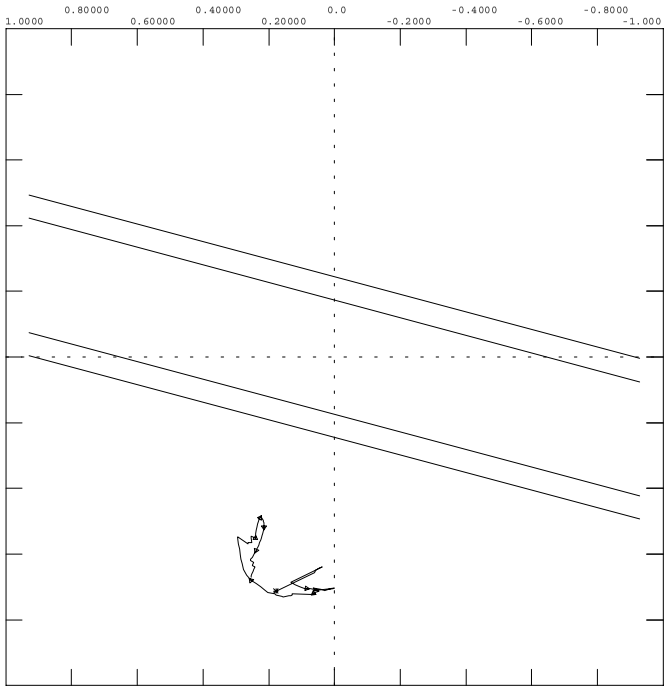
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

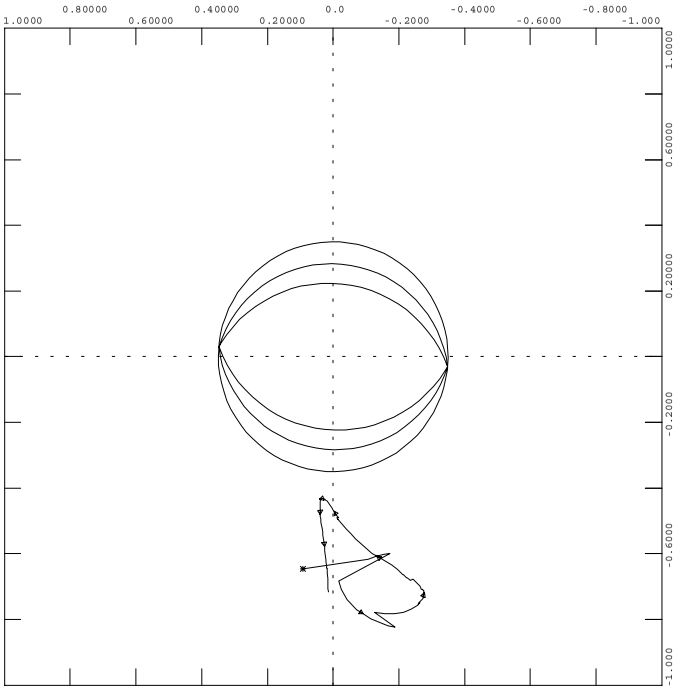
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

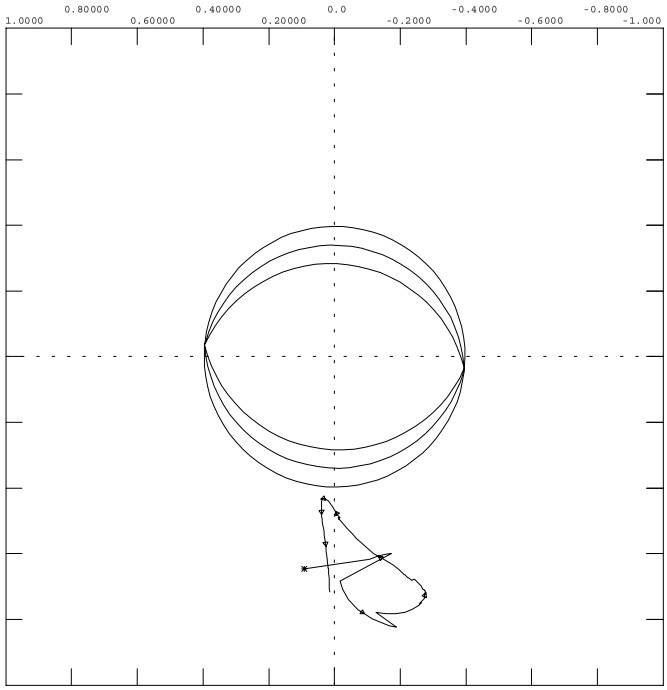
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

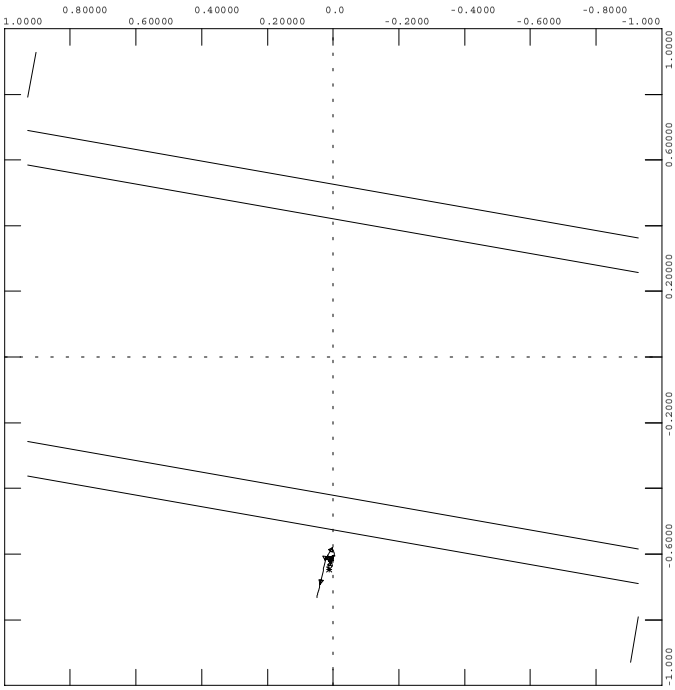
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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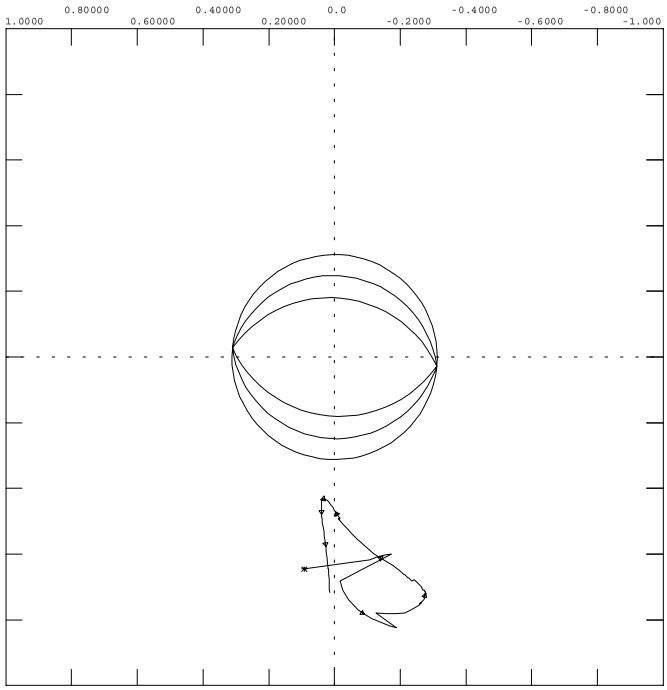
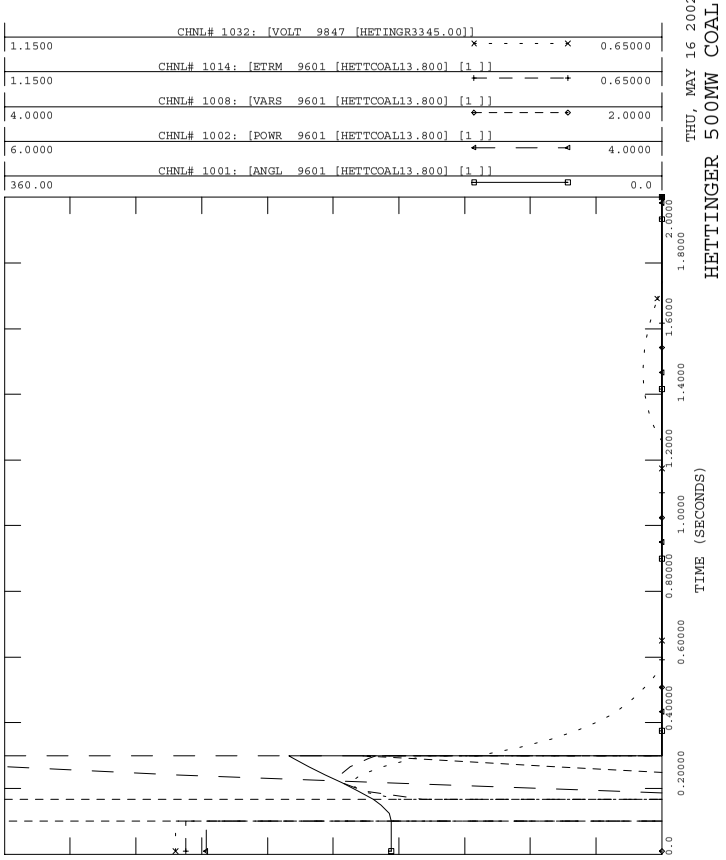
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

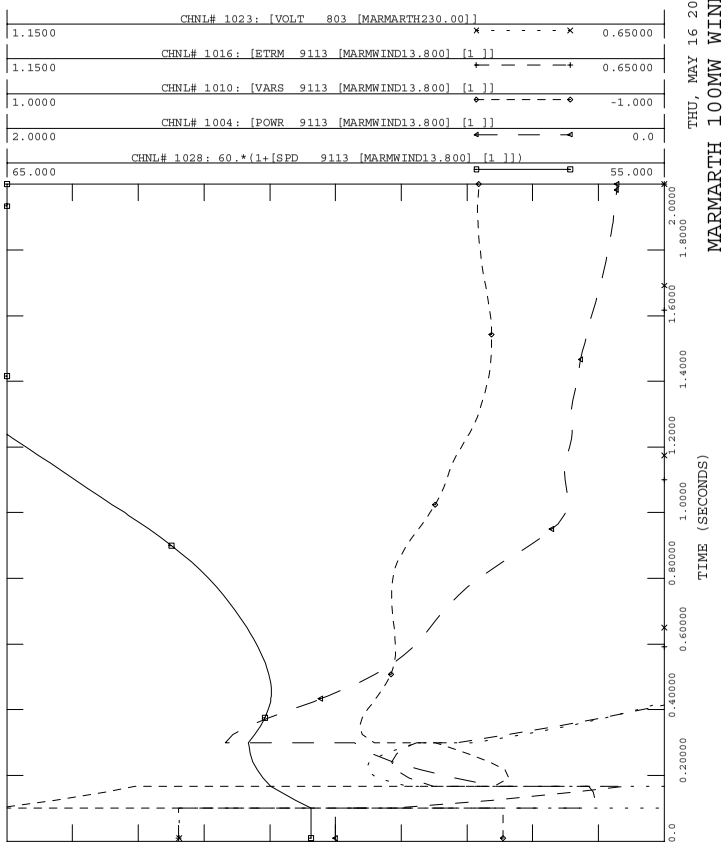


UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin



THU, MAY 16 2002 11:40
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

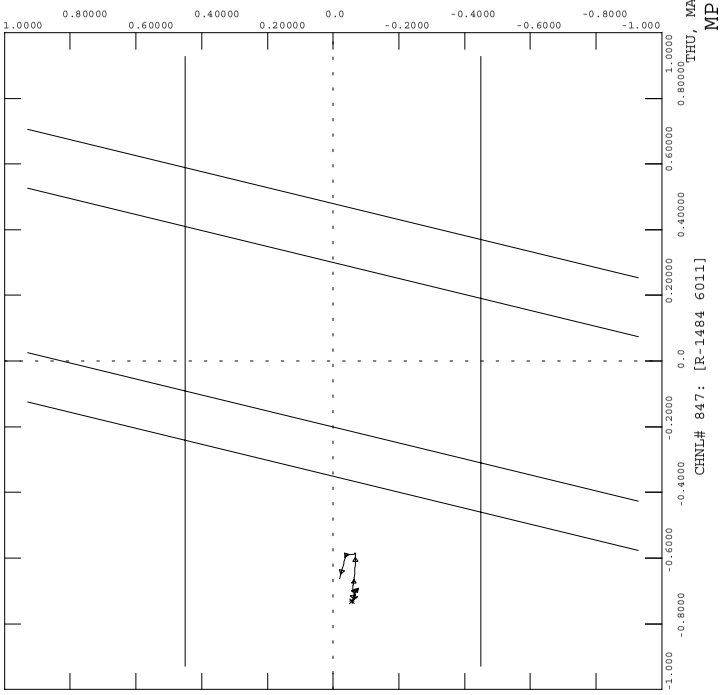


THU, MAY 16 2002 11:40
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

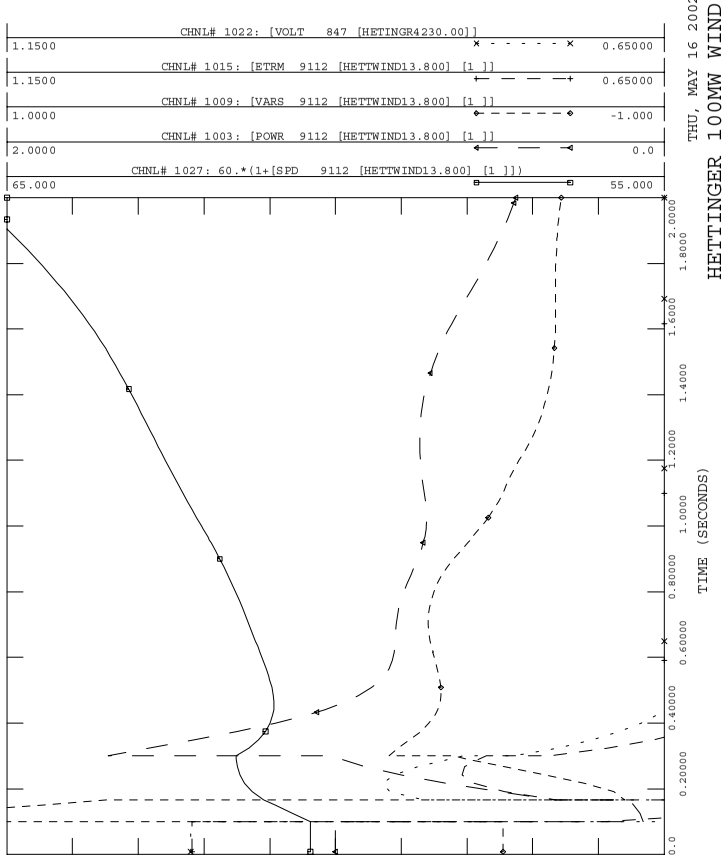
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



THU, MAY 16 2002 11:40
MP-OH I.FALLS (779)

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

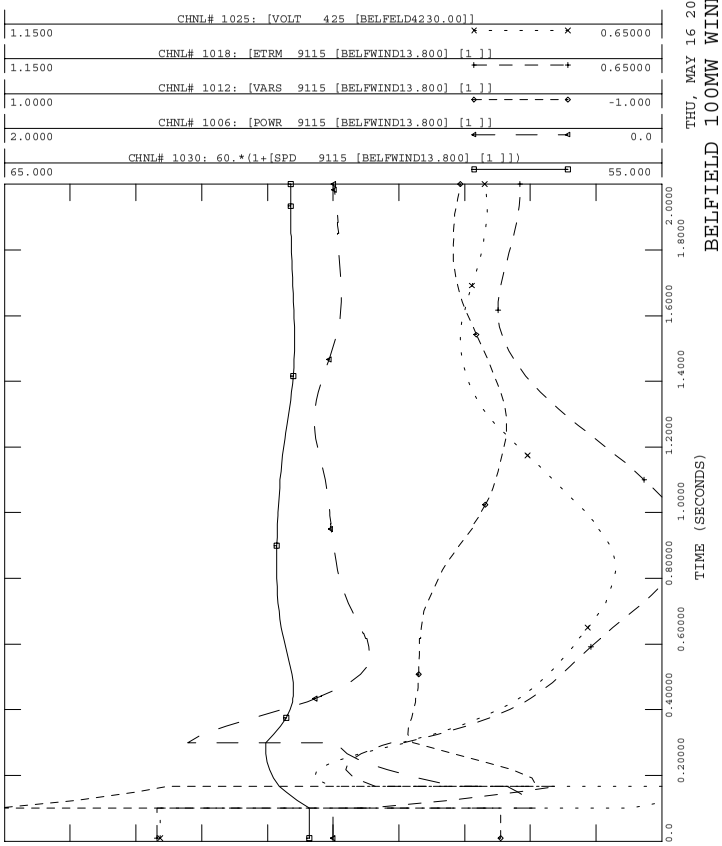


THU, MAY 16 2002 11:40
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40

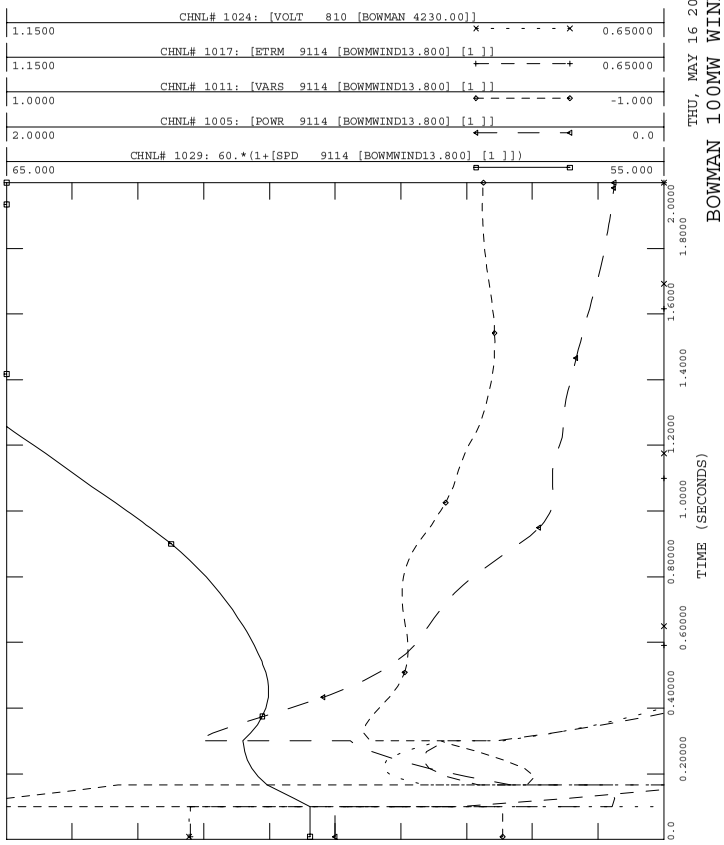
BELFIELD 100MW WIND UNIT



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40

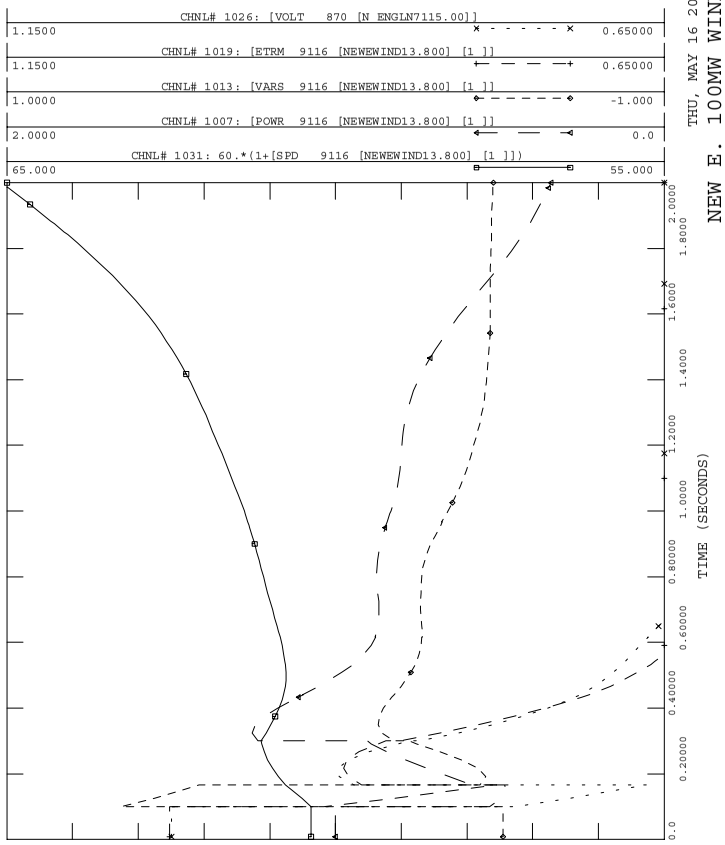
BOWMAN 100MW WIND UNIT



UPE-SO04AA.S1C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2928,MH=2171,MW=1479,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXX-cb3.bin

THU, MAY 16 2002 11:40

NEW E. 100MW WIND UNIT



APPENDIX 11

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

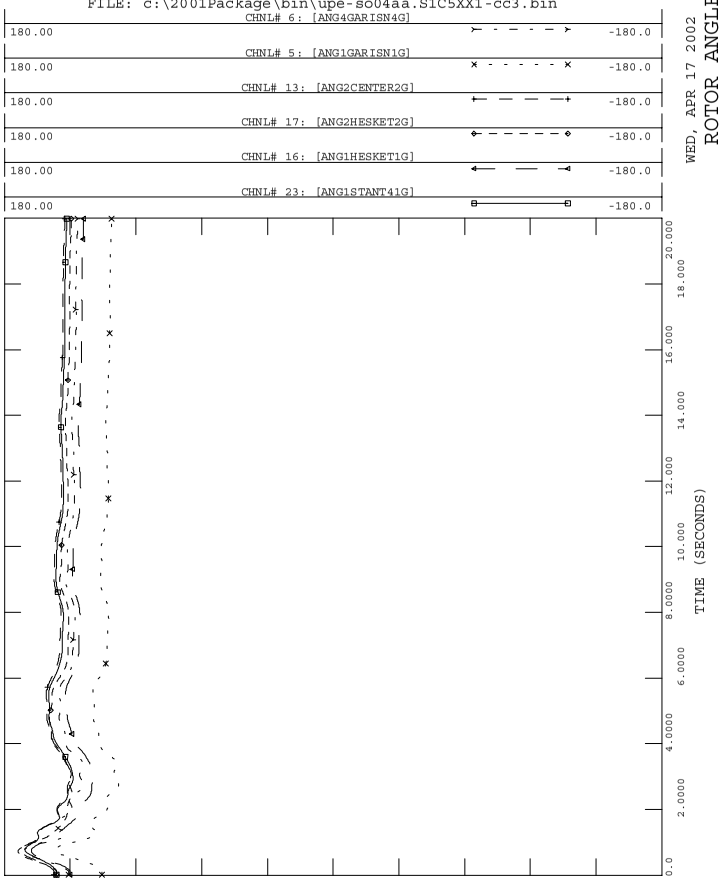
SITE 1 (HETTINGER)

CASE S1C5XX1

CONTINGENCY CC3

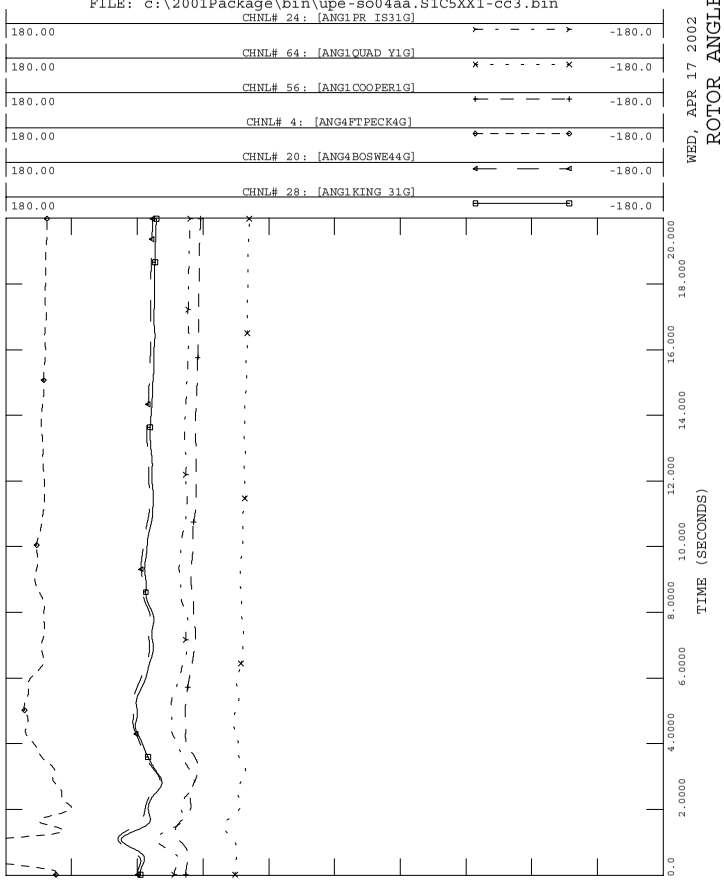
4 cycle 3 phase fault at Hettinger 500 kV on Hettinger-Glenham 500 kV. Trip Hettinger Glenham.

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



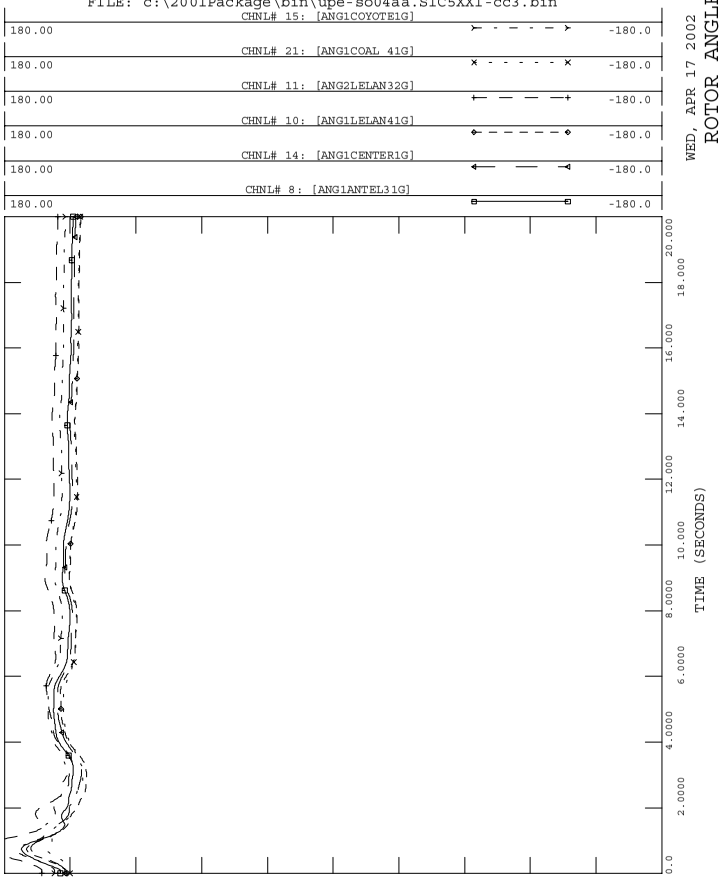
WED, APR 17 2002 16:37
ROTOR ANGLES 2

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



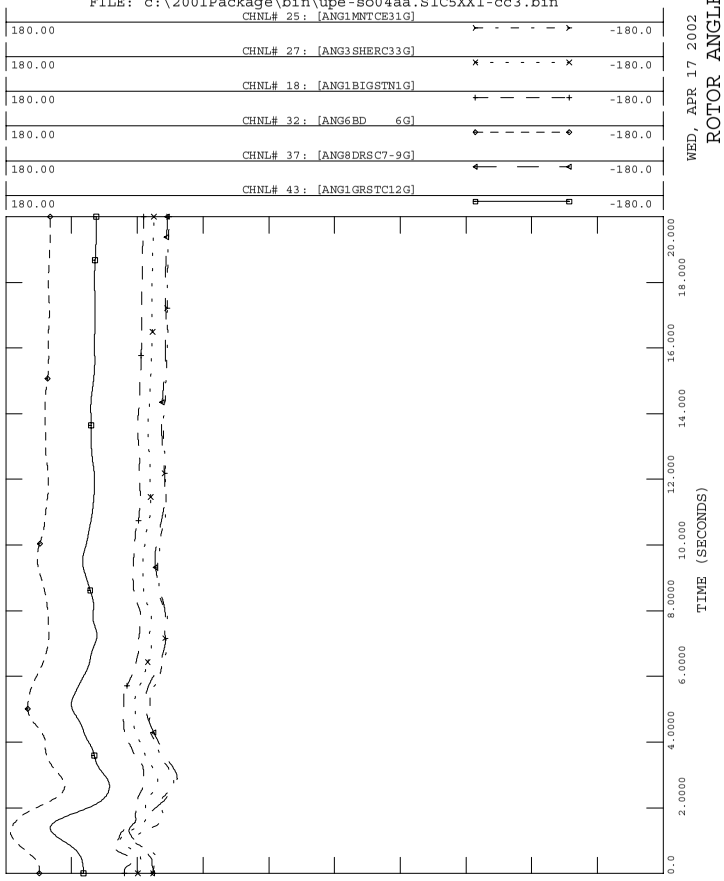
WED, APR 17 2002 16:37
ROTOR ANGLES 4

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



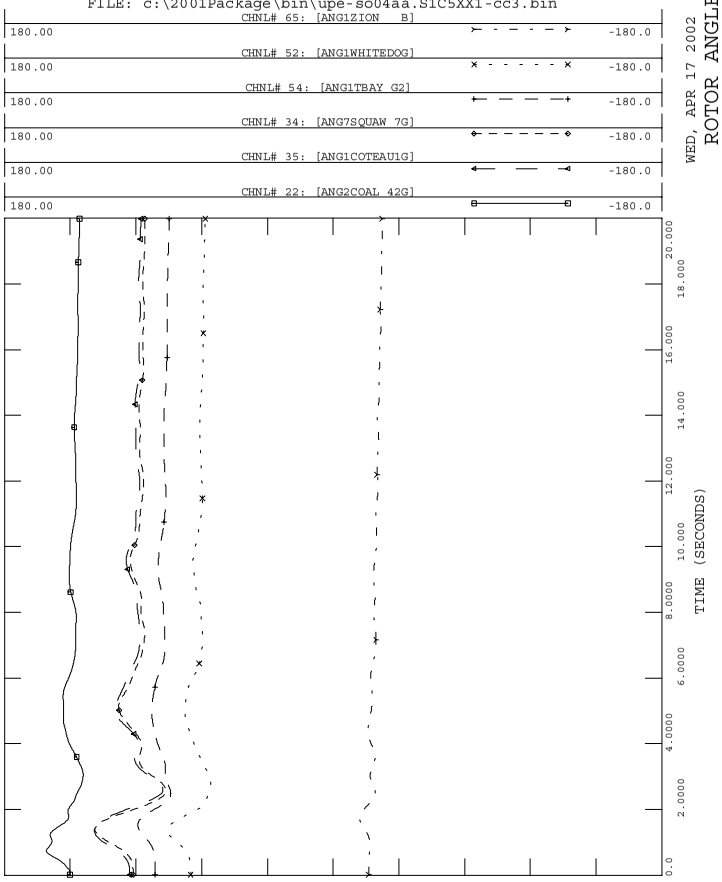
WED, APR 17 2002 16:37
ROTOR ANGLES 1

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



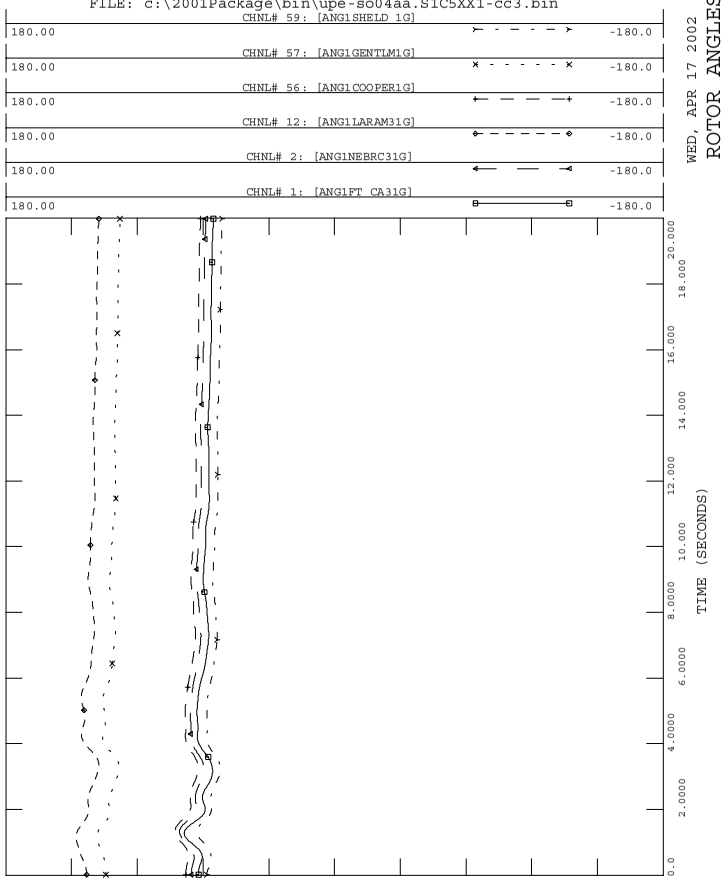
WED, APR 17 2002 16:37
ROTOR ANGLES 3

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



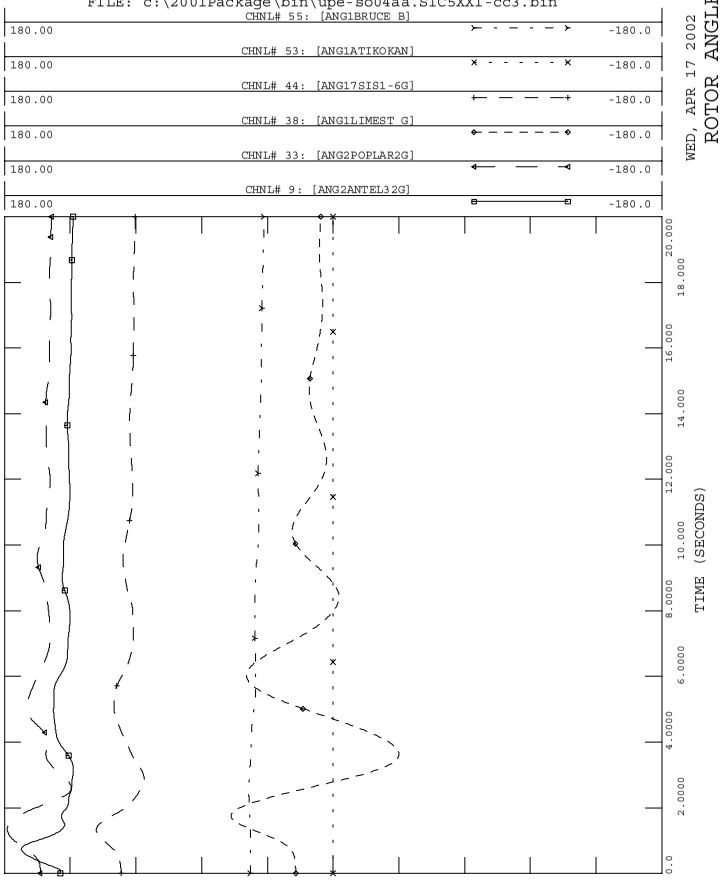
WED, APR 17 2002 16:37
ROTOR ANGLES 6

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



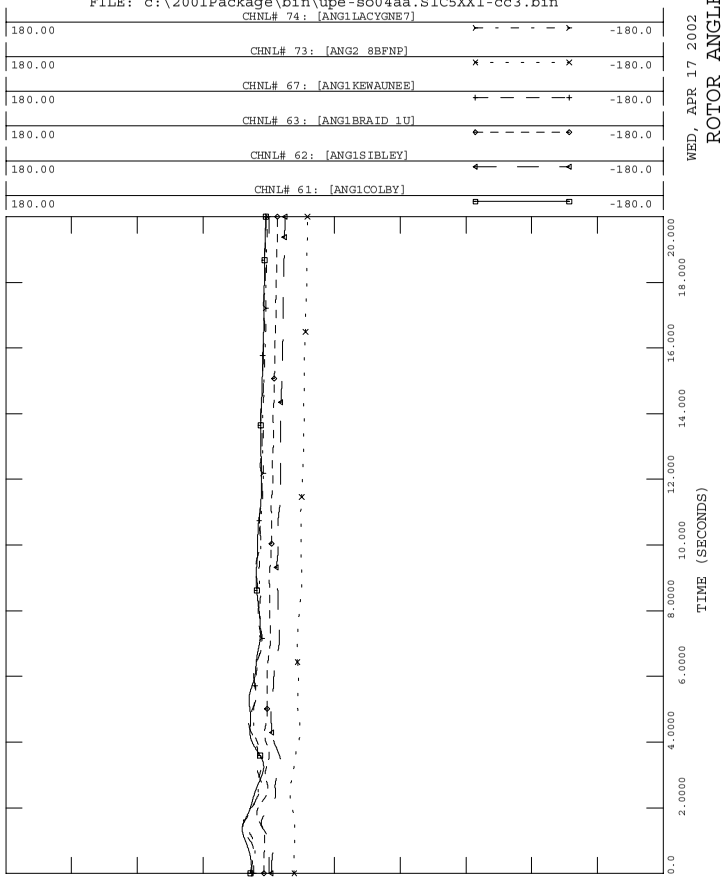
WED, APR 17 2002 16:37
ROTOR ANGLES NB

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



WED, APR 17 2002 16:37
ROTOR ANGLES 5

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



WED, APR 17 2002 16:37
ROTOR ANGLES 7

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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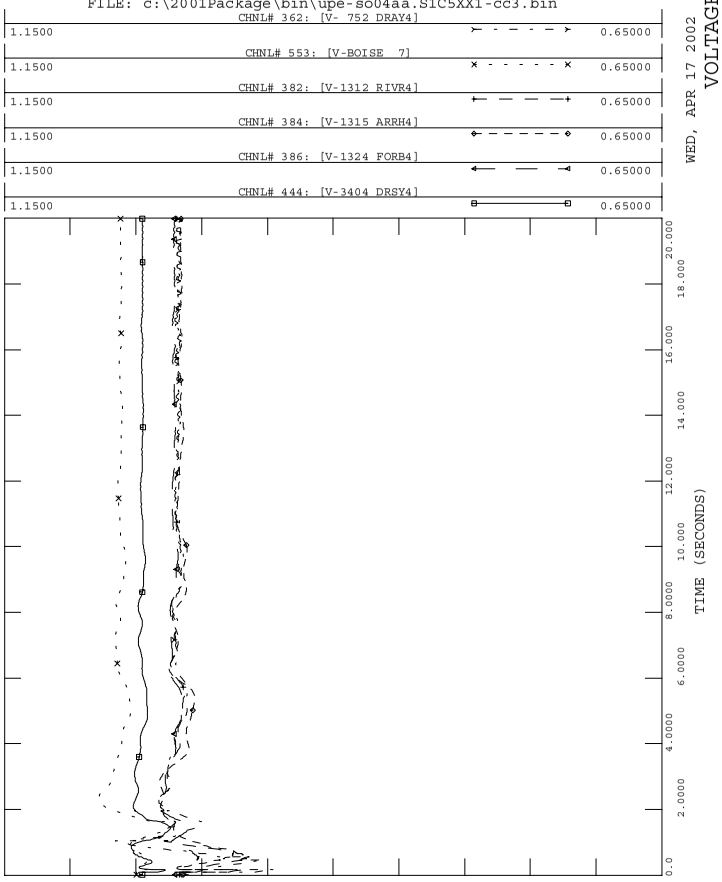
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37
VOLTAGES 1



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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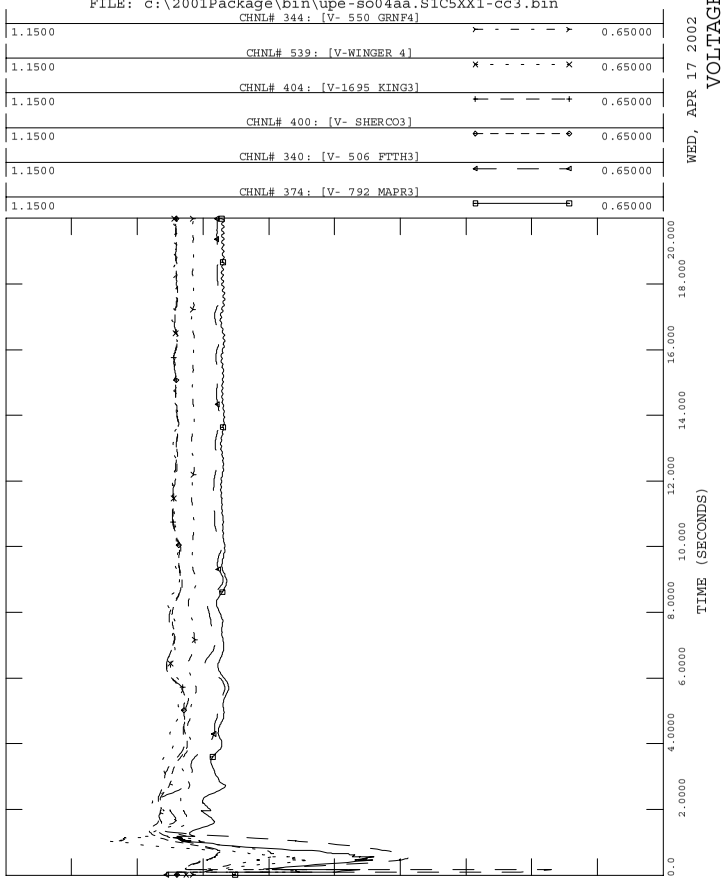
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37
VOLTAGES 3



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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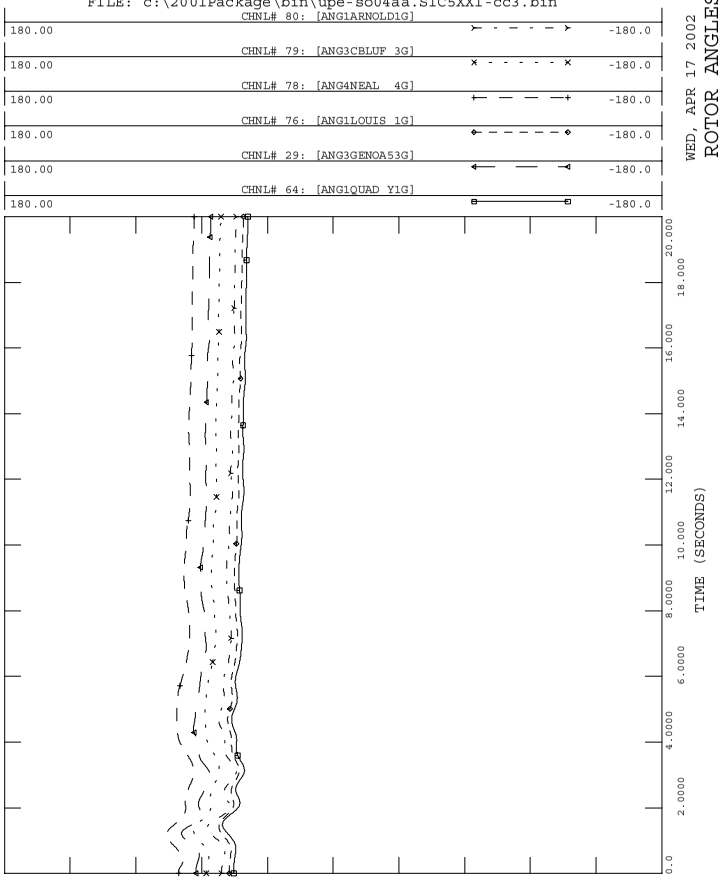
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37
ROTOR ANGLES IA



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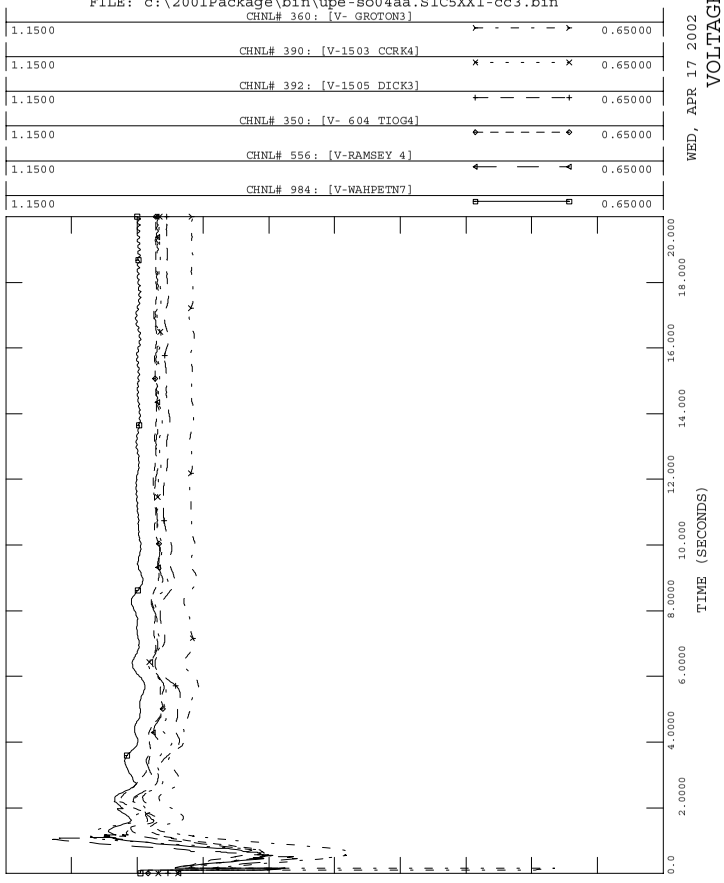
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37
VOLTAGES 2



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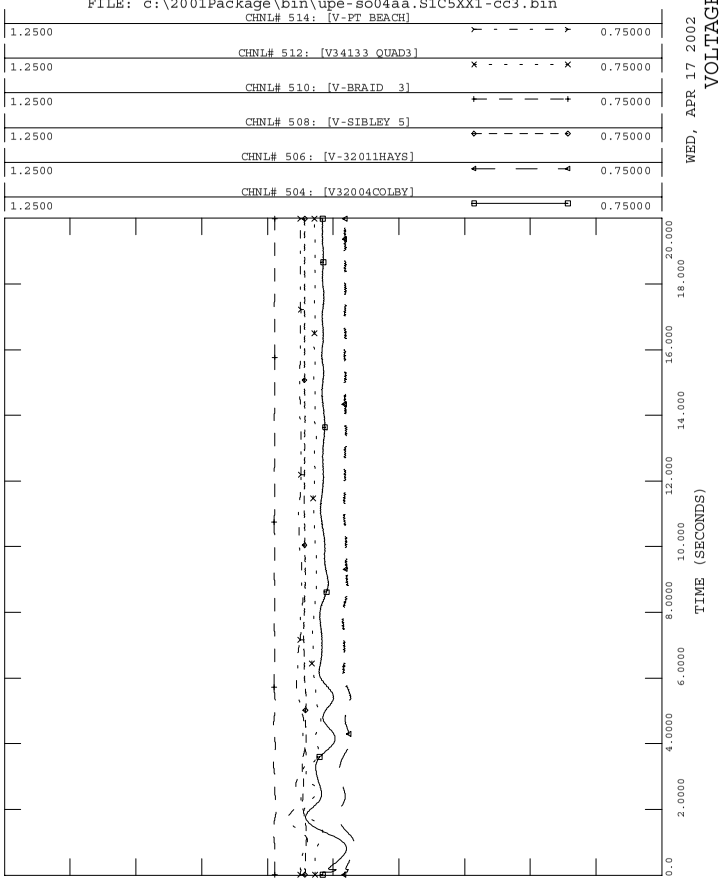
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



WED, APR 17 2002 16:37
VOLTAGES 5

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
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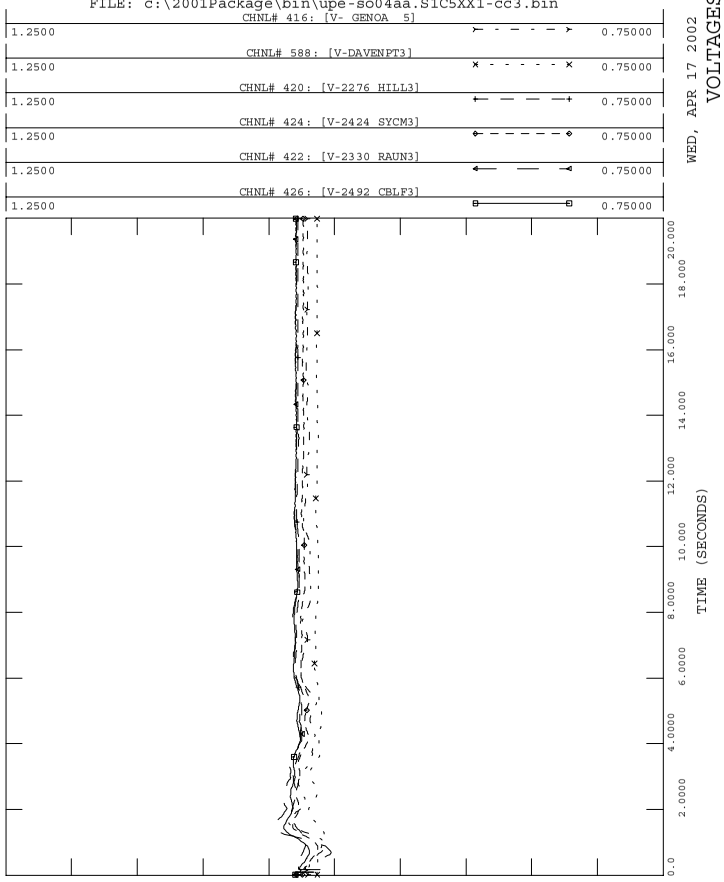

WED, APR 17 2002 16:37
VOLTAGES IA

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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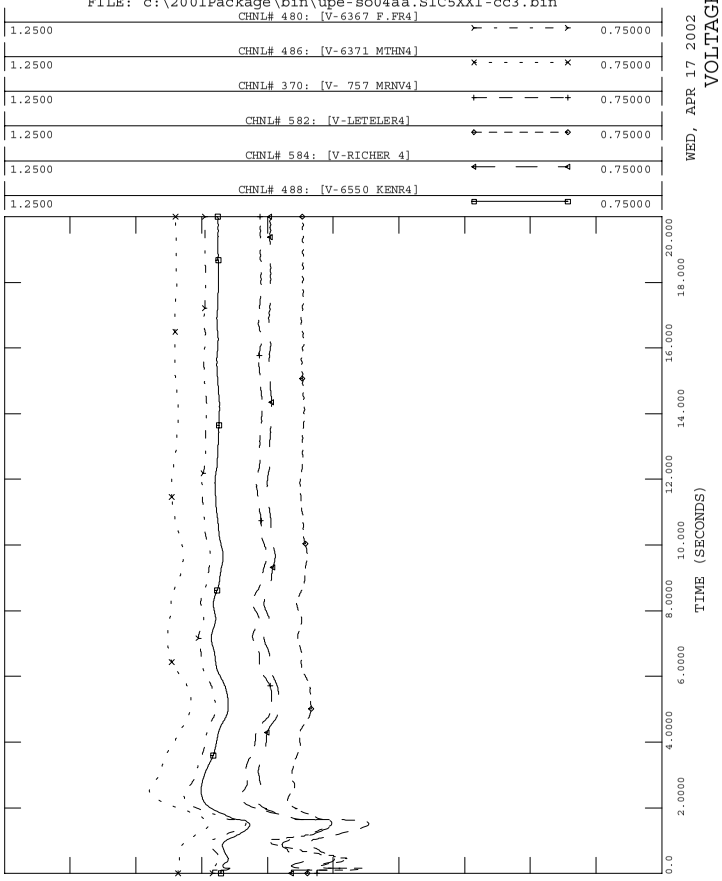
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



WED, APR 17 2002 16:37
VOLTAGES 4

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TRIP HETTINGER GLENHAM 500KV LINE
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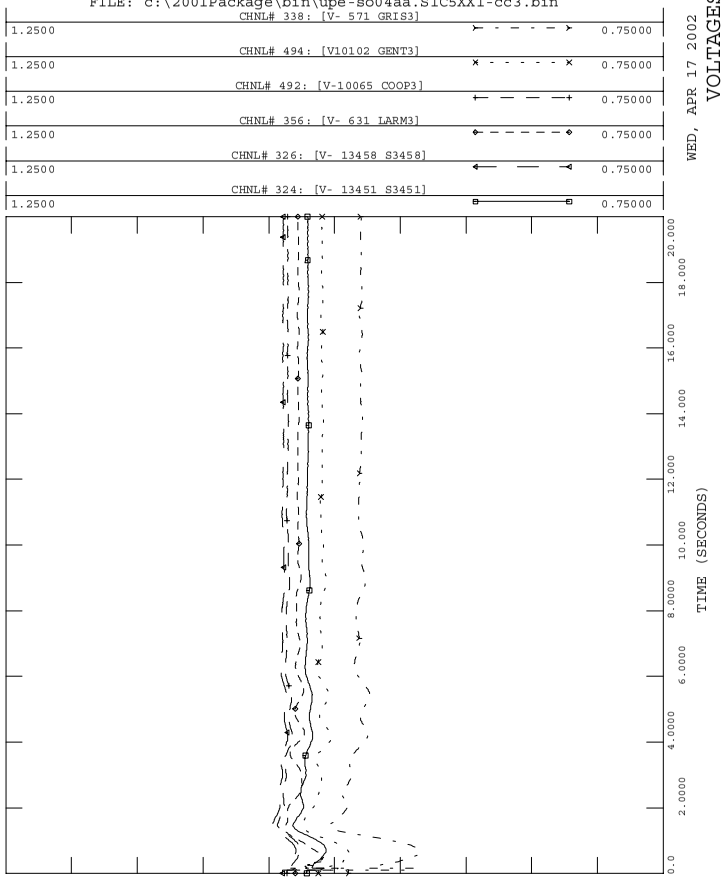
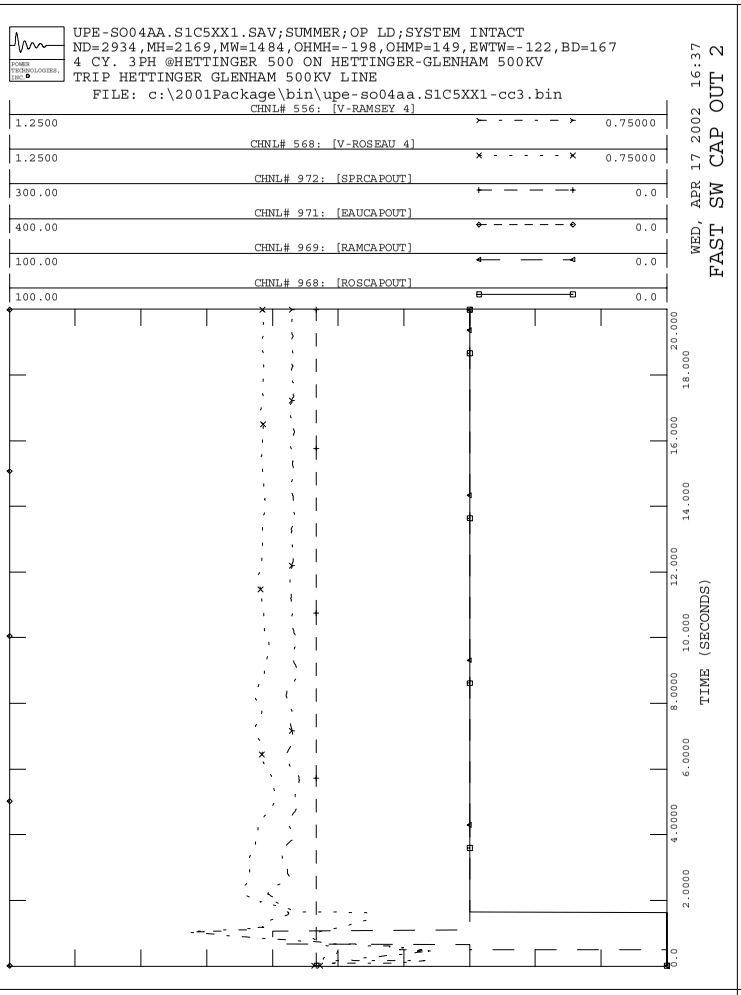


WED, APR 17 2002 16:37
VOLTAGES NB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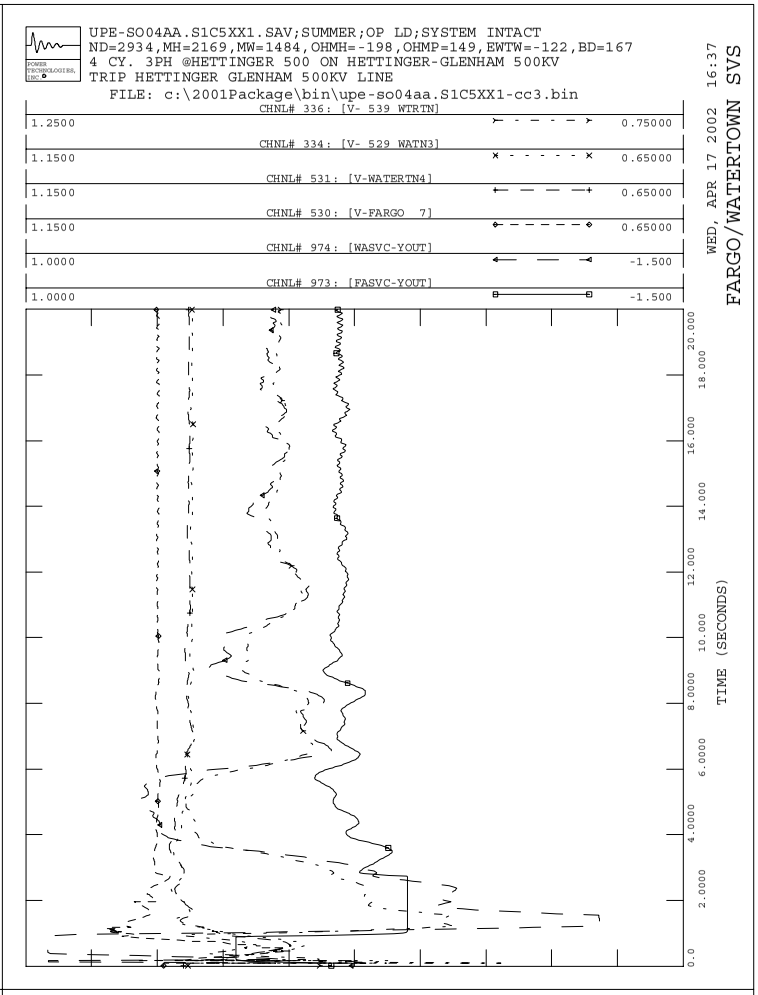
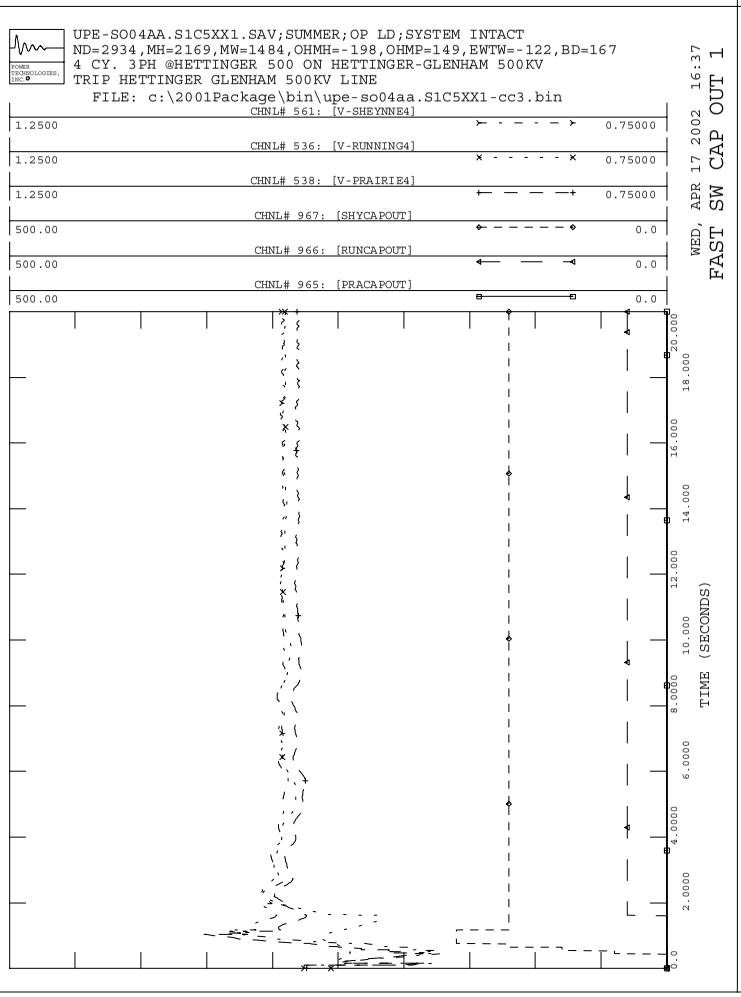
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
WED, APR 17 2002 16:37
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
WED, APR 17 2002 16:37
FARGO/WATERTOWN SVS
TIME (SECONDS)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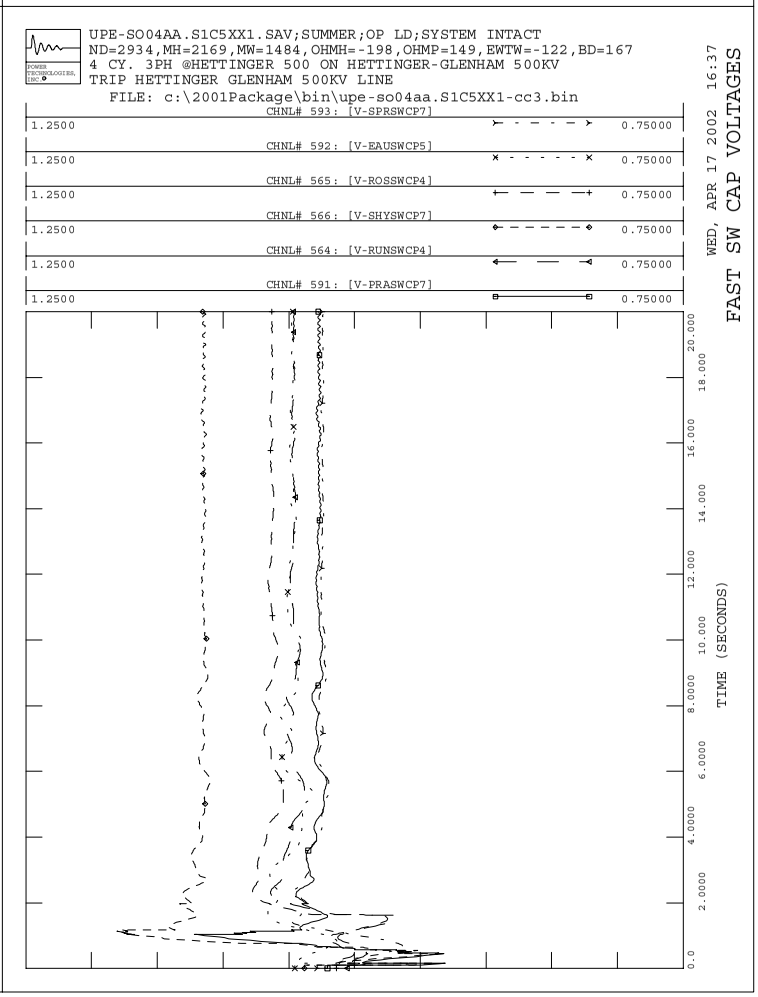
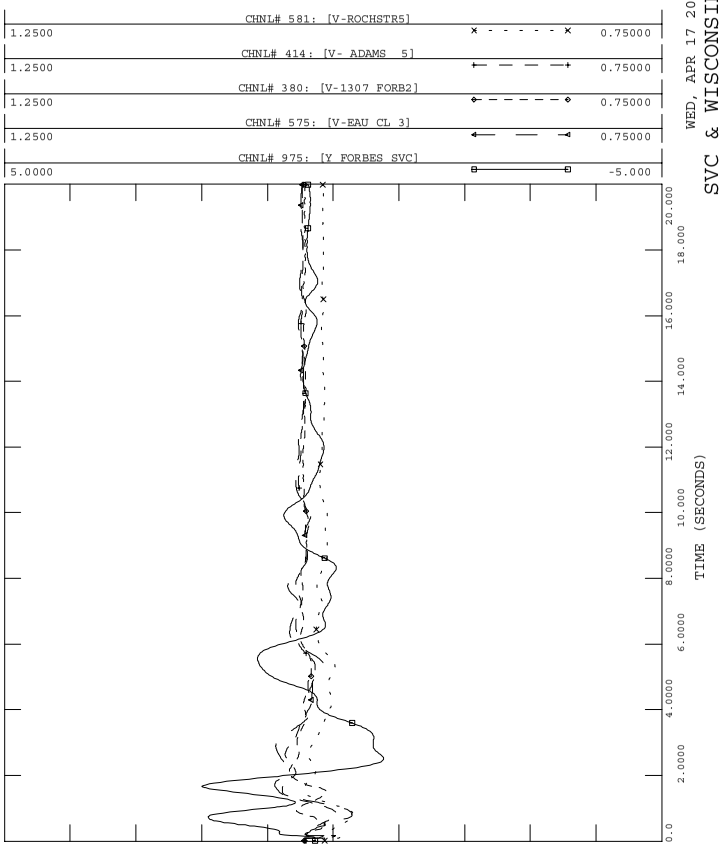
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
WED, APR 17 2002 16:37
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
WED, APR 17 2002 16:37
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37

SVC & WISCONSIN VOLT



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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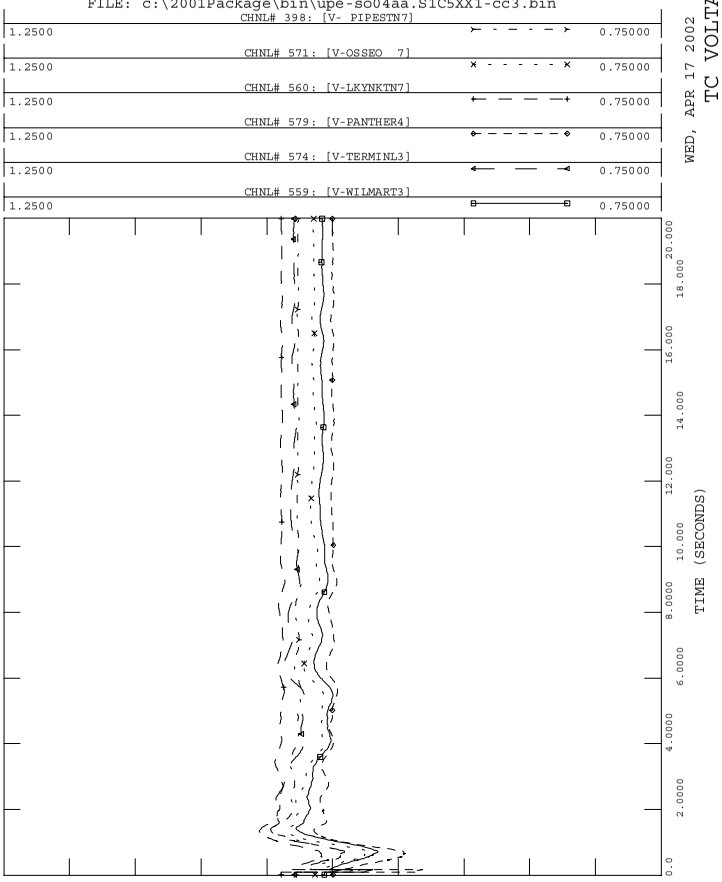
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37

TC VOLTAGES



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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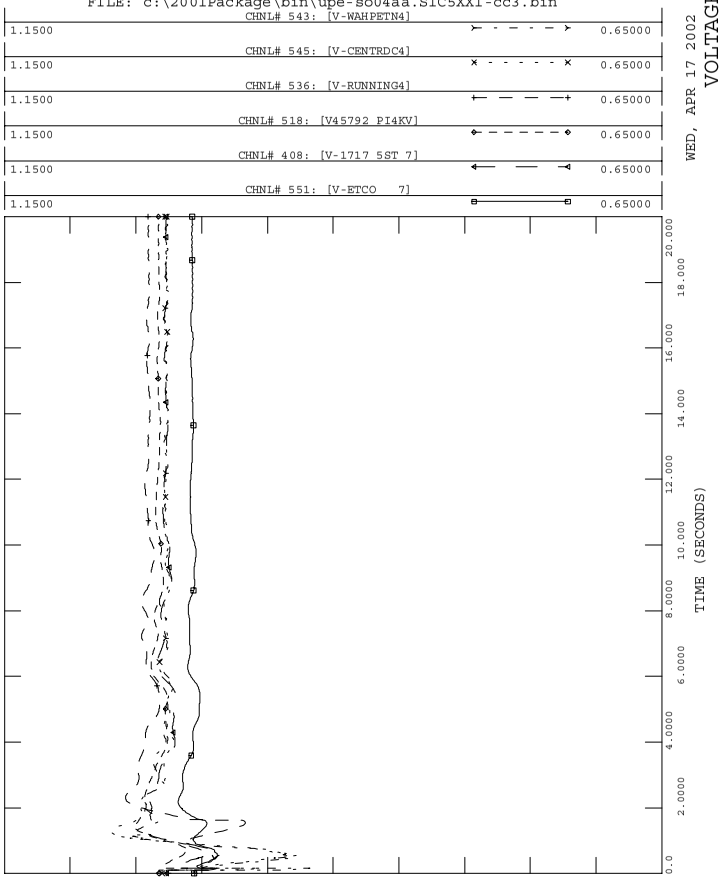
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37

VOLTAGES 6



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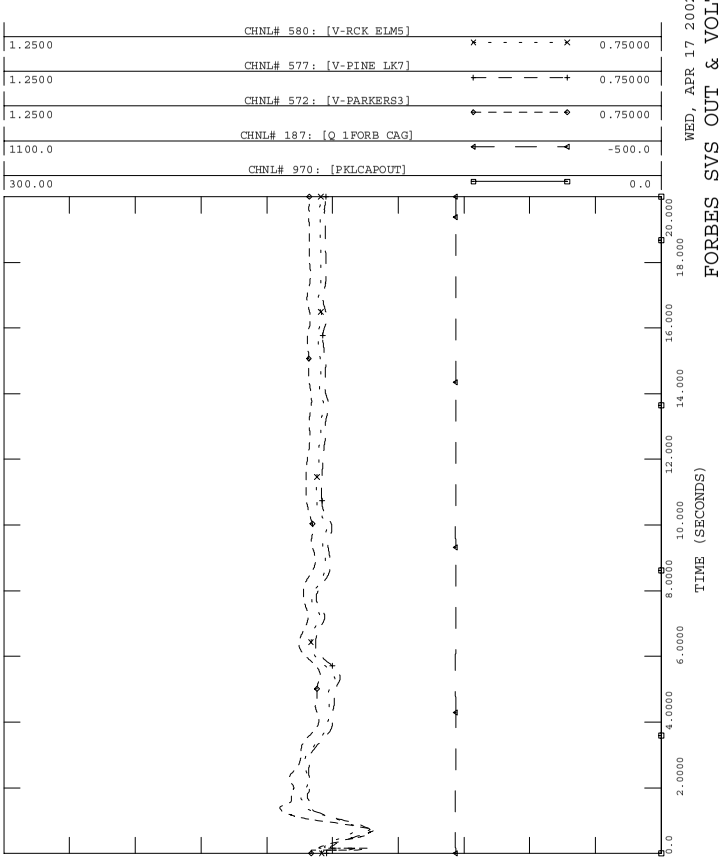
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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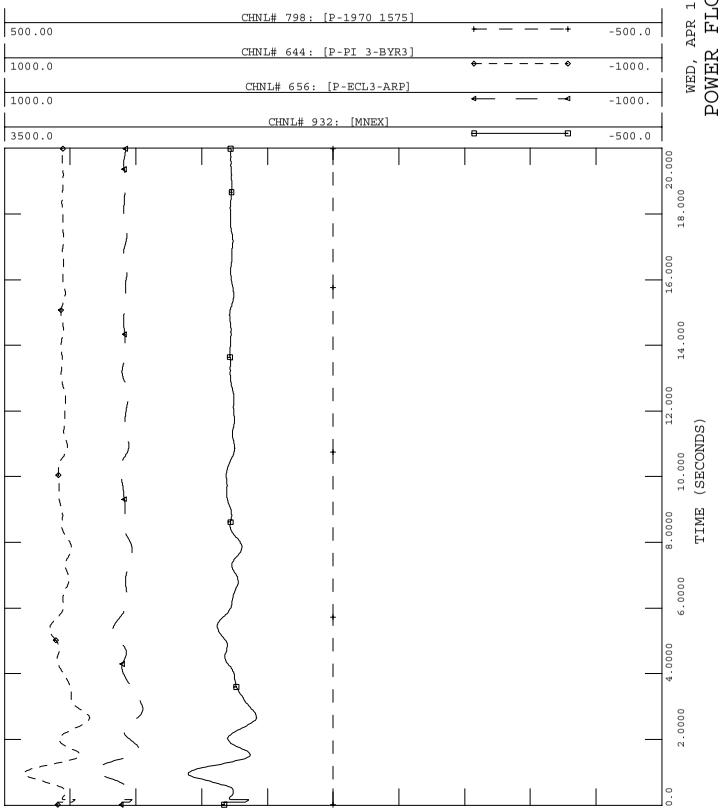
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37
POWER FLOW SUMS 2



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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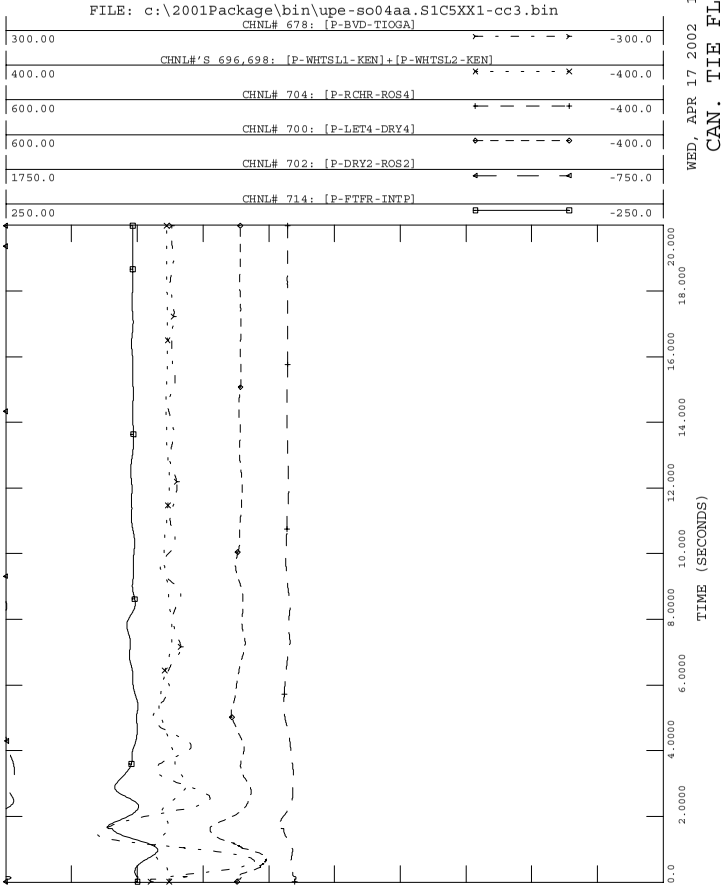
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37
CAN. TIE FLOWS



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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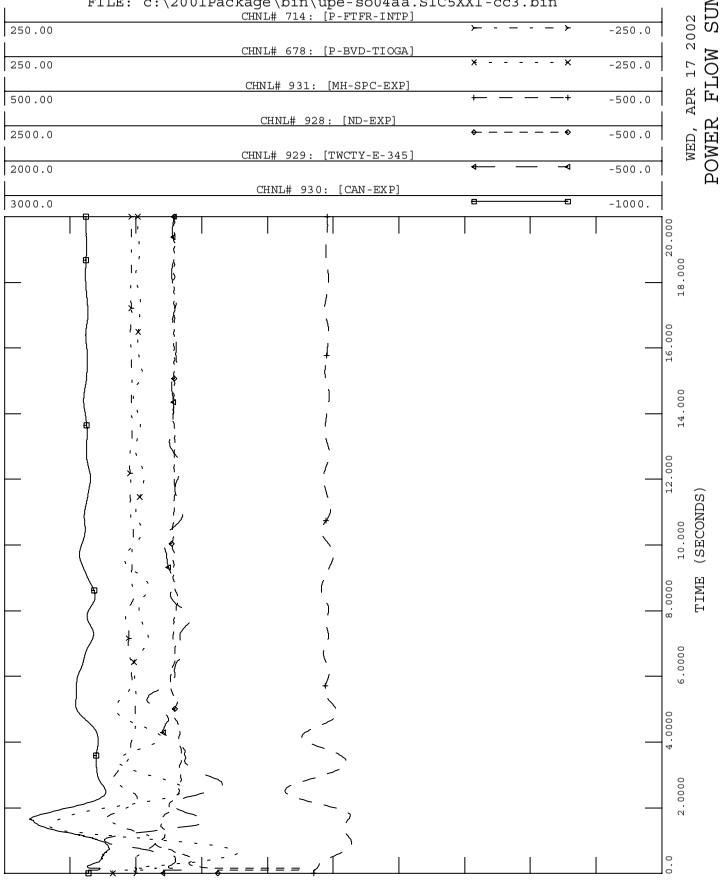
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37
POWER FLOW SUMS 1



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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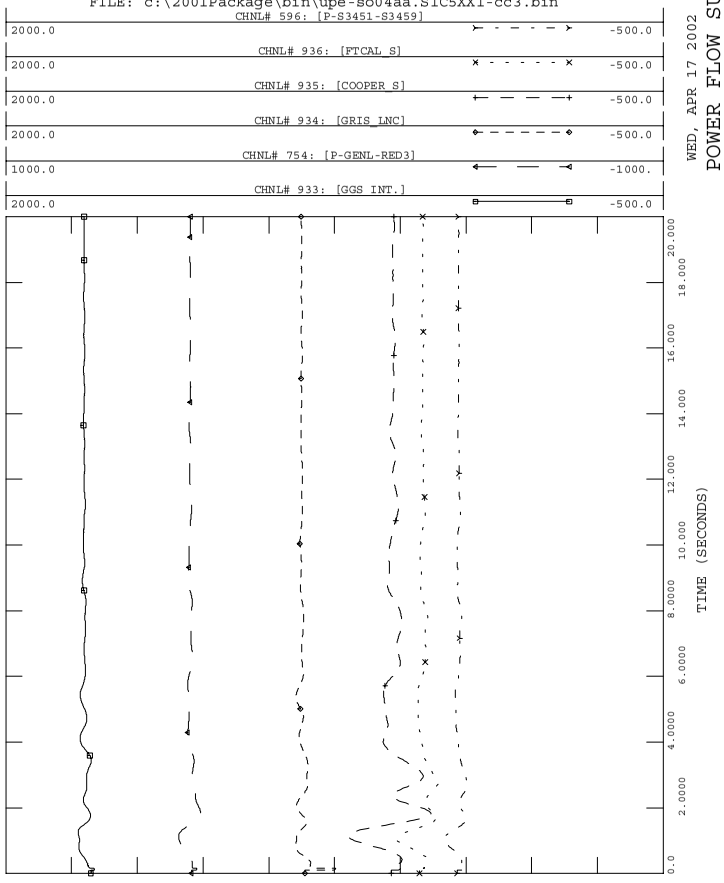
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37
POWER FLOW SUM 3



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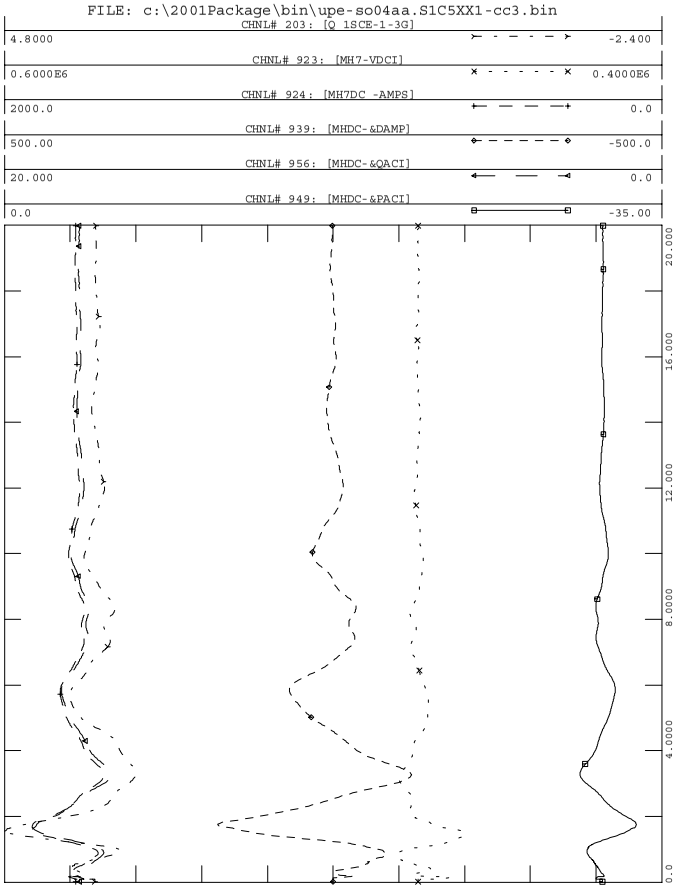
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37
MH DC PARAMETERS



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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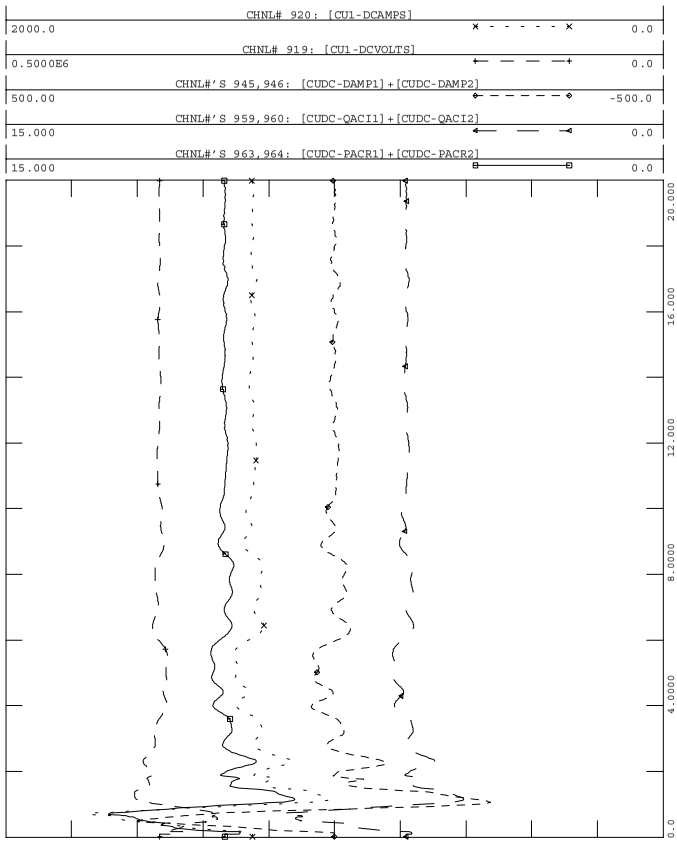
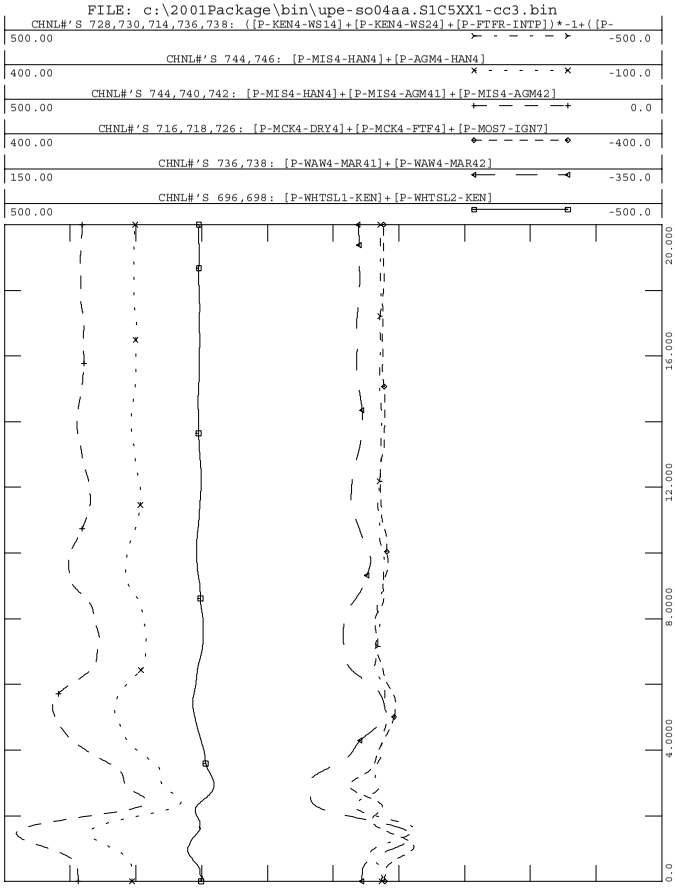
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

WED, APR 17 2002 16:37
CU DC #1



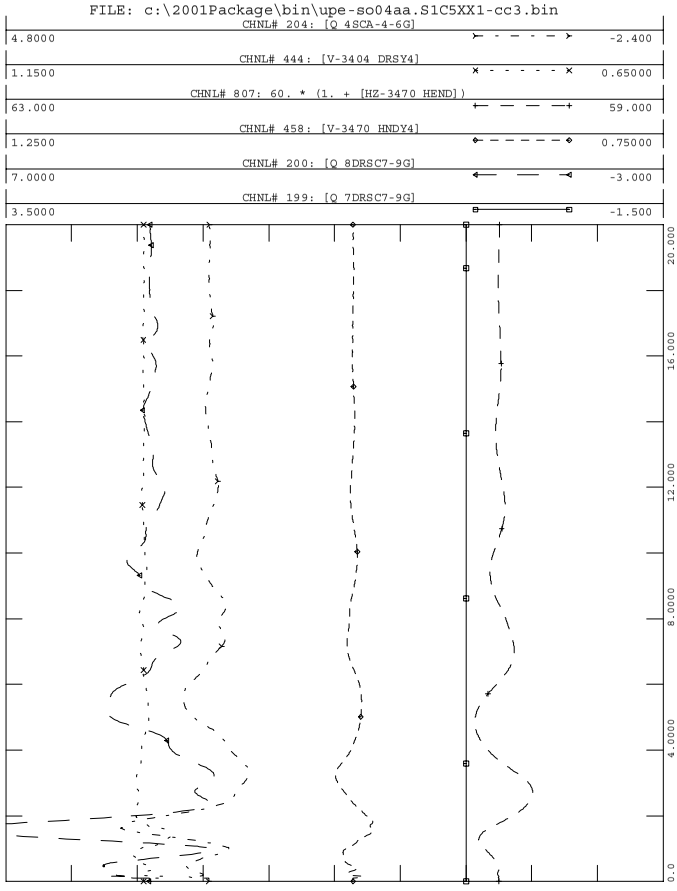
UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

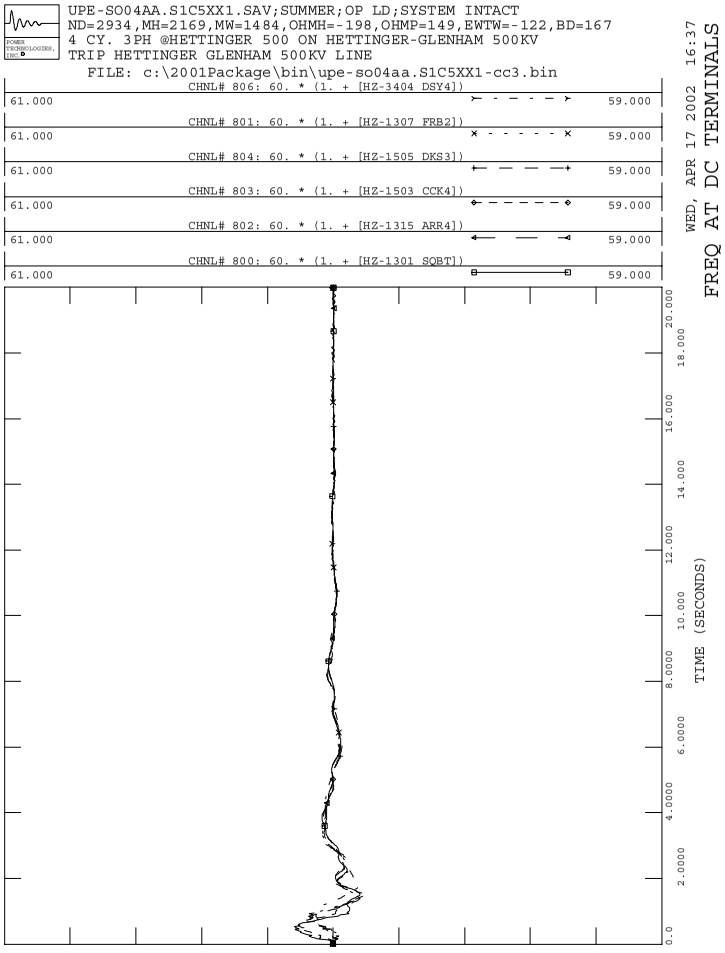
WED, APR 17 2002 16:37
OH TIE FLOWS

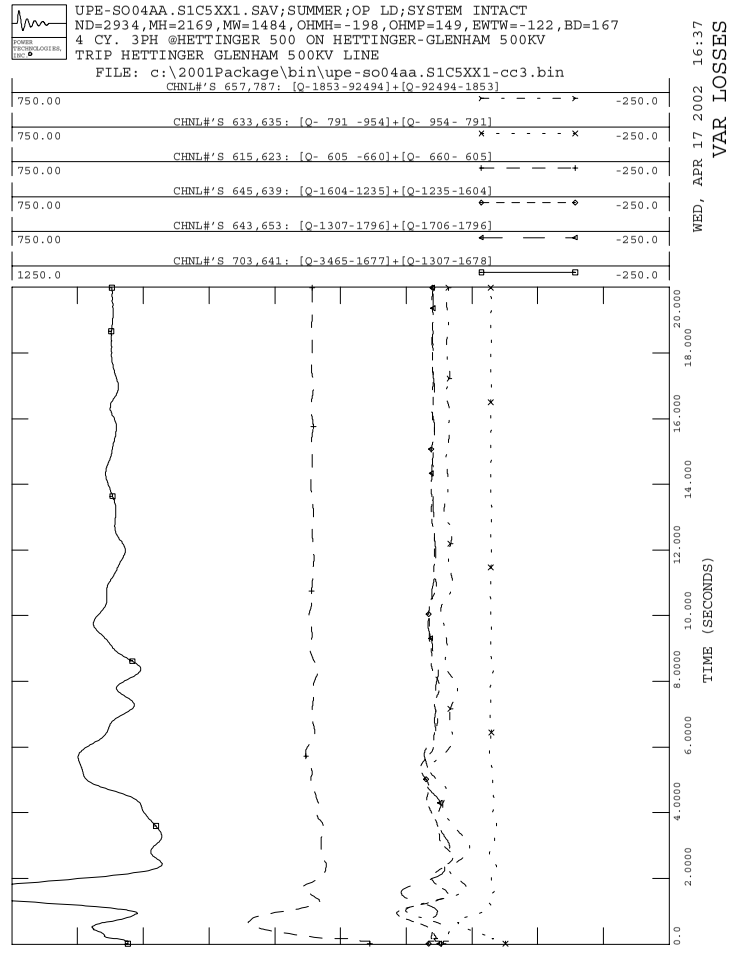


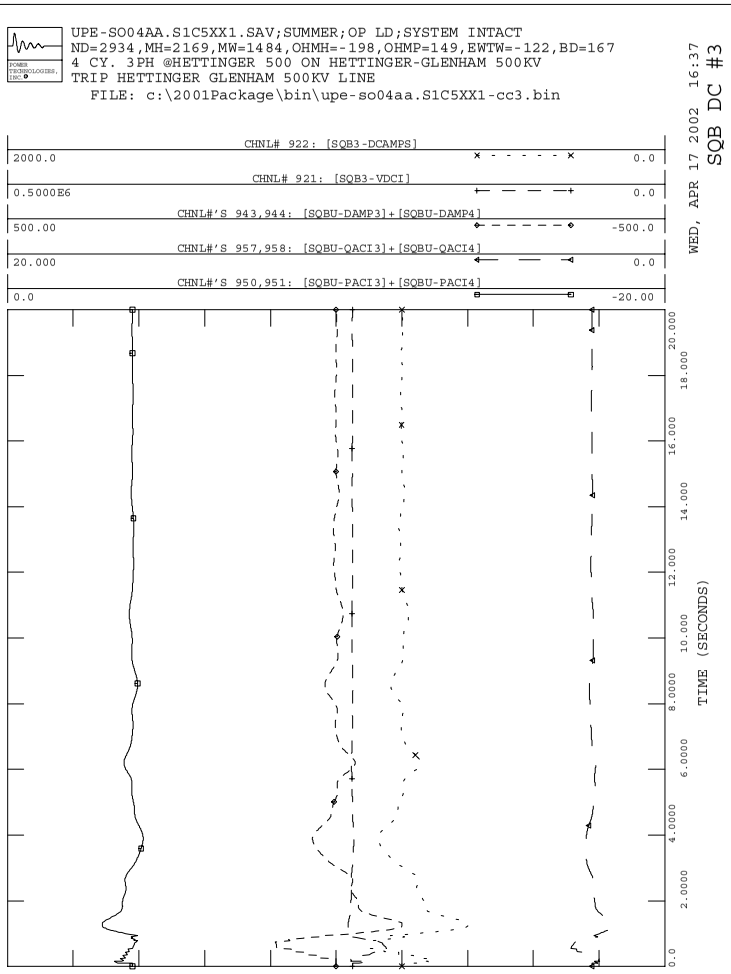
UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

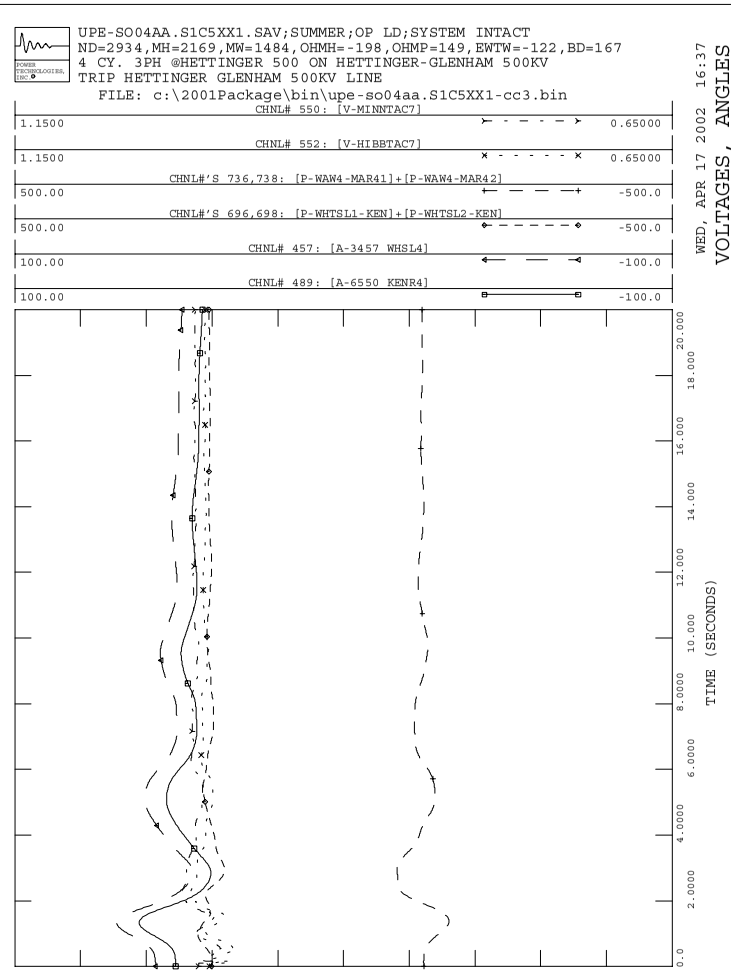
WED, APR 17 2002 16:37
MH DC PARAMETERS




UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
WED, APR 17 2002 16:37
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
WED, APR 17 2002 16:37
VAR LOSSES
TIME (SECONDS)

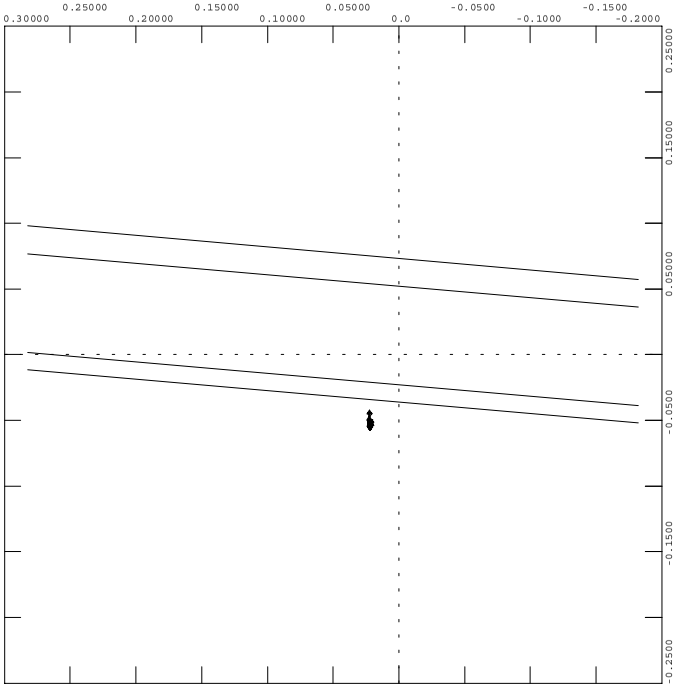

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
WED, APR 17 2002 16:37
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
WED, APR 17 2002 16:37
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

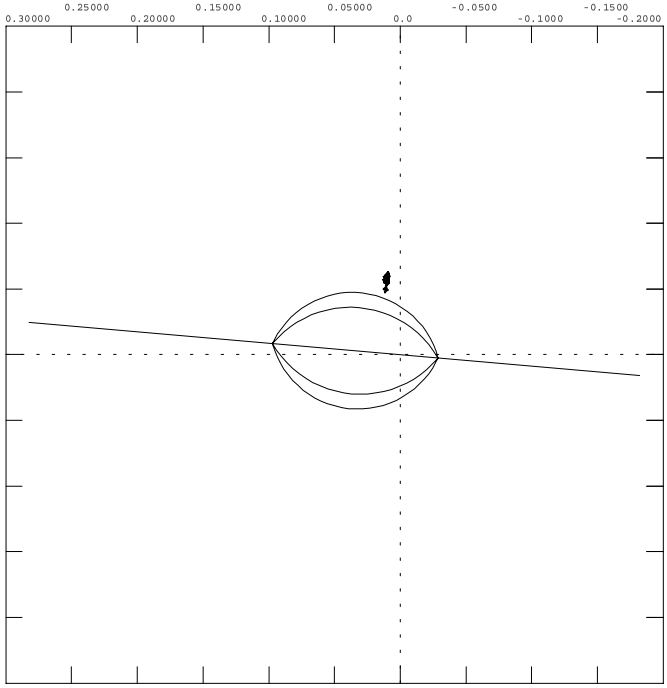


WED, APR 17 2002 16:37
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

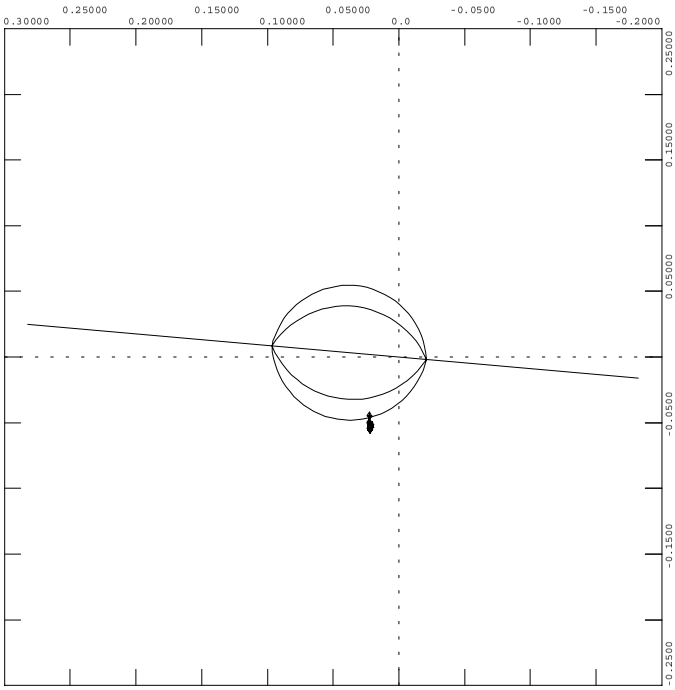


WED, APR 17 2002 16:37
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

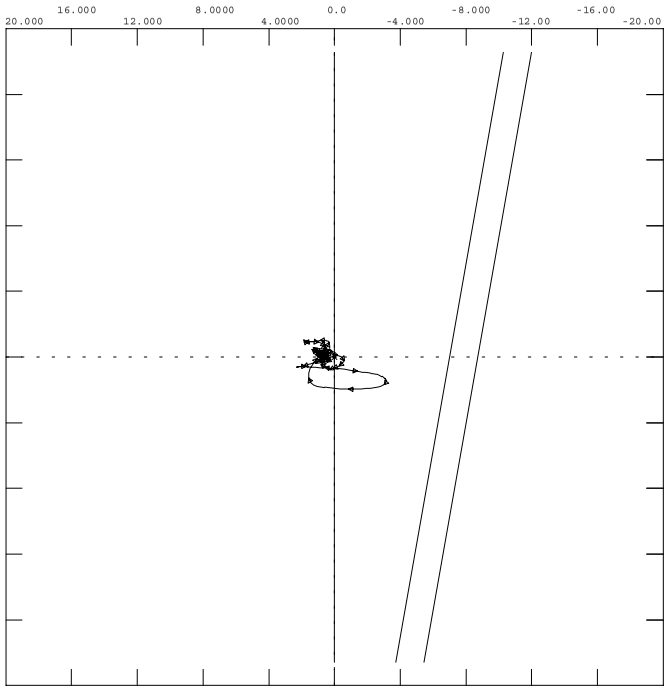


WED, APR 17 2002 16:37
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

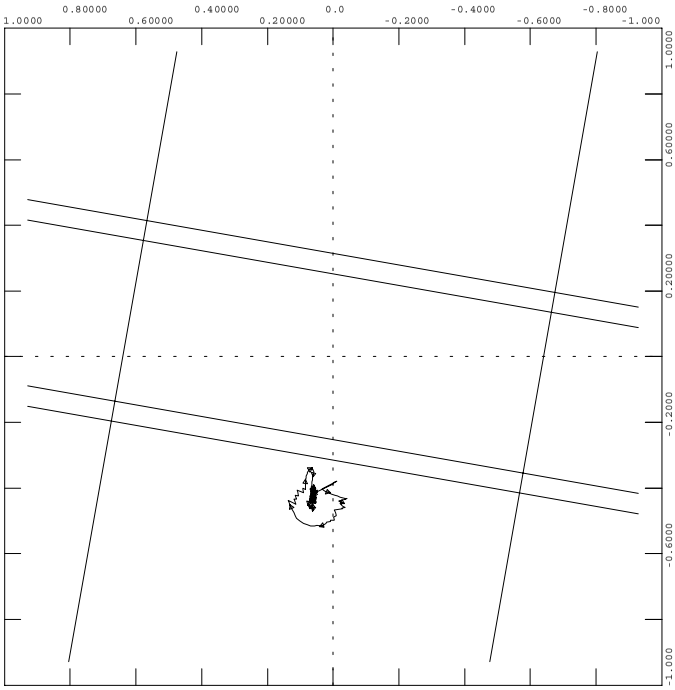


WED, APR 17 2002 16:37
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

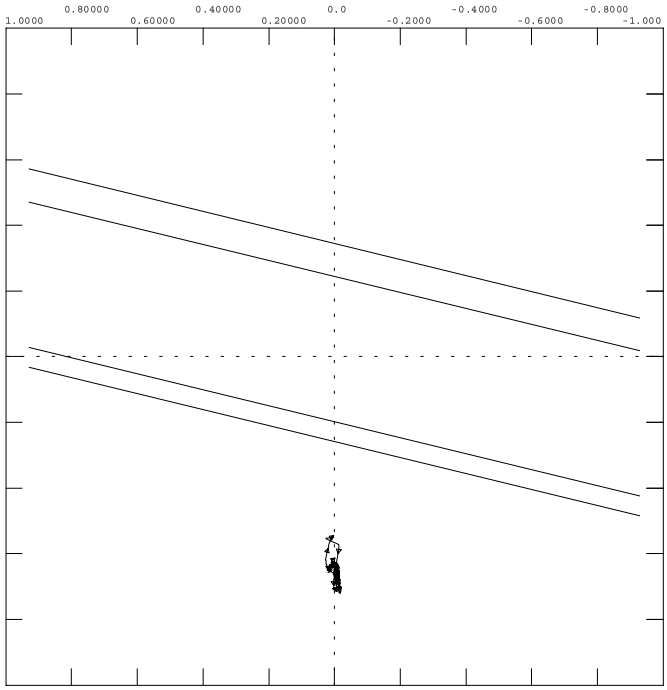
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

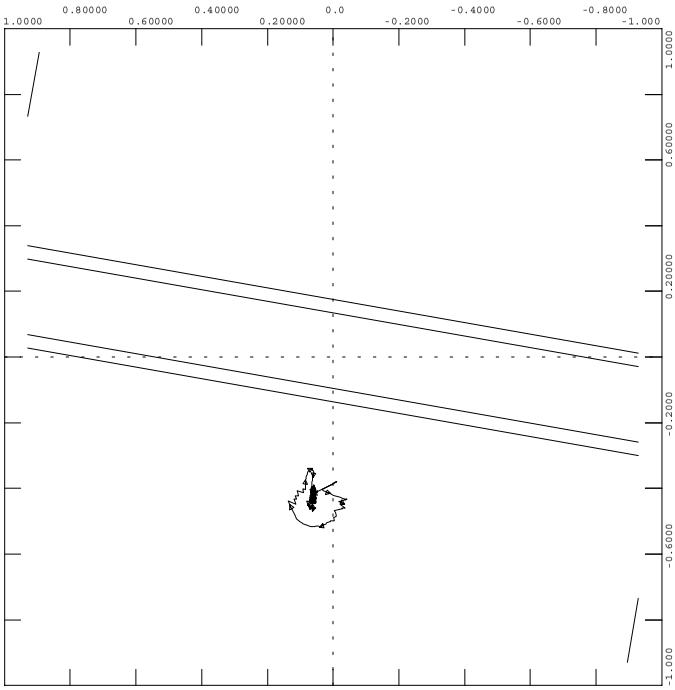
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

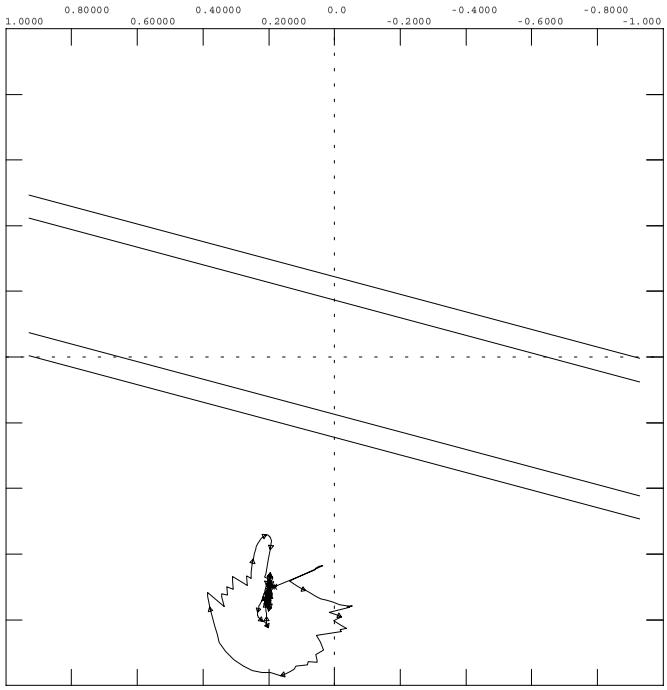
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

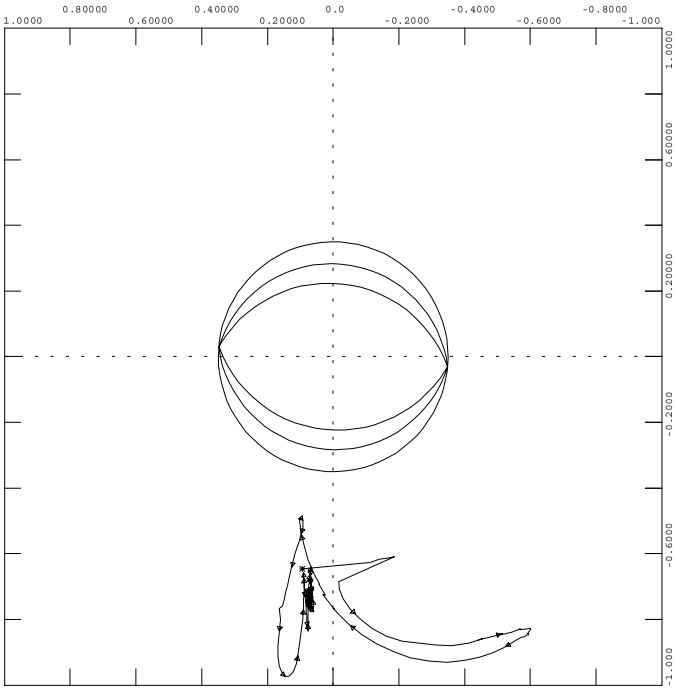
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

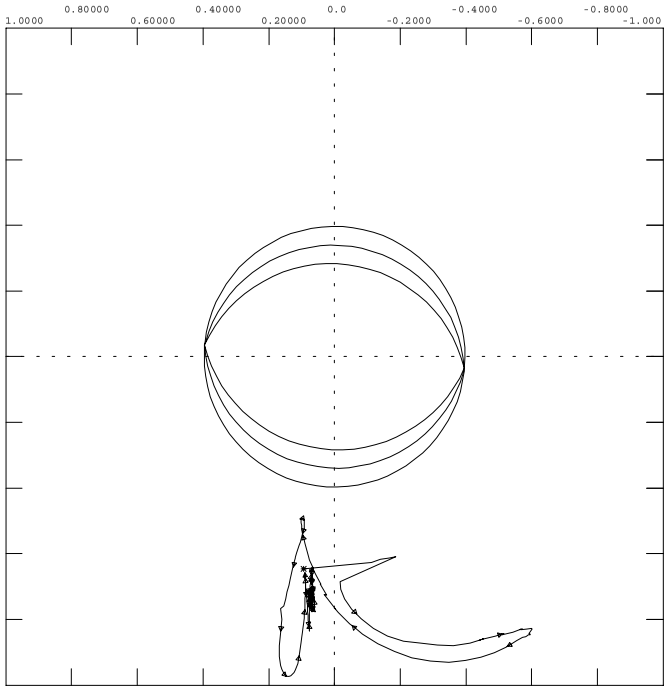


WED, APR 17 2002 16:37
TIOGA-B.DAM-SOUTH (266)

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

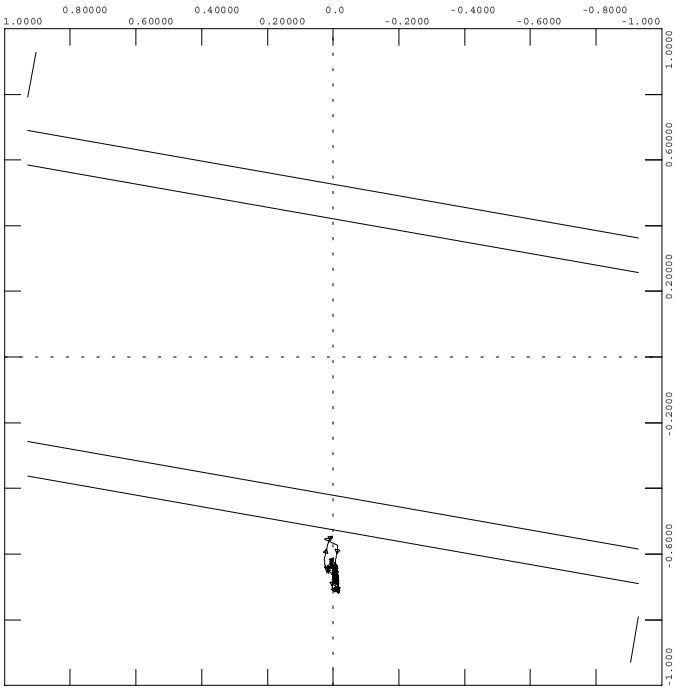


WED, APR 17 2002 16:37
TIOGA-B.DAM-EMRG (267)

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

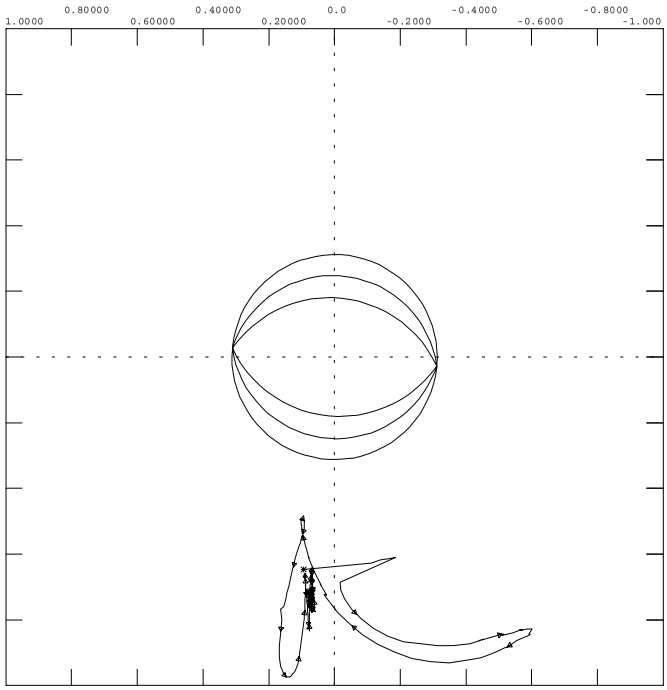


WED, APR 17 2002 16:37
R50M-MORANVILLE-EMRG (777

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

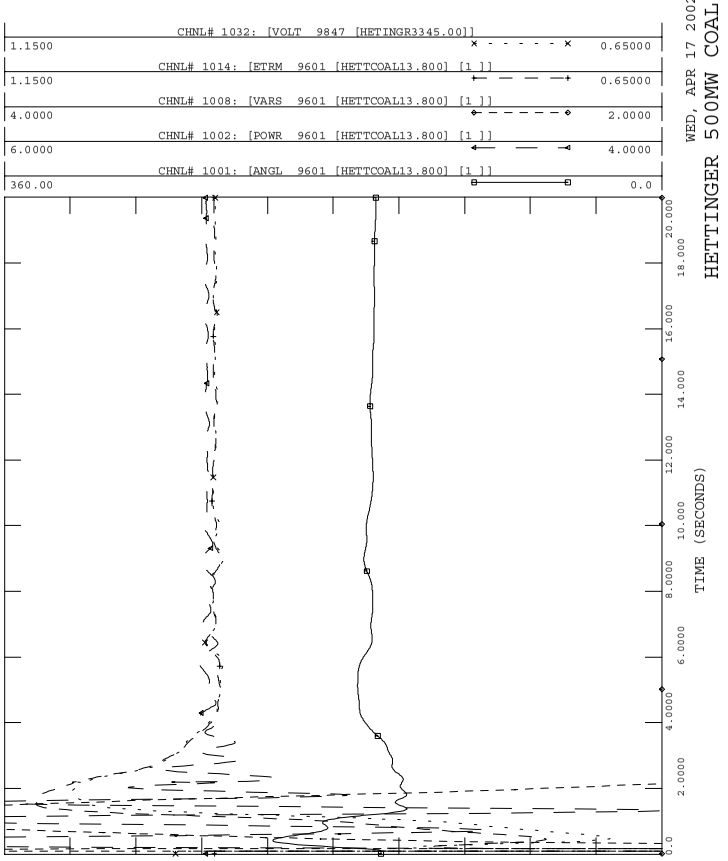
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



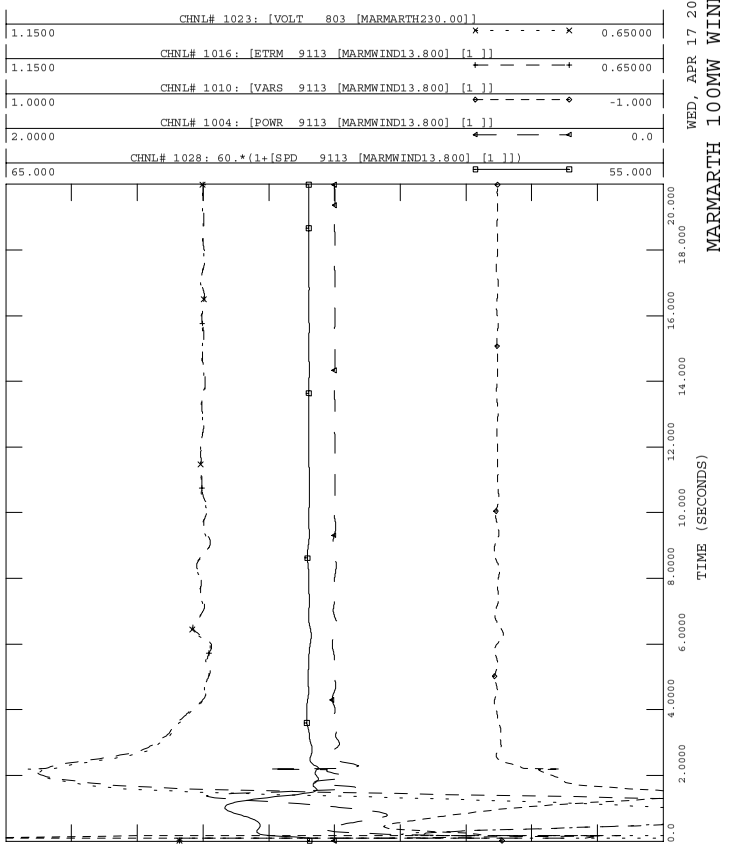
WED, APR 17 2002 16:37
TIOGA-B.DAM-NORTH (268)

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



WED, APR 17 2002 16:37
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

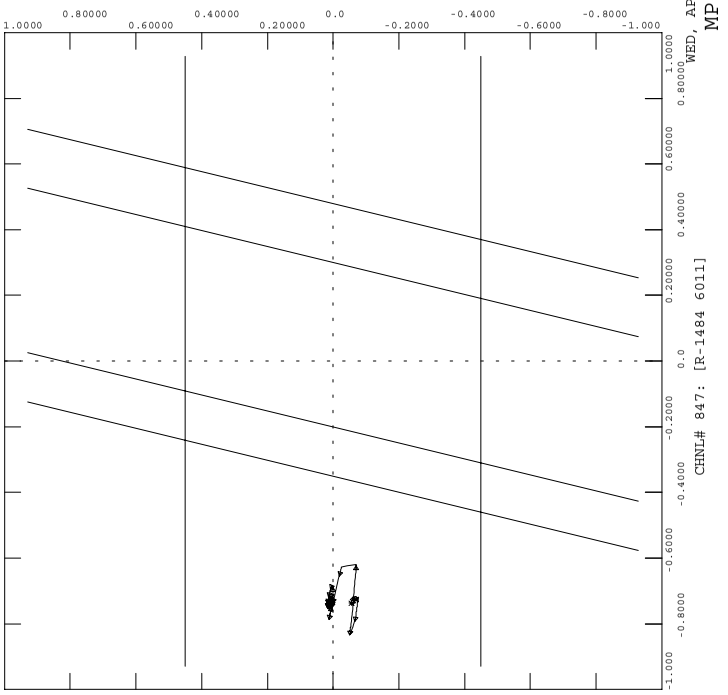


WED, APR 17 2002 16:37
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
TRIP HETTINGER GLENHAM 500KV LINE

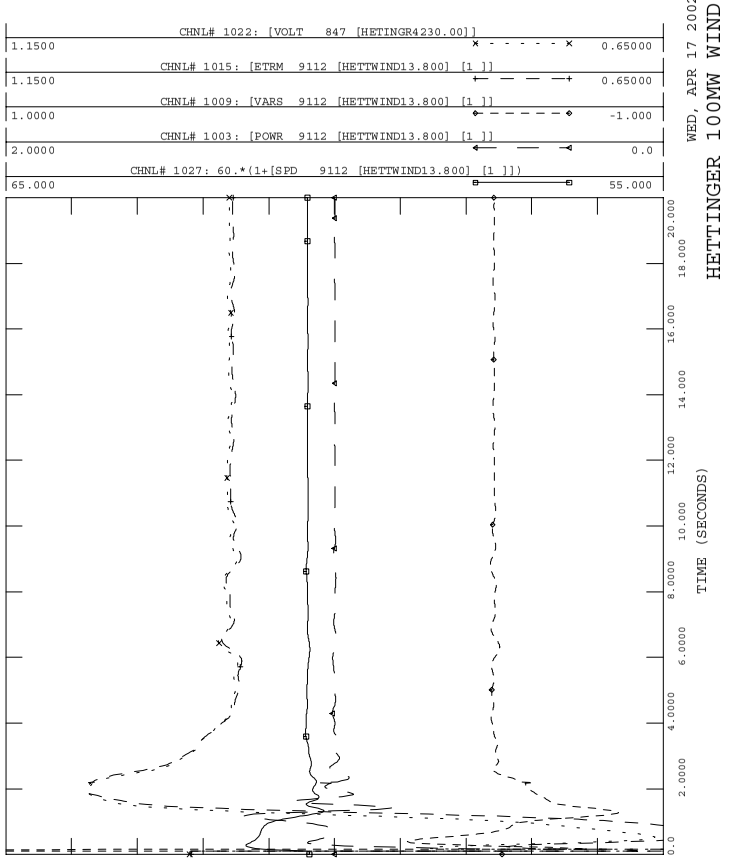
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



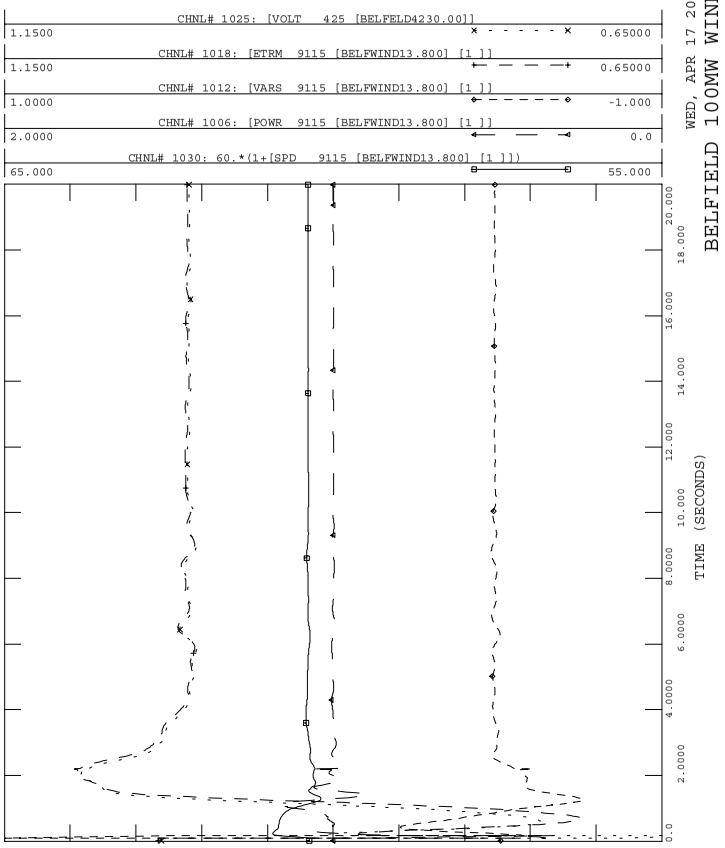
WED, APR 17 2002 16:37
MP-OH I.FALLS (779)

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



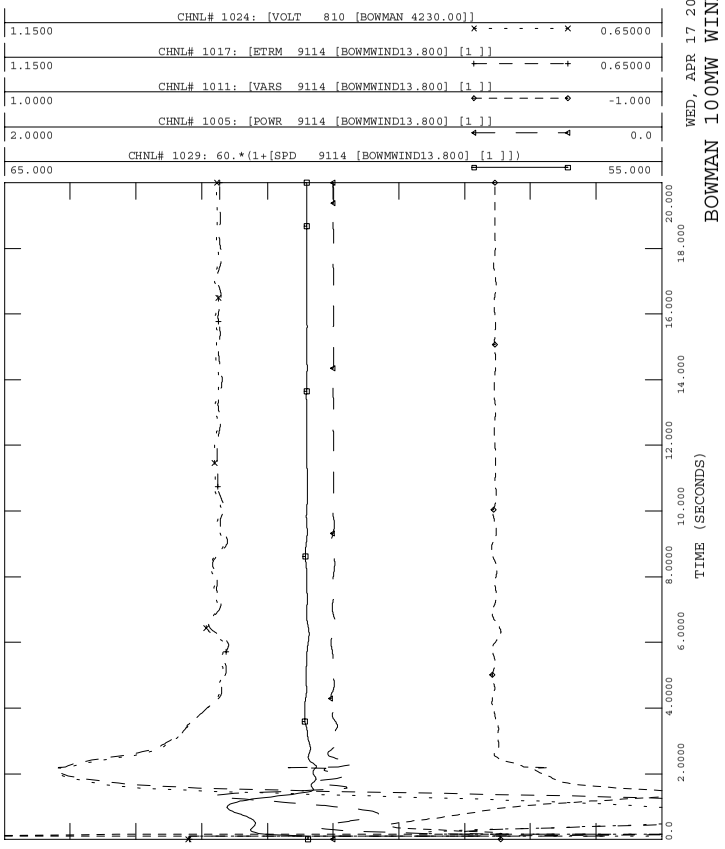
WED, APR 17 2002 16:37
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



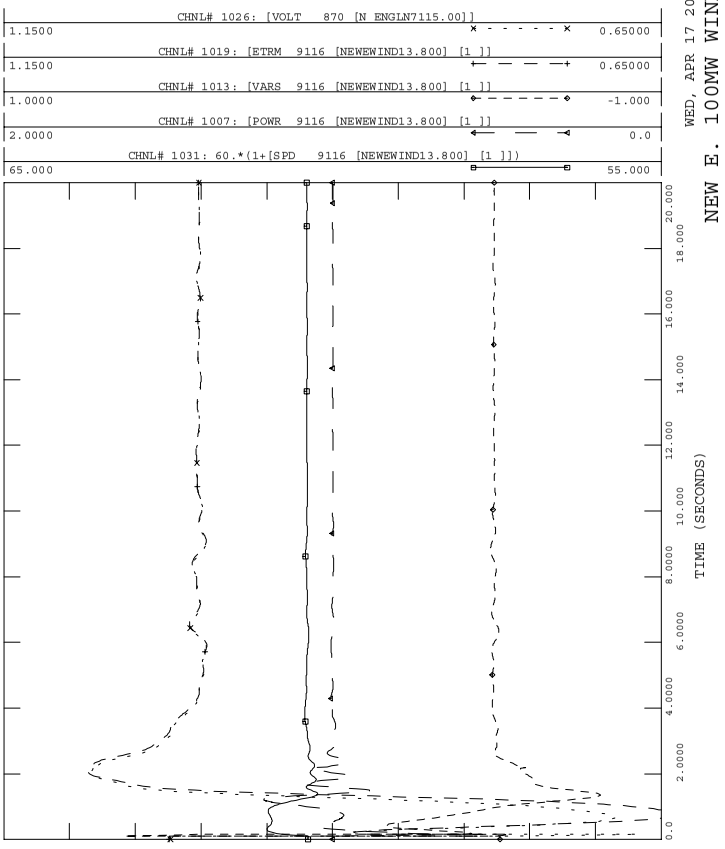
WED, APR 17 2002 16:37
BELFIELD 100MW WIND UNIT

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



WED, APR 17 2002 16:37
BOWMAN 100MW WIND UNIT

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cc3.bin



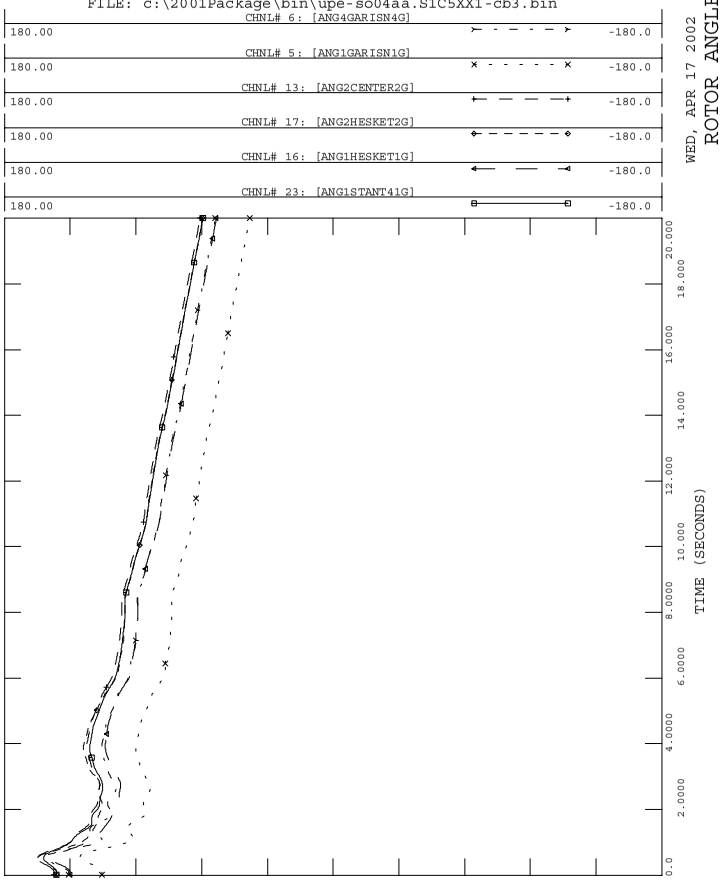
WED, APR 17 2002 16:37
NEW E. 100MW WIND UNIT

CONTINGENCY CB3

4 cycle 3 phase fault at Hettinger 500 kV on Hettinger-Glenham 500kV. Trip Hettinger coal unit 12 cycles after fault inception.

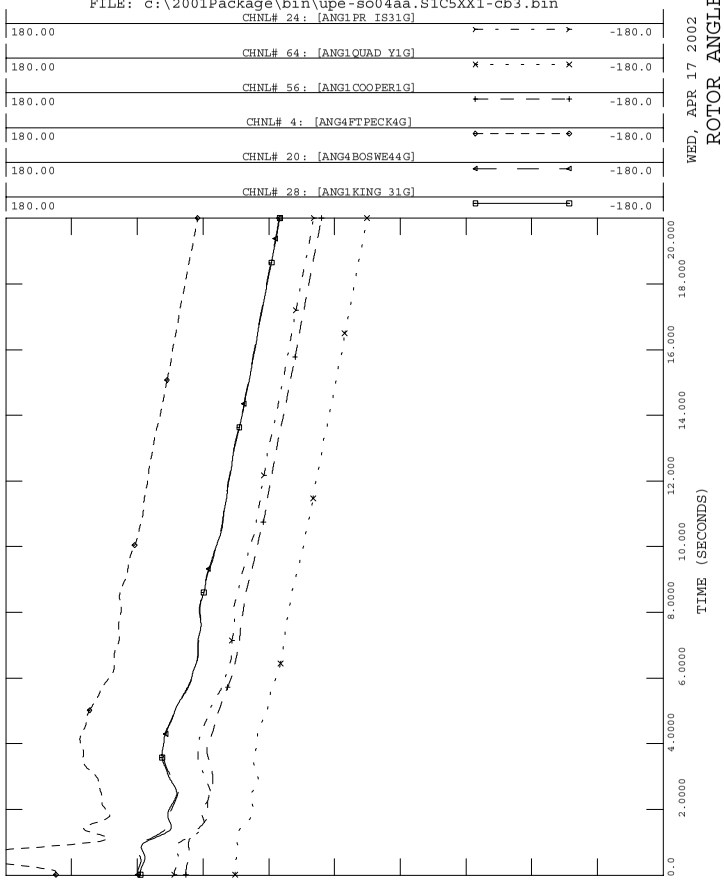
UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

WED, APR 17 2002 17:20
ROTOR ANGLES 2



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

WED, APR 17 2002 17:20
ROTOR ANGLES 4



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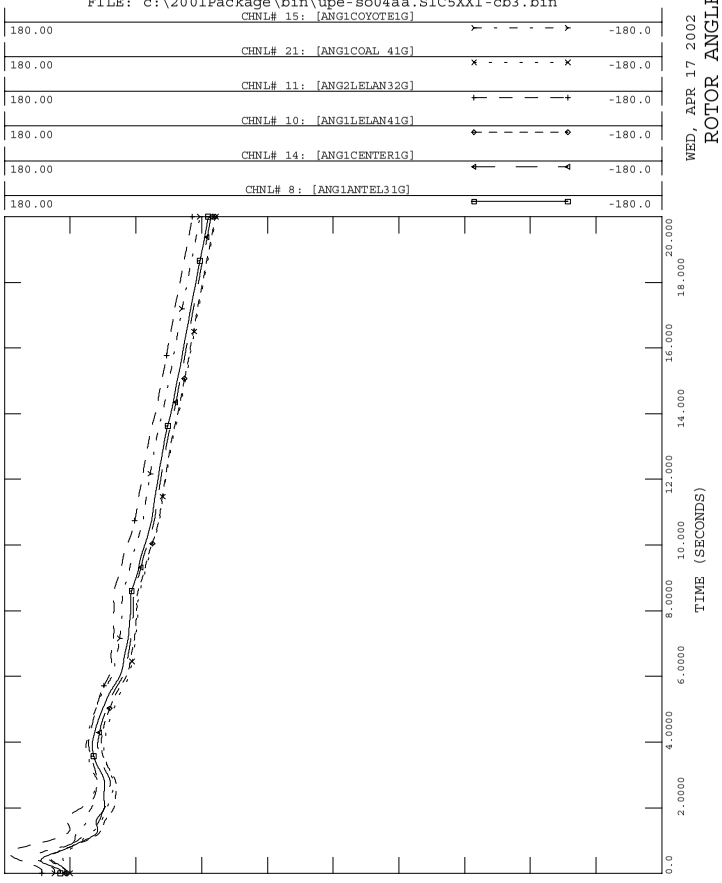
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

WED, APR 17 2002 17:20
ROTOR ANGLES 1



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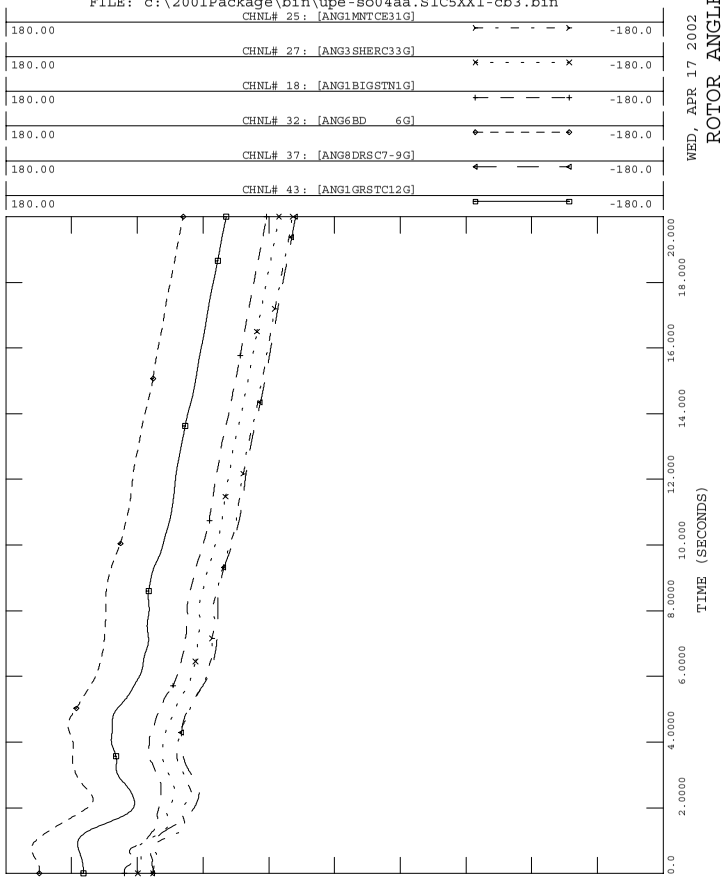
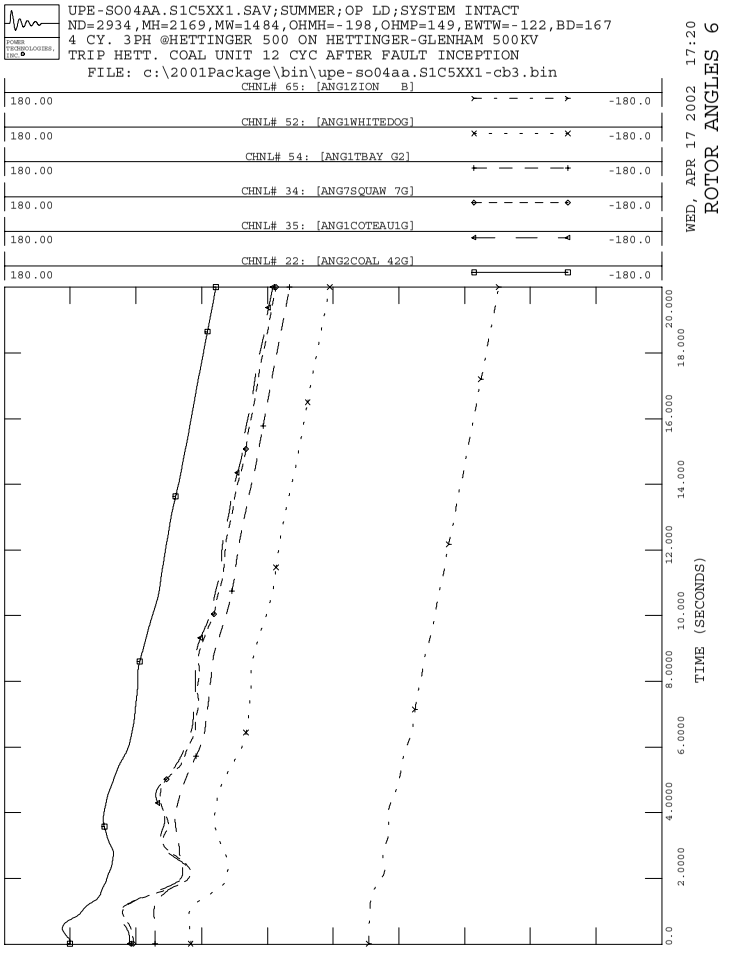
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

WED, APR 17 2002 17:20
ROTOR ANGLES 3

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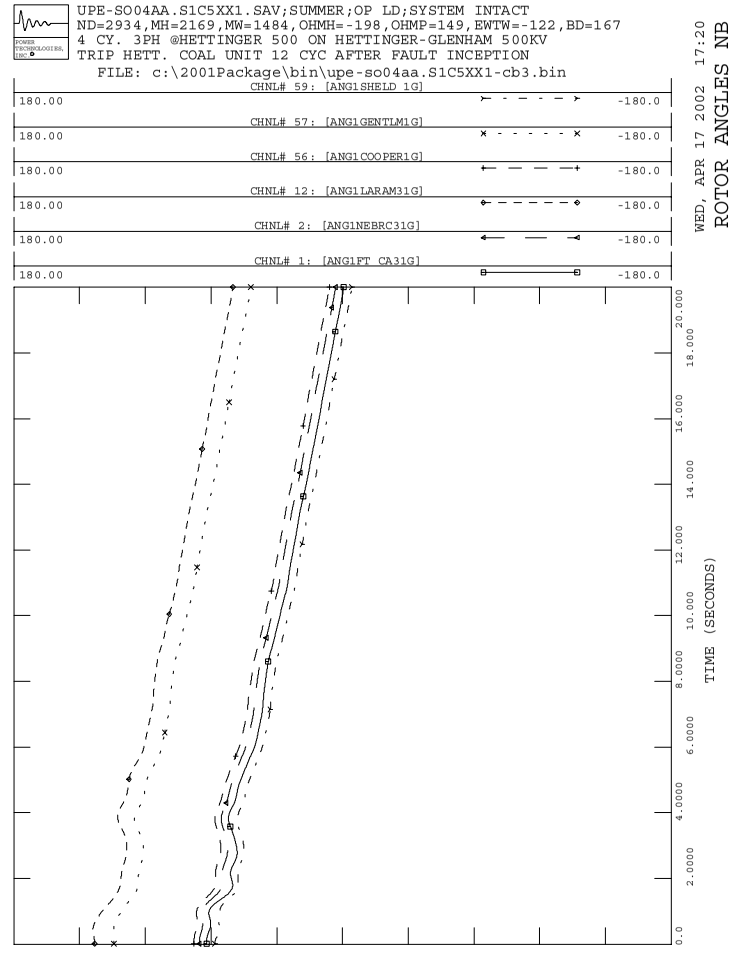
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
WED, APR 17 2002 17:20
ROTOR ANGLES 6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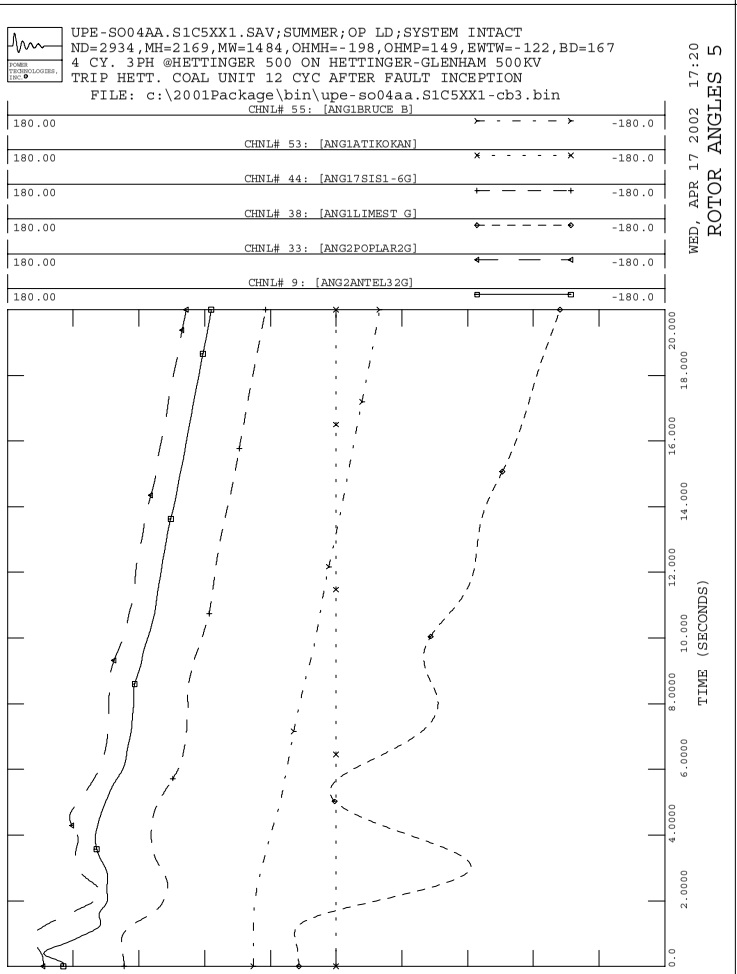
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
WED, APR 17 2002 17:20
ROTOR ANGLES NB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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
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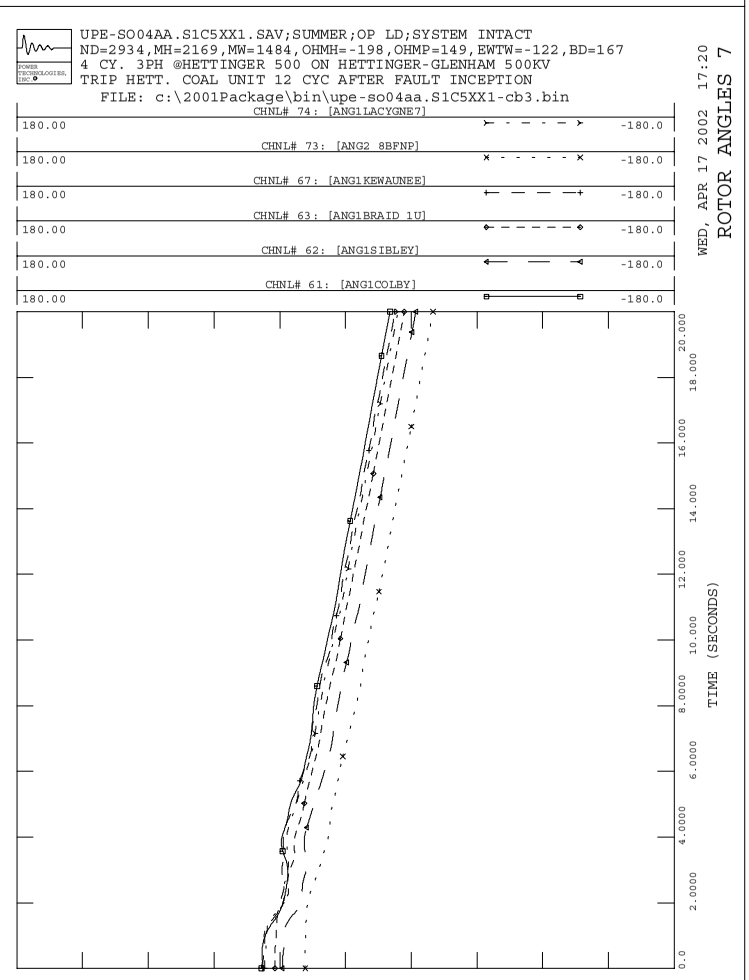
TIME (SECONDS)
WED, APR 17 2002 17:20
ROTOR ANGLES 5


UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
WED, APR 17 2002 17:20
ROTOR ANGLES 7

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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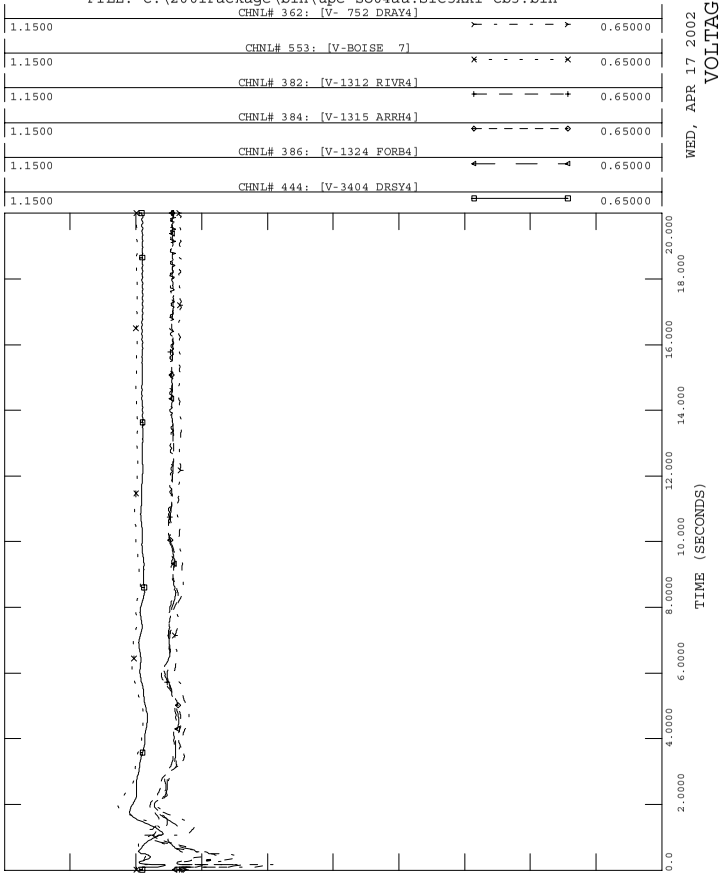
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



WED, APR 17 2002 17:20
VOLTAGES 1

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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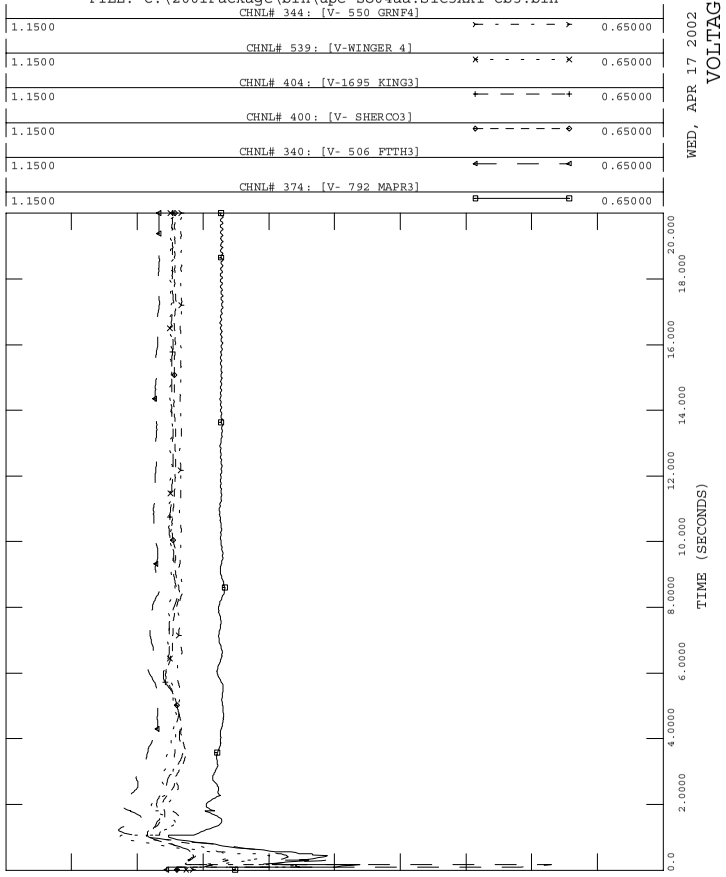
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



WED, APR 17 2002 17:20
VOLTAGES 3

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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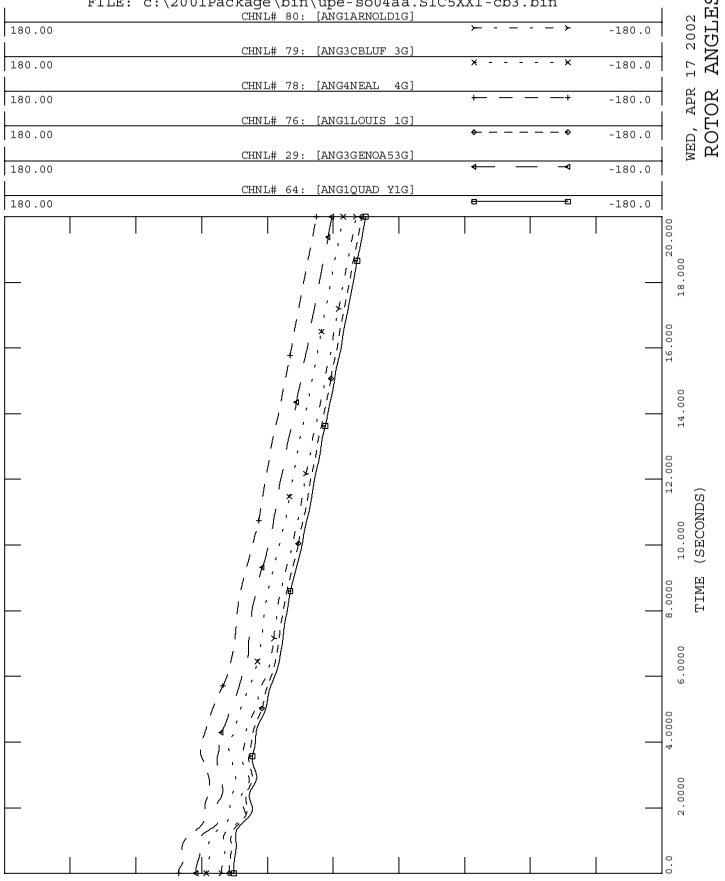
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



WED, APR 17 2002 17:20
ROTOR ANGLES IA

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
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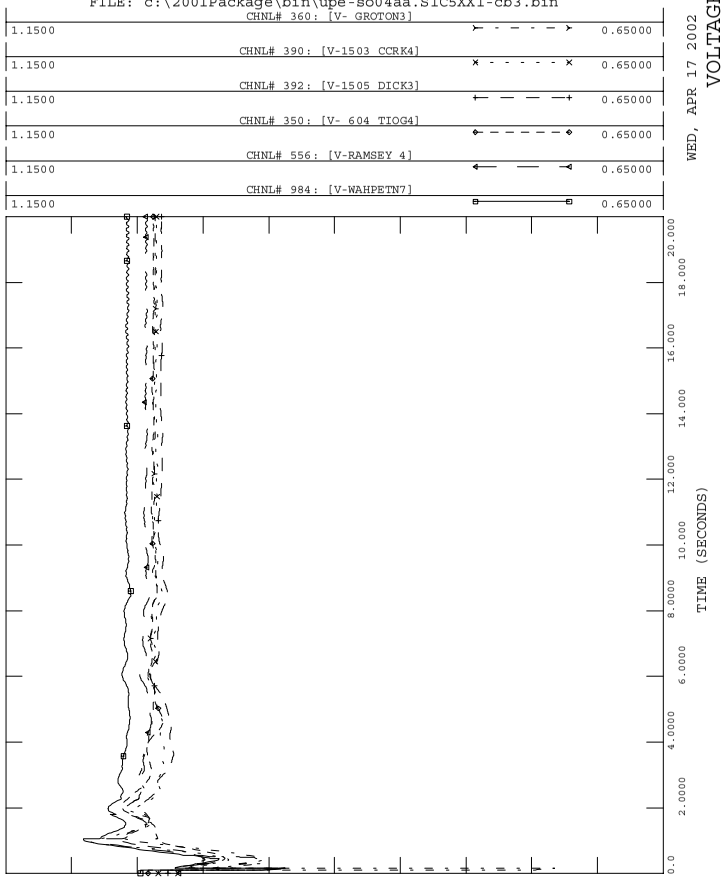

WED, APR 17 2002 17:20
VOLTAGES 2

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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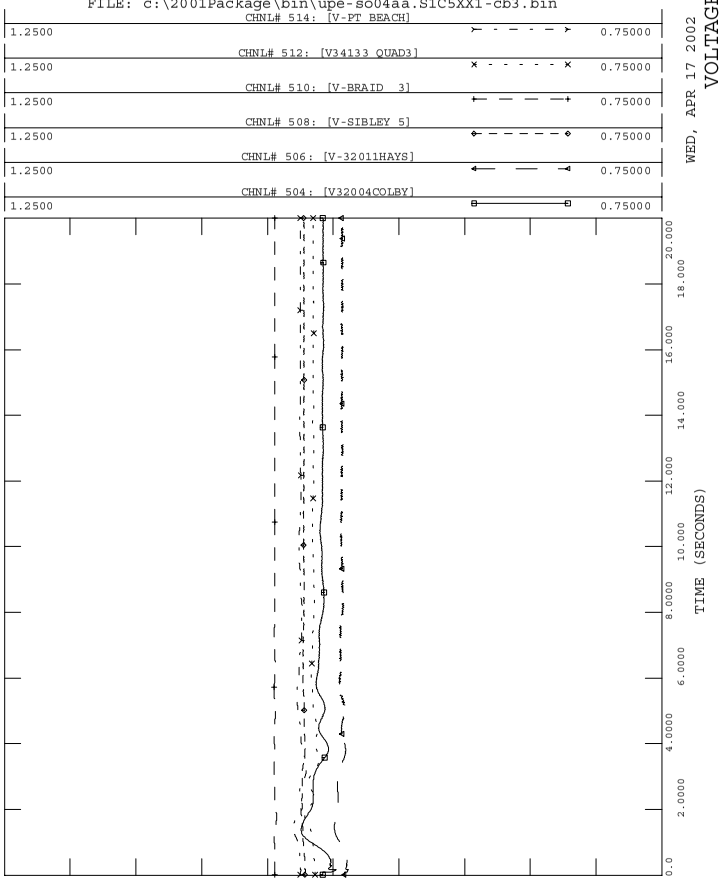
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

WED, APR 17 2002 17:20
VOLTAGES 5



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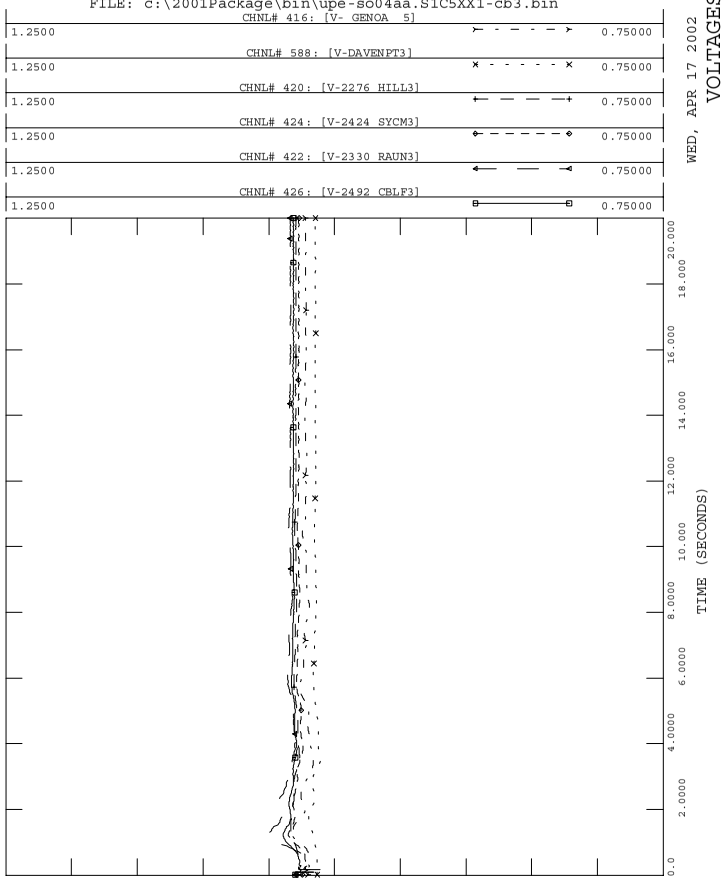
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

WED, APR 17 2002 17:20
VOLTAGES IA



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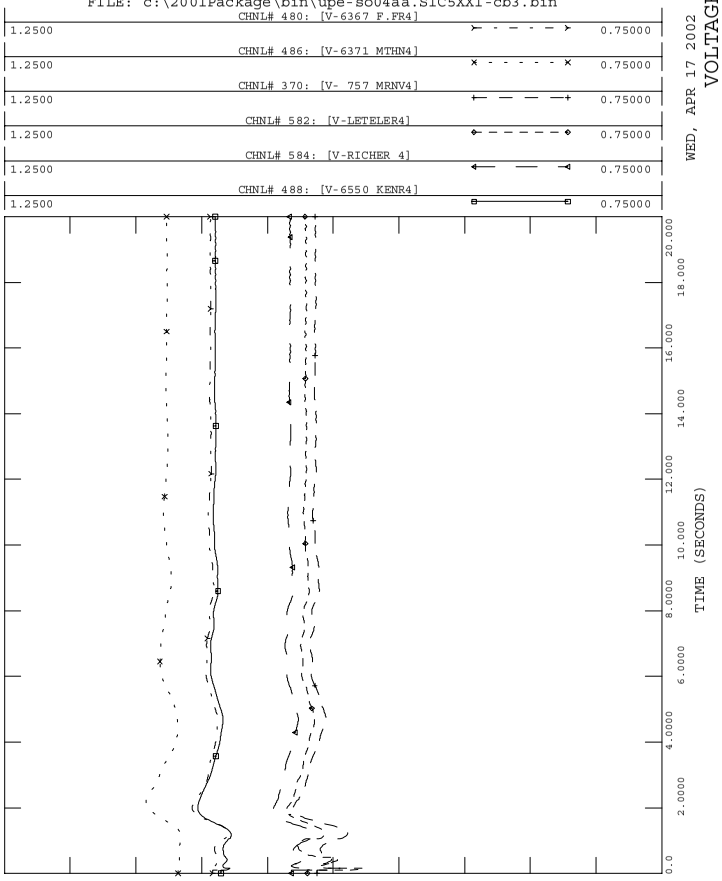
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

WED, APR 17 2002 17:20
VOLTAGES 4



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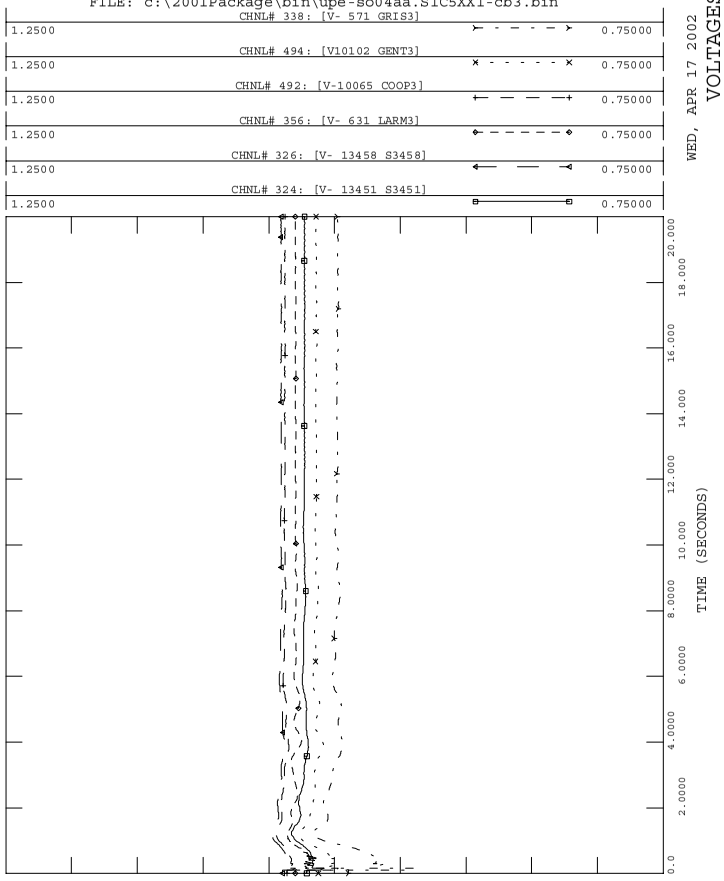
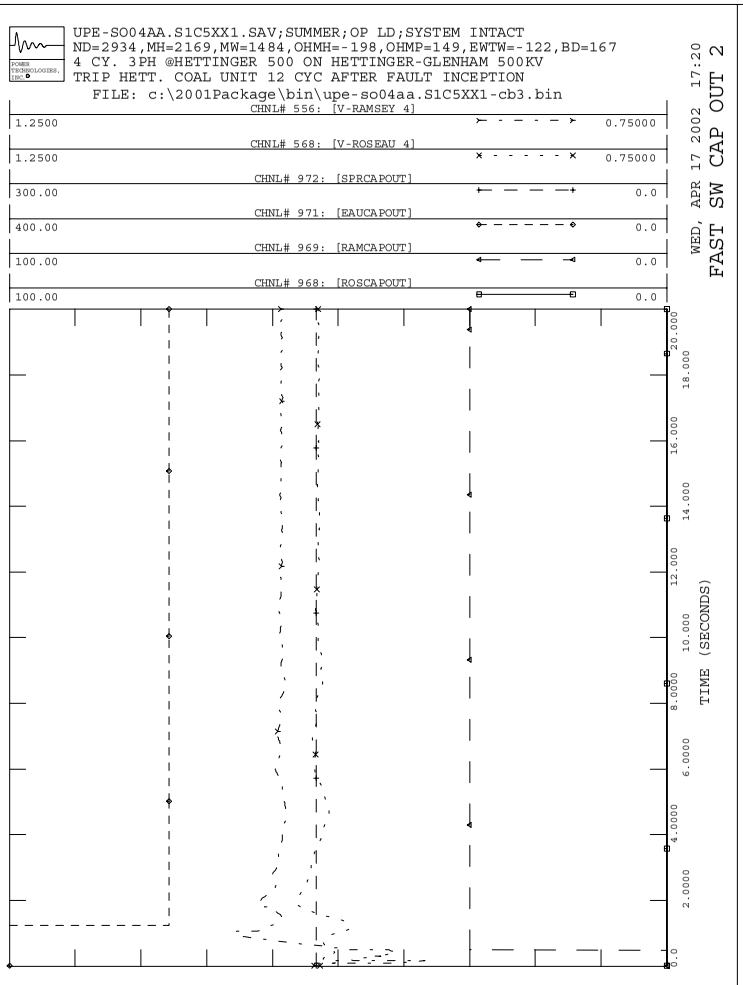
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

WED, APR 17 2002 17:20
VOLTAGES NB




UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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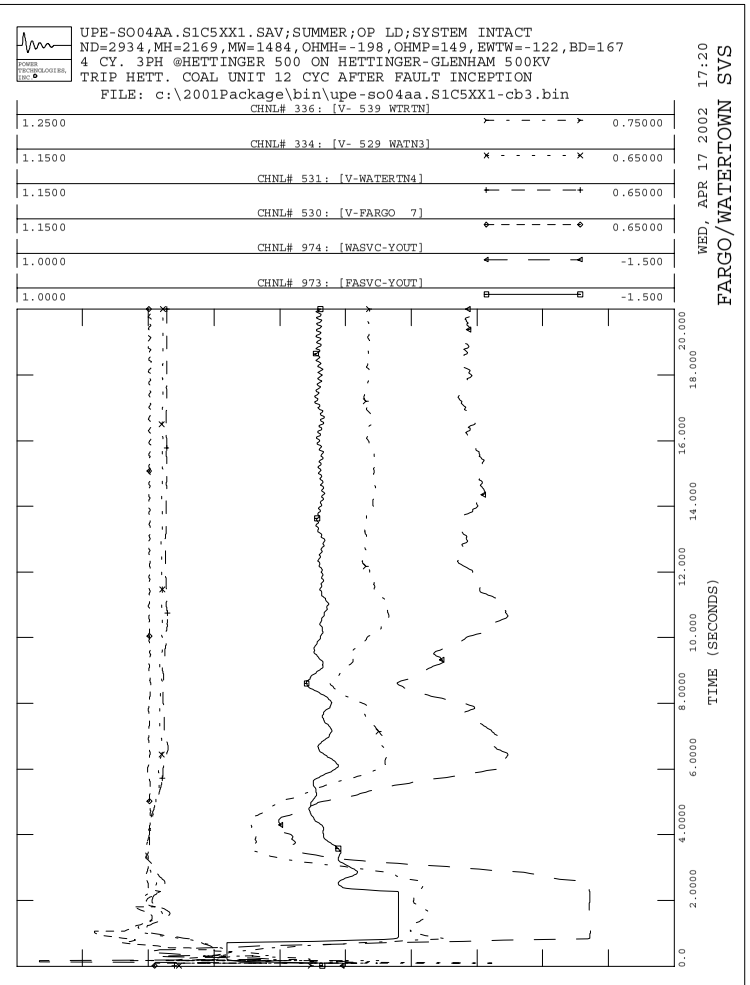
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
WED, APR 17 2002 17:20
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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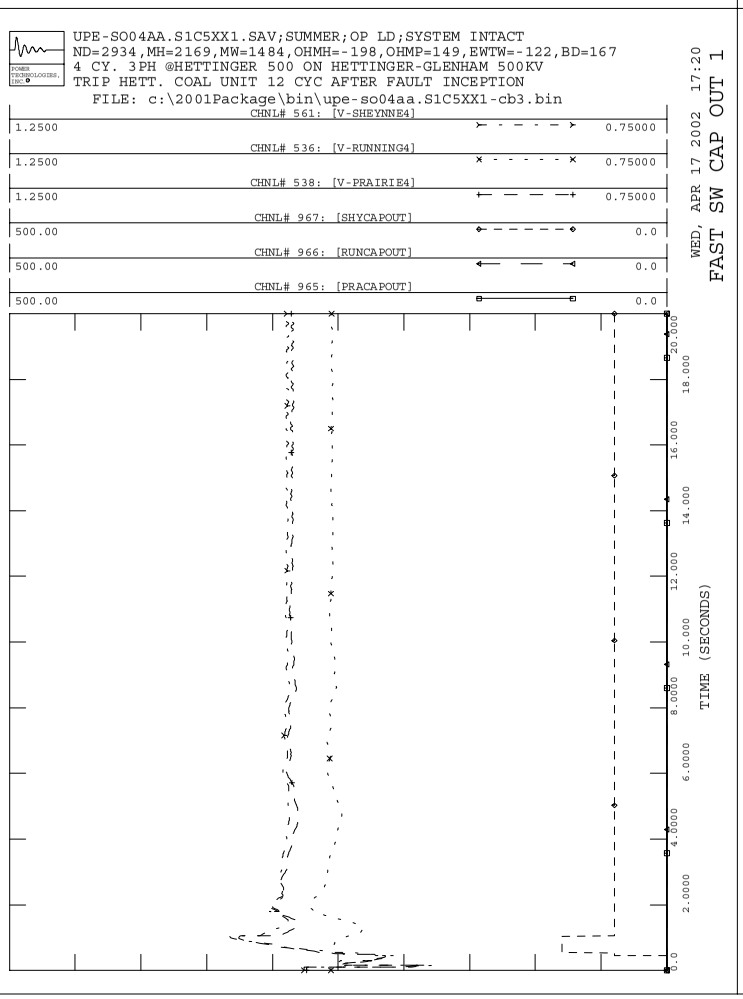
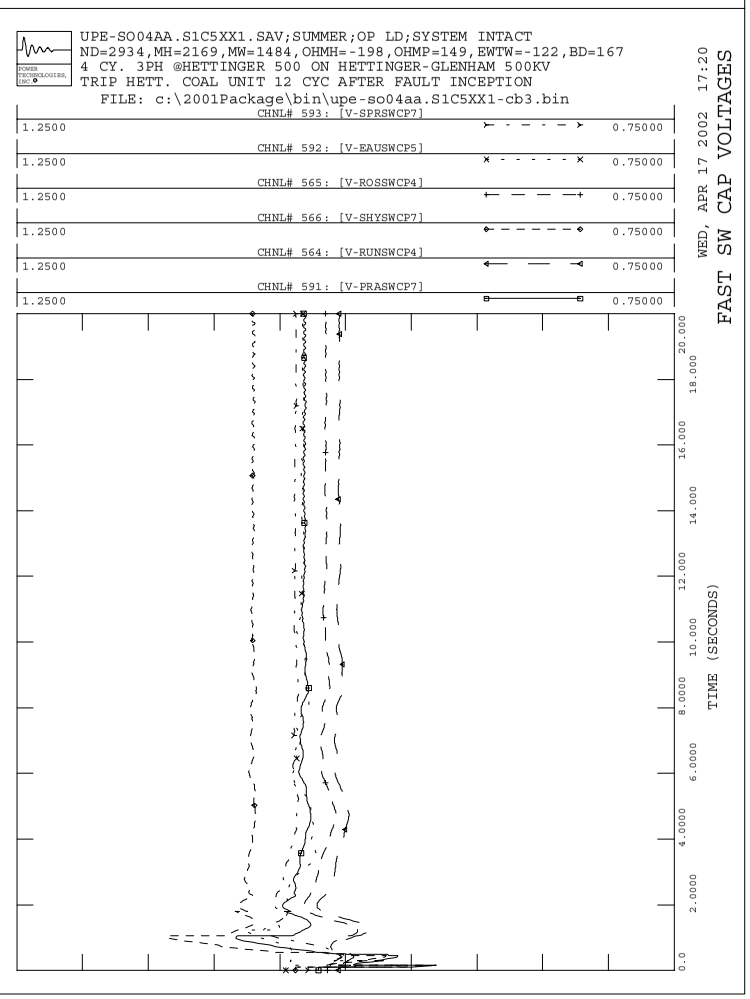
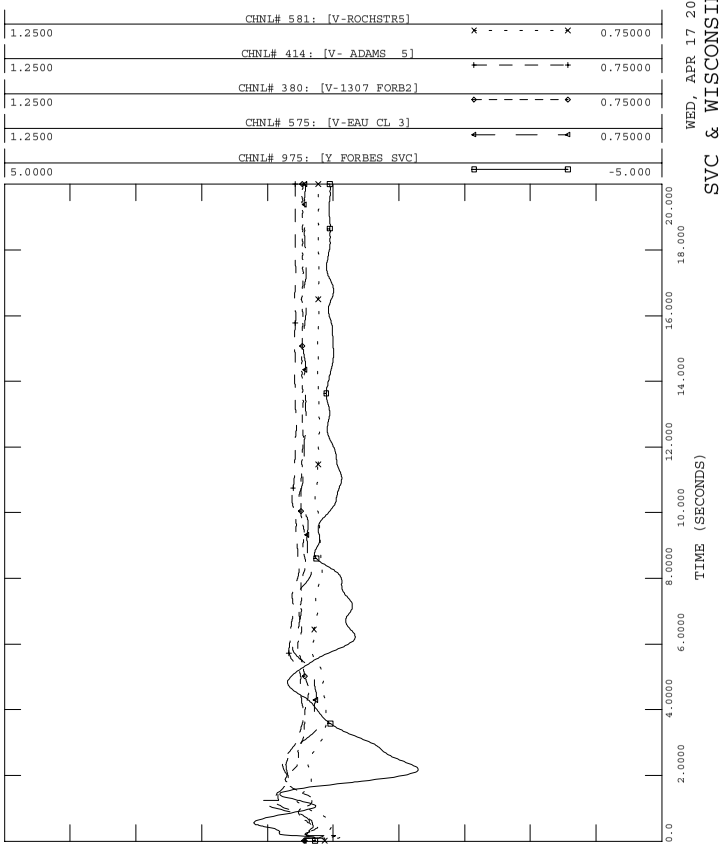
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
WED, APR 17 2002 17:20
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
WED, APR 17 2002 17:20
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
WED, APR 17 2002 17:20
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



WED, APR 17 2002 17:20
SVC & WISCONSIN VOLT

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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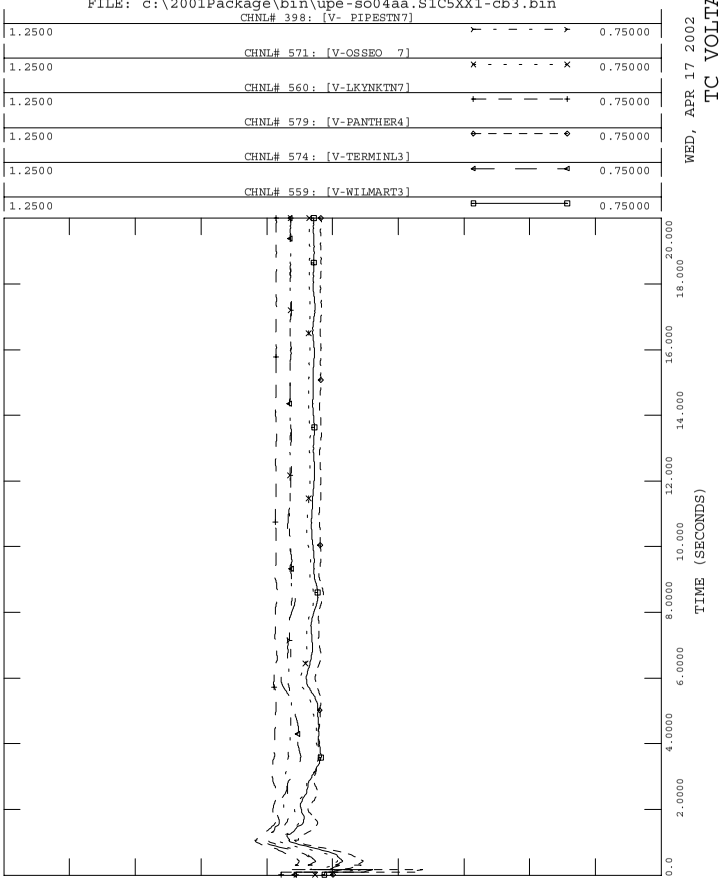
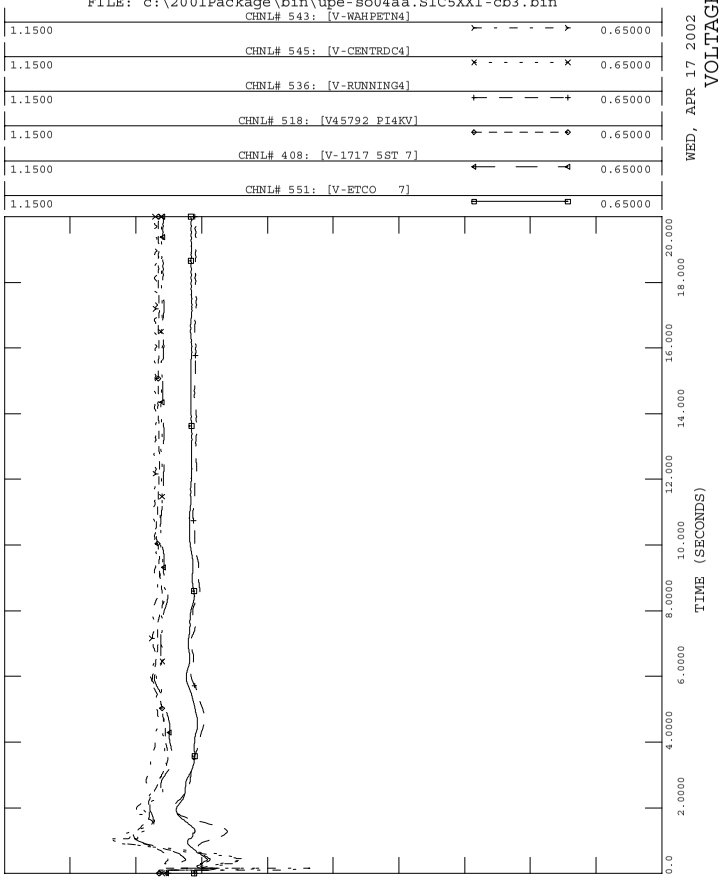
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



WED, APR 17 2002 17:20
TC VOLTAGES

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



WED, APR 17 2002 17:20
VOLTAGES 6

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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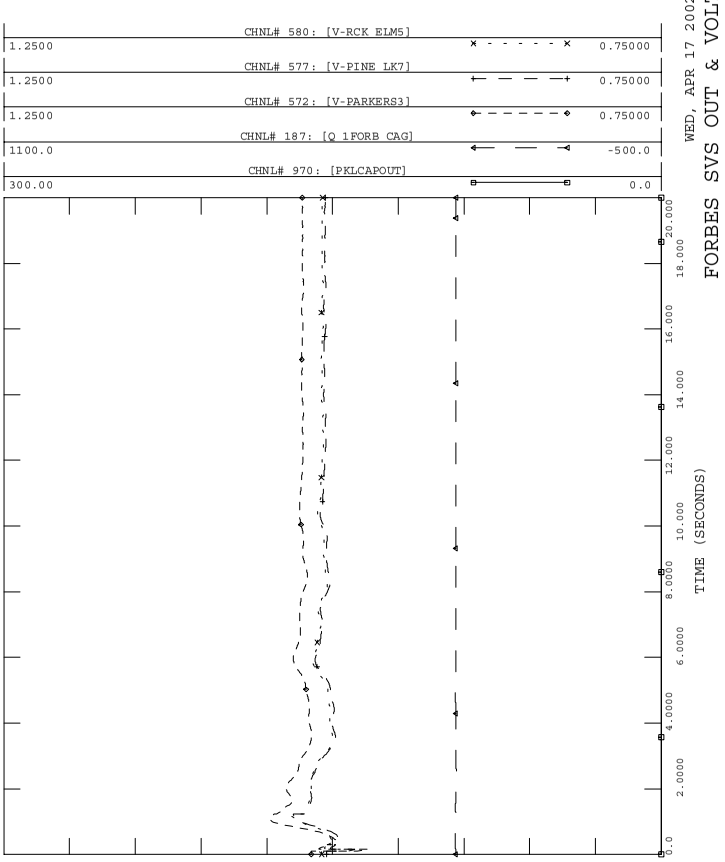
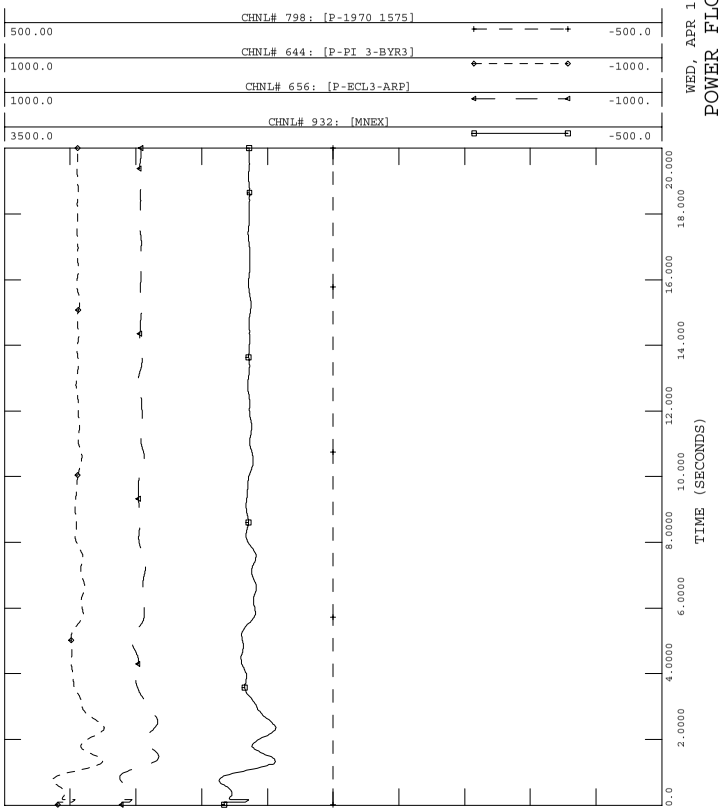
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



WED, APR 17 2002 17:20
FORBES SVS OUT & VOLTAGES

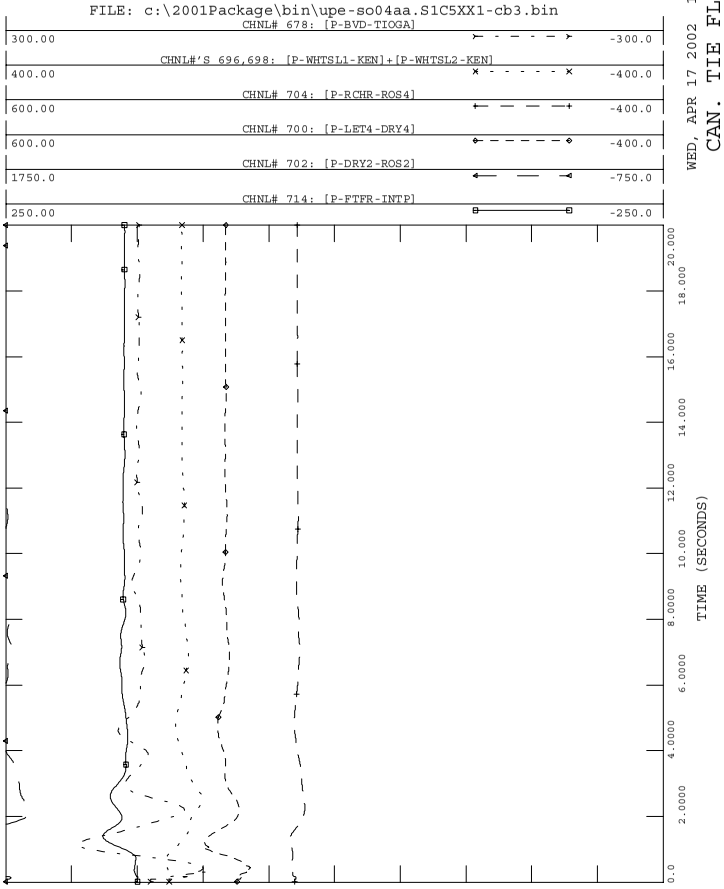
UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

WED, APR 17 2002 17:20
POWER FLOW SUMS 2



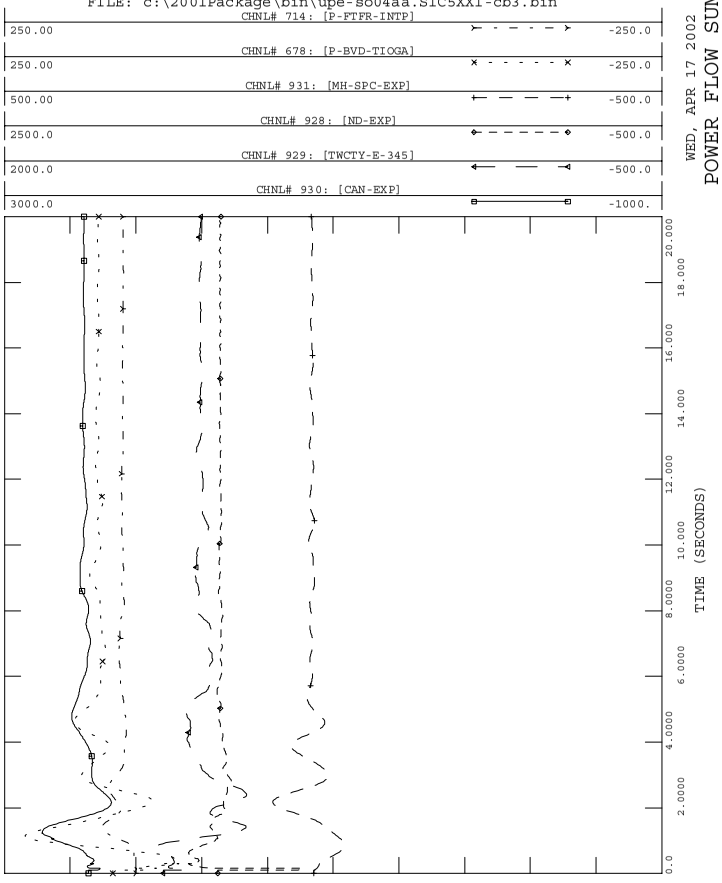
UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

WED, APR 17 2002 17:20
CAN. TIE FLOWS



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

WED, APR 17 2002 17:20
POWER FLOW SUMS 1



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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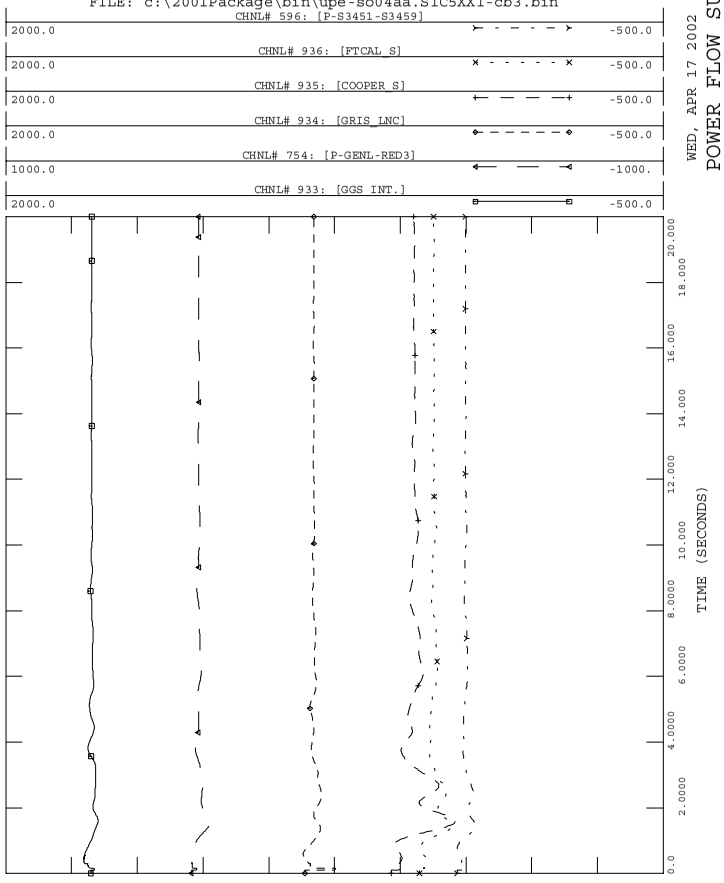
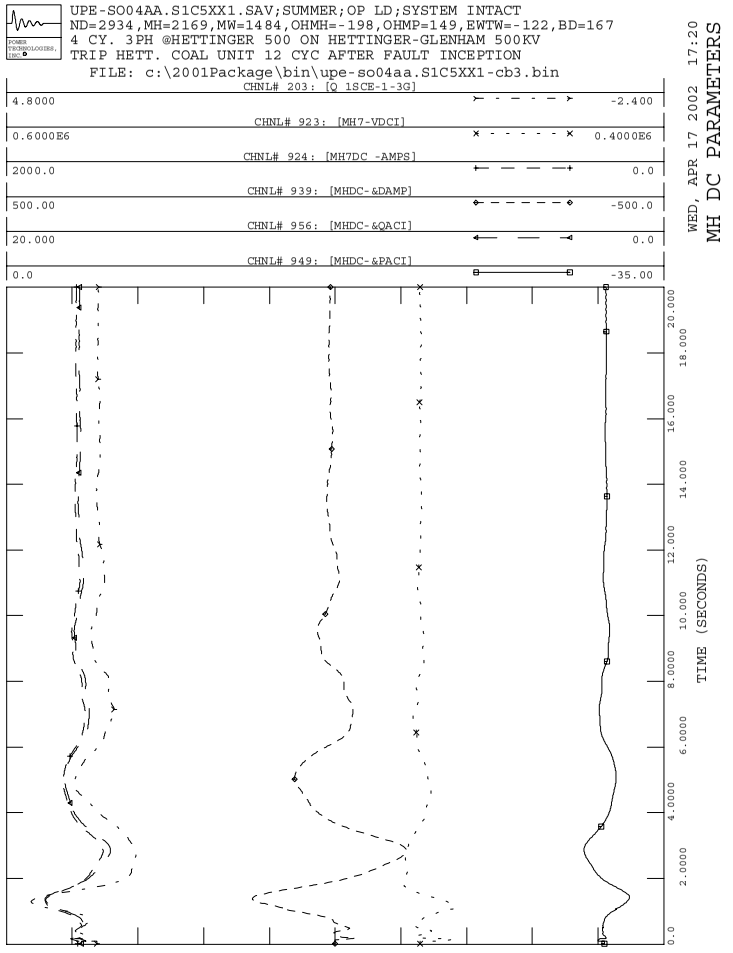
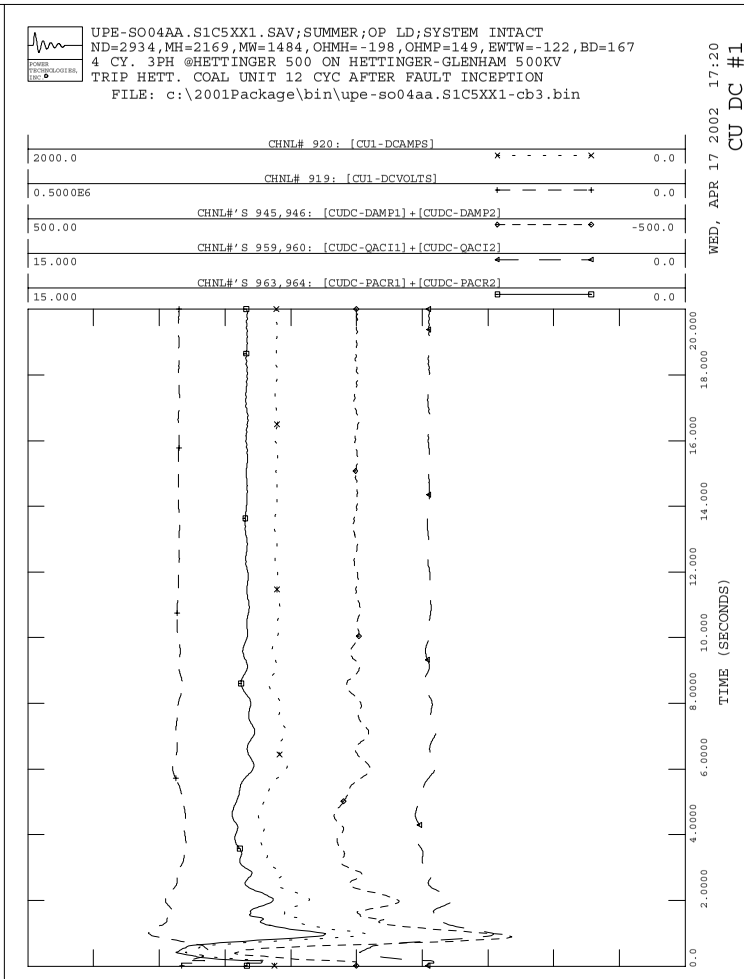
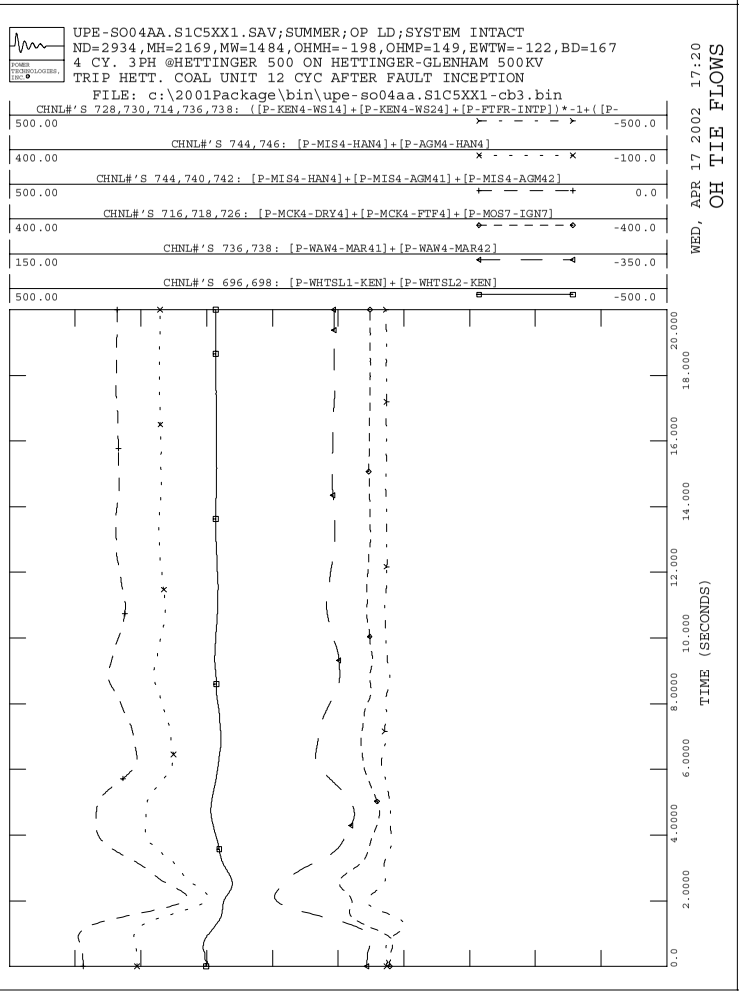
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

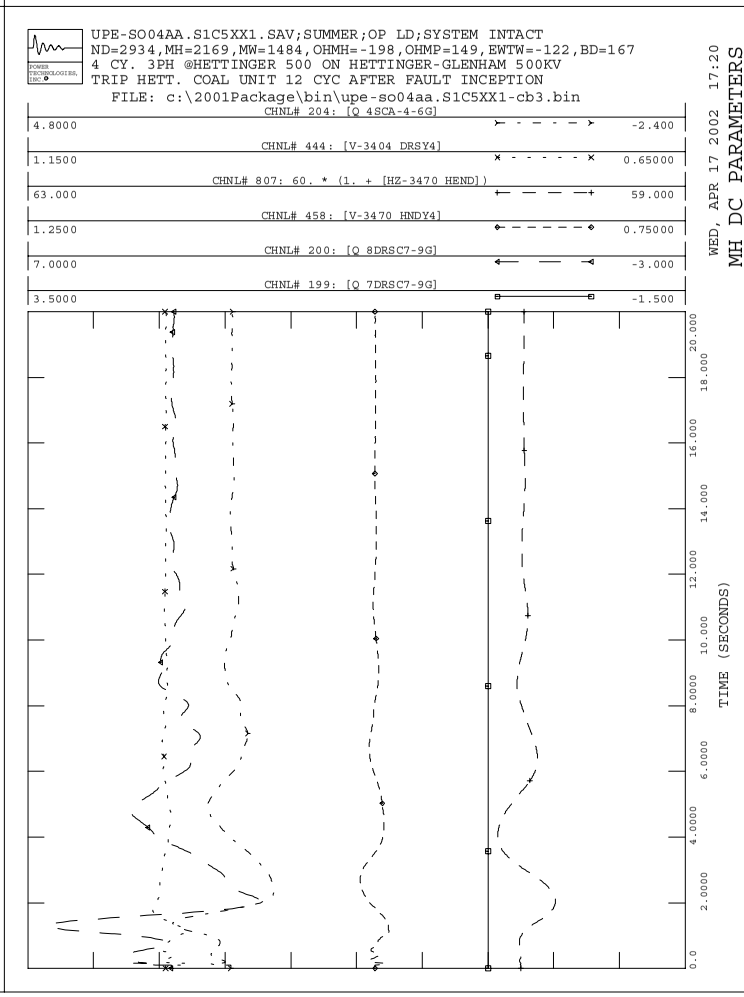
WED, APR 17 2002 17:20
POWER FLOW SUM 3



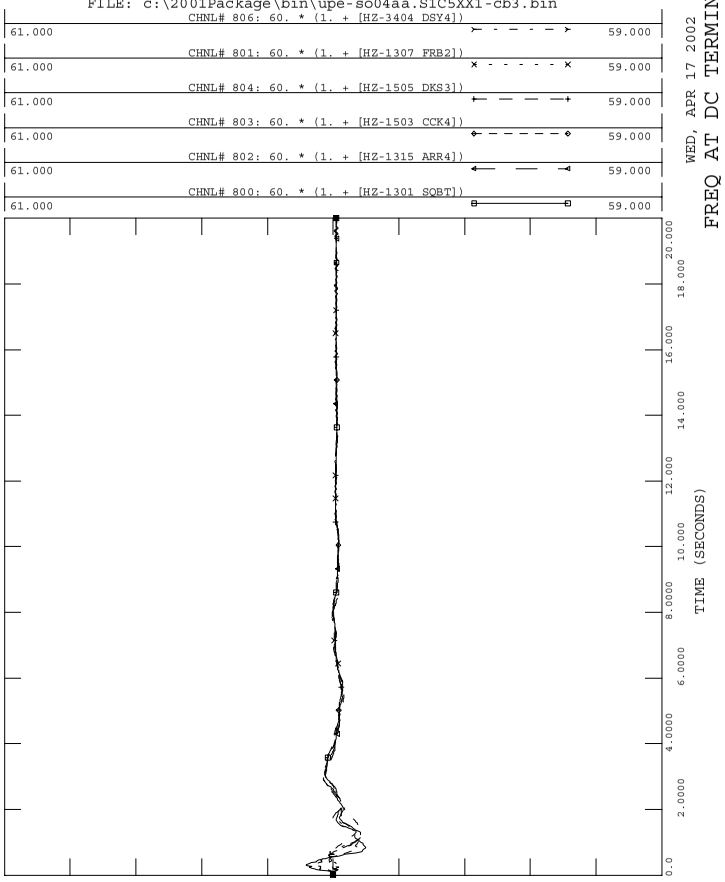

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
WED, APR 17 2002 17:20
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
WED, APR 17 2002 17:20
CU DC #1
TIME (SECONDS)


UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
WED, APR 17 2002 17:20
OH TIE FLOWS
TIME (SECONDS)

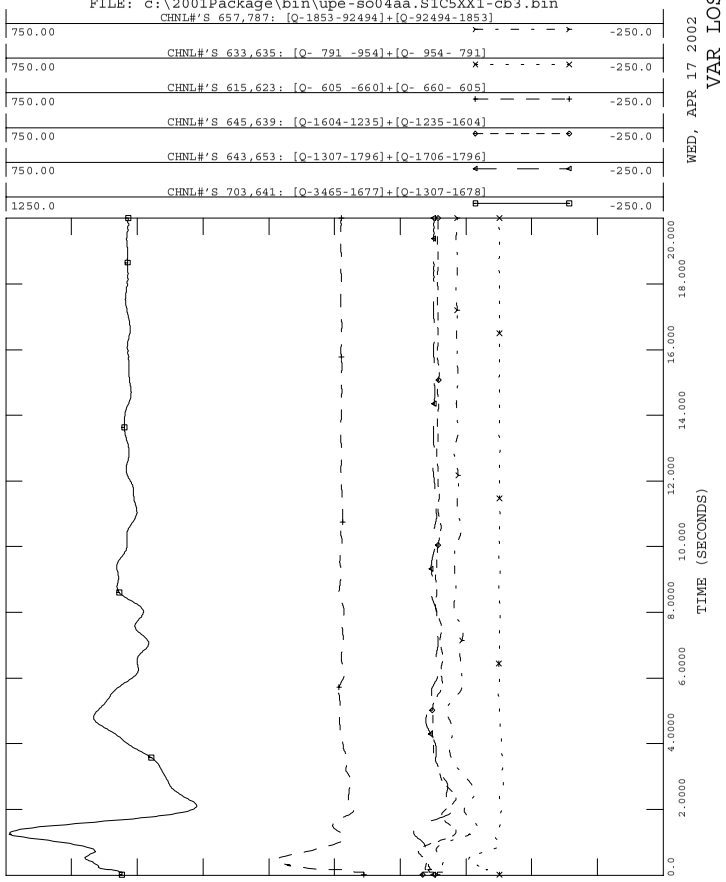

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
WED, APR 17 2002 17:20
MH DC PARAMETERS
TIME (SECONDS)

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



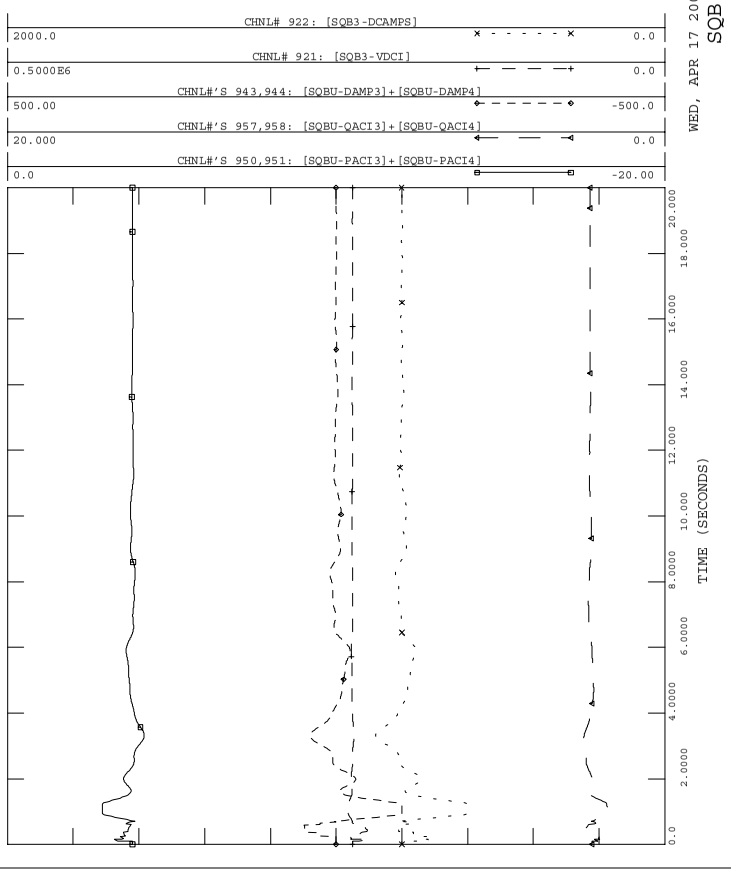
WED, APR 17 2002 17:20
FREQ AT DC TERMINALS

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



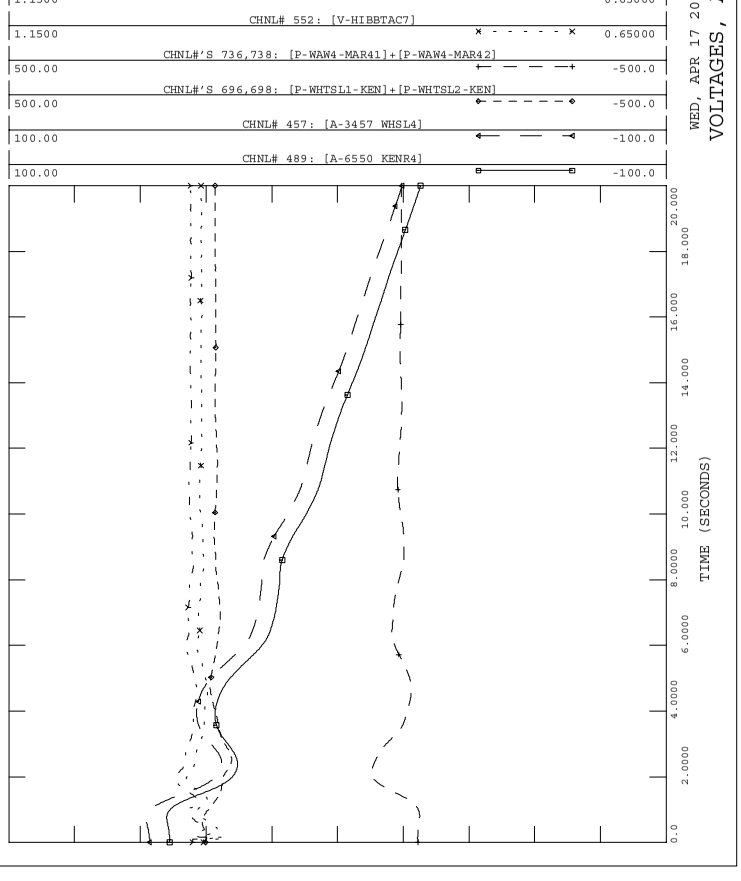
WED, APR 17 2002 17:20
VAR LOSSES

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



WED, APR 17 2002 17:20
SQB DC #3

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

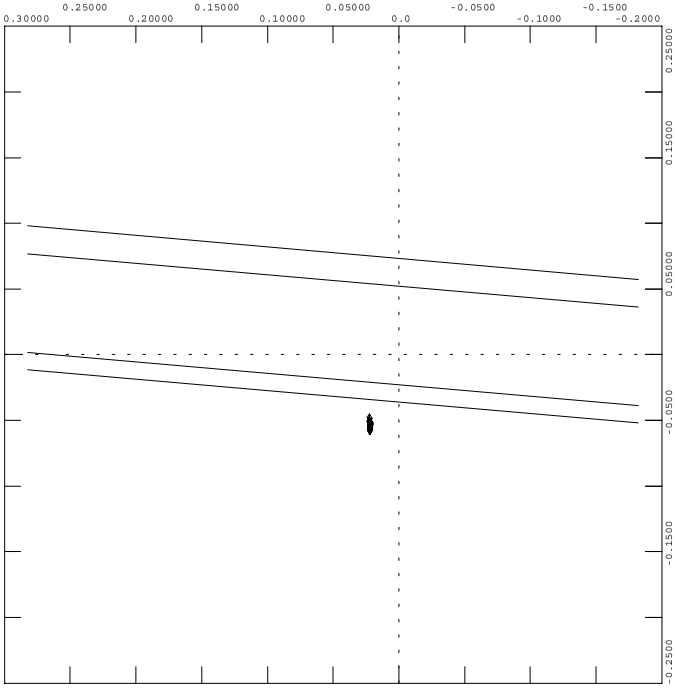


WED, APR 17 2002 17:20
VOLTAGES, ANGLES

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



WED, APR 17 2002 17:20
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

RELAY: RELAYG
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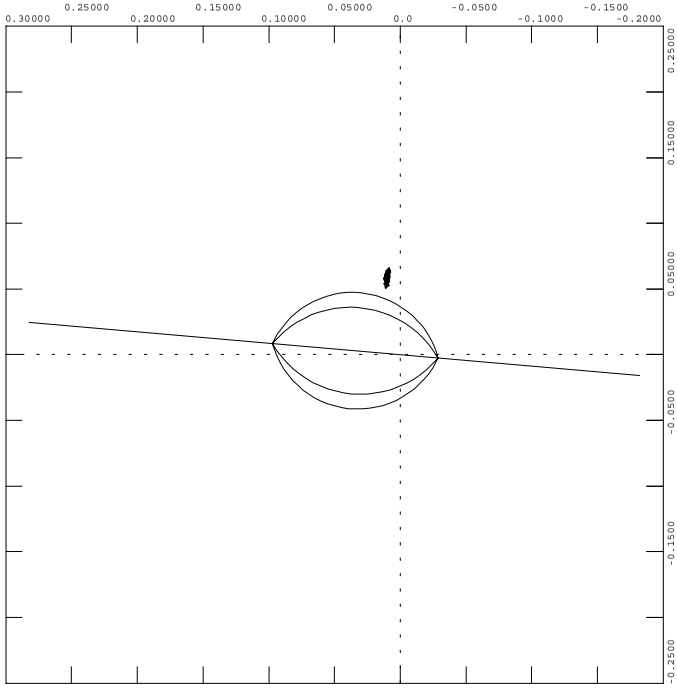
CHNL# 856: [X-DSY2-ROS2]

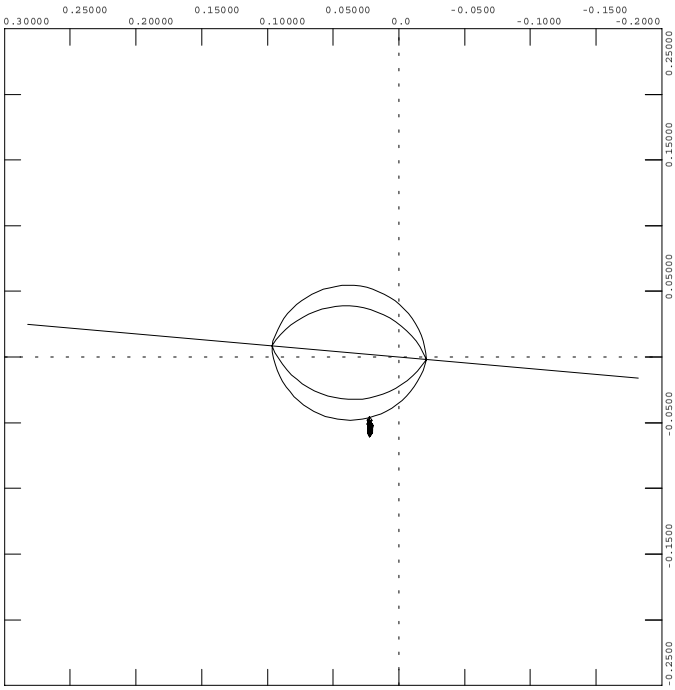


WED, APR 17 2002 17:20
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

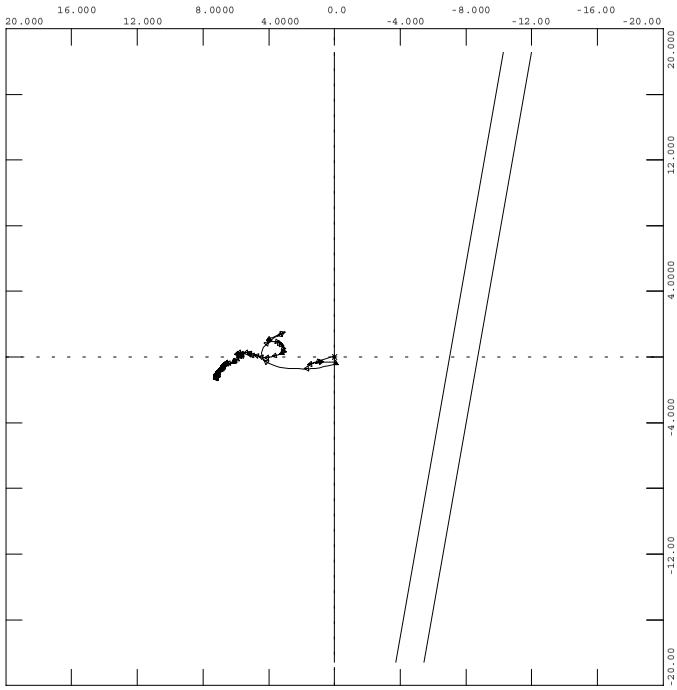


WED, APR 17 2002 17:20
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

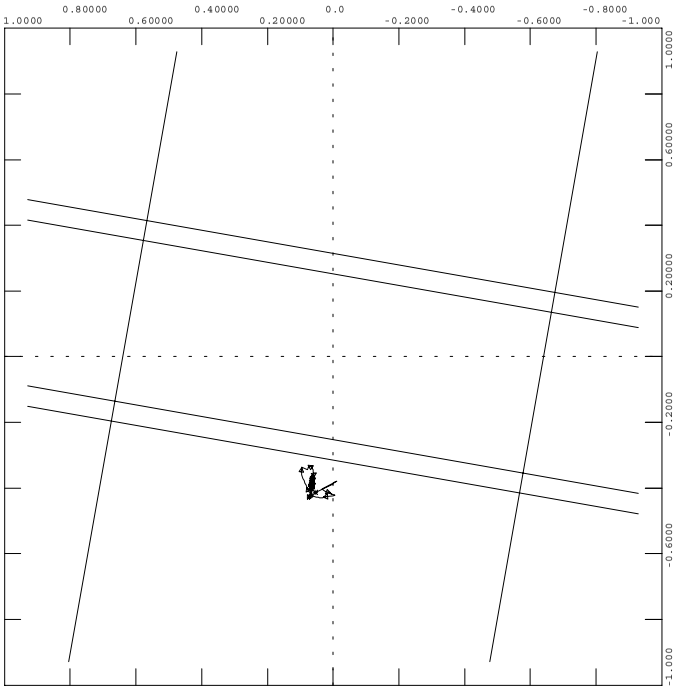


WED, APR 17 2002 17:20
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

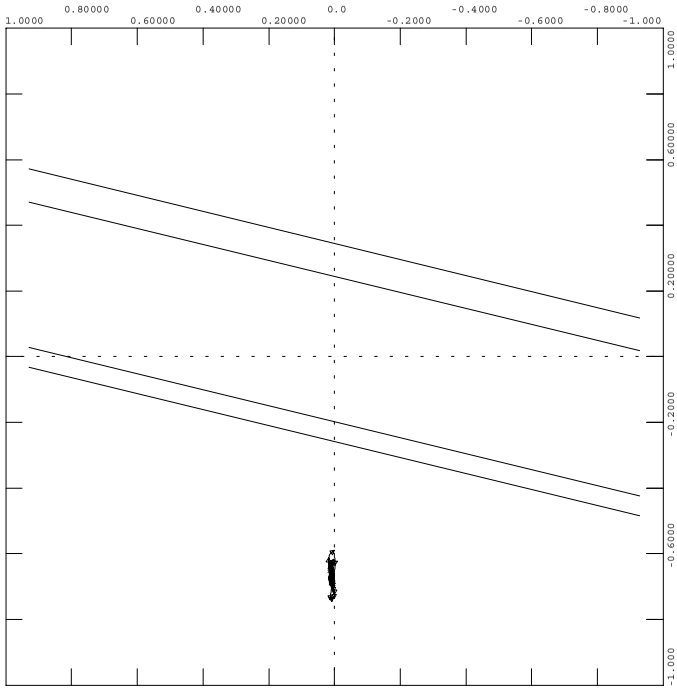
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

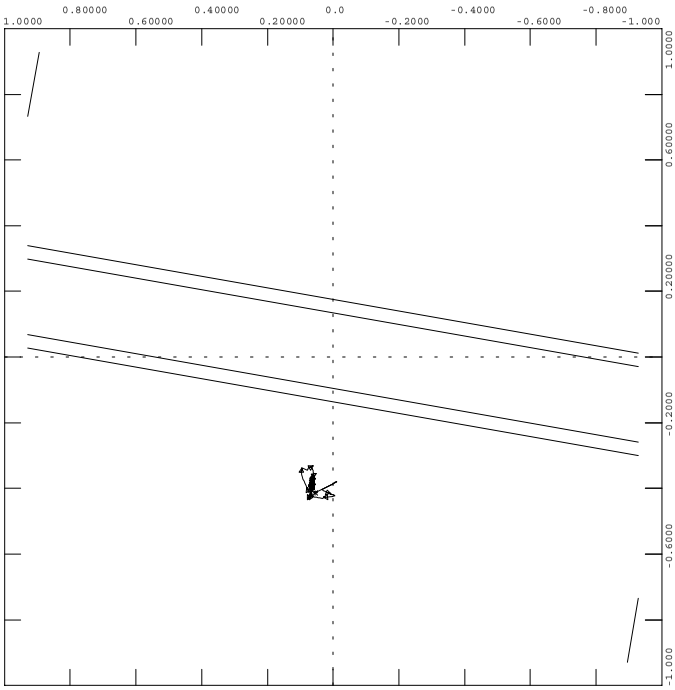
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

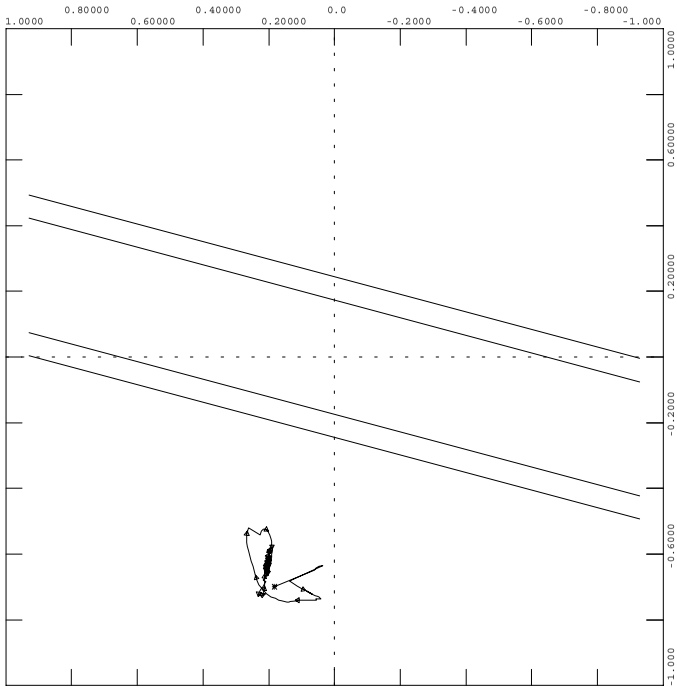
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

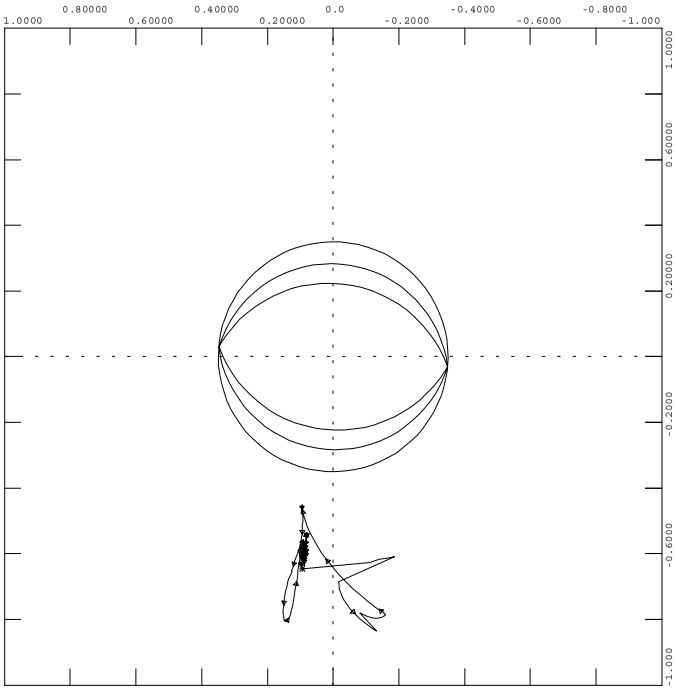
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

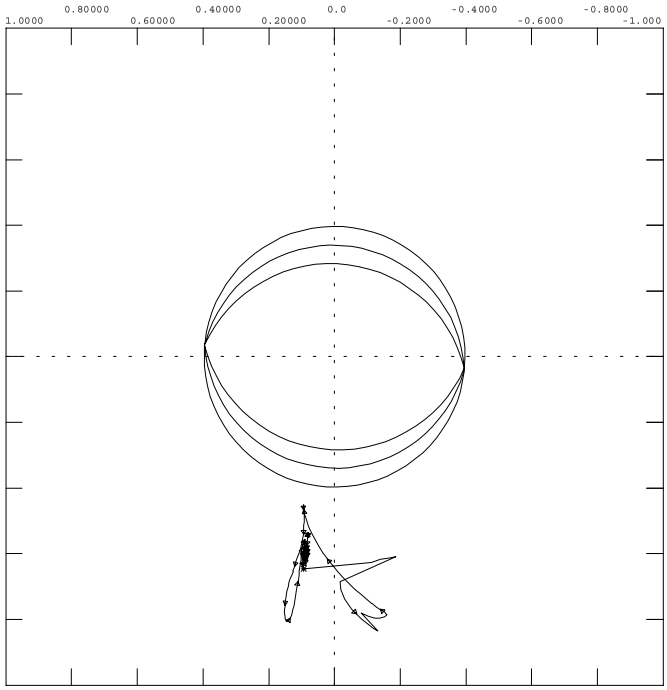
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

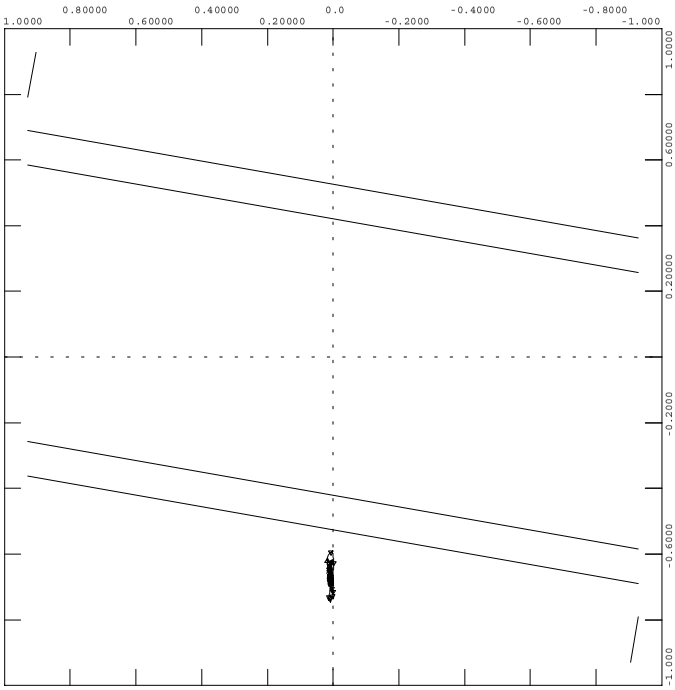
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

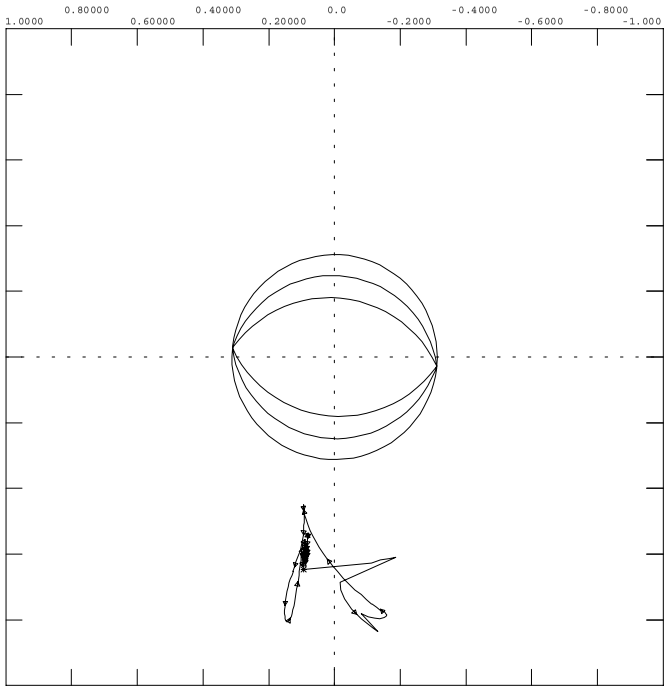
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



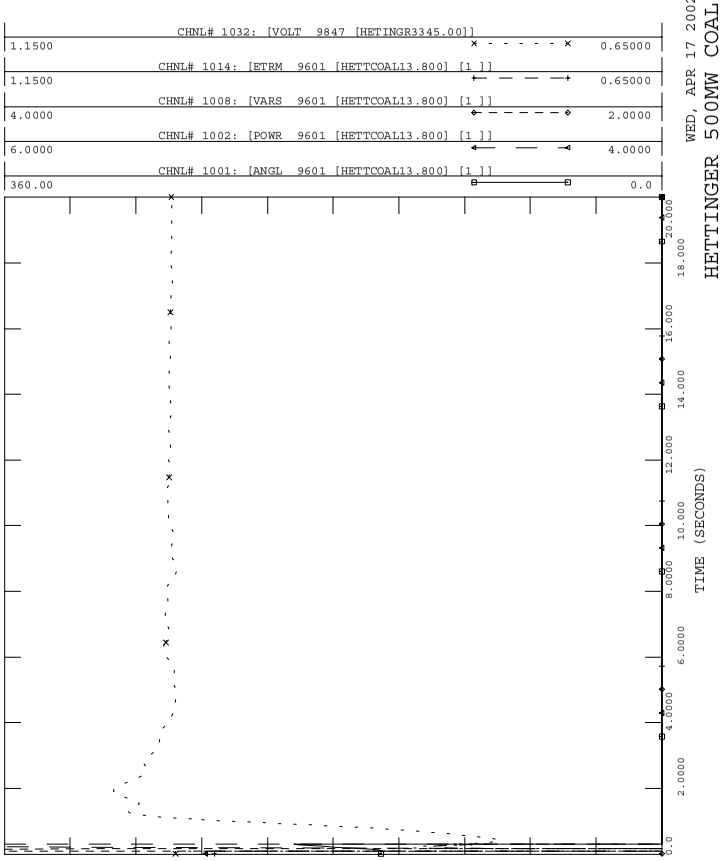
UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

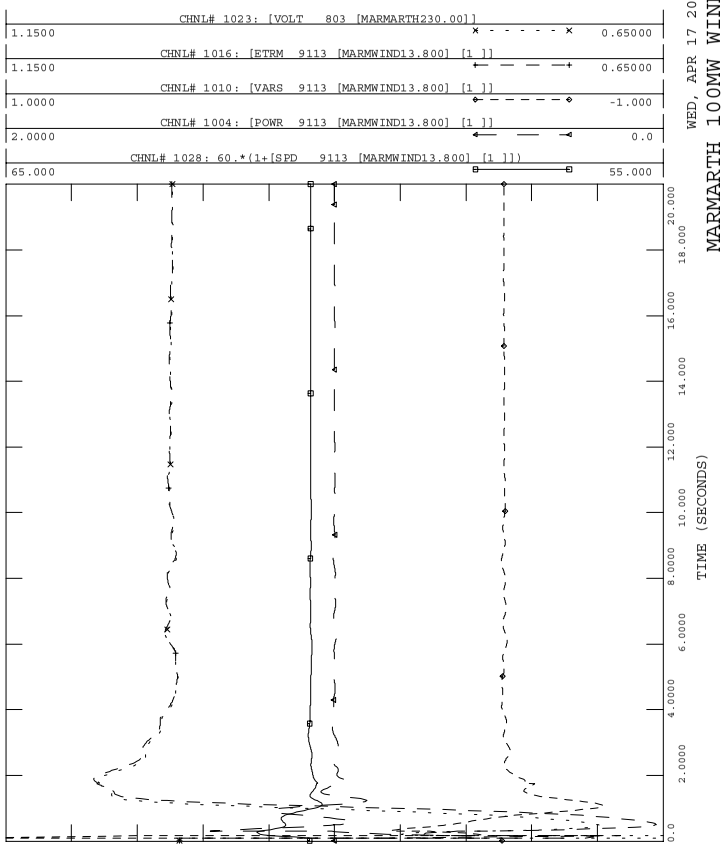


UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



WED, APR 17 2002 17:20
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

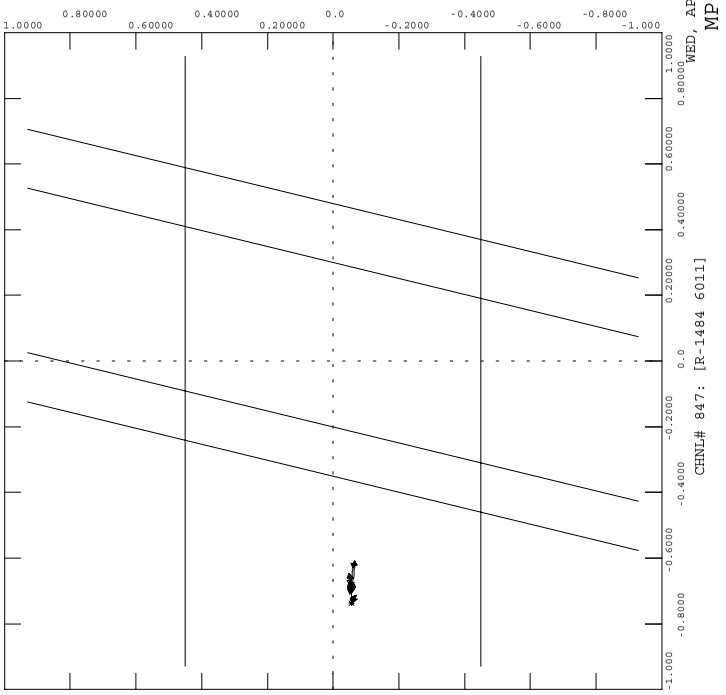


WED, APR 17 2002 17:20
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

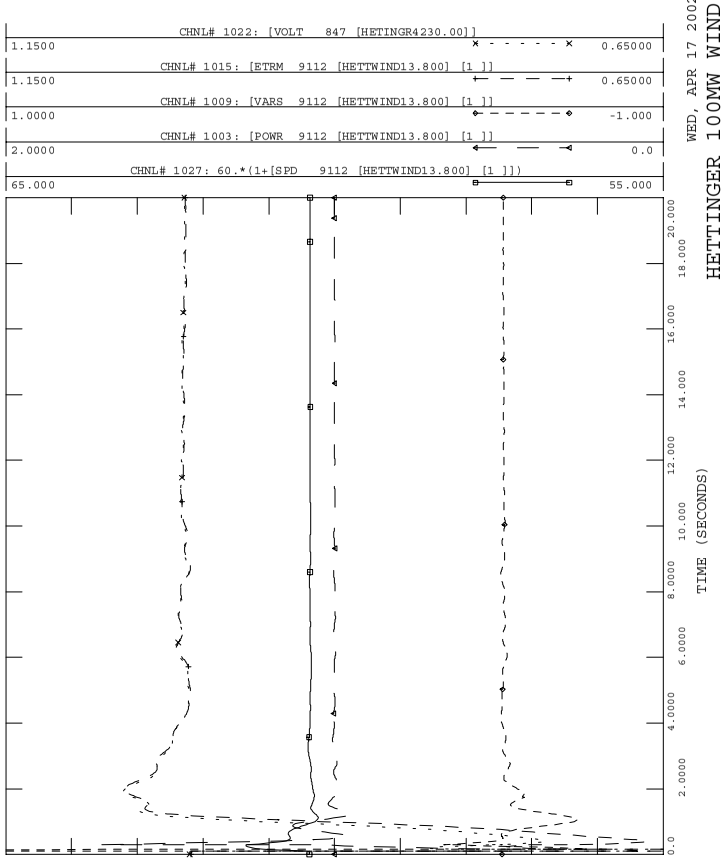
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



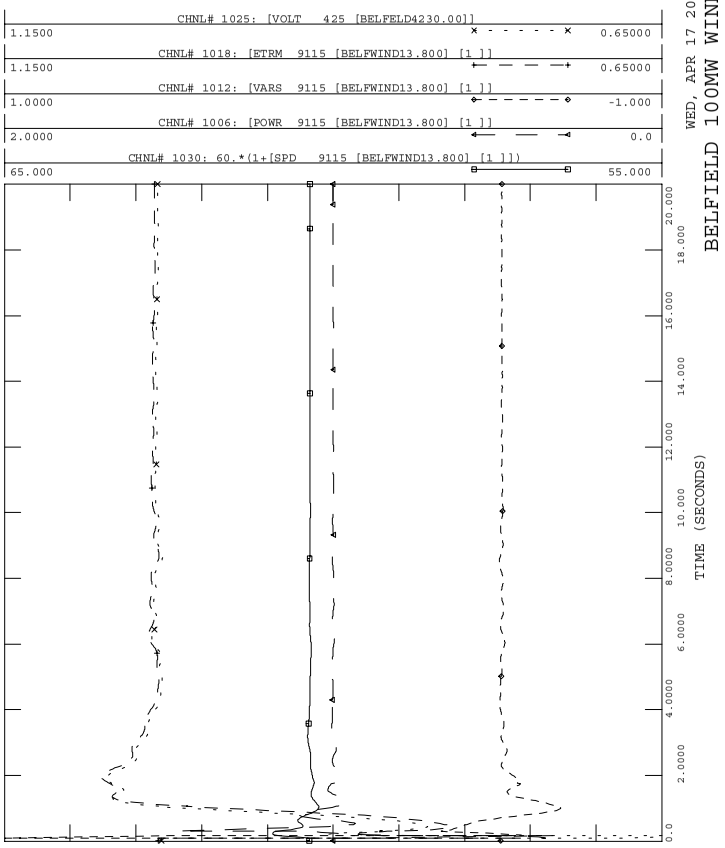
WED, APR 17 2002 17:20
MP-OH I.FALLS (779)

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



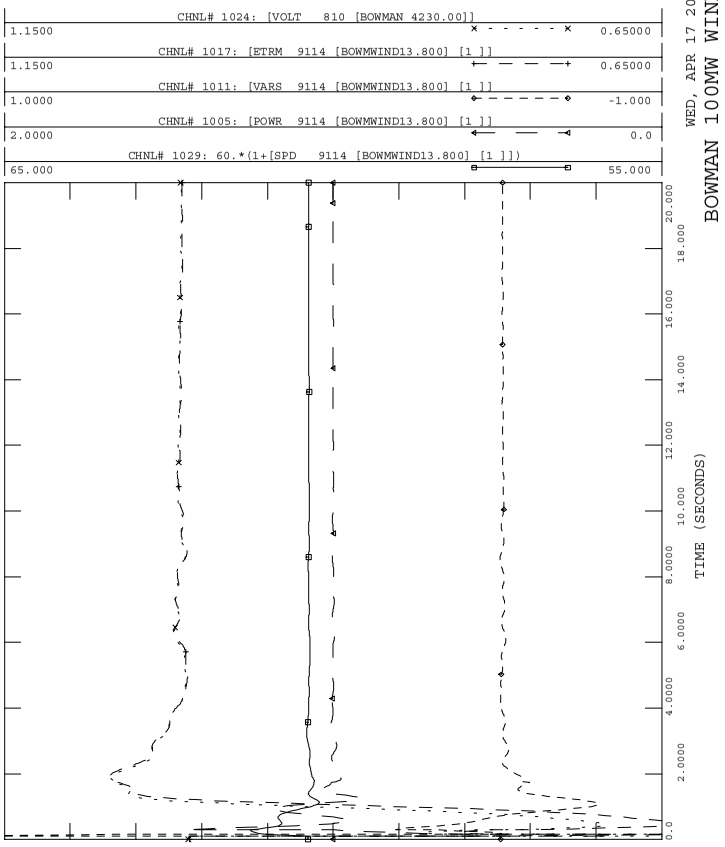
WED, APR 17 2002 17:20
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



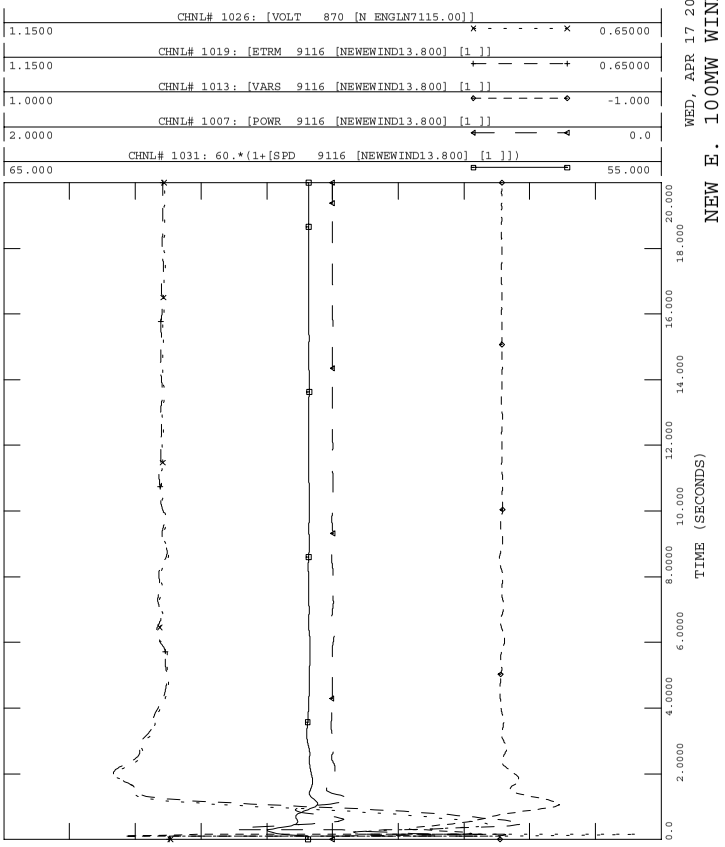
WED, APR 17 2002 17:20
BELFIELD 100MW WIND UNIT

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



WED, APR 17 2002 17:20
BOWMAN 100MW WIND UNIT

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XX1-cb3.bin



WED, APR 17 2002 17:20
NEW E. 100MW WIND UNIT

APPENDIX 12

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

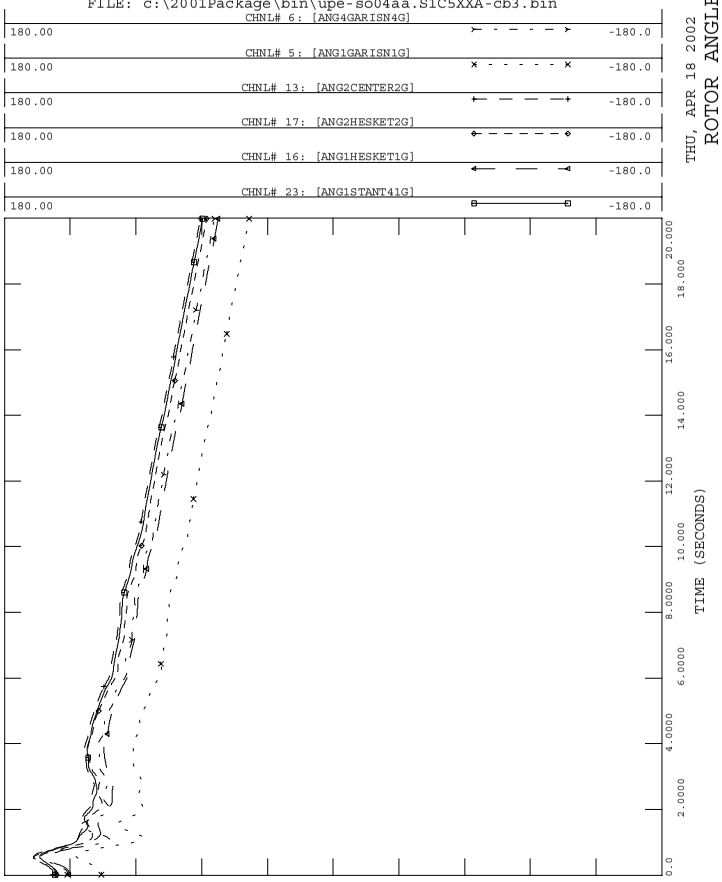
SITE 1 (HETTINGER)

CASE S1C5XXA

CONTINGENCY CB3

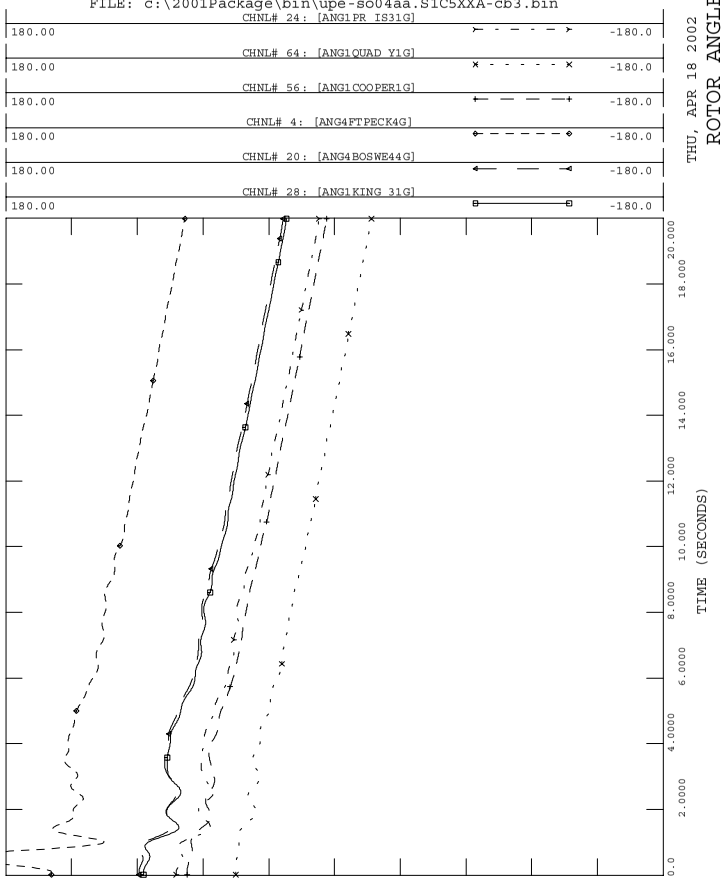
4 cycle 3 phase fault at Hettinger 500 kV on Hettinger-Glenham 500kV. Trip Hettinger coal unit 12 cycles after fault inception.

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



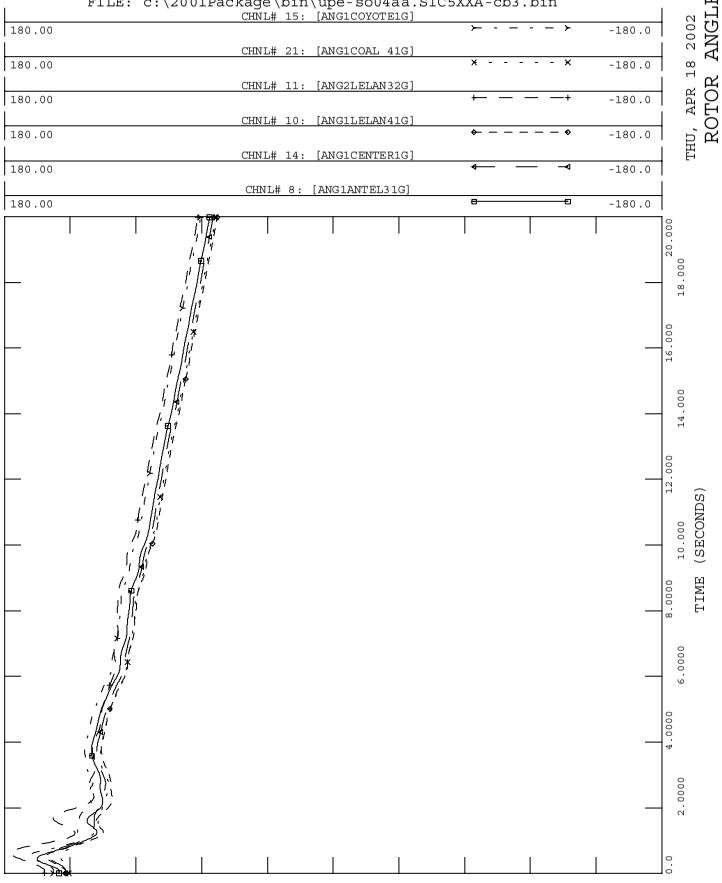
THU, APR 18 2002 17:27
ROTOR ANGLES 2

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



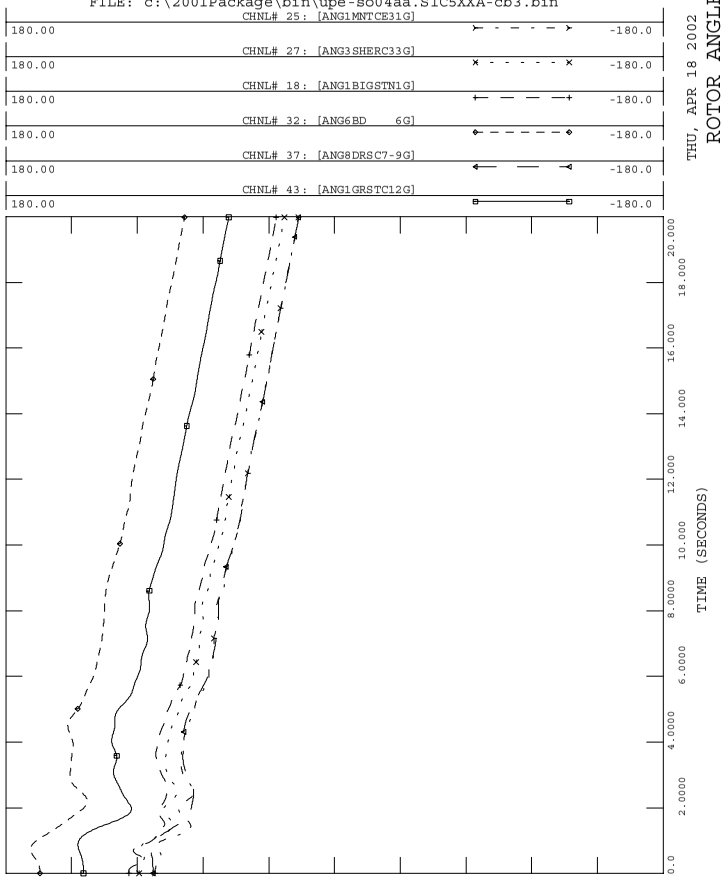
THU, APR 18 2002 17:27
ROTOR ANGLES 4

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

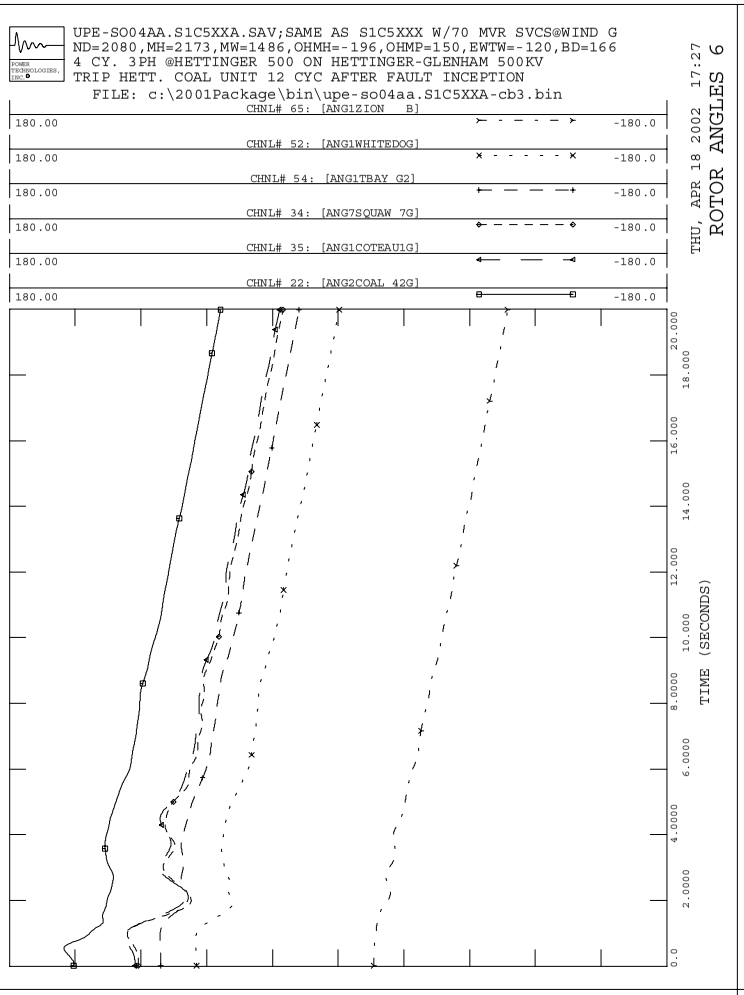


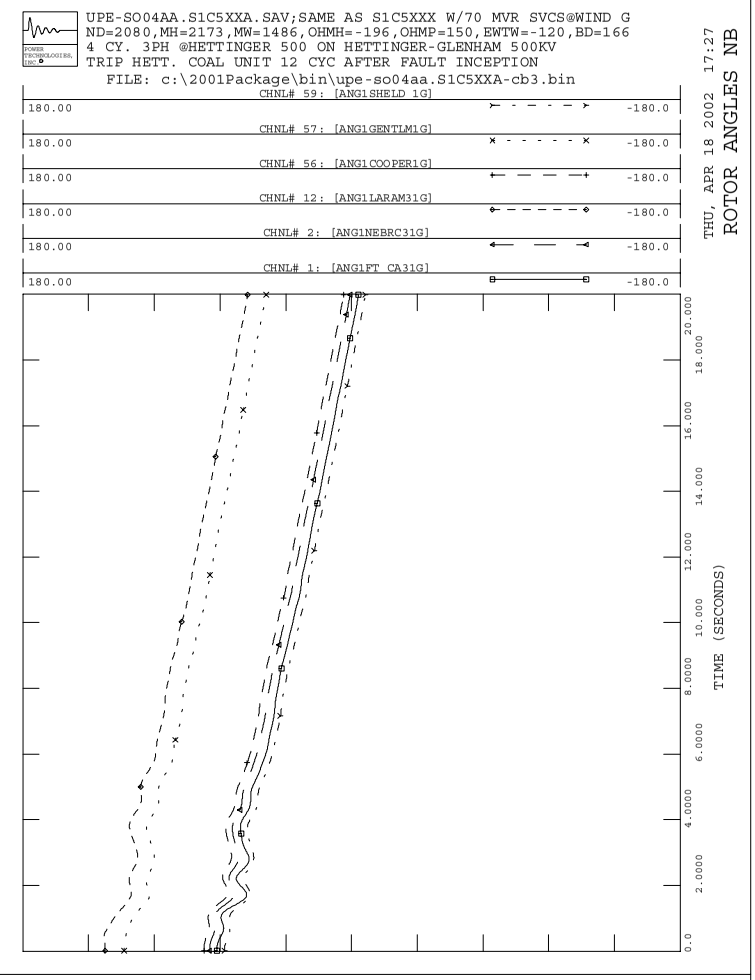
THU, APR 18 2002 17:27
ROTOR ANGLES 1

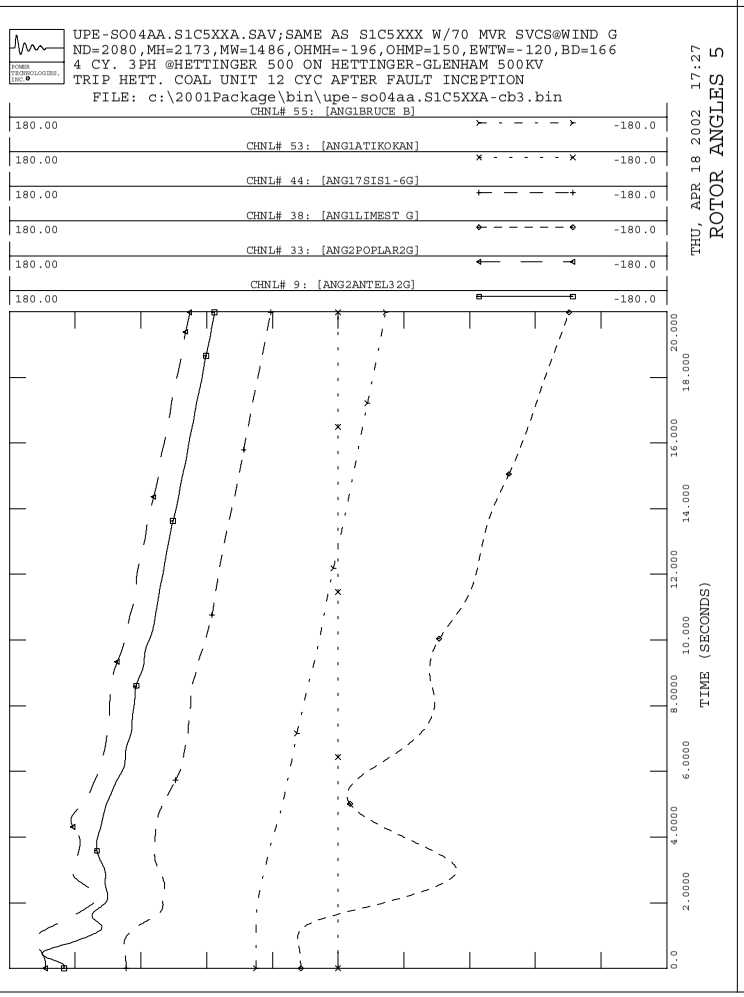
UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

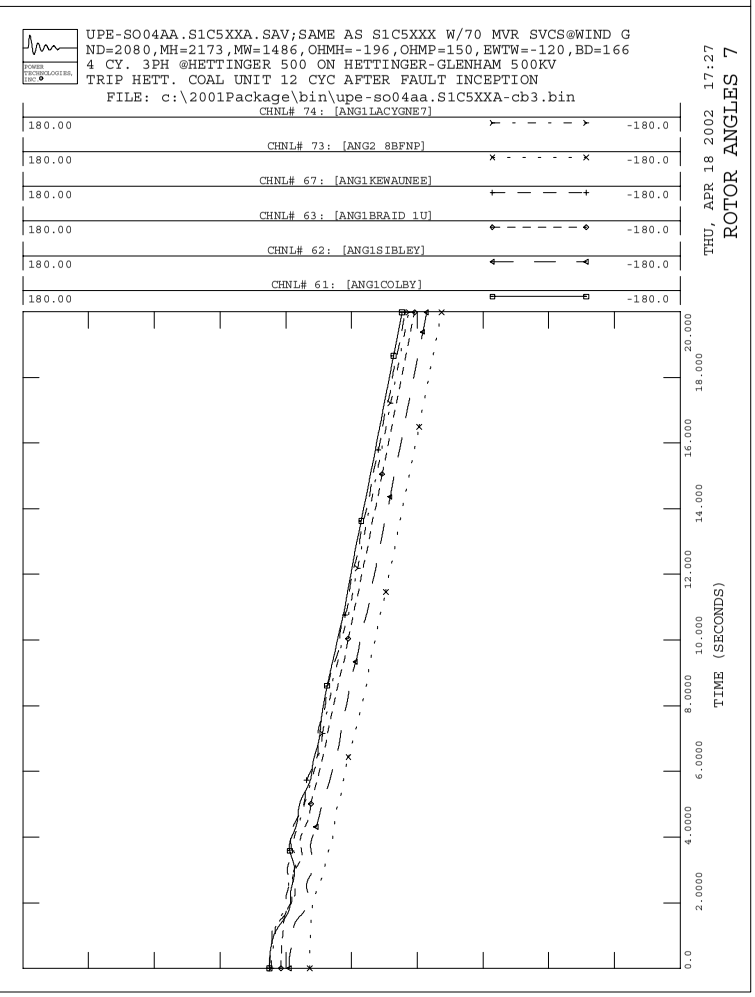


THU, APR 18 2002 17:27
ROTOR ANGLES 3

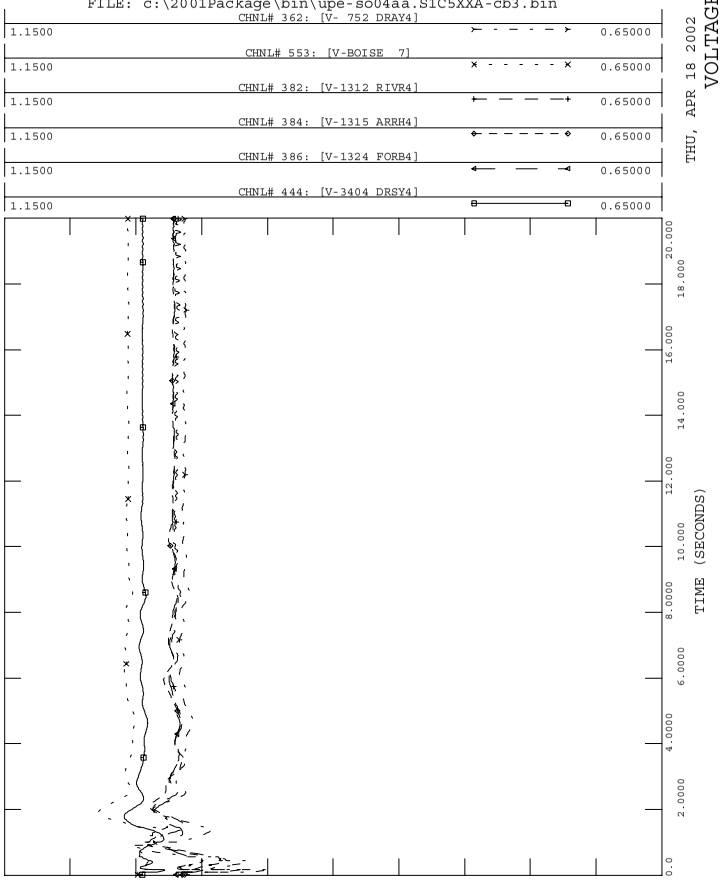

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
THU, APR 18 2002 17:27
ROTOR ANGLES 6
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
THU, APR 18 2002 17:27
ROTOR ANGLES NB
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
THU, APR 18 2002 17:27
ROTOR ANGLES 5
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

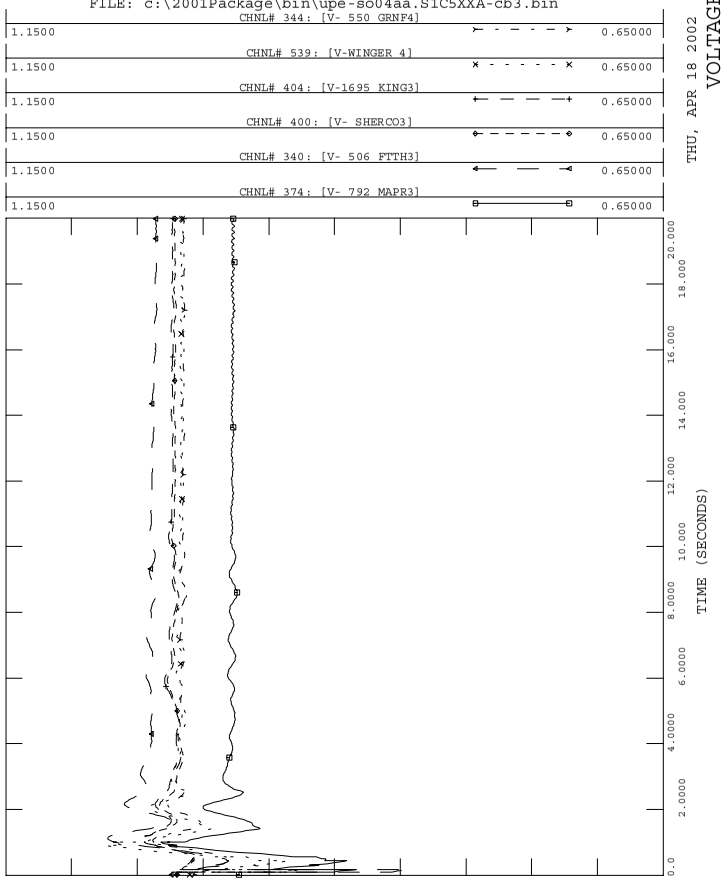

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
THU, APR 18 2002 17:27
ROTOR ANGLES 7
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



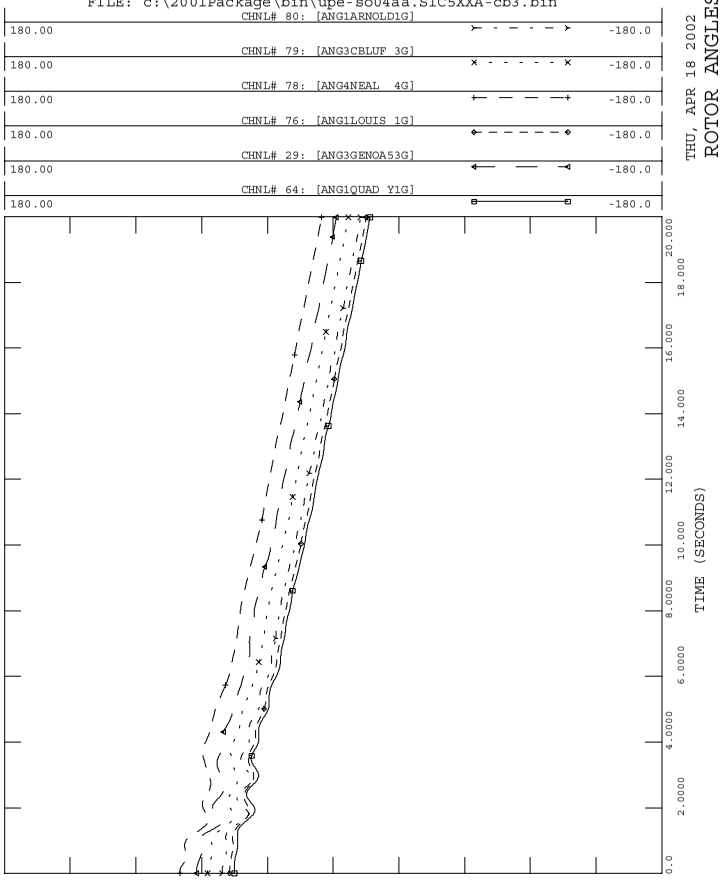
THU, APR 18 2002 17:27
VOLTAGES 1

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



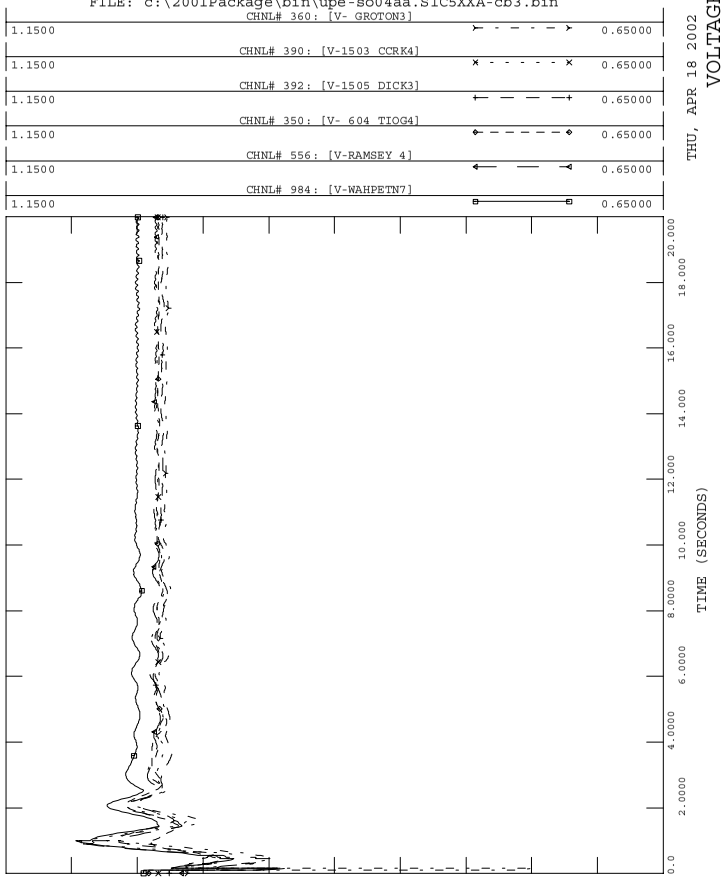
THU, APR 18 2002 17:27
VOLTAGES 3

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



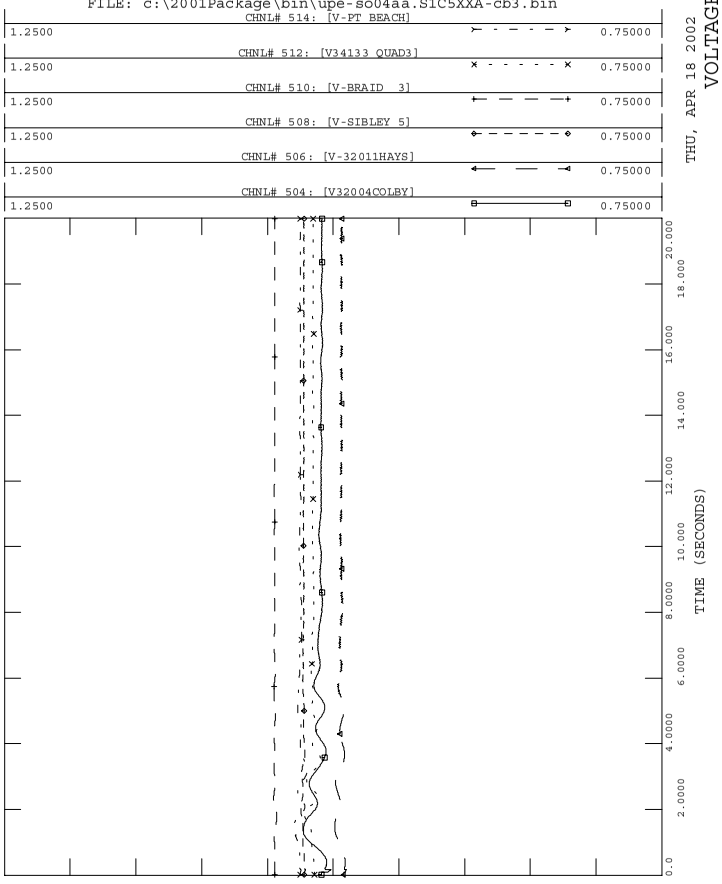
THU, APR 18 2002 17:27
ROTOR ANGLES IA

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



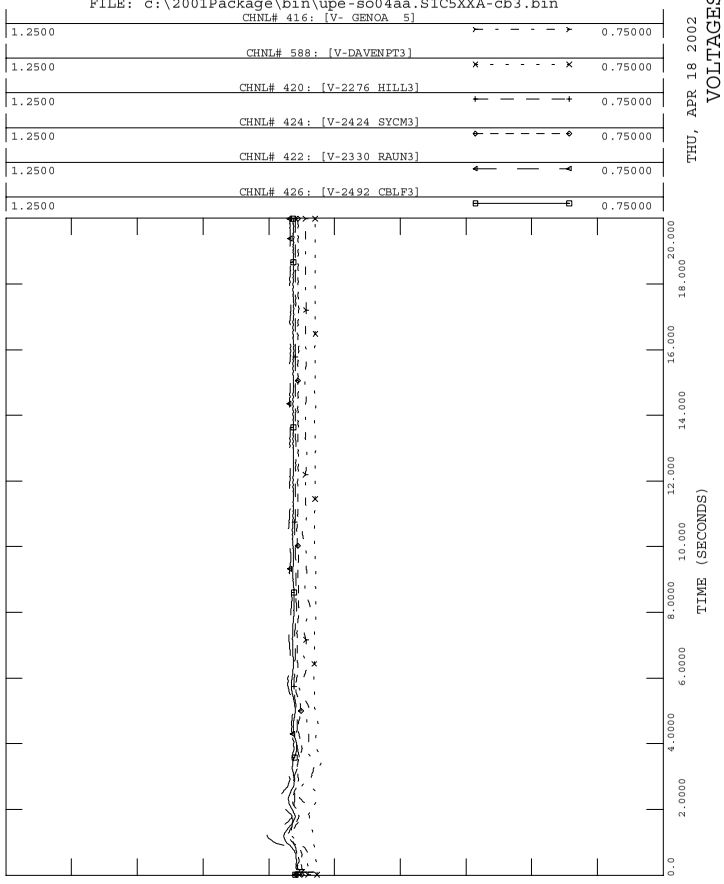
THU, APR 18 2002 17:27
VOLTAGES 2

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



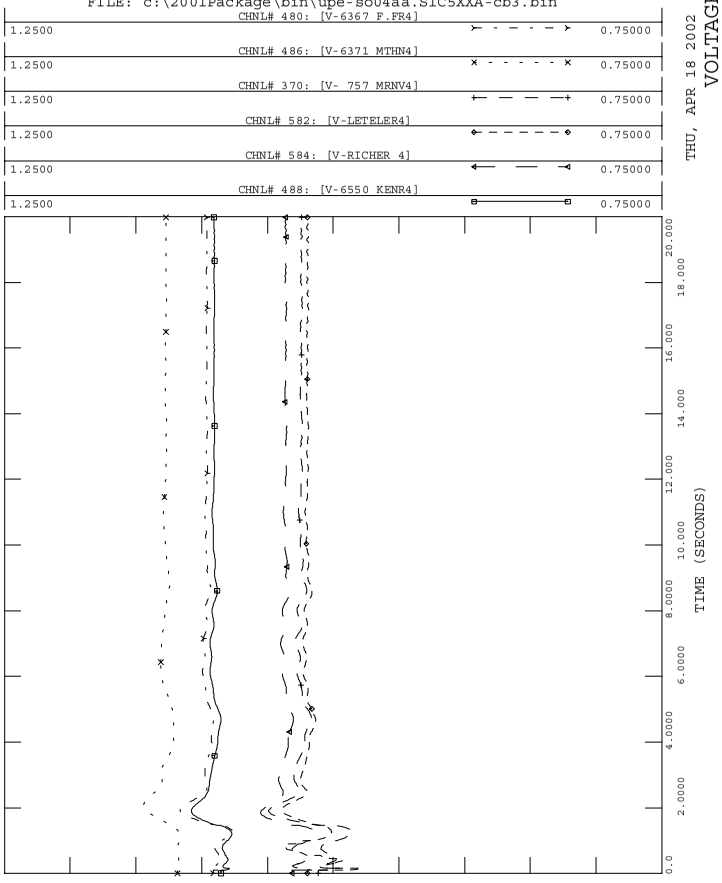
THU, APR 18 2002 17:27
VOLTAGES 5

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



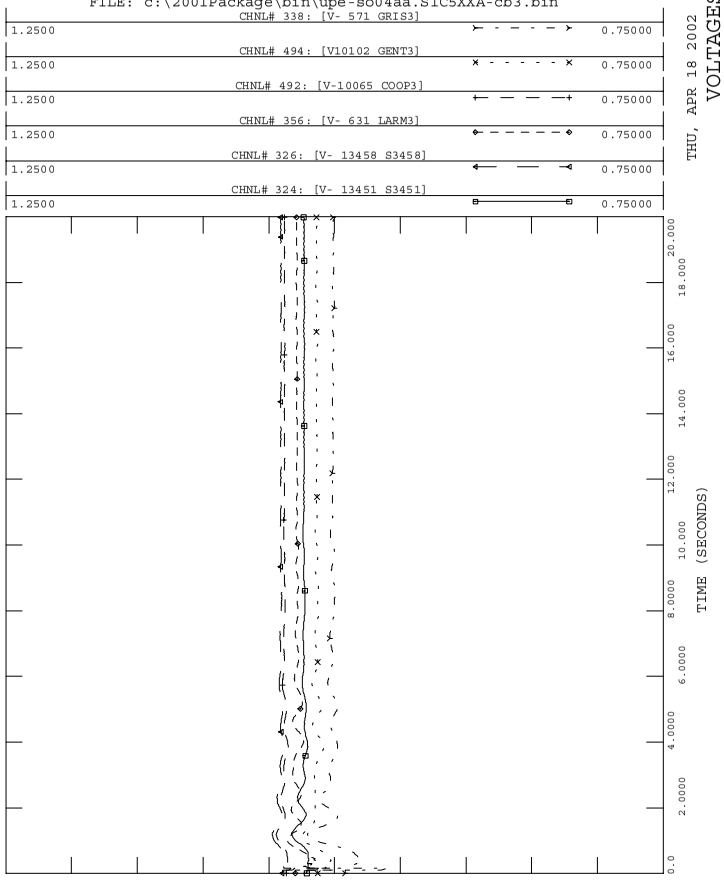
THU, APR 18 2002 17:27
VOLTAGES IA

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

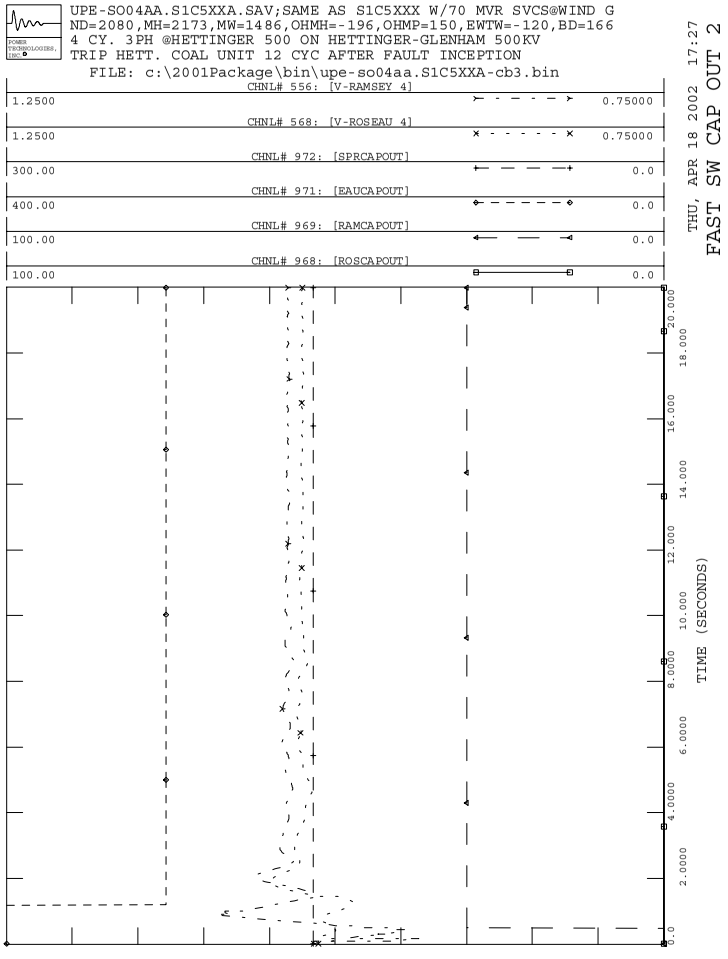


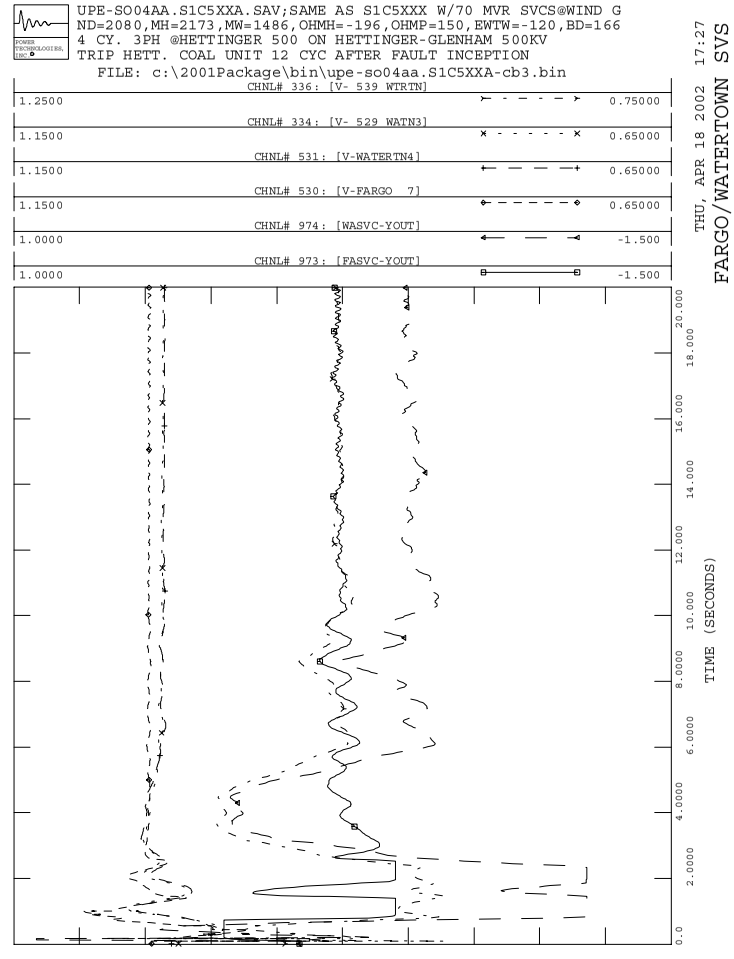
THU, APR 18 2002 17:27
VOLTAGES 4

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



THU, APR 18 2002 17:27
VOLTAGES NB


UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
THU, APR 18 2002 17:27
FAST SW CAP OUT 2
TIME (SECONDS)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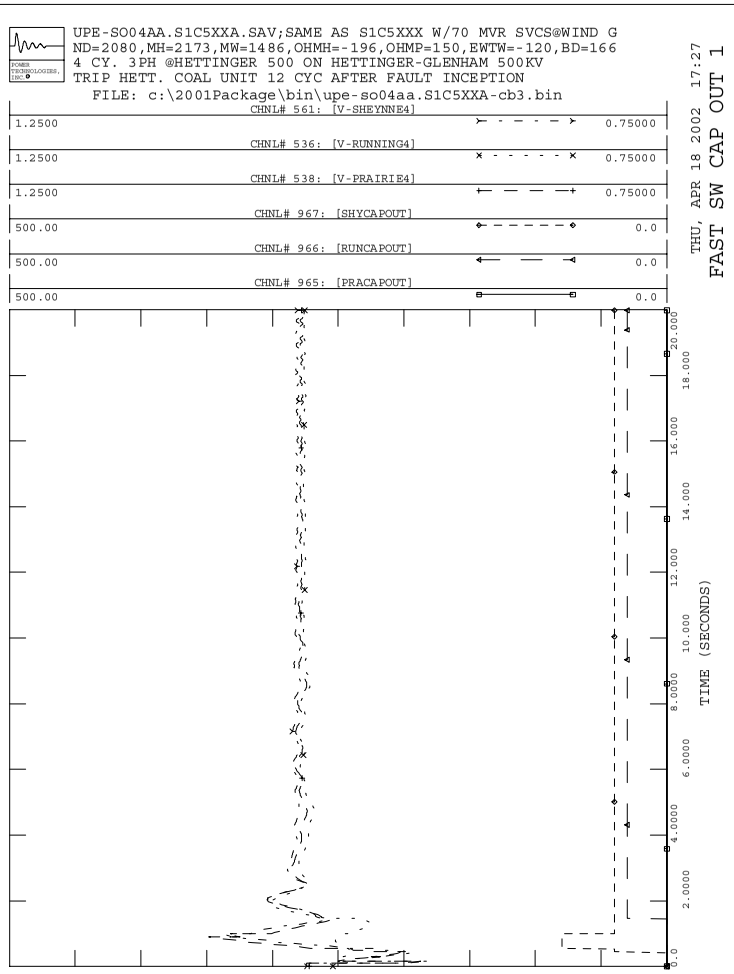
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
THU, APR 18 2002 17:27
FARGO/WATERTOWN SVS
TIME (SECONDS)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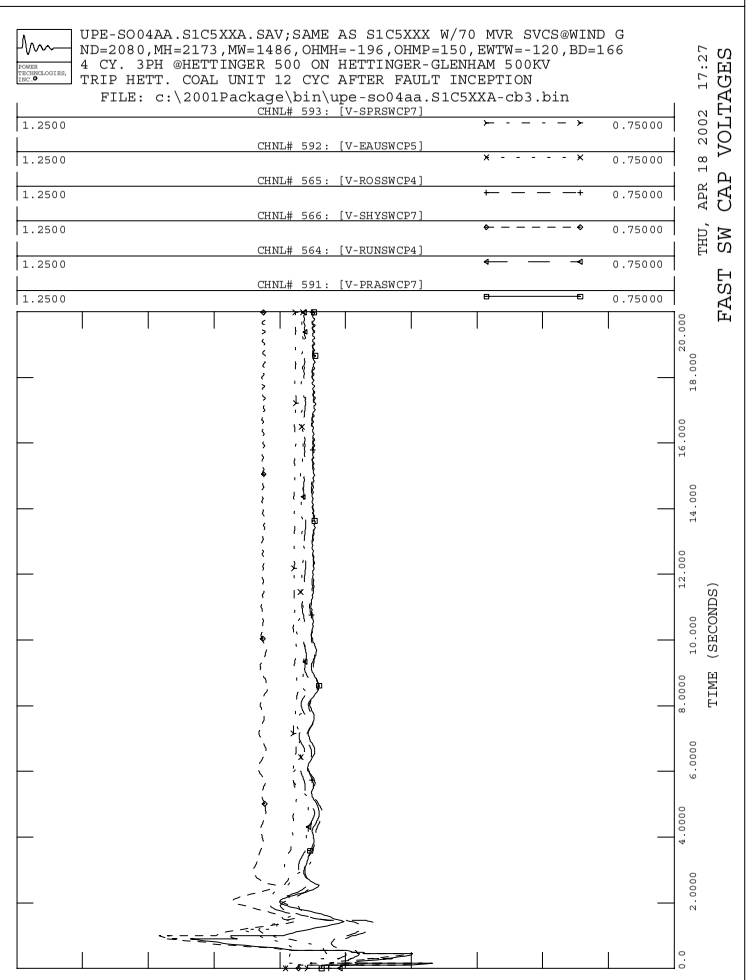
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
THU, APR 18 2002 17:27
FAST SW CAP OUT 1
TIME (SECONDS)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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
THU, APR 18 2002 17:27
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

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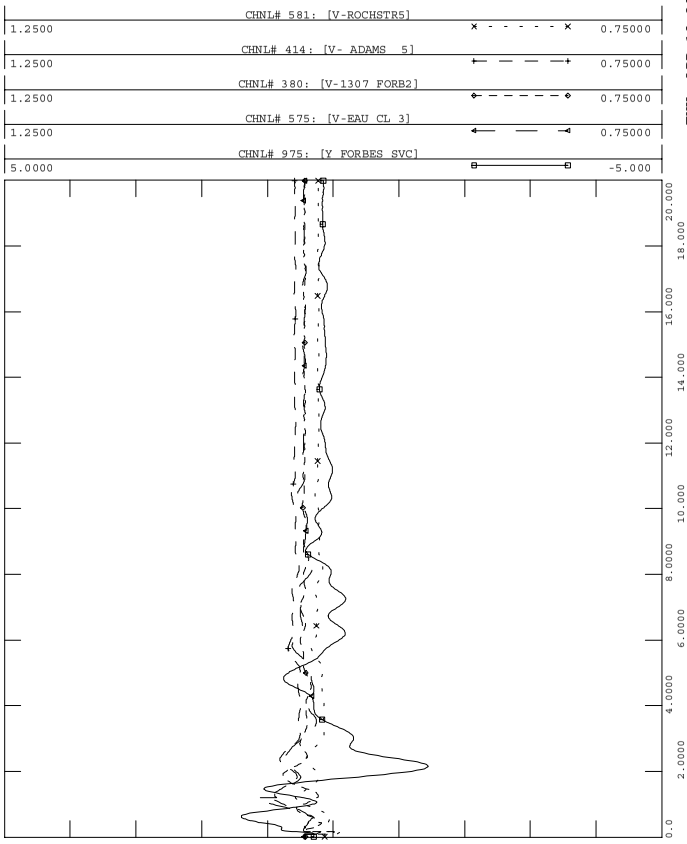
SVC & WISCONSIN VOLT



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ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

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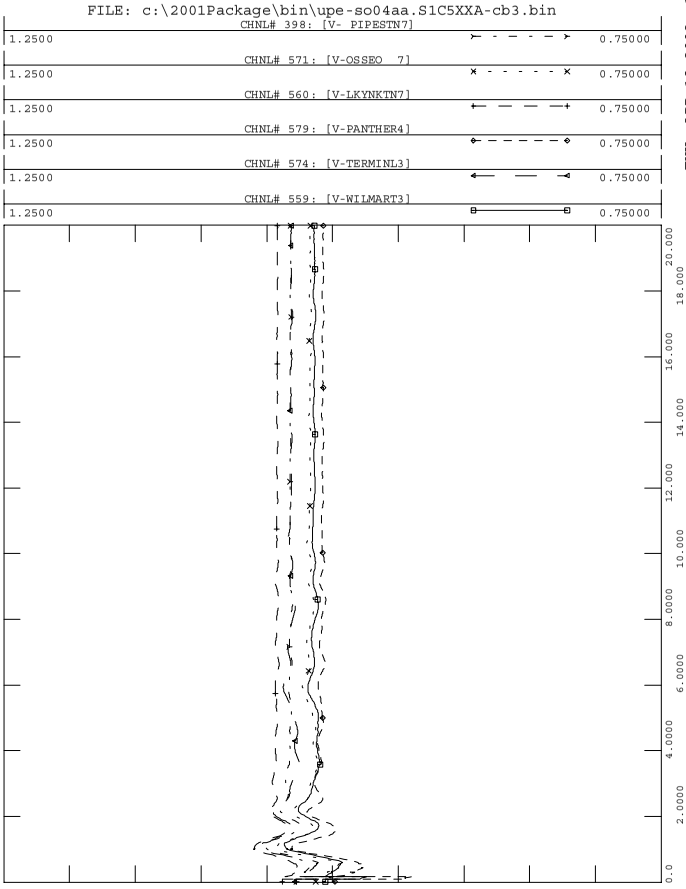
TC VOLTAGES



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

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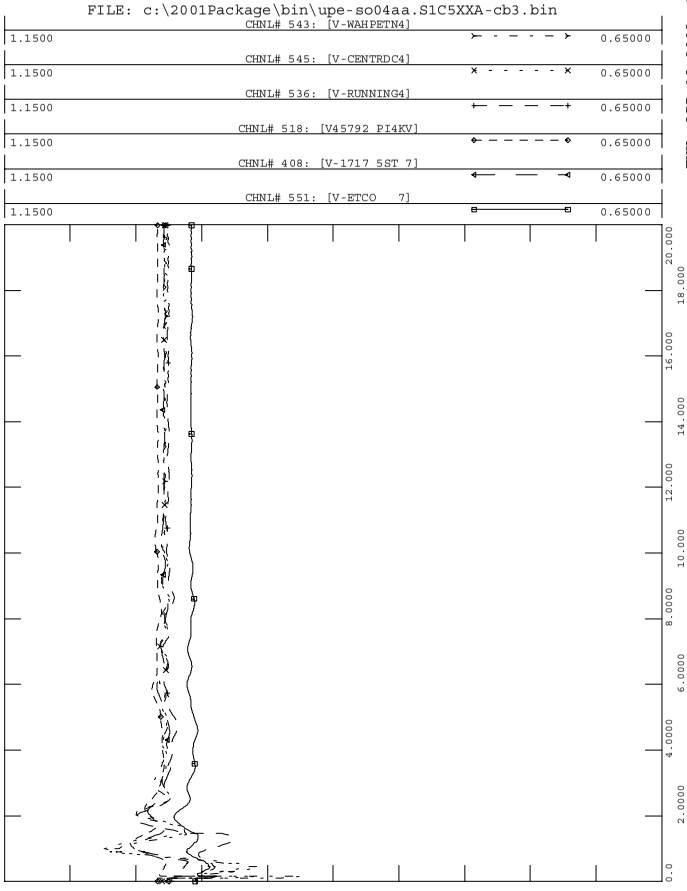
VOLTAGES 6



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

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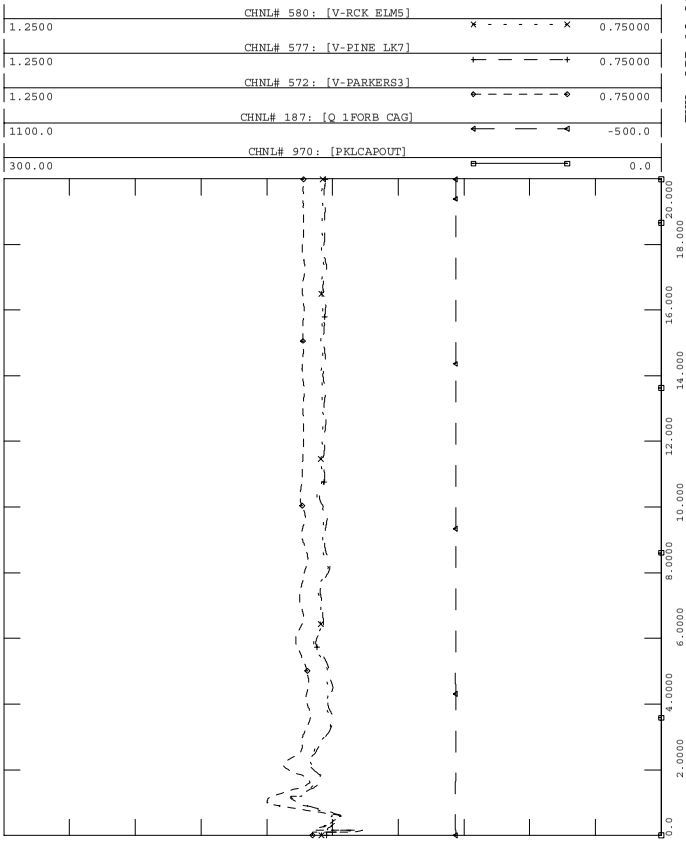
FORBES SVS OUT & VOLTAGES



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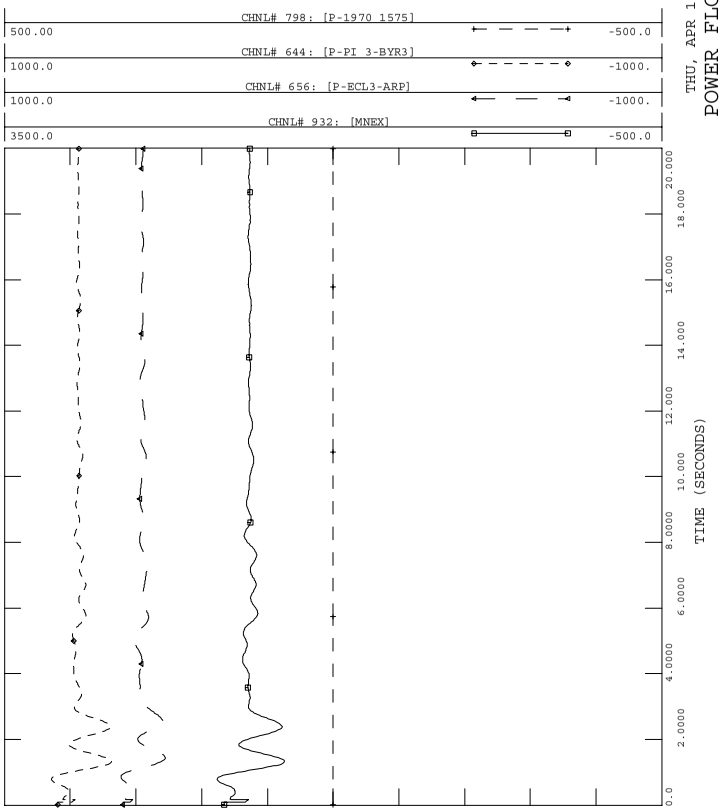
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

THU, APR 18 2002 17:27
POWER FLOW SUMS 2



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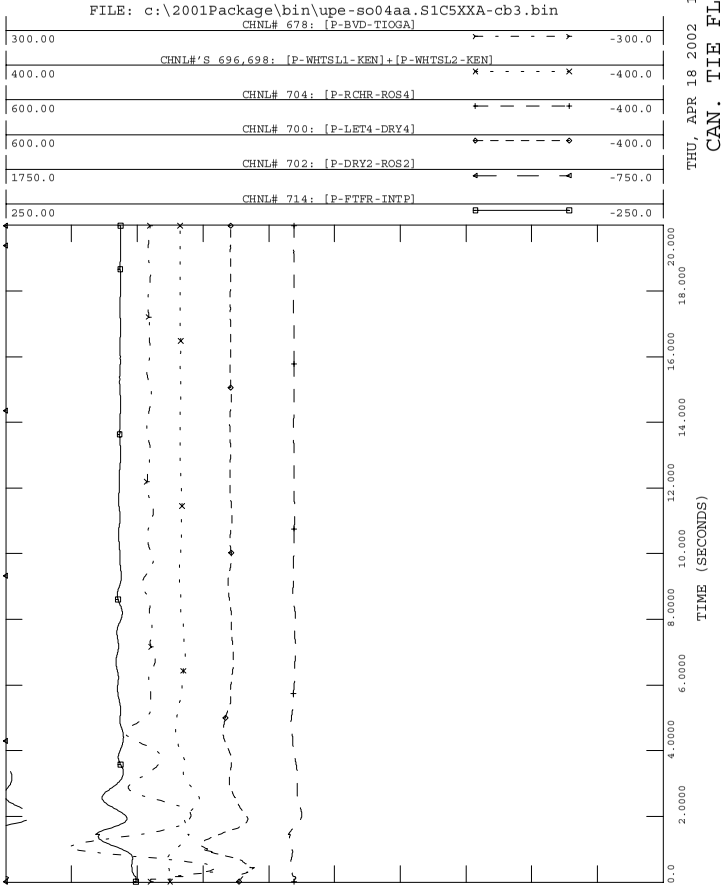
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

THU, APR 18 2002 17:27
CAN. TIE FLOWS



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
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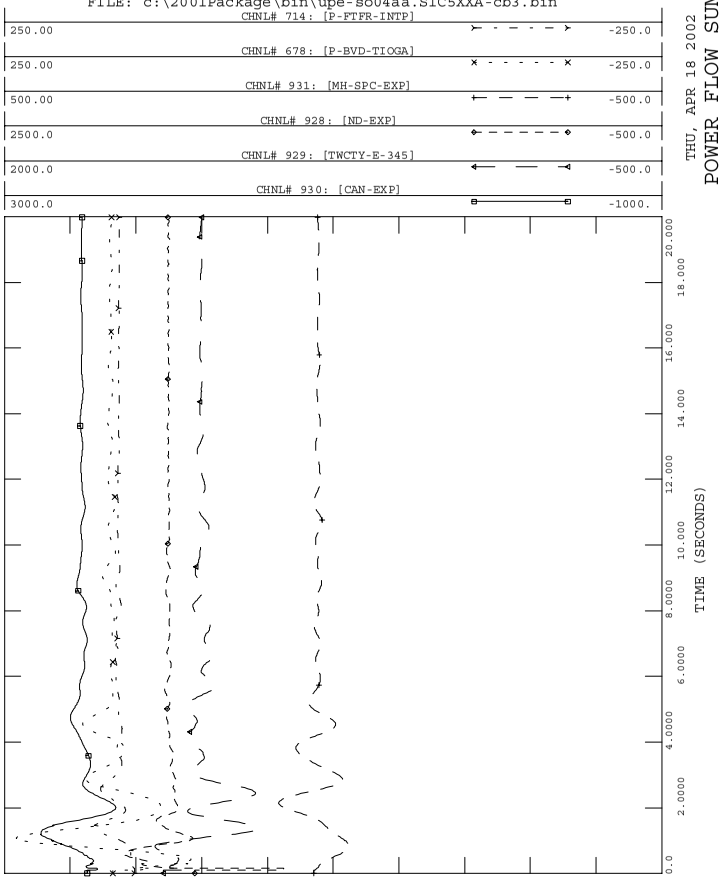
THU, APR 18 2002 17:27
POWER FLOW SUMS 1



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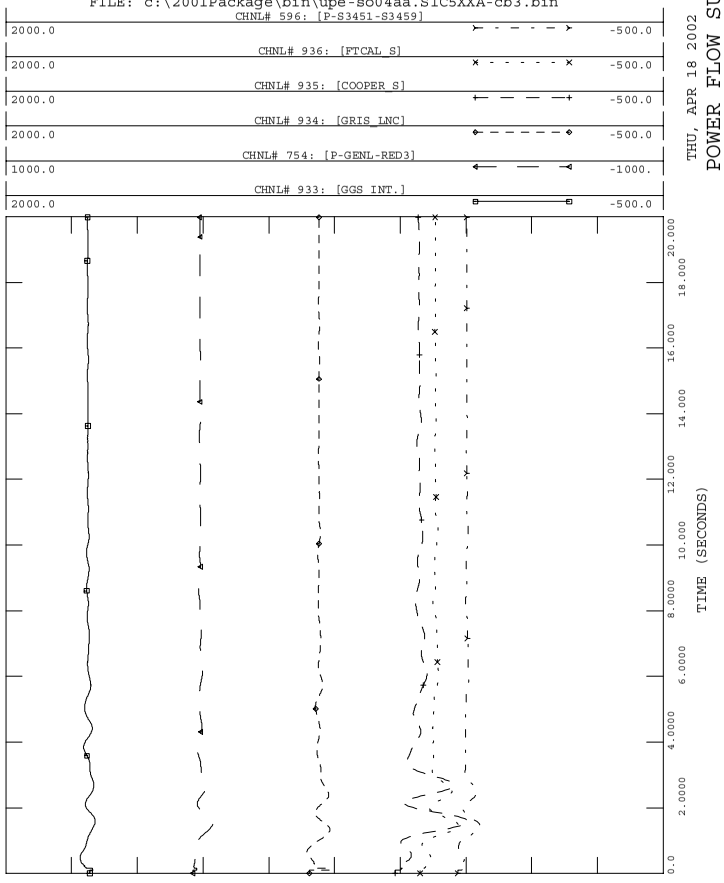
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

THU, APR 18 2002 17:27
POWER FLOW SUM 3



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
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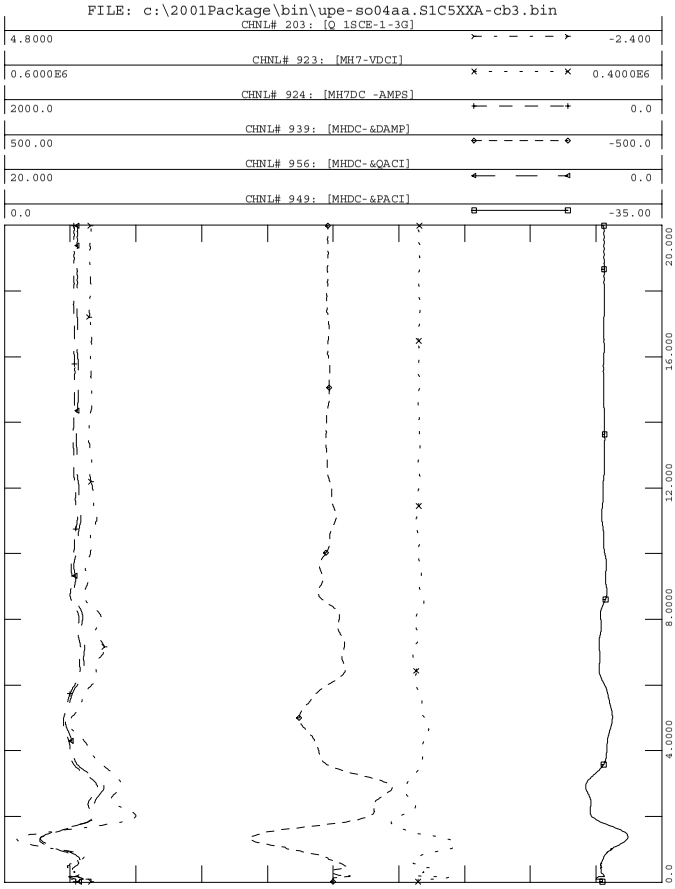
THU, APR 18 2002 17:27
MH DC PARAMETERS



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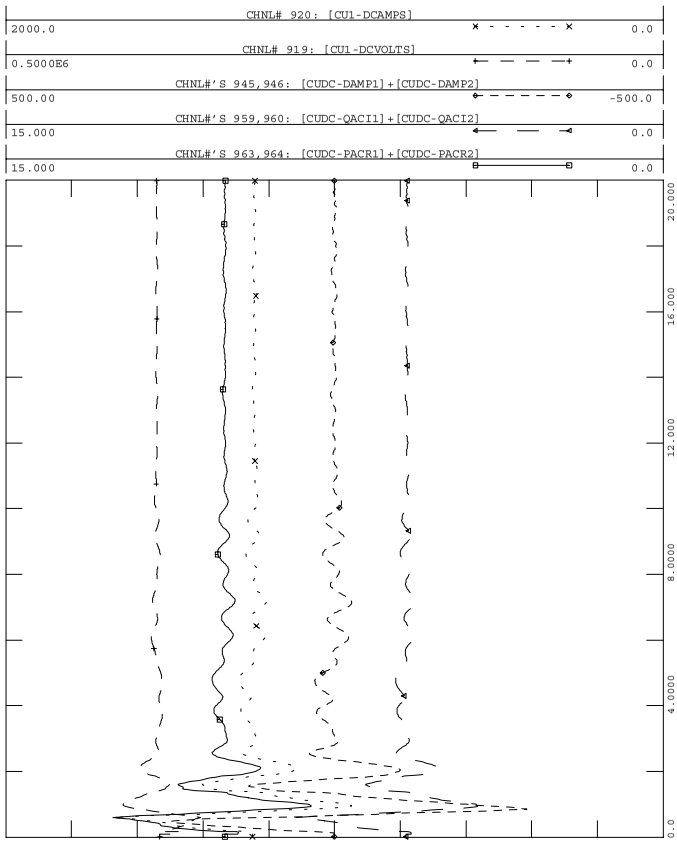
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

THU, APR 18 2002 17:27
CU DC #1



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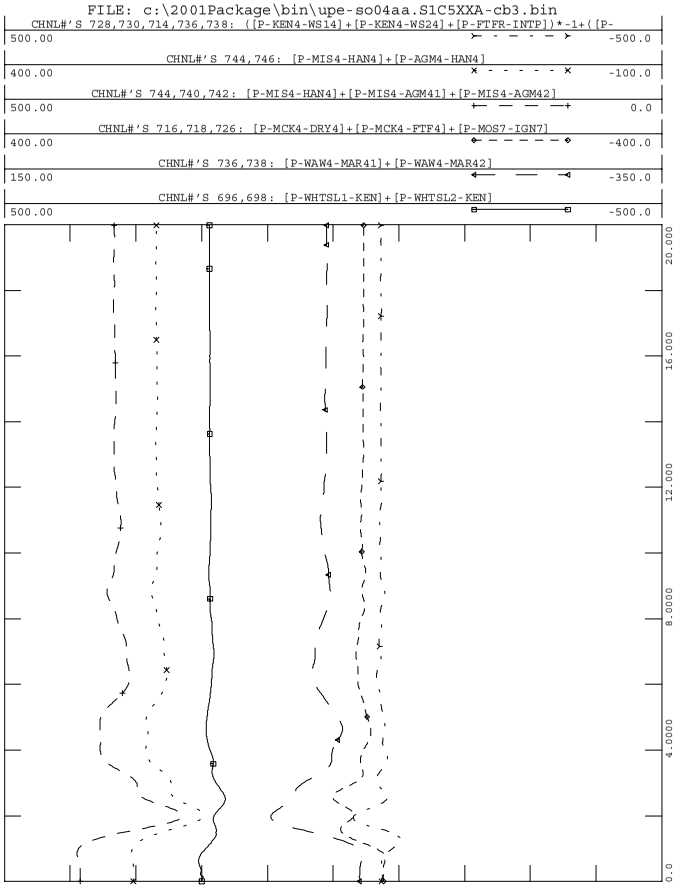
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

THU, APR 18 2002 17:27
OH TIE FLOWS



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
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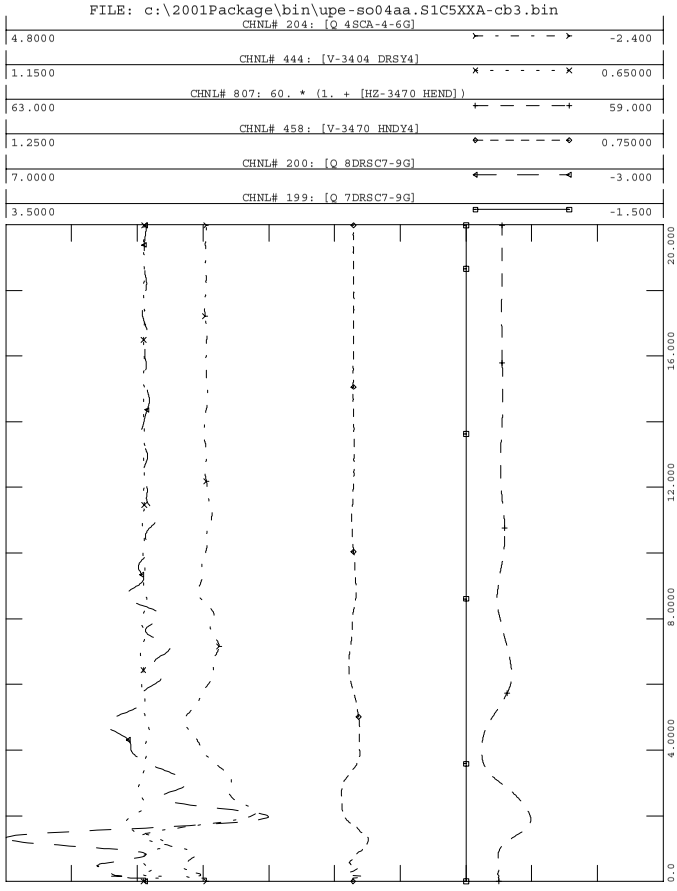
THU, APR 18 2002 17:27
MH DC PARAMETERS



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

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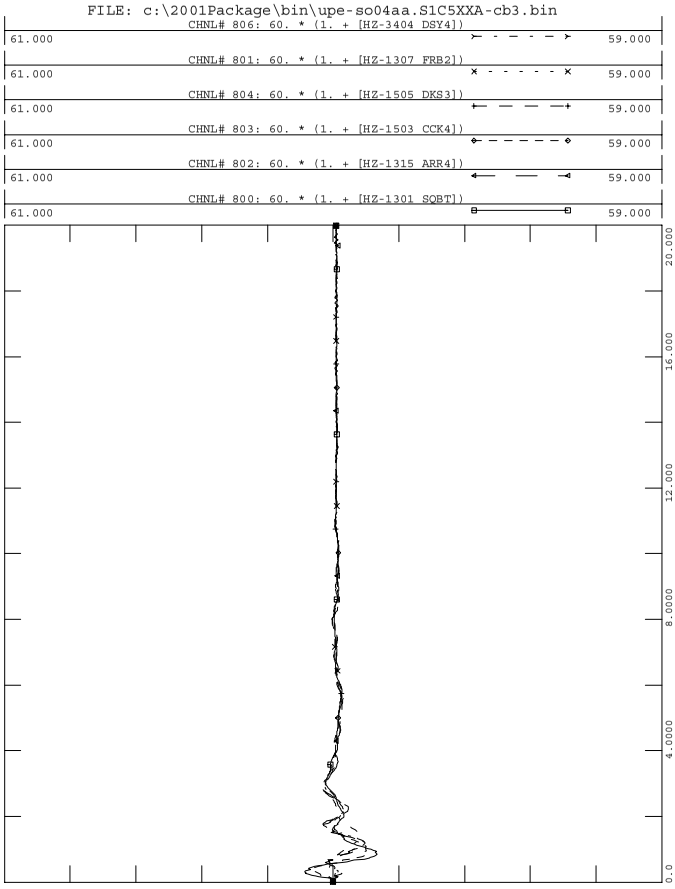
FREQ AT DC TERMINALS



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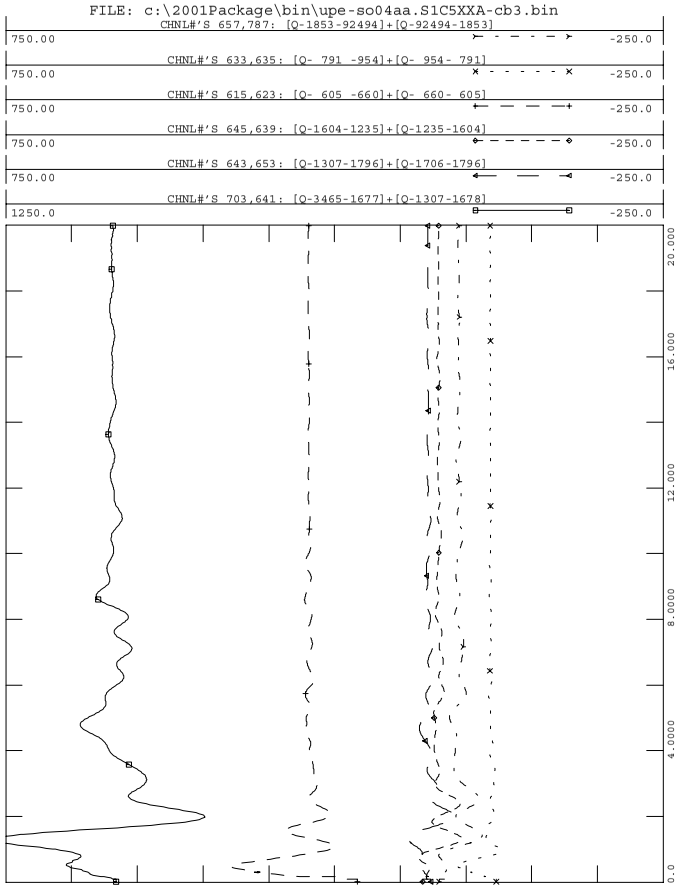
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

THU, APR 18 2002 17:27

VAR LOSSES



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
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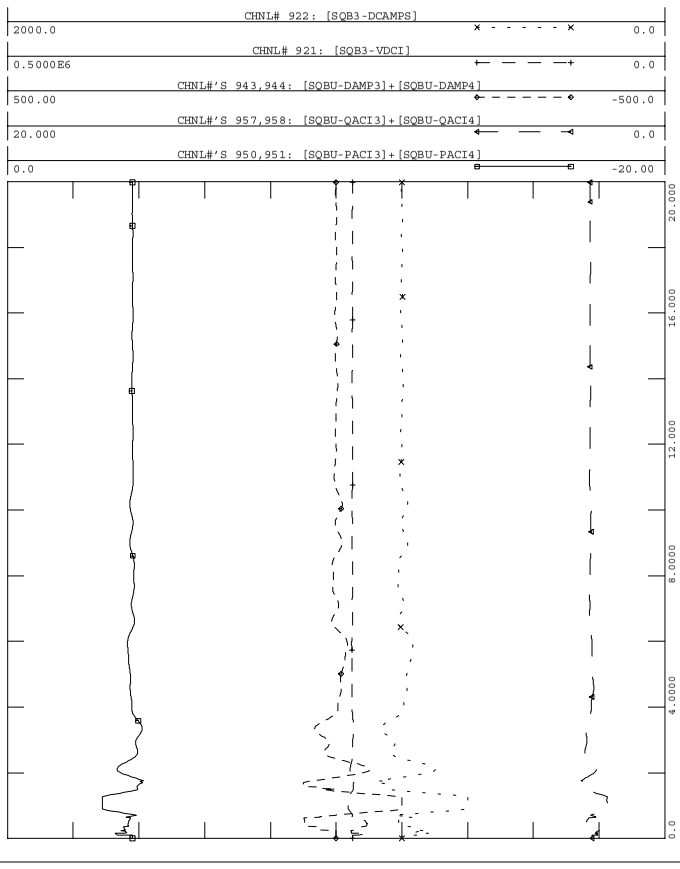
THU, APR 18 2002 17:27

SQB DC #3



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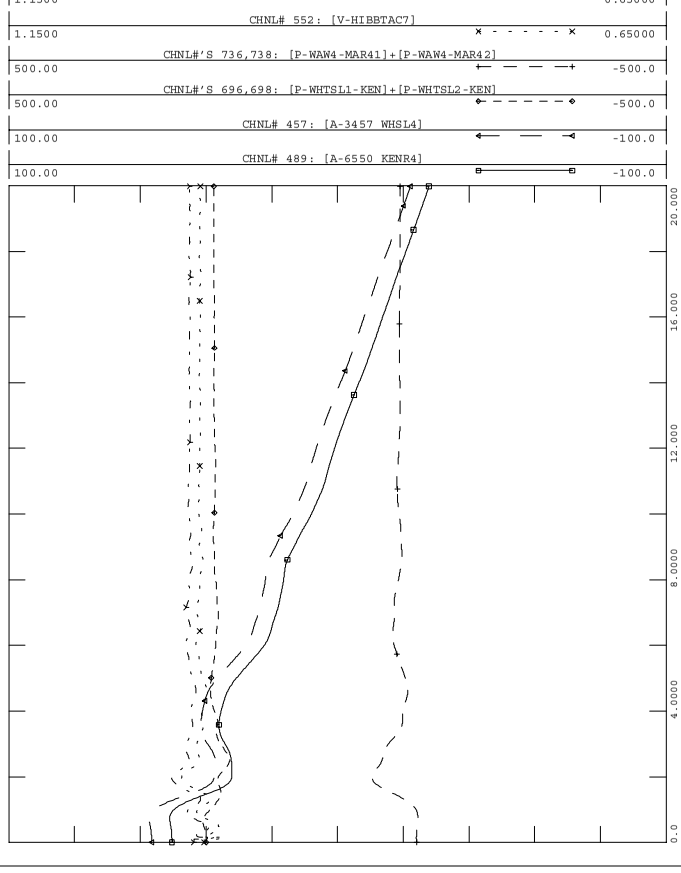
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

THU, APR 18 2002 17:27

VOLTAGES, ANGLES



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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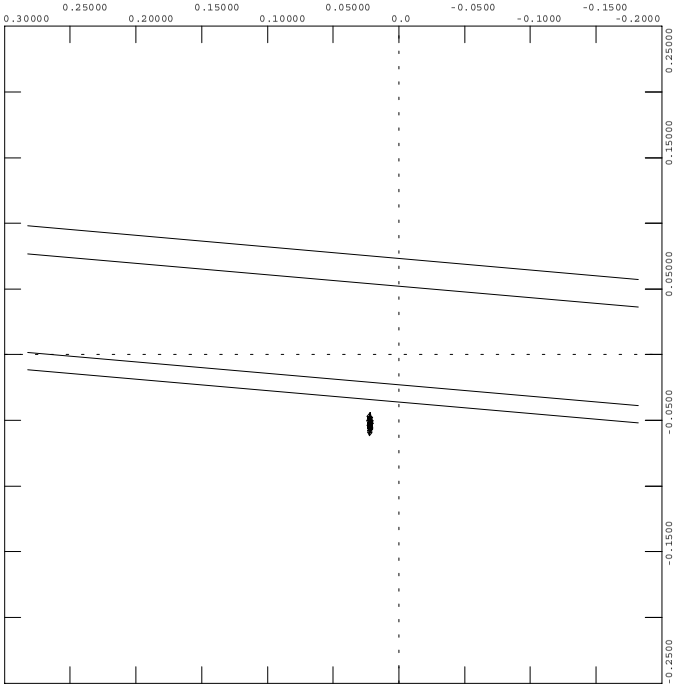

THU, APR 18 2002 17:27
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

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ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

RELAY: RELAYG
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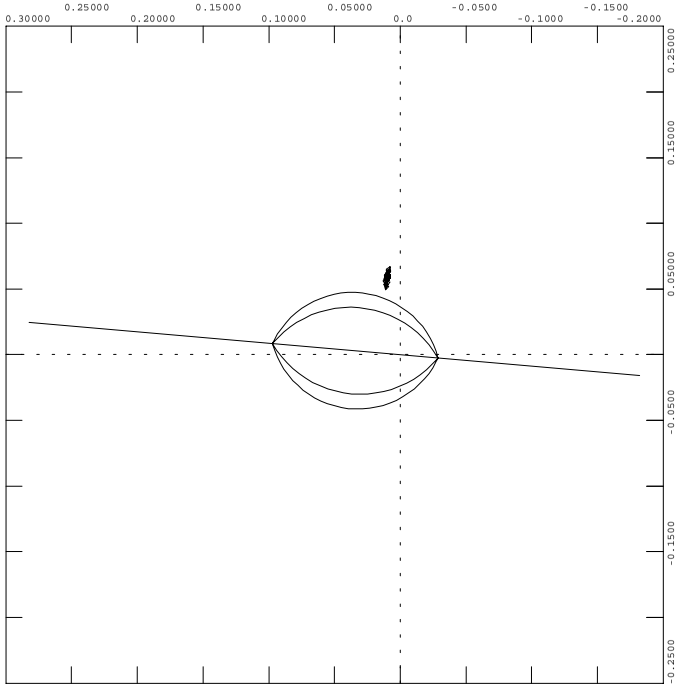

THU, APR 18 2002 17:27
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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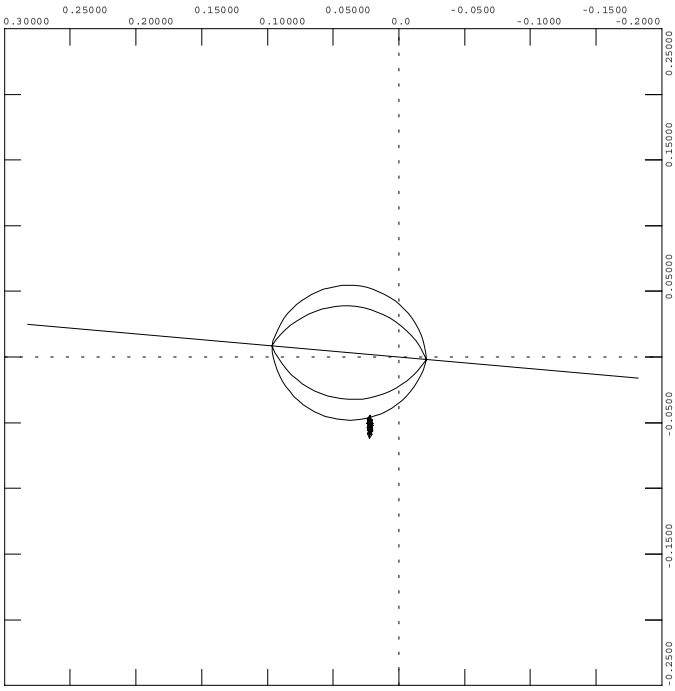
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, APR 18 2002 17:27
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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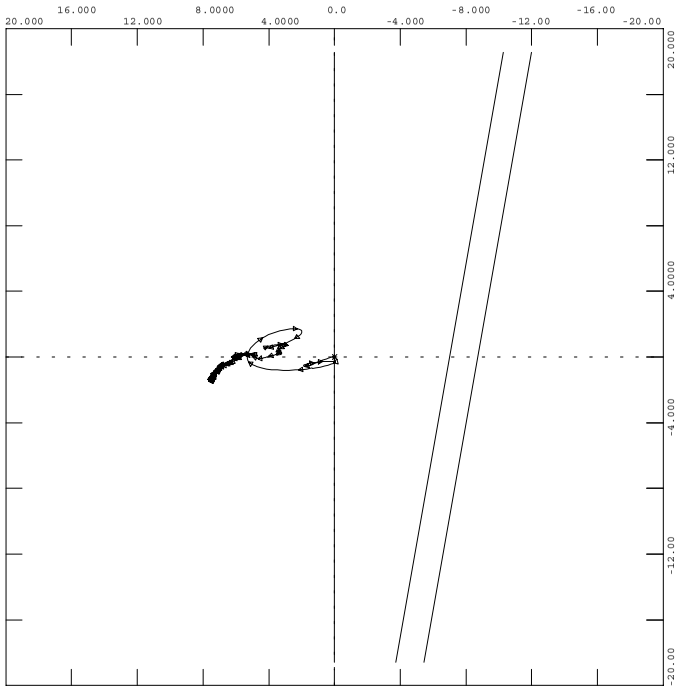

THU, APR 18 2002 17:27
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

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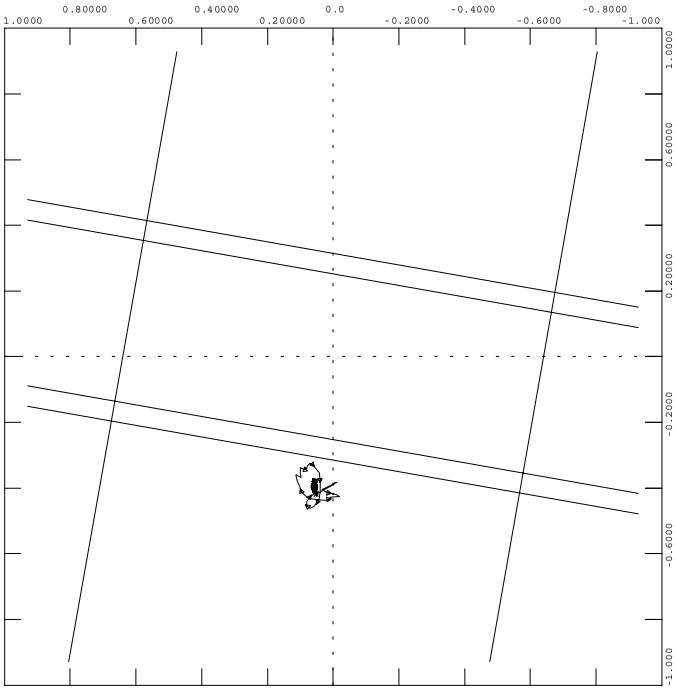
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

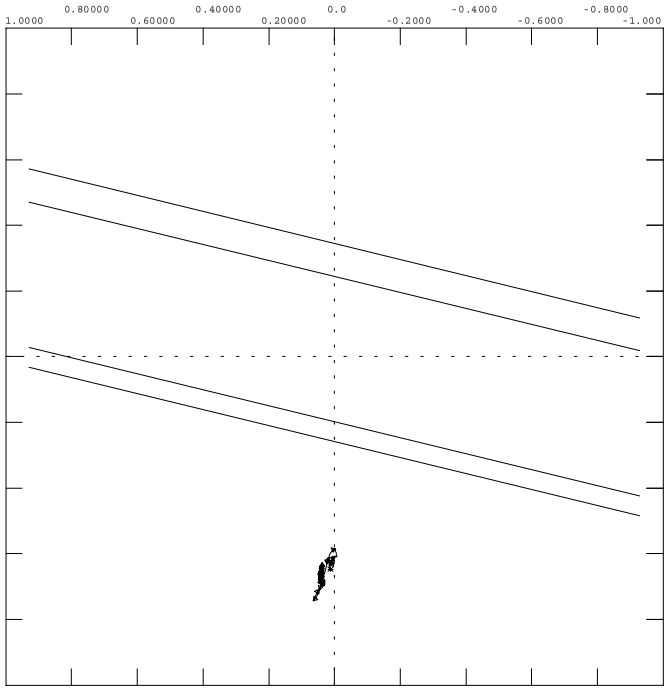
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

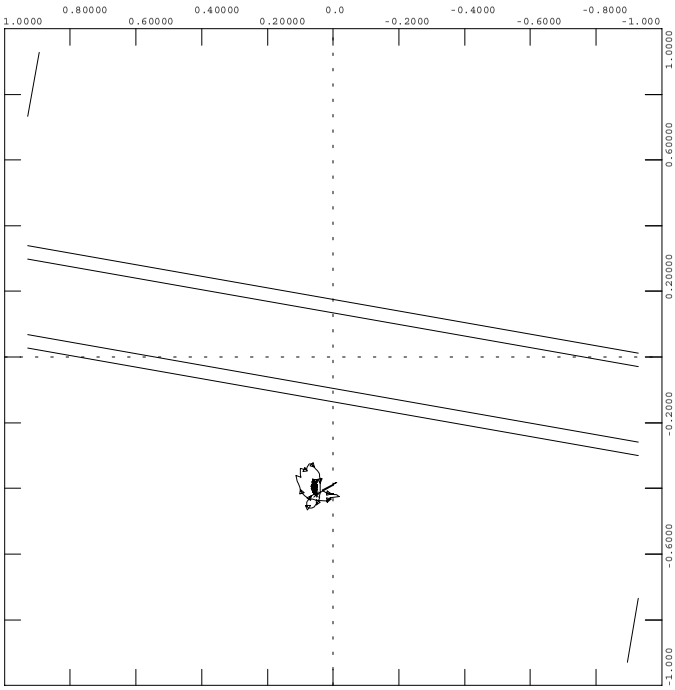
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

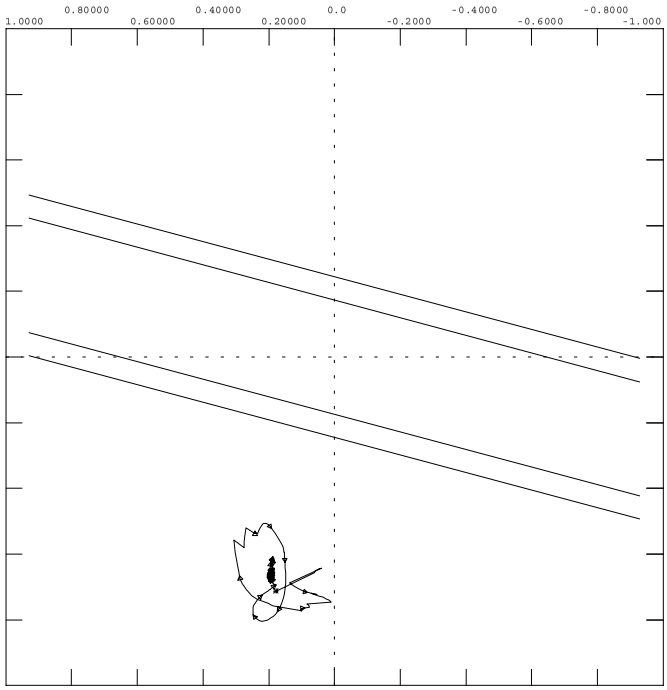
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

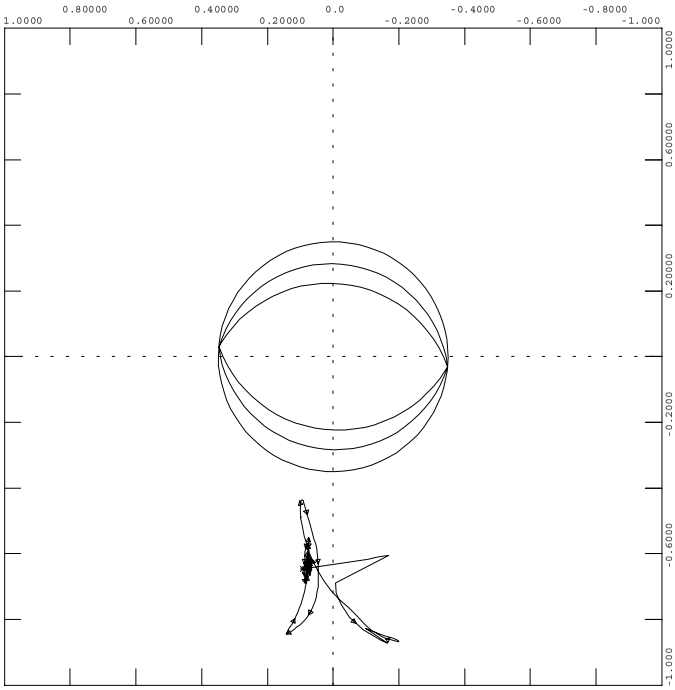
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

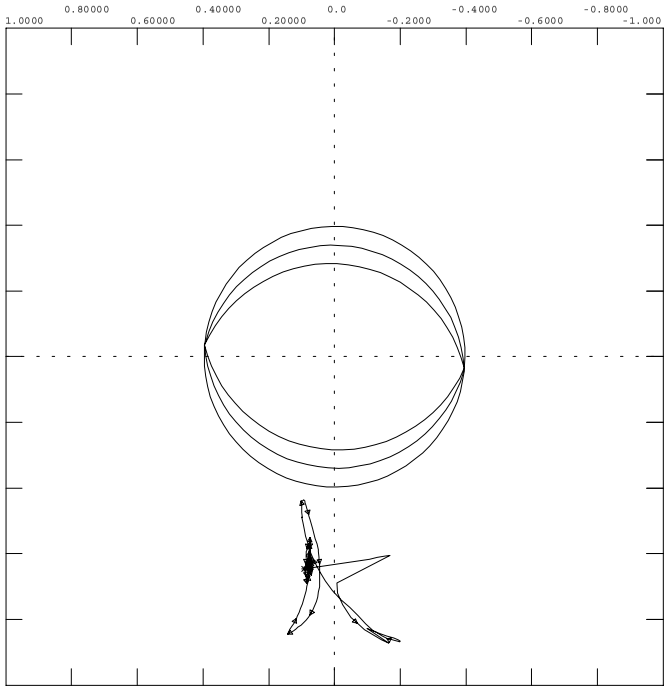
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

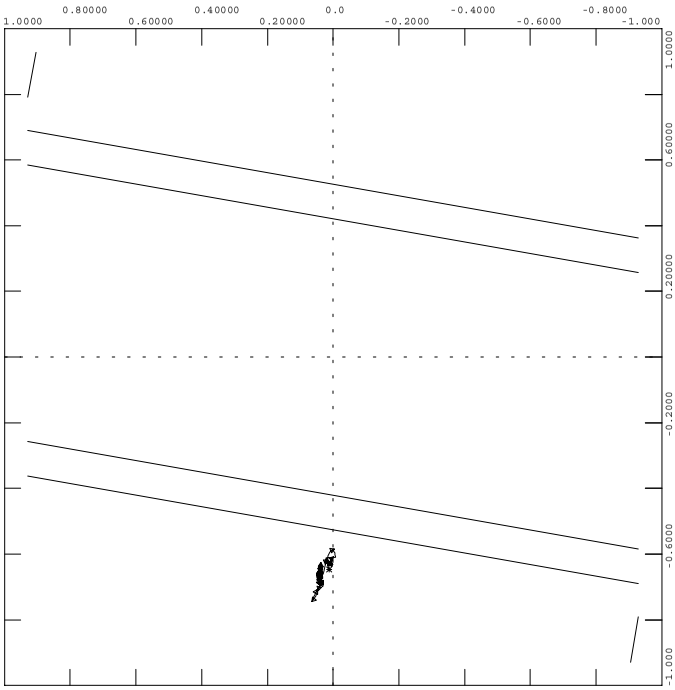
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

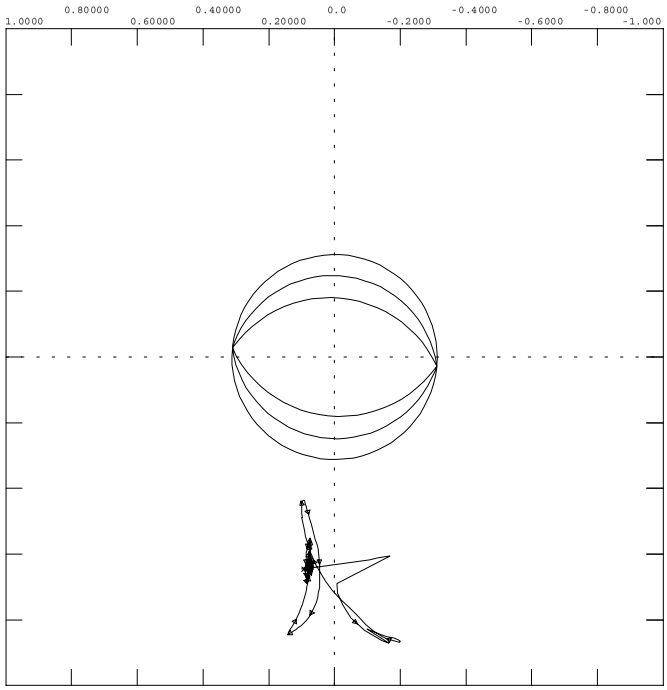
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



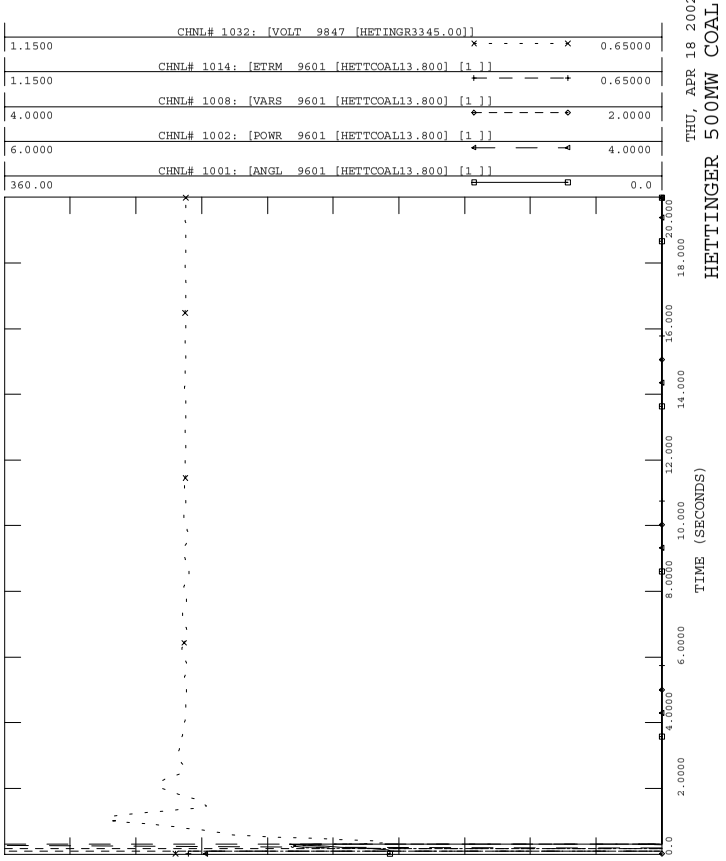
UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

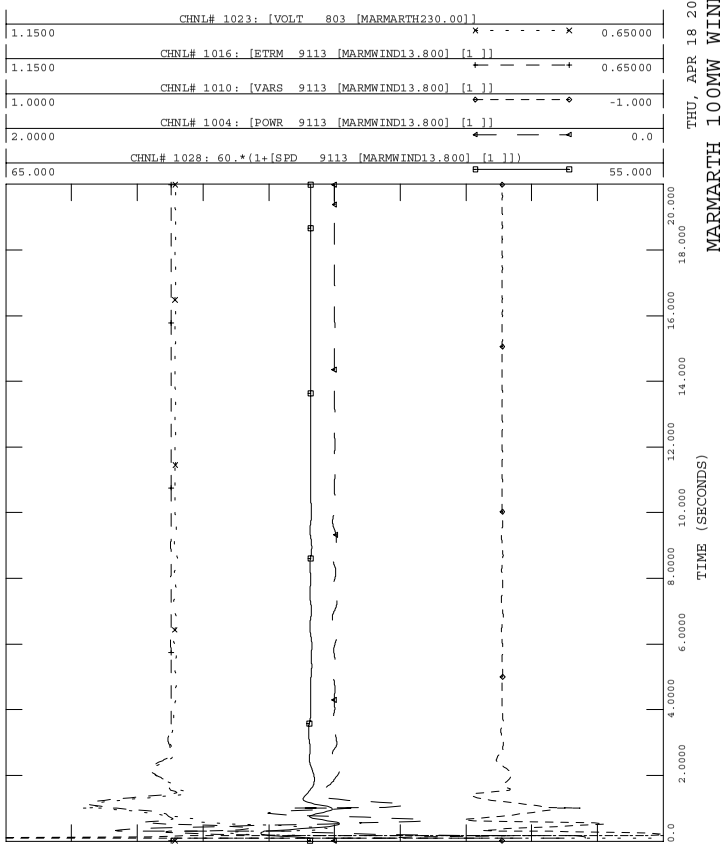


UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



THU, APR 18 2002 17:27
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

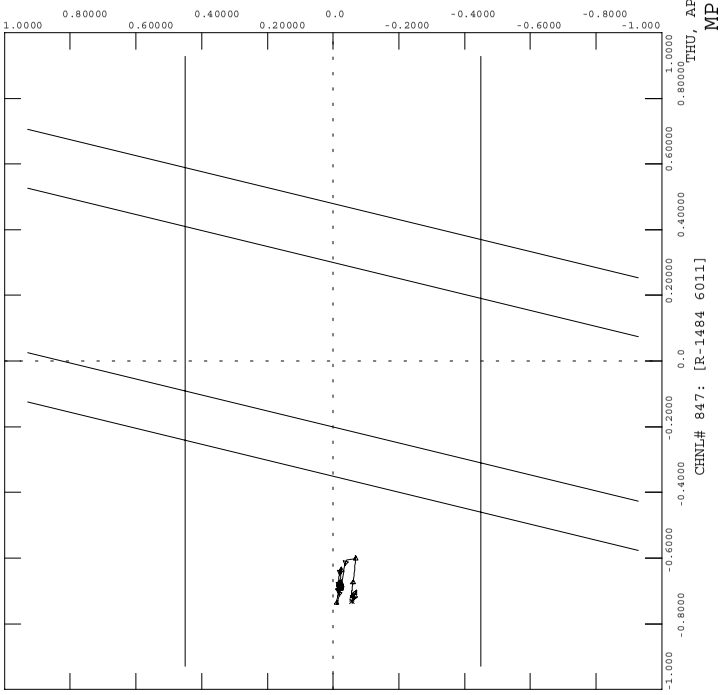


THU, APR 18 2002 17:27
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION

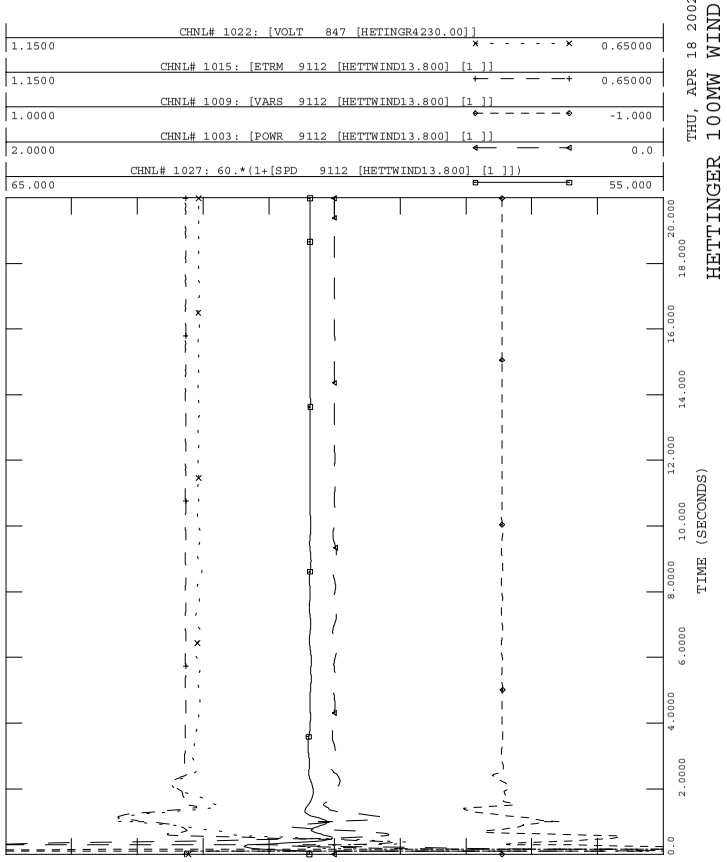
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



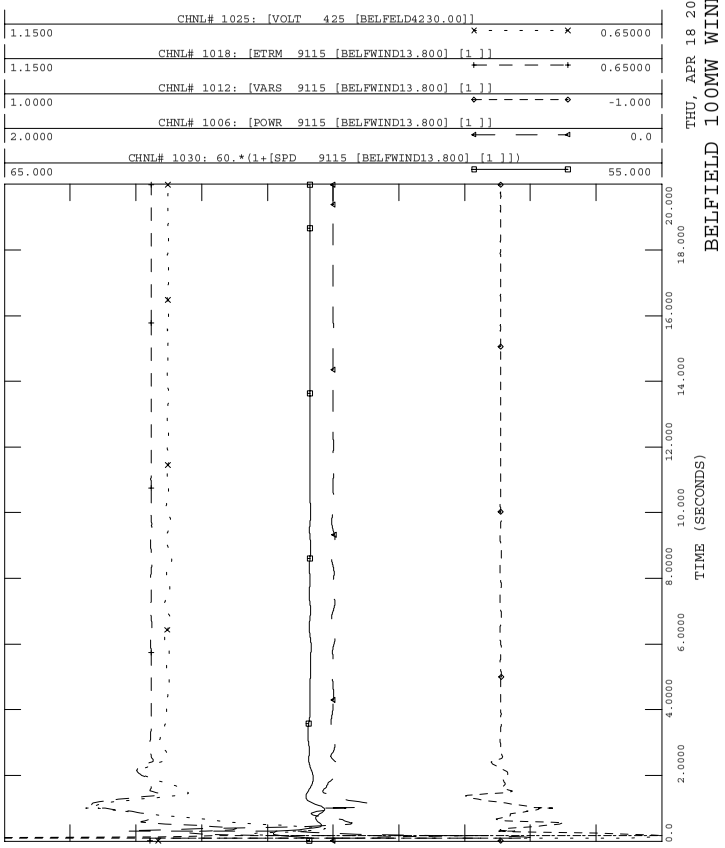
THU, APR 18 2002 17:27
MP-OH I.FALLS (779)

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



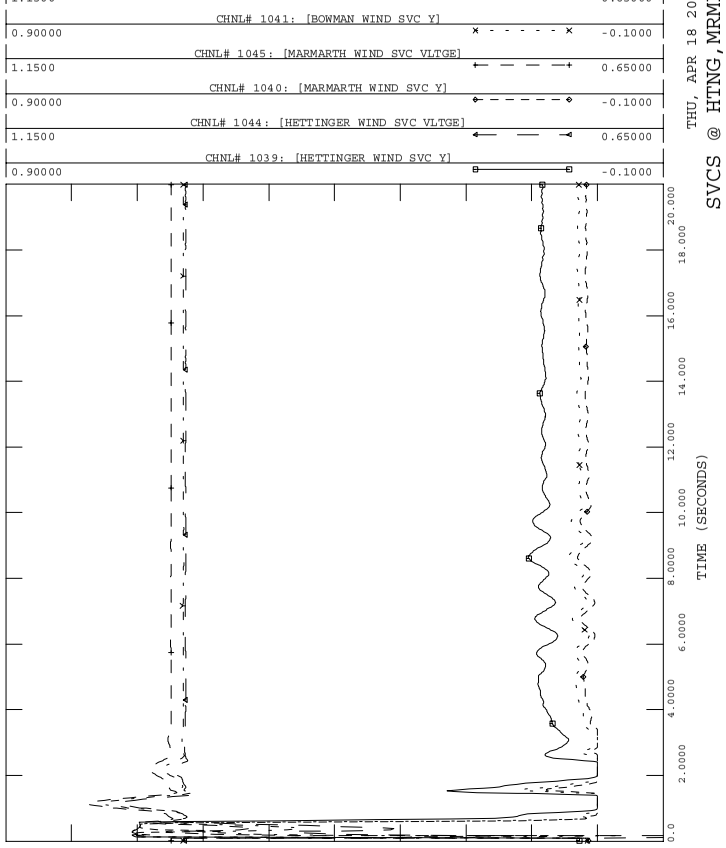
THU, APR 18 2002 17:27
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



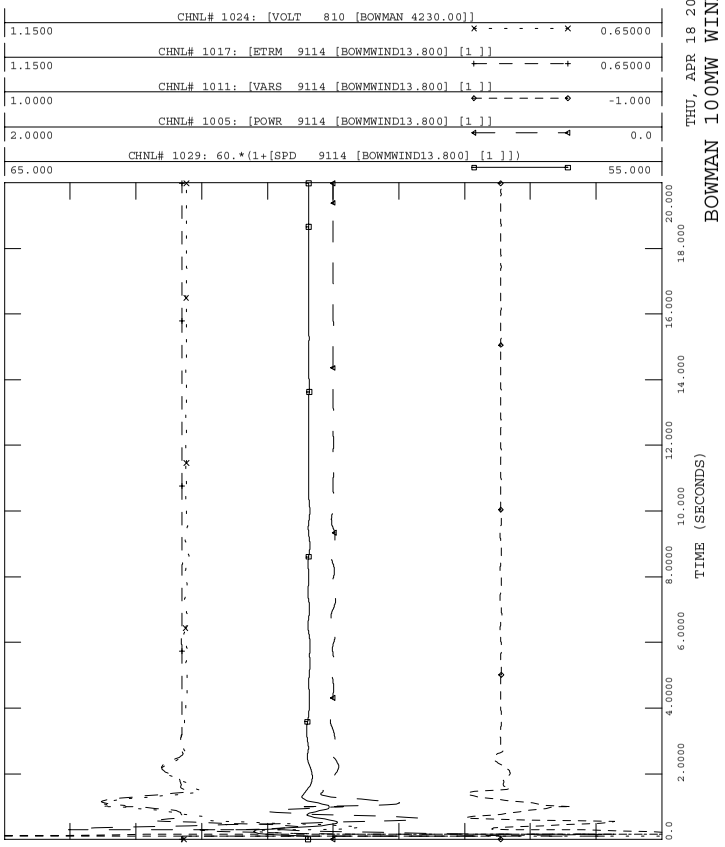
THU, APR 18 2002 17:27
BELFIELD 100MW WIND UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



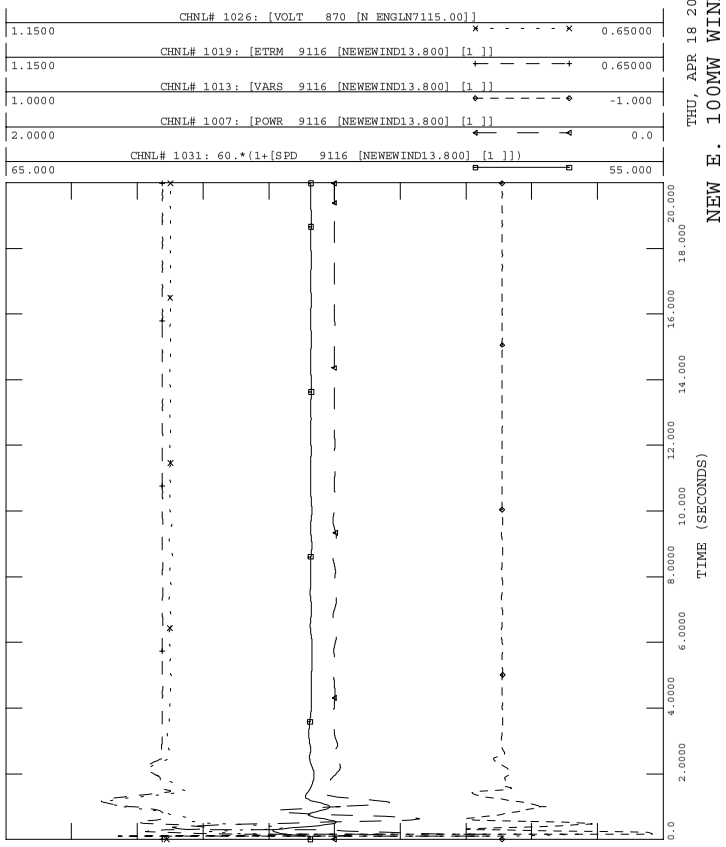
THU, APR 18 2002 17:27
SVCS @ HTNG,MRMR&BWMN

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



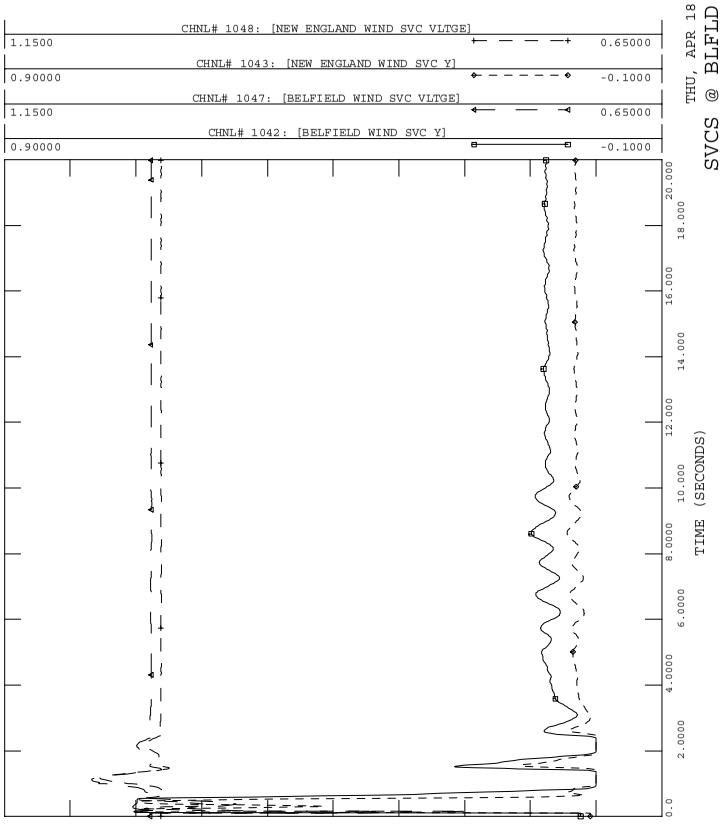
THU, APR 18 2002 17:27
BOWMAN 100MW WIND UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



THU, APR 18 2002 17:27
NEW E. 100MW WIND UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETT. COAL UNIT 12 CYC AFTER FAULT INCEPTION
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cb3.bin



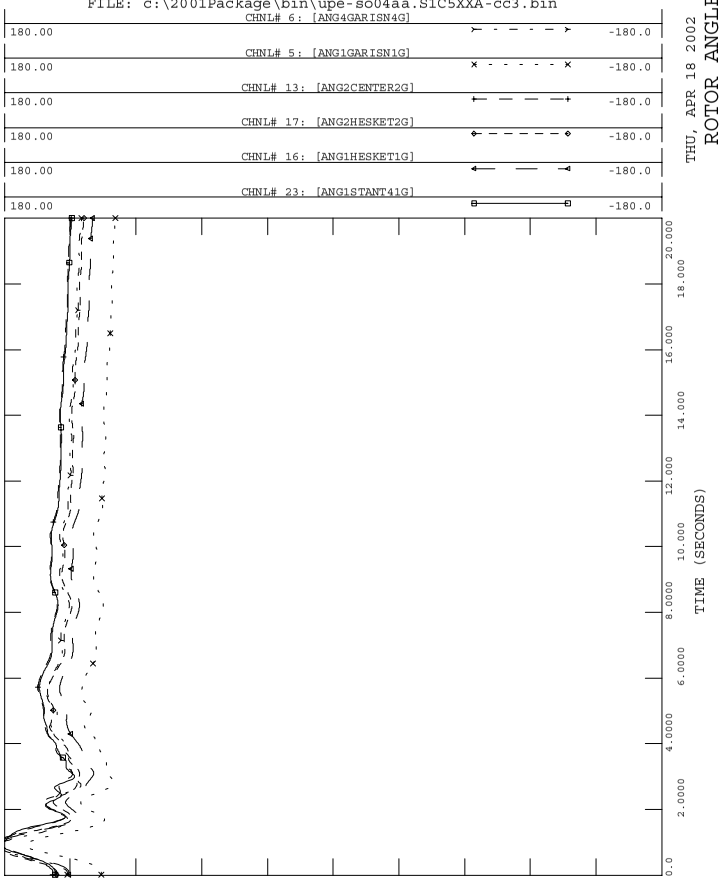
THU, APR 18 2002 17:27

SVCS @ BLFLD & NWENG

CONTINGENCY CC3

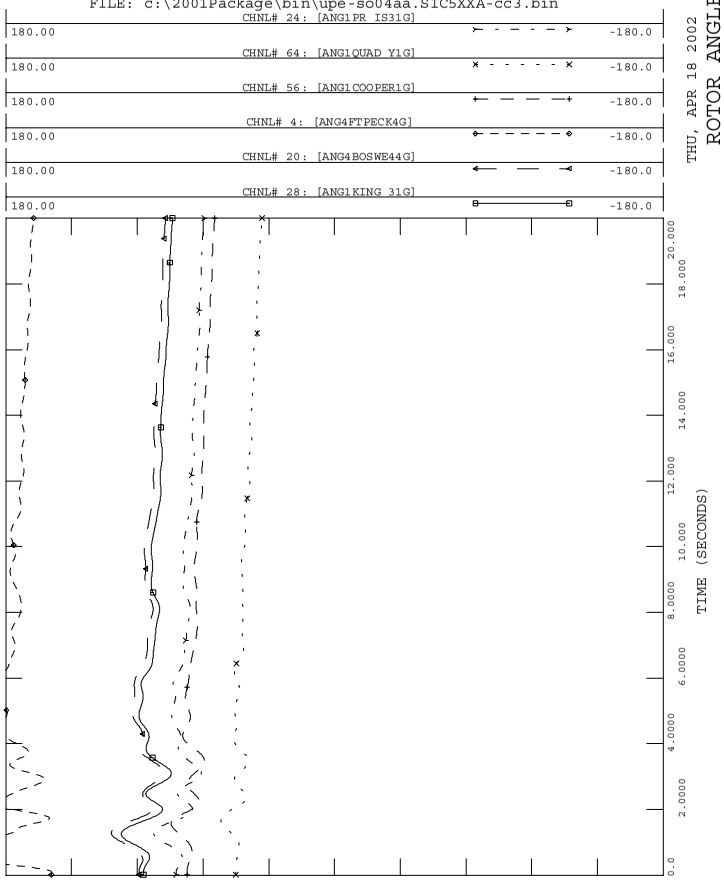
4 cycle 3 phase fault at Hettinger 500 kV on Hettinger-Glenham 500 kV. Trip Hettinger Glenham.

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



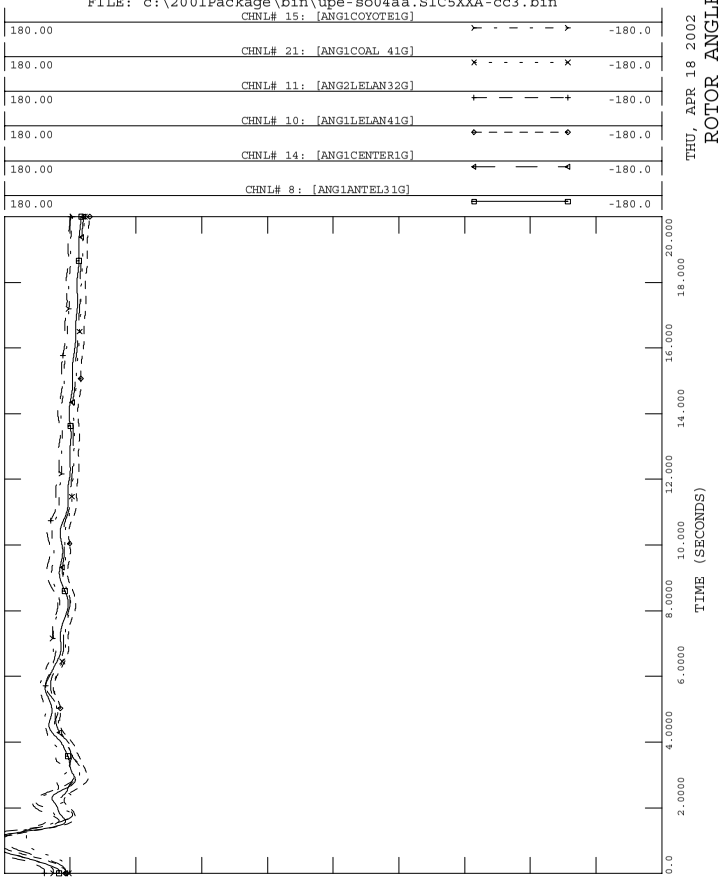
THU, APR 18 2002 17:44
ROTOR ANGLES 2

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



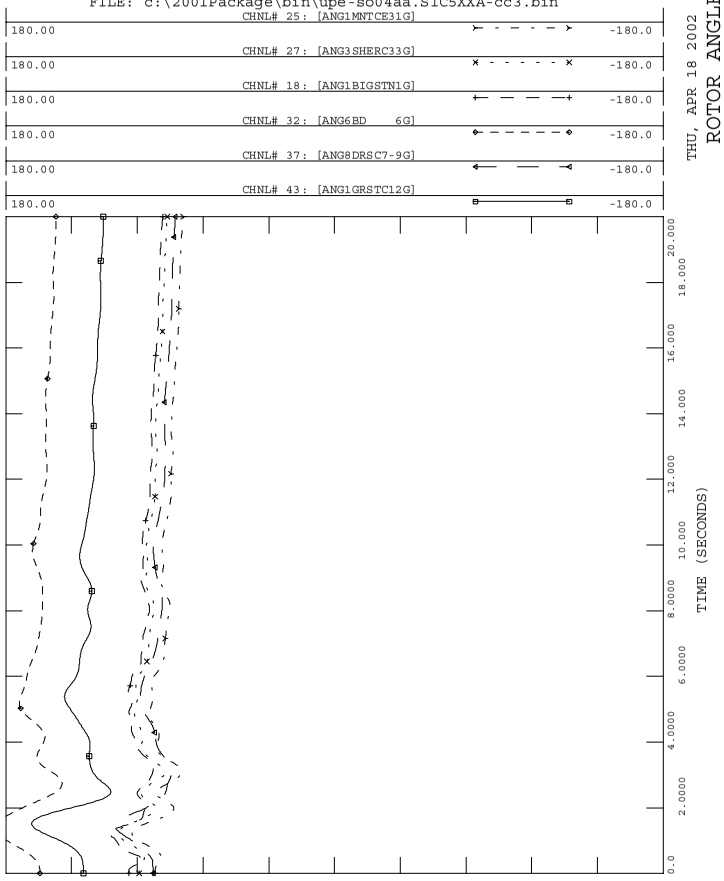
THU, APR 18 2002 17:44
ROTOR ANGLES 4

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



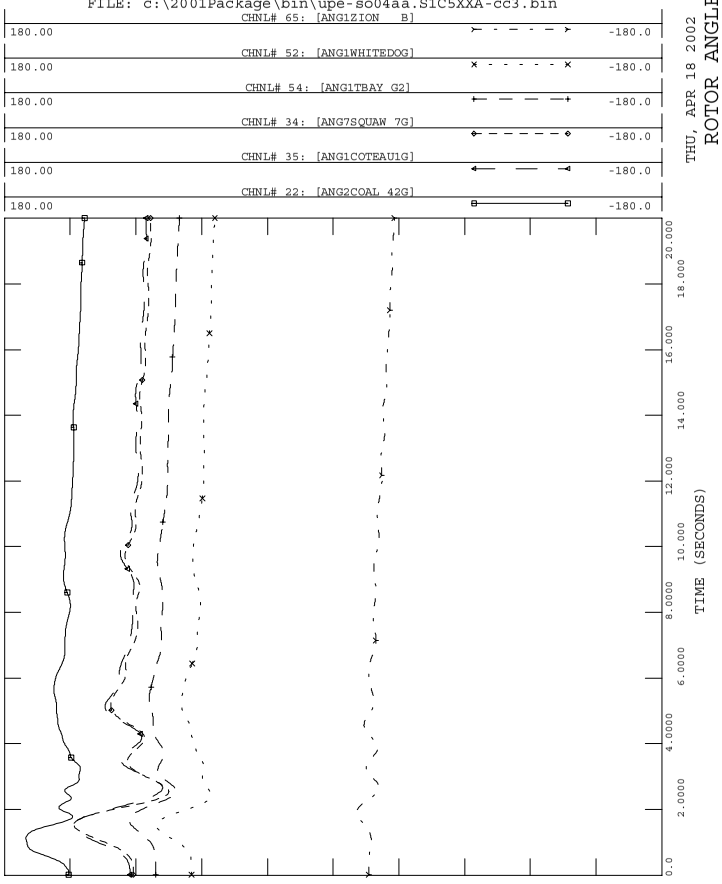
THU, APR 18 2002 17:44
ROTOR ANGLES 1

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



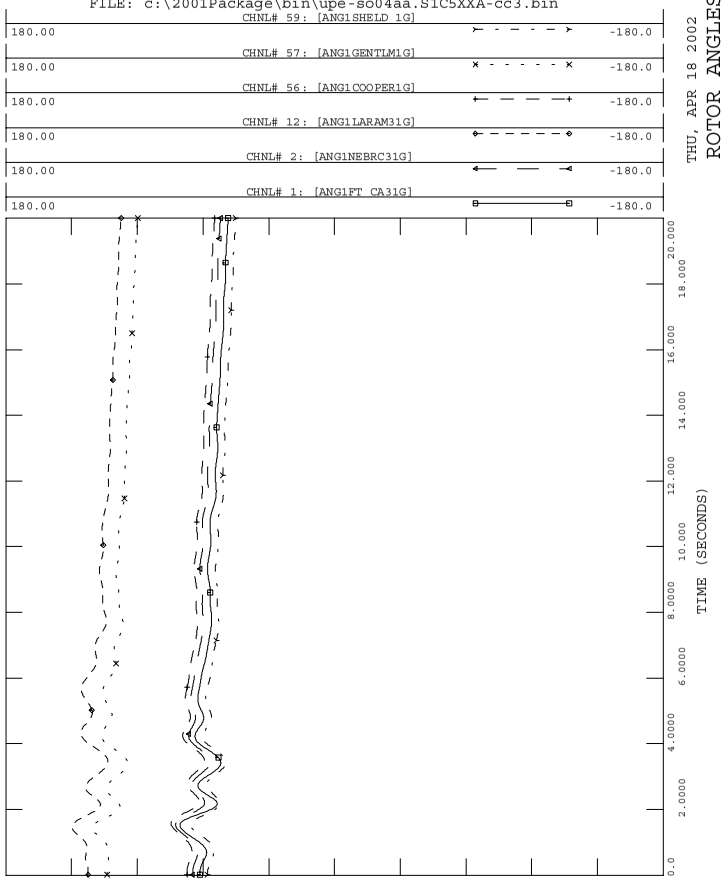
THU, APR 18 2002 17:44
ROTOR ANGLES 3

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



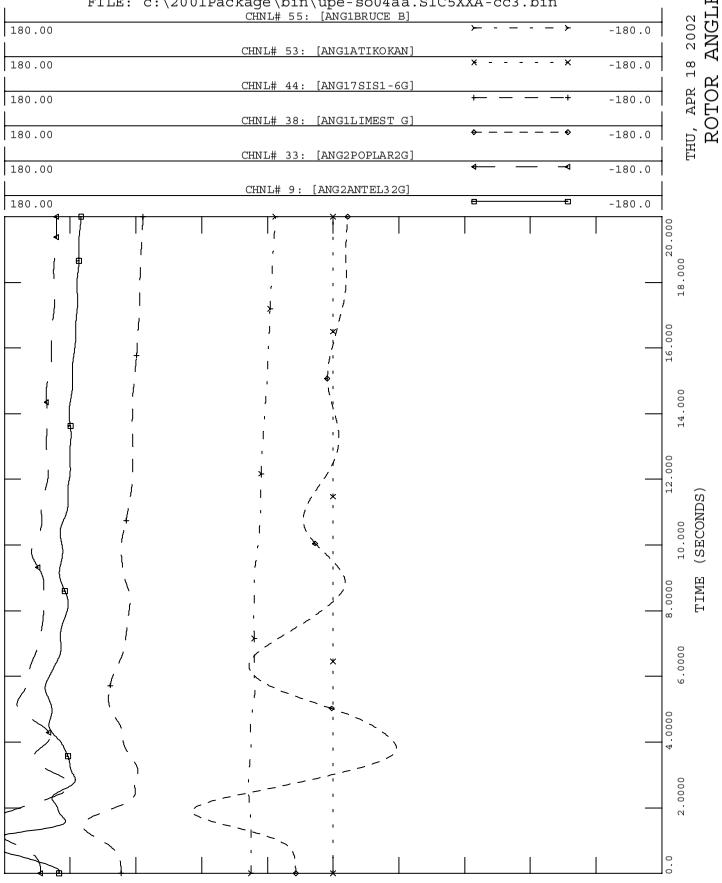
THU, APR 18 2002 17:44
ROTOR ANGLES 6

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



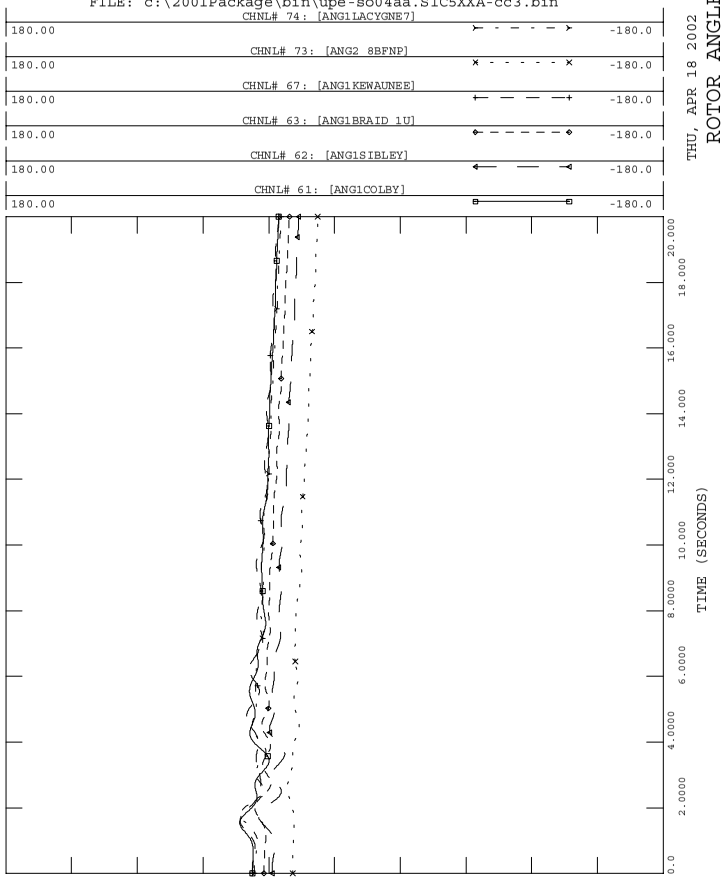
THU, APR 18 2002 17:44
ROTOR ANGLES NB

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



THU, APR 18 2002 17:44
ROTOR ANGLES 5

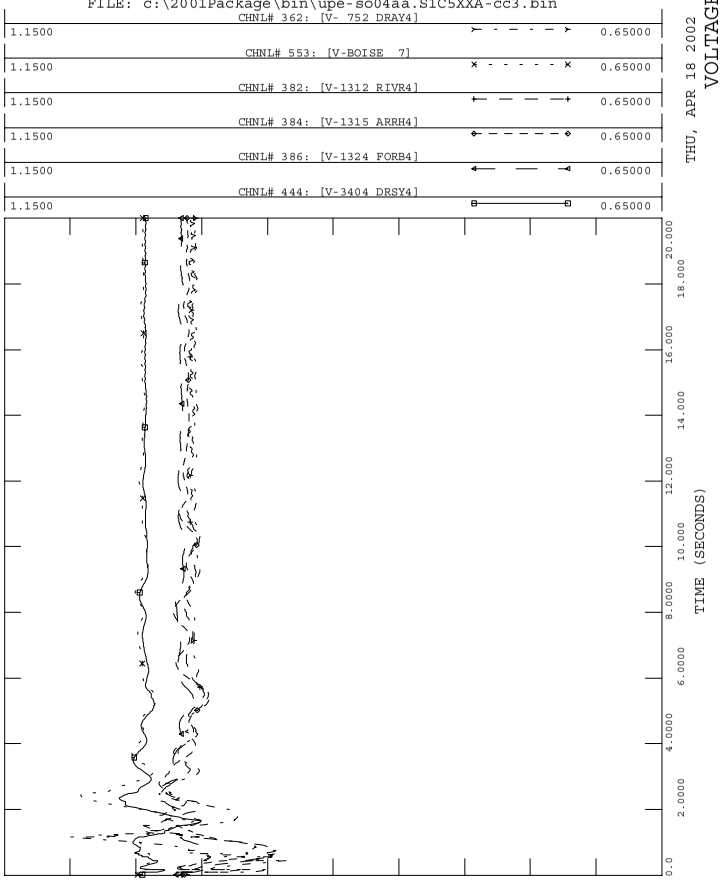
UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



THU, APR 18 2002 17:44
ROTOR ANGLES 7

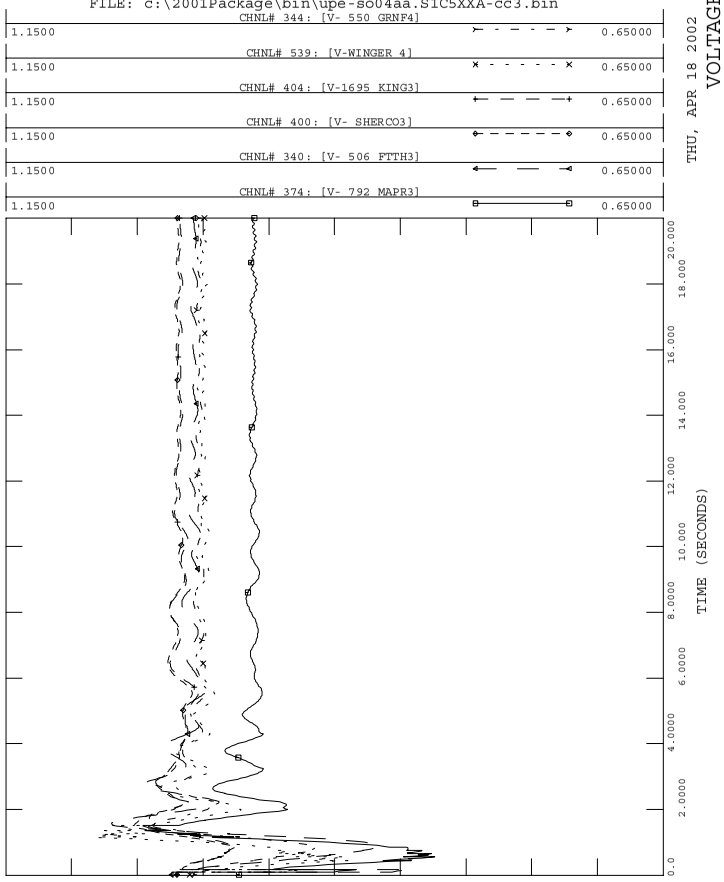
UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

THU, APR 18 2002 17:44
VOLTAGES 1



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

THU, APR 18 2002 17:44
VOLTAGES 3



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ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
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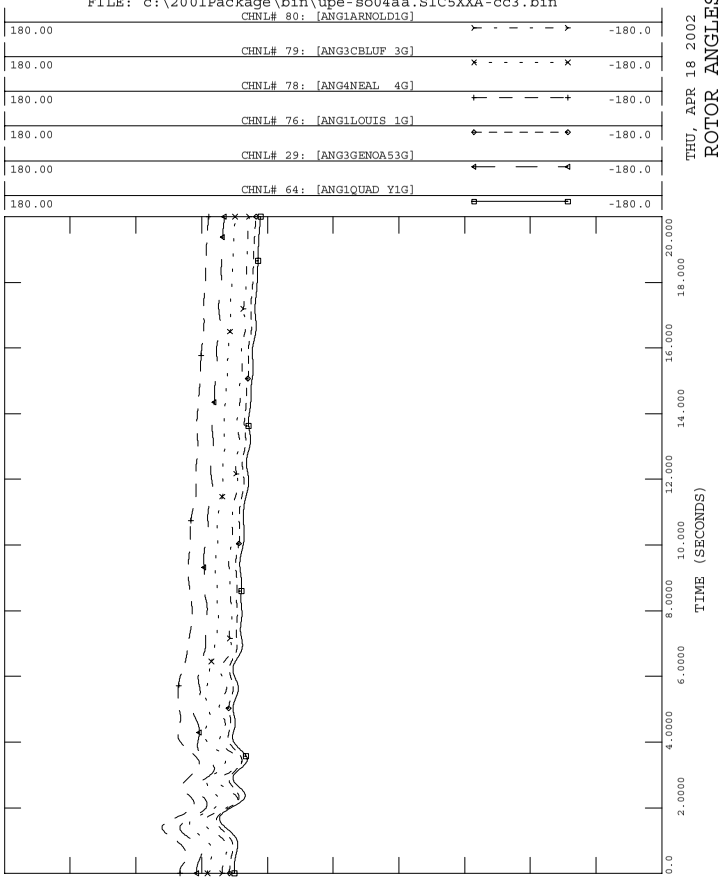
THU, APR 18 2002 17:44
ROTOR ANGLES IA



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
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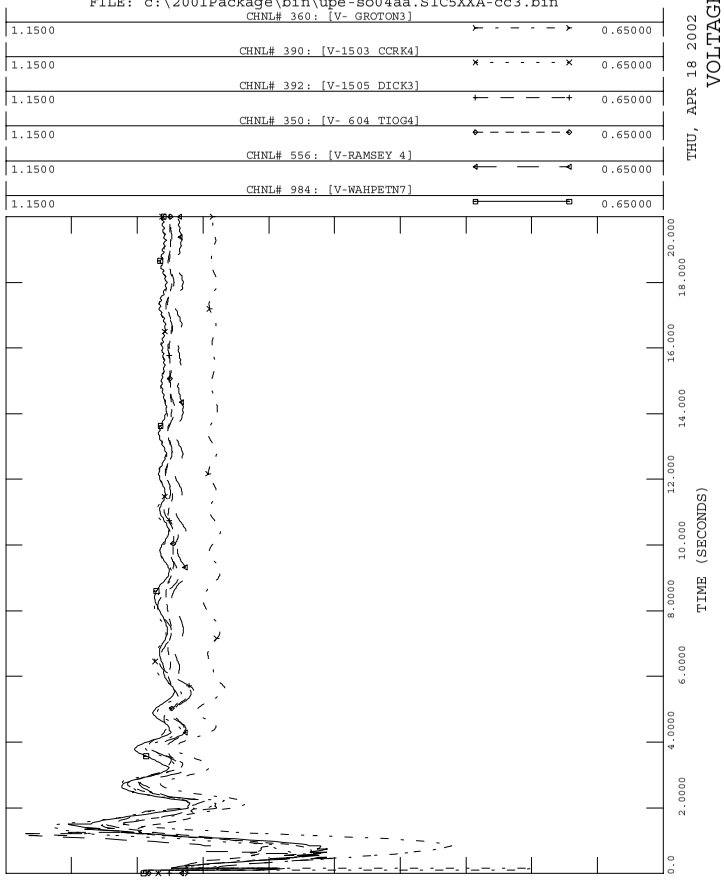
THU, APR 18 2002 17:44
VOLTAGES 2



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
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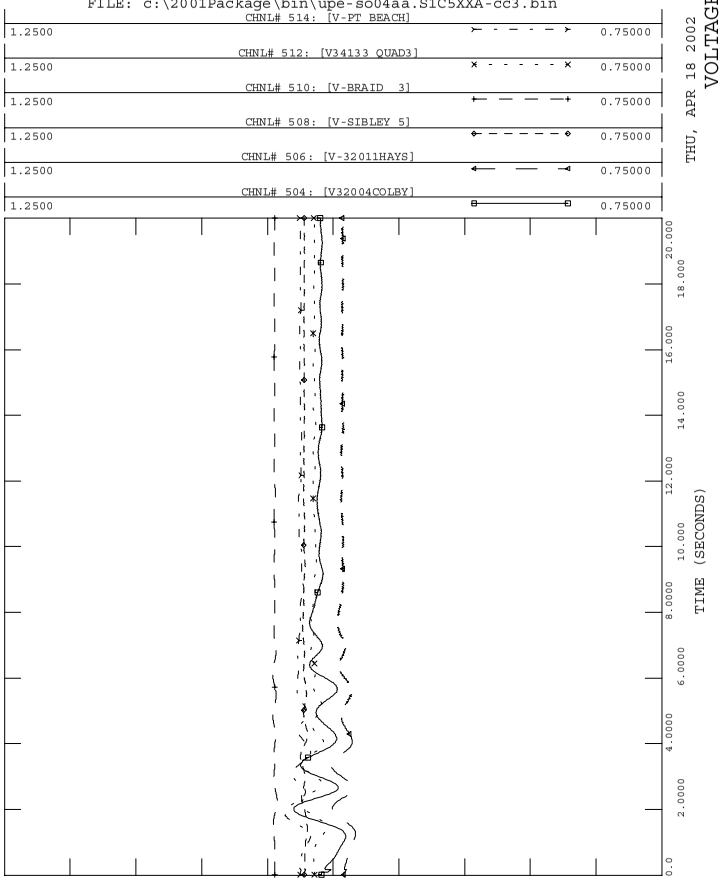
THU, APR 18 2002 17:44
VOLTAGES 5



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
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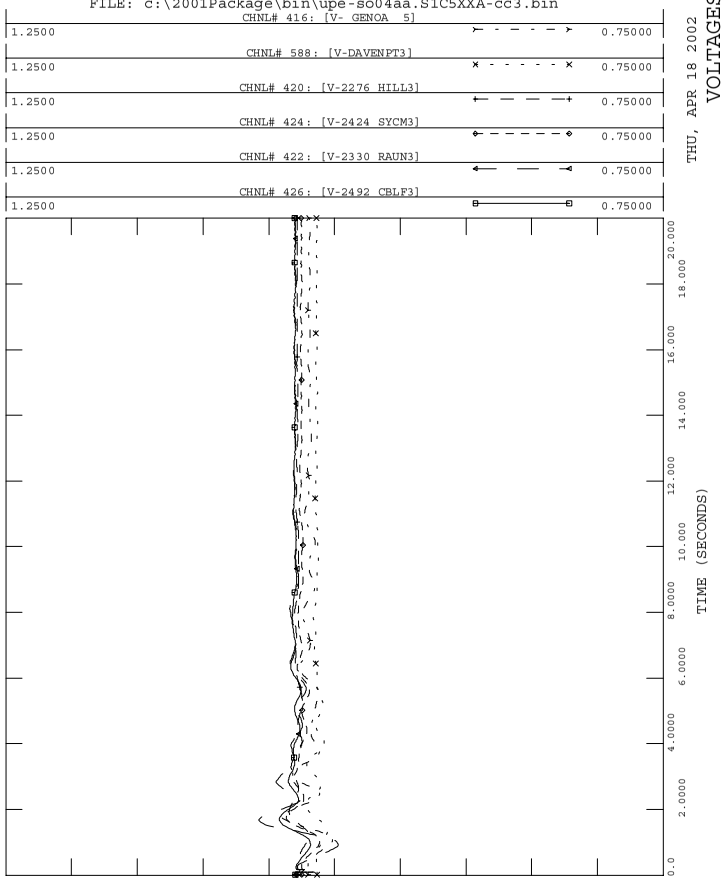
THU, APR 18 2002 17:44
VOLTAGES IA



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TRIP HETTINGER GLENHAM 500KV LINE
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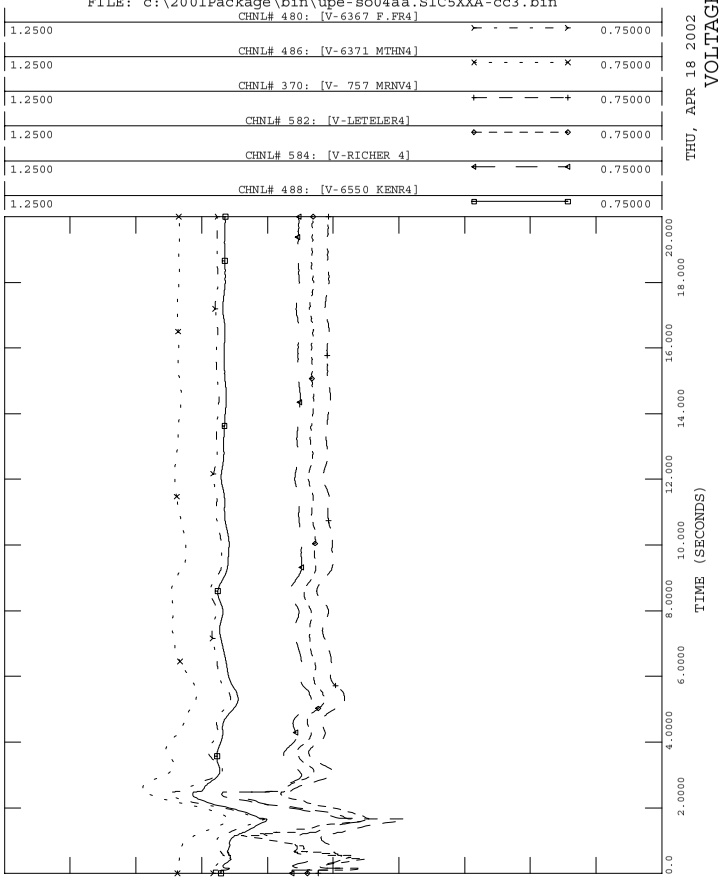
THU, APR 18 2002 17:44
VOLTAGES 4



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
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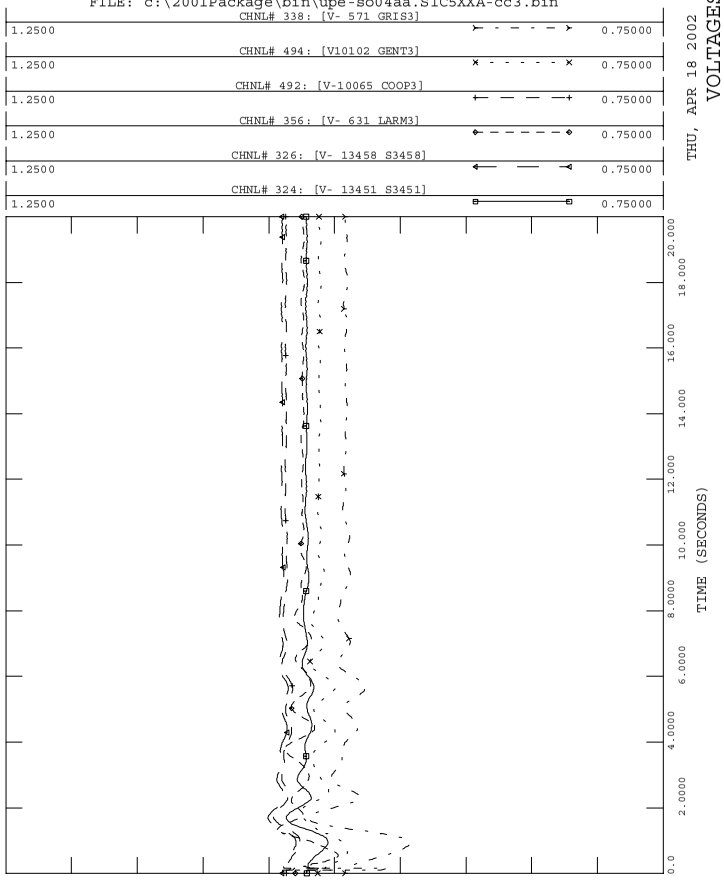
THU, APR 18 2002 17:44
VOLTAGES NB



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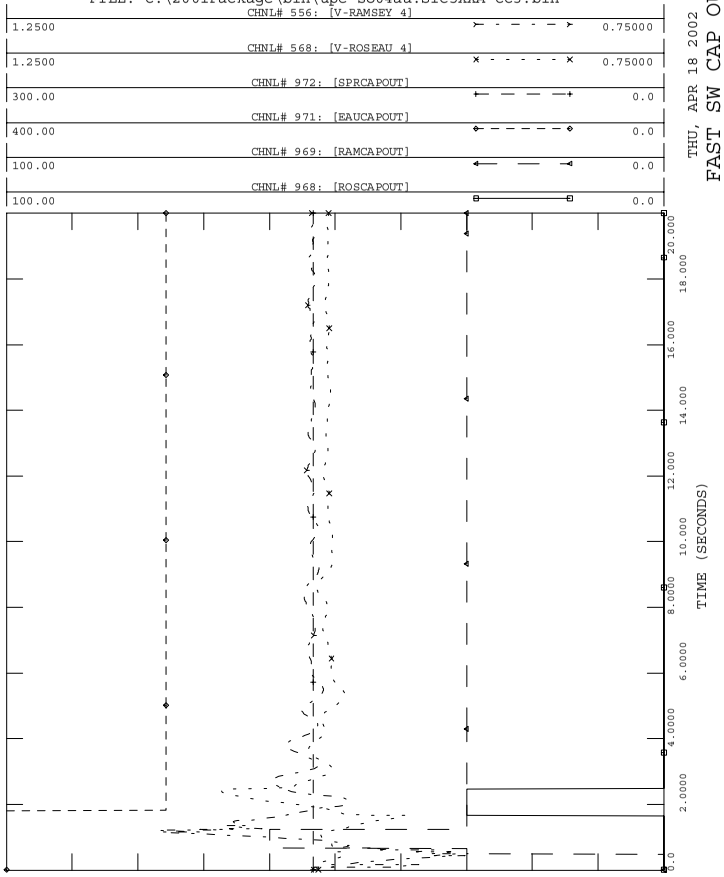
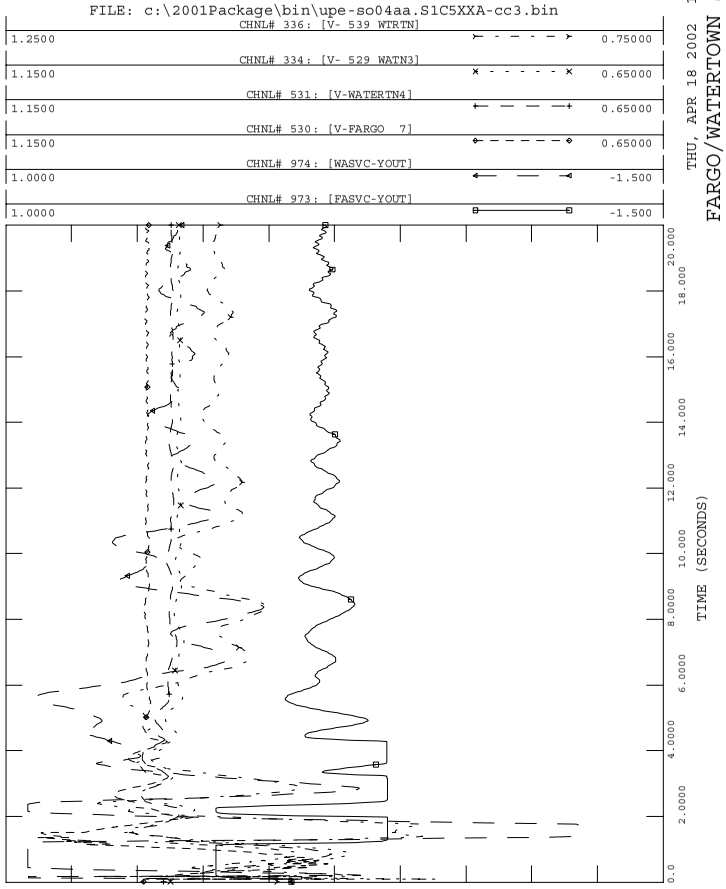
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



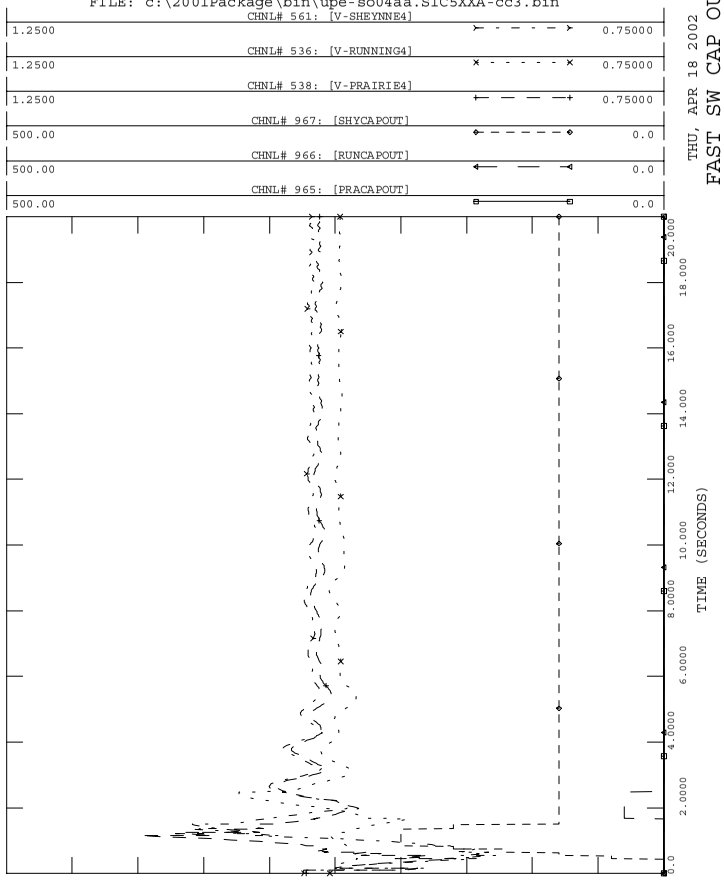
THU, APR 18 2002 17:44
FAST SW CAP OUT 2

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



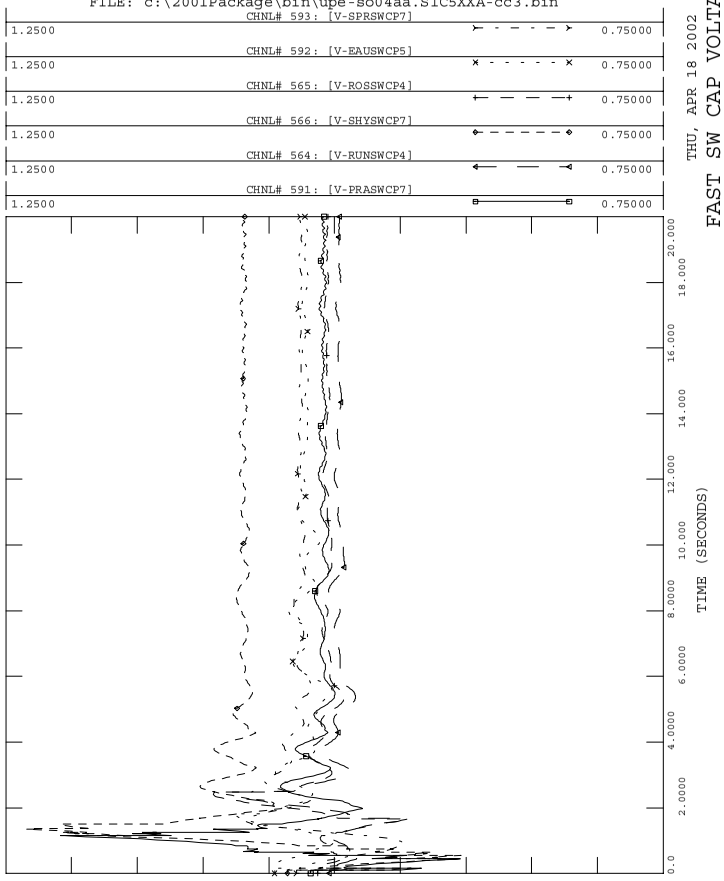
THU, APR 18 2002 17:44
FARGO/WATERTOWN SVS

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



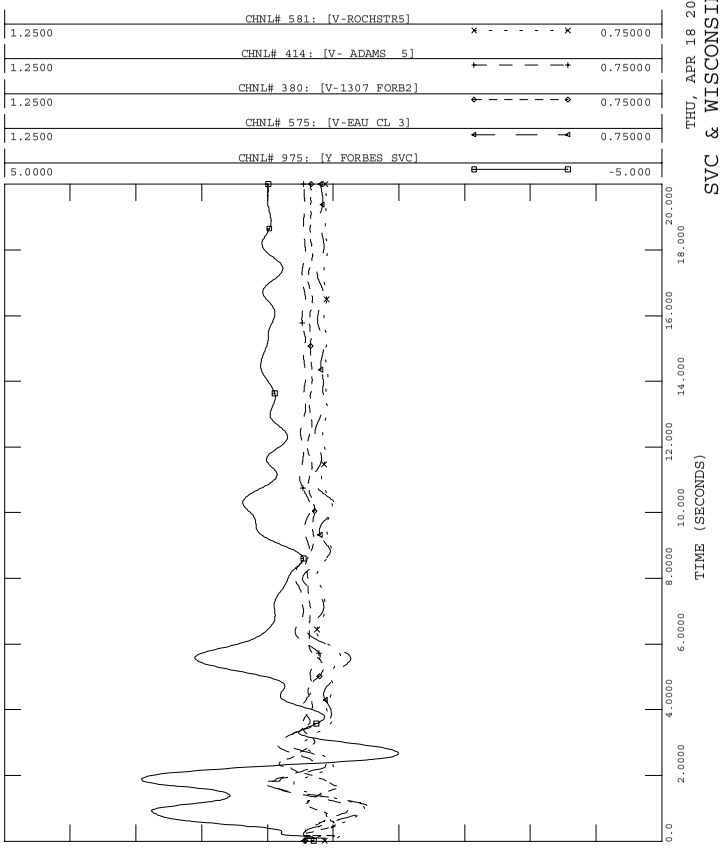
THU, APR 18 2002 17:44
FAST SW CAP OUT 1

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



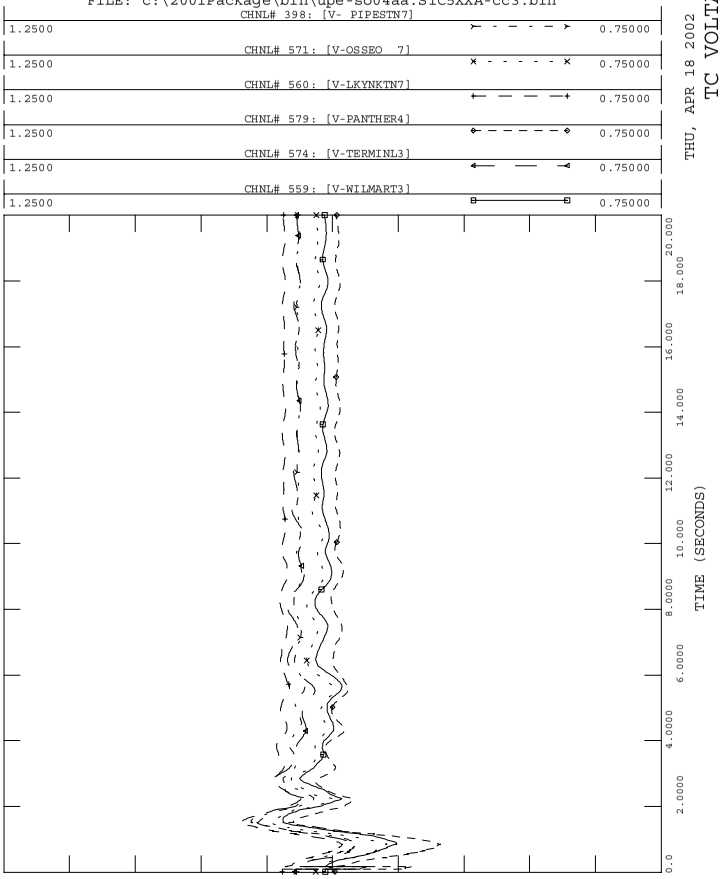
THU, APR 18 2002 17:44
FAST SW CAP VOLTAGES

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



THU, APR 18 2002 17:44
SVC & WISCONSIN VOLT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



THU, APR 18 2002 17:44
TC VOLTAGES

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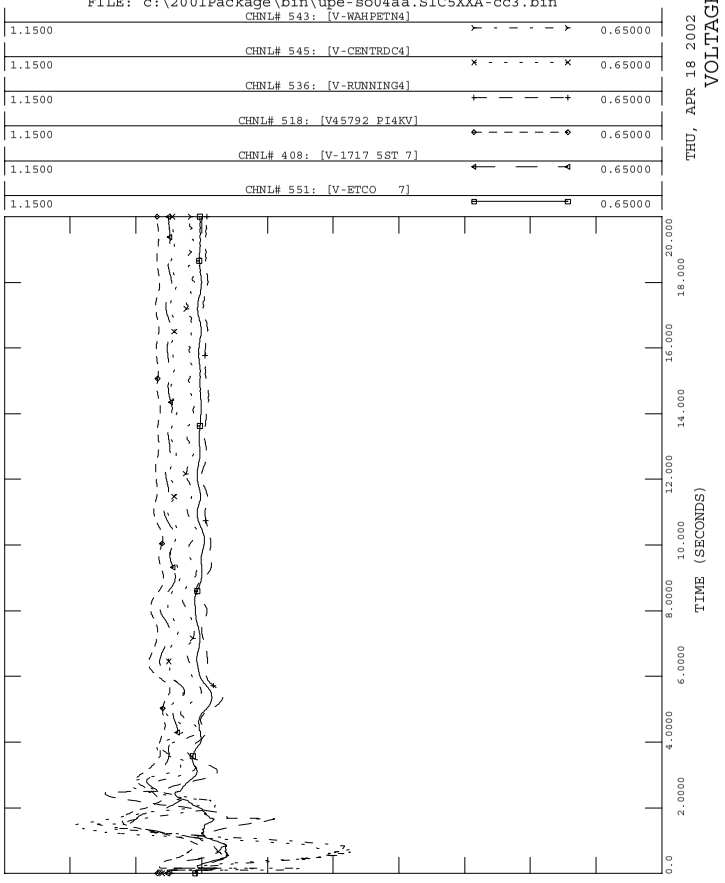
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



THU, APR 18 2002 17:44
VOLTAGES 6

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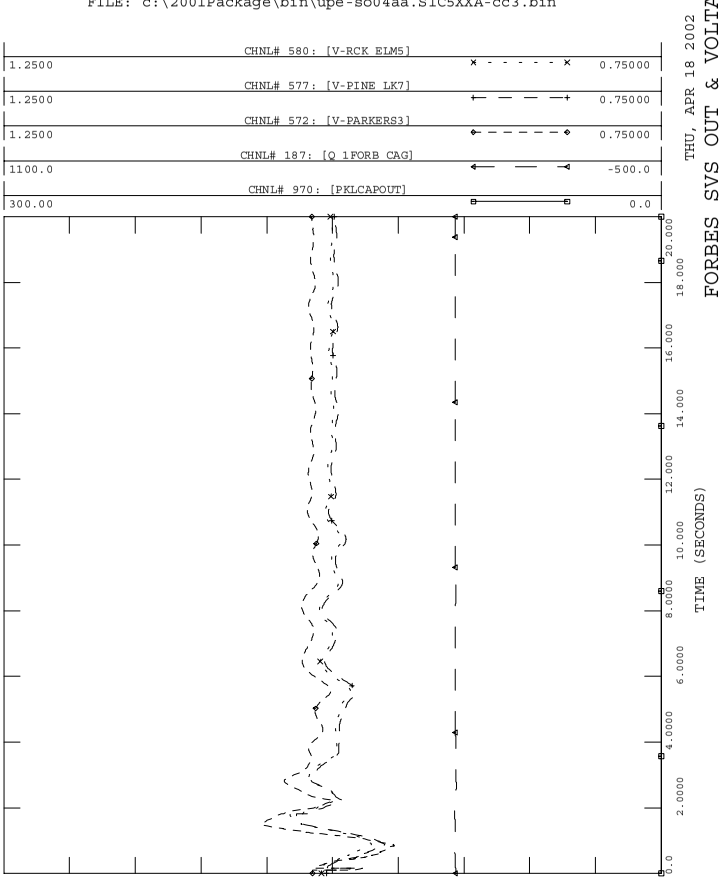
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



THU, APR 18 2002 17:44
FORBES SVS OUT & VOLTAGES

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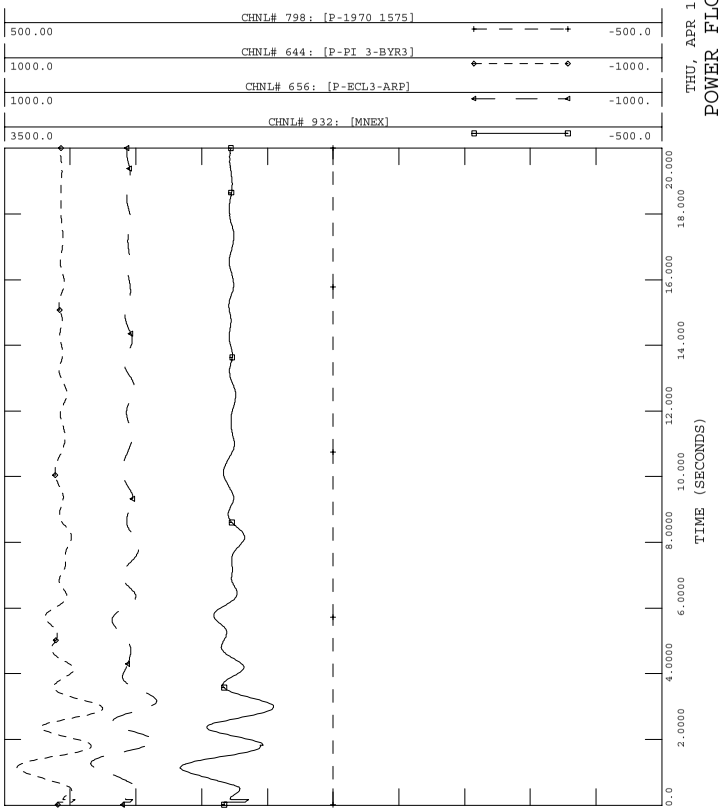
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

THU, APR 18 2002 17:44
POWER FLOW SUMS 2



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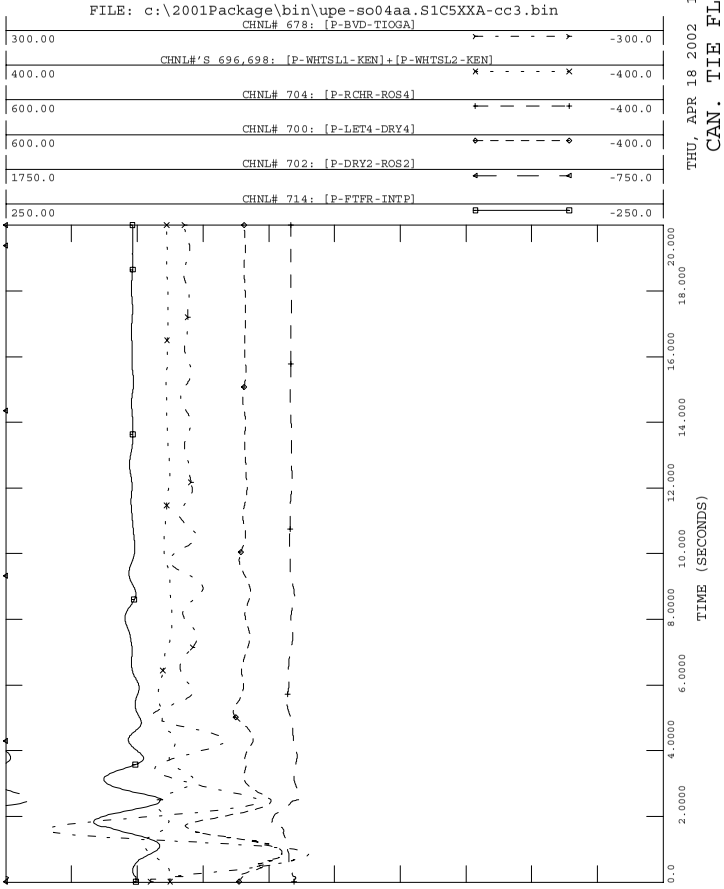
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

THU, APR 18 2002 17:44
CAN. TIE FLOWS



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4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
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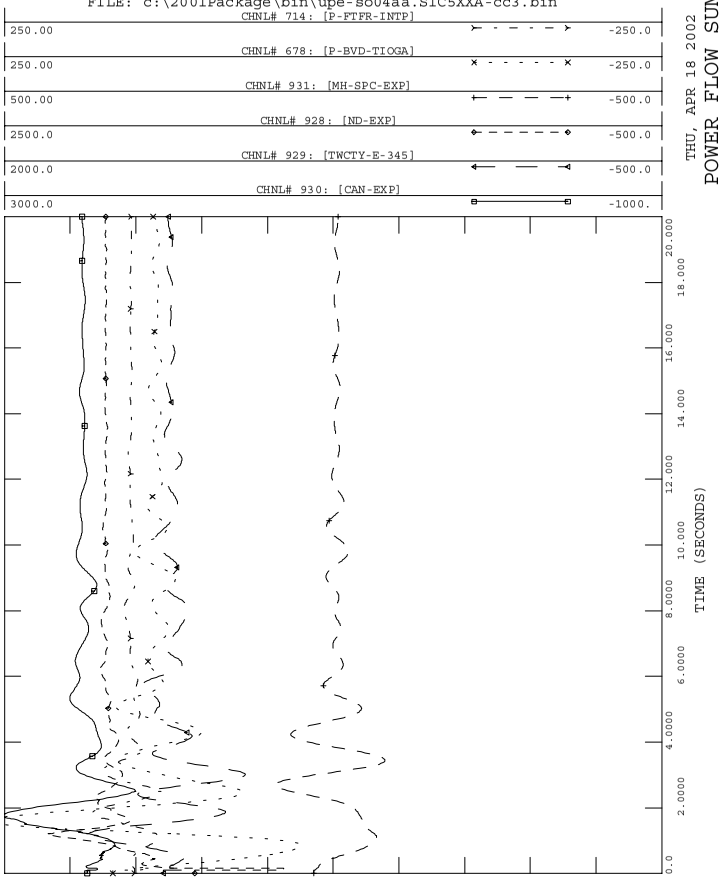
THU, APR 18 2002 17:44
POWER FLOW SUMS 1



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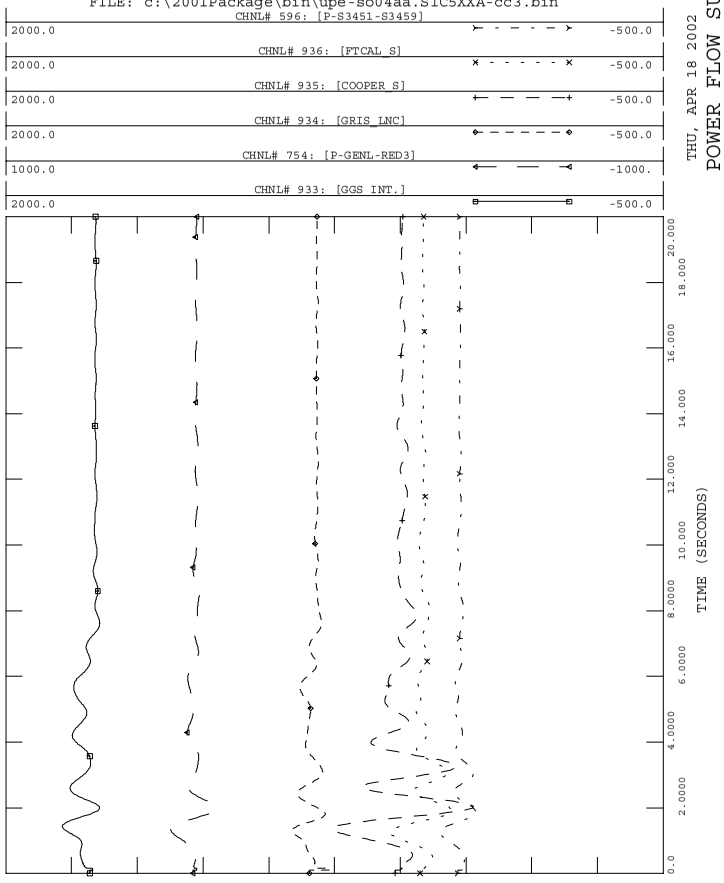
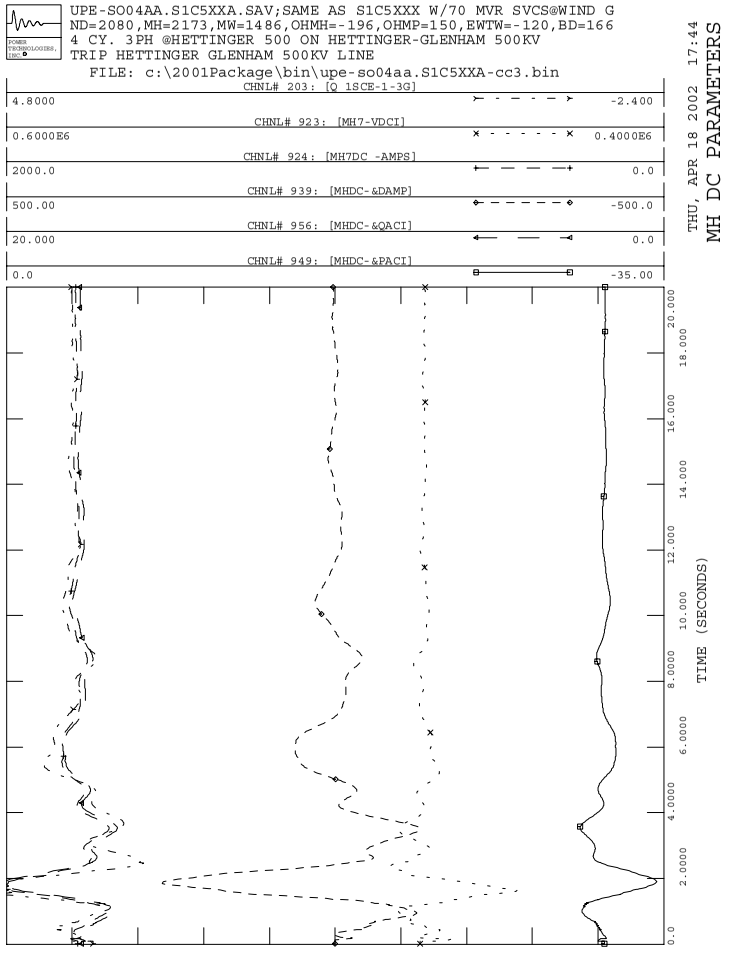
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

THU, APR 18 2002 17:44
POWER FLOW SUM 3

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ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
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CHNL# 949: [MHDC-&PACI]
0.0
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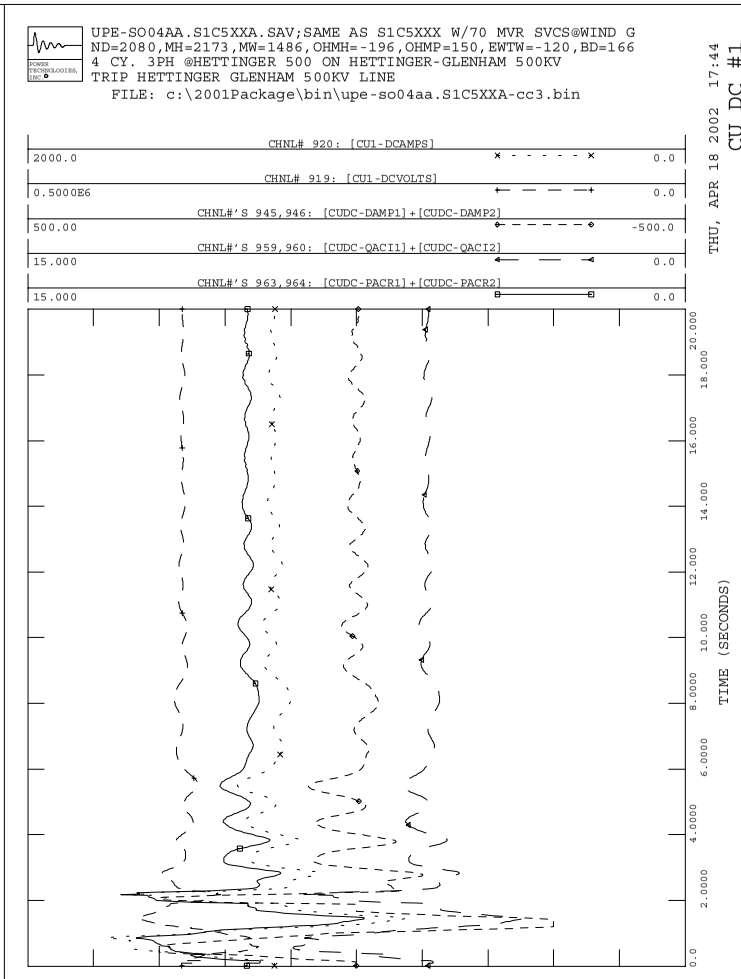
THU, APR 18 2002 17:44
MH DC PARAMETERS
TIME (SECONDS)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ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
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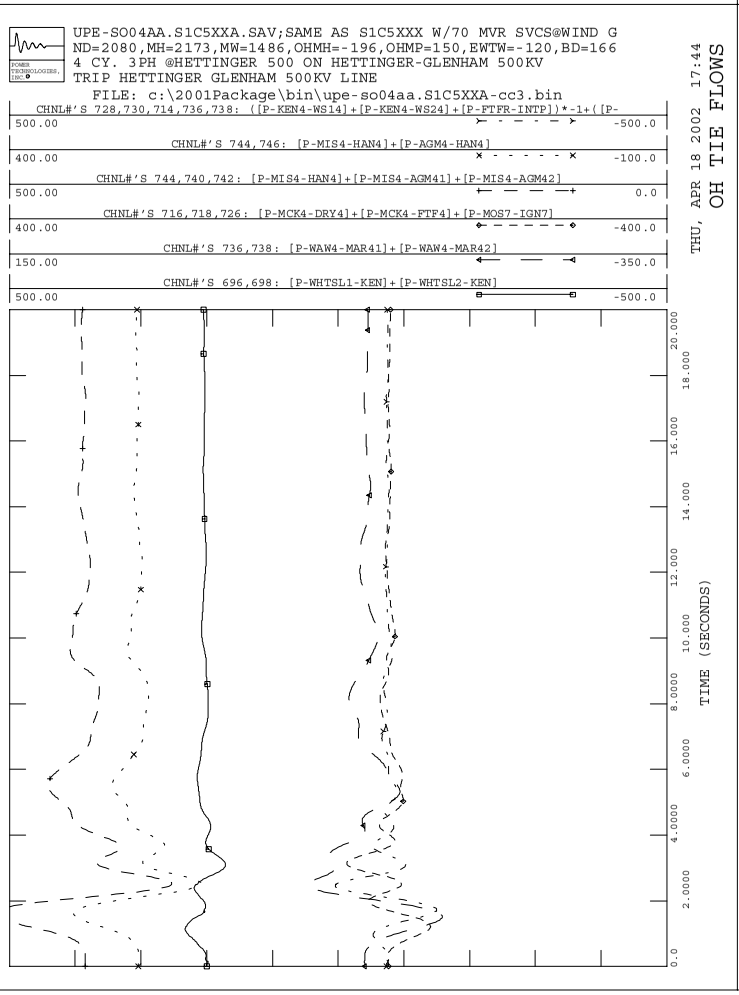
THU, APR 18 2002 17:44
CU DC #1
TIME (SECONDS)


UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
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CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
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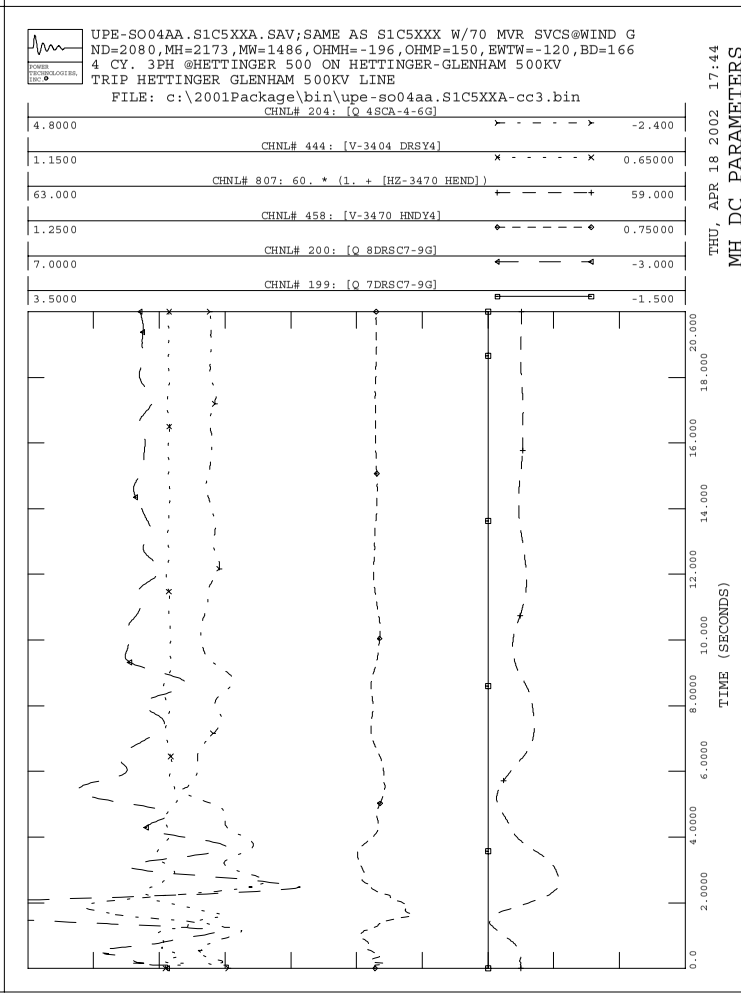
-500.0
THU, APR 18 2002 17:44
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
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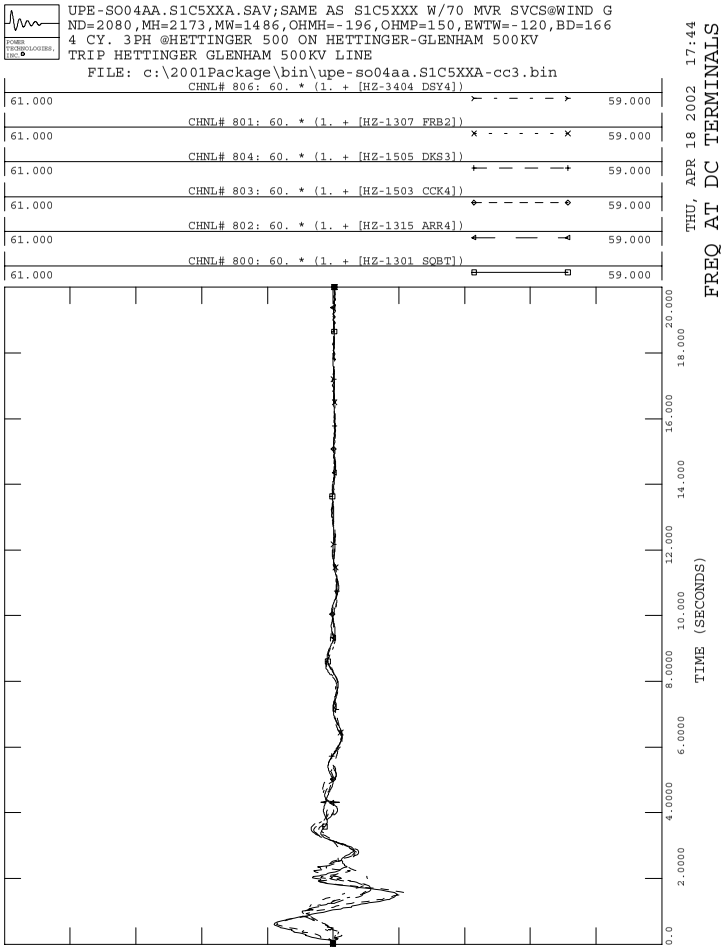
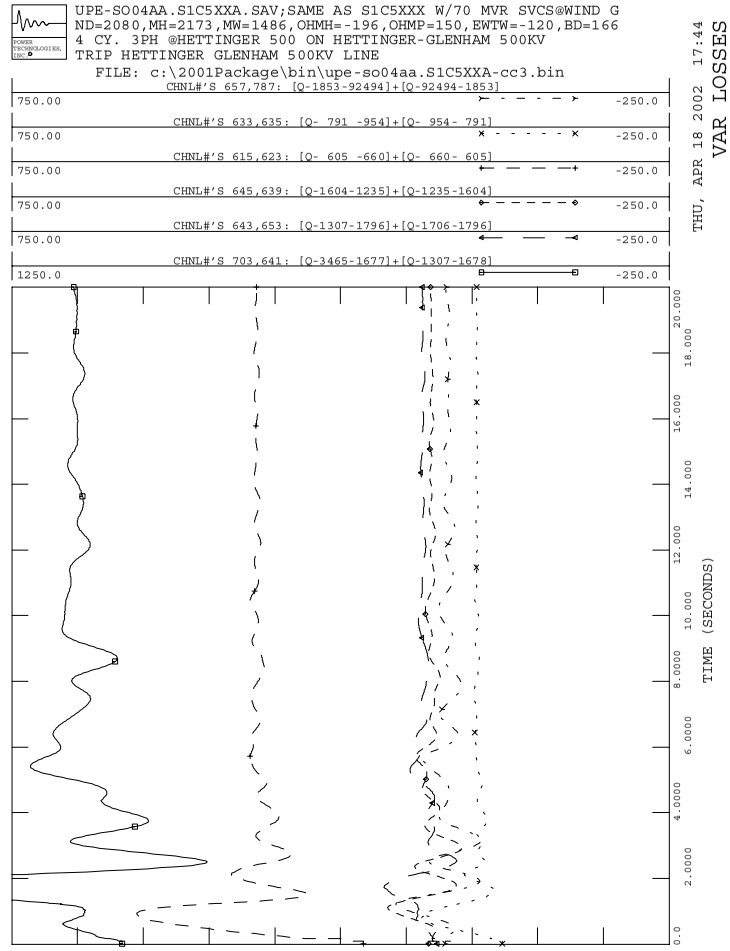
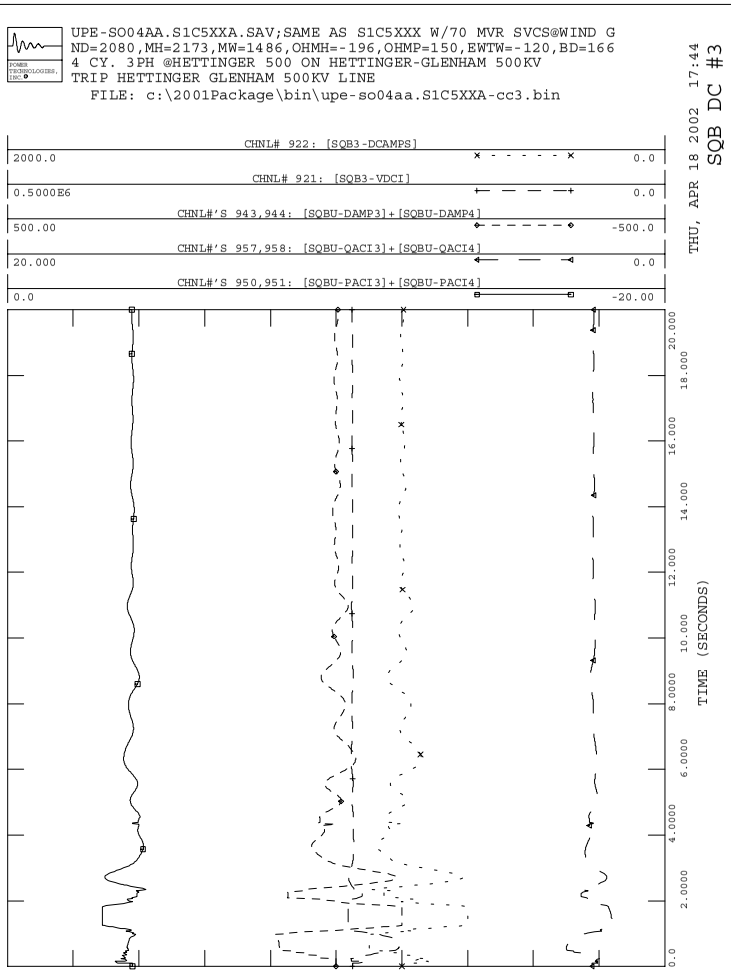
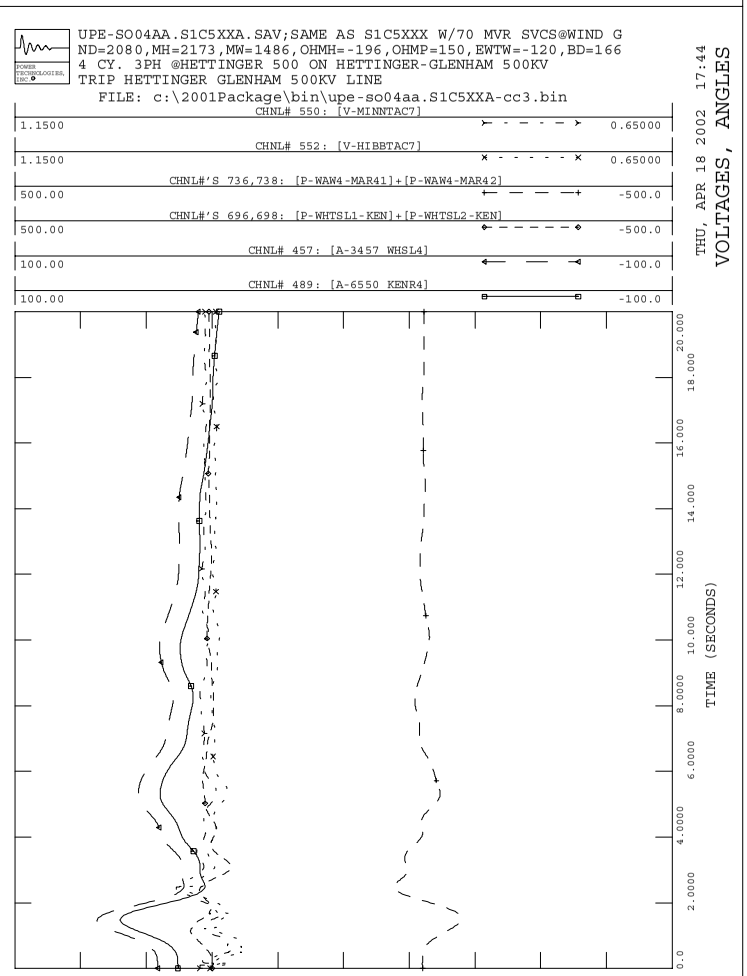
THU, APR 18 2002 17:44
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
THU, APR 18 2002 17:44
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
THU, APR 18 2002 17:44
VAR LOSSES
TIME (SECONDS)

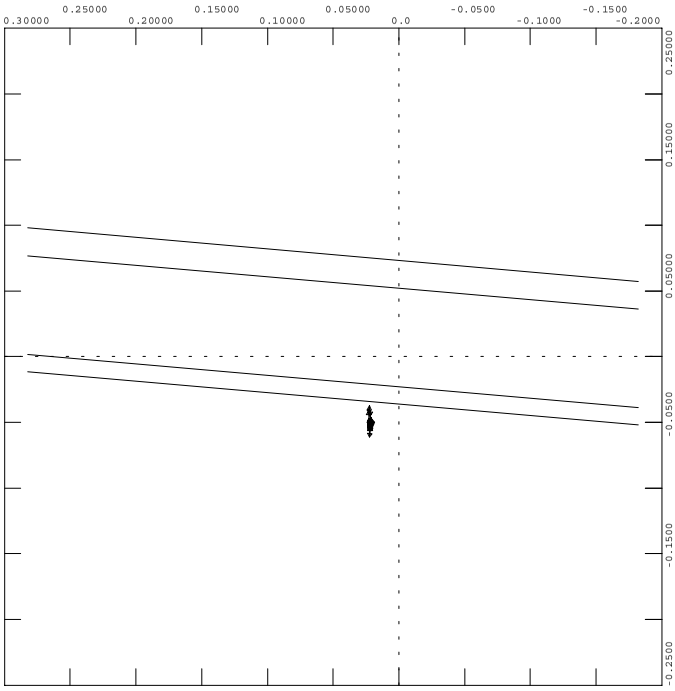

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
THU, APR 18 2002 17:44
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
THU, APR 18 2002 17:44
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

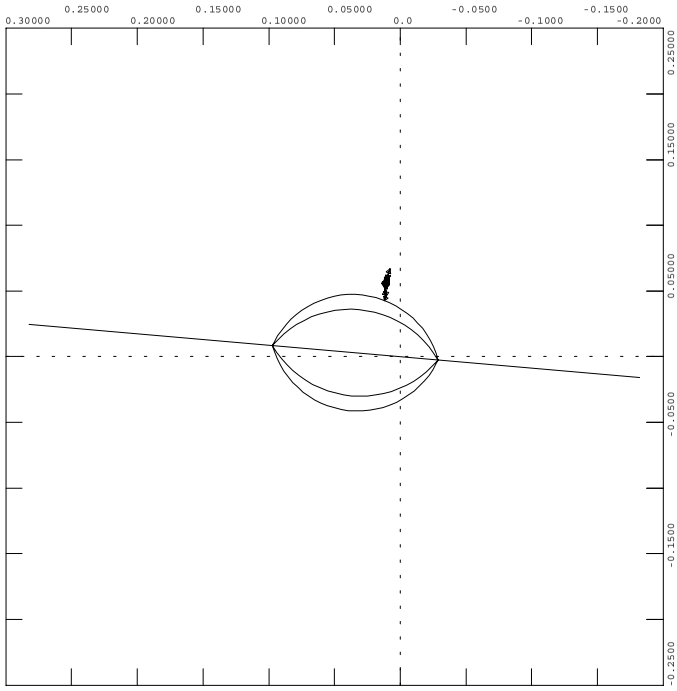


THU, APR 18 2002 17:44
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

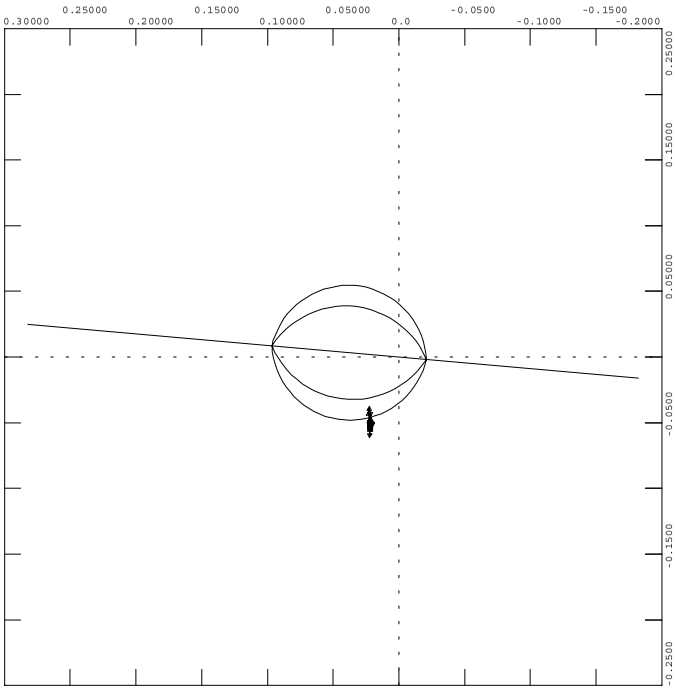


THU, APR 18 2002 17:44
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

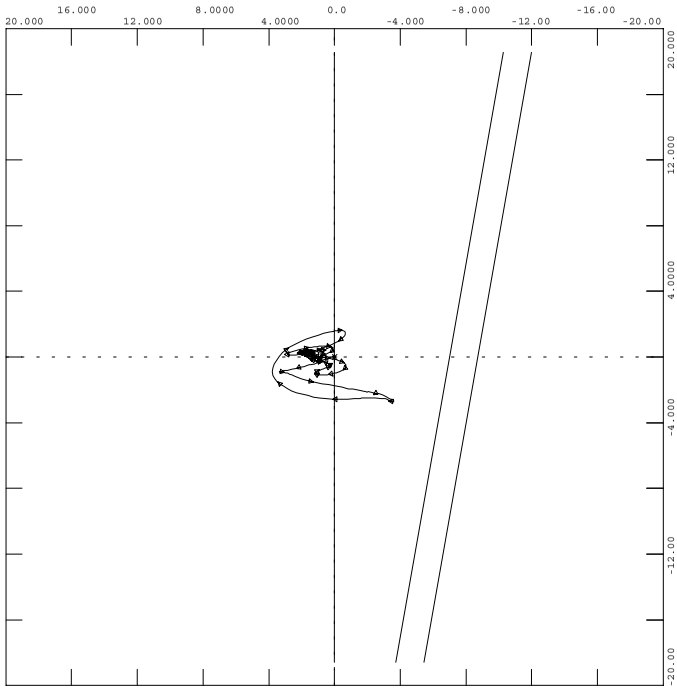


THU, APR 18 2002 17:44
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

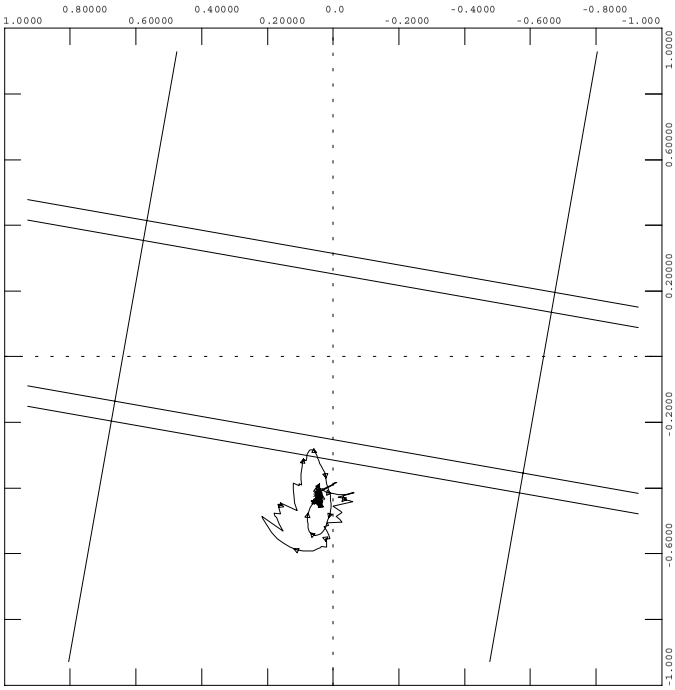


THU, APR 18 2002 17:44
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

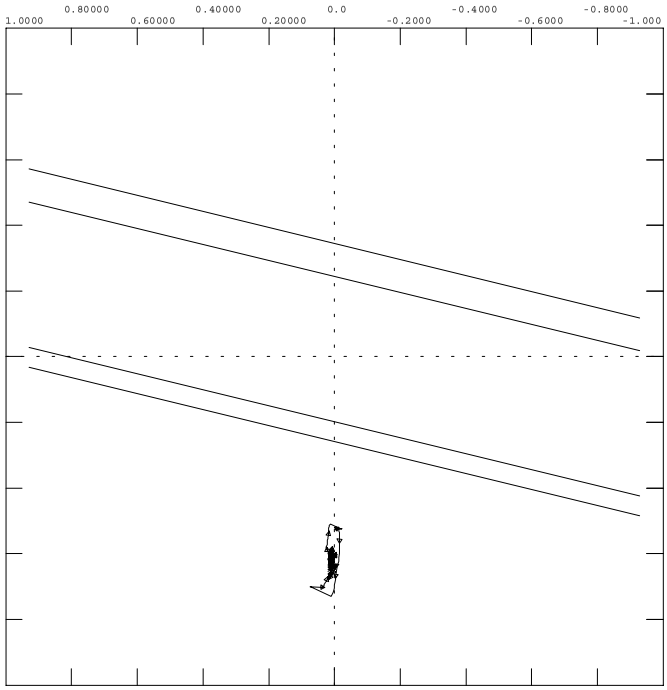
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

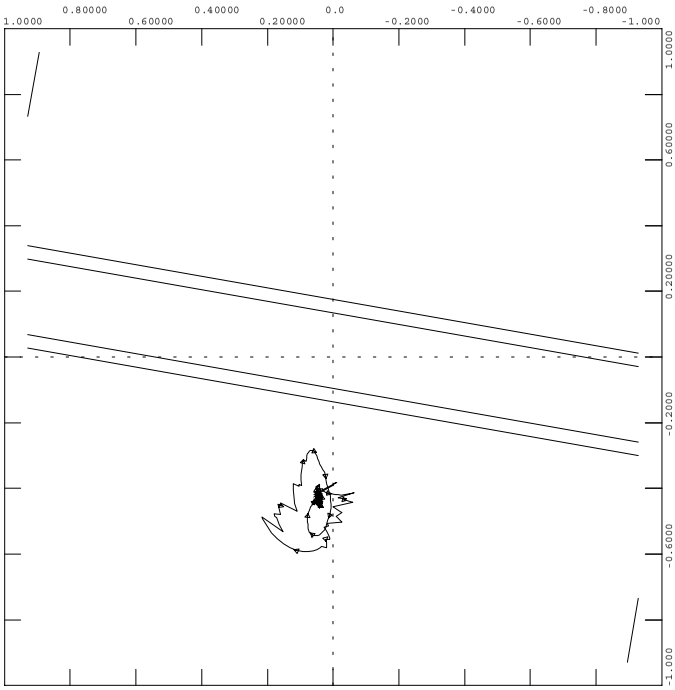
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

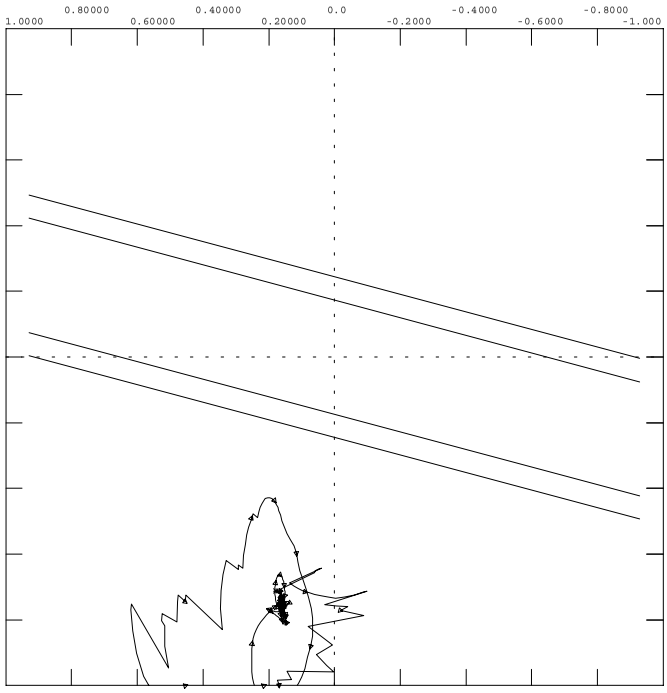
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

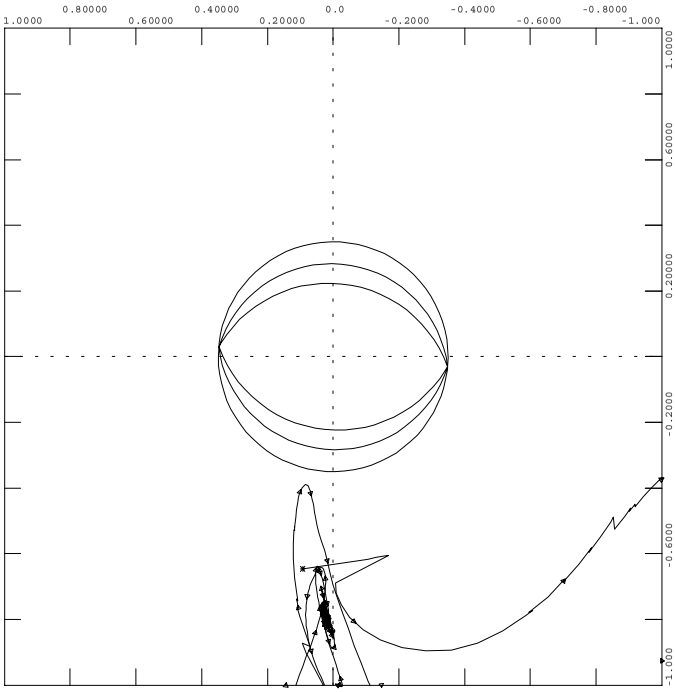
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

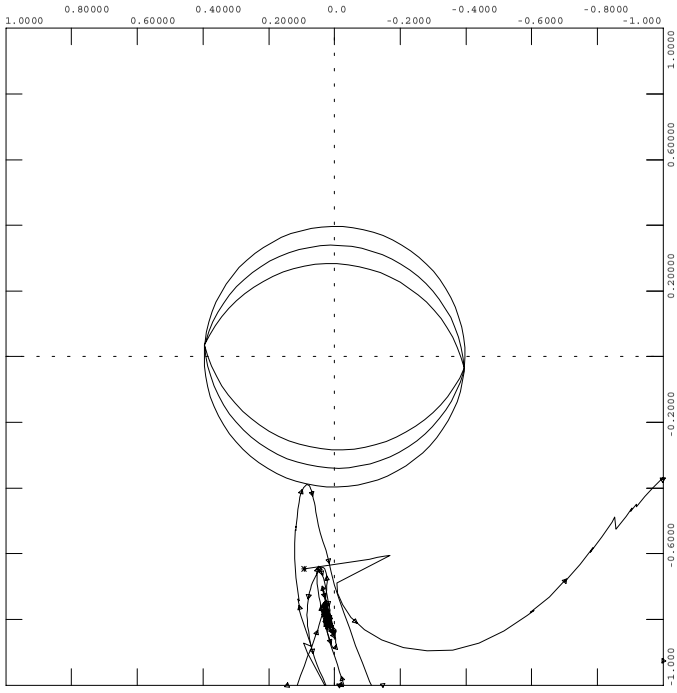
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

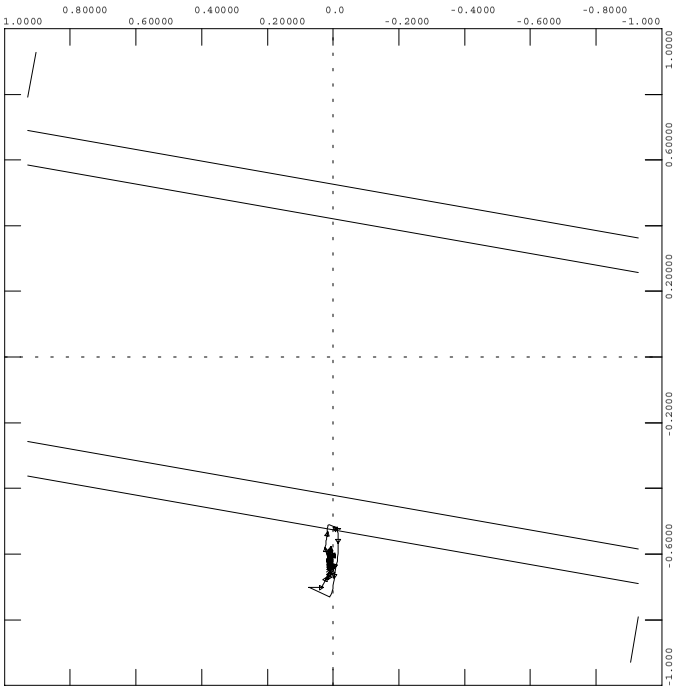
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

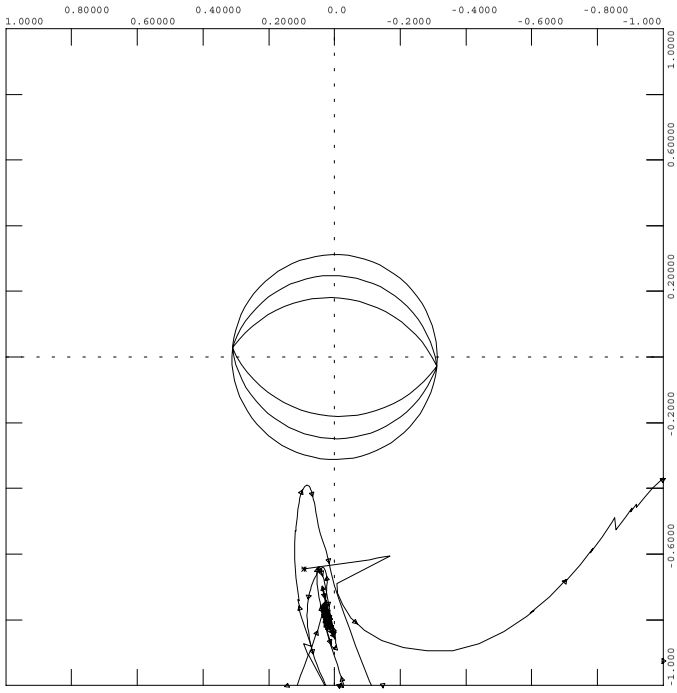
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



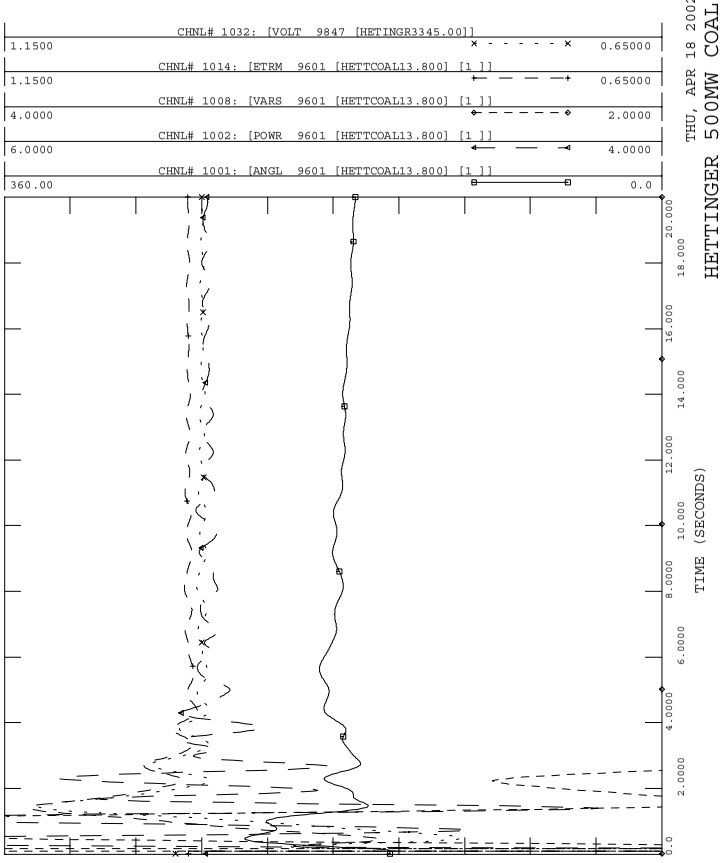
UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

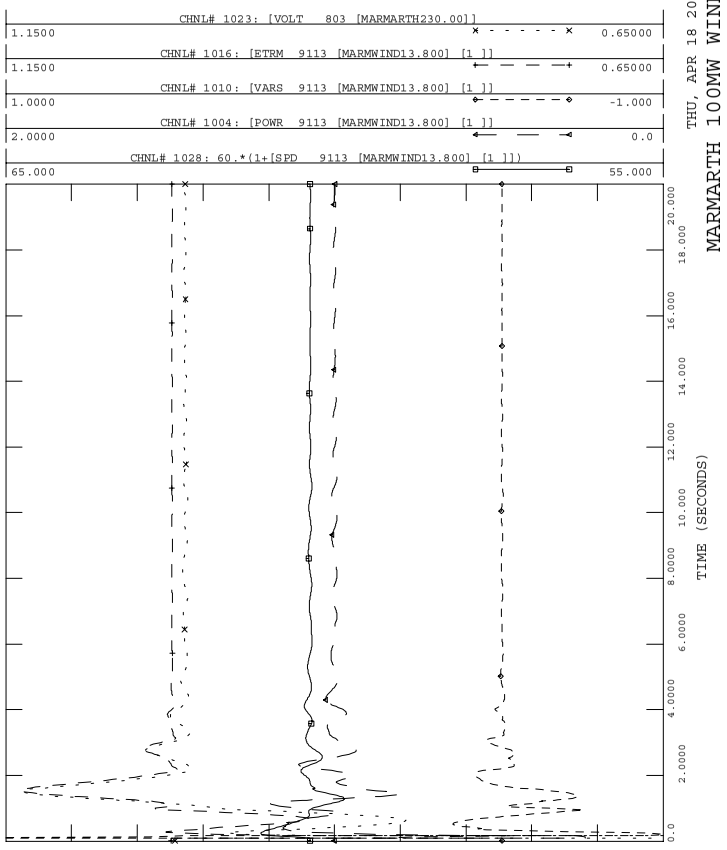


UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



THU, APR 18 2002 17:44
HETTINGER 500MW COAL UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

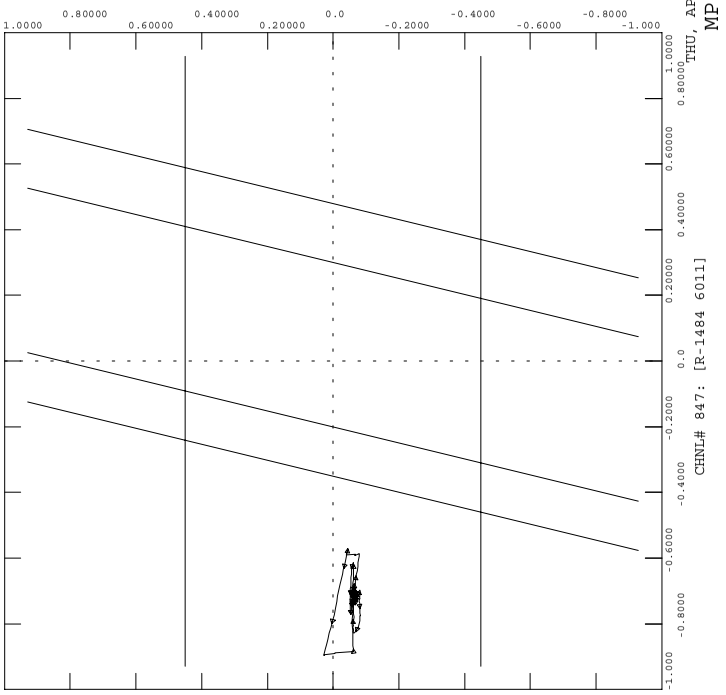


THU, APR 18 2002 17:44
MARMARTH 100MW WIND UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE

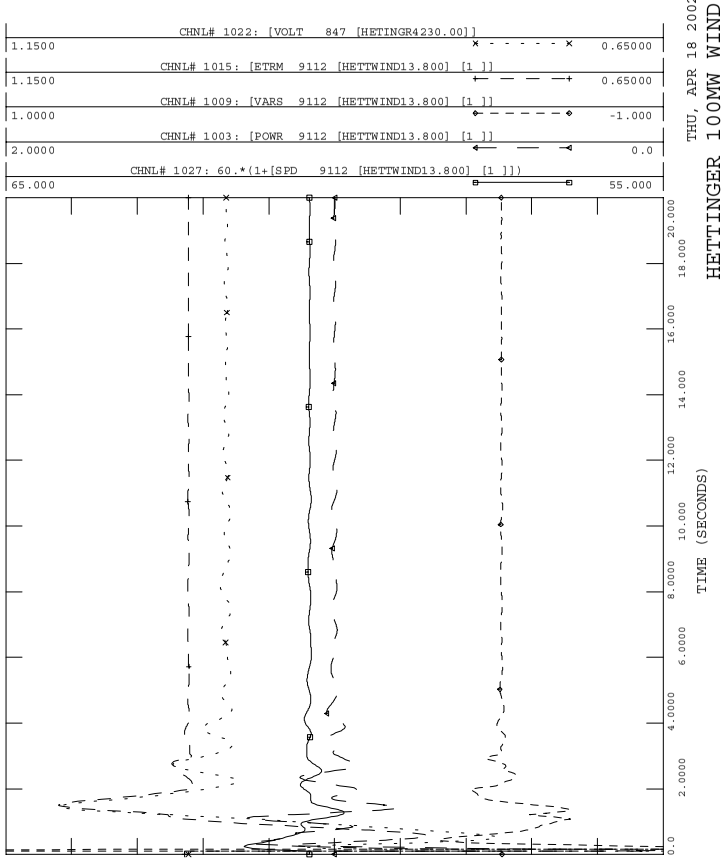
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



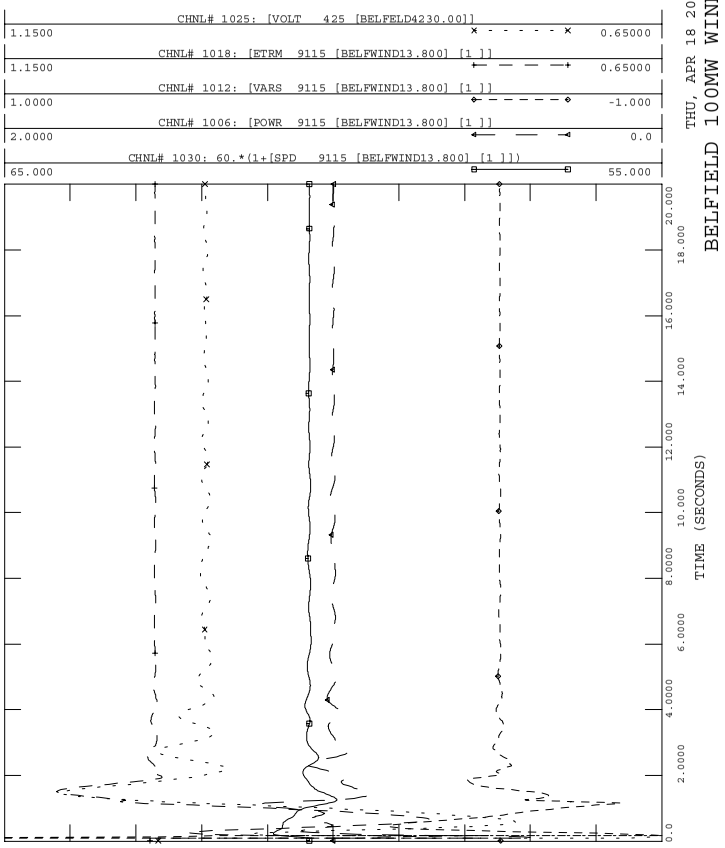
THU, APR 18 2002 17:44
MP-OH I.FALLS (779)

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



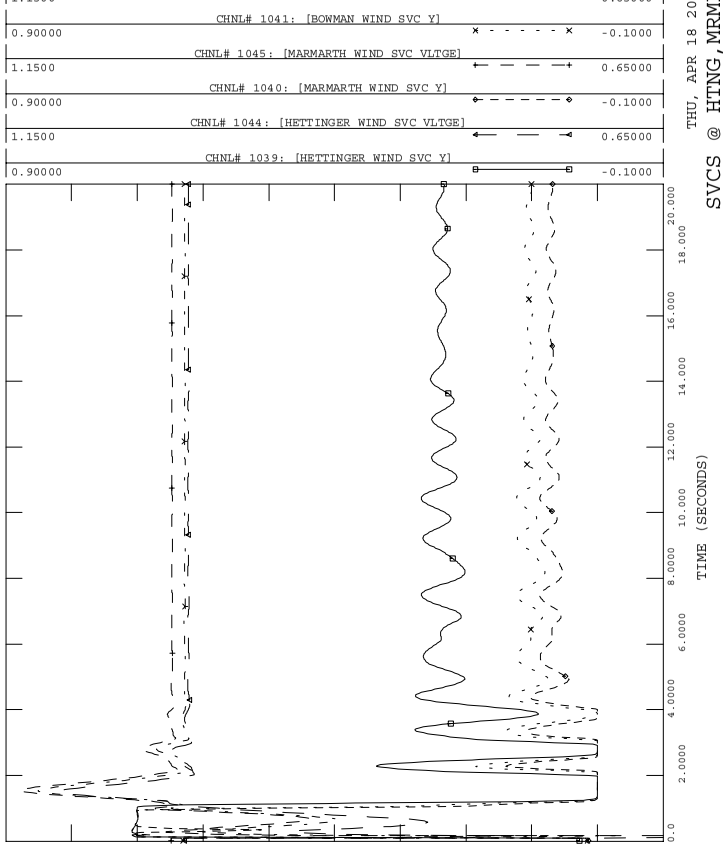
THU, APR 18 2002 17:44
HETTINGER 100MW WIND UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



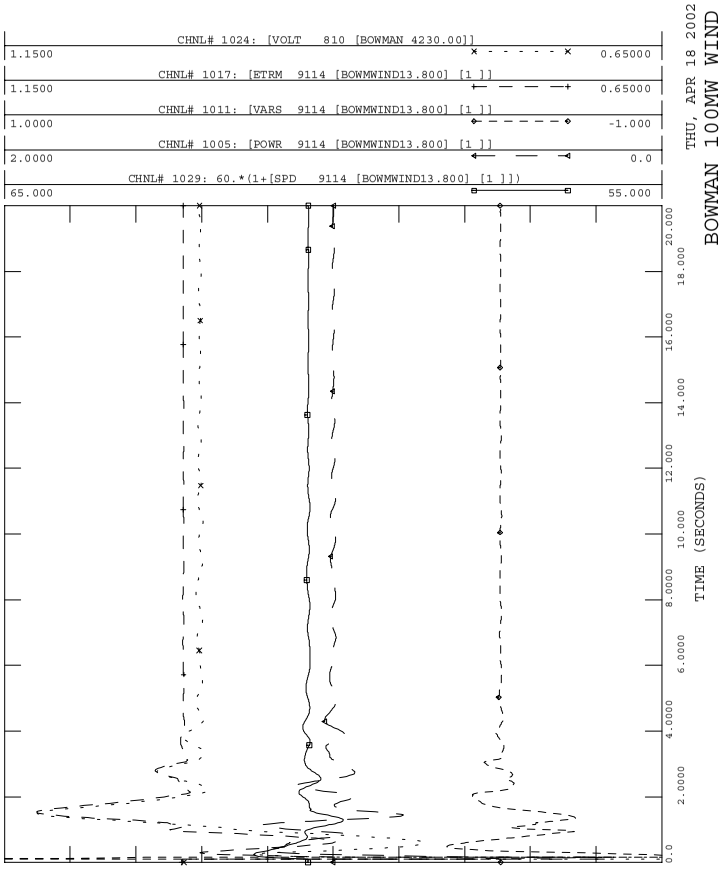
THU, APR 18 2002 17:44
BELFIELD 100MW WIND UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



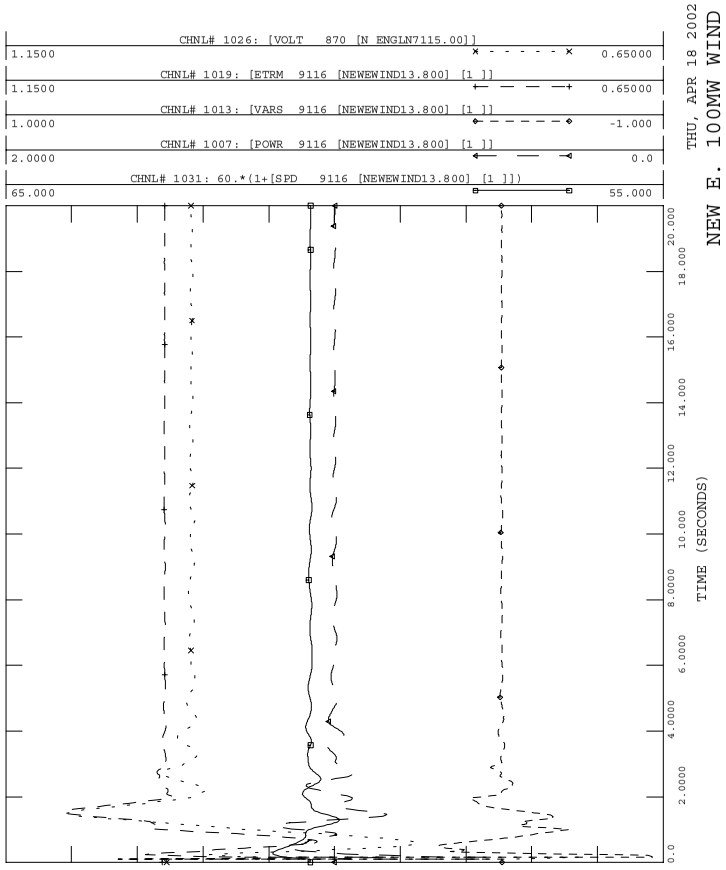
THU, APR 18 2002 17:44
SVCS @ HTNG,MRMR&BWMN

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



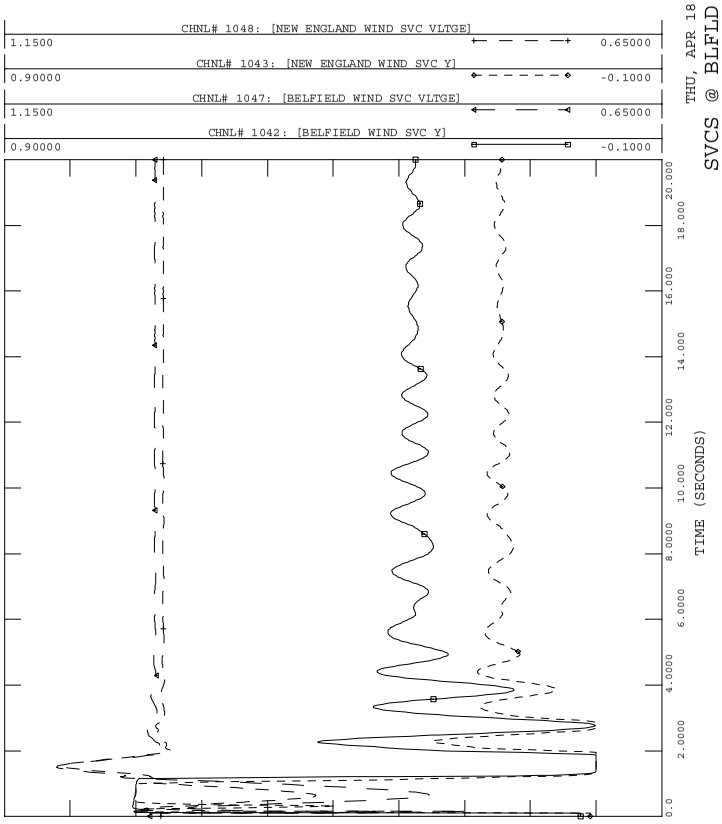
THU, APR 18 2002 17:44
BOWMAN 100MW WIND UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



THU, APR 18 2002 17:44
NEW E. 100MW WIND UNIT

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
4 CY. 3PH @HETTINGER 500 ON HETTINGER-GLENHAM 500KV
TRIP HETTINGER GLENHAM 500KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S1C5XXA-cc3.bin



THU, APR 18 2002 17:44

SVCS @ BLFLD & NWENG

APPENDIX 13

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 2 (JAMESTOWN)

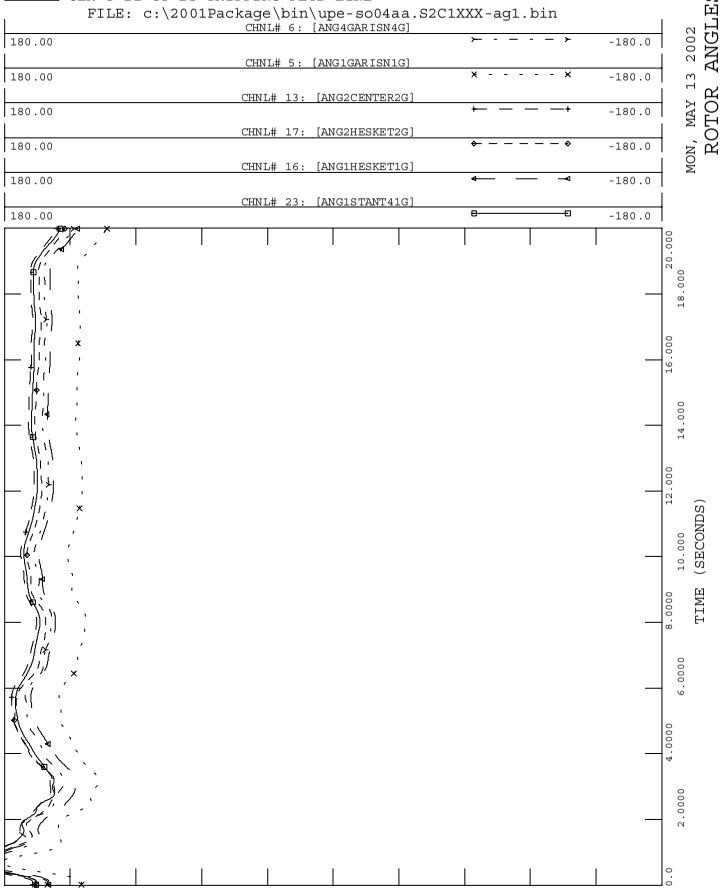
CASE S2C1XXX

CONTINGENCY AG1

Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

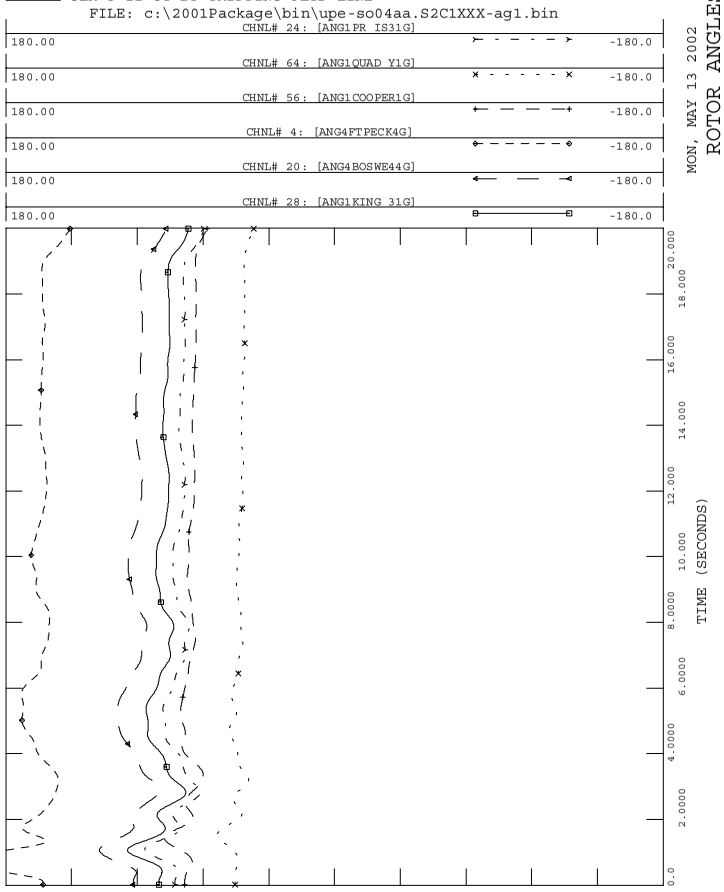
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50
ROTOR ANGLES 2



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50
ROTOR ANGLES 4



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50
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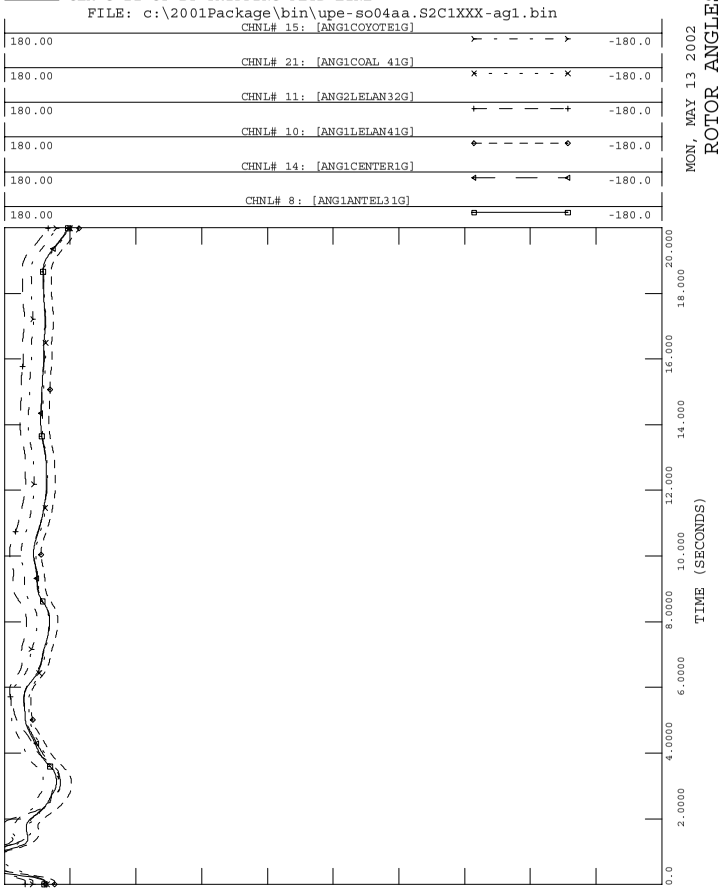

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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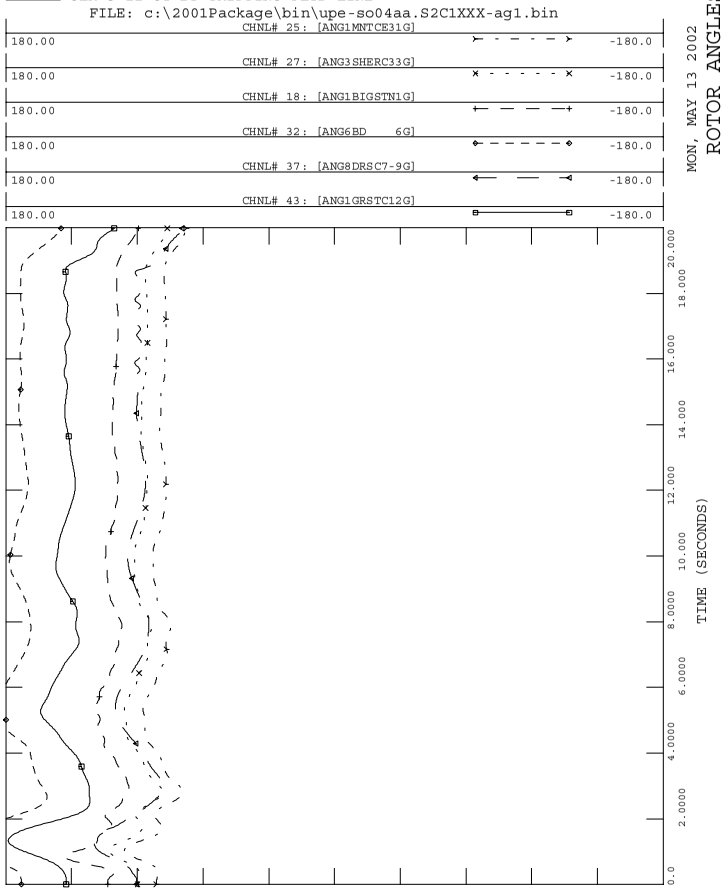
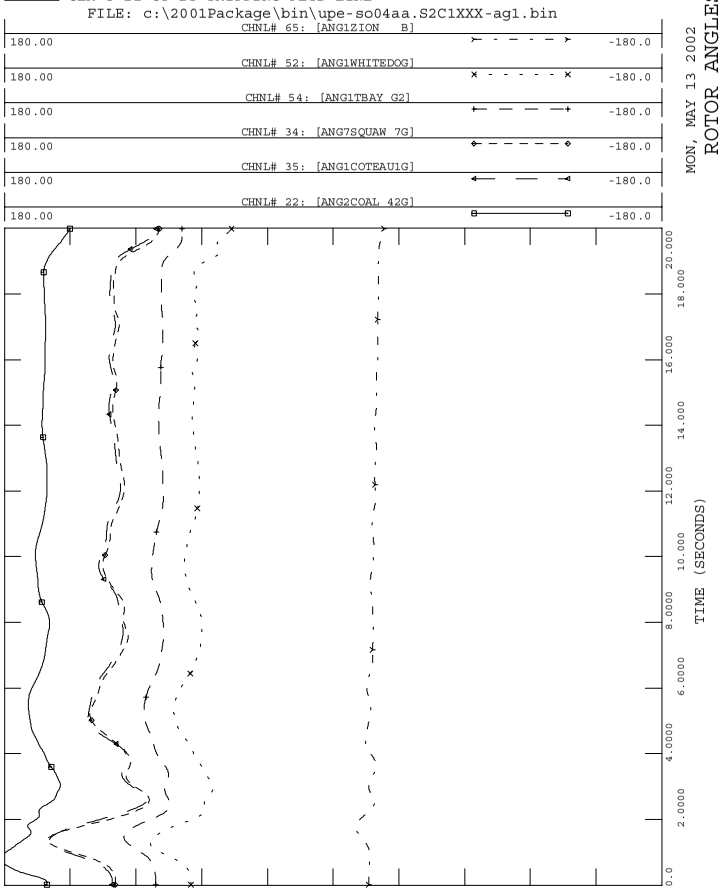
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50
ROTOR ANGLES 3



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



MON, MAY 13 2002 8:50
ROTOR ANGLES 6

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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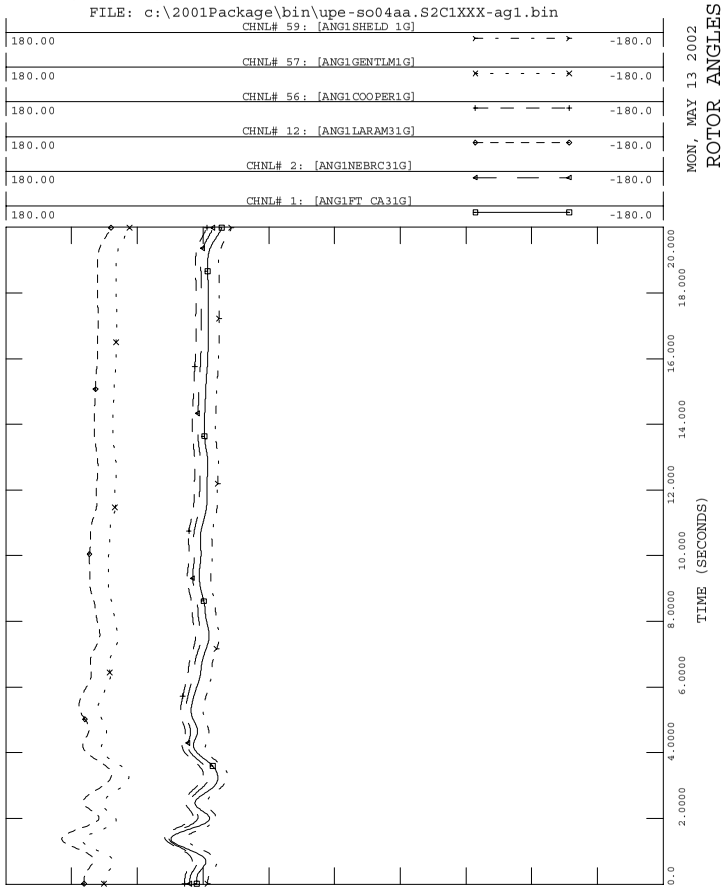
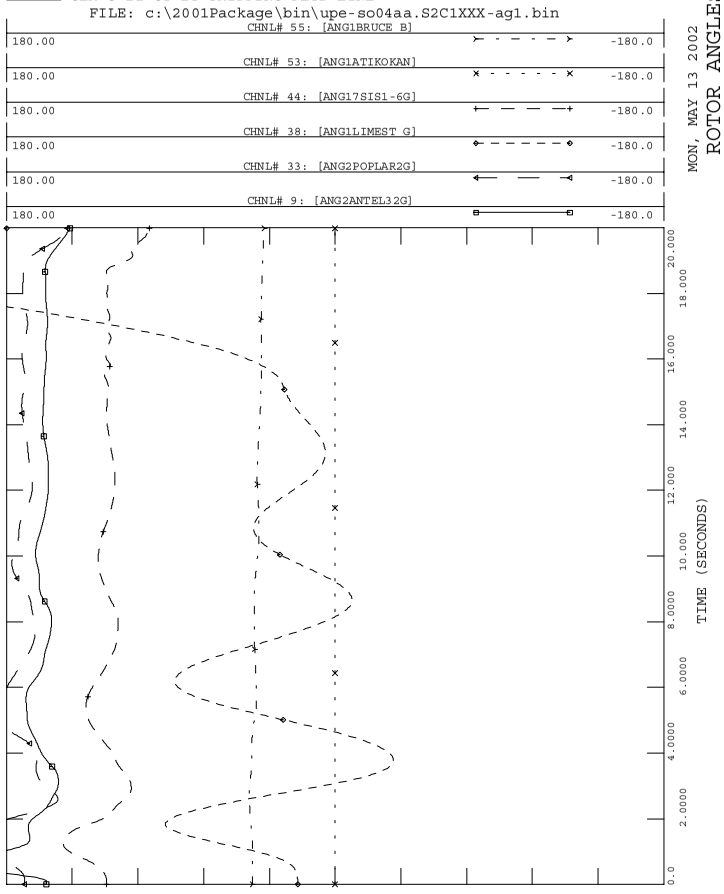
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



MON, MAY 13 2002 8:50
ROTOR ANGLES NB

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



MON, MAY 13 2002 8:50
ROTOR ANGLES 5

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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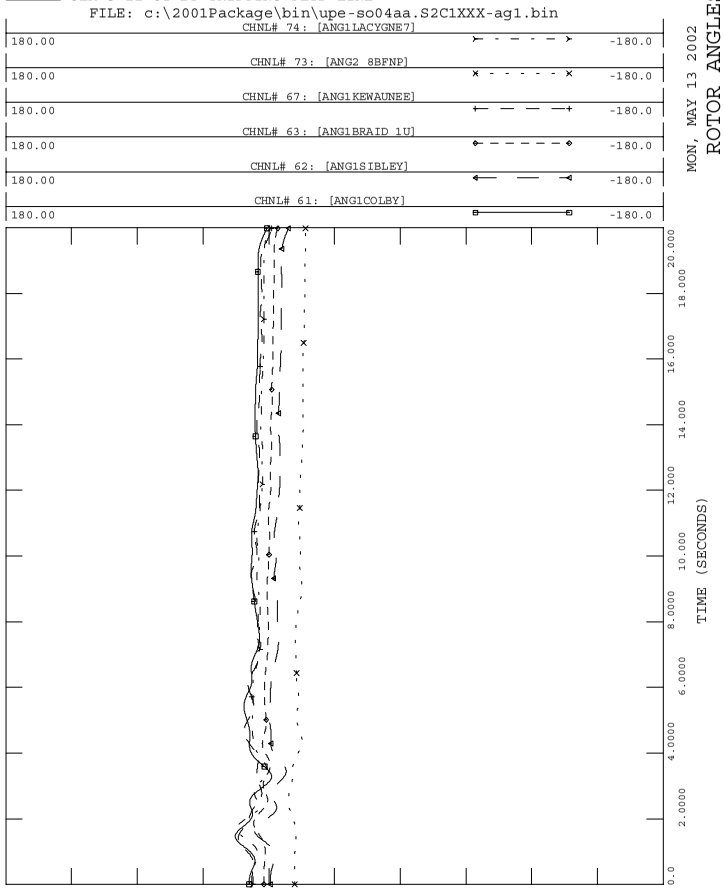
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



MON, MAY 13 2002 8:50
ROTOR ANGLES 7

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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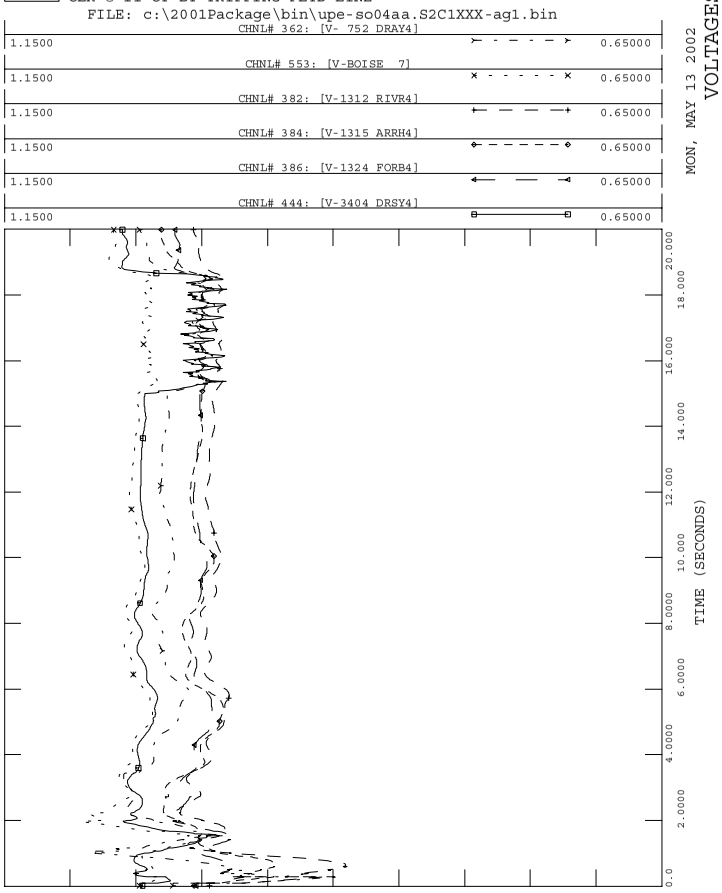
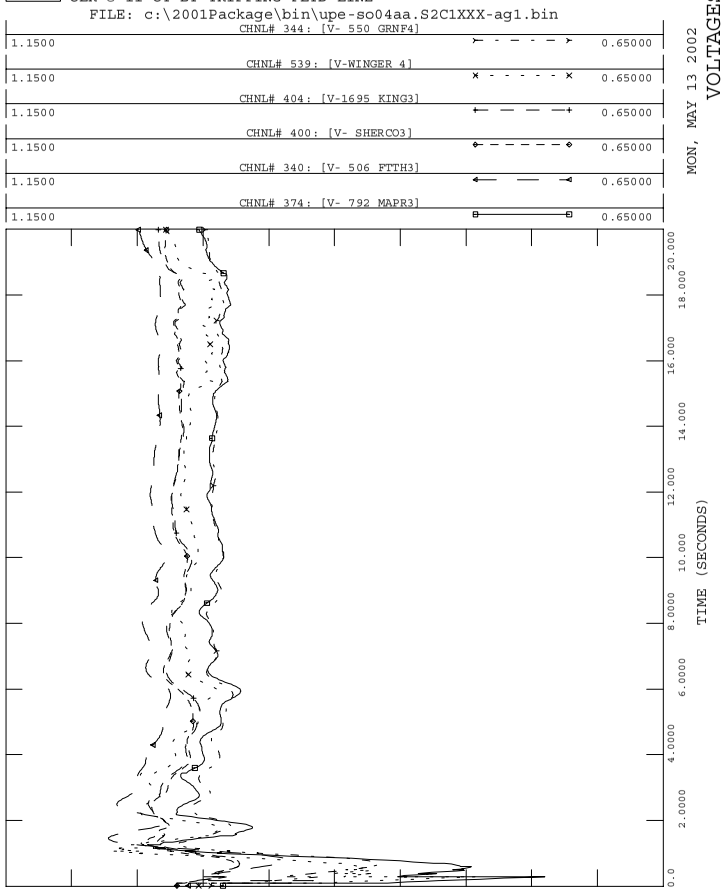
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



MON, MAY 13 2002 8:50
VOLTAGES 1

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



MON, MAY 13 2002 8:50
VOLTAGES 3

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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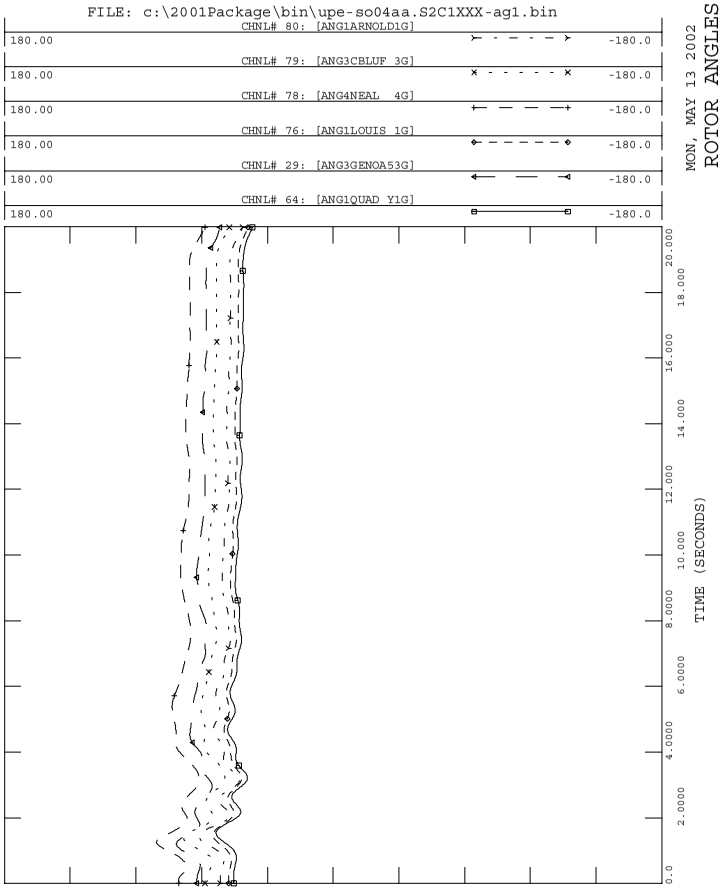
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



MON, MAY 13 2002 8:50
ROTOR ANGLES IA

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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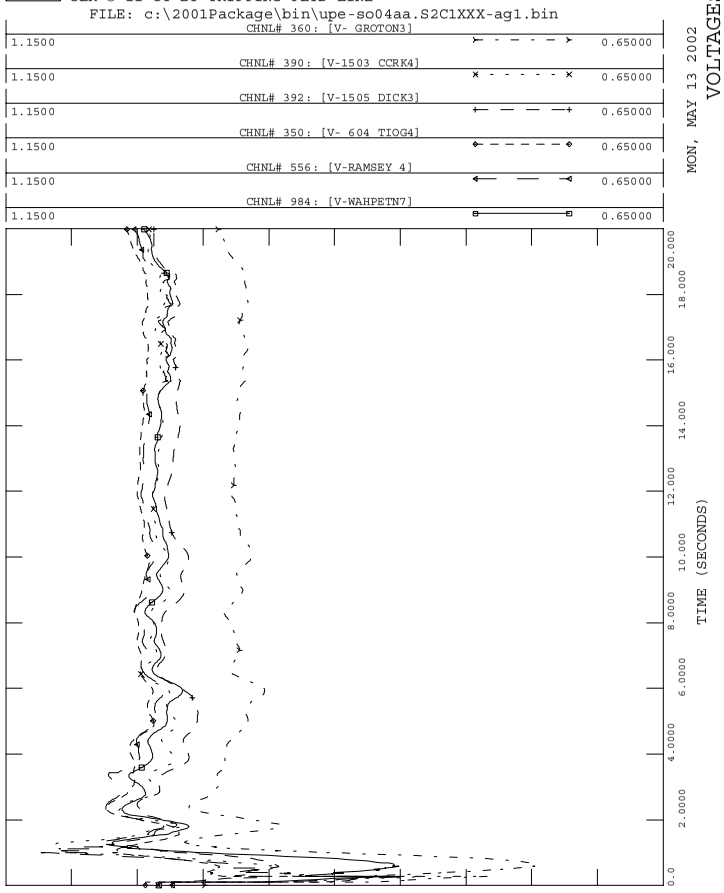
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



MON, MAY 13 2002 8:50
VOLTAGES 2

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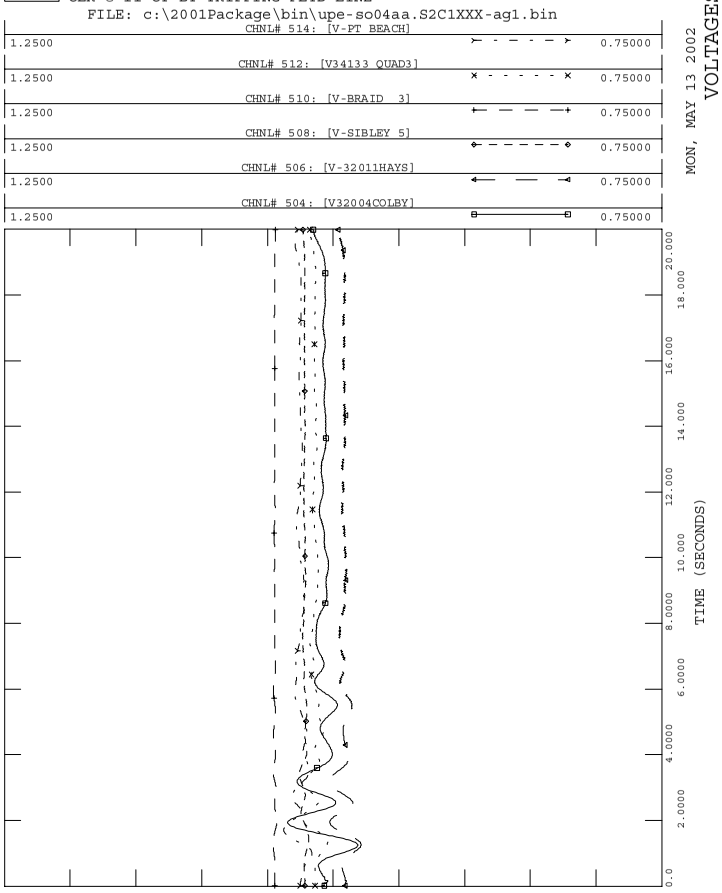
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50

VOLTAGES 5



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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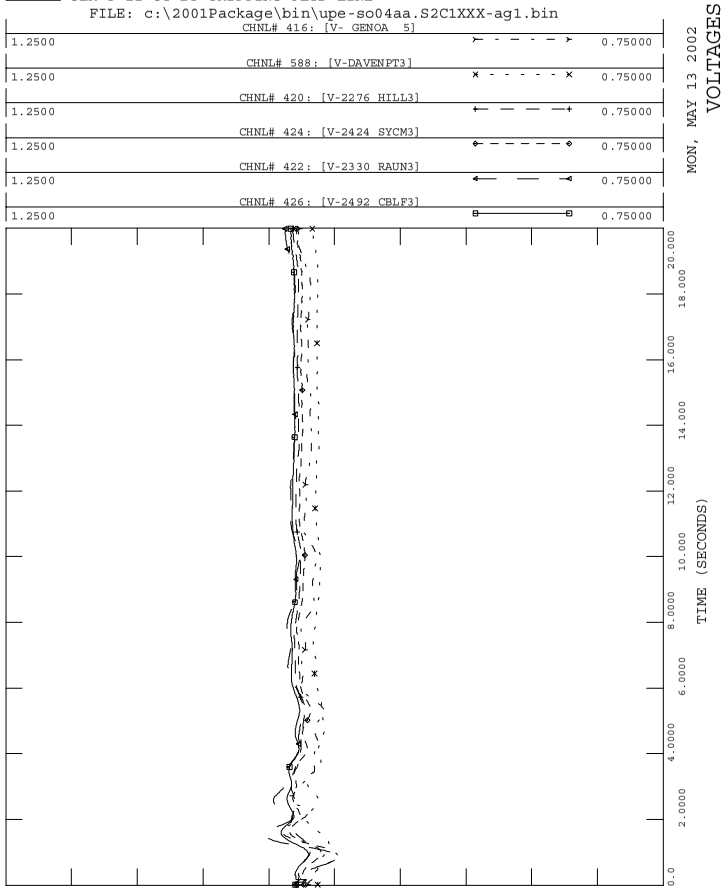
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50

VOLTAGES IA



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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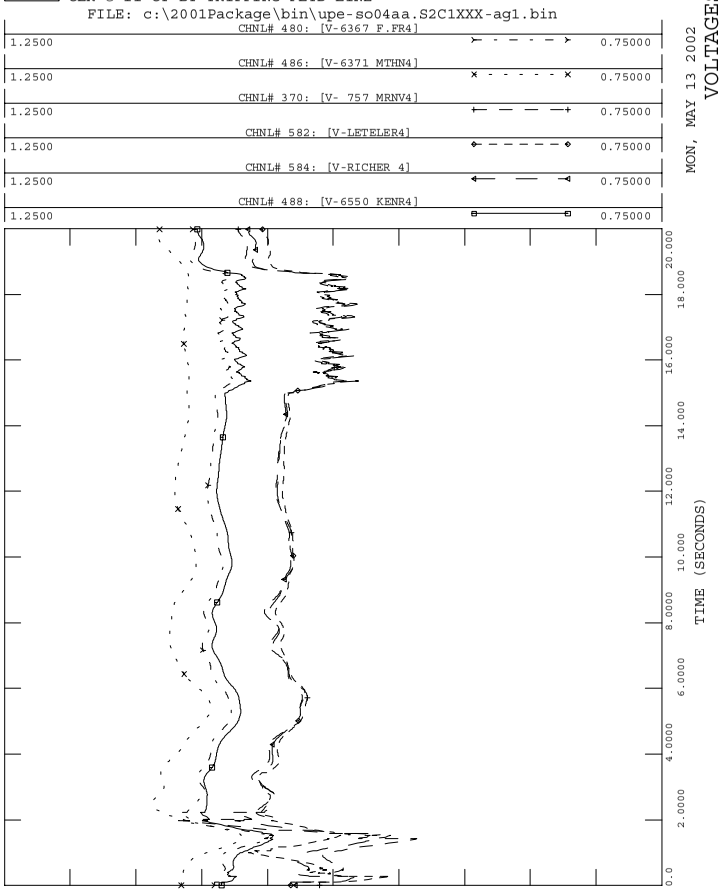
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50

VOLTAGES 4



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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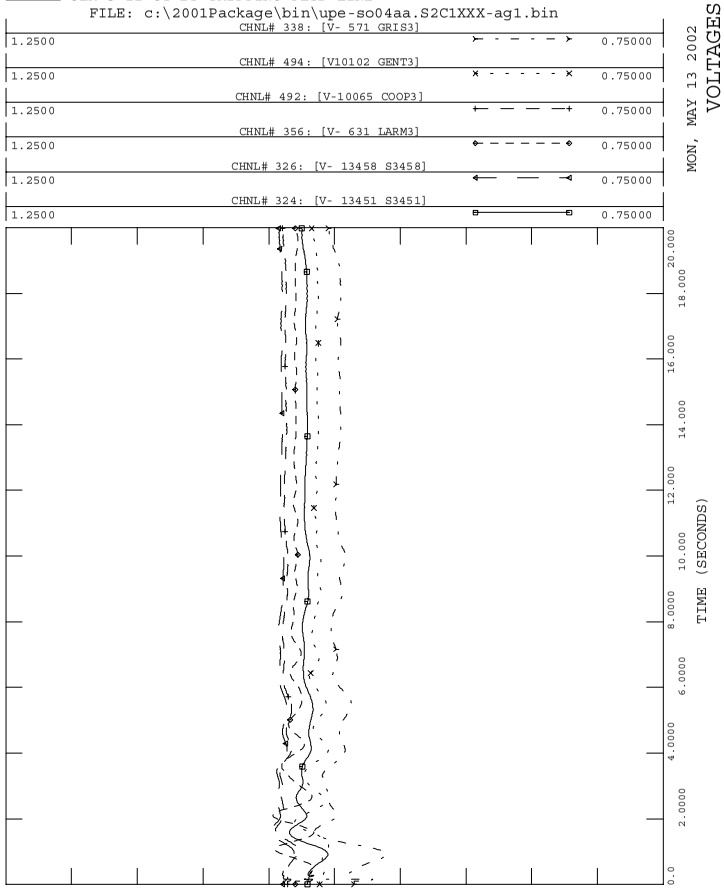
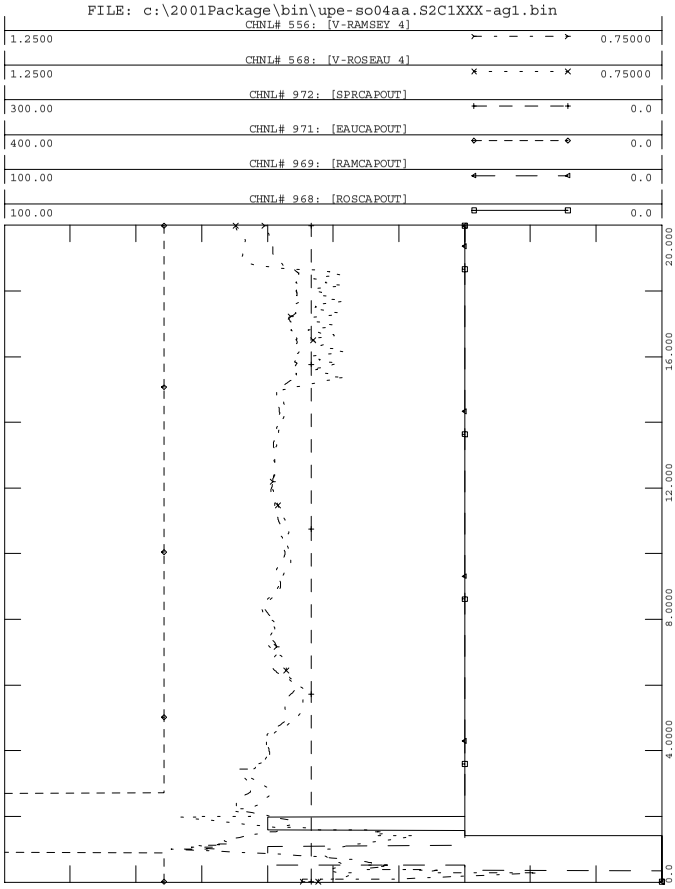
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50

VOLTAGES NB

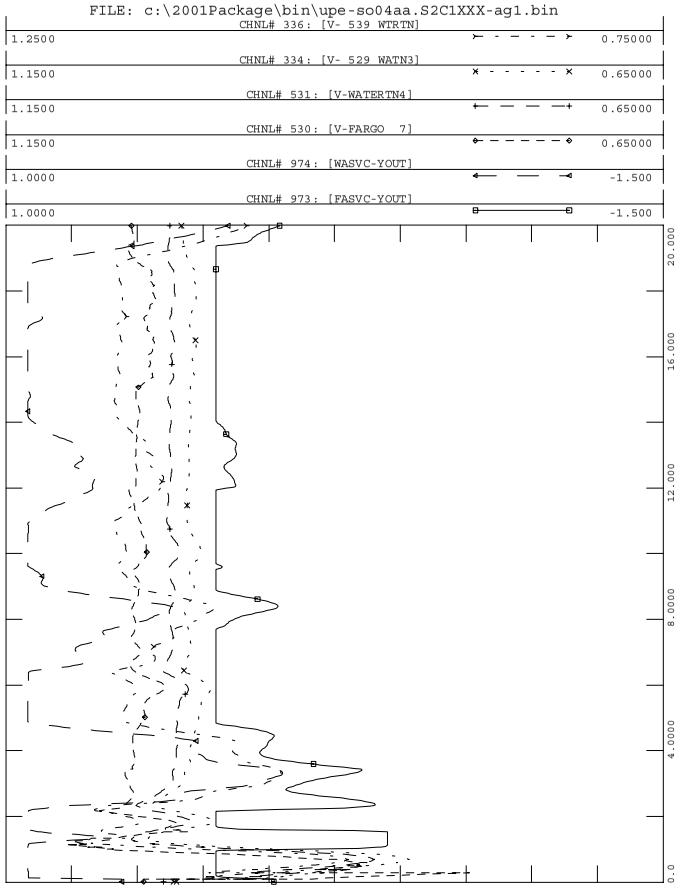


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



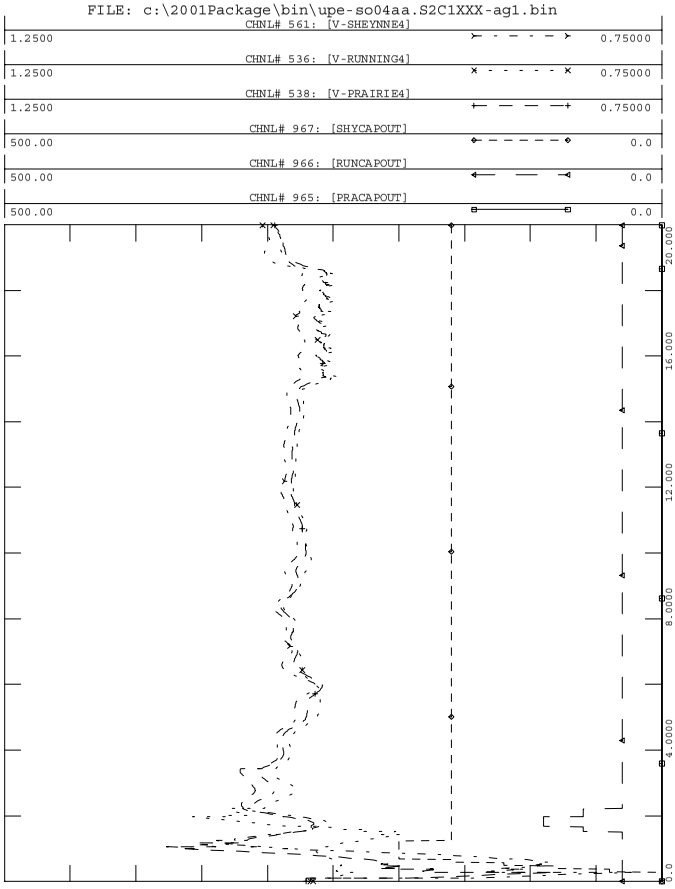
MON, MAY 13 2002 8:50
FAST SW CAP OUT 2

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



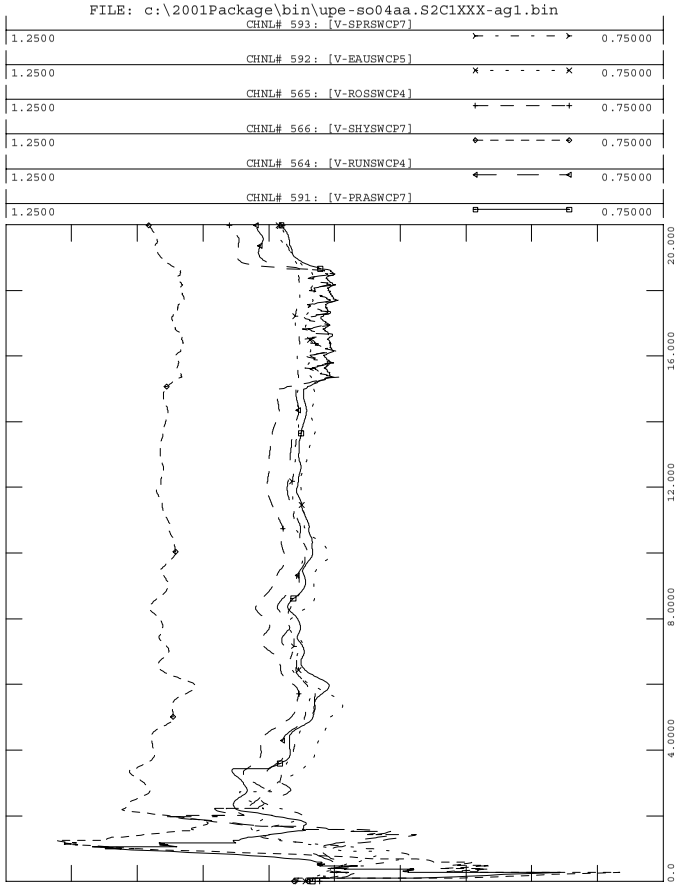
MON, MAY 13 2002 8:50
FARGO/WATERTOWN SVS

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



MON, MAY 13 2002 8:50
FAST SW CAP OUT 1

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



MON, MAY 13 2002 8:50
FAST SW CAP VOLTAGES

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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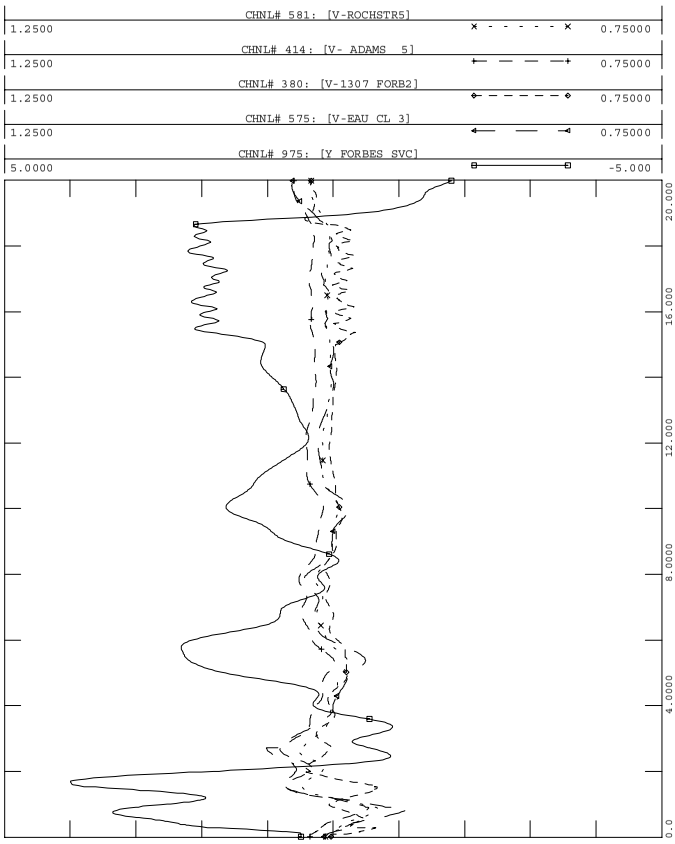
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50

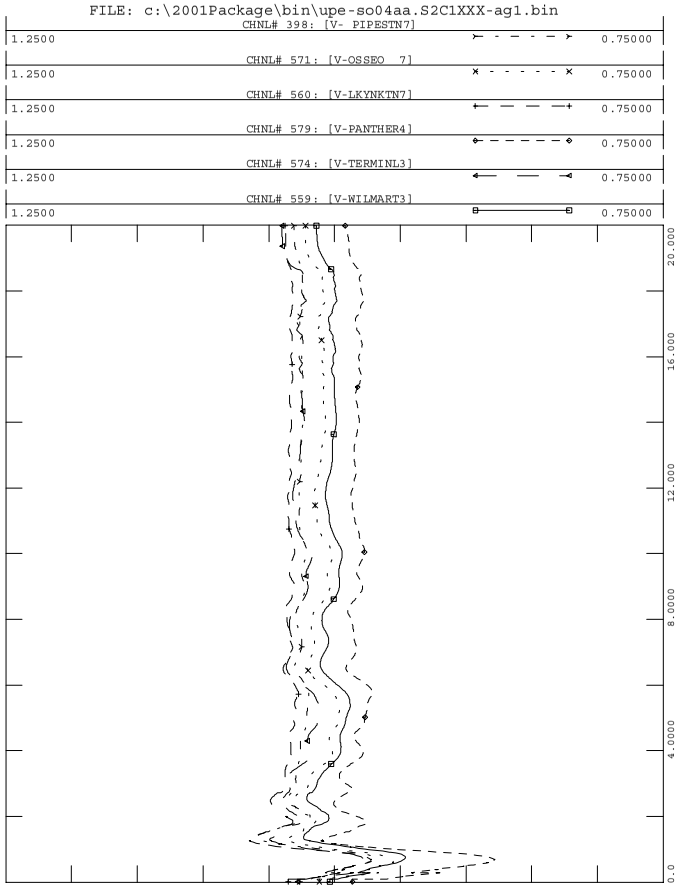
SVC & WISCONSIN VOLT



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50

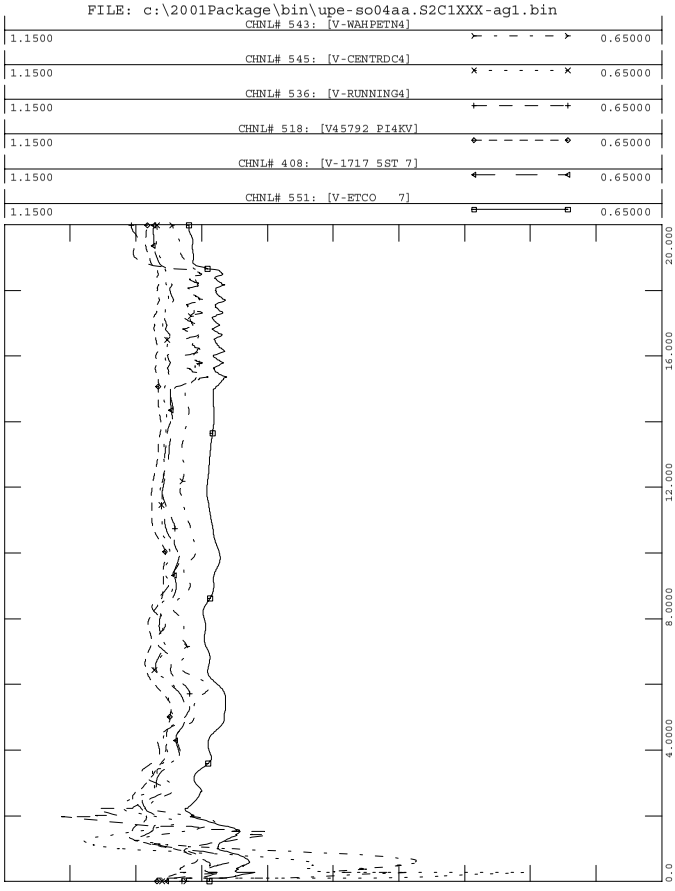
TC VOLTAGES



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50

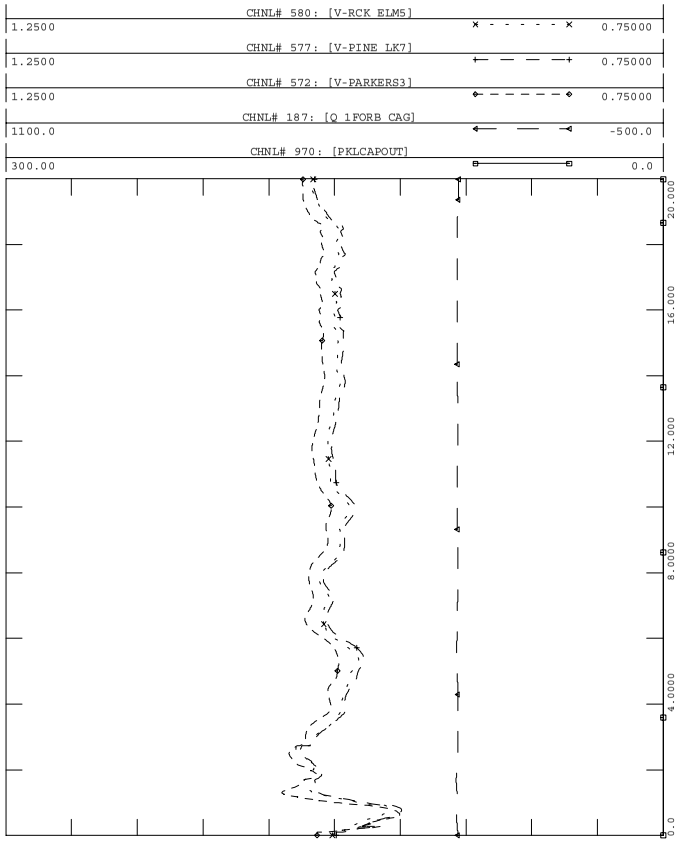
VOLTAGES 6



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

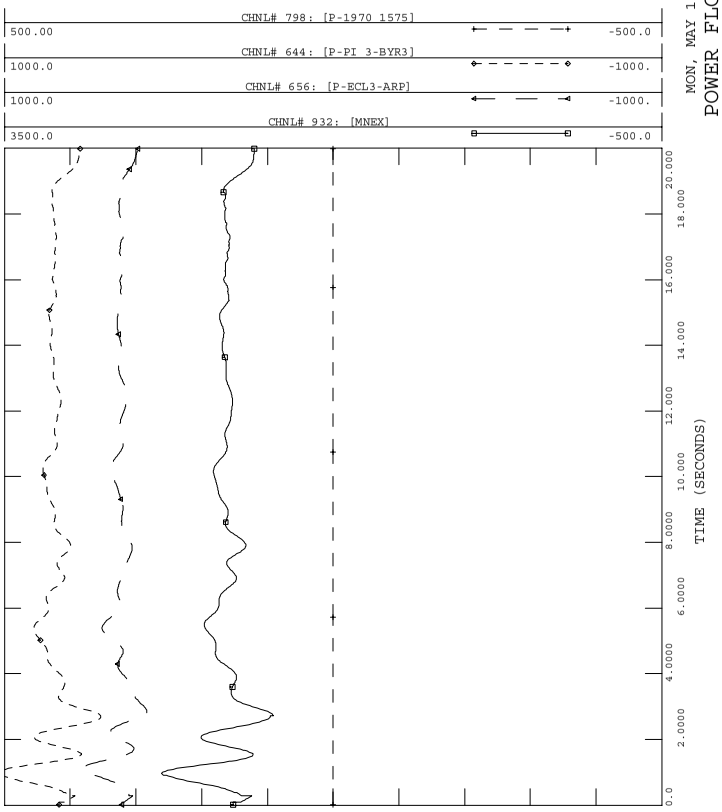
MON, MAY 13 2002 8:50

FORBES SVS OUT & VOLTAGES



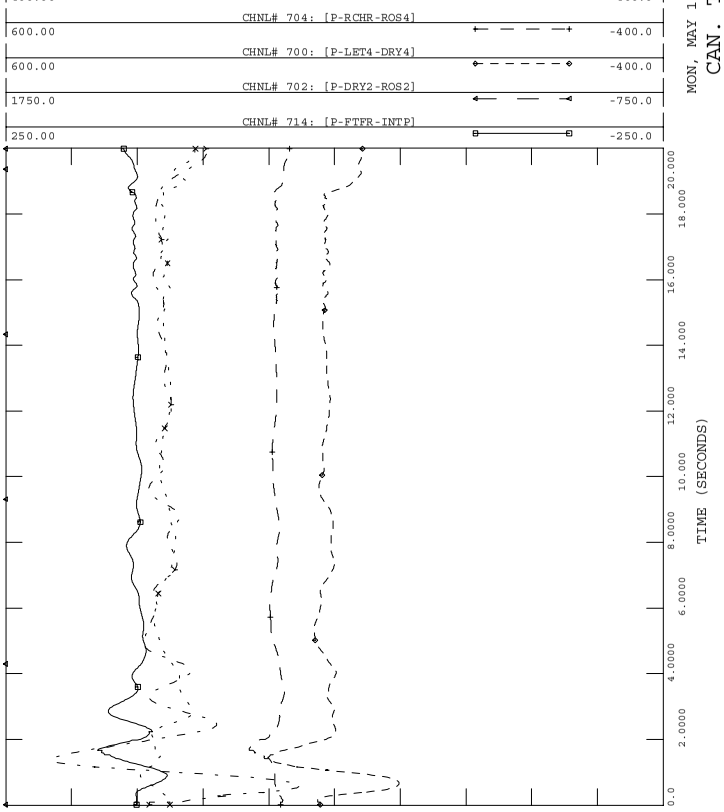
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:51
POWER FLOW SUMS 2



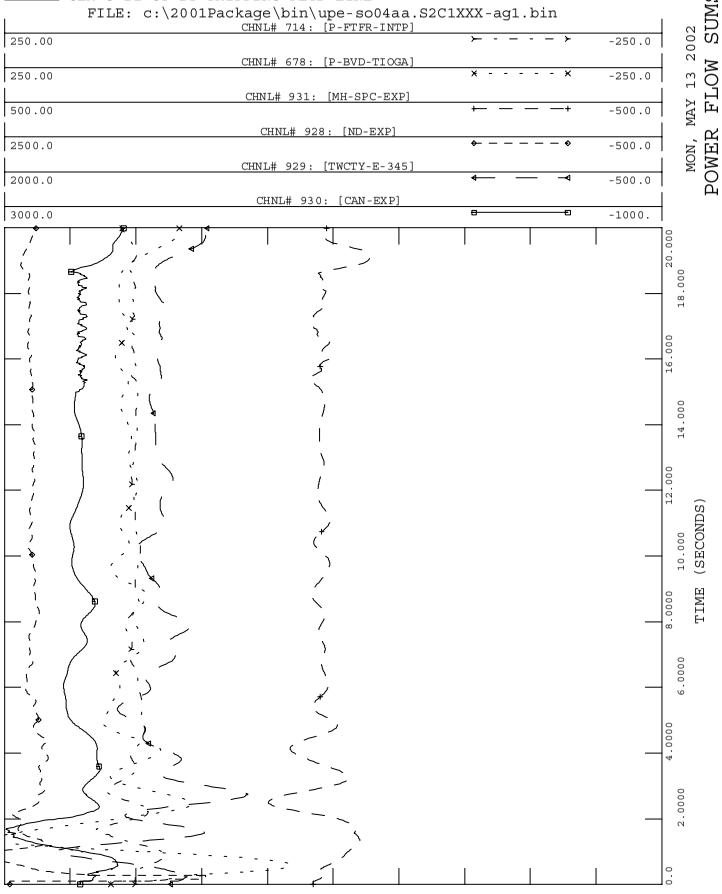
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:51
CAN. TIE FLOWS



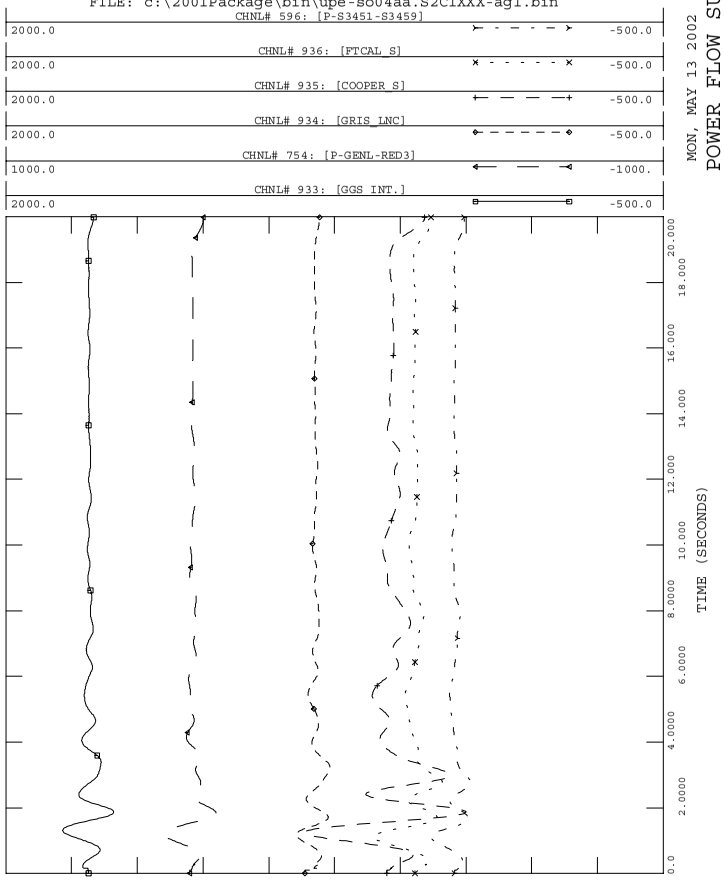
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:50
POWER FLOW SUMS 1



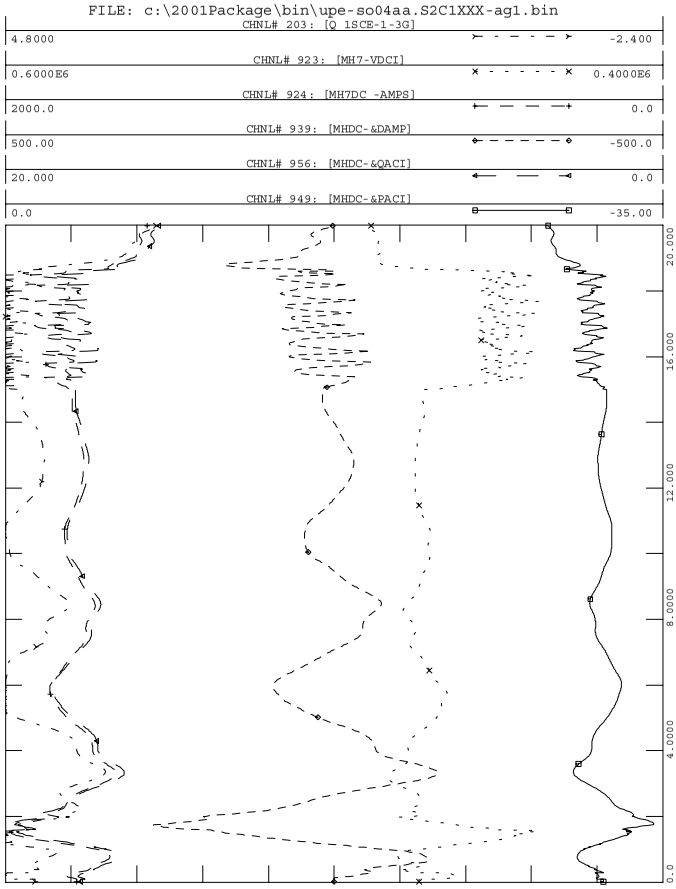
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:51
POWER FLOW SUM 3



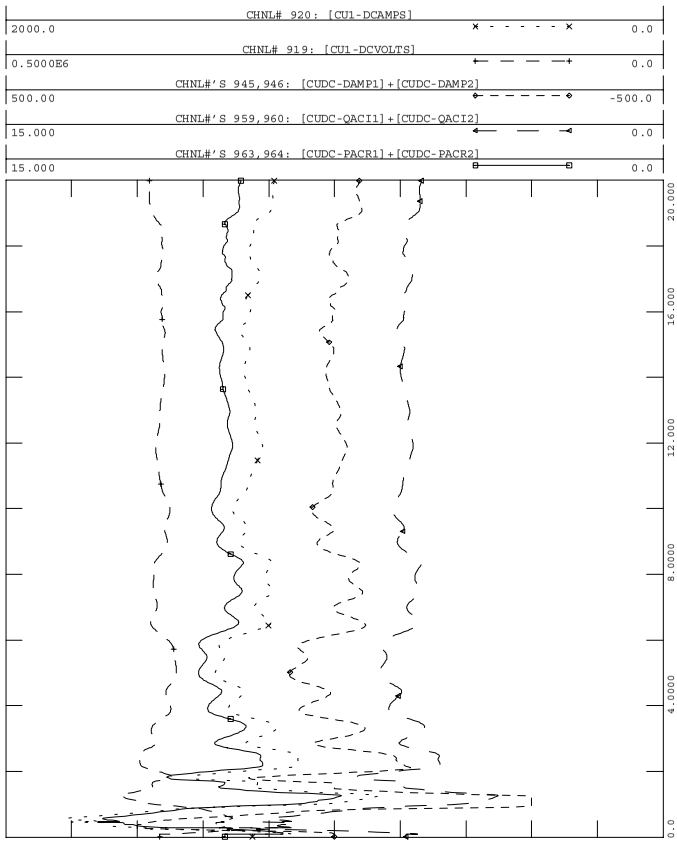
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:51
MH DC PARAMETERS



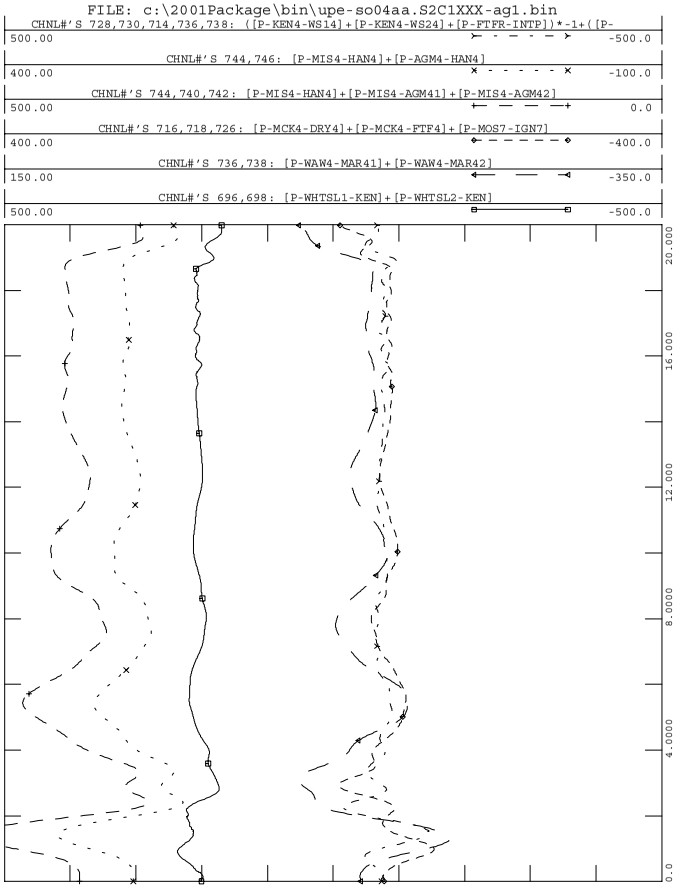
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:51
CU DC #1



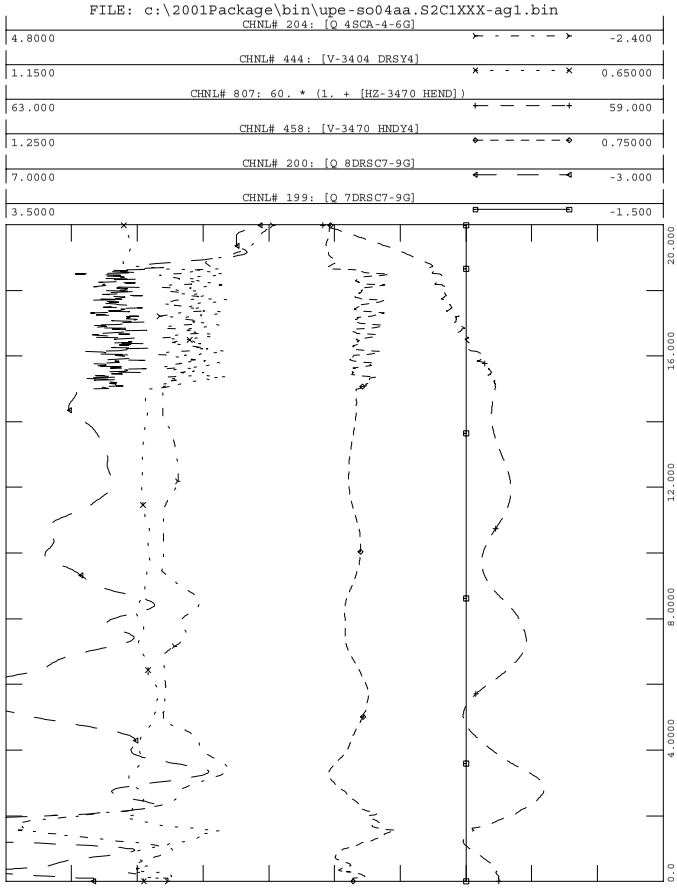
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

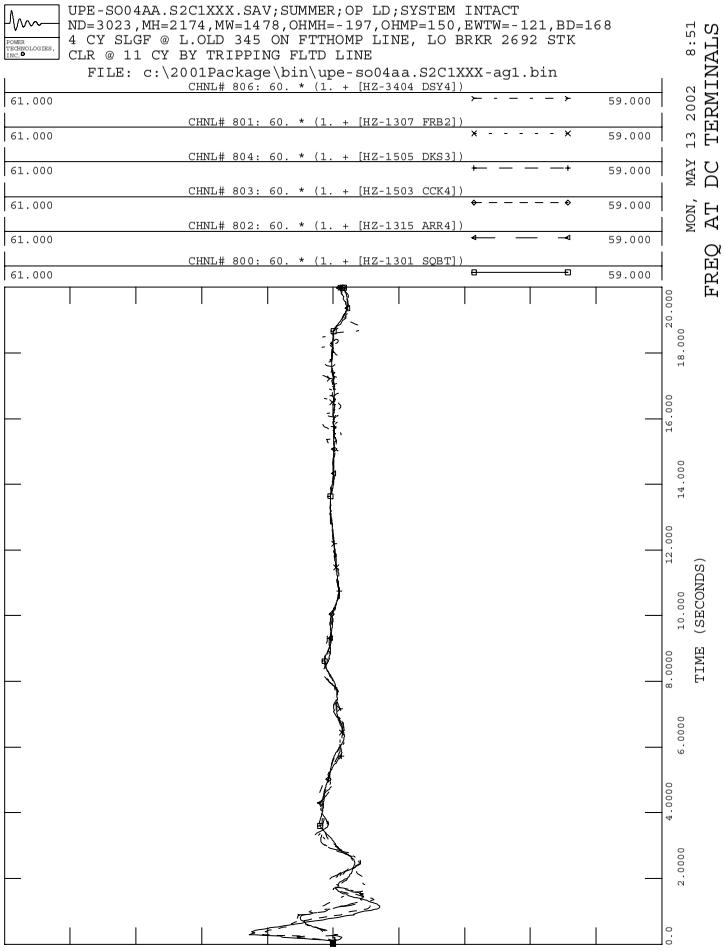
MON, MAY 13 2002 8:51
OH TIE FLOWS

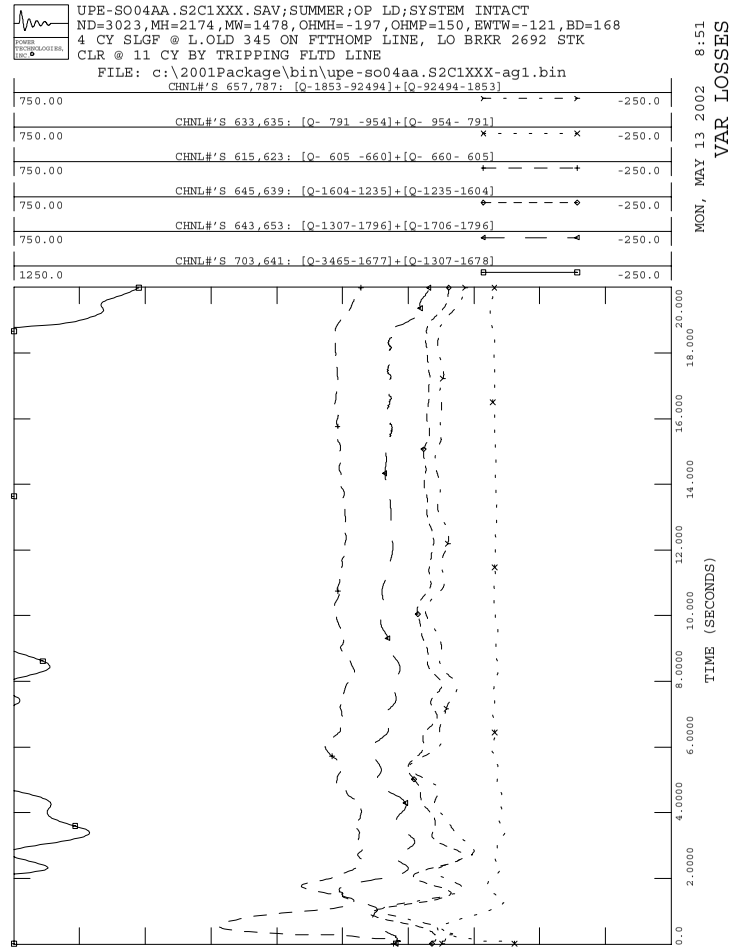


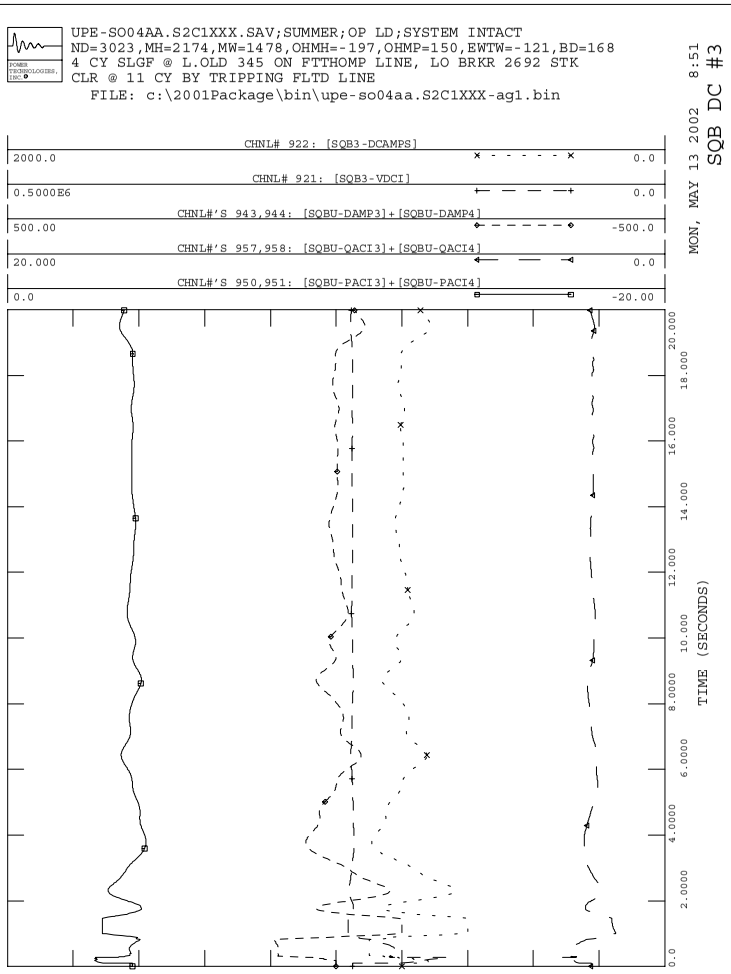
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

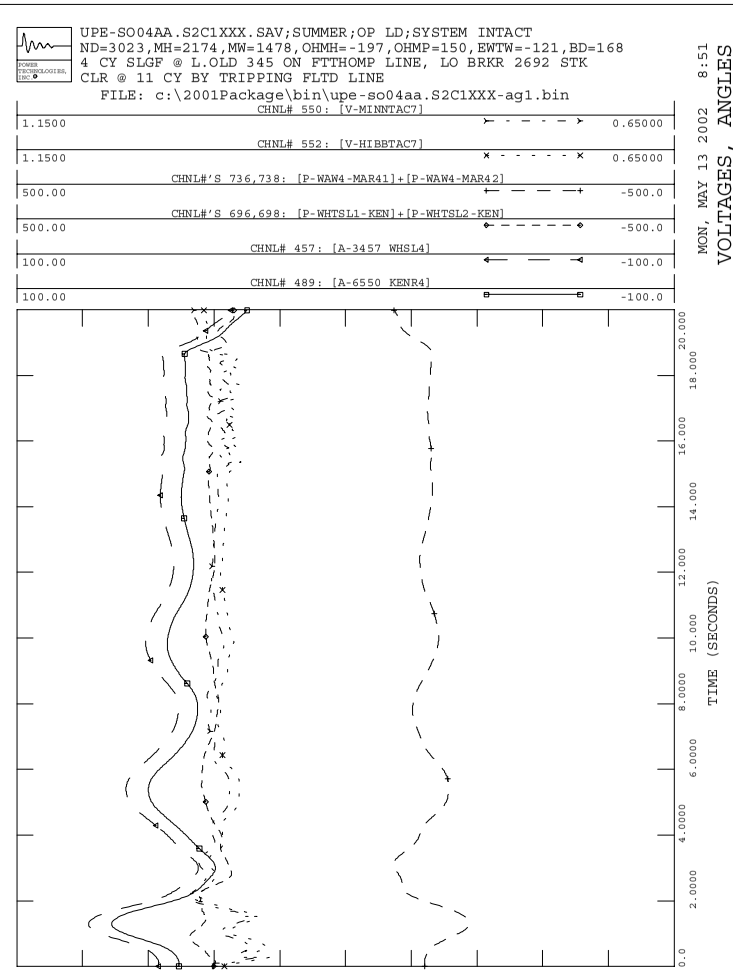
MON, MAY 13 2002 8:51
MH DC PARAMETERS




UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
MON, MAY 13 2002 8:51
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
MON, MAY 13 2002 8:51
VAR LOSSES
TIME (SECONDS)

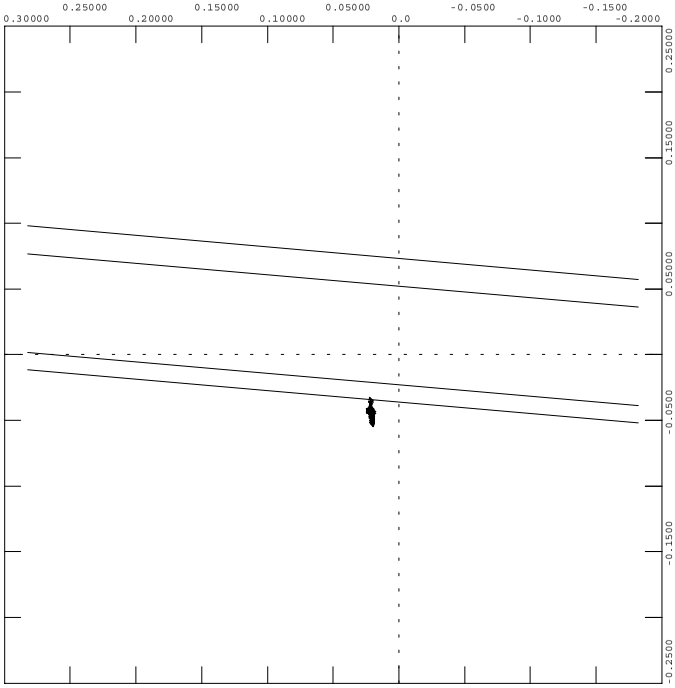

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
MON, MAY 13 2002 8:51
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
MON, MAY 13 2002 8:51
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

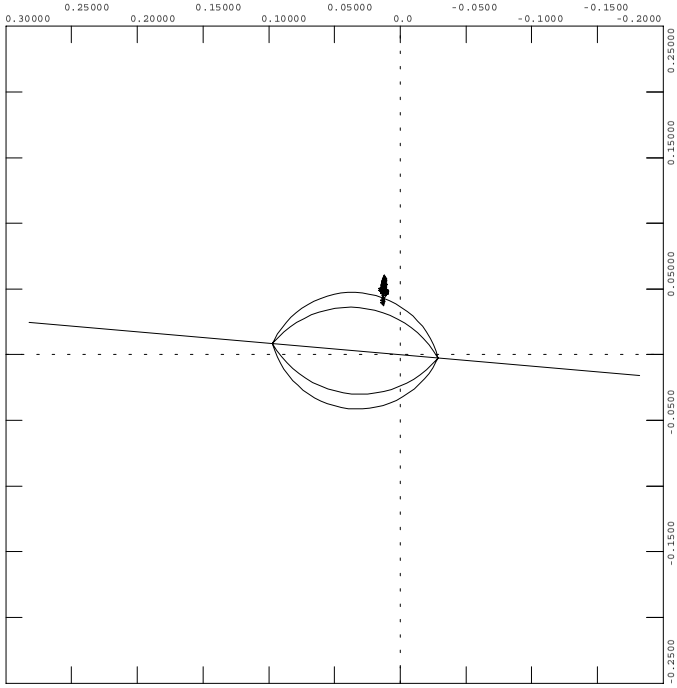


MON, MAY 13 2002 8:51
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

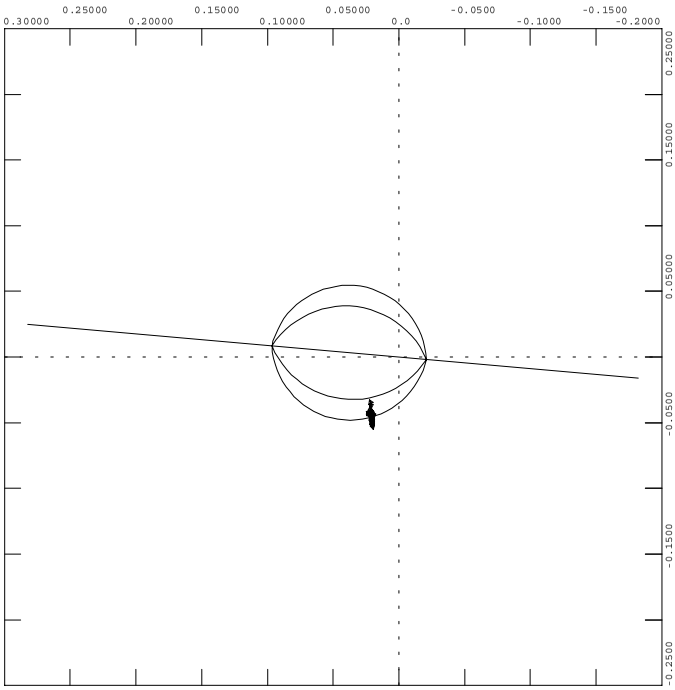


MON, MAY 13 2002 8:51
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

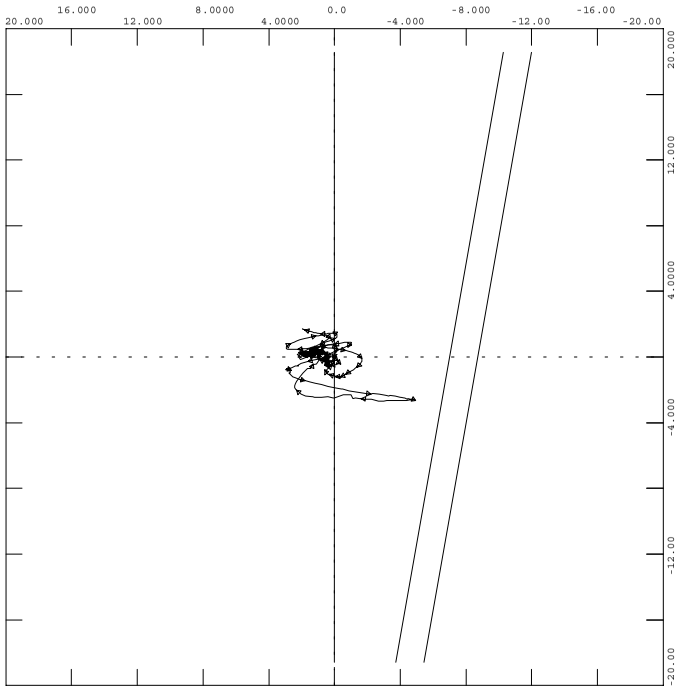


MON, MAY 13 2002 8:51
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

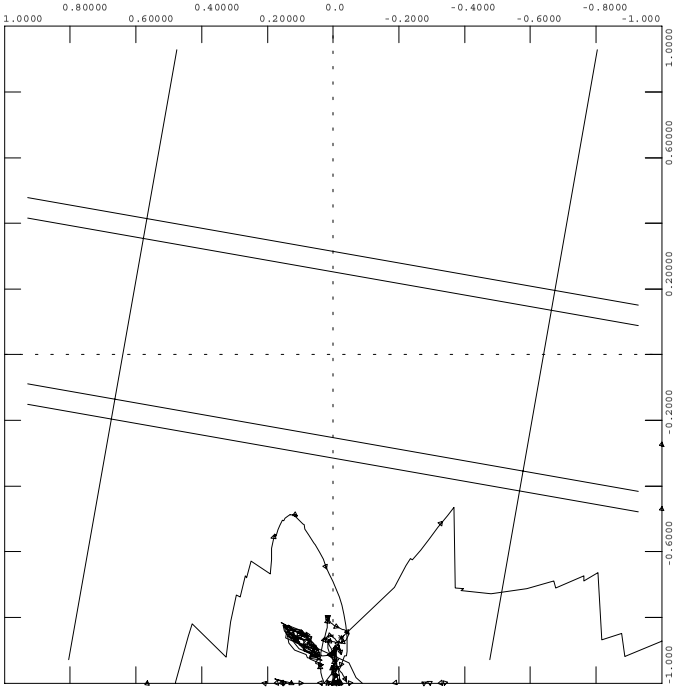


MON, MAY 13 2002 8:51
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

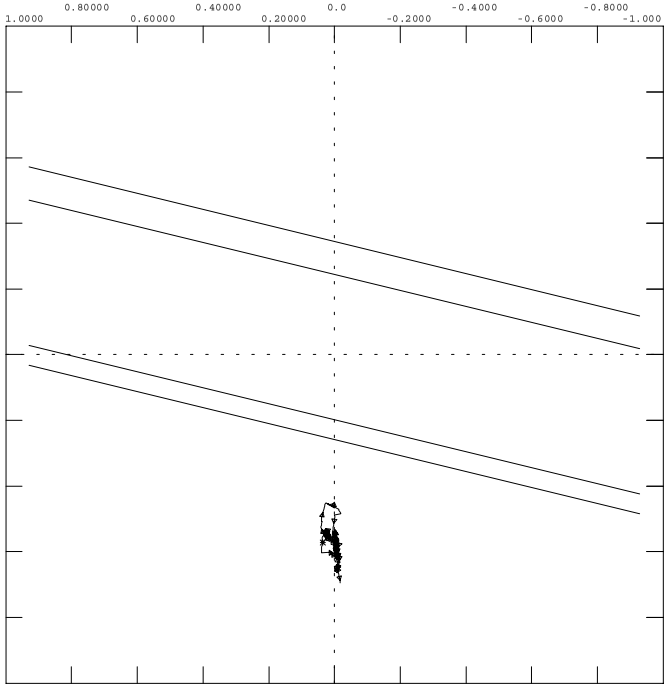


MON, MAY 13 2002 8:51
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

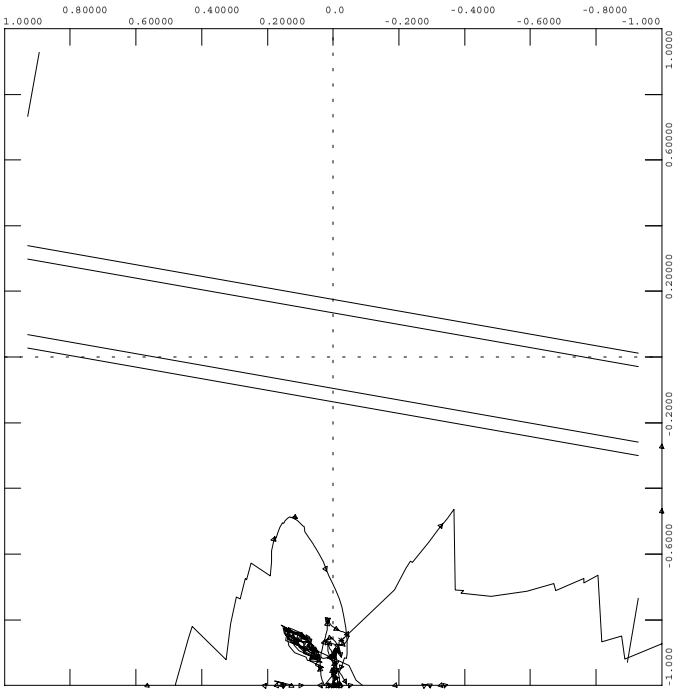


MON, MAY 13 2002 8:51
R50M AT MORANVILLE (520)

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

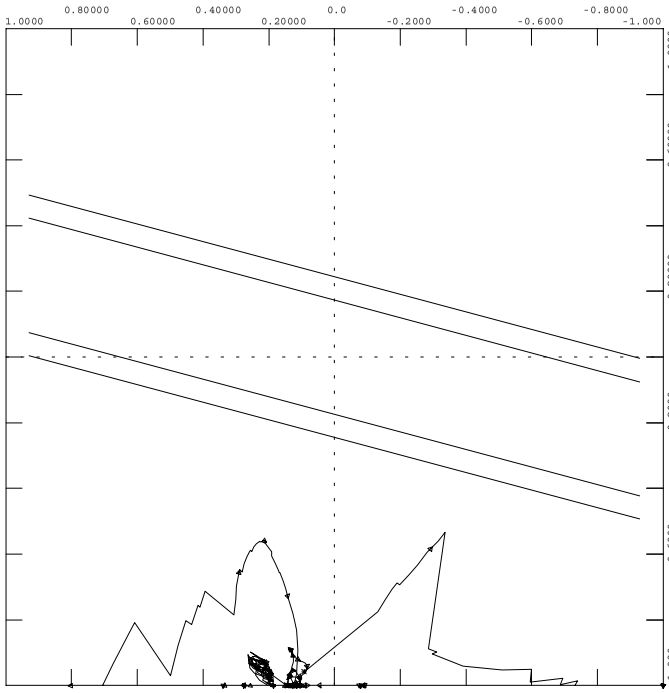


MON, MAY 13 2002 8:51
L20D AT DRAYTON (506)

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

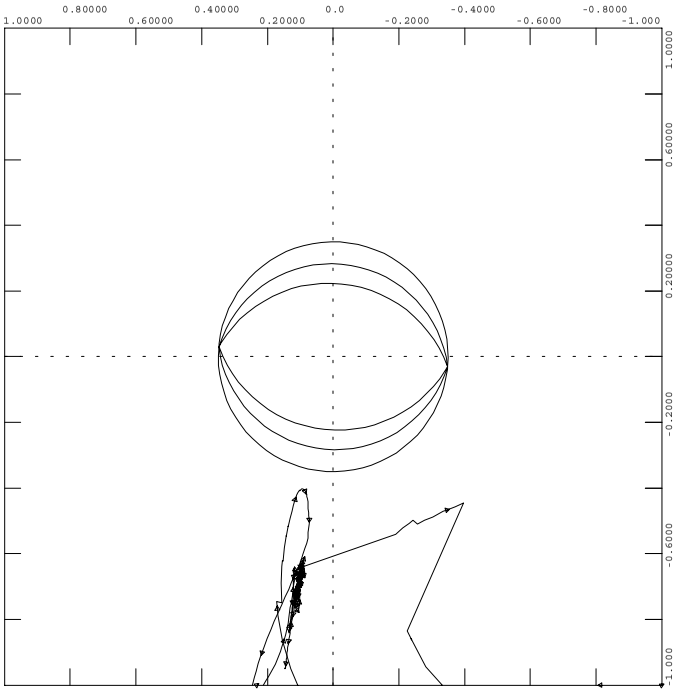


MON, MAY 13 2002 8:51
L20D-PRAIRIE (510)

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

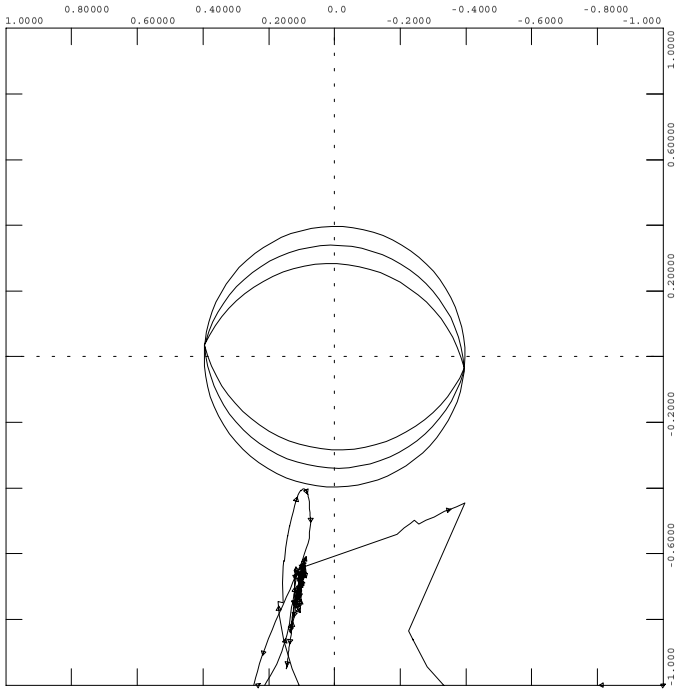


MON, MAY 13 2002 8:51
TIOGA-B.DAM-SOUTH (266)

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

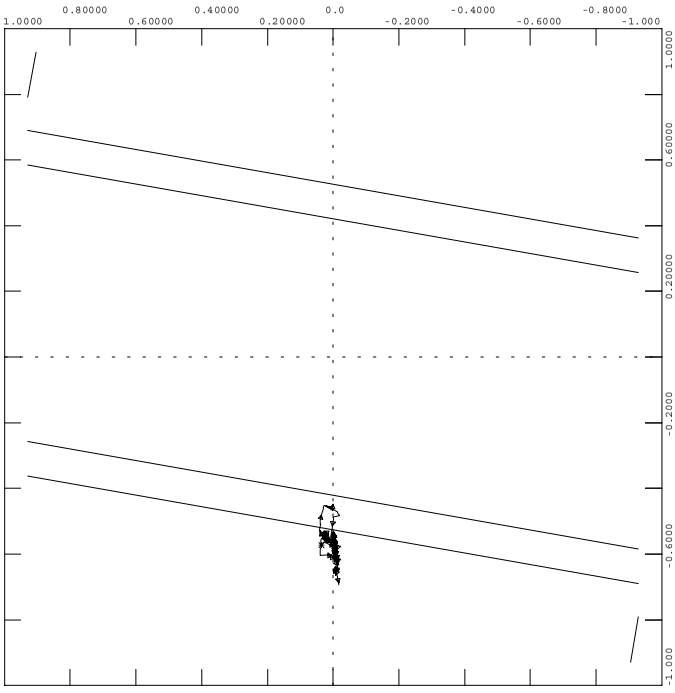


MON, MAY 13 2002 8:51
TIOGA-B.DAM-EMRG (267)

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

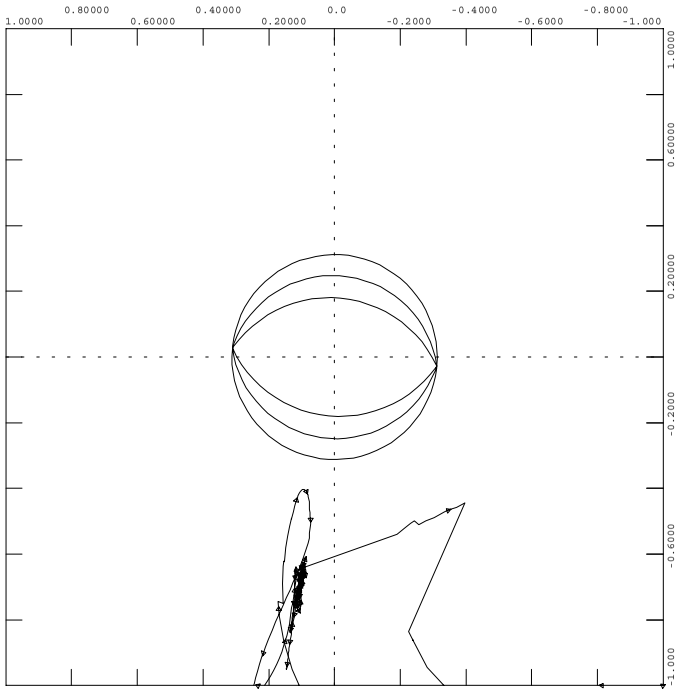


MON, MAY 13 2002 8:51
R50M-MORANVILLE-EMRG (777

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

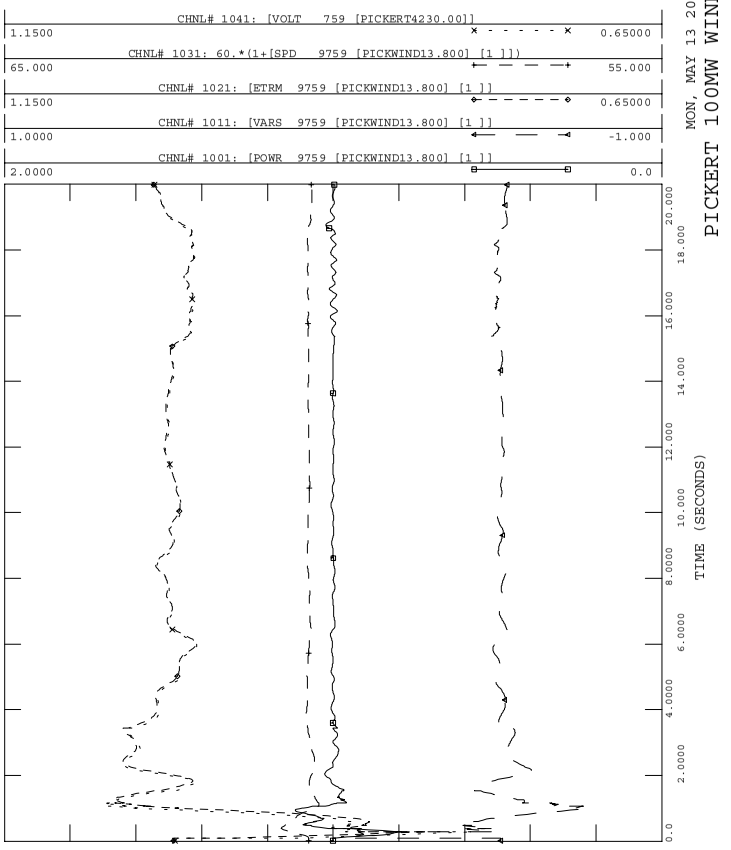
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



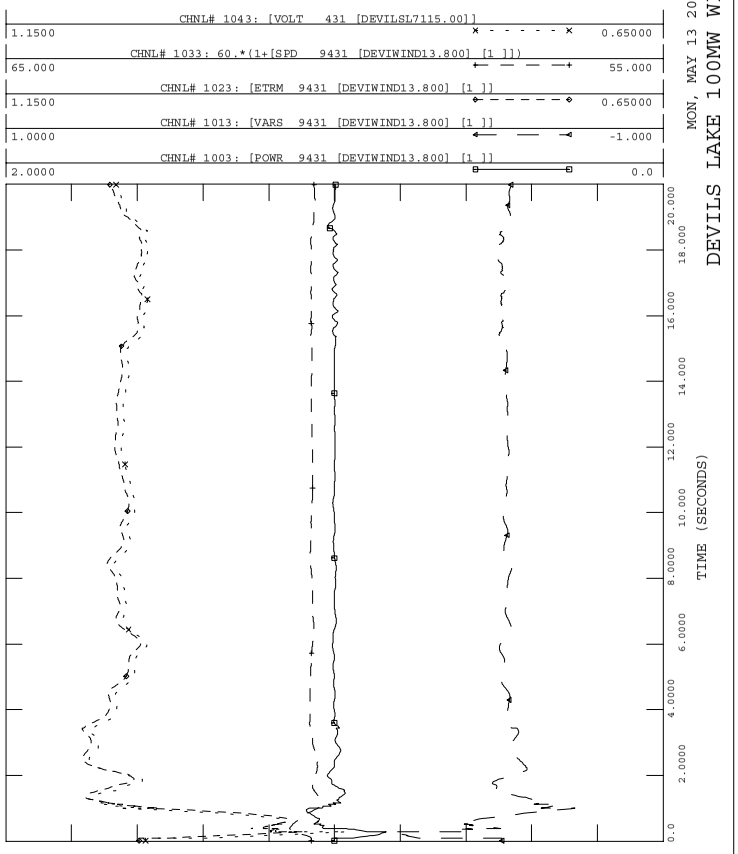
MON, MAY 13 2002 8:51
TIOGA-B.DAM-NORTH (268)

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin



MON, MAY 13 2002 8:51
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

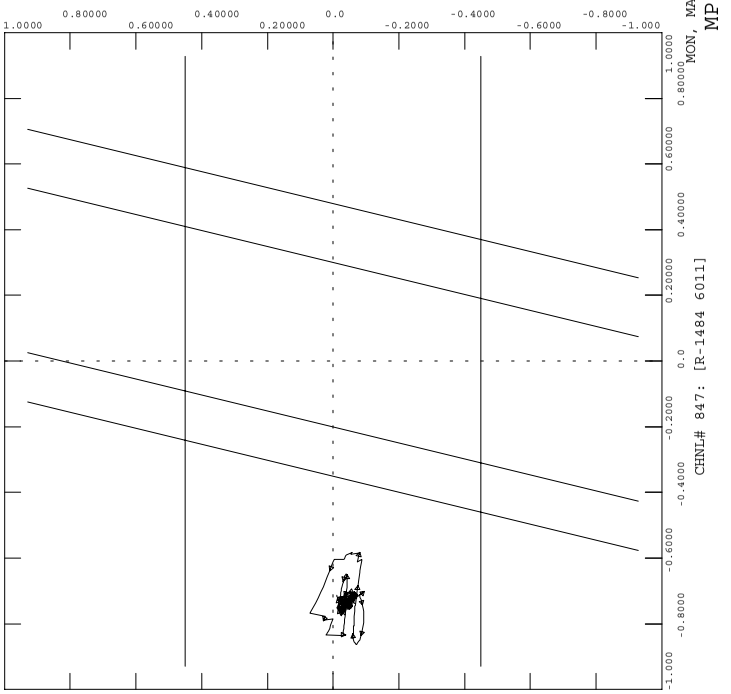


MON, MAY 13 2002 8:51
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

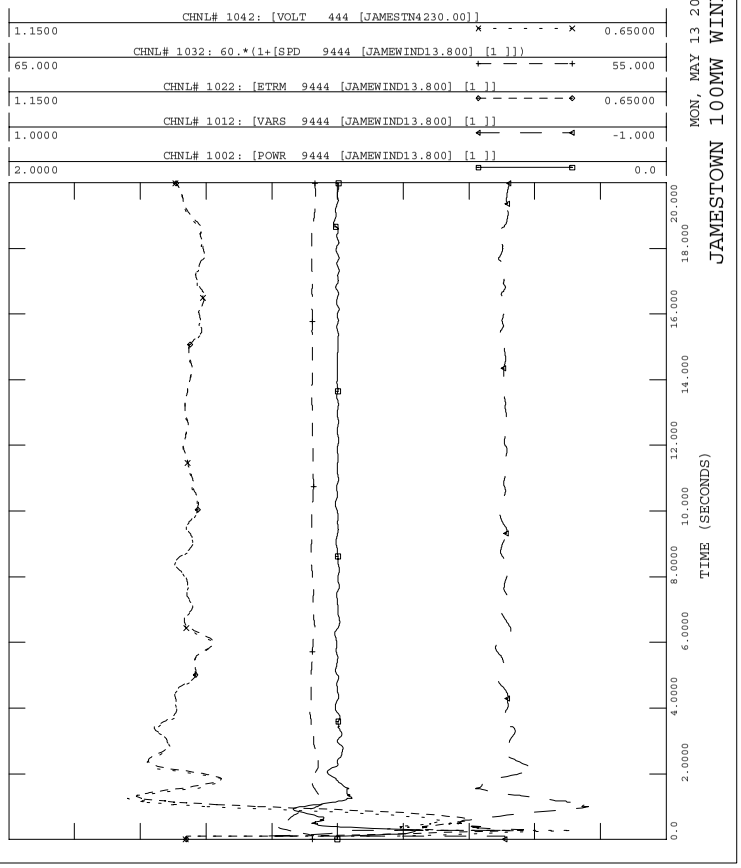
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, MAY 13 2002 8:51
MP-OH I.FALLS (779)

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

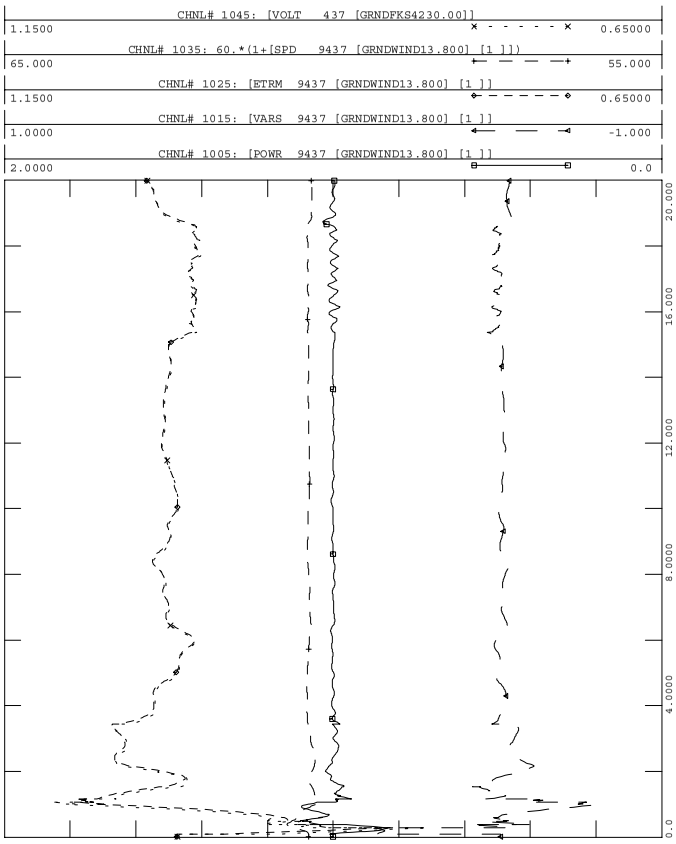


MON, MAY 13 2002 8:51
JAMESTOWN 100MW WIND UNIT

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:51

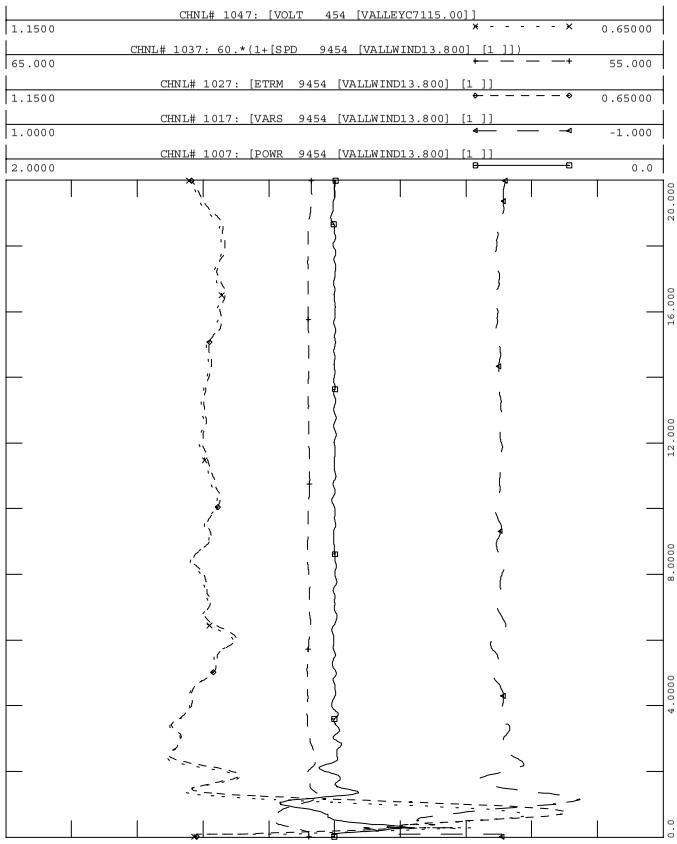
GRAND FORKS 100MW WIND UN



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:51

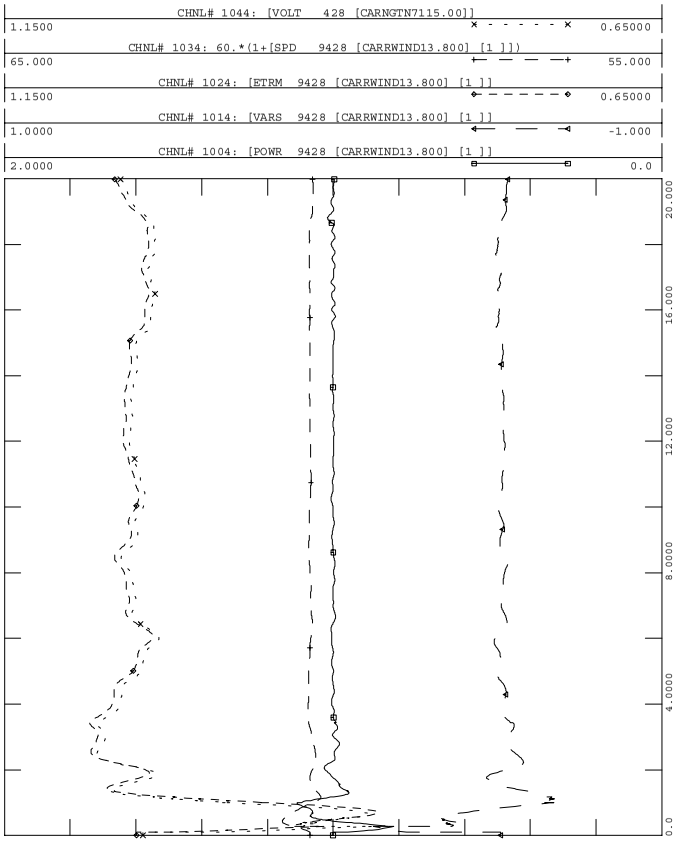
VALLEY CITY 100MW WIND UN



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:51

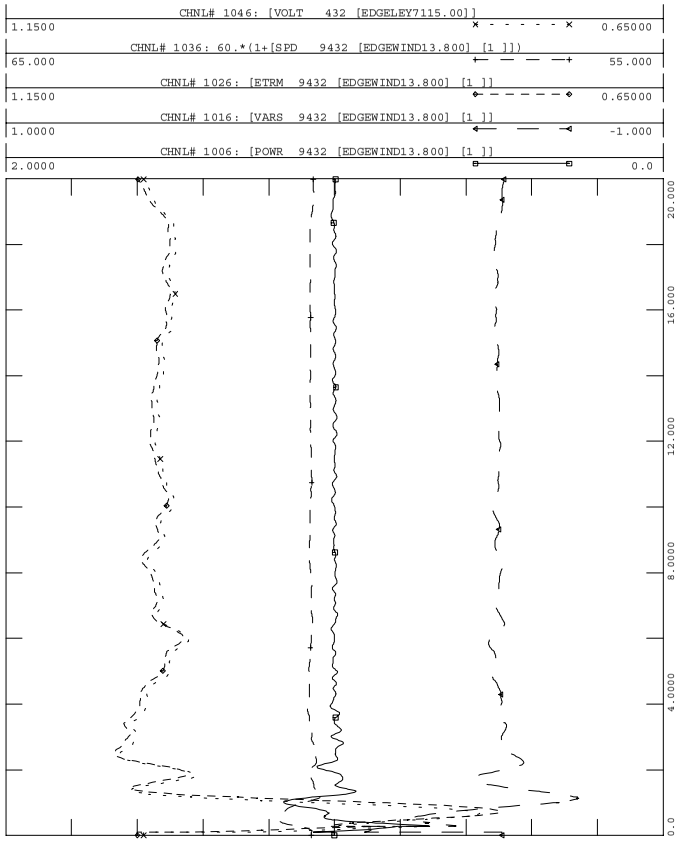
CARRINGTON 100MW WIND UNI



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:51

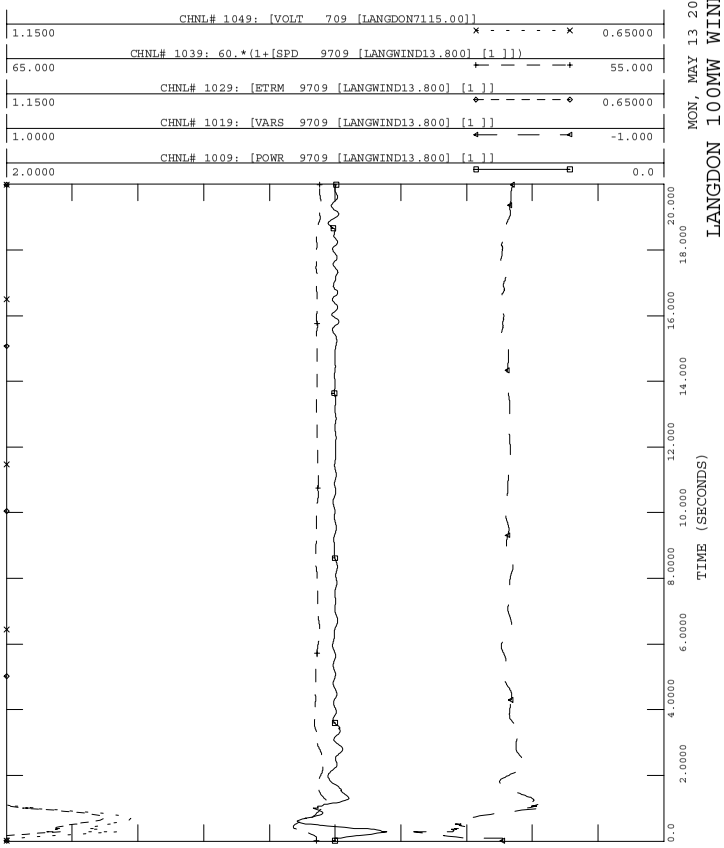
EDGELEY 100MW WIND UNIT



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:51

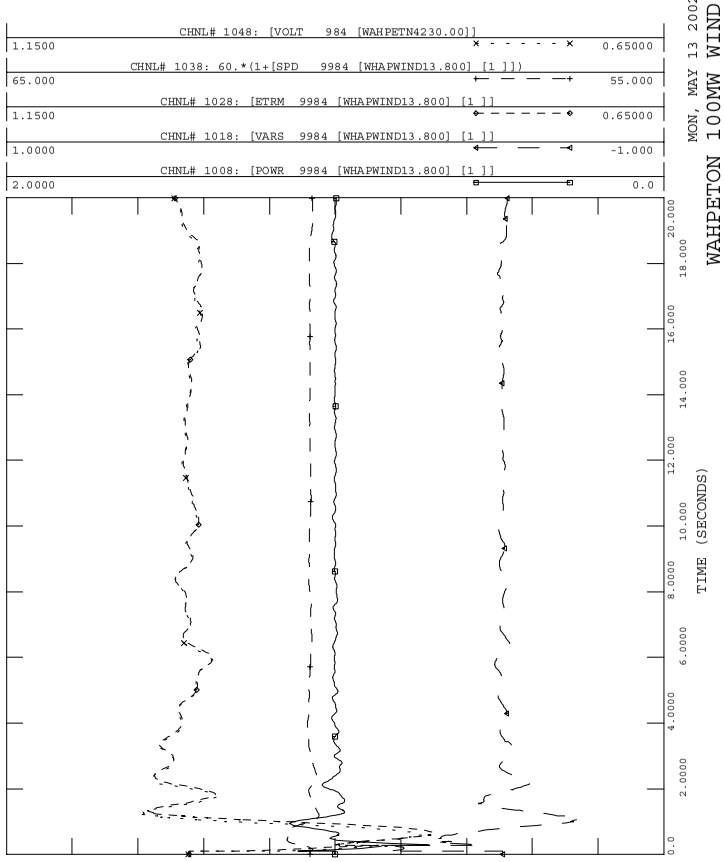
LANGDON 100MW WIND UNIT



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

MON, MAY 13 2002 8:51

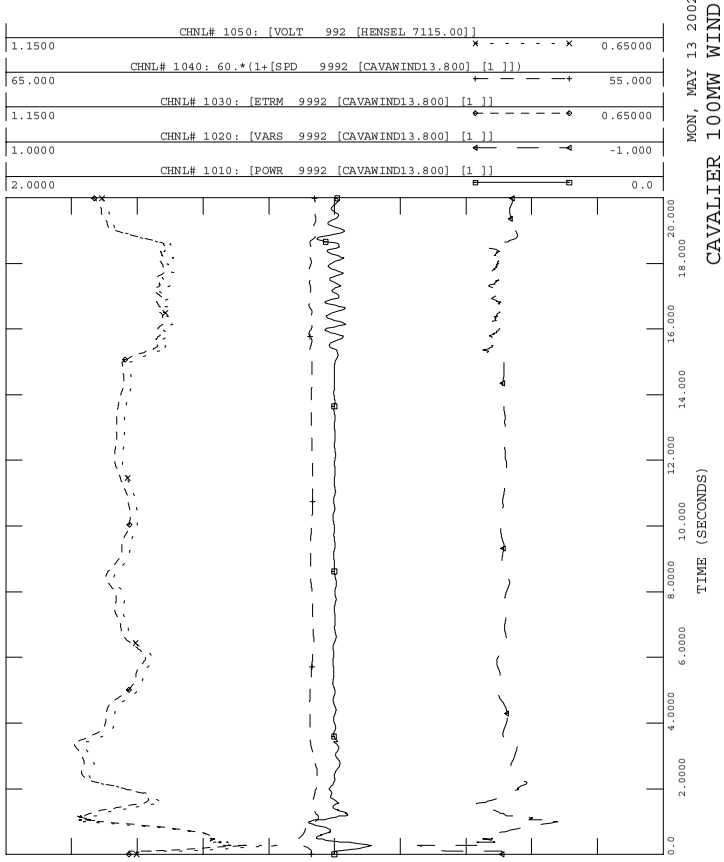
WAHPETON 100MW WIND UNIT



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag1.bin

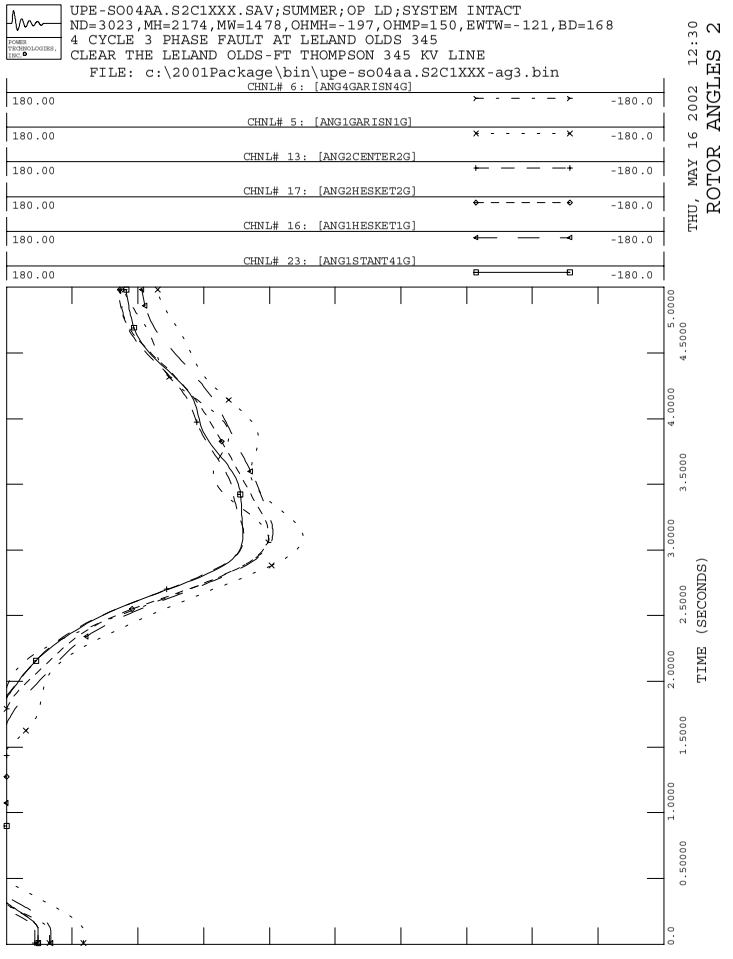
MON, MAY 13 2002 8:51

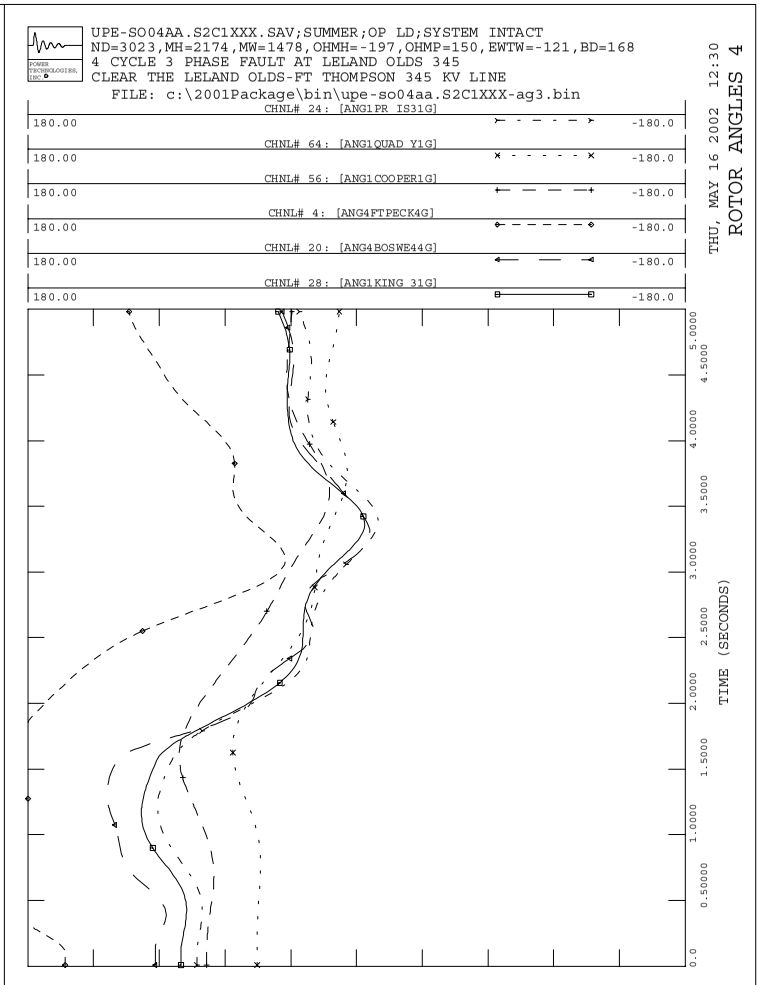
CAVALIER 100MW WIND UNIT

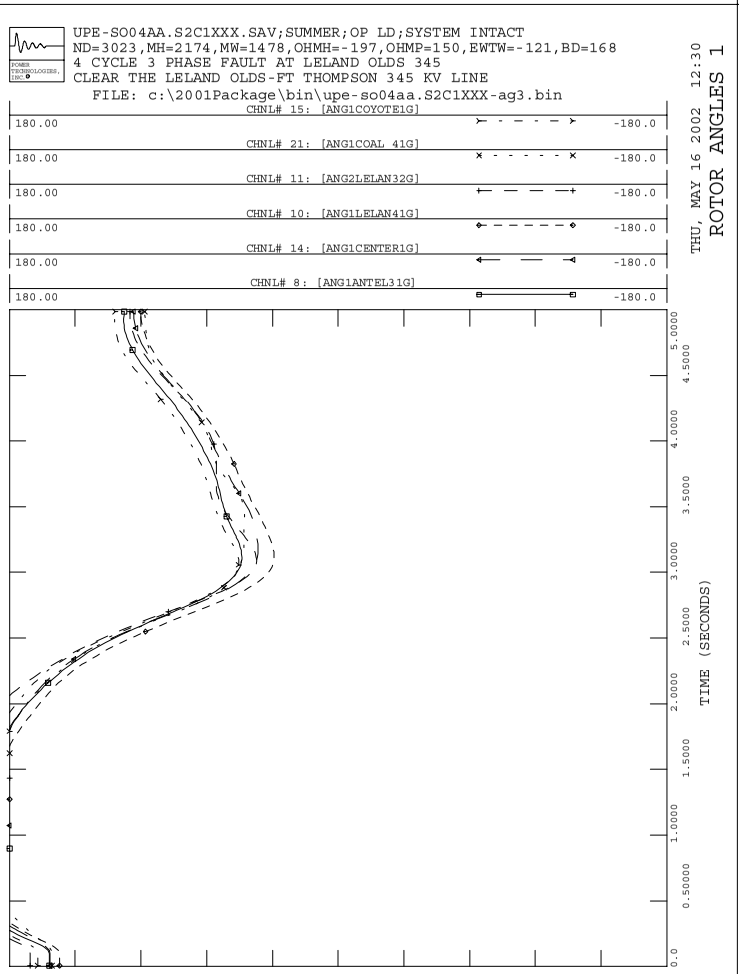


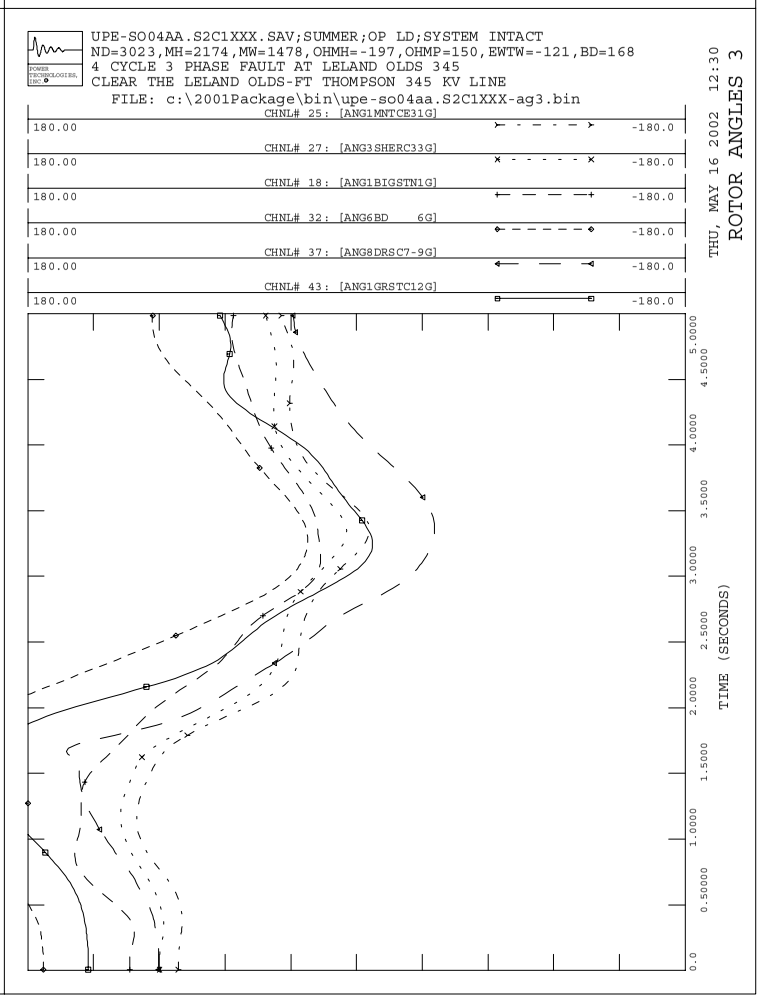
CONTINGENCY AG3

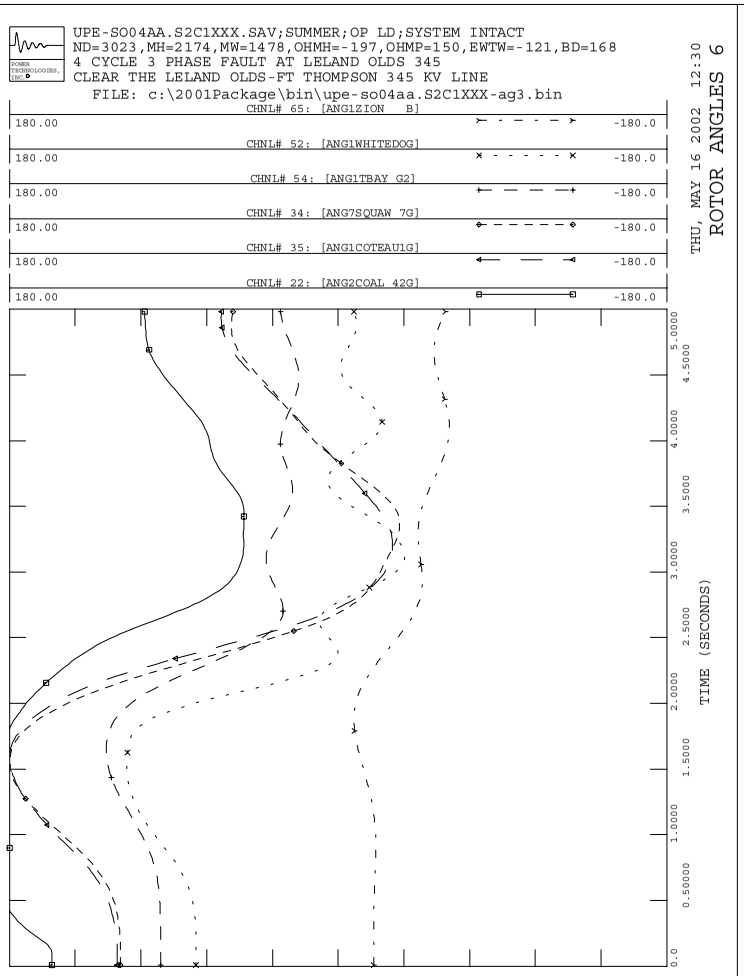
Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

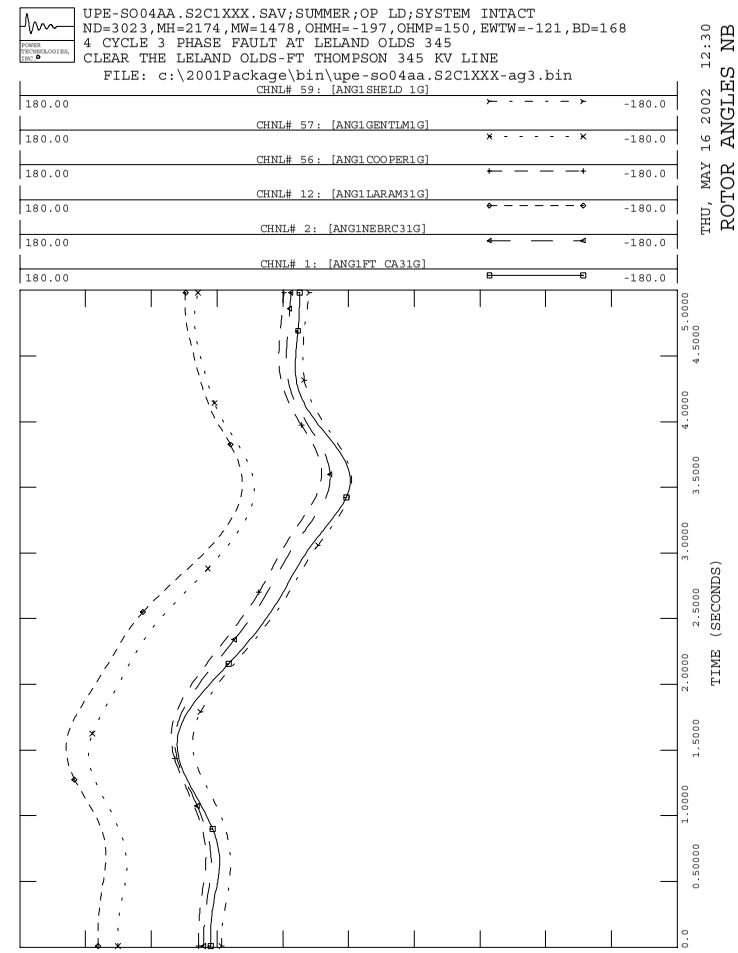

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 12:30
ROTOR ANGLES 2

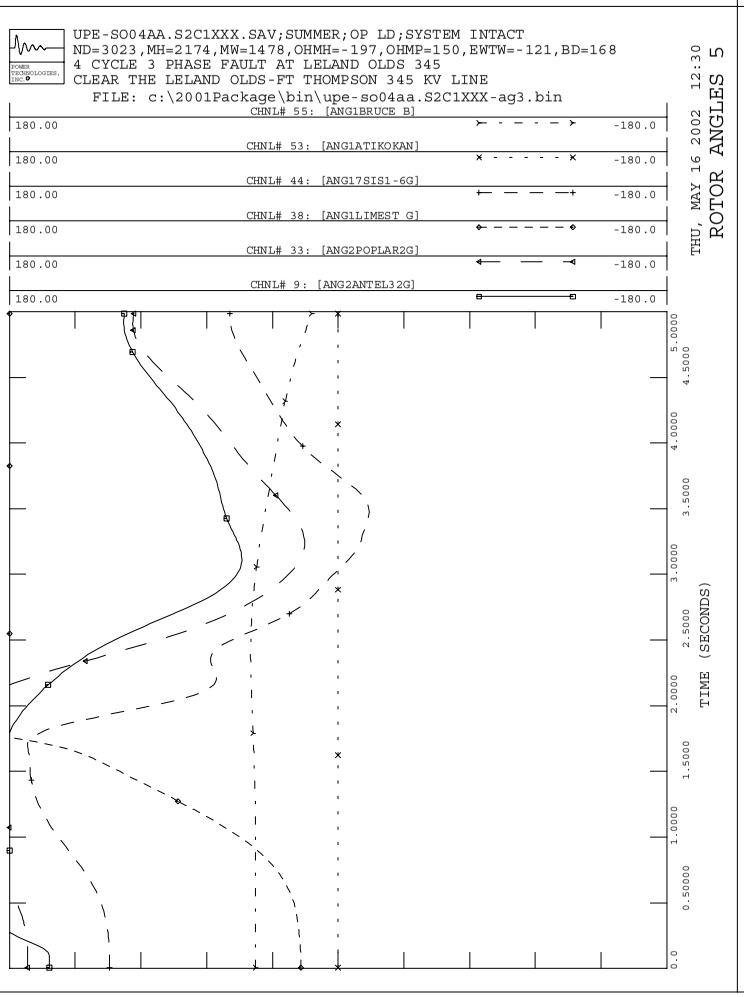

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 12:30
ROTOR ANGLES 4

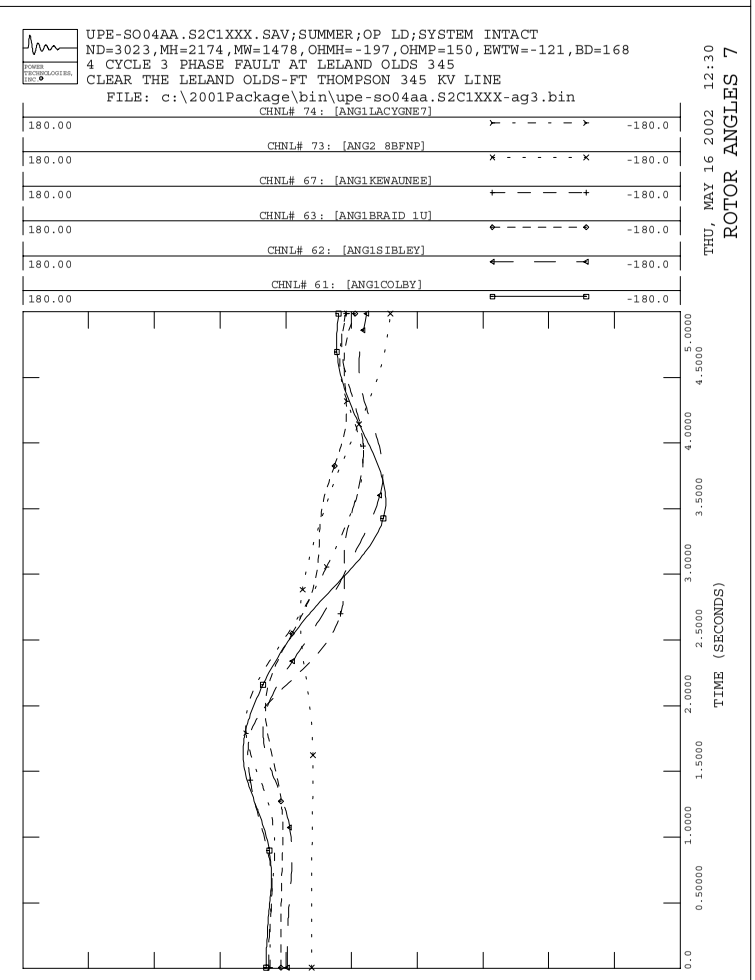

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 12:30
ROTOR ANGLES 1

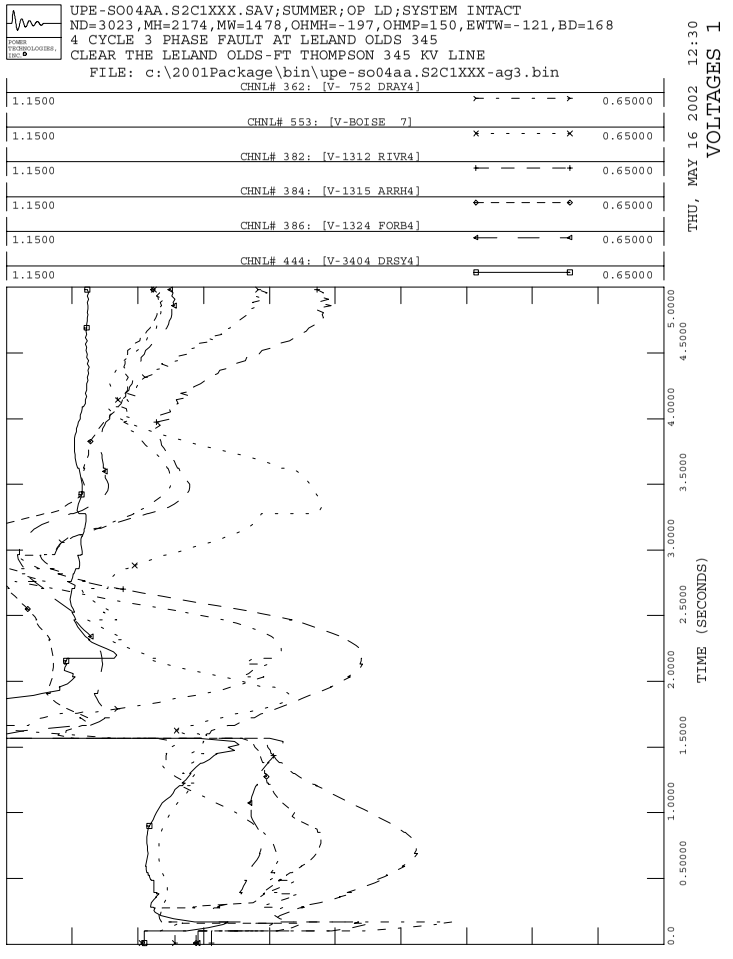

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 12:30
ROTOR ANGLES 3

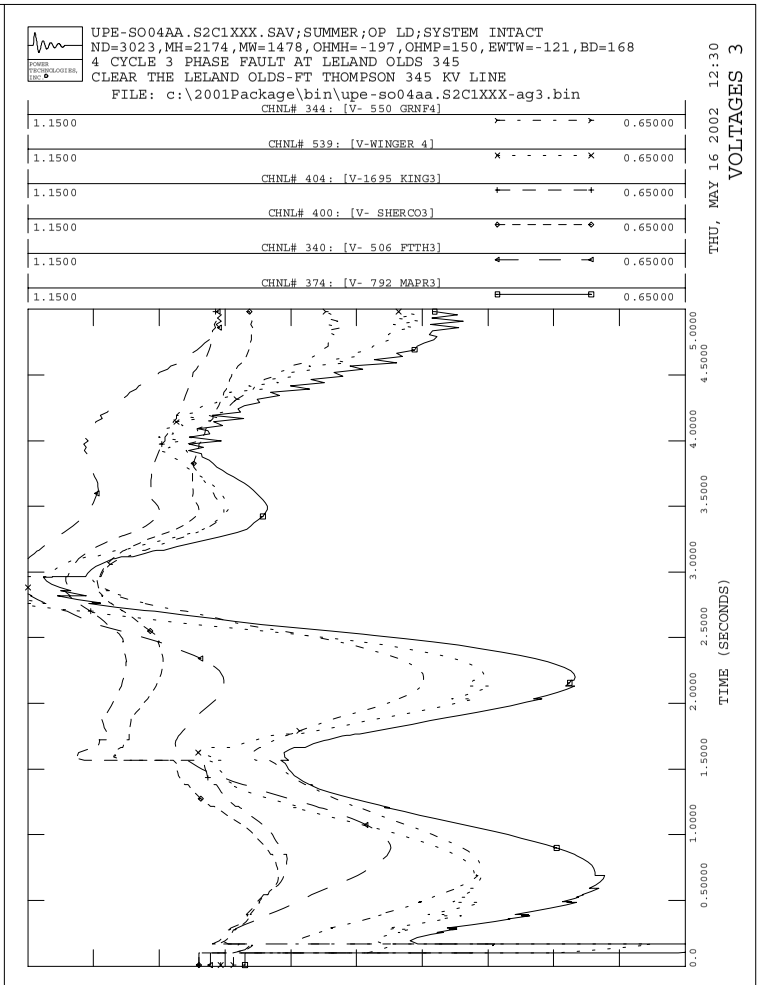

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 12:30
ROTOR ANGLES 6

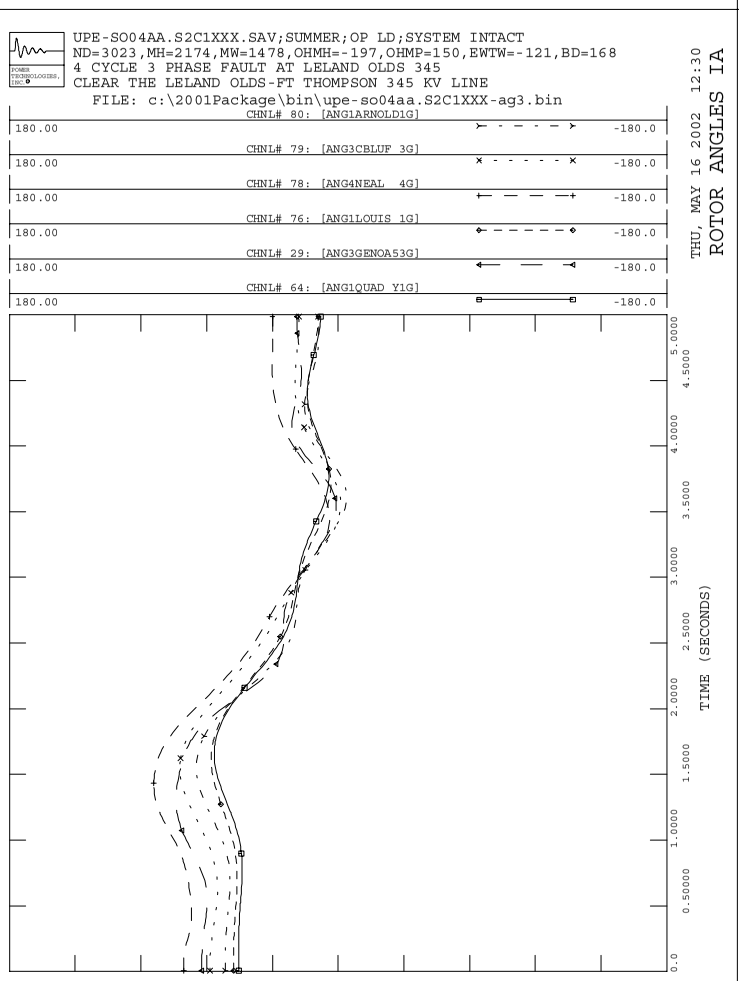

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 12:30
ROTOR ANGLES NB

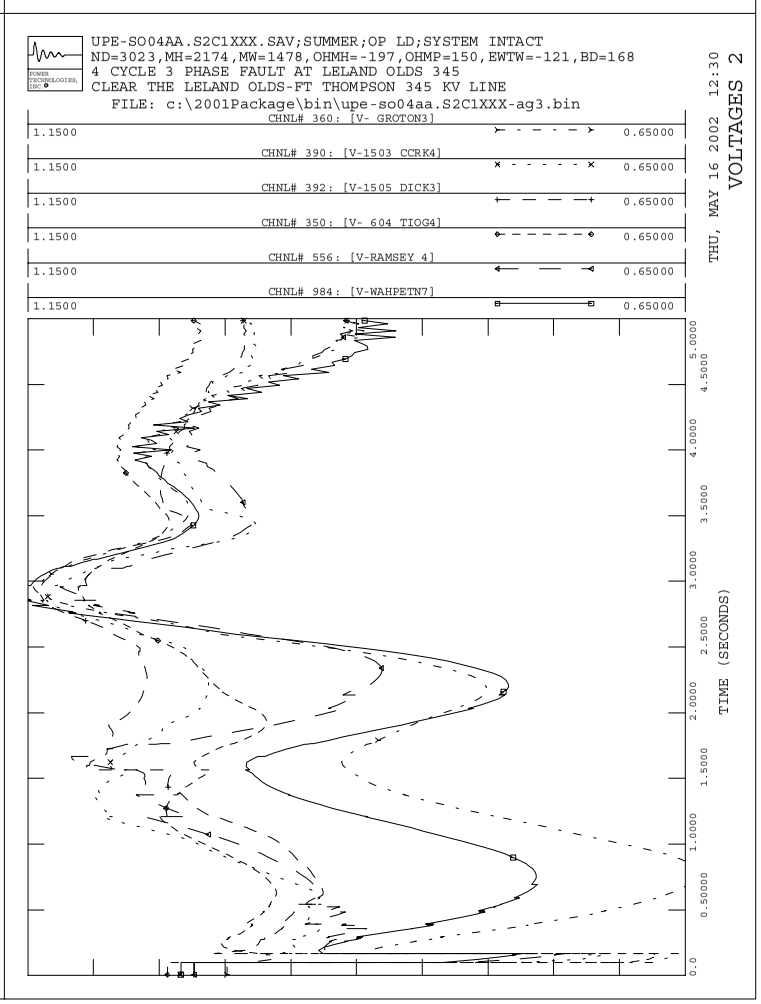

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 12:30
ROTOR ANGLES 5


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 12:30
ROTOR ANGLES 7

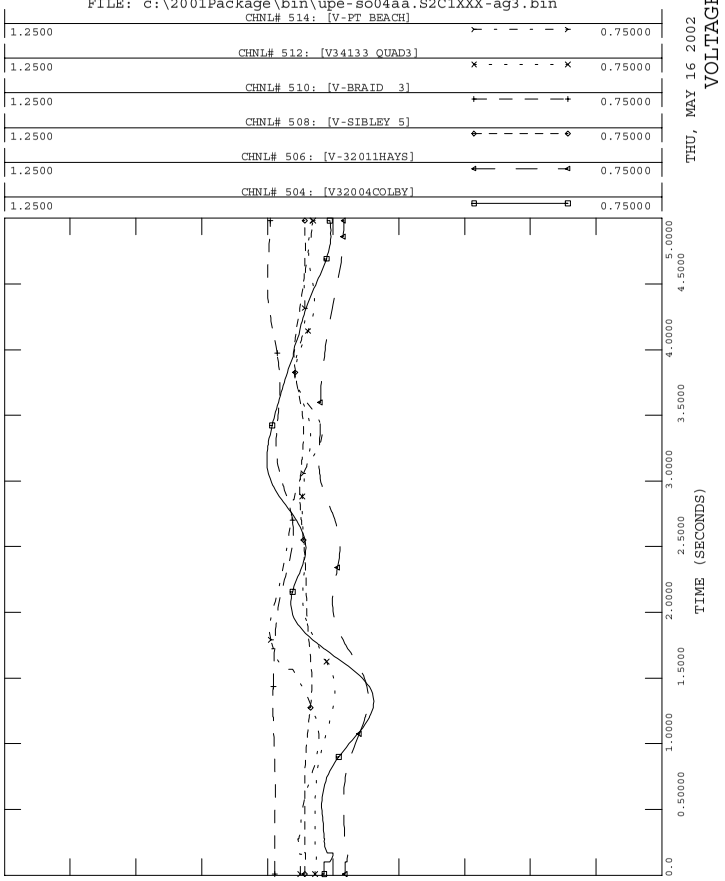

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 362: [V- 752 DRAY4]
CHNL# 553: [V-BOISE 7]
CHNL# 382: [V-1312 RIVR4]
CHNL# 384: [V-1315 ARRH4]
CHNL# 386: [V-1324 FORB4]
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
TIME (SECONDS)
THU, MAY 16 2002 12:30
VOLTAGES 1


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 344: [V- 550 GRNF4]
CHNL# 539: [V-WINGER 4]
CHNL# 404: [V-1695 KING3]
CHNL# 400: [V- SHERCO3]
CHNL# 340: [V- 506 FTTH3]
CHNL# 374: [V- 792 MAPR3]
1.1500
0.65000
TIME (SECONDS)
THU, MAY 16 2002 12:30
VOLTAGES 3


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 80: [ANG1ARNOLD1G]
CHNL# 79: [ANG3CBLUF 3G]
CHNL# 78: [ANG4NEAL 4G]
CHNL# 76: [ANG1LOUIS 1G]
CHNL# 29: [ANG3GENOA53G]
CHNL# 64: [ANG1QUAD Y1G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 12:30
ROTOR ANGLES IA

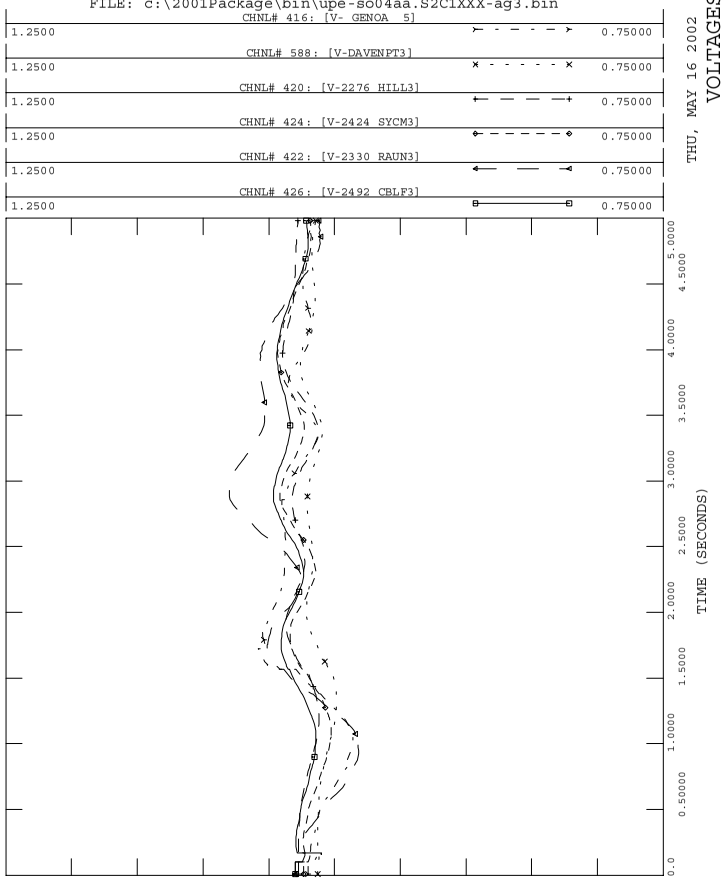

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 360: [V- GROTON3]
CHNL# 390: [V-1503 CCRK4]
CHNL# 392: [V-1505 DICK3]
CHNL# 350: [V- 604 TIOG4]
CHNL# 556: [V-RAMSEY 4]
CHNL# 984: [V-WAHPETN7]
1.1500
0.65000
TIME (SECONDS)
THU, MAY 16 2002 12:30
VOLTAGES 2

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin



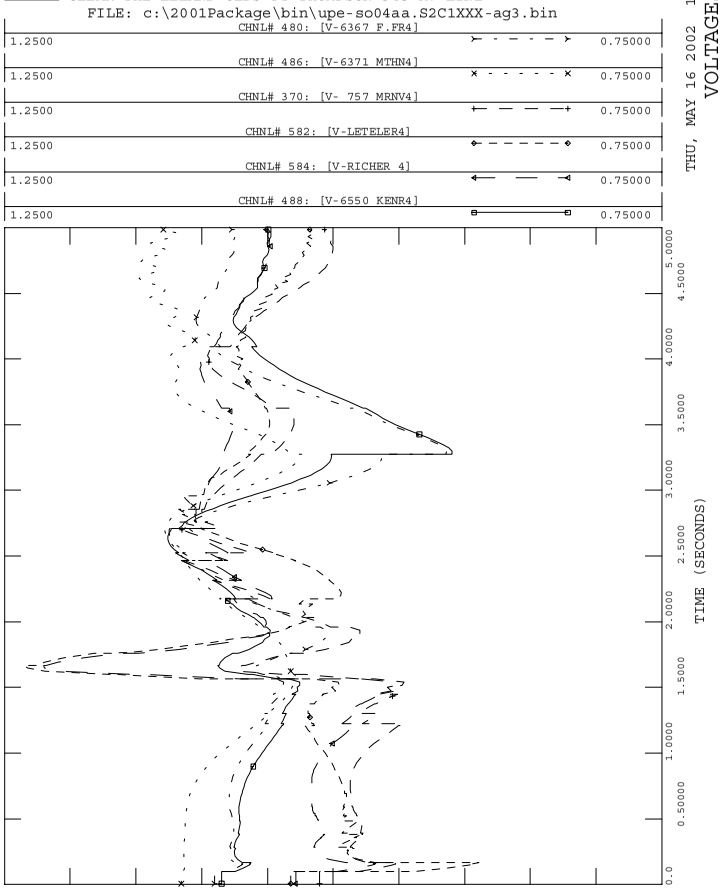
THU, MAY 16 2002 12:30
VOLTAGES 5

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin



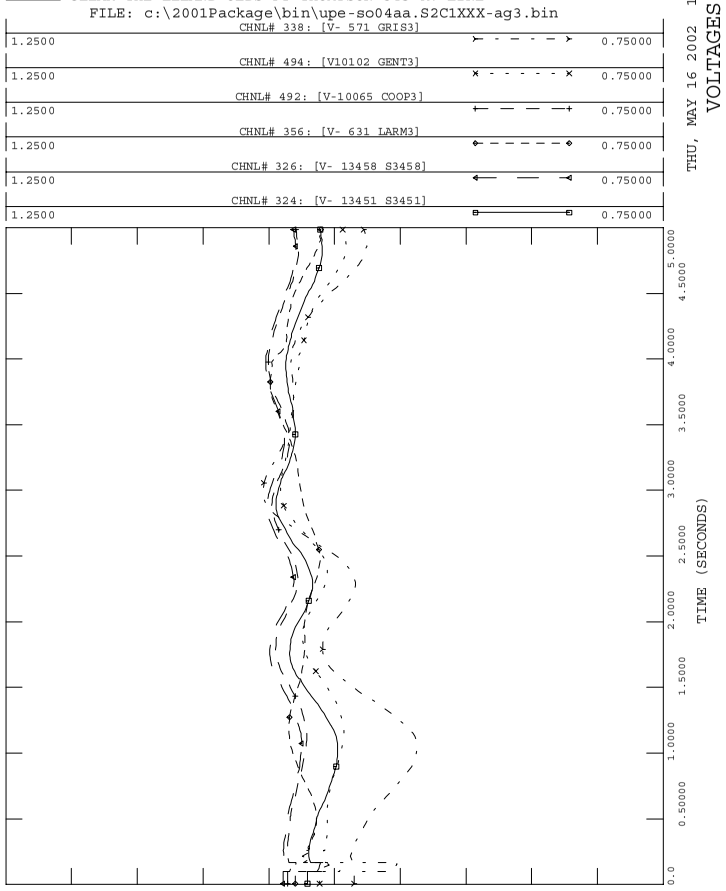
THU, MAY 16 2002 12:30
VOLTAGES IA

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

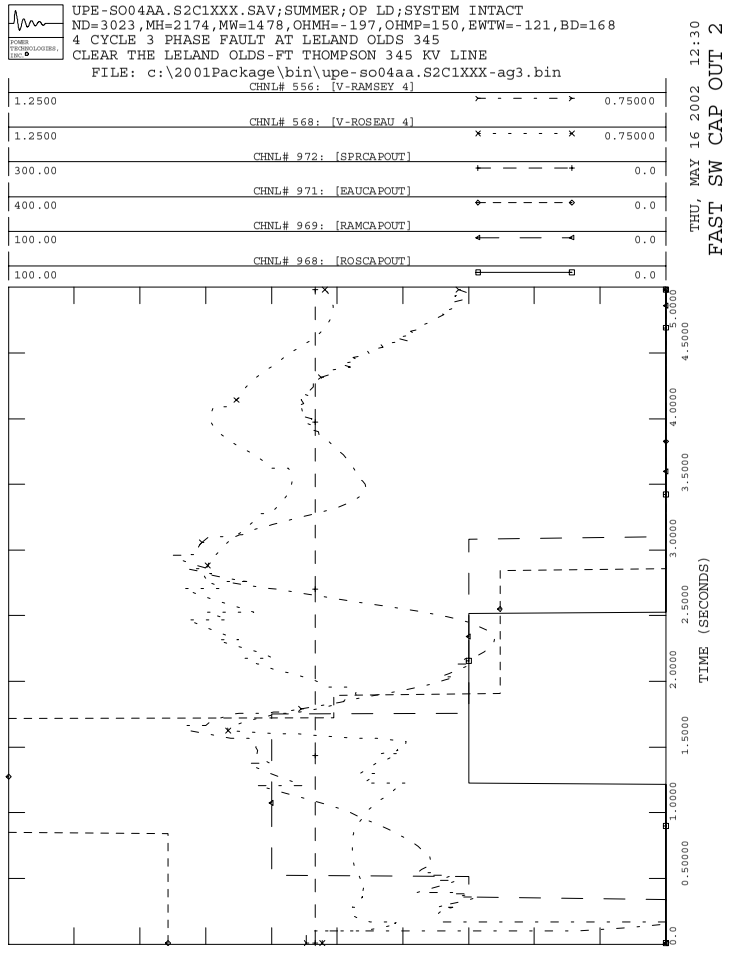


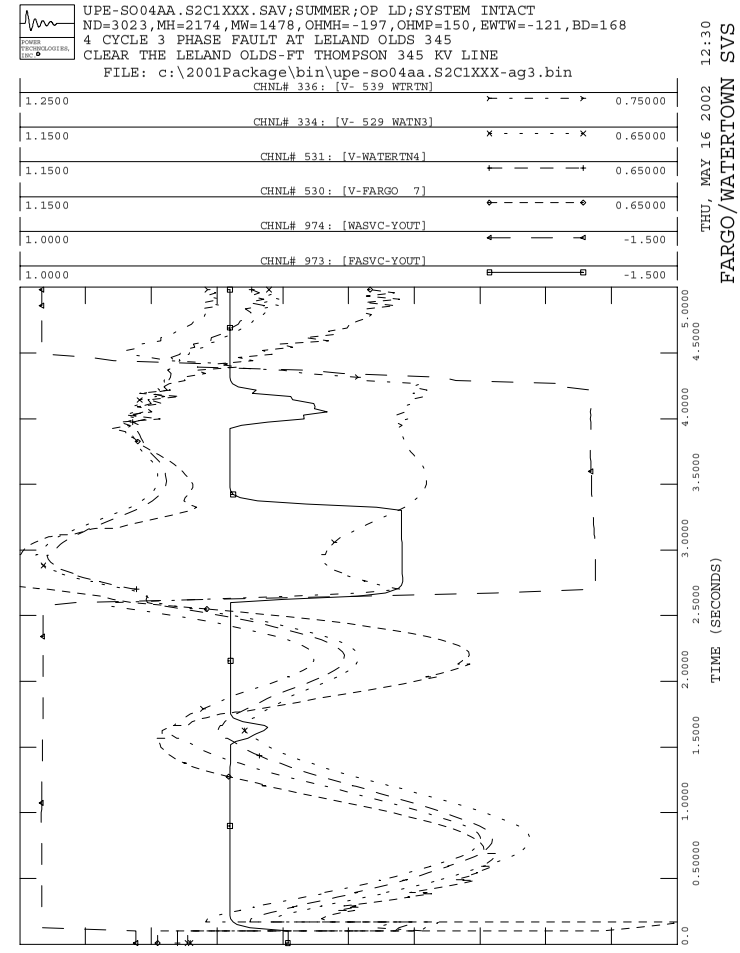
THU, MAY 16 2002 12:30
VOLTAGES 4

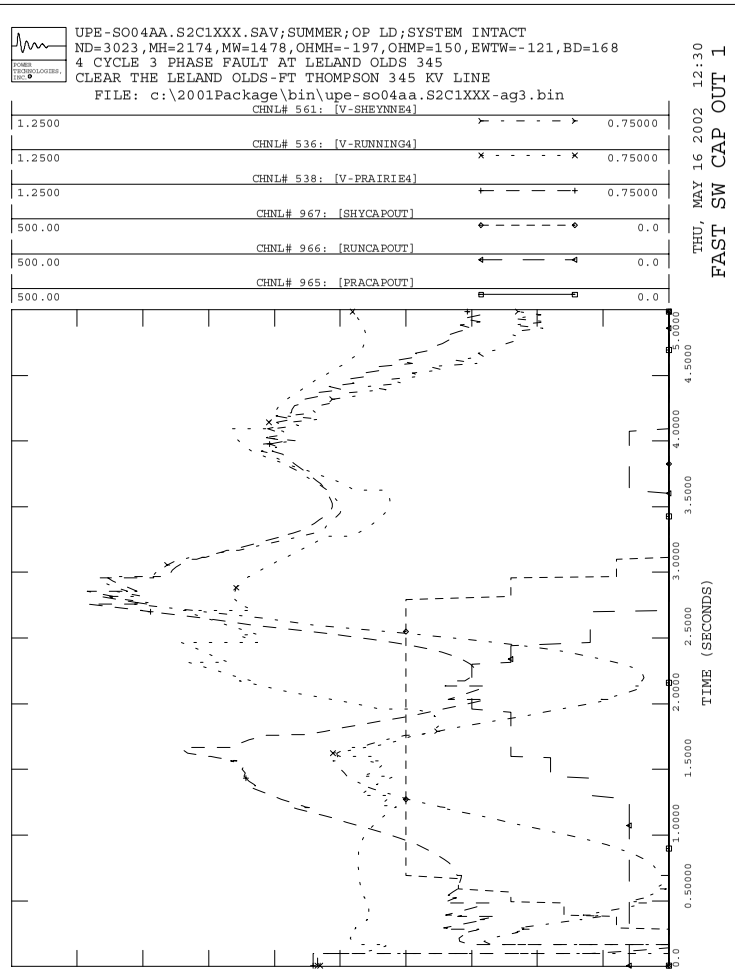
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

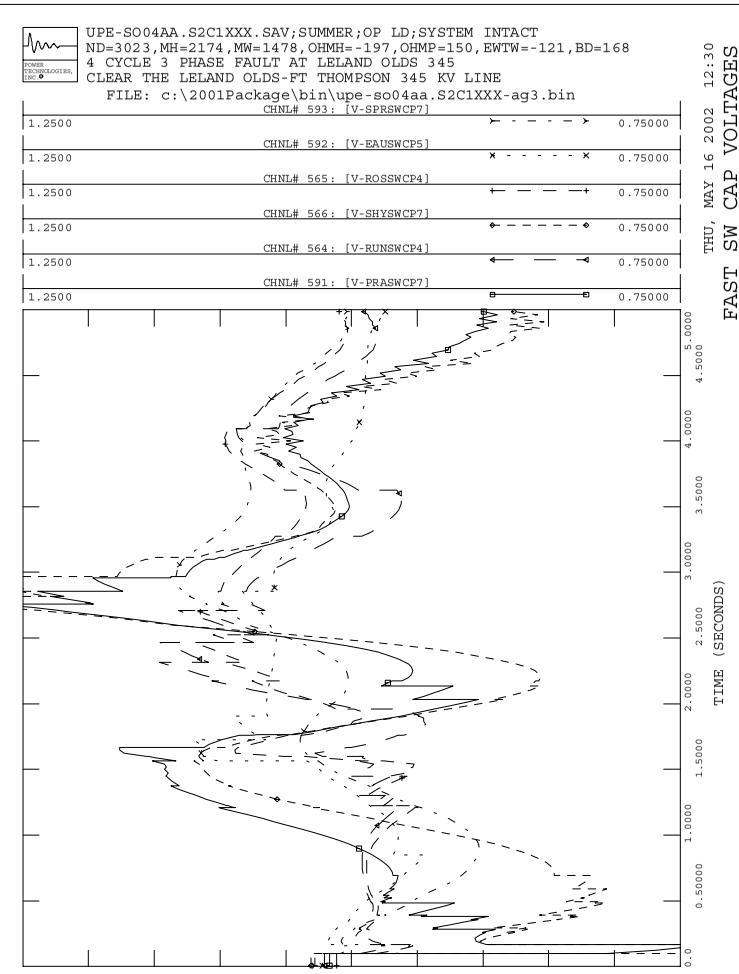


THU, MAY 16 2002 12:30
VOLTAGES NB


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
THU, MAY 16 2002 12:30
FAST SW CAP OUT 2


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
THU, MAY 16 2002 12:30
FARGO/WATERTOWN SVS

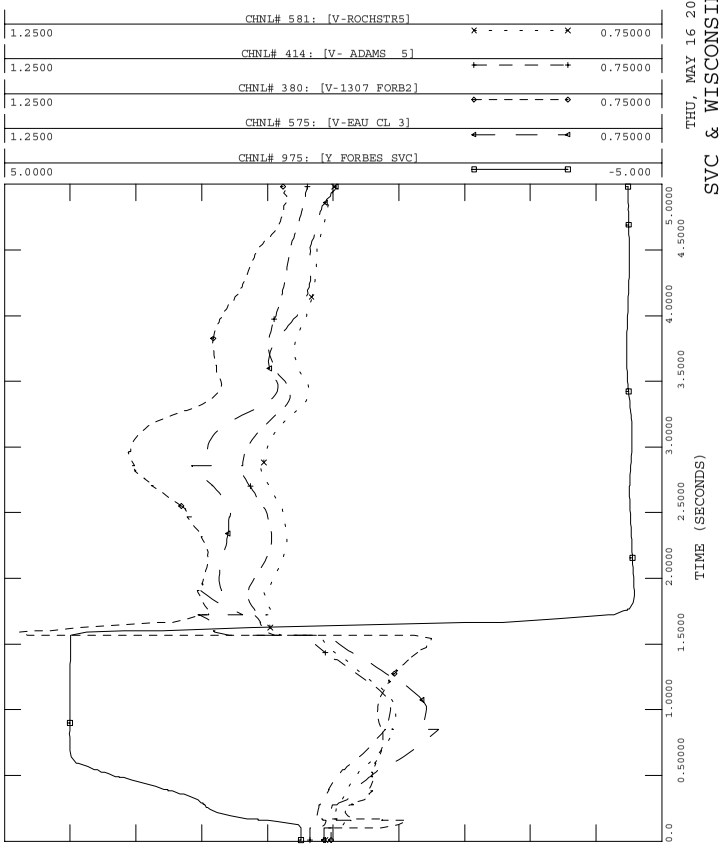

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
THU, MAY 16 2002 12:30
FAST SW CAP OUT 1


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
THU, MAY 16 2002 12:30
FAST SW CAP VOLTAGES

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

THU, MAY 16 2002 12:30

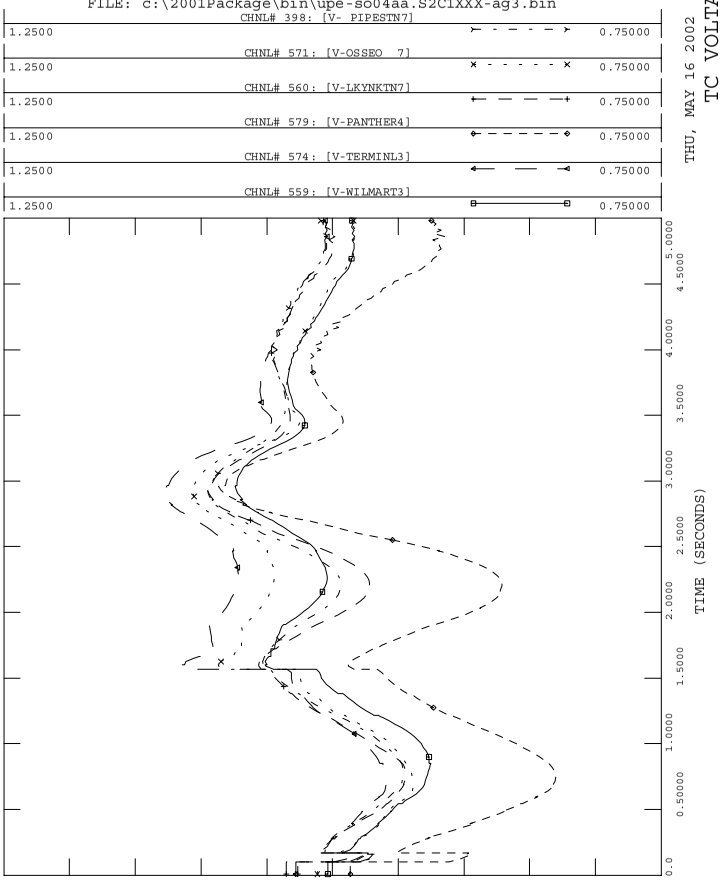
SVC & WISCONSIN VOLT



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

THU, MAY 16 2002 12:30

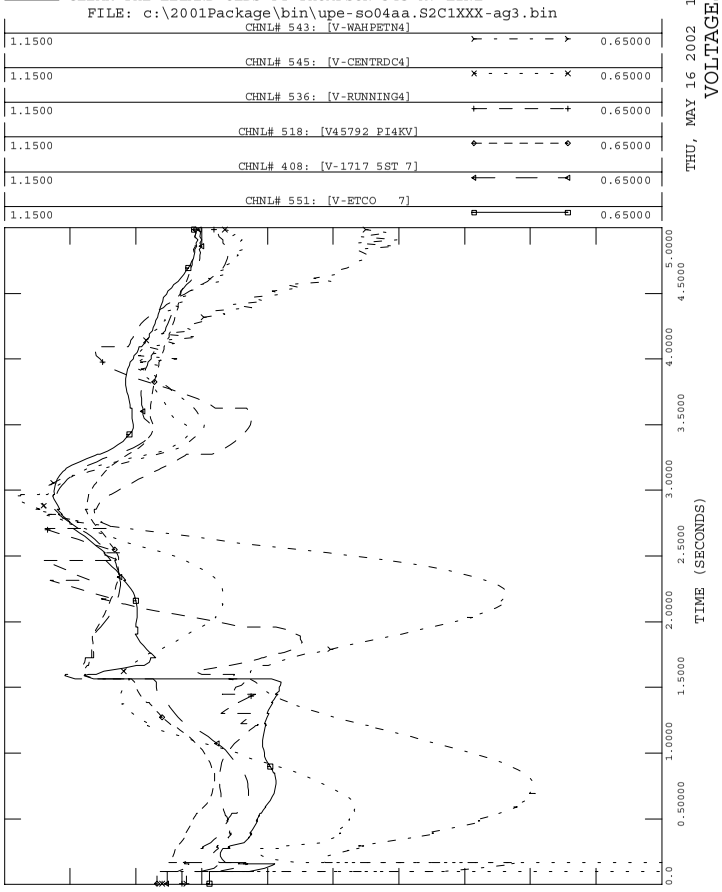
TC VOLTAGES



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

THU, MAY 16 2002 12:30

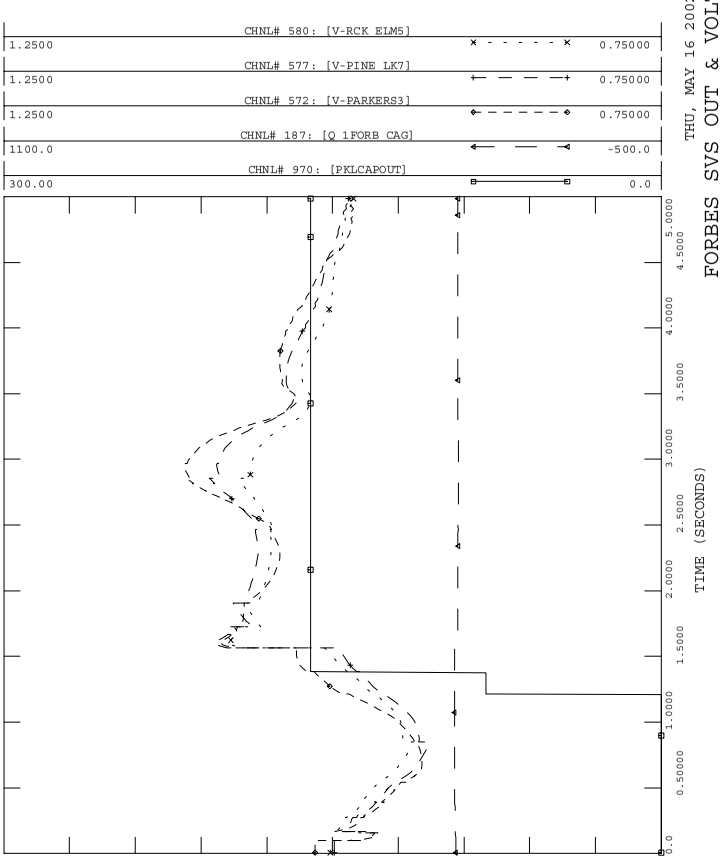
VOLTAGES 6



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

THU, MAY 16 2002 12:30

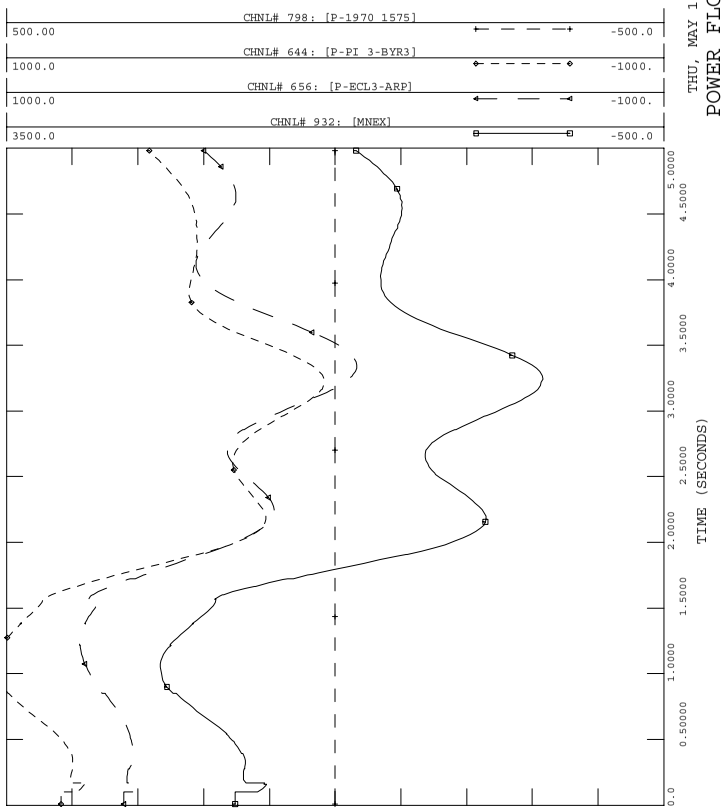
FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

THU, MAY 16 2002 12:30

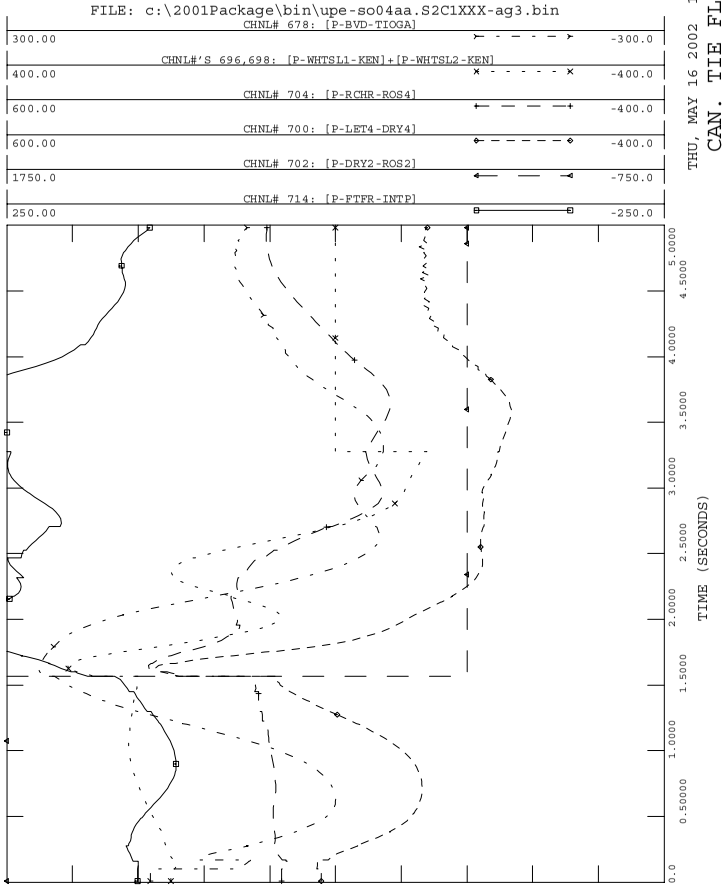
POWER FLOW SUMS 2



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

THU, MAY 16 2002 12:30

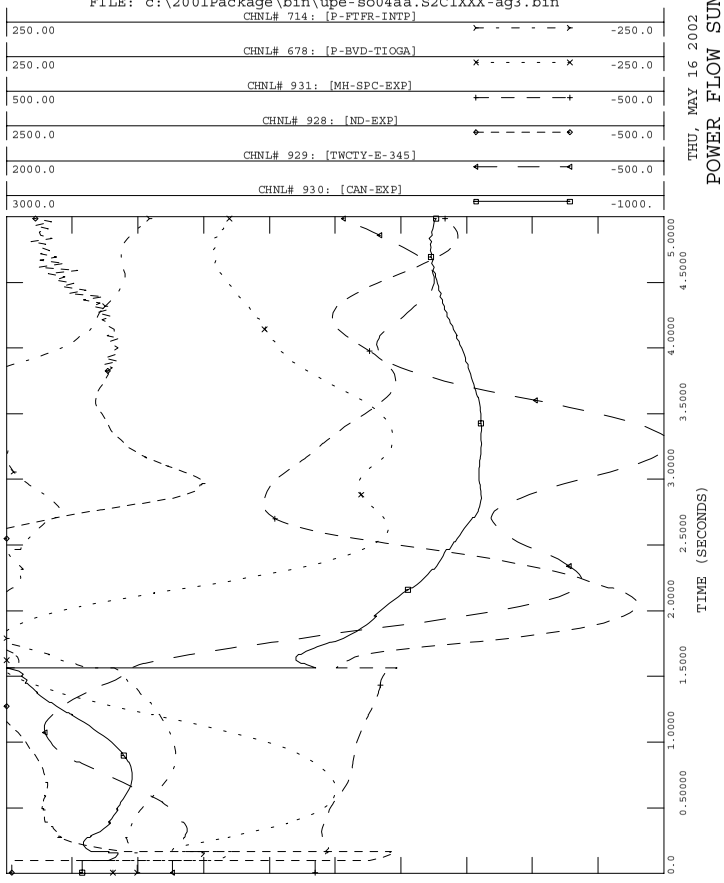
CAN. TIE FLOWS



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

THU, MAY 16 2002 12:30

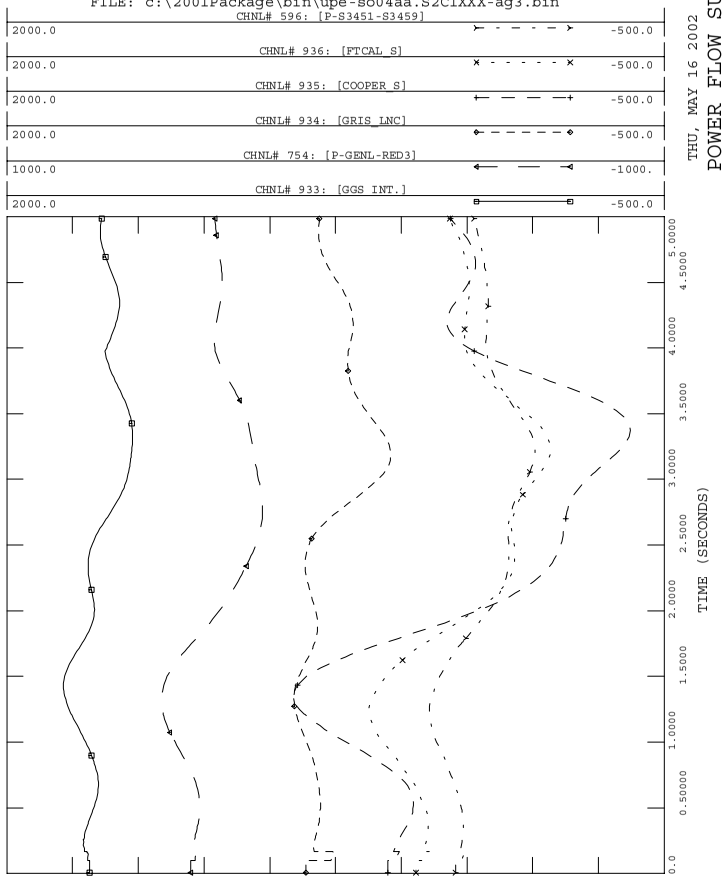
POWER FLOW SUMS 1



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

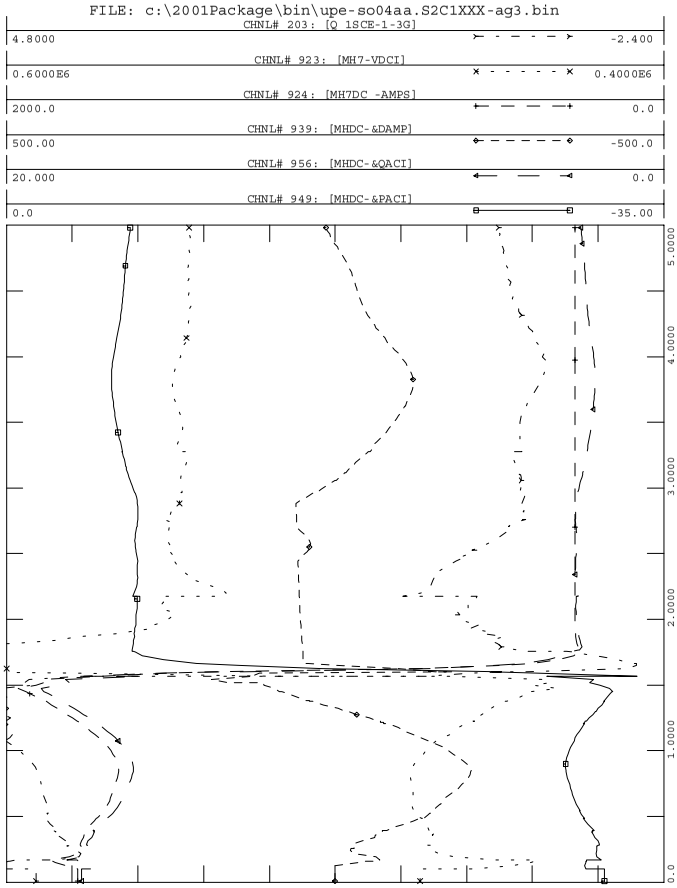
THU, MAY 16 2002 12:30

POWER FLOW SUM 3



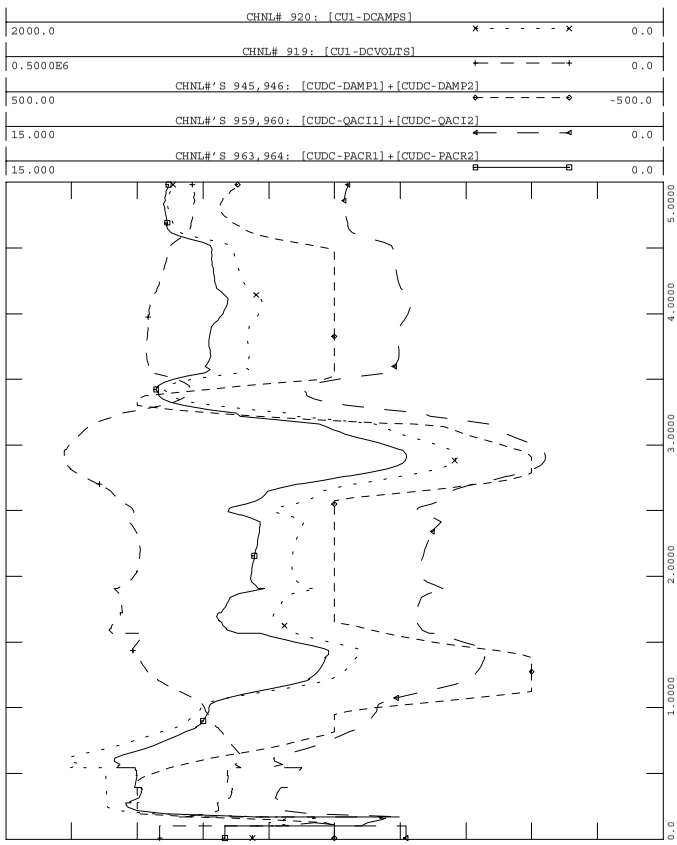
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

THU, MAY 16 2002 12:30
MH DC PARAMETERS



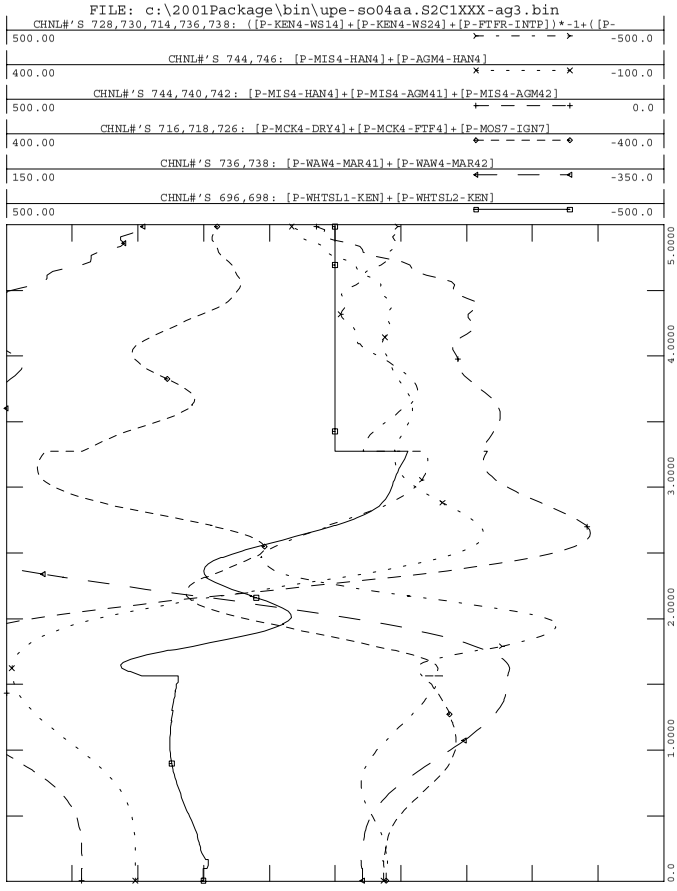
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

THU, MAY 16 2002 12:30
CU DC #1



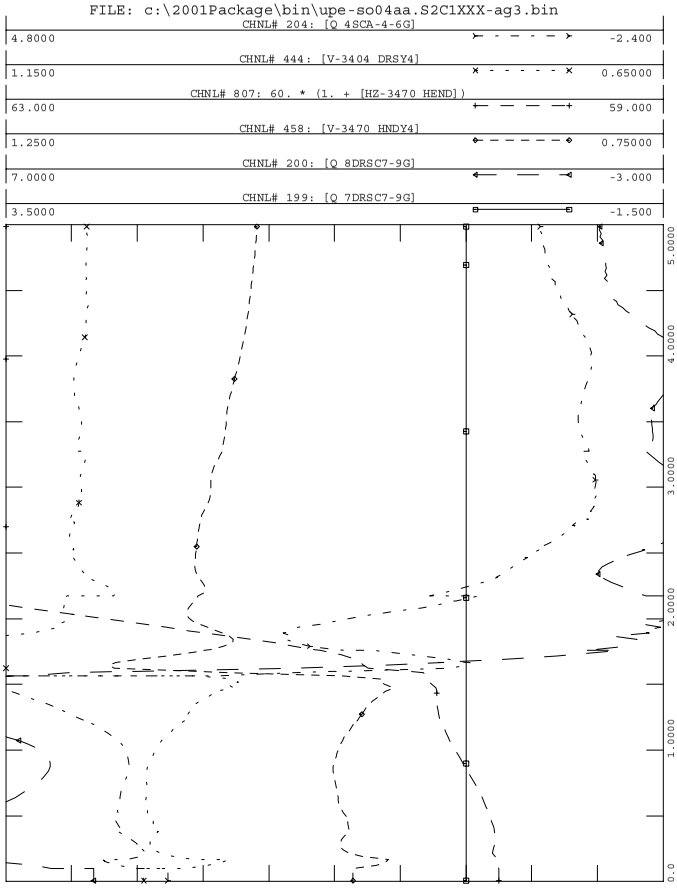
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

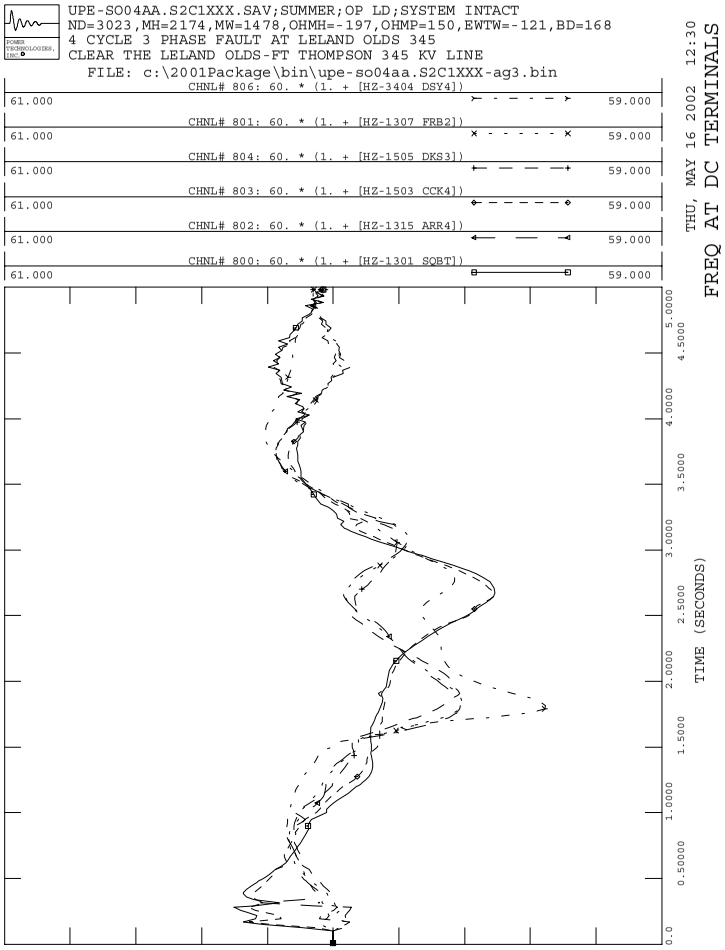
THU, MAY 16 2002 12:30
OH TIE FLOWS

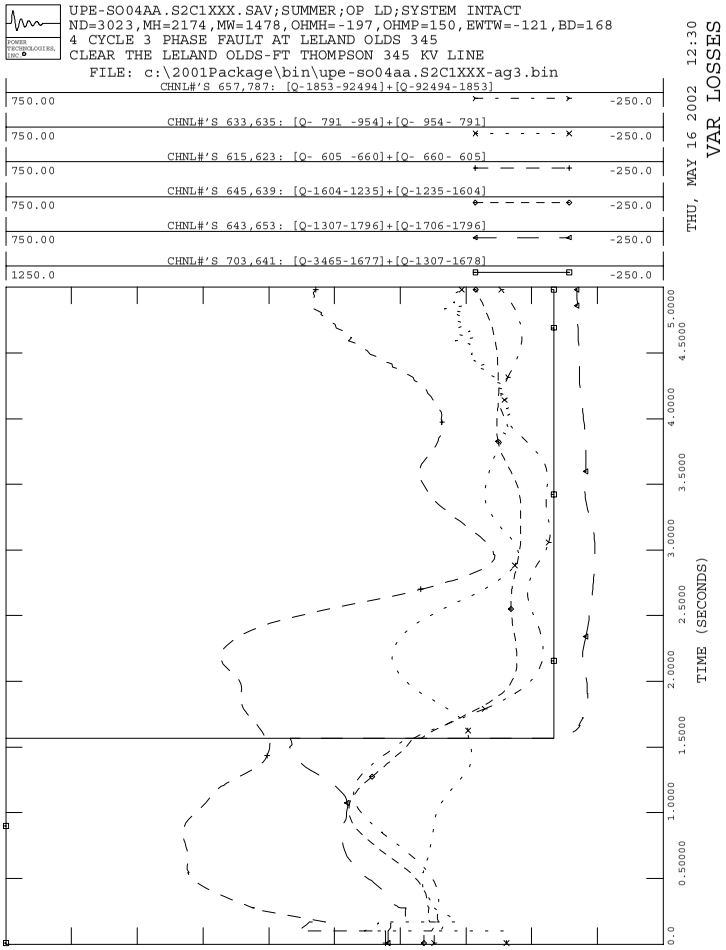


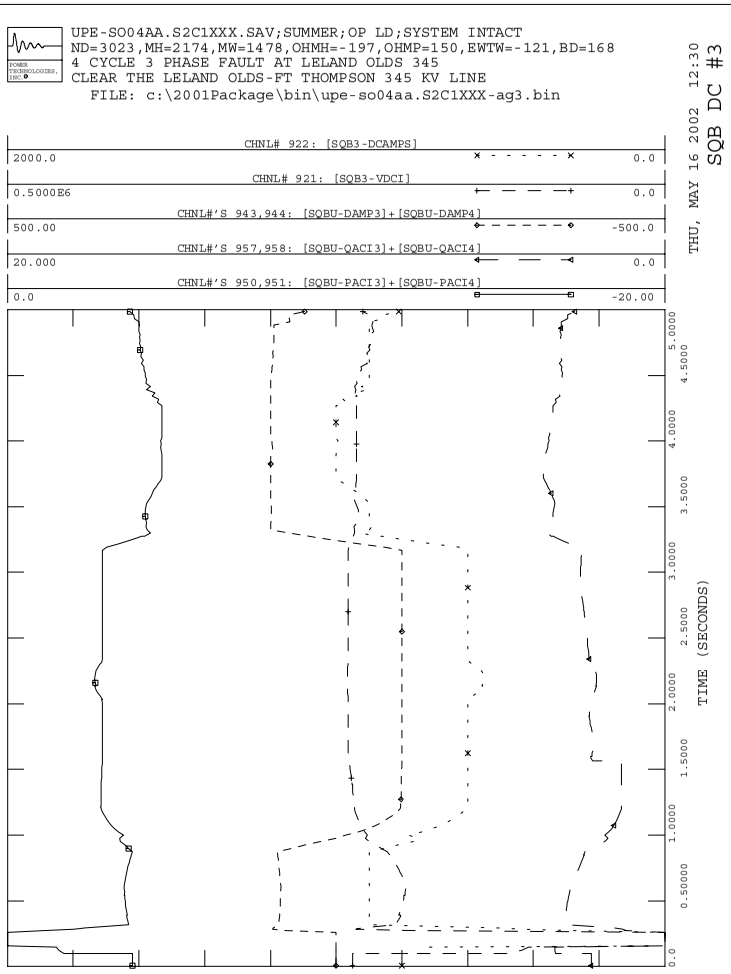
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

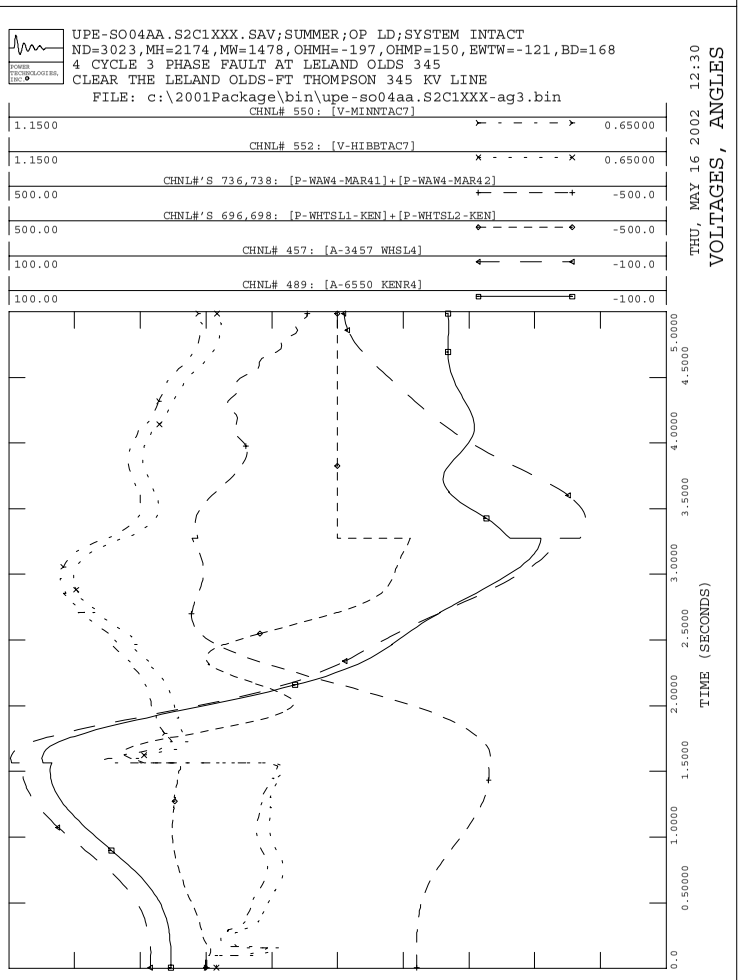
THU, MAY 16 2002 12:30
MH DC PARAMETERS




UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
THU, MAY 16 2002 12:30
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
THU, MAY 16 2002 12:30
VAR LOSSES
TIME (SECONDS)

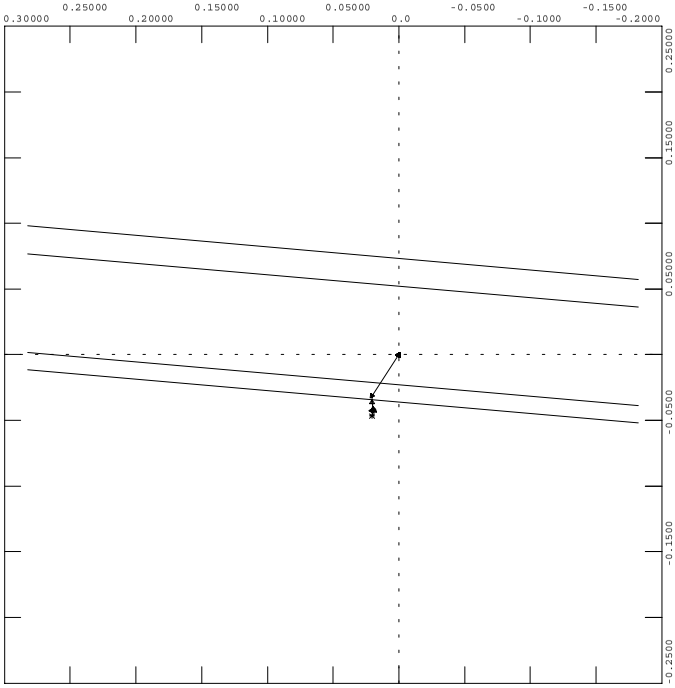

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
-500.0
20.000
0.0
-20.00
THU, MAY 16 2002 12:30
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
THU, MAY 16 2002 12:30
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

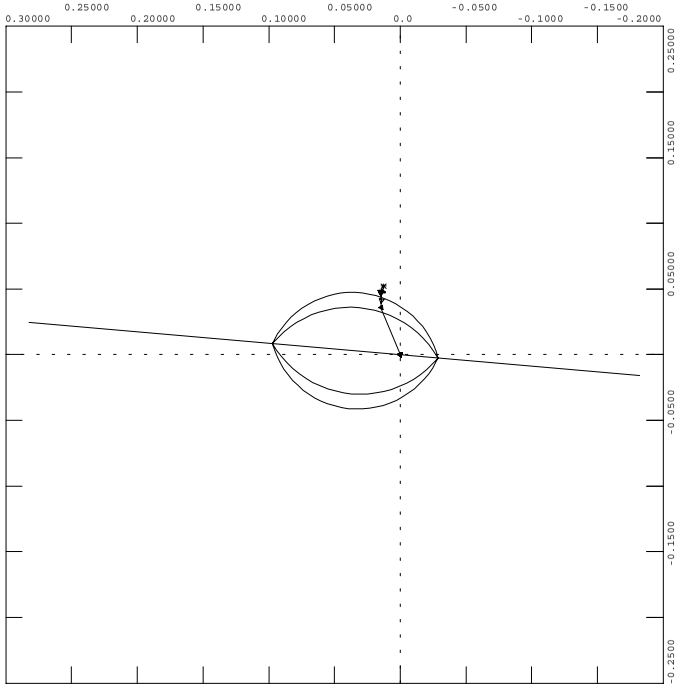


THU, MAY 16 2002 12:30
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

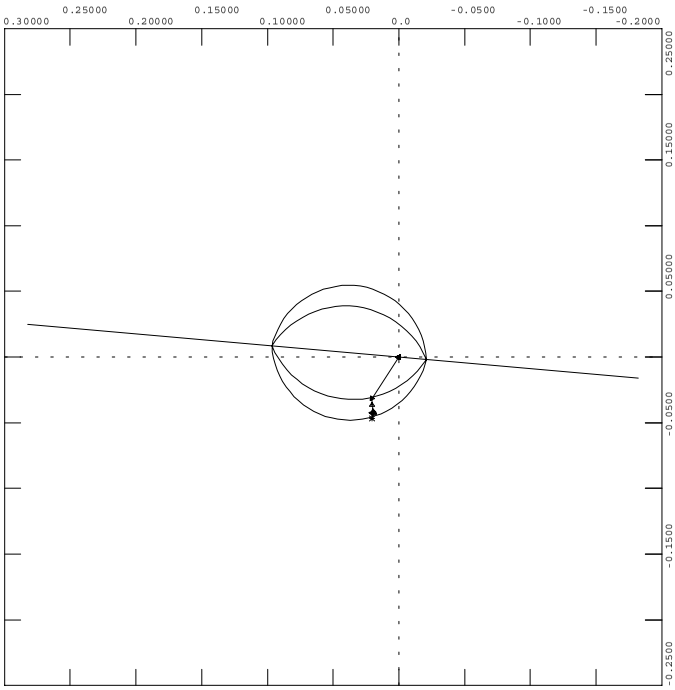


THU, MAY 16 2002 12:30
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

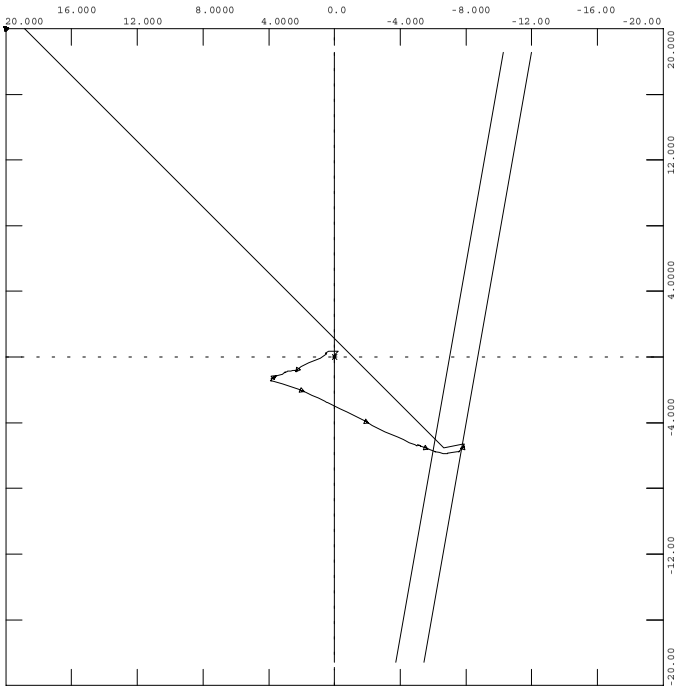


THU, MAY 16 2002 12:30
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

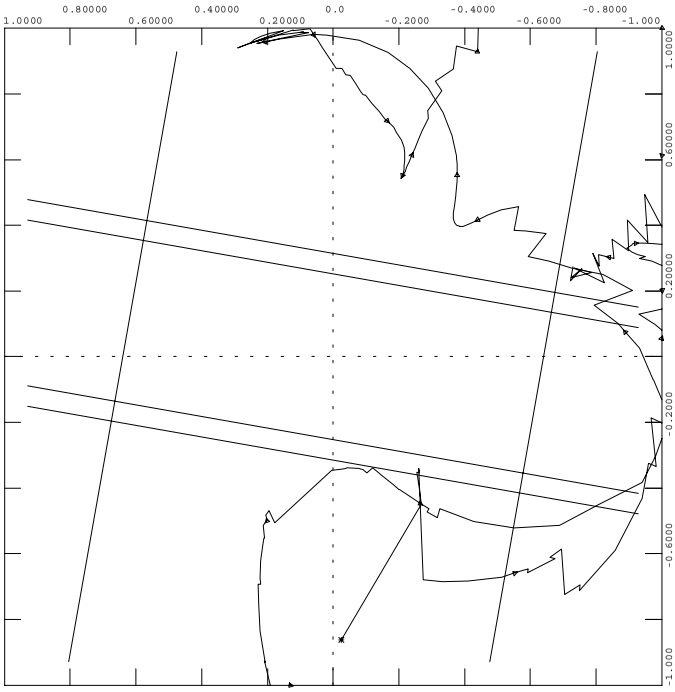


THU, MAY 16 2002 12:30
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

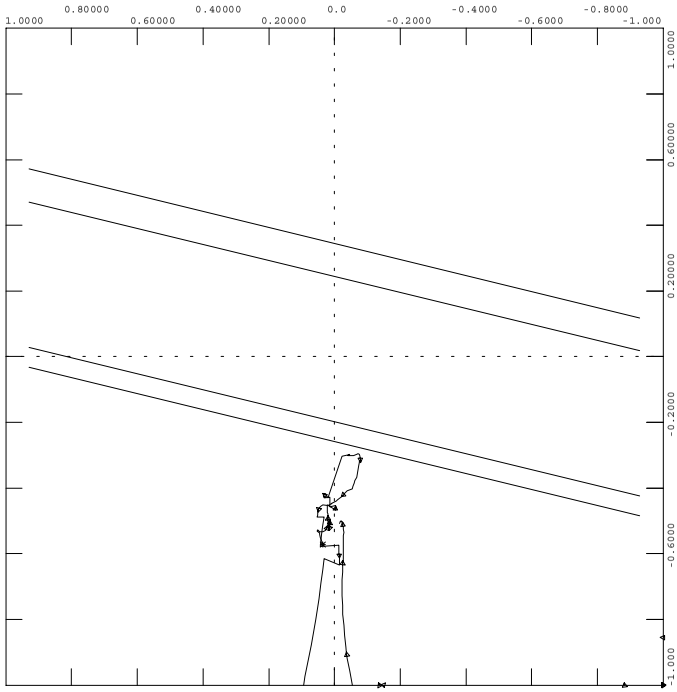
RELAY: SLINOS
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

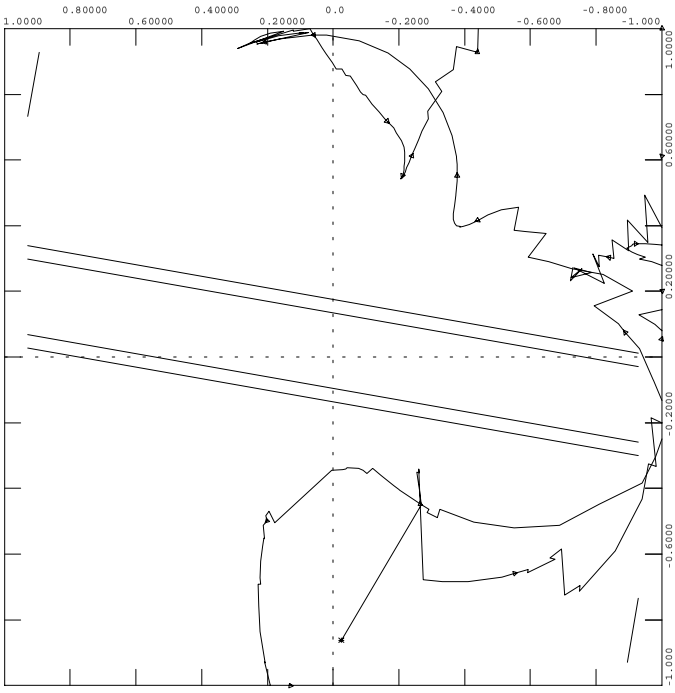
RELAY: SLINOS
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

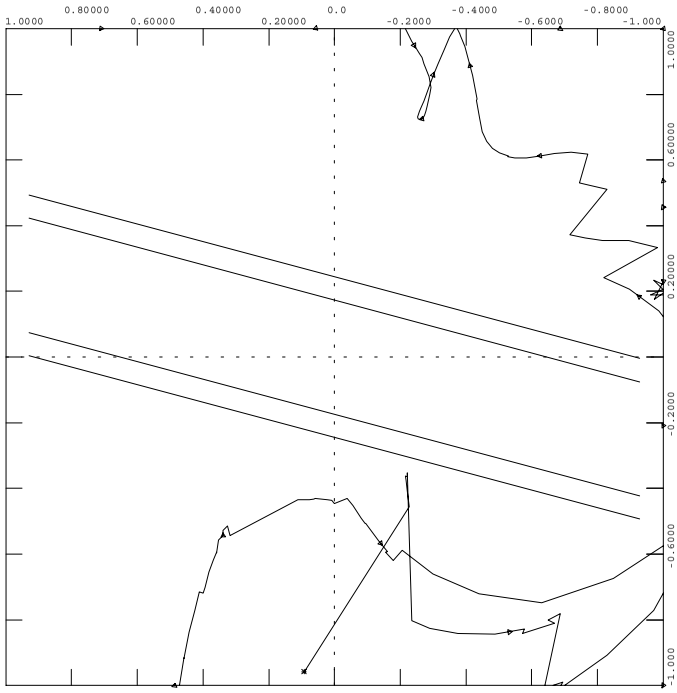
RELAY: SLINOS
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

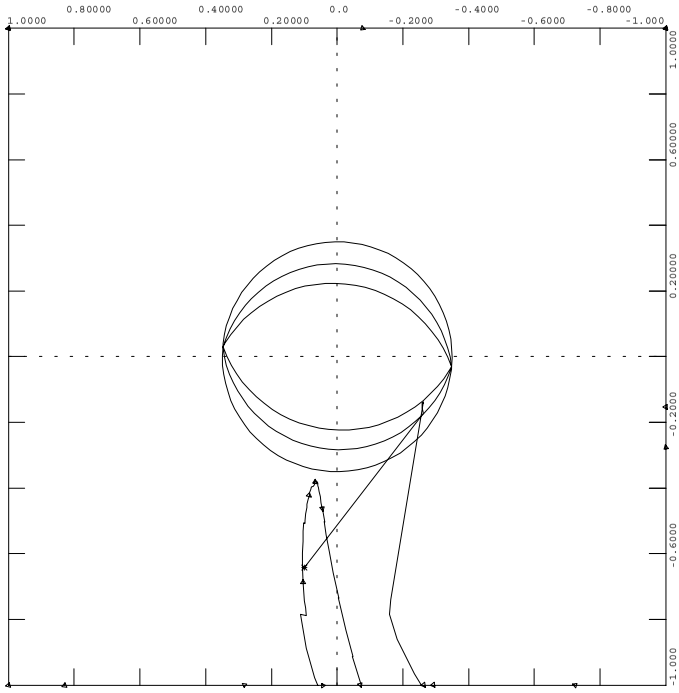
RELAY: SLINOS
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

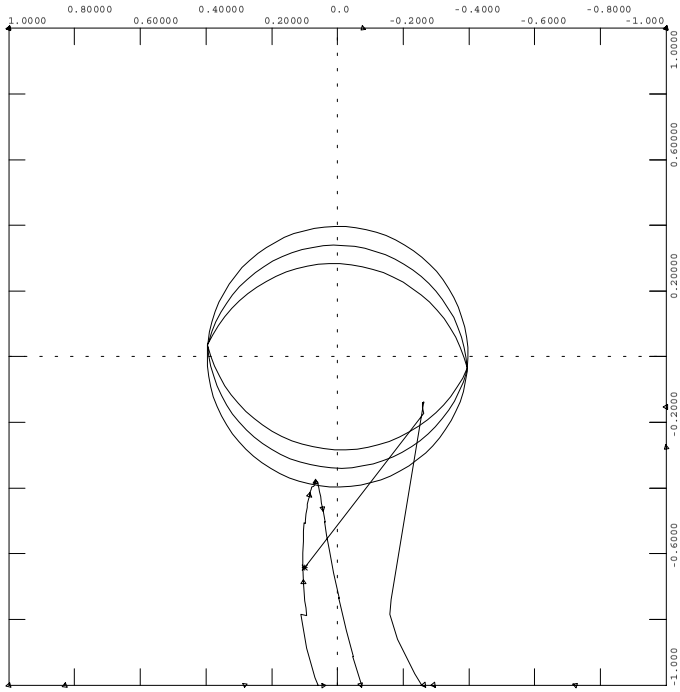
RELAY: SLLP
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

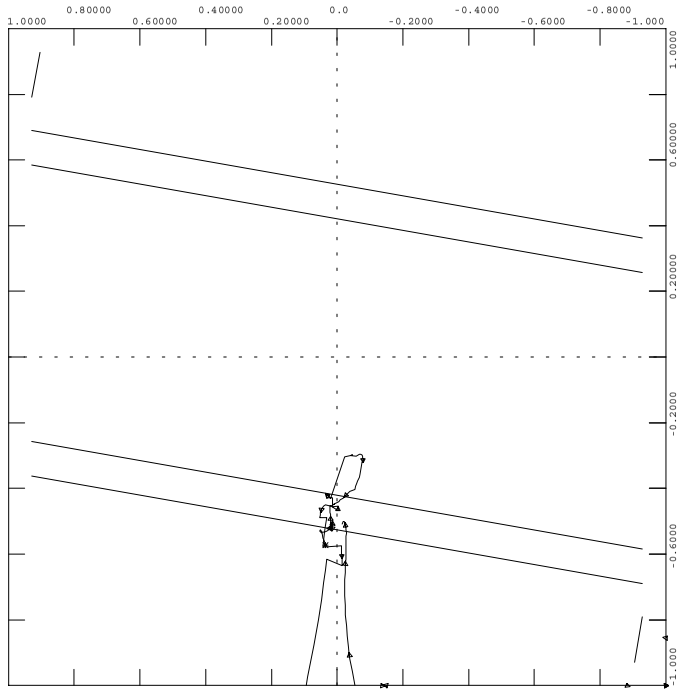
RELAY: SLLP
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

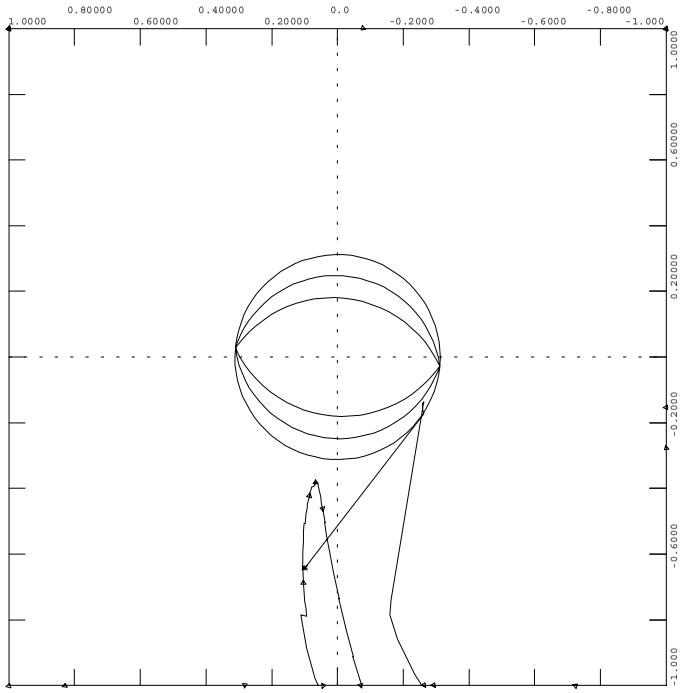
RELAY: SLINOS
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



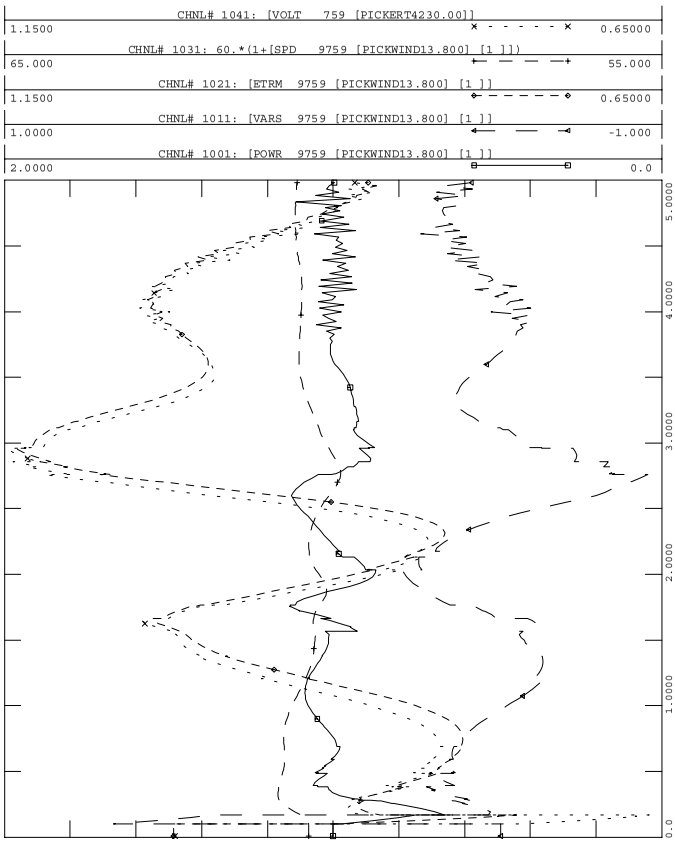
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

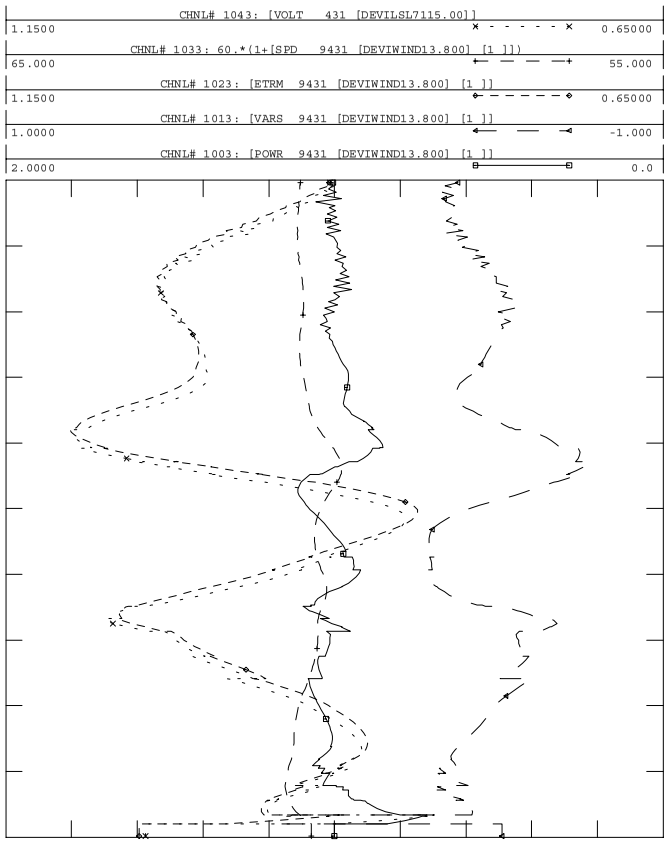
RELAY: SLLP
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin



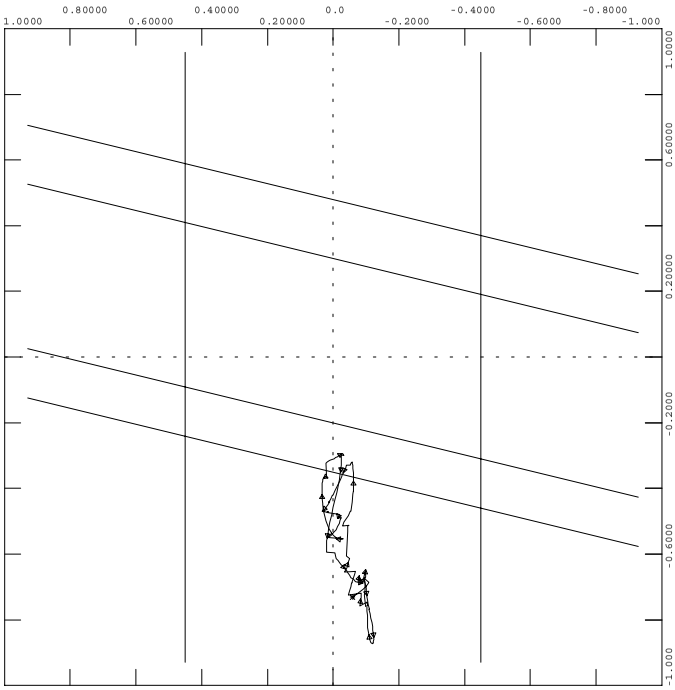
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin



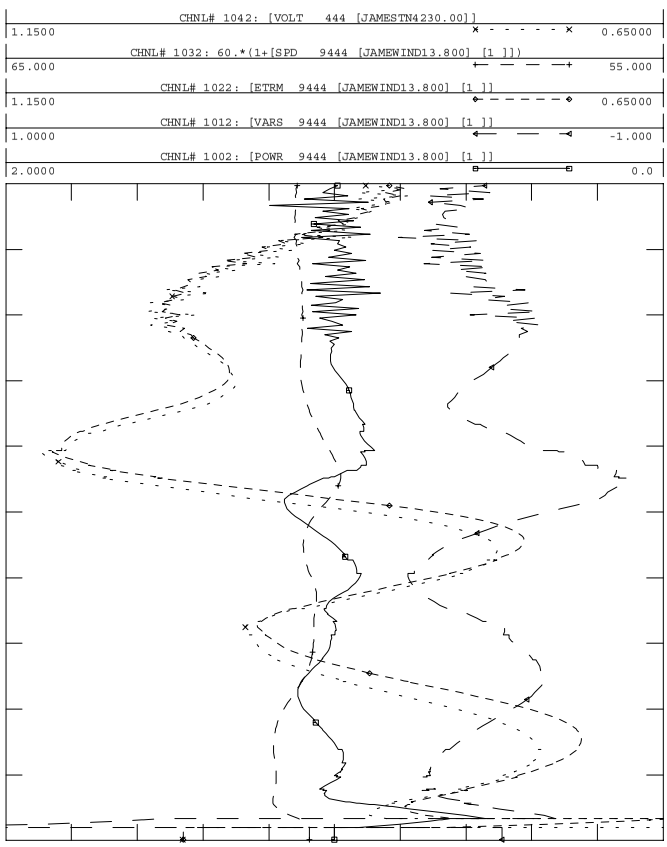
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

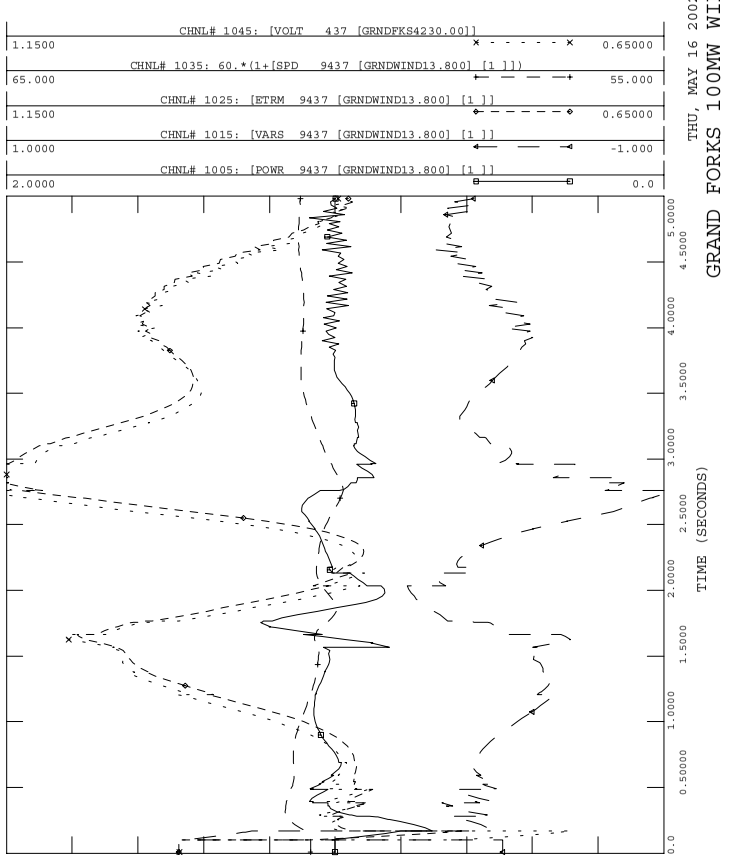
RELAY: SLINOS
TSTART: 0.0 TSTOP: 5.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin

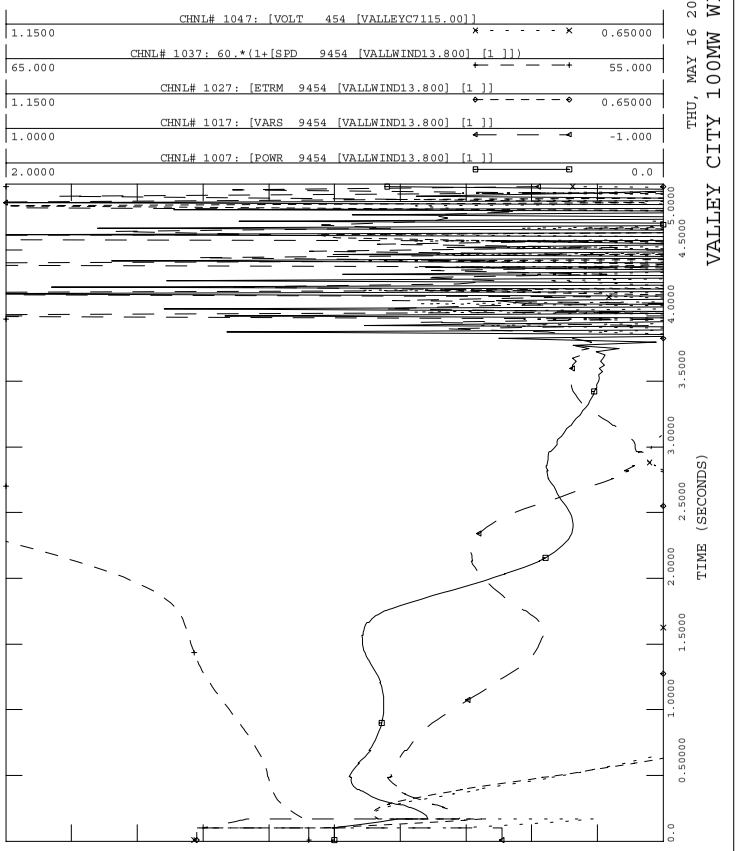


UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin



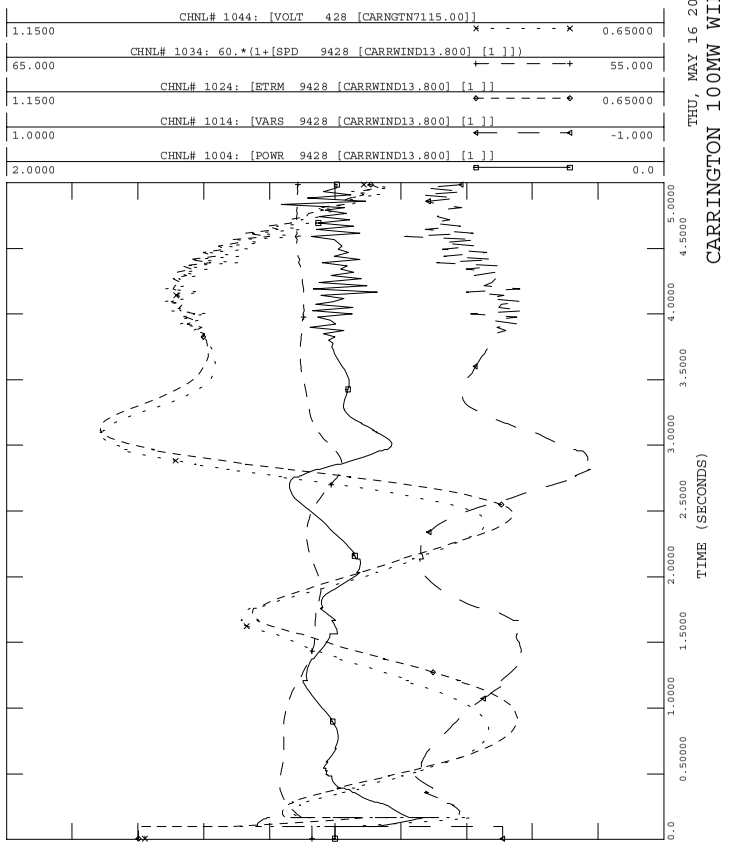
THU, MAY 16 2002 12:30
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin



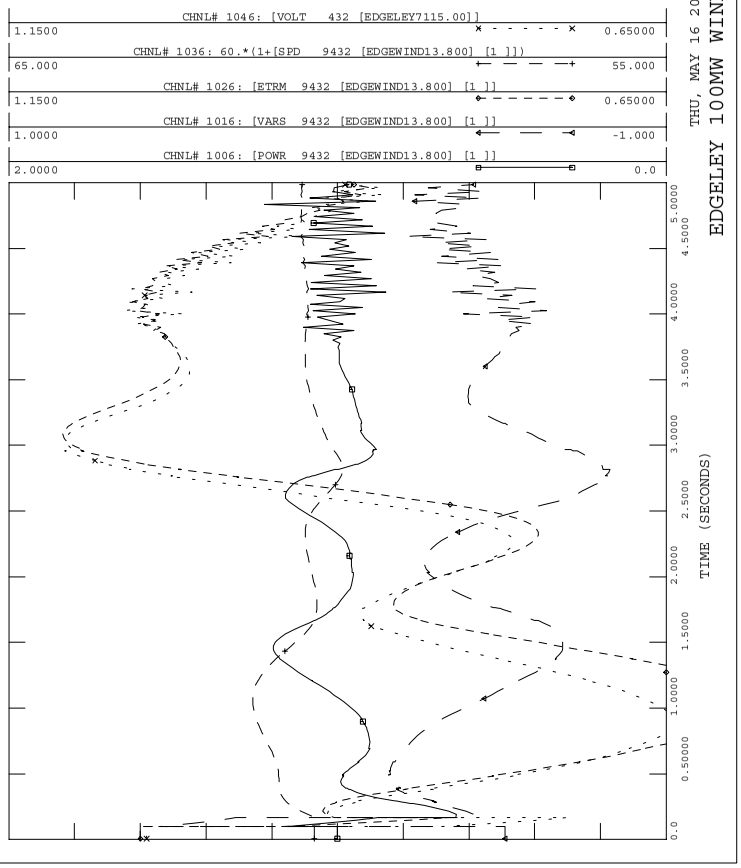
THU, MAY 16 2002 12:30
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin



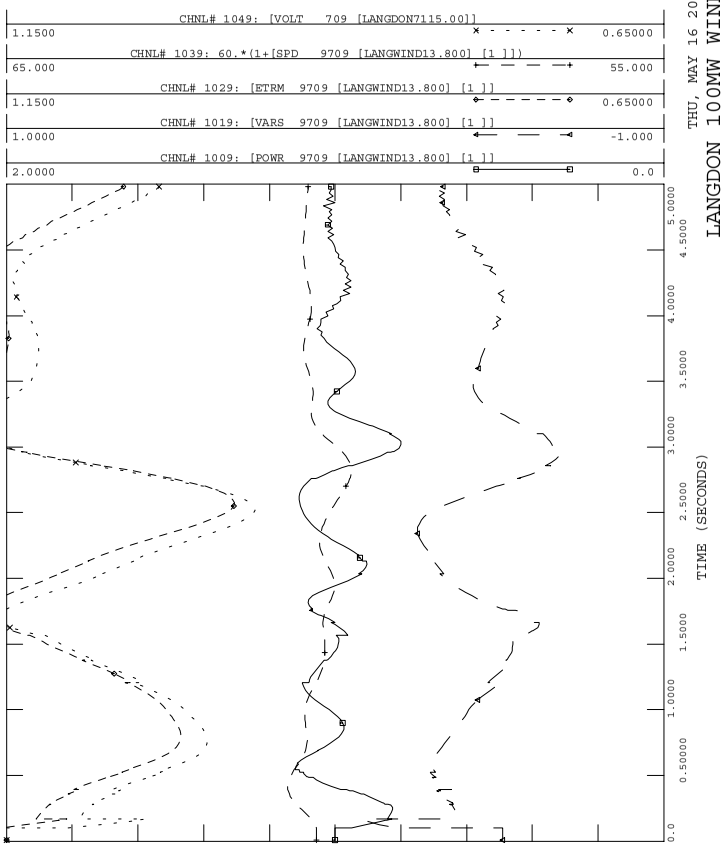
THU, MAY 16 2002 12:30
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin



THU, MAY 16 2002 12:30
EDGELEY 100MW WIND UNIT

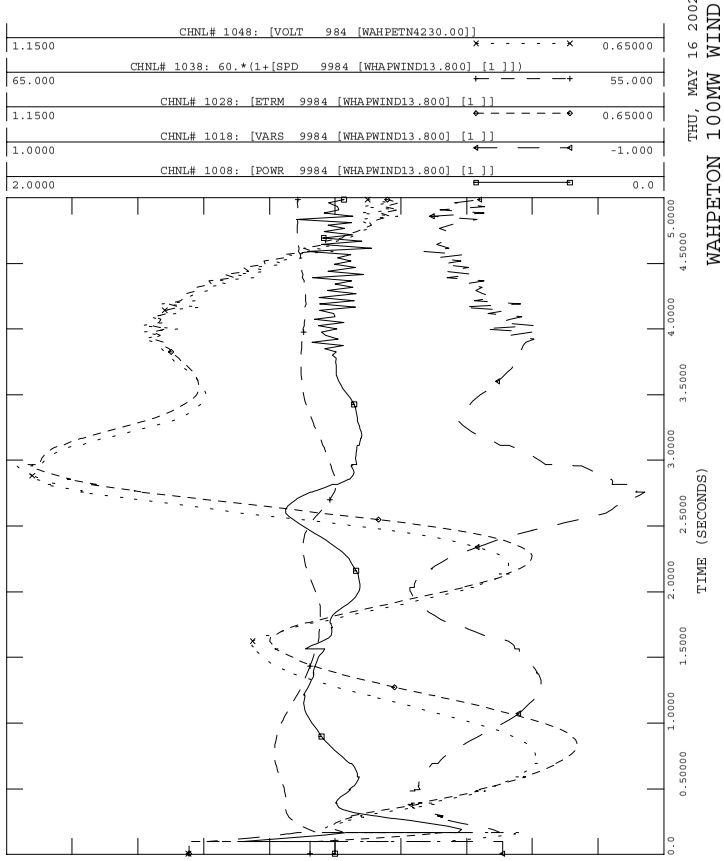
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin



THU, MAY 16 2002 12:30

LANGDON 100MW WIND UNIT

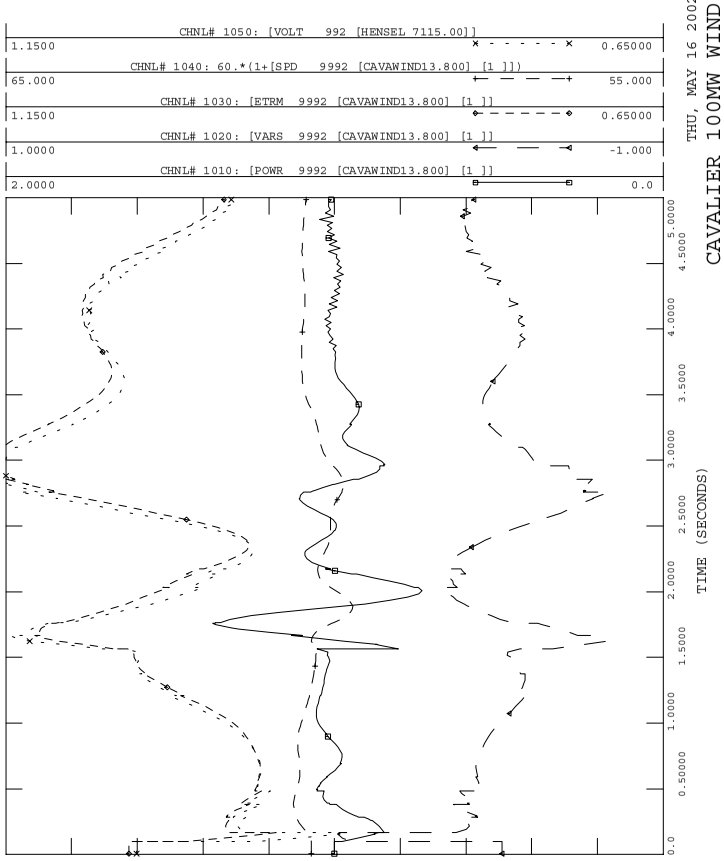
UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin



THU, MAY 16 2002 12:30

WAHPETON 100MW WIND UNIT

UPE-SO04AA.S2C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3023,MH=2174,MW=1478,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ag3.bin



THU, MAY 16 2002 12:30

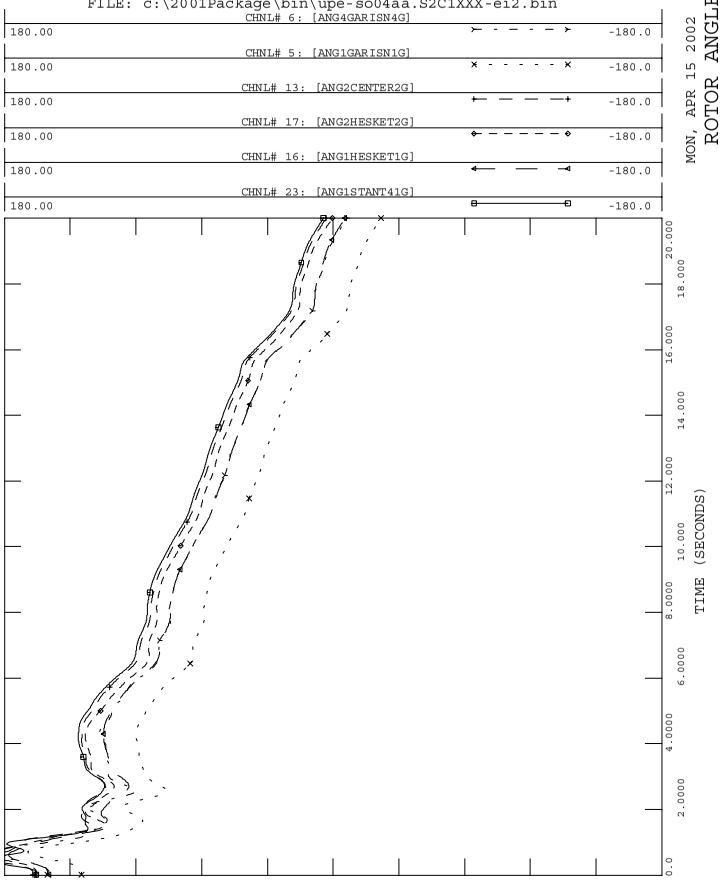
CAVALIER 100MW WIND UNIT

CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

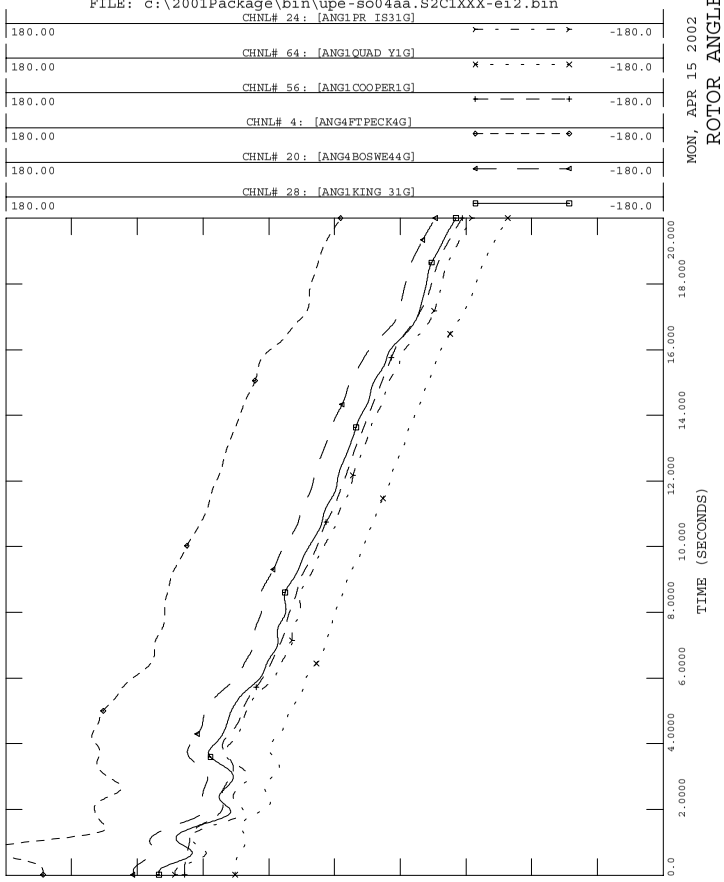
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
ROTOR ANGLES 2



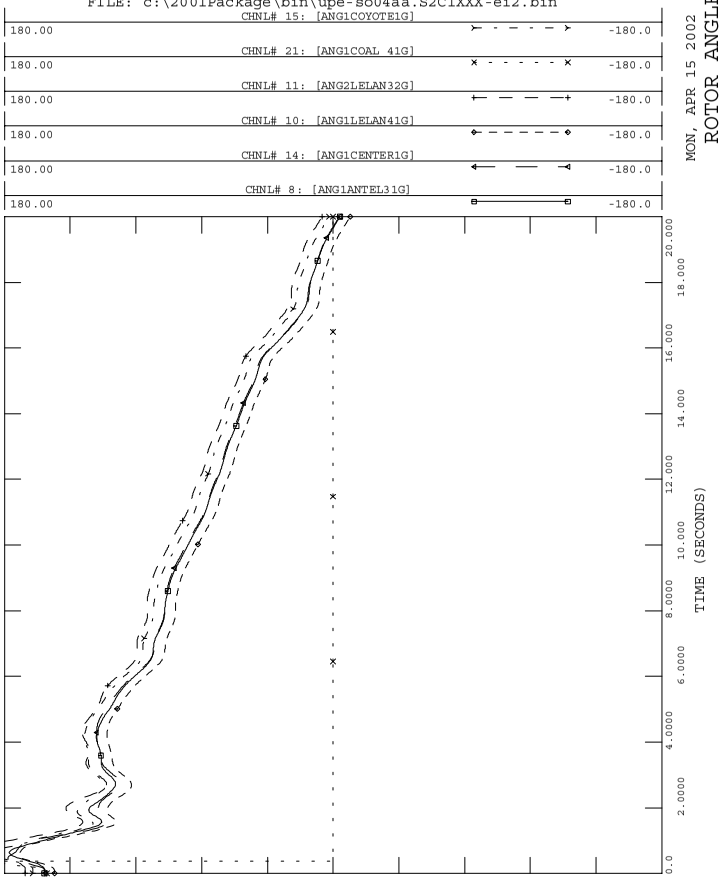
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
ROTOR ANGLES 4



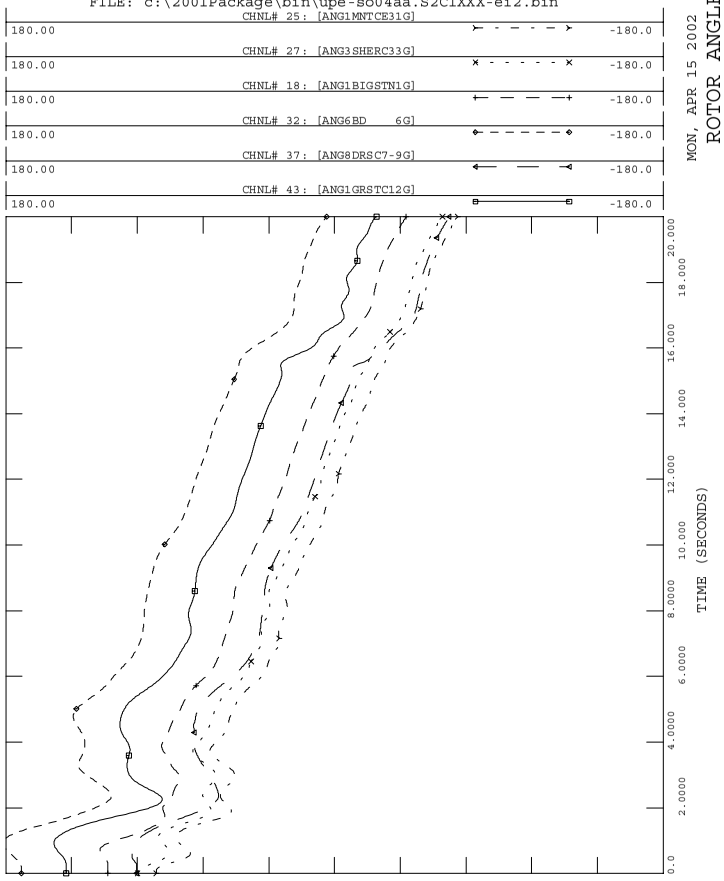
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

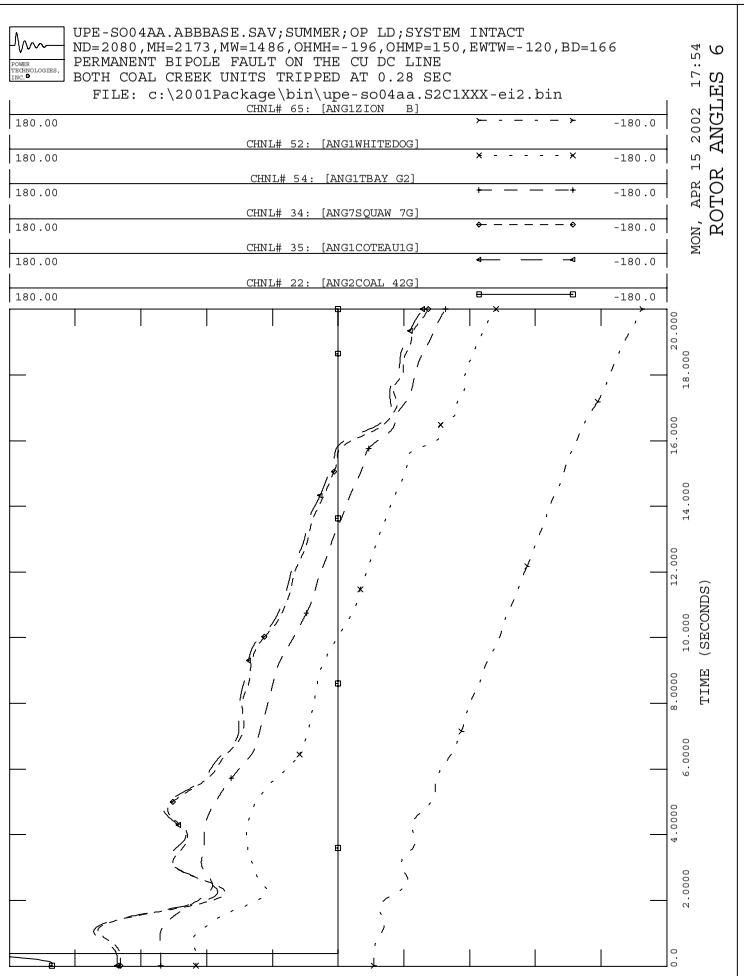
MON, APR 15 2002 17:54
ROTOR ANGLES 1

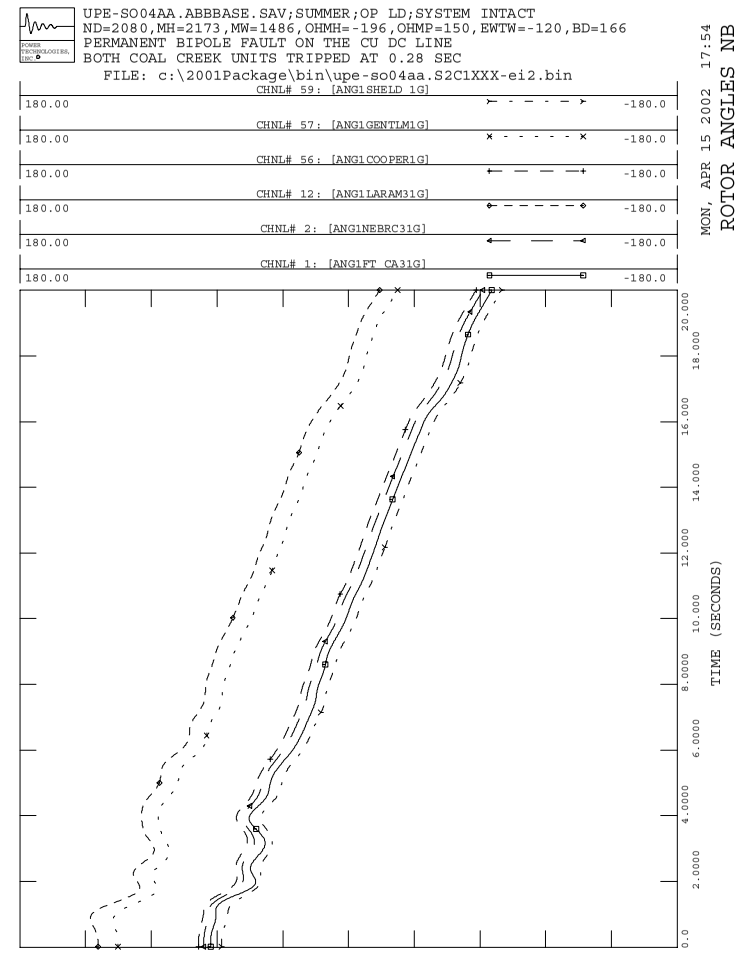


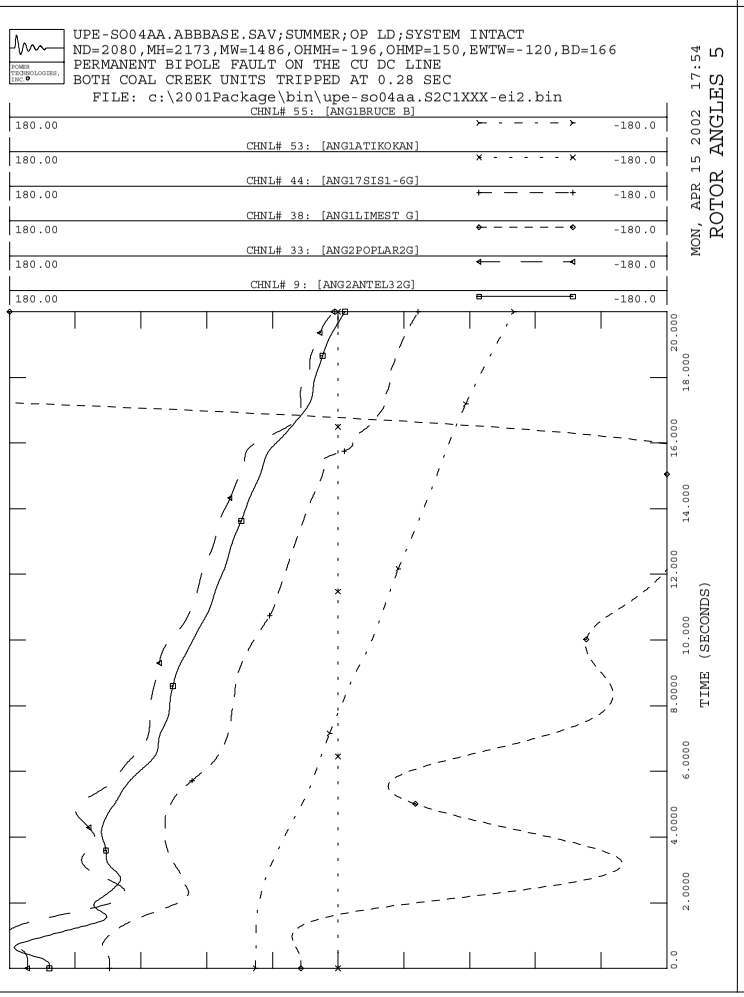
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
ROTOR ANGLES 3




UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
MON, APR 15 2002 17:54
ROTOR ANGLES 6


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
MON, APR 15 2002 17:54
ROTOR ANGLES NB


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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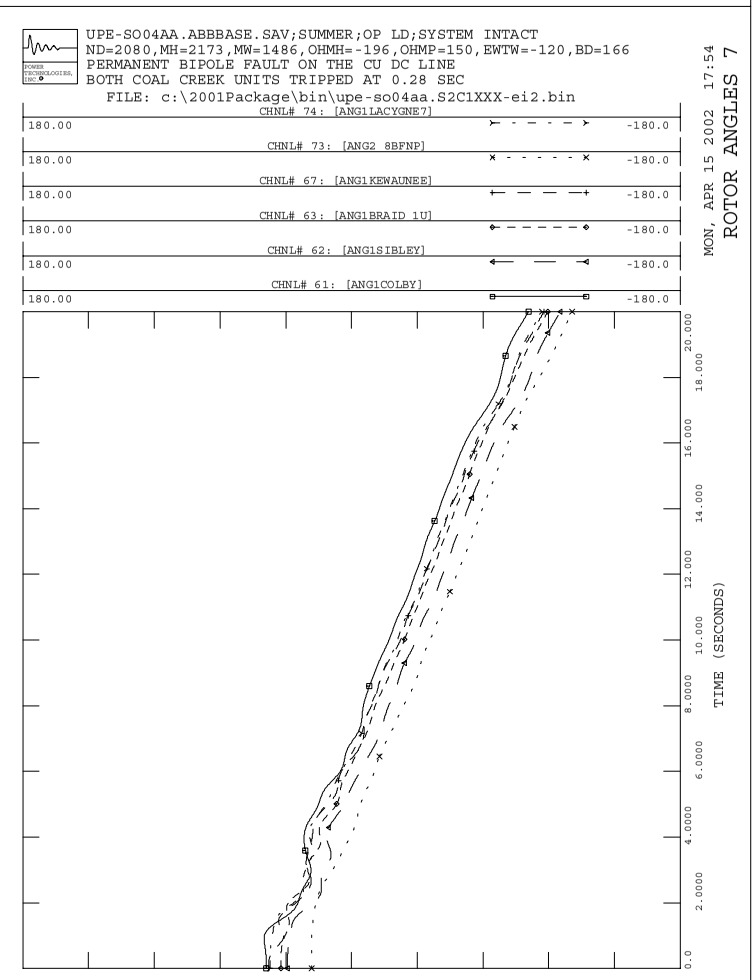
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
MON, APR 15 2002 17:54
ROTOR ANGLES 5


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
MON, APR 15 2002 17:54
ROTOR ANGLES 7

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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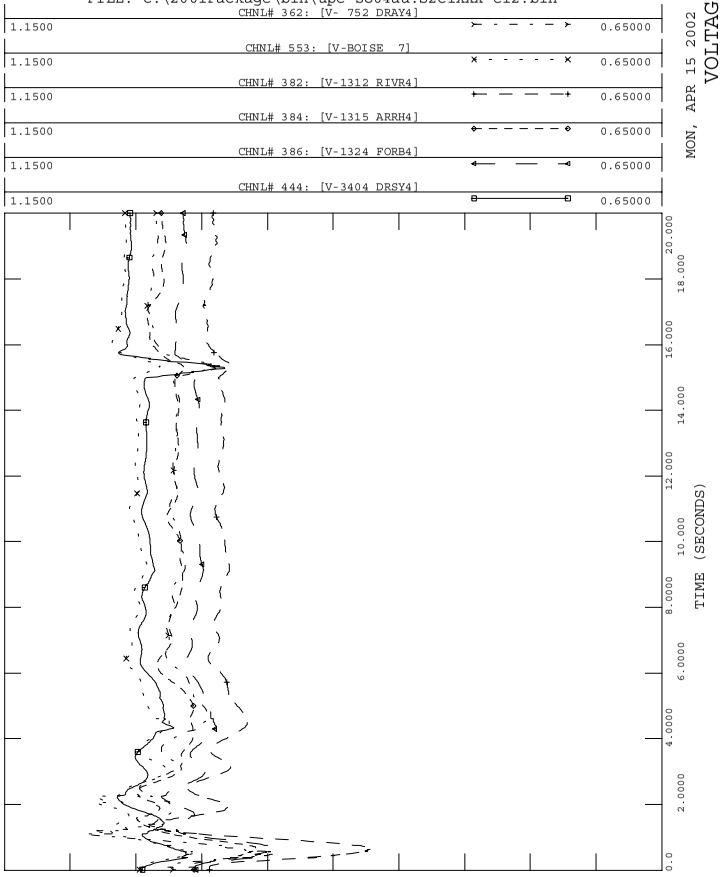
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



MON, APR 15 2002 17:54
VOLTAGES 1

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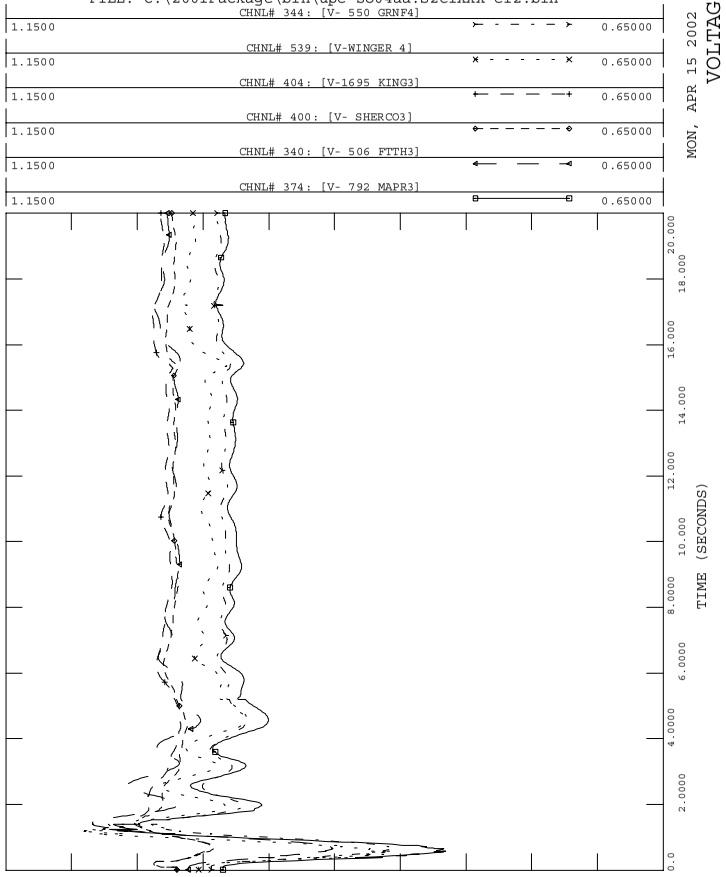
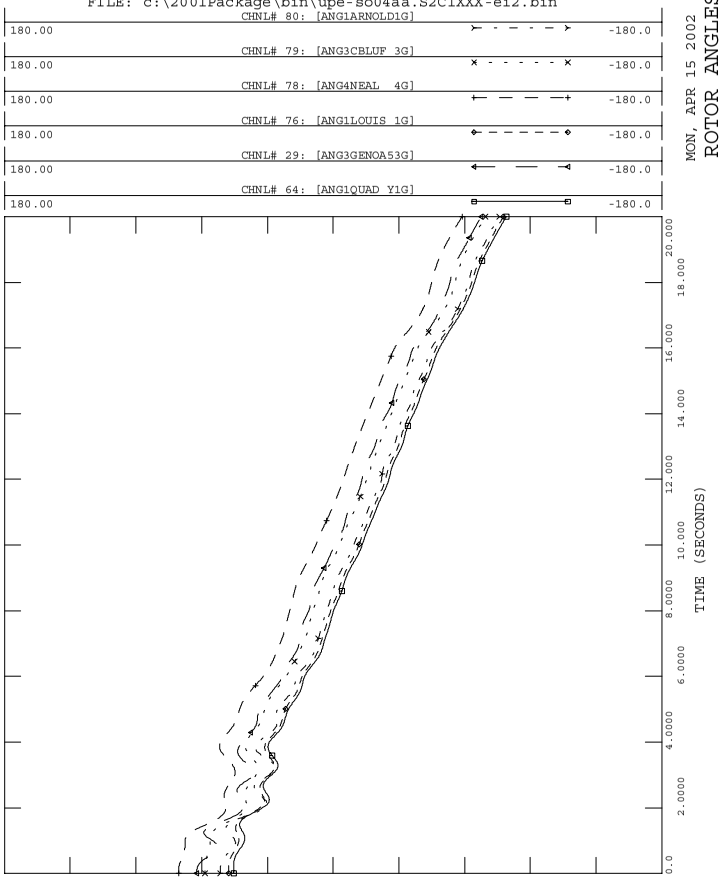
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



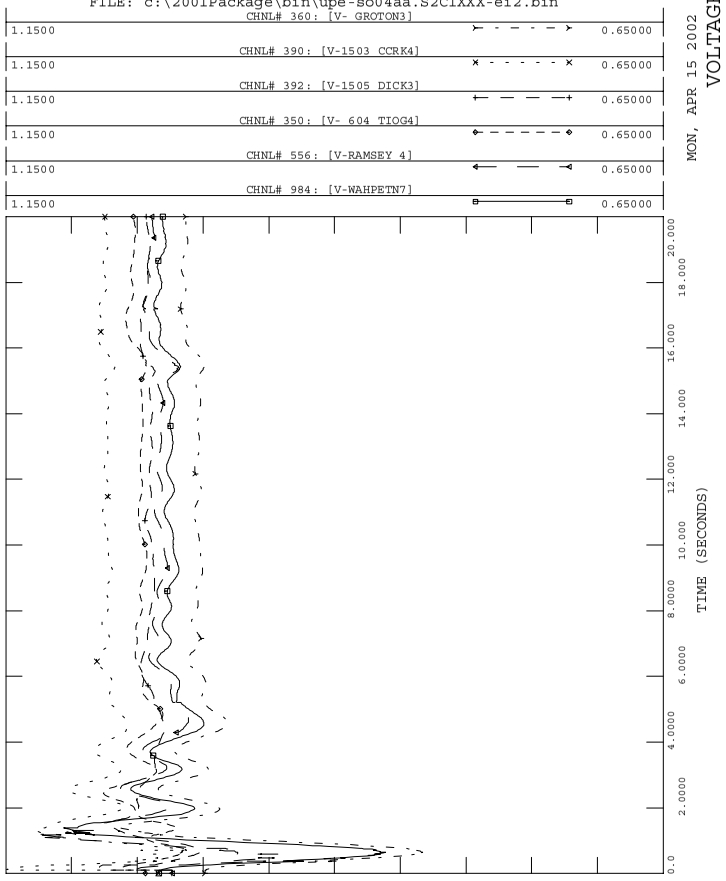
MON, APR 15 2002 17:54
VOLTAGES 3

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



MON, APR 15 2002 17:54
ROTOR ANGLES IA

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



MON, APR 15 2002 17:54
VOLTAGES 2

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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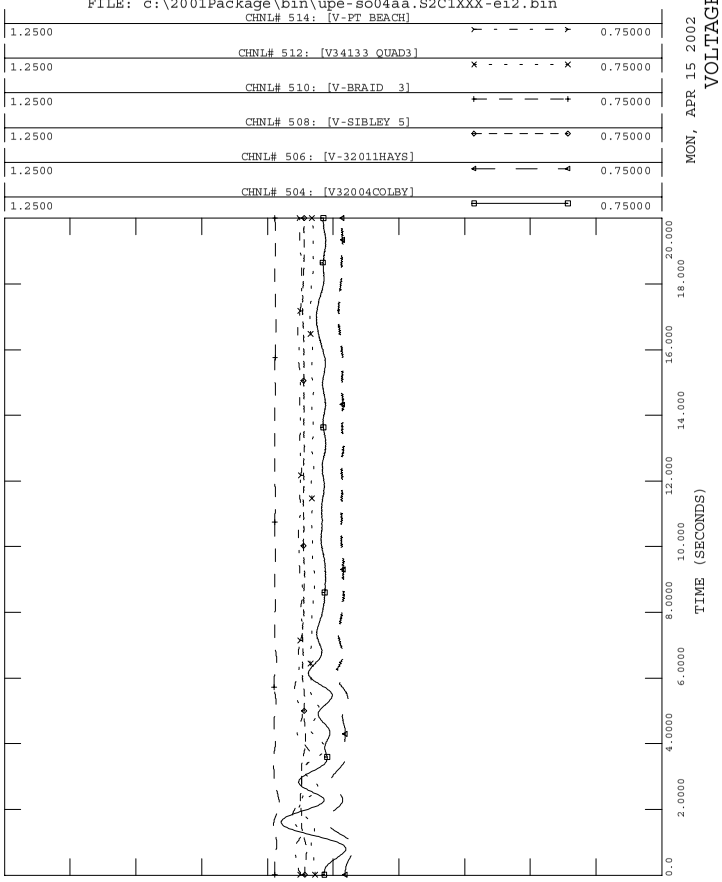
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
VOLTAGES 5



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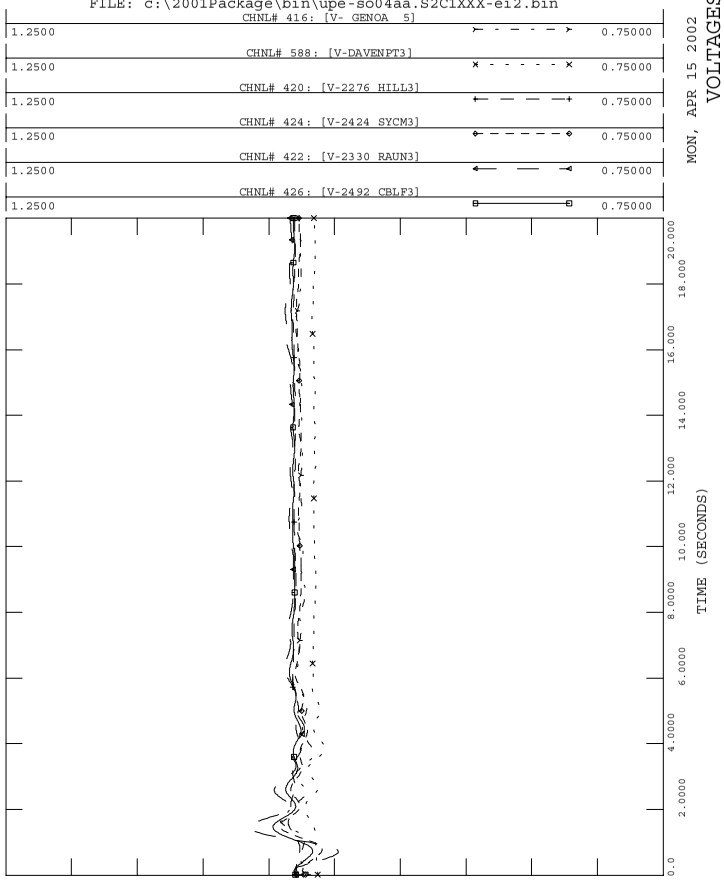
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
VOLTAGES IA



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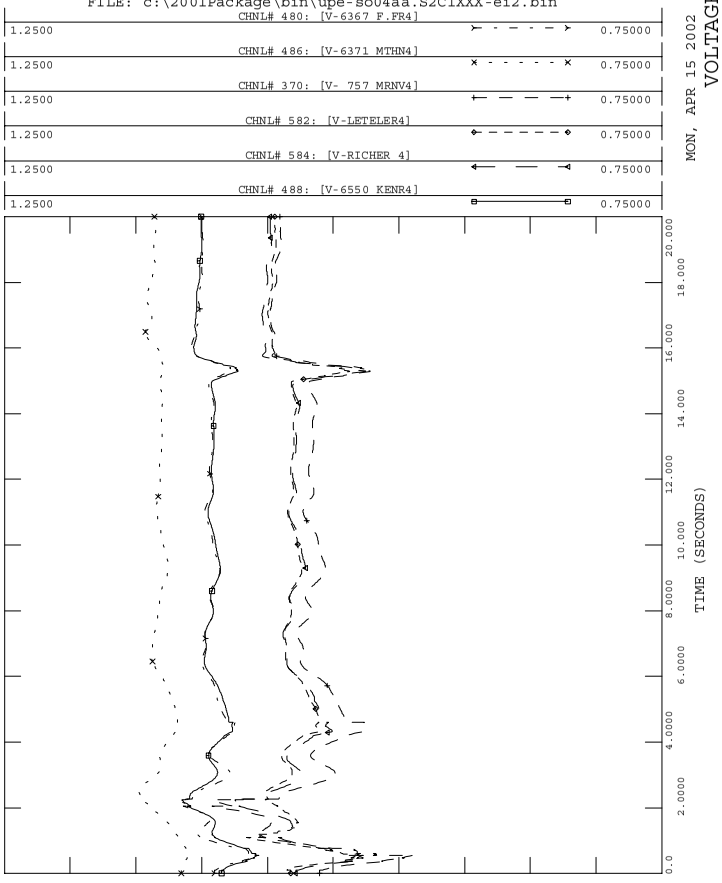
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
VOLTAGES 4



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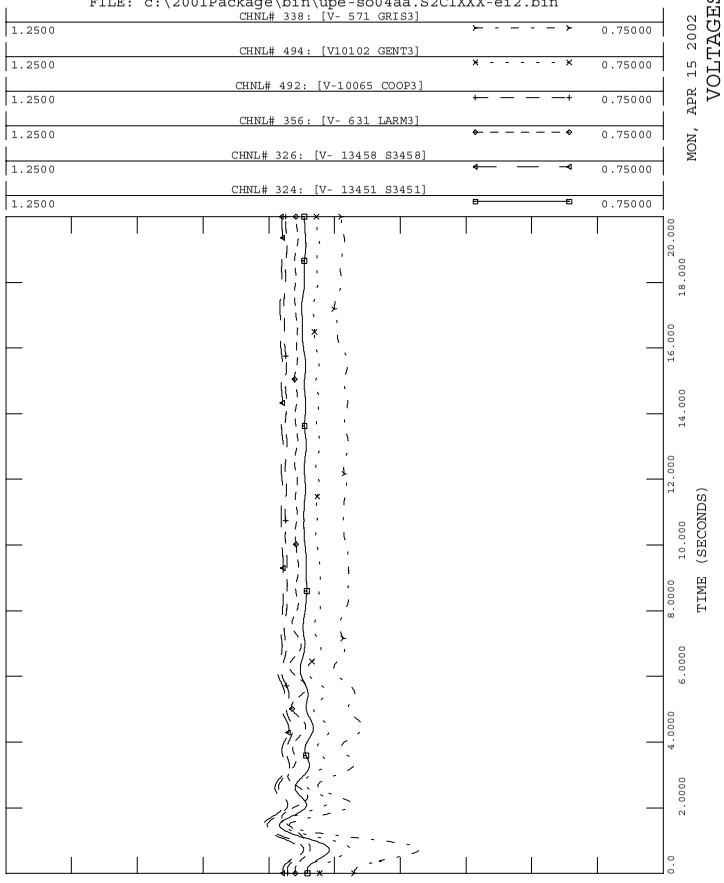
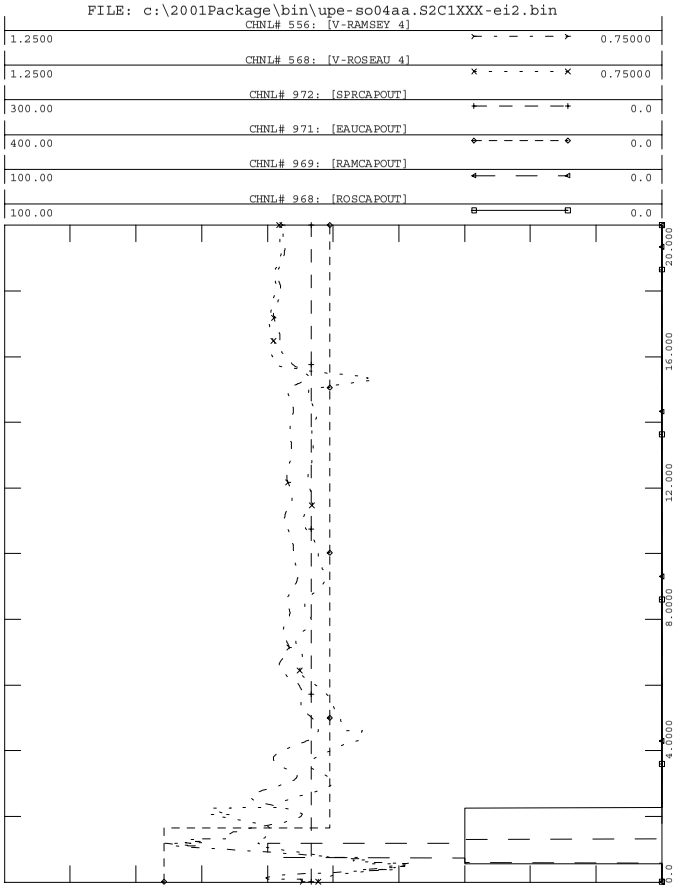
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
VOLTAGES NB



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



MON, APR 15 2002 17:54
FAST SW CAP OUT 2

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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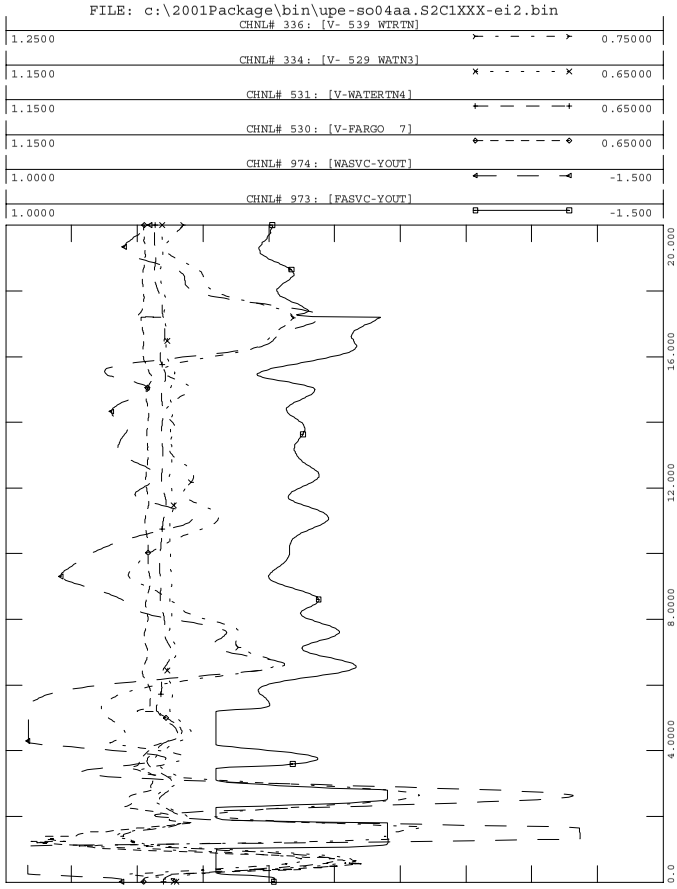
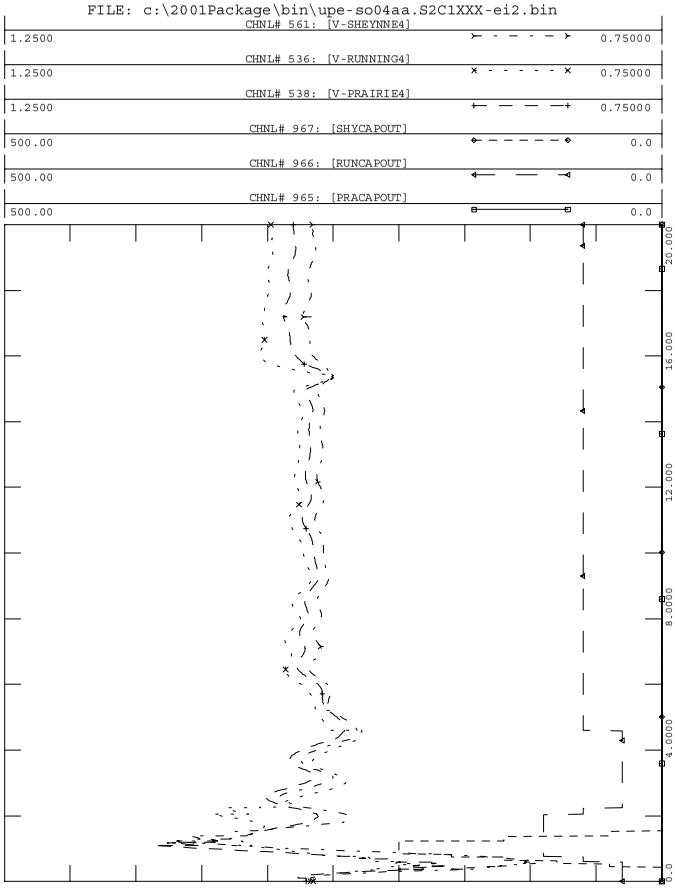
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



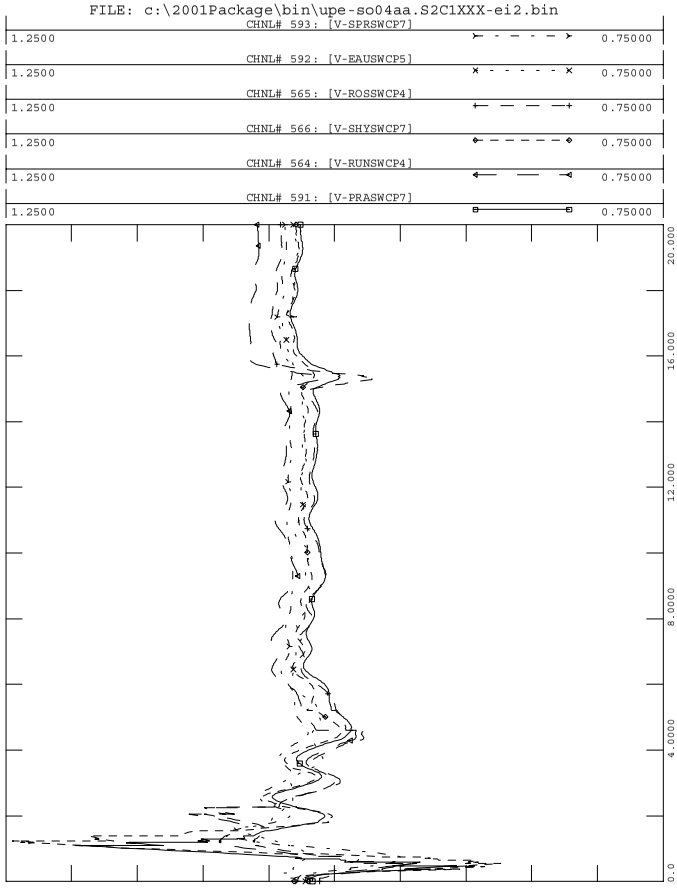
MON, APR 15 2002 17:54
FARGO/WATERTOWN SVS

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



MON, APR 15 2002 17:54
FAST SW CAP OUT 1

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



MON, APR 15 2002 17:54
FAST SW CAP VOLTAGES

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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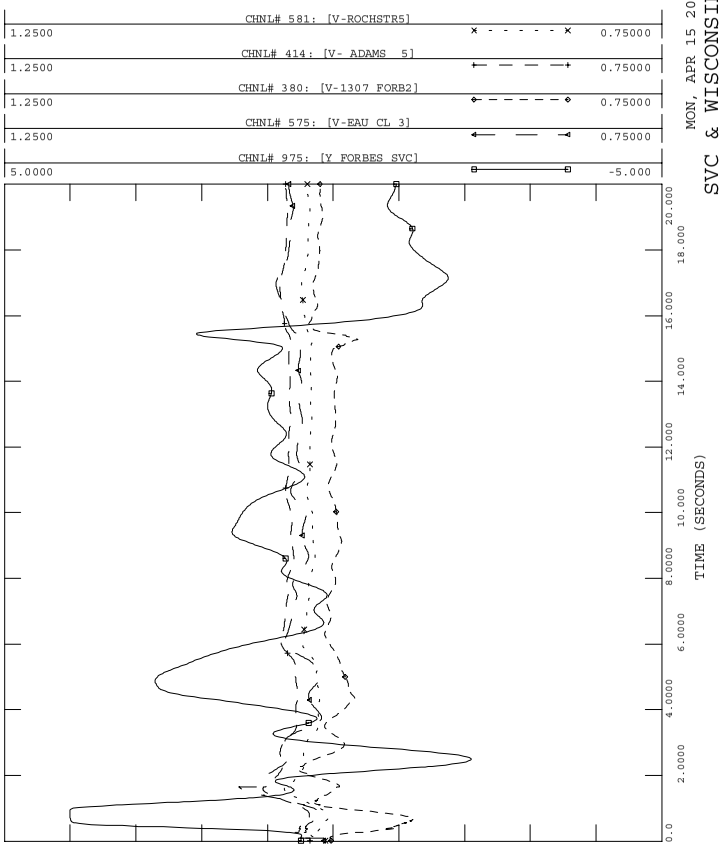
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54

SVC & WISCONSIN VOLT



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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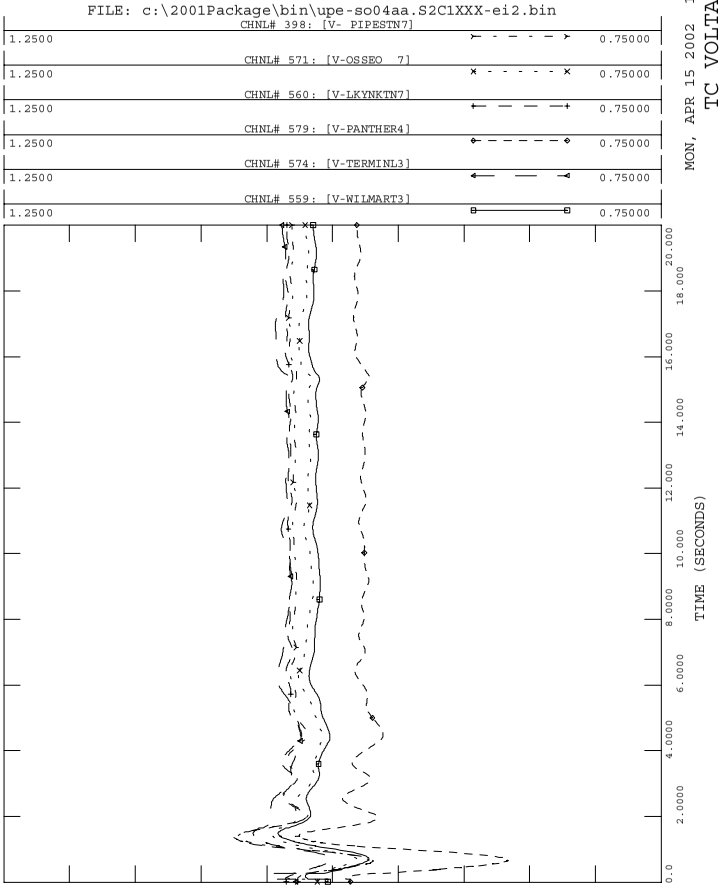
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54

TC VOLTAGES



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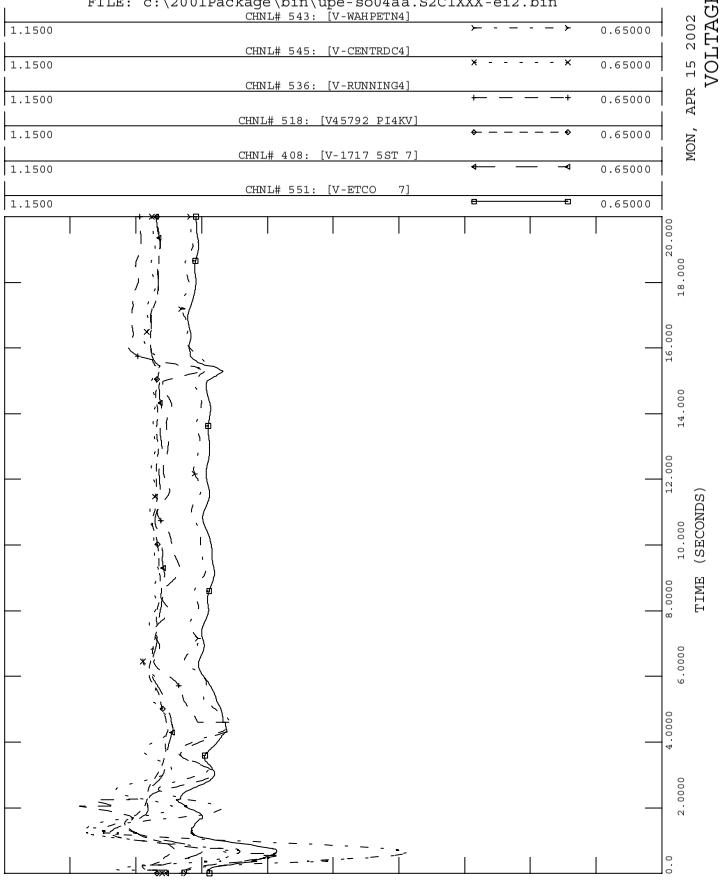
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54

VOLTAGES 6



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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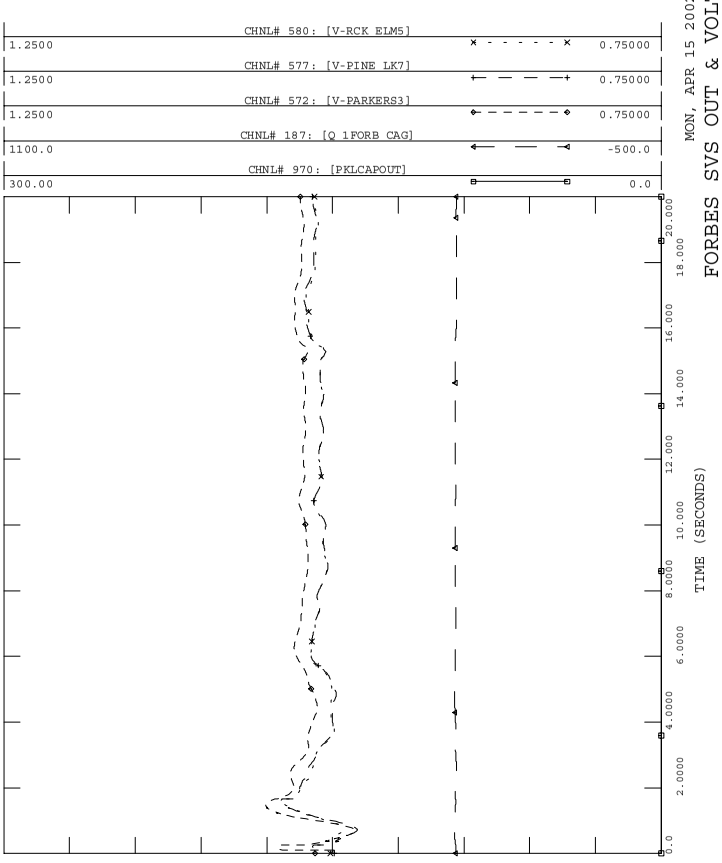
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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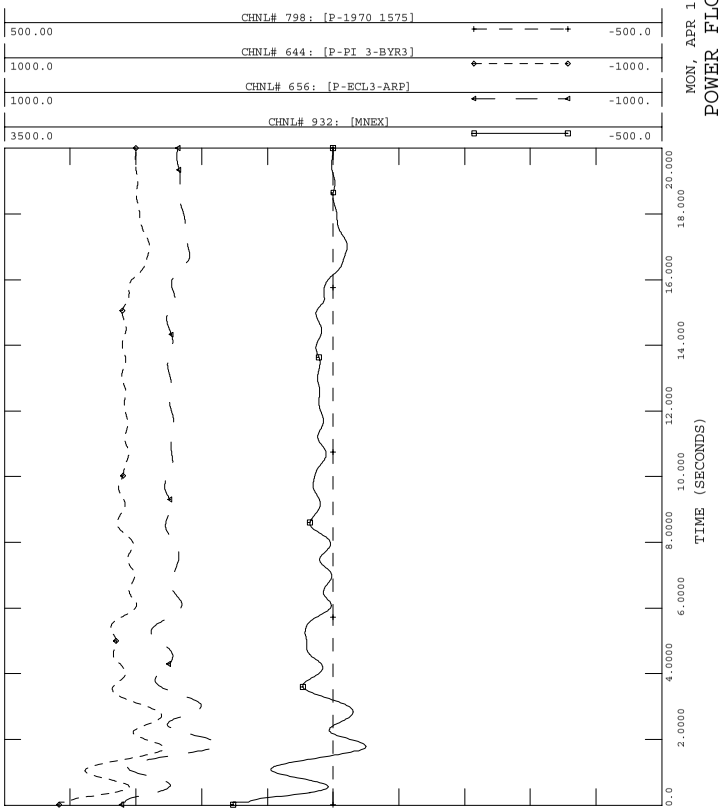
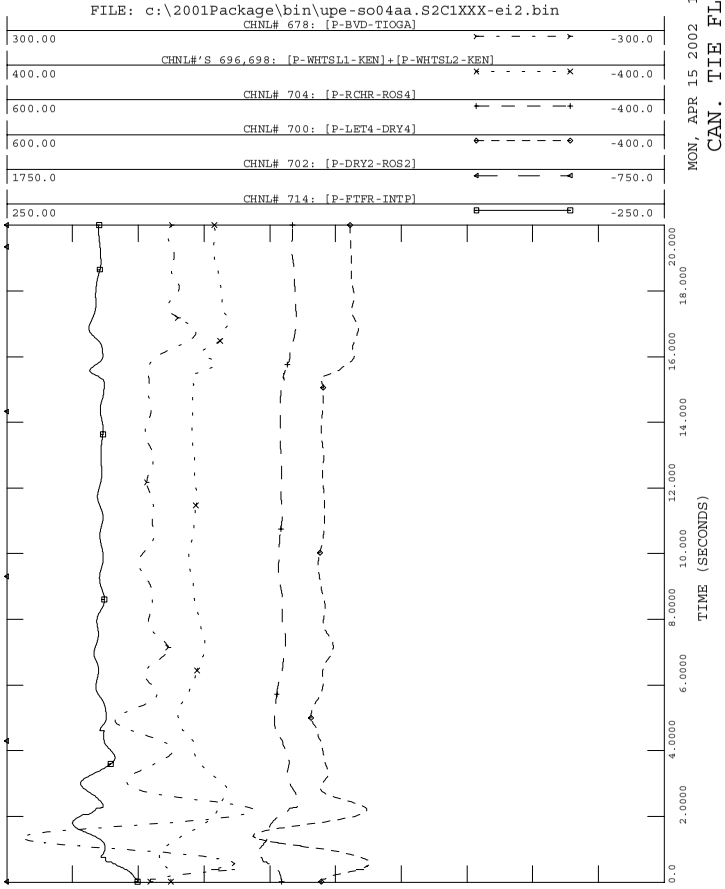
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
POWER FLOW SUMS 2



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
CAN. TIE FLOWS



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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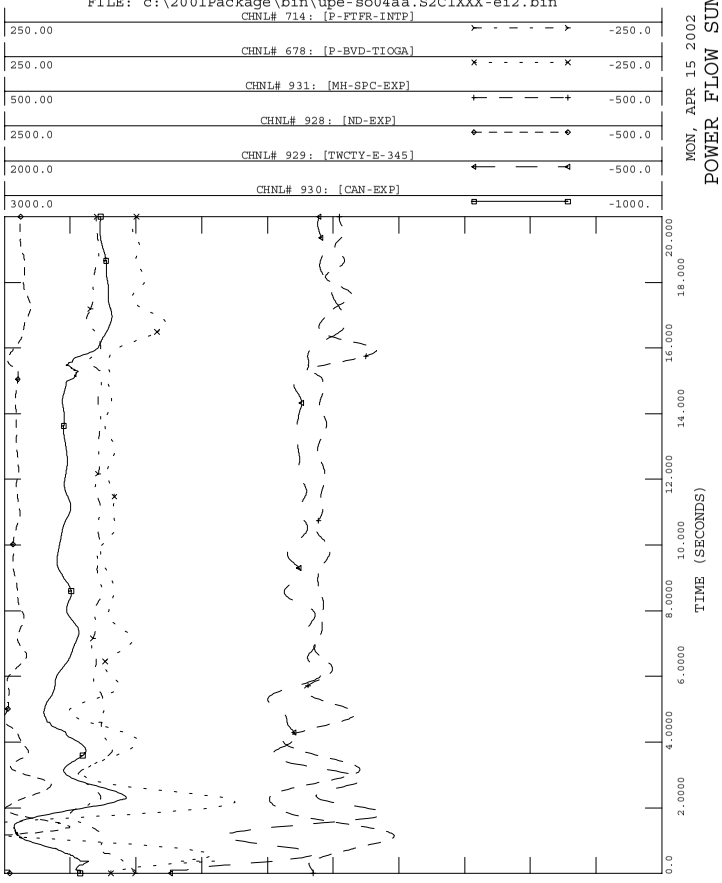
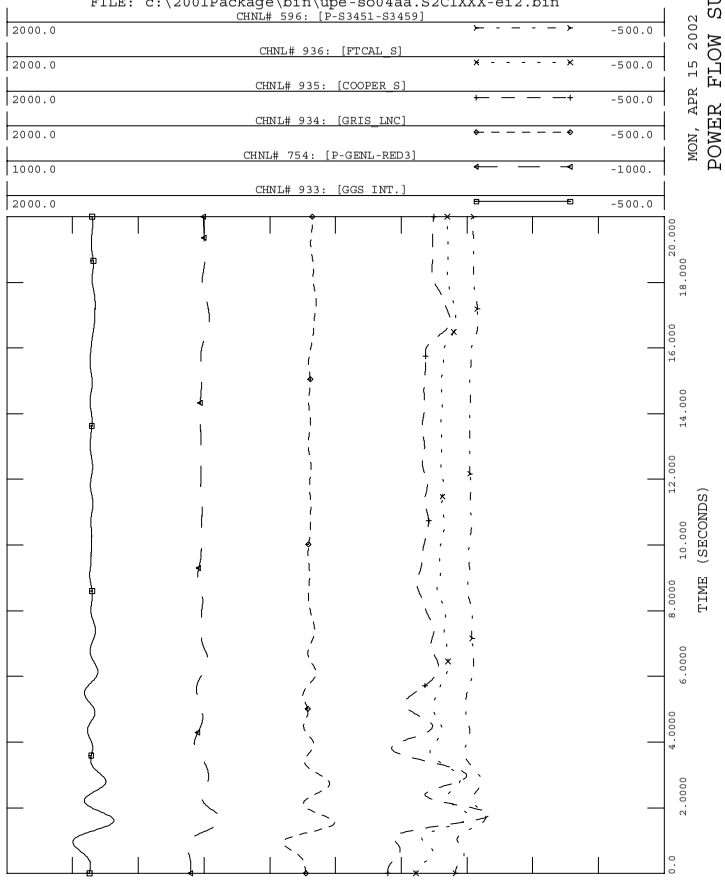
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
POWER FLOW SUMS 1



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
POWER FLOW SUM 3



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
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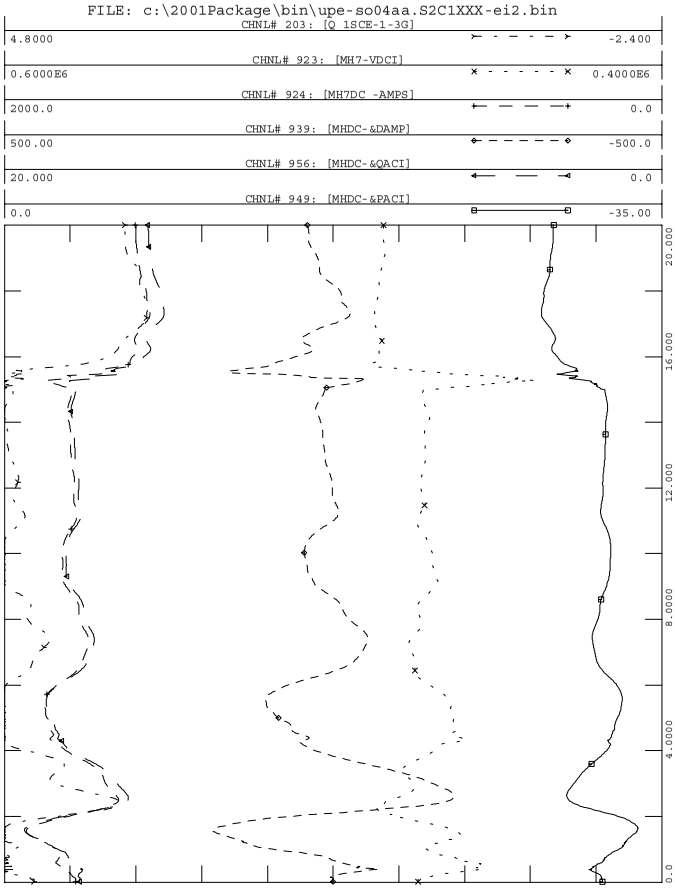
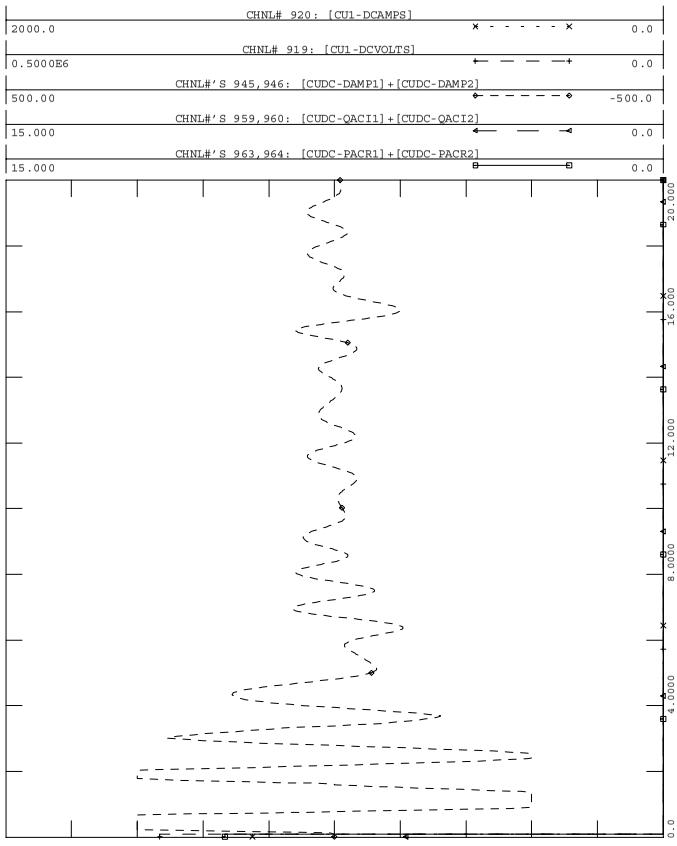
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
MH DC PARAMETERS



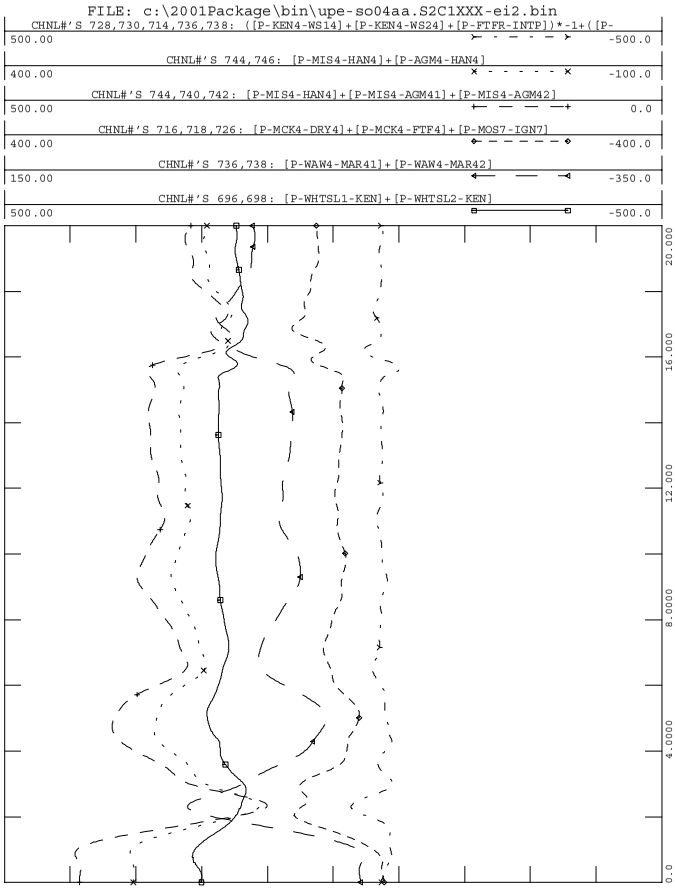
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54
CU DC #1



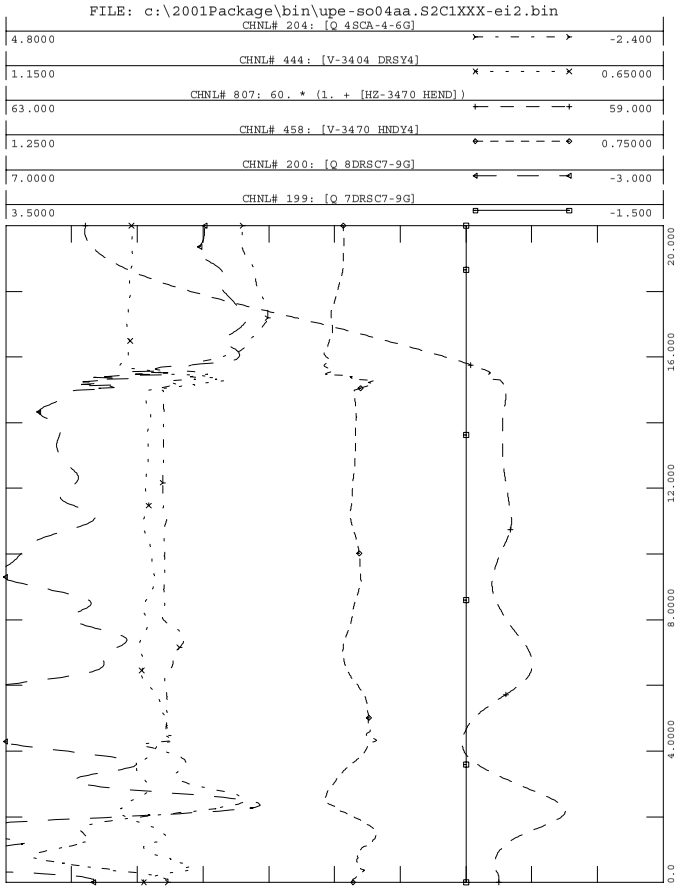
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

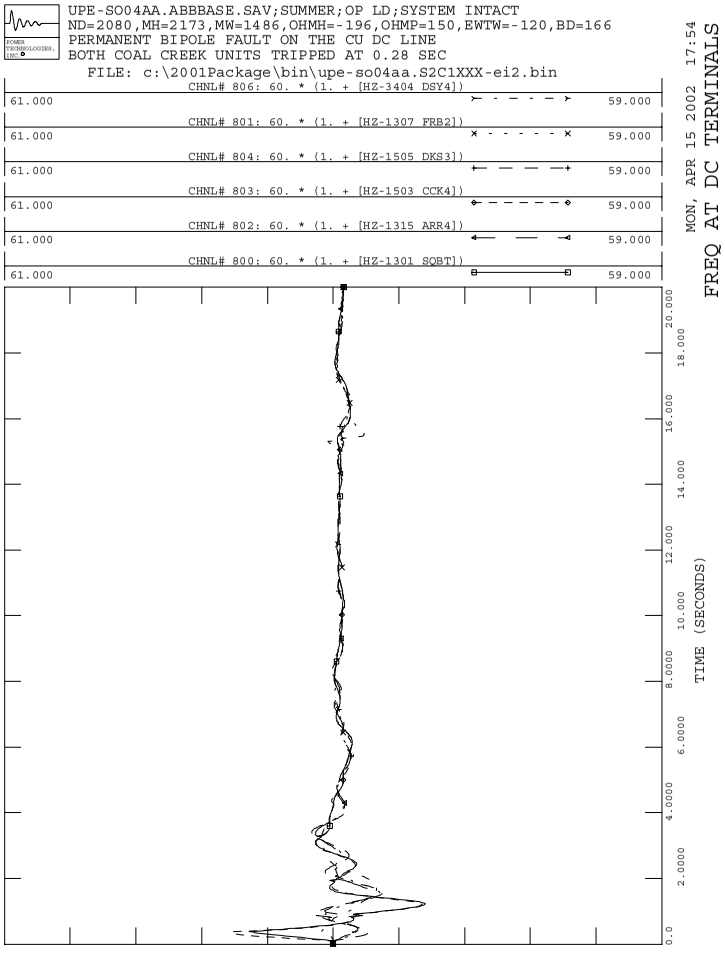
MON, APR 15 2002 17:54
OH TIE FLOWS

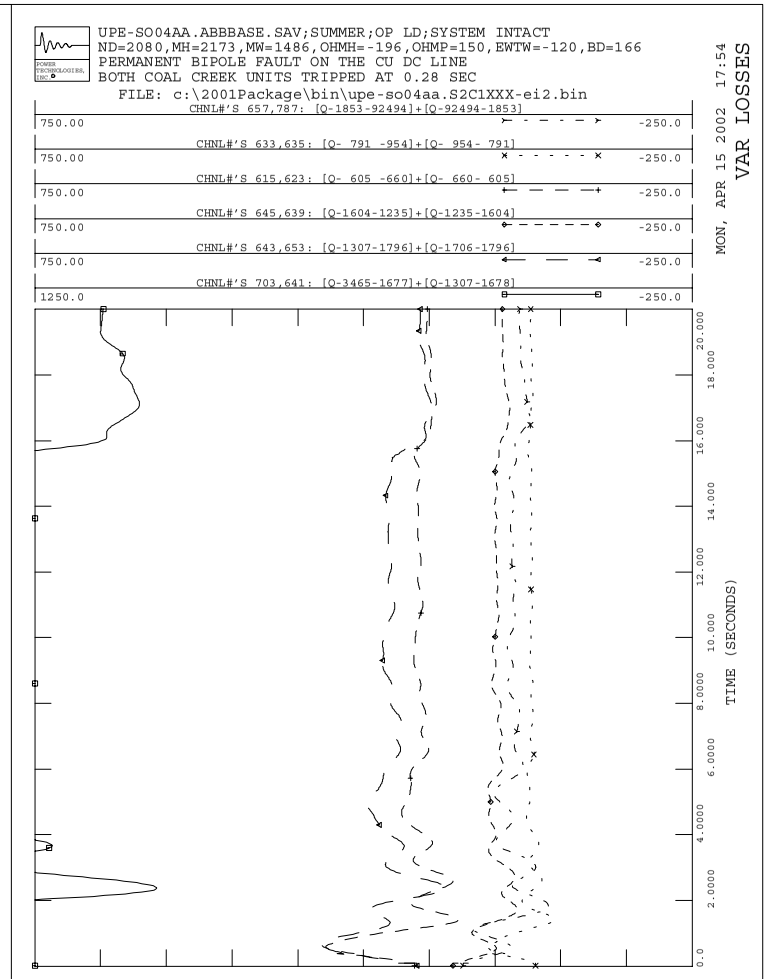


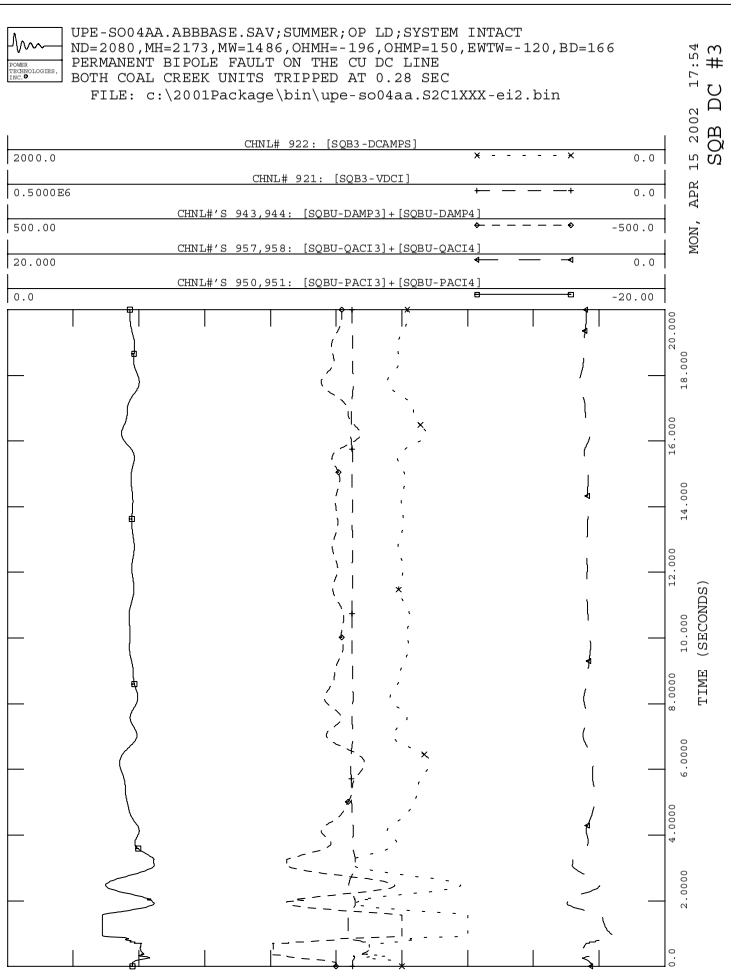
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

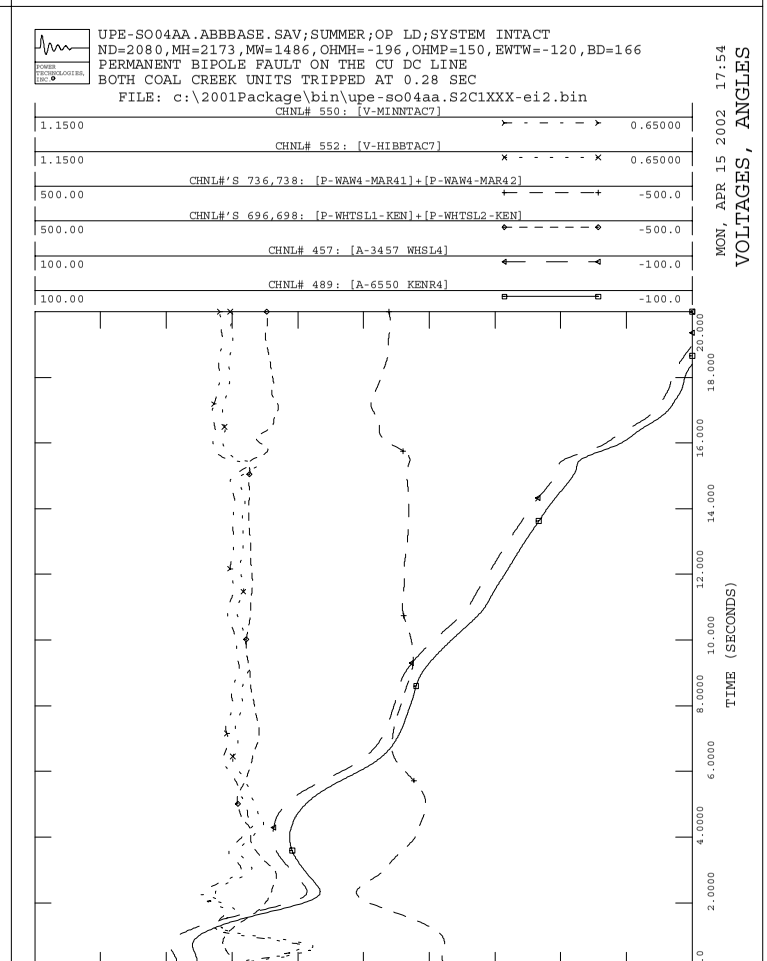
MON, APR 15 2002 17:54
MH DC PARAMETERS




UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
MON, APR 15 2002 17:54
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
MON, APR 15 2002 17:54
VAR LOSSES
TIME (SECONDS)

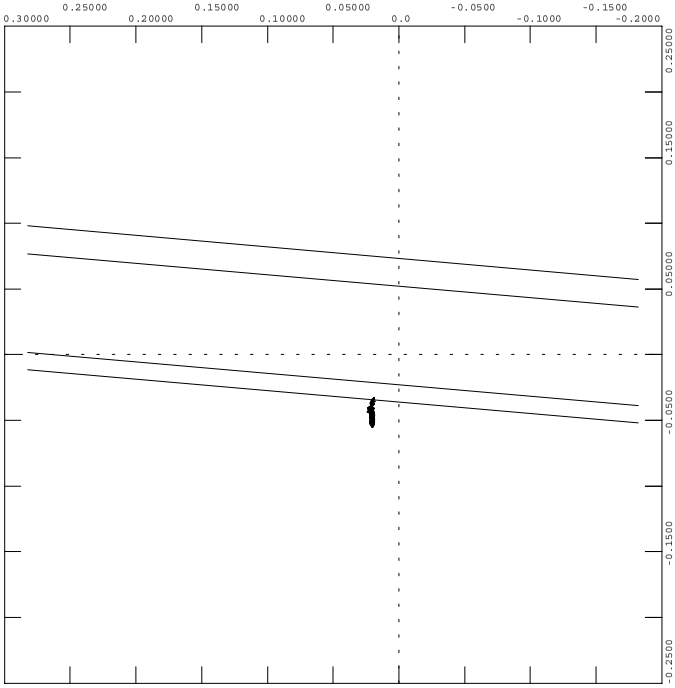

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
MON, APR 15 2002 17:54
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
MON, APR 15 2002 17:54
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

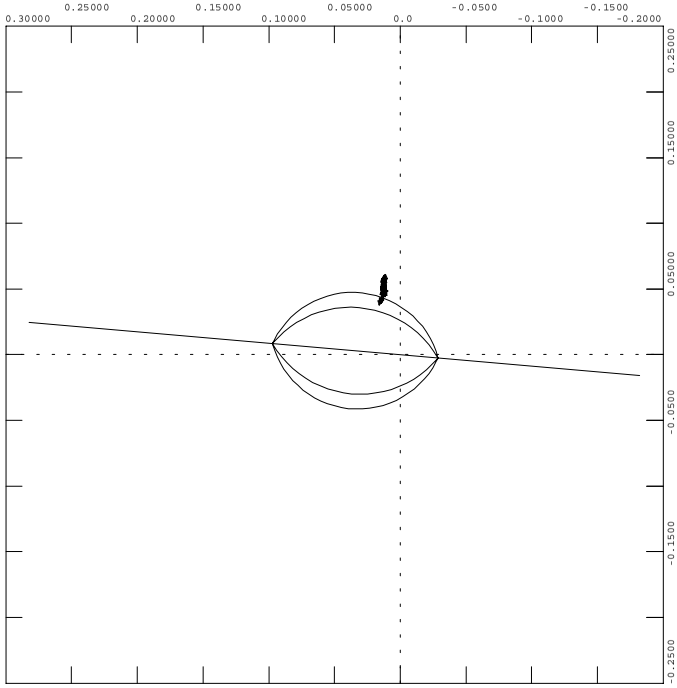


MON, APR 15 2002 17:54
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

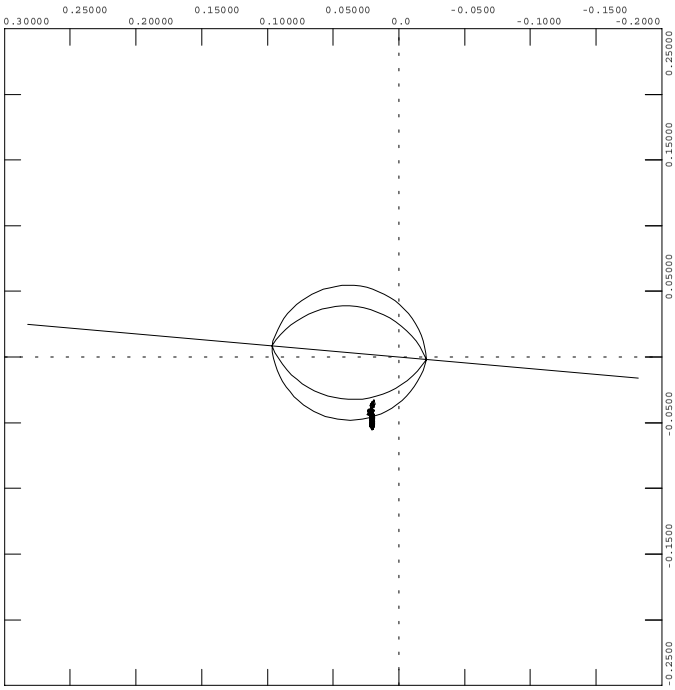


MON, APR 15 2002 17:54
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

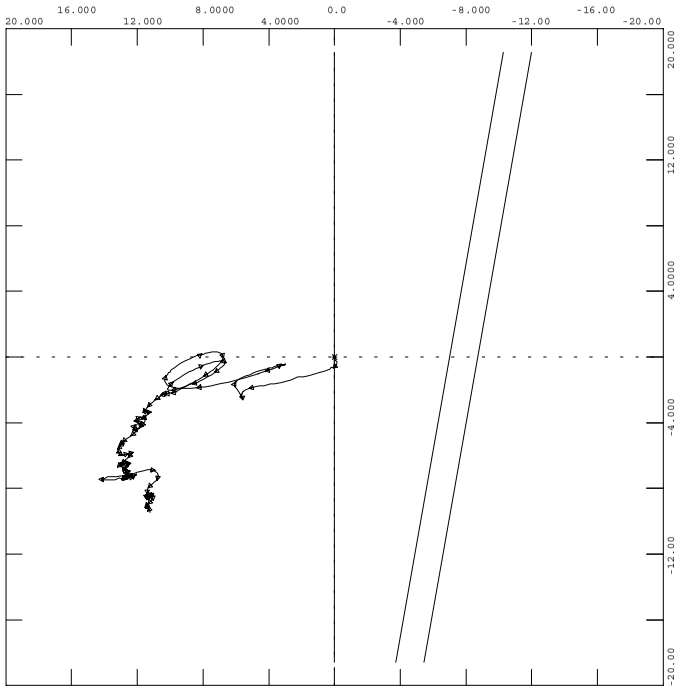


MON, APR 15 2002 17:54
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

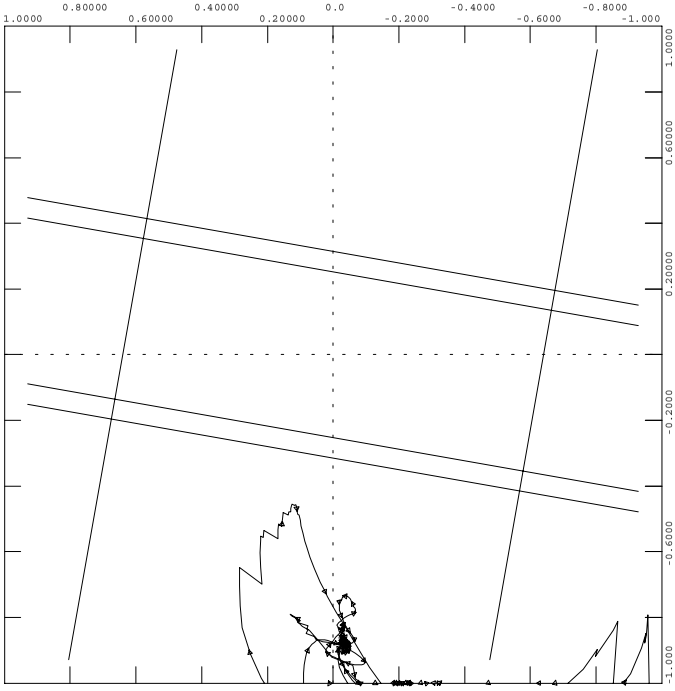


MON, APR 15 2002 17:54
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

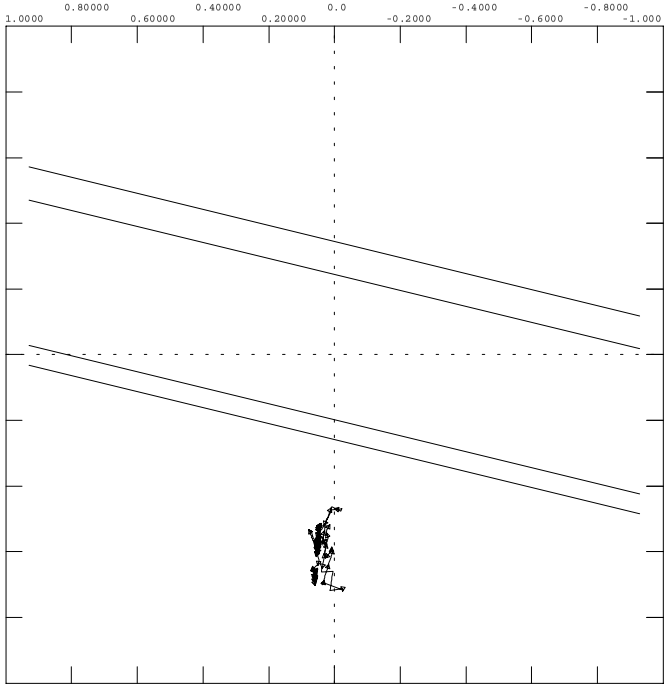


MON, APR 15 2002 17:54
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

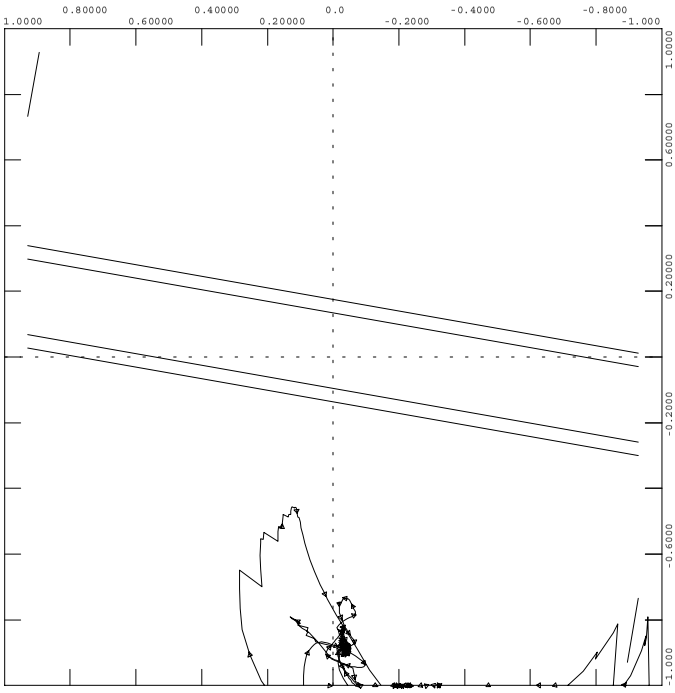


MON, APR 15 2002 17:54
R50M AT MORANVILLE (520)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

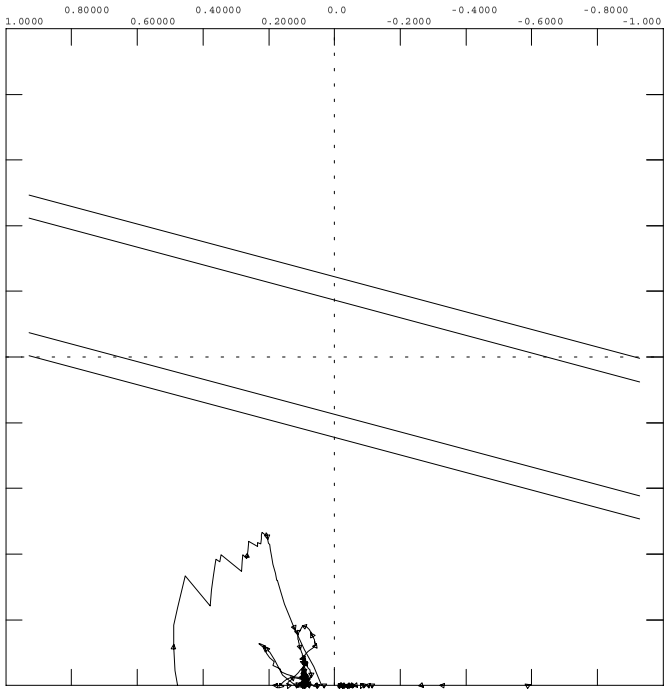


MON, APR 15 2002 17:54
L20D AT DRAYTON (506)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

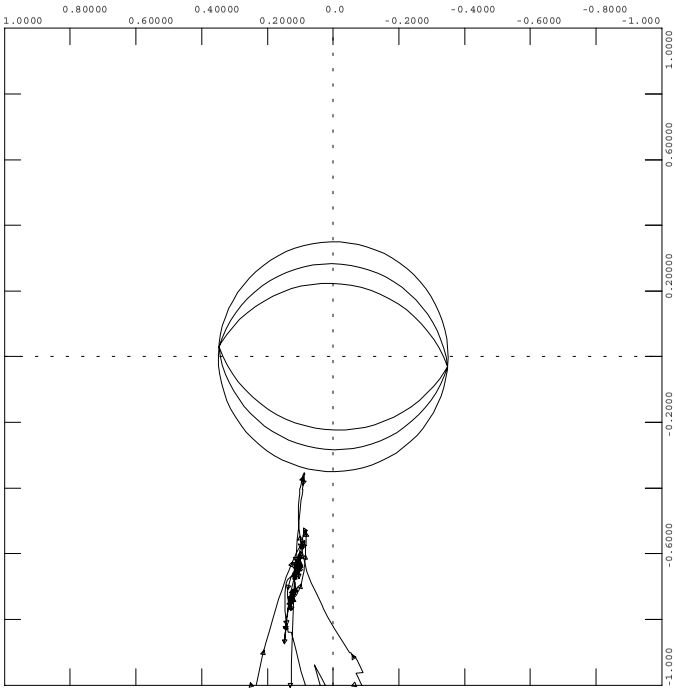


MON, APR 15 2002 17:54
L20D-PRAIRIE (510)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

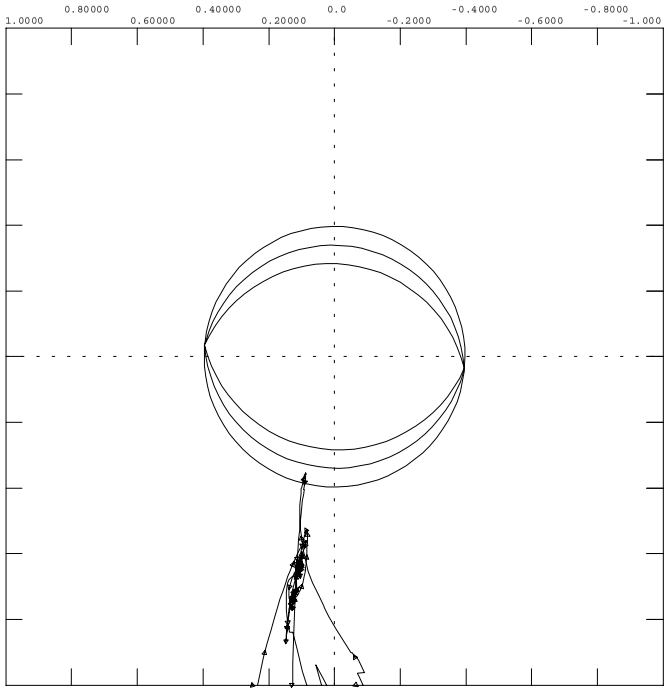
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

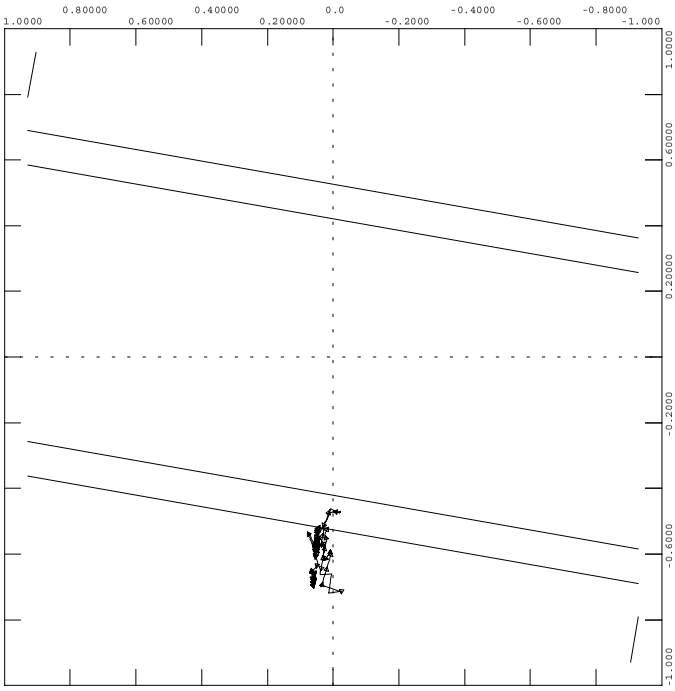
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

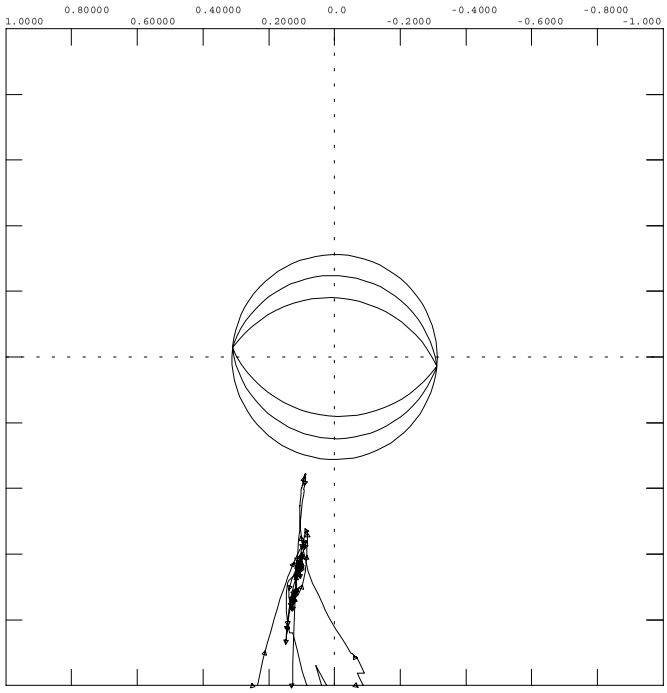
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



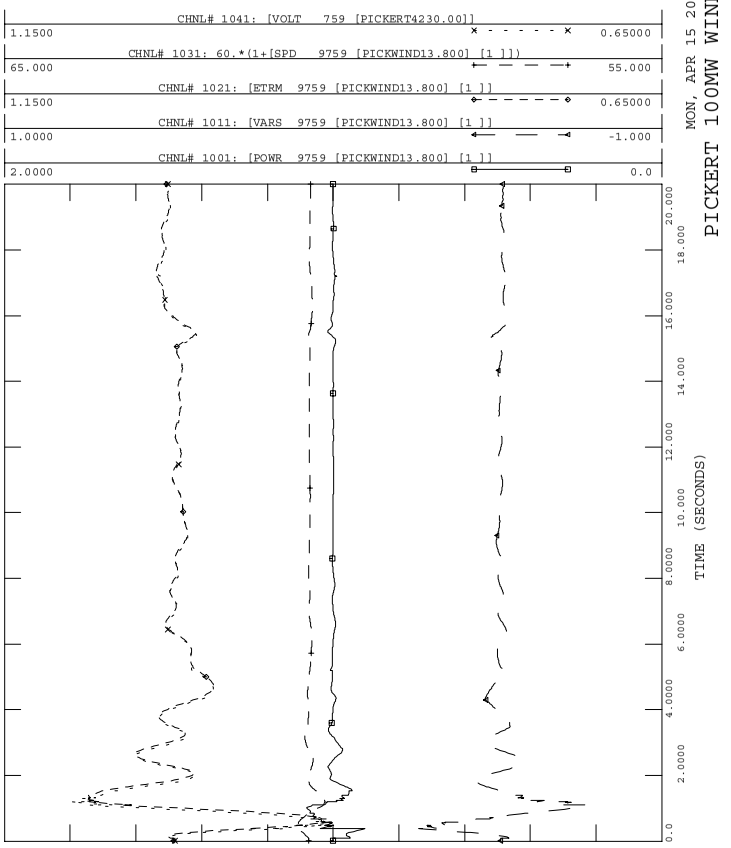
UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

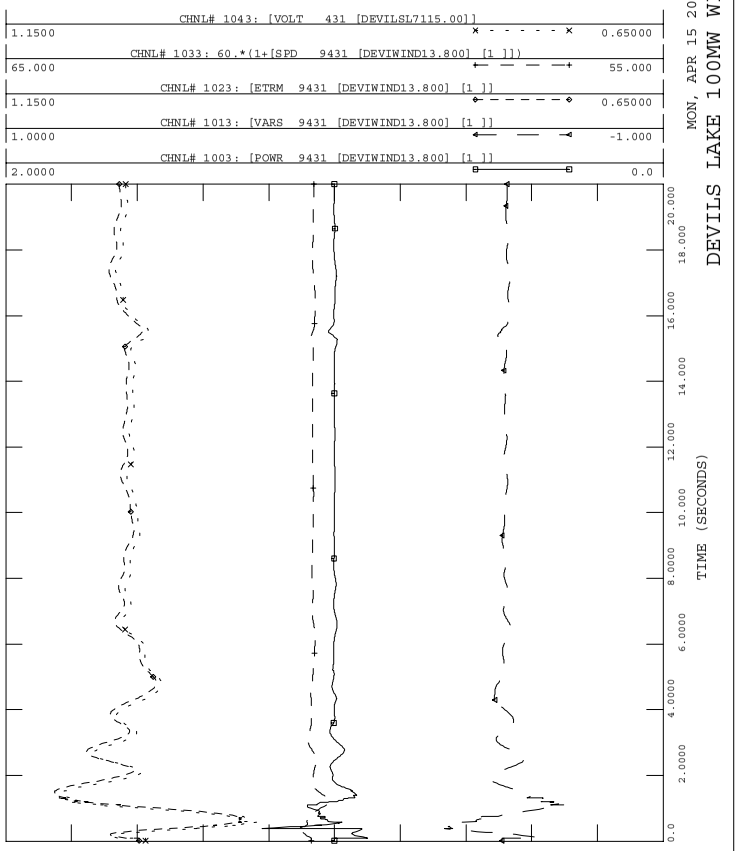


UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



MON, APR 15 2002 17:54
PICKERT 100MW WIND UNIT

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

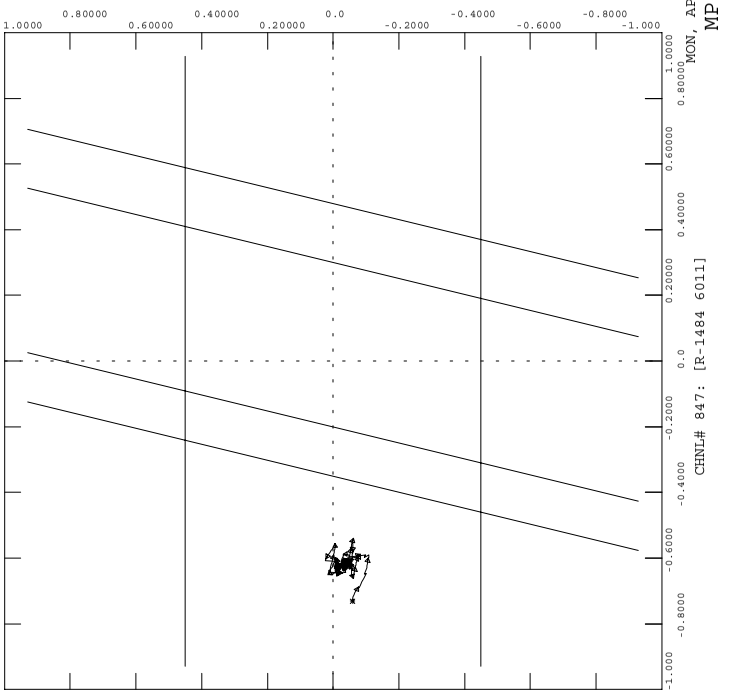


MON, APR 15 2002 17:54
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

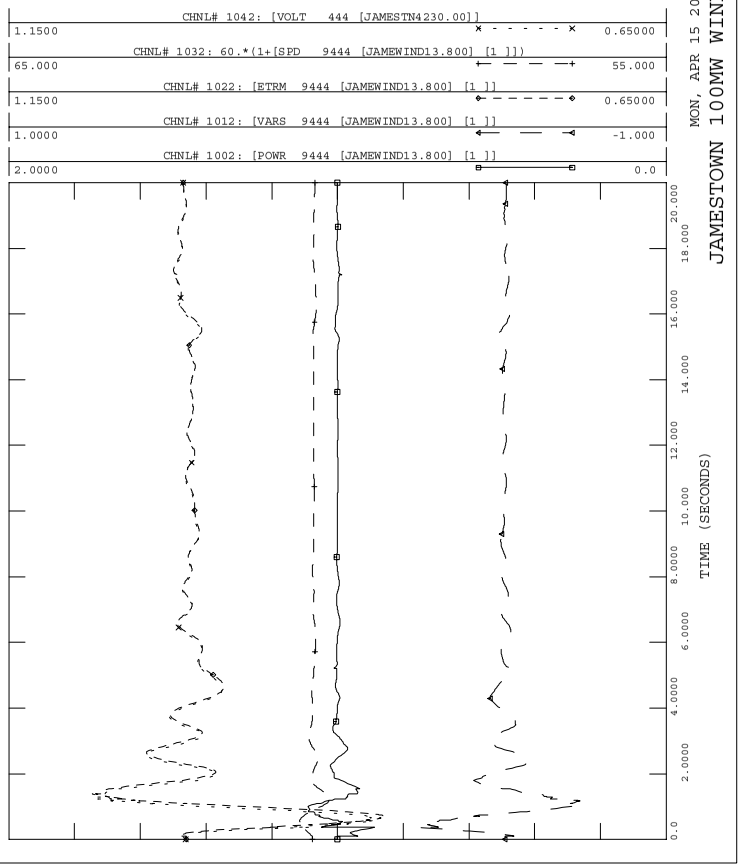
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



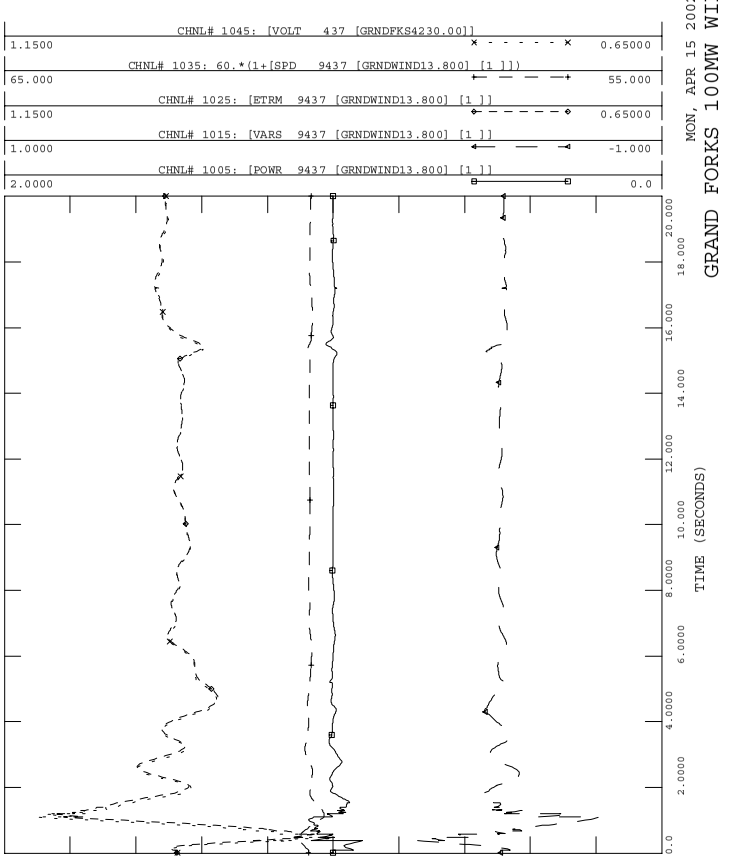
MON, APR 15 2002 17:54
MP-OH I.FALLS (779)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



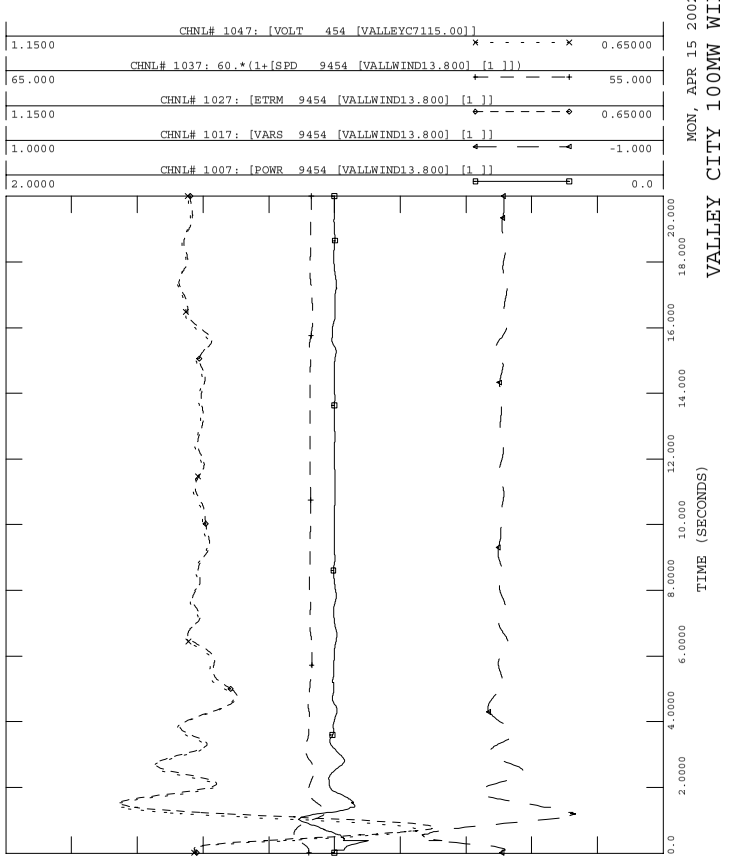
MON, APR 15 2002 17:54
JAMESTOWN 100MW WIND UNIT

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



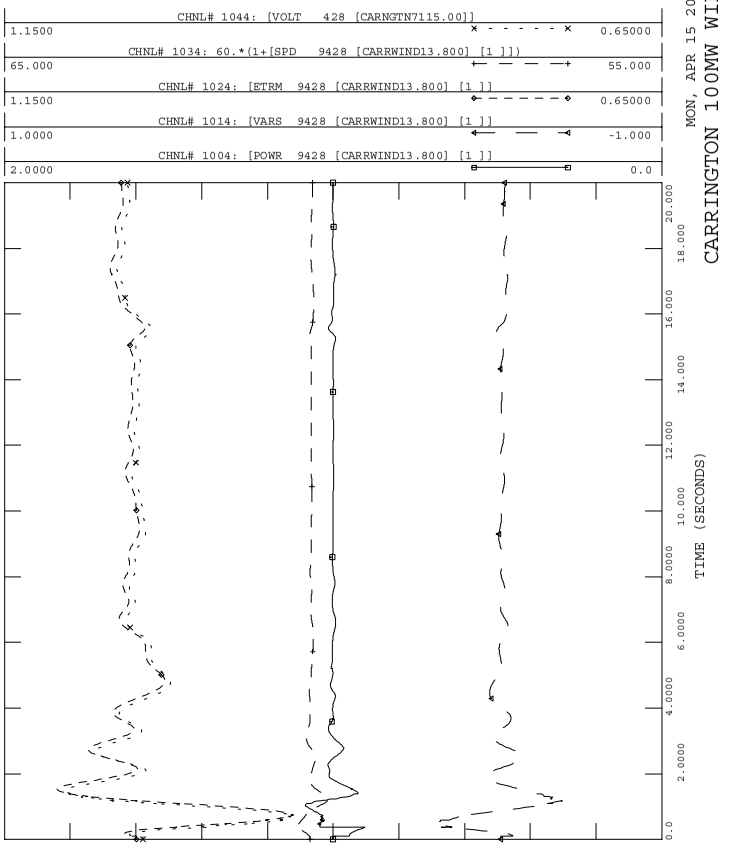
MON, APR 15 2002 17:54
GRAND FORKS 100MW WIND UN

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



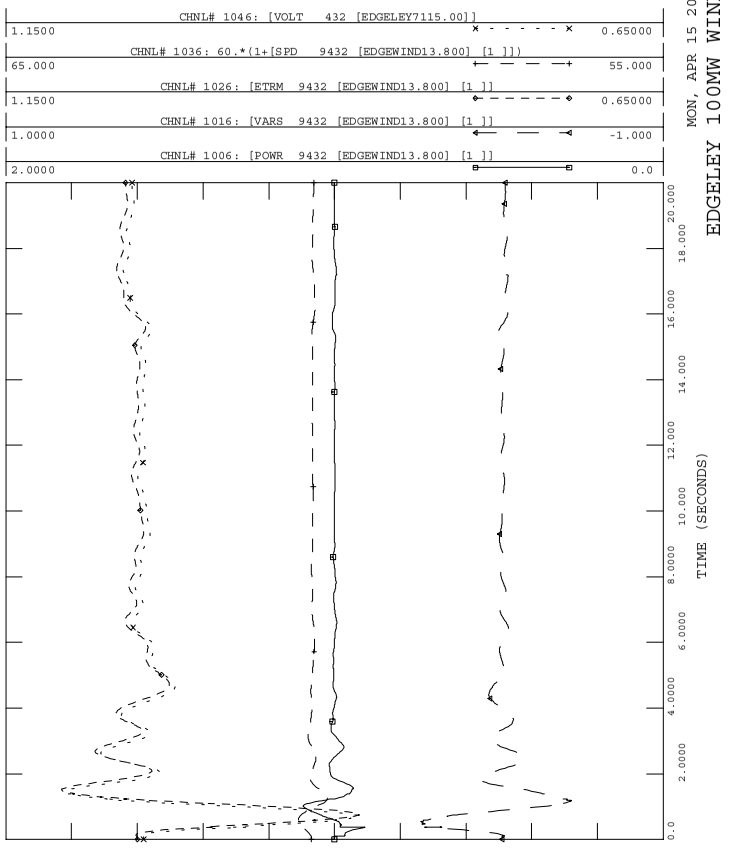
MON, APR 15 2002 17:54
VALLEY CITY 100MW WIND UN

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin



MON, APR 15 2002 17:54
CARRINGTON 100MW WIND UNI

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

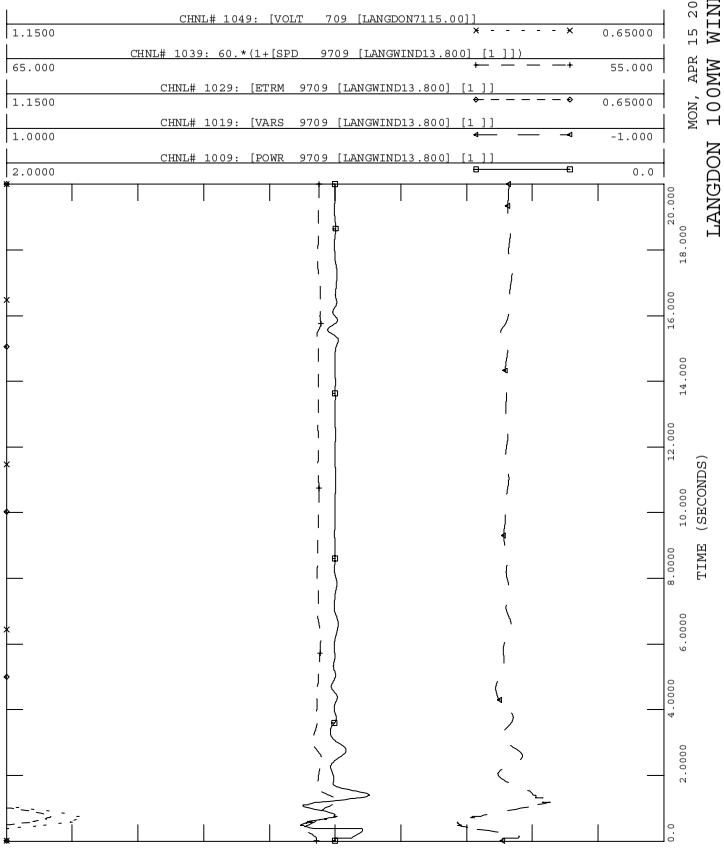


MON, APR 15 2002 17:54
EDGELEY 100MW WIND UNIT

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54

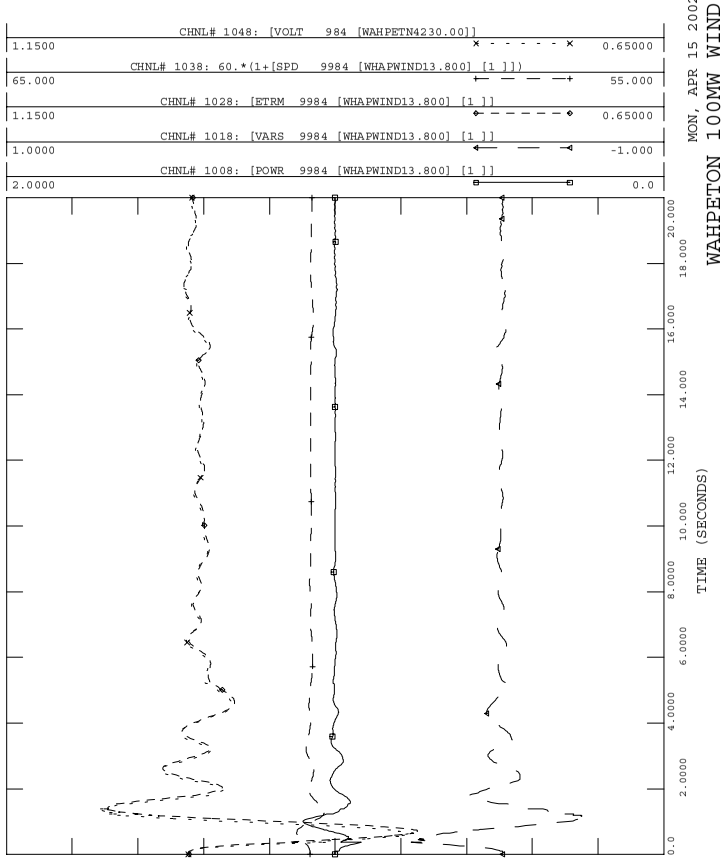
LANGDON 100MW WIND UNIT



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54

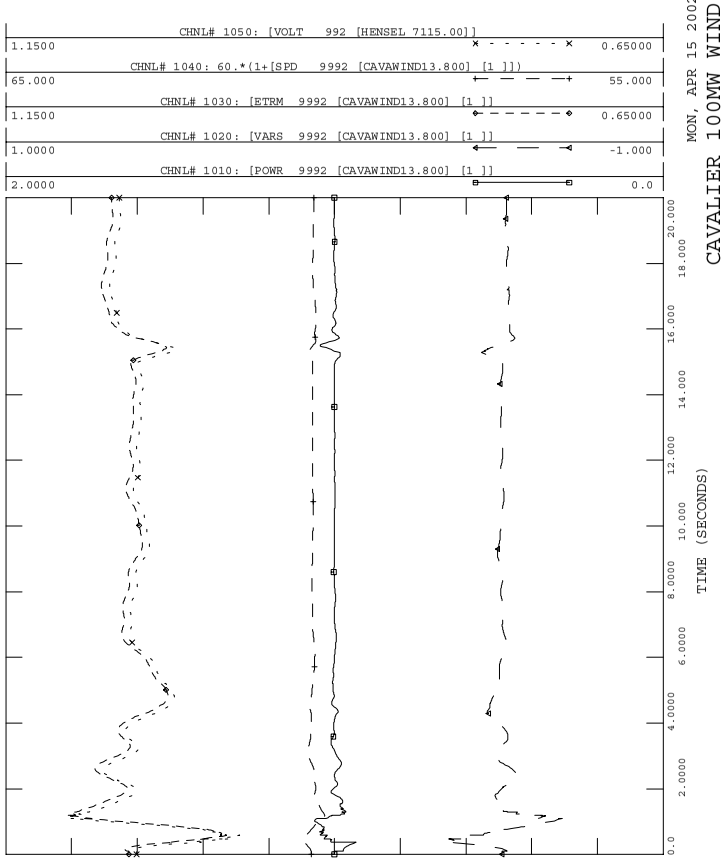
WAHPETON 100MW WIND UNIT



UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C1XXX-ei2.bin

MON, APR 15 2002 17:54

CAVALIER 100MW WIND UNIT



APPENDIX 14

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 2 (JAMESTOWN)

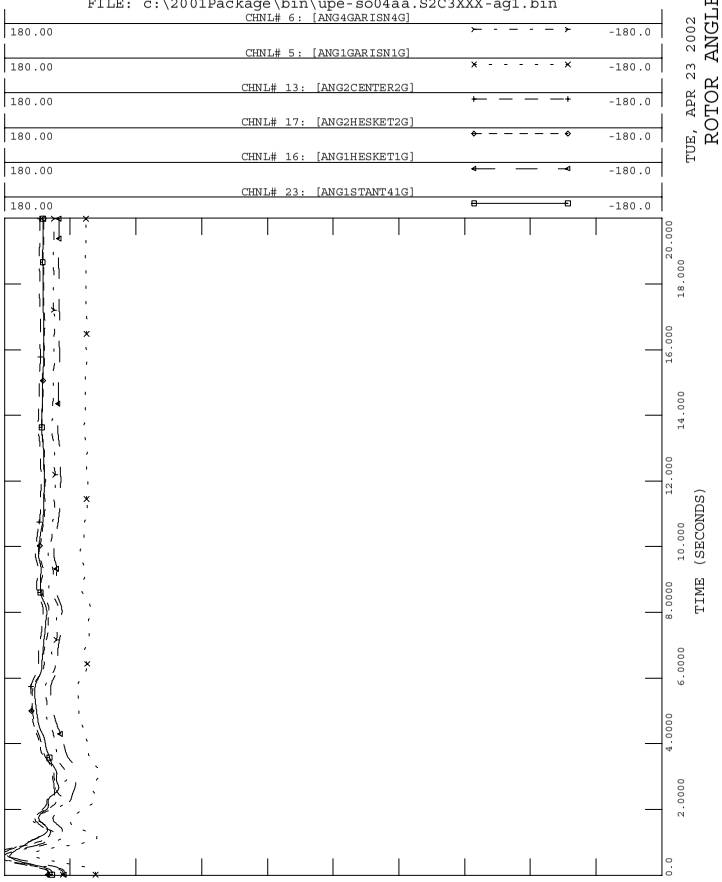
CASE S2C3XXX

CONTINGENCY AG1

Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

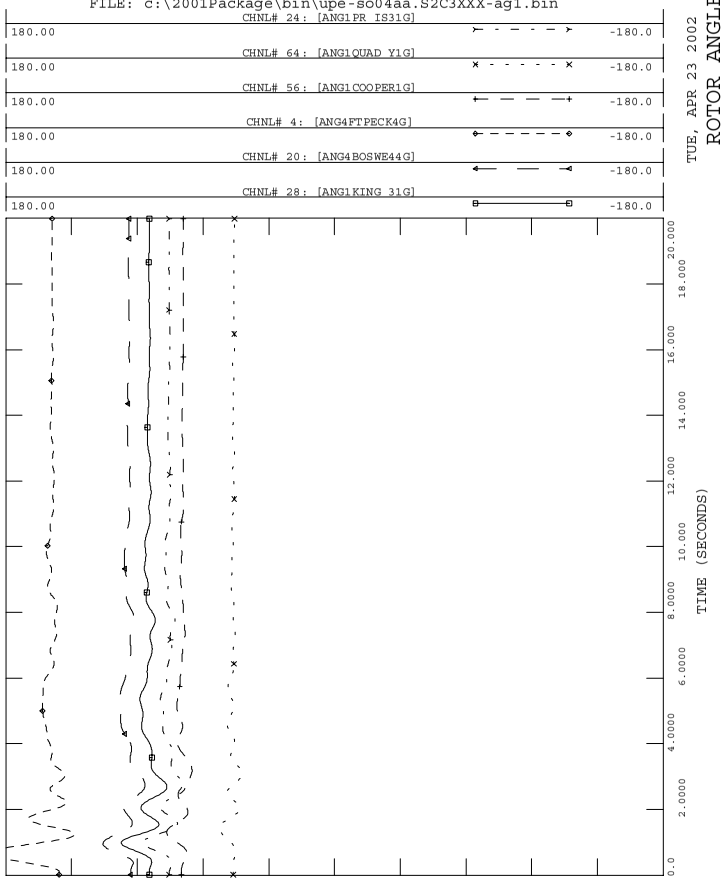
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
ROTOR ANGLES 2



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
ROTOR ANGLES 4



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
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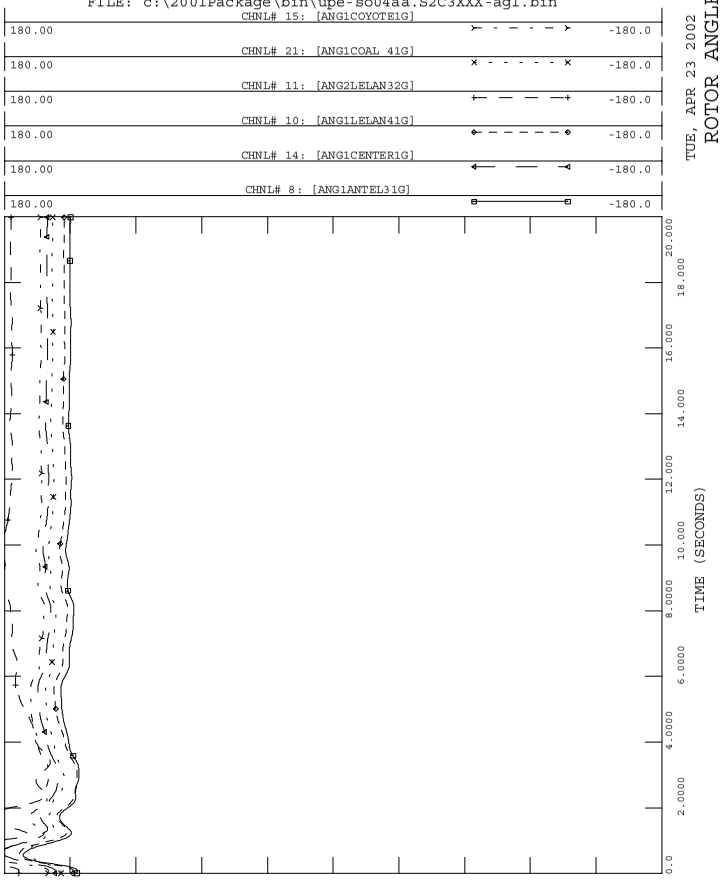

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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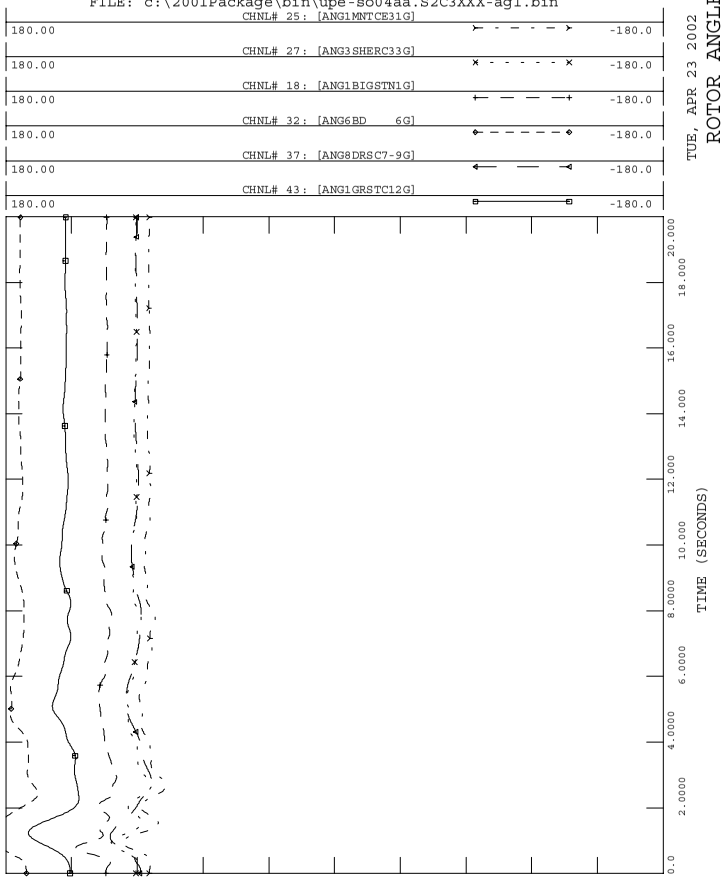
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
ROTOR ANGLES 3



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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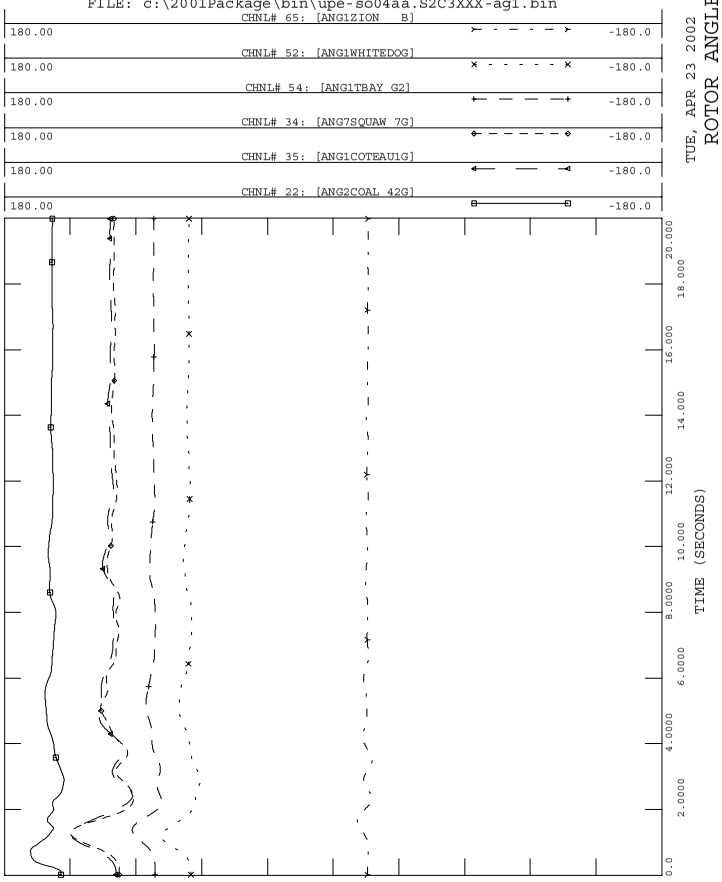
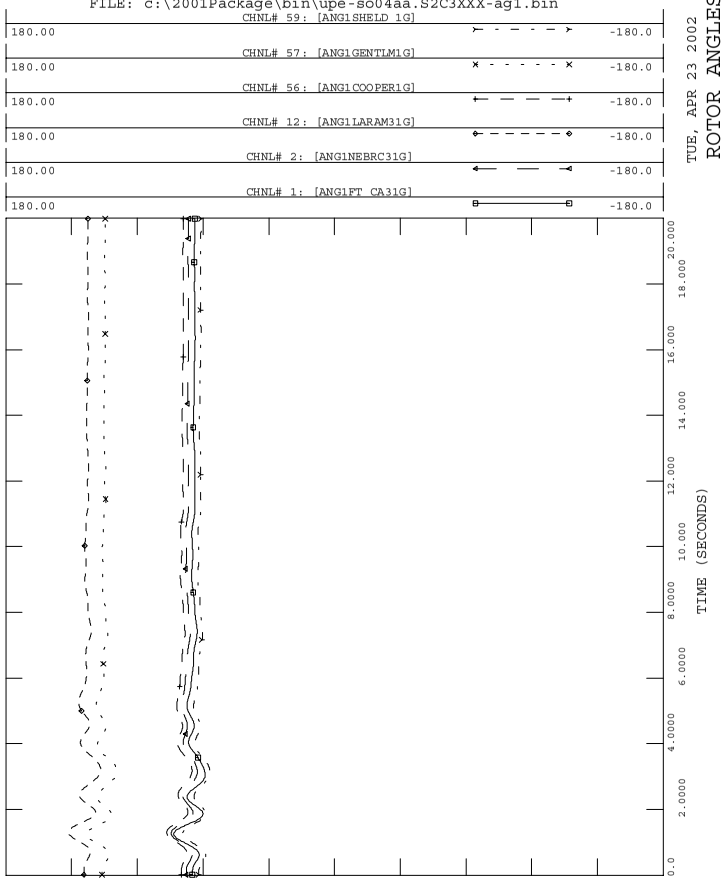
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
ROTOR ANGLES 6



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
ROTOR ANGLES NB



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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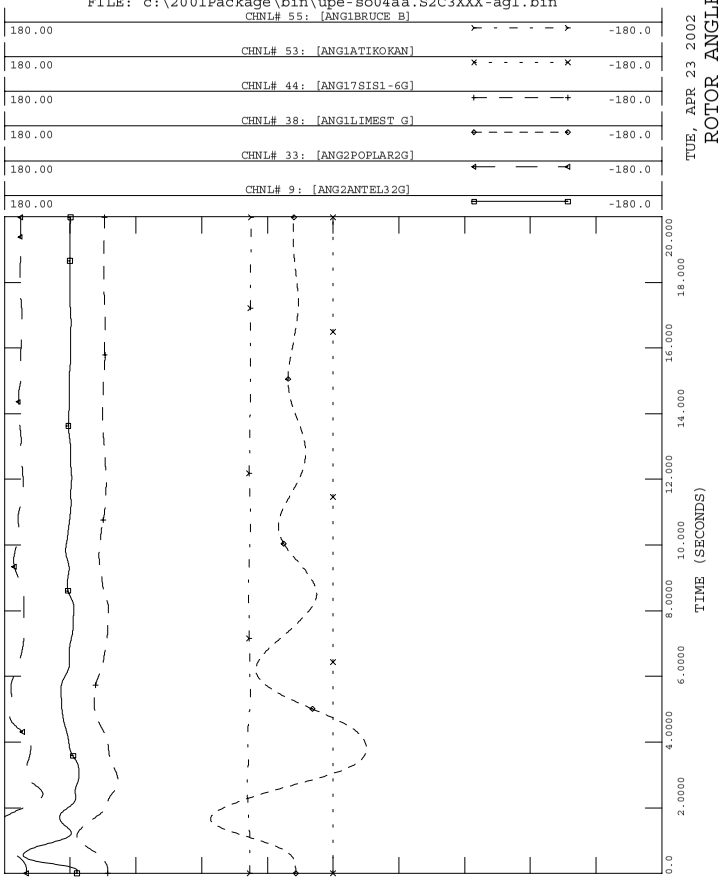
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
ROTOR ANGLES 5



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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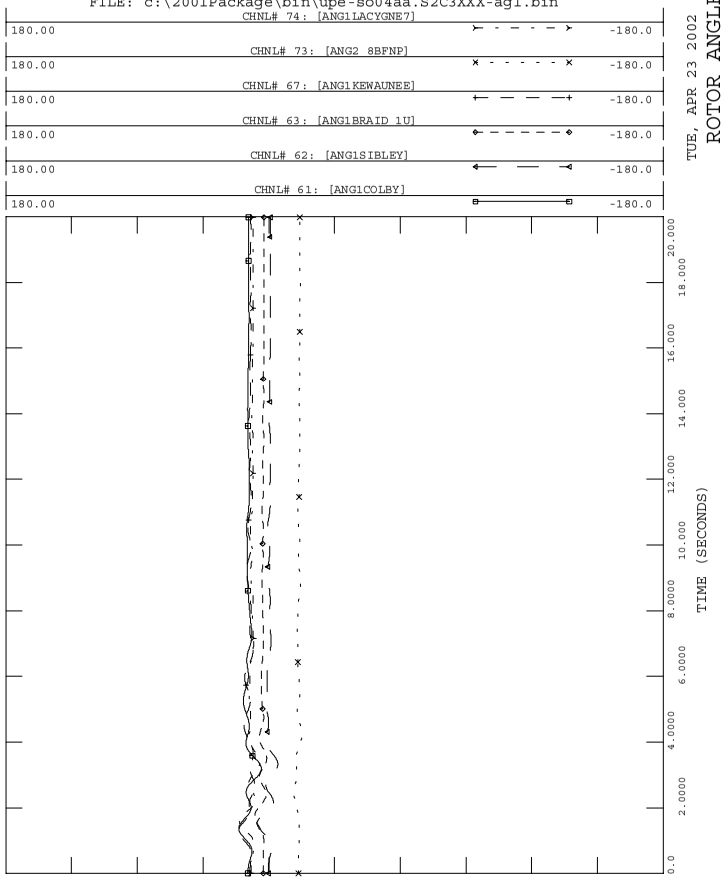
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
ROTOR ANGLES 7



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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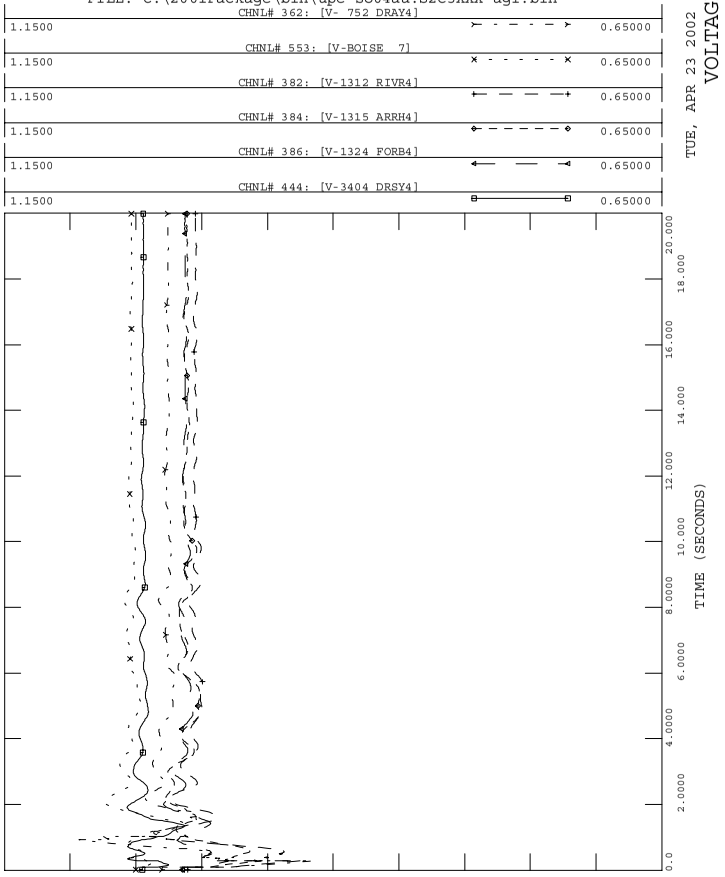
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin



TUE, APR 23 2002 11:36
VOLTAGES 1

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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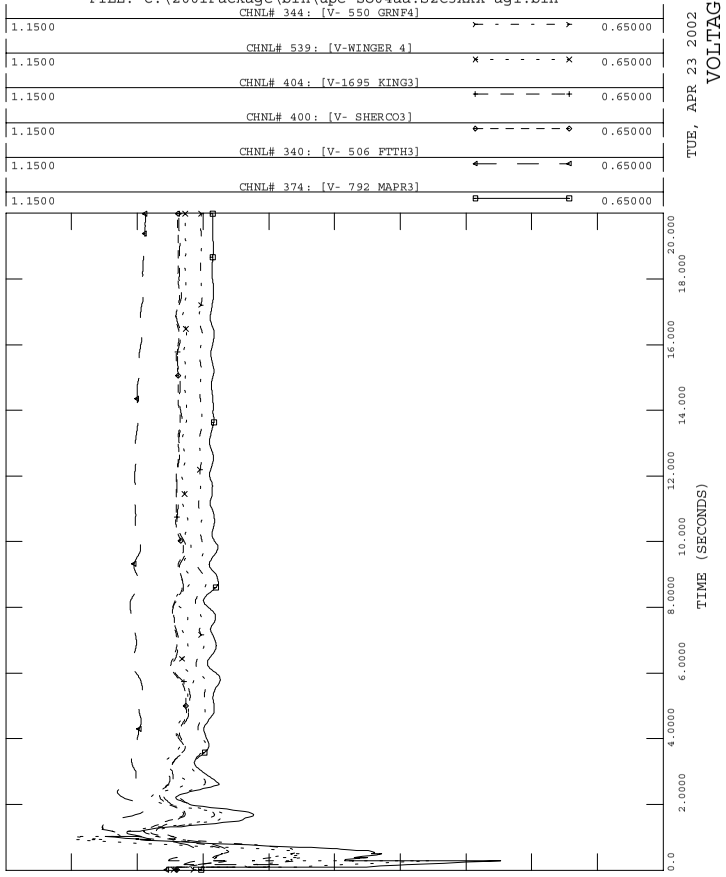
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin



TUE, APR 23 2002 11:36
VOLTAGES 3

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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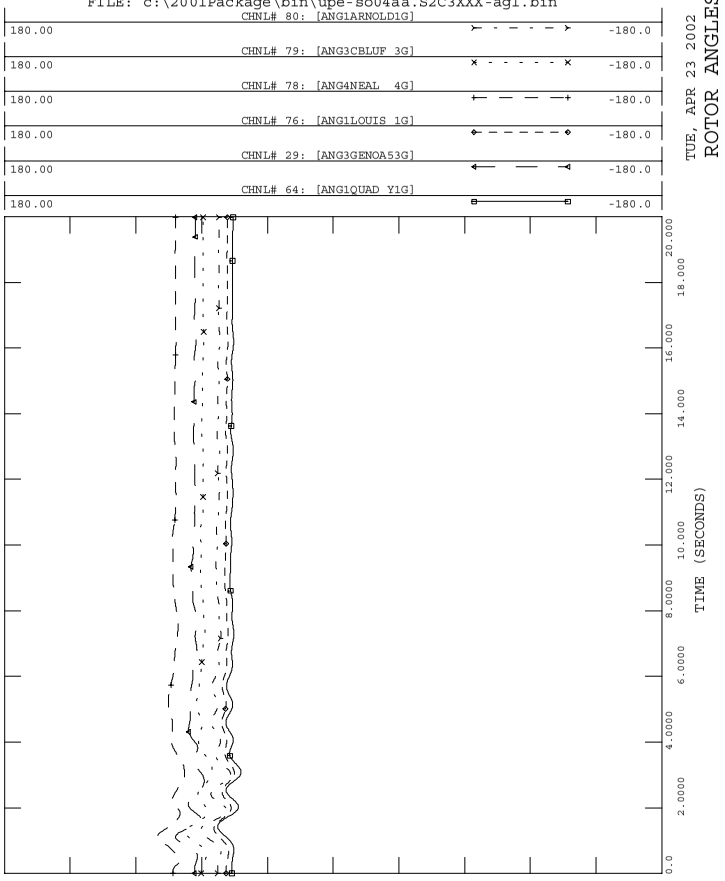
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin



TUE, APR 23 2002 11:36
ROTOR ANGLES IA

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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CLR @ 11 CY BY TRIPPING FLTD LINE
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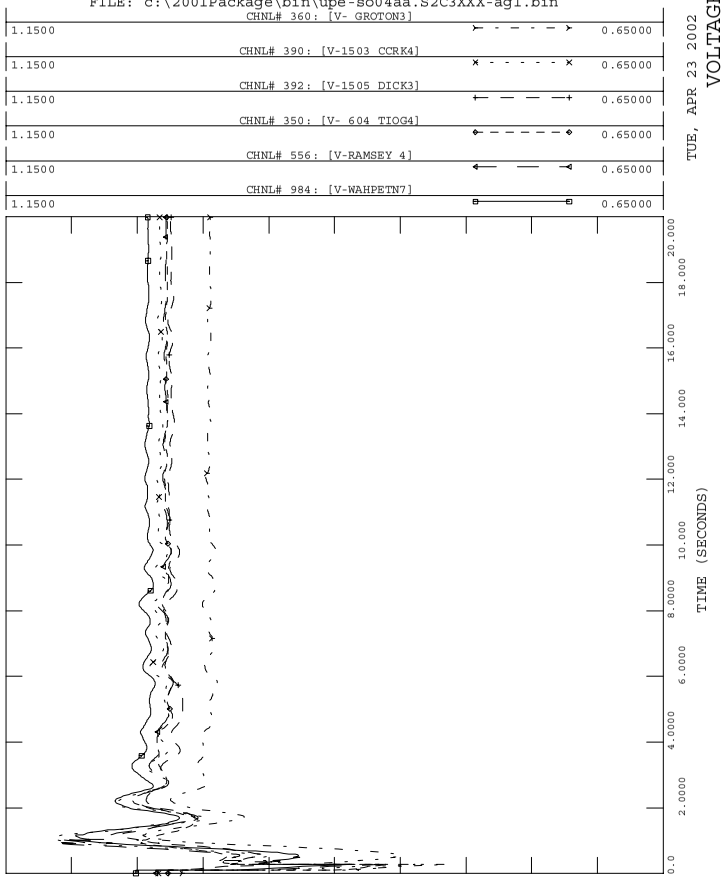

TUE, APR 23 2002 11:36
VOLTAGES 2

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CLR @ 11 CY BY TRIPPING FLTD LINE
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TUE, APR 23 2002 11:36
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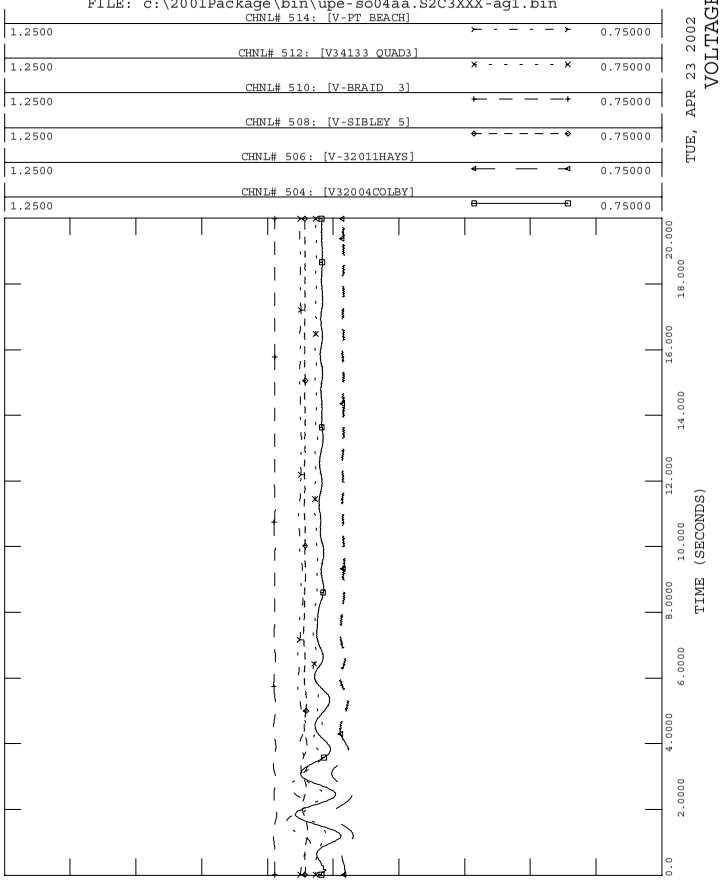

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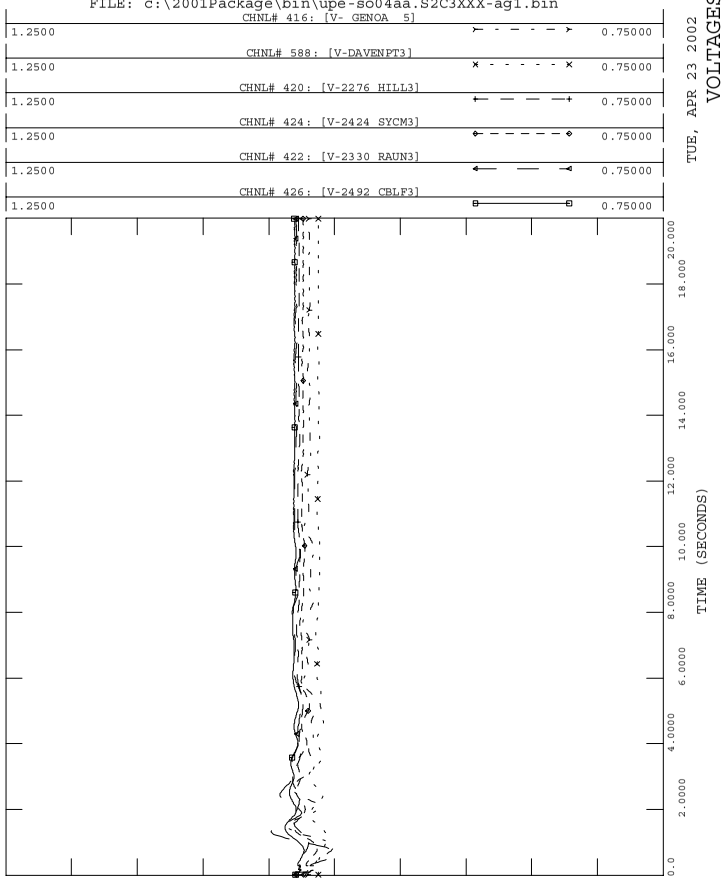
TUE, APR 23 2002 11:36
VOLTAGES IA



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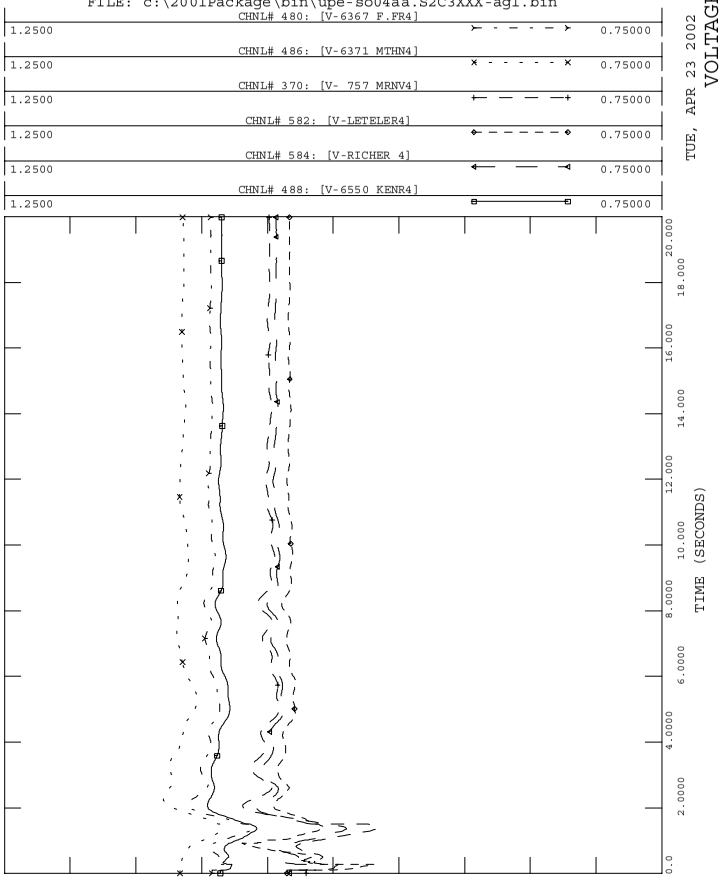
TUE, APR 23 2002 11:36
VOLTAGES 4



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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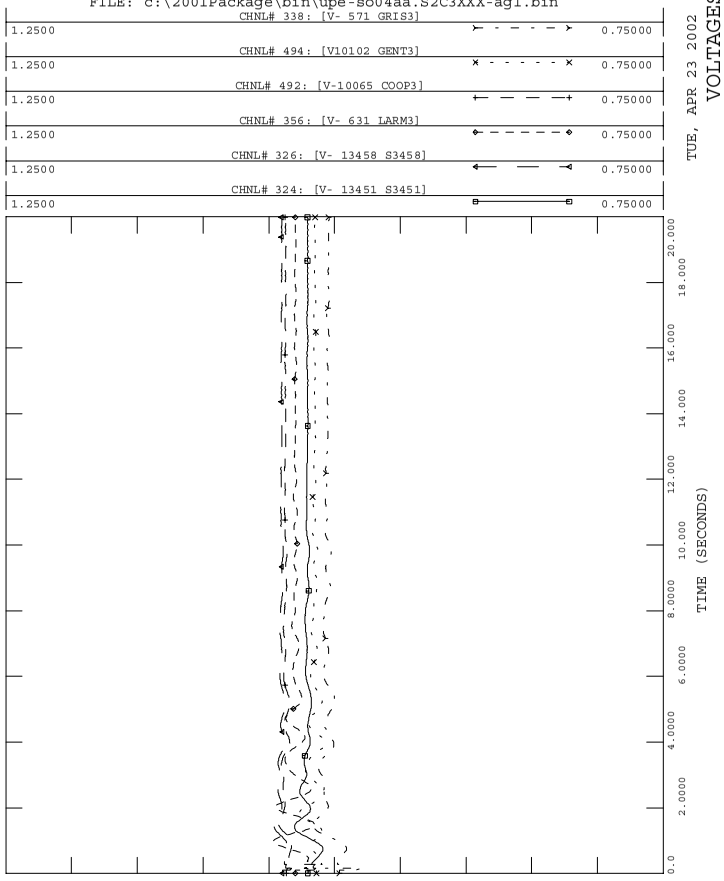
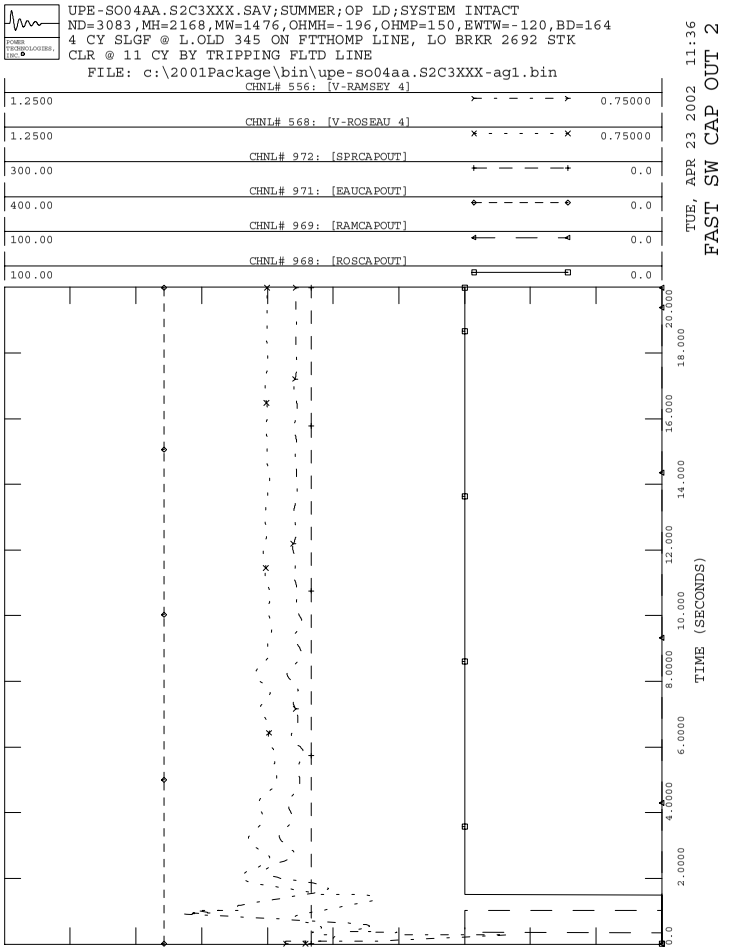
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
VOLTAGES NB

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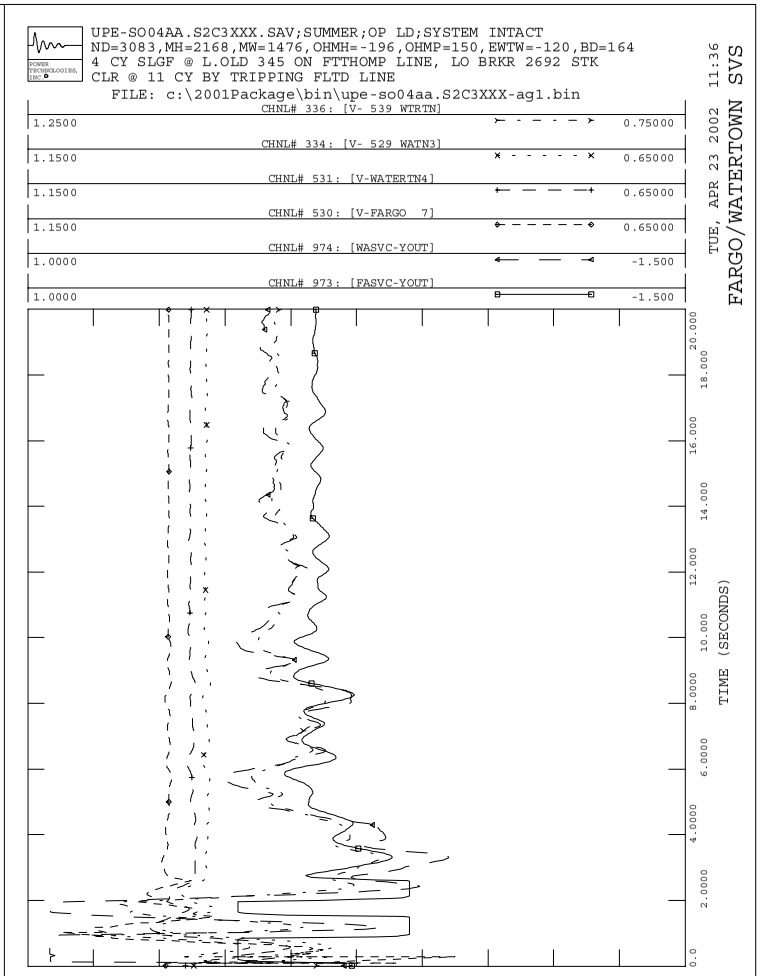
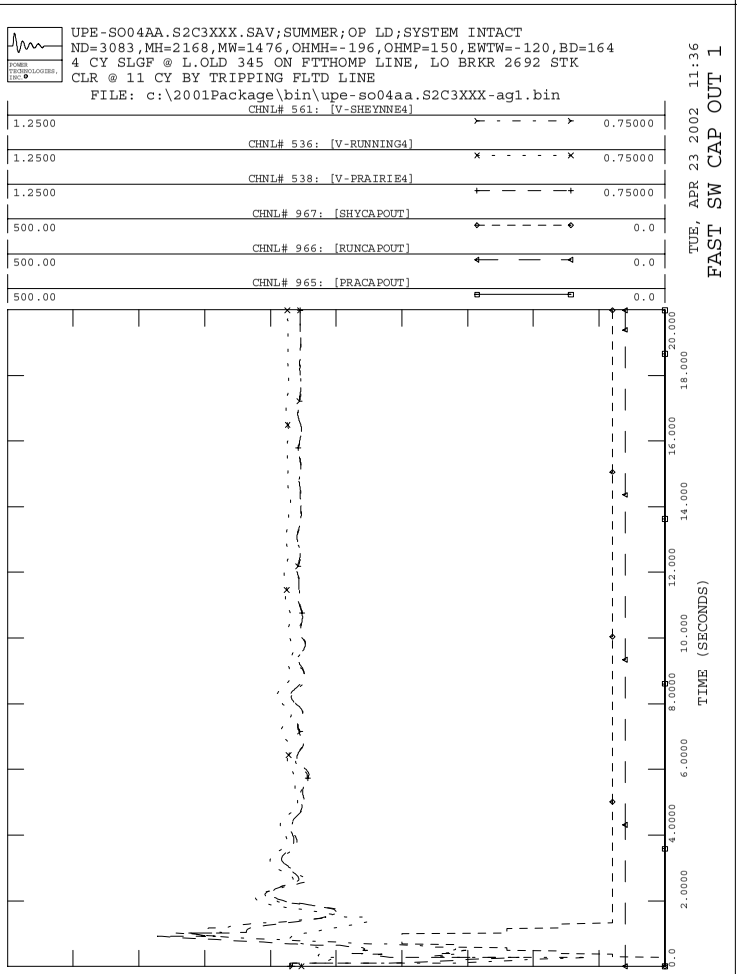
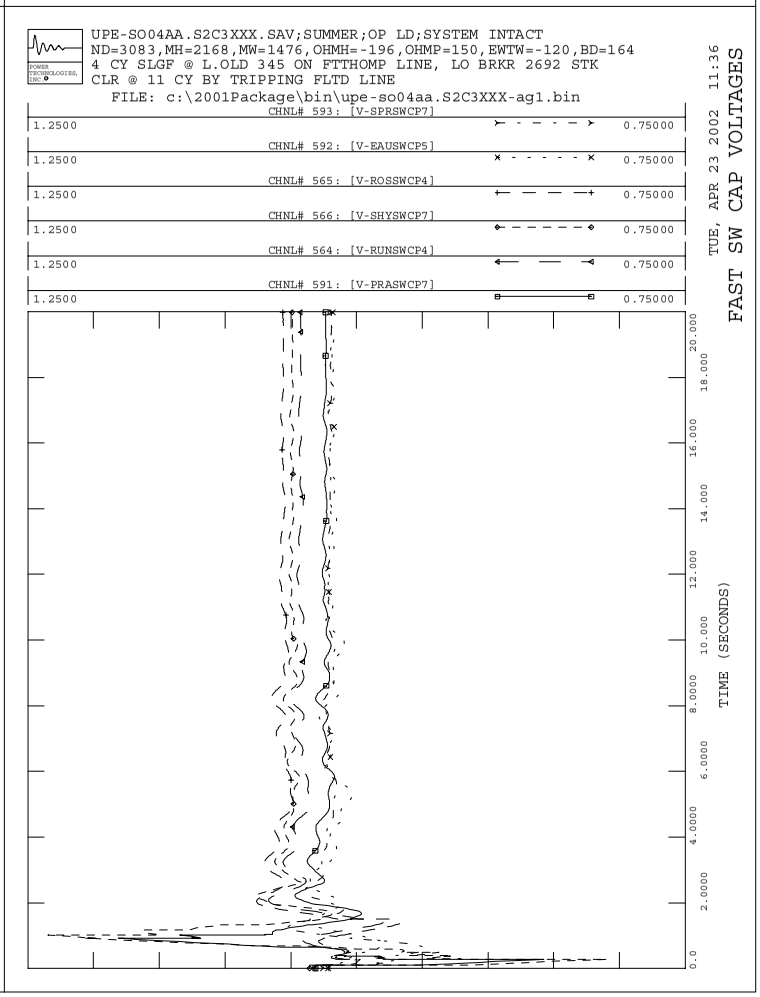
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TUE, APR 23 2002 11:36
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TUE, APR 23 2002 11:36
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TUE, APR 23 2002 11:36
FAST SW CAP OUT 1
TIME (SECONDS)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ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TUE, APR 23 2002 11:36
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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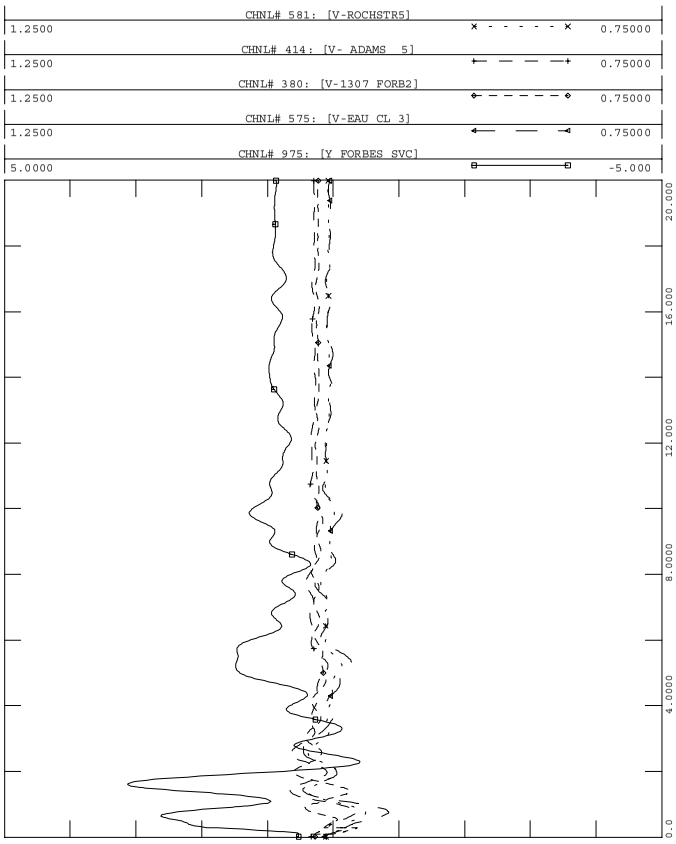
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36

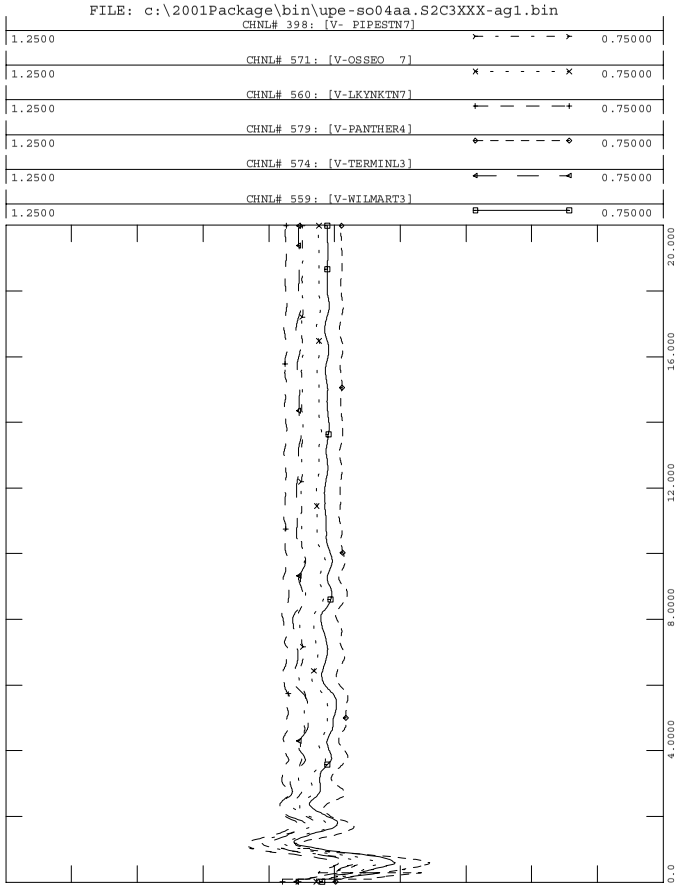
SVC & WISCONSIN VOLT



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36

TC VOLTAGES



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

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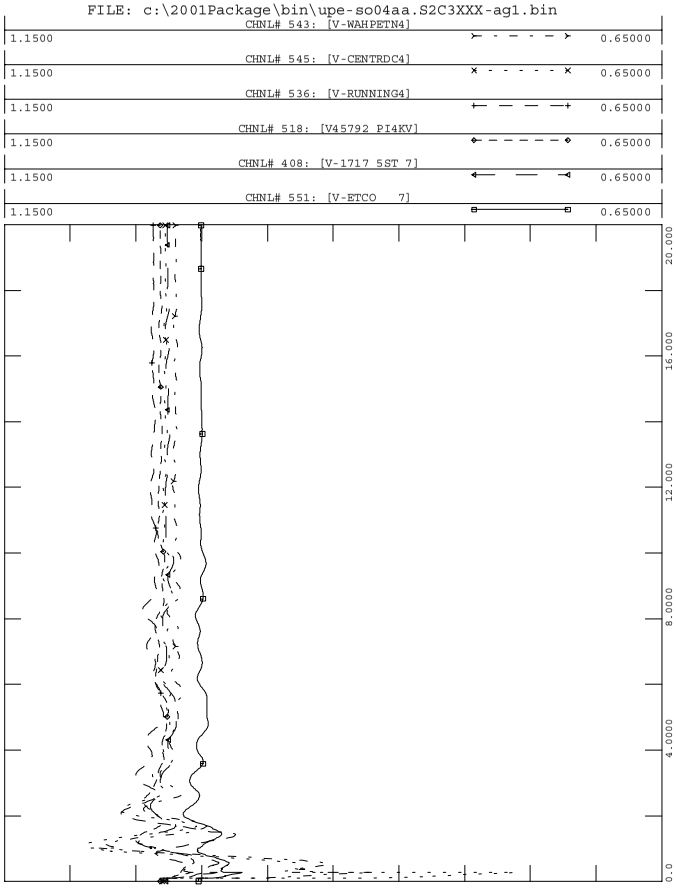
VOLTAGES 6



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

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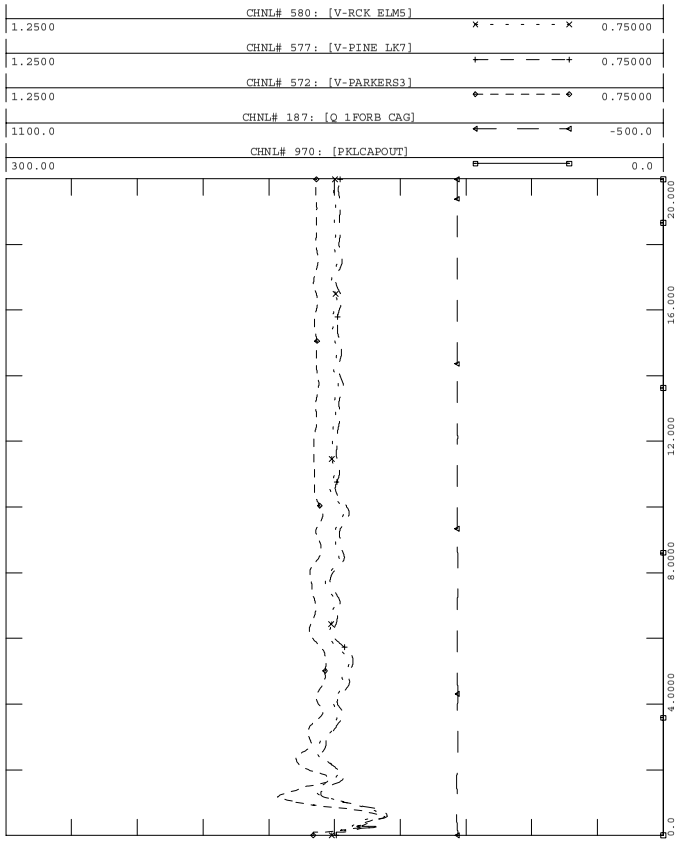
FORBES SVS OUT & VOLTAGES



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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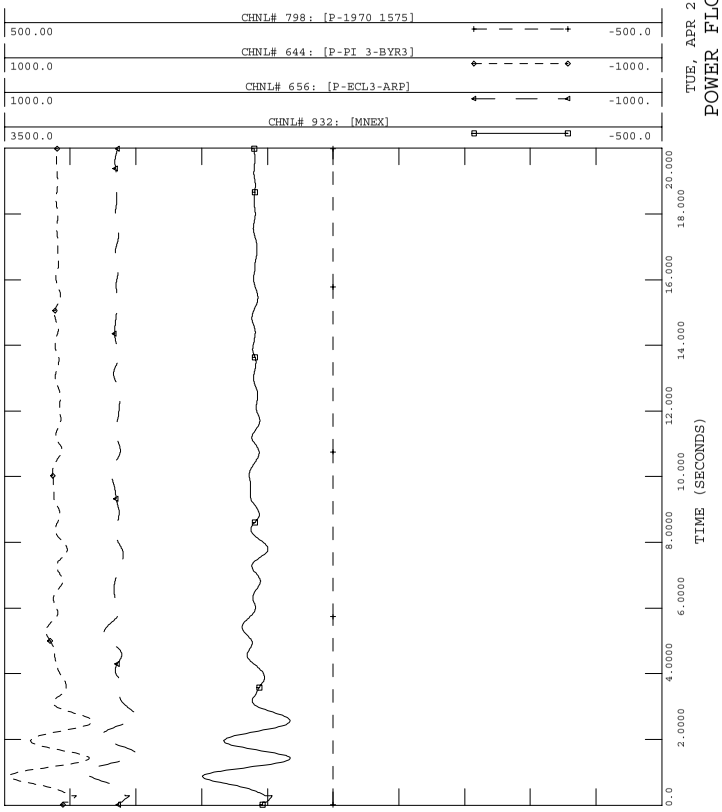
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
POWER FLOW SUMS 2



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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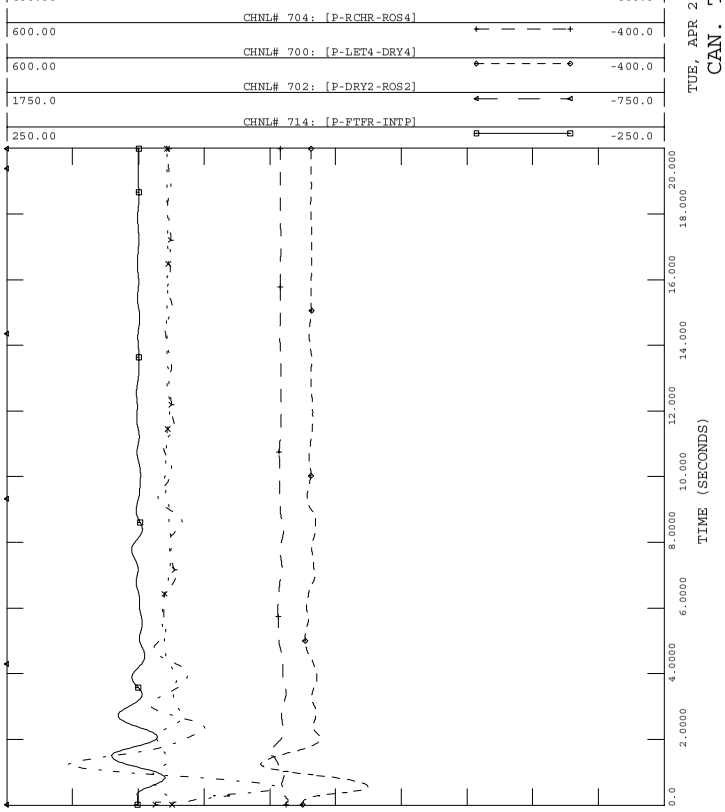
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
CAN. TIE FLOWS



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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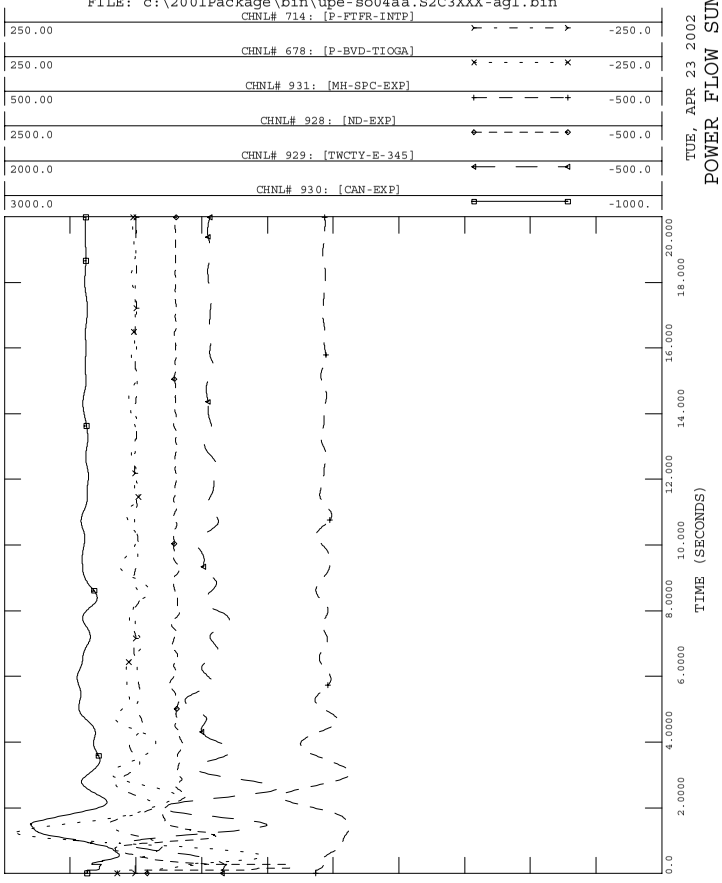
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
POWER FLOW SUMS 1



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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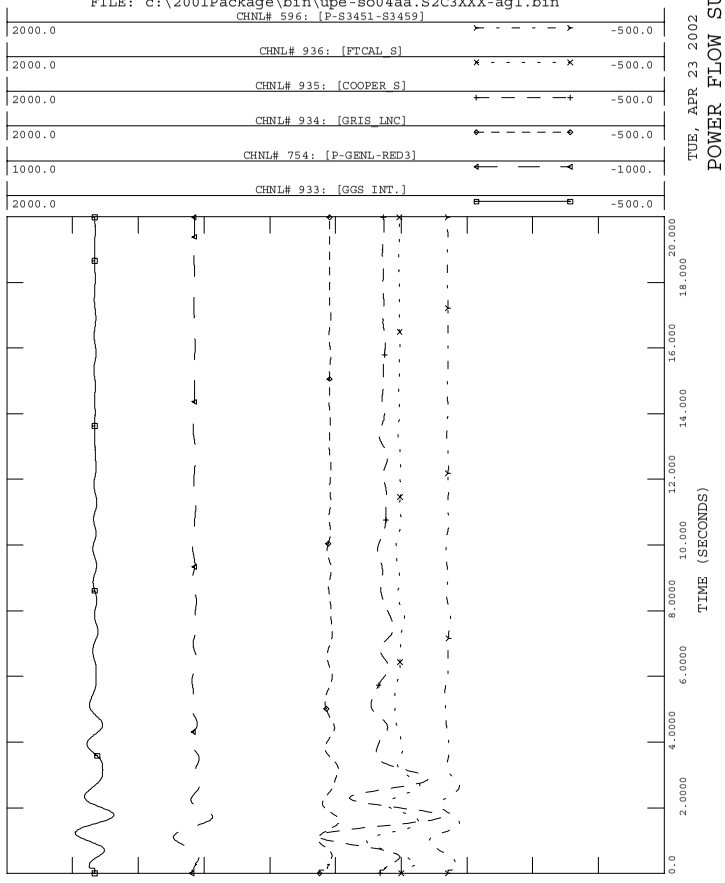
TUE, APR 23 2002 11:36
POWER FLOW SUM 3



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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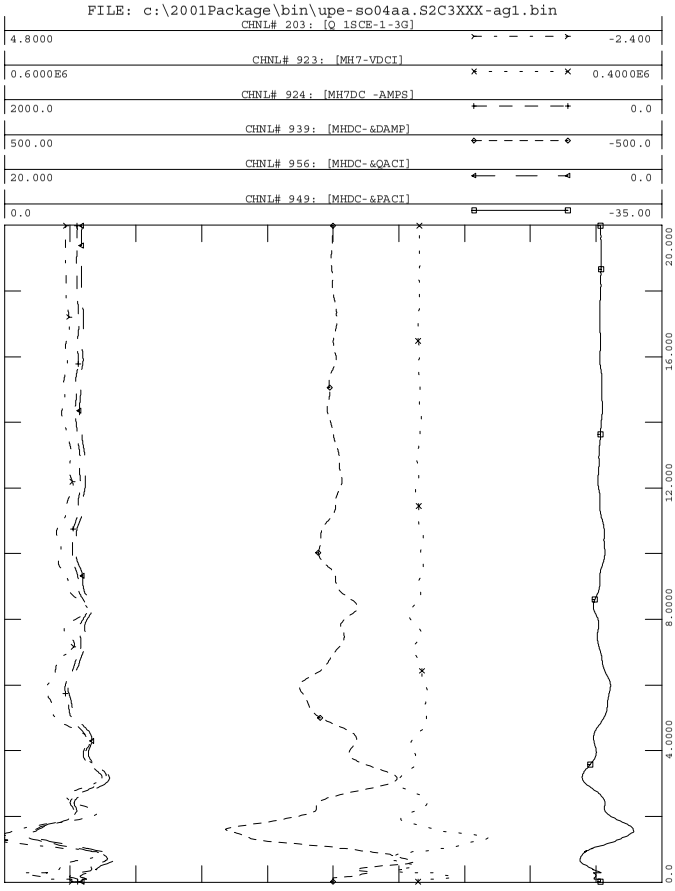
TUE, APR 23 2002 11:36
MH DC PARAMETERS



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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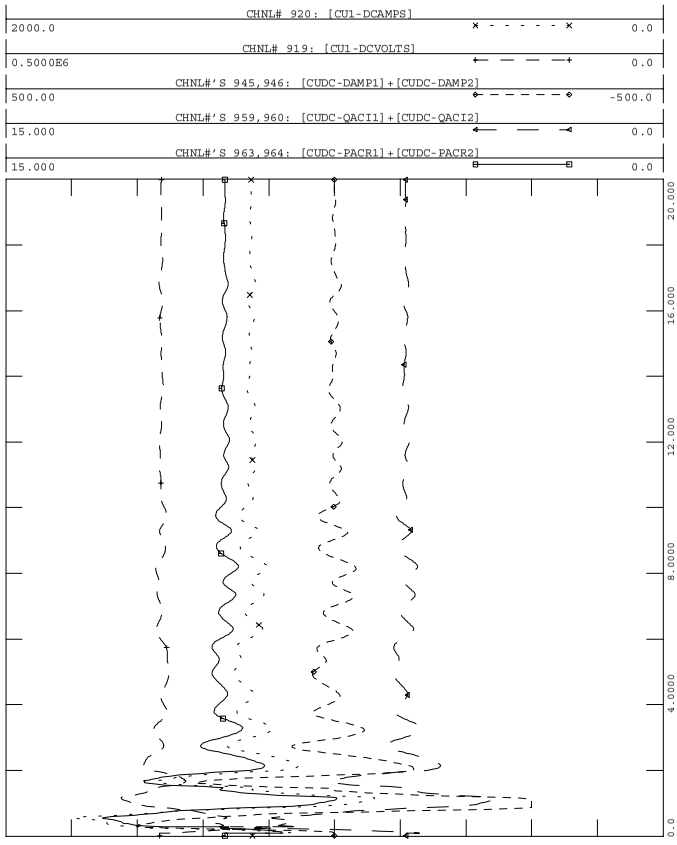
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
CU DC #1



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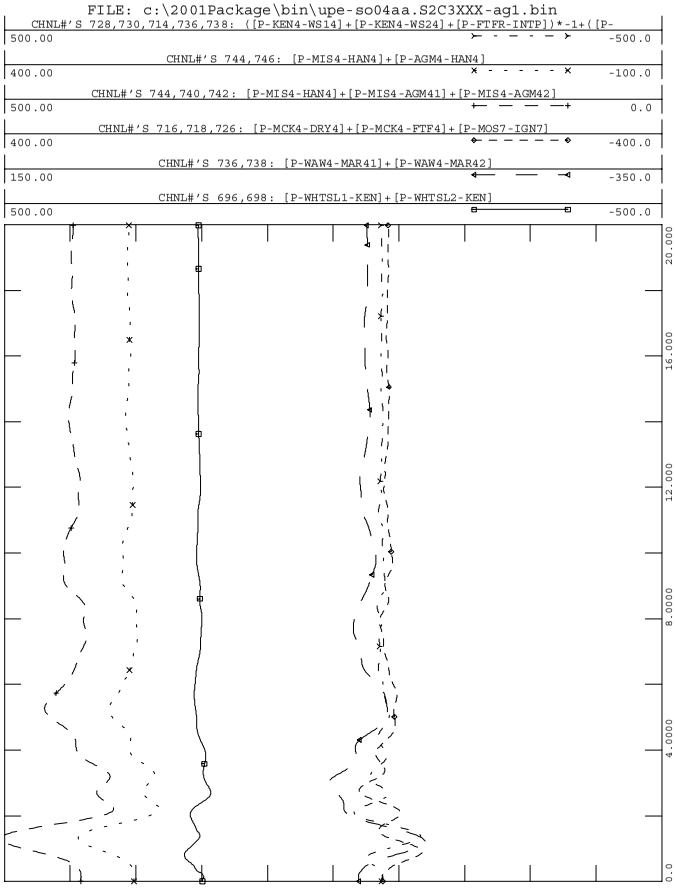
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
OH TIE FLOWS



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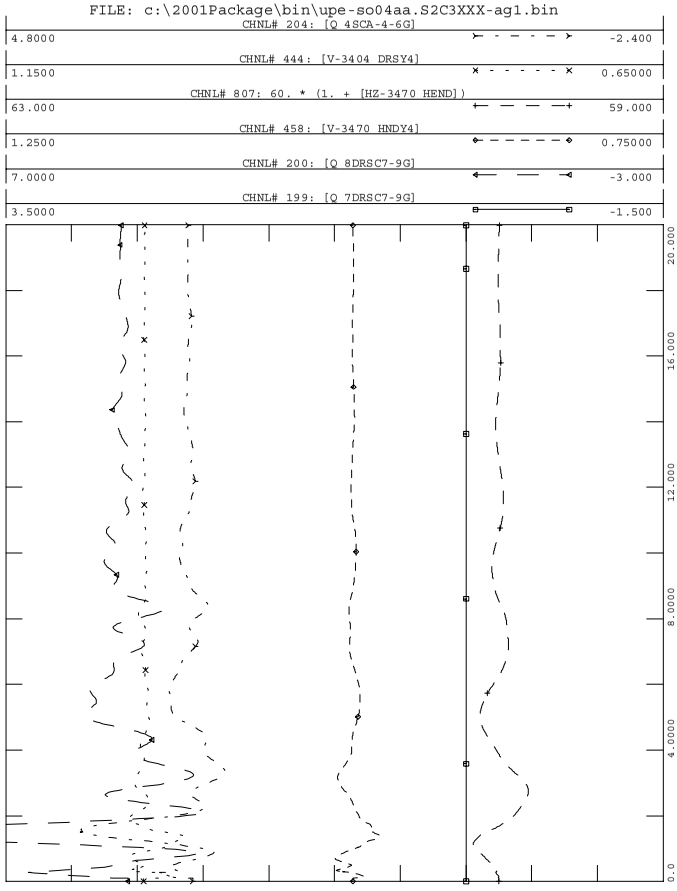
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36
MH DC PARAMETERS



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

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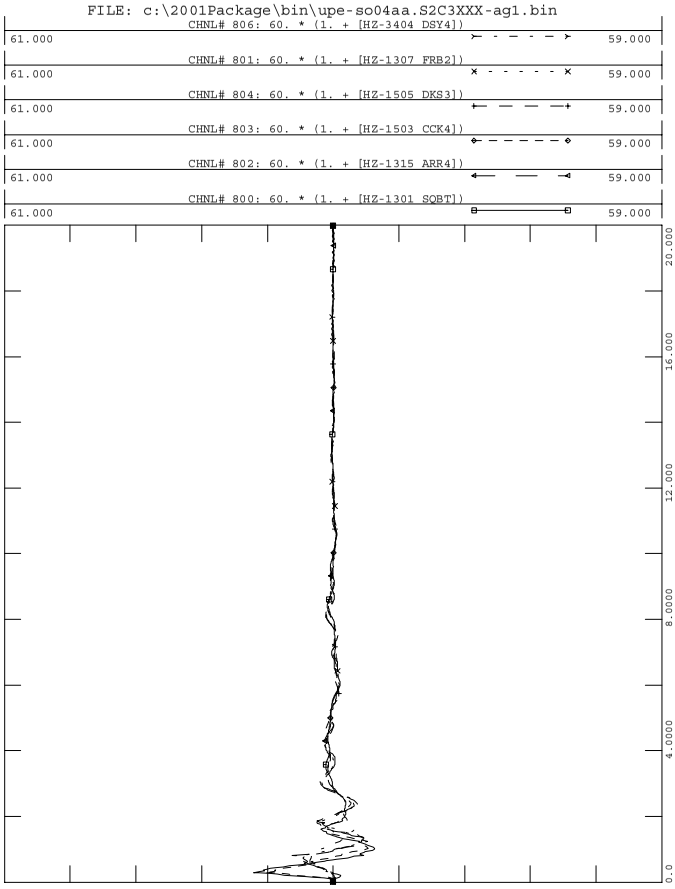
FREQ AT DC TERMINALS



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ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

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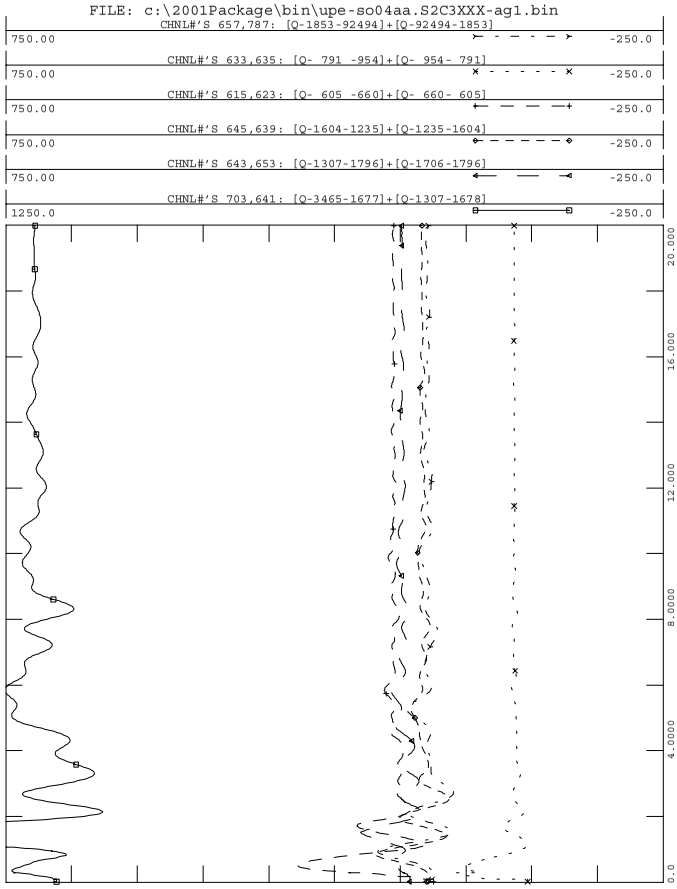
VAR LOSSES



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

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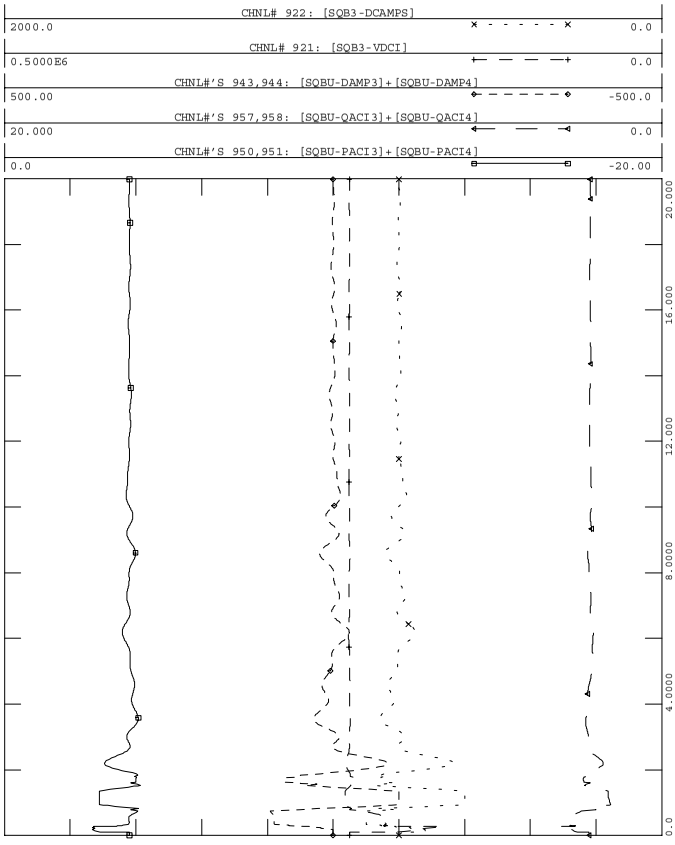
SQB DC #3



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

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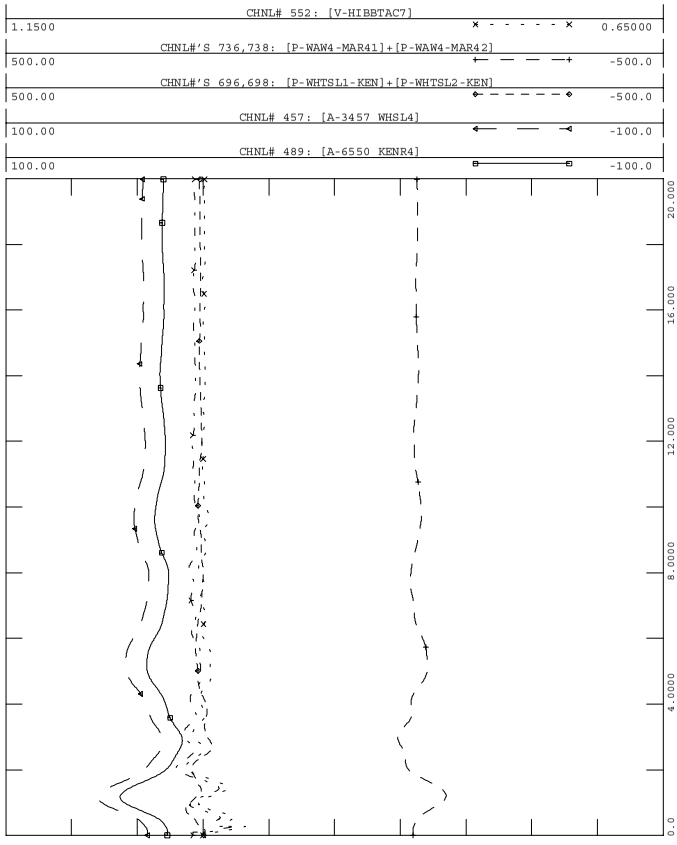
VOLTAGES, ANGLES



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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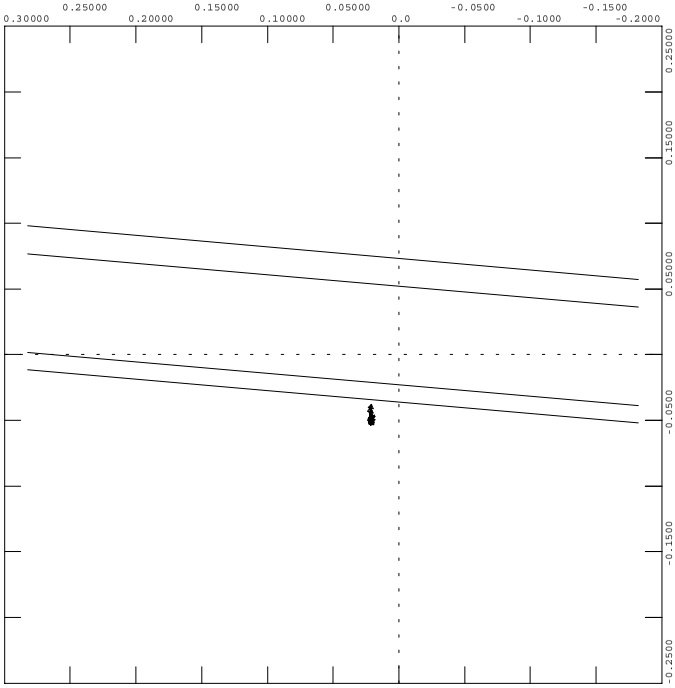
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 23 2002 11:36
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

RELAY: RELAYG
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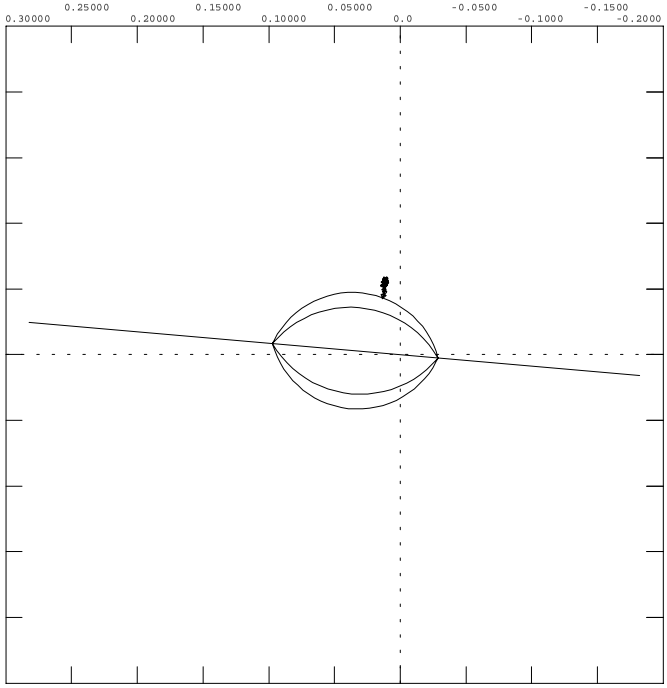
CHNL# 856: [X-DSY2-ROS2]



TUE, APR 23 2002 11:36
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

RELAY: RELAYG
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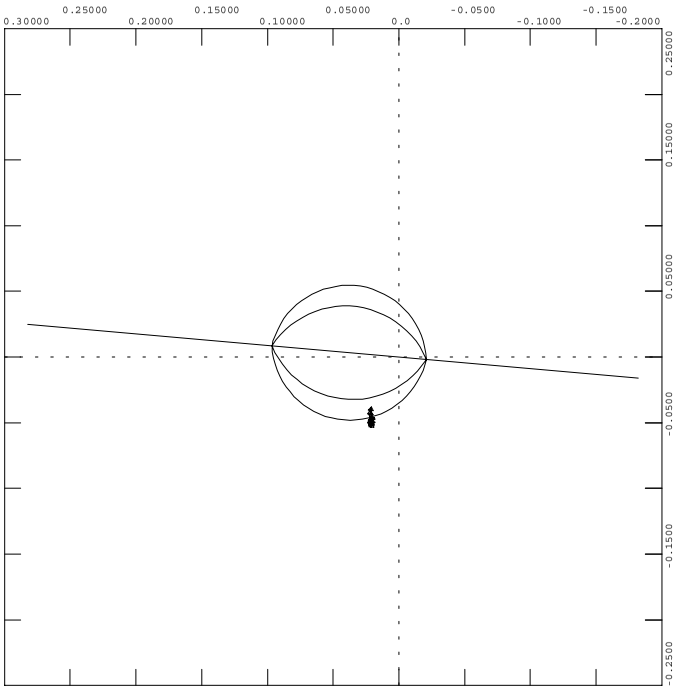
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 23 2002 11:36
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

RELAY: SLINOS
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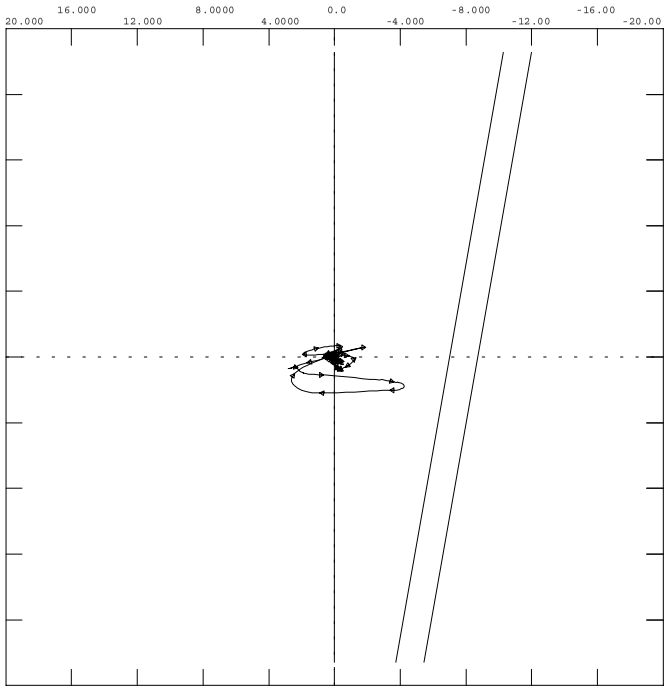

TUE, APR 23 2002 11:36
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

RELAY: SLINOS
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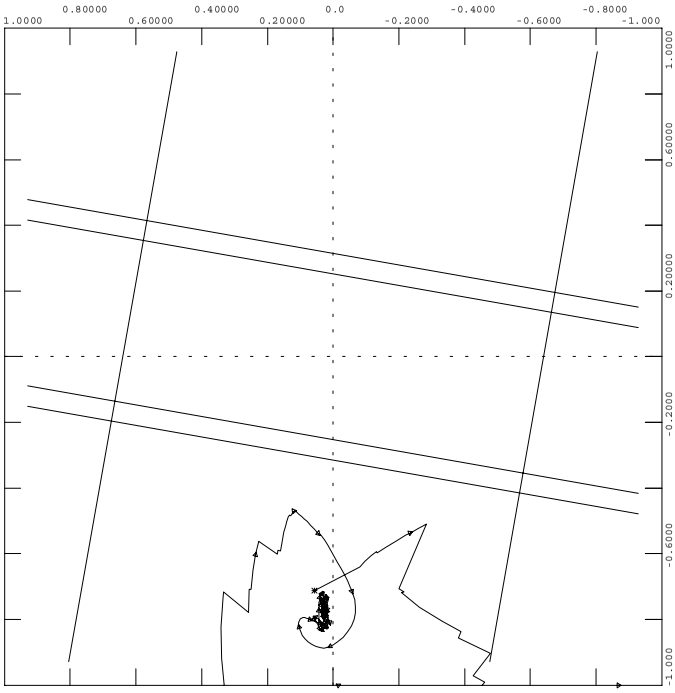
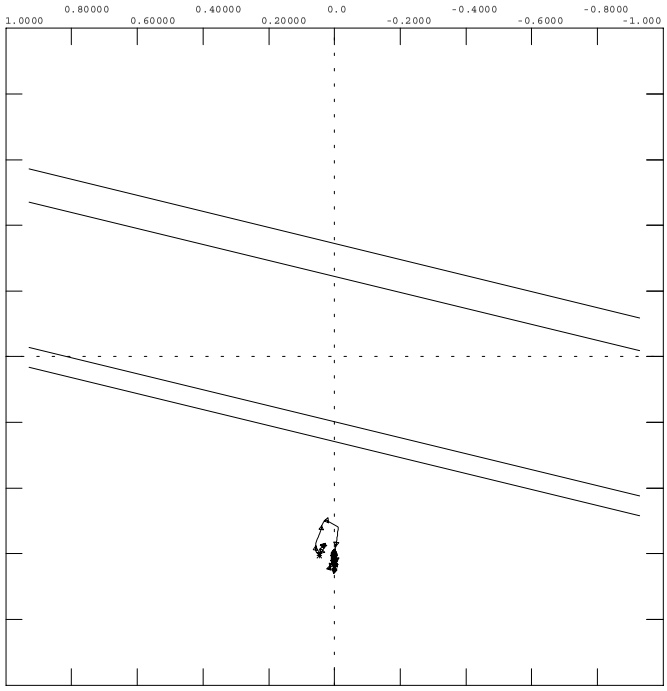
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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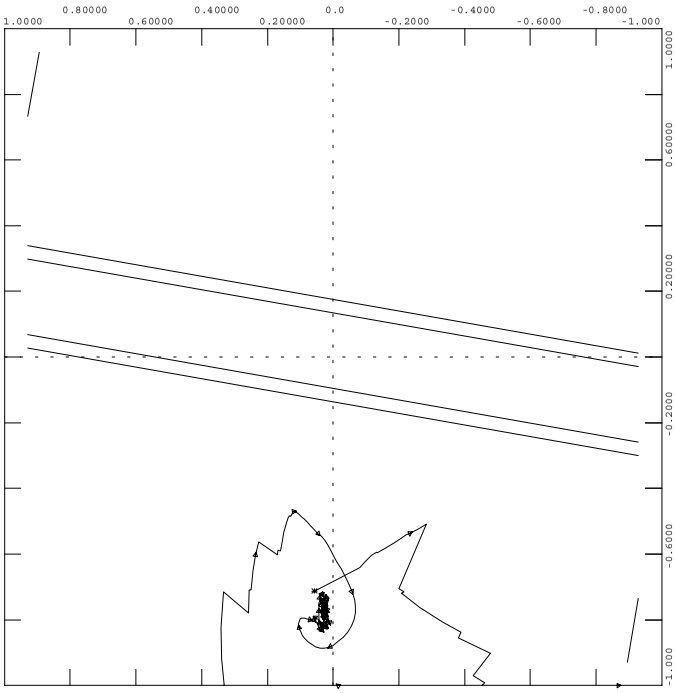

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

RELAY: SLINOS
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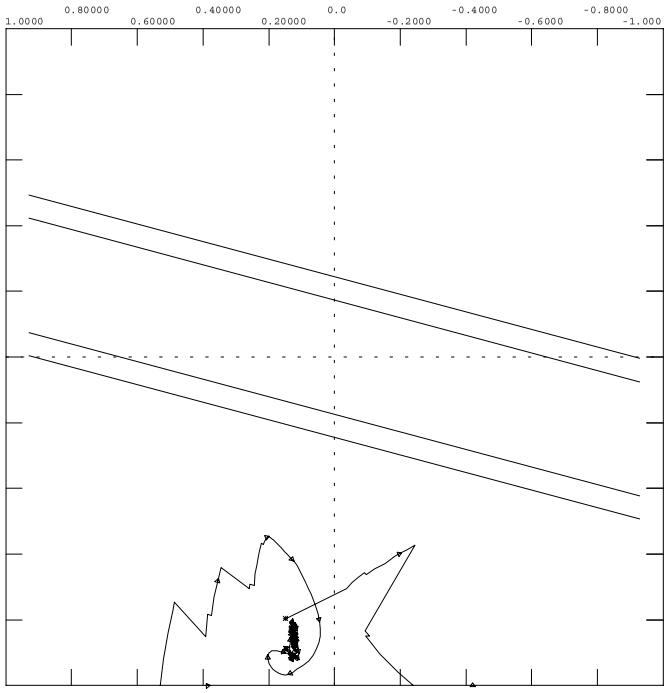
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

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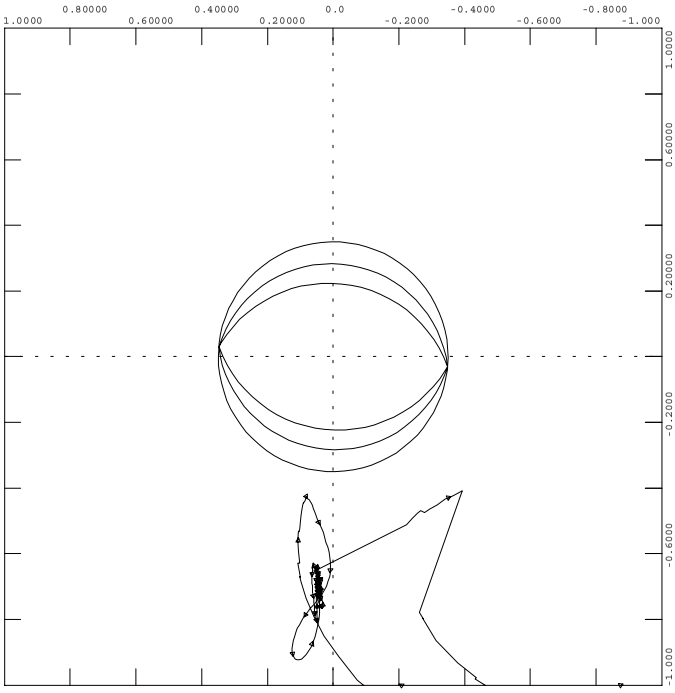
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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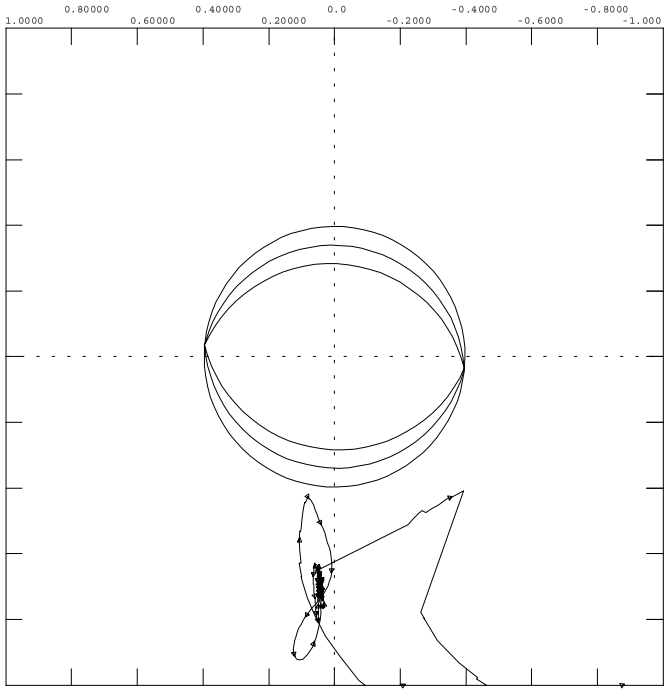
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

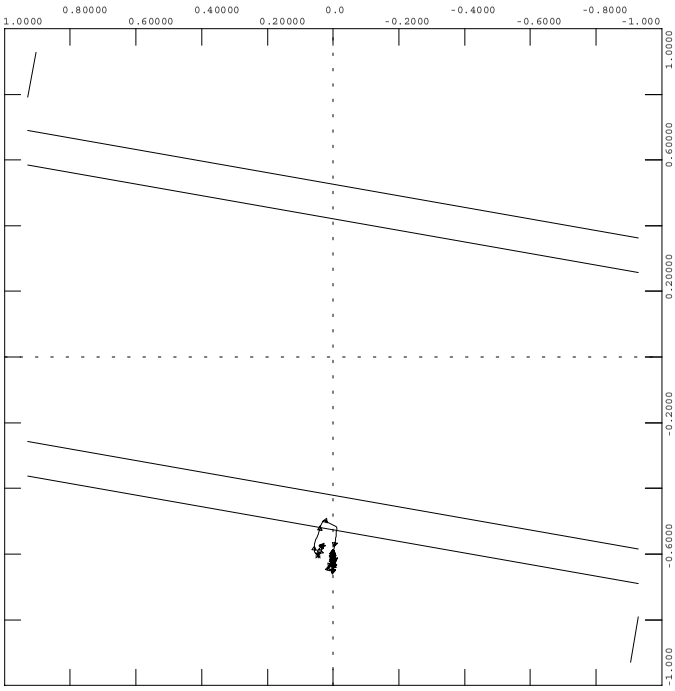
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

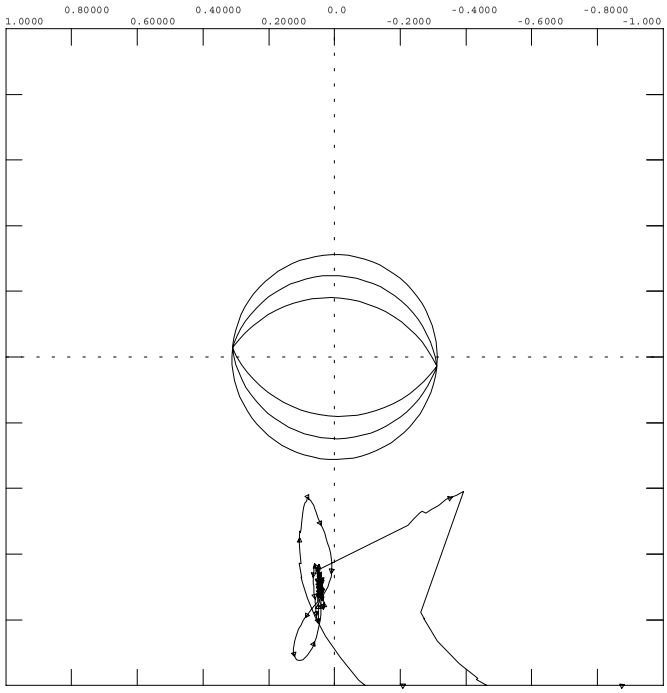
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



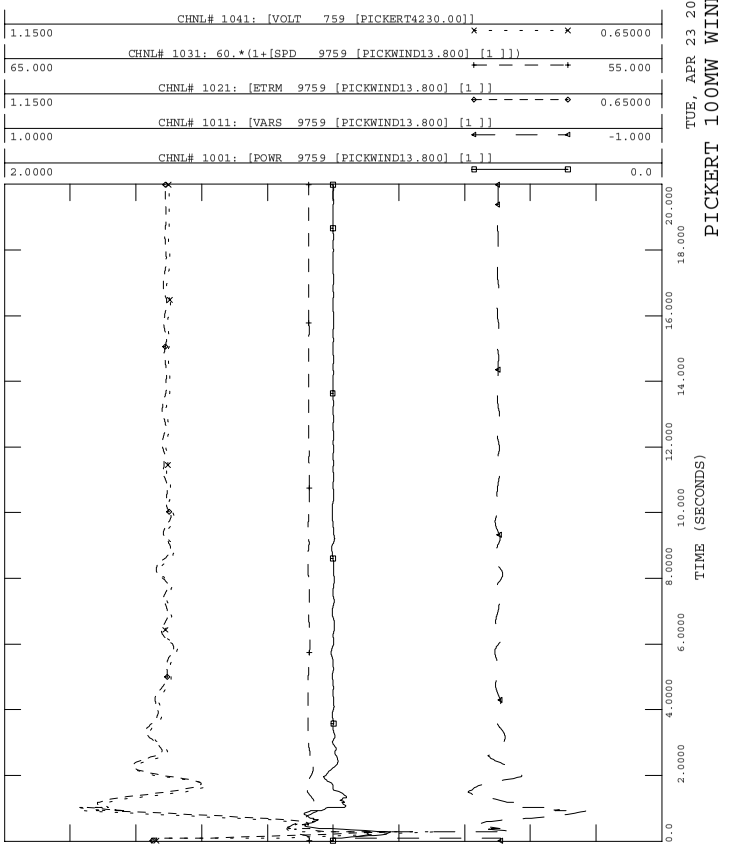
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

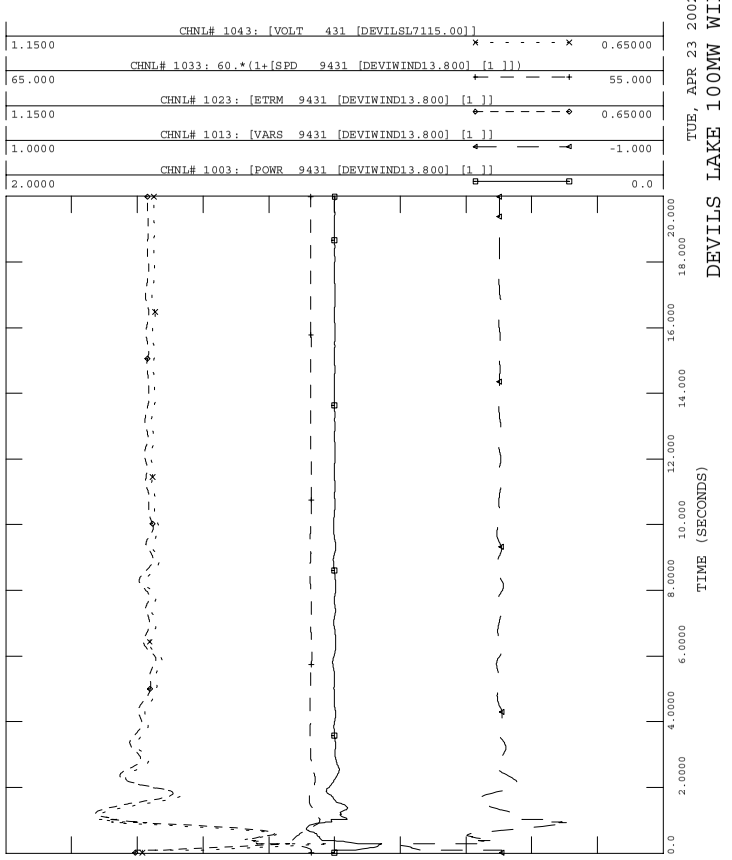
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin



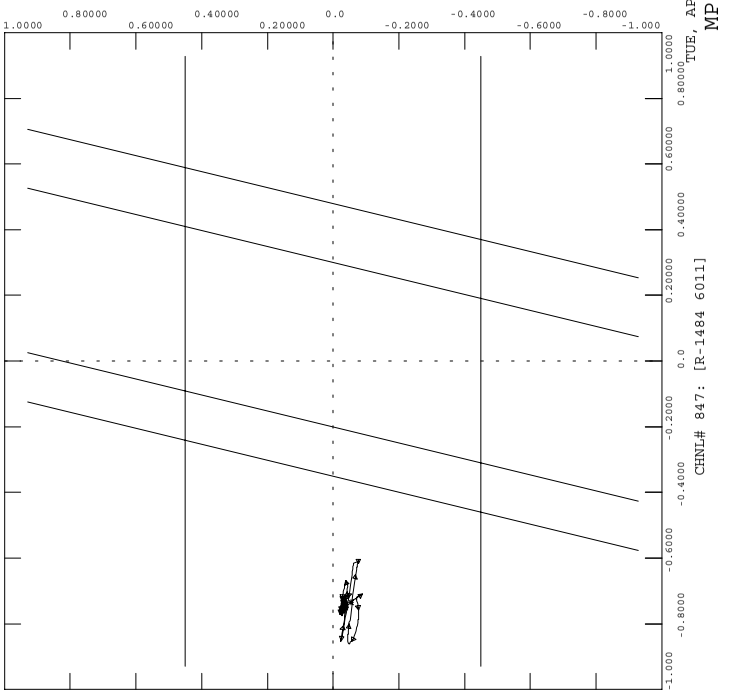
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin



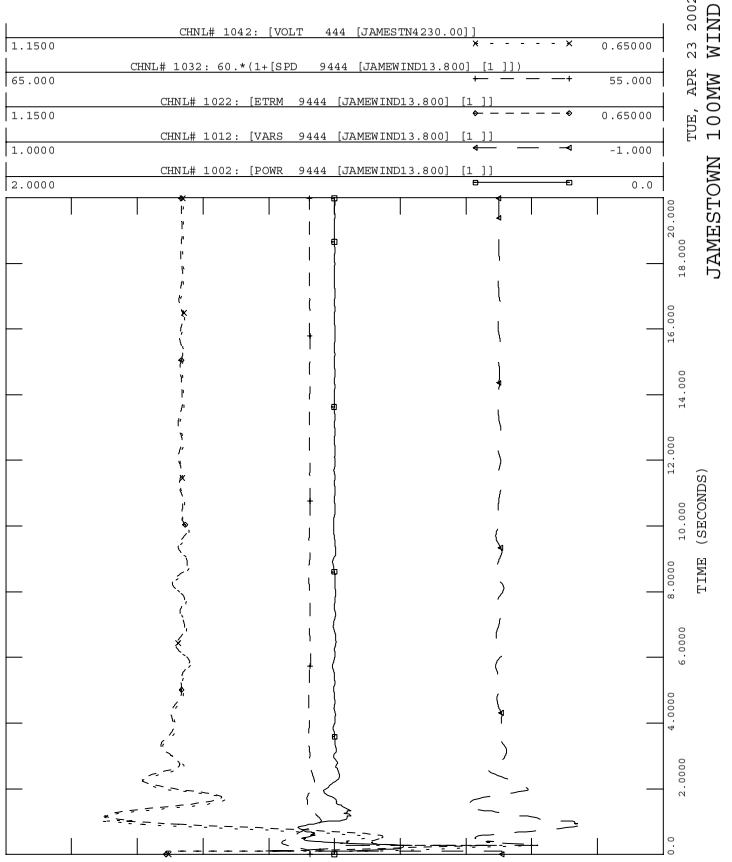
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

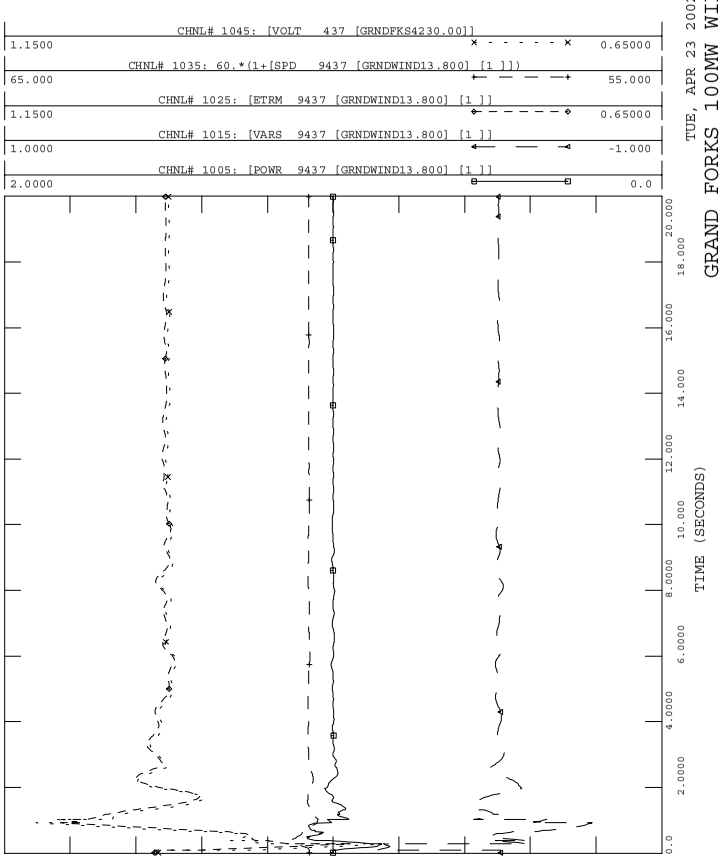
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

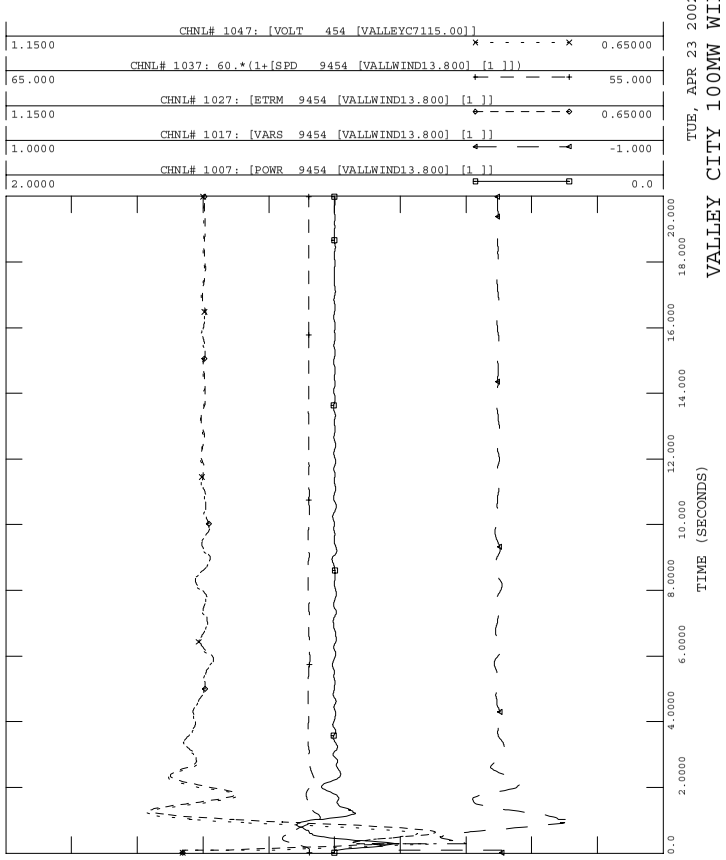


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin



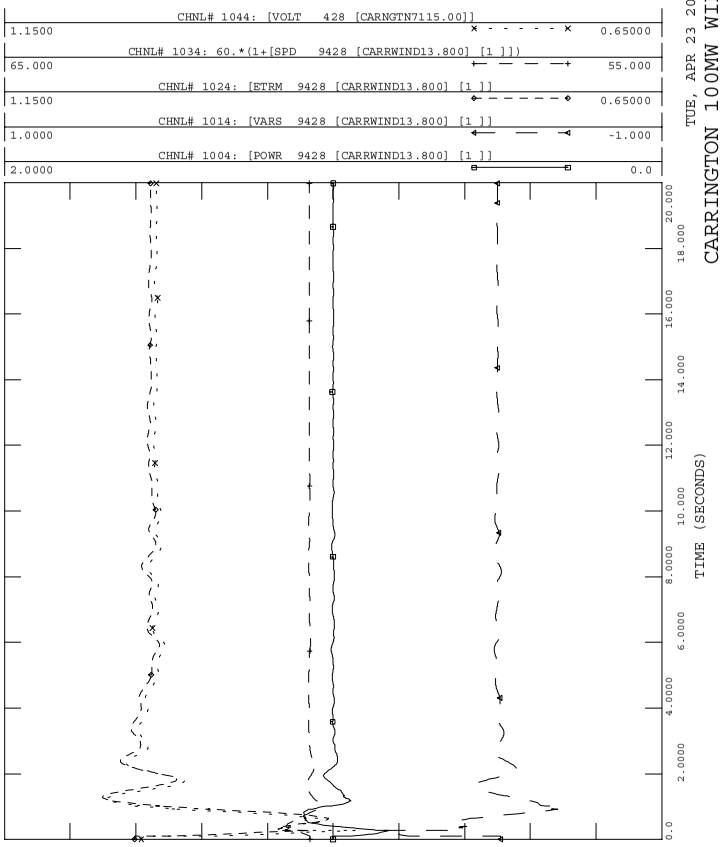
TUE, APR 23 2002 11:36
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin



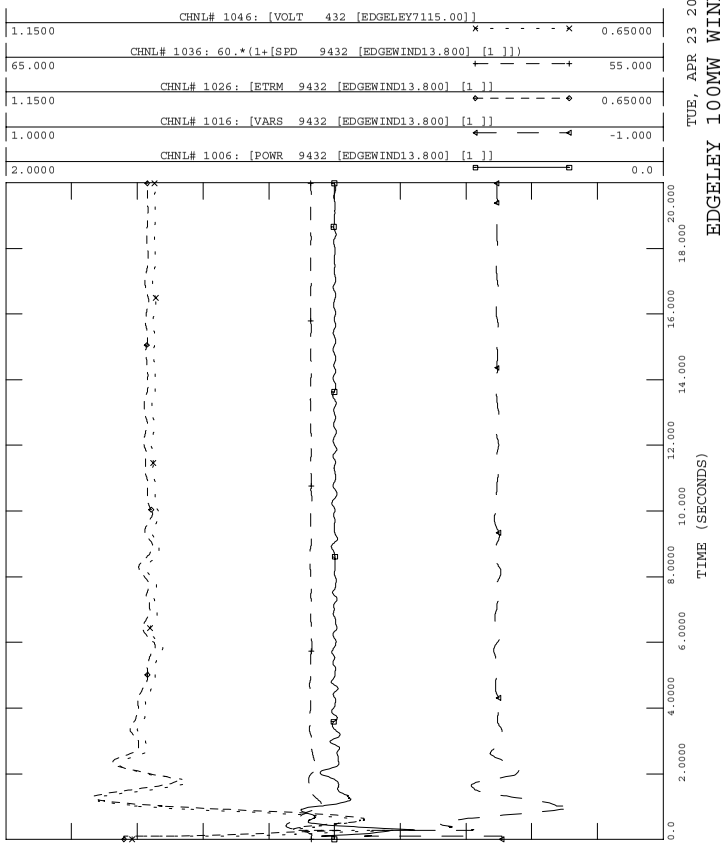
TUE, APR 23 2002 11:36
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin



TUE, APR 23 2002 11:36
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

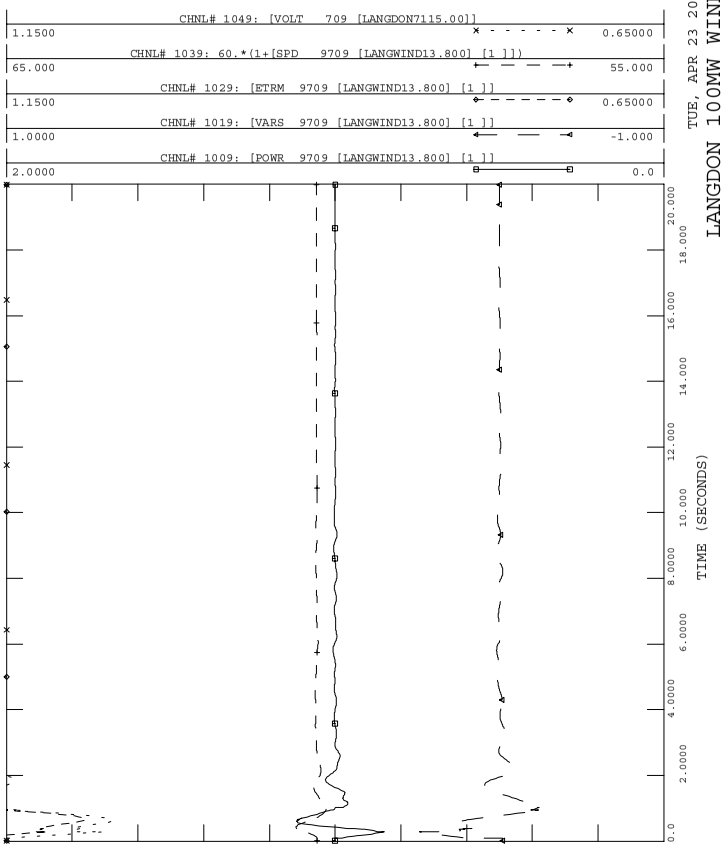


TUE, APR 23 2002 11:36
EDGELEY 100MW WIND UNIT

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36

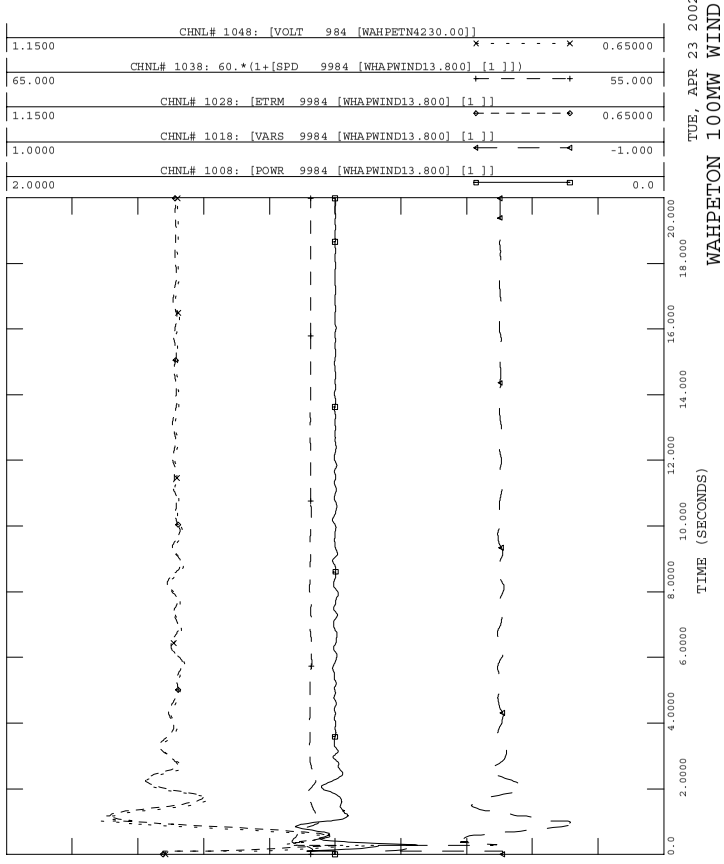
LANGDON 100MW WIND UNIT



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36

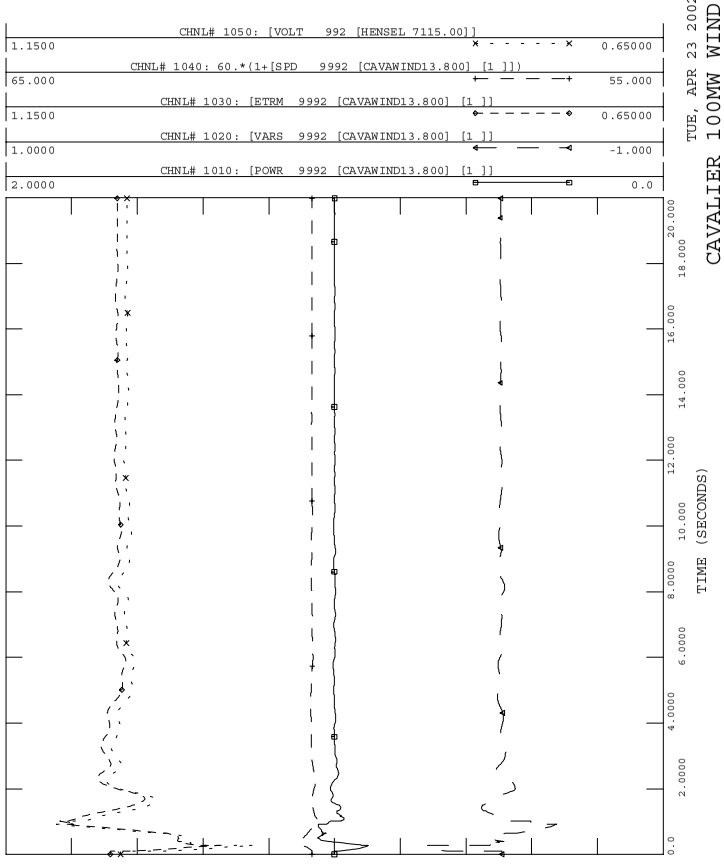
WAHPETON 100MW WIND UNIT



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag1.bin

TUE, APR 23 2002 11:36

CAVALIER 100MW WIND UNIT

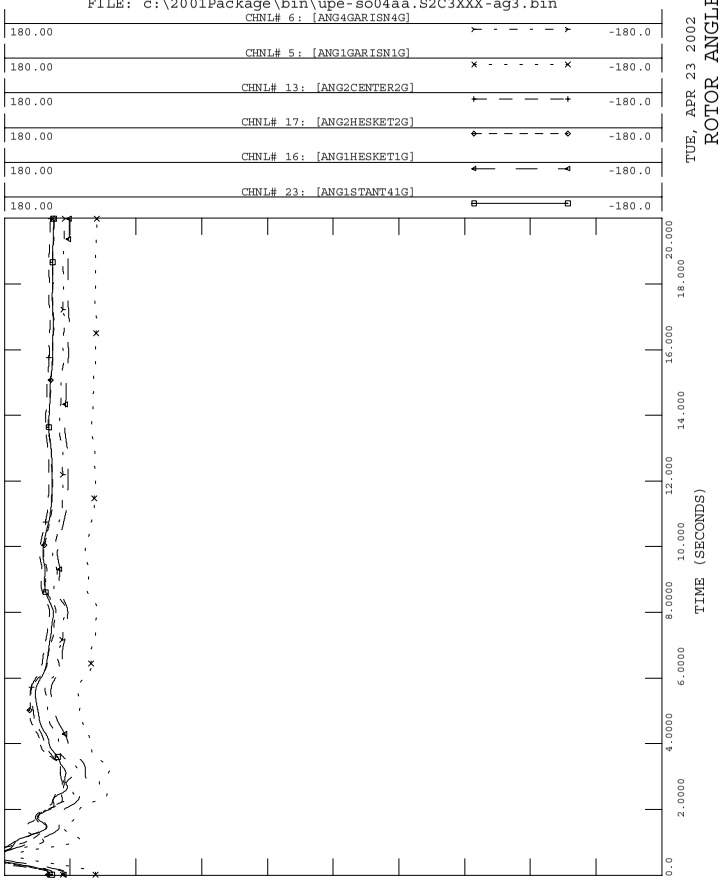


CONTINGENCY AG3

Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

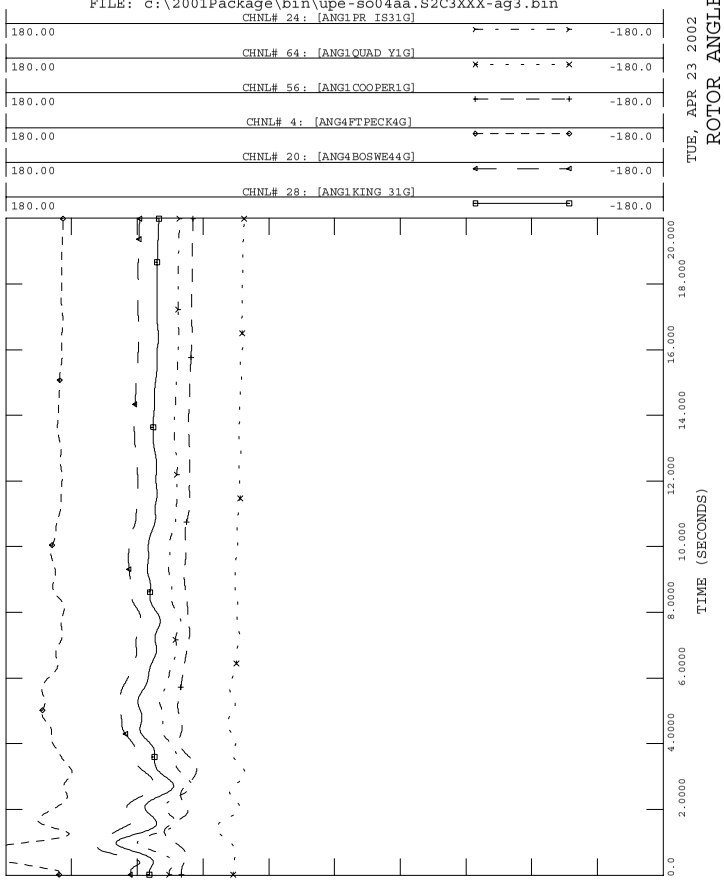
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
ROTOR ANGLES 2



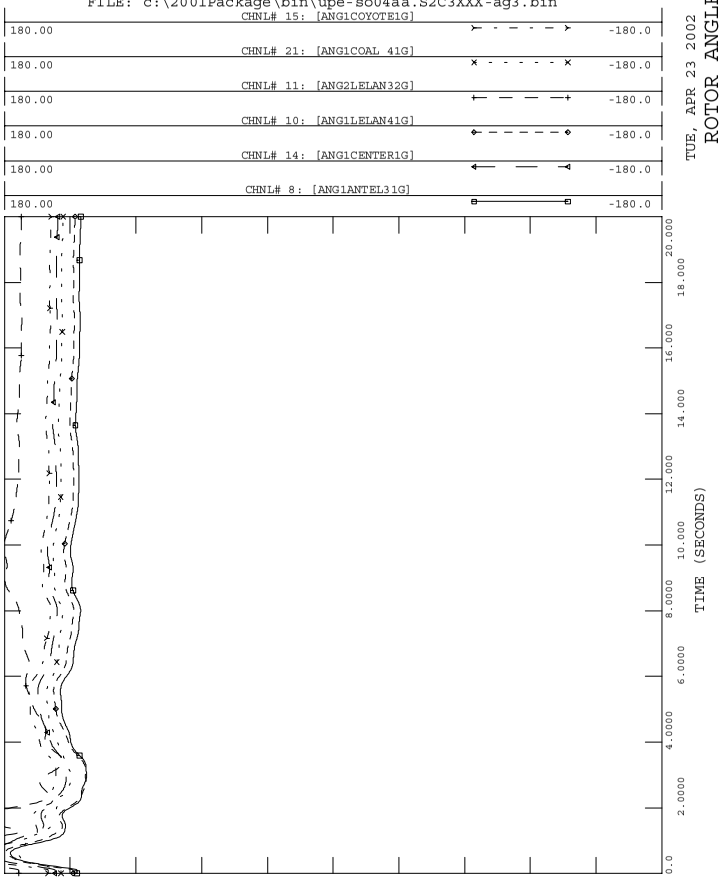
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
ROTOR ANGLES 4



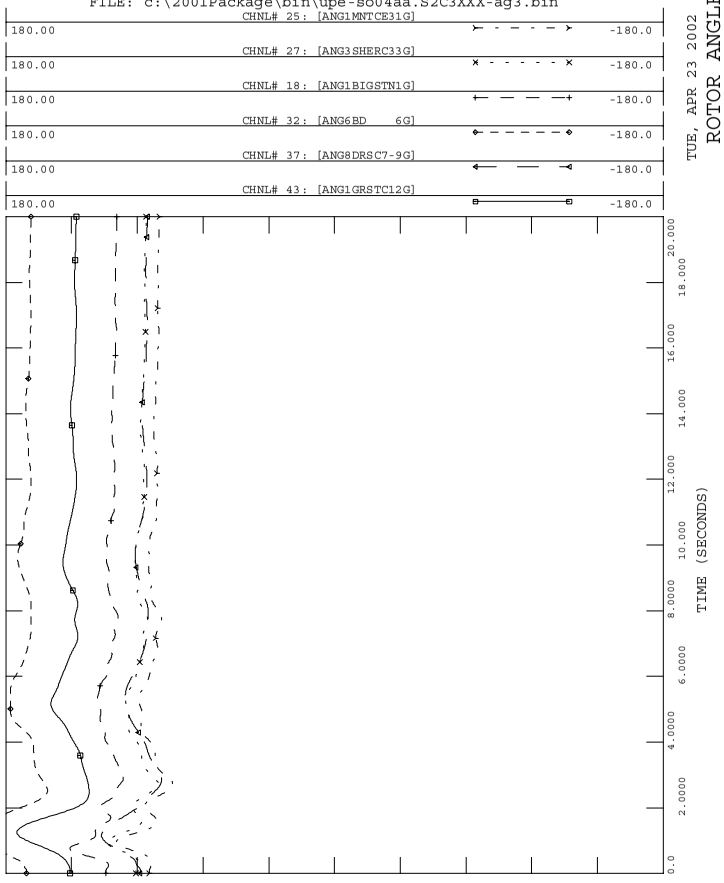
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
ROTOR ANGLES 1



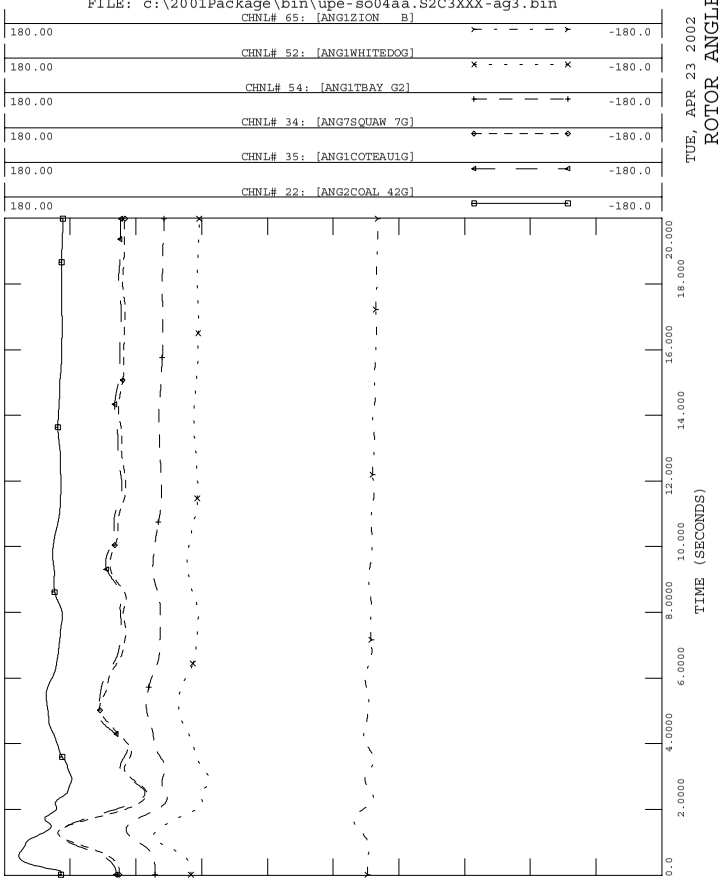
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
ROTOR ANGLES 3



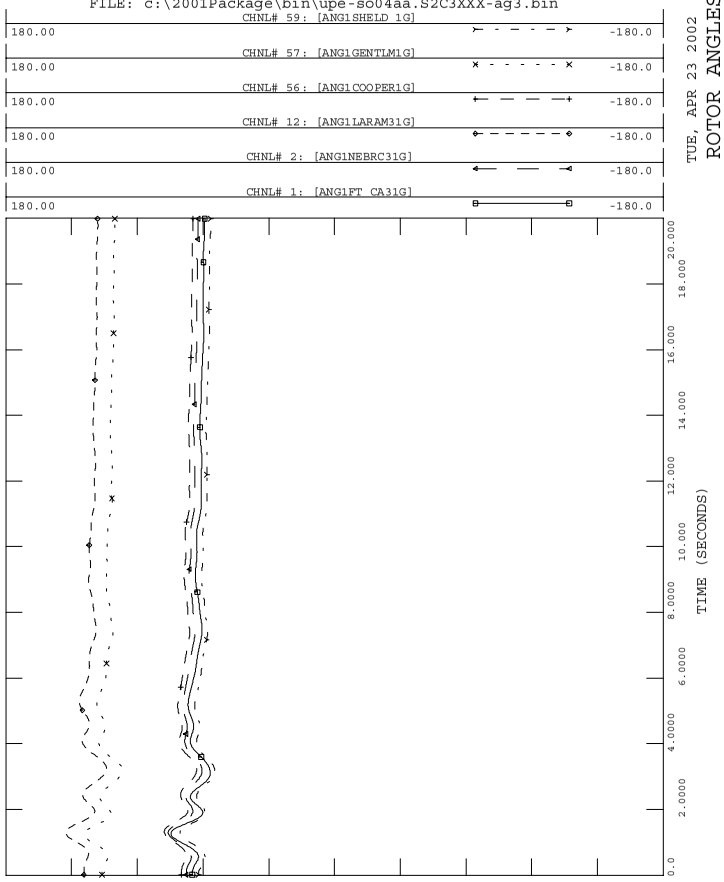
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
ROTOR ANGLES 6



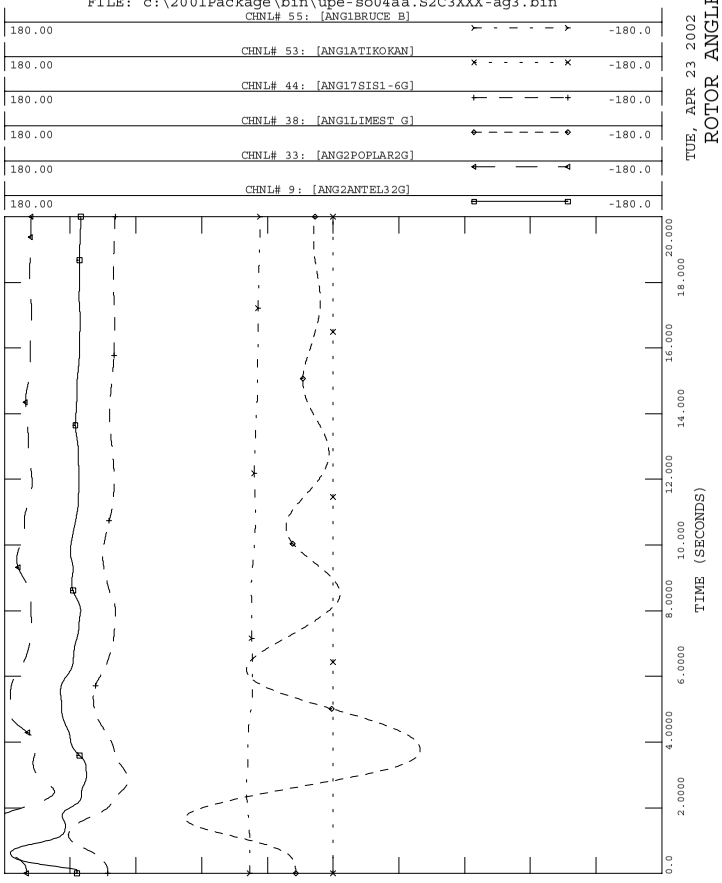
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
ROTOR ANGLES NB



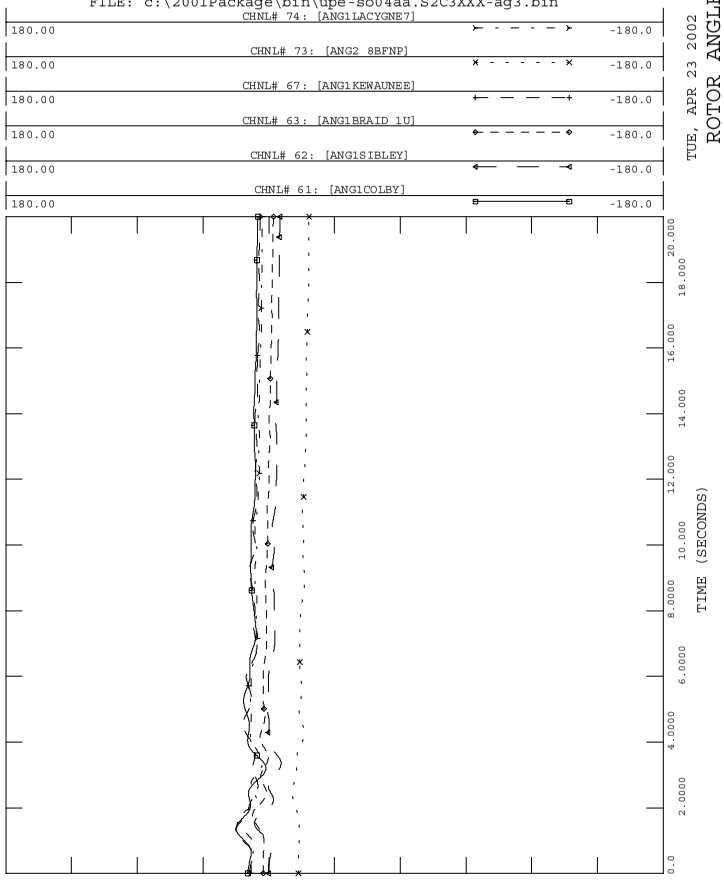
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
ROTOR ANGLES 5



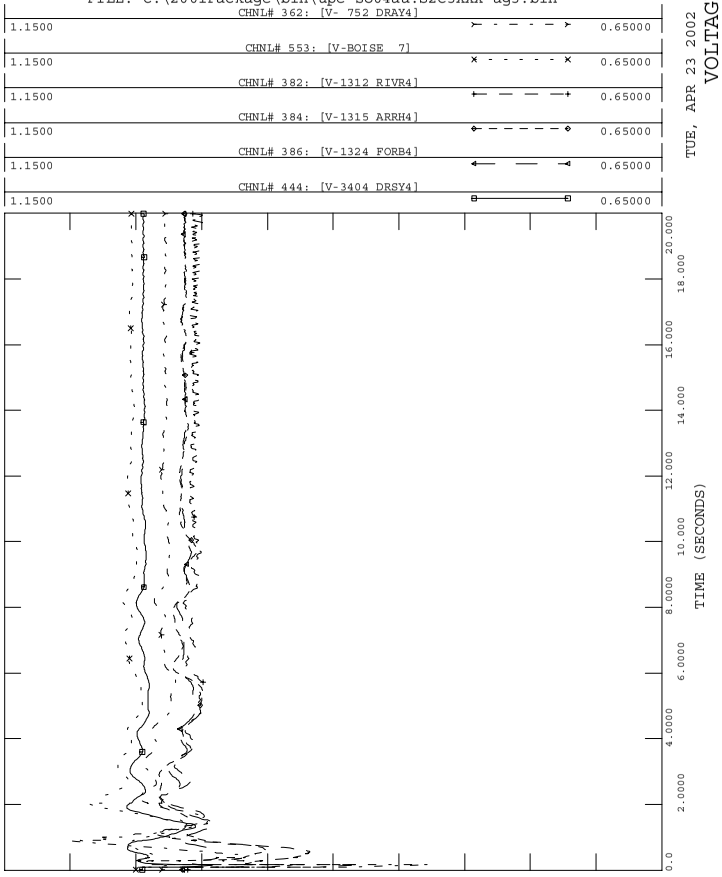
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
ROTOR ANGLES 7



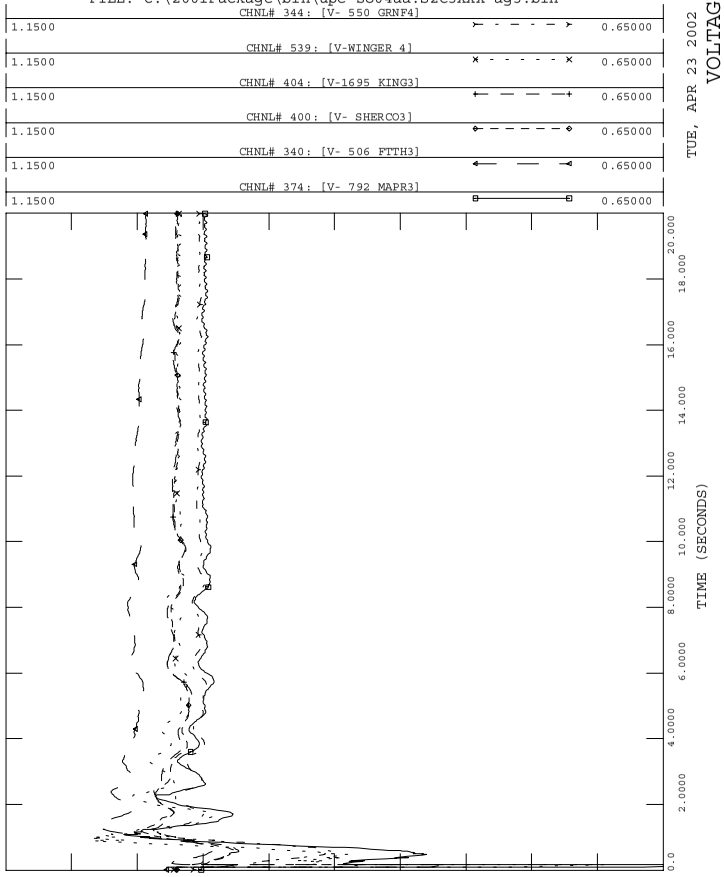
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
VOLTAGES 1



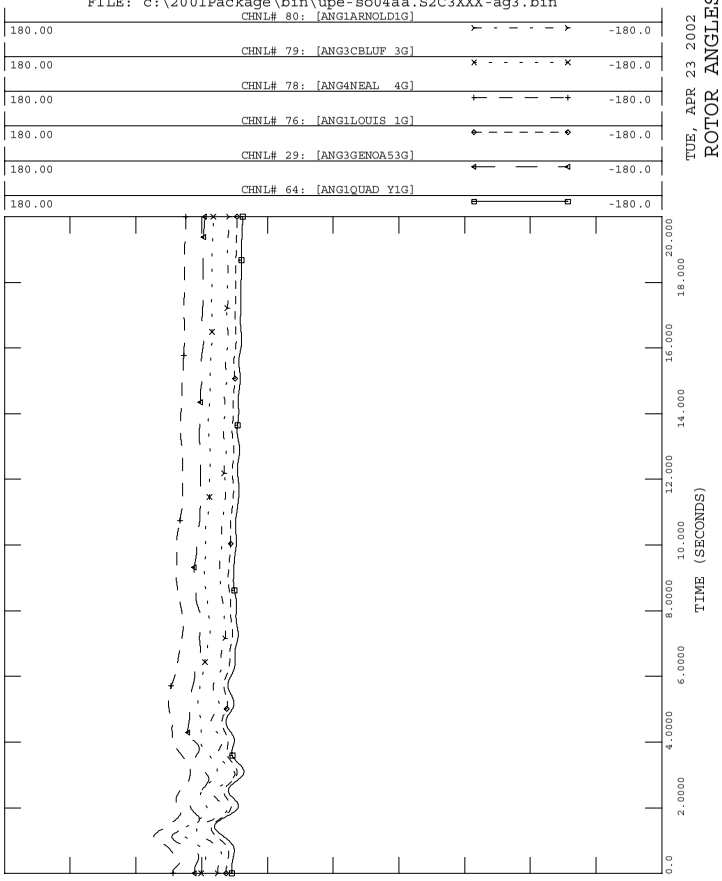
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
VOLTAGES 3



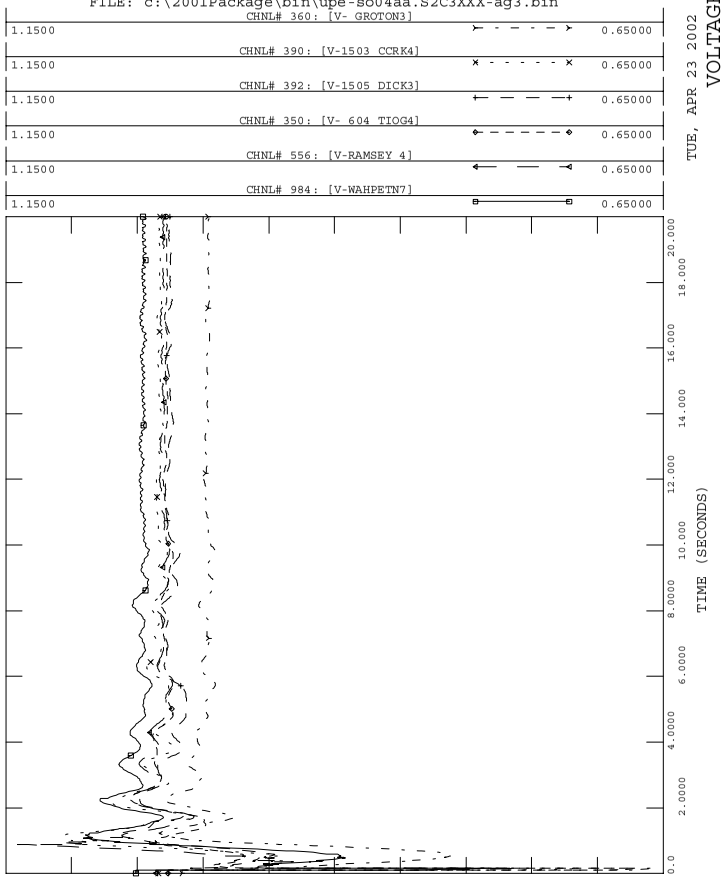
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
ROTOR ANGLES IA



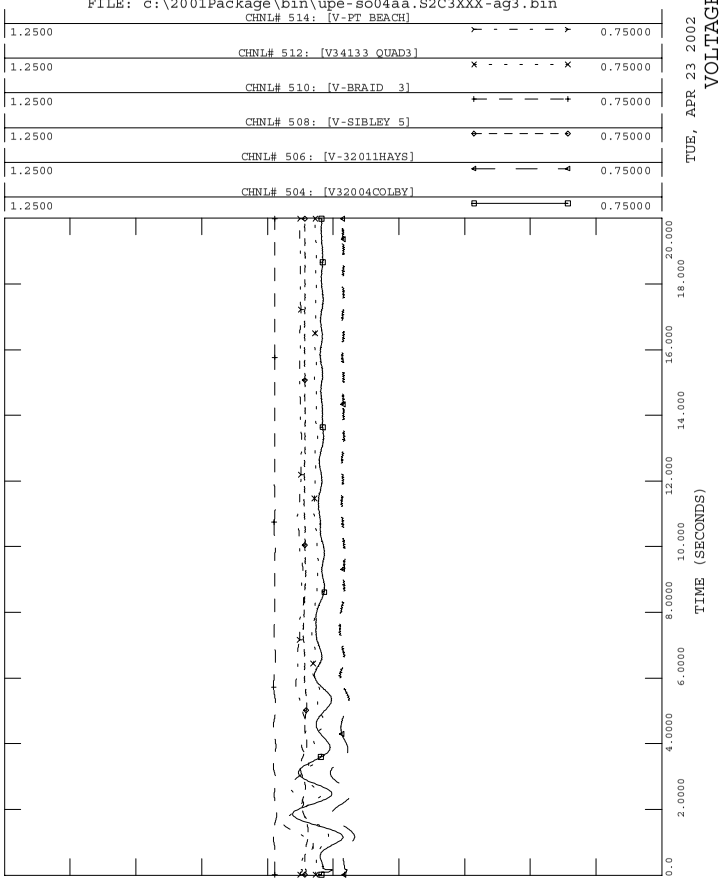
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
VOLTAGES 2



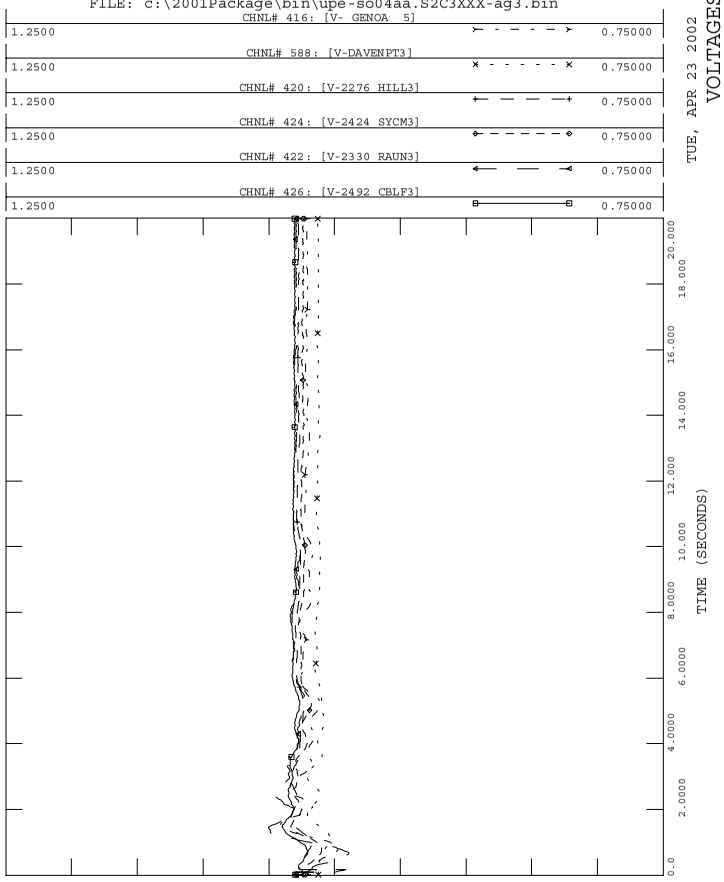
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
VOLTAGES 5



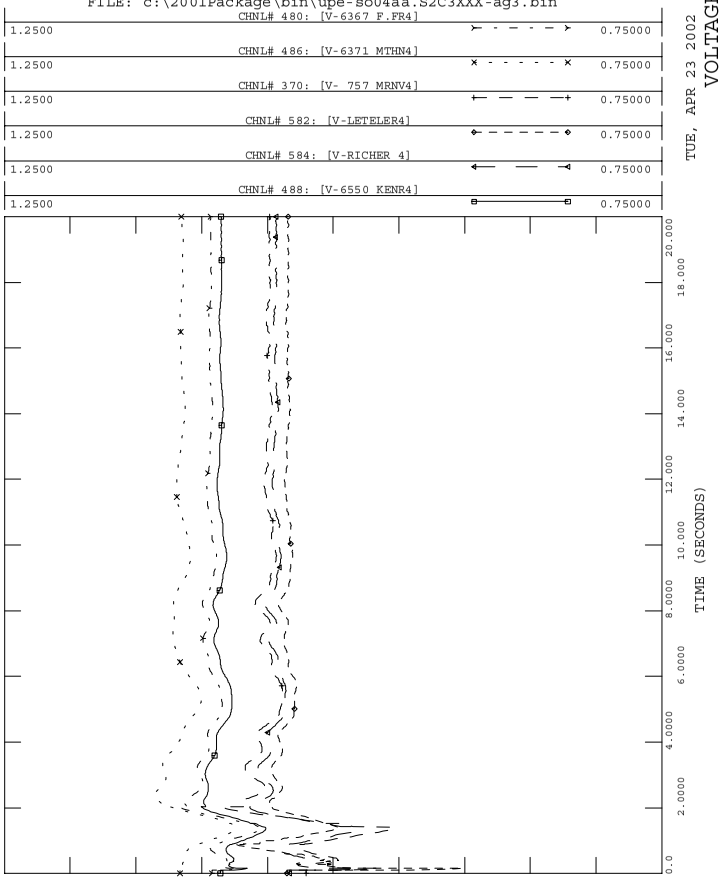
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:52
VOLTAGES IA



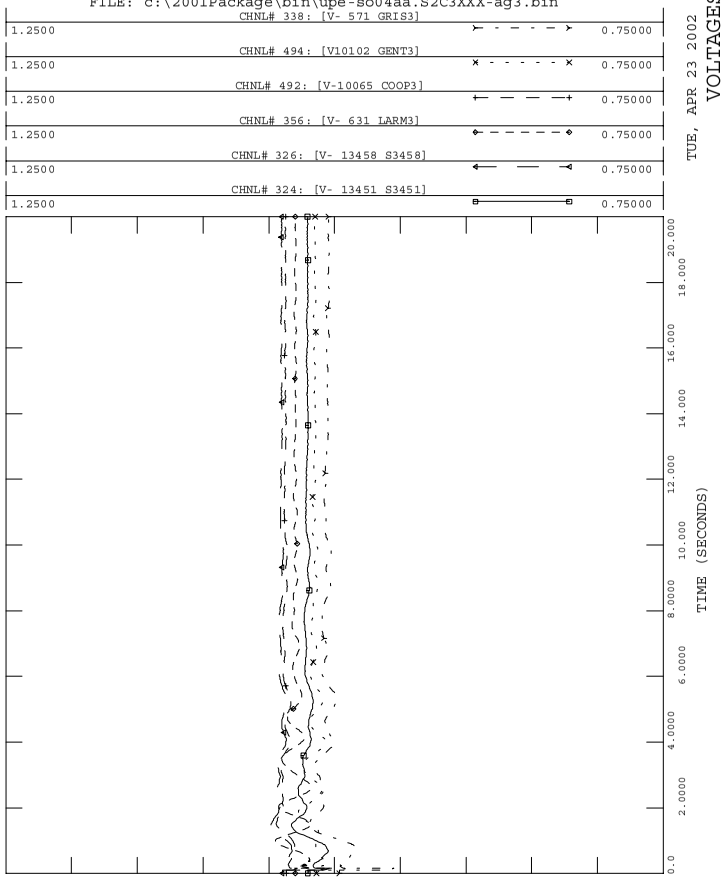
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

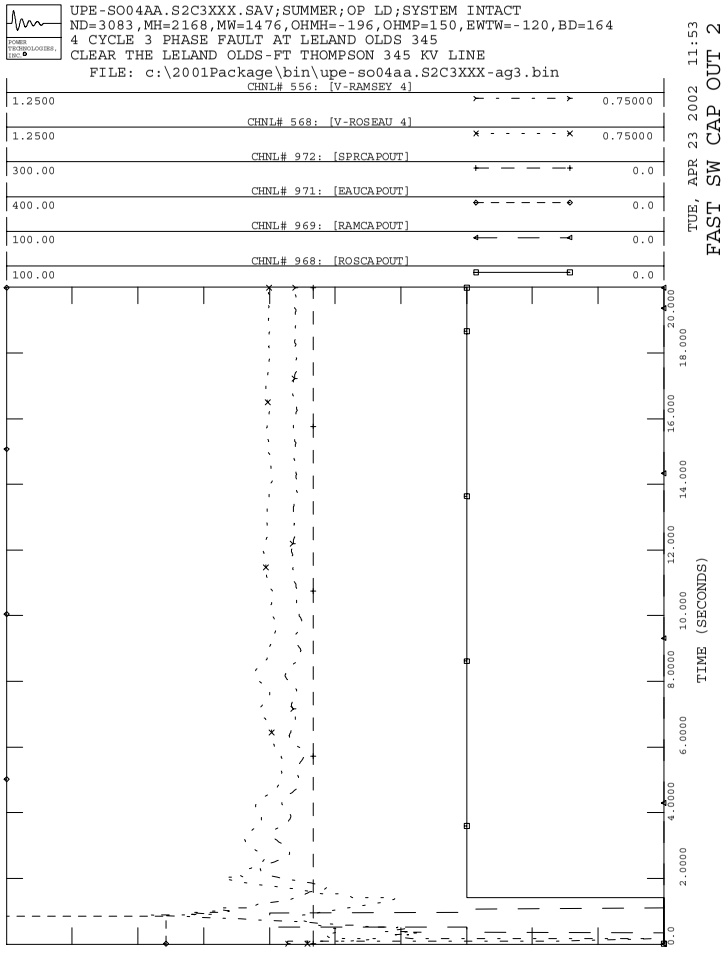
TUE, APR 23 2002 11:52
VOLTAGES 4

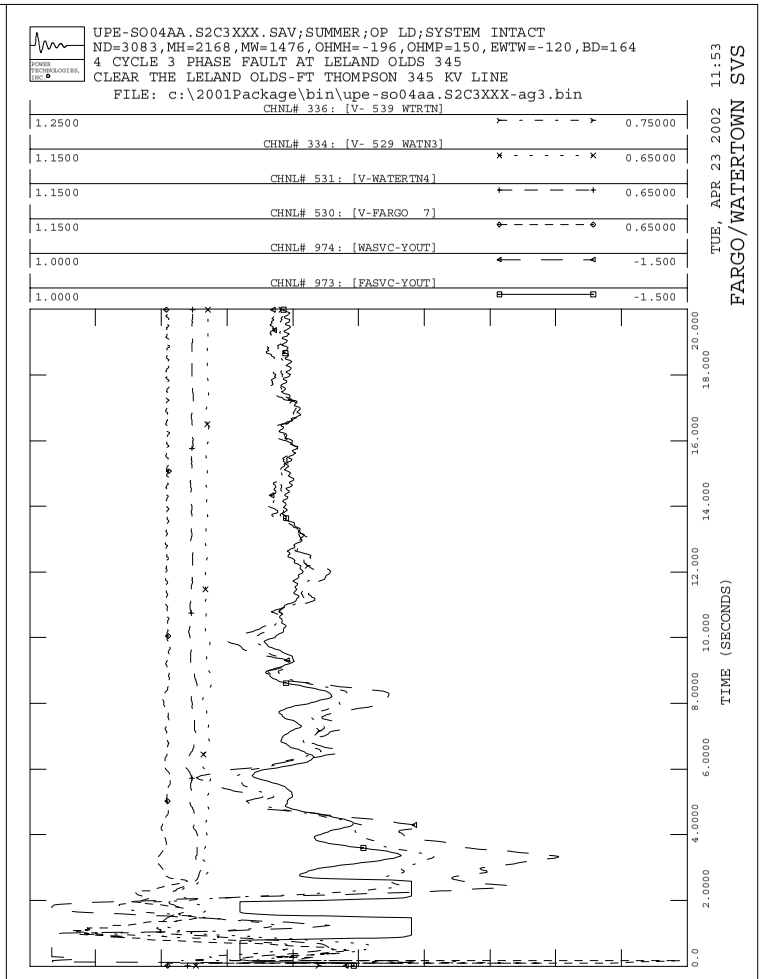


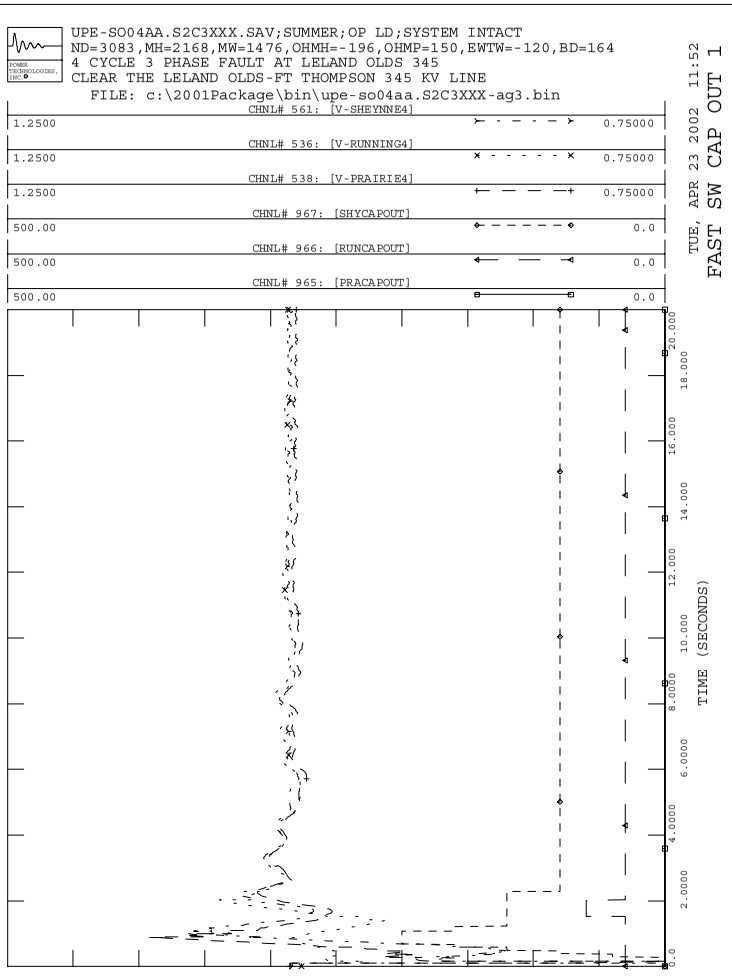
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

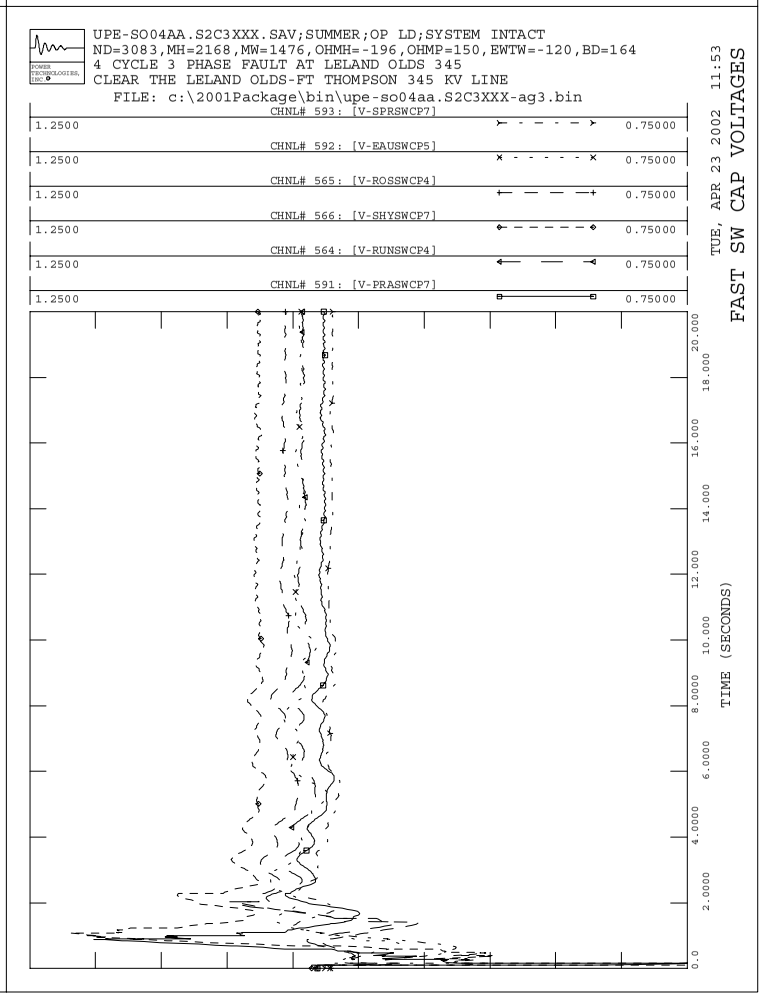
TUE, APR 23 2002 11:52
VOLTAGES NB



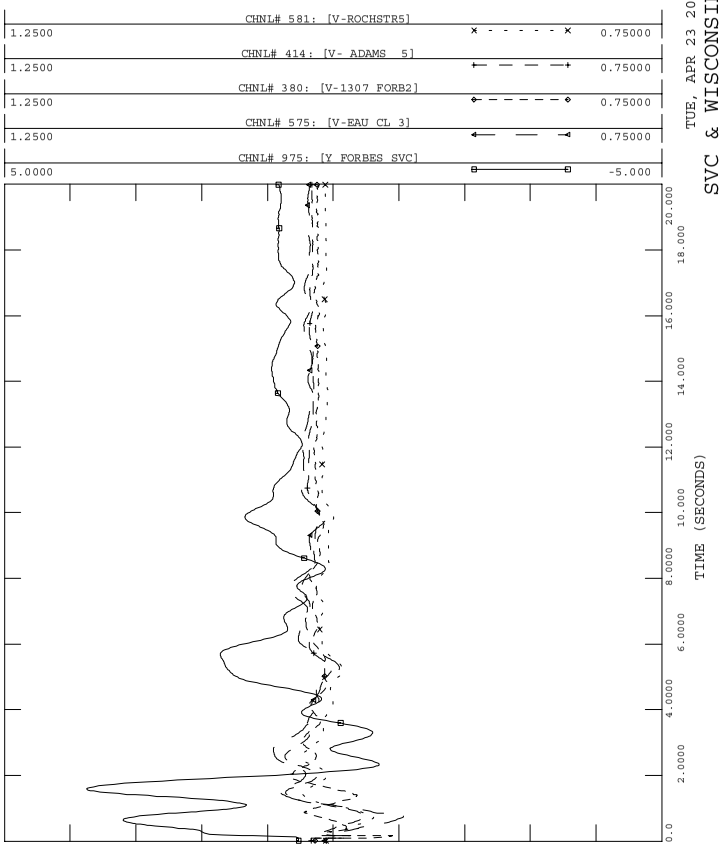

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TUE, APR 23 2002 11:53
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TUE, APR 23 2002 11:53
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TUE, APR 23 2002 11:52
FAST SW CAP OUT 1
TIME (SECONDS)

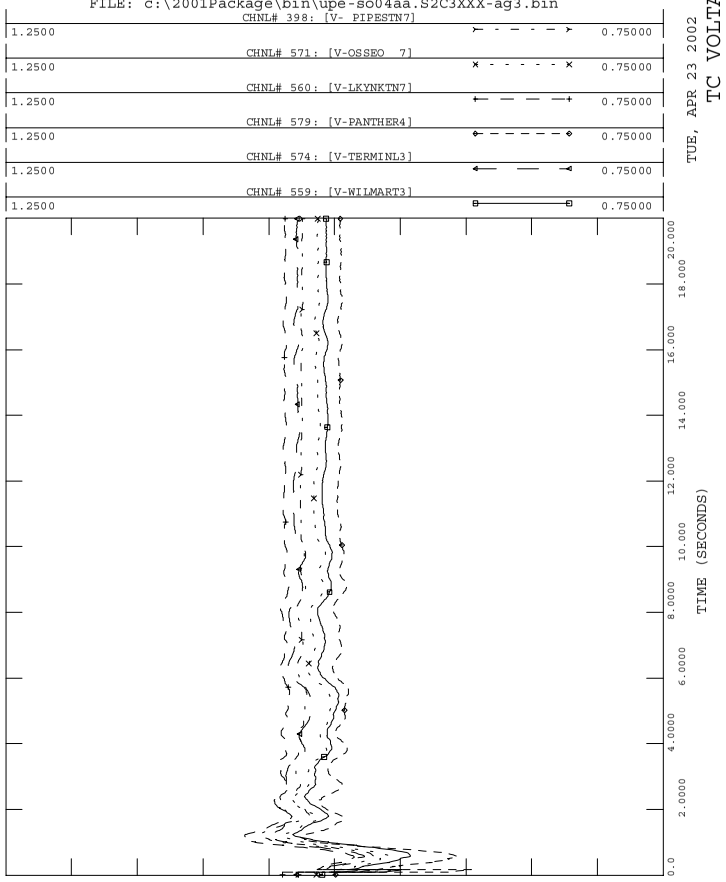

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TUE, APR 23 2002 11:53
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



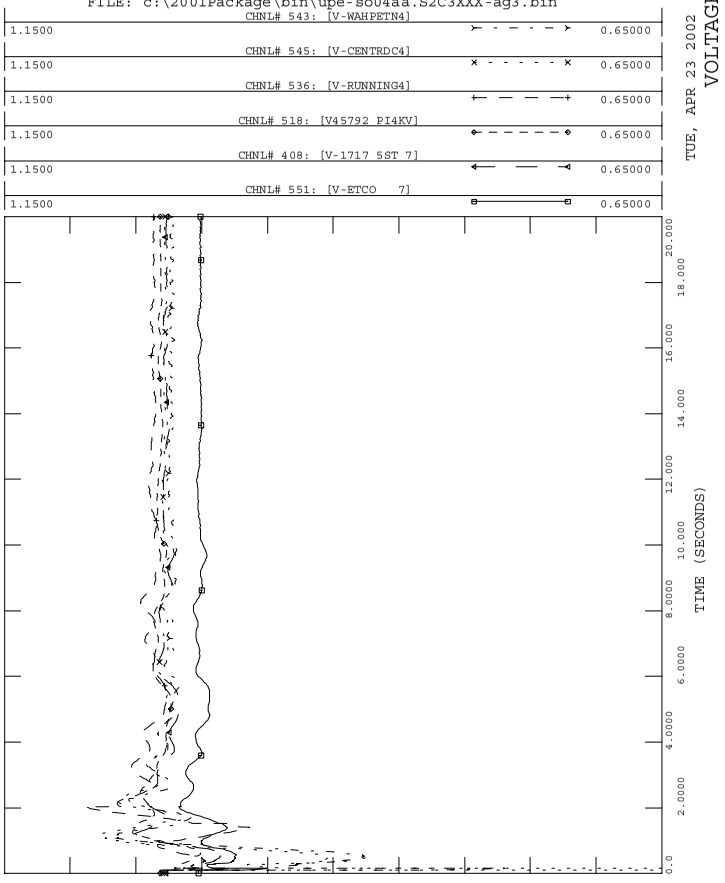
TUE, APR 23 2002 11:53
SVC & WISCONSIN VOLT

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



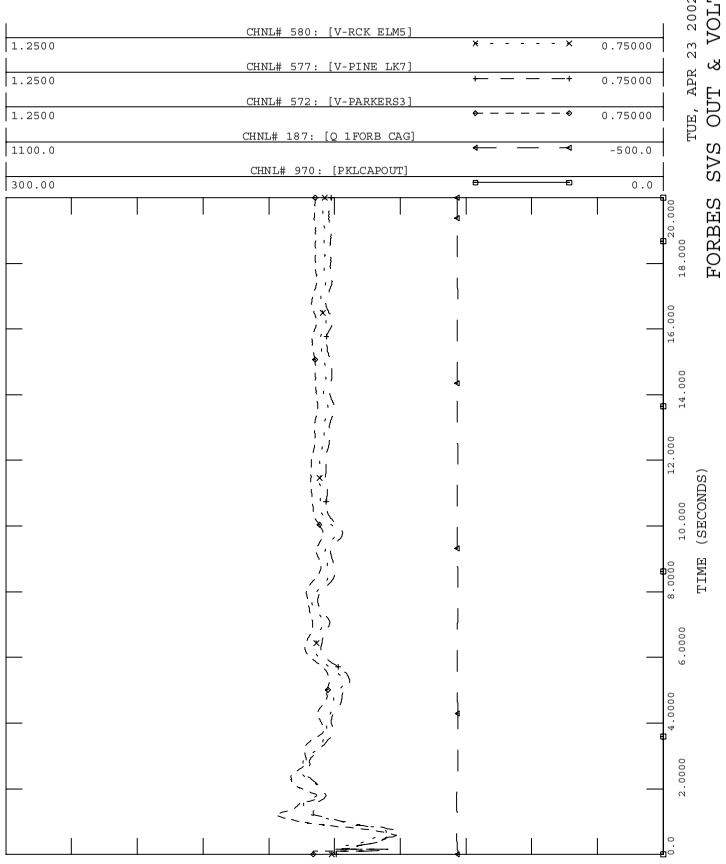
TUE, APR 23 2002 11:53
TC VOLTAGES

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



TUE, APR 23 2002 11:53
VOLTAGES 6

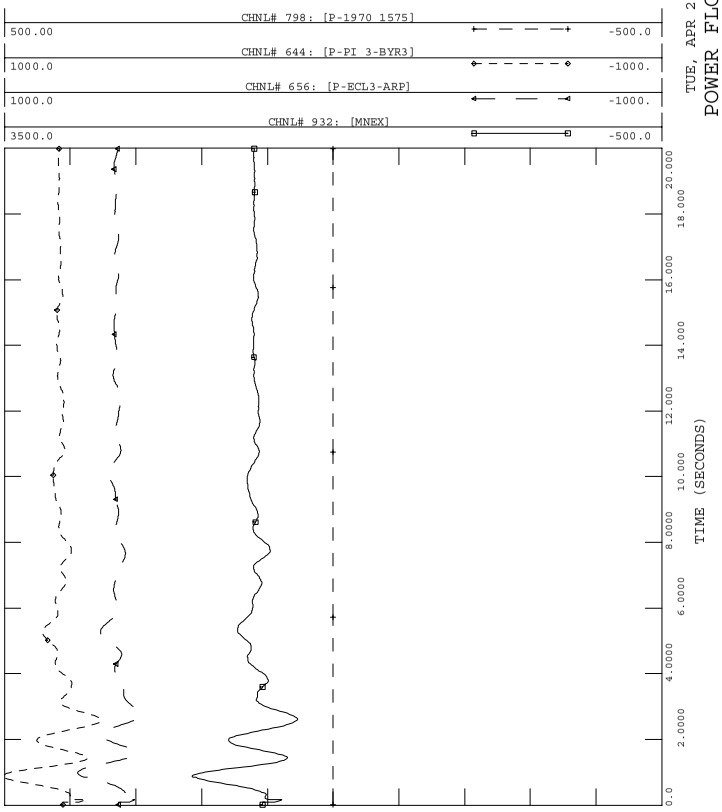
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



TUE, APR 23 2002 11:53
FORBES SVS OUT & VOLTAGES

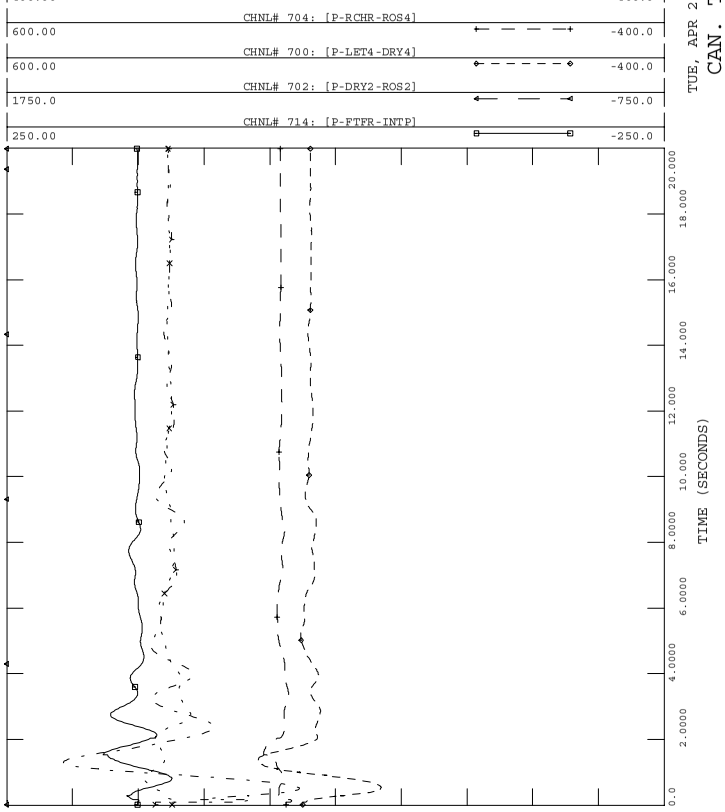
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:53
POWER FLOW SUMS 2



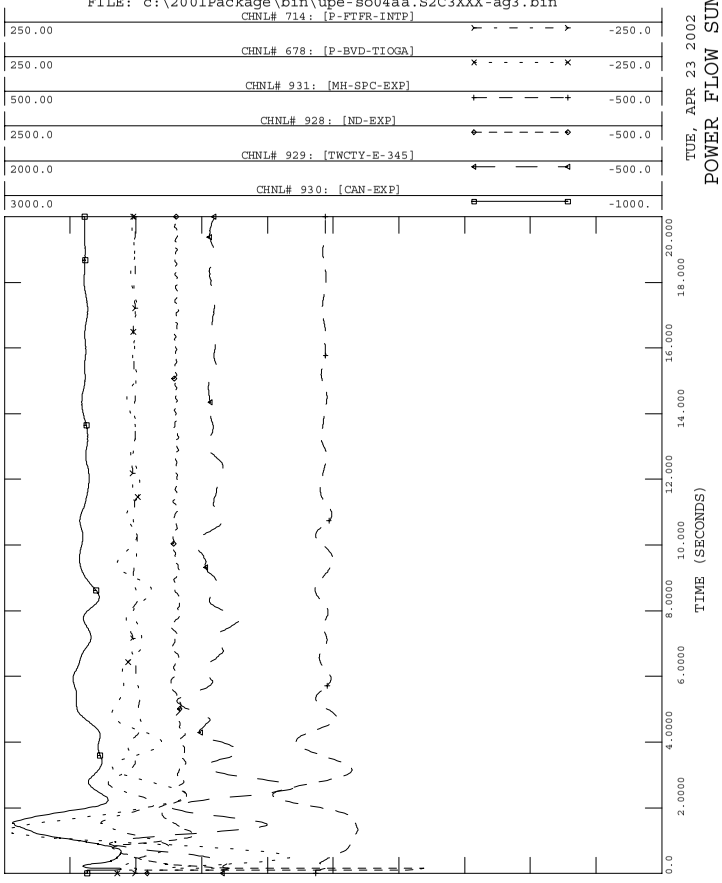
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:53
CAN. TIE FLOWS



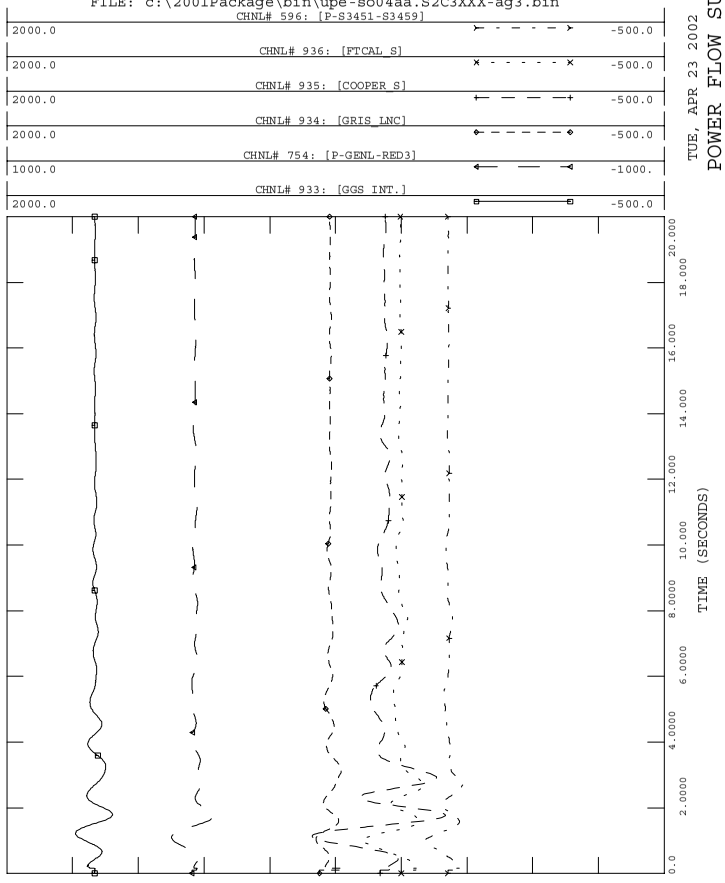
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:53
POWER FLOW SUMS 1



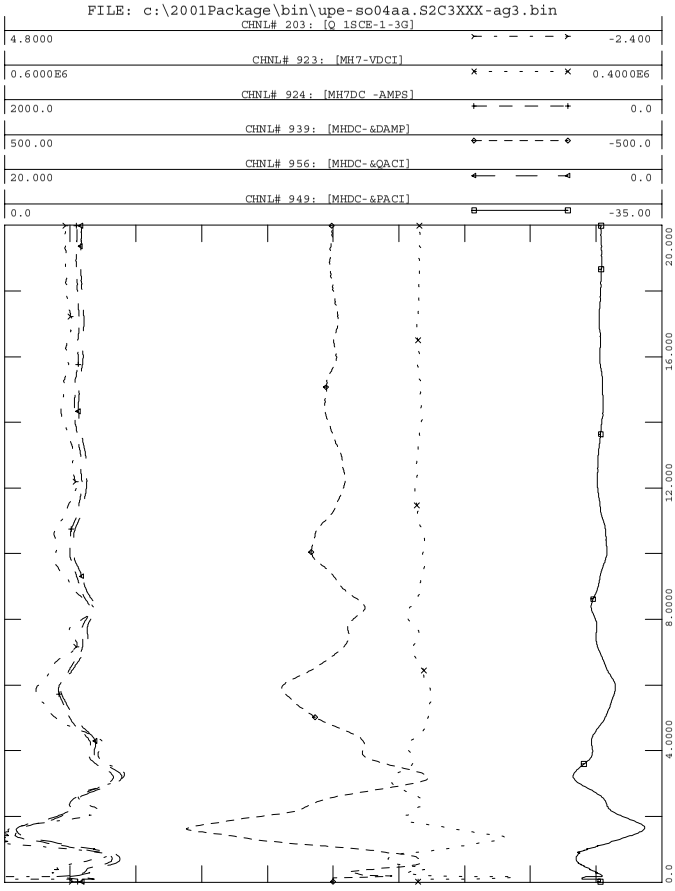
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:53
POWER FLOW SUM 3



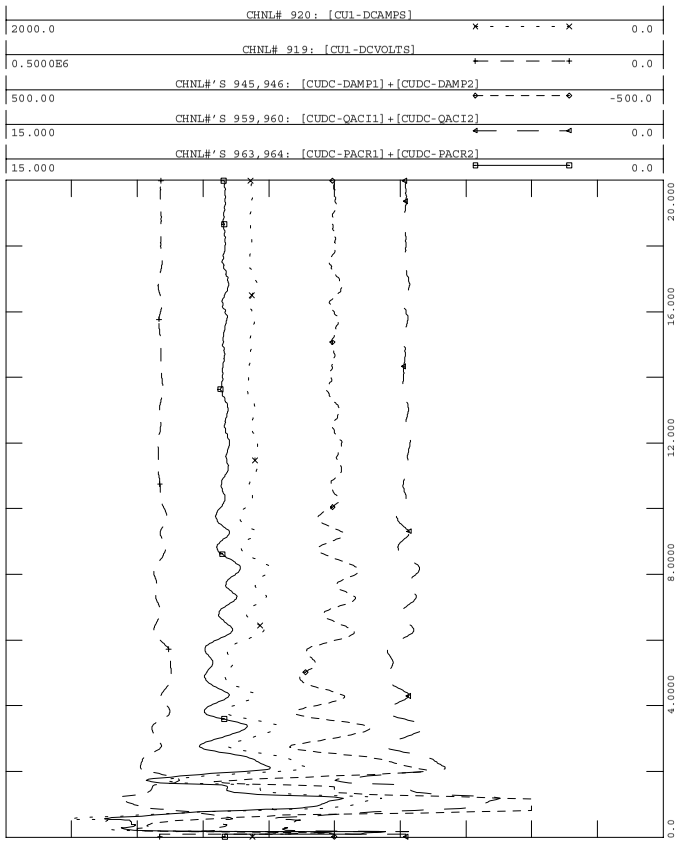
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:53
MH DC PARAMETERS



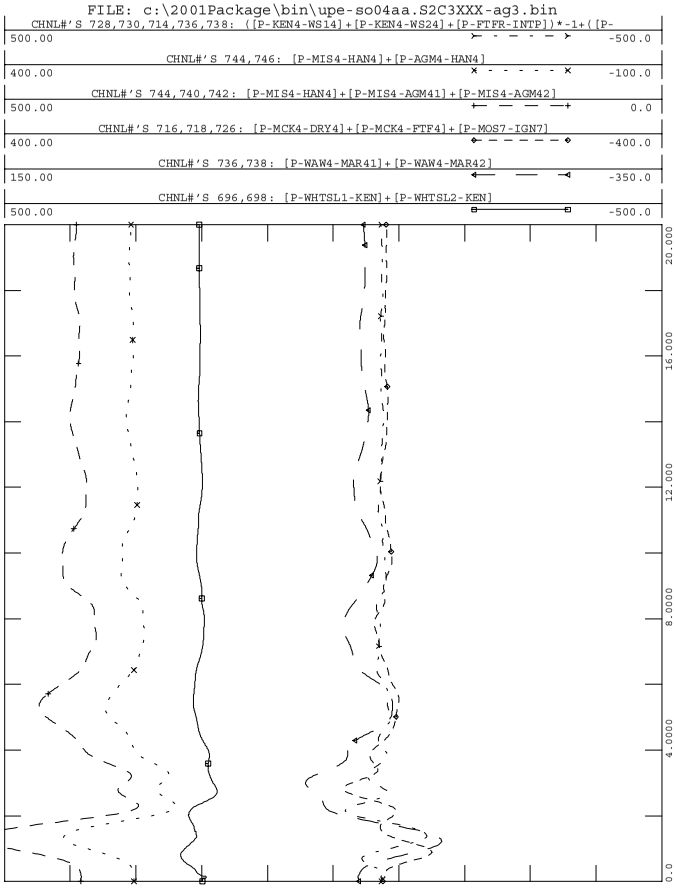
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:53
CU DC #1



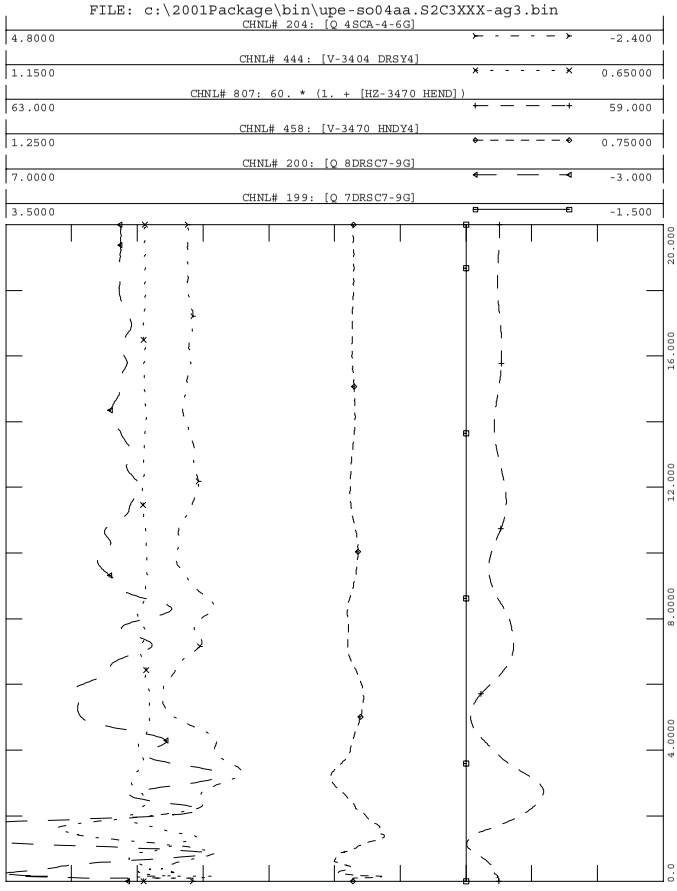
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:53
OH TIE FLOWS

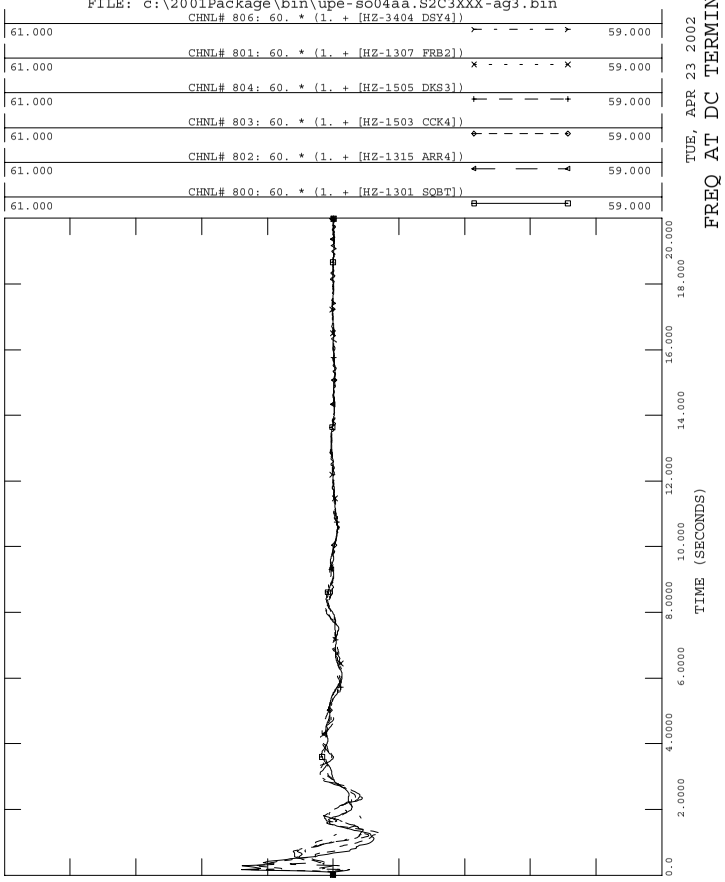


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:53
MH DC PARAMETERS

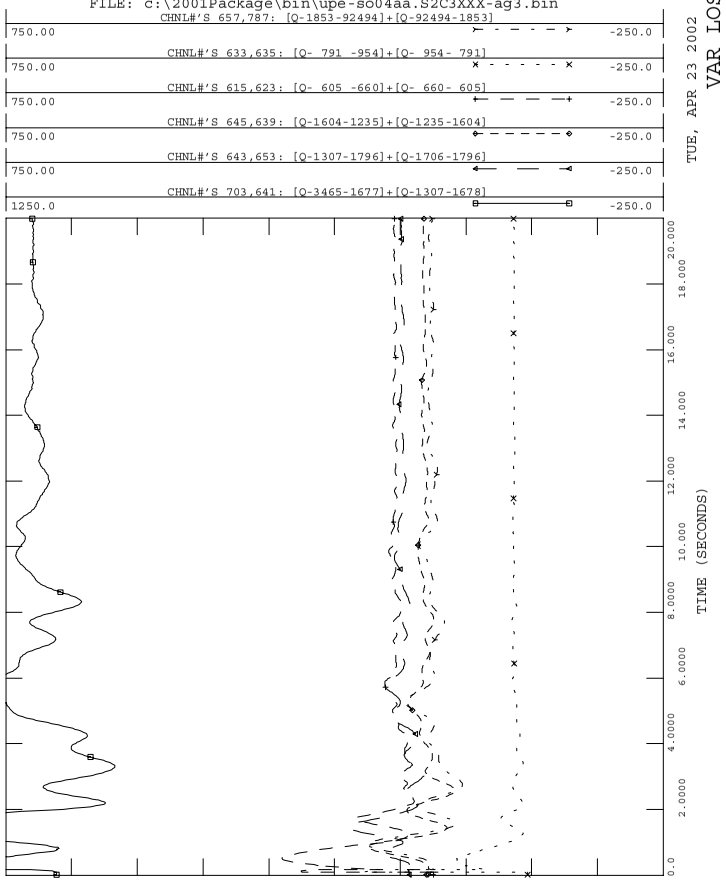


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



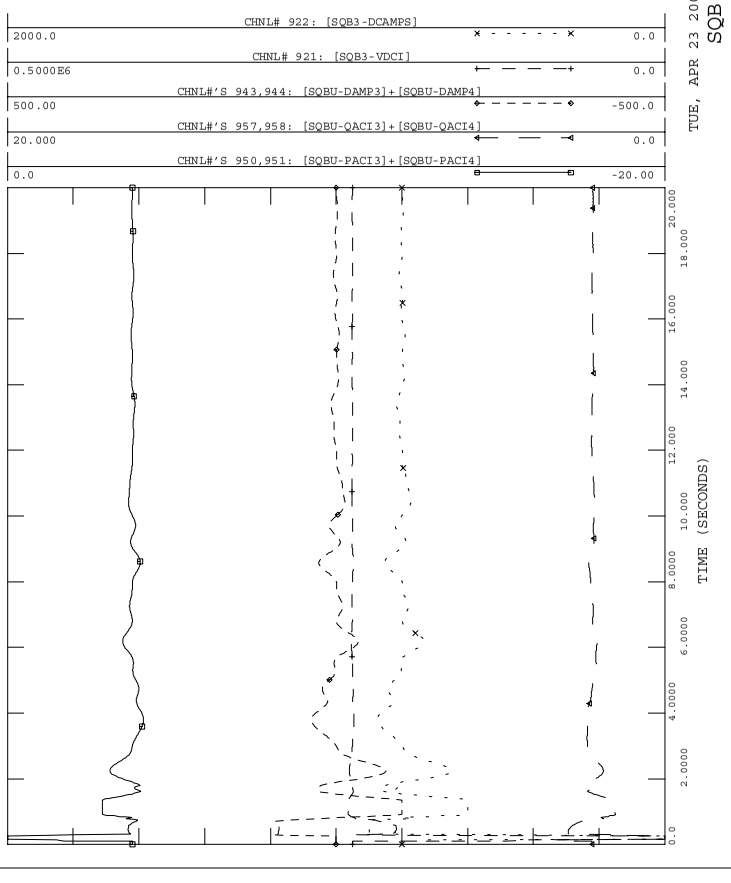
TUE, APR 23 2002 11:53
FREQ AT DC TERMINALS

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



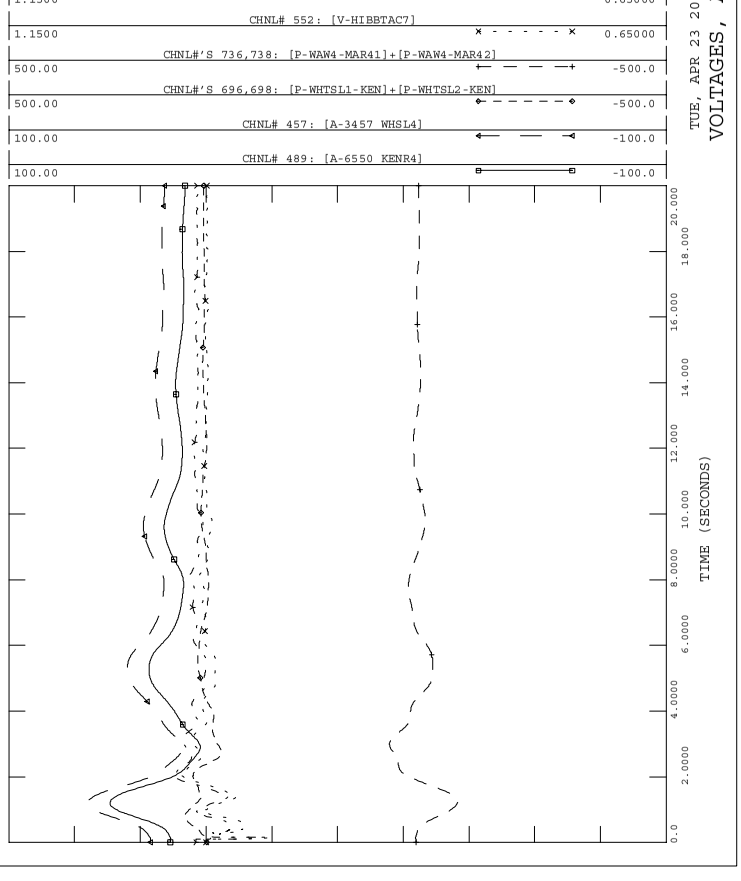
TUE, APR 23 2002 11:53
VAR LOSSES

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



TUE, APR 23 2002 11:53
SQB DC #3

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

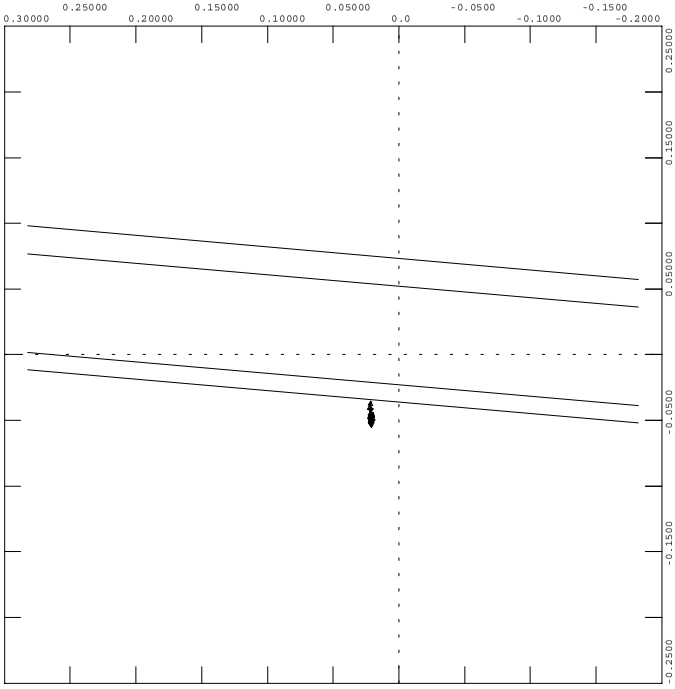


TUE, APR 23 2002 11:53
VOLTAGES, ANGLES

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

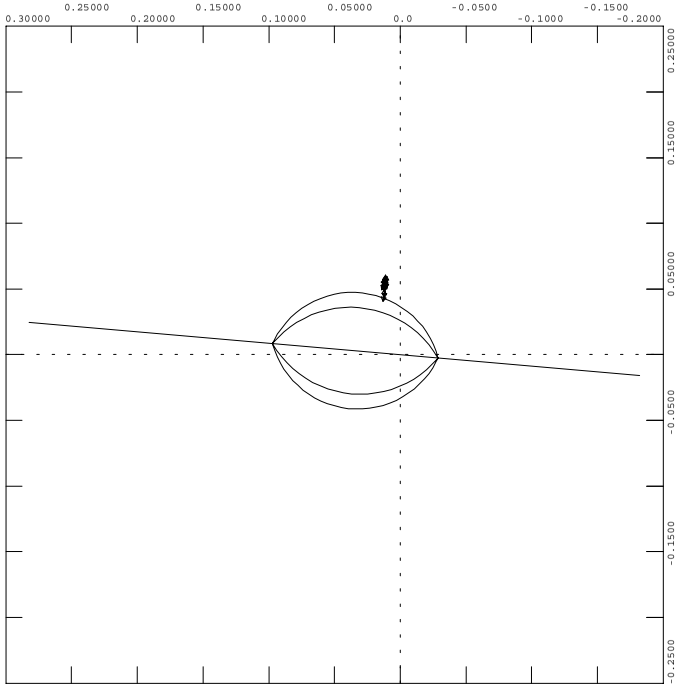


TUE, APR 23 2002 11:53
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

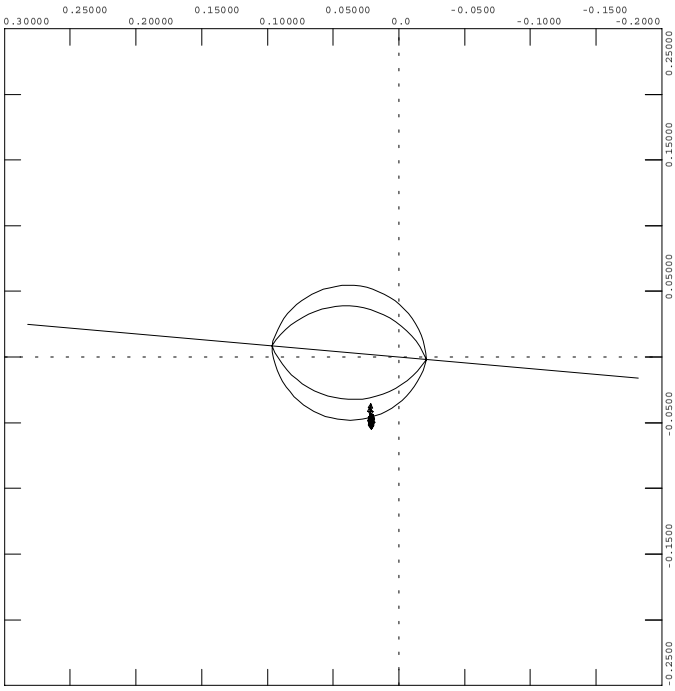


TUE, APR 23 2002 11:53
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

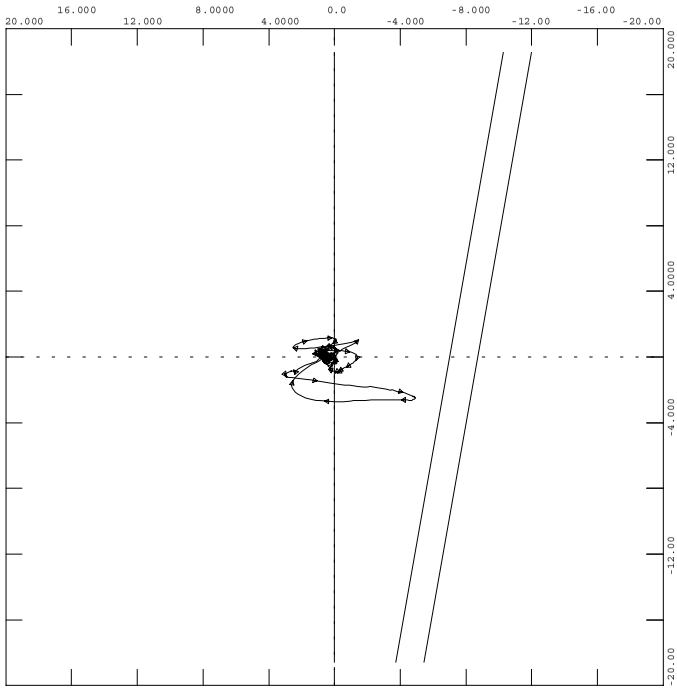


TUE, APR 23 2002 11:53
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

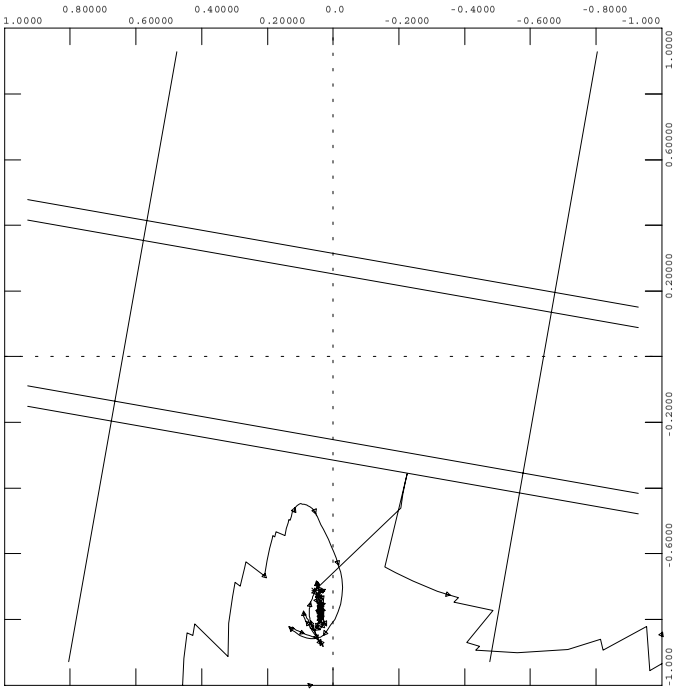


TUE, APR 23 2002 11:53
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

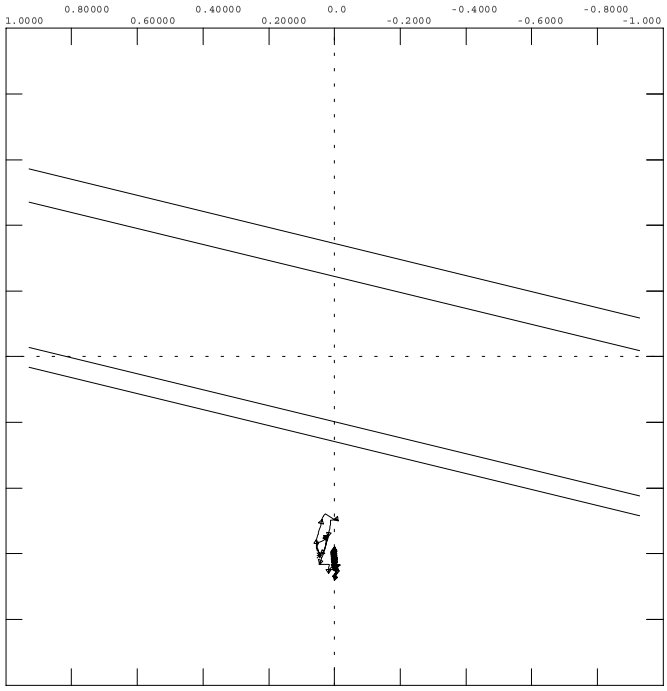
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

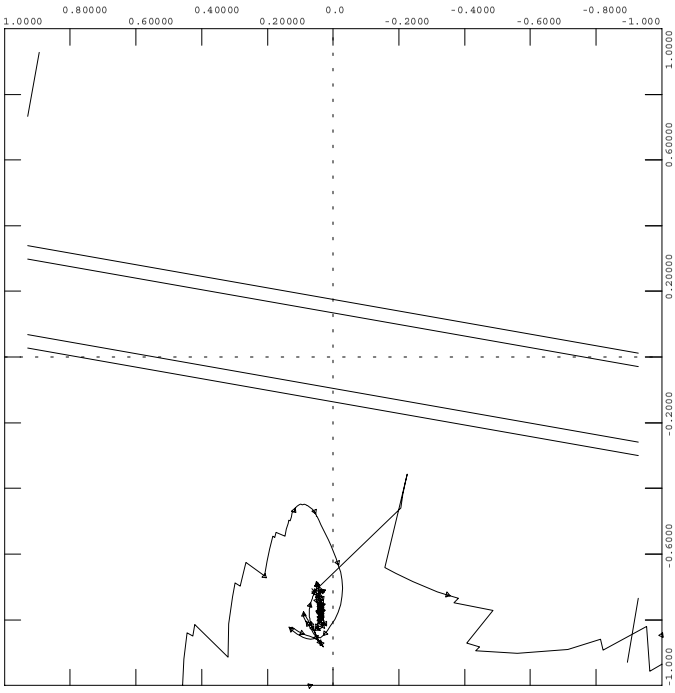
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

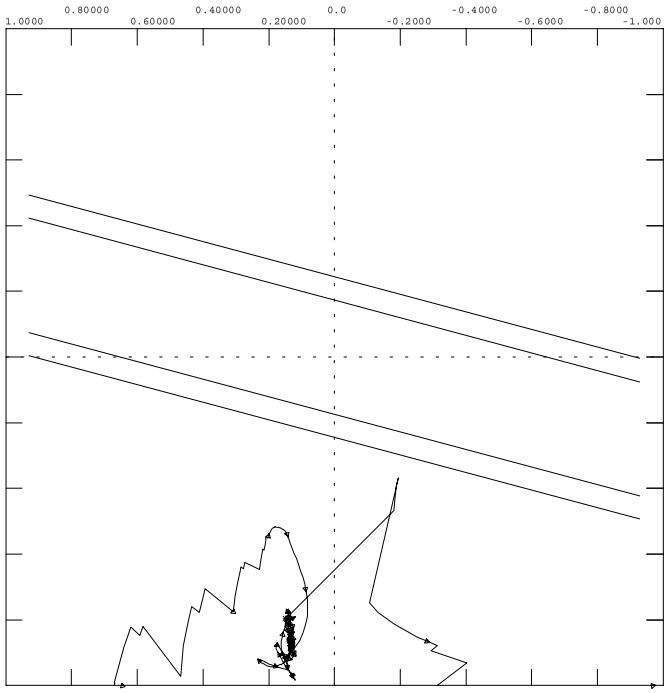
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

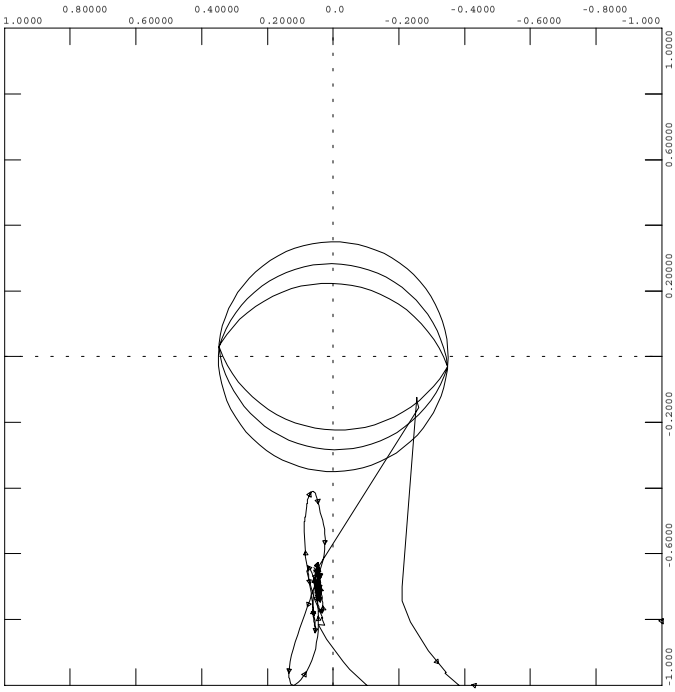
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

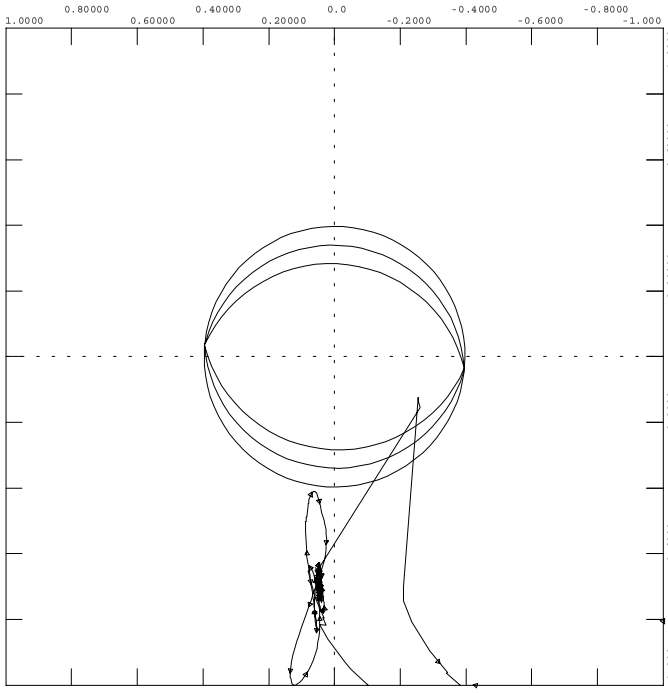
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

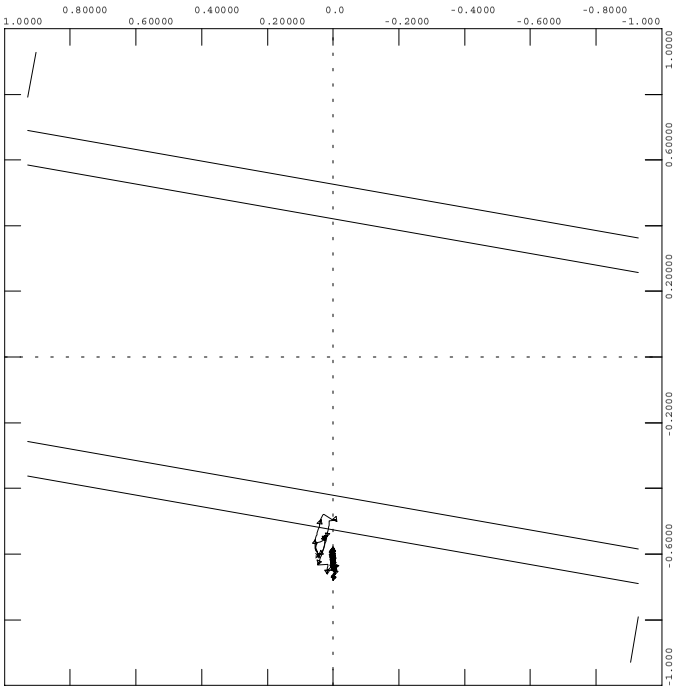
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

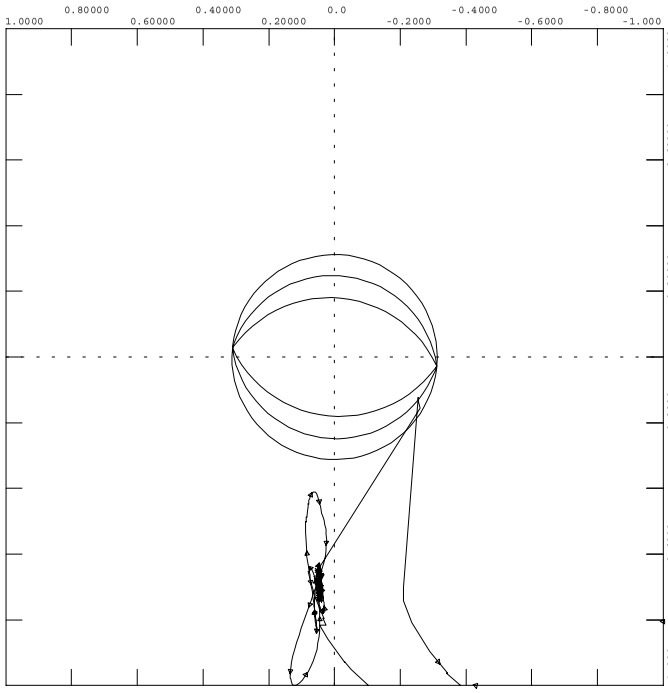
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



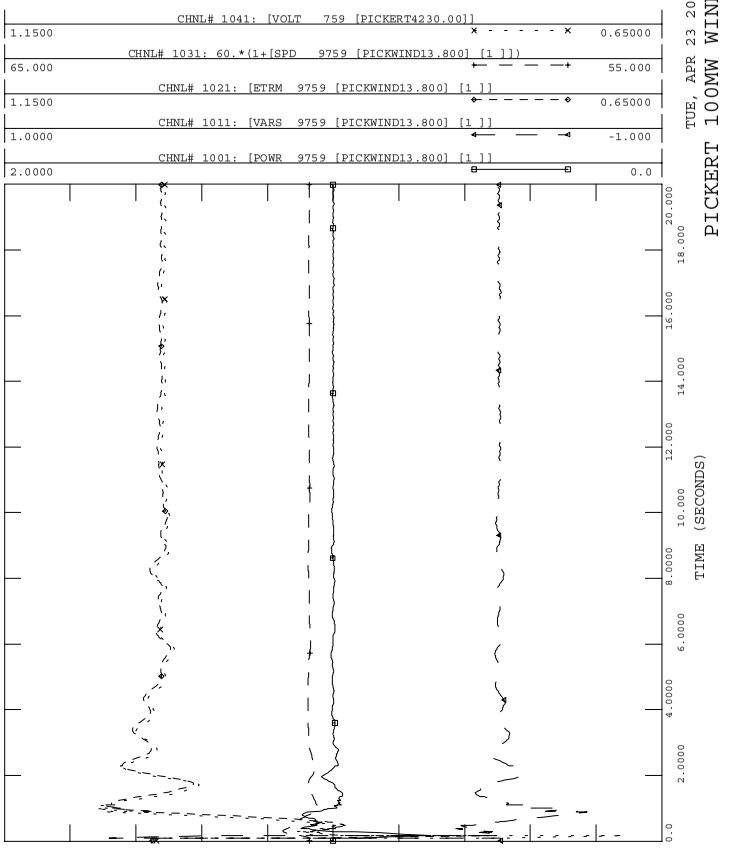
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

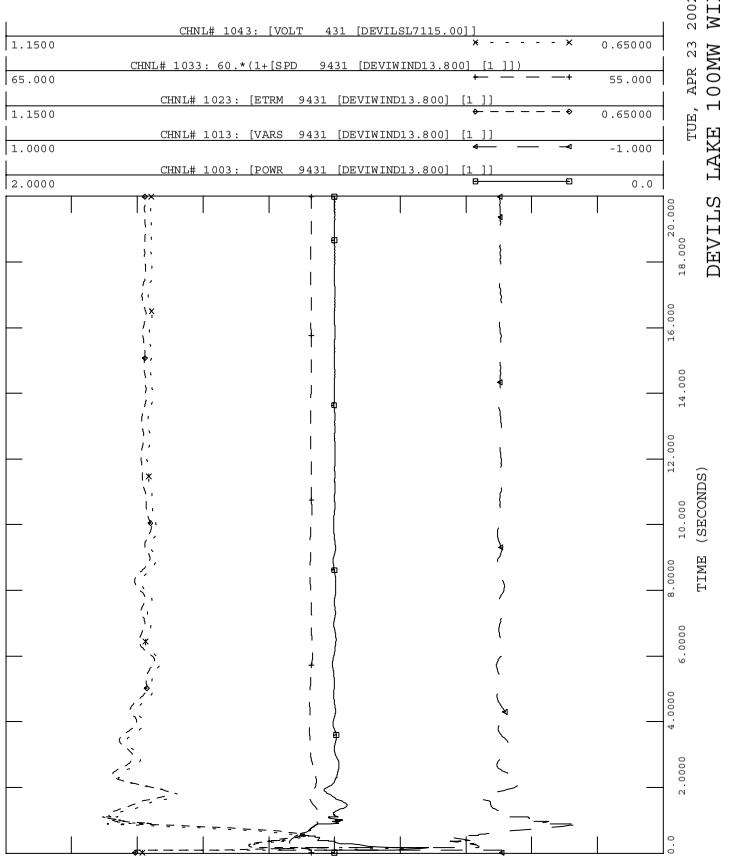
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



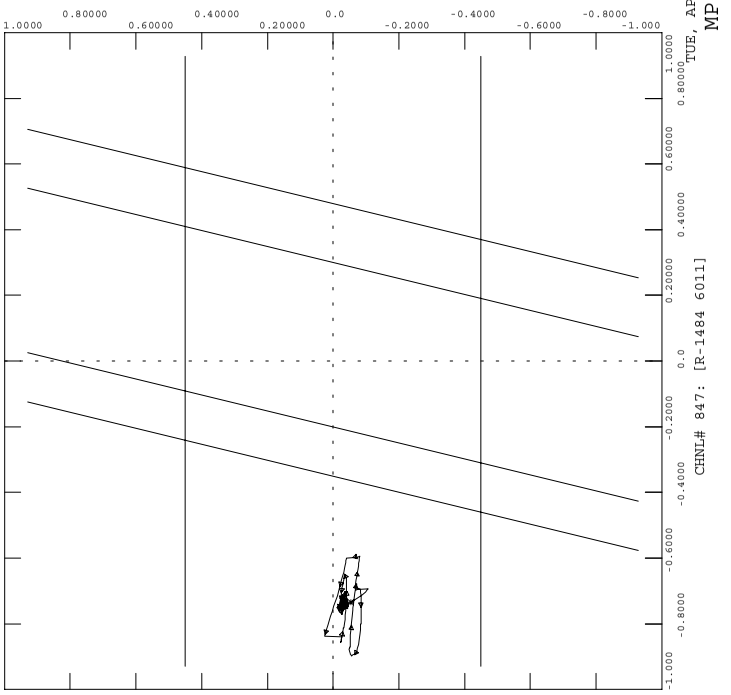
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



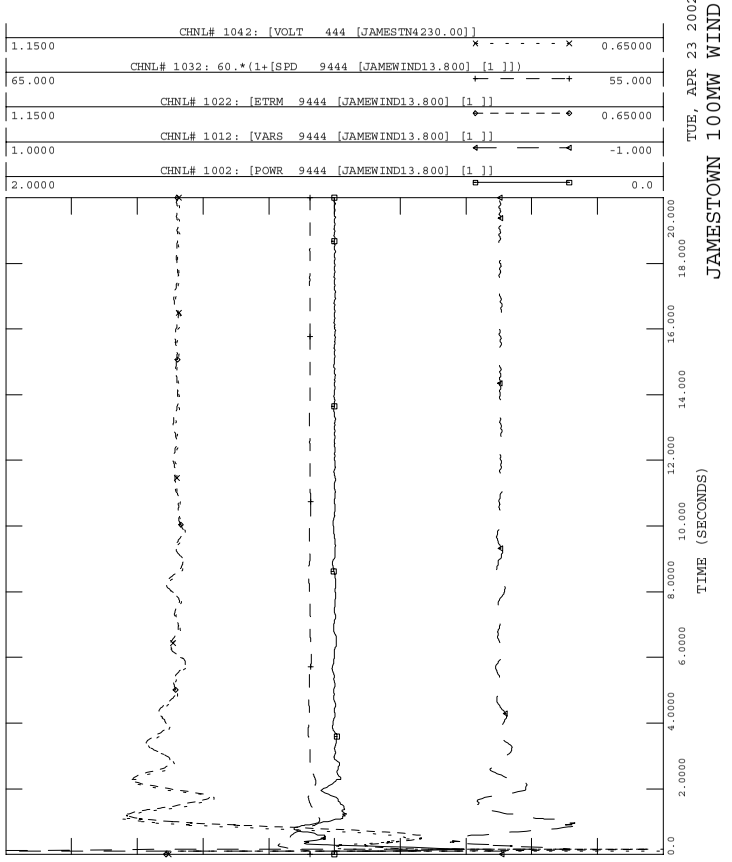
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

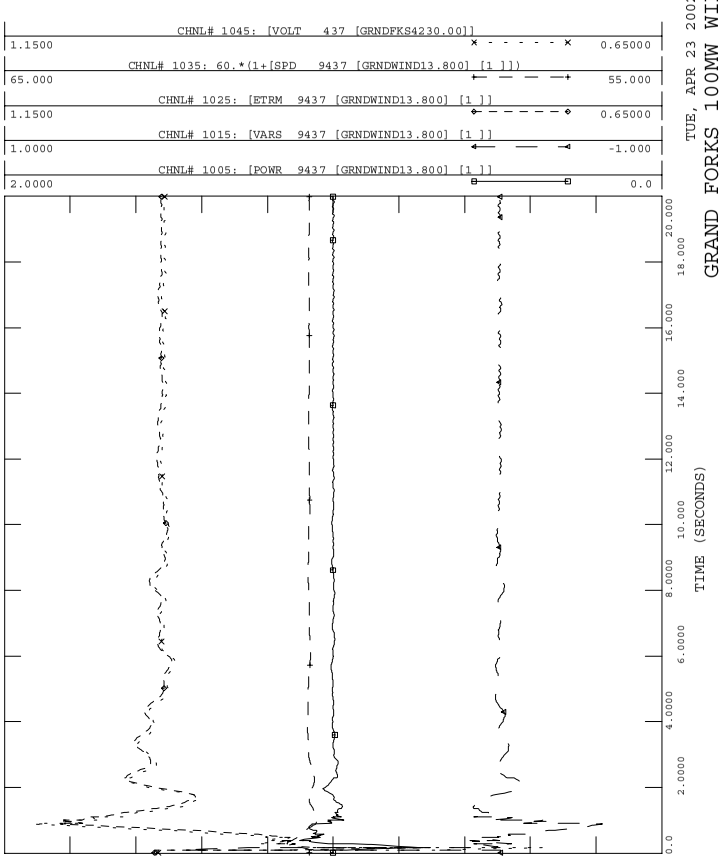
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



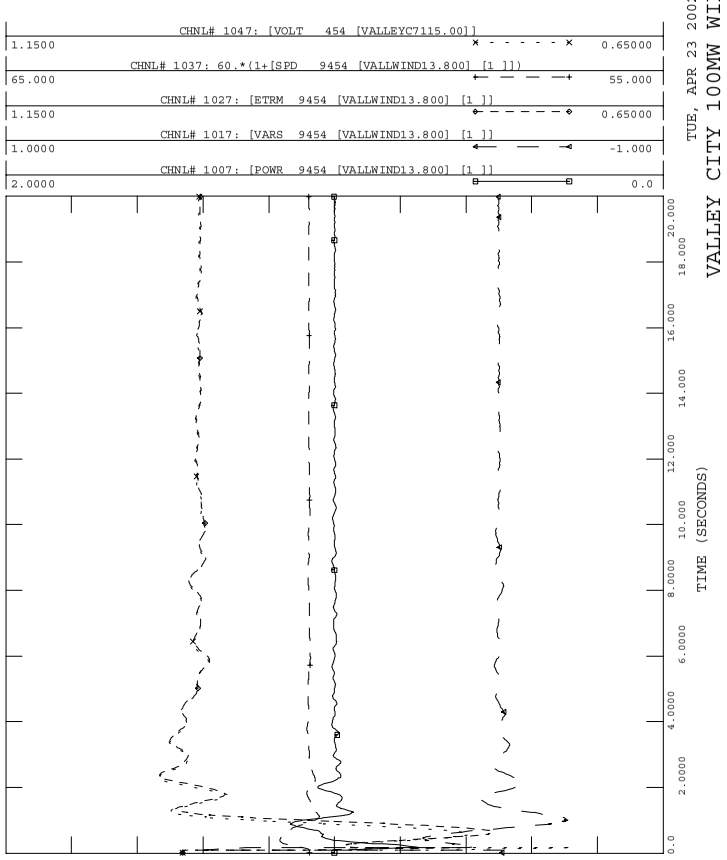
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



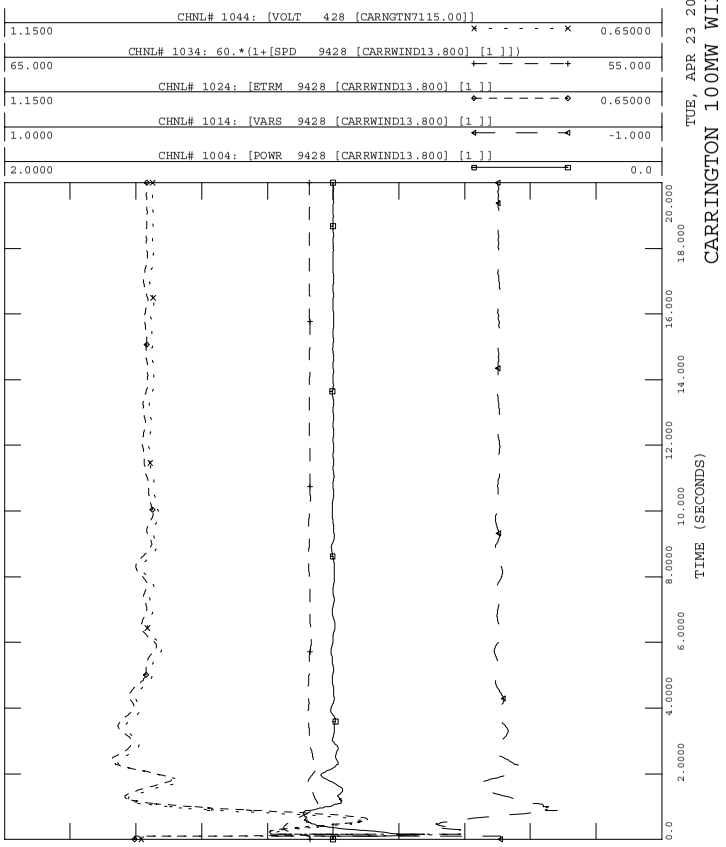
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



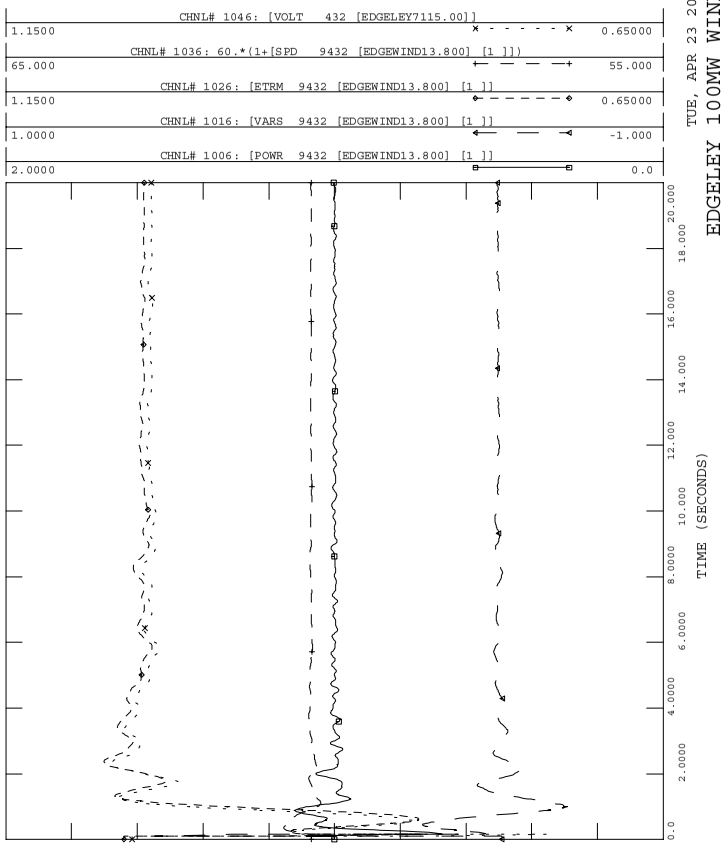
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



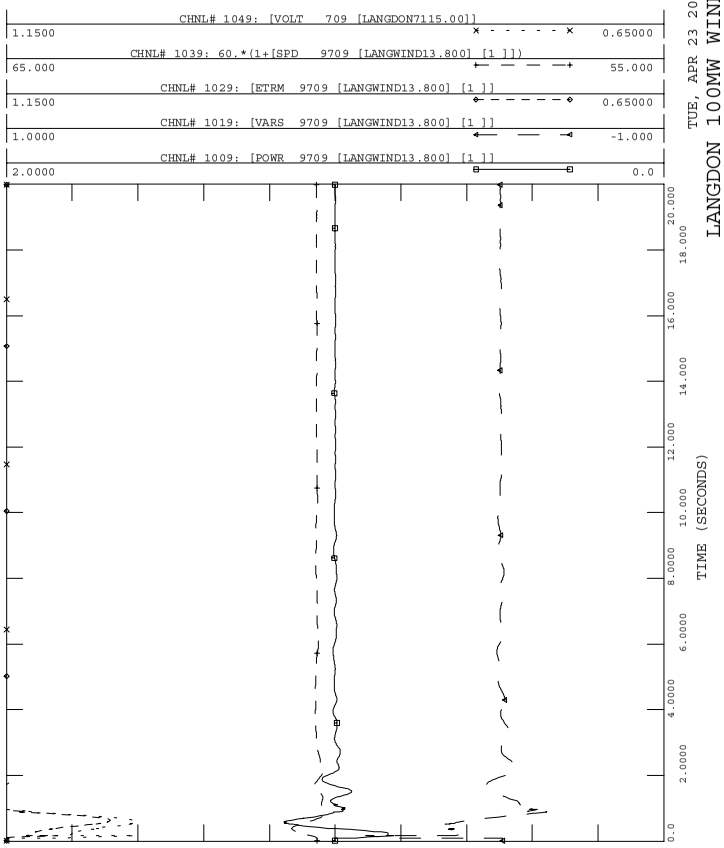
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:53

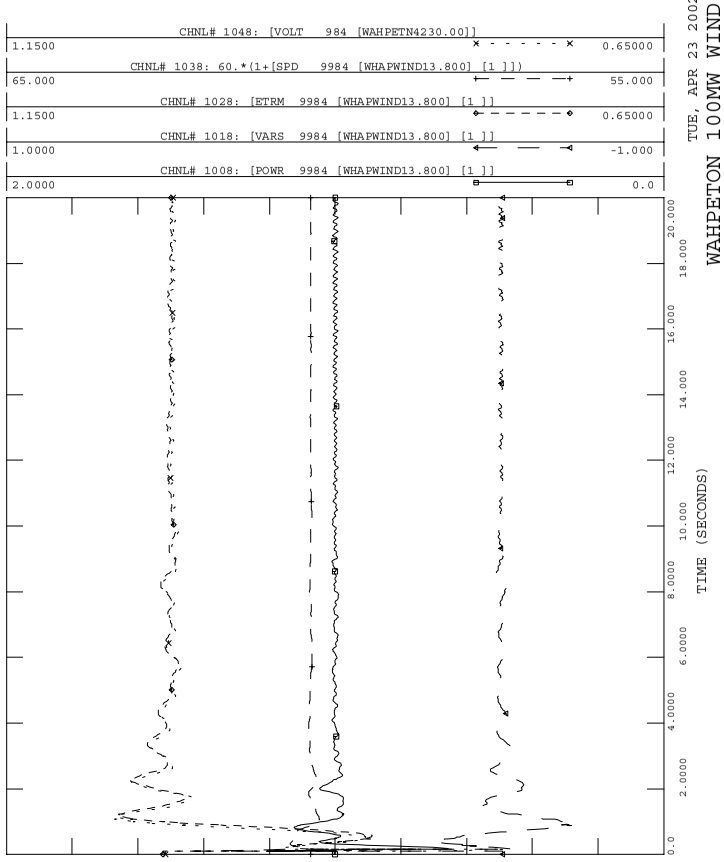
LANGDON 100MW WIND UNIT



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:53

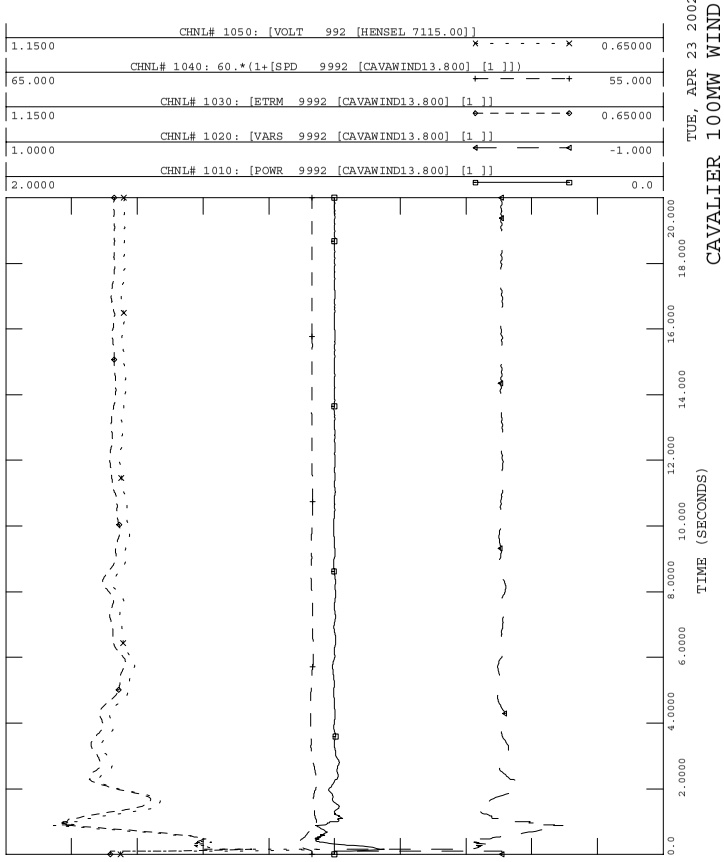
WAHPETON 100MW WIND UNIT



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ag3.bin

TUE, APR 23 2002 11:53

CAVALIER 100MW WIND UNIT

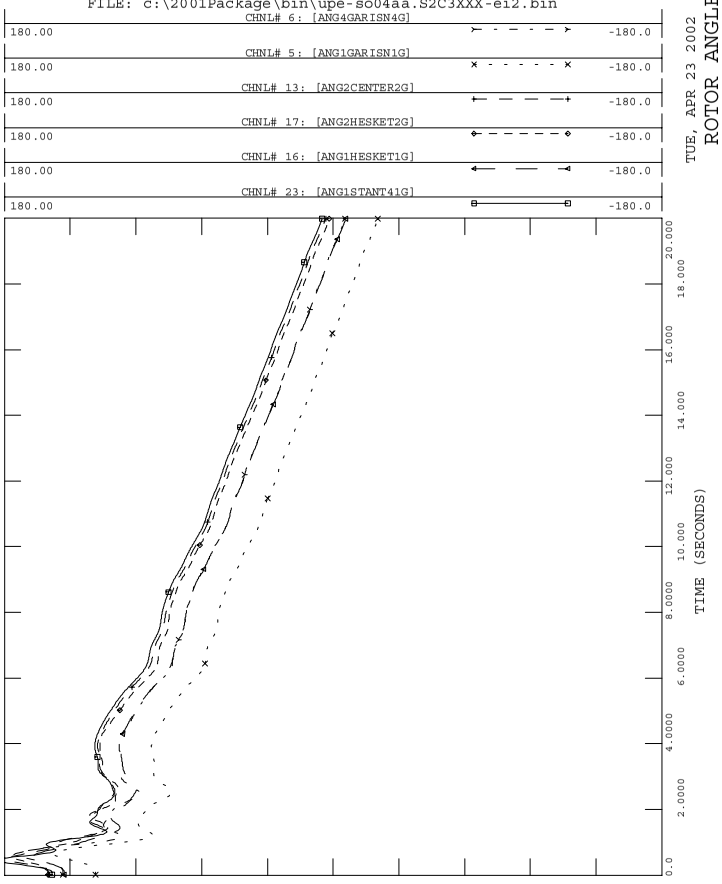


CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

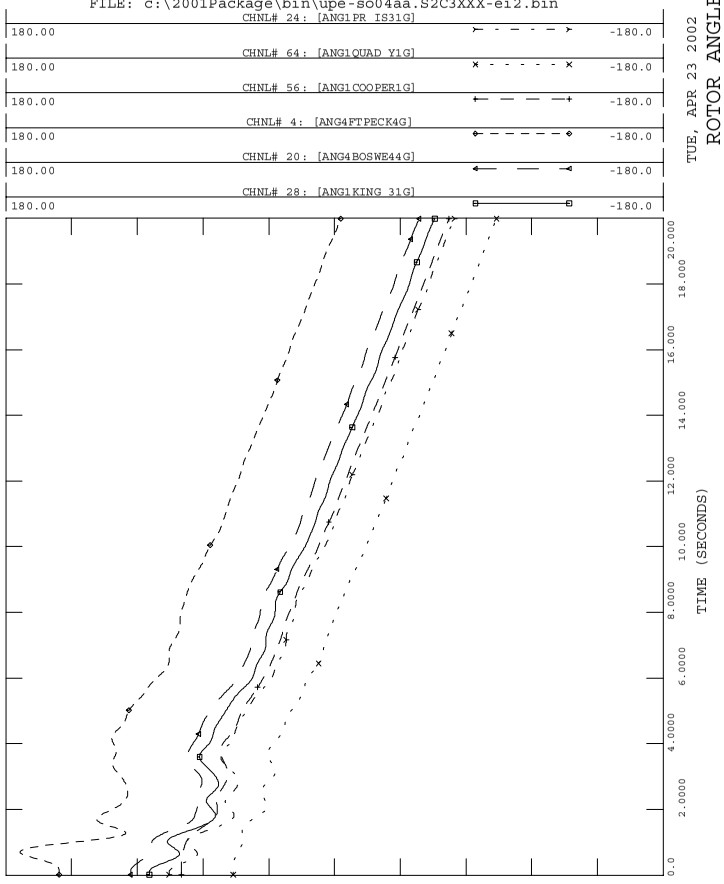
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
ROTOR ANGLES 2



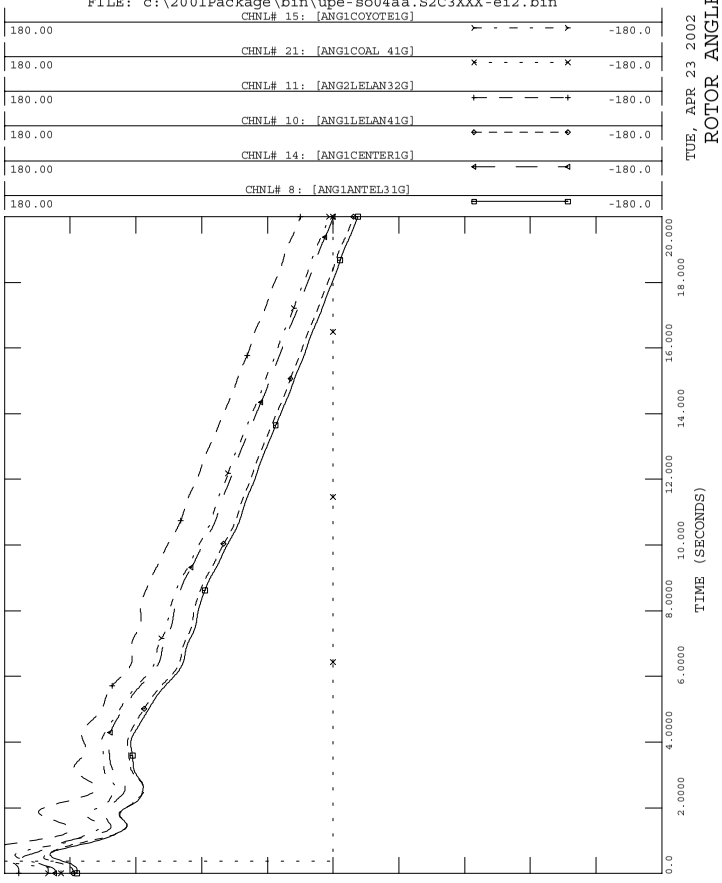
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
ROTOR ANGLES 4



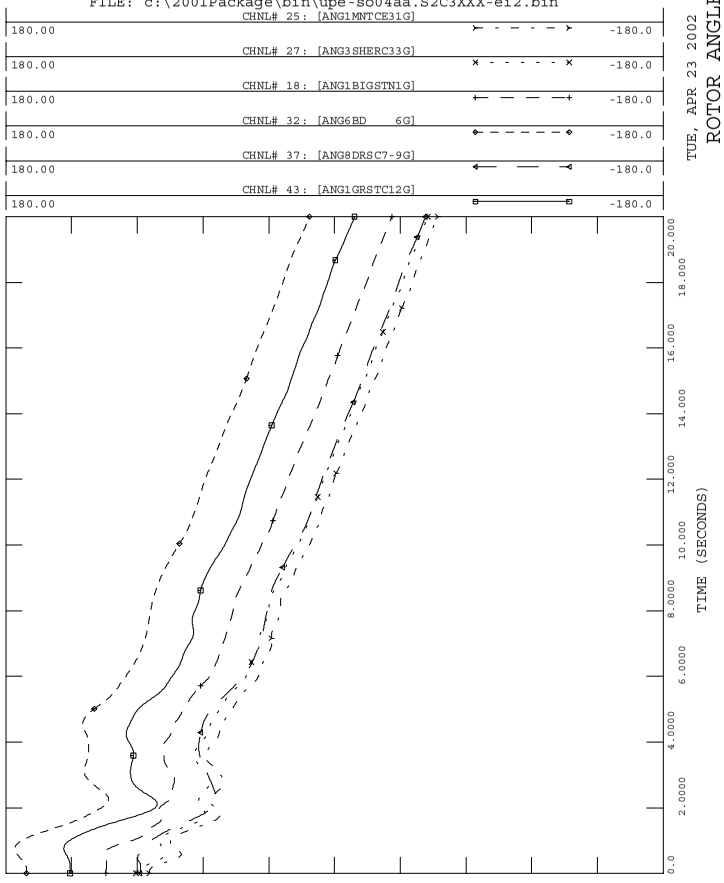
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
ROTOR ANGLES 1



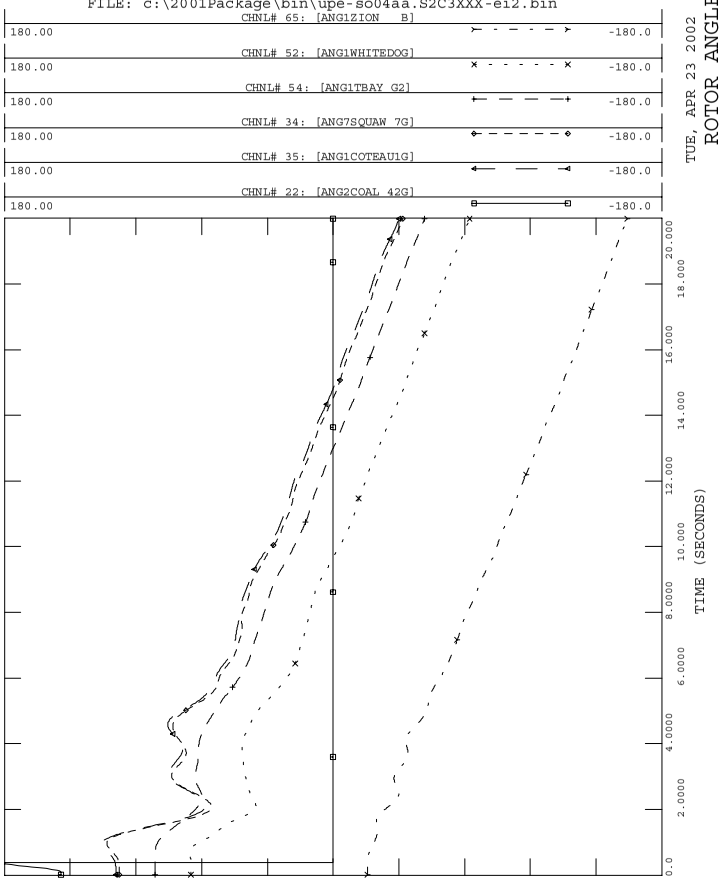
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
ROTOR ANGLES 3



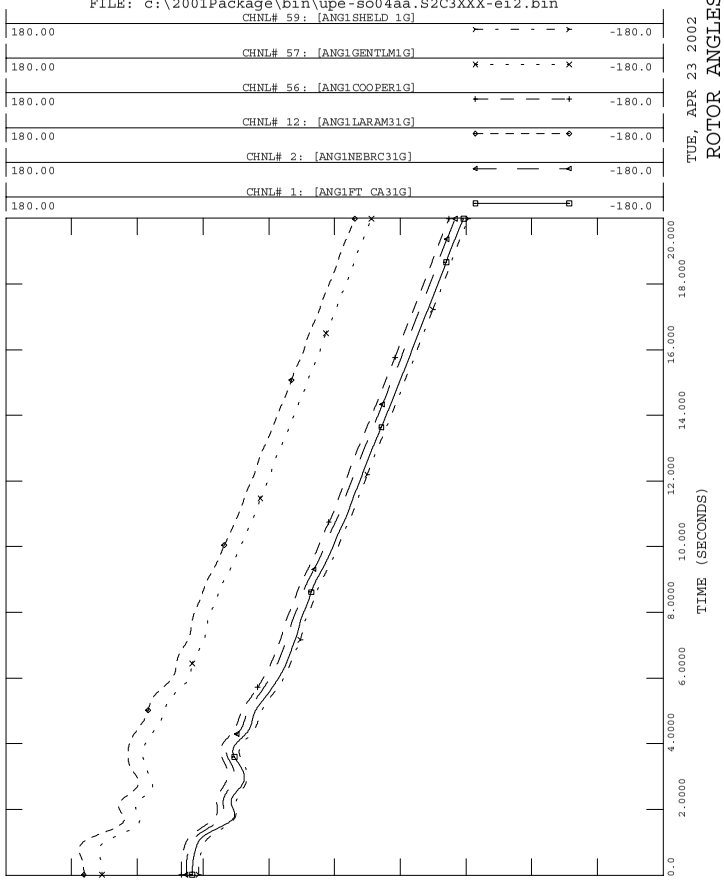
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
ROTOR ANGLES 6



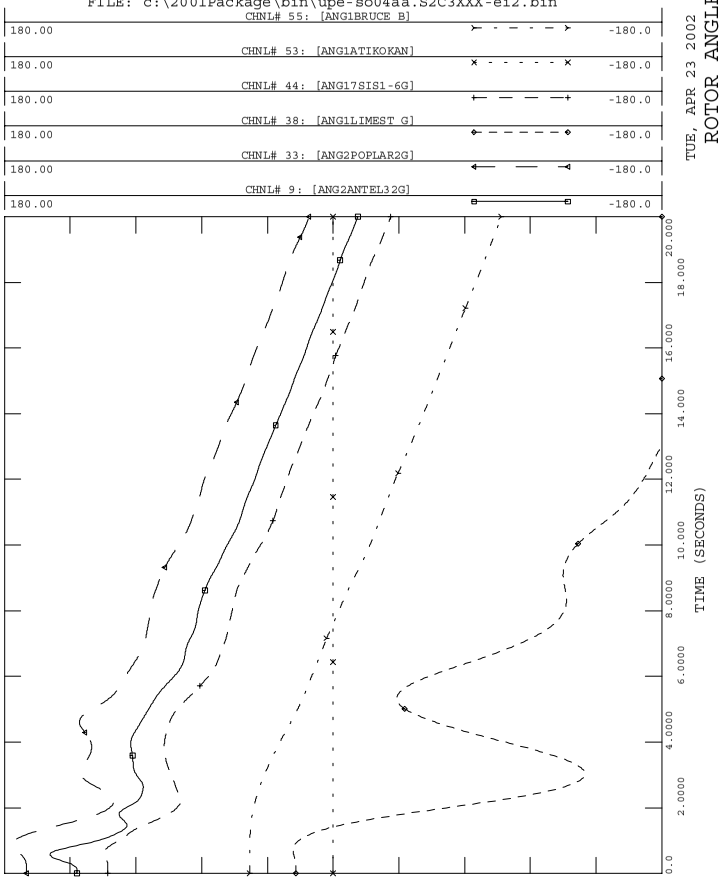
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
ROTOR ANGLES NB



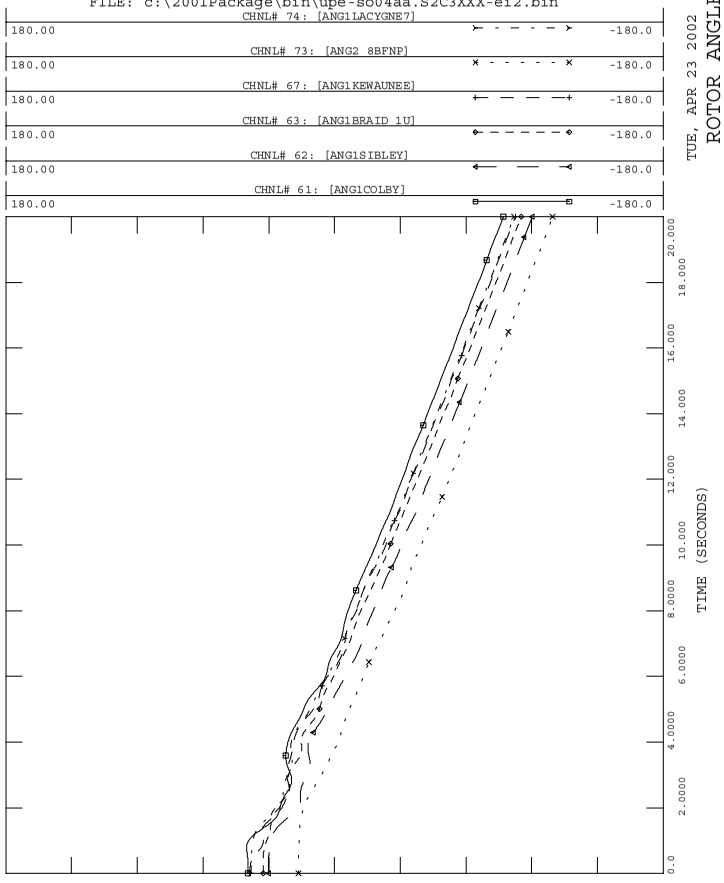
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
ROTOR ANGLES 5

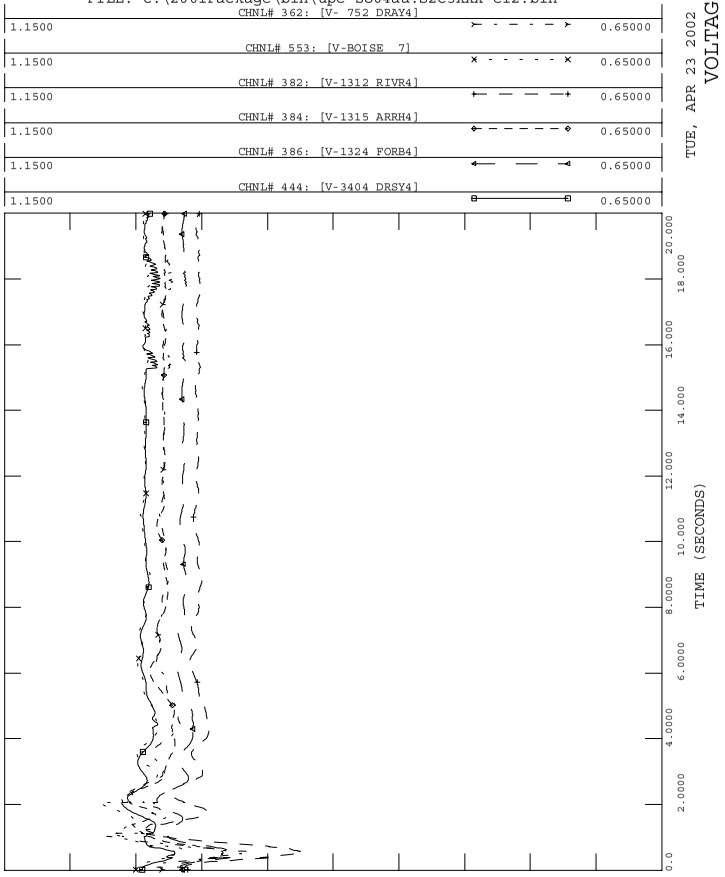


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
ROTOR ANGLES 7

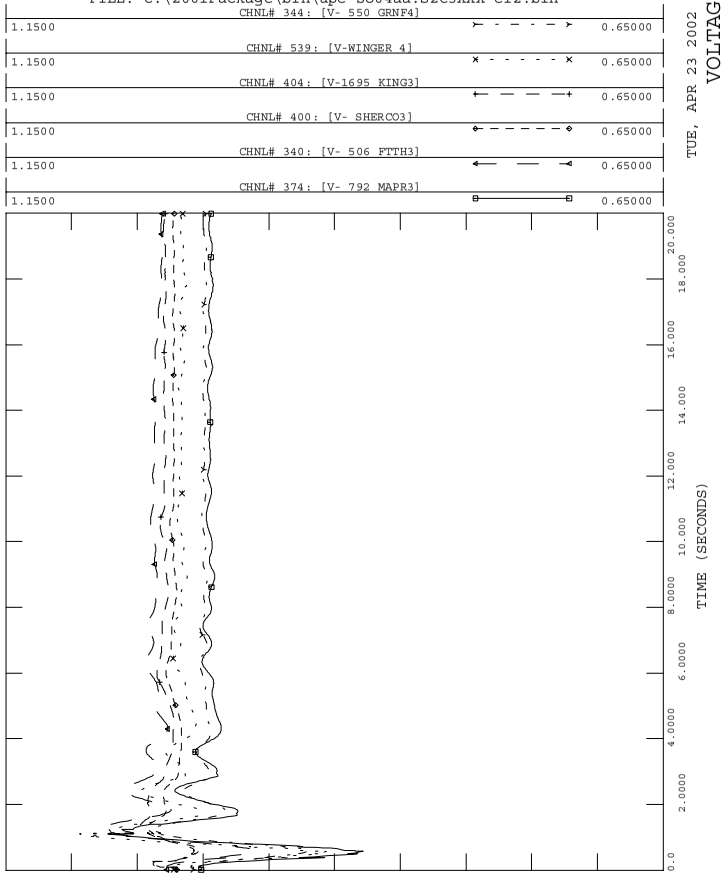


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



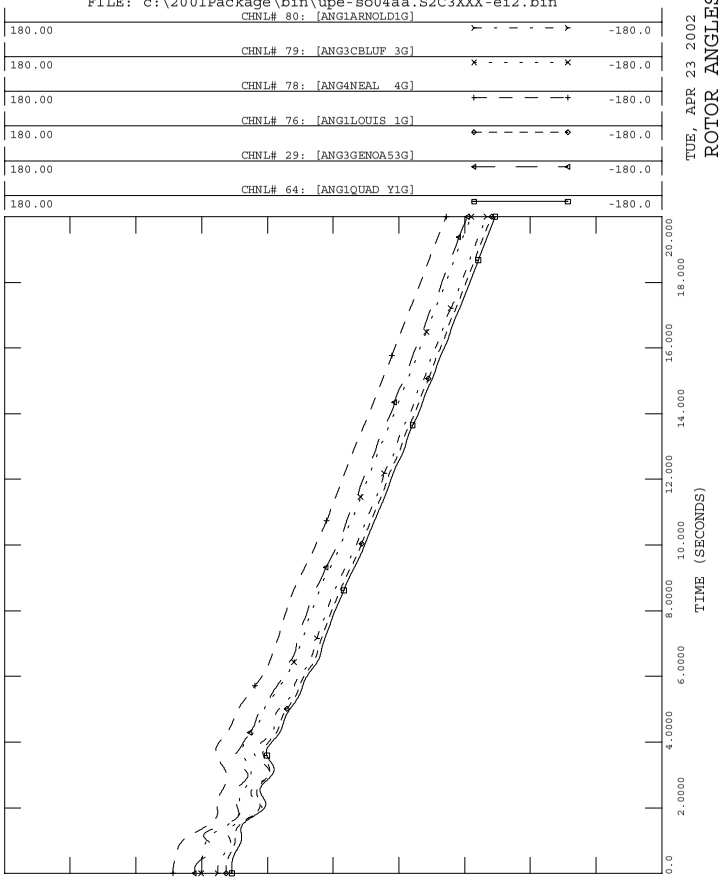
TUE, APR 23 2002 12:07
VOLTAGES 1

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



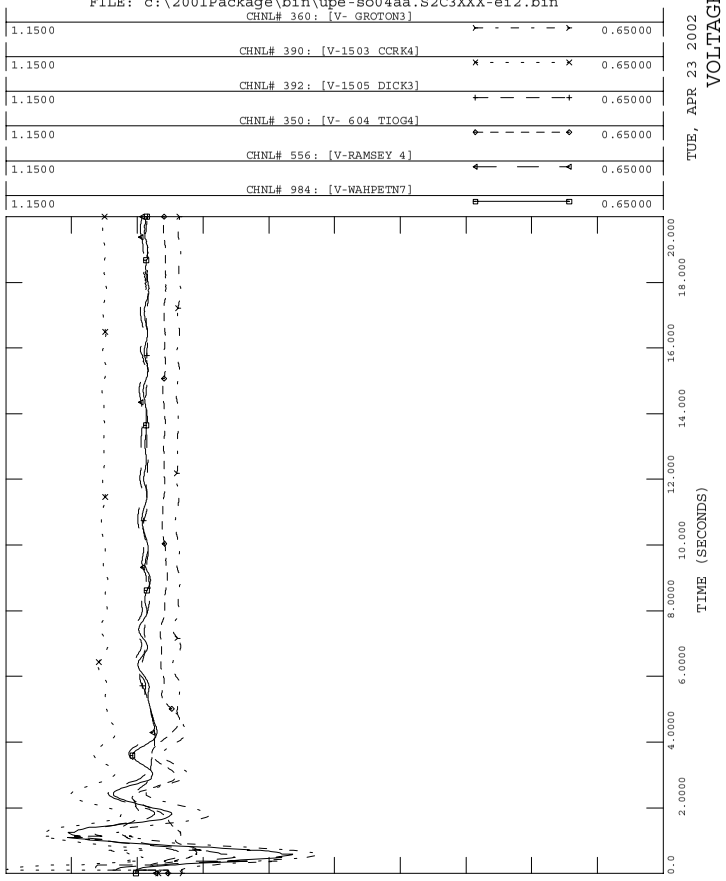
TUE, APR 23 2002 12:07
VOLTAGES 3

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



TUE, APR 23 2002 12:07
ROTOR ANGLES IA

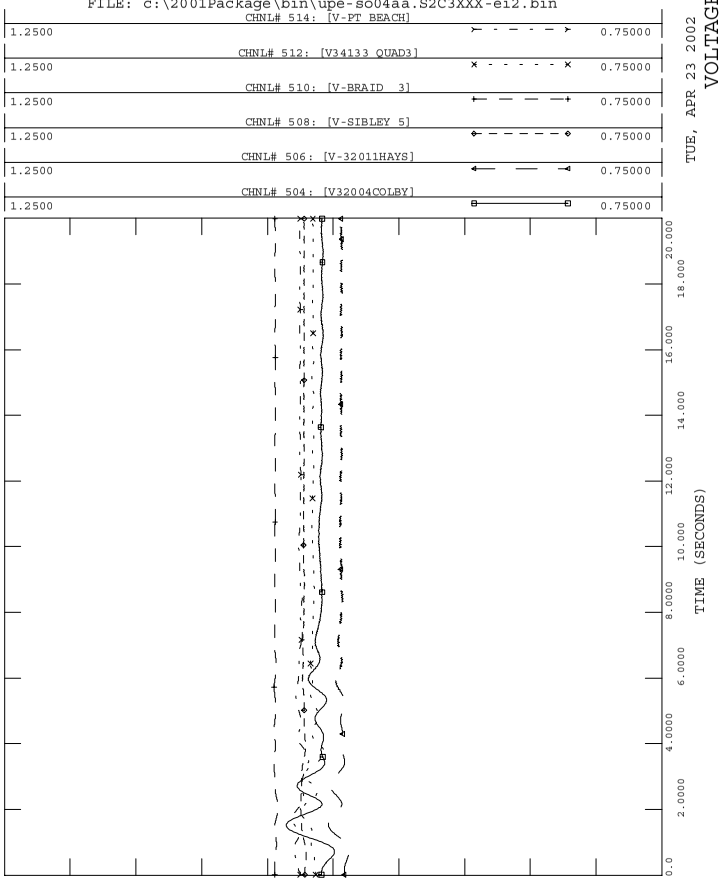
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



TUE, APR 23 2002 12:07
VOLTAGES 2

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
VOLTAGES 5



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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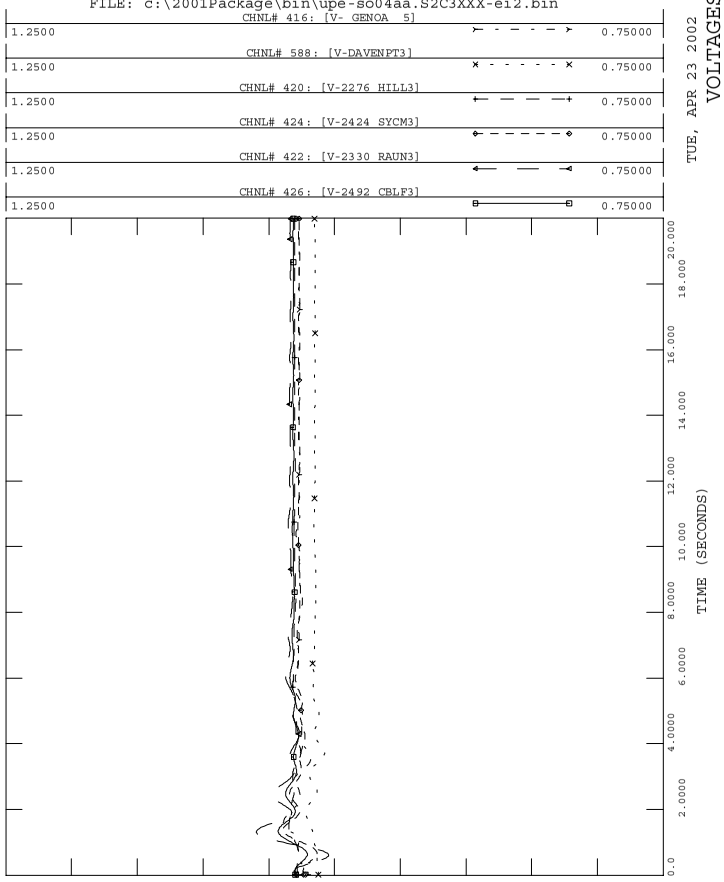
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
VOLTAGES IA



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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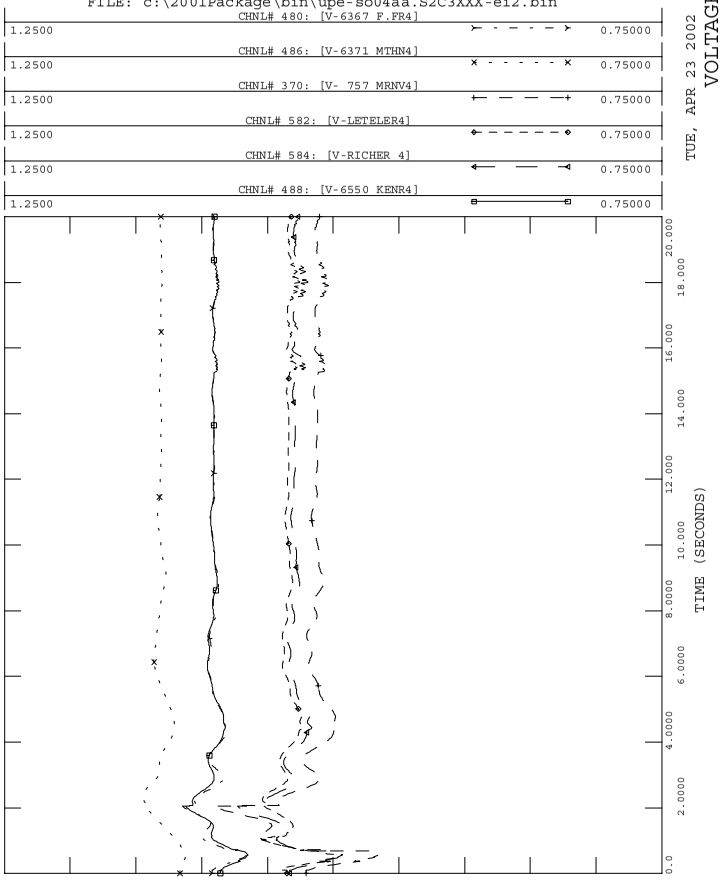
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
VOLTAGES 4



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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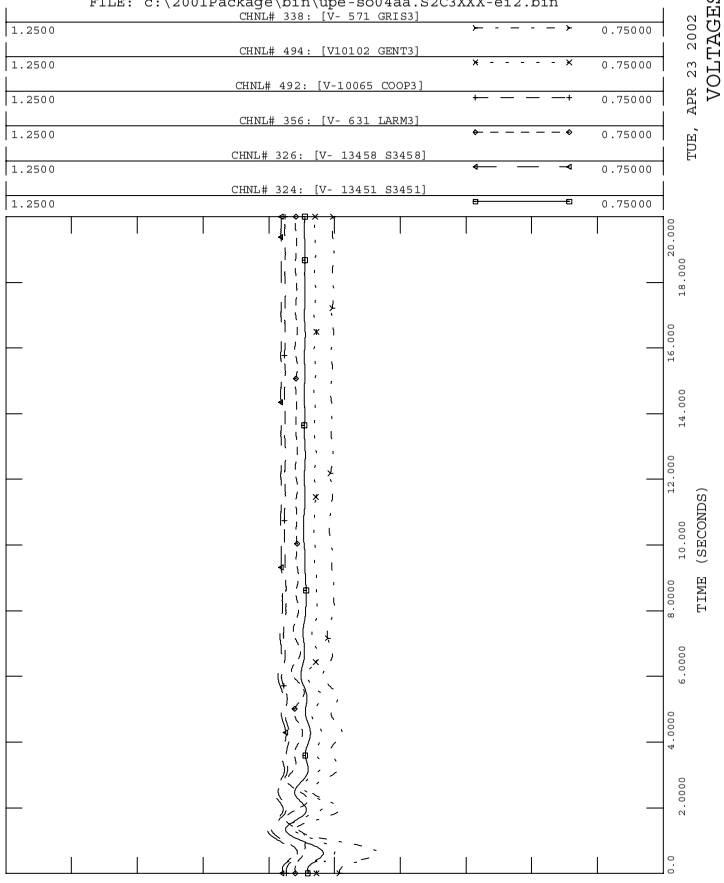
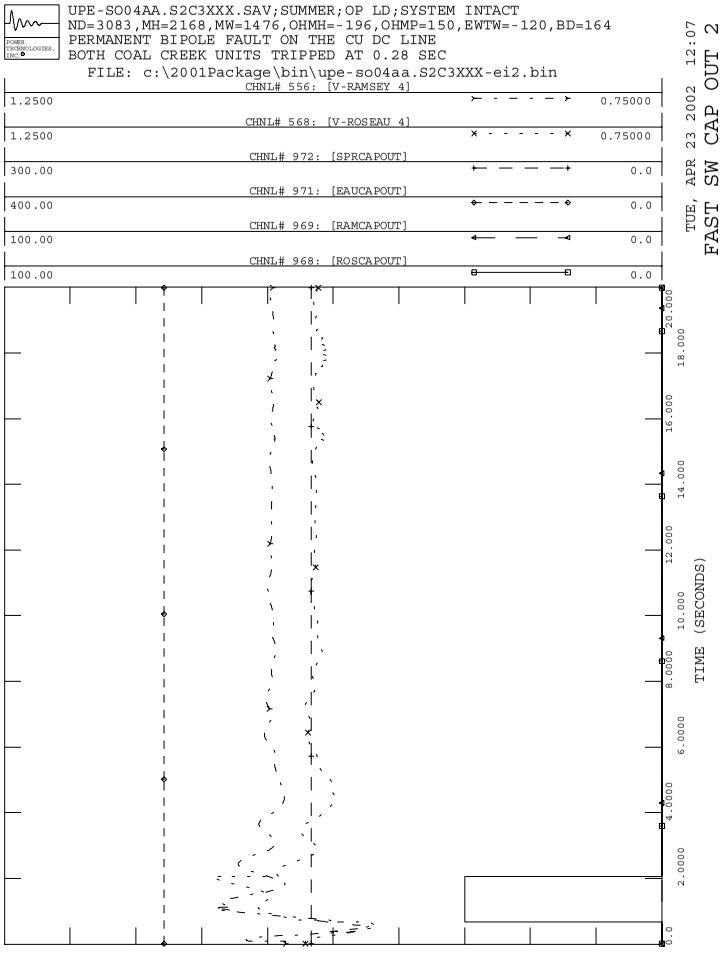
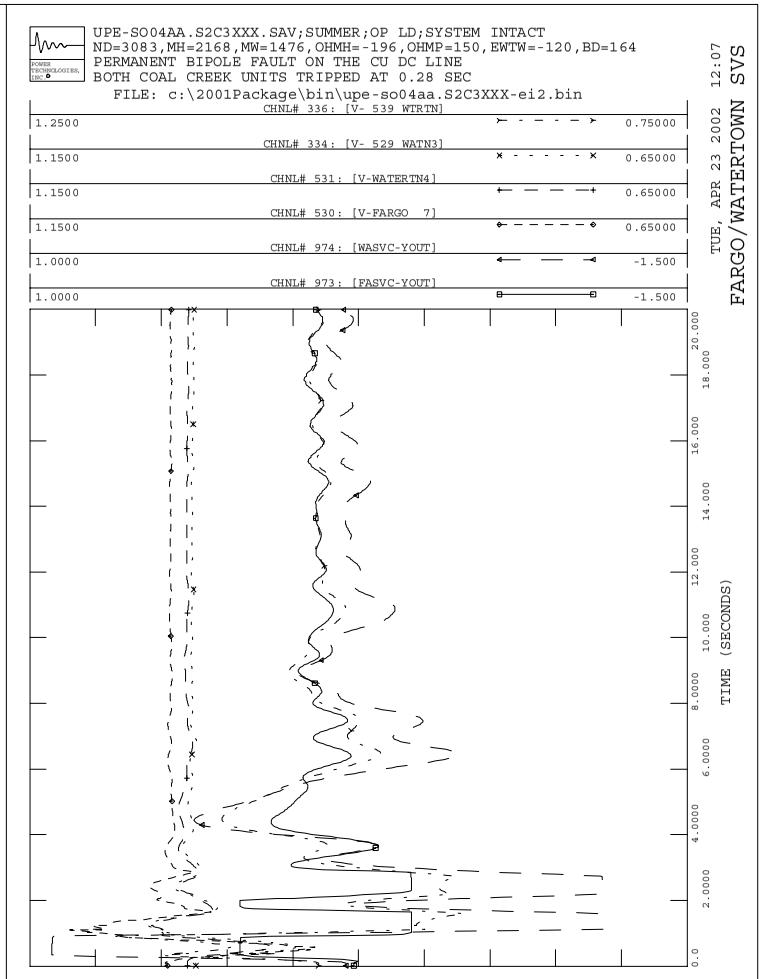
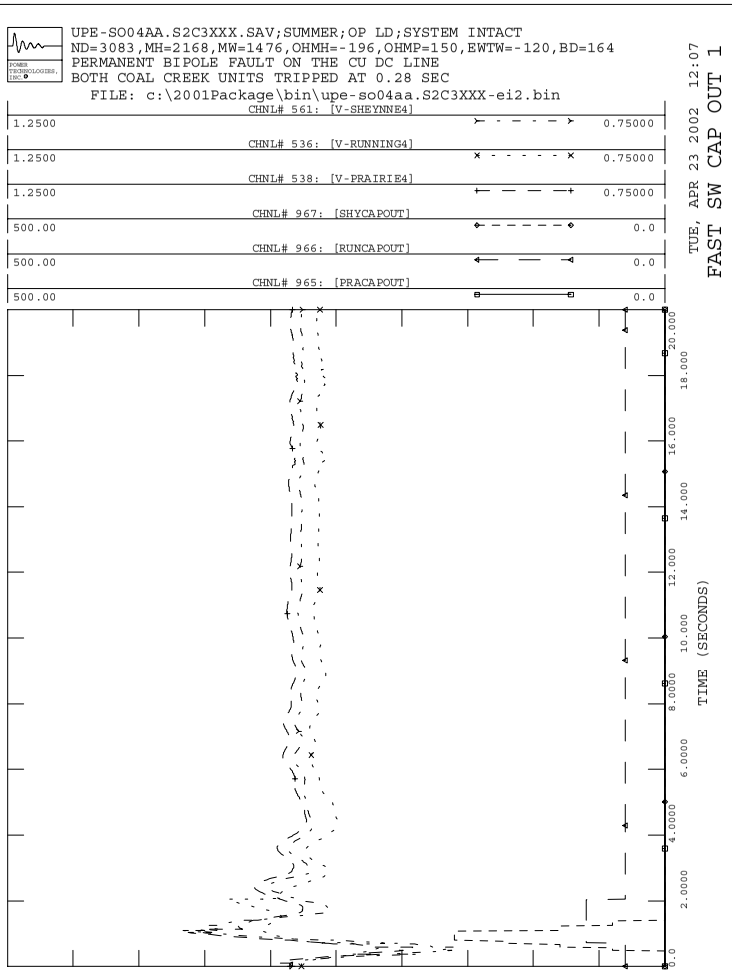
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

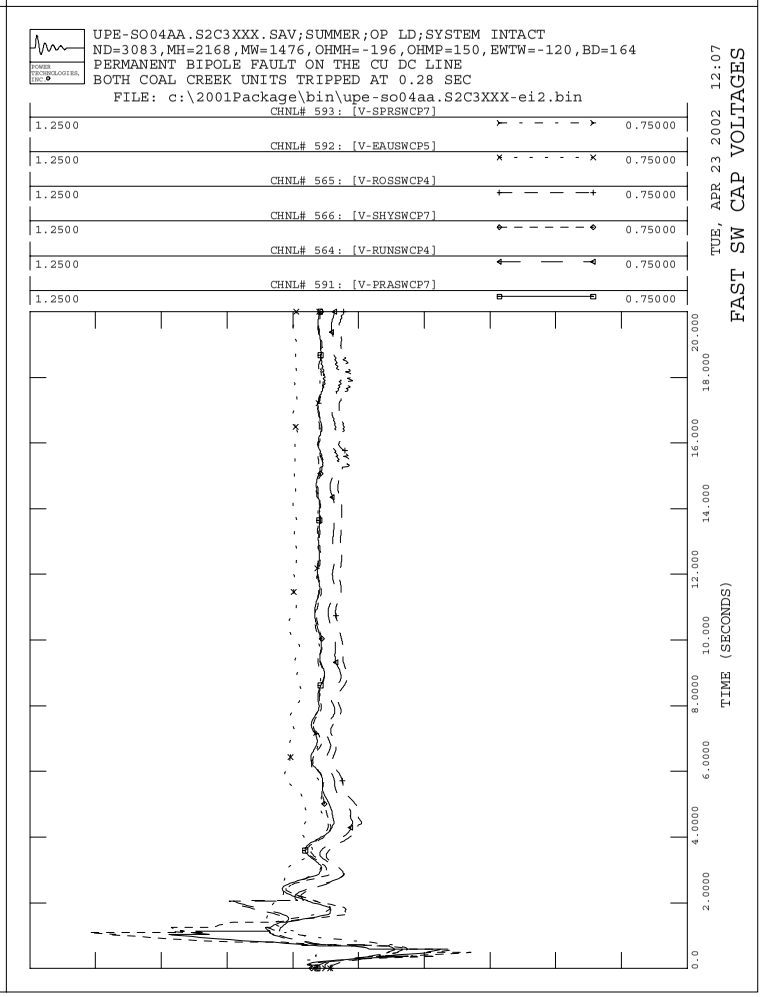
TUE, APR 23 2002 12:07
VOLTAGES NB




UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TUE, APR 23 2002 12:07
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TUE, APR 23 2002 12:07
FARGO/WATERTOWN SVS
TIME (SECONDS)

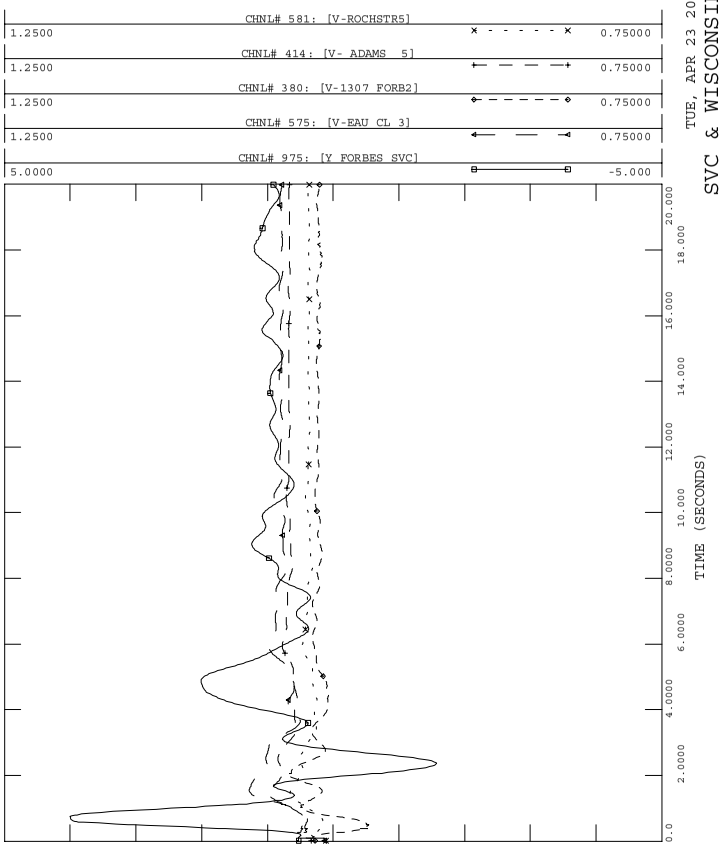

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TUE, APR 23 2002 12:07
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TUE, APR 23 2002 12:07
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07

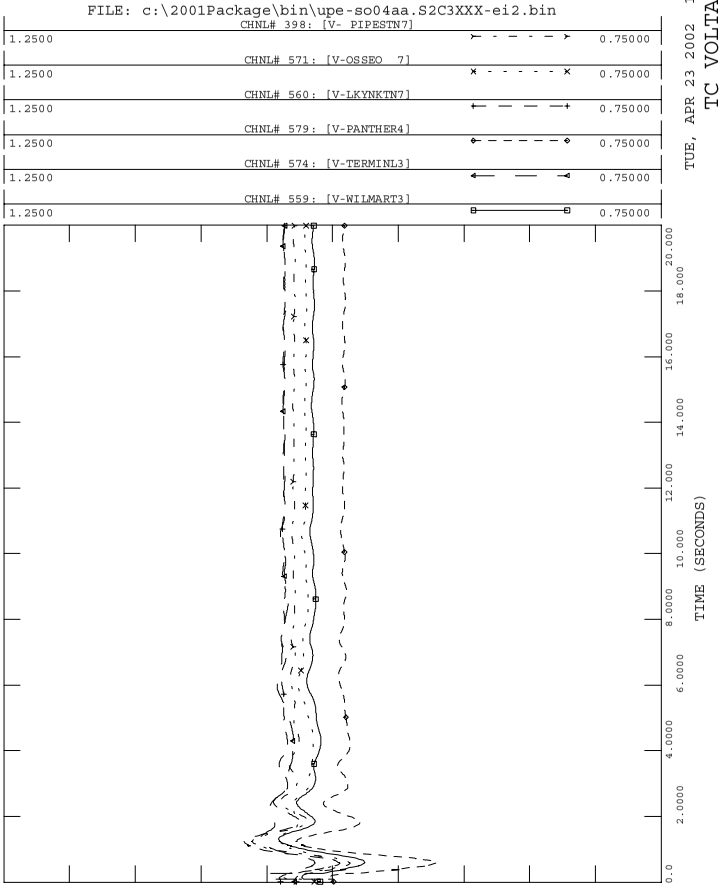
SVC & WISCONSIN VOLT



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07

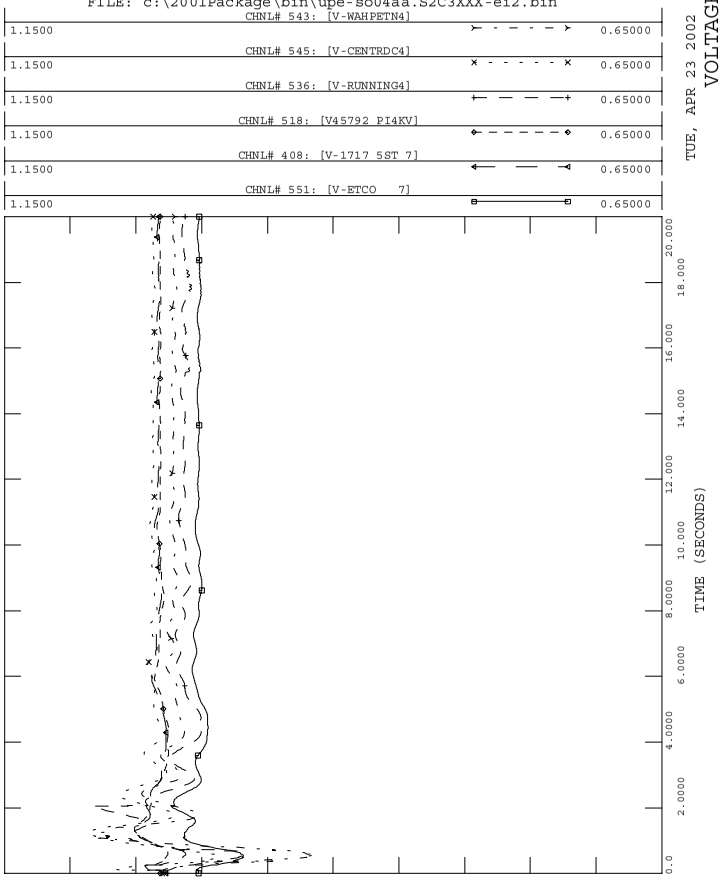
TC VOLTAGES



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07

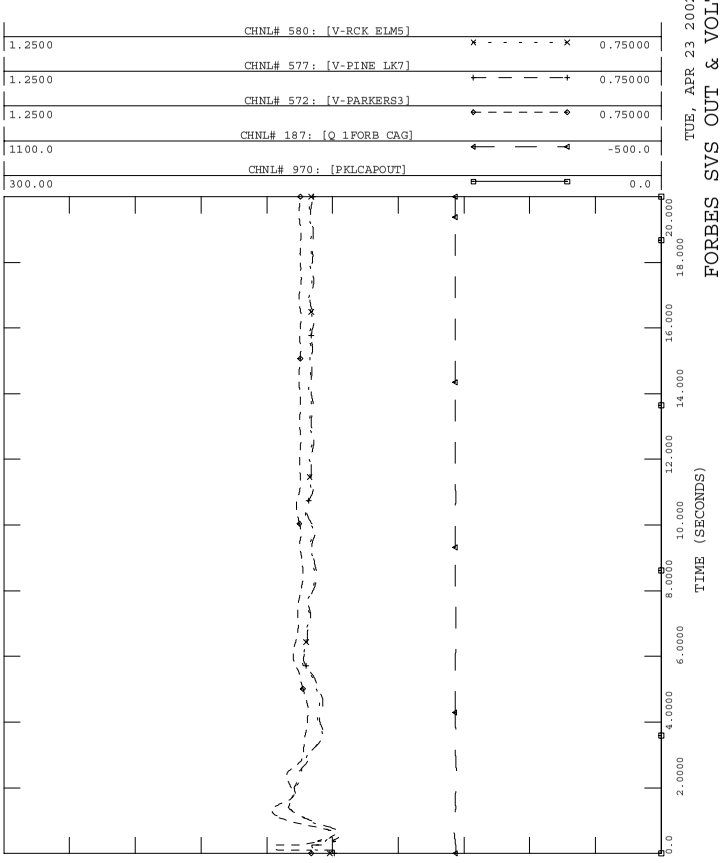
VOLTAGES 6



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

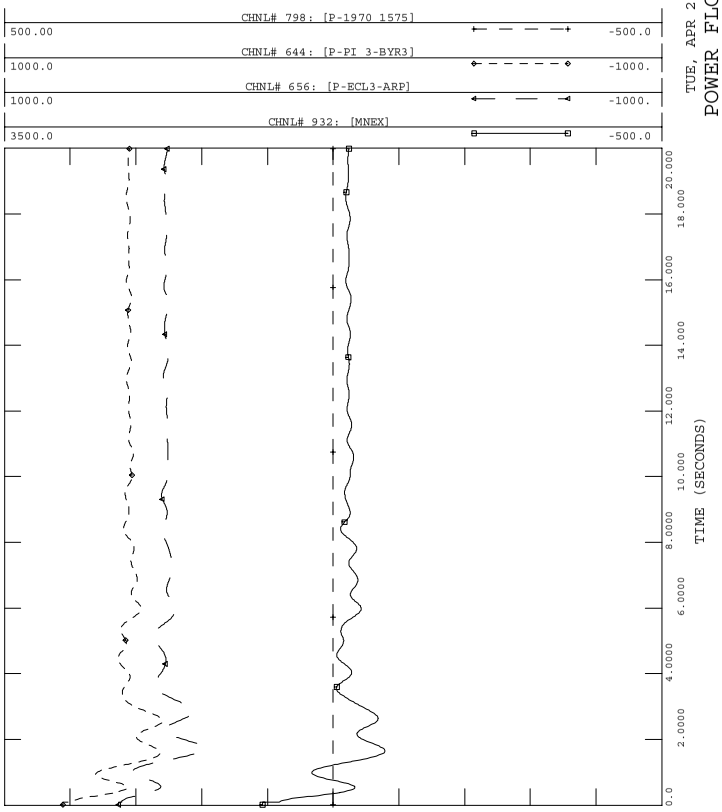
TUE, APR 23 2002 12:07

FORBES SVS OUT & VOLTAGES



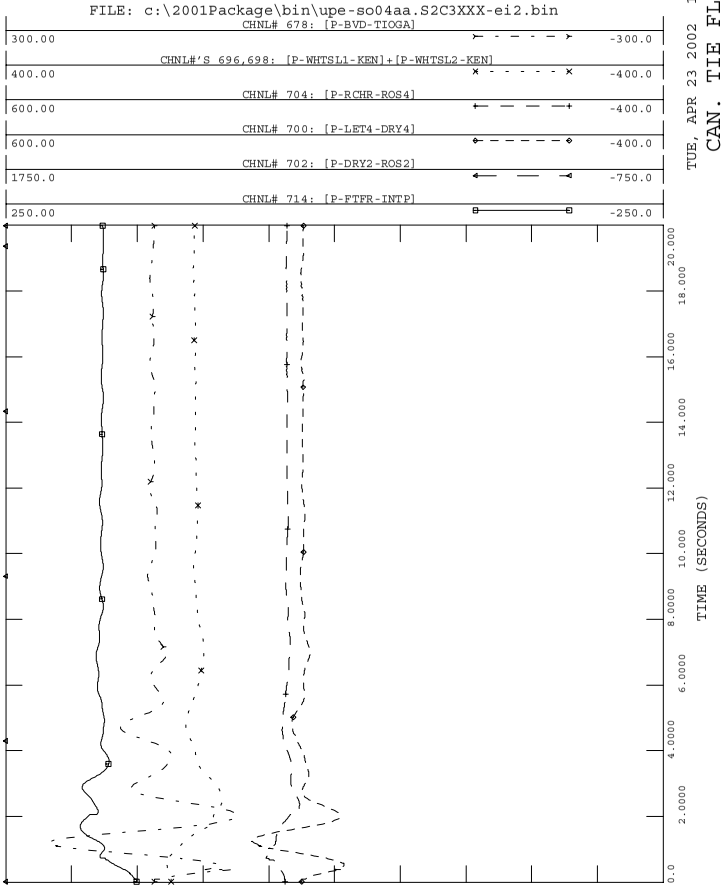
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
POWER FLOW SUMS 2



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
CAN. TIE FLOWS



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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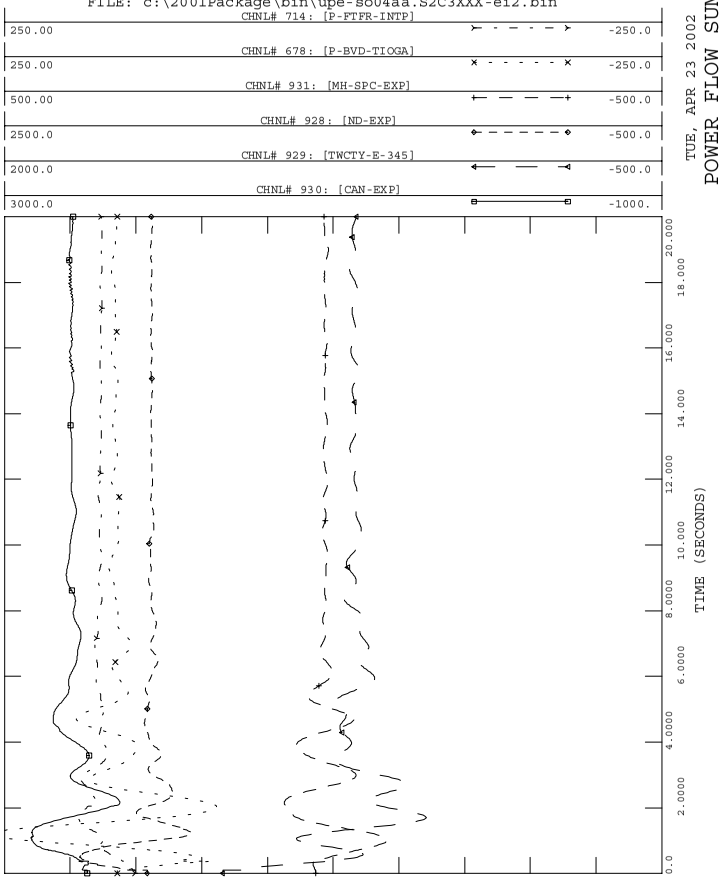
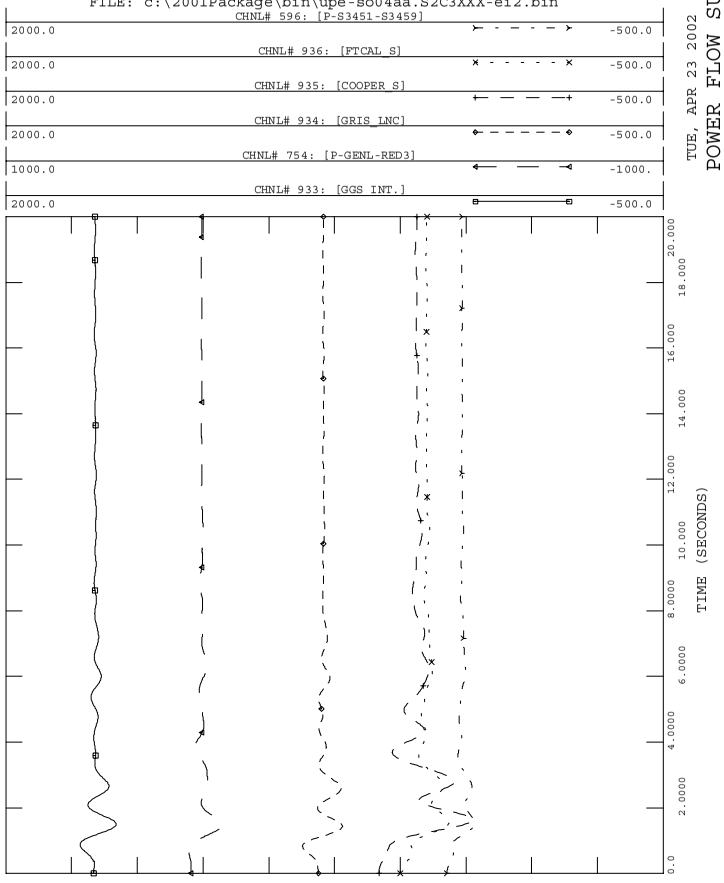
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
POWER FLOW SUMS 1



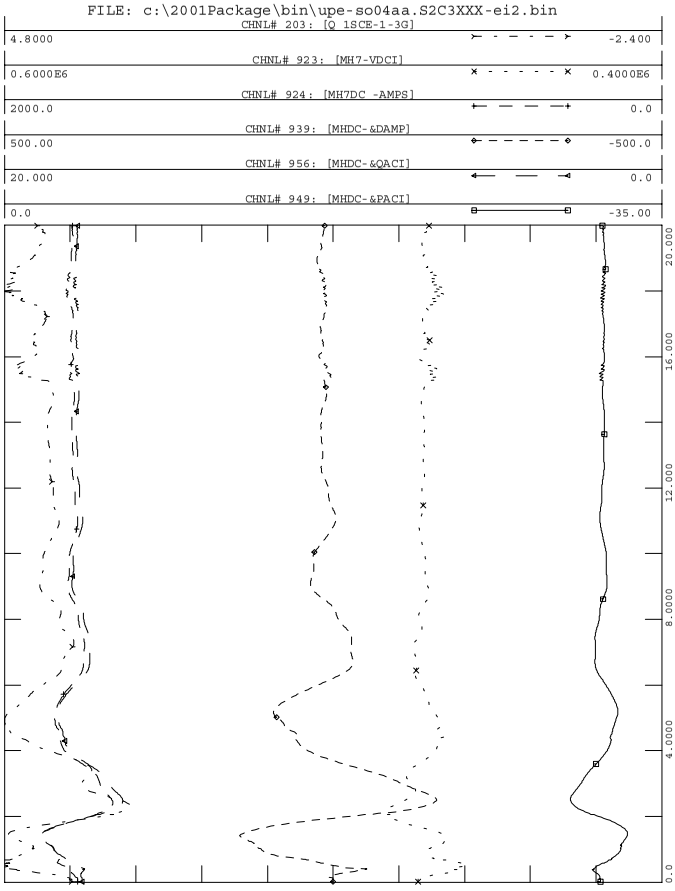
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
POWER FLOW SUM 3



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
MH DC PARAMETERS



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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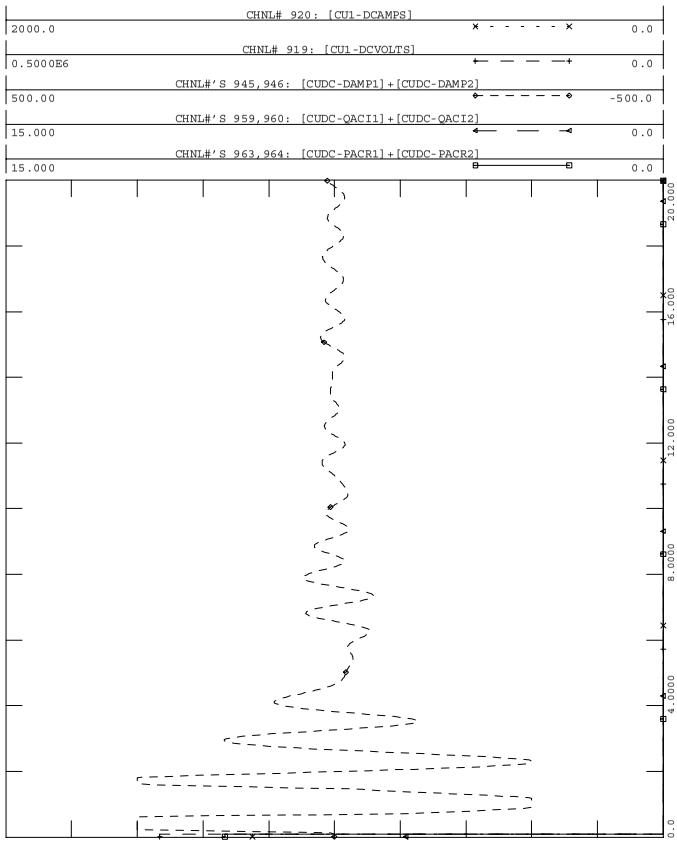
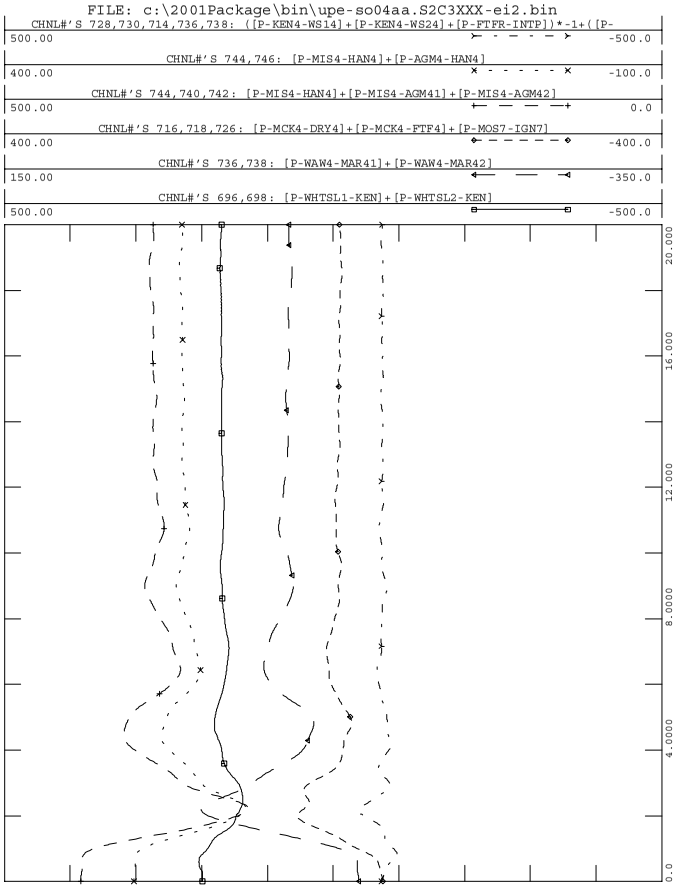
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
CU DC #1



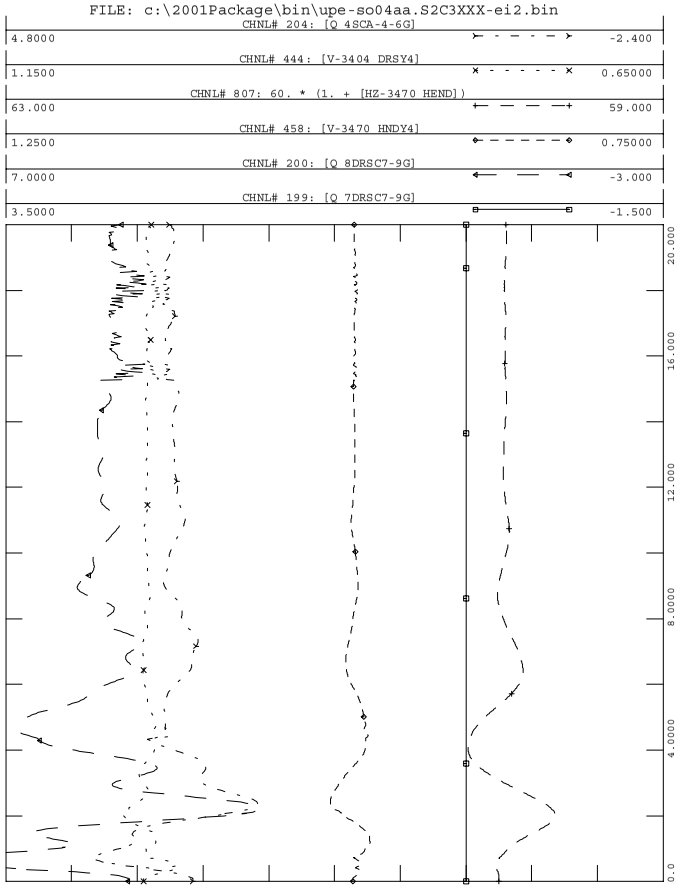
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07
OH TIE FLOWS



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

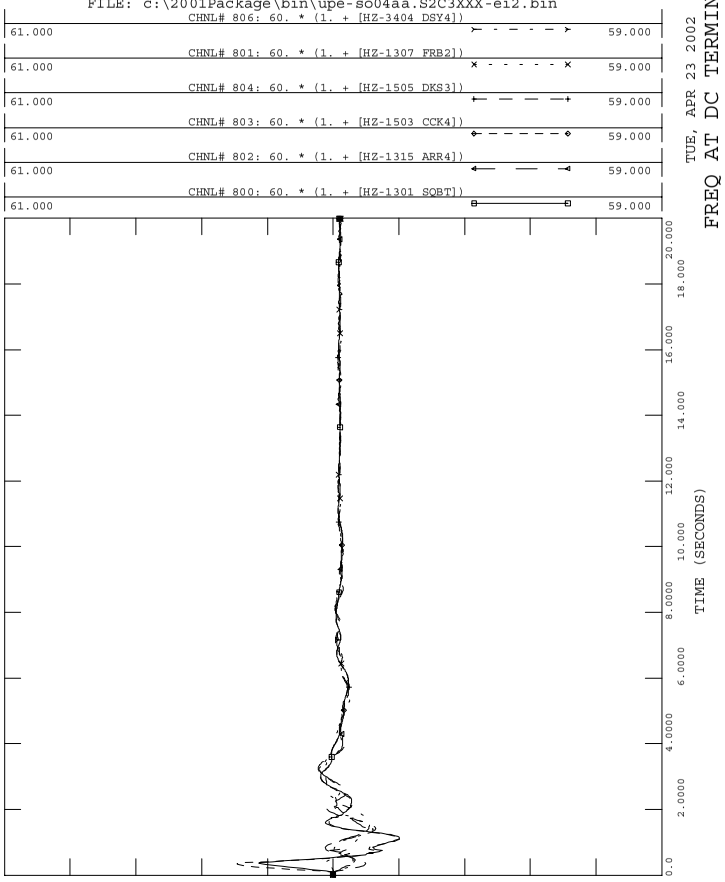
TUE, APR 23 2002 12:07
MH DC PARAMETERS



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07

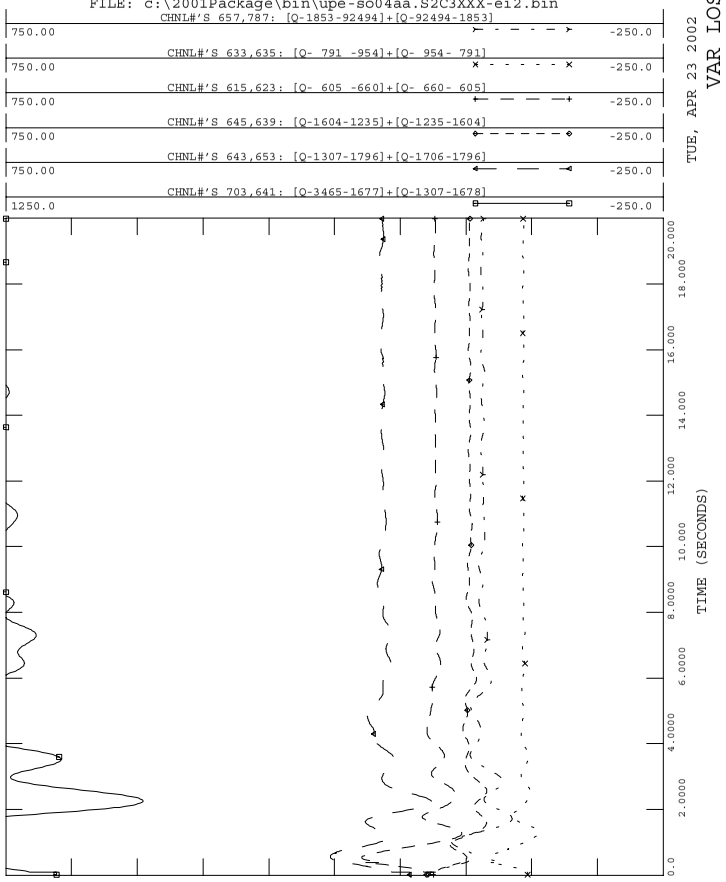
FREQ AT DC TERMINALS



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07

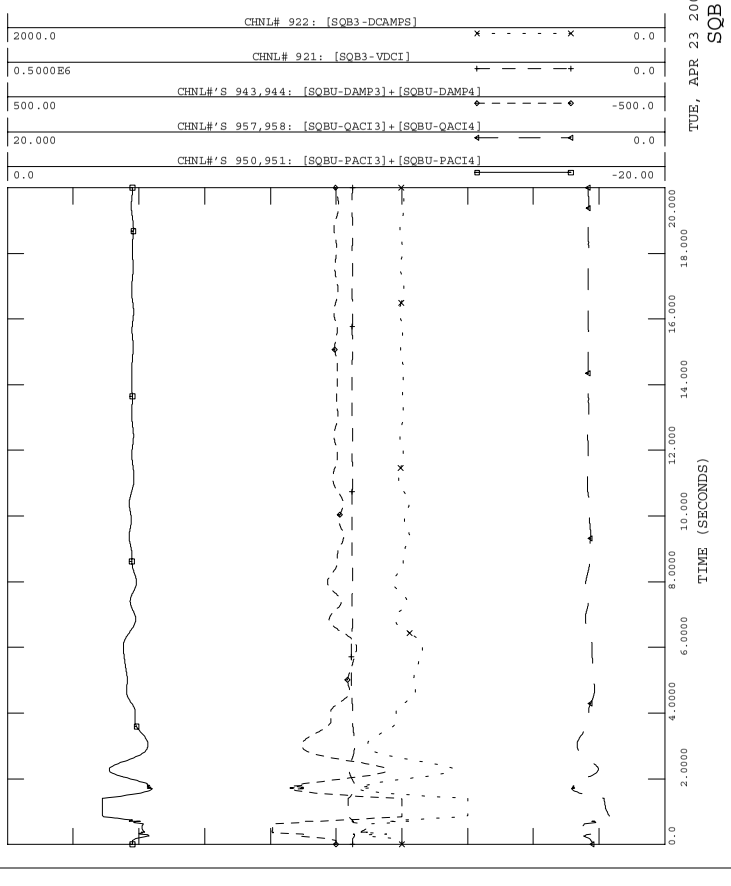
VAR LOSSES



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07

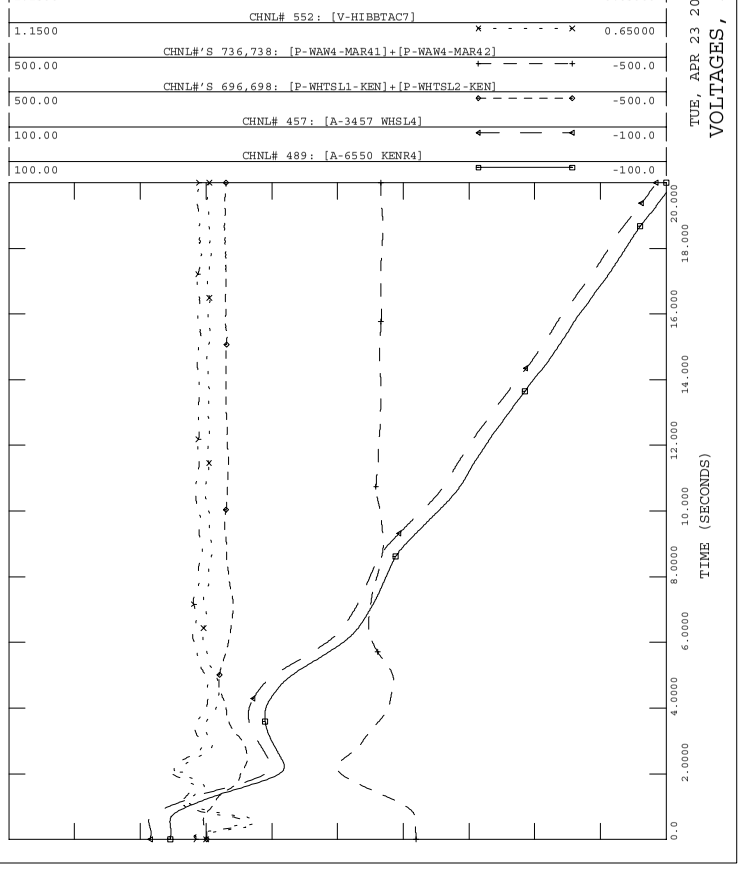
SQB DC #3



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

TUE, APR 23 2002 12:07

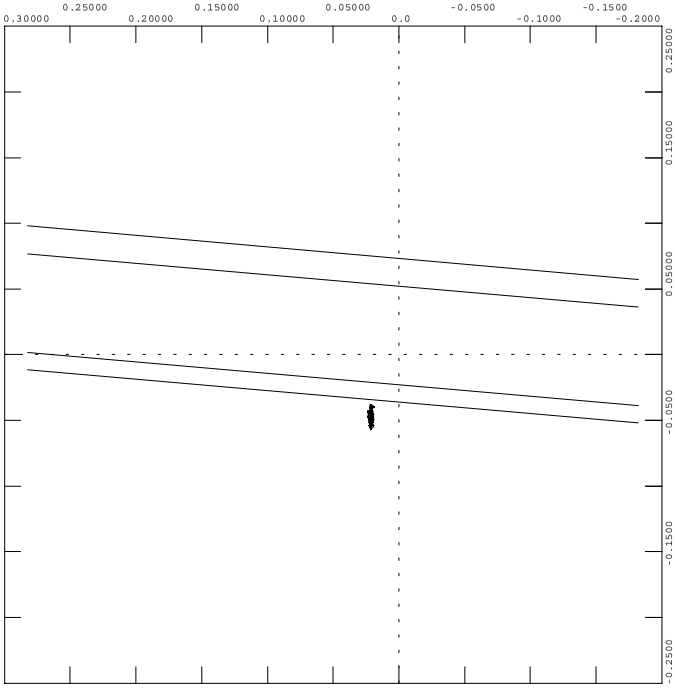
VOLTAGES, ANGLES



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 23 2002 12:07
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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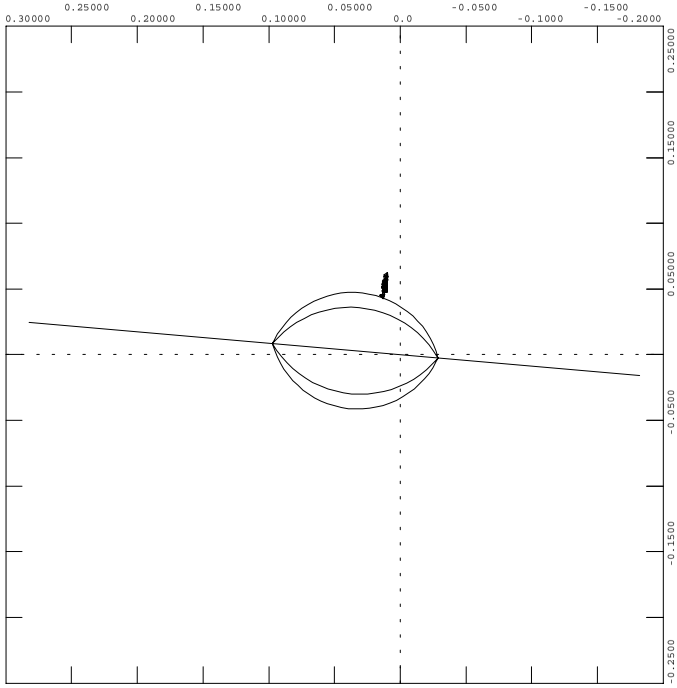
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

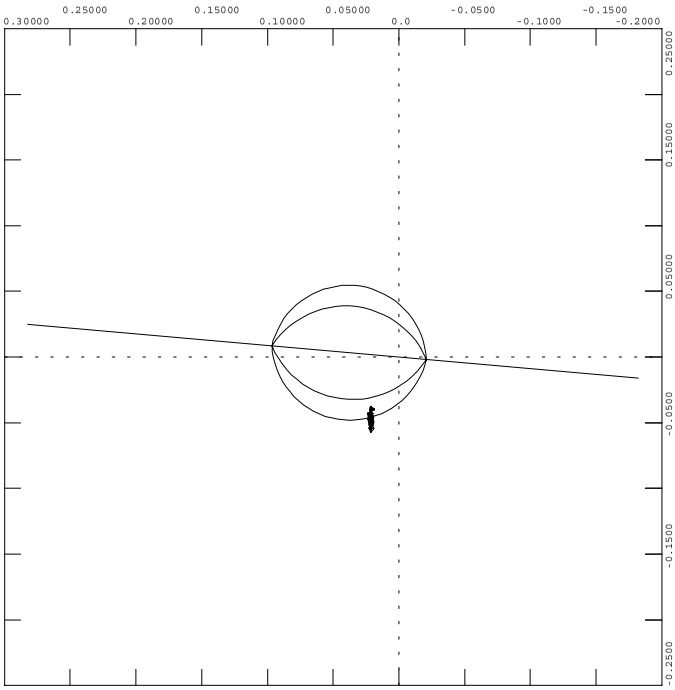


TUE, APR 23 2002 12:07
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

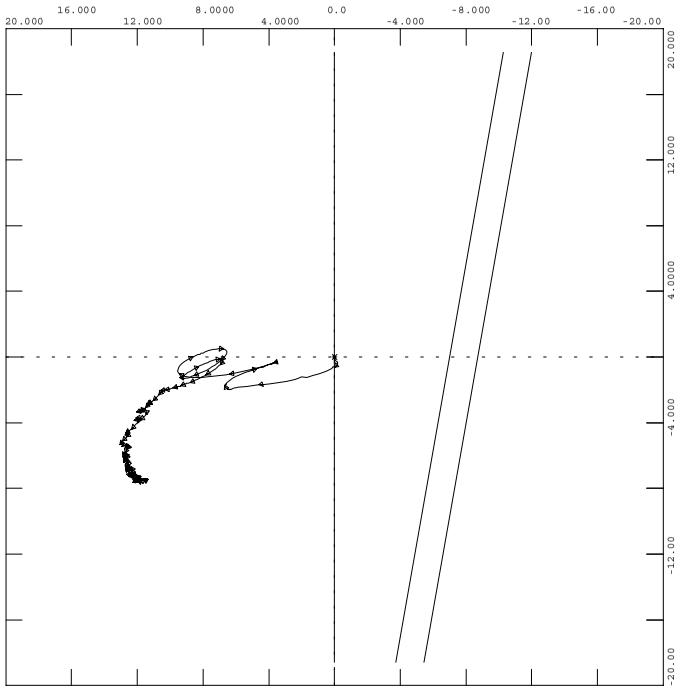


TUE, APR 23 2002 12:07
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

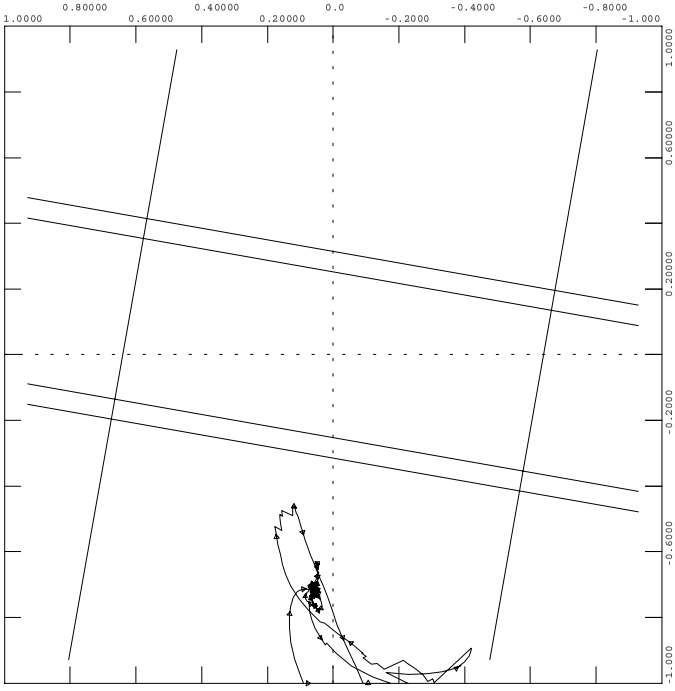


TUE, APR 23 2002 12:07
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

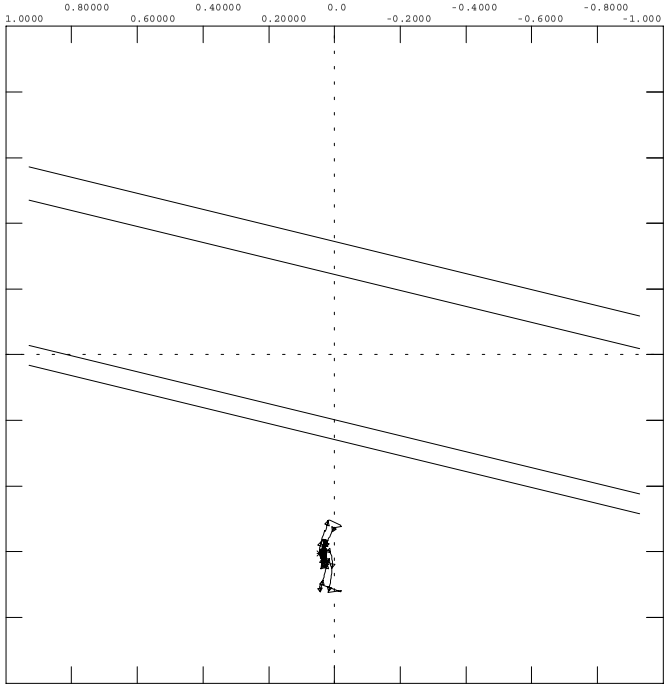


TUE, APR 23 2002 12:07
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

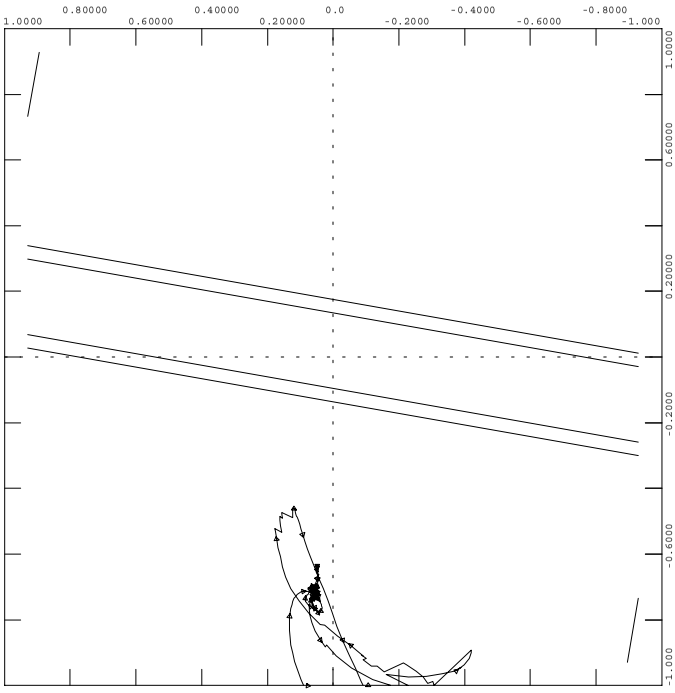


TUE, APR 23 2002 12:07
R50M AT MORANVILLE (520)

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

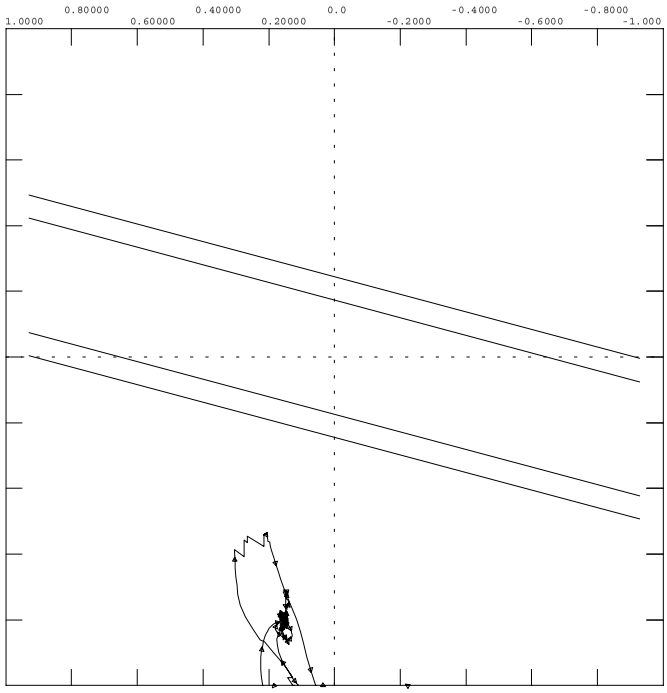


TUE, APR 23 2002 12:07
L20D AT DRAYTON (506)

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

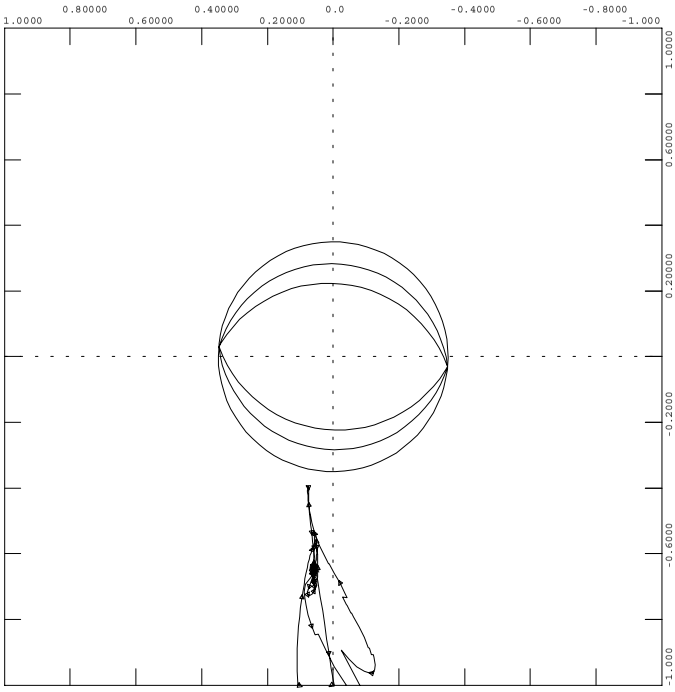


TUE, APR 23 2002 12:07
L20D-PRAIRIE (510)

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

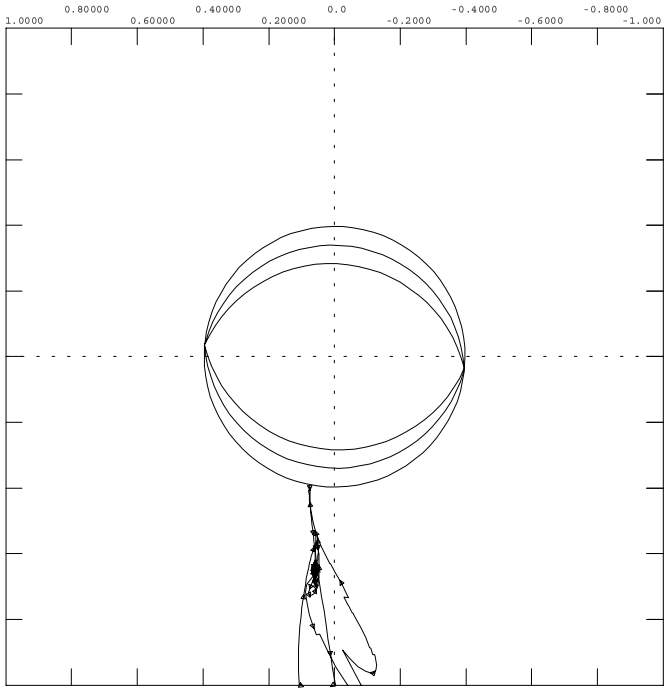
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

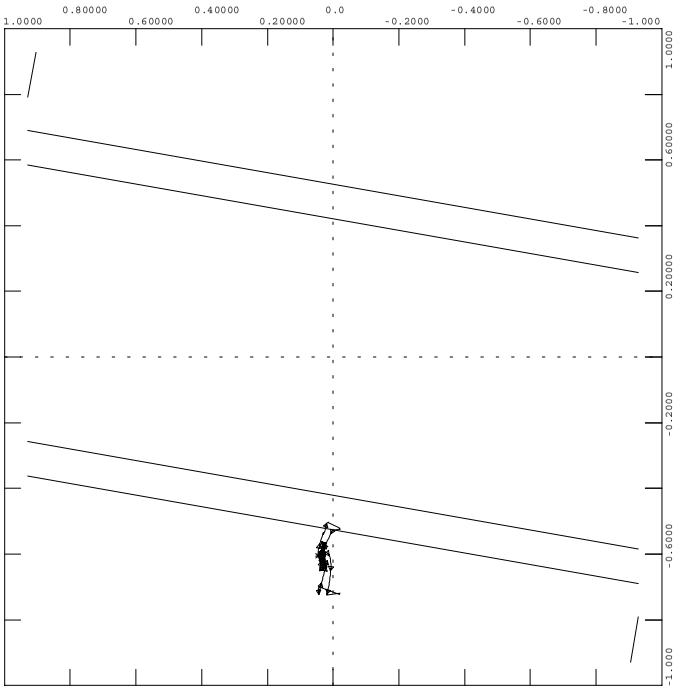
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

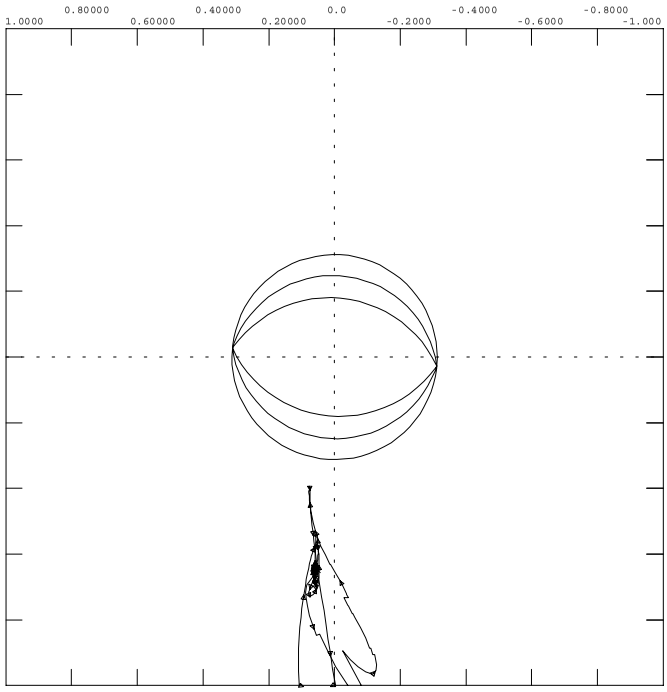
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



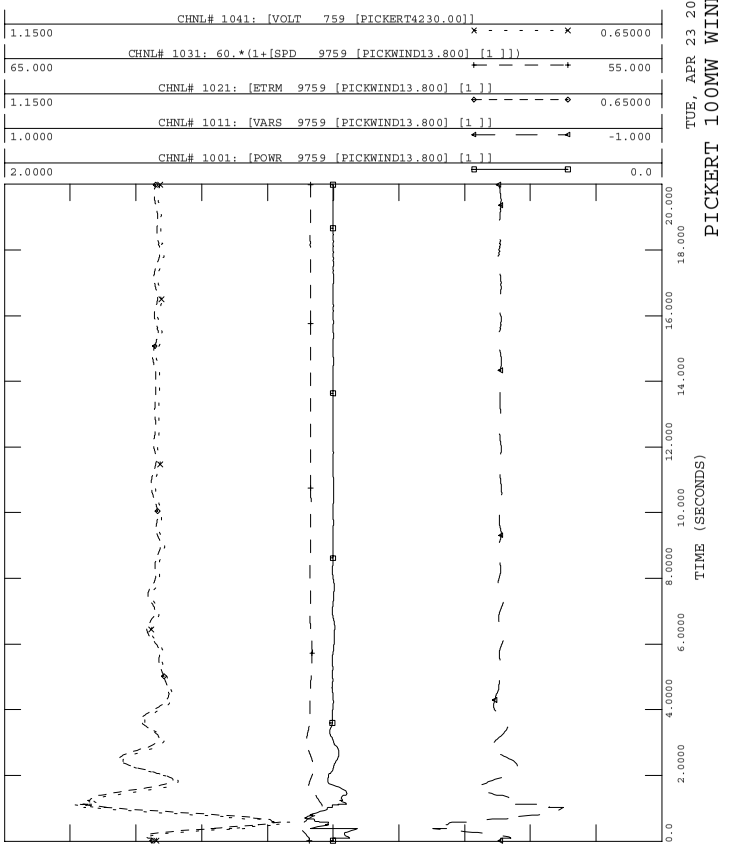
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

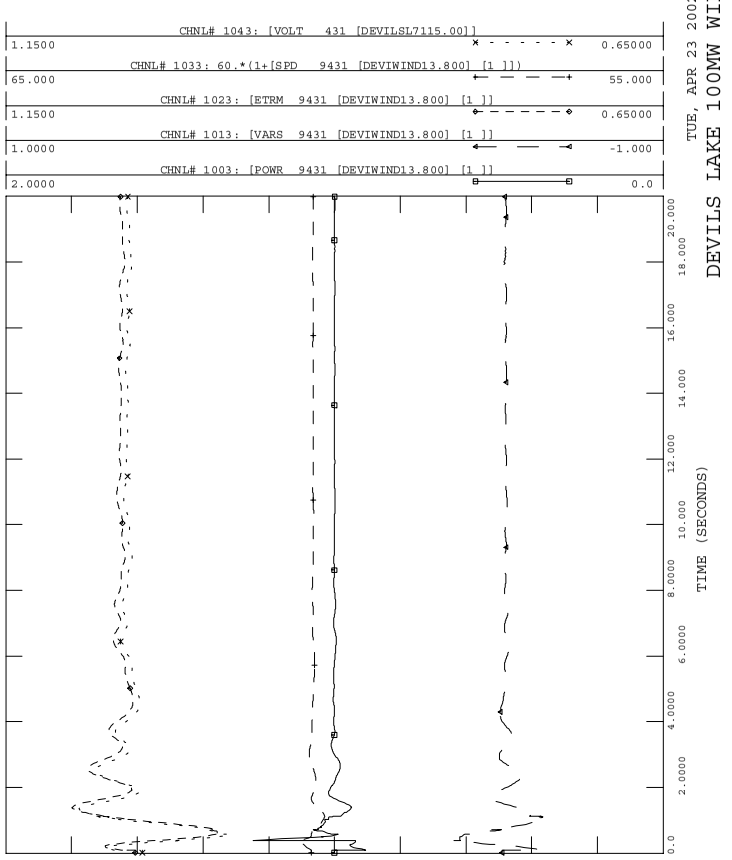


UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



TUE, APR 23 2002 12:07
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

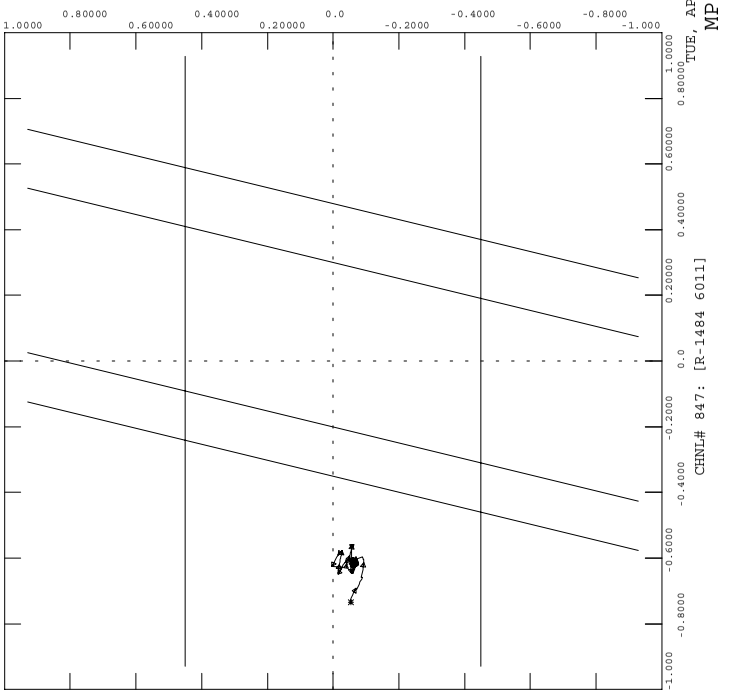


TUE, APR 23 2002 12:07
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

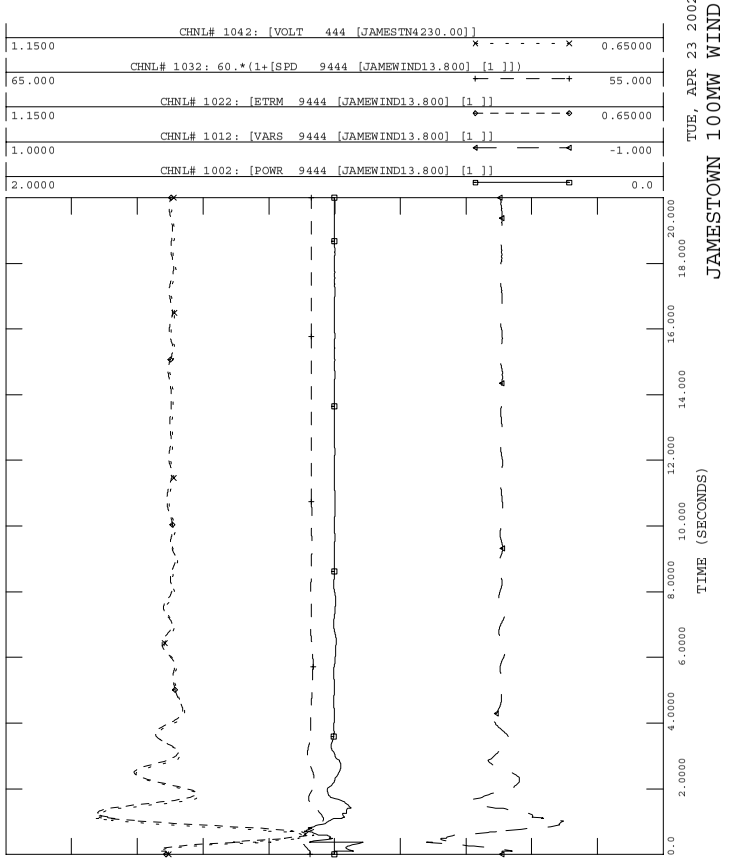
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



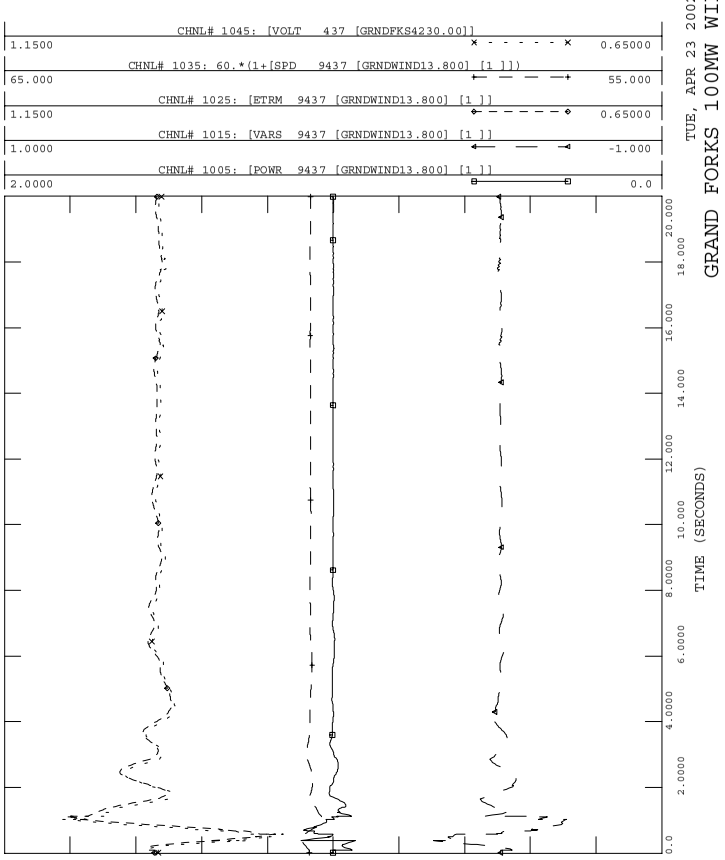
TUE, APR 23 2002 12:07
MP-OH I.FALLS (779)

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



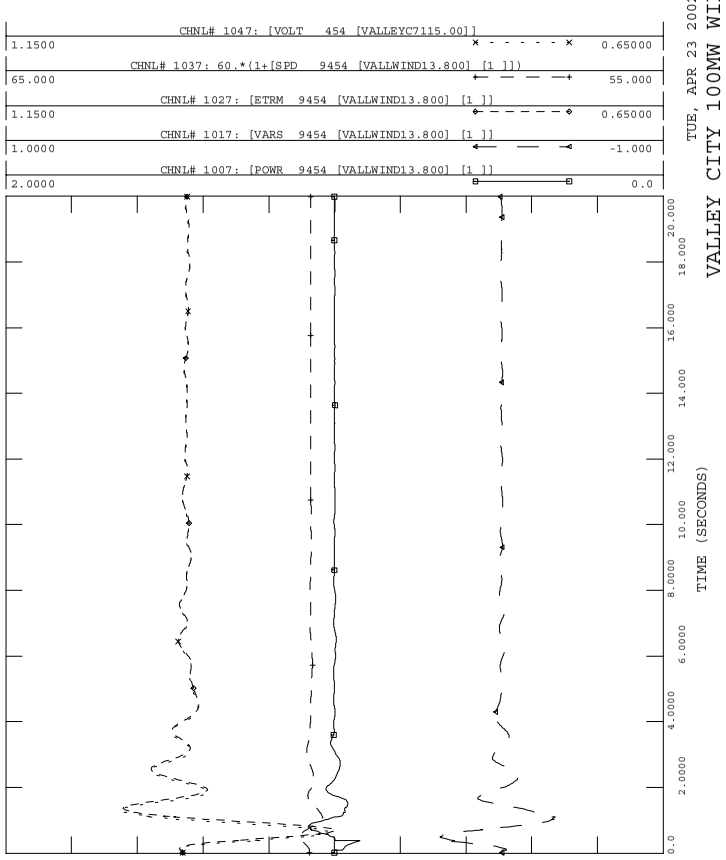
TUE, APR 23 2002 12:07
JAMESTOWN 100MW WIND UNIT

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



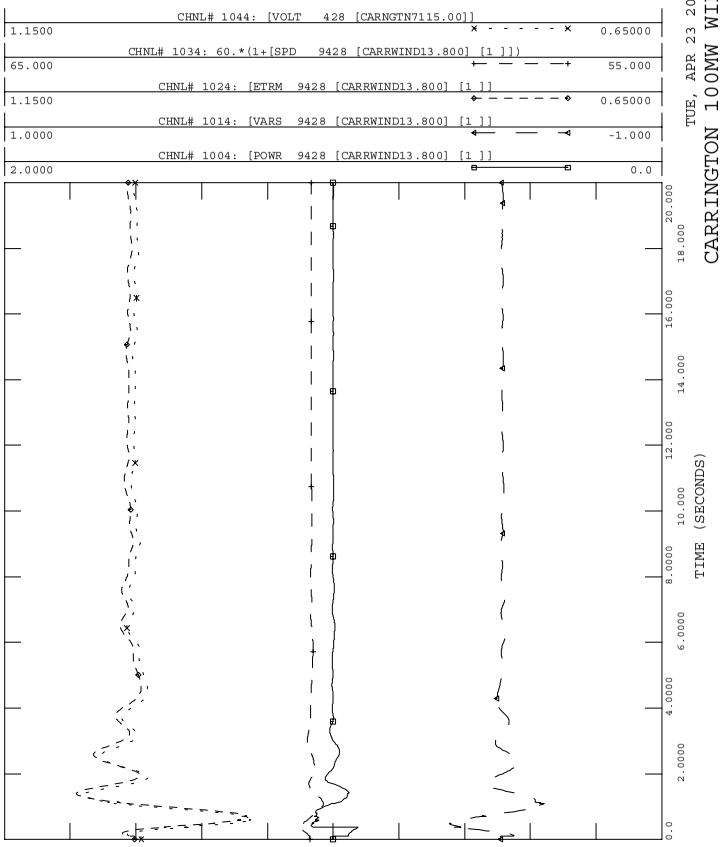
TUE, APR 23 2002 12:07
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



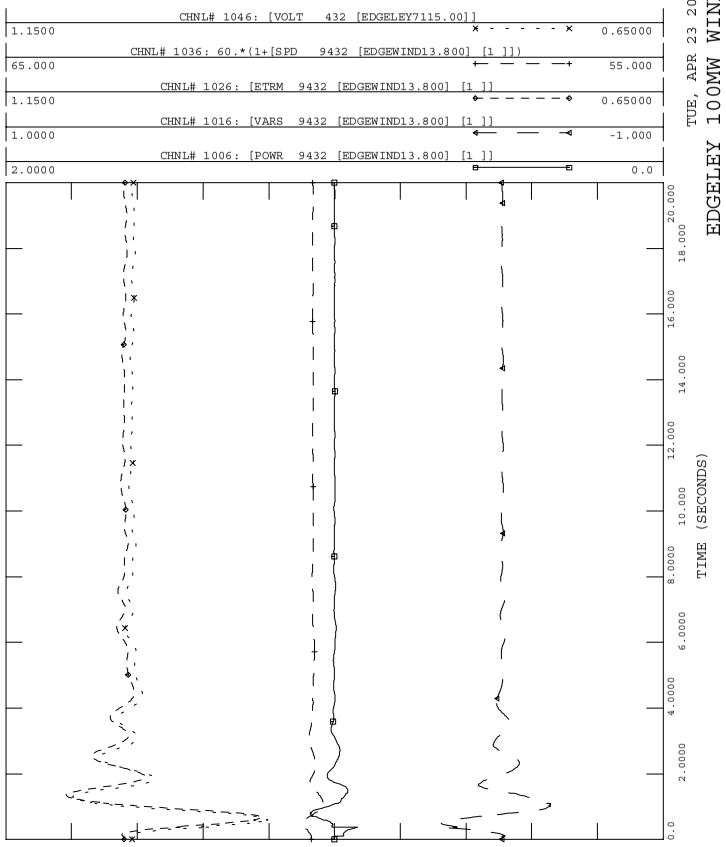
TUE, APR 23 2002 12:07
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



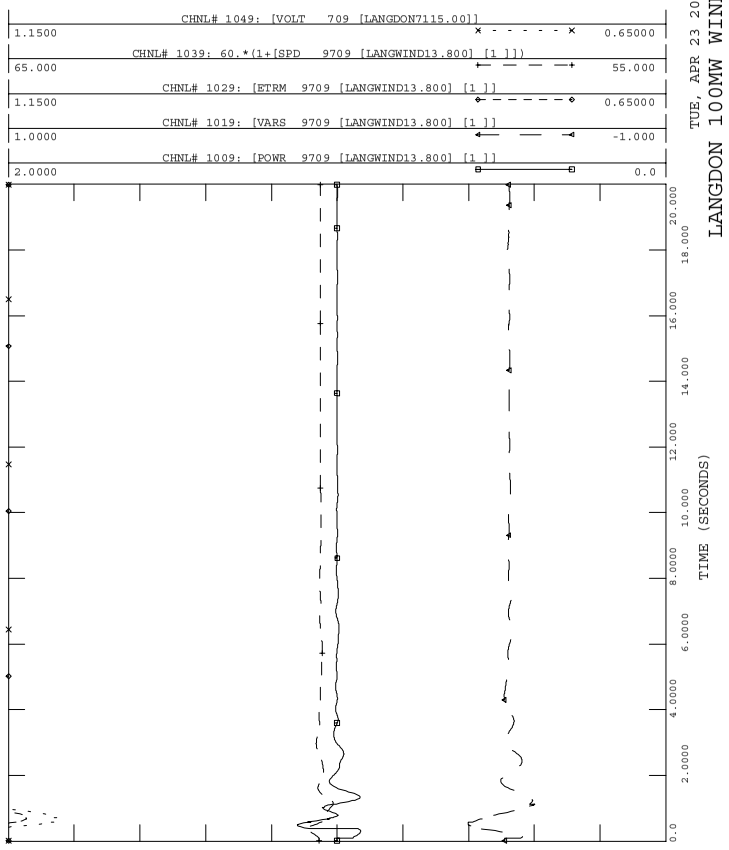
TUE, APR 23 2002 12:07
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin

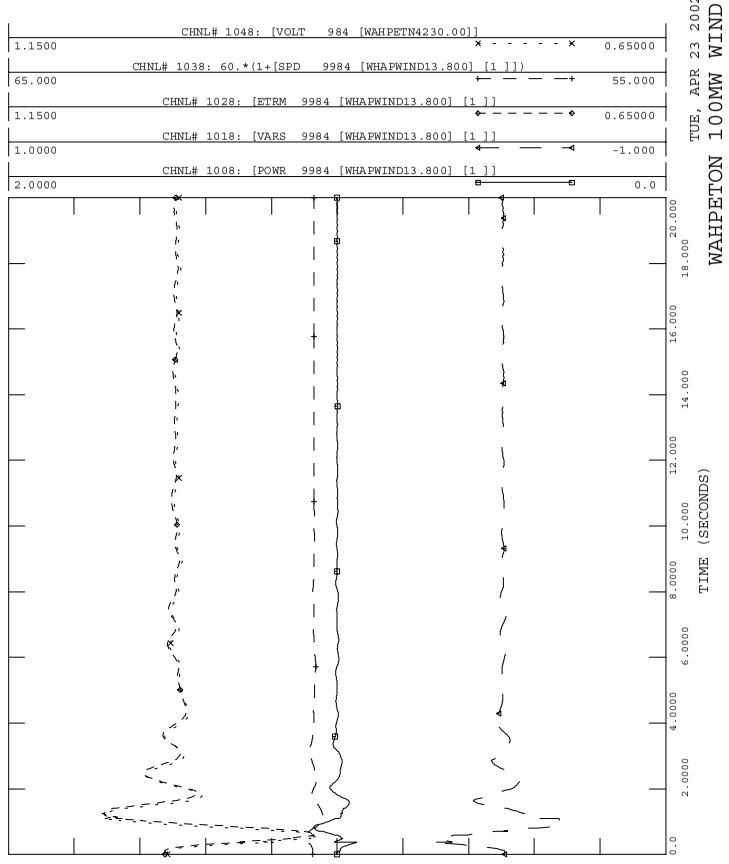


TUE, APR 23 2002 12:07
EDGELEY 100MW WIND UNIT

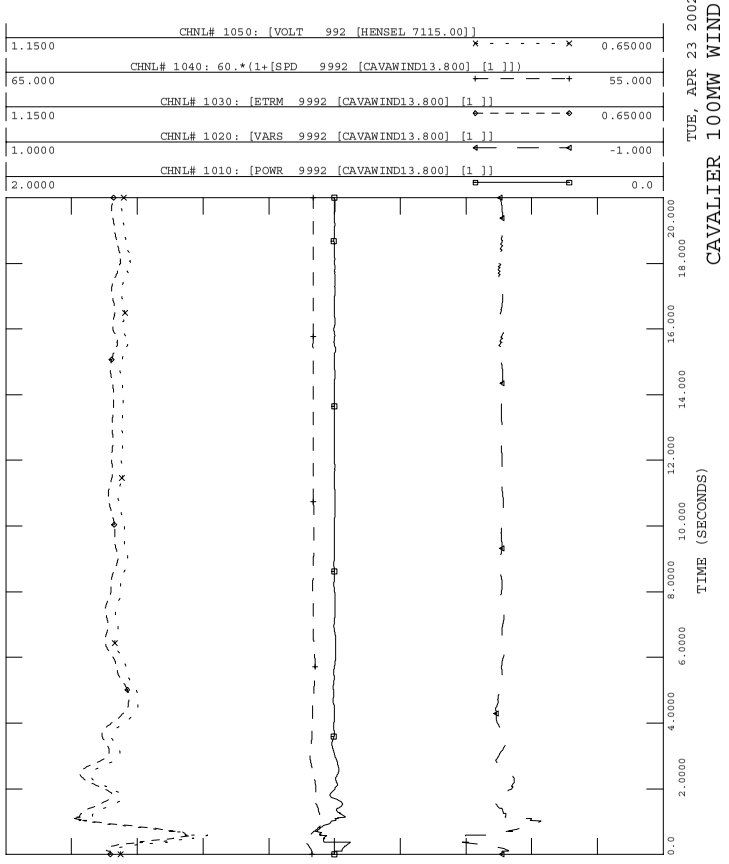
UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



UPE-SO04AA.S2C3XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3083,MH=2168,MW=1476,OHMH=-196,OHMP=150,EWTW=-120,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XXX-ei2.bin



APPENDIX 15

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

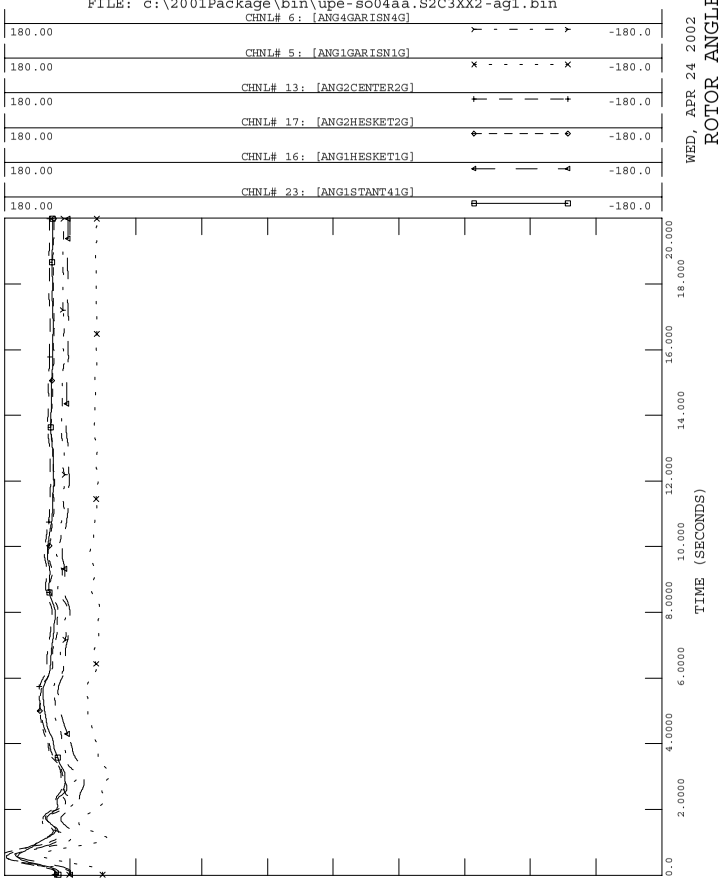
SITE 2 (JAMESTOWN)

CASE S2C3XX2

CONTINGENCY AG1

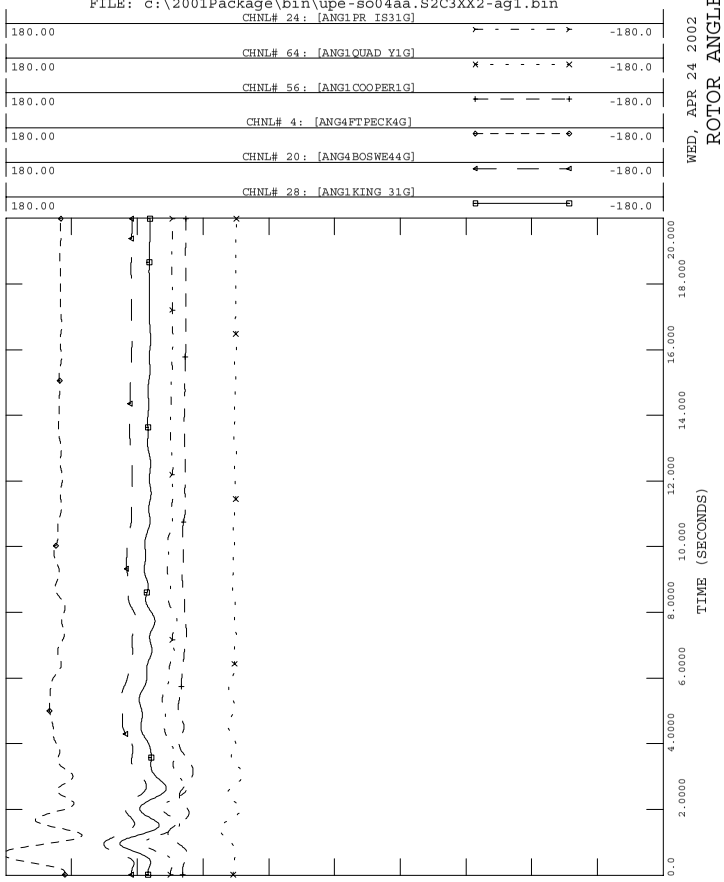
Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



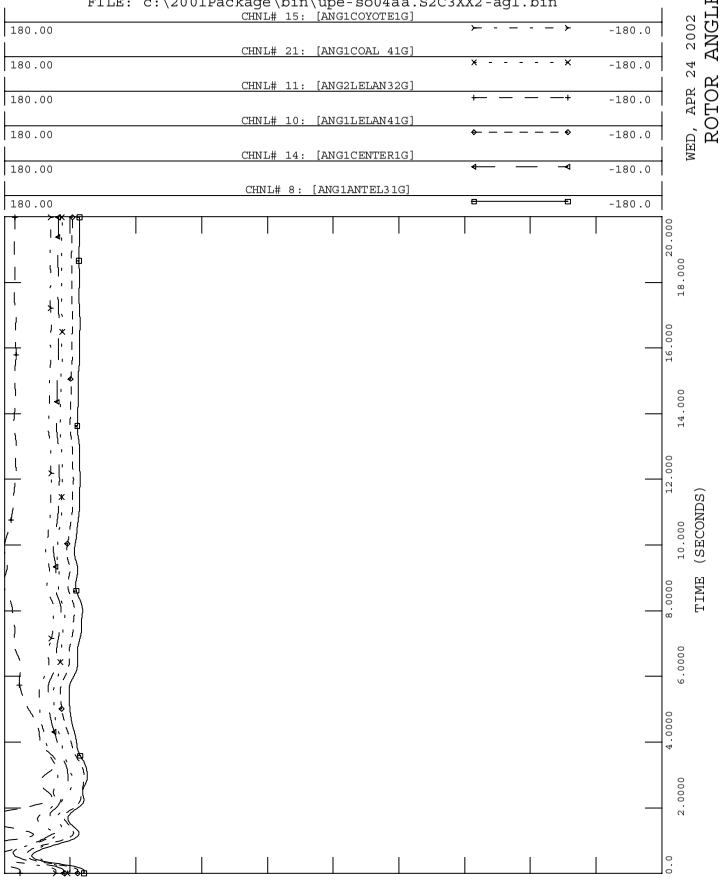
WED, APR 24 2002 17:18
ROTOR ANGLES 2

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



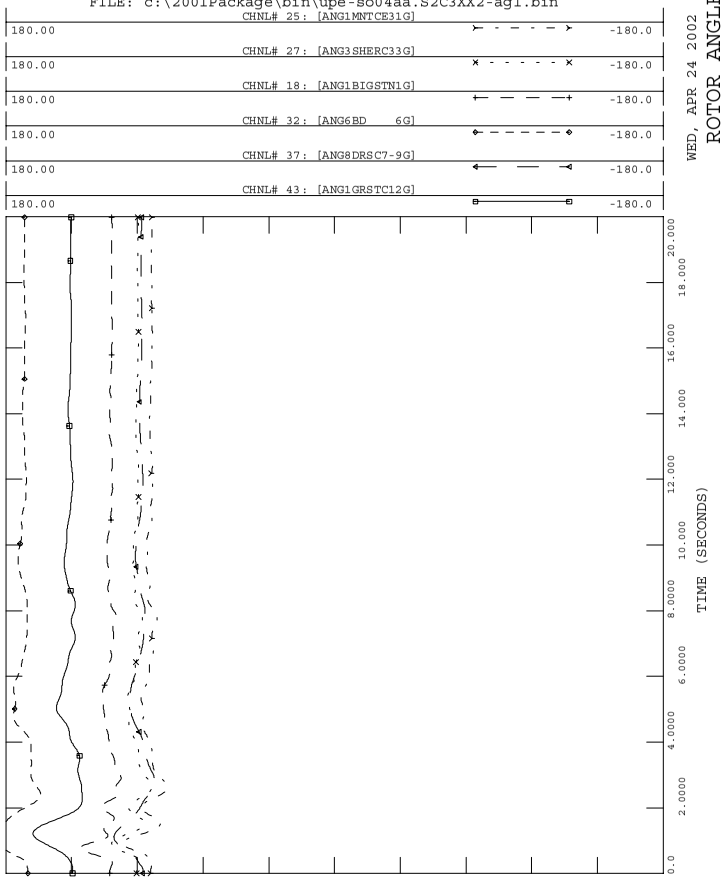
WED, APR 24 2002 17:18
ROTOR ANGLES 4

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



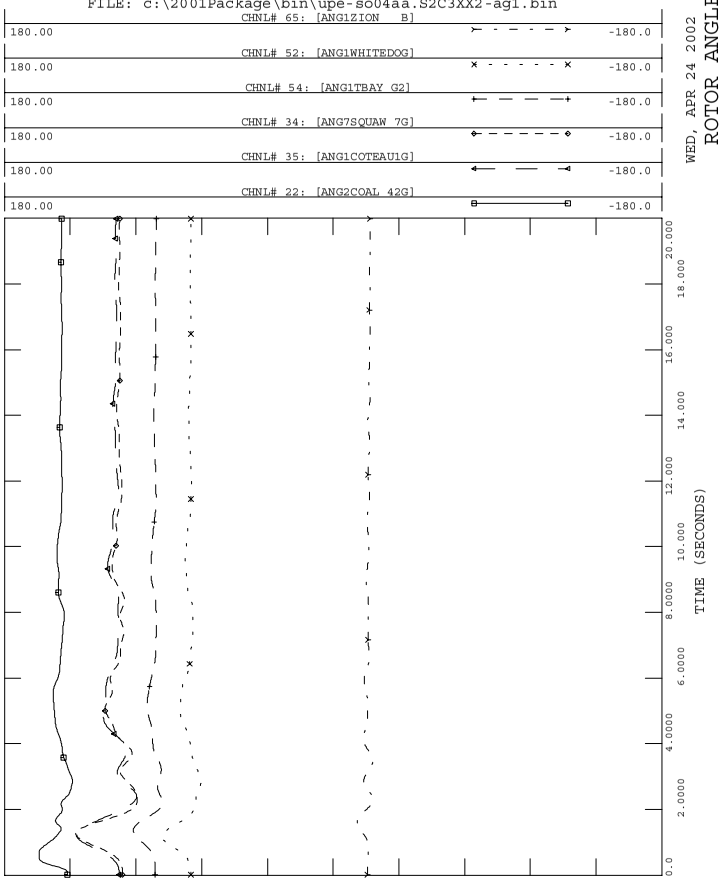
WED, APR 24 2002 17:18
ROTOR ANGLES 1

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



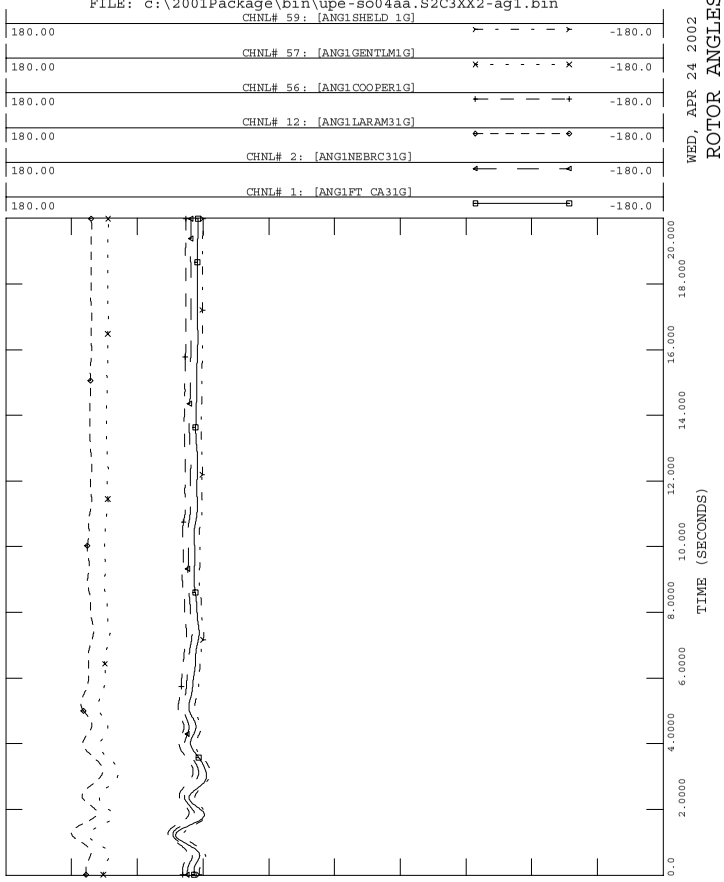
WED, APR 24 2002 17:18
ROTOR ANGLES 3

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



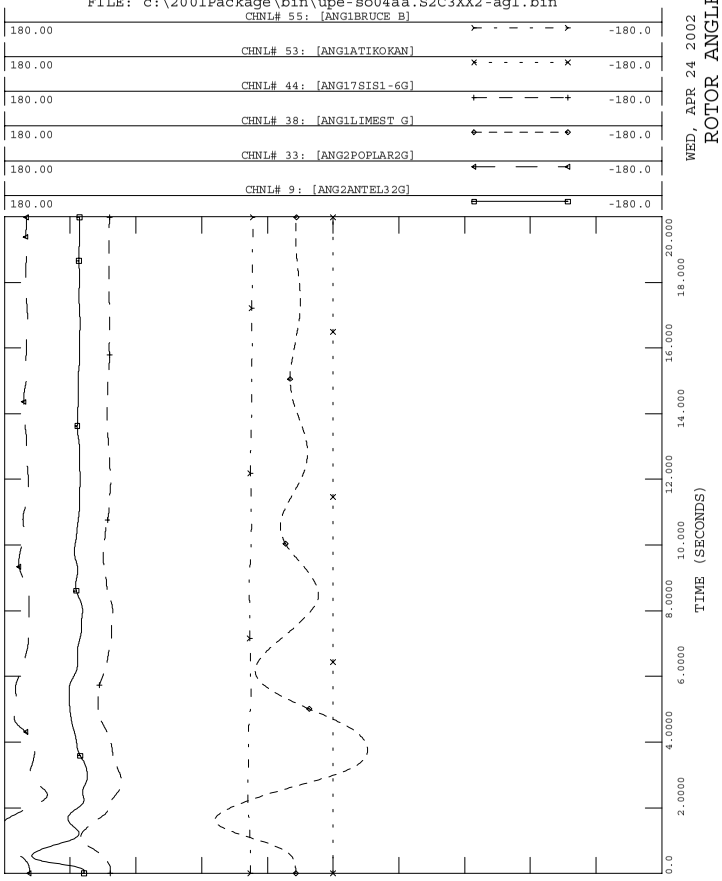
WED, APR 24 2002 17:18
ROTOR ANGLES 6

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



WED, APR 24 2002 17:18
ROTOR ANGLES NB

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



WED, APR 24 2002 17:18
ROTOR ANGLES 5

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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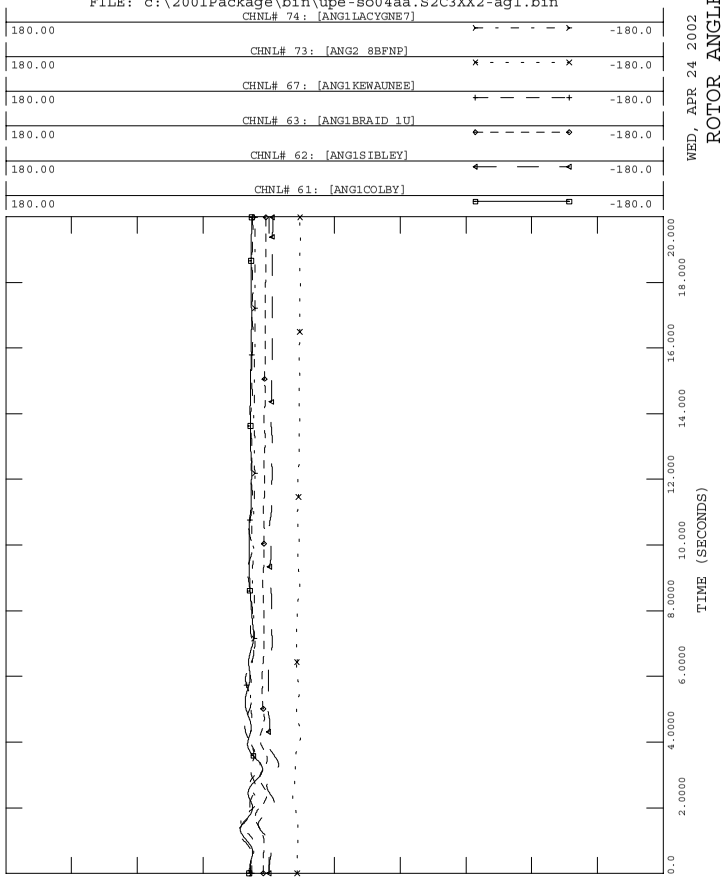
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



WED, APR 24 2002 17:18
ROTOR ANGLES 7

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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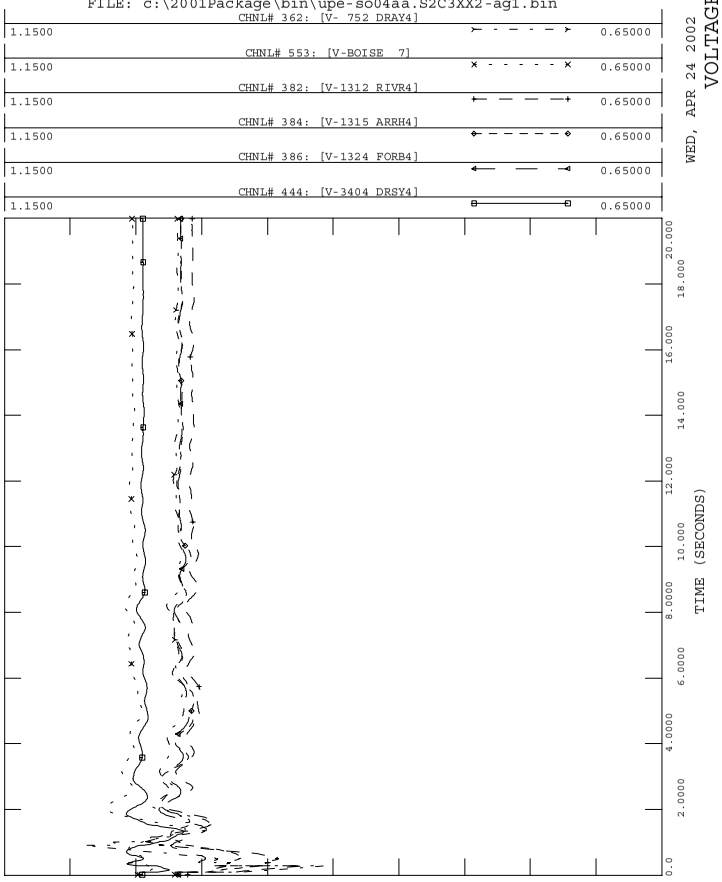
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
VOLTAGES 1



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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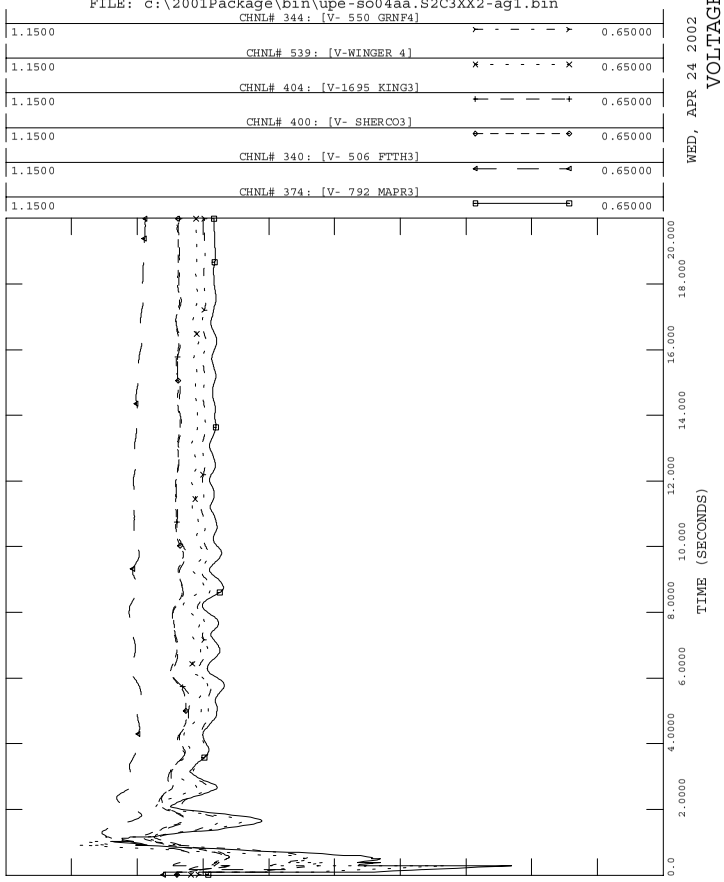
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
VOLTAGES 3



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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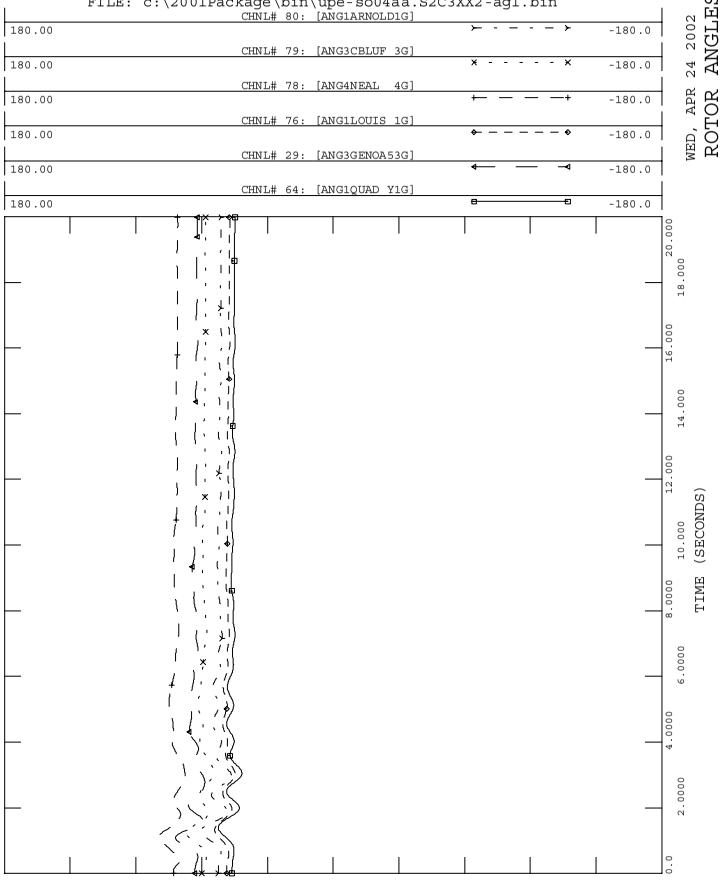
WED, APR 24 2002 17:18
ROTOR ANGLES IA



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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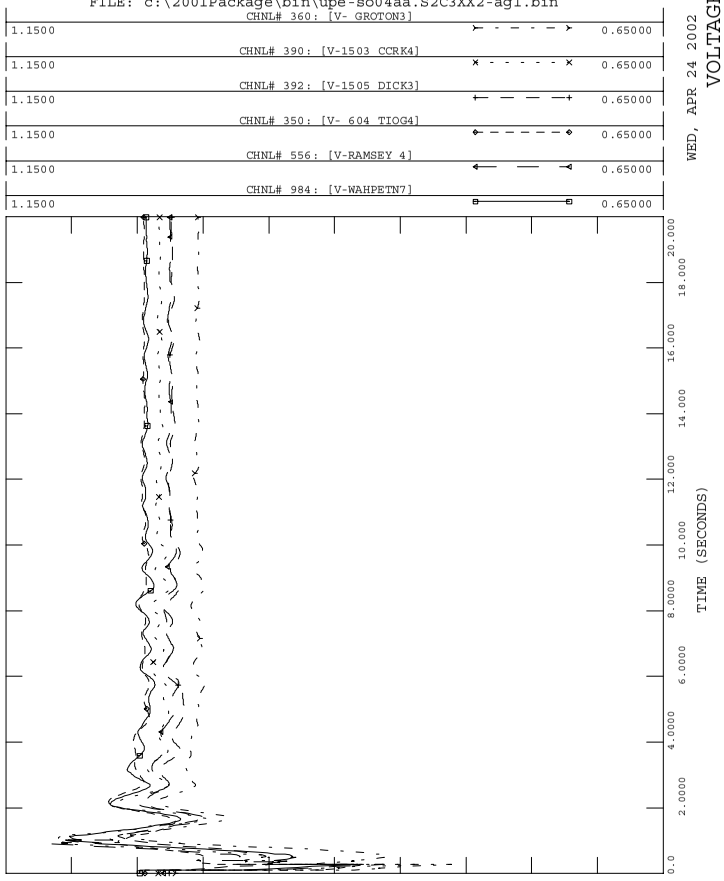
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
VOLTAGES 2



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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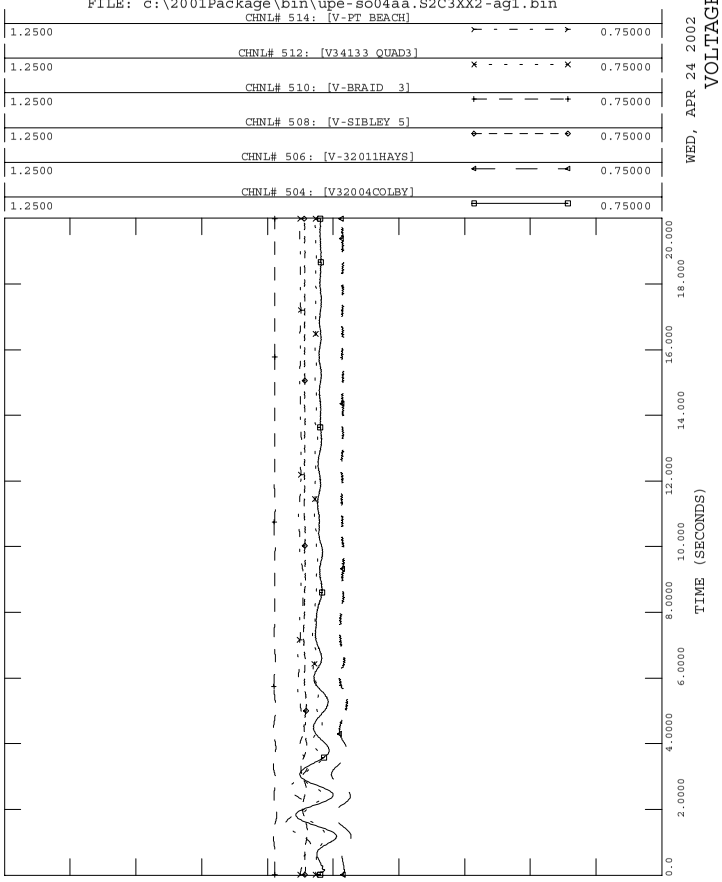
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
VOLTAGES 5



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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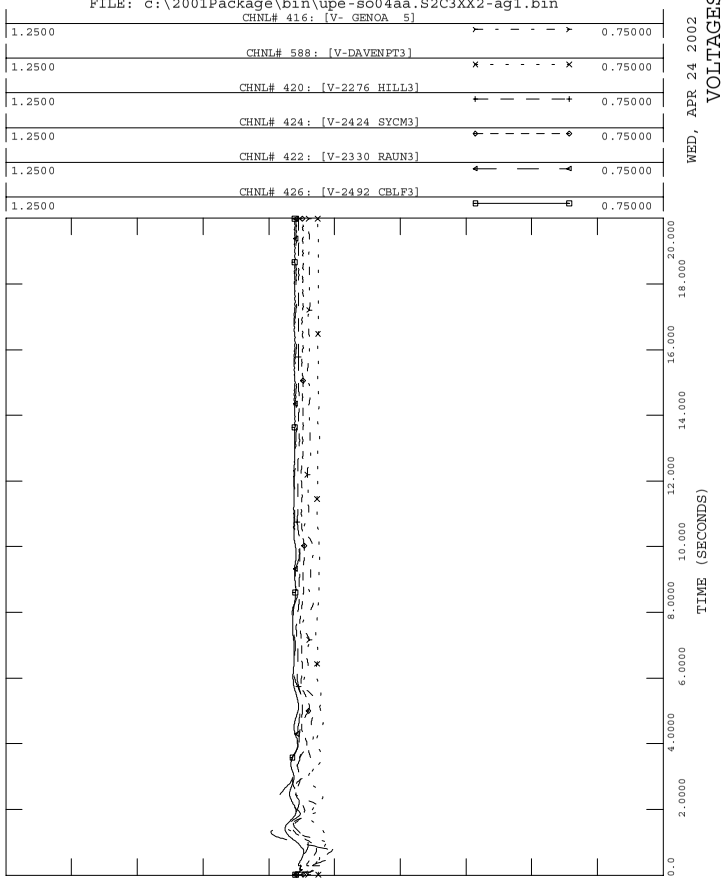
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
VOLTAGES IA



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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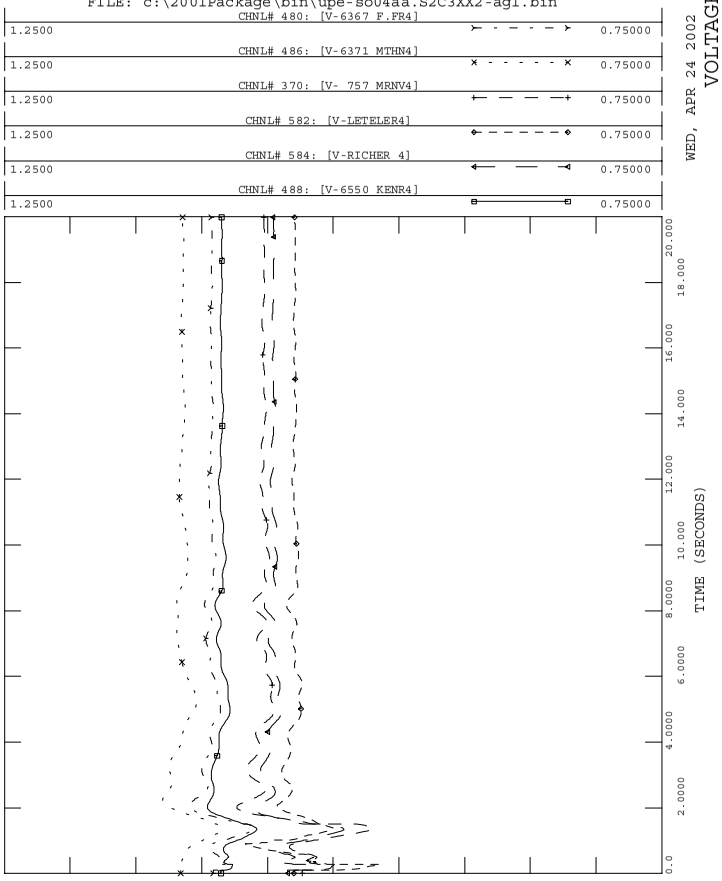
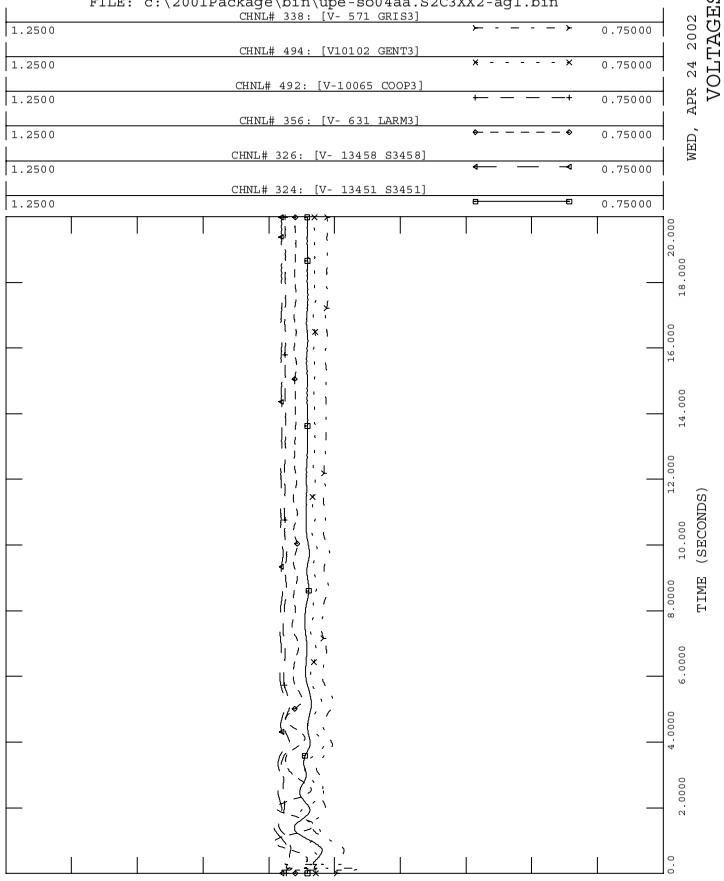
WED, APR 24 2002 17:18
VOLTAGES 4

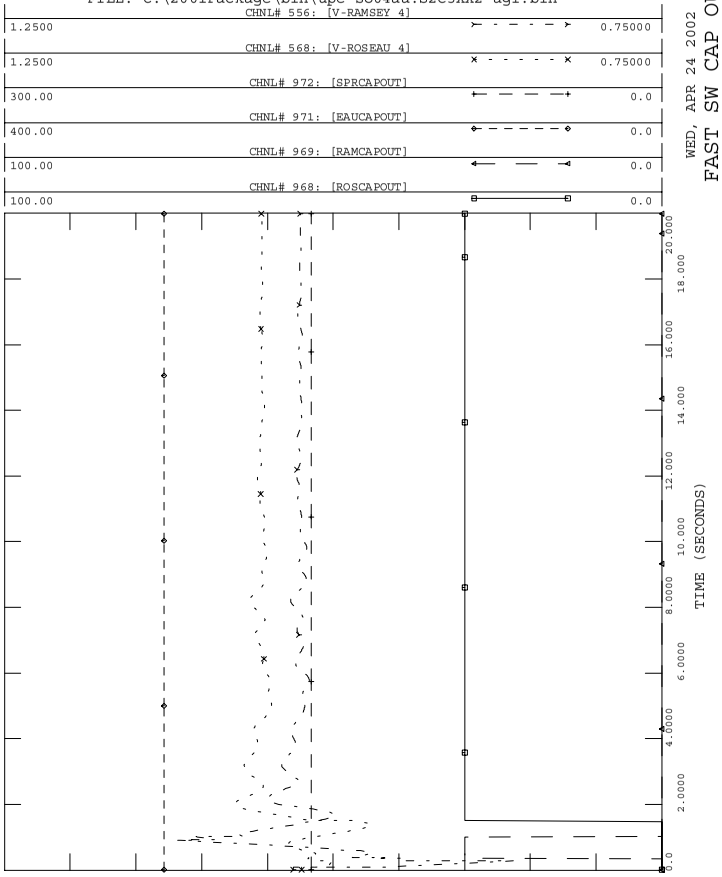


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
VOLTAGES NB

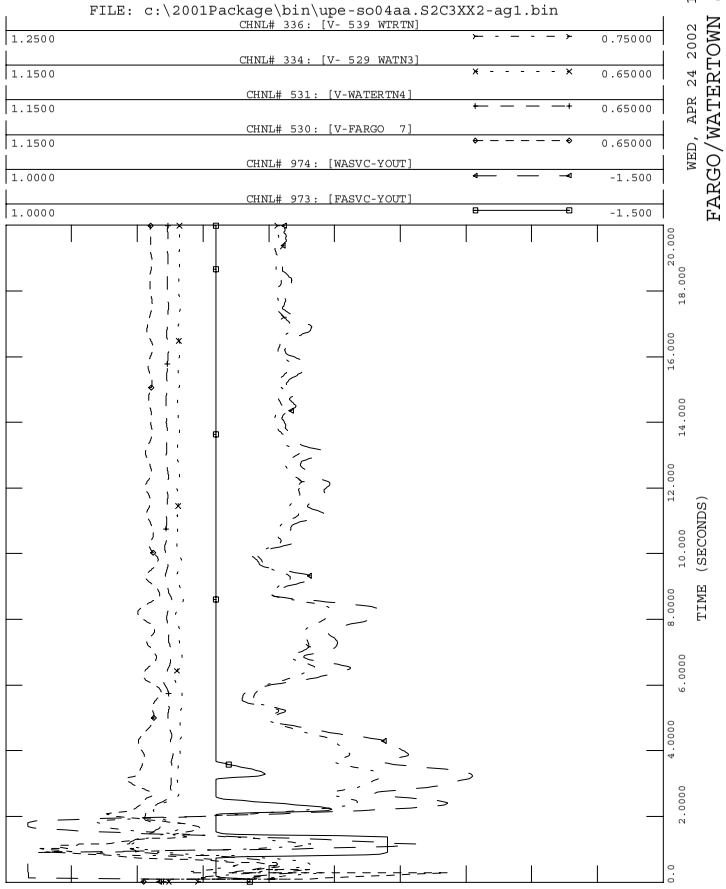


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



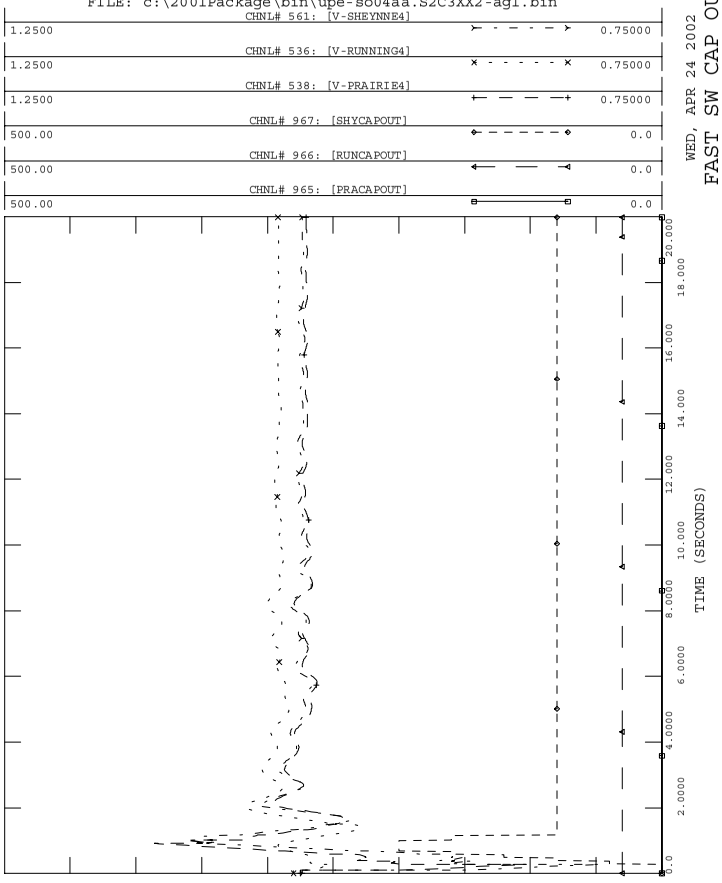
WED, APR 24 2002 17:18
FAST SW CAP OUT 2

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



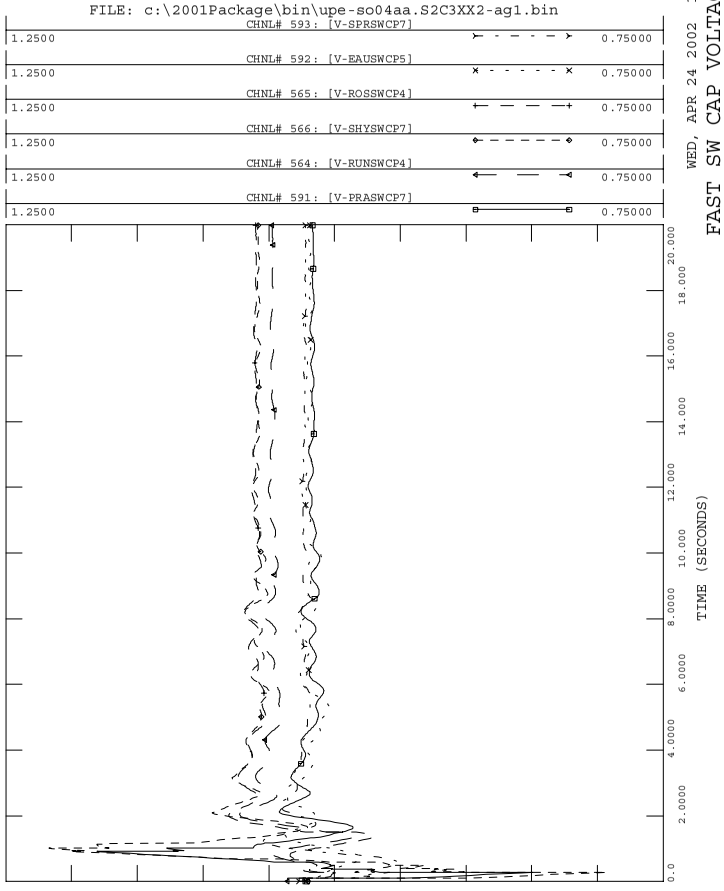
WED, APR 24 2002 17:18
FARGO/WATERTOWN SVS

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



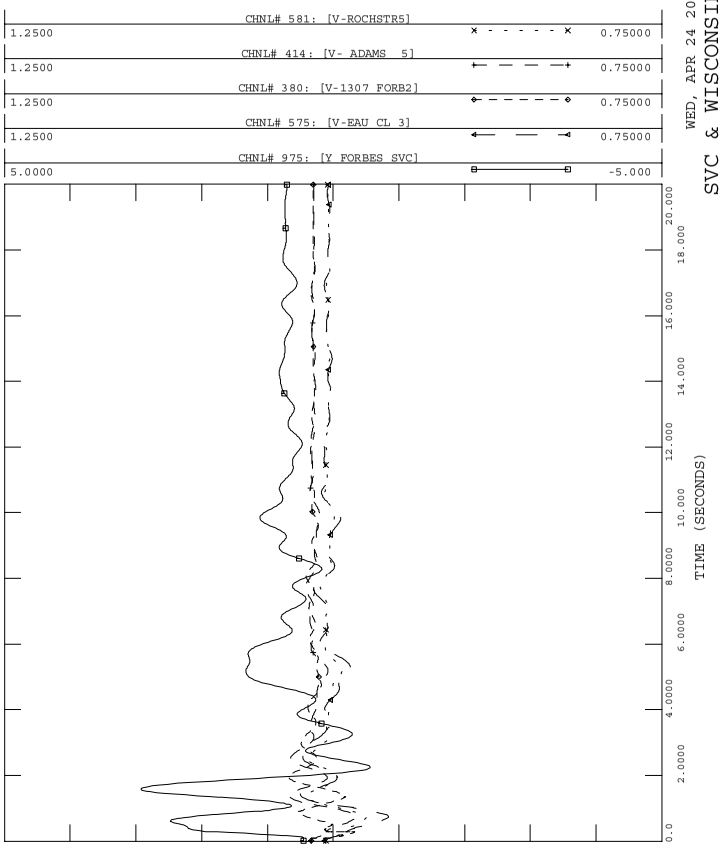
WED, APR 24 2002 17:18
FAST SW CAP OUT 1

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



WED, APR 24 2002 17:18
FAST SW CAP VOLTAGES

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



WED, APR 24 2002 17:18
SVC & WISCONSIN VOLT

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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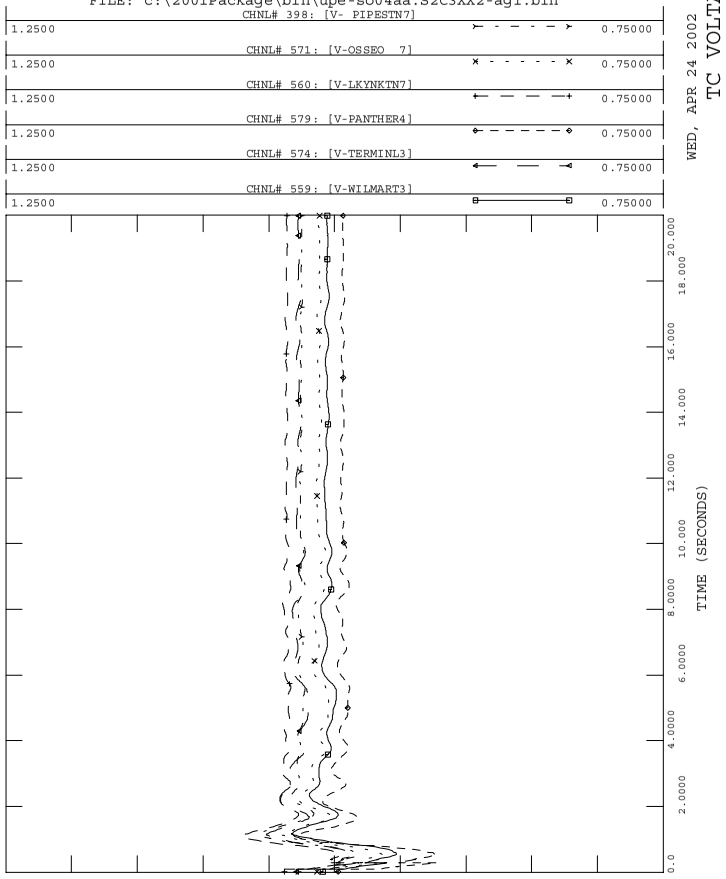
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



WED, APR 24 2002 17:18
TC VOLTAGES

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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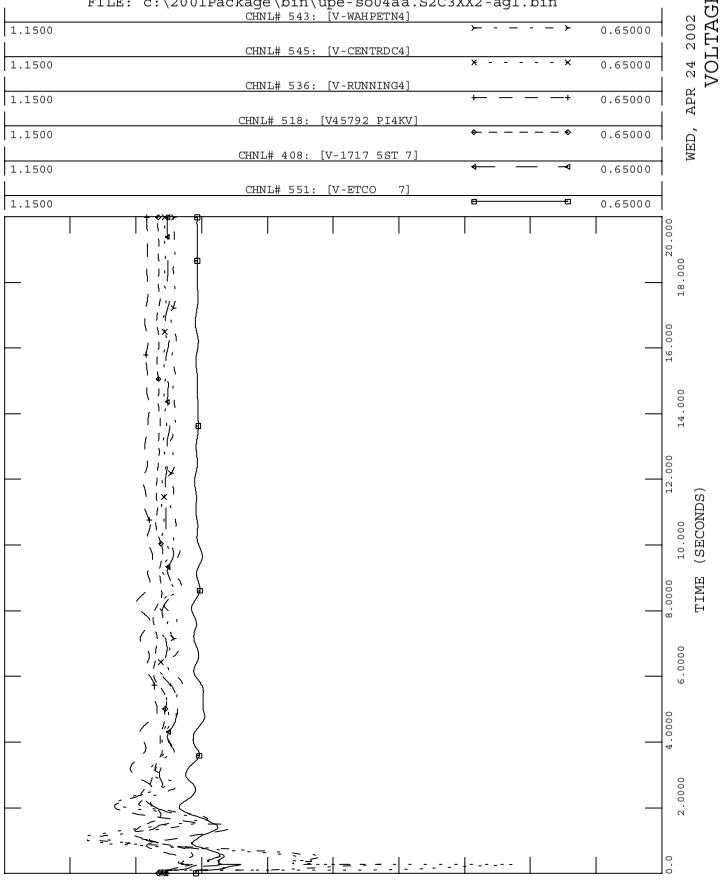
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



WED, APR 24 2002 17:18
VOLTAGES 6

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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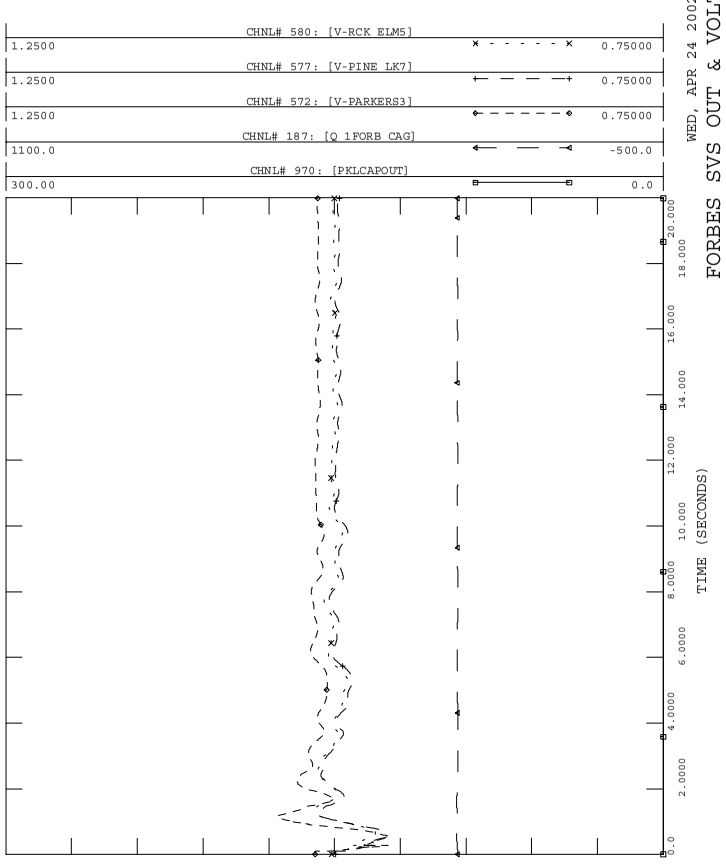
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



WED, APR 24 2002 17:18
FORBES SVS OUT & VOLTAGES

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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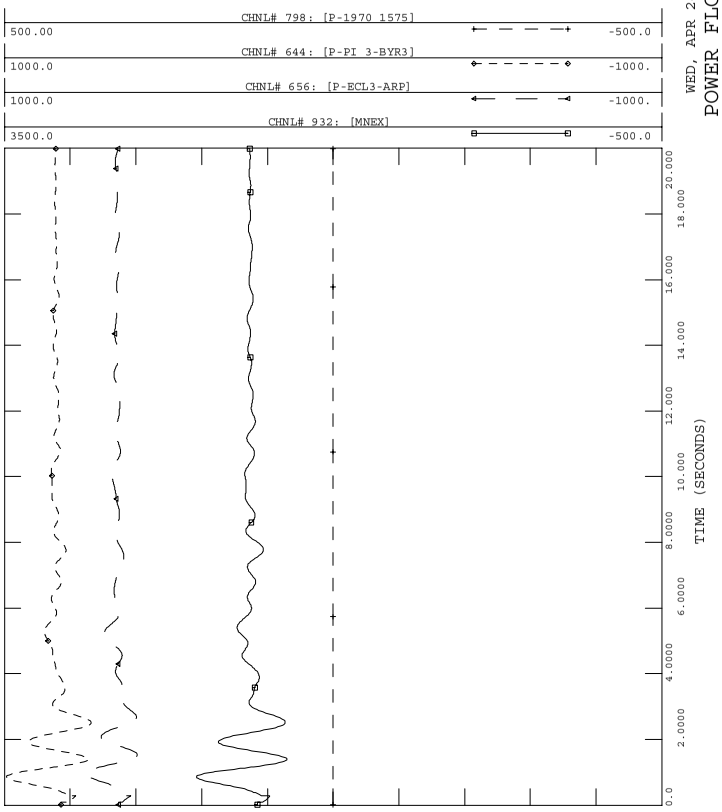
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
POWER FLOW SUMS 2



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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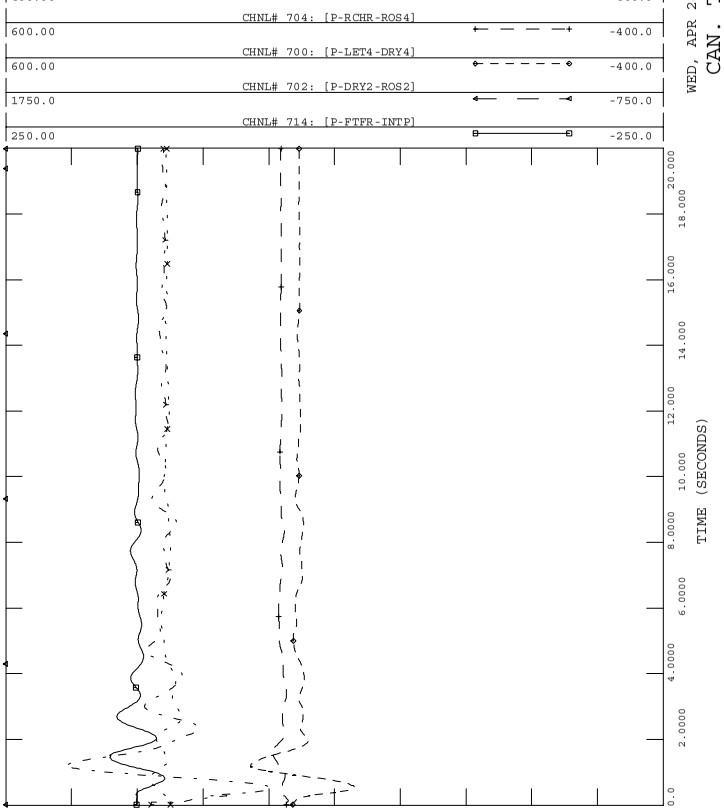
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
CAN. TIE FLOWS



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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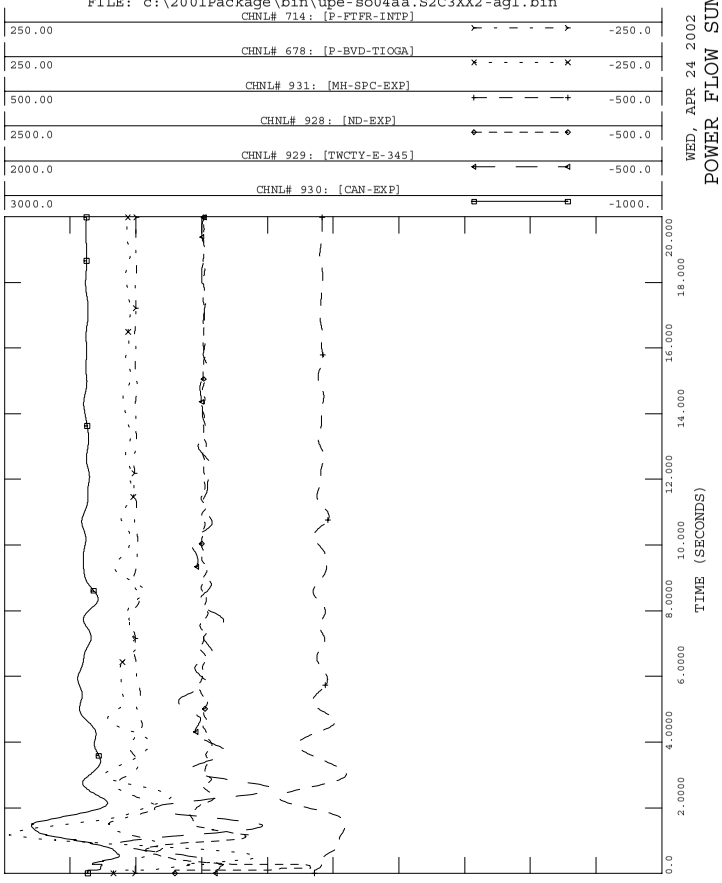
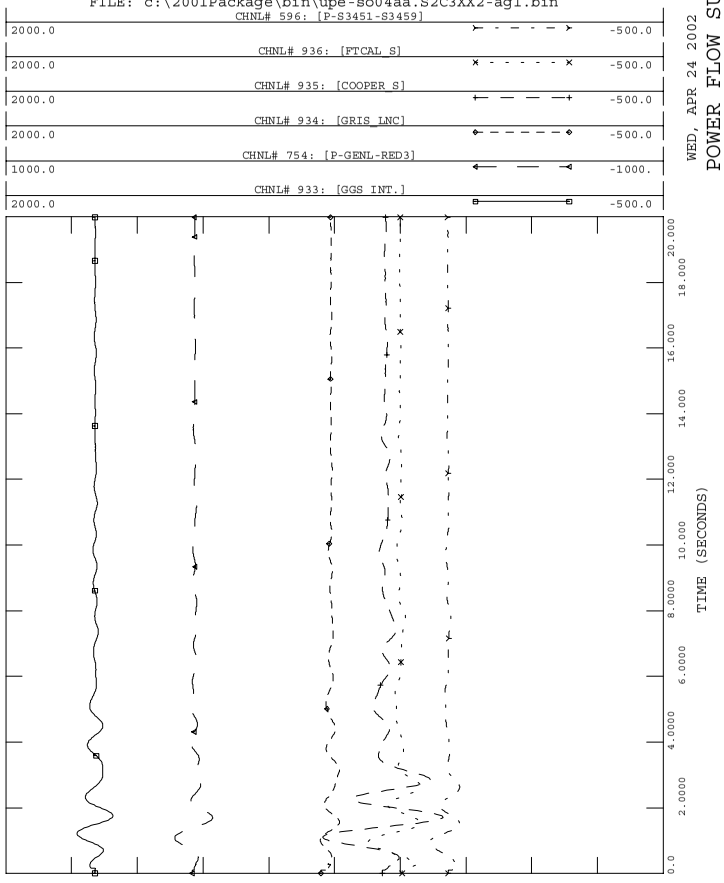
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
POWER FLOW SUMS 1



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
POWER FLOW SUM 3



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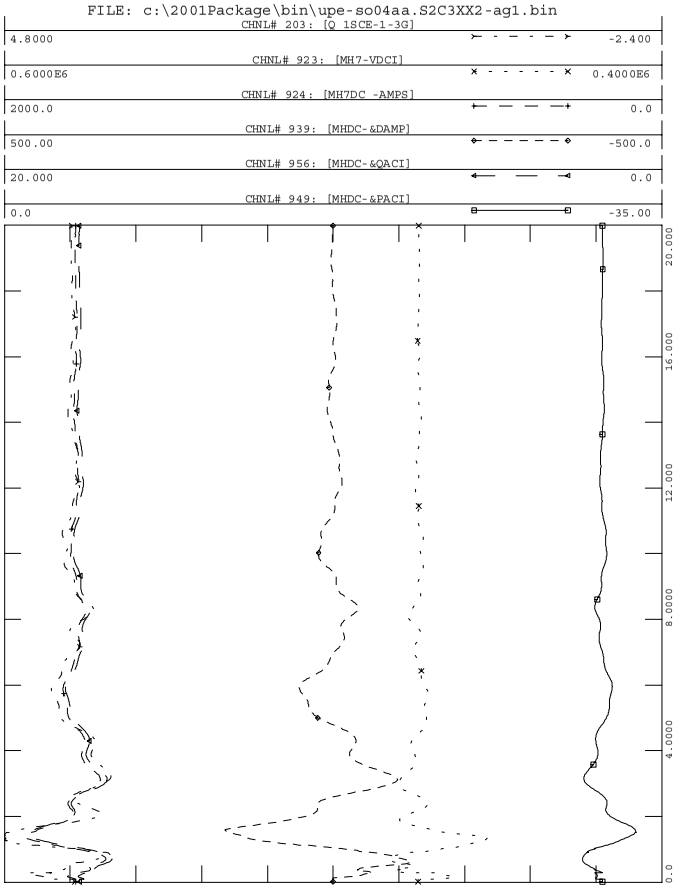
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
MH DC PARAMETERS



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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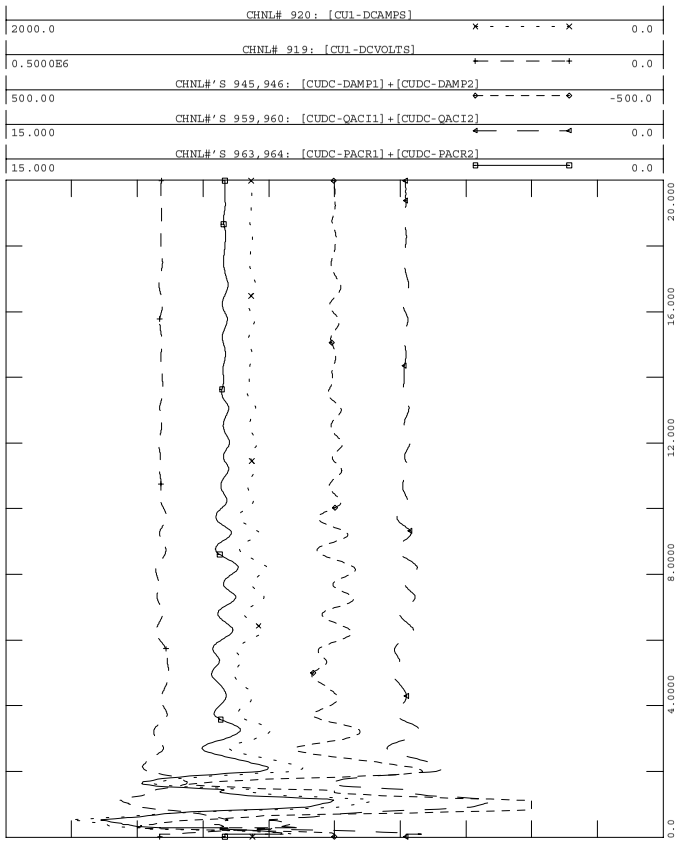
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

WED, APR 24 2002 17:18
CU DC #1



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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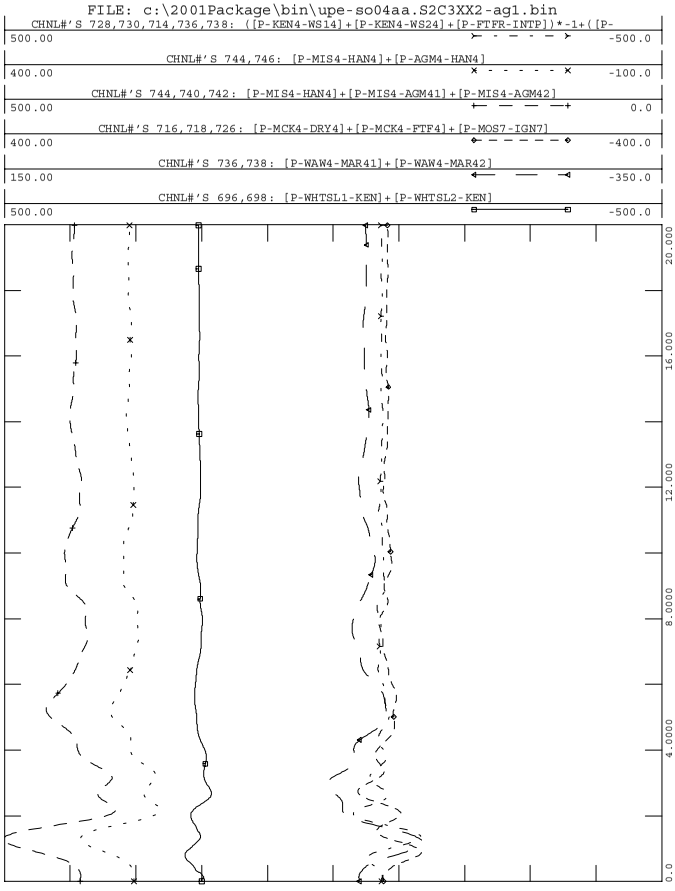
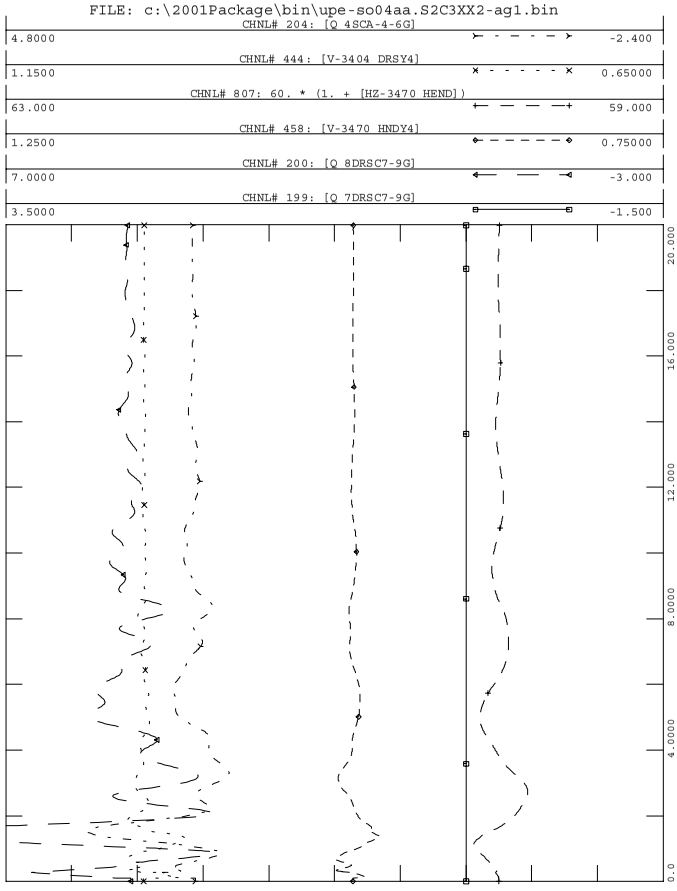
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

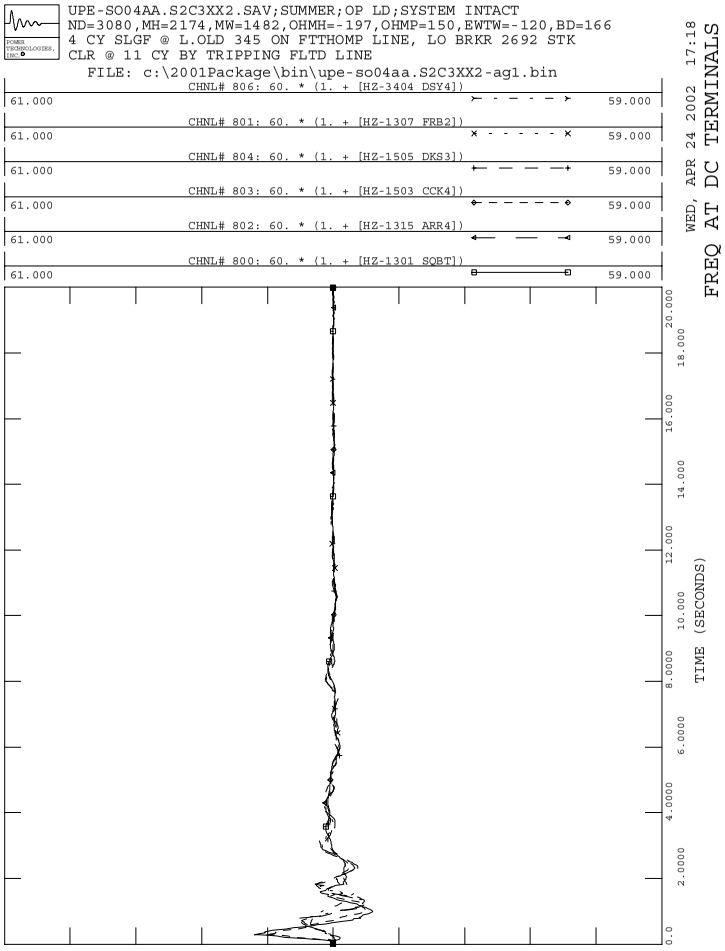
WED, APR 24 2002 17:18
OH TIE FLOWS

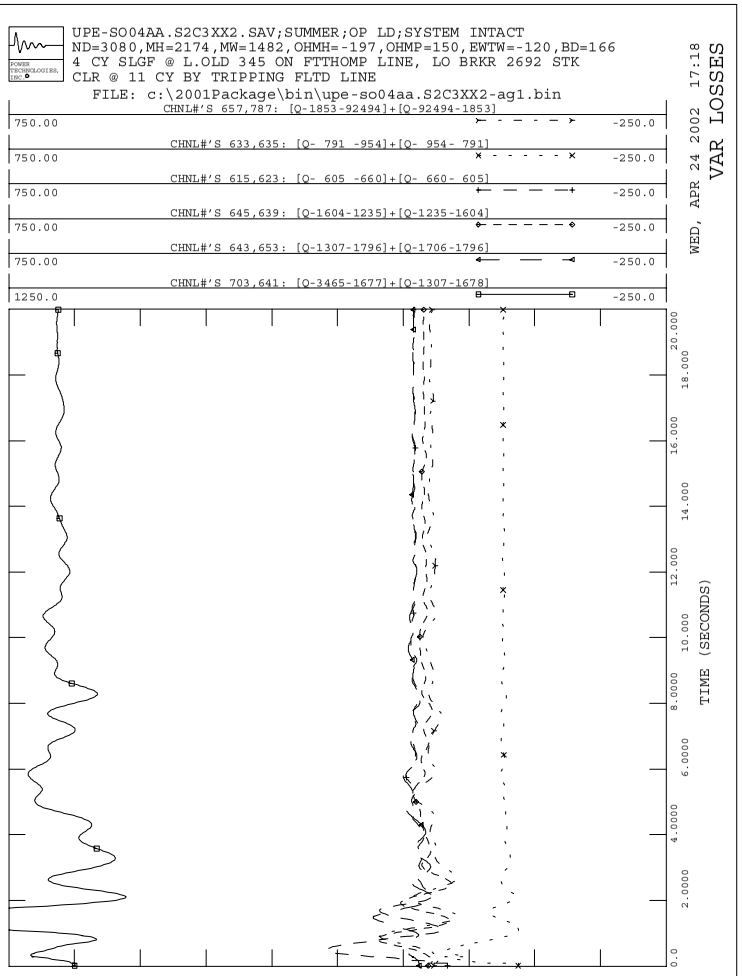


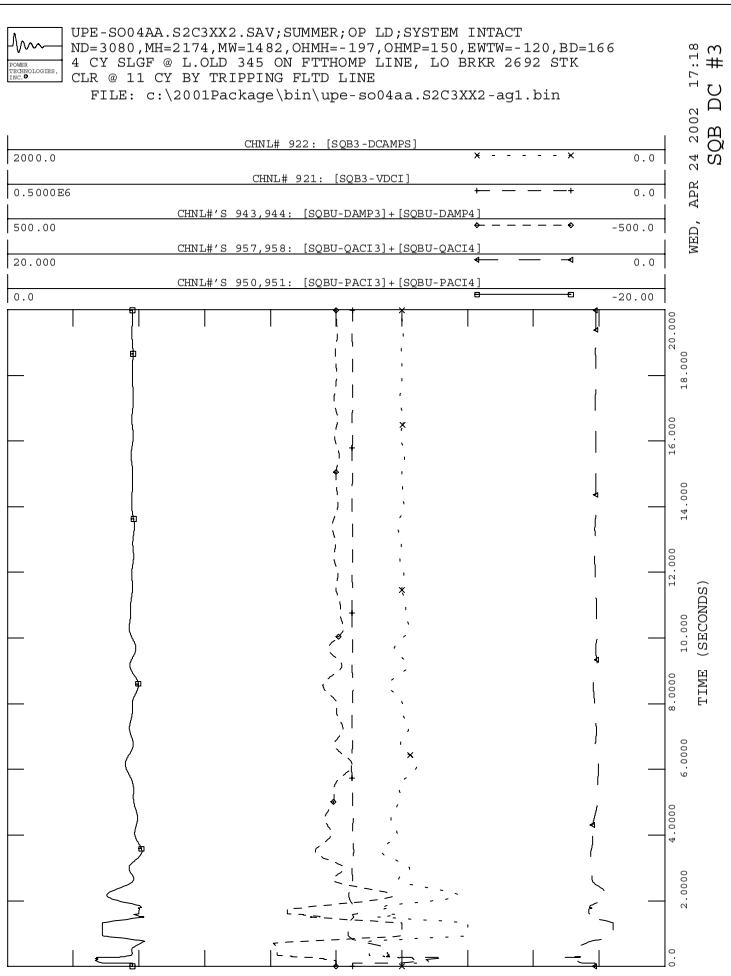
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

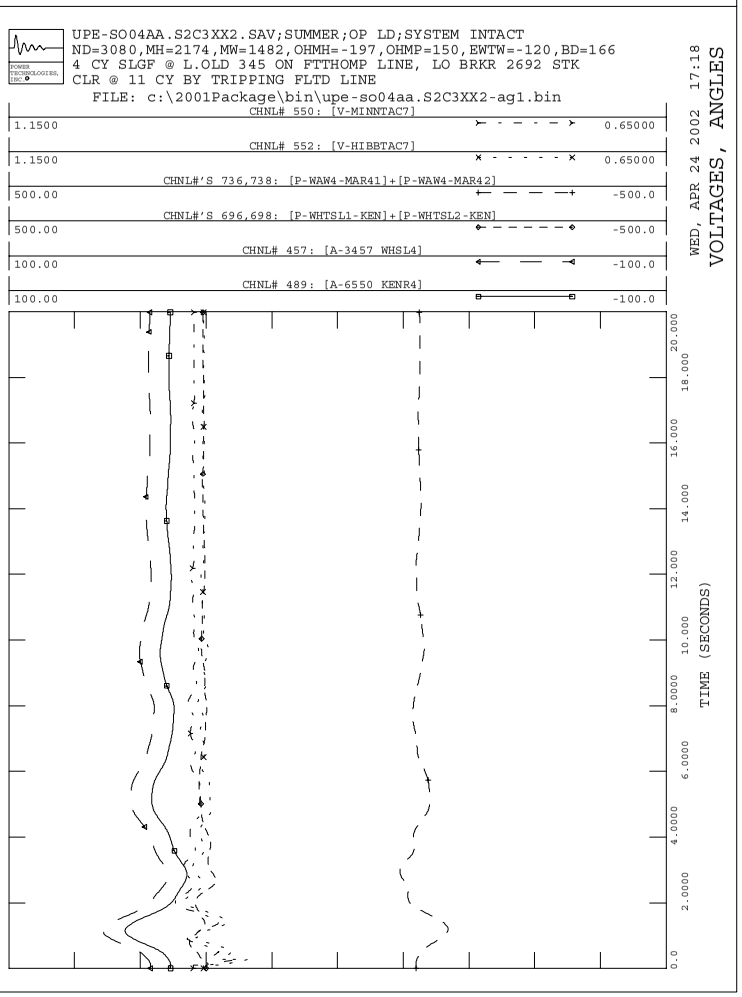
WED, APR 24 2002 17:18
MH DC PARAMETERS




UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
WED, APR 24 2002 17:18
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
WED, APR 24 2002 17:18
VAR LOSSES
TIME (SECONDS)

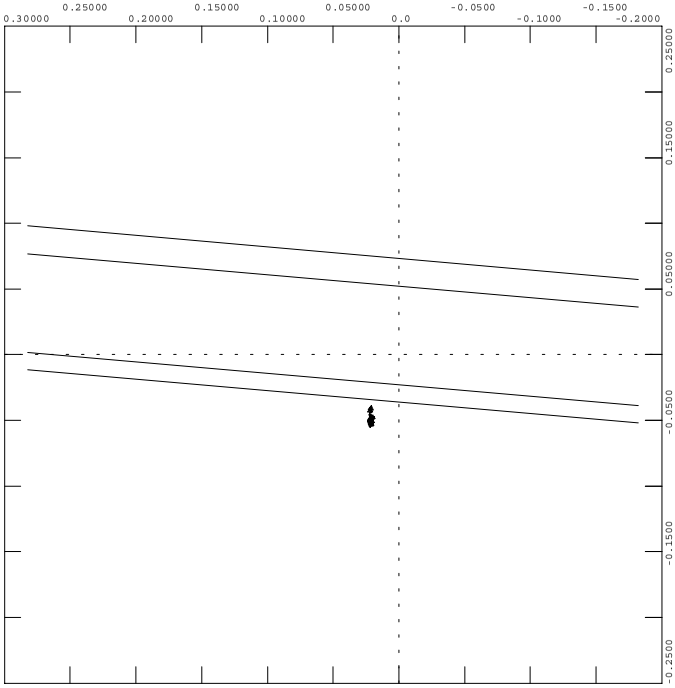

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
WED, APR 24 2002 17:18
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
WED, APR 24 2002 17:18
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

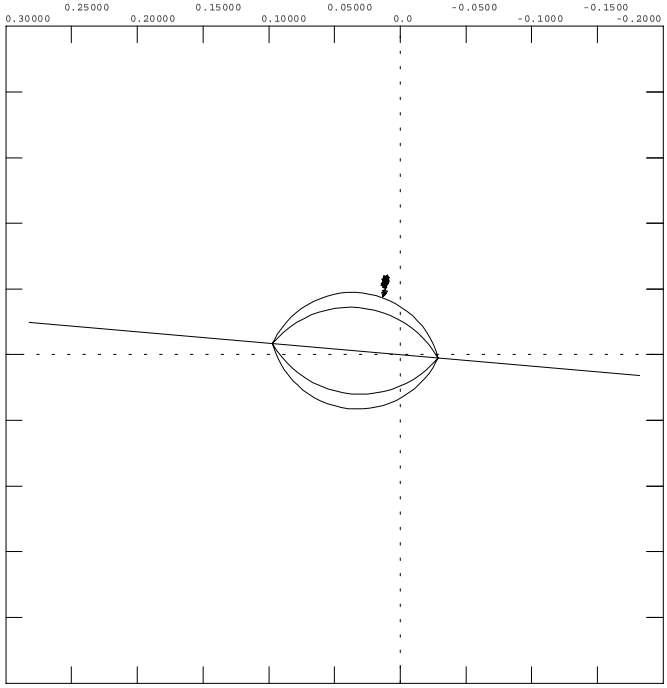


WED, APR 24 2002 17:18
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

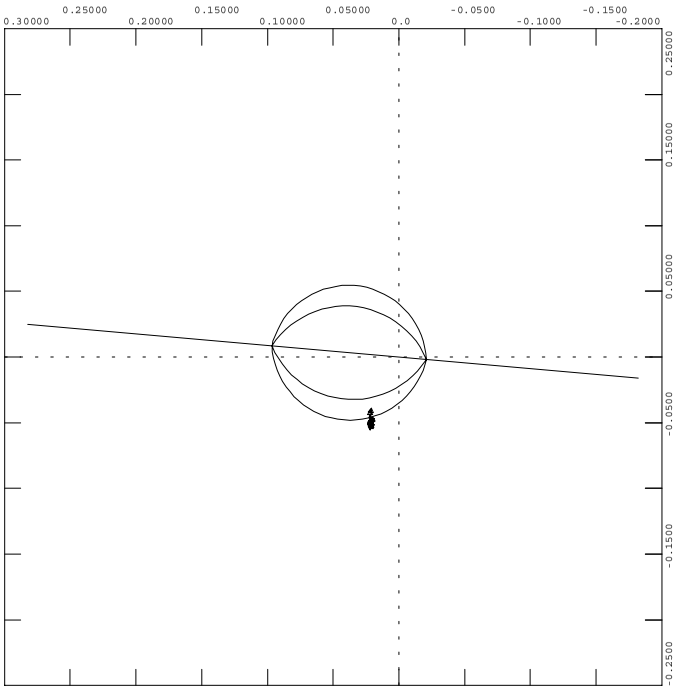


WED, APR 24 2002 17:18
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

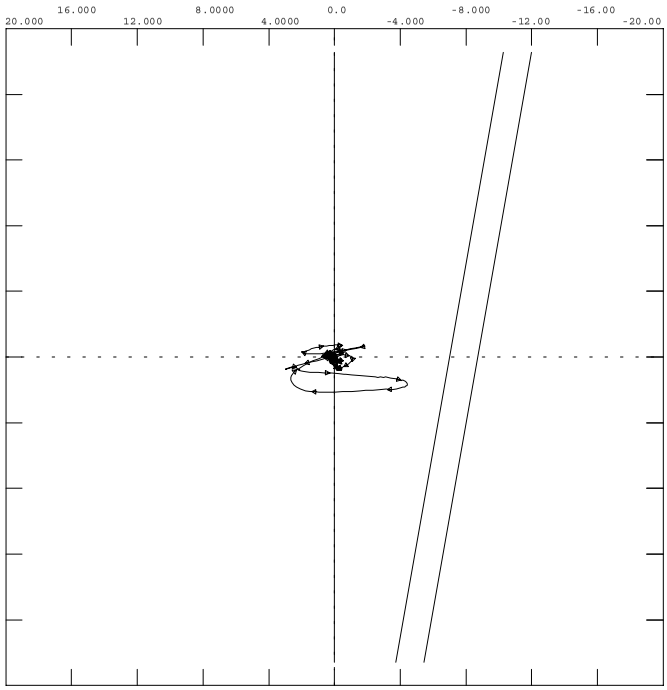


WED, APR 24 2002 17:18
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

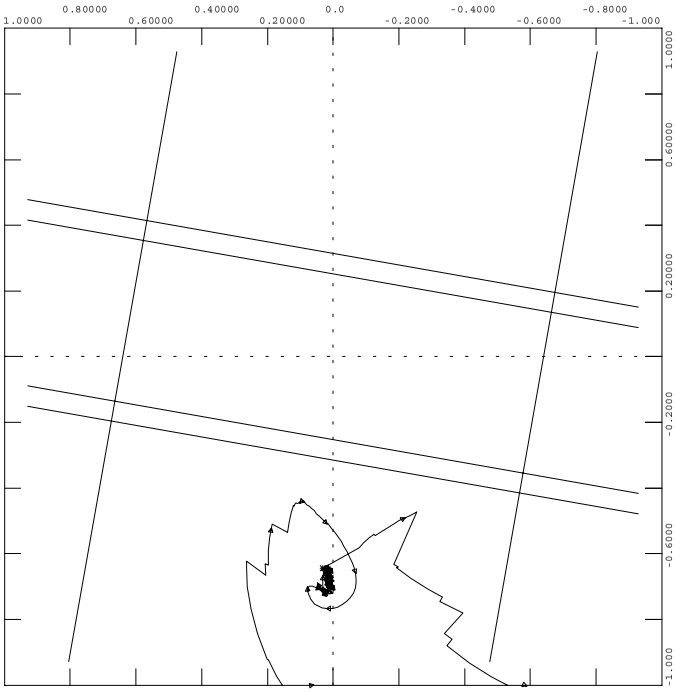


WED, APR 24 2002 17:18
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

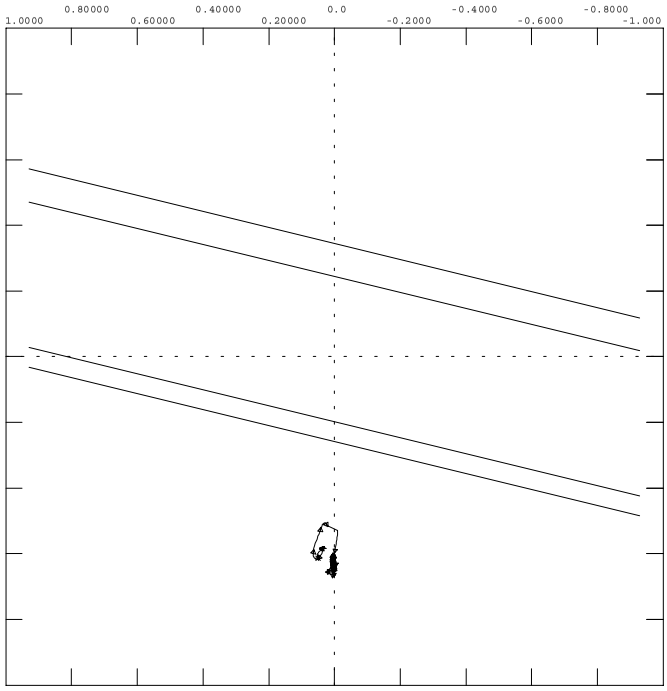


WED, APR 24 2002 17:18
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

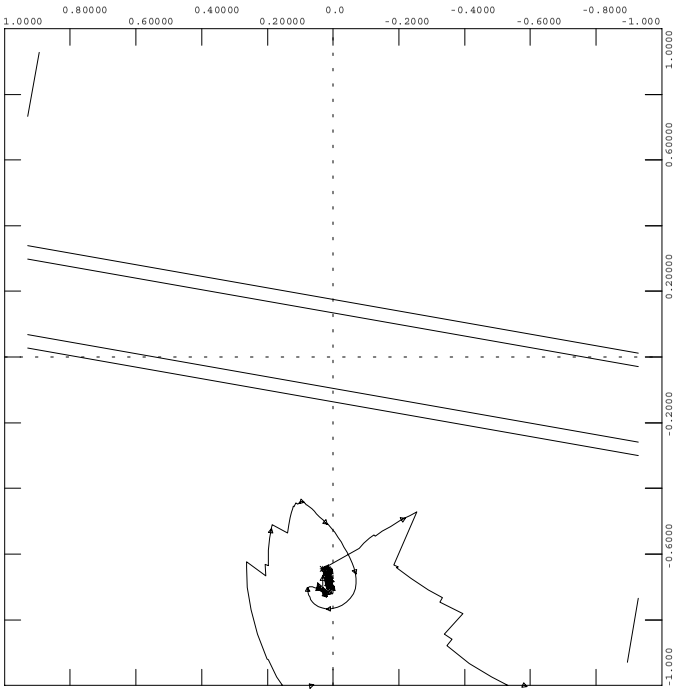


WED, APR 24 2002 17:18
R50M AT MORANVILLE (520)

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

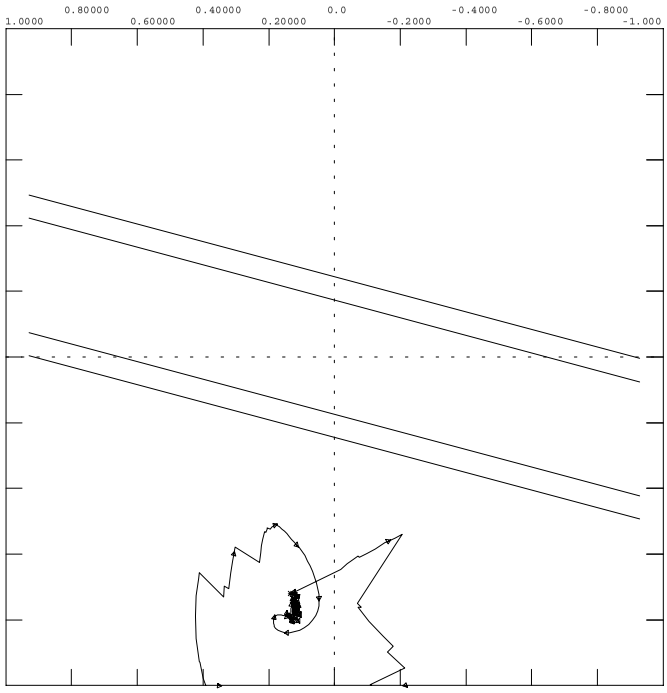


WED, APR 24 2002 17:18
L20D AT DRAYTON (506)

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

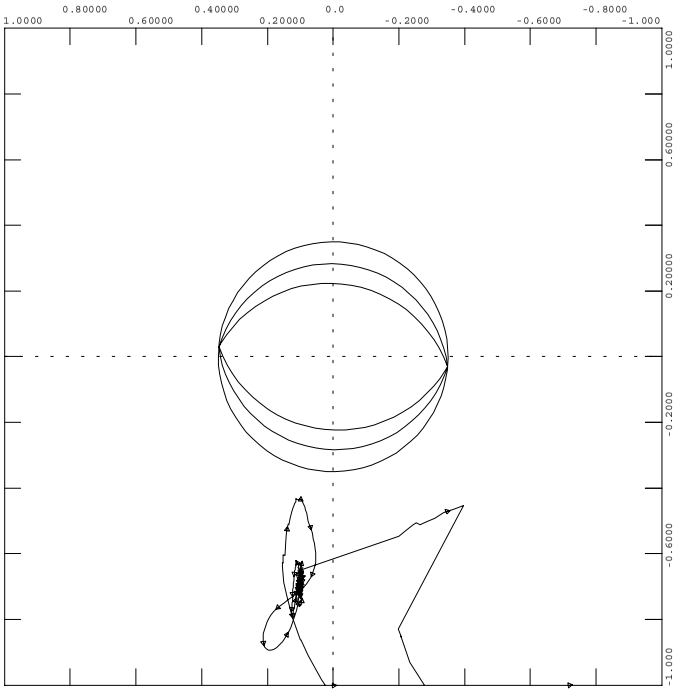


WED, APR 24 2002 17:18
L20D-PRAIRIE (510)

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

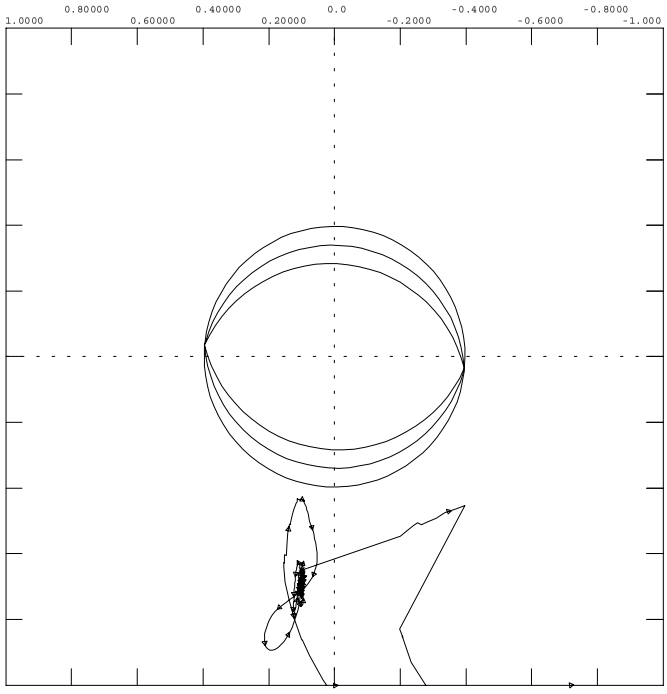
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

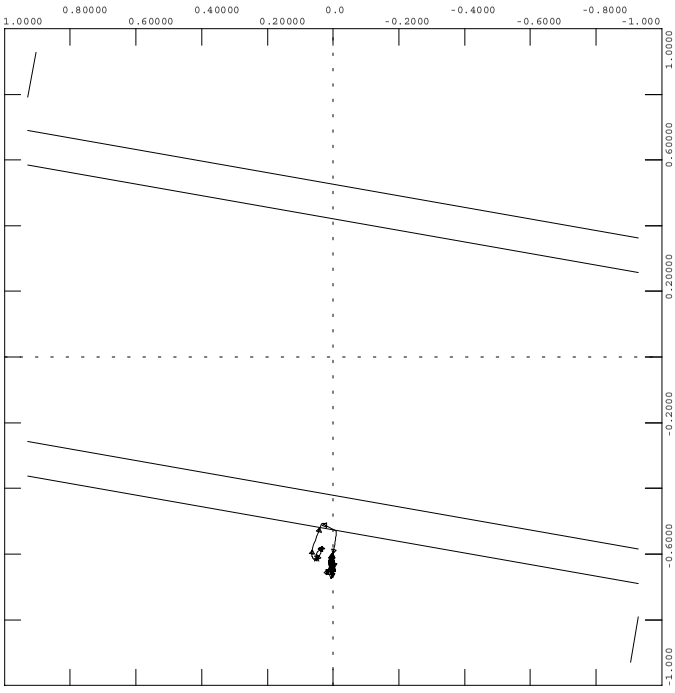
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

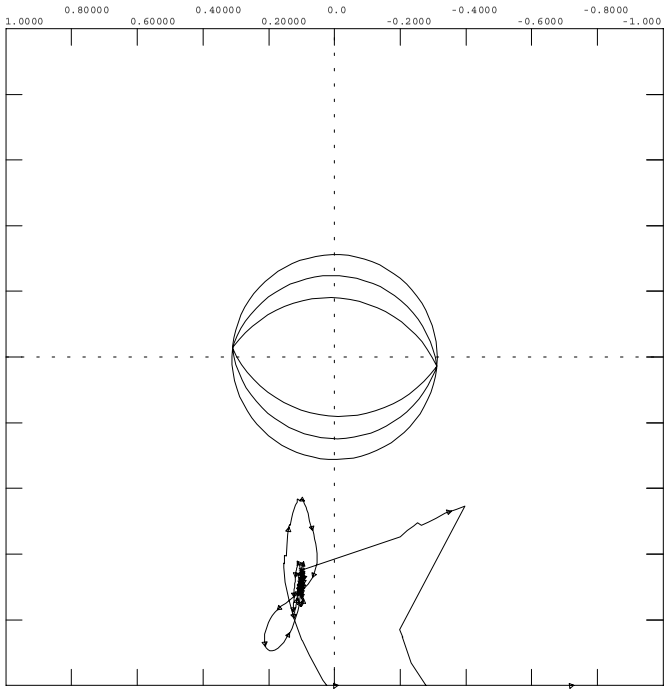
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



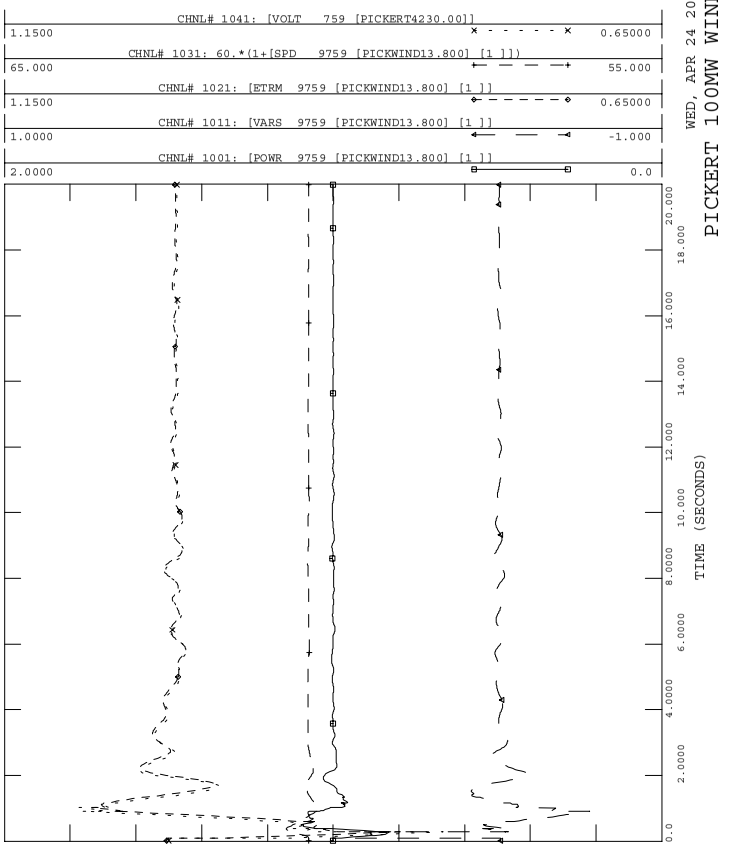
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

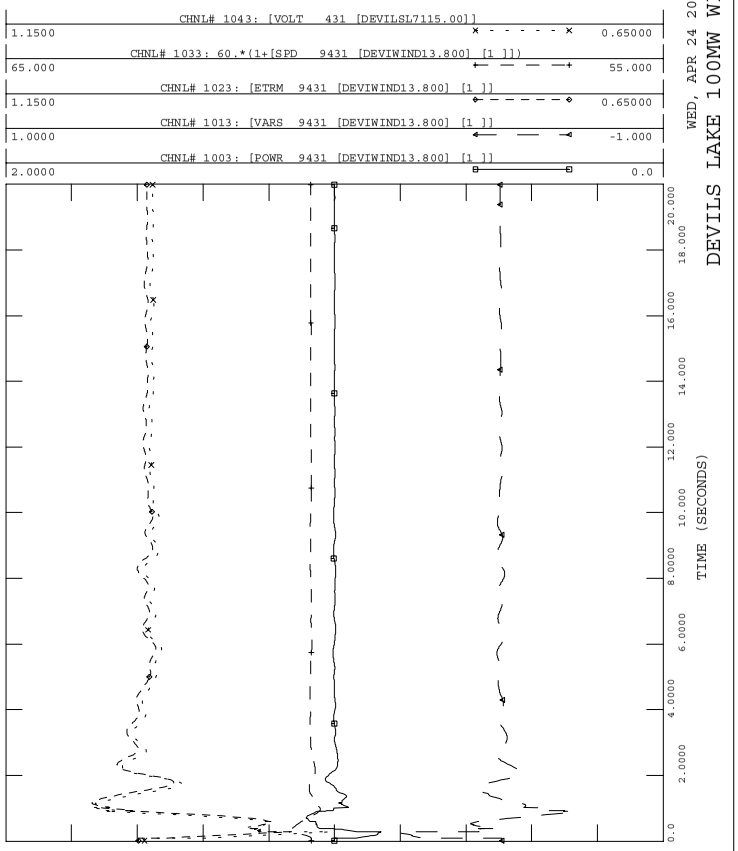


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



WED, APR 24 2002 17:18
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

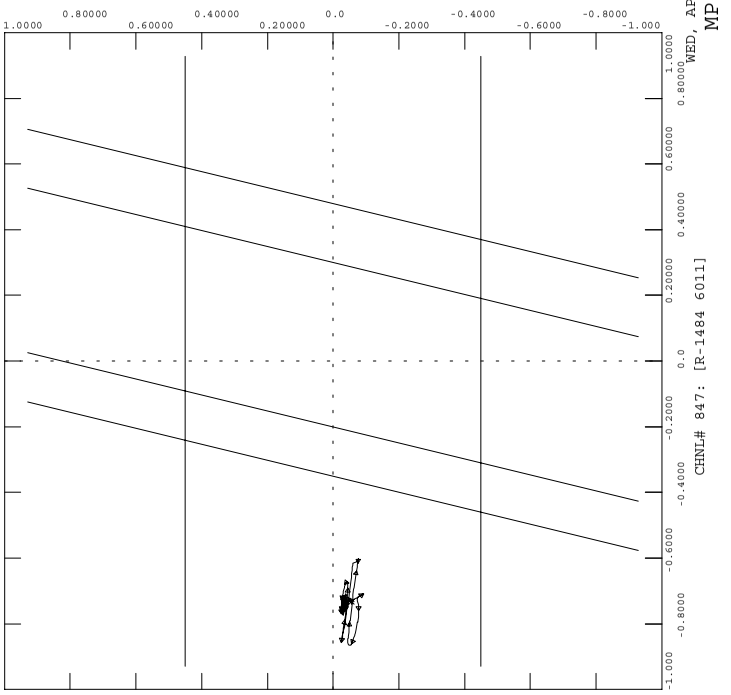


WED, APR 24 2002 17:18
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

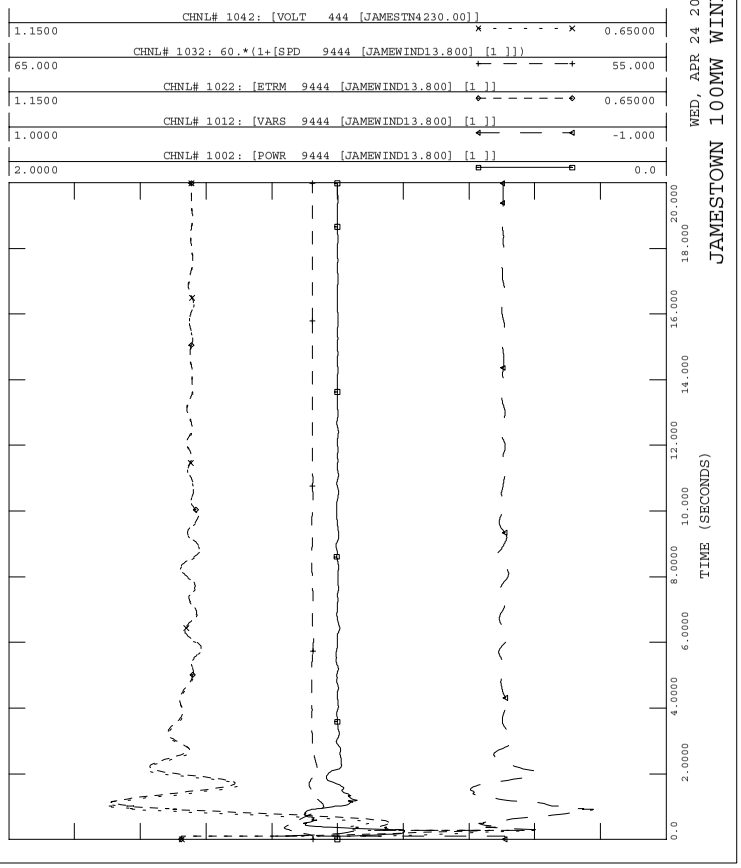
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



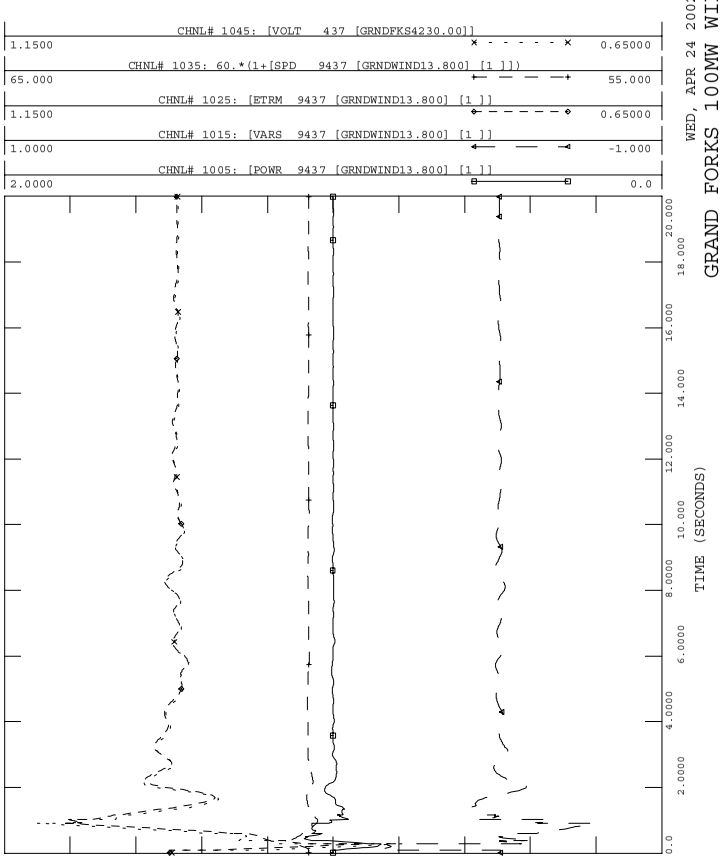
WED, APR 24 2002 17:18
MP-OH I.FALLS (779)

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



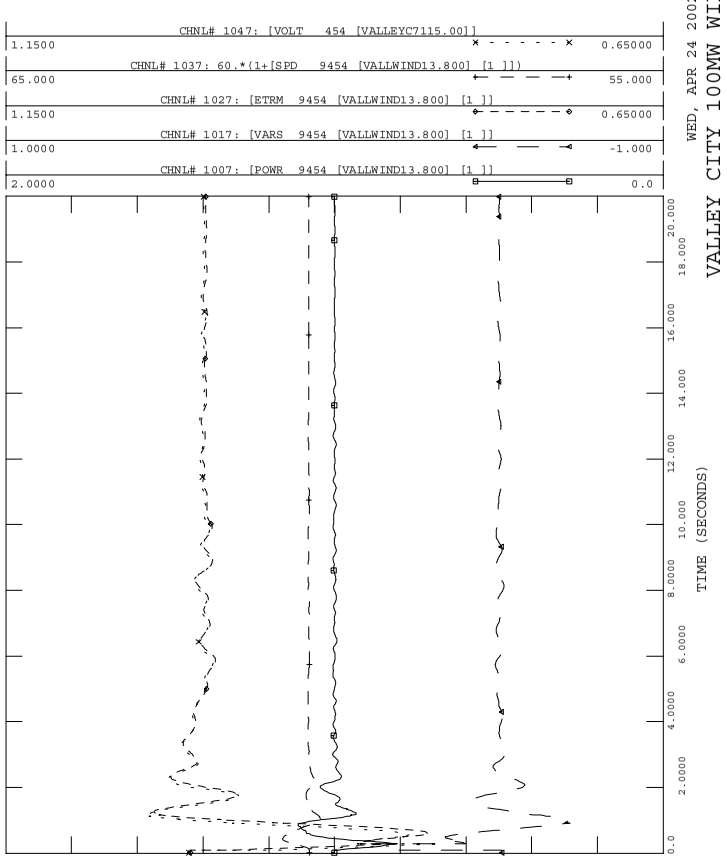
WED, APR 24 2002 17:18
JAMESTOWN 100MW WIND UNIT

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



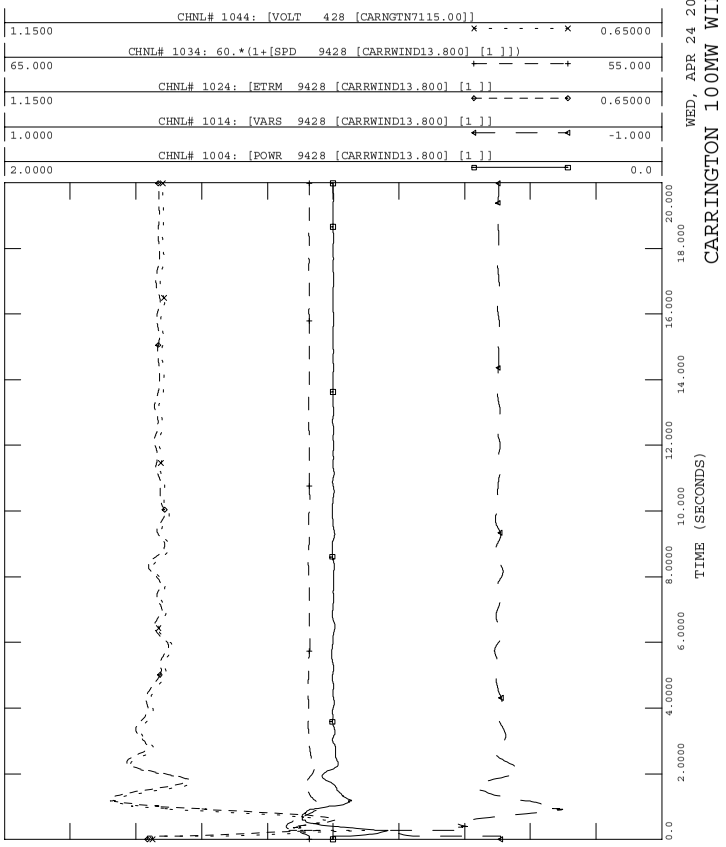
WED, APR 24 2002 17:18
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



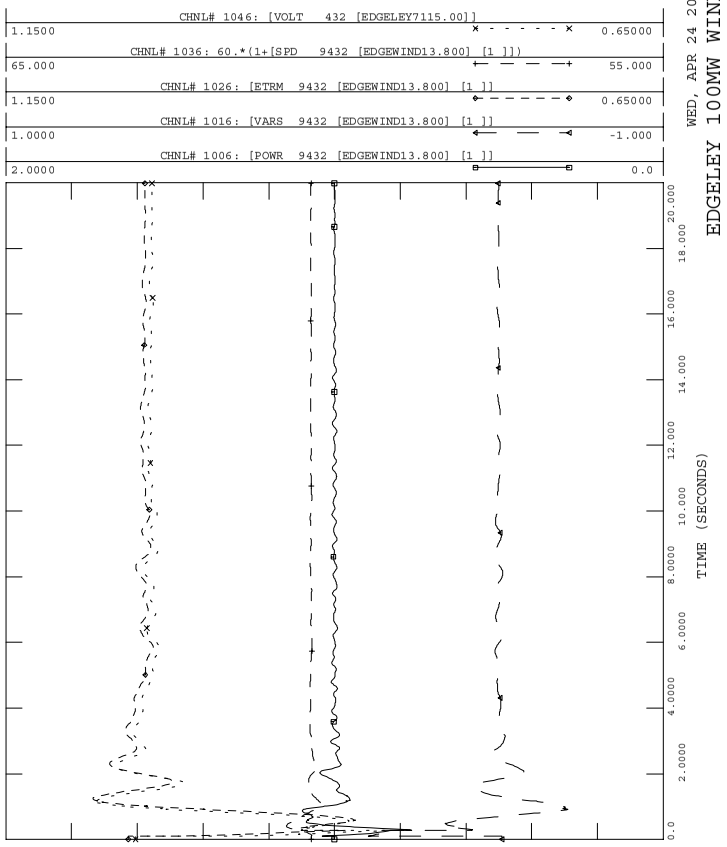
WED, APR 24 2002 17:18
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



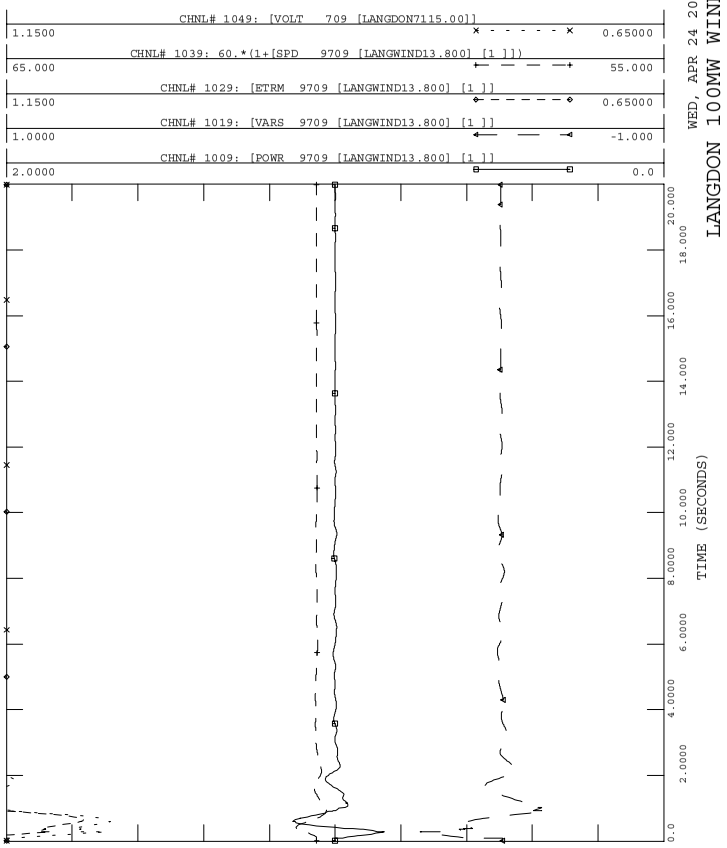
WED, APR 24 2002 17:18
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



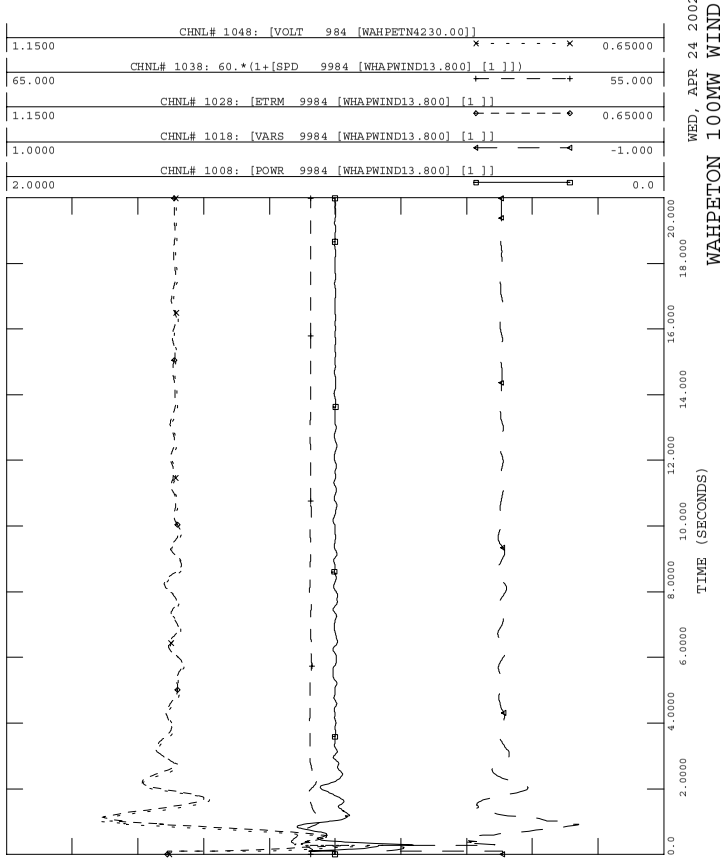
WED, APR 24 2002 17:18
EDGELEY 100MW WIND UNIT

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



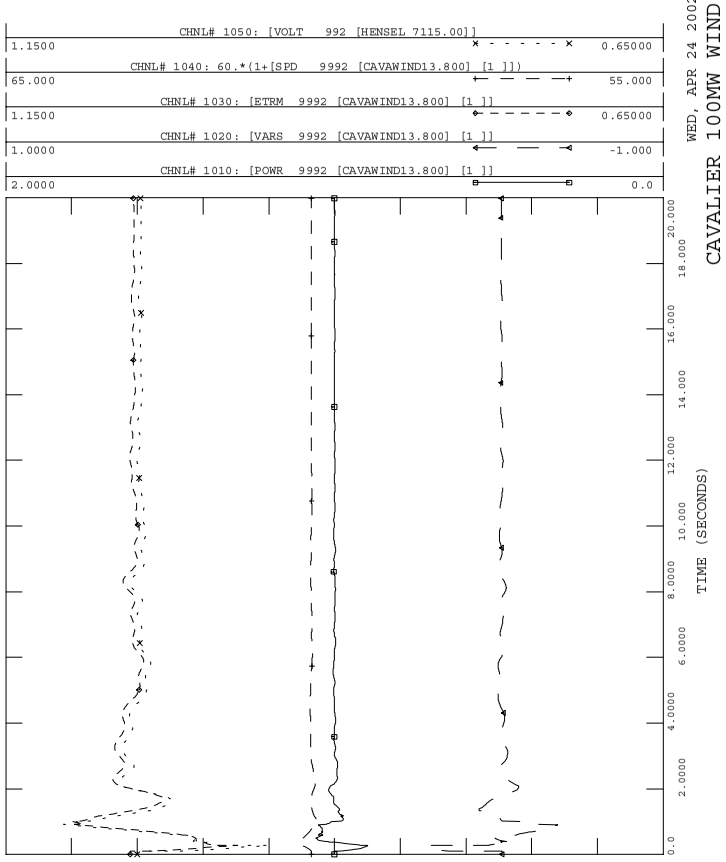
WED, APR 24 2002 17:18
LANGDON 100MW WIND UNIT

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin



WED, APR 24 2002 17:18
WAHPETON 100MW WIND UNIT

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag1.bin

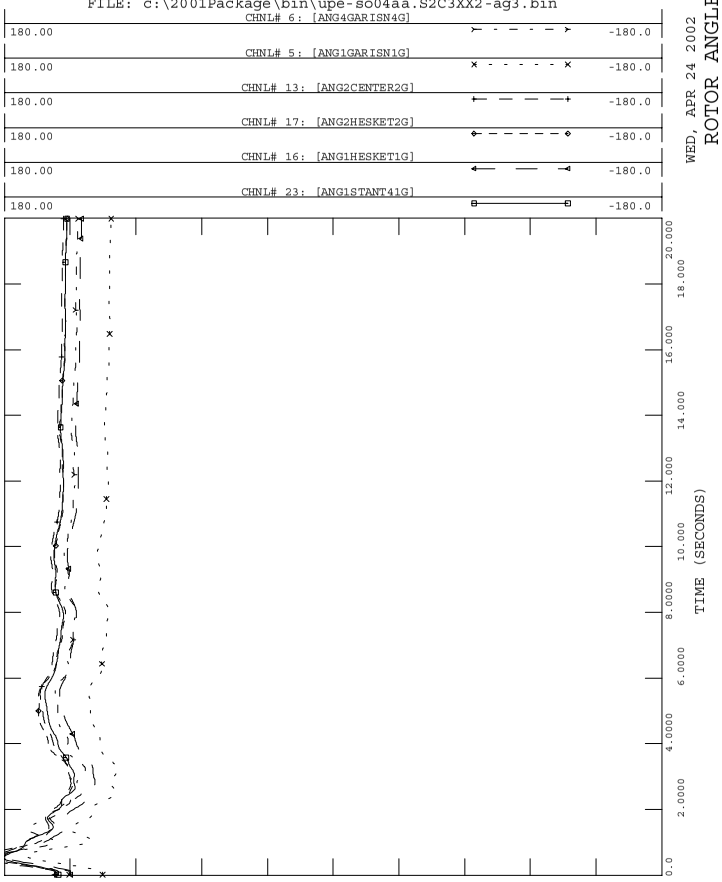


WED, APR 24 2002 17:18
CAVALIER 100MW WIND UNIT

CONTINGENCY AG3

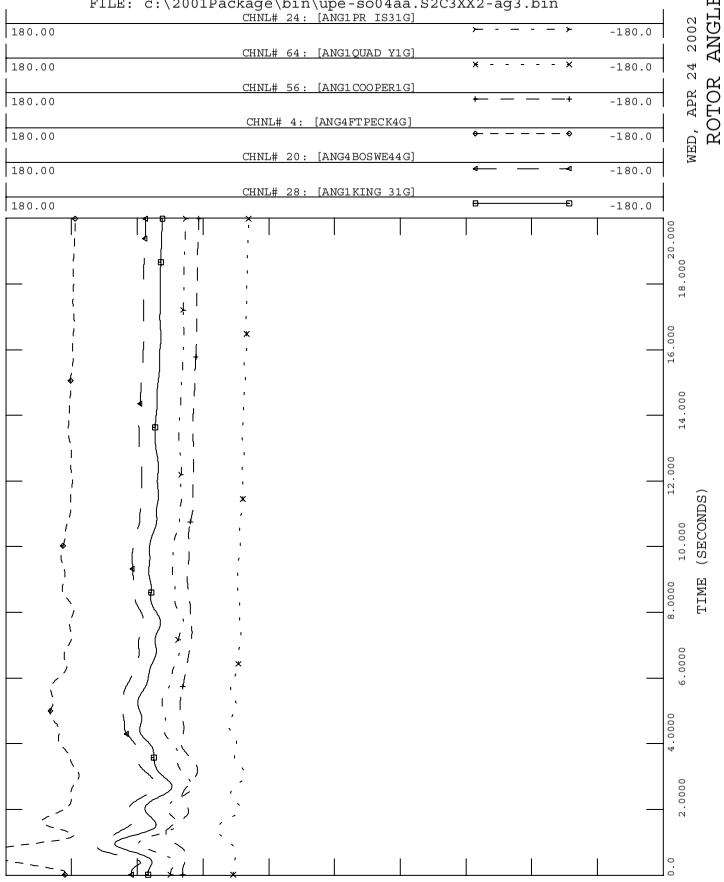
Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



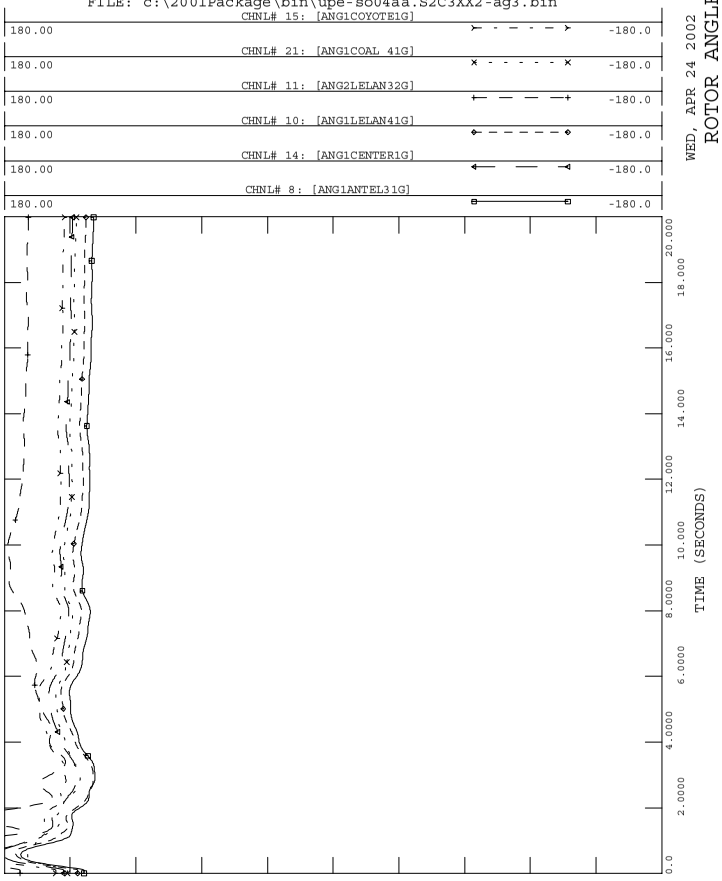
WED, APR 24 2002 17:34
ROTOR ANGLES 2

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



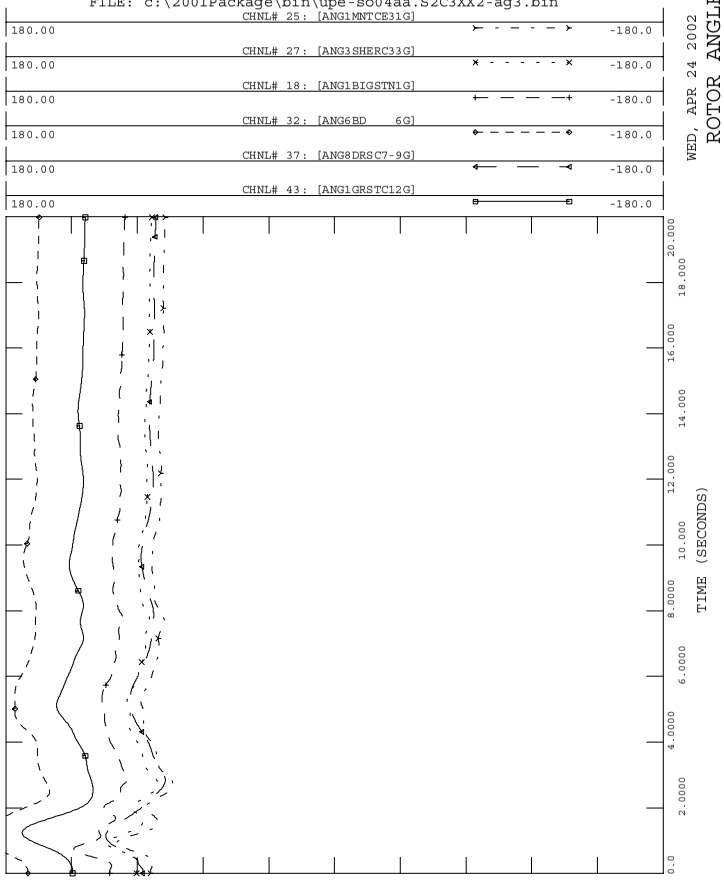
WED, APR 24 2002 17:34
ROTOR ANGLES 4

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



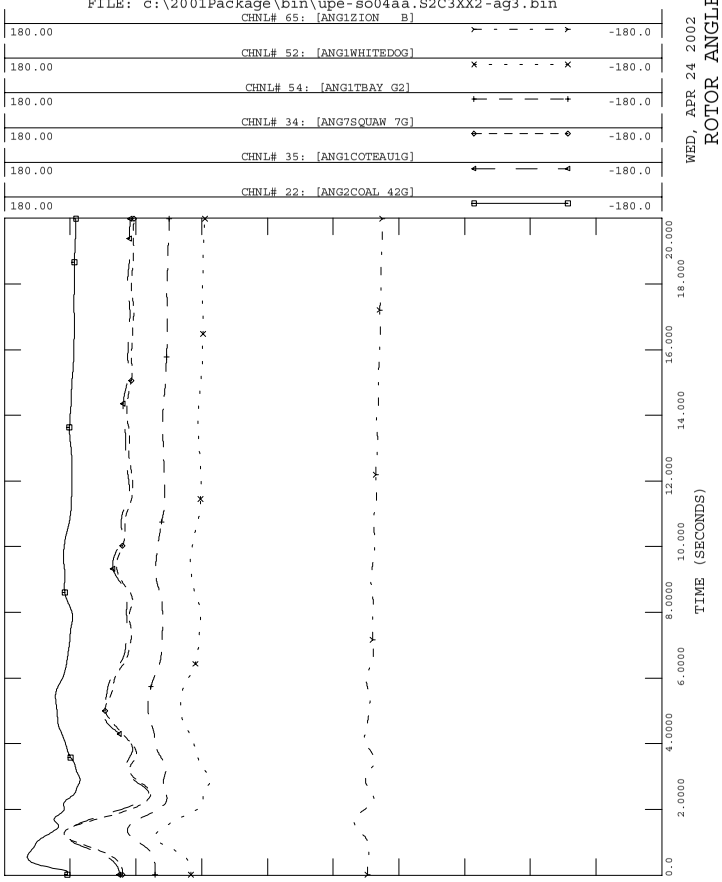
WED, APR 24 2002 17:34
ROTOR ANGLES 1

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



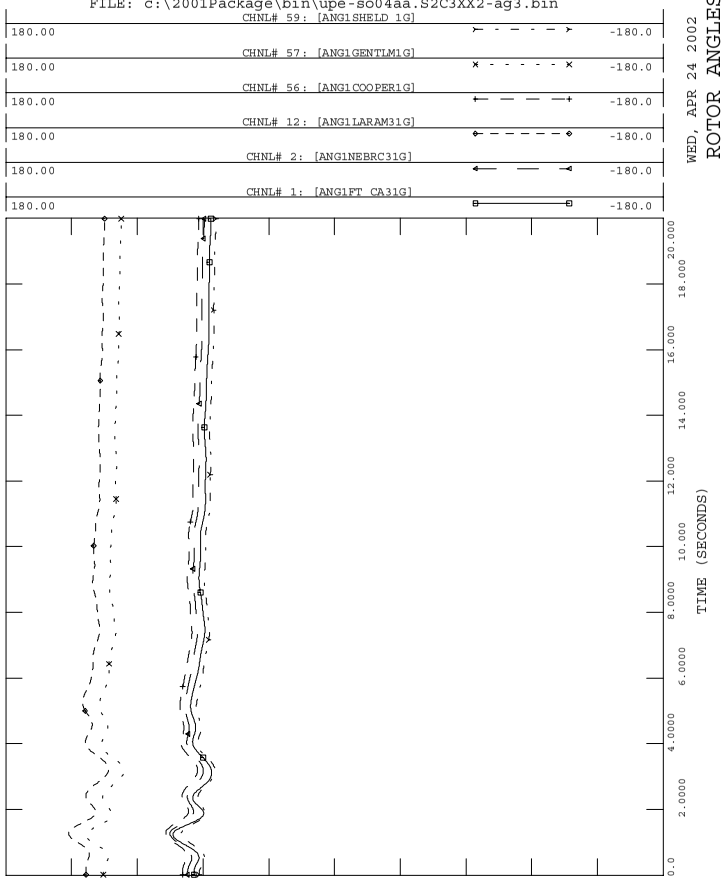
WED, APR 24 2002 17:34
ROTOR ANGLES 3

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



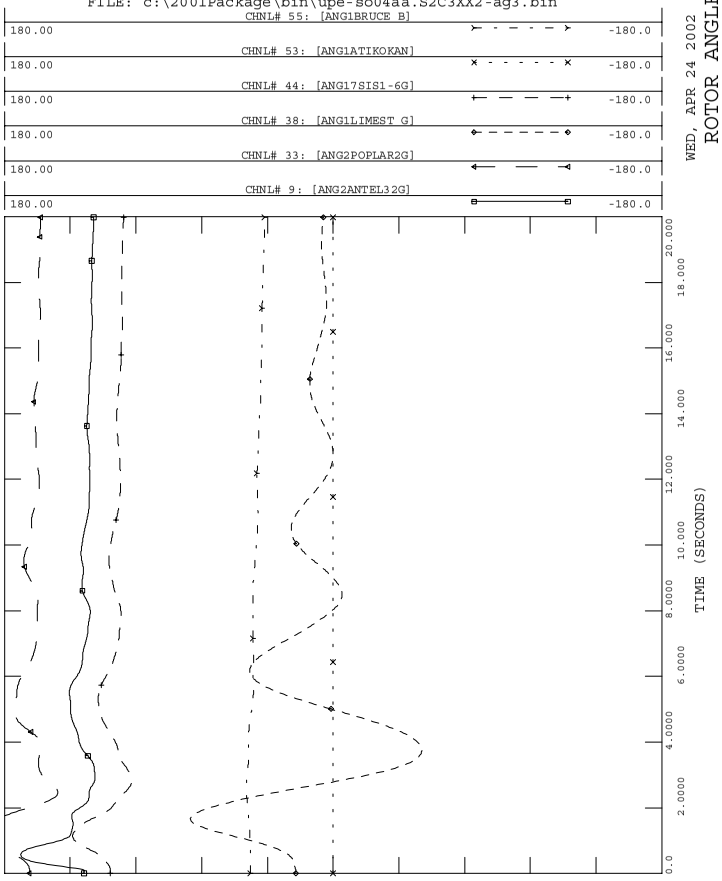
WED, APR 24 2002 17:34
ROTOR ANGLES 6

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



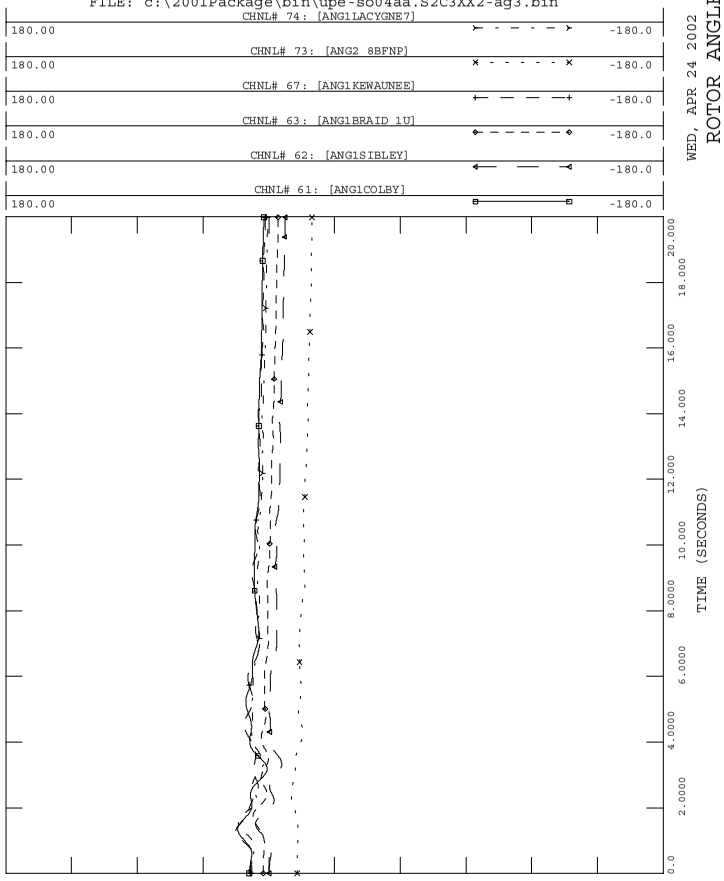
WED, APR 24 2002 17:34
ROTOR ANGLES NB

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



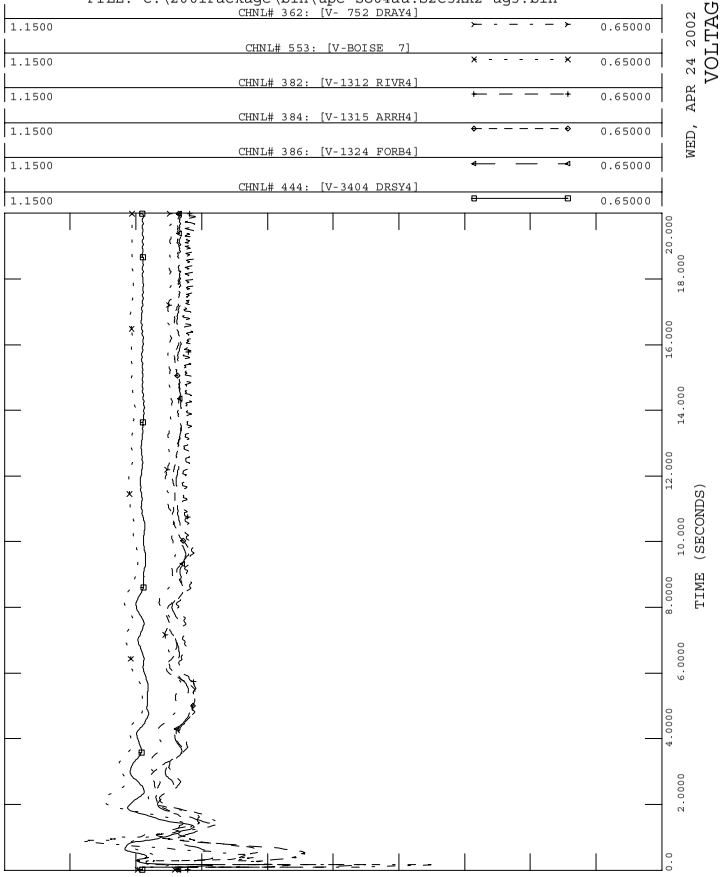
WED, APR 24 2002 17:34
ROTOR ANGLES 5

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



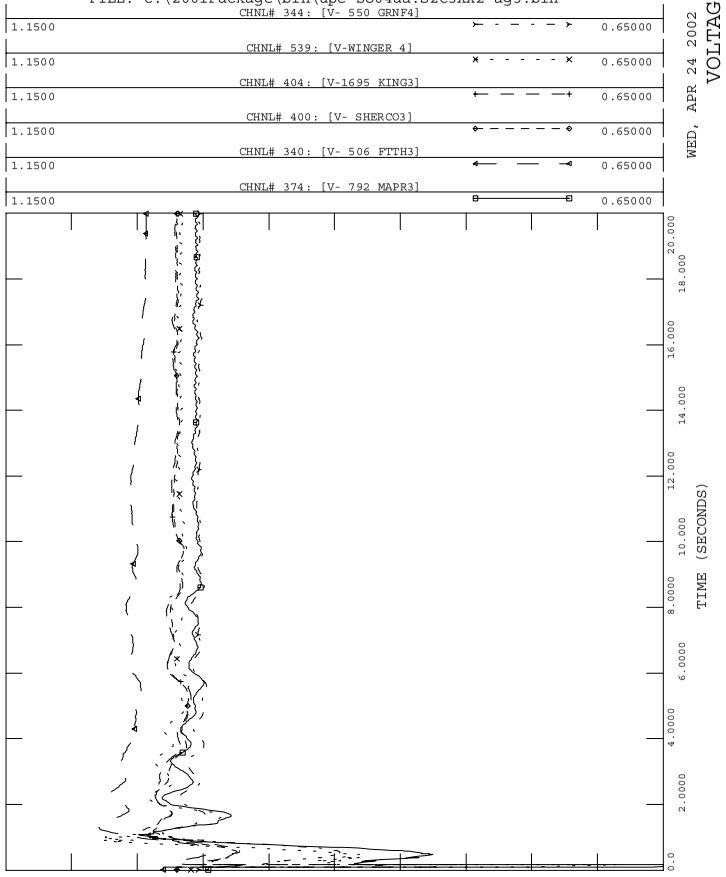
WED, APR 24 2002 17:34
ROTOR ANGLES 7

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



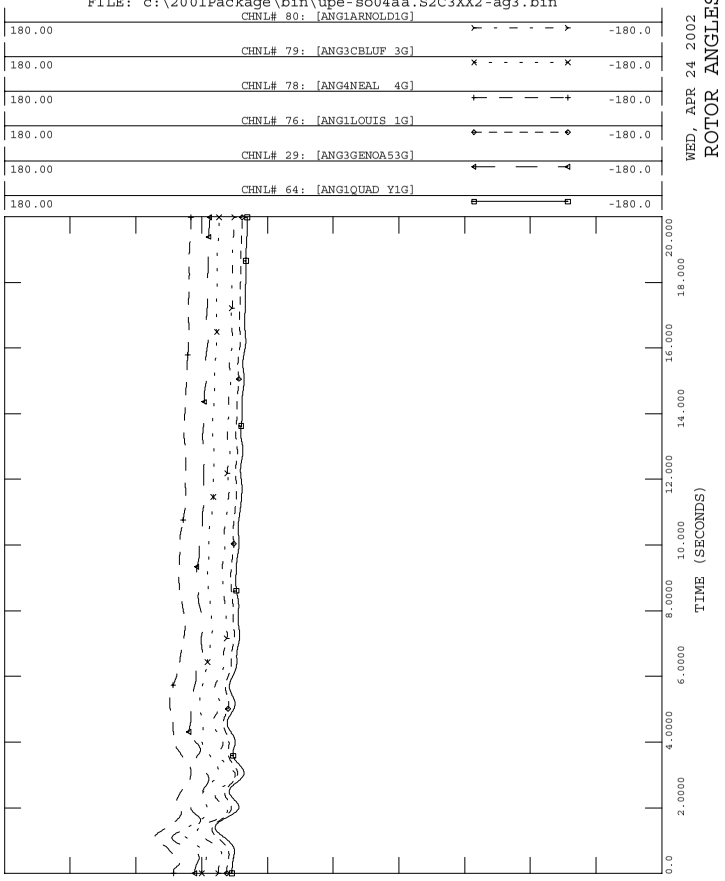
WED, APR 24 2002 17:34
VOLTAGES 1

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



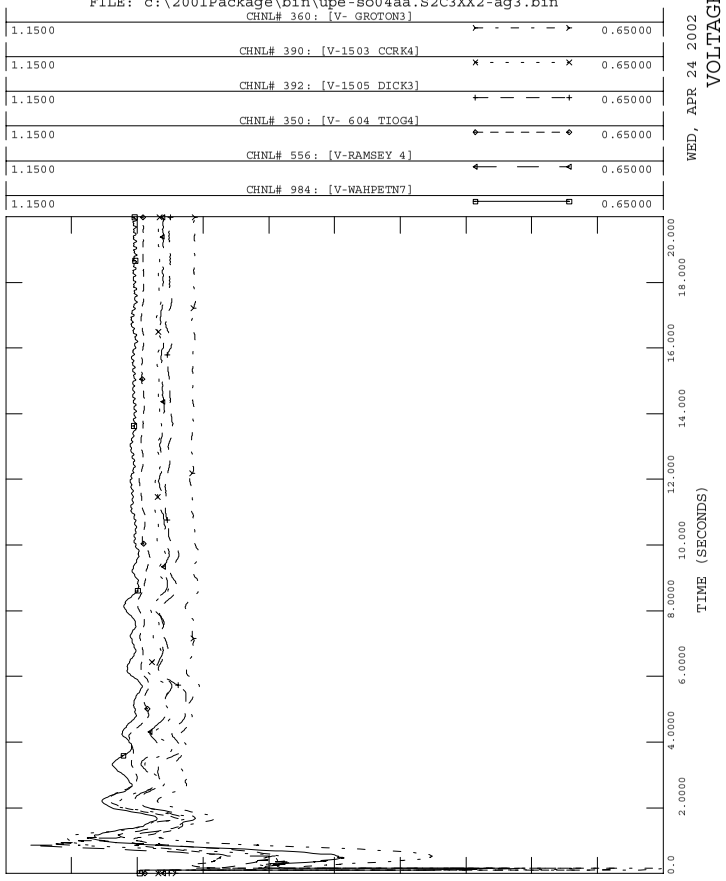
WED, APR 24 2002 17:34
VOLTAGES 3

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



WED, APR 24 2002 17:34
ROTOR ANGLES IA

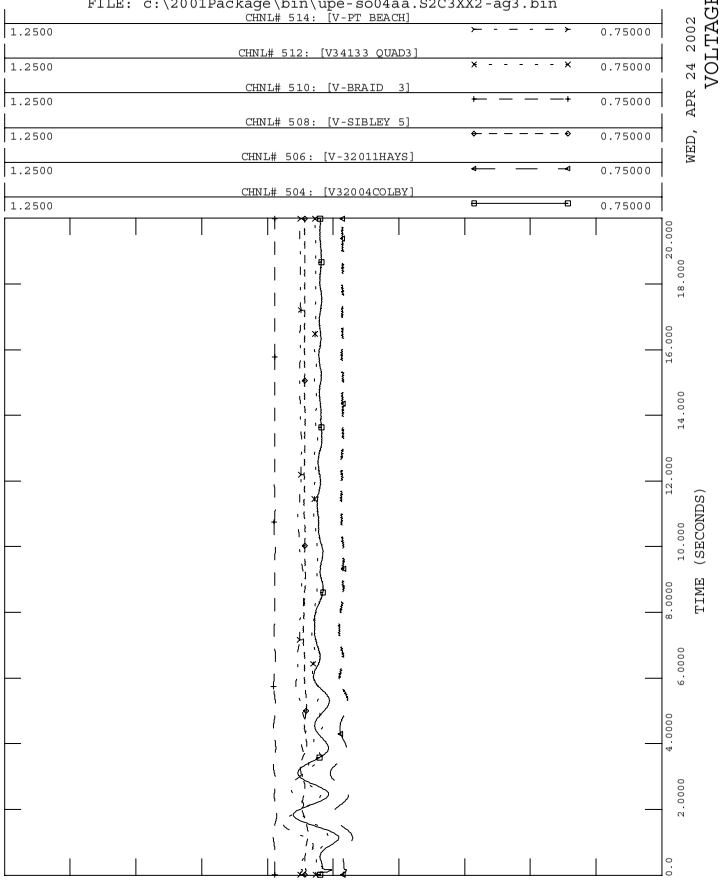
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



WED, APR 24 2002 17:34
VOLTAGES 2

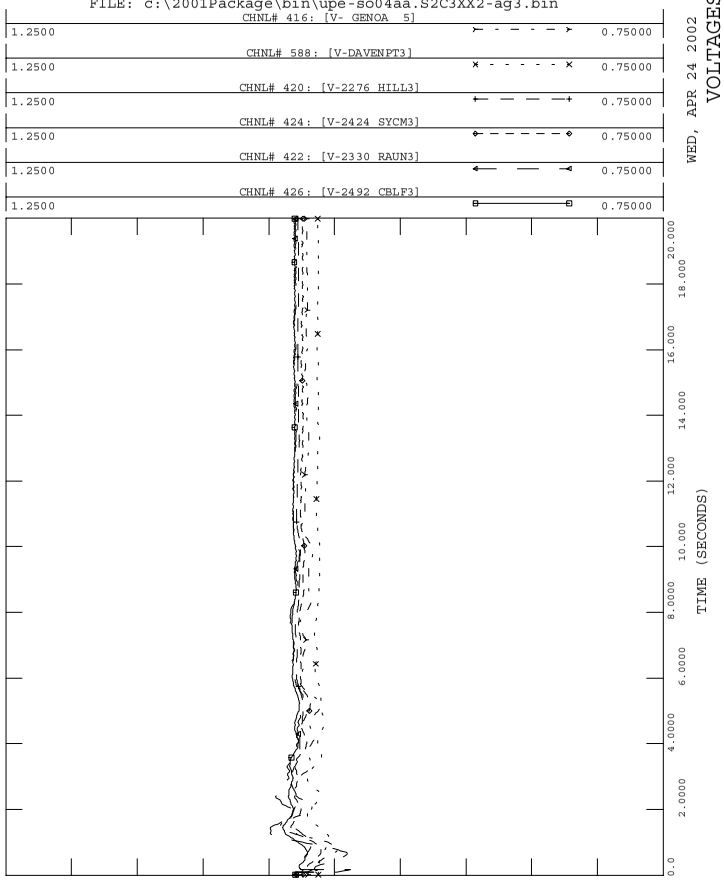
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

WED, APR 24 2002 17:34
VOLTAGES 5



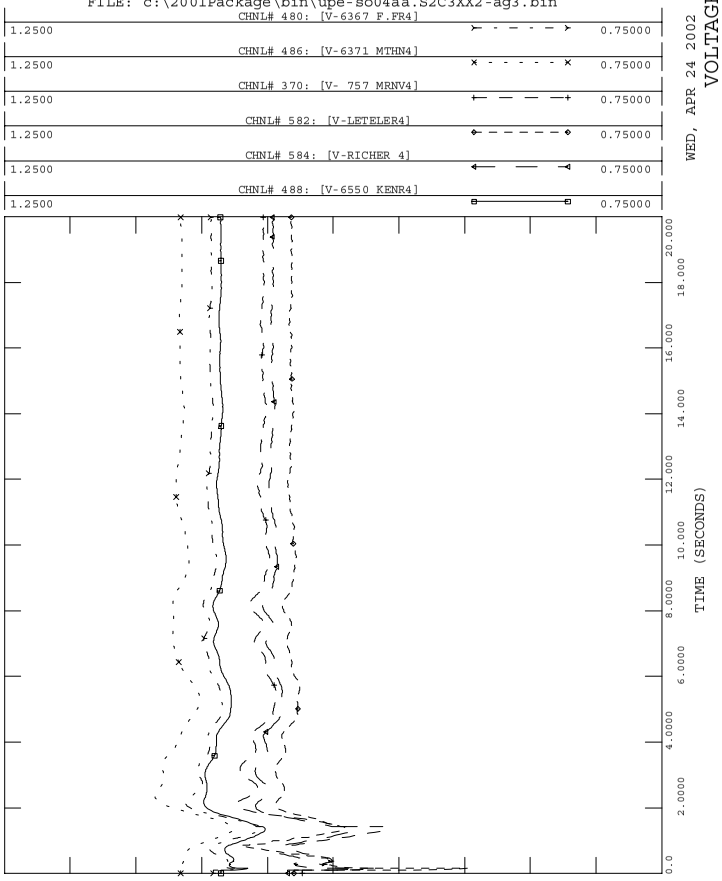
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

WED, APR 24 2002 17:34
VOLTAGES IA



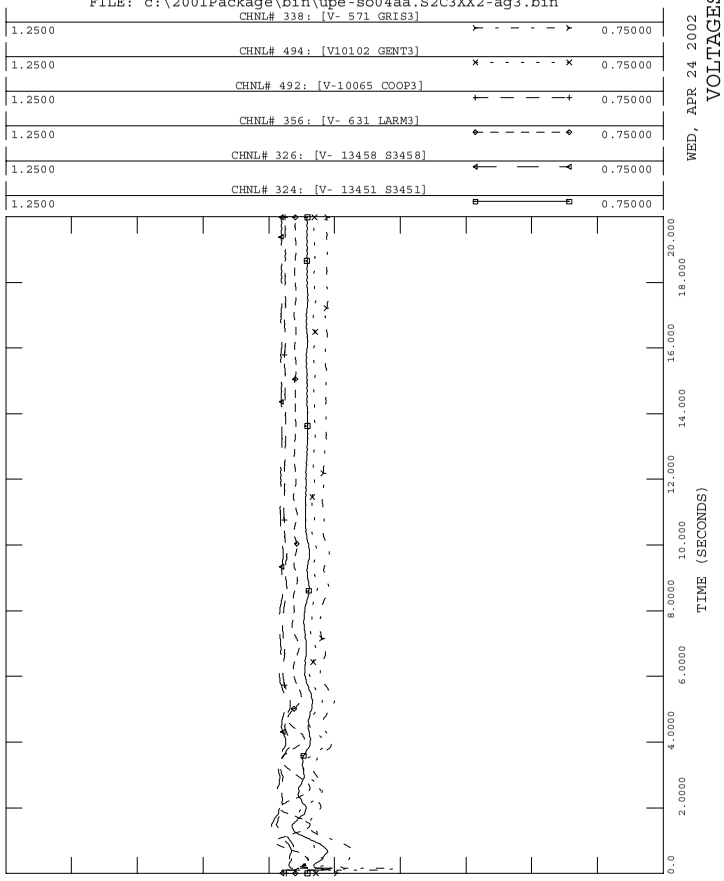
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

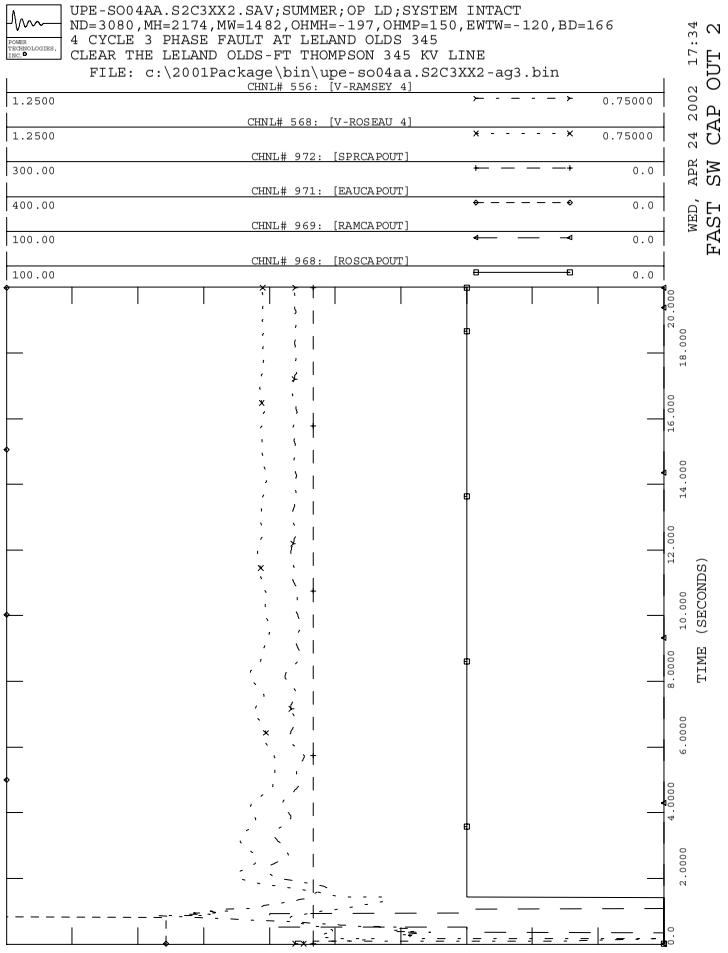
WED, APR 24 2002 17:34
VOLTAGES 4

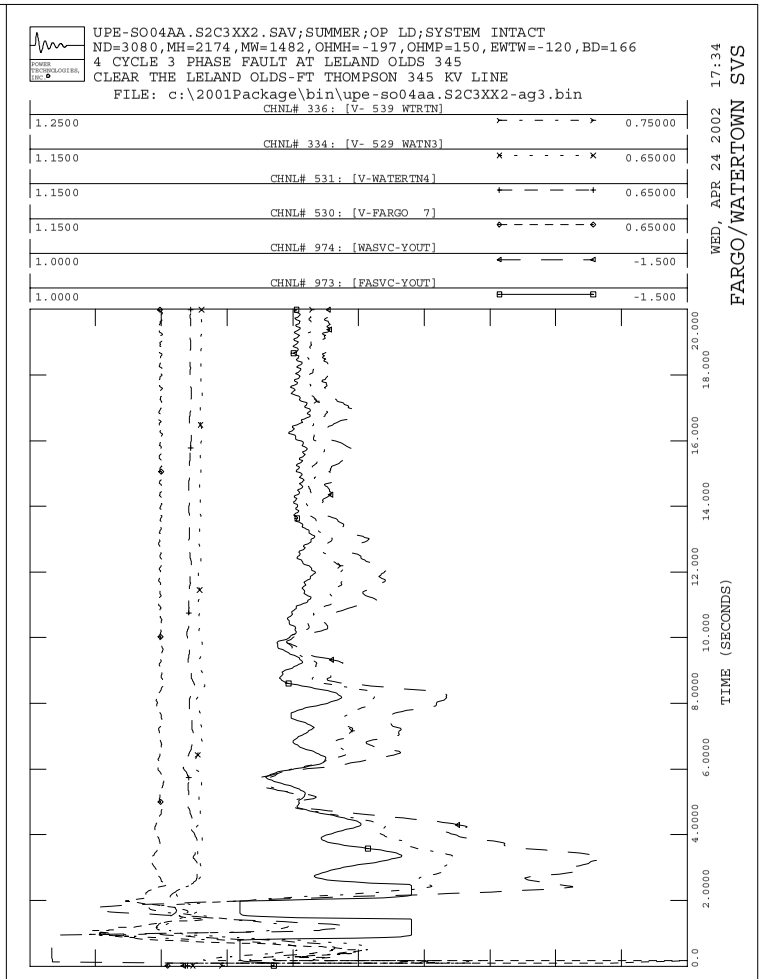


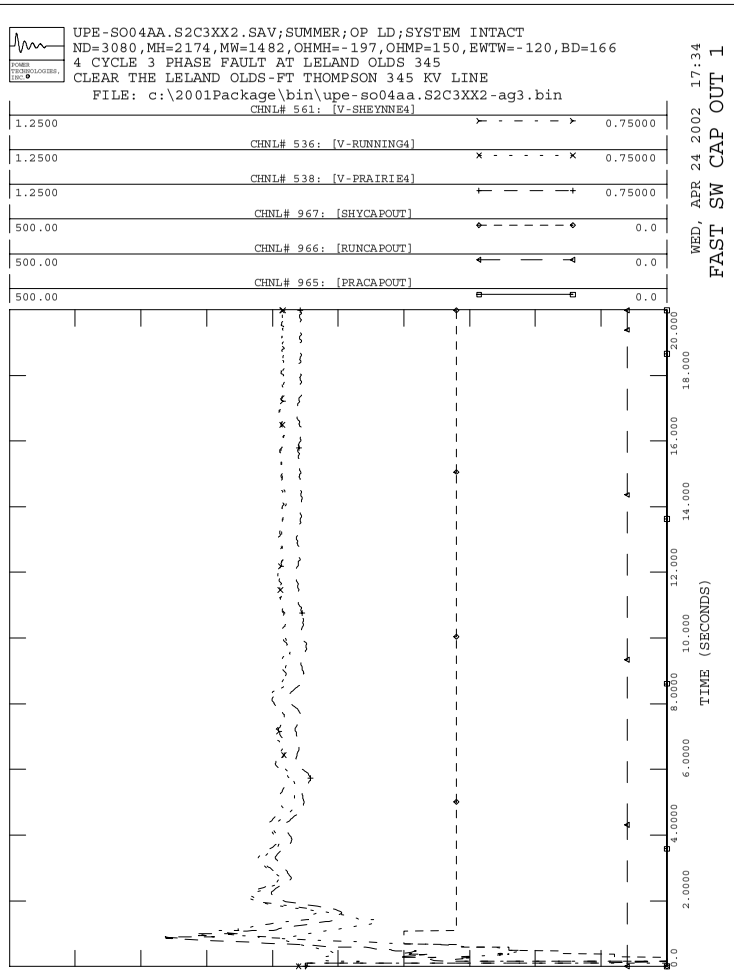
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

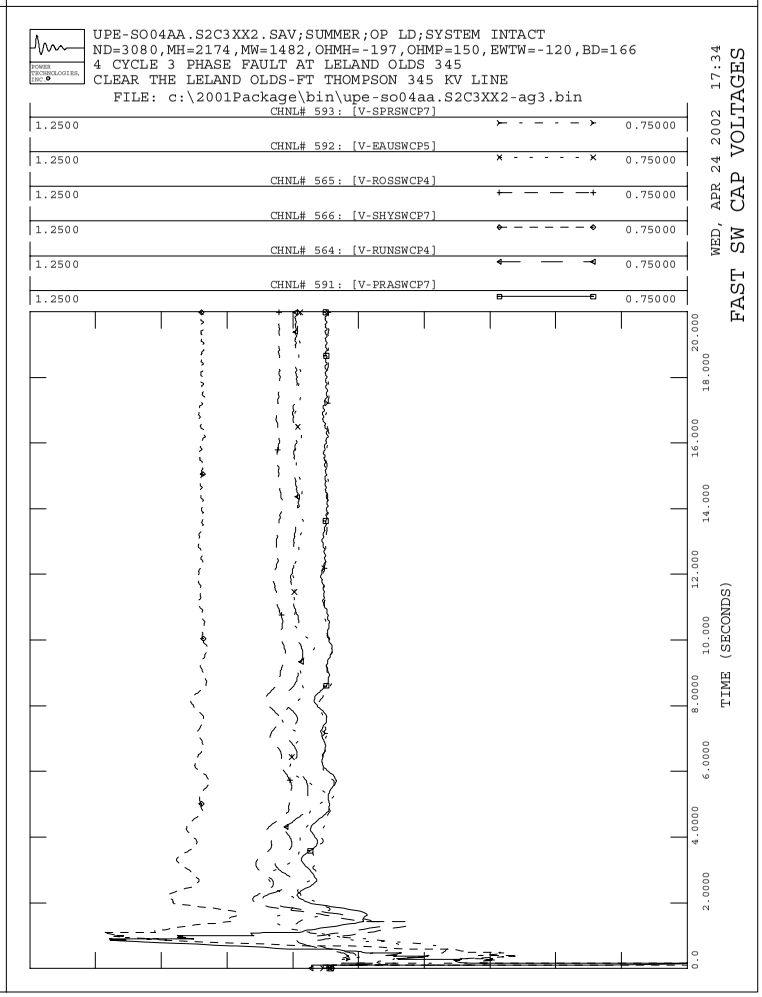
WED, APR 24 2002 17:34
VOLTAGES NB



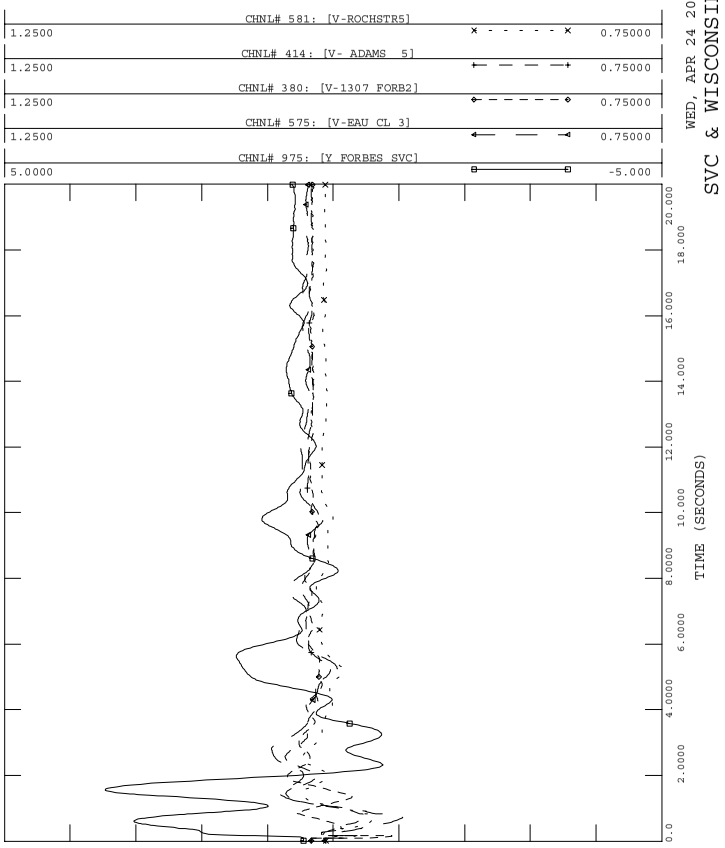

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
WED, APR 24 2002 17:34
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
WED, APR 24 2002 17:34
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
WED, APR 24 2002 17:34
FAST SW CAP OUT 1
TIME (SECONDS)

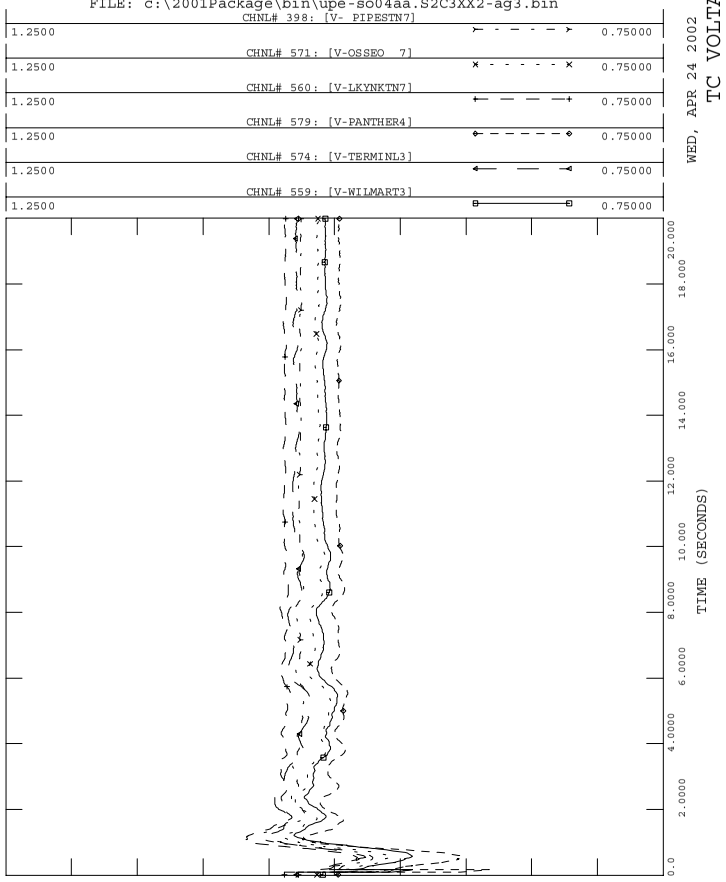

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
WED, APR 24 2002 17:34
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



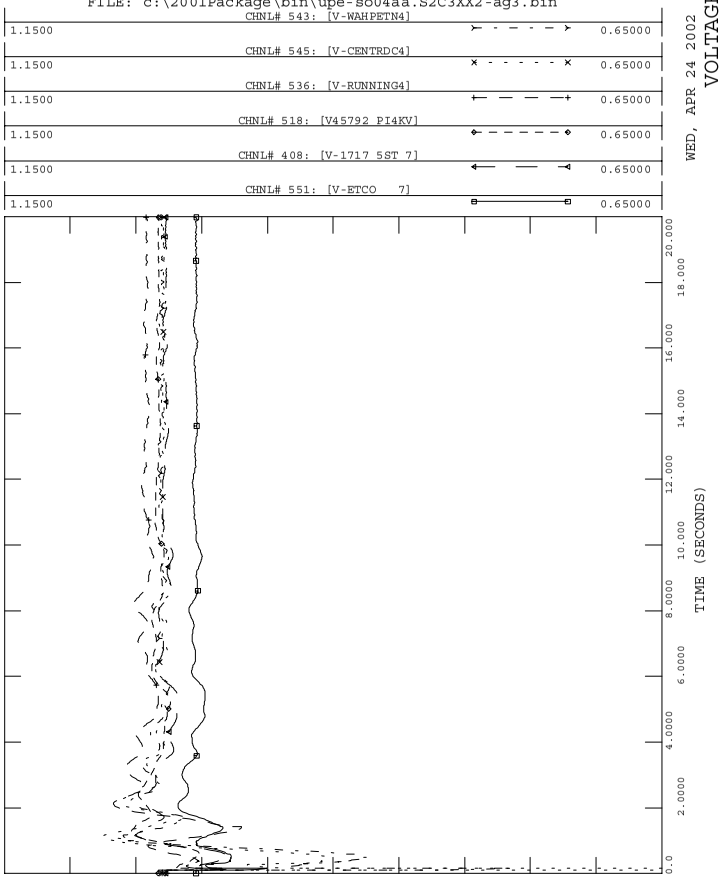
WED, APR 24 2002 17:34
SVC & WISCONSIN VOLT

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



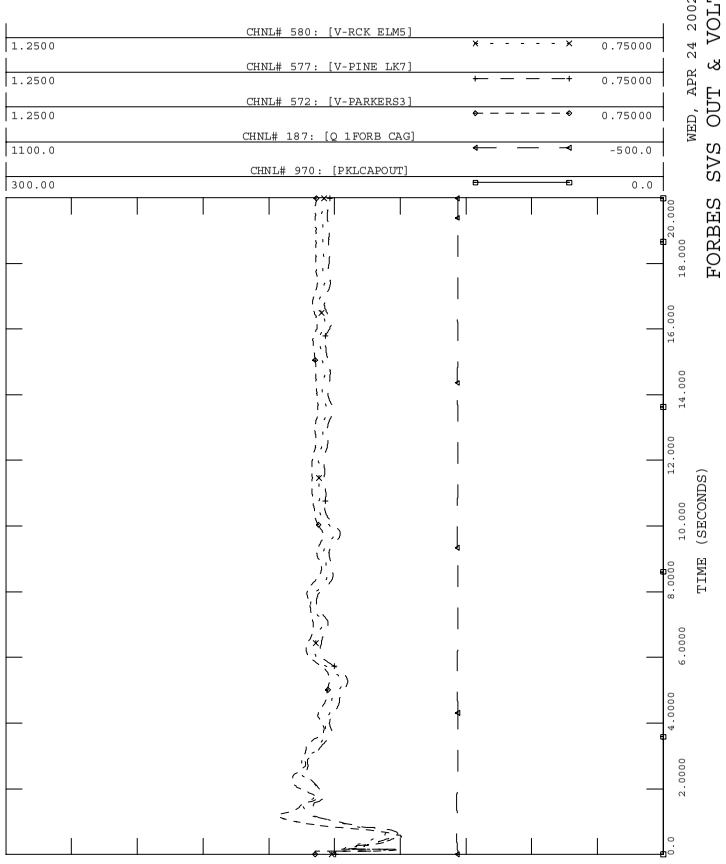
WED, APR 24 2002 17:34
TC VOLTAGES

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

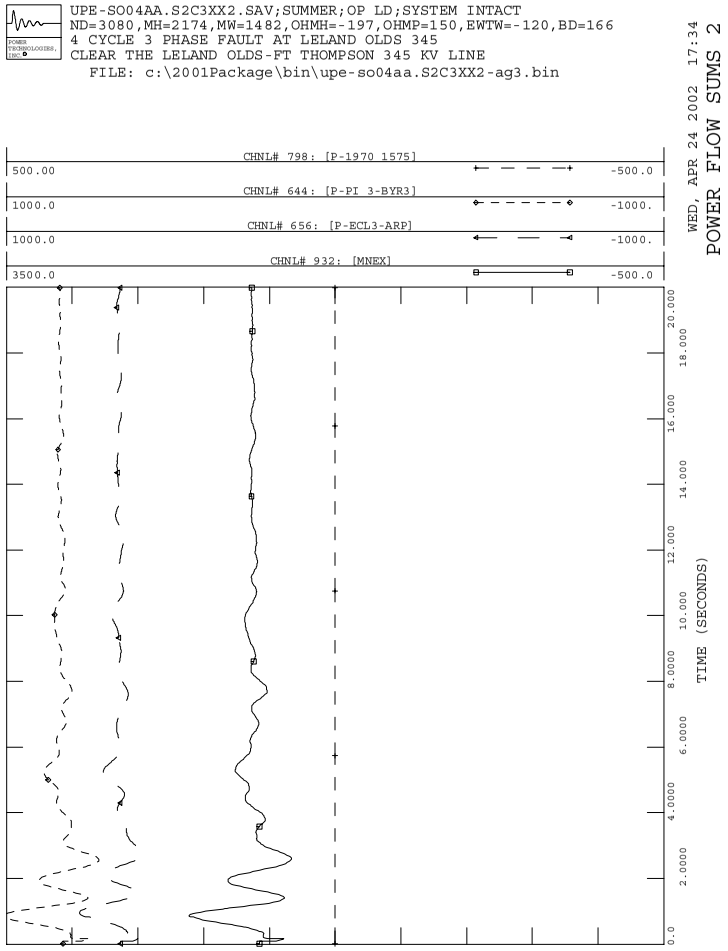


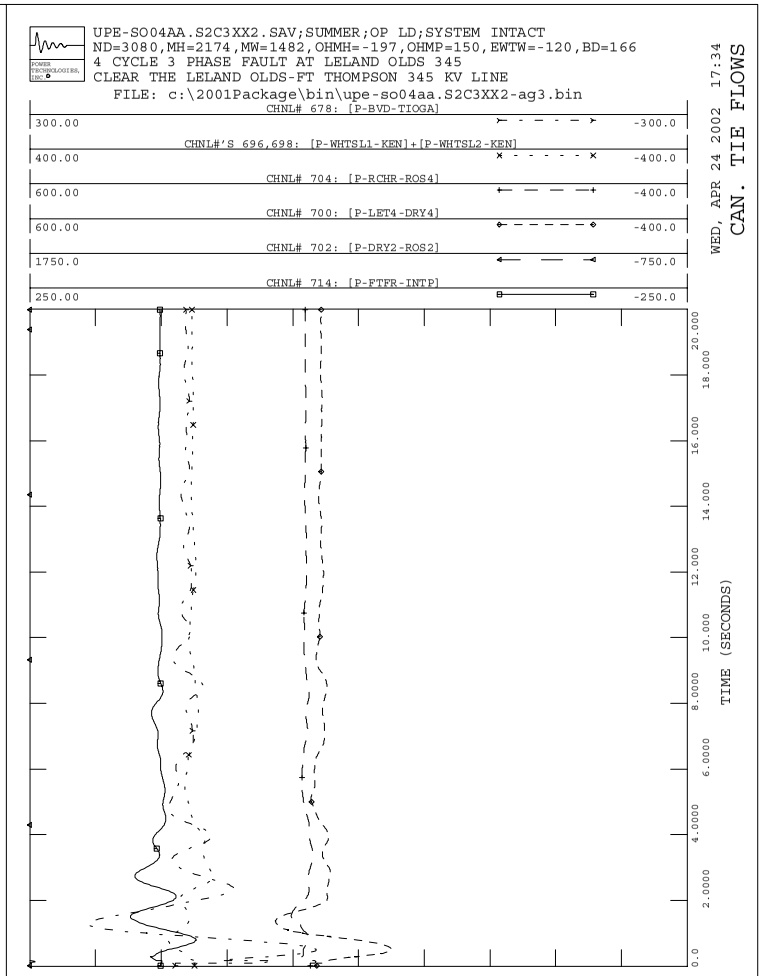
WED, APR 24 2002 17:34
VOLTAGES 6

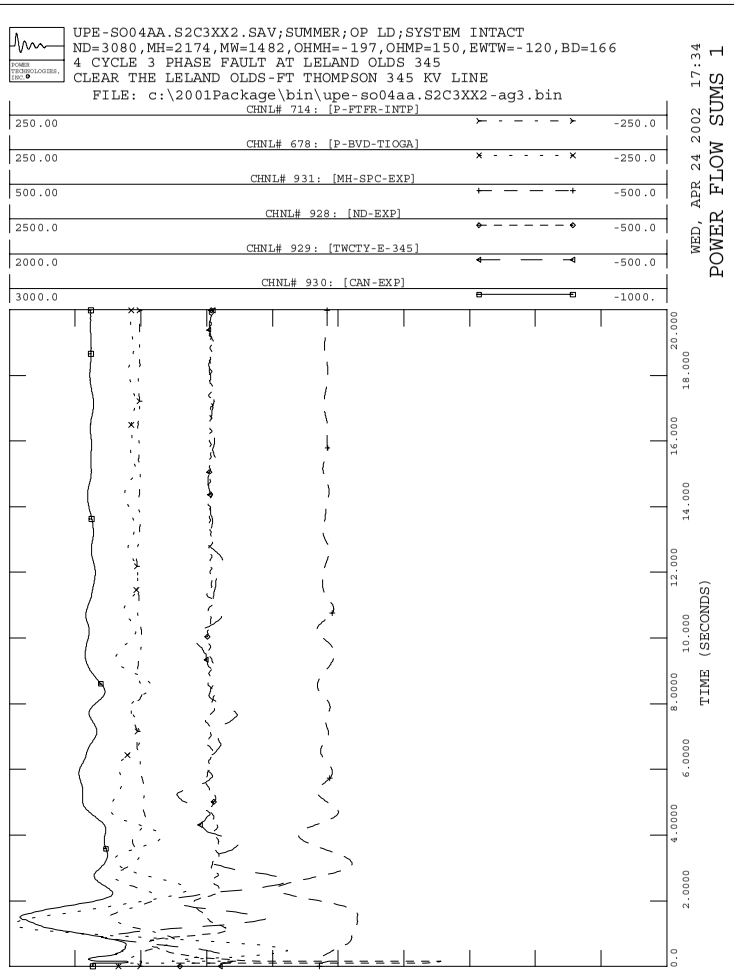
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

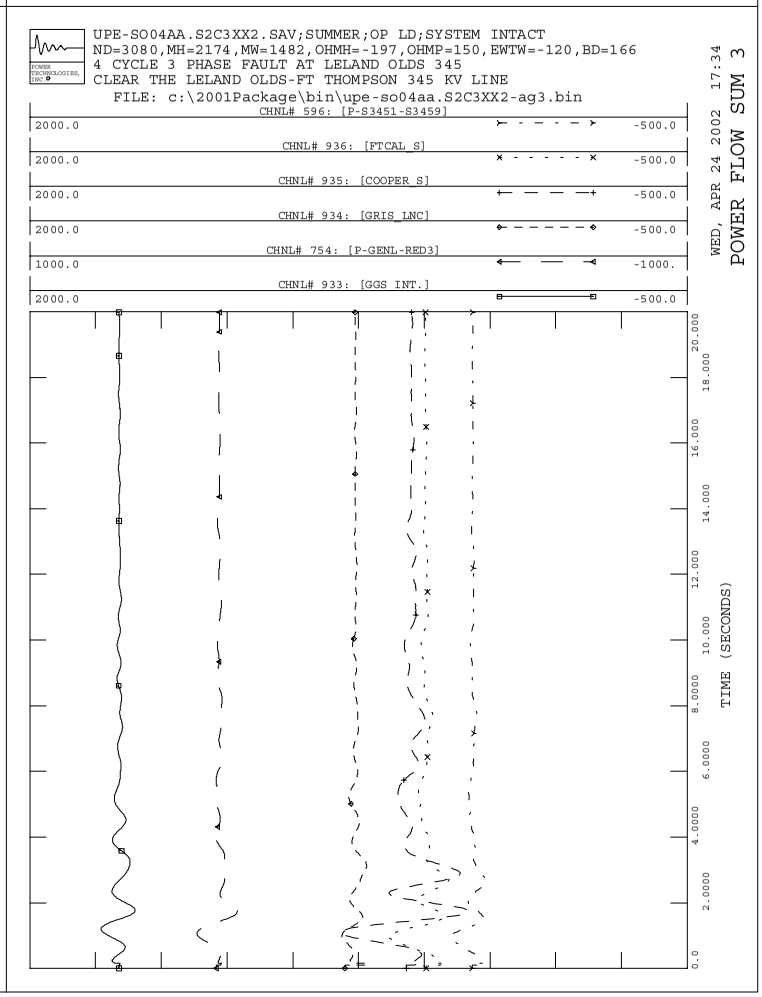


WED, APR 24 2002 17:34
FORBES SVS OUT & VOLTAGES


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL# 798: [P-1970 1575]
500.00
-500.0
CHNL# 644: [P-PI 3-BYR3]
1000.0
-1000.
CHNL# 656: [P-ECL3-ARP]
1000.0
-1000.
CHNL# 932: [MNEX]
3500.0
-500.0
TIME (SECONDS)
WED, APR 24 2002 17:34
POWER FLOW SUMS 2

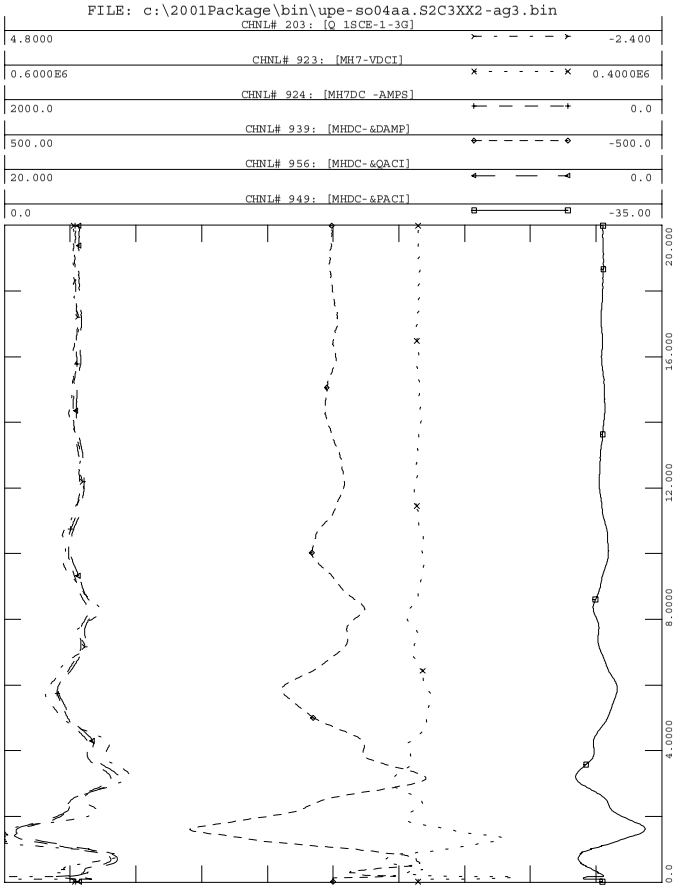

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL# 678: [P-BVD-TIOGA]
300.00
-300.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
400.00
-400.0
CHNL# 704: [P-RCHR-ROS4]
600.00
-400.0
CHNL# 700: [P-LET4-DRY4]
600.00
-400.0
CHNL# 702: [P-DRY2-ROS2]
1750.0
-750.0
CHNL# 714: [P-FTFR-INTP]
250.00
-250.0
TIME (SECONDS)
WED, APR 24 2002 17:34
CAN. TIE FLOWS


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL# 714: [P-FTFR-INTP]
250.00
-250.0
CHNL# 678: [P-BVD-TIOGA]
250.00
-250.0
CHNL# 931: [MH-SPC-EXP]
500.00
-500.0
CHNL# 928: [ND-EXP]
2500.0
-500.0
CHNL# 929: [TWCTY-E-345]
2000.0
-500.0
CHNL# 930: [CAN-EXP]
3000.0
-1000.
TIME (SECONDS)
WED, APR 24 2002 17:34
POWER FLOW SUMS 1


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL# 596: [P-S3451-S3459]
2000.0
-500.0
CHNL# 936: [FTCAL S]
2000.0
-500.0
CHNL# 935: [COOPER S]
2000.0
-500.0
CHNL# 934: [GRIS LNC]
2000.0
-500.0
CHNL# 754: [P-GENL-RED3]
1000.0
-1000.
CHNL# 933: [GGS INT.]
2000.0
-500.0
TIME (SECONDS)
WED, APR 24 2002 17:34
POWER FLOW SUM 3

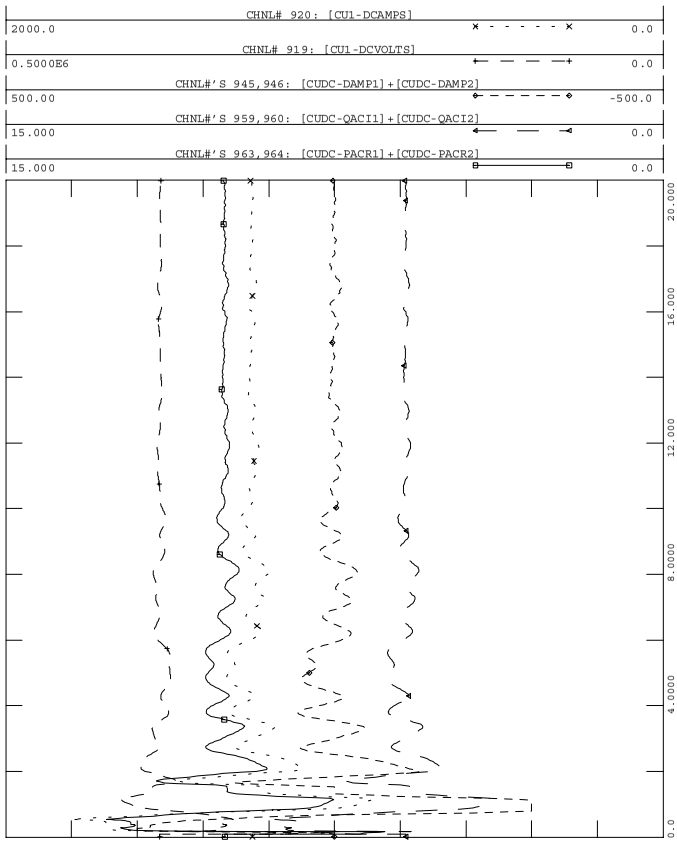
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

WED, APR 24 2002 17:35
MH DC PARAMETERS



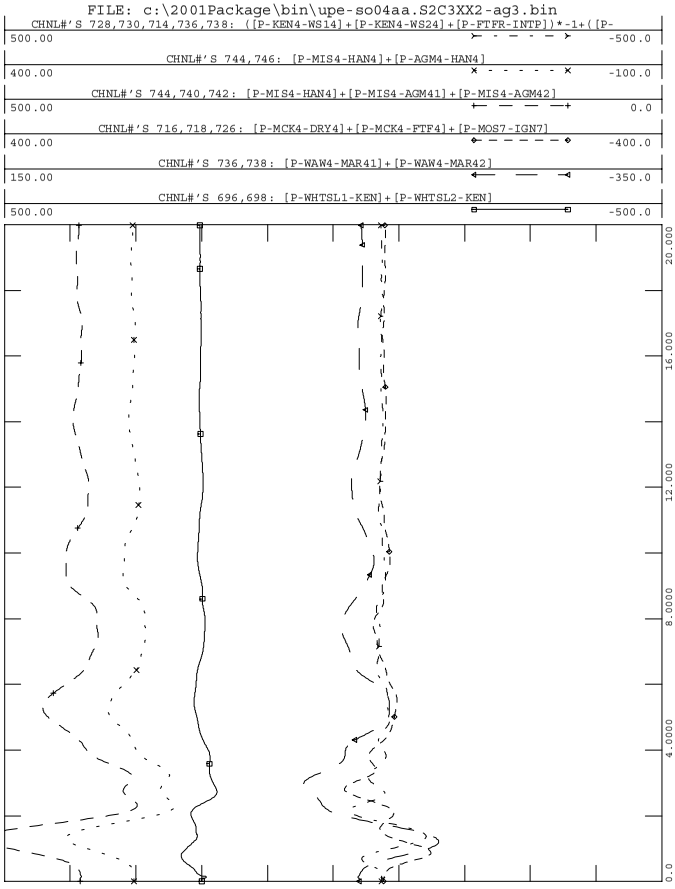
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

WED, APR 24 2002 17:35
CU DC #1



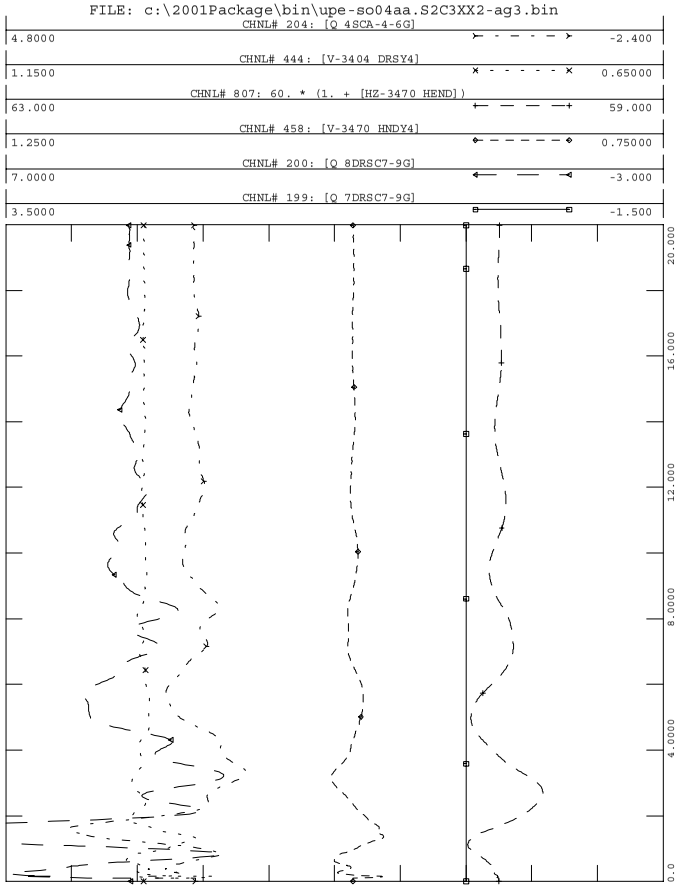
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

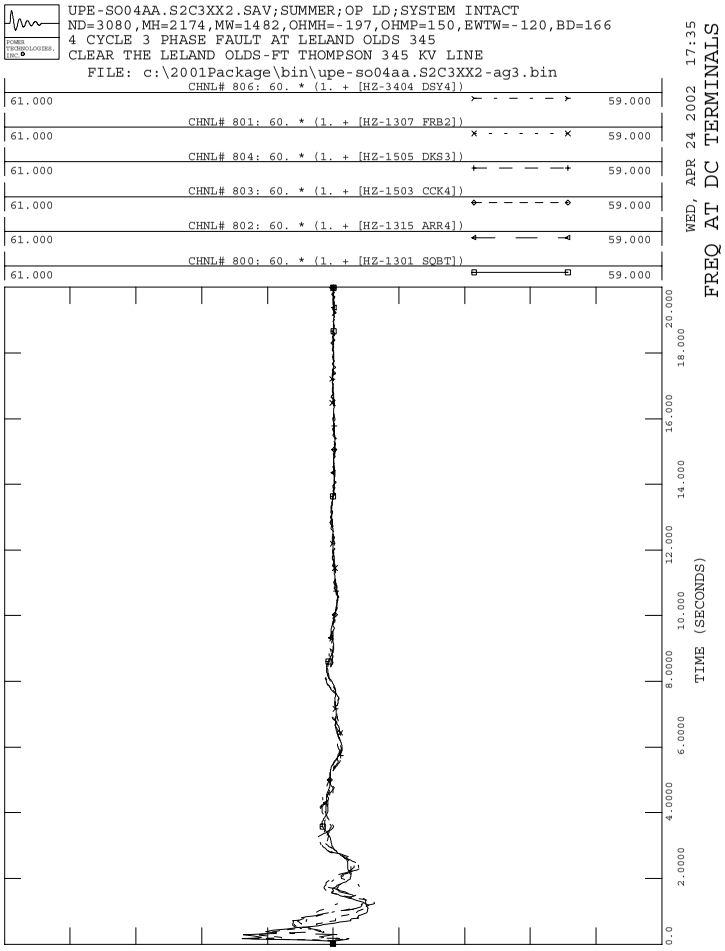
WED, APR 24 2002 17:34
OH TIE FLOWS

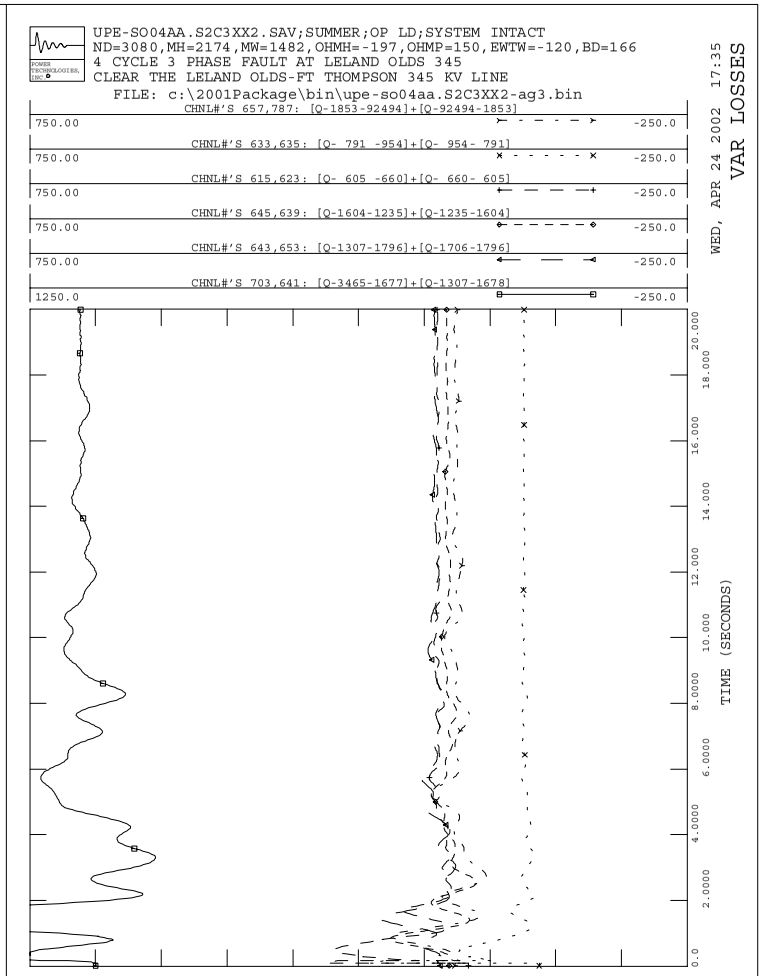


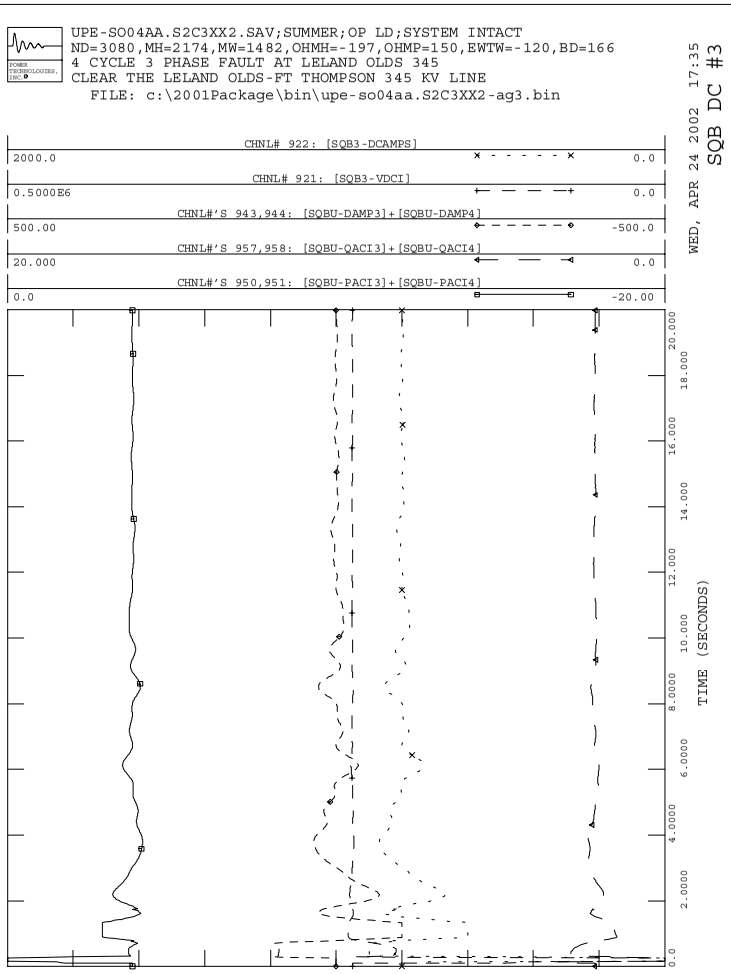
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

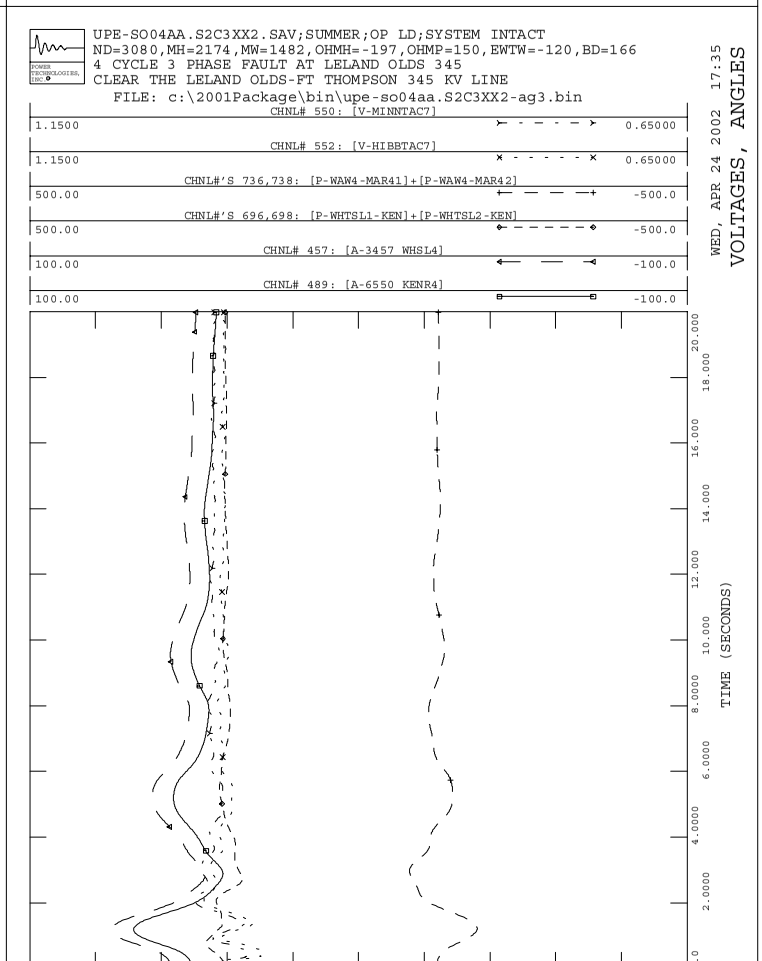
WED, APR 24 2002 17:35
MH DC PARAMETERS




UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
WED, APR 24 2002 17:35
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
WED, APR 24 2002 17:35
VAR LOSSES
TIME (SECONDS)

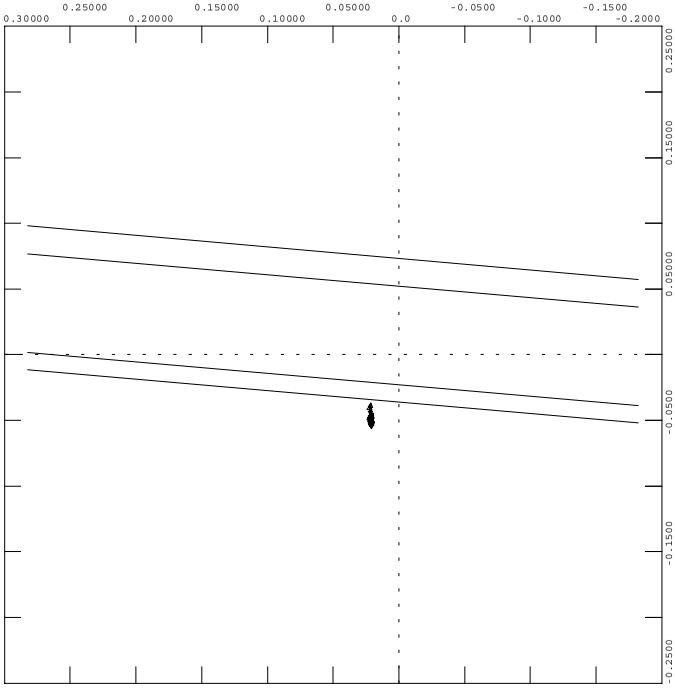

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
WED, APR 24 2002 17:35
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
WED, APR 24 2002 17:35
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

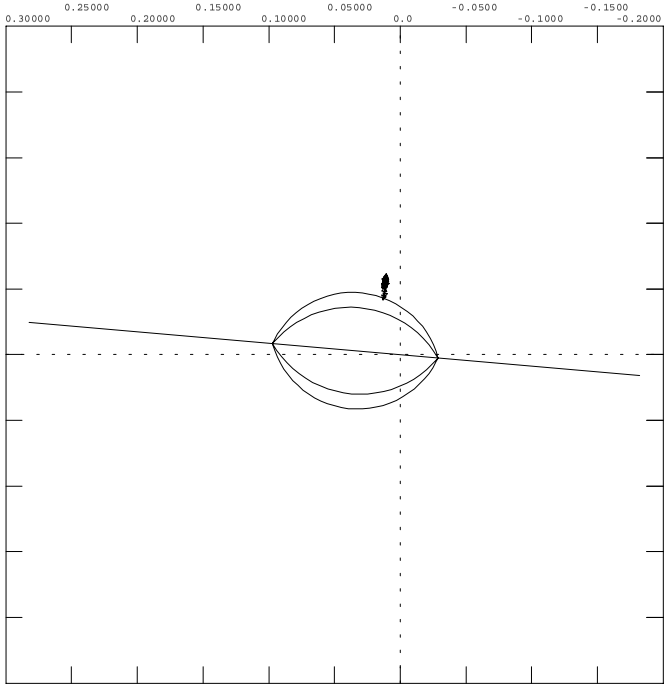


WED, APR 24 2002 17:35
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

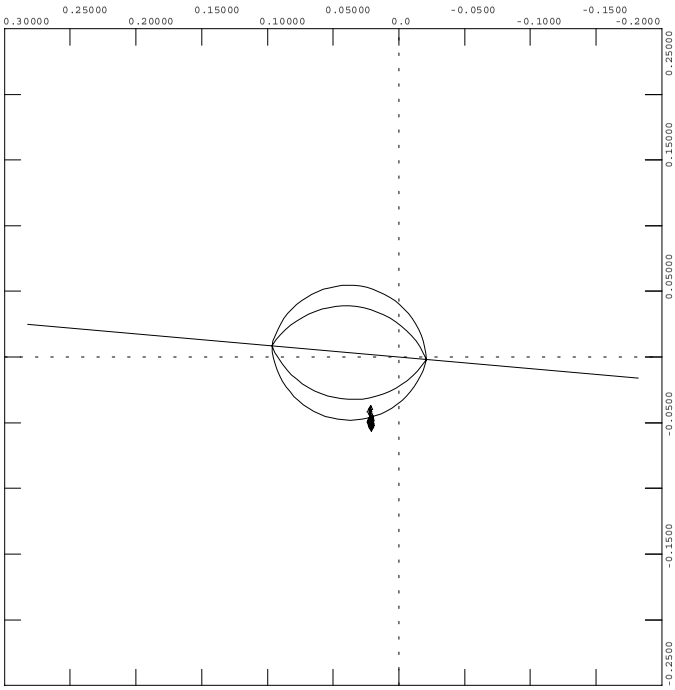


WED, APR 24 2002 17:35
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

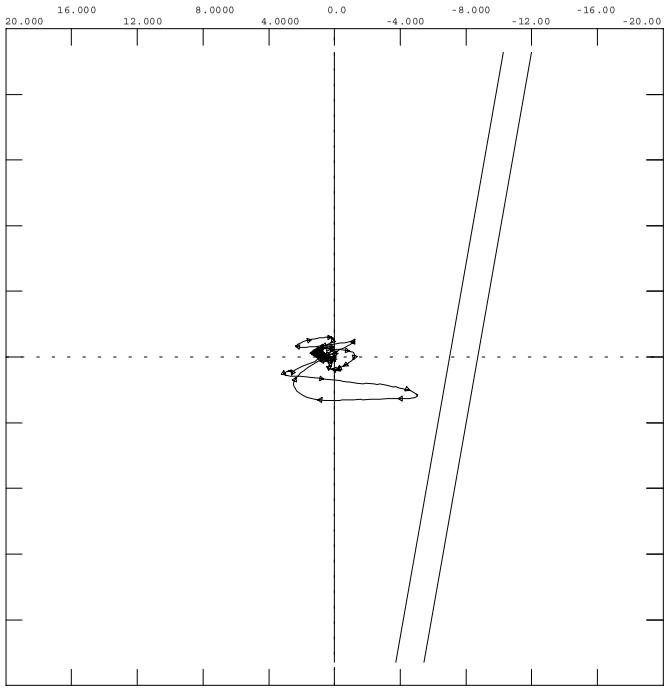


WED, APR 24 2002 17:35
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

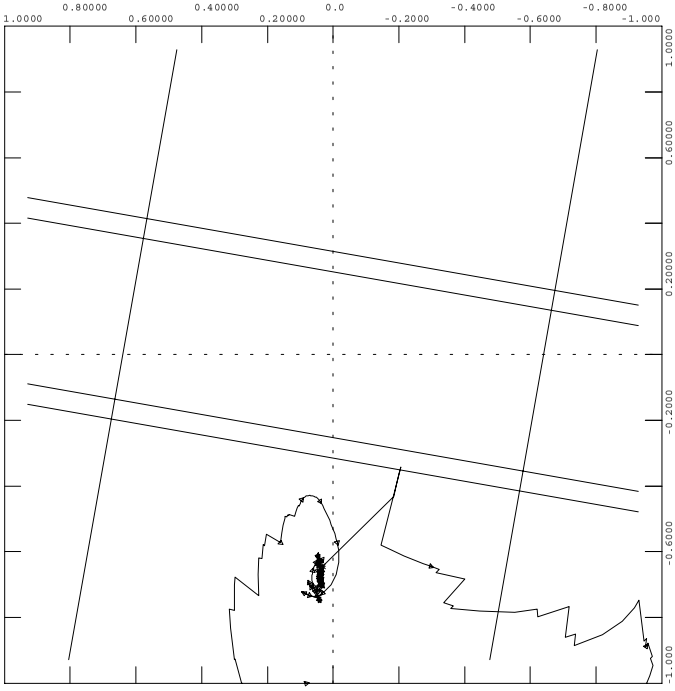


WED, APR 24 2002 17:35
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

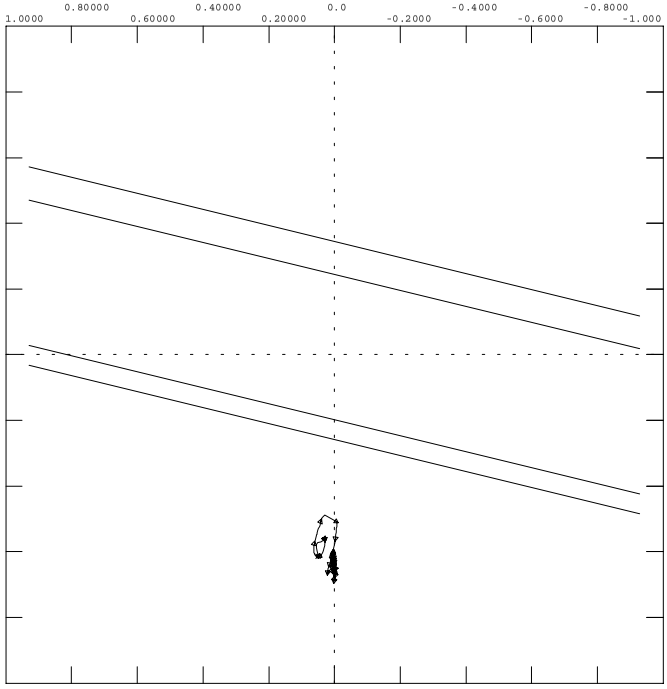
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

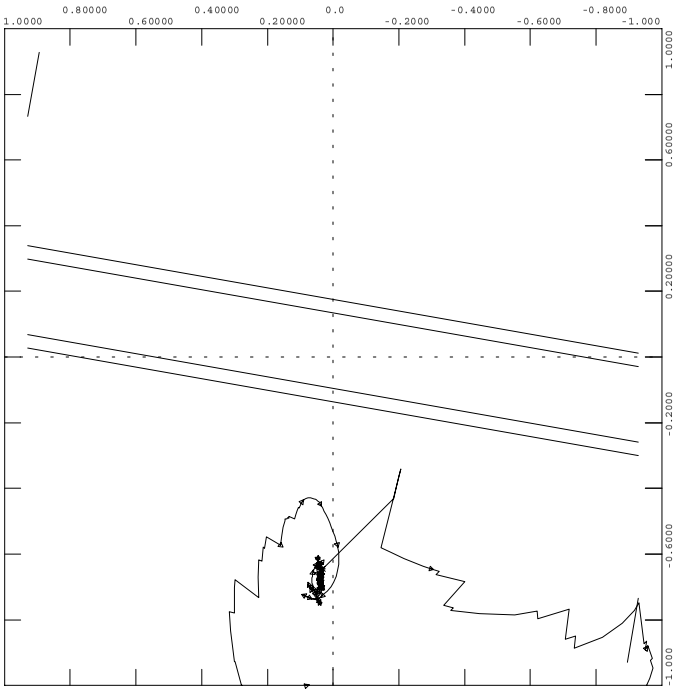
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

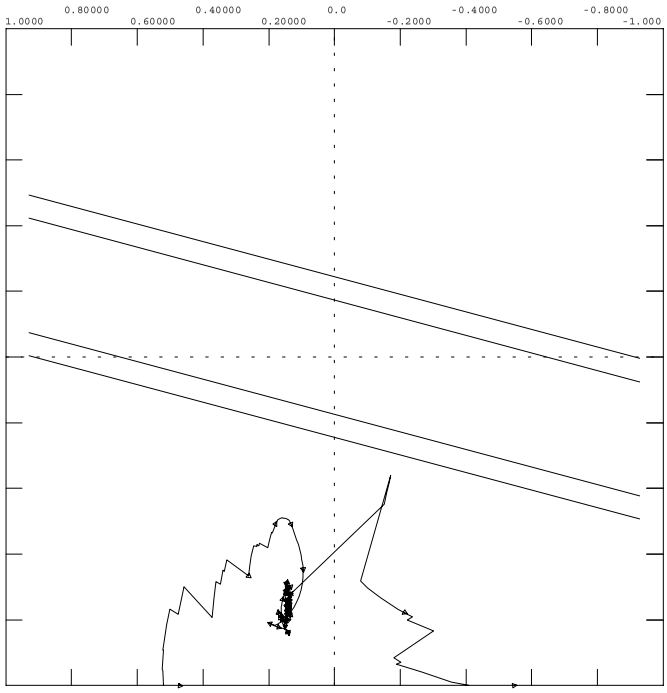
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

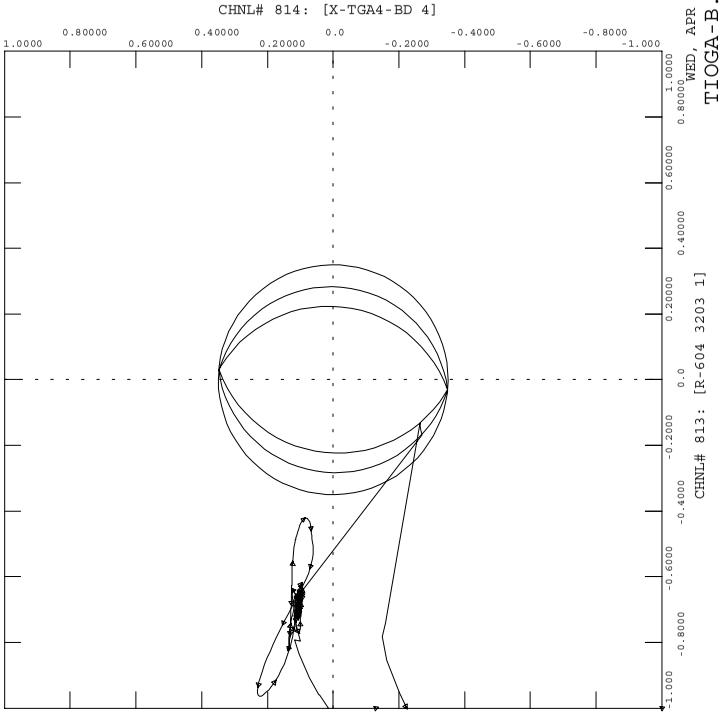
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

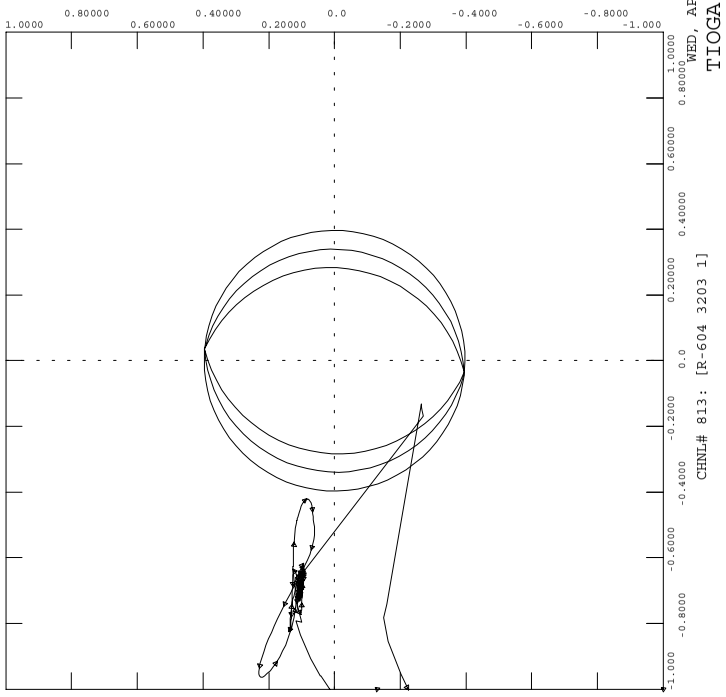
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

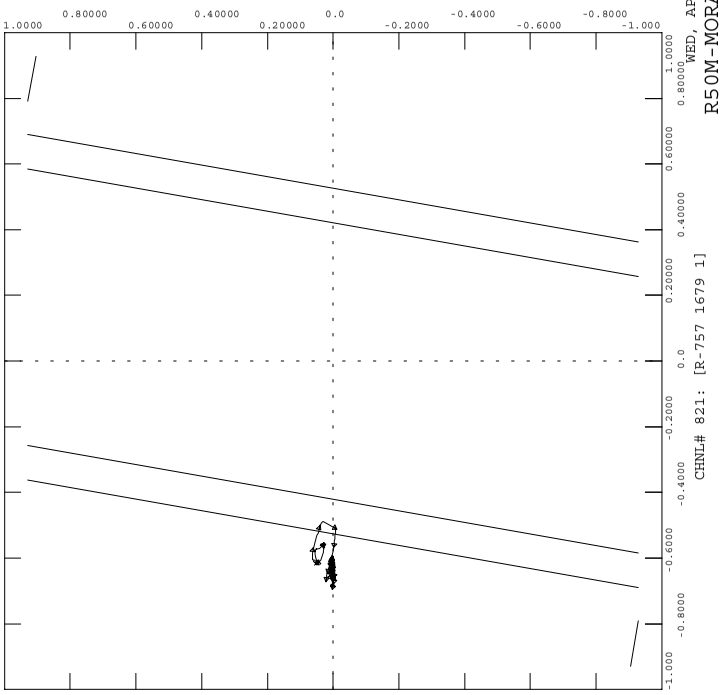
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

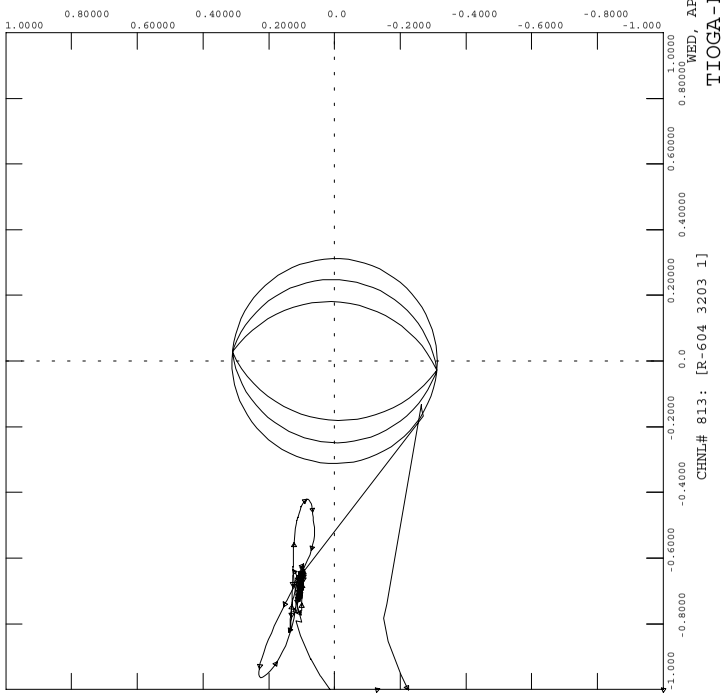
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



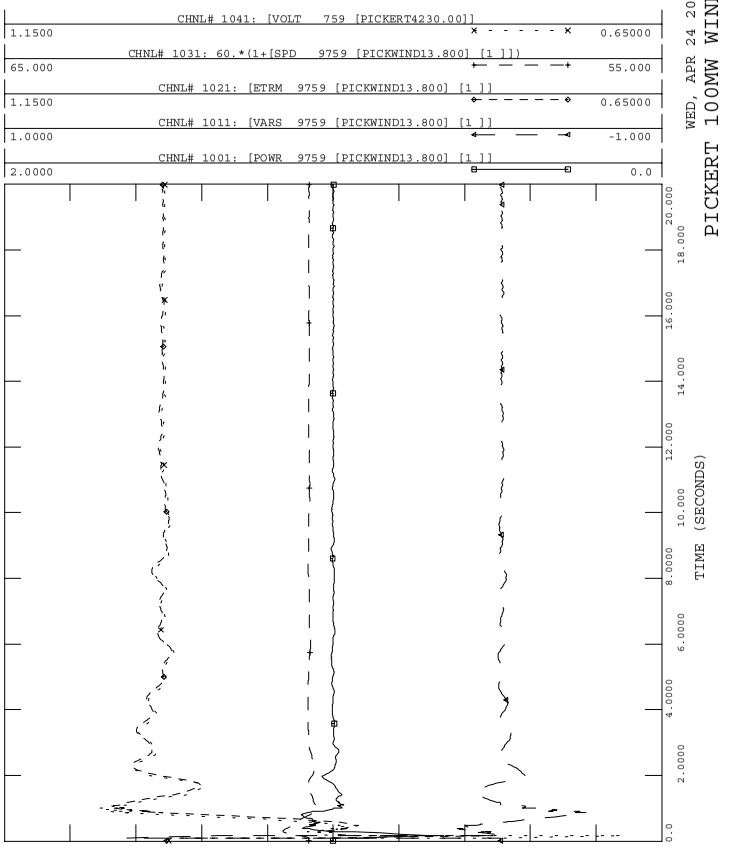
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

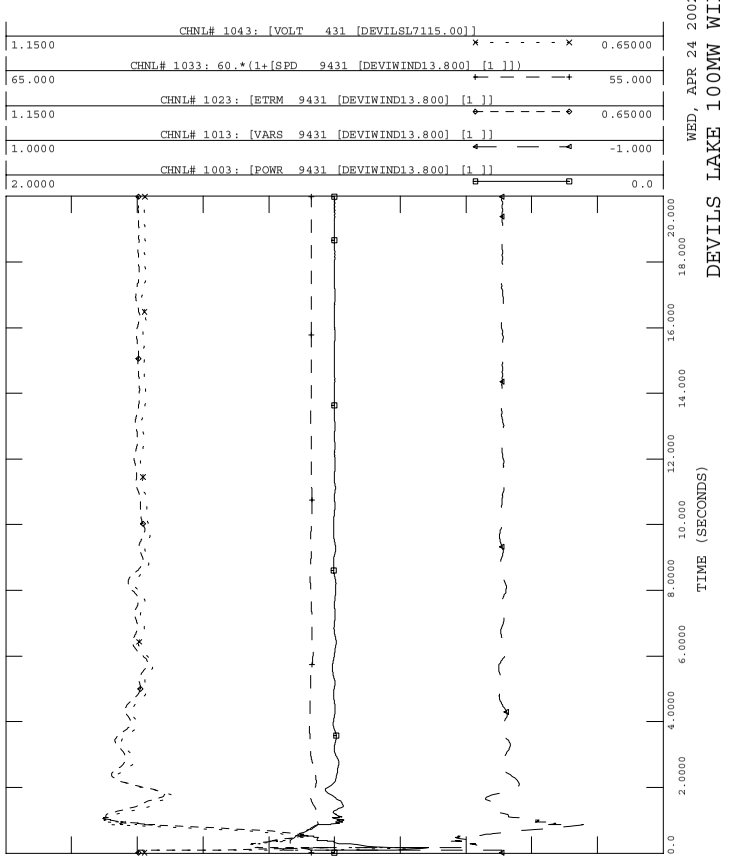


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



WED, APR 24 2002 17:35
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

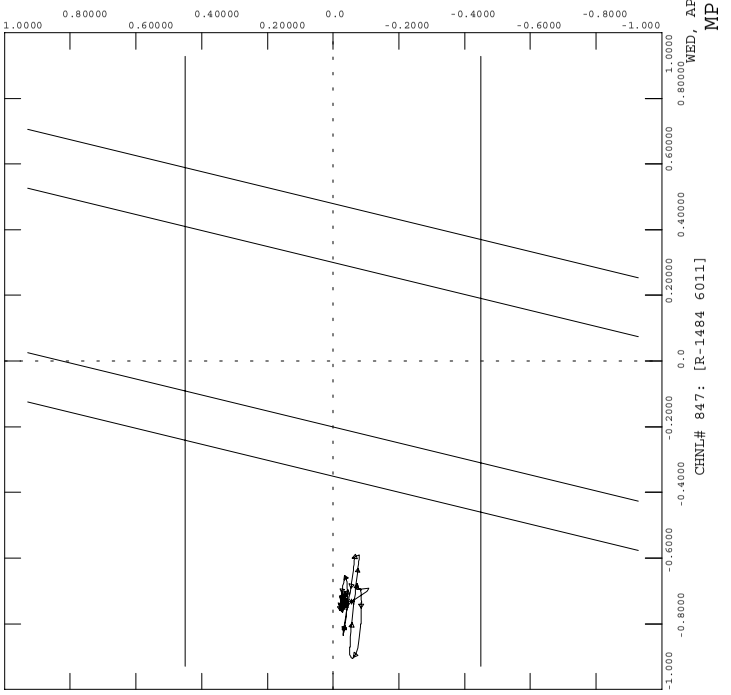


WED, APR 24 2002 17:35
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

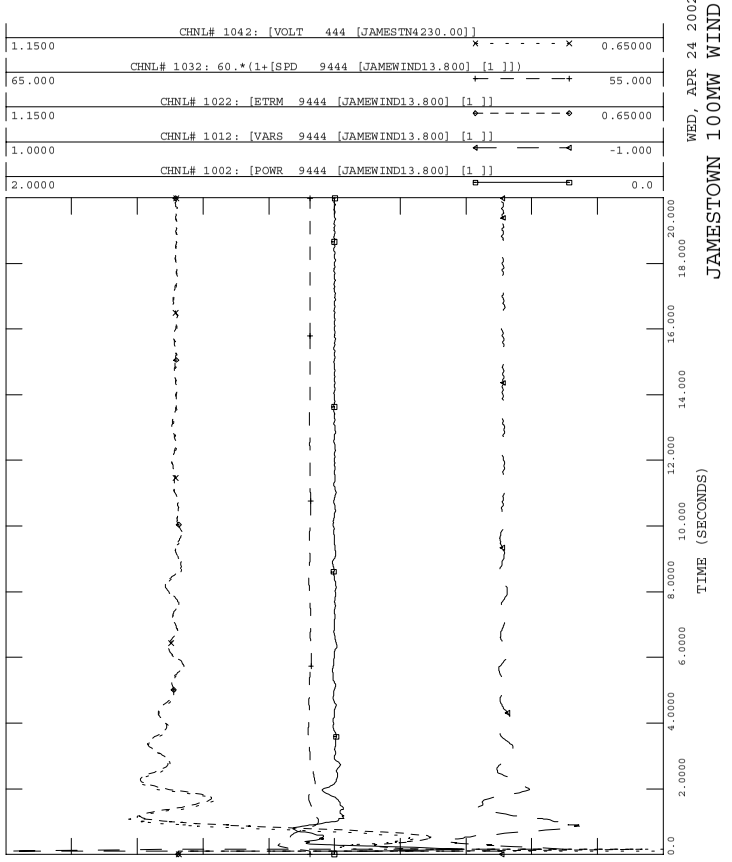
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



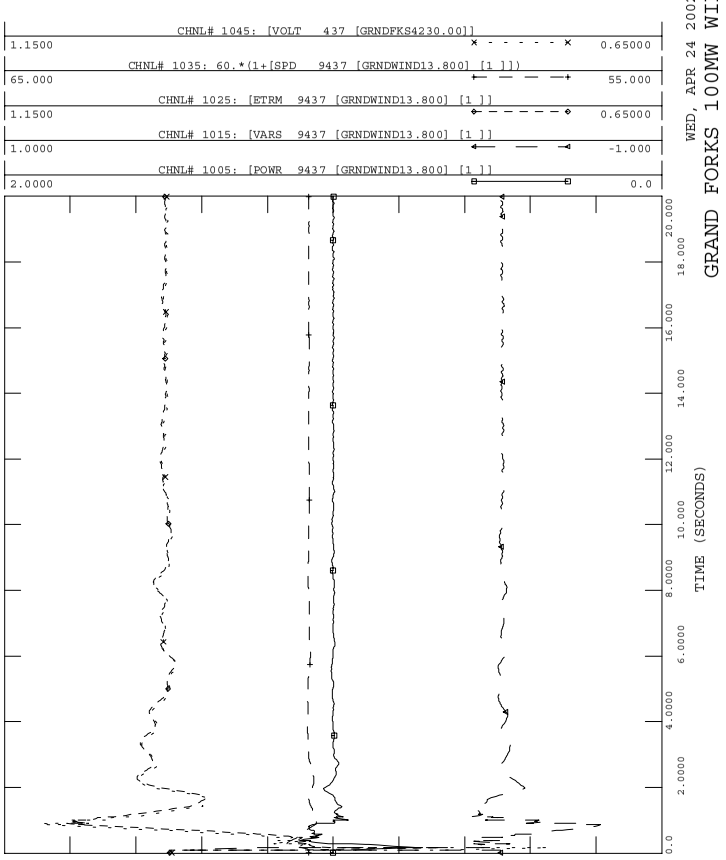
WED, APR 24 2002 17:35
MP-OH I.FALLS (779)

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

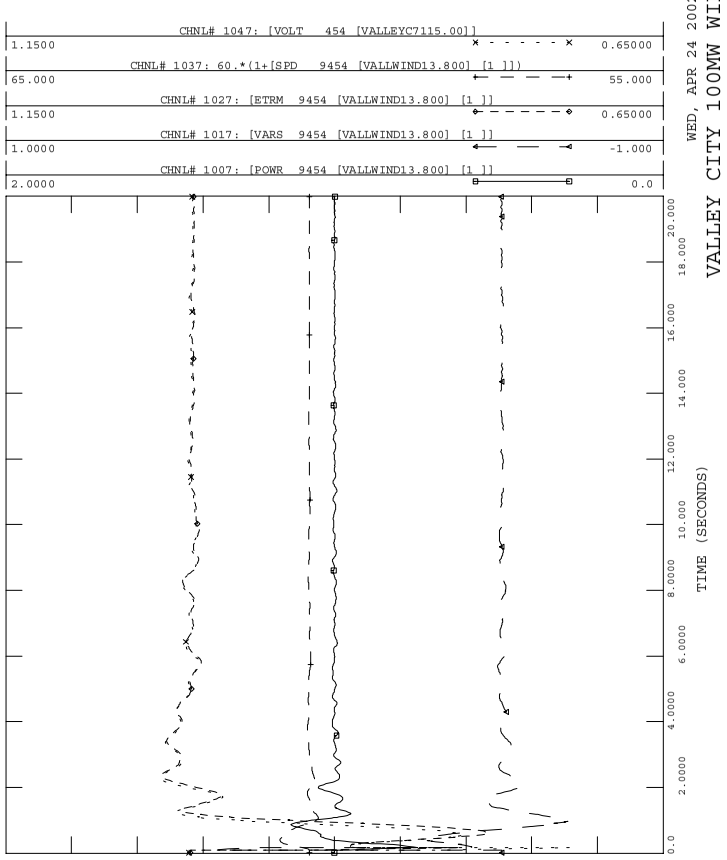


WED, APR 24 2002 17:35
JAMESTOWN 100MW WIND UNIT

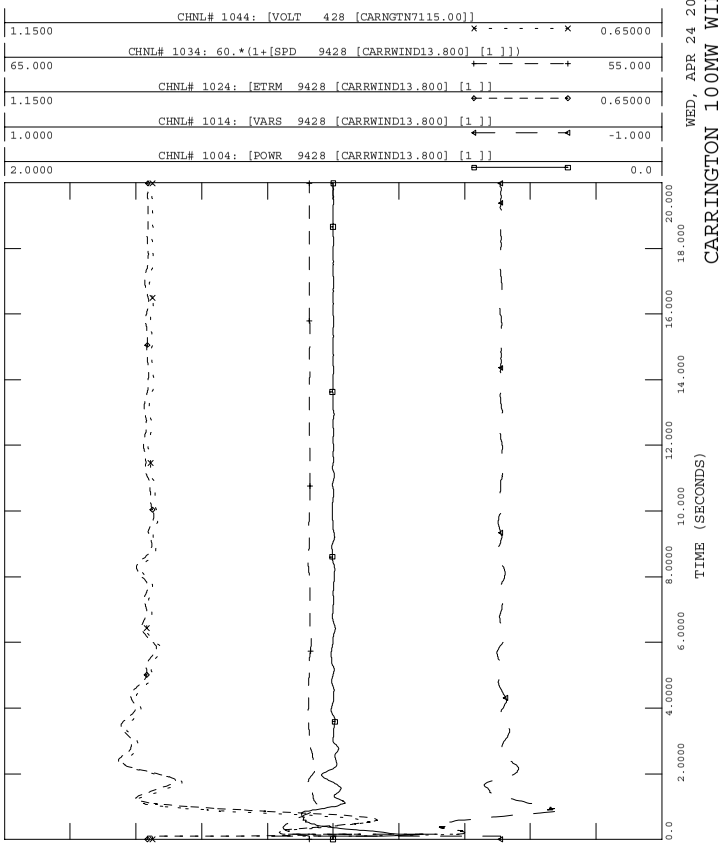
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



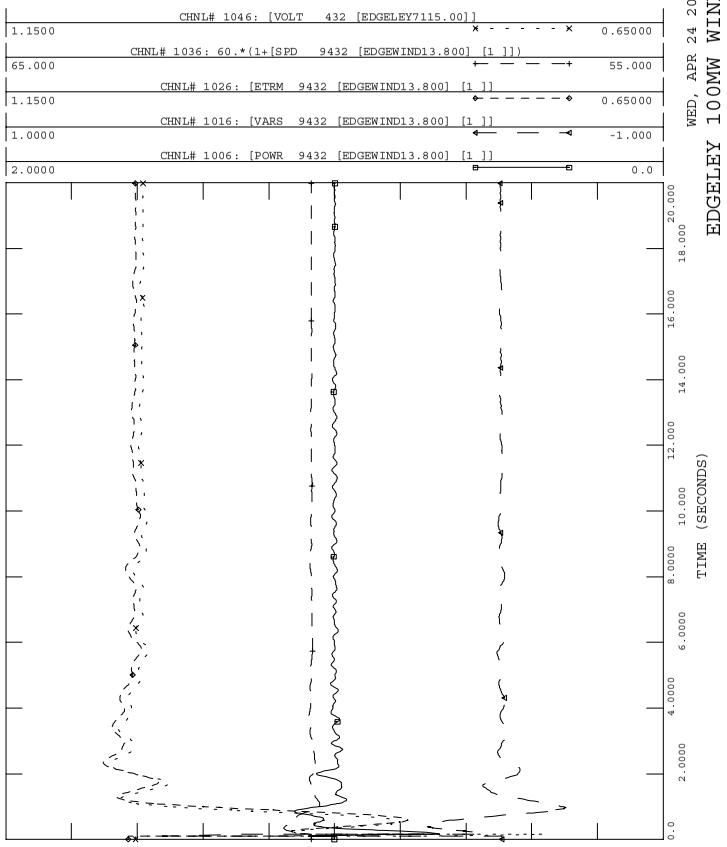
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



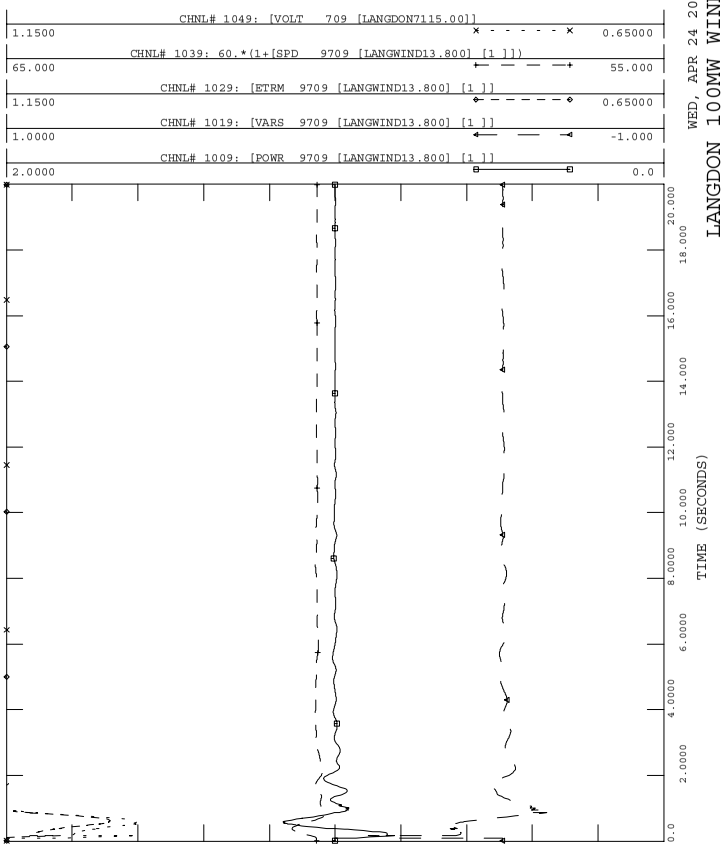
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

WED, APR 24 2002 17:35

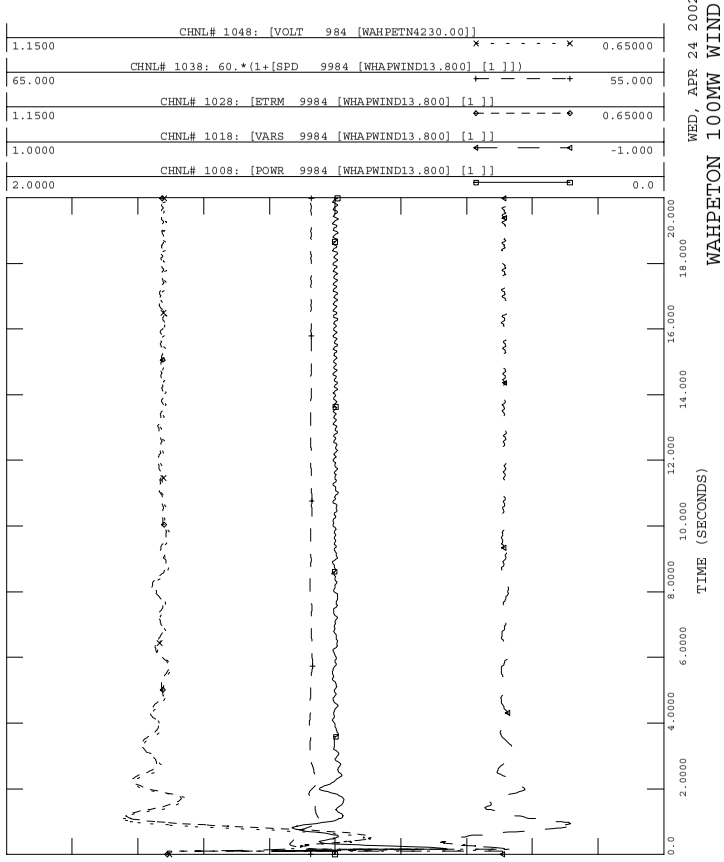
LANGDON 100MW WIND UNIT



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

WED, APR 24 2002 17:35

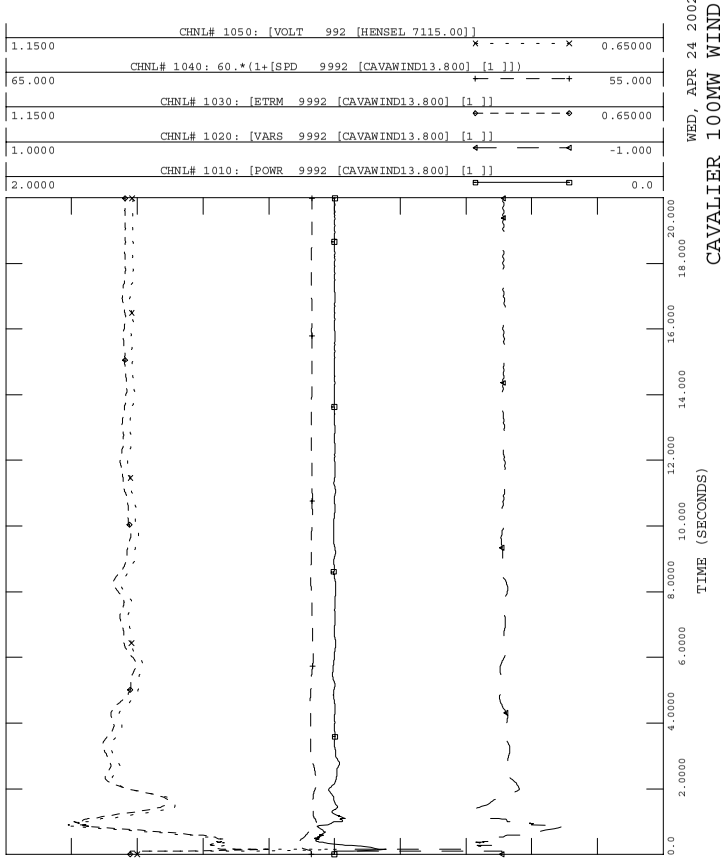
WAHPETON 100MW WIND UNIT



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ag3.bin

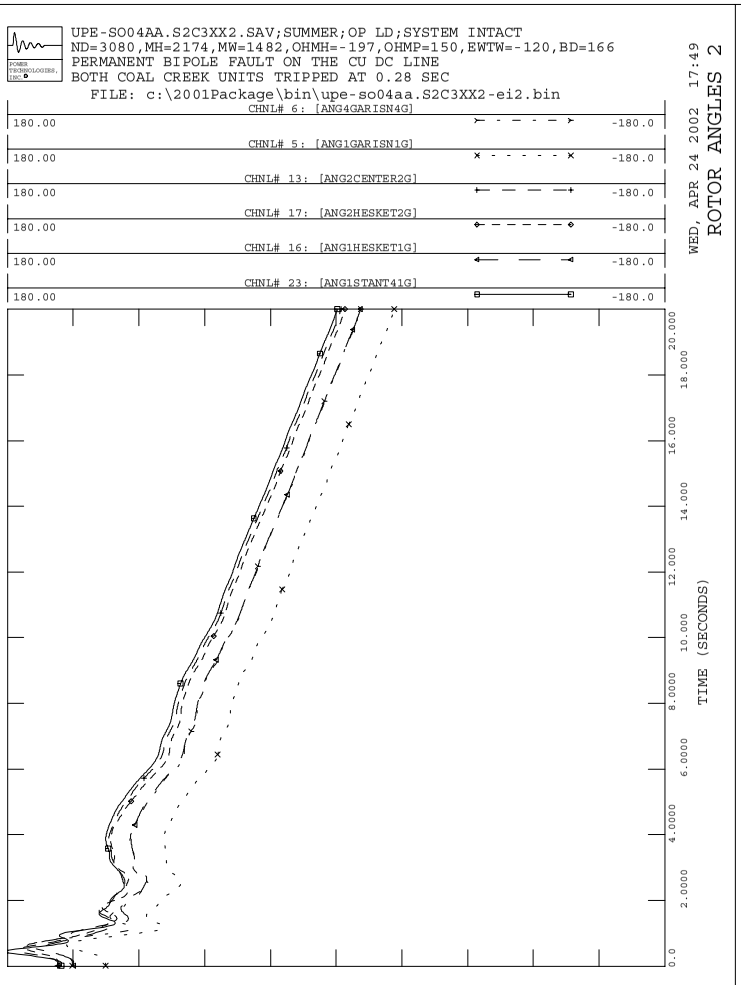
WED, APR 24 2002 17:35

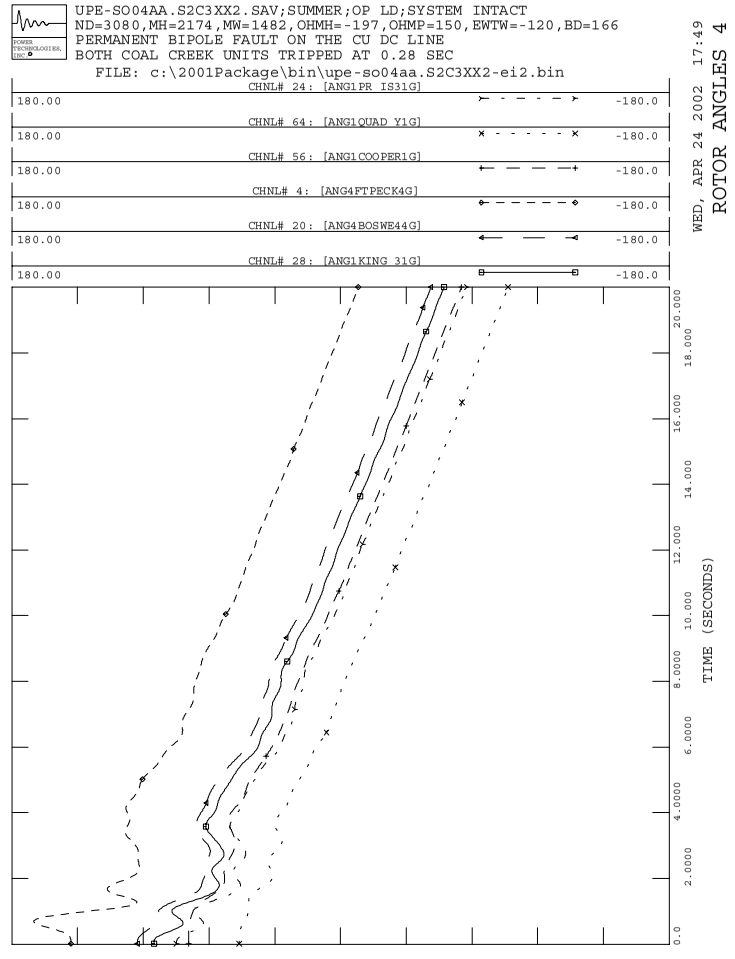
CAVALIER 100MW WIND UNIT

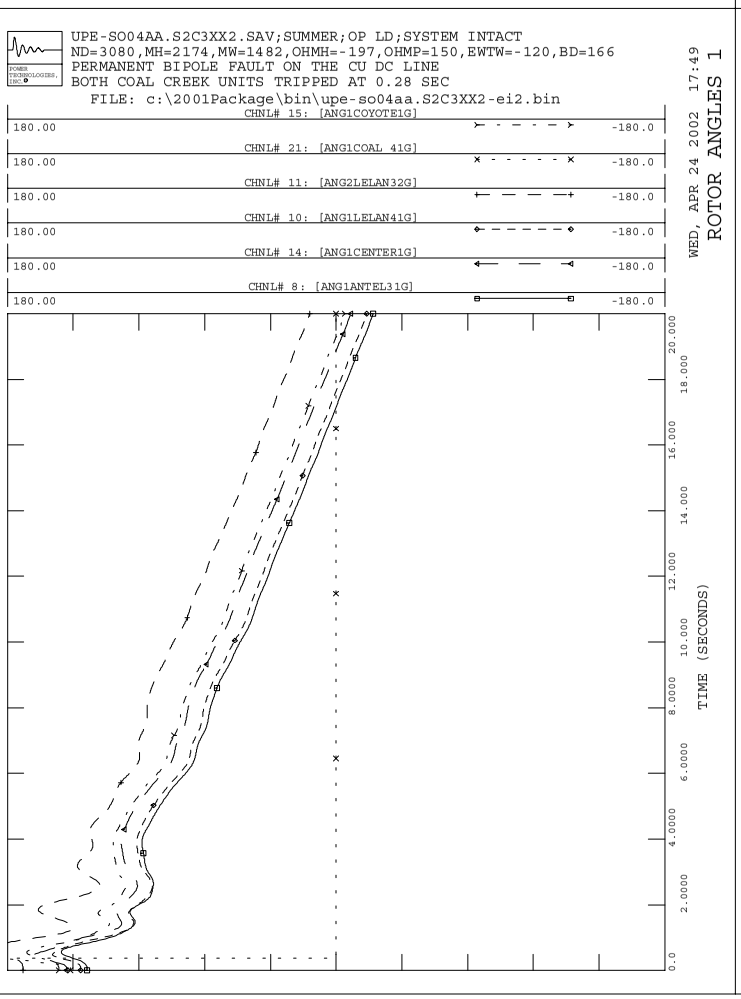


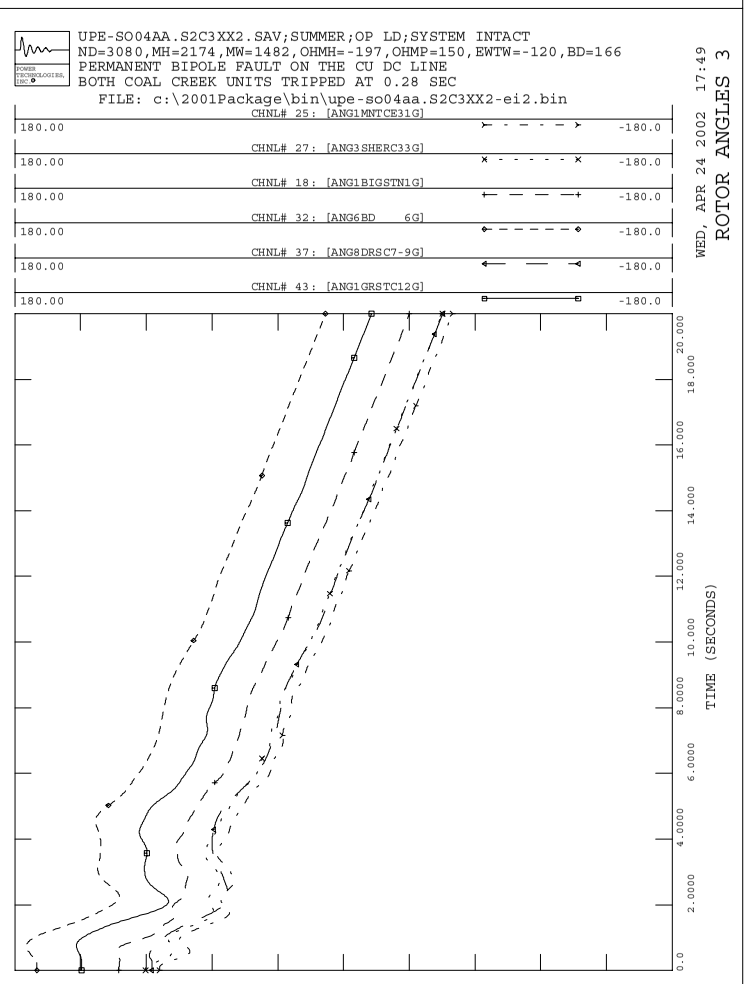
CONTINGENCY EI2

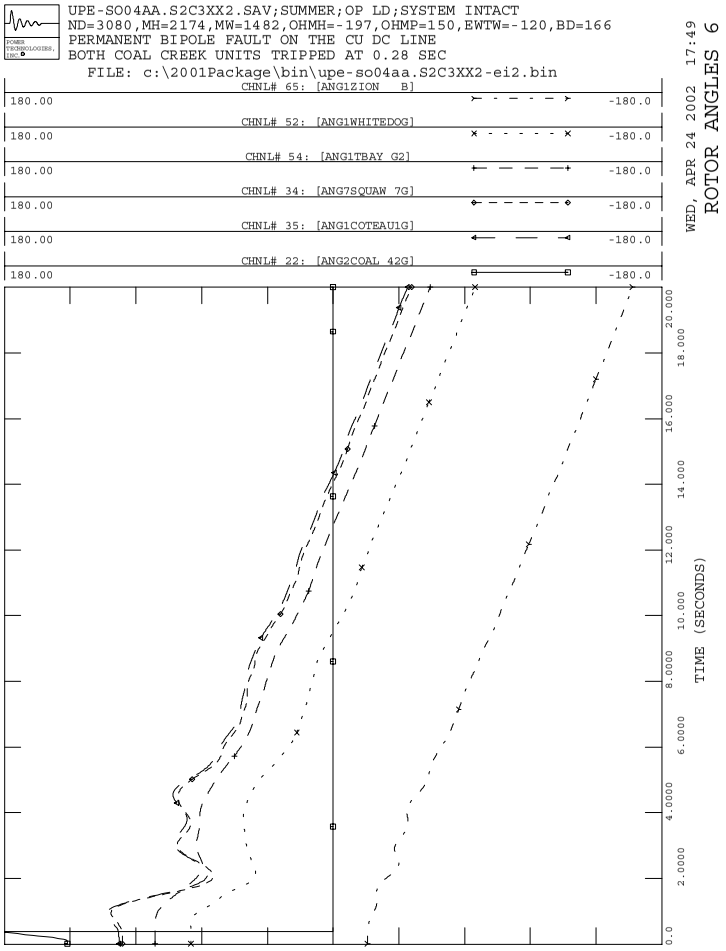
CU DC Permanent Bipole Fault with tripping of both Coal Creek units

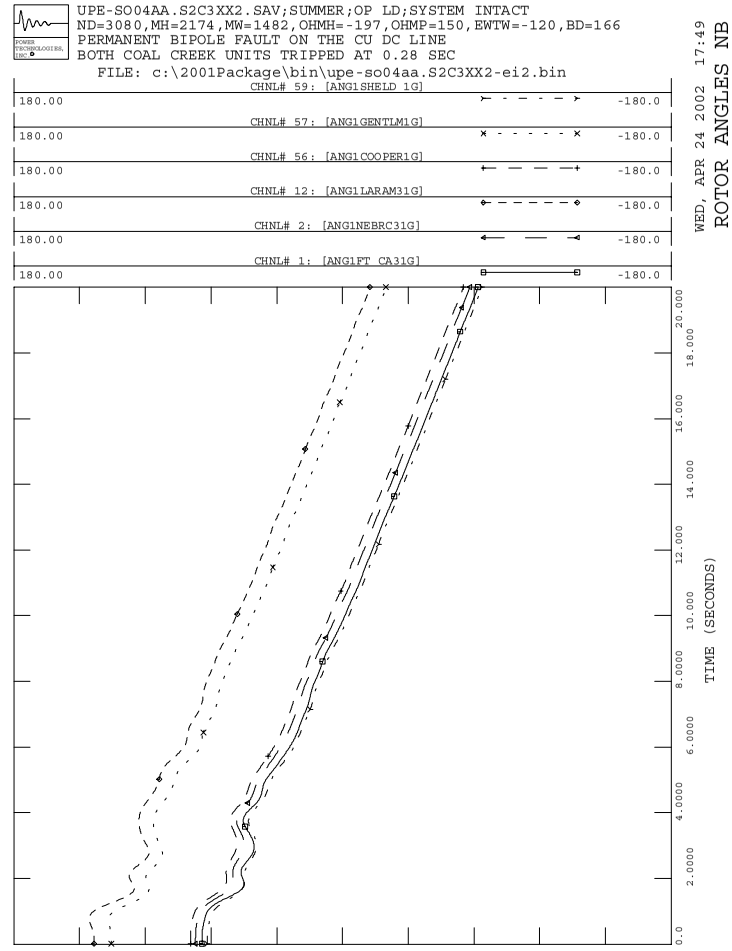

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 17:49
ROTOR ANGLES 2

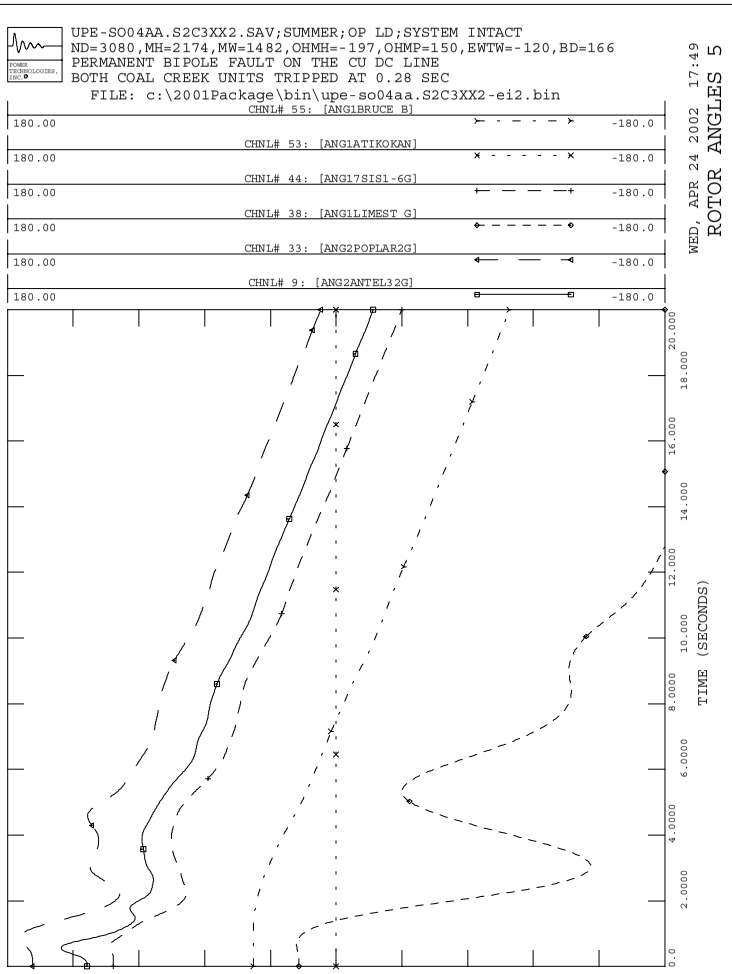

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 17:49
ROTOR ANGLES 4

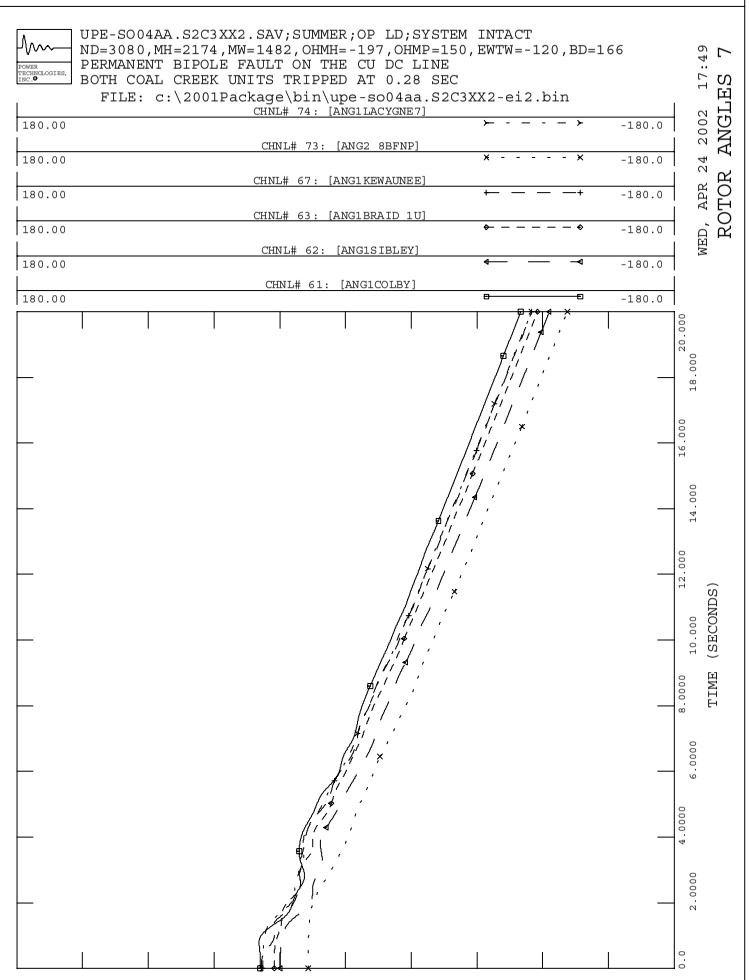

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 17:49
ROTOR ANGLES 1

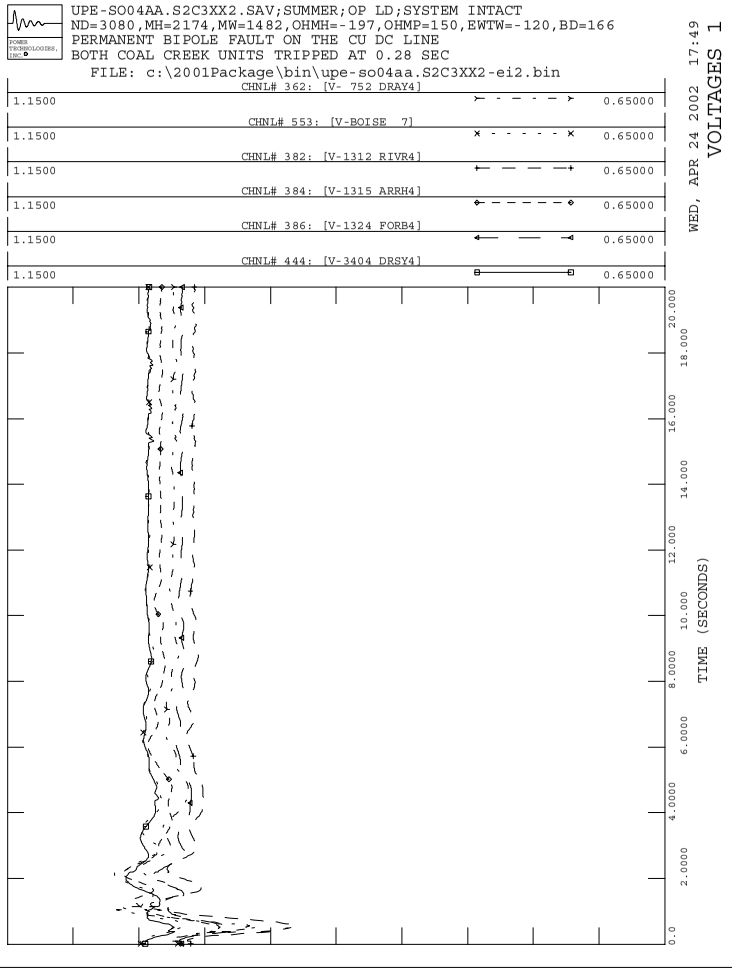

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 17:49
ROTOR ANGLES 3

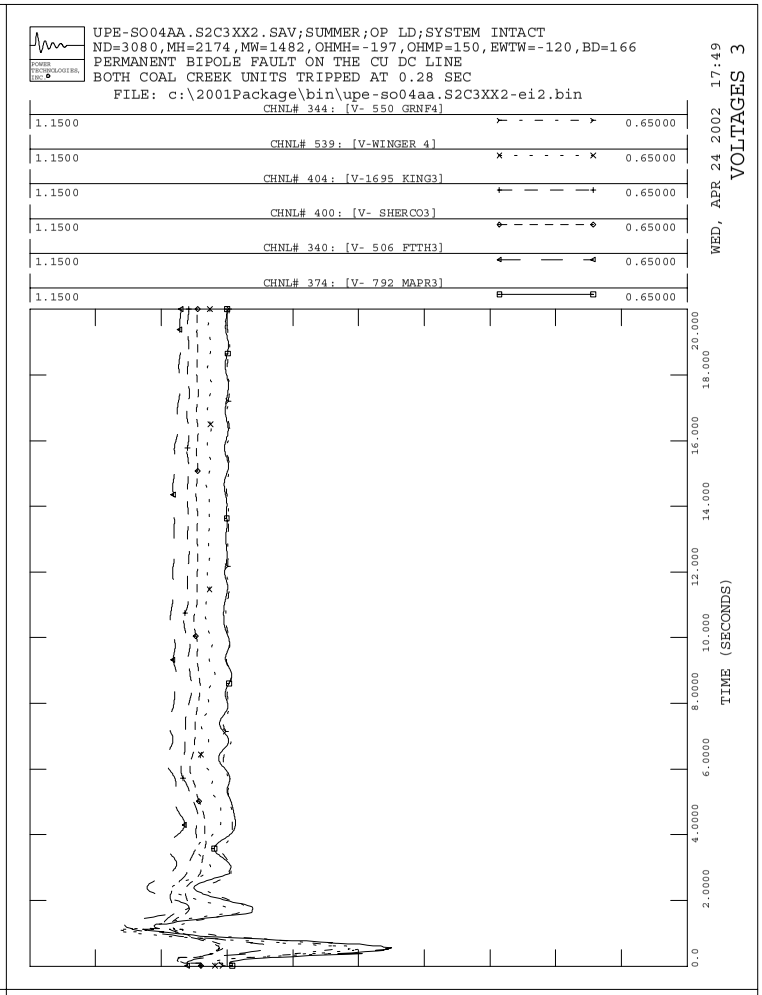

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 17:49
ROTOR ANGLES 6

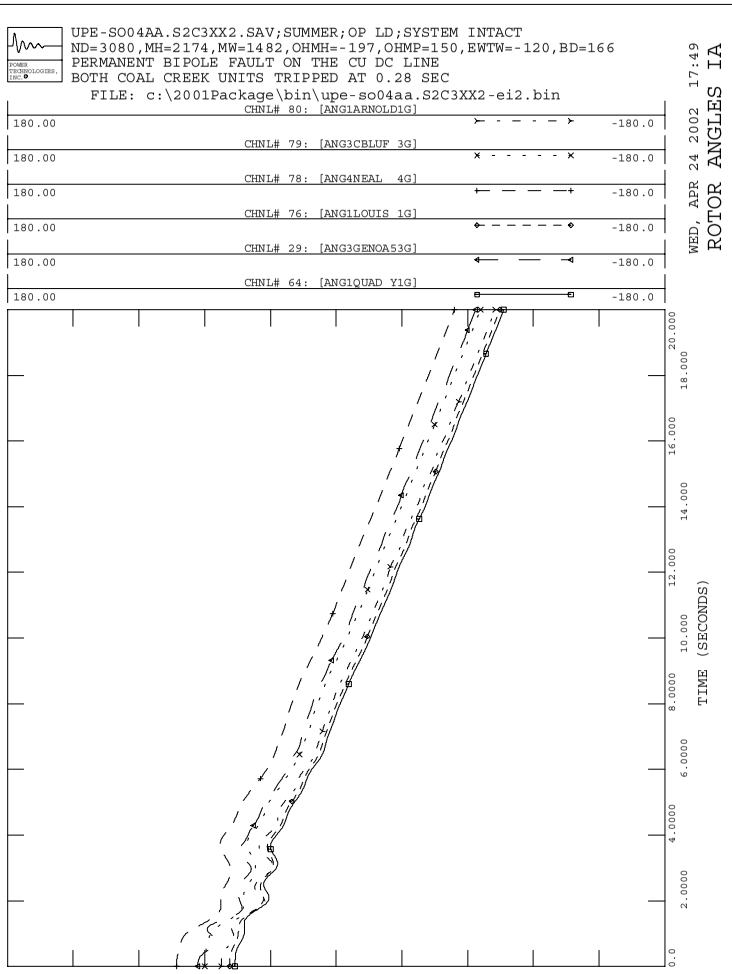

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 17:49
ROTOR ANGLES NB

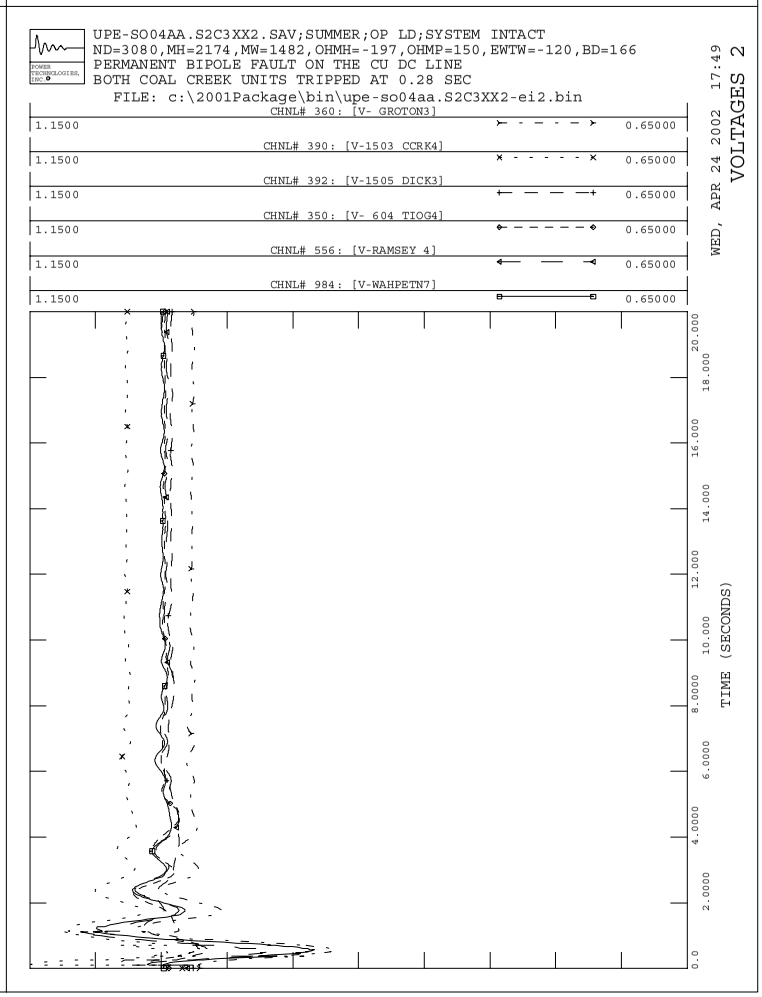

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 17:49
ROTOR ANGLES 5


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 17:49
ROTOR ANGLES 7


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 362: [V- 752 DRAY4]
CHNL# 553: [V-BOISE 7]
CHNL# 382: [V-1312 RIVR4]
CHNL# 384: [V-1315 ARRH4]
CHNL# 386: [V-1324 FORB4]
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
WED, APR 24 2002 17:49
VOLTAGES 1
TIME (SECONDS)

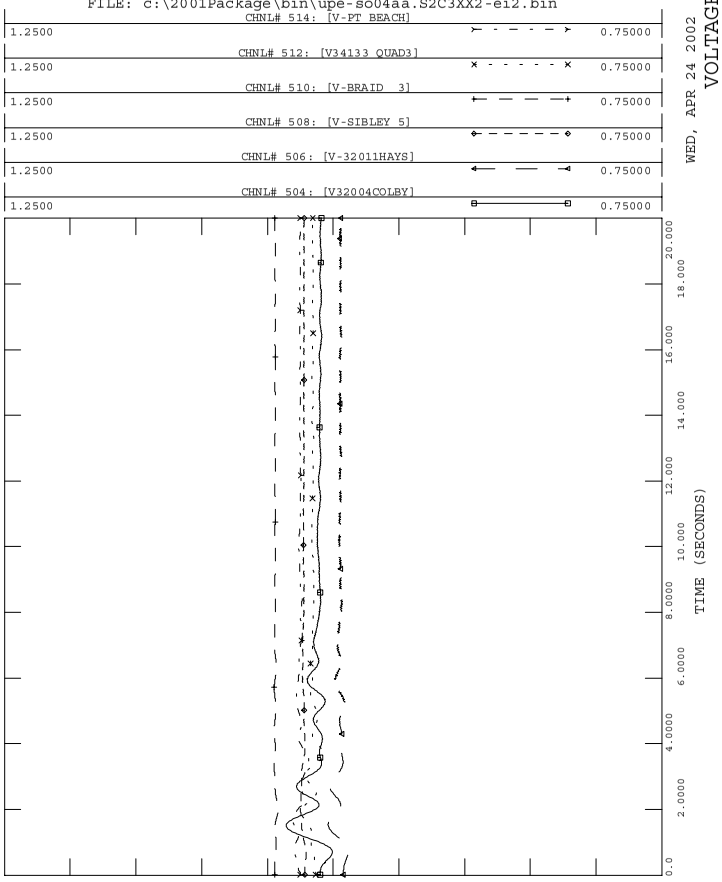

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 344: [V- 550 GRNF4]
CHNL# 539: [V-WINGER 4]
CHNL# 404: [V-1695 KING3]
CHNL# 400: [V- SHERCO3]
CHNL# 340: [V- 506 FTTH3]
CHNL# 374: [V- 792 MAPR3]
1.1500
0.65000
WED, APR 24 2002 17:49
VOLTAGES 3
TIME (SECONDS)


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 80: [ANG1ARNOLD1G]
CHNL# 79: [ANG3CBLUF 3G]
CHNL# 78: [ANG4NEAL 4G]
CHNL# 76: [ANG1LOUIS 1G]
CHNL# 29: [ANG3GENOA53G]
CHNL# 64: [ANG1QUAD Y1G]
180.00
-180.0
WED, APR 24 2002 17:49
ROTOR ANGLES IA
TIME (SECONDS)


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 360: [V- GROTON3]
CHNL# 390: [V-1503 CCRK4]
CHNL# 392: [V-1505 DICK3]
CHNL# 350: [V- 604 TIOG4]
CHNL# 556: [V-RAMSEY 4]
CHNL# 984: [V-WAHPETN7]
1.1500
0.65000
WED, APR 24 2002 17:49
VOLTAGES 2
TIME (SECONDS)

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49
VOLTAGES 5



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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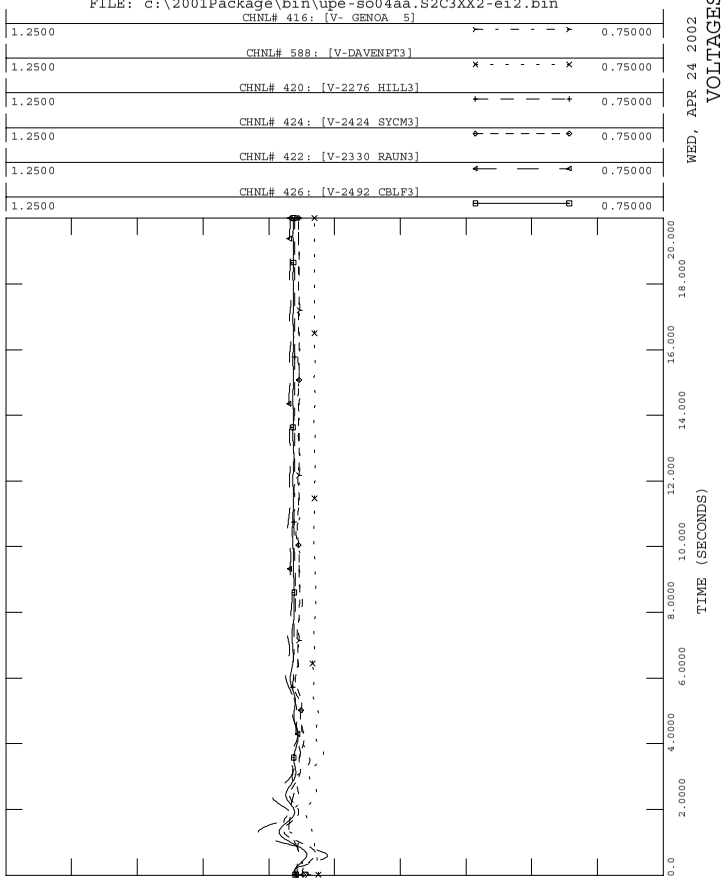
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49
VOLTAGES IA



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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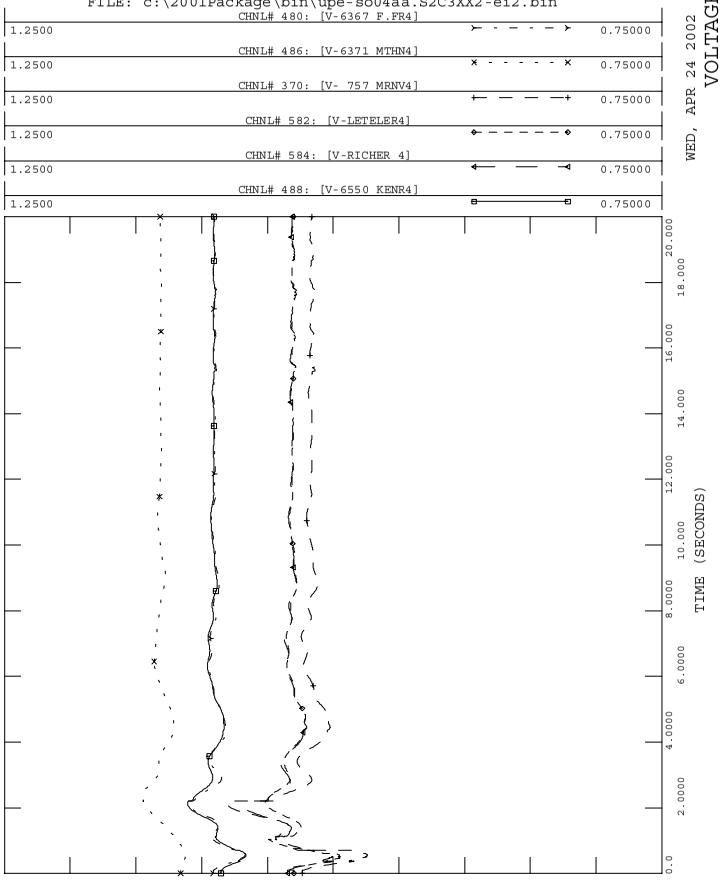
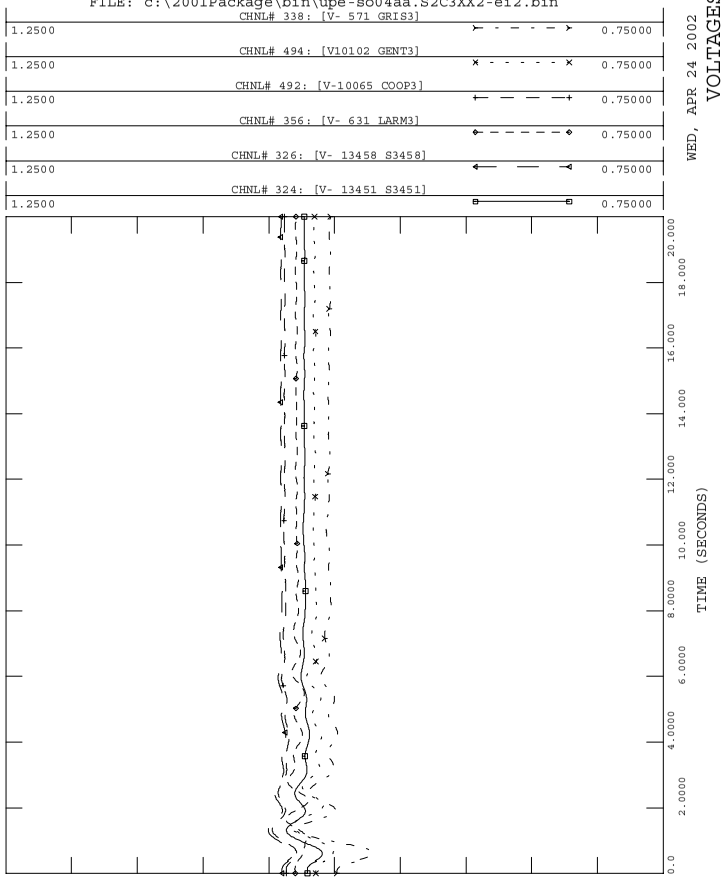
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

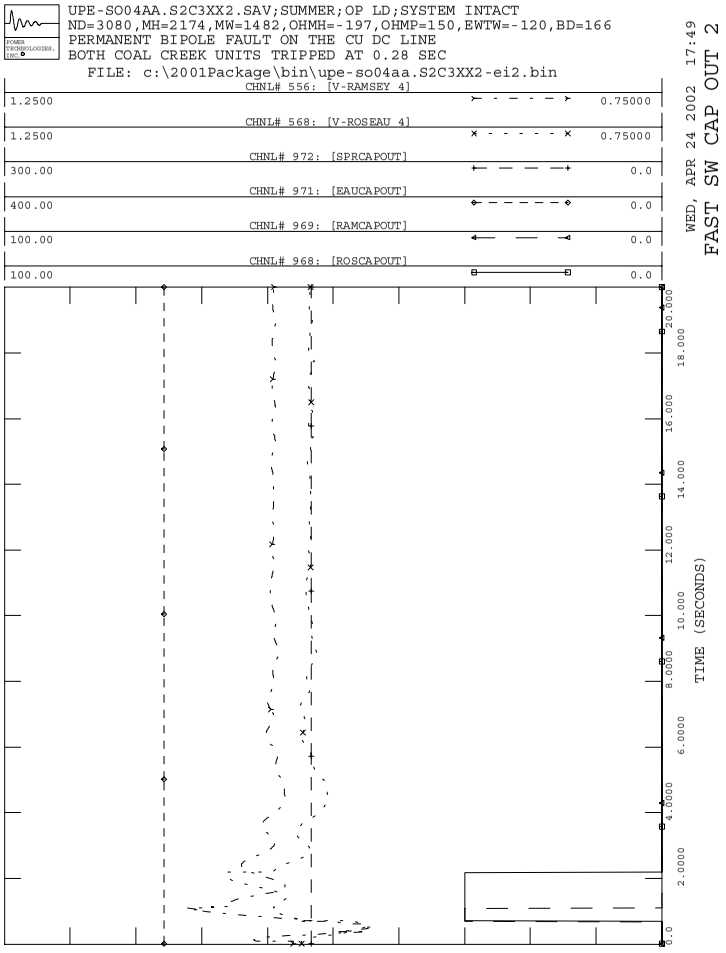
WED, APR 24 2002 17:49
VOLTAGES 4

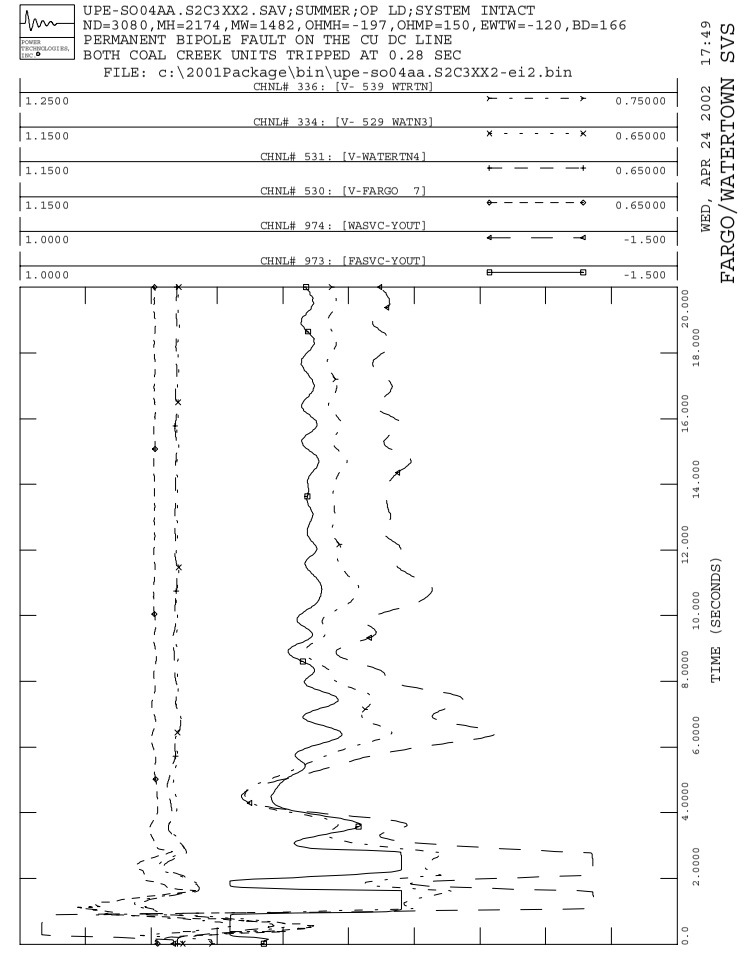


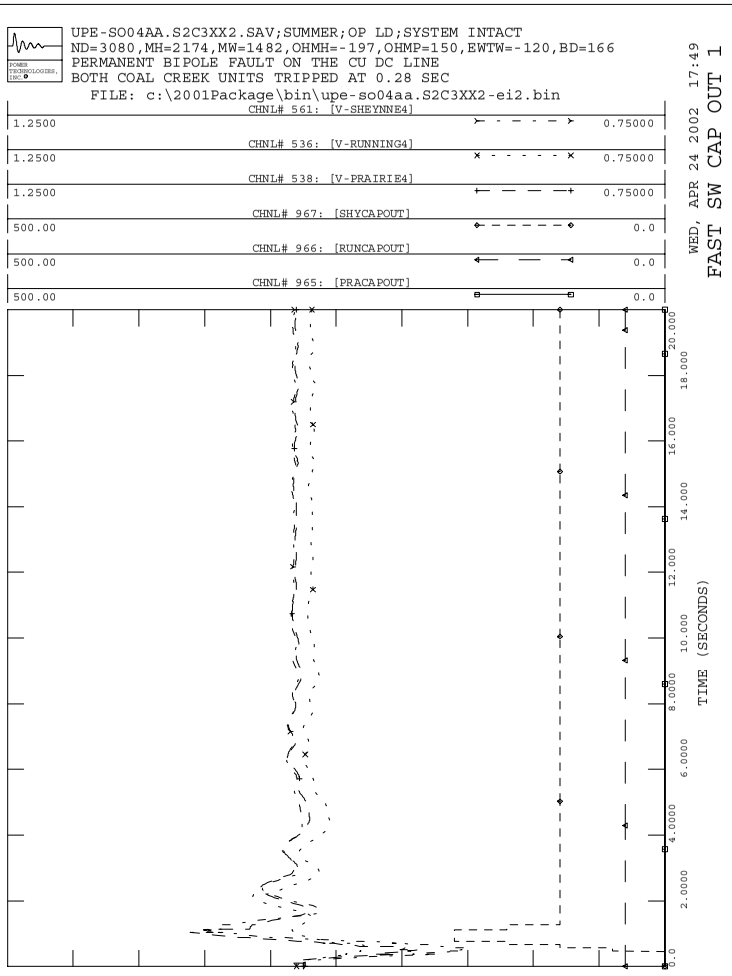
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

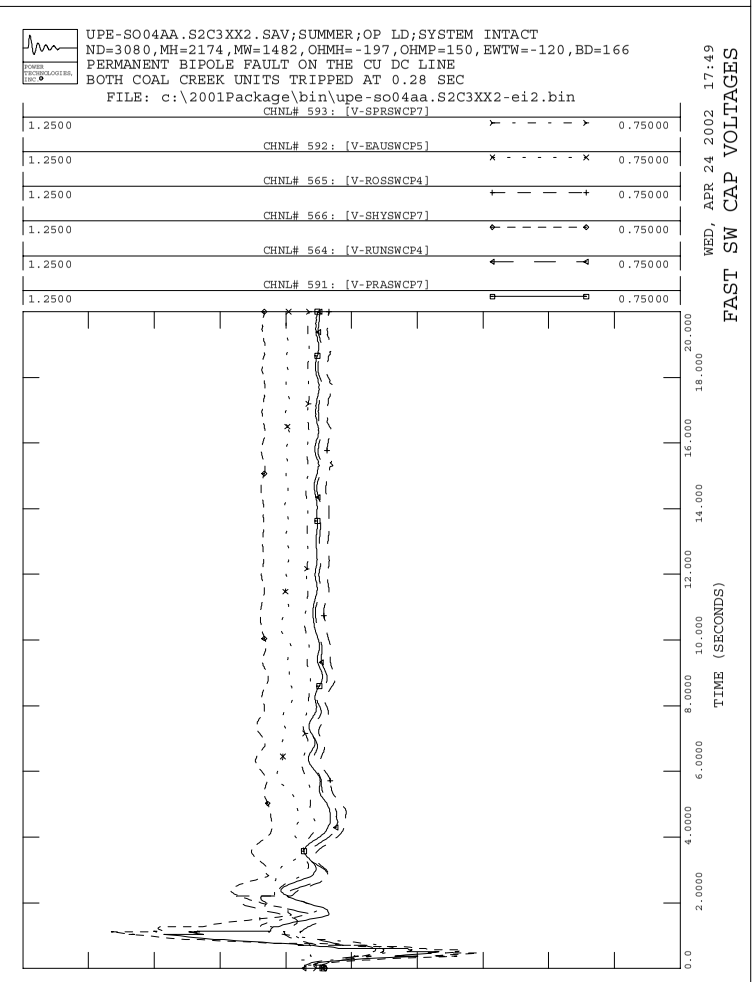
WED, APR 24 2002 17:49
VOLTAGES NB




UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
WED, APR 24 2002 17:49
FAST SW CAP OUT 2


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
WED, APR 24 2002 17:49
FARGO/WATERTOWN SVS

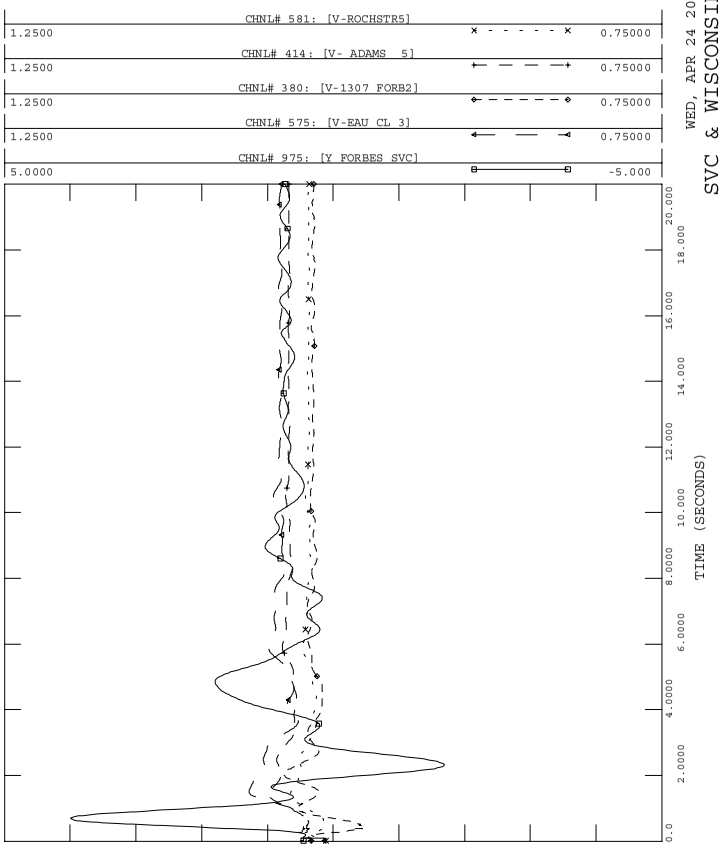

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
WED, APR 24 2002 17:49
FAST SW CAP OUT 1


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
WED, APR 24 2002 17:49
FAST SW CAP VOLTAGES

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49

SVC & WISCONSIN VOLT



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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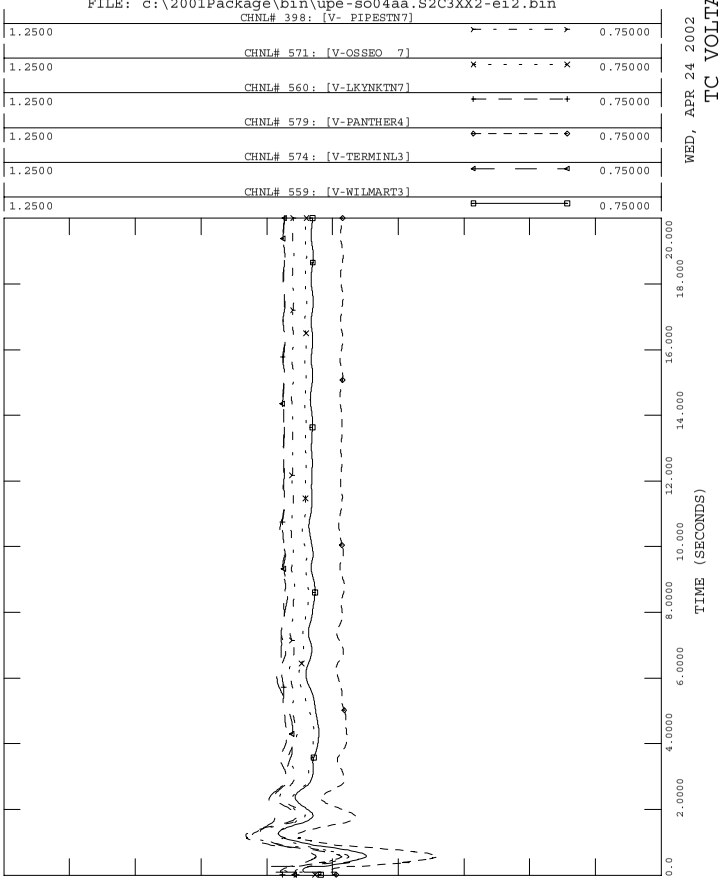
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49

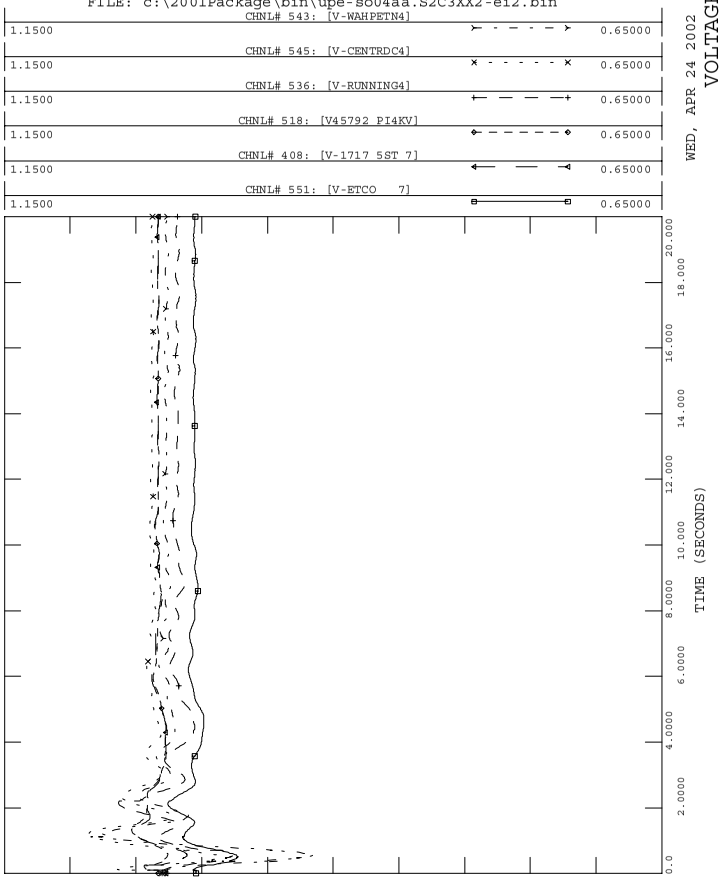
TC VOLTAGES



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49

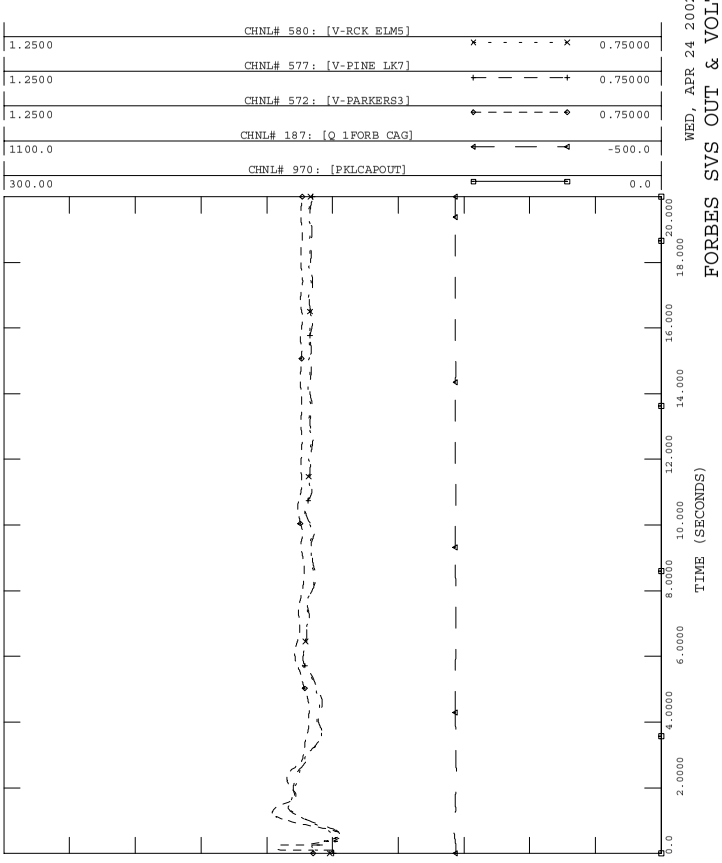
VOLTAGES 6

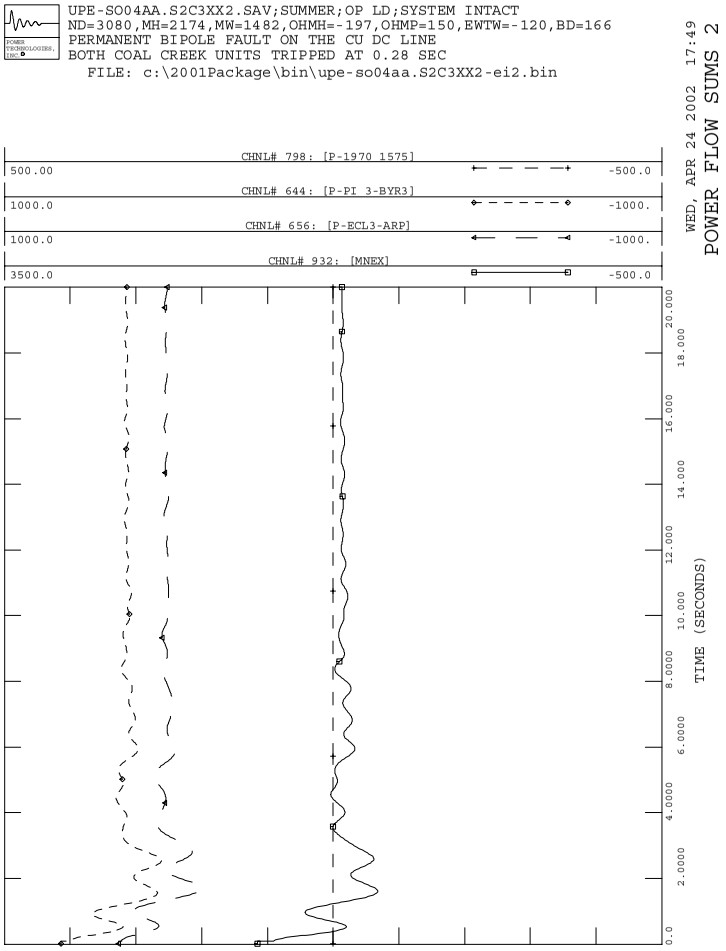


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49

FORBES SVS OUT & VOLTAGES




UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
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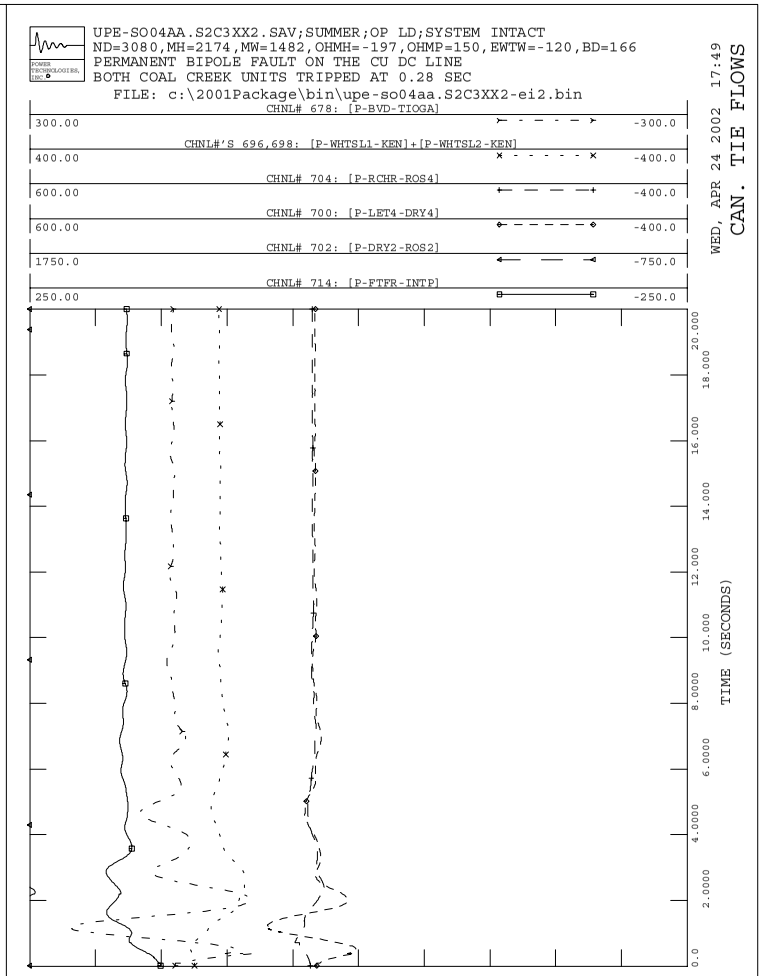
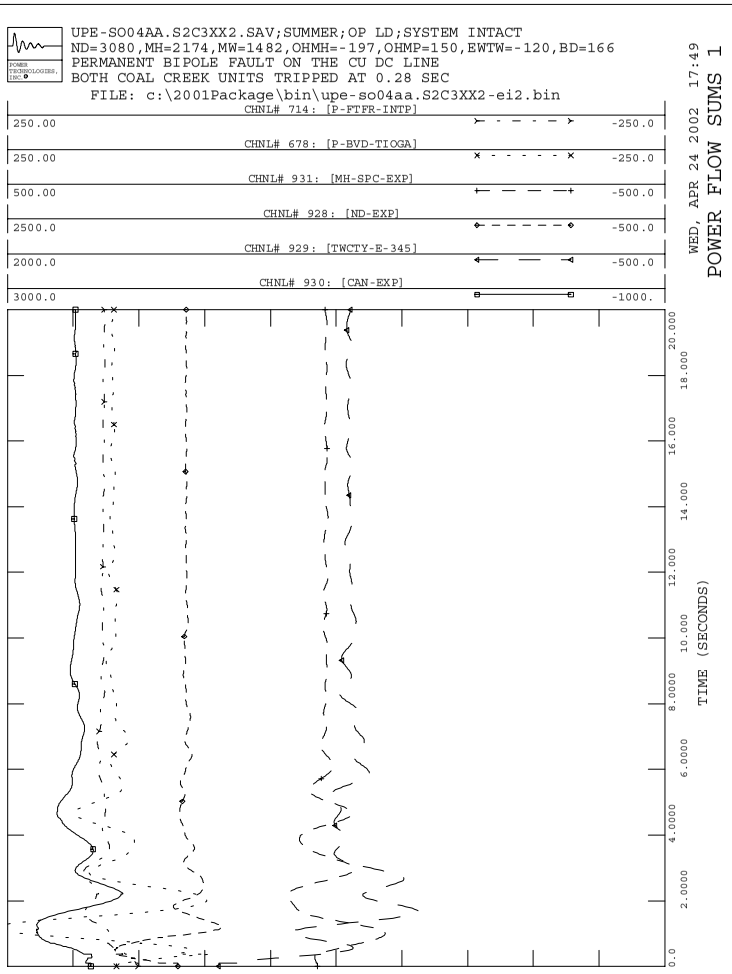
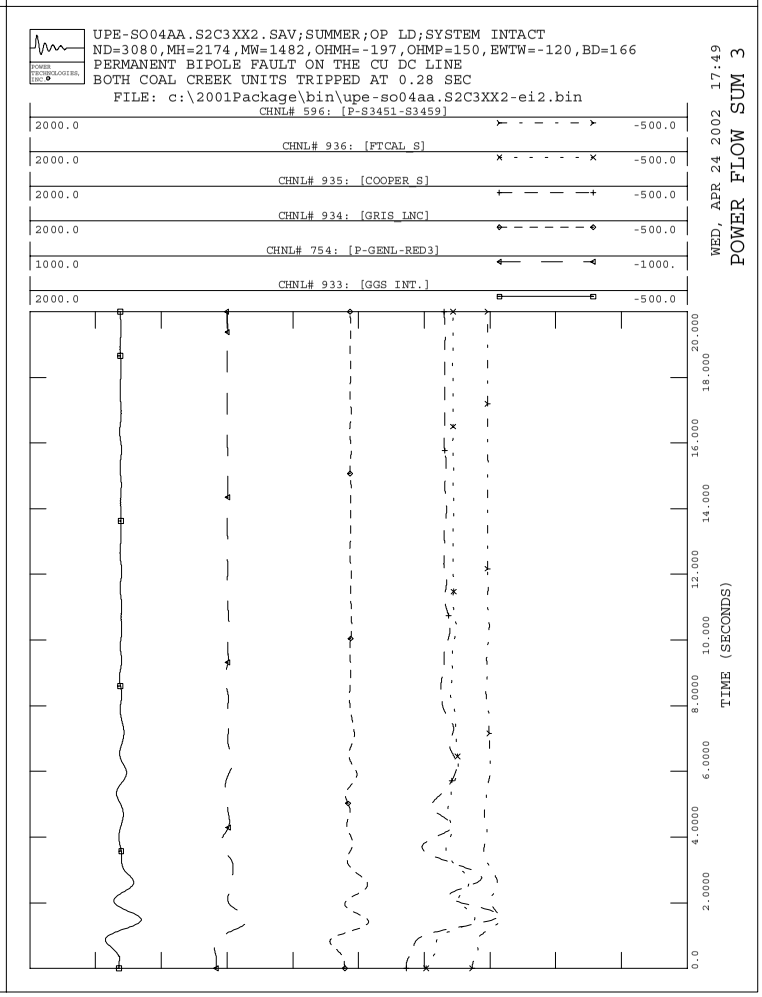
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 798: [P-1970 1575]
500.00
-500.0
CHNL# 644: [P-PI 3-BYR3]
1000.0
-1000.
CHNL# 656: [P-ECL3-ARP]
1000.0
-1000.
CHNL# 932: [MNEX]
3500.0
-500.0
WED, APR 24 2002 17:49
POWER FLOW SUMS 2
TIME (SECONDS)

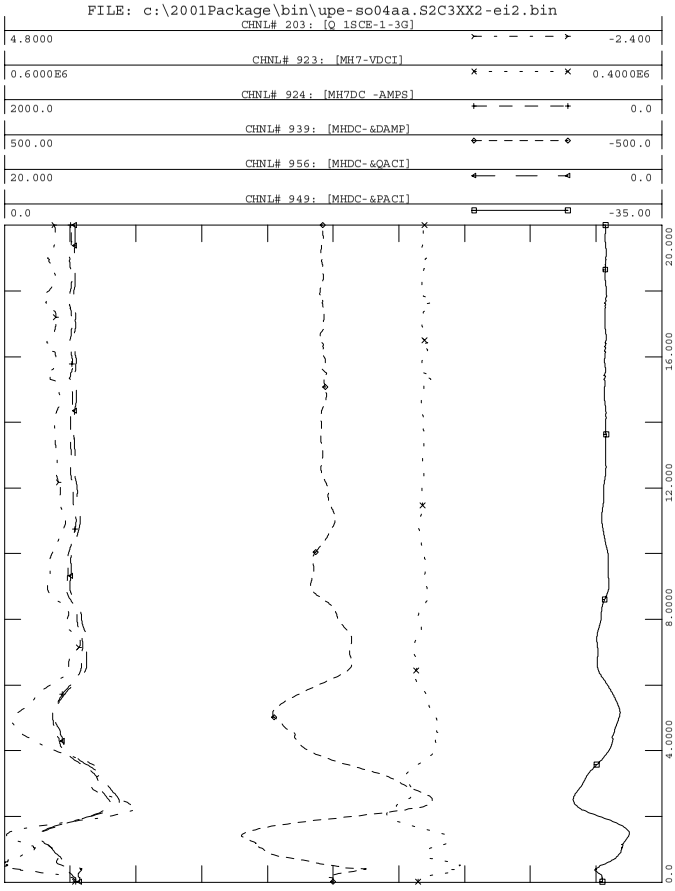

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 678: [P-BVD-TIOGA]
300.00
-300.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
400.00
-400.0
CHNL# 704: [P-RCHR-ROS4]
600.00
-400.0
CHNL# 700: [P-LET4-DRY4]
600.00
-400.0
CHNL# 702: [P-DRY2-ROS2]
1750.0
-750.0
CHNL# 714: [P-FTFR-INTP]
250.00
-250.0
WED, APR 24 2002 17:49
CAN. TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 714: [P-FTFR-INTP]
250.00
-250.0
CHNL# 678: [P-BVD-TIOGA]
250.00
-250.0
CHNL# 931: [MH-SPC-EXP]
500.00
-500.0
CHNL# 928: [ND-EXP]
2500.0
-500.0
CHNL# 929: [TWCTY-E-345]
2000.0
-500.0
CHNL# 930: [CAN-EXP]
3000.0
-1000.
WED, APR 24 2002 17:49
POWER FLOW SUMS 1
TIME (SECONDS)


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin
CHNL# 596: [P-S3451-S3459]
2000.0
-500.0
CHNL# 936: [FTCAL S]
2000.0
-500.0
CHNL# 935: [COOPER S]
2000.0
-500.0
CHNL# 934: [GRIS LNC]
2000.0
-500.0
CHNL# 754: [P-GENL-RED3]
1000.0
-1000.
CHNL# 933: [GGS INT.]
2000.0
-500.0
WED, APR 24 2002 17:49
POWER FLOW SUM 3
TIME (SECONDS)

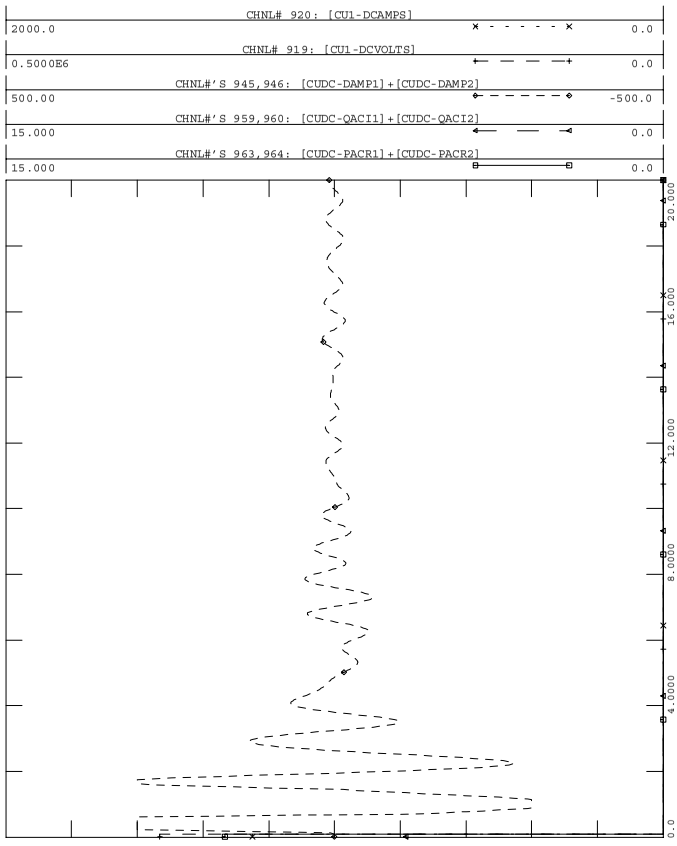
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49
MH DC PARAMETERS



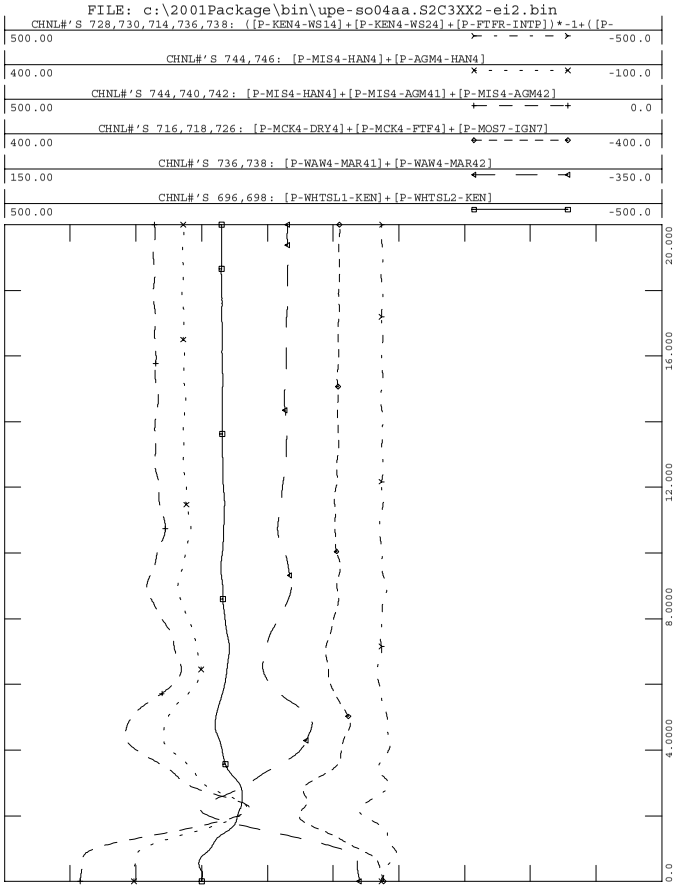
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49
CU DC #1



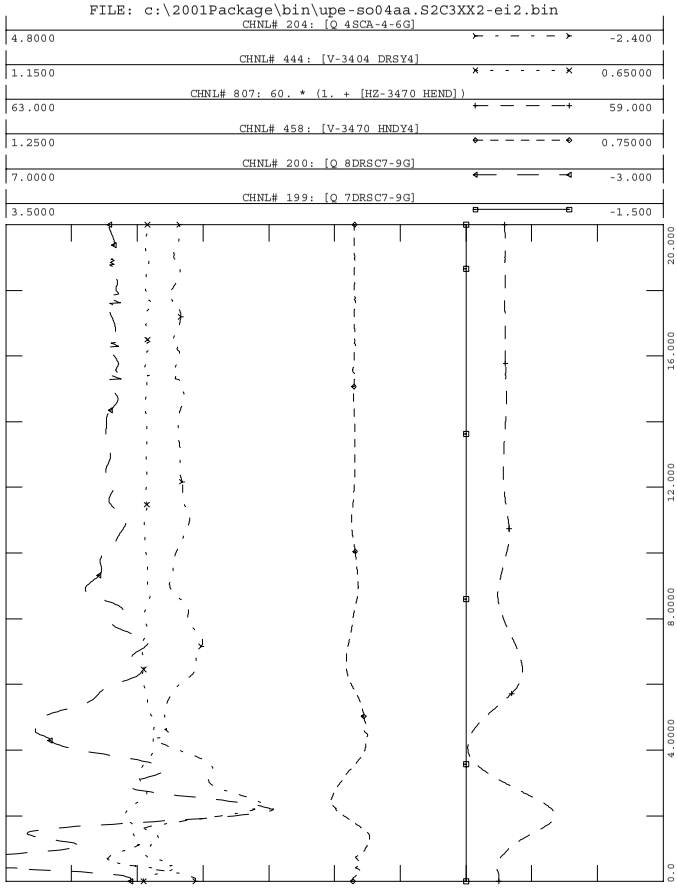
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49
OH TIE FLOWS

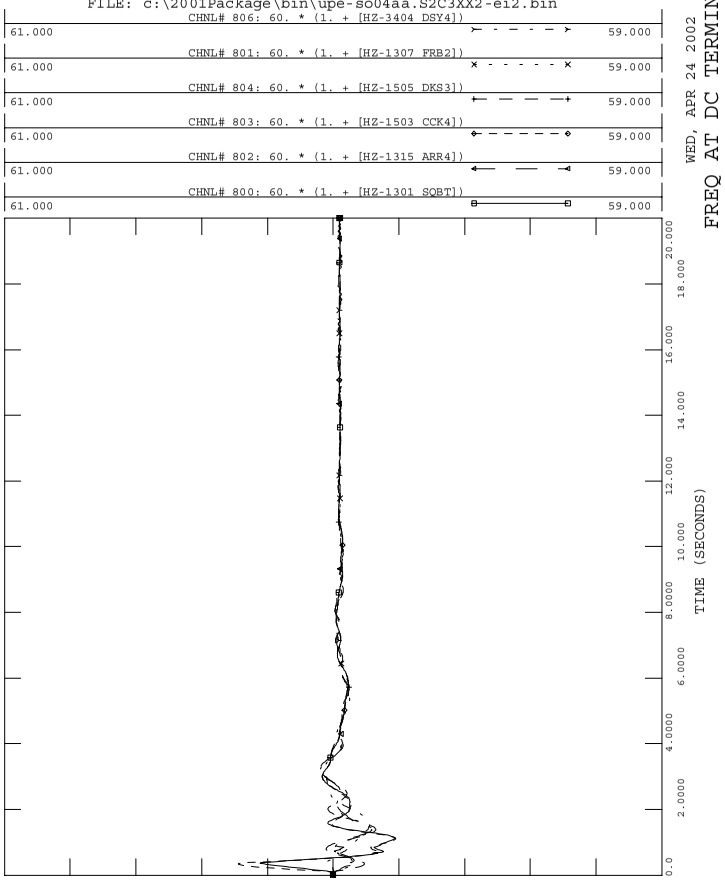


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49
MH DC PARAMETERS

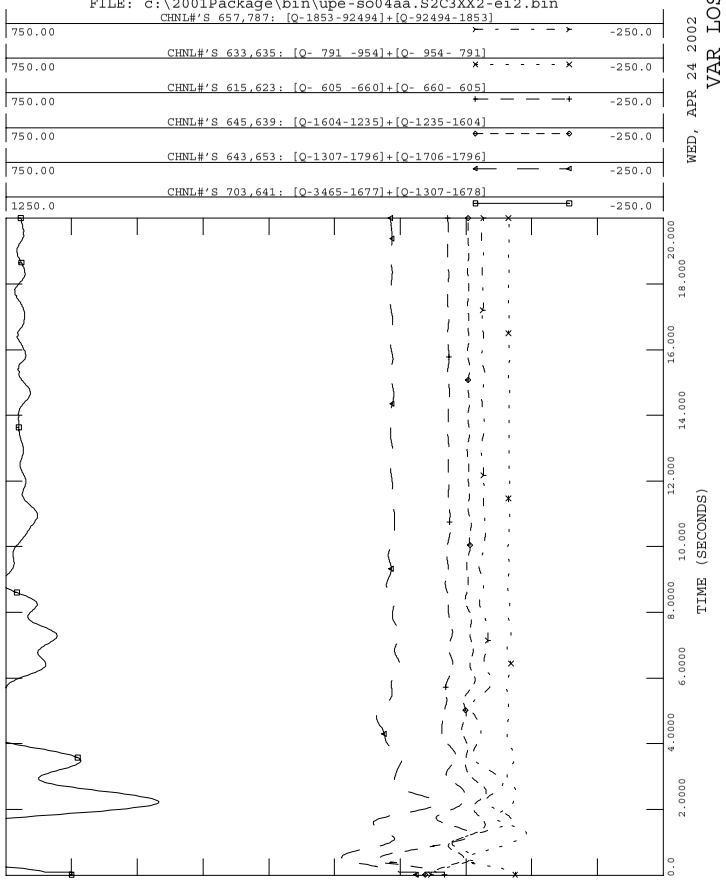


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin



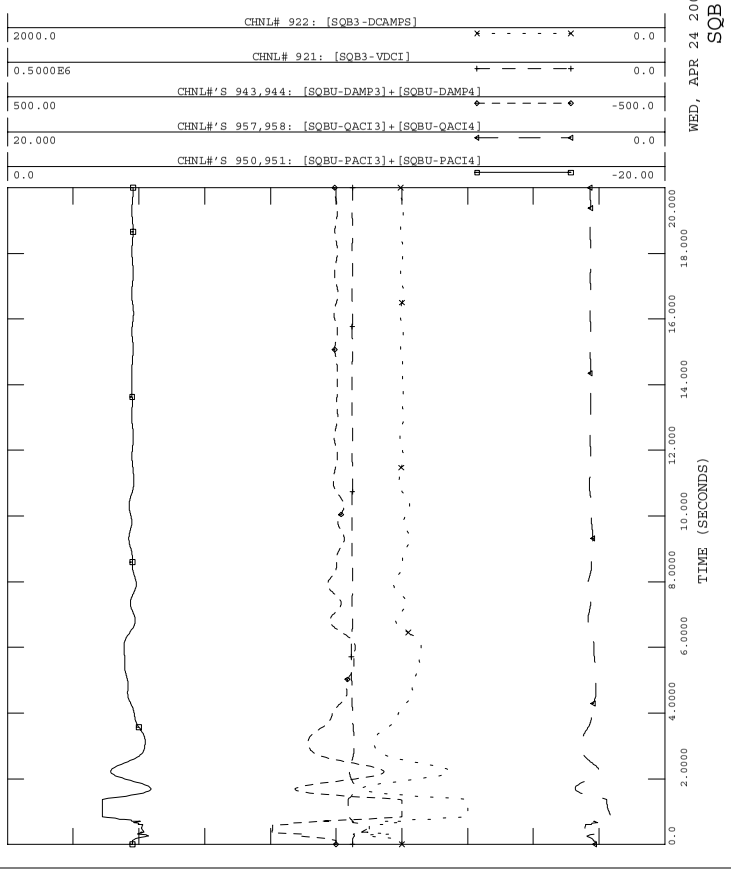
WED, APR 24 2002 17:49
FREQ AT DC TERMINALS

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin



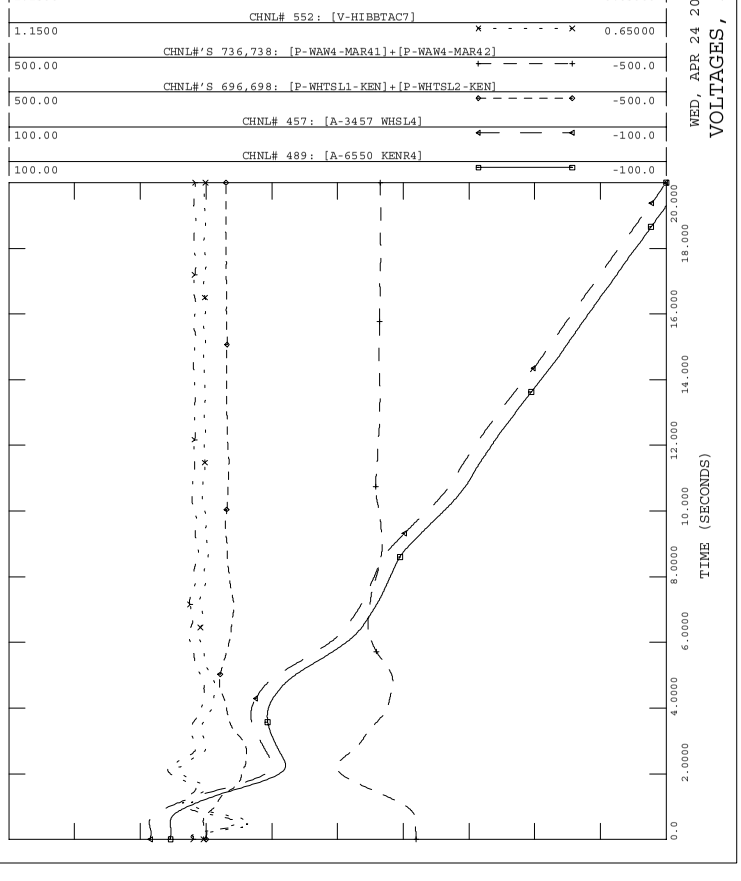
WED, APR 24 2002 17:49
VAR LOSSES

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin



WED, APR 24 2002 17:49
SQB DC #3

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

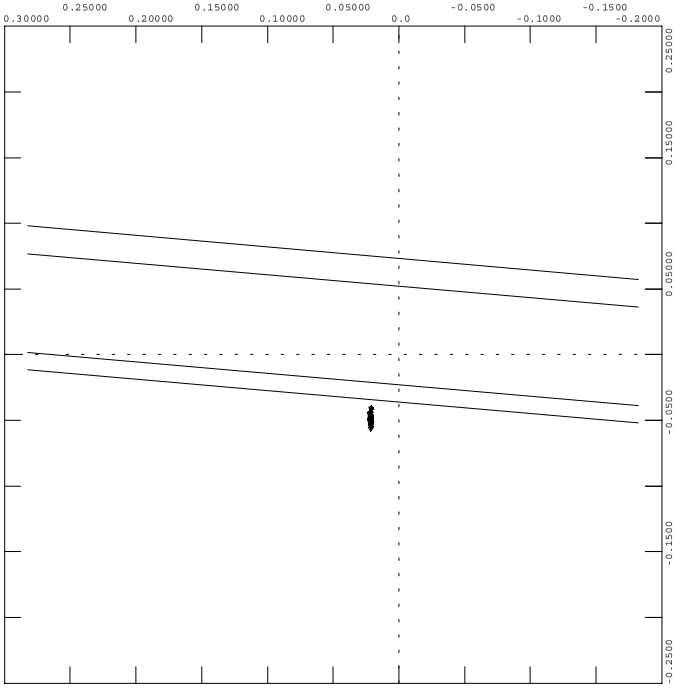


WED, APR 24 2002 17:49
VOLTAGES, ANGLES

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

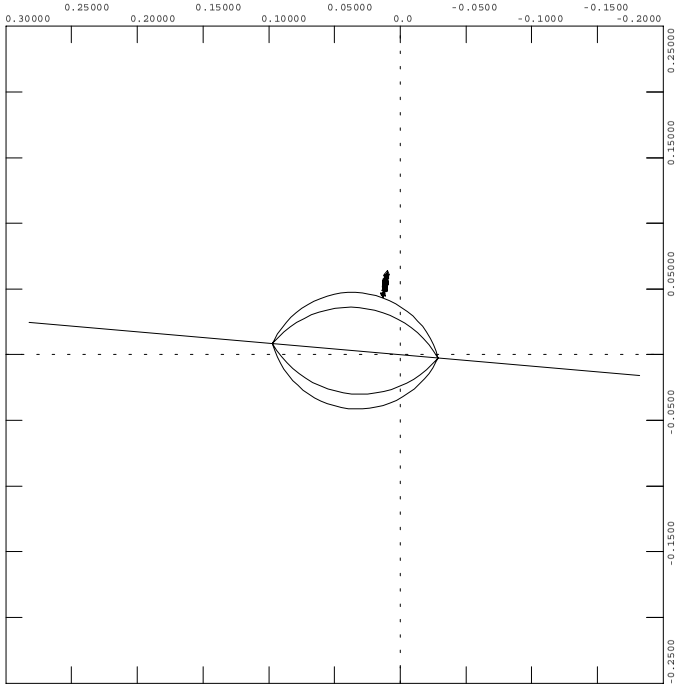


WED, APR 24 2002 17:49
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

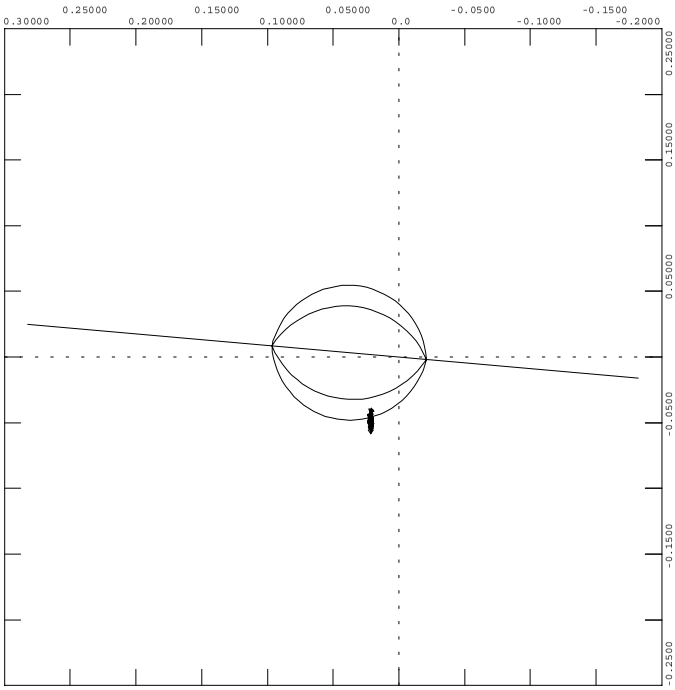


WED, APR 24 2002 17:49
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

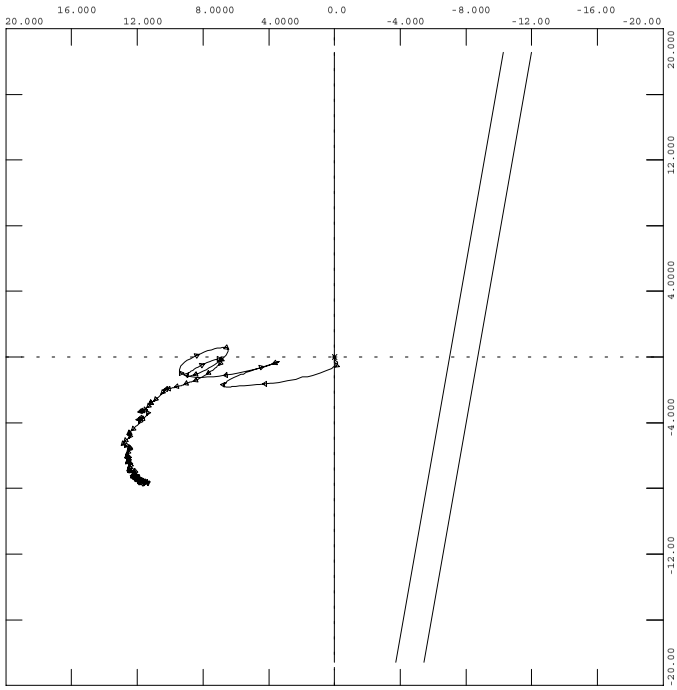


WED, APR 24 2002 17:49
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

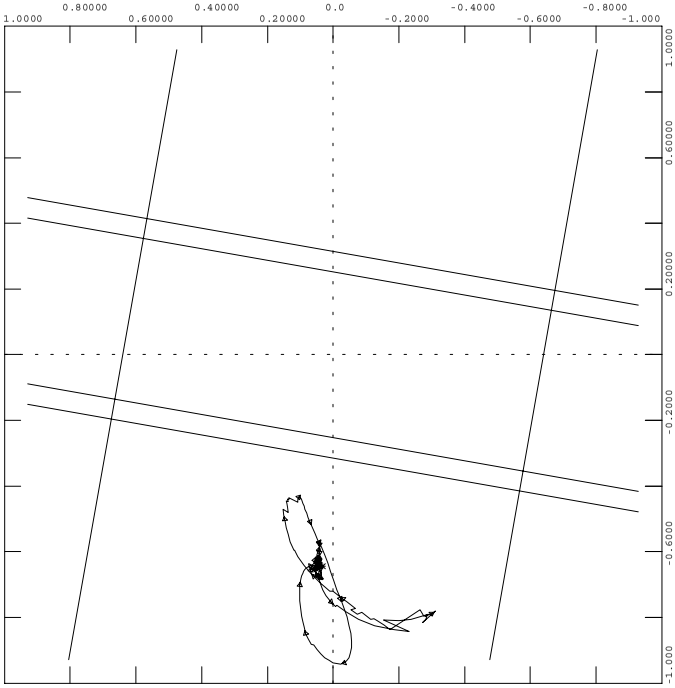


WED, APR 24 2002 17:49
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

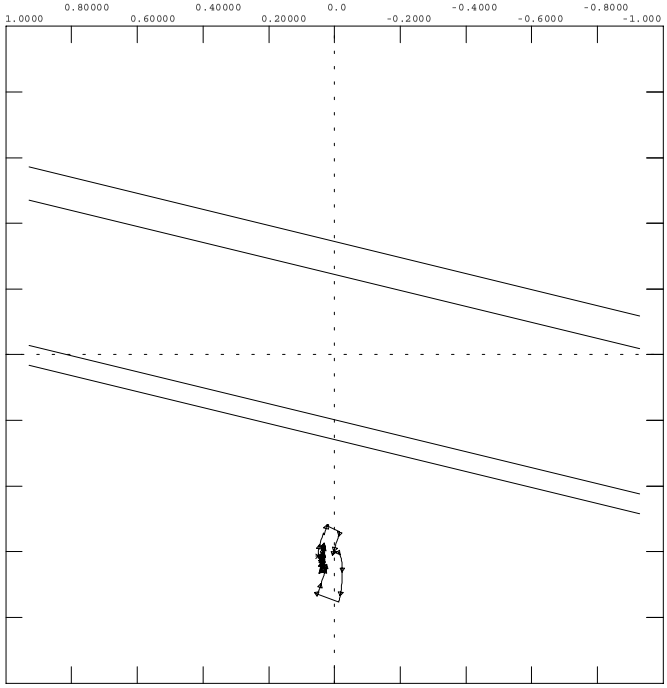
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

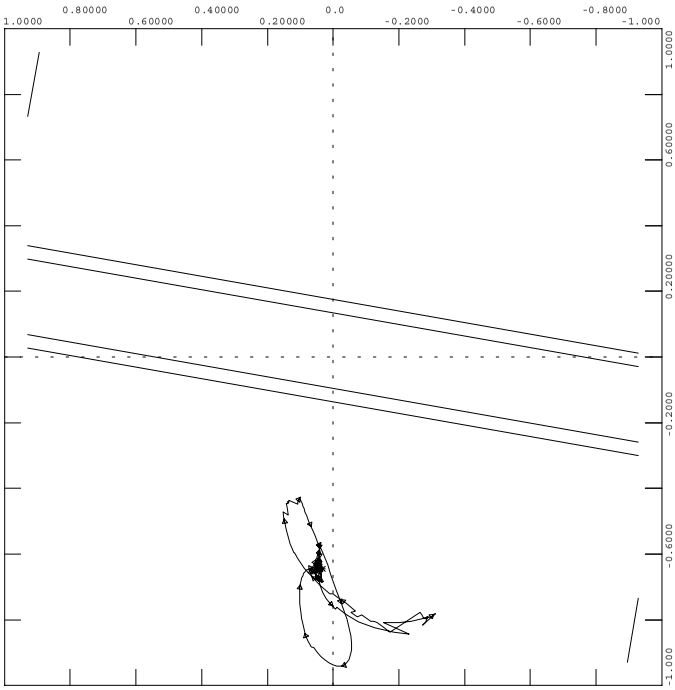
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

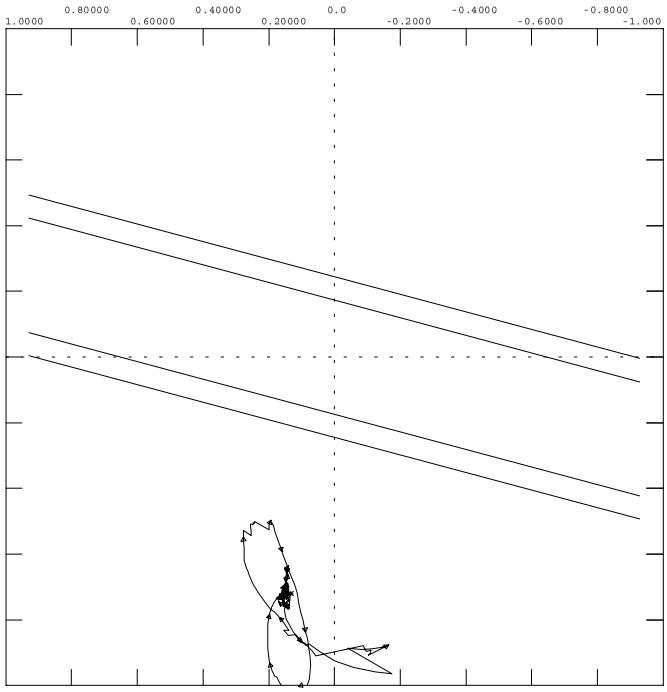
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

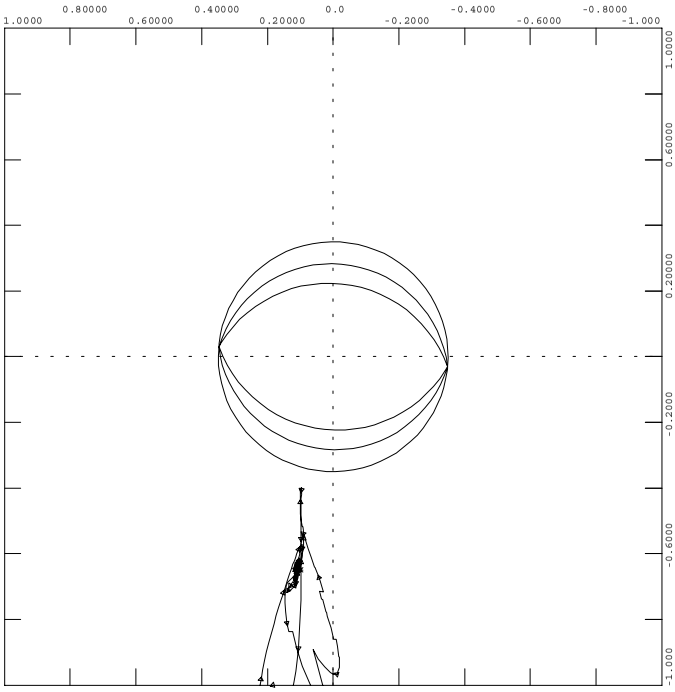
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

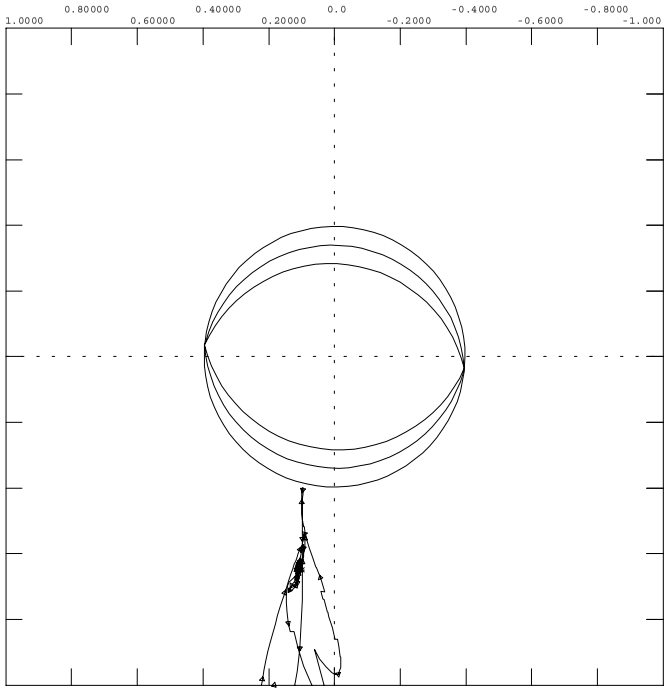
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

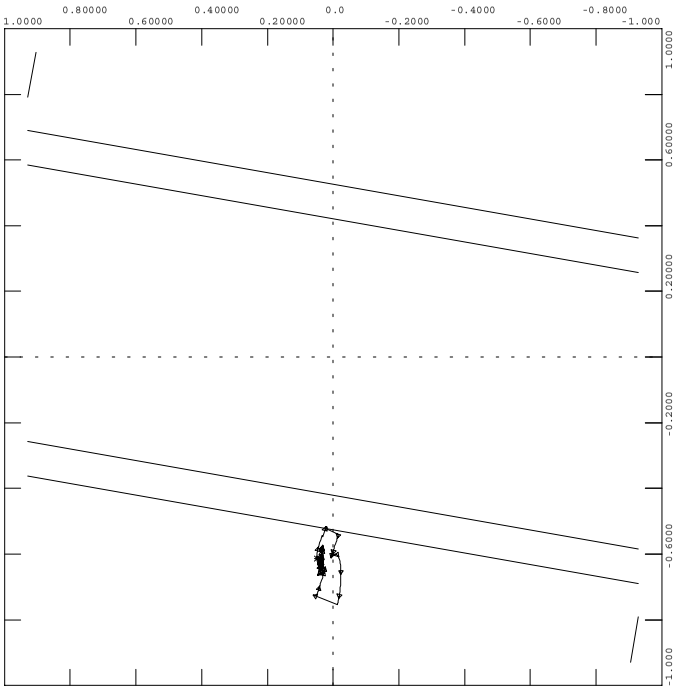
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

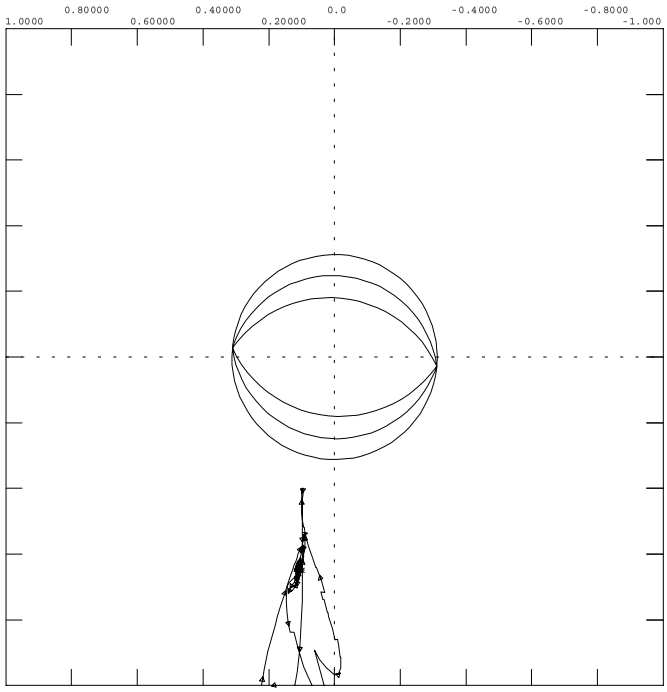
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



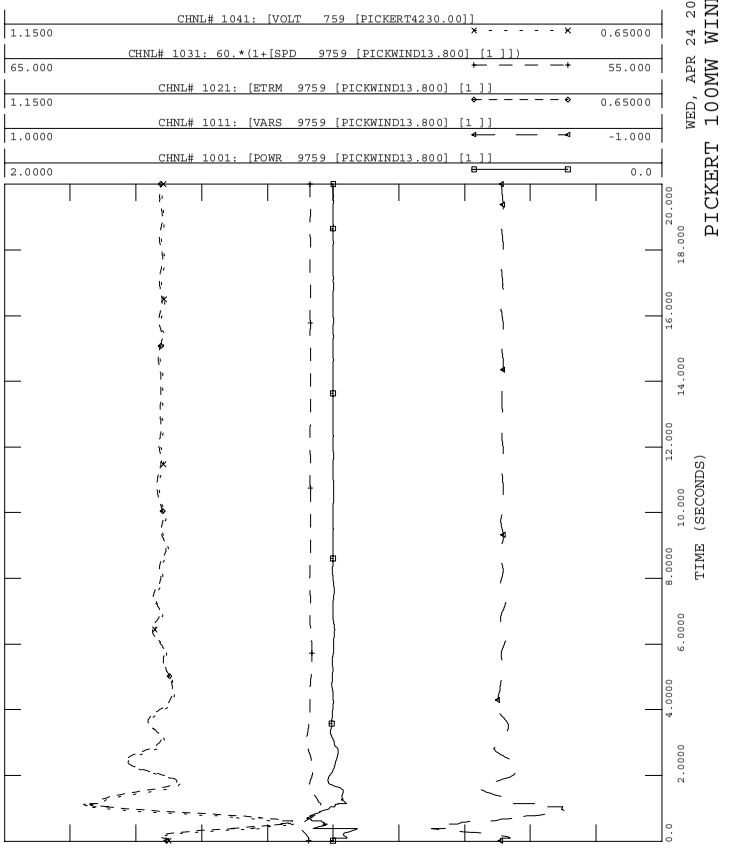
UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

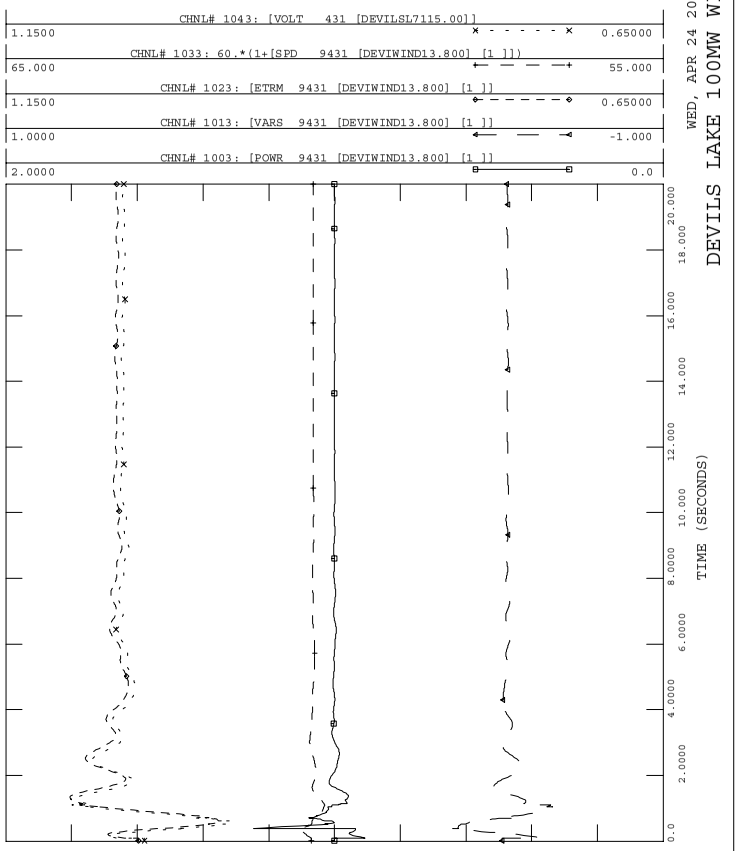


UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin



WED, APR 24 2002 17:49
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

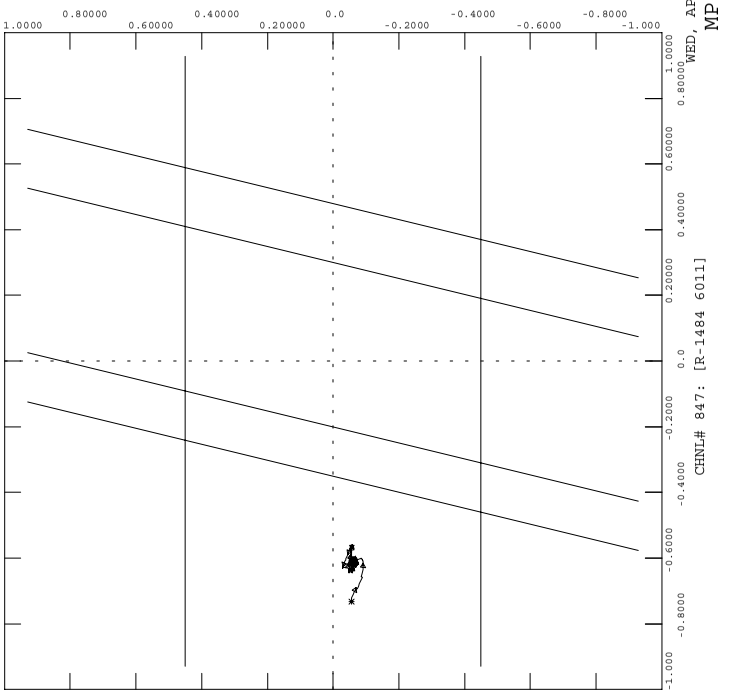


WED, APR 24 2002 17:49
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

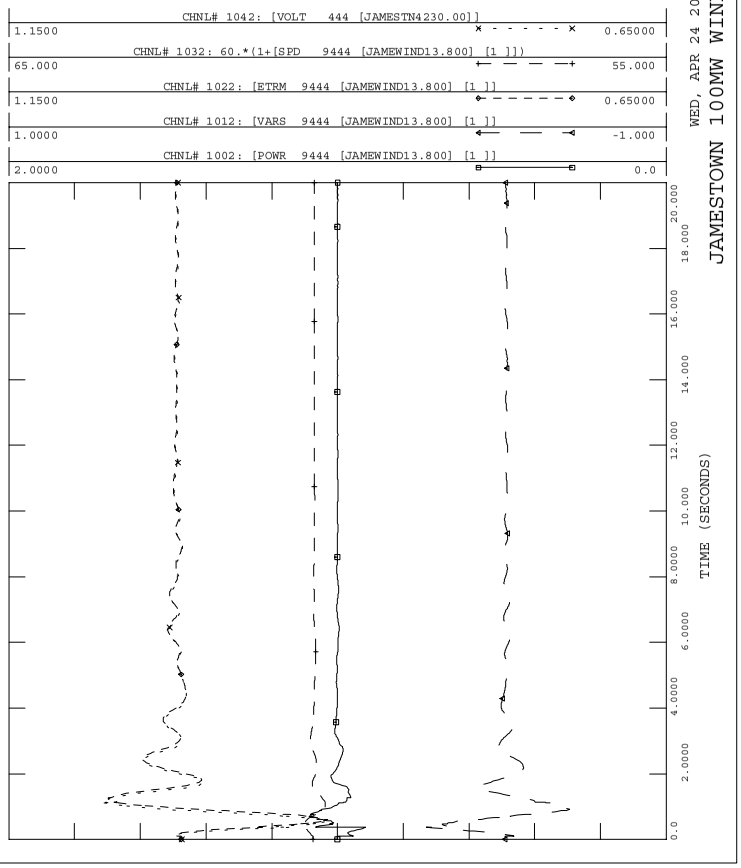
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



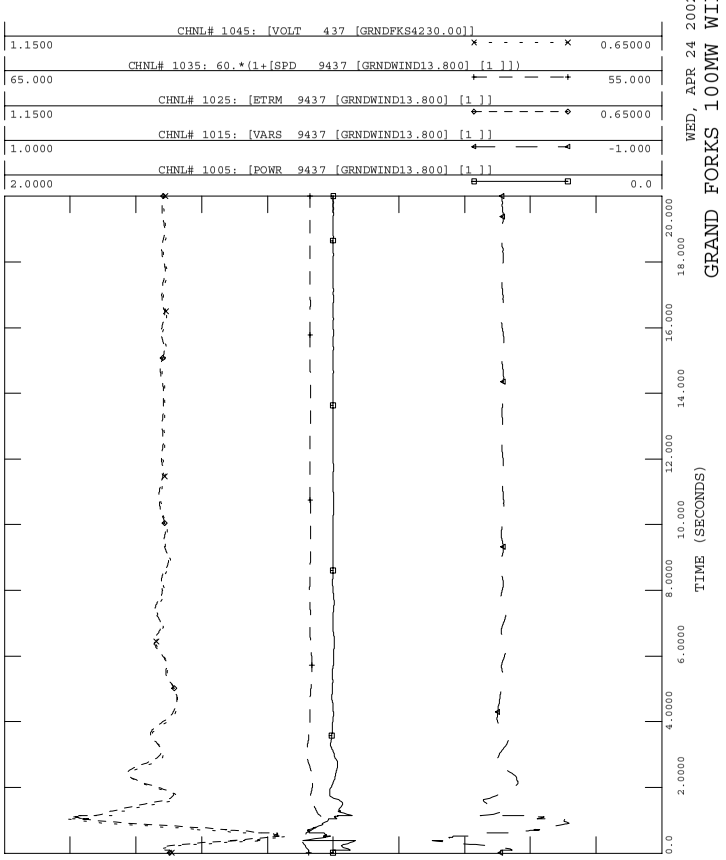
WED, APR 24 2002 17:49
MP-OH I.FALLS (779)

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin



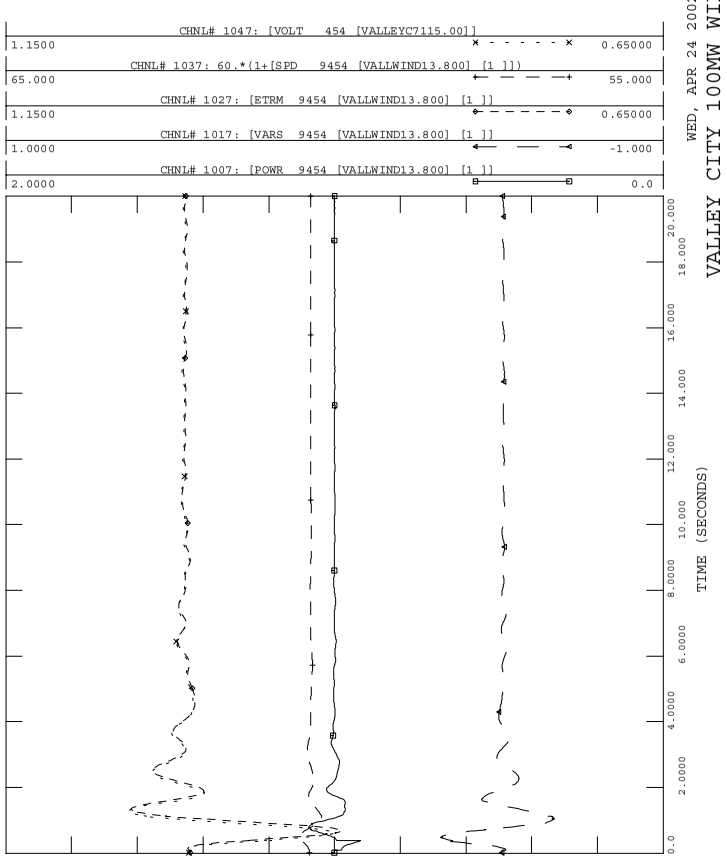
WED, APR 24 2002 17:49
JAMESTOWN 100MW WIND UNIT

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin



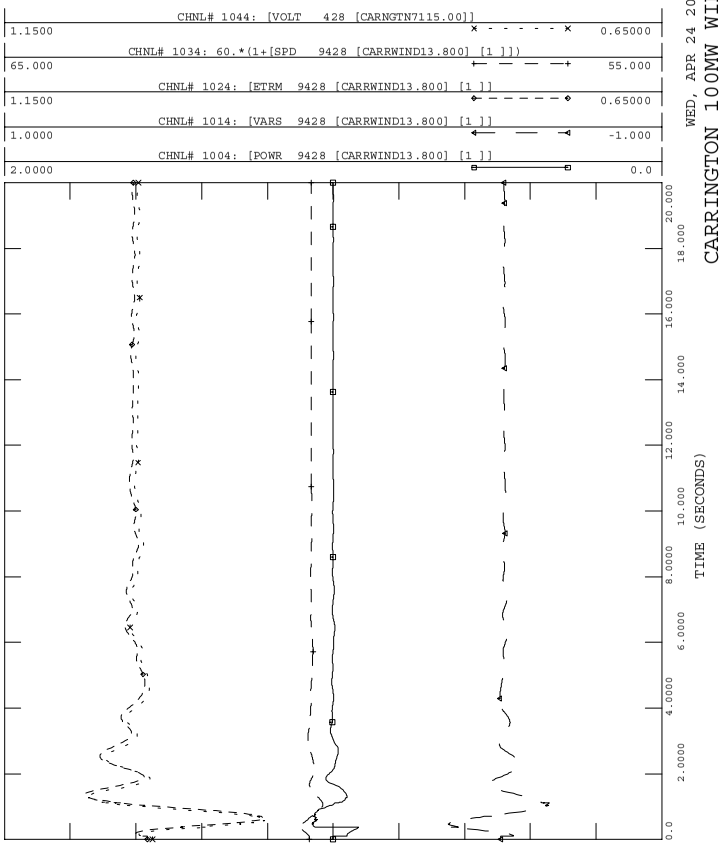
WED, APR 24 2002 17:49
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin



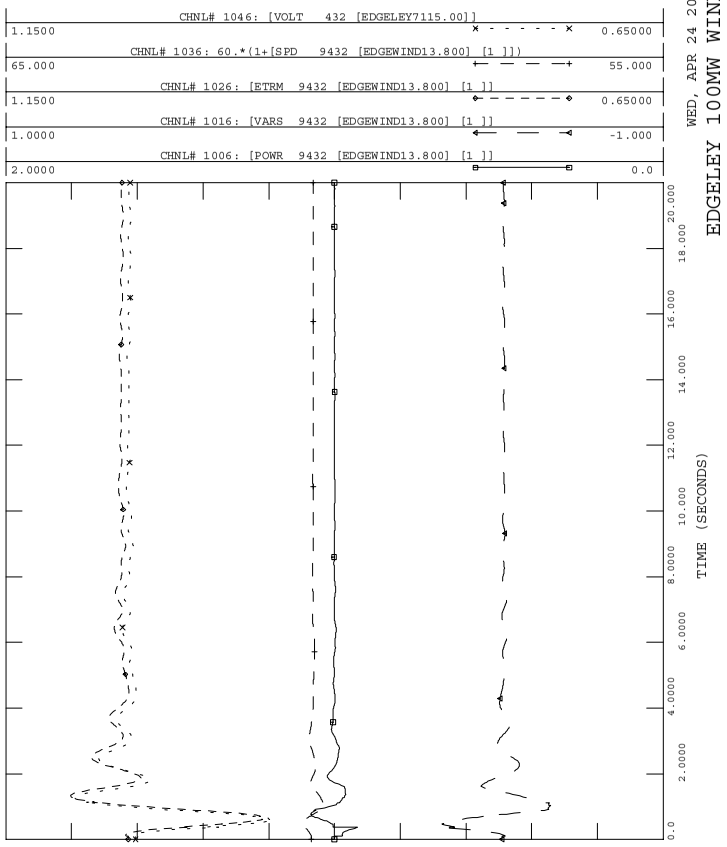
WED, APR 24 2002 17:49
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin



WED, APR 24 2002 17:49
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

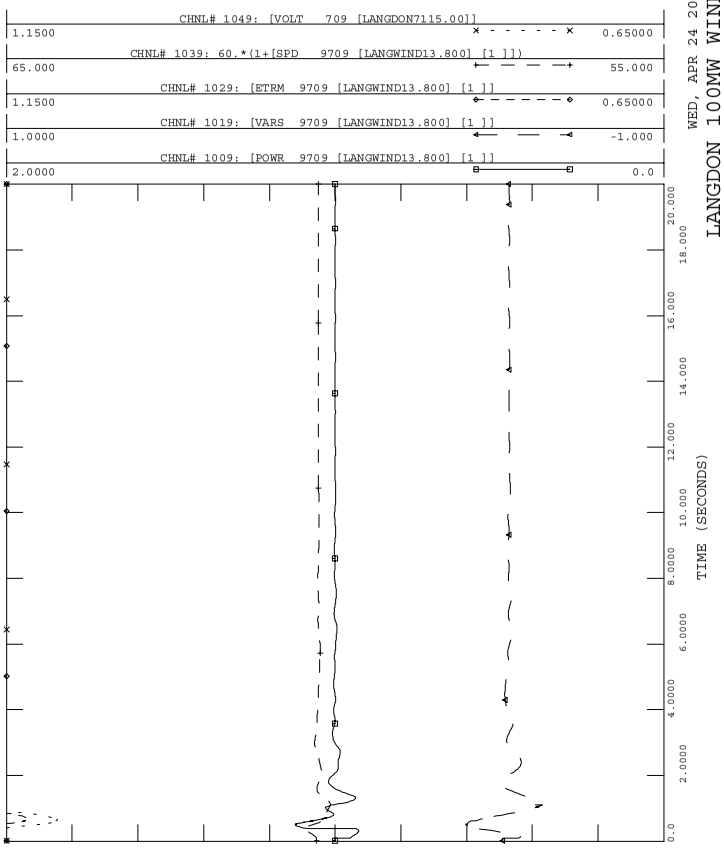


WED, APR 24 2002 17:49
EDGELEY 100MW WIND UNIT

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49

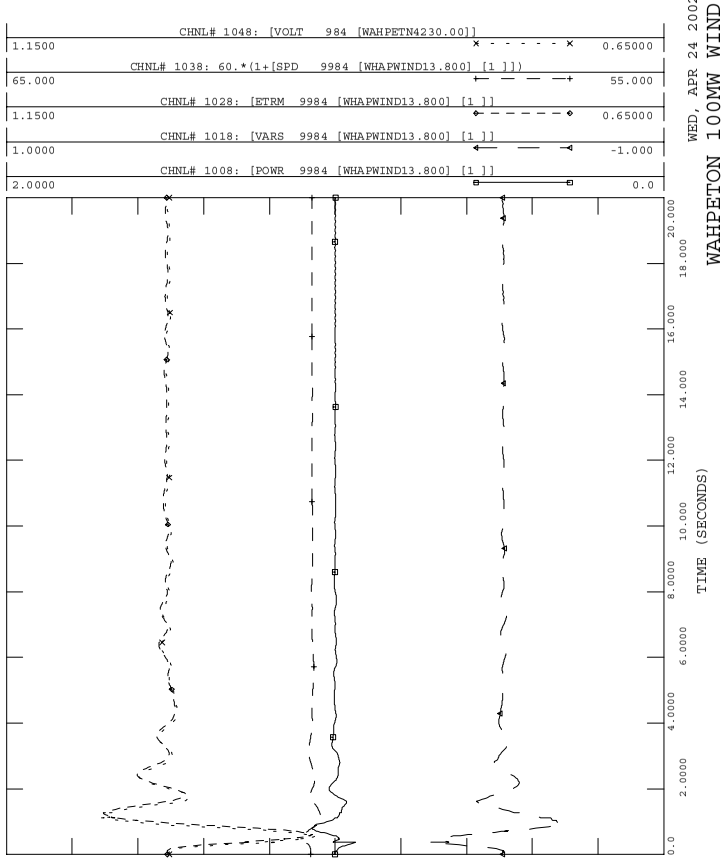
LANGDON 100MW WIND UNIT



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49

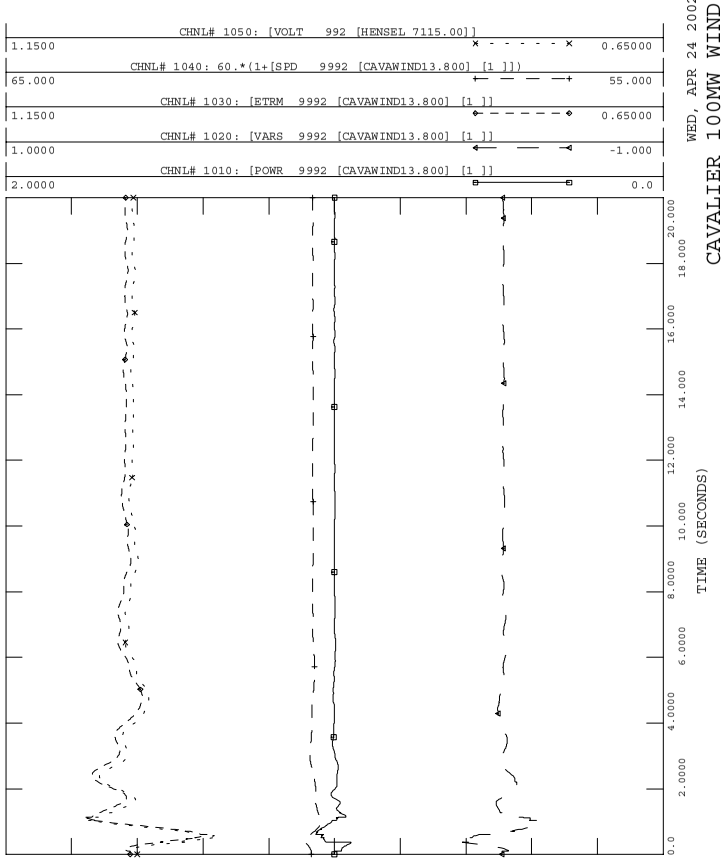
WAHPETON 100MW WIND UNIT



UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C3XX2-ei2.bin

WED, APR 24 2002 17:49

CAVALIER 100MW WIND UNIT



APPENDIX 16

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 2 (JAMESTOWN)

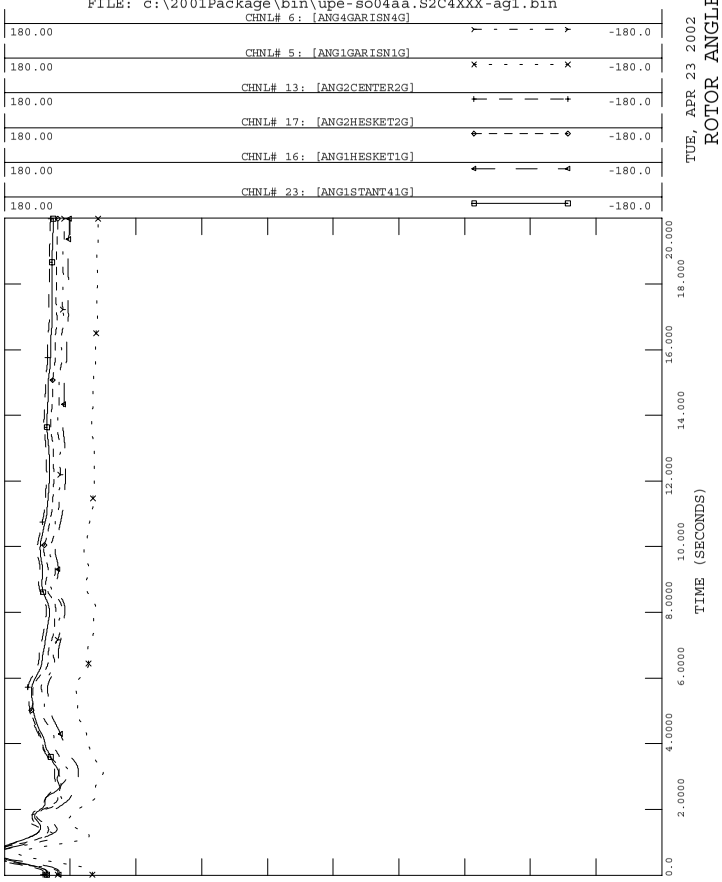
CASE S2C4XXX

CONTINGENCY AG1

Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53
ROTOR ANGLES 2



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TUE, APR 23 2002 17:53
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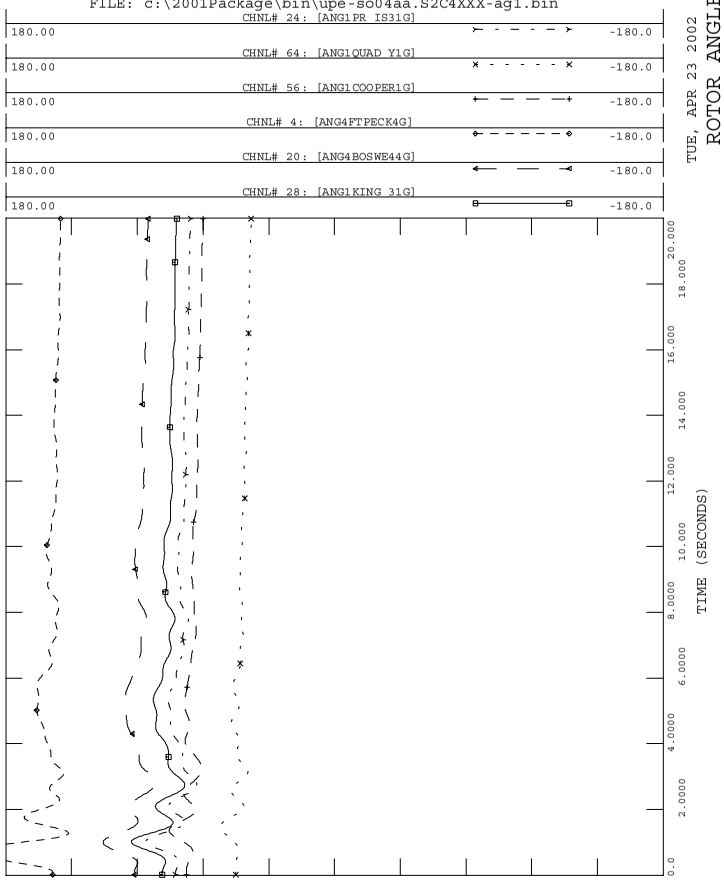

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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CLR @ 11 CY BY TRIPPING FLTD LINE
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TUE, APR 23 2002 17:53
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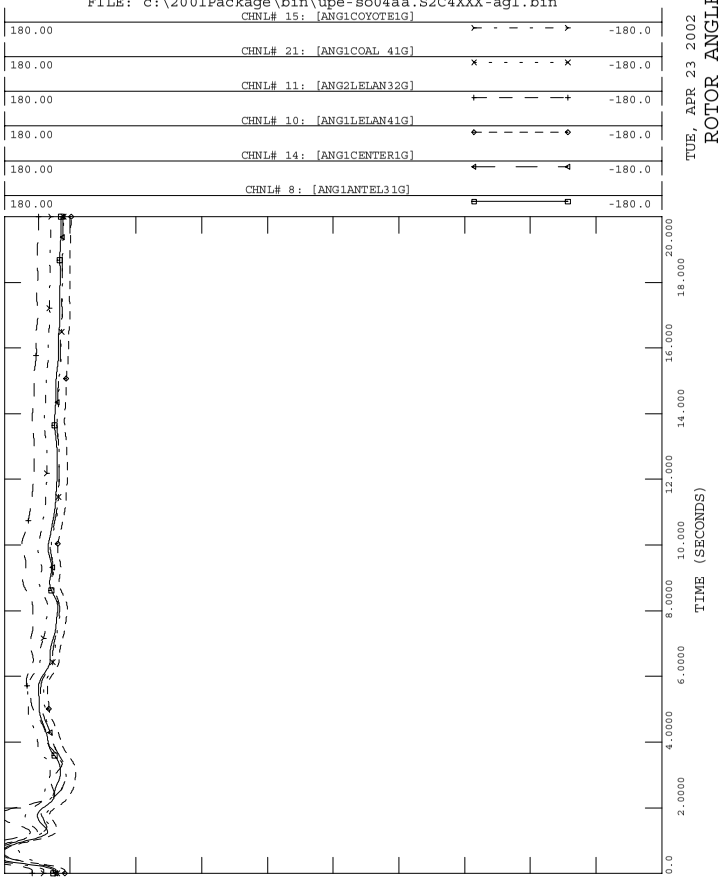

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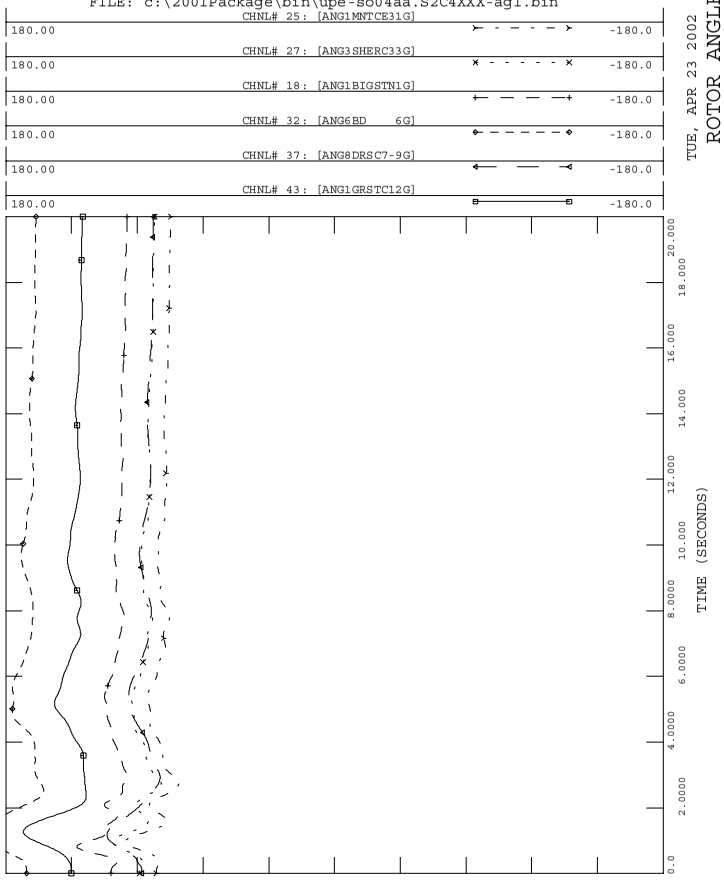
TUE, APR 23 2002 17:53
ROTOR ANGLES 3



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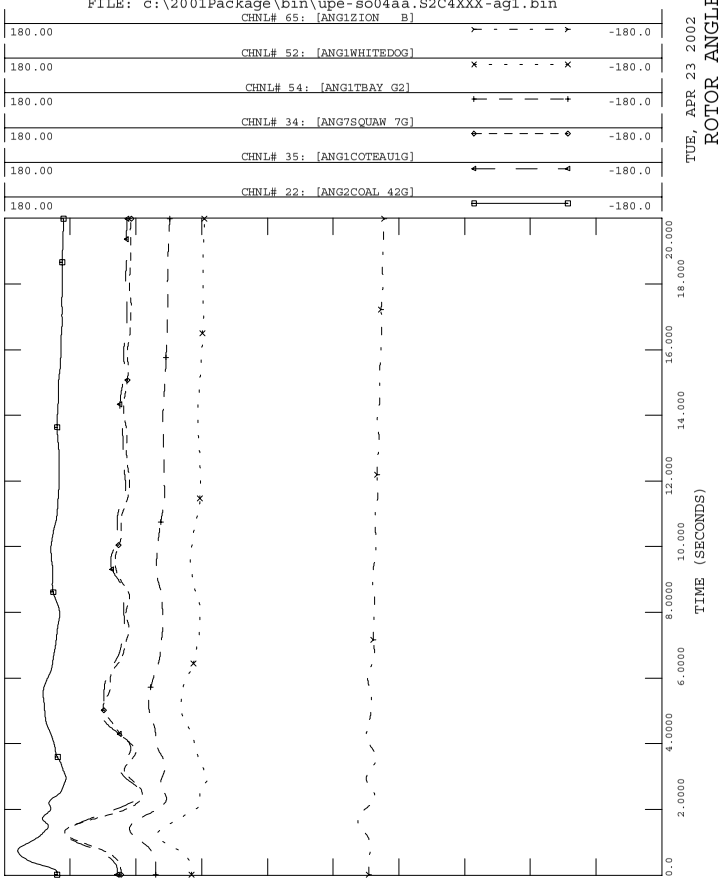
TUE, APR 23 2002 17:53
ROTOR ANGLES 6



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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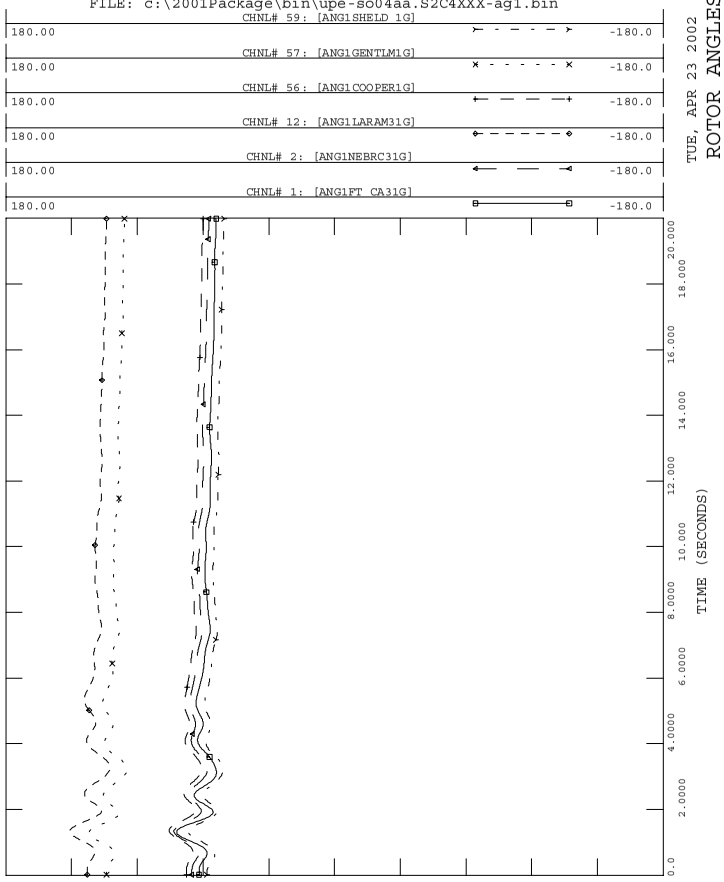
TUE, APR 23 2002 17:53
ROTOR ANGLES NB



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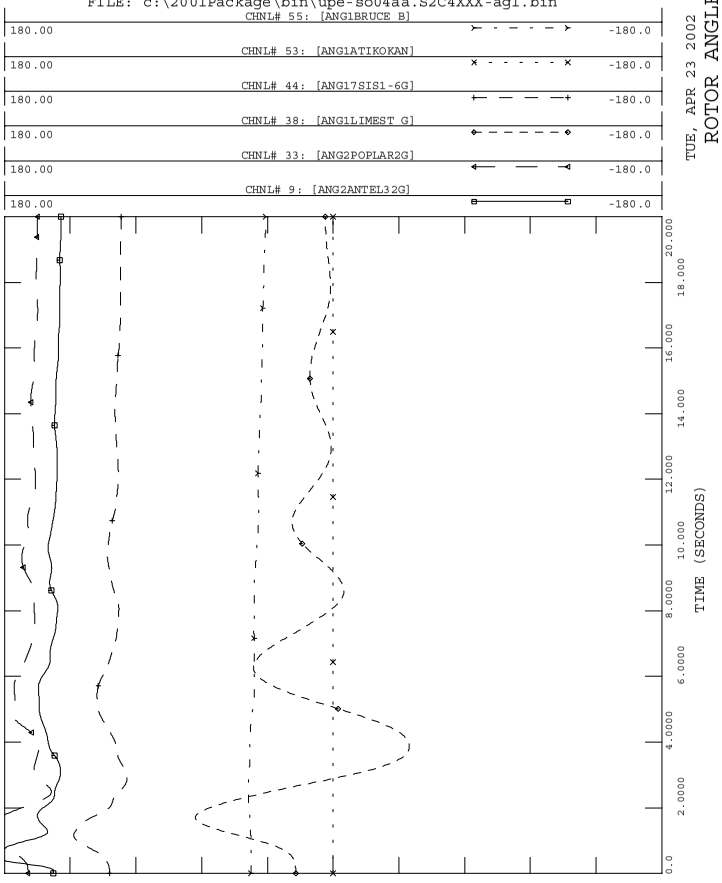
TUE, APR 23 2002 17:53
ROTOR ANGLES 5



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CLR @ 11 CY BY TRIPPING FLTD LINE
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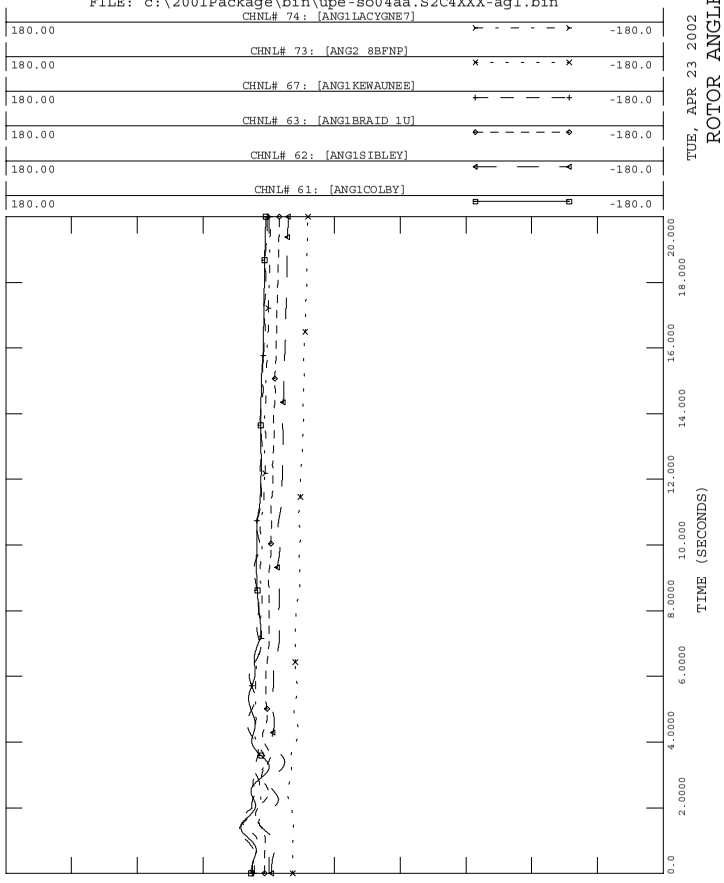
TUE, APR 23 2002 17:53
ROTOR ANGLES 7



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CLR @ 11 CY BY TRIPPING FLTD LINE
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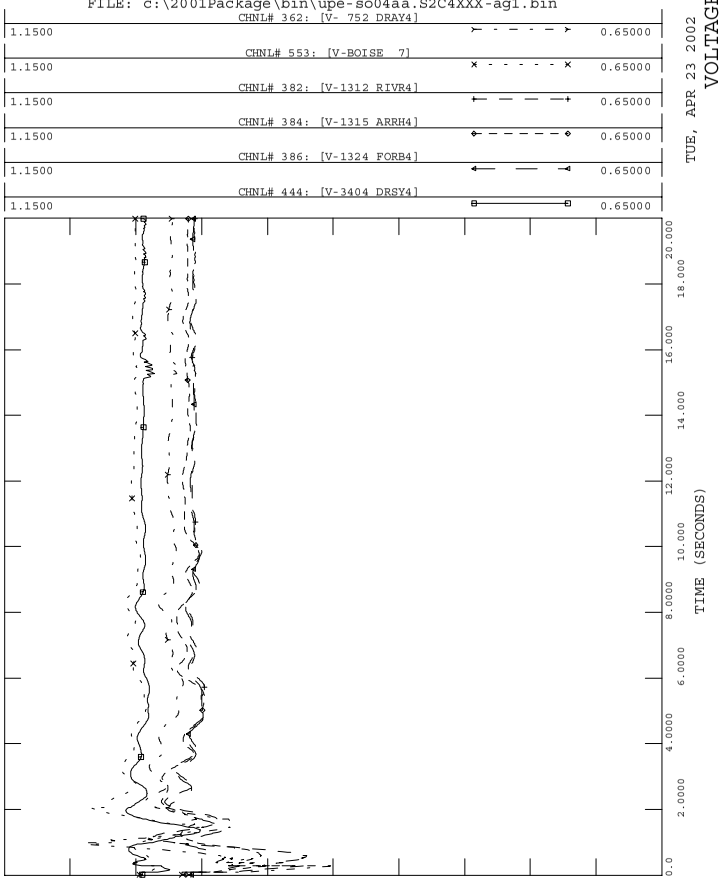

TUE, APR 23 2002 17:53
VOLTAGES 1

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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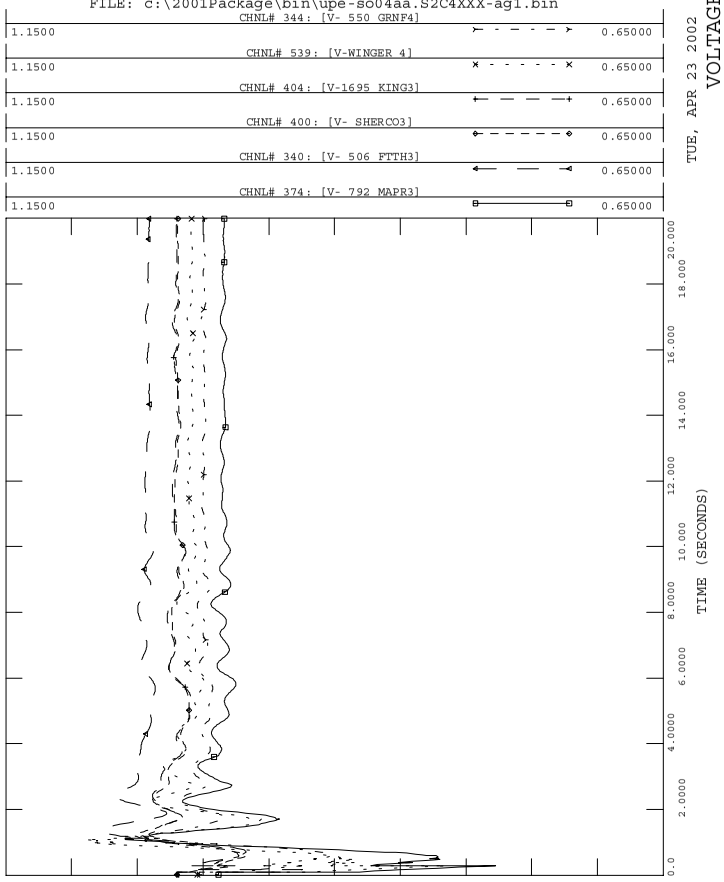

TUE, APR 23 2002 17:53
VOLTAGES 3

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CLR @ 11 CY BY TRIPPING FLTD LINE
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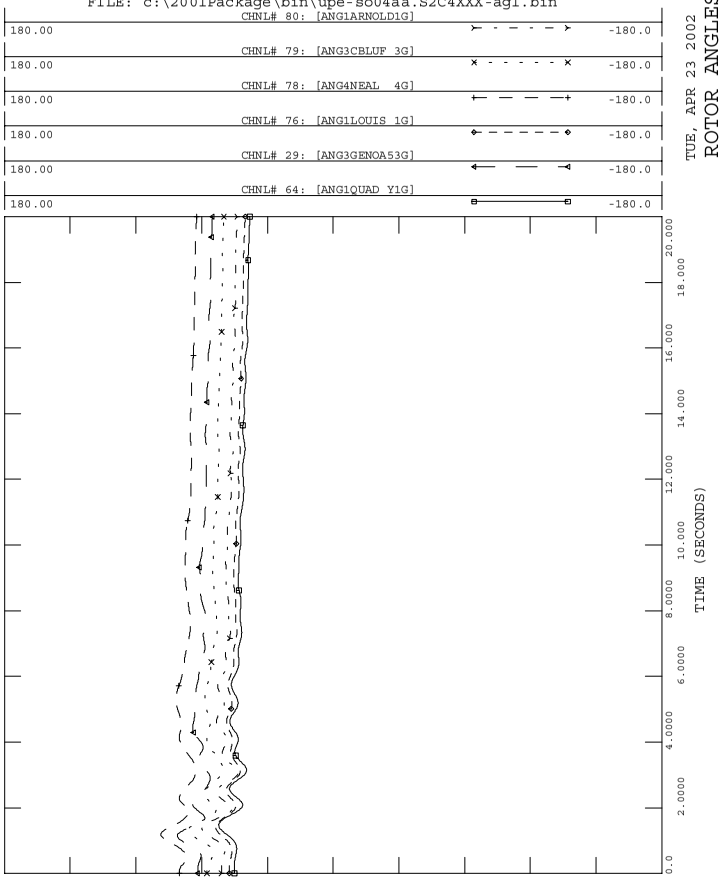

TUE, APR 23 2002 17:53
ROTOR ANGLES IA

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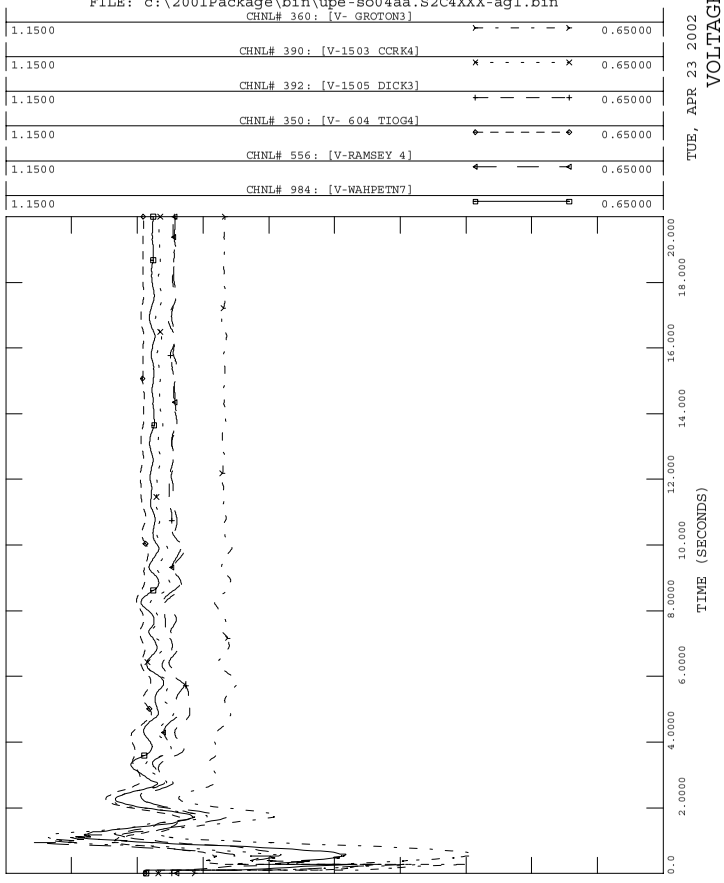

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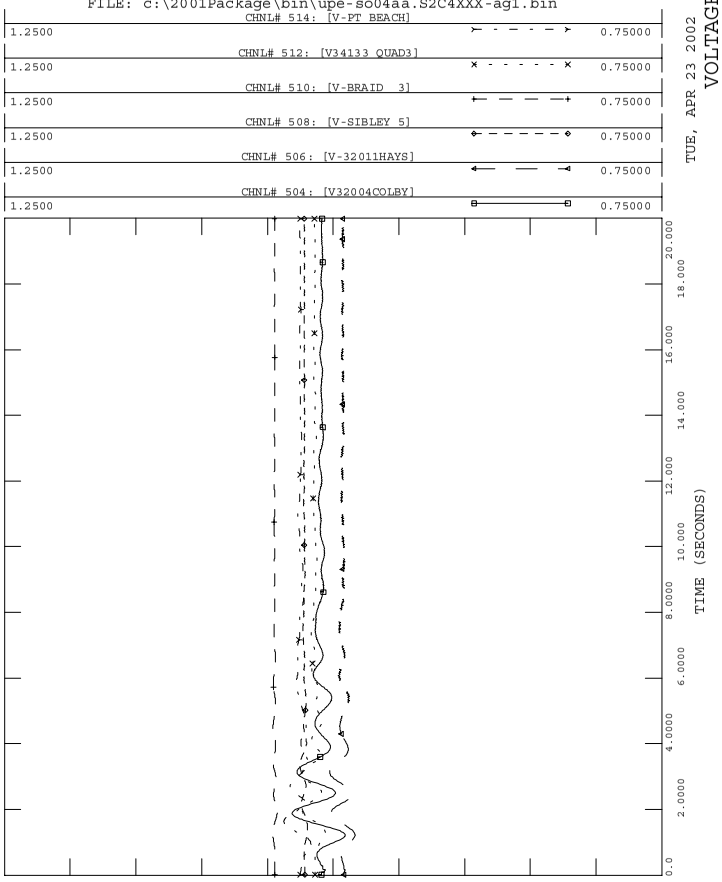

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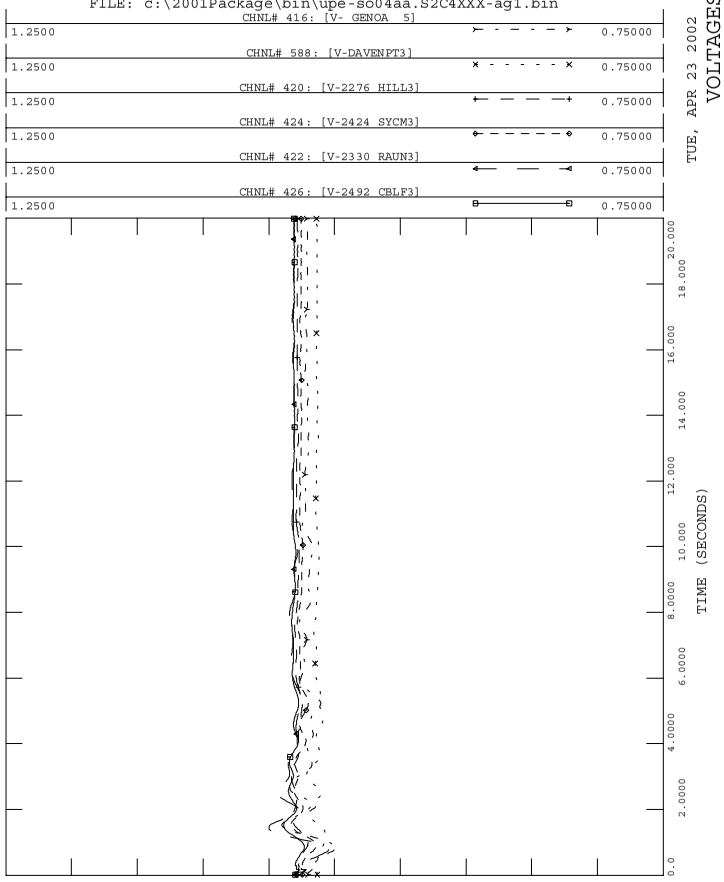

TUE, APR 23 2002 17:53
VOLTAGES IA

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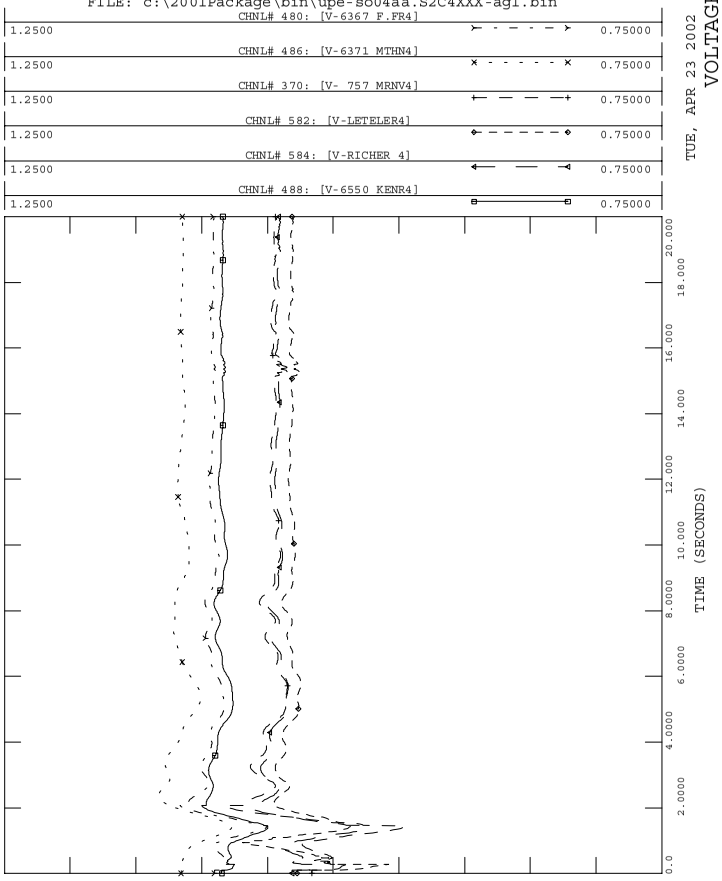

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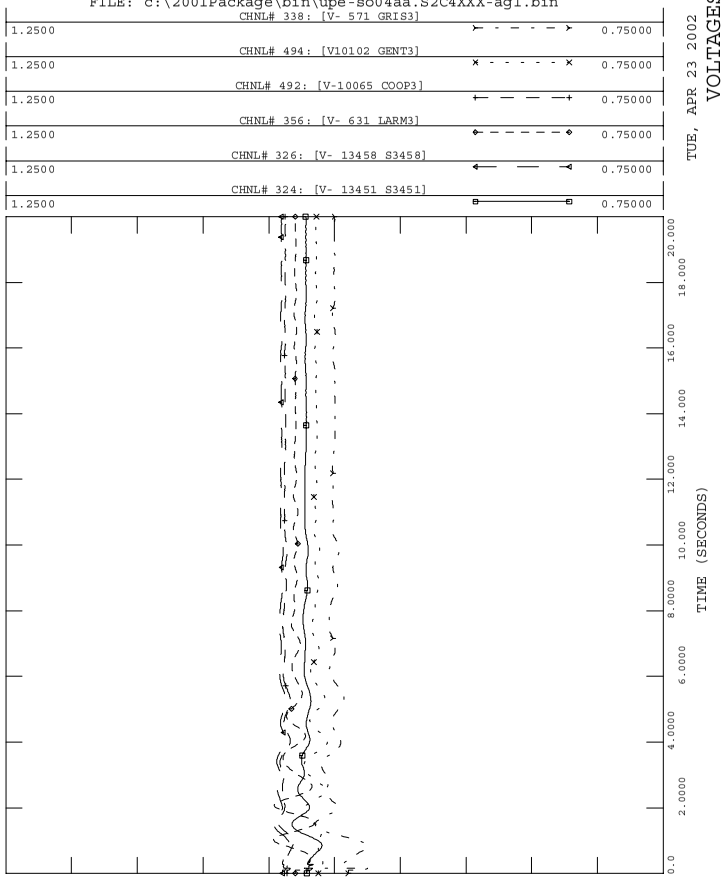

TUE, APR 23 2002 17:53
VOLTAGES NB

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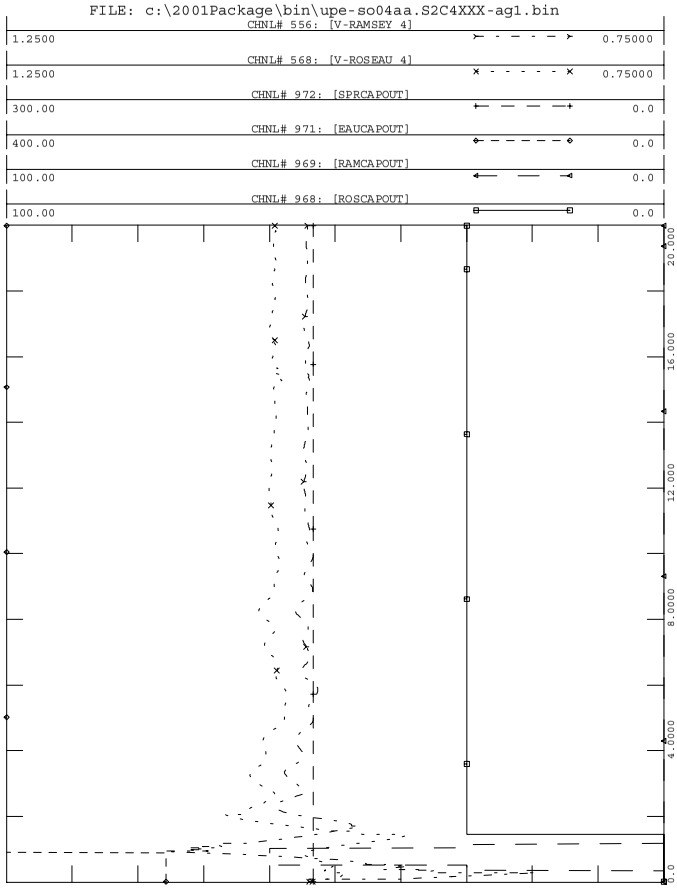

TUE, APR 23 2002 17:53
FAST SW CAP OUT 2

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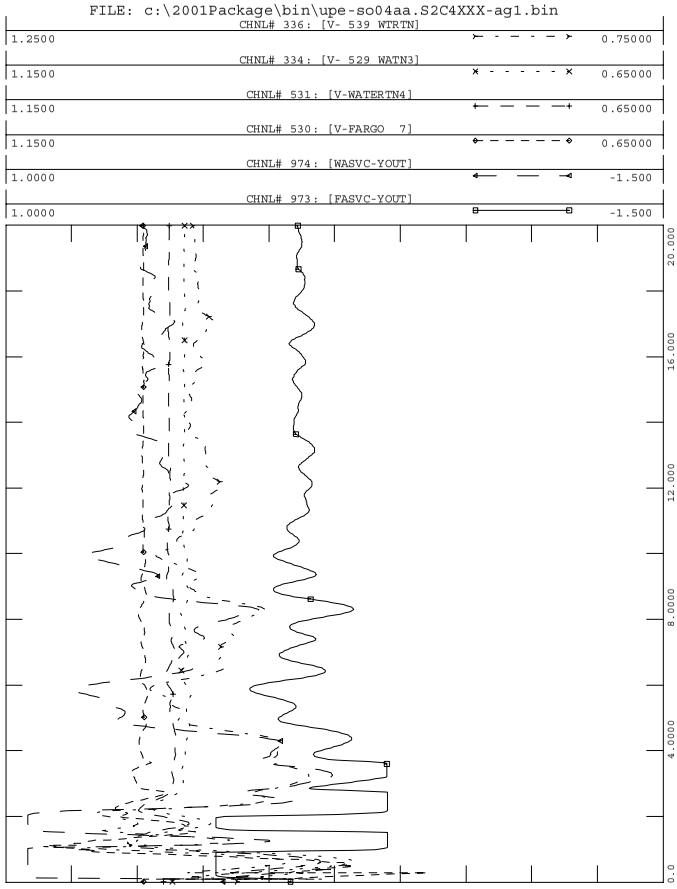

TUE, APR 23 2002 17:53
FARGO/WATERTOWN SVS

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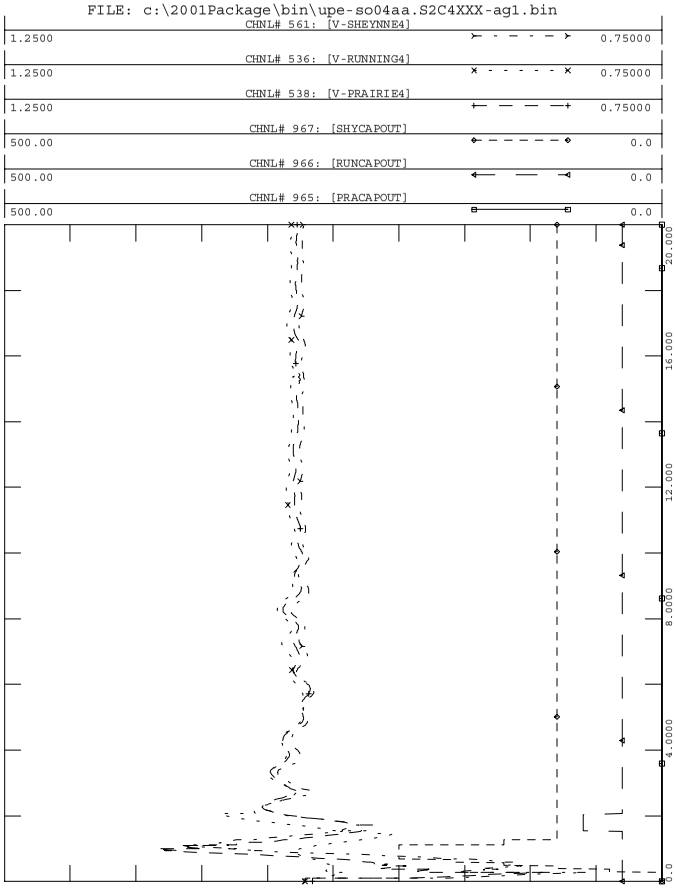

TUE, APR 23 2002 17:53
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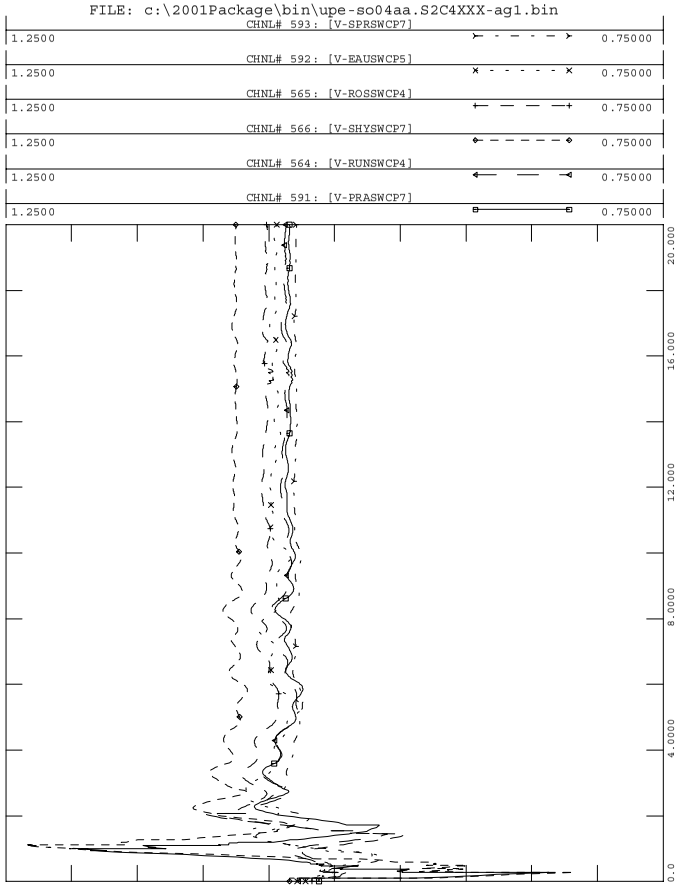

TUE, APR 23 2002 17:53
FAST SW CAP VOLTAGES

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CLR @ 11 CY BY TRIPPING FLTD LINE
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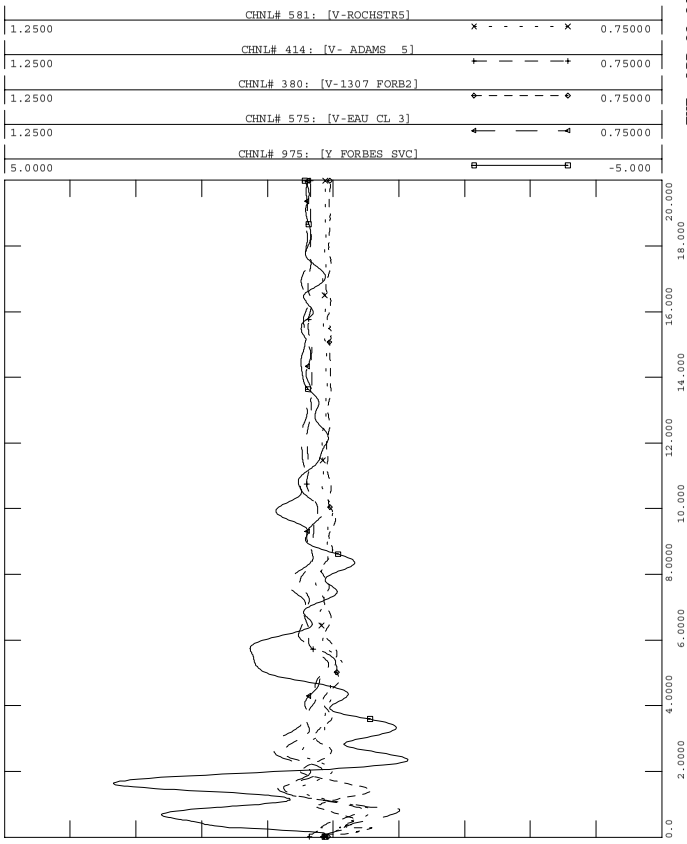
TUE, APR 23 2002 17:53

SVC & WISCONSIN VOLT



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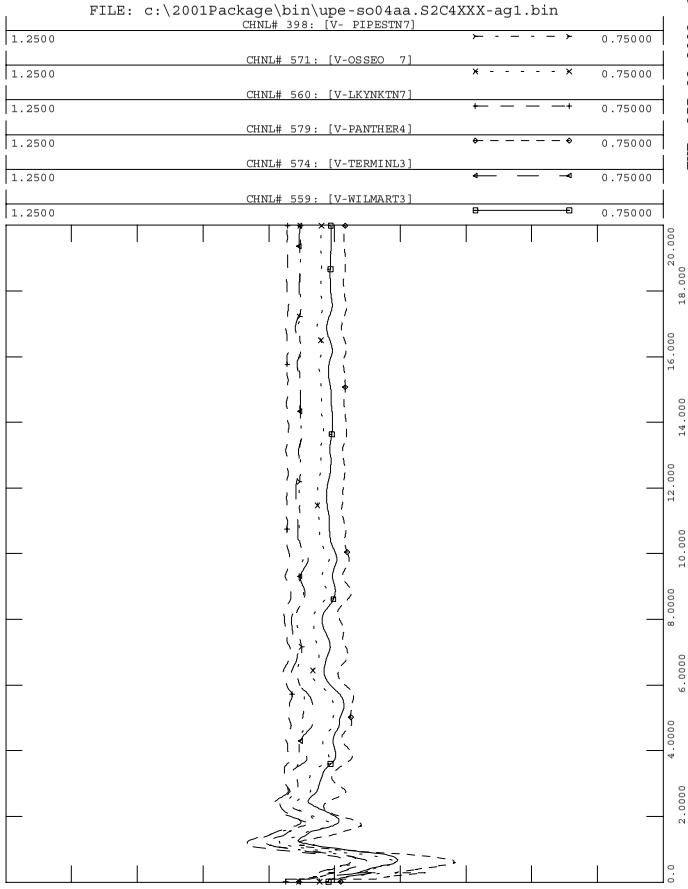
TUE, APR 23 2002 17:53

TC VOLTAGES



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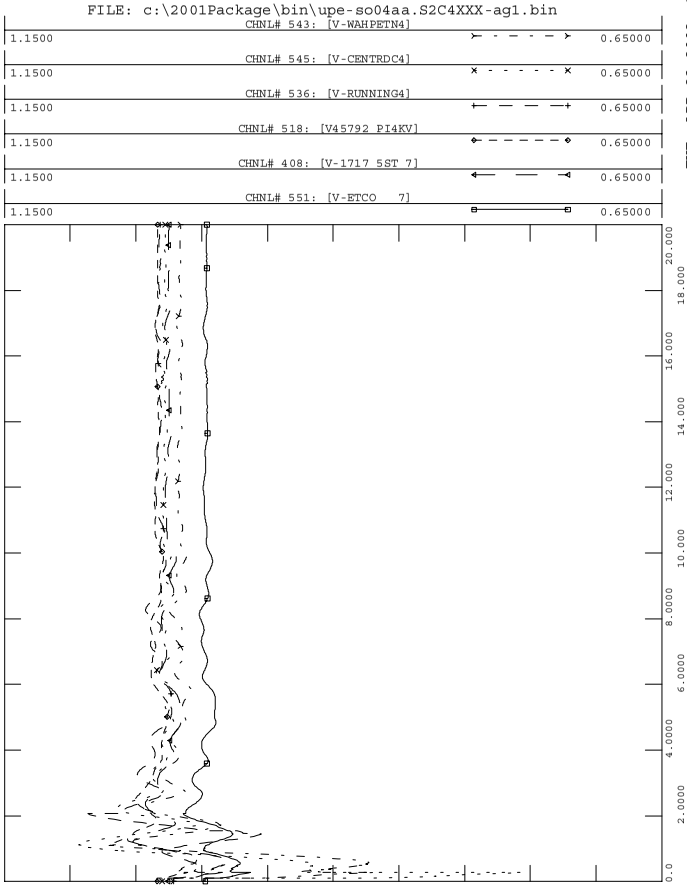
TUE, APR 23 2002 17:53

VOLTAGES 6



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CLR @ 11 CY BY TRIPPING FLTD LINE
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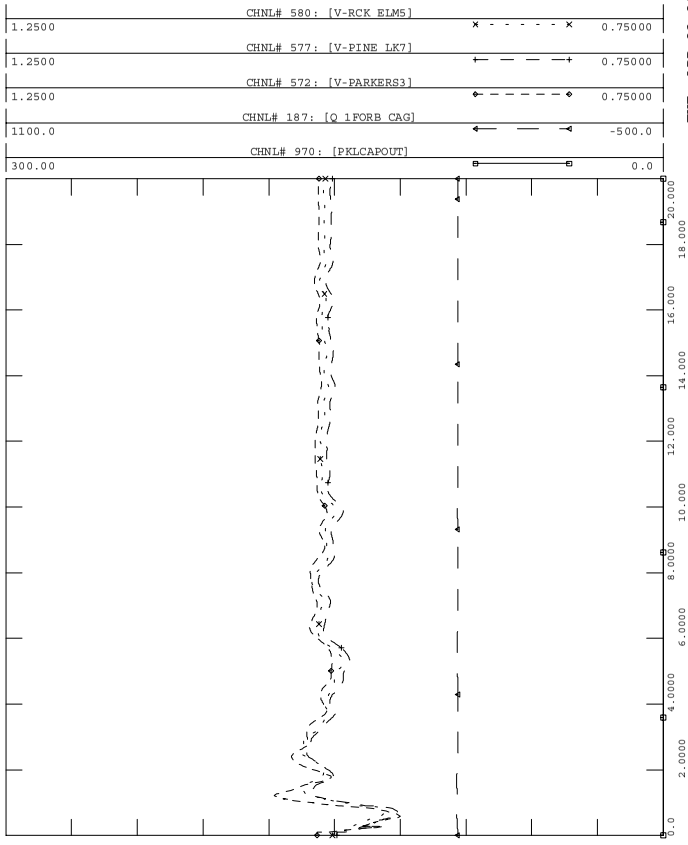
TUE, APR 23 2002 17:53

FORBES SVS OUT & VOLTAGES



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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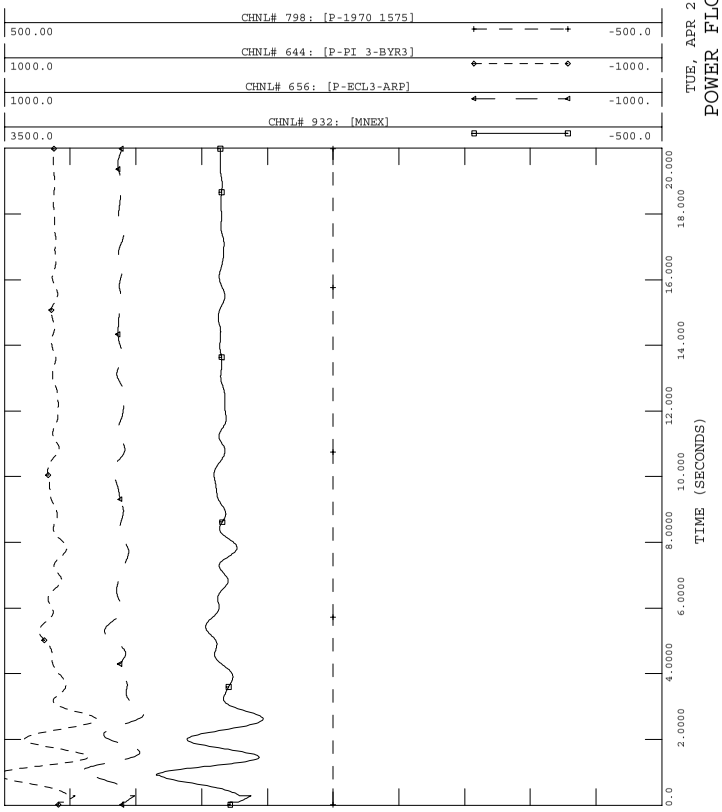
TUE, APR 23 2002 17:53
POWER FLOW SUMS 2



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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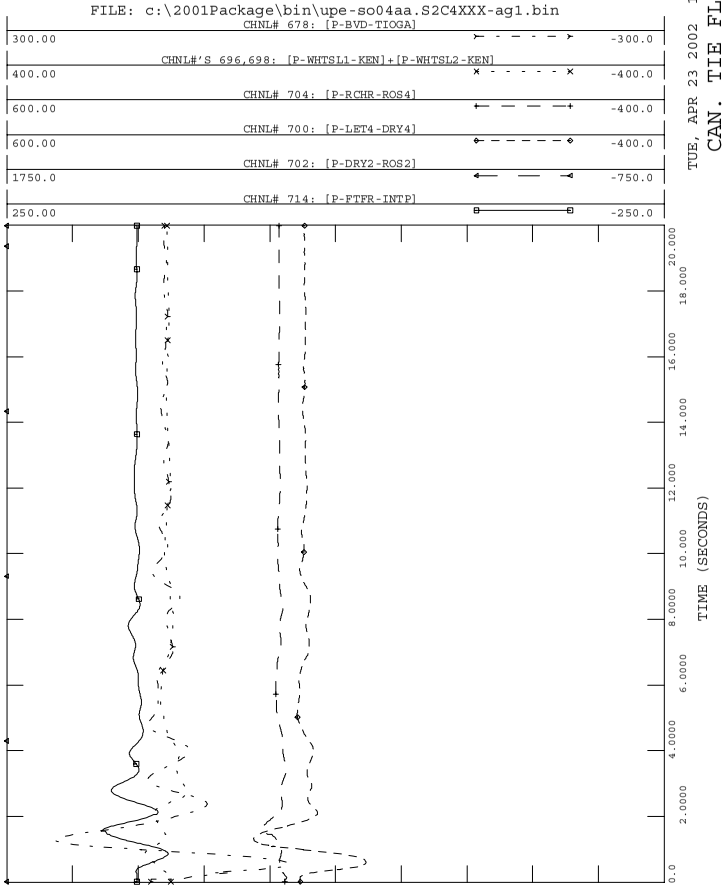
TUE, APR 23 2002 17:53
CAN. TIE FLOWS



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ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53
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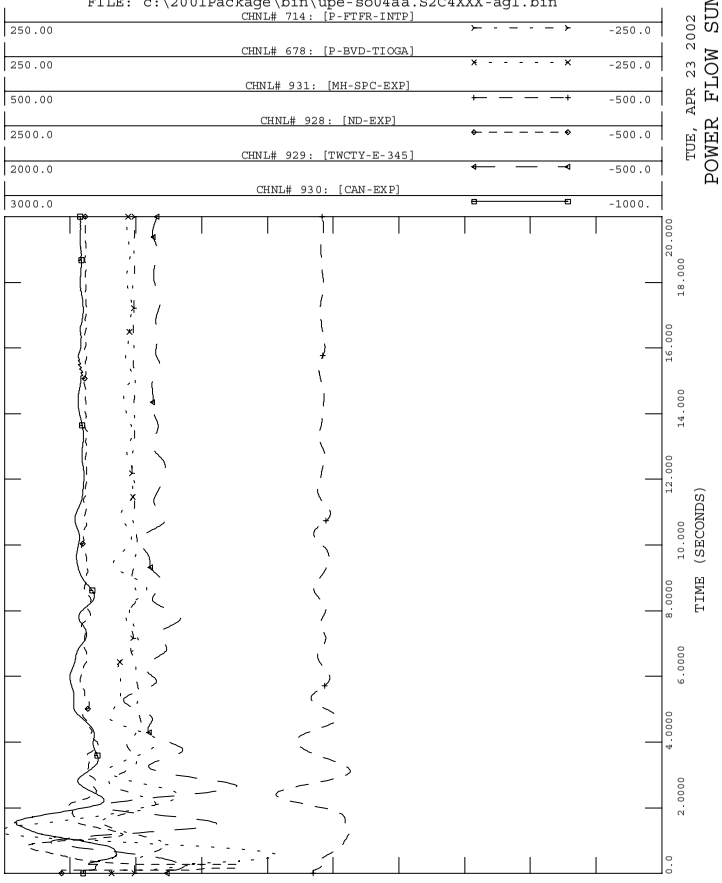

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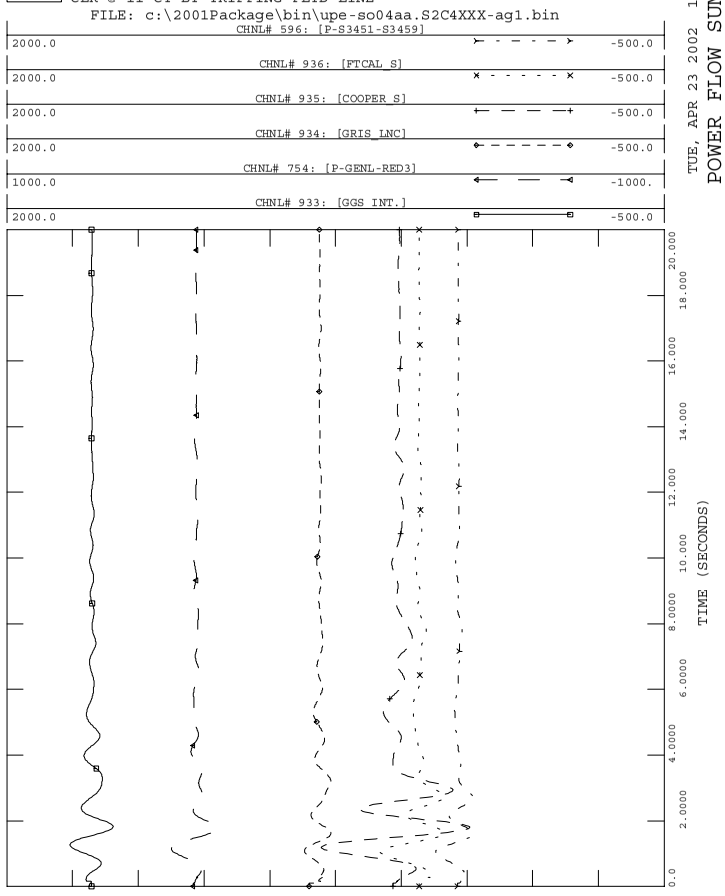
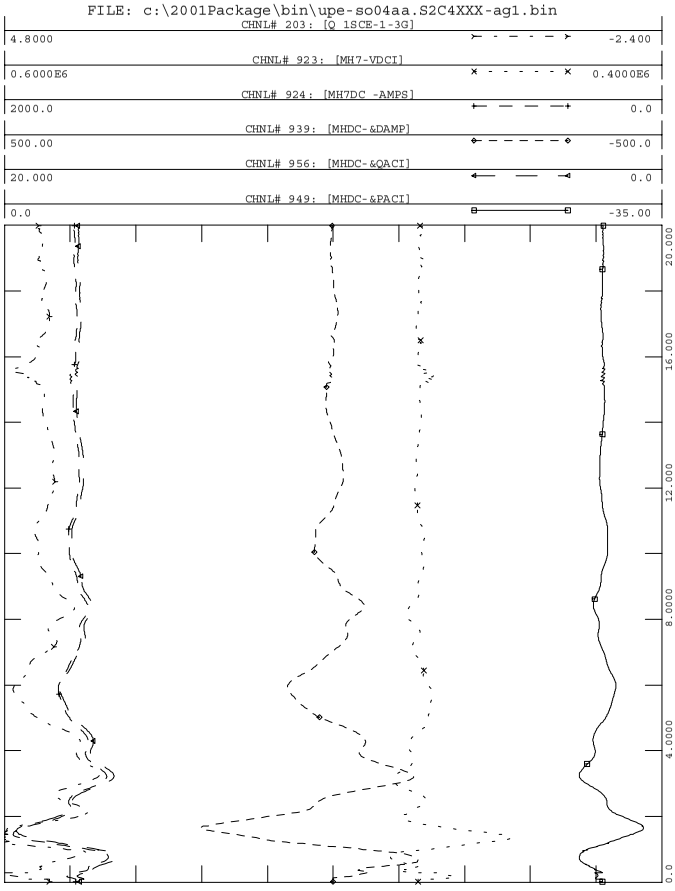
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53
POWER FLOW SUM 3



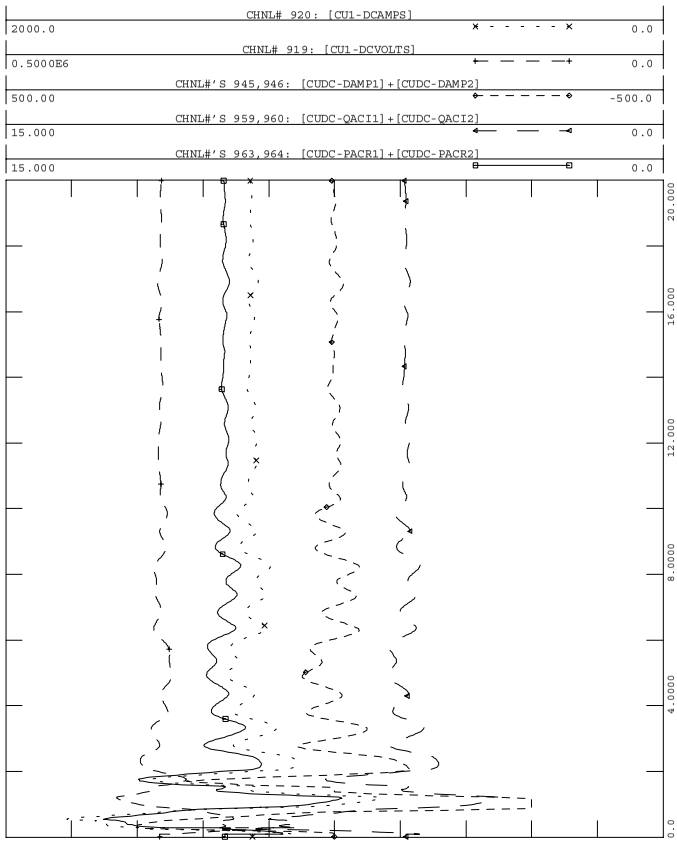
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53
MH DC PARAMETERS



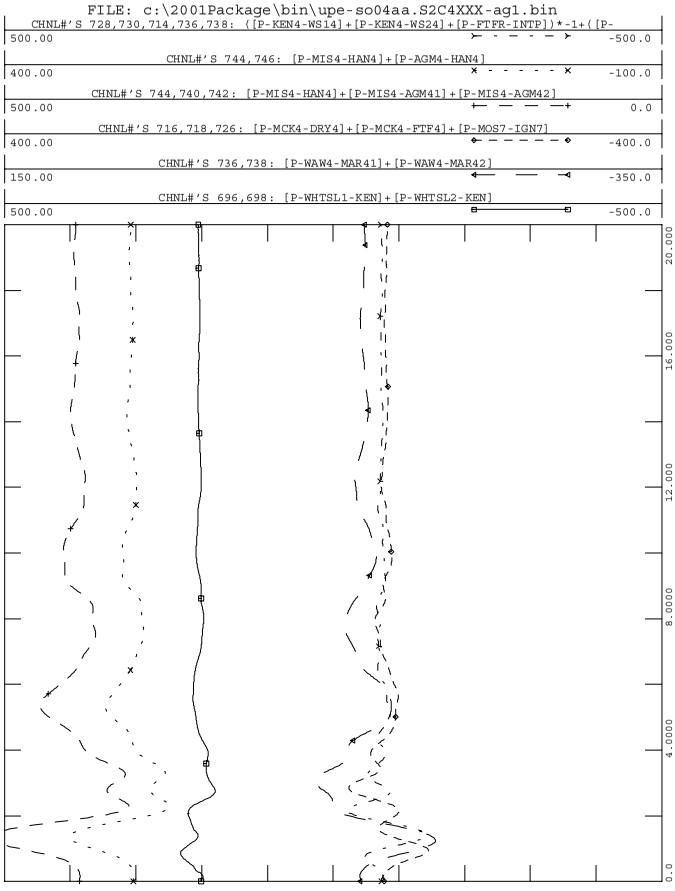
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53
CU DC #1



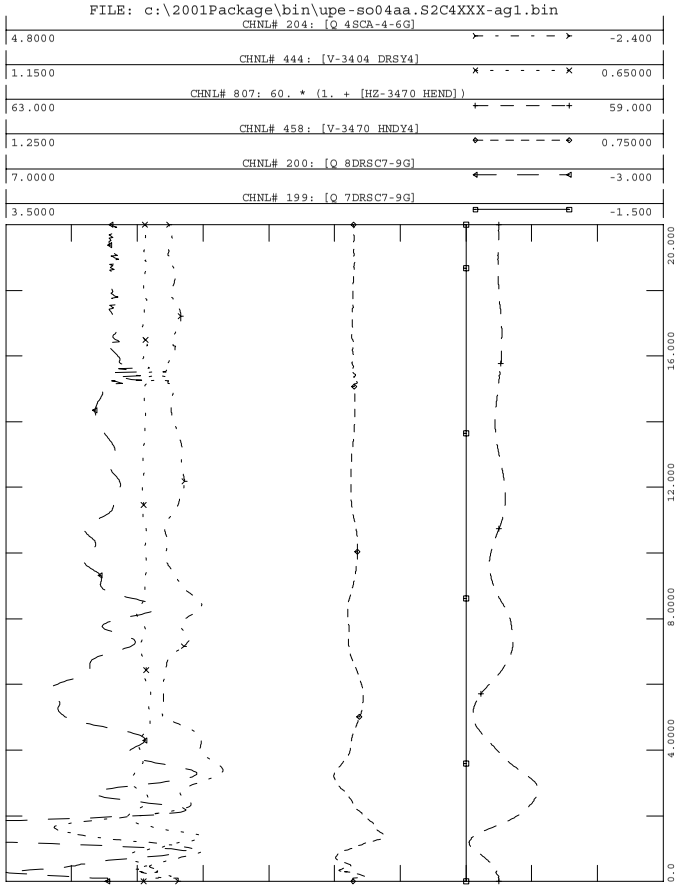
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53
OH TIE FLOWS



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53
MH DC PARAMETERS



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

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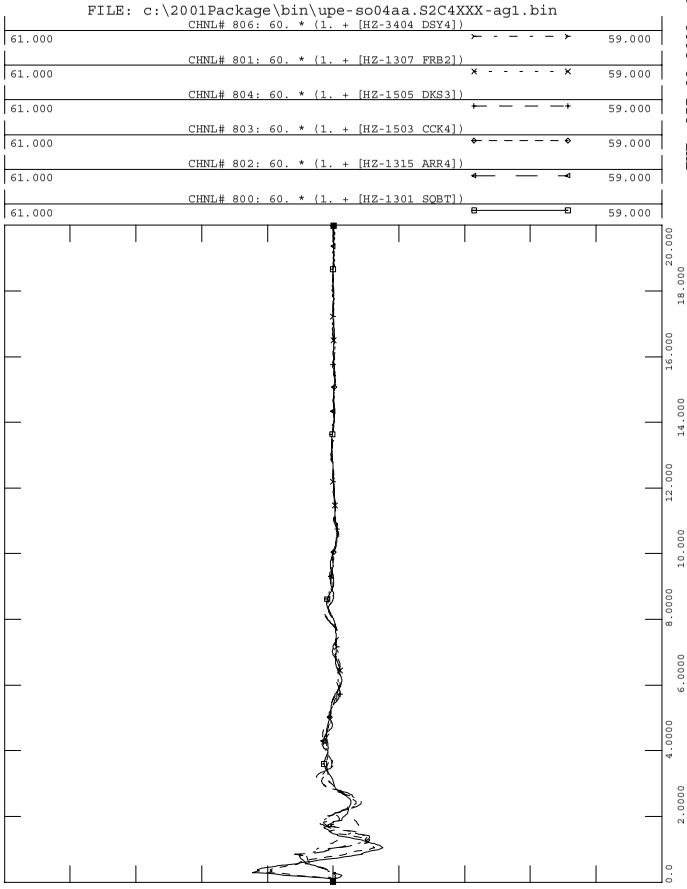
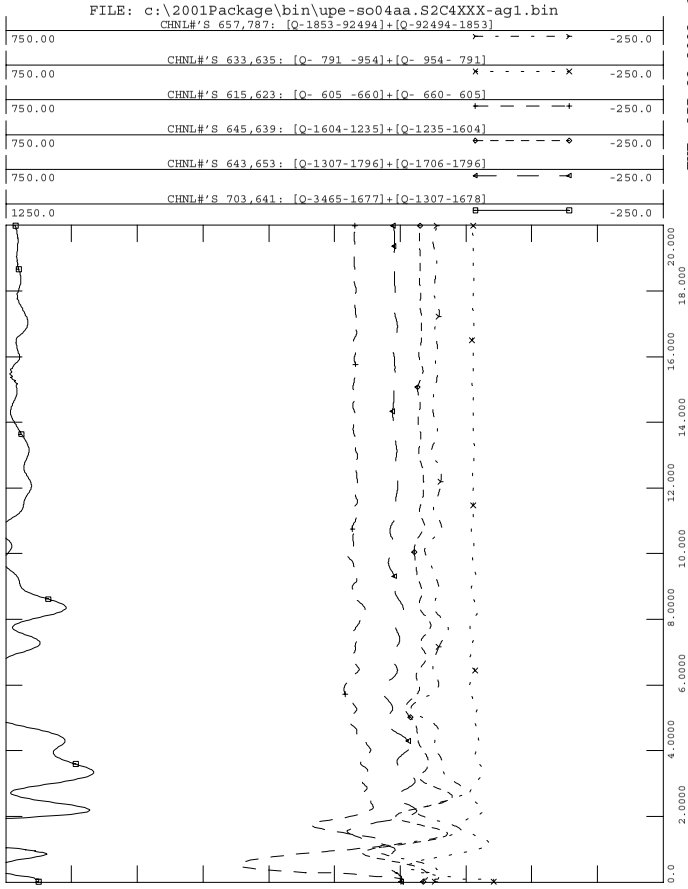
FREQ AT DC TERMINALS



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53

VAR LOSSES



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

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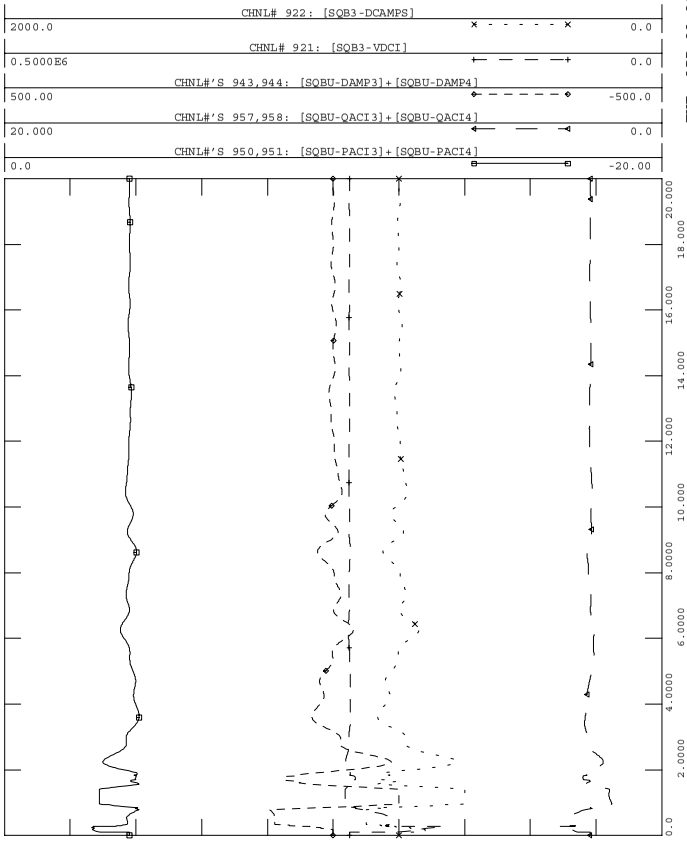
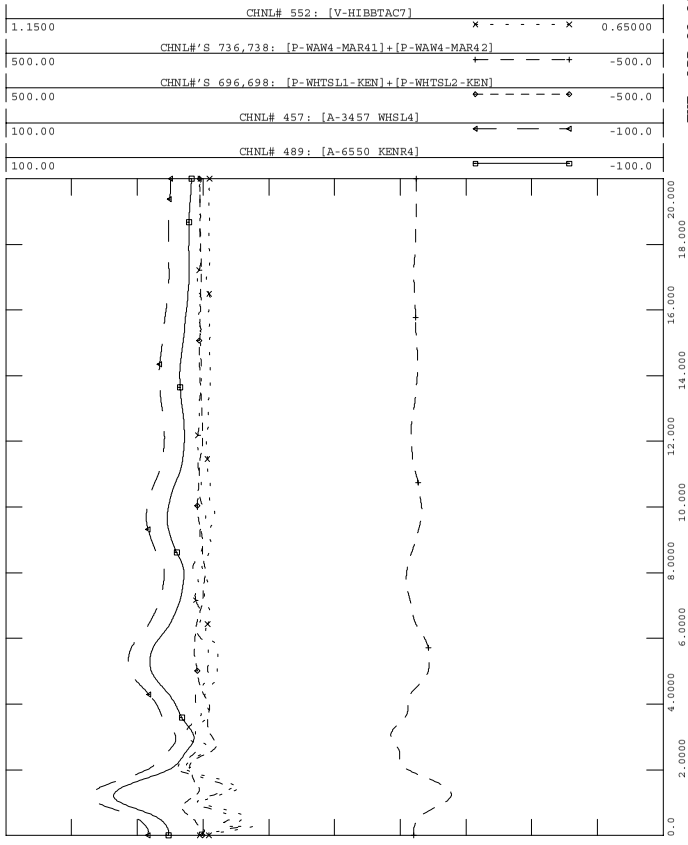
SQB DC #3



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53

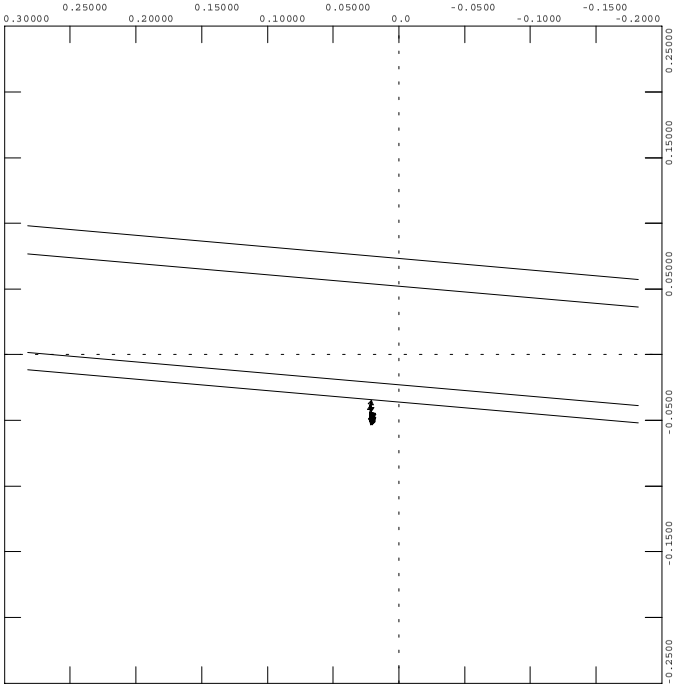
VOLTAGES, ANGLES



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

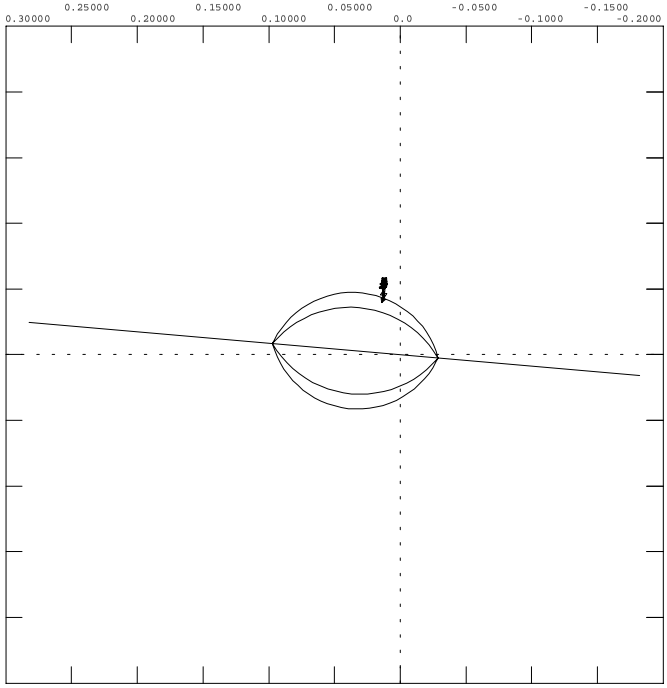


TUE, APR 23 2002 17:53
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

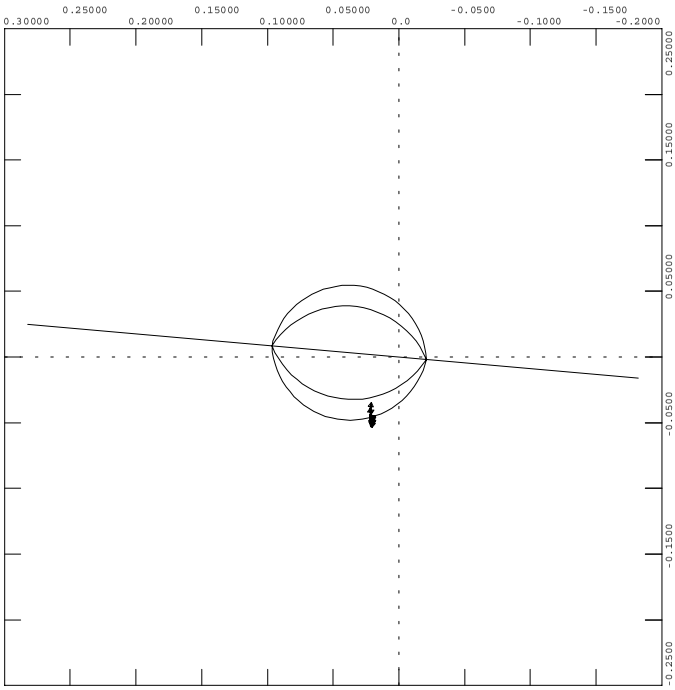


TUE, APR 23 2002 17:53
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

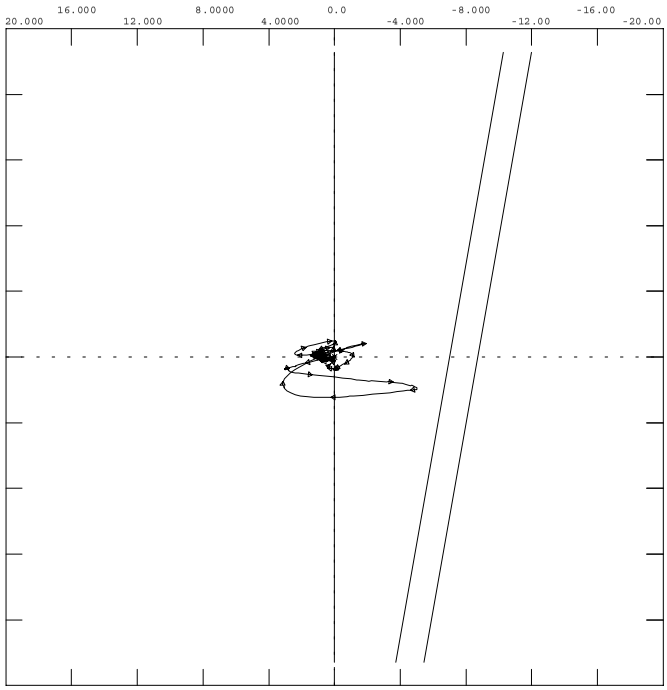


TUE, APR 23 2002 17:53
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

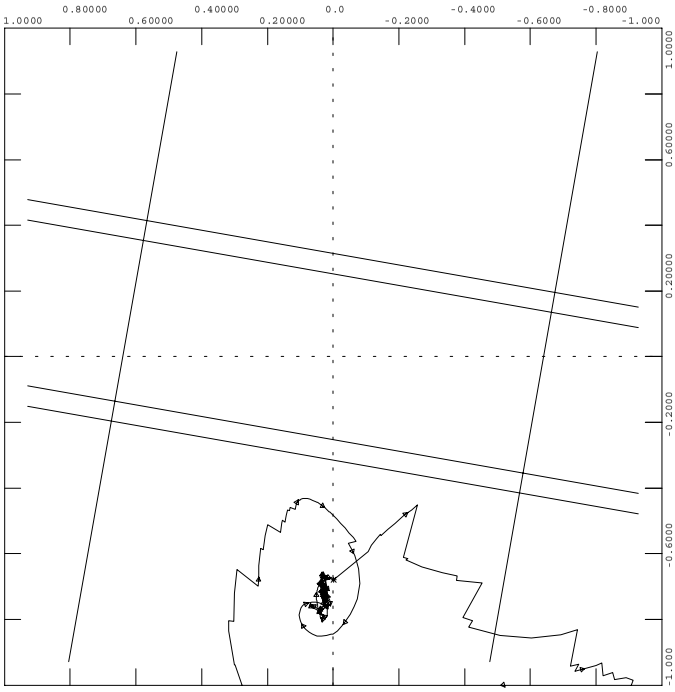


TUE, APR 23 2002 17:53
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

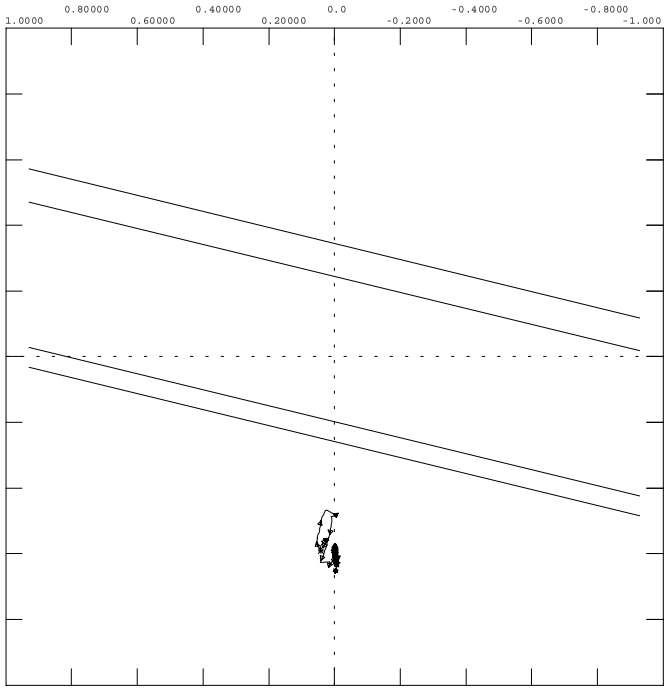
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

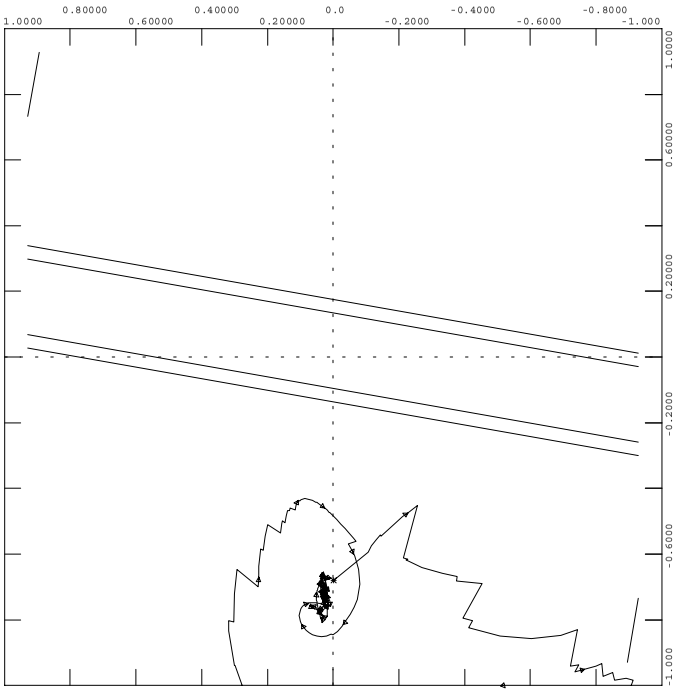
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

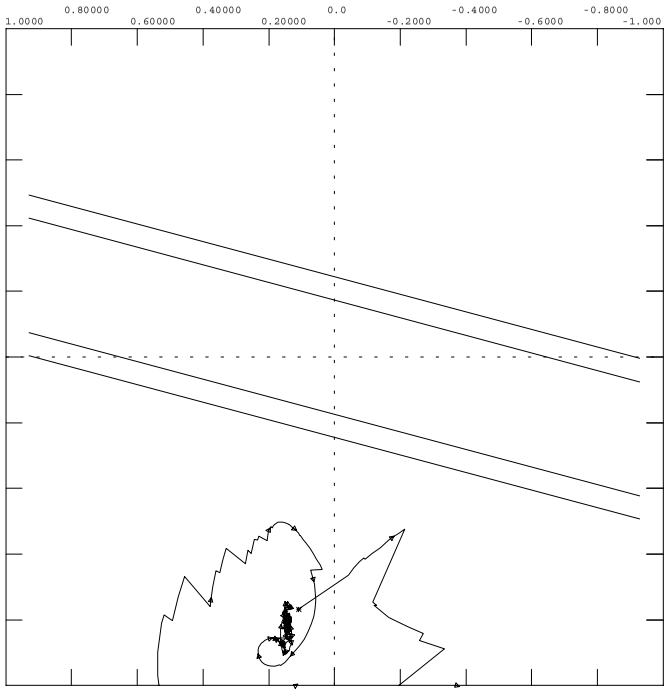
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

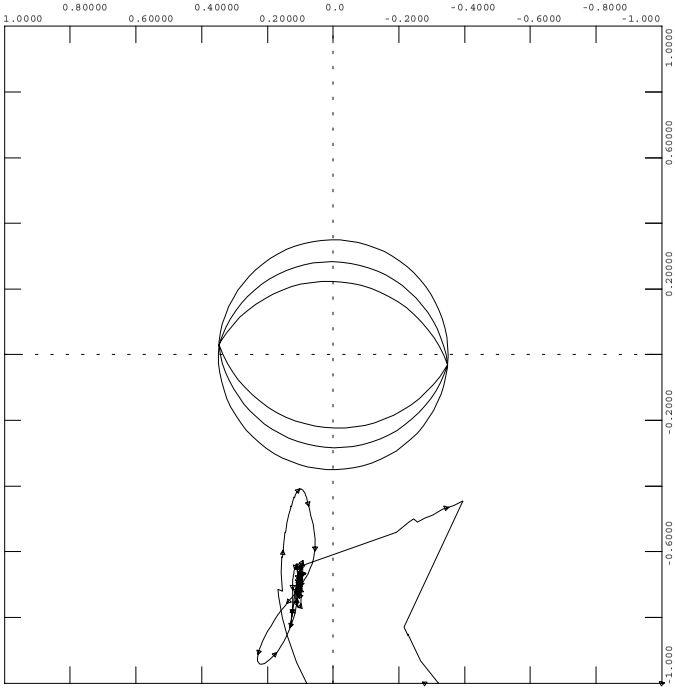
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

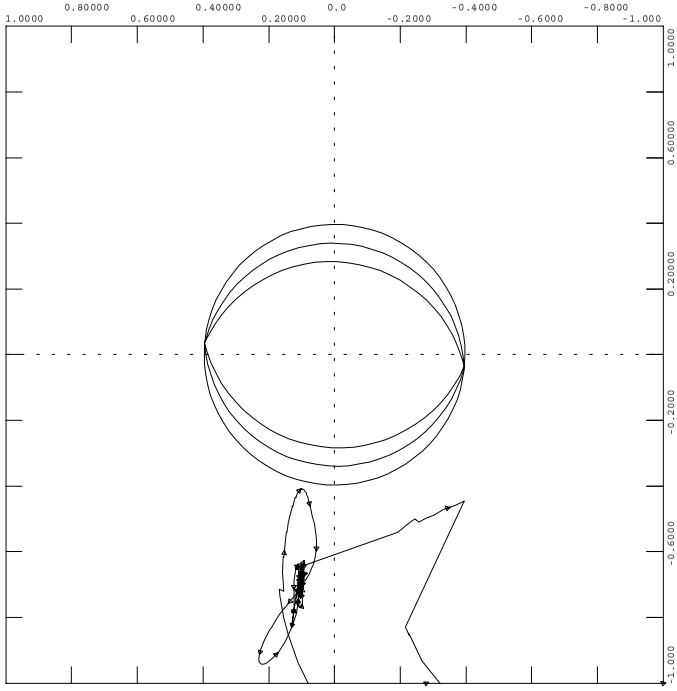
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

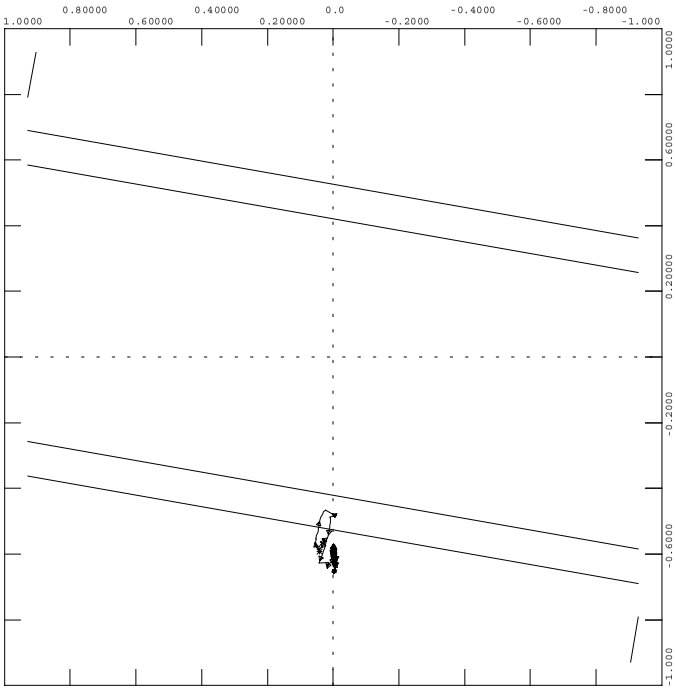
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

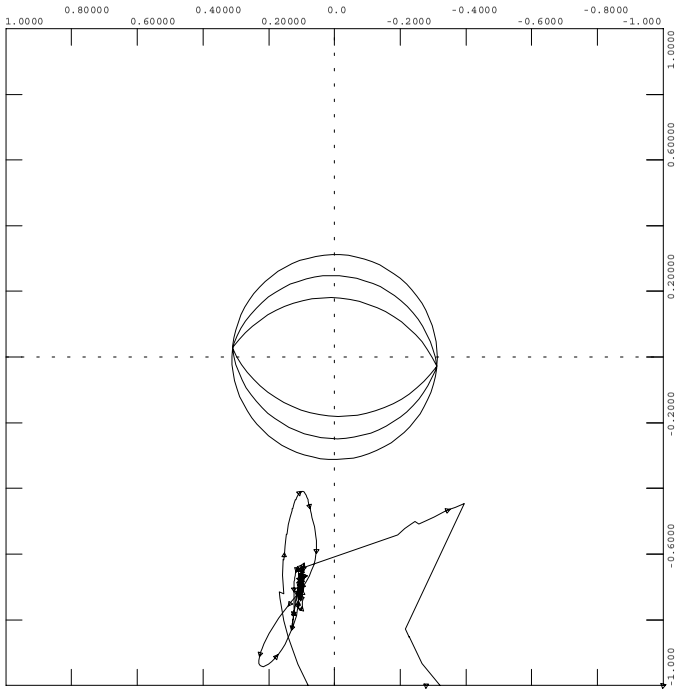
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



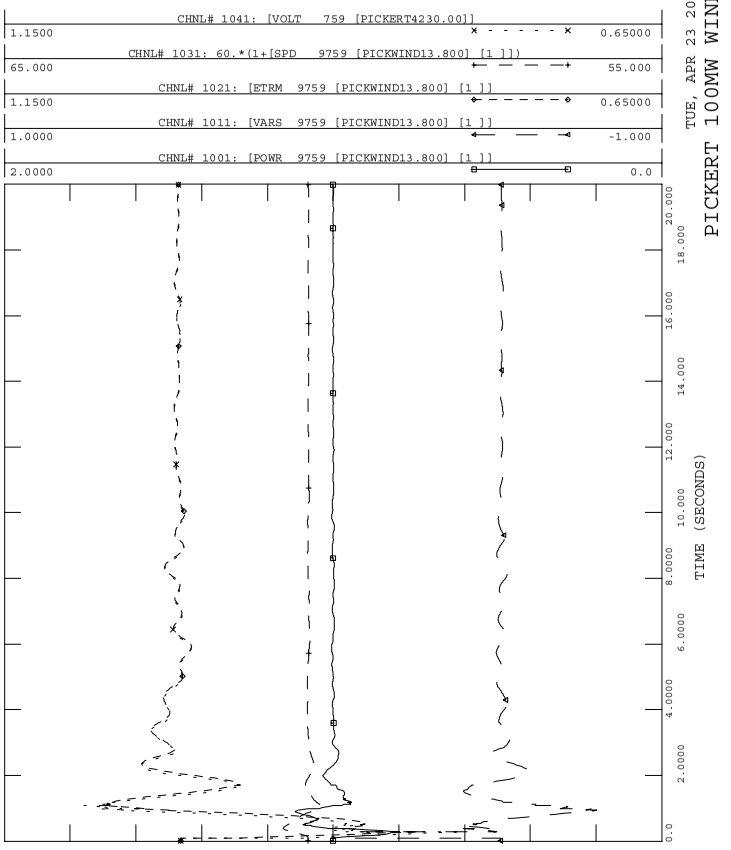
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

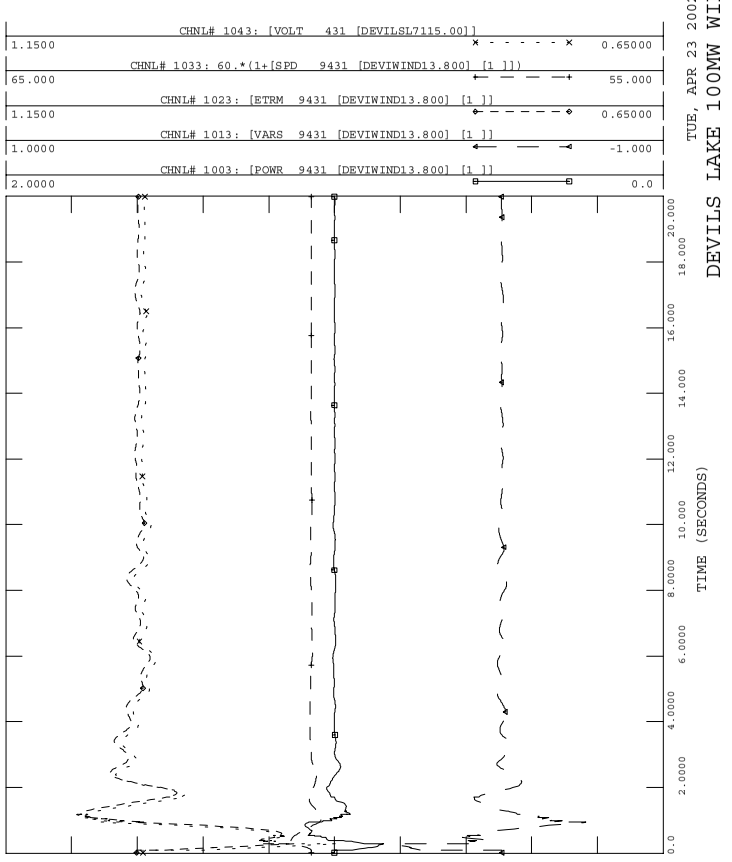


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin



TUE, APR 23 2002 17:53
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

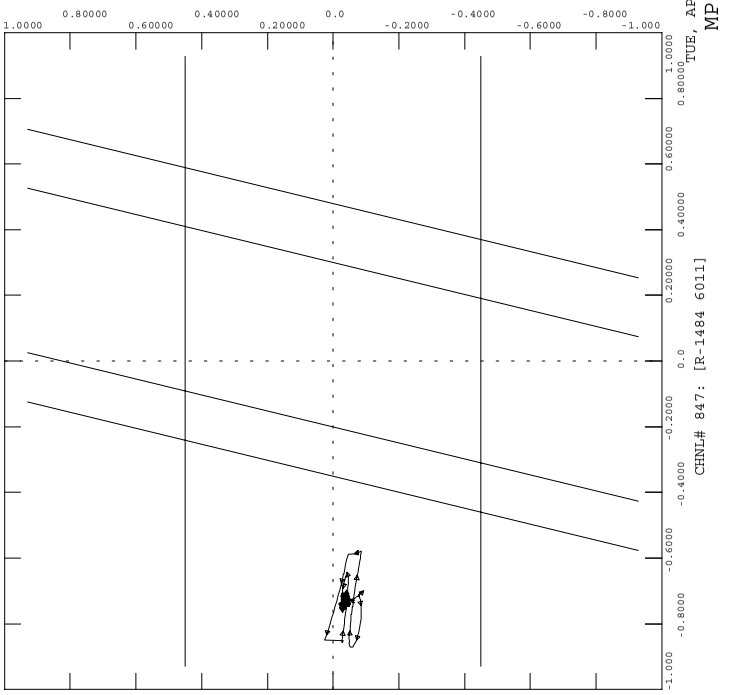


TUE, APR 23 2002 17:53
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

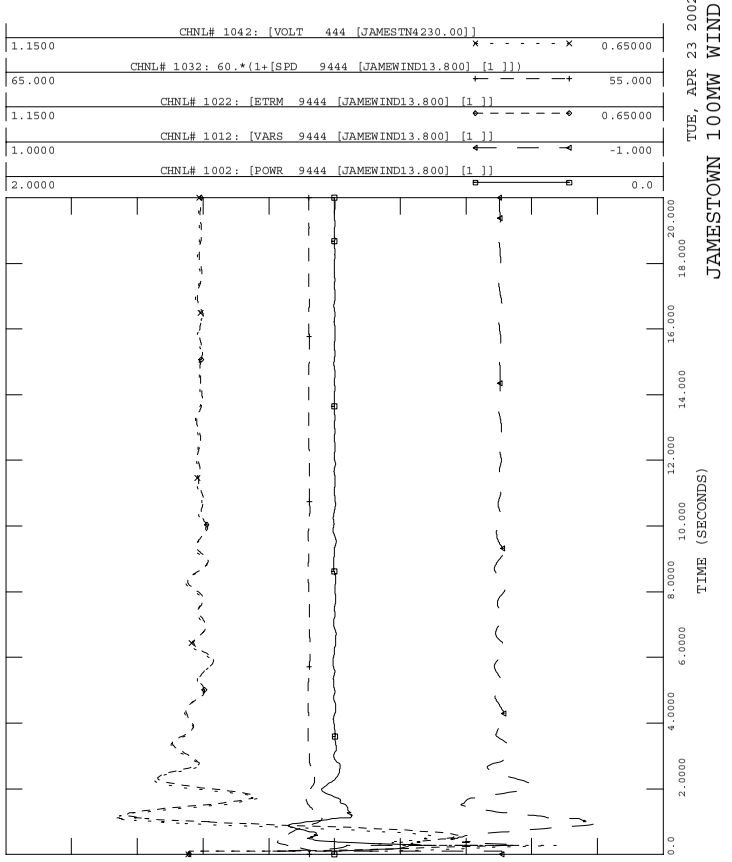
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



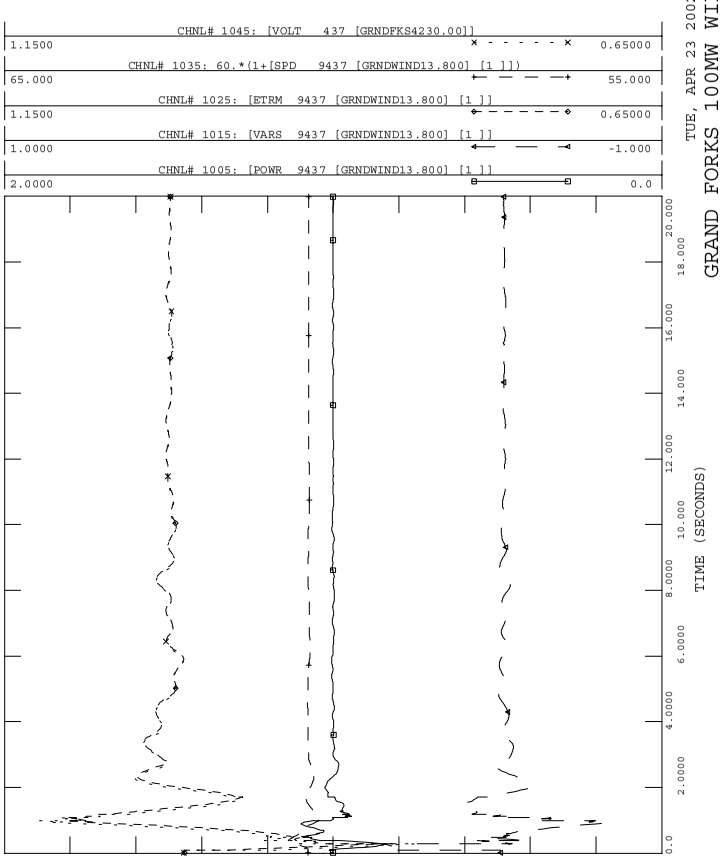
TUE, APR 23 2002 17:53
MP-OH I.FALLS (779)

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

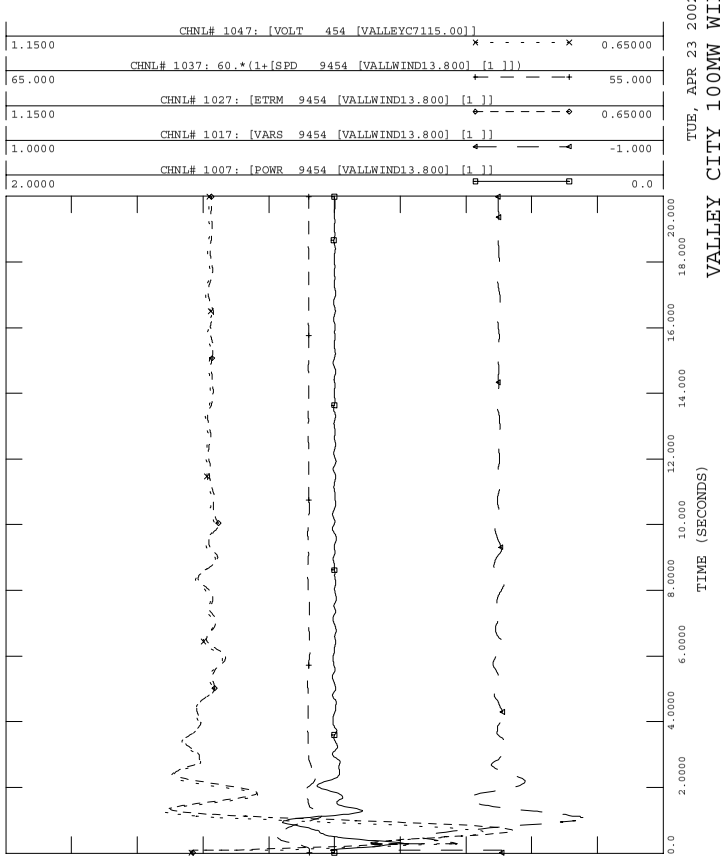


TUE, APR 23 2002 17:53
JAMESTOWN 100MW WIND UNIT

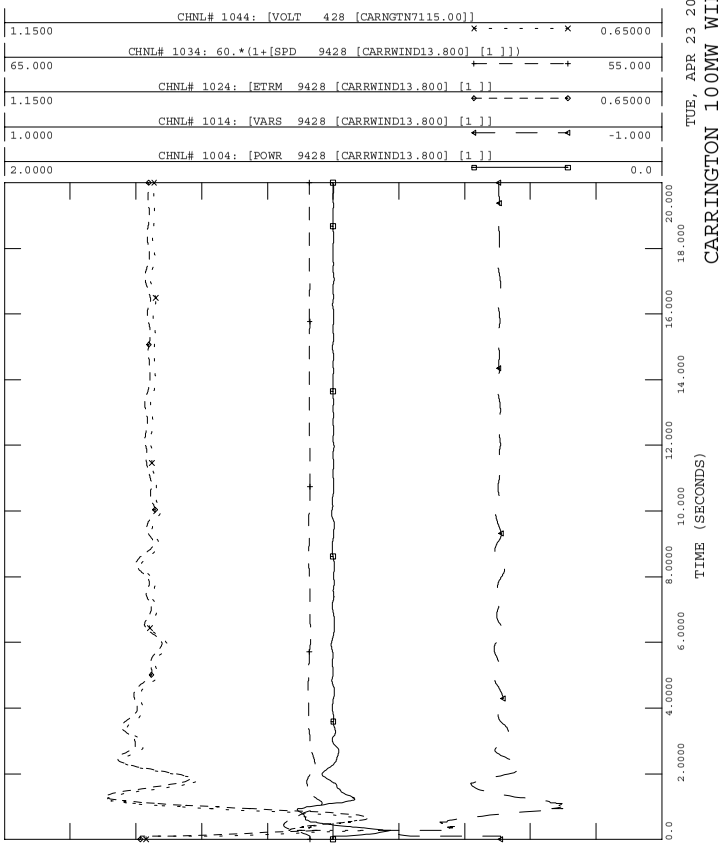
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin



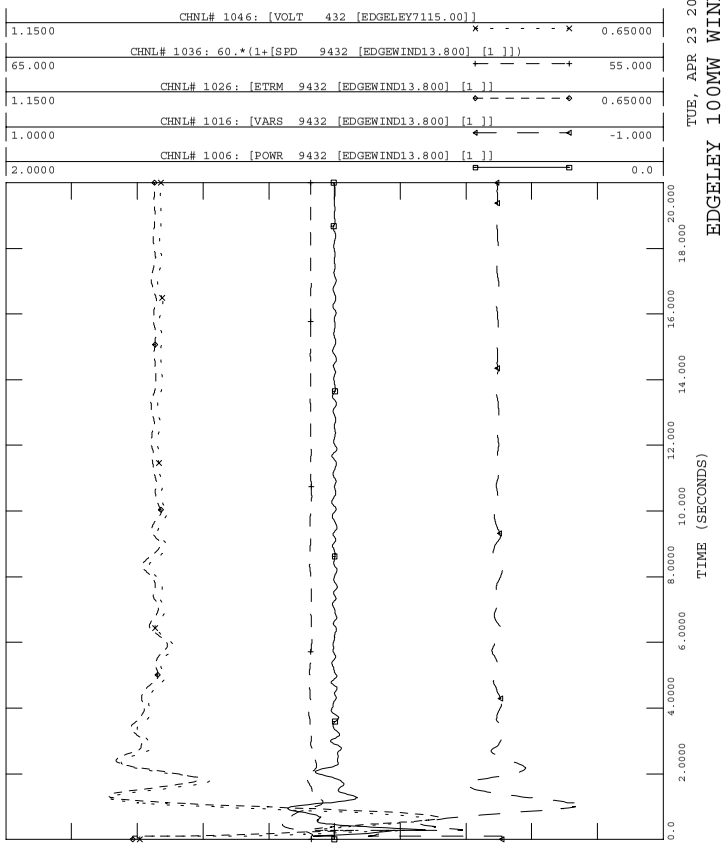
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin



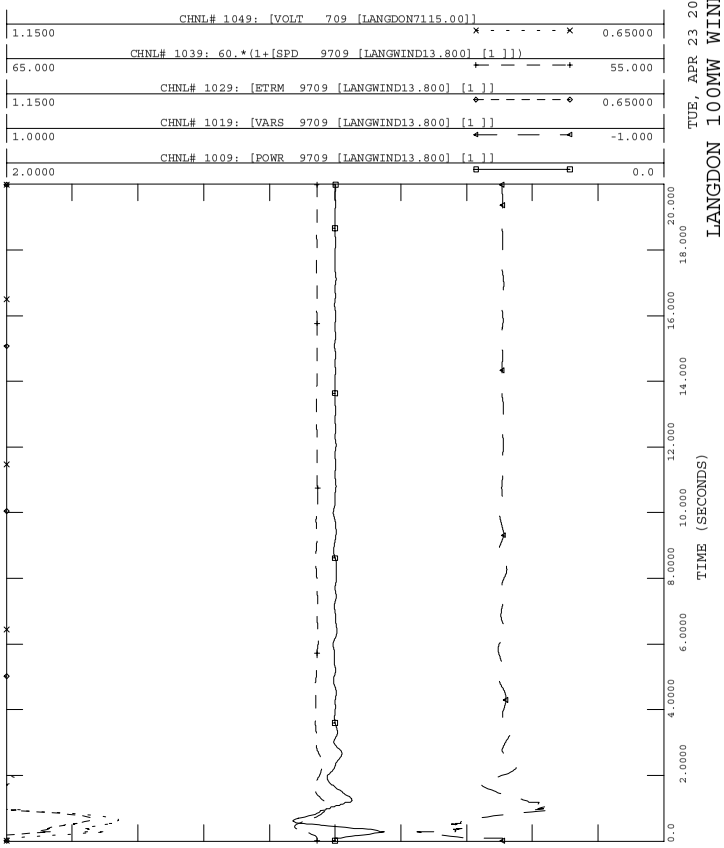
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53

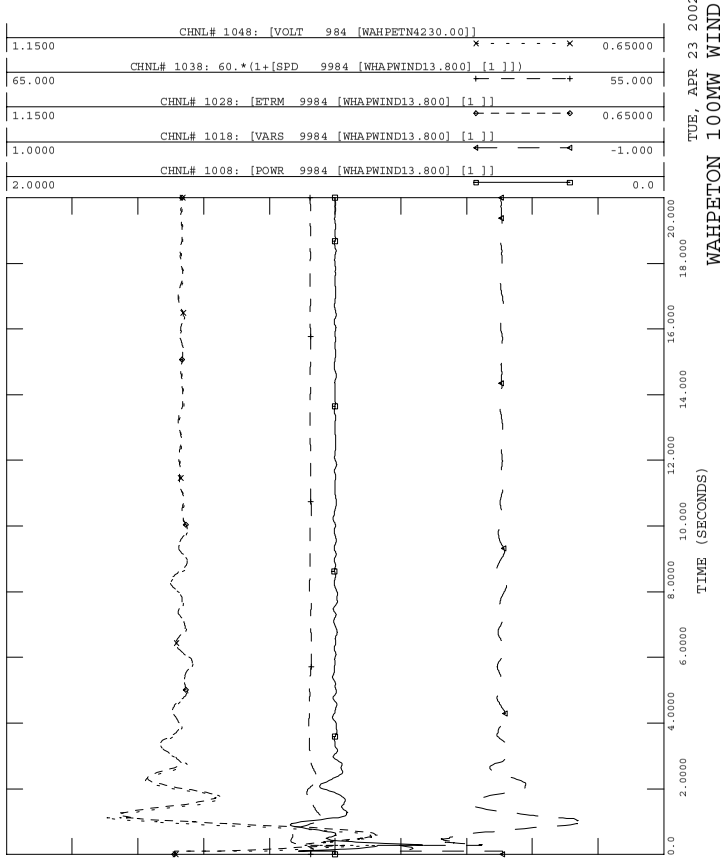
LANGDON 100MW WIND UNIT



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53

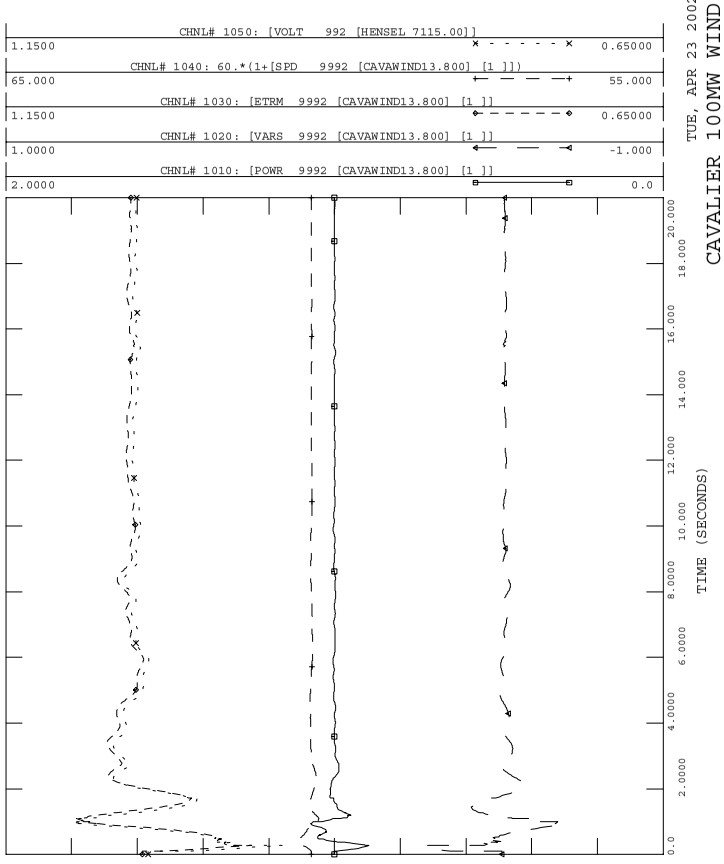
WAHPETON 100MW WIND UNIT



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag1.bin

TUE, APR 23 2002 17:53

CAVALIER 100MW WIND UNIT

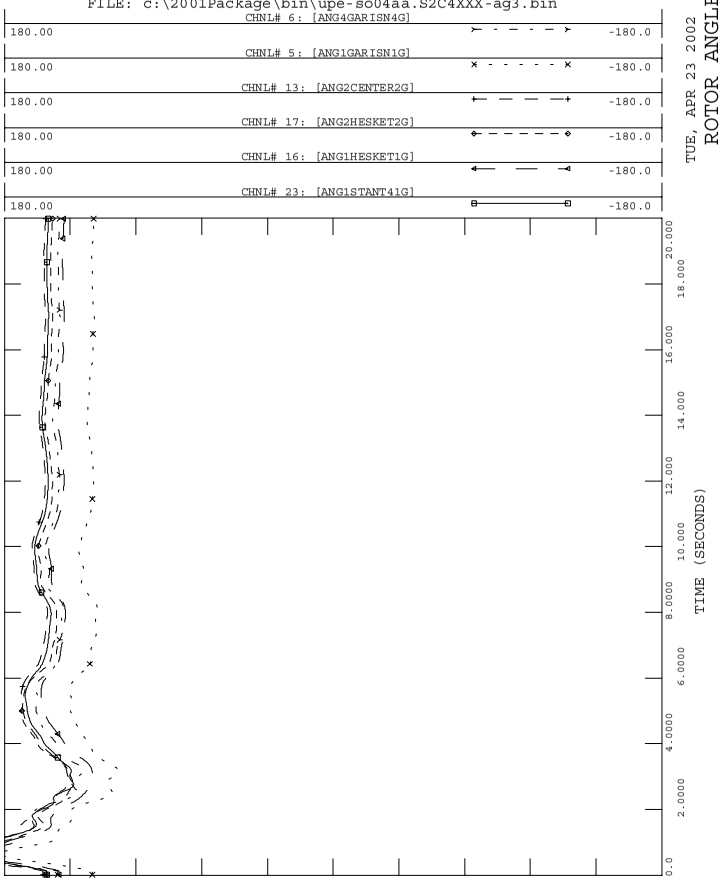


CONTINGENCY AG3

Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

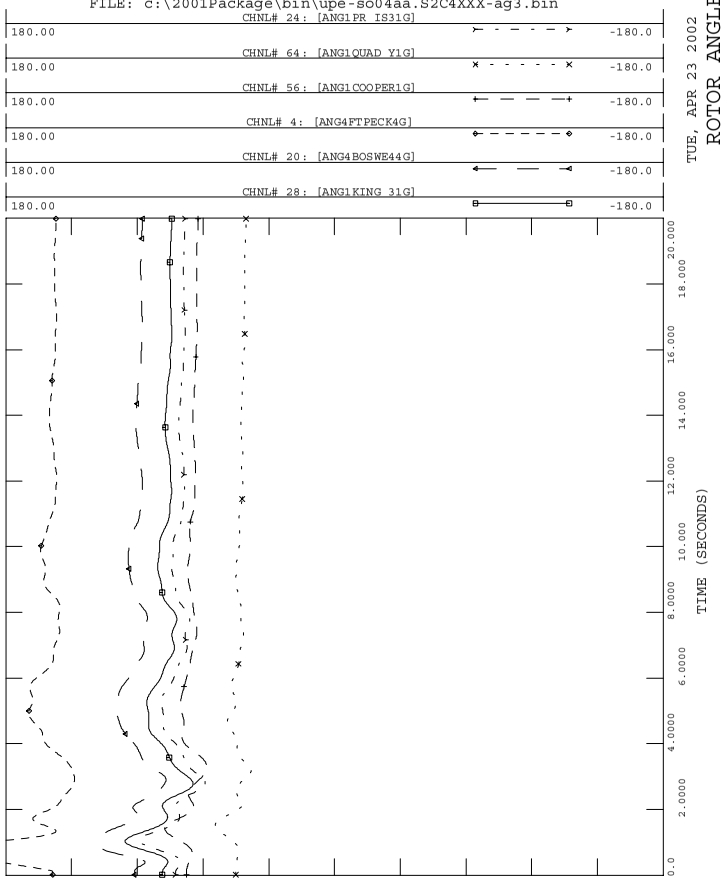
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
ROTOR ANGLES 2



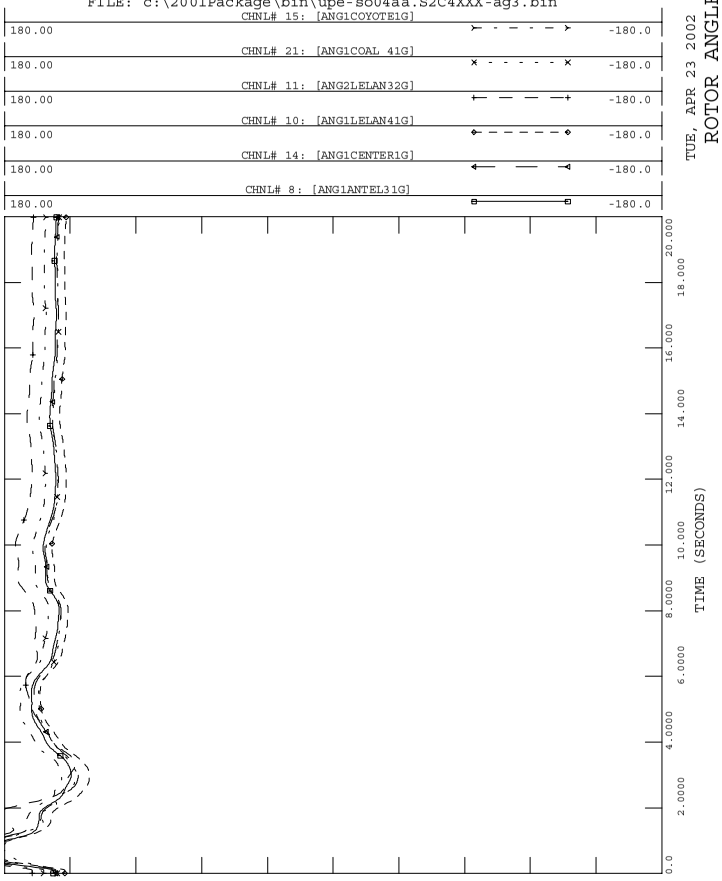
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
ROTOR ANGLES 4



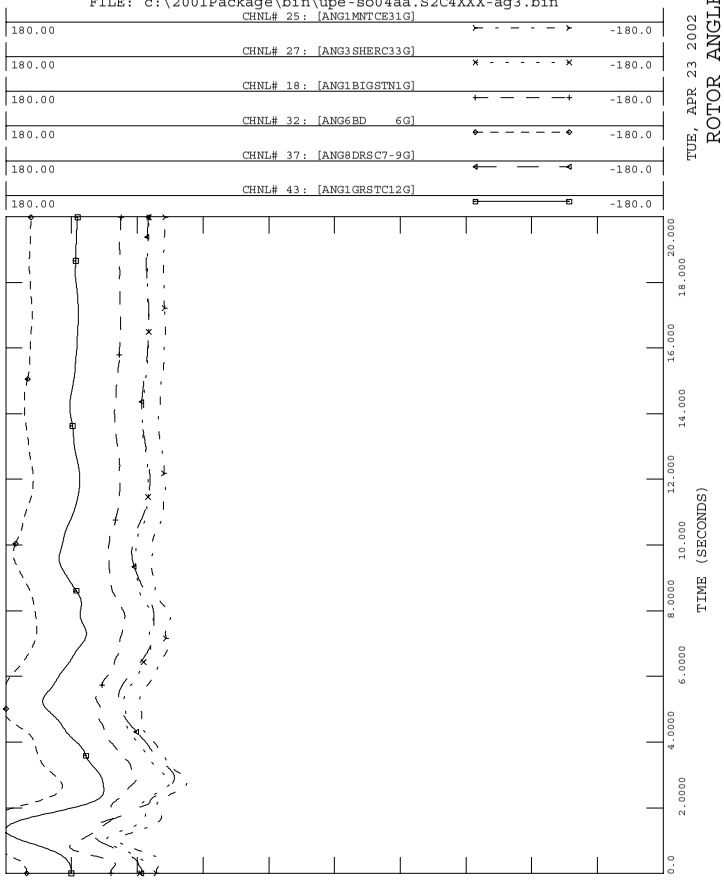
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

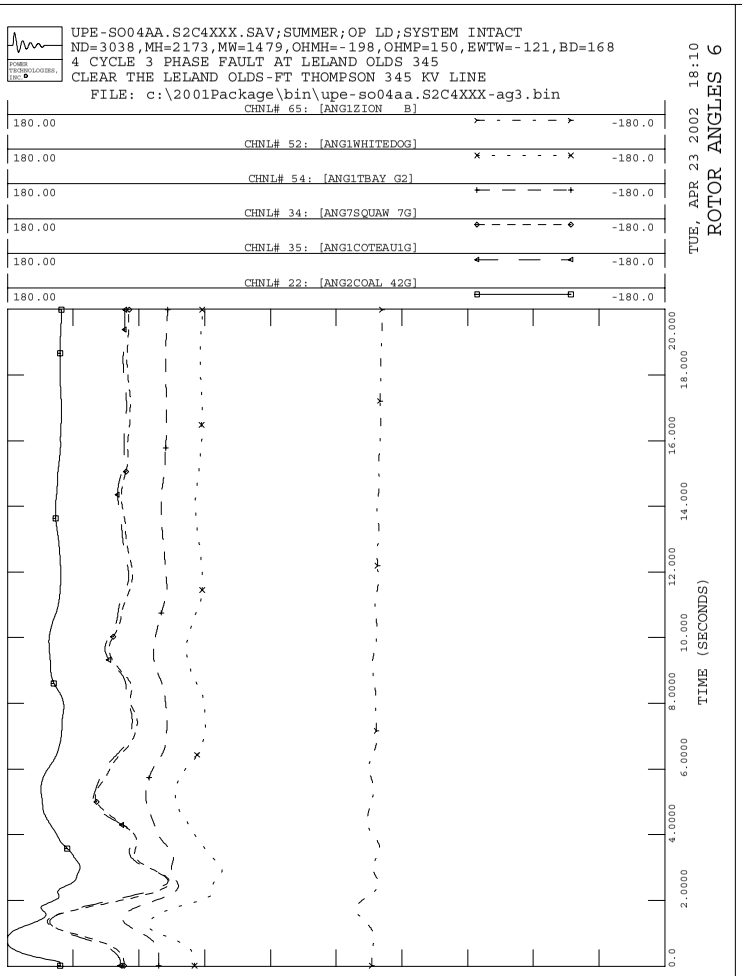
TUE, APR 23 2002 18:10
ROTOR ANGLES 1

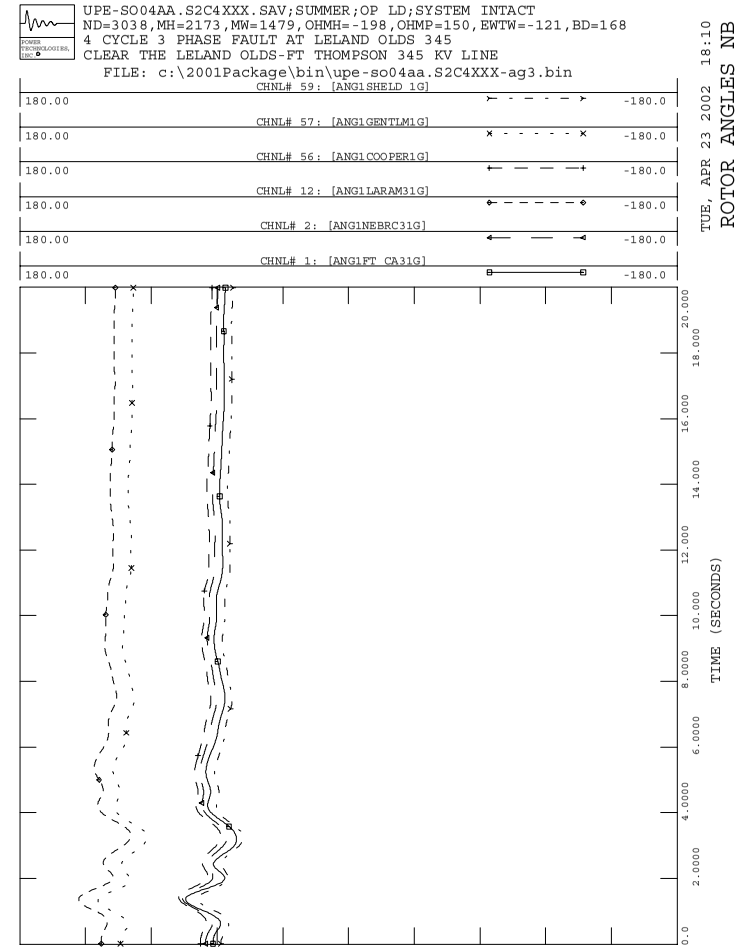


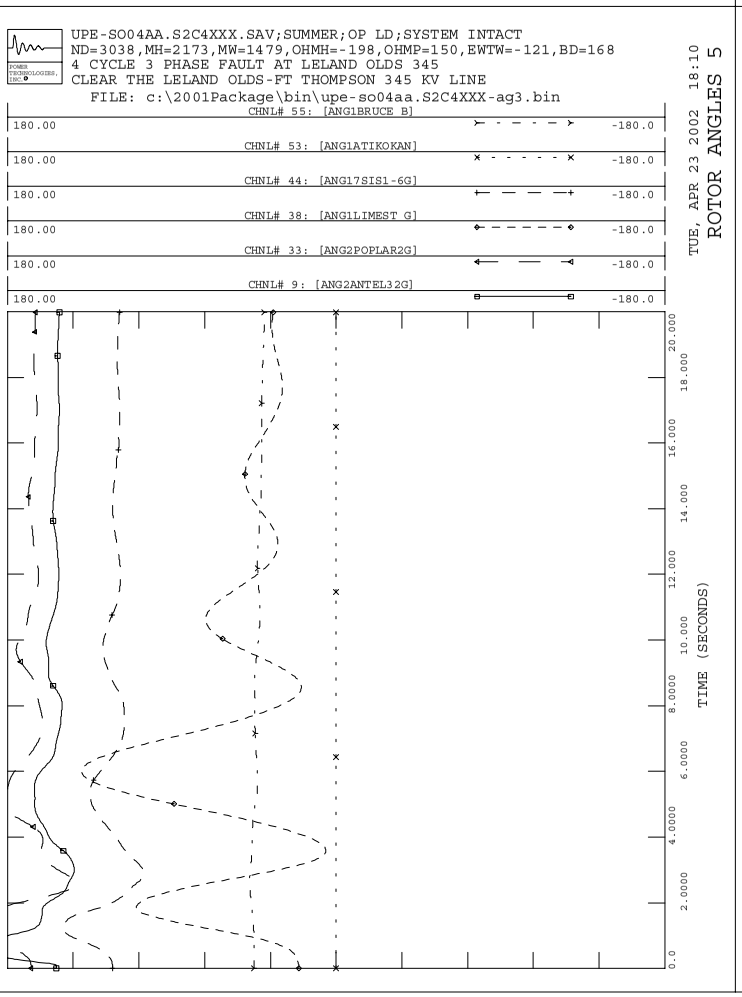
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

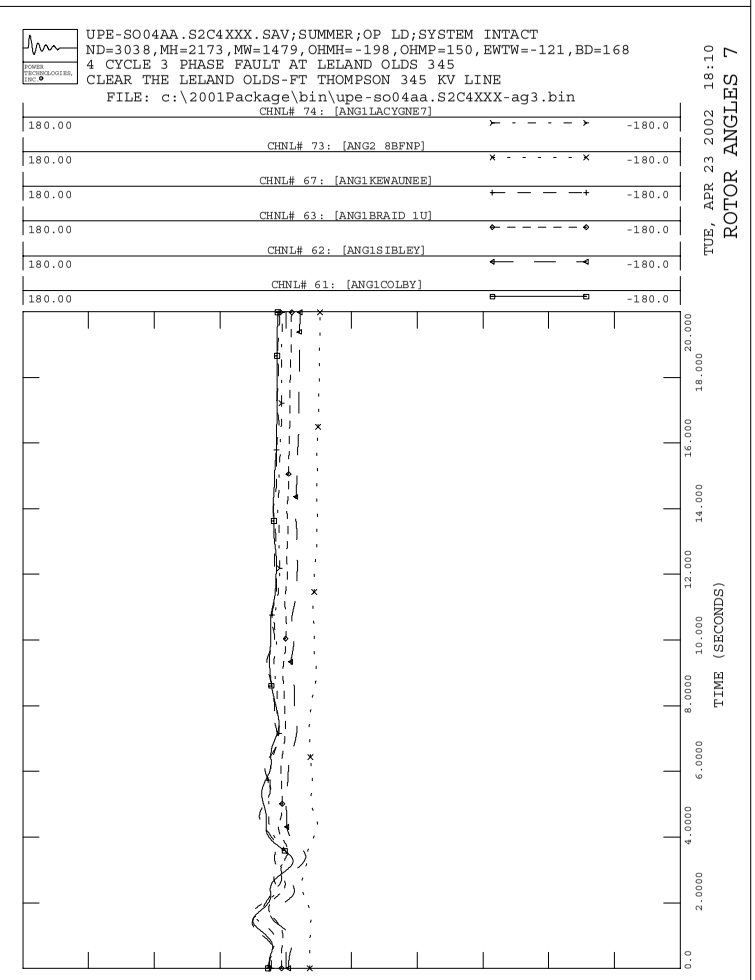
TUE, APR 23 2002 18:10
ROTOR ANGLES 3

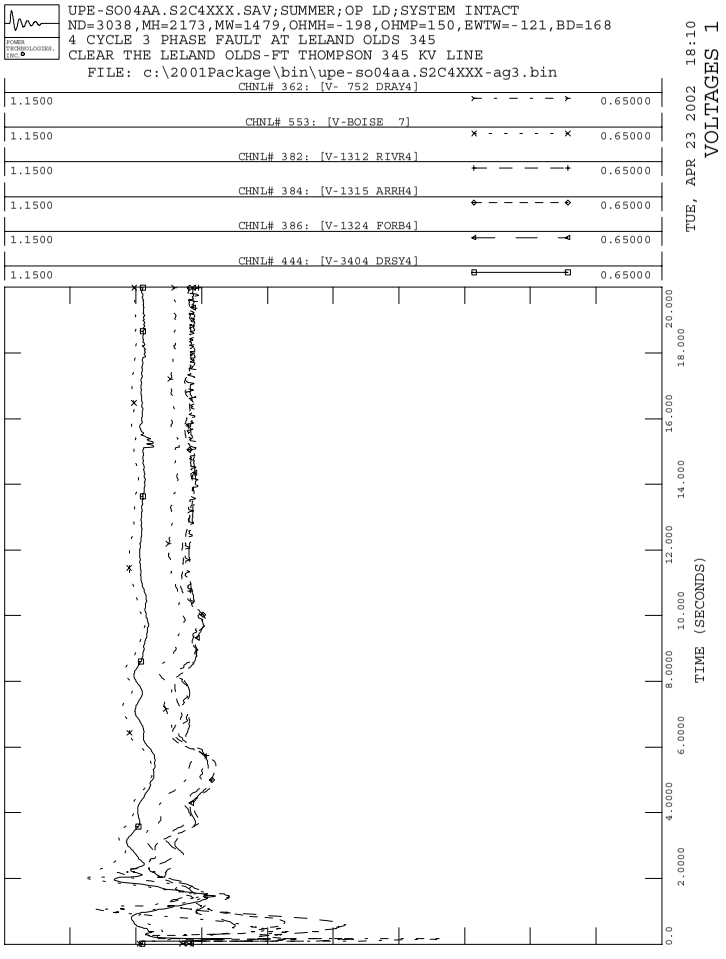


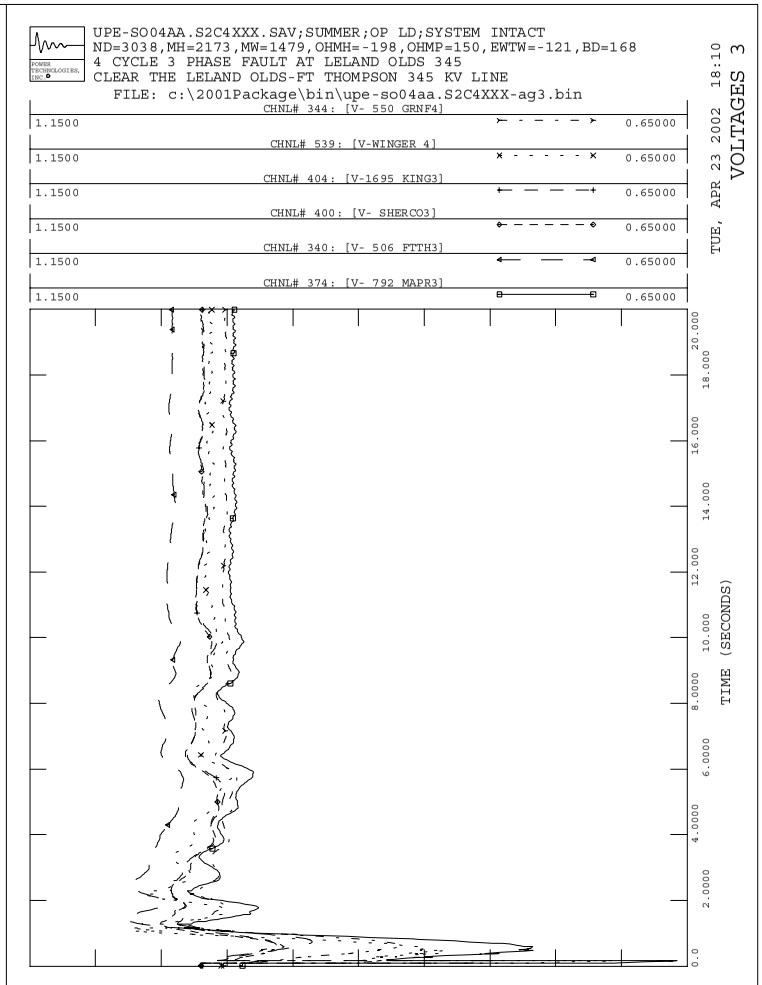

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 23 2002 18:10
ROTOR ANGLES 6

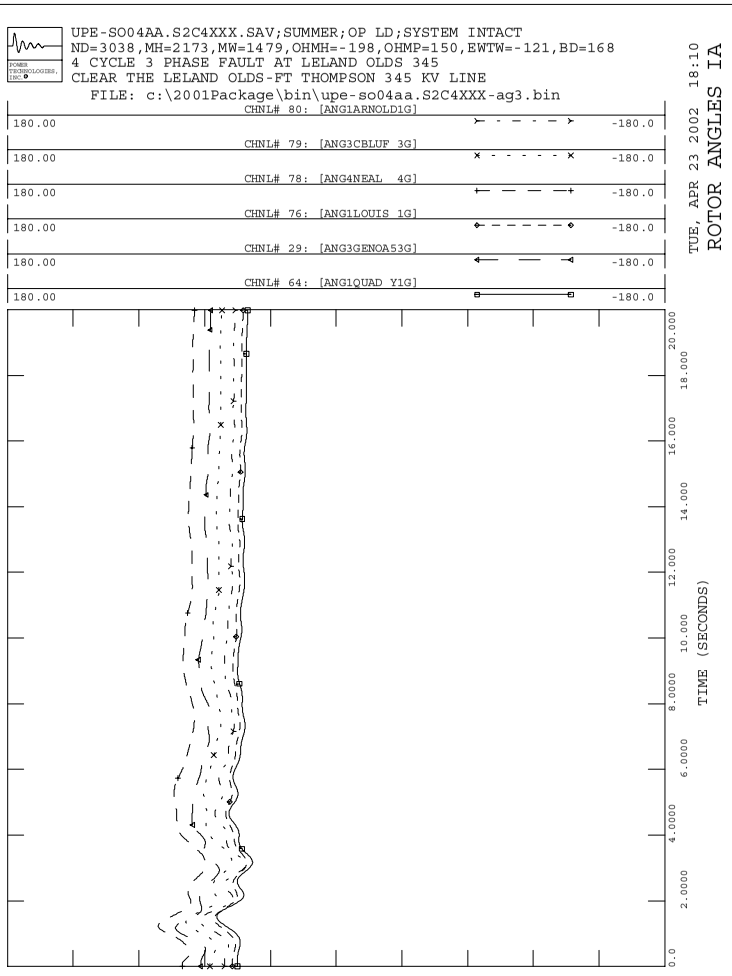

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 23 2002 18:10
ROTOR ANGLES NB

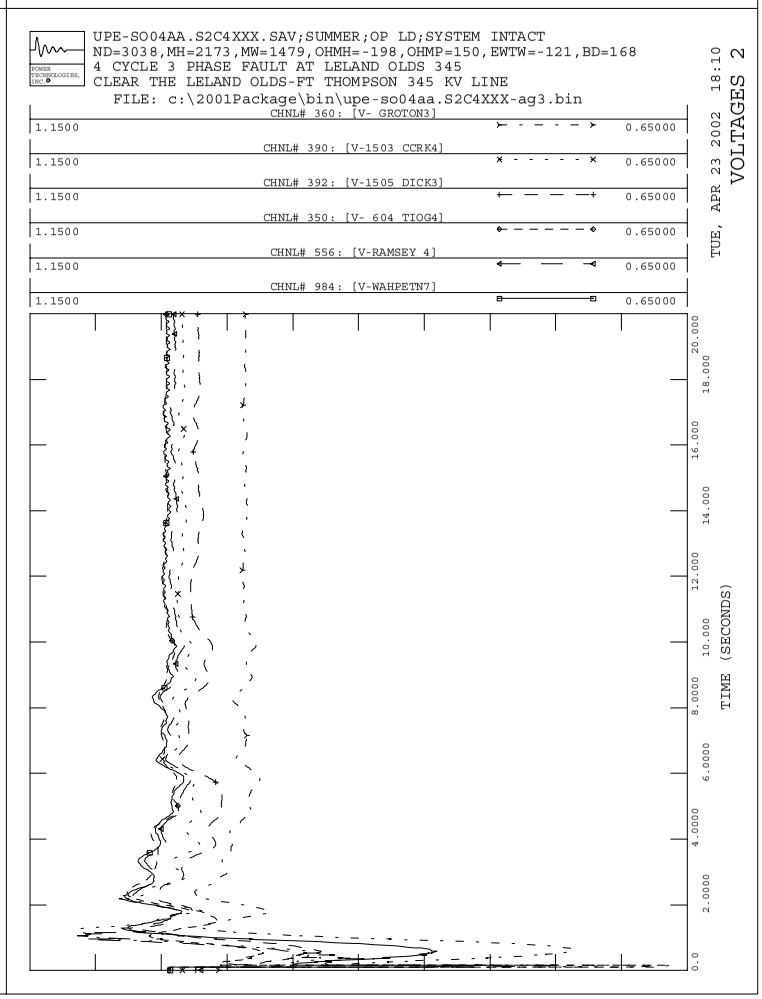

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 23 2002 18:10
ROTOR ANGLES 5


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
TUE, APR 23 2002 18:10
ROTOR ANGLES 7


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 362: [V- 752 DRAY4]
CHNL# 553: [V-BOISE 7]
CHNL# 382: [V-1312 RIVR4]
CHNL# 384: [V-1315 ARRH4]
CHNL# 386: [V-1324 FORB4]
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
TUE, APR 23 2002 18:10
VOLTAGES 1
TIME (SECONDS)

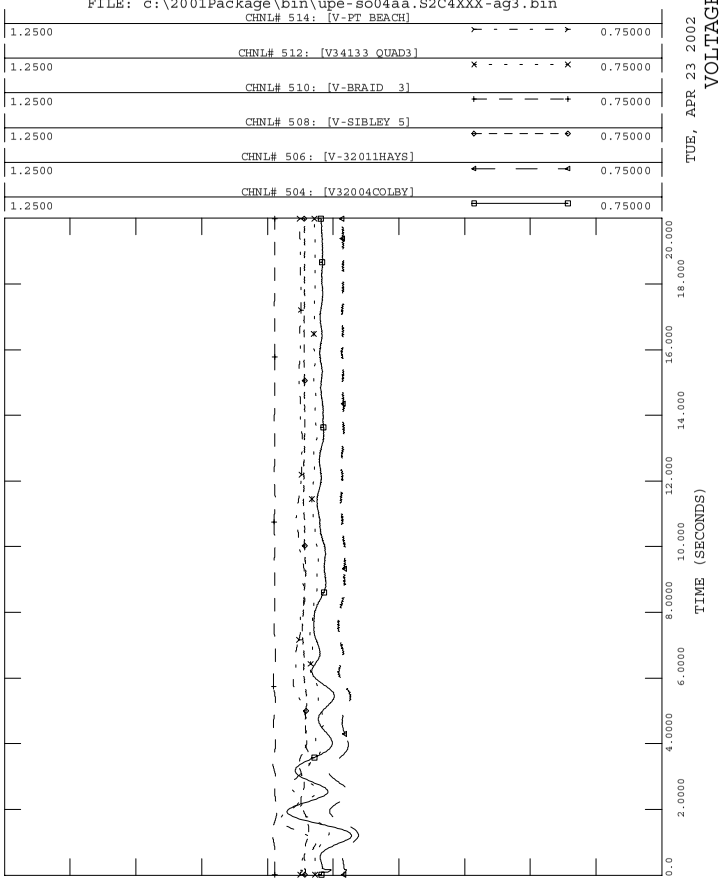

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 344: [V- 550 GRNF4]
CHNL# 539: [V-WINGER 4]
CHNL# 404: [V-1695 KING3]
CHNL# 400: [V- SHERCO3]
CHNL# 340: [V- 506 FTTH3]
CHNL# 374: [V- 792 MAPR3]
1.1500
0.65000
TUE, APR 23 2002 18:10
VOLTAGES 3
TIME (SECONDS)


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 80: [ANG1ARNOLD1G]
CHNL# 79: [ANG3CBLUF 3G]
CHNL# 78: [ANG4NEAL 4G]
CHNL# 76: [ANG1LOUIS 1G]
CHNL# 29: [ANG3GENOA53G]
CHNL# 64: [ANG1QUAD Y1G]
180.00
-180.0
TUE, APR 23 2002 18:10
ROTOR ANGLES IA
TIME (SECONDS)


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 360: [V- GROTON3]
CHNL# 390: [V-1503 CCRK4]
CHNL# 392: [V-1505 DICK3]
CHNL# 350: [V- 604 TIOG4]
CHNL# 556: [V-RAMSEY 4]
CHNL# 984: [V-WAHPETN7]
1.1500
0.65000
TUE, APR 23 2002 18:10
VOLTAGES 2
TIME (SECONDS)

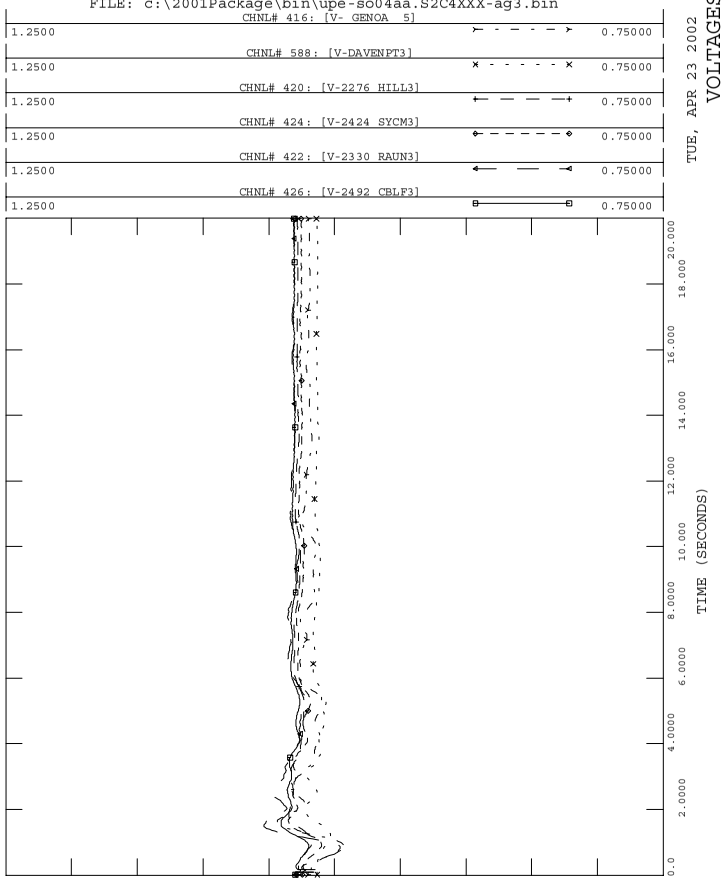
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
VOLTAGES 5



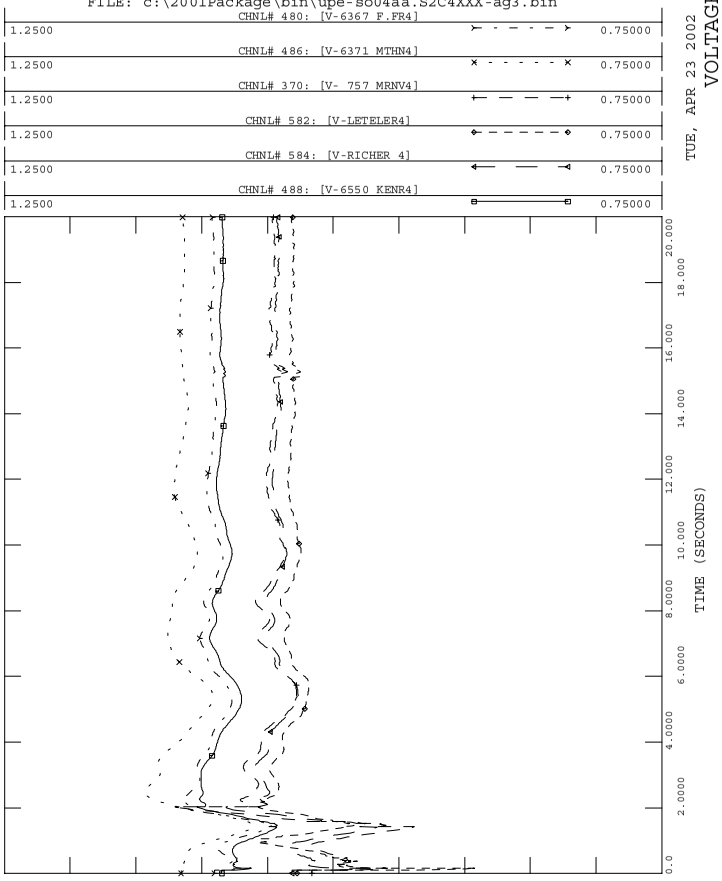
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
VOLTAGES IA



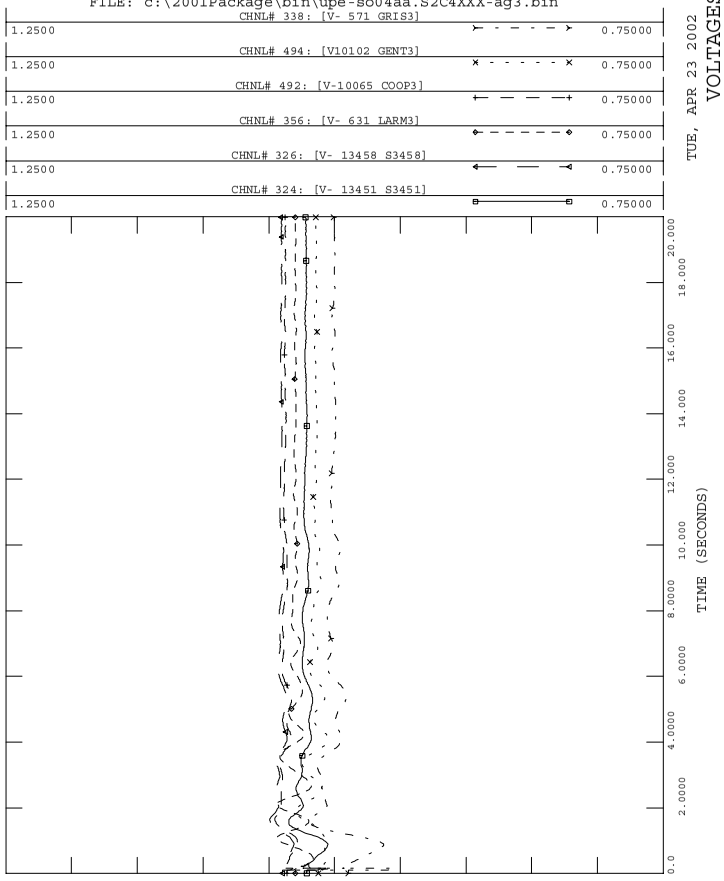
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

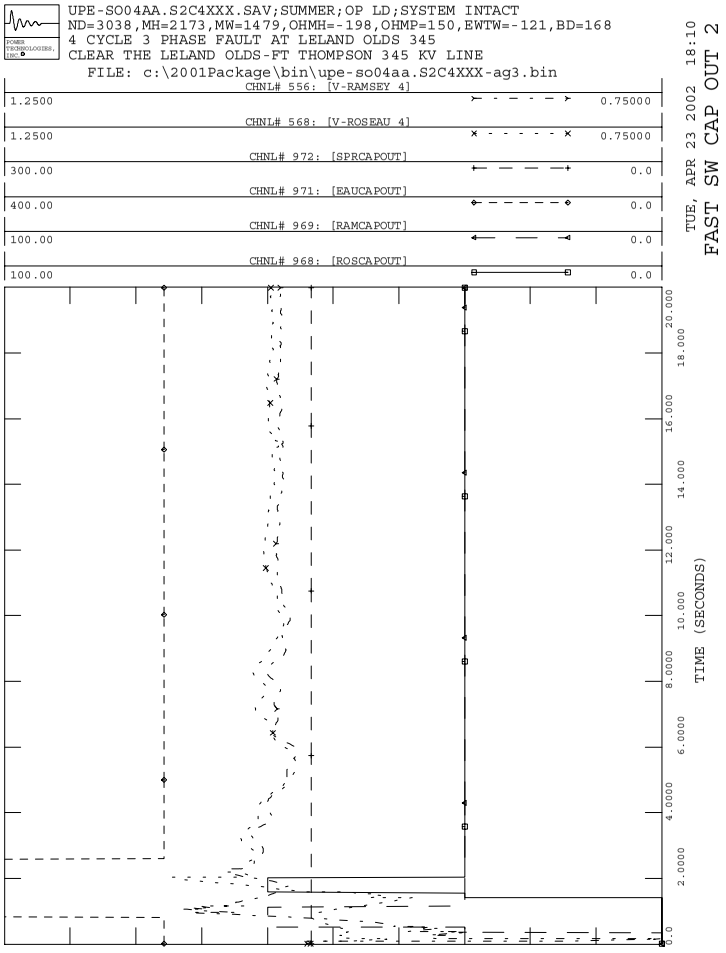
TUE, APR 23 2002 18:10
VOLTAGES 4

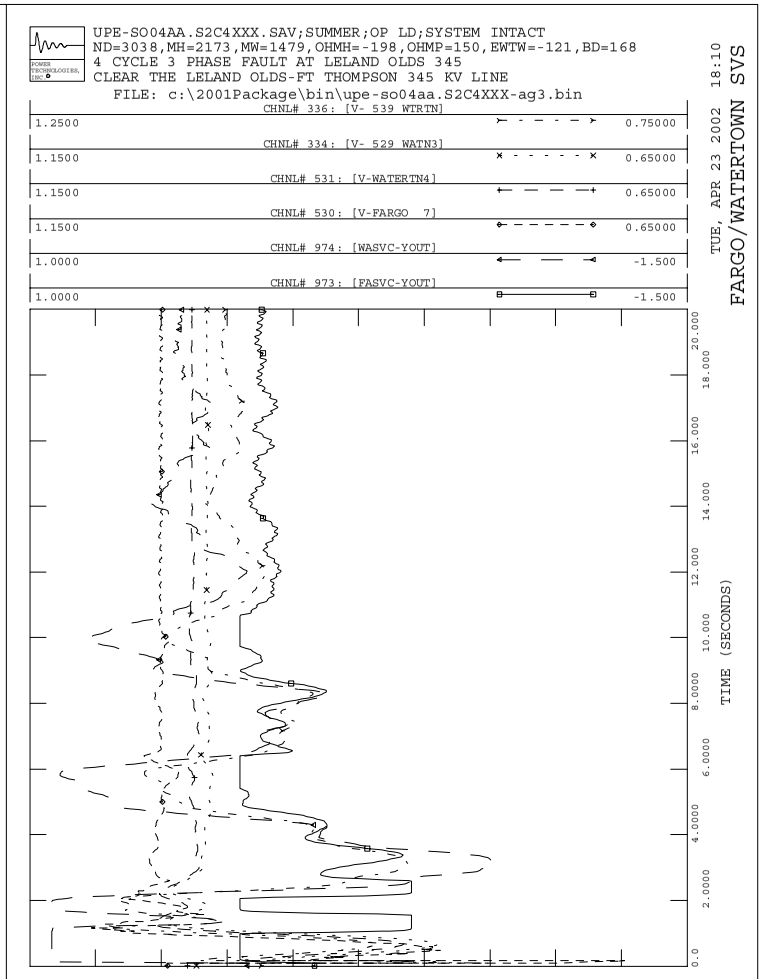


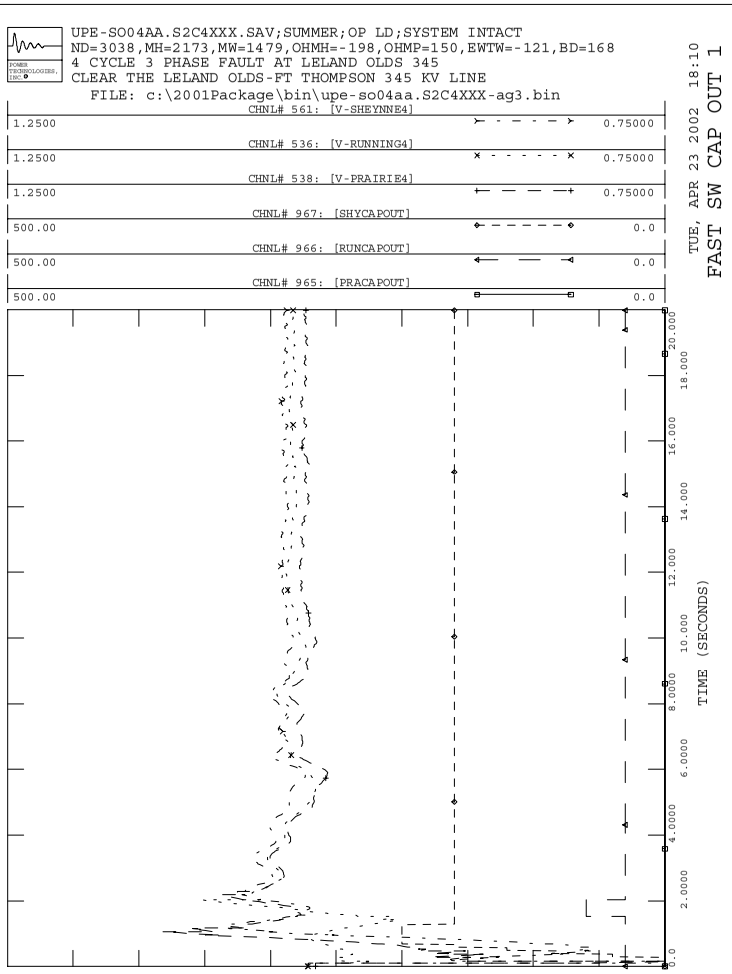
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

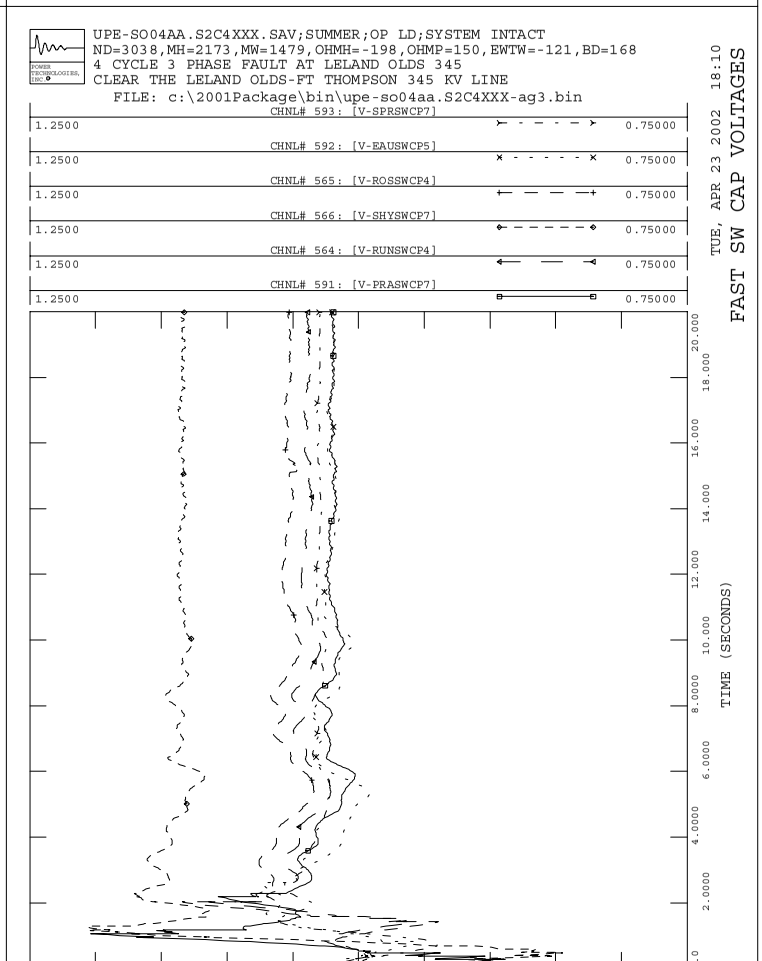
TUE, APR 23 2002 18:10
VOLTAGES NB




UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
TUE, APR 23 2002 18:10
FAST SW CAP OUT 2


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
TUE, APR 23 2002 18:10
FARGO/WATERTOWN SVS

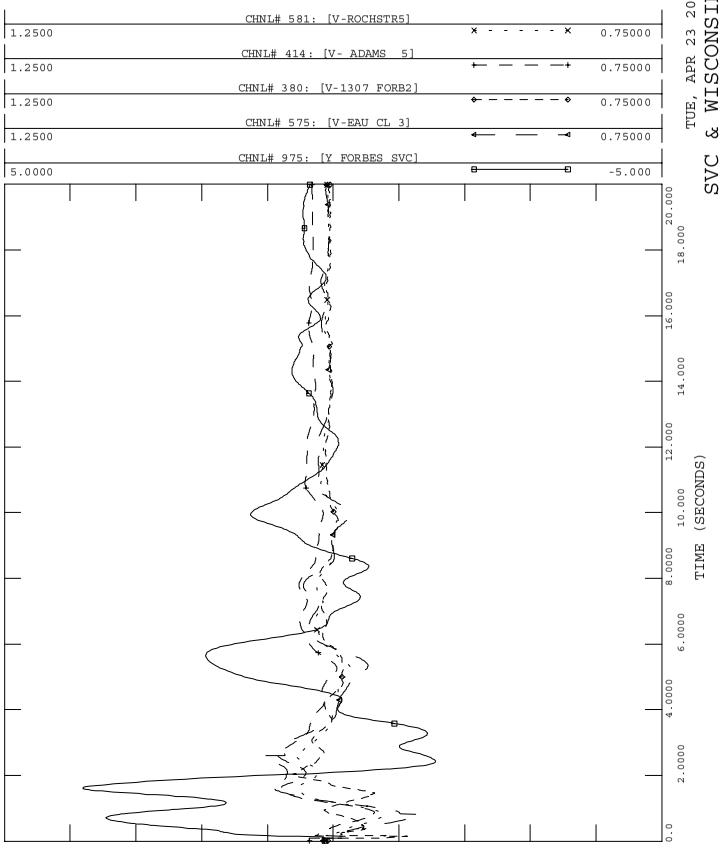

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
TUE, APR 23 2002 18:10
FAST SW CAP OUT 1


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
TUE, APR 23 2002 18:10
FAST SW CAP VOLTAGES

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10

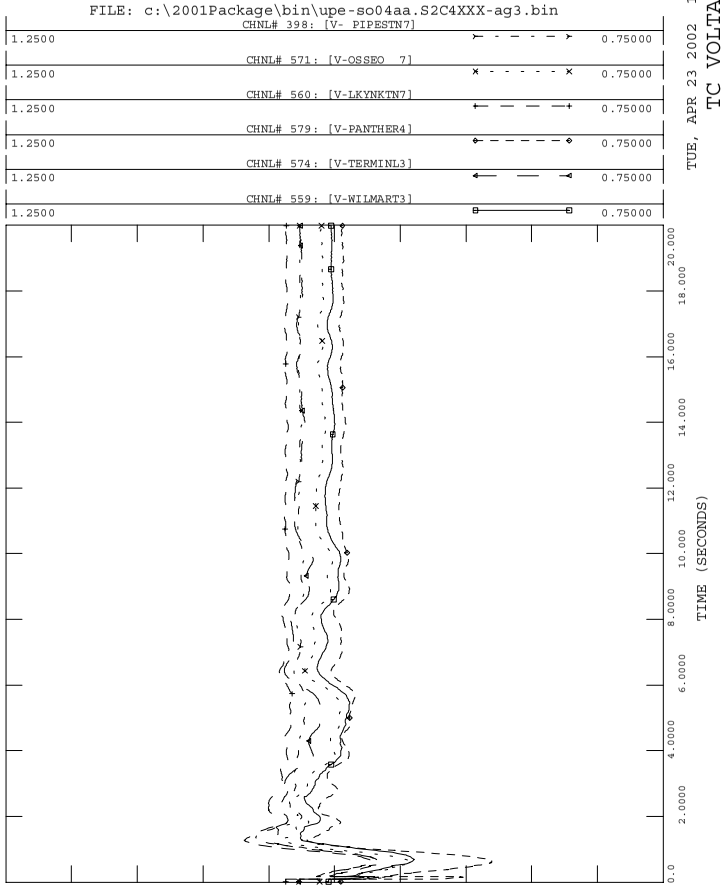
SVC & WISCONSIN VOLT



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10

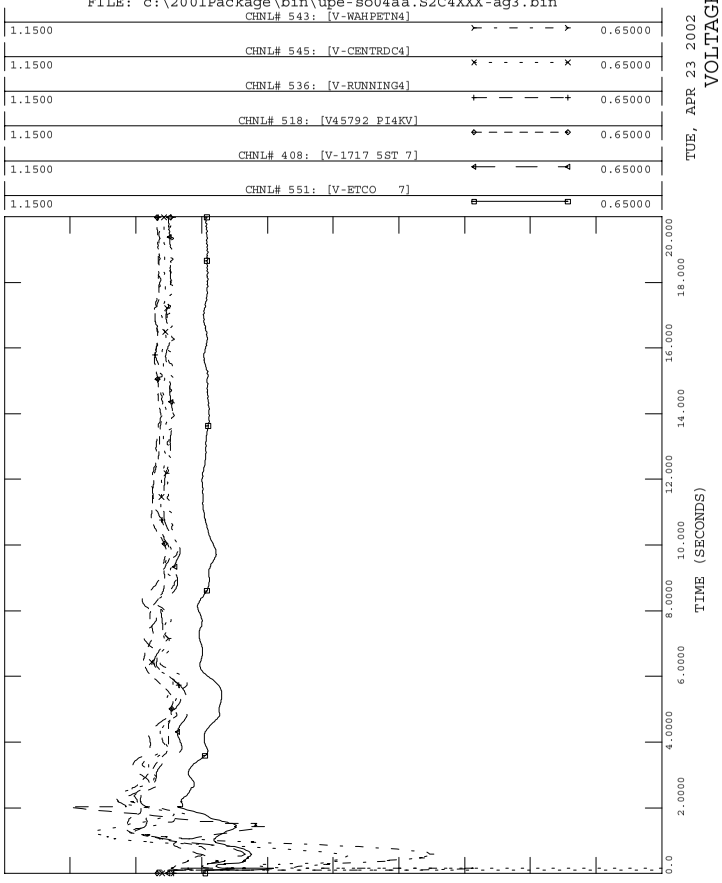
TC VOLTAGES



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10

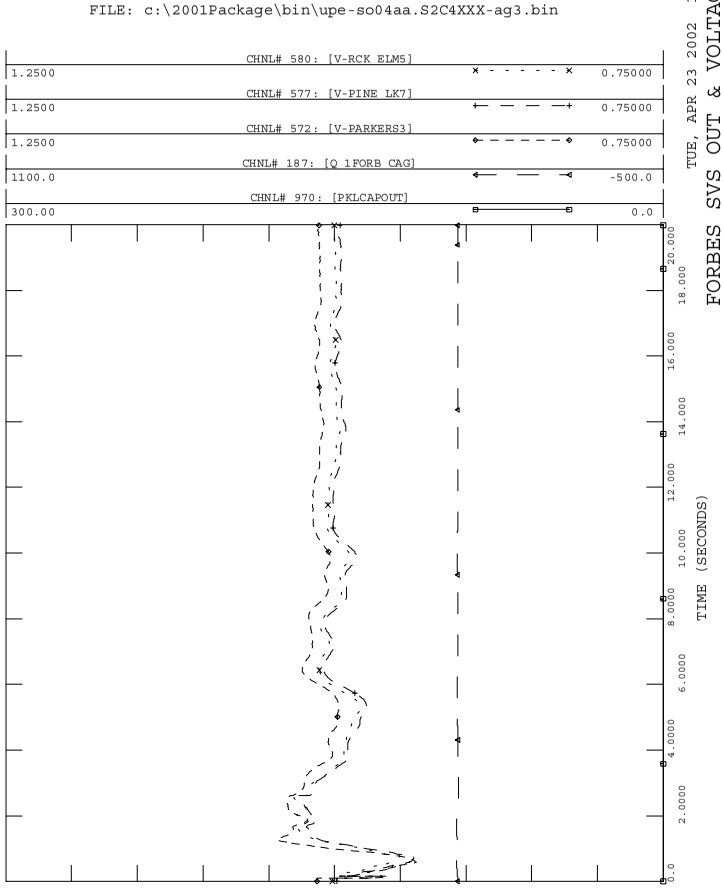
VOLTAGES 6



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

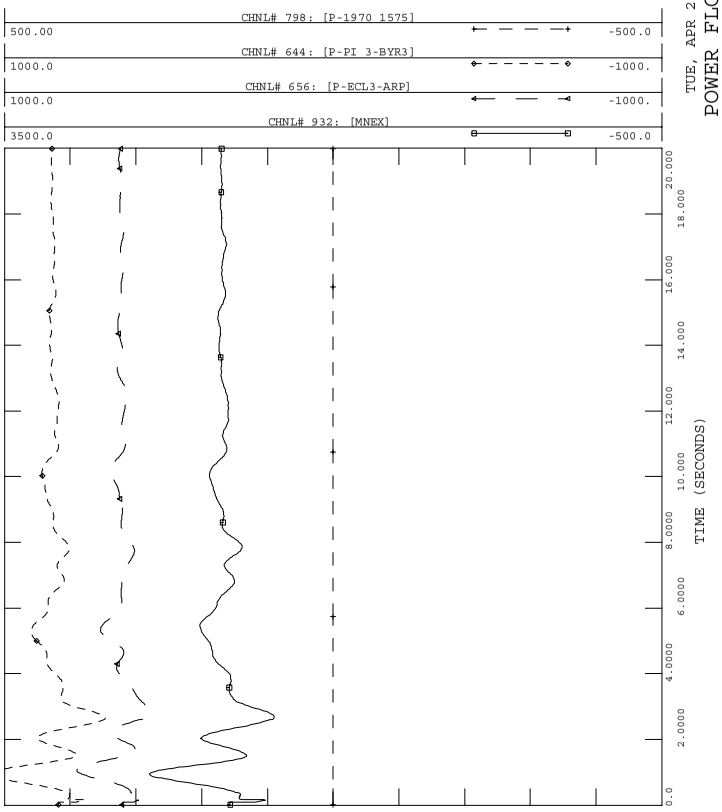
TUE, APR 23 2002 18:10

FORBES SVS OUT & VOLTAGES



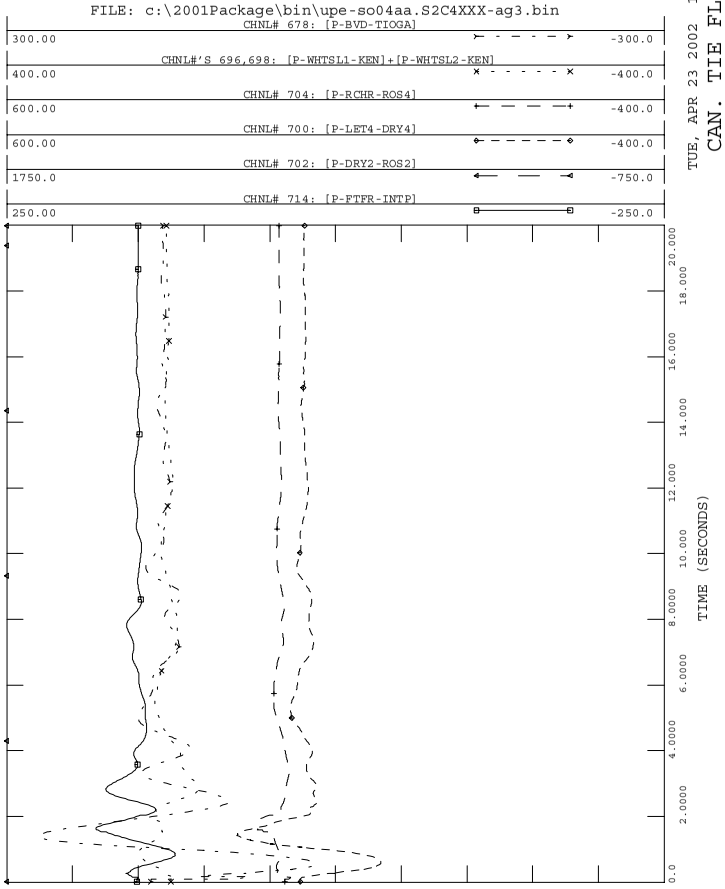
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
POWER FLOW SUMS 2



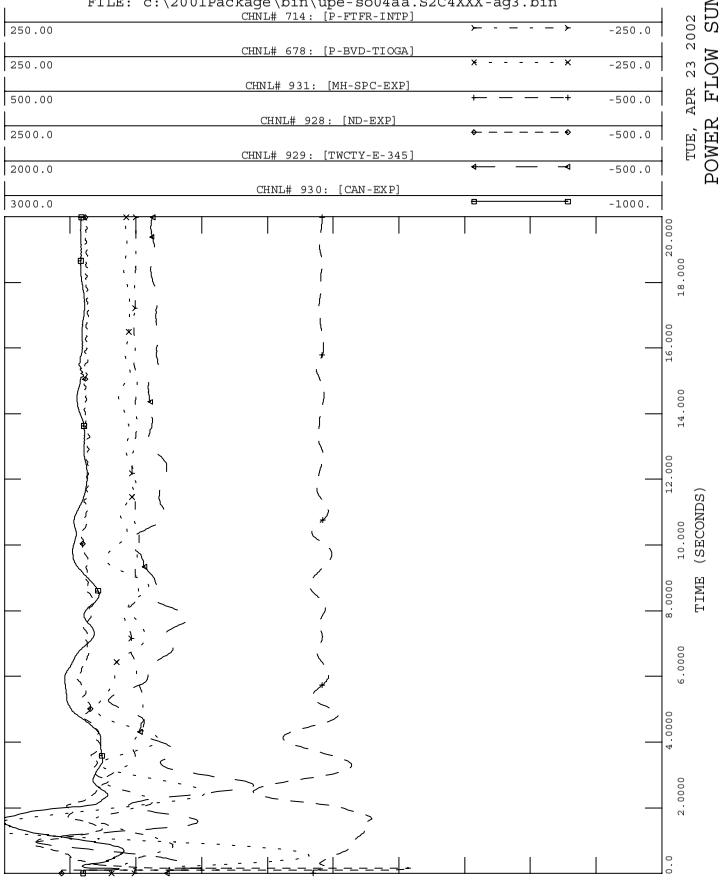
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
CAN. TIE FLOWS



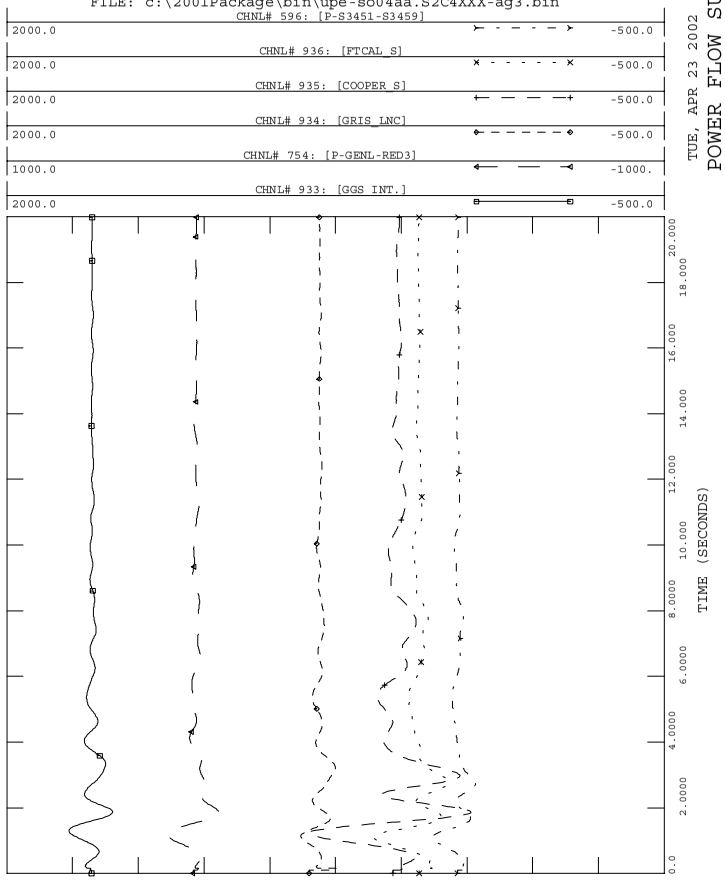
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
POWER FLOW SUMS 1



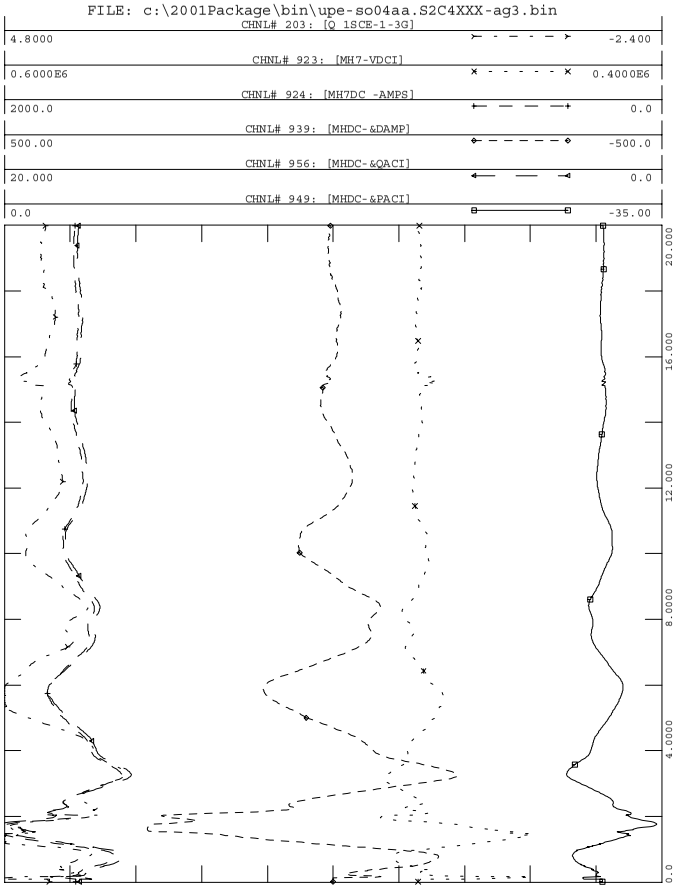
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
POWER FLOW SUM 3



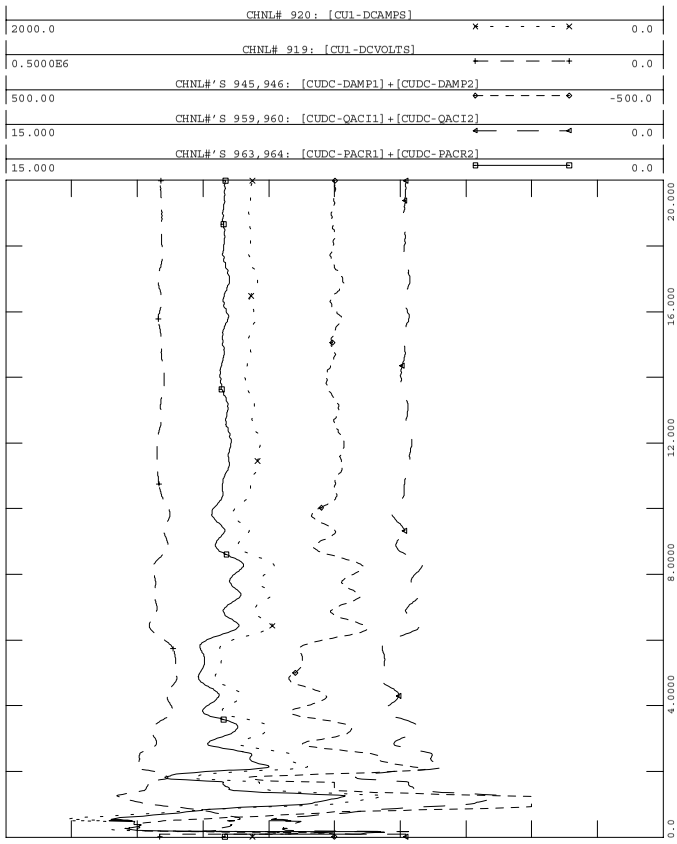
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
MH DC PARAMETERS



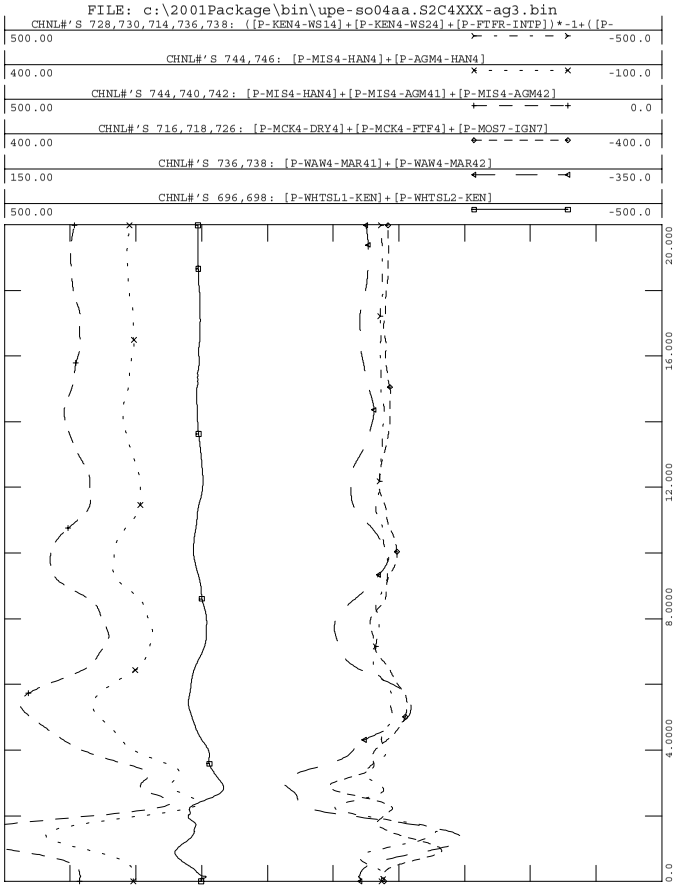
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
CU DC #1



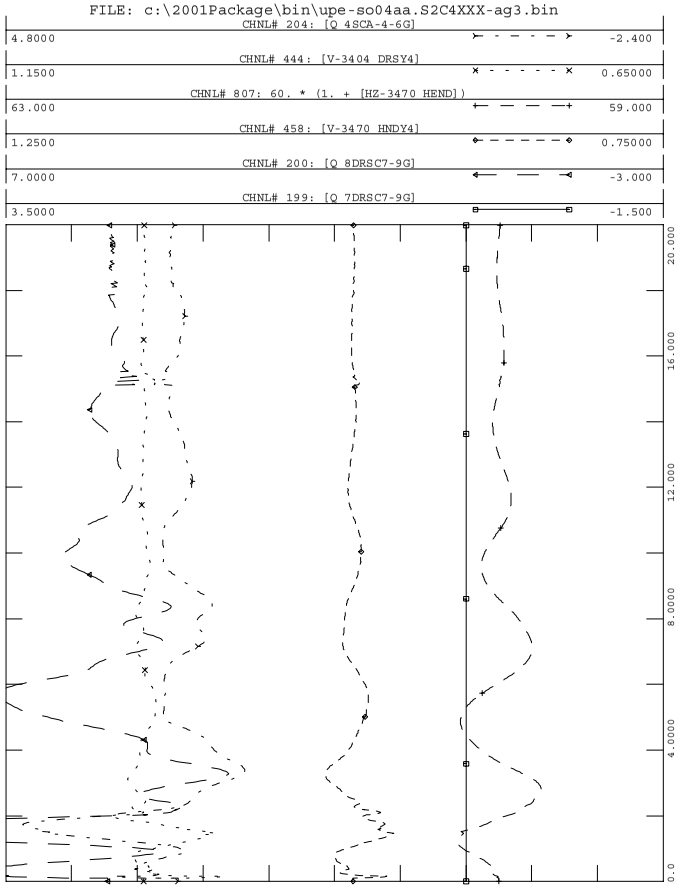
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
OH TIE FLOWS



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10
MH DC PARAMETERS



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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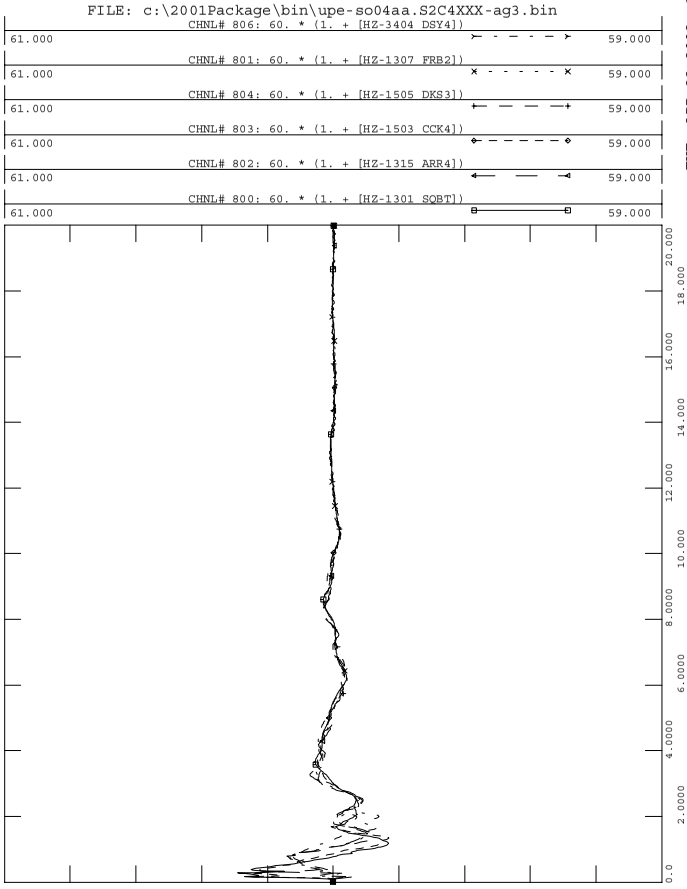
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10

FREQ AT DC TERMINALS



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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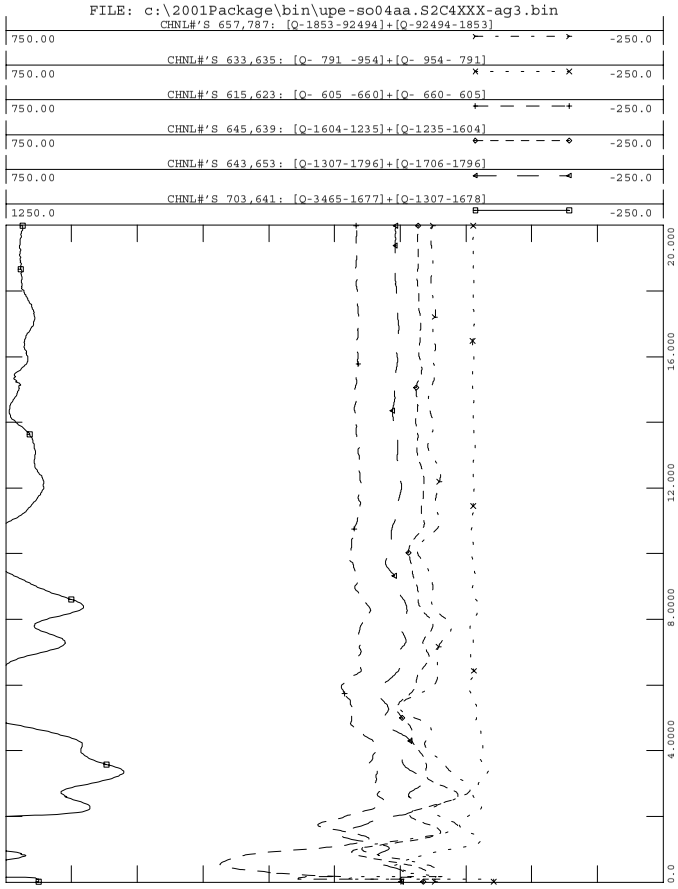
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10

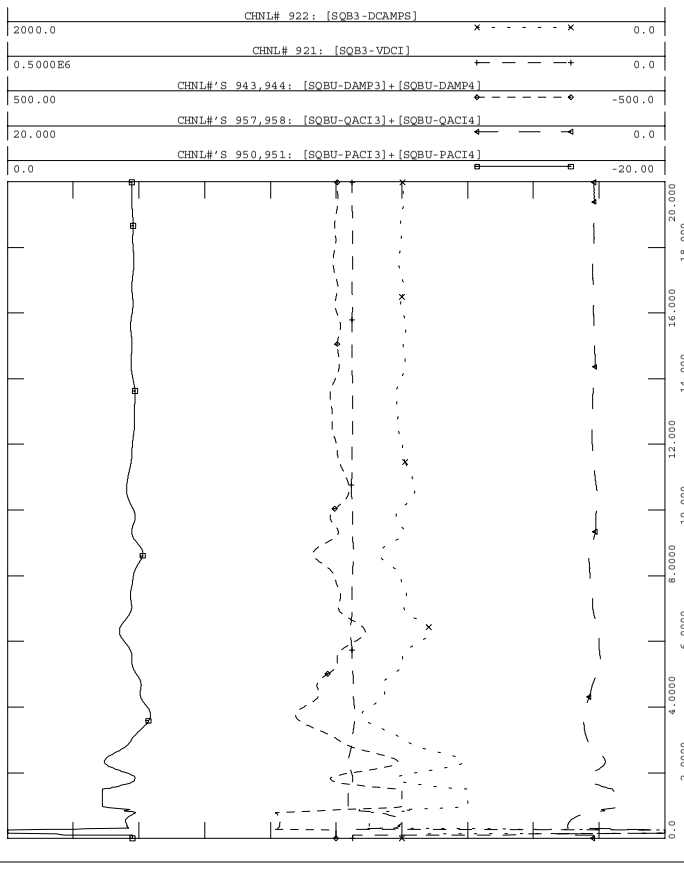
VAR LOSSES



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10

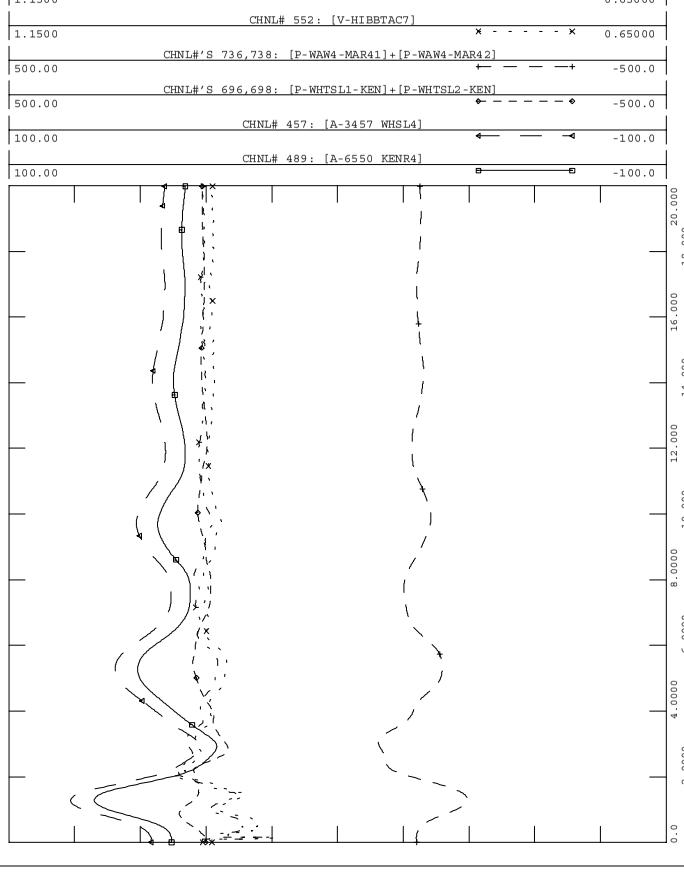
SQB DC #3



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10

VOLTAGES, ANGLES



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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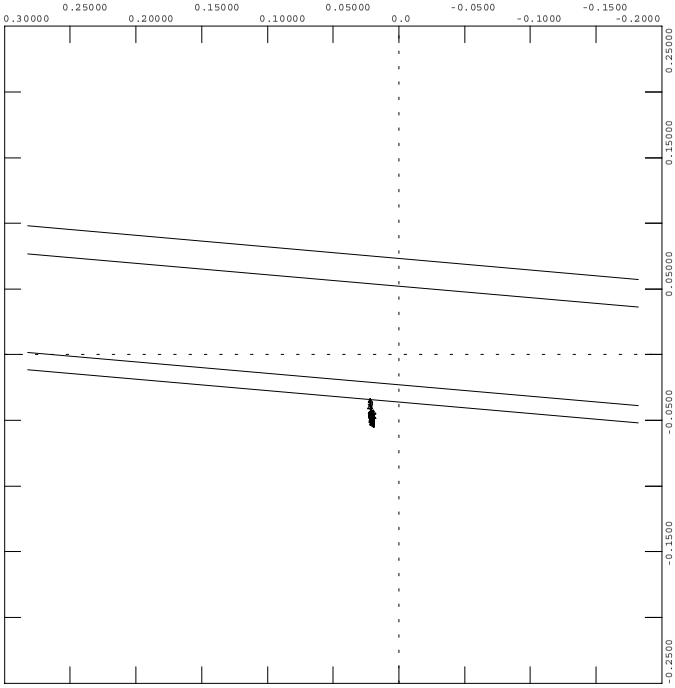
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

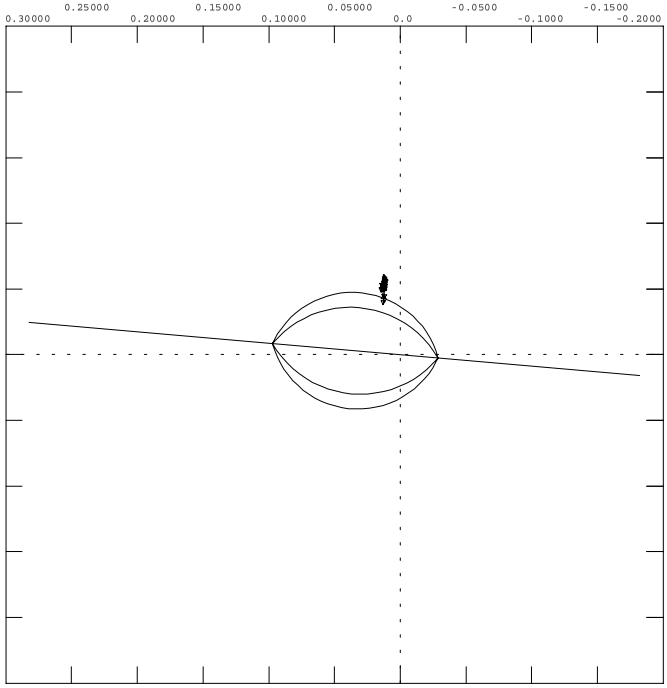


TUE, APR 23 2002 18:10
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

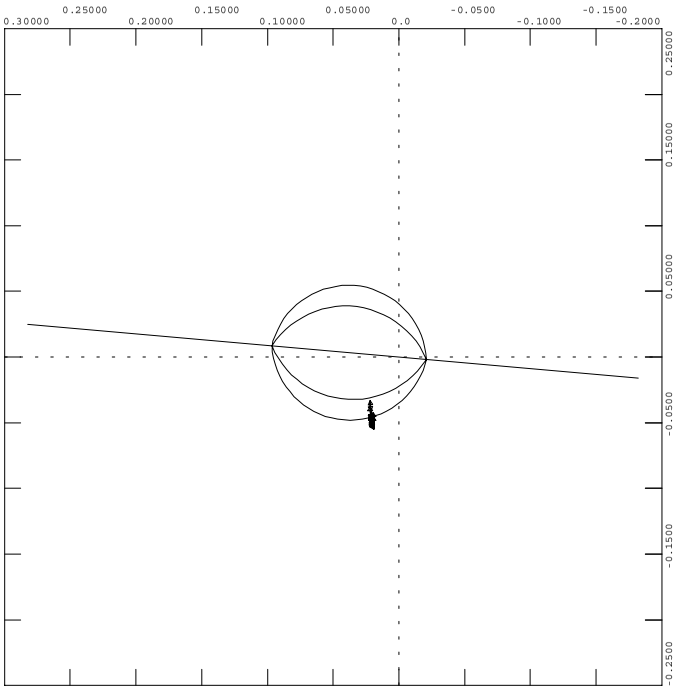


TUE, APR 23 2002 18:10
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

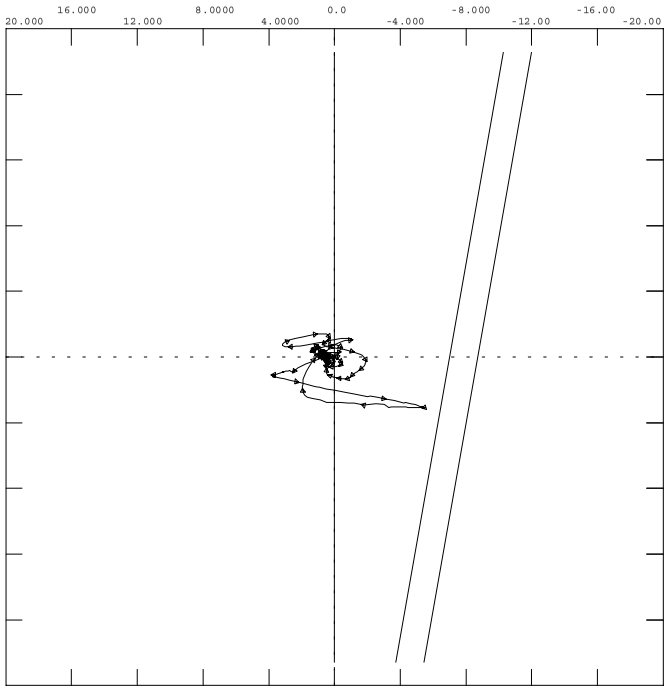


TUE, APR 23 2002 18:10
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

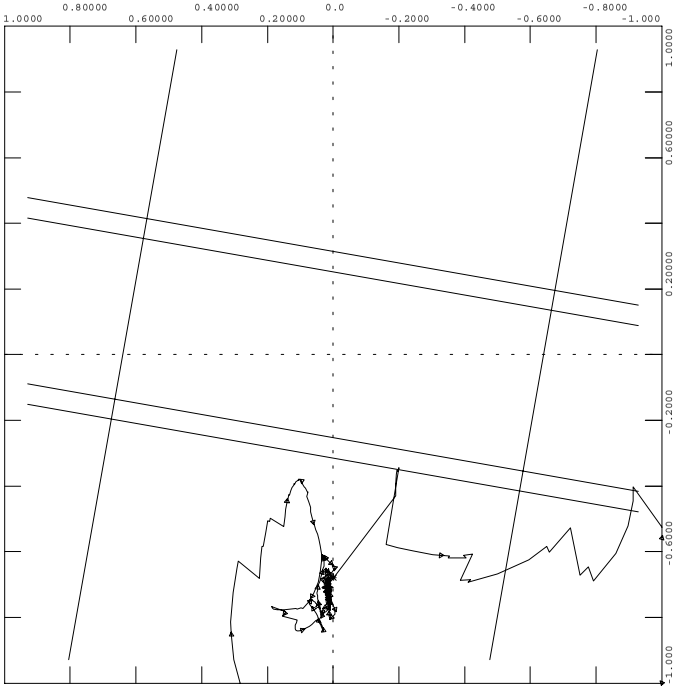


TUE, APR 23 2002 18:10
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

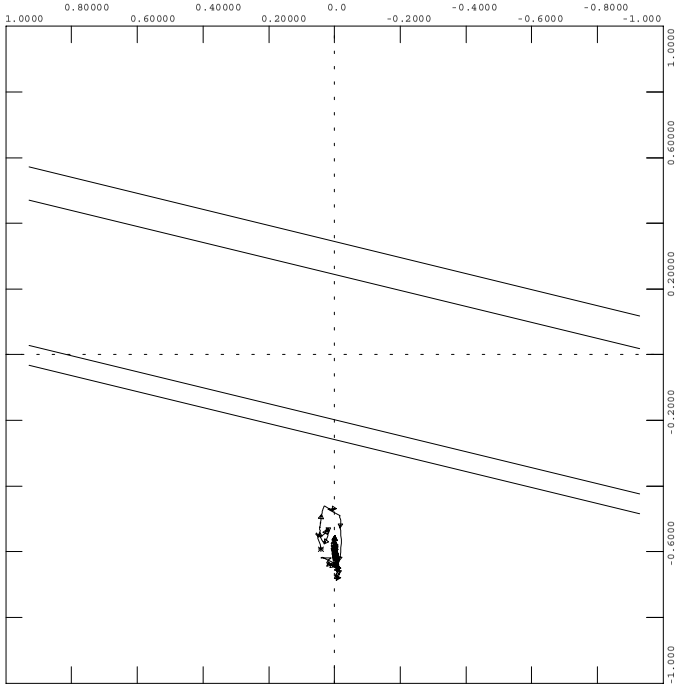
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

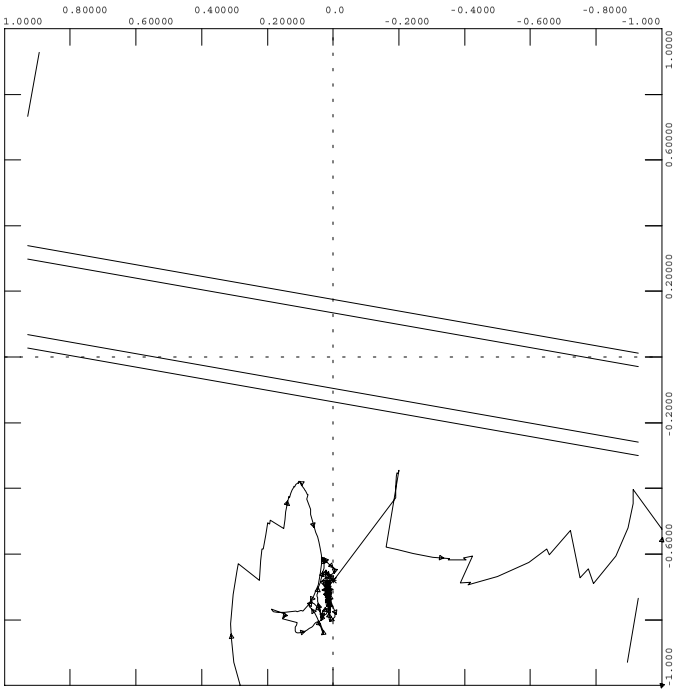
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

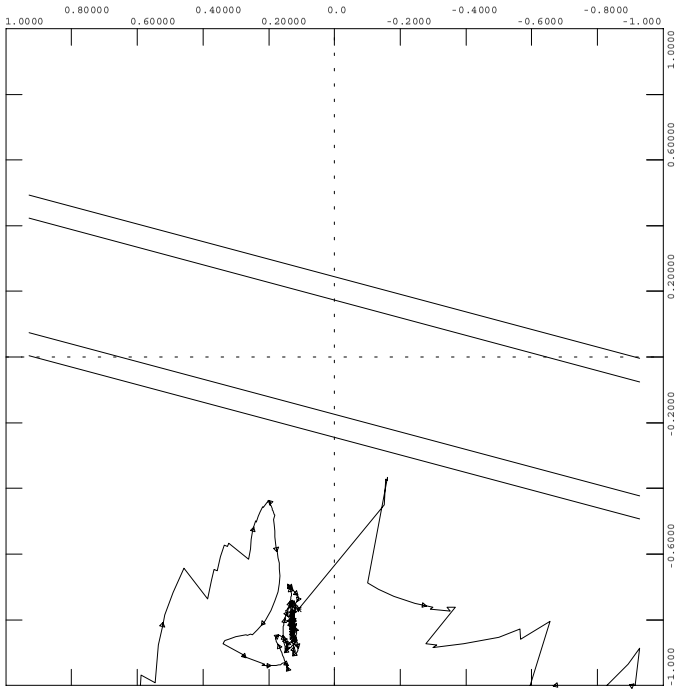
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

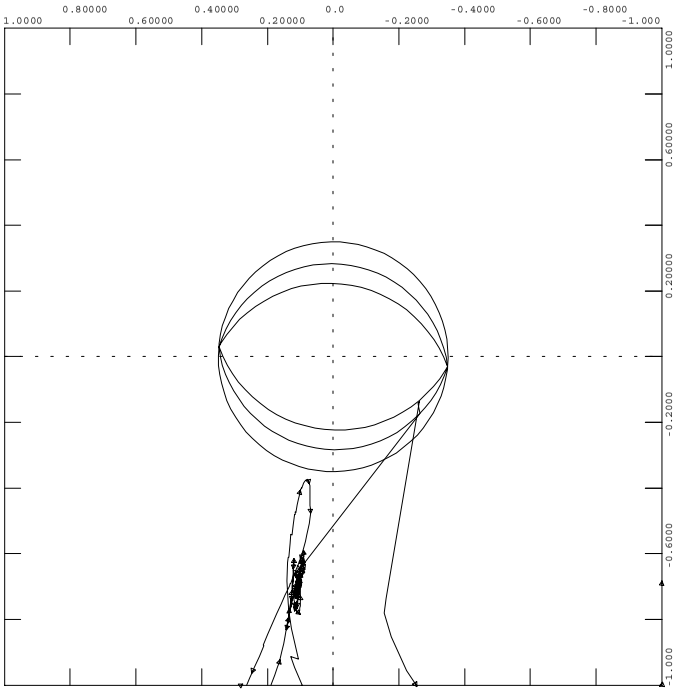
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

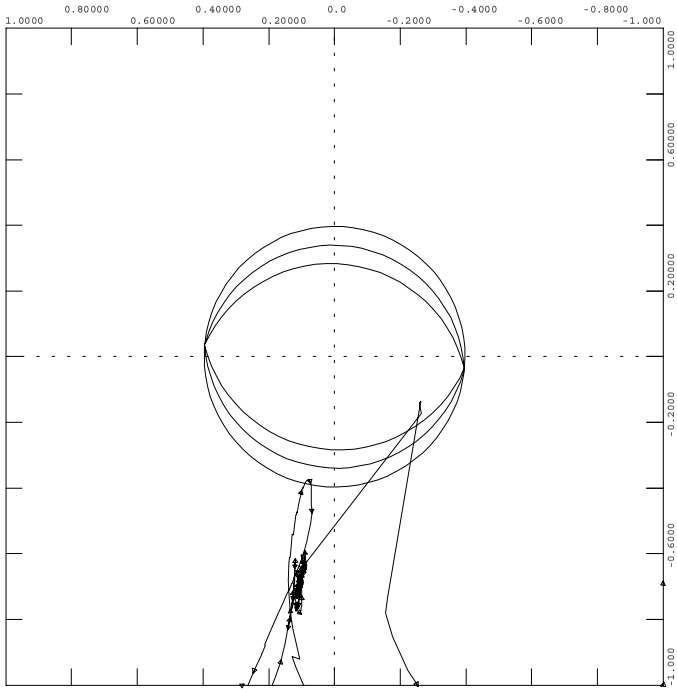
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

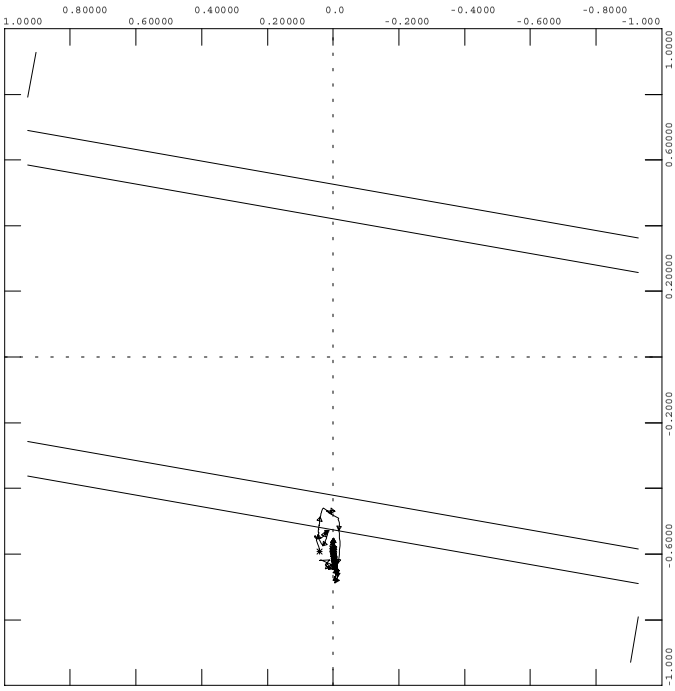
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

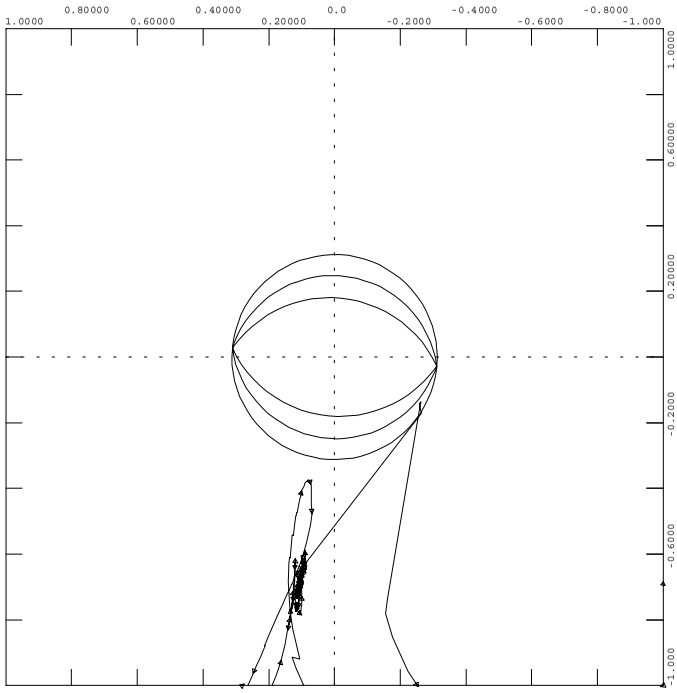
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



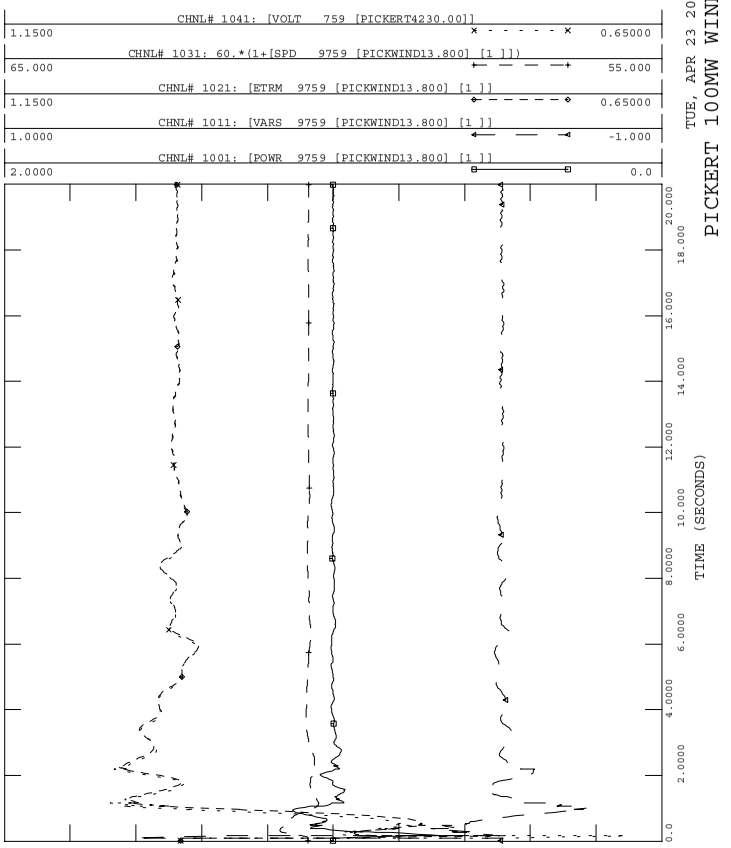
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

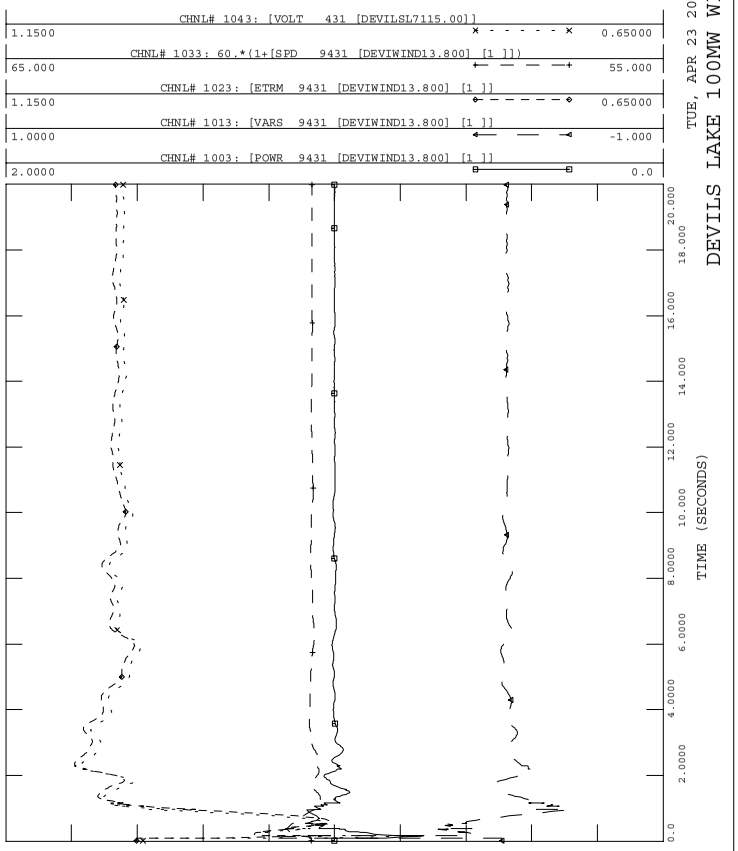


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin



TUE, APR 23 2002 18:10
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

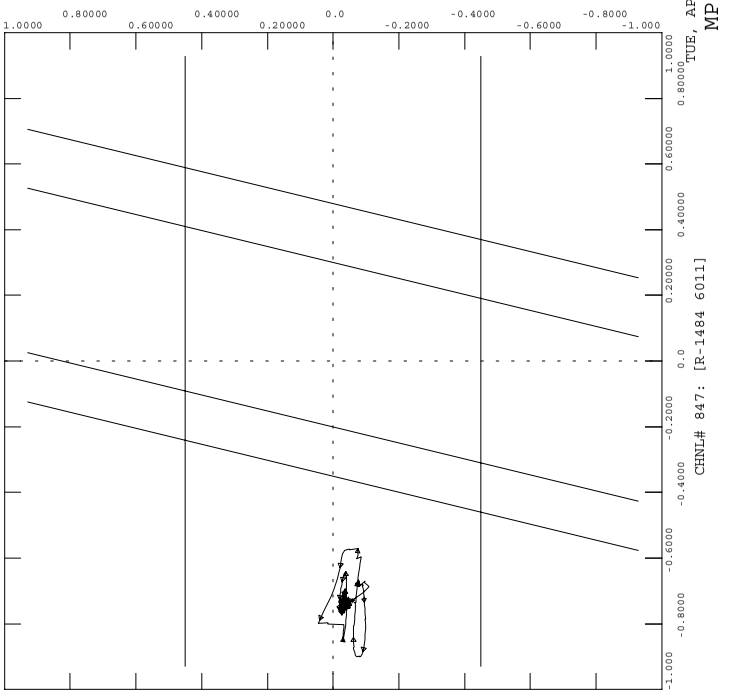


TUE, APR 23 2002 18:10
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

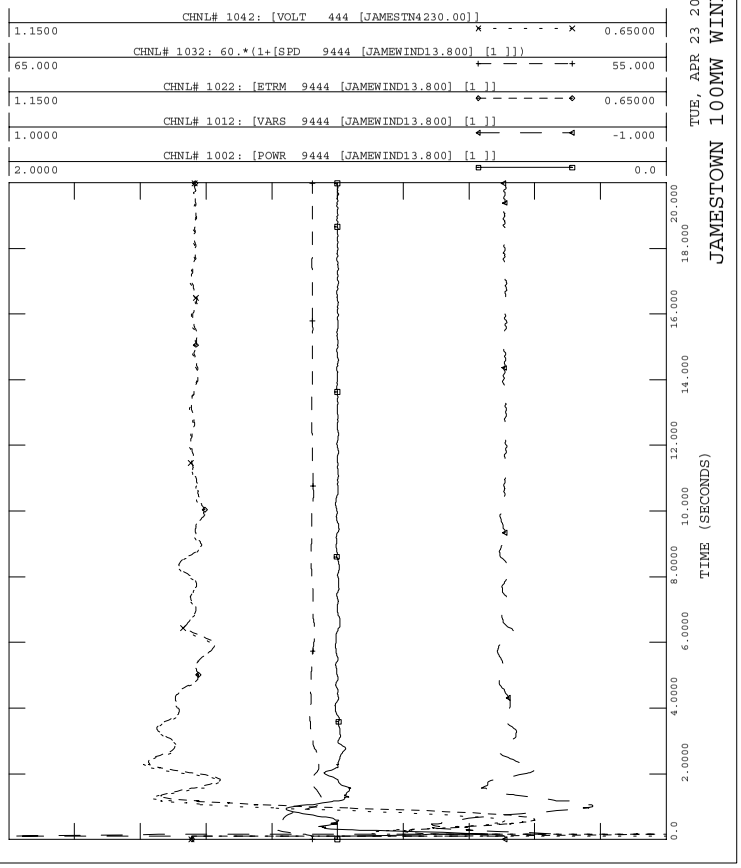
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



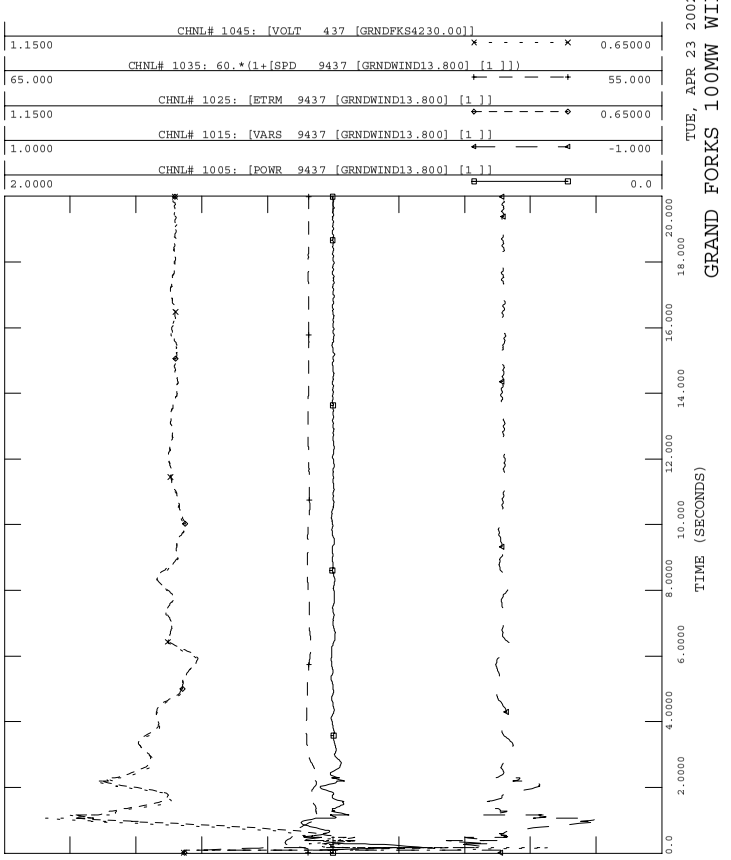
TUE, APR 23 2002 18:10
MP-OH I.FALLS (779)

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin



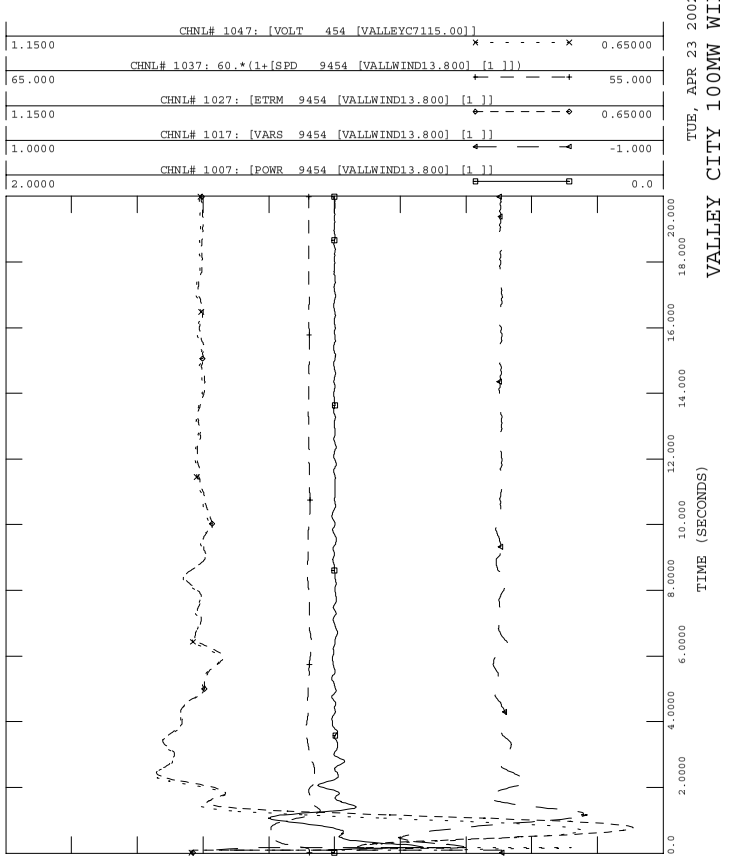
TUE, APR 23 2002 18:10
JAMESTOWN 100MW WIND UNIT

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin



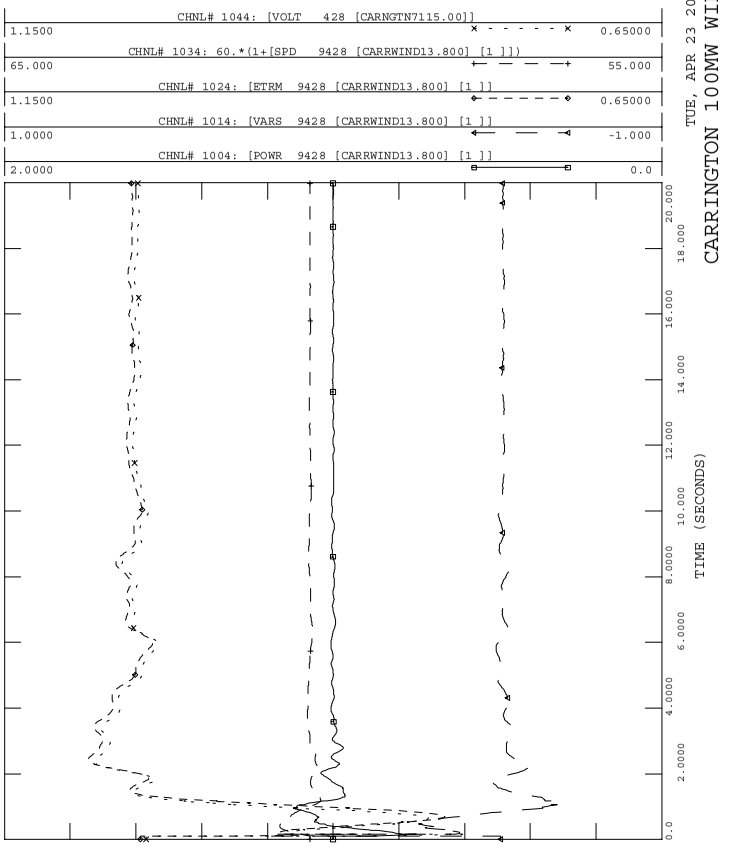
TUE, APR 23 2002 18:10
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin



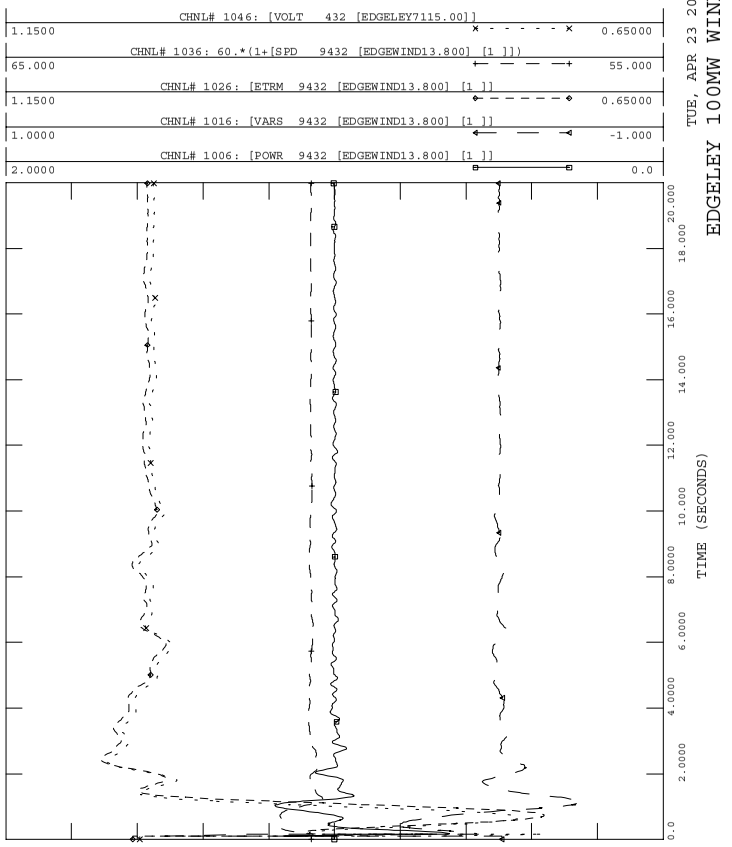
TUE, APR 23 2002 18:10
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin



TUE, APR 23 2002 18:10
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

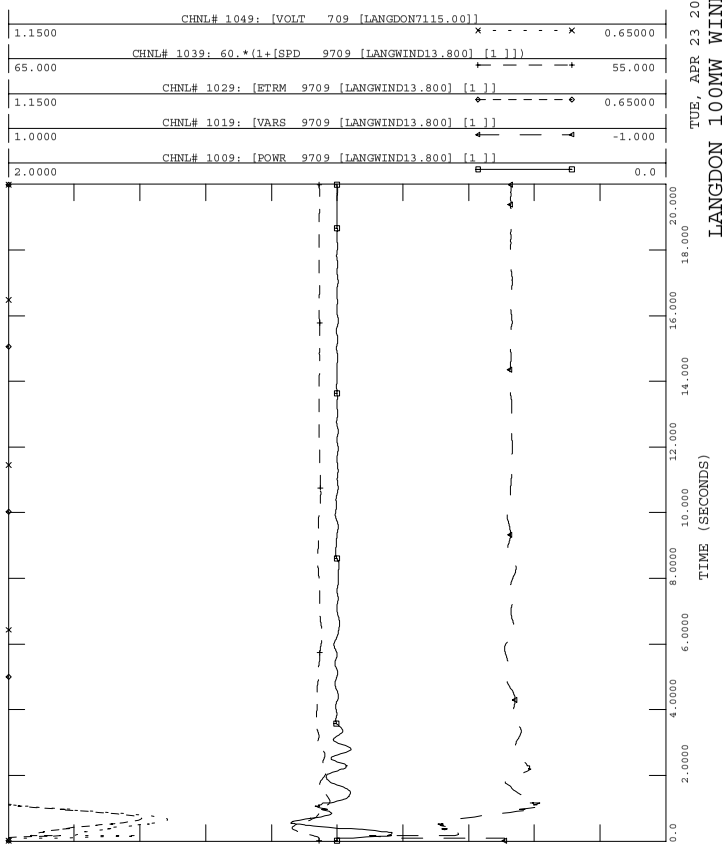


TUE, APR 23 2002 18:10
EDGELEY 100MW WIND UNIT

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10

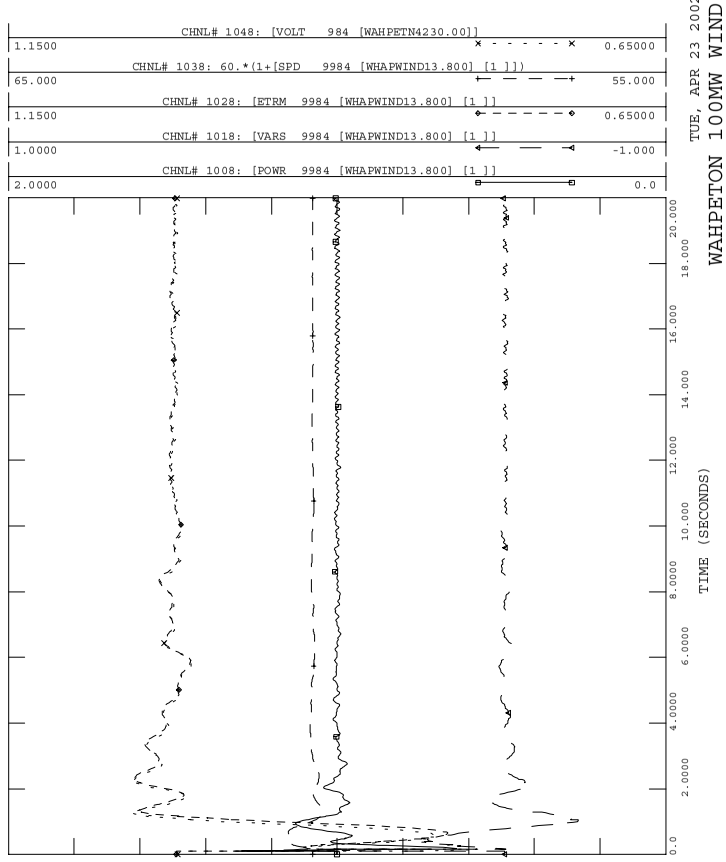
LANGDON 100MW WIND UNIT



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10

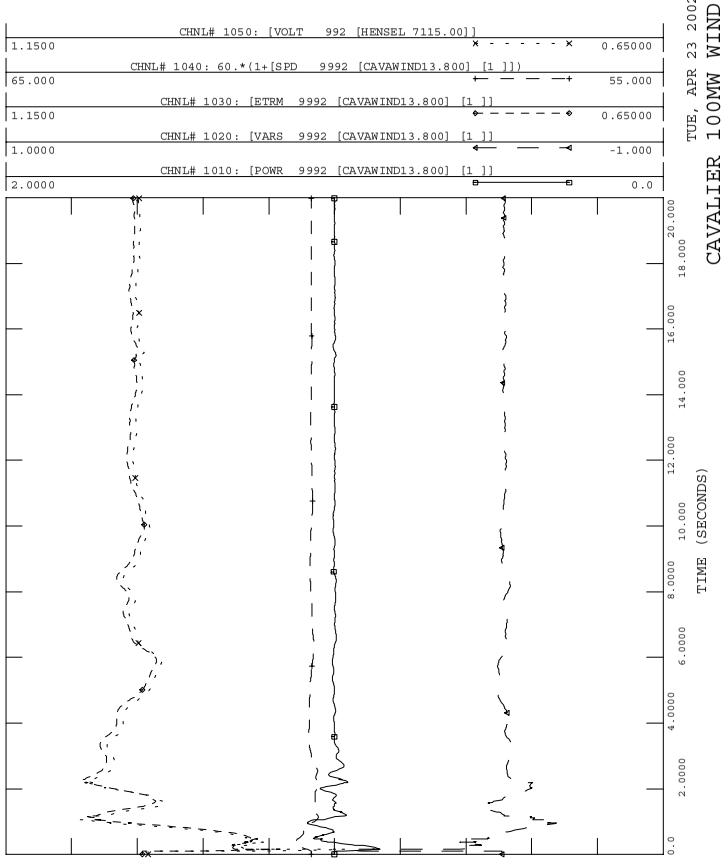
WAHPETON 100MW WIND UNIT



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ag3.bin

TUE, APR 23 2002 18:10

CAVALIER 100MW WIND UNIT

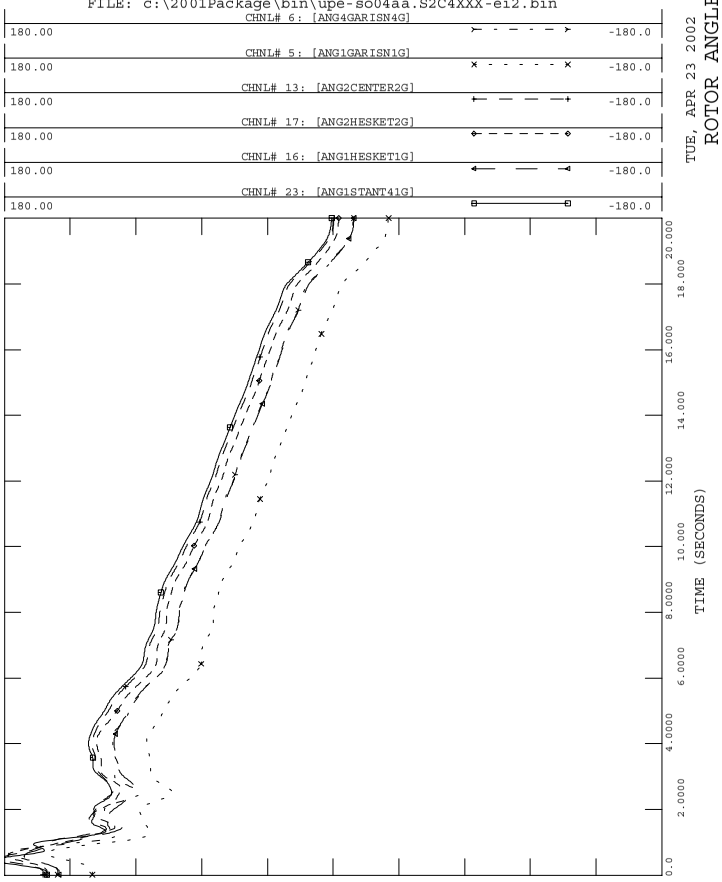


CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

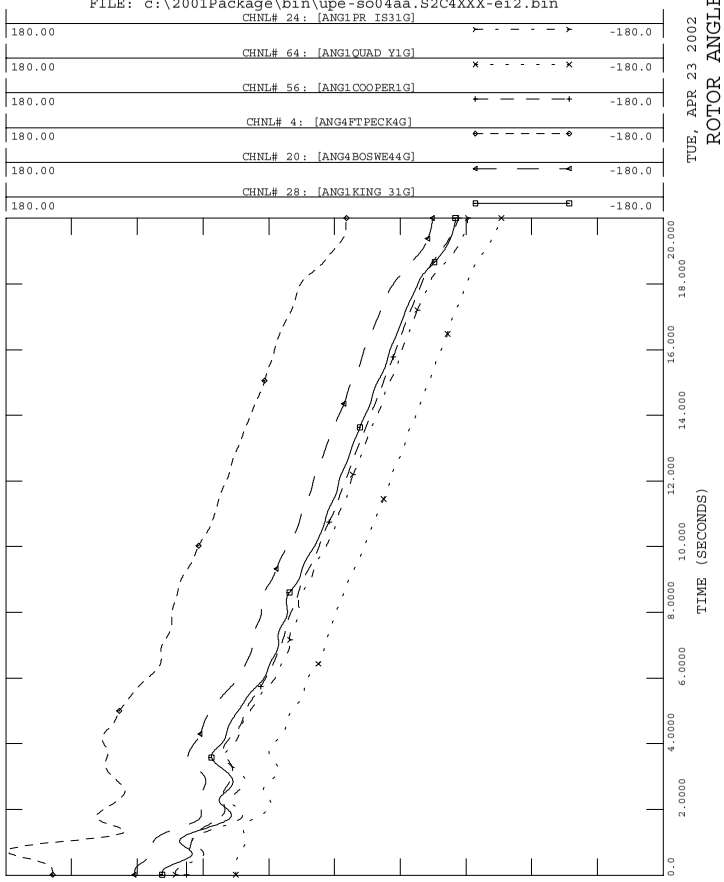
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
ROTOR ANGLES 2



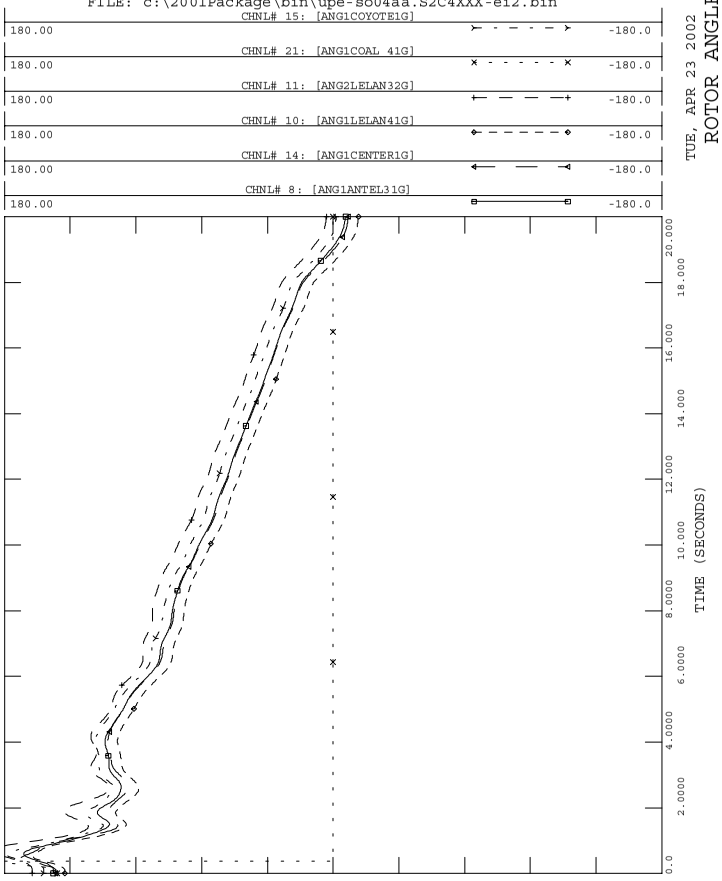
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
ROTOR ANGLES 4



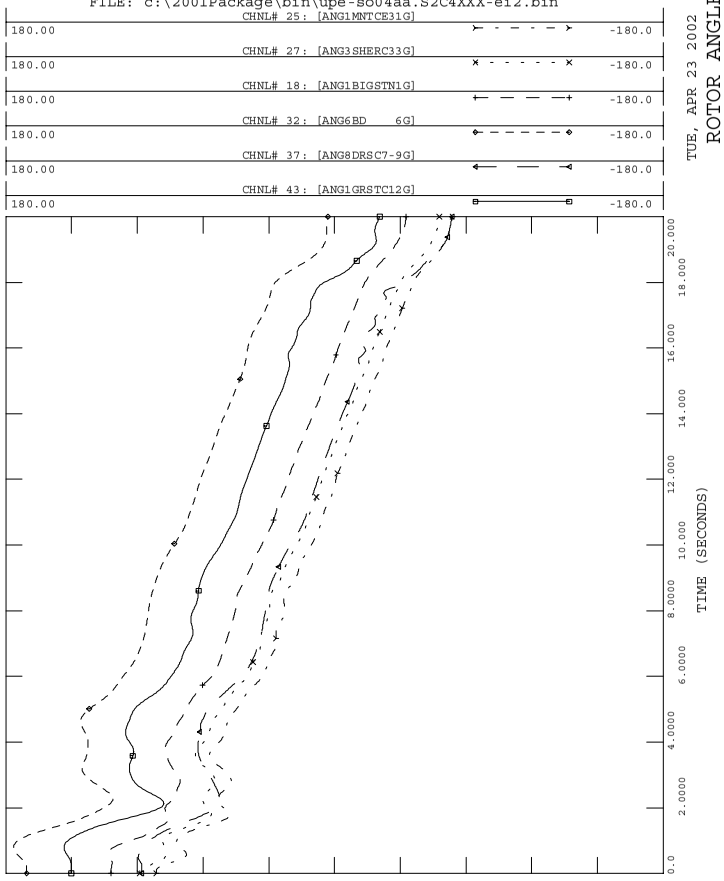
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
ROTOR ANGLES 1

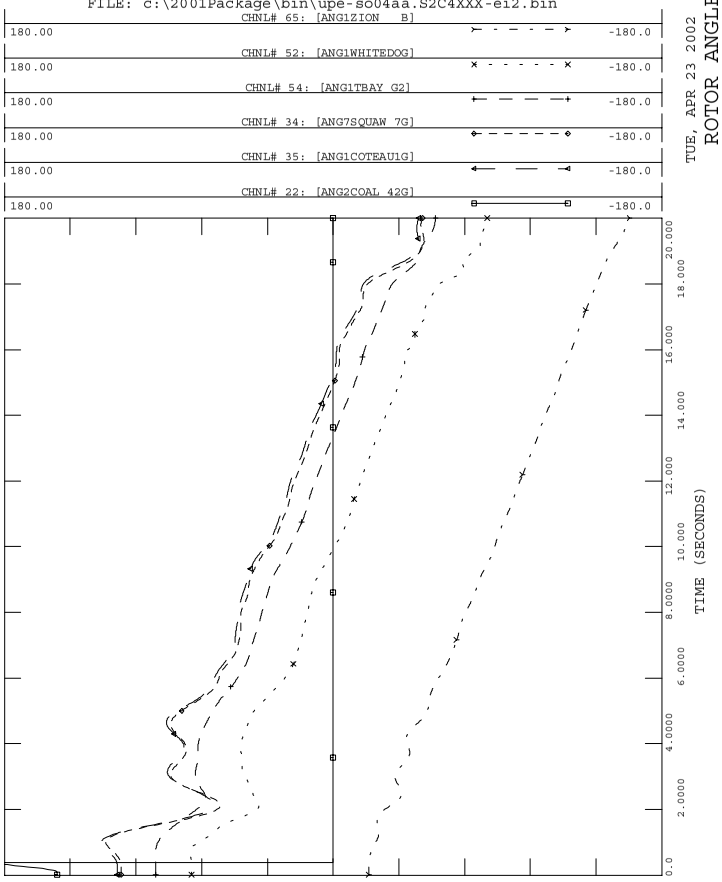


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
ROTOR ANGLES 3

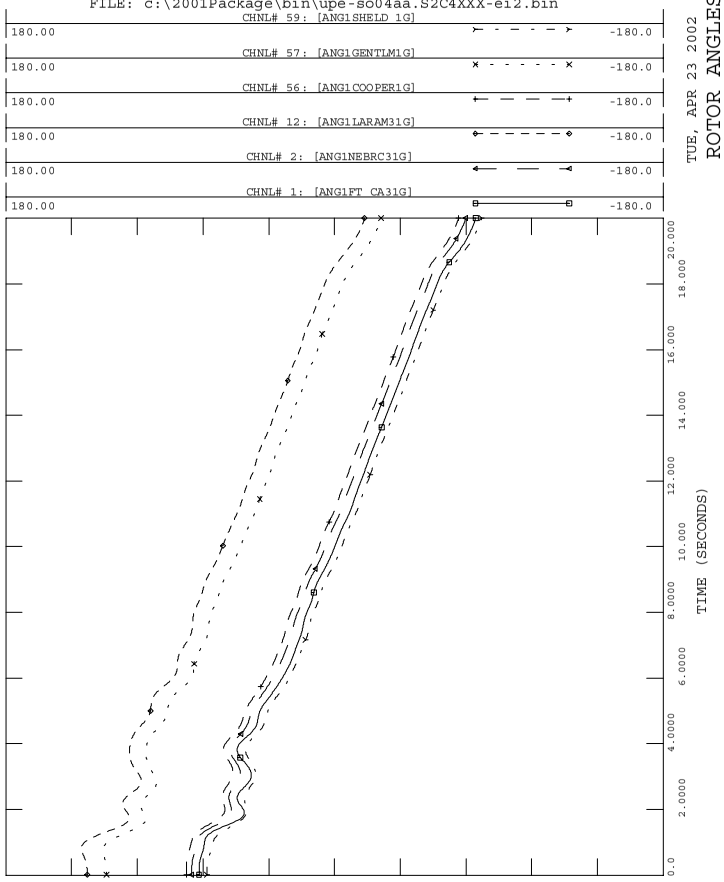


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



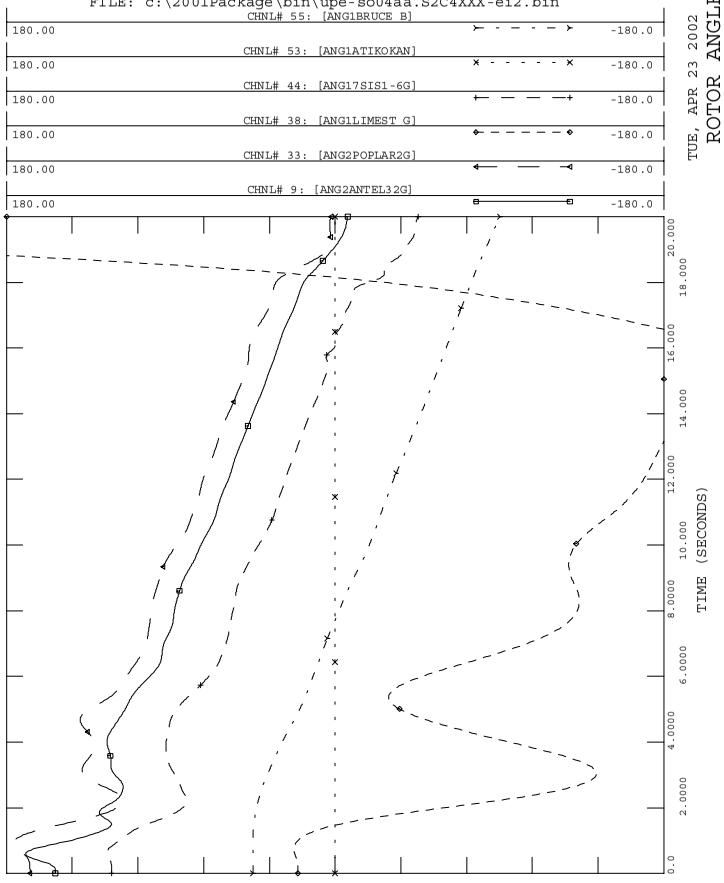
TUE, APR 23 2002 18:25
ROTOR ANGLES 6

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



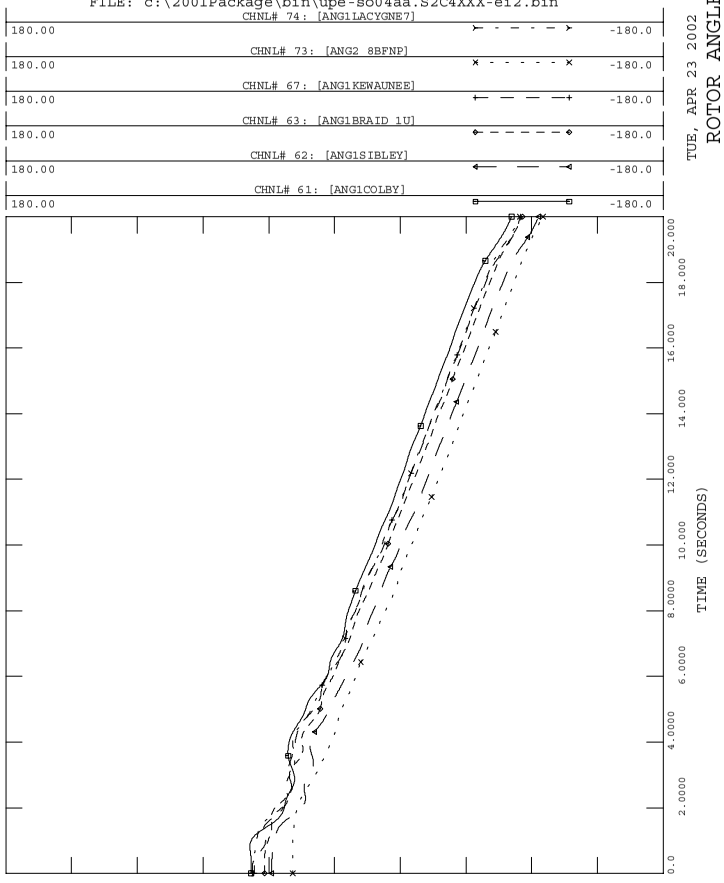
TUE, APR 23 2002 18:25
ROTOR ANGLES NB

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



TUE, APR 23 2002 18:25
ROTOR ANGLES 5

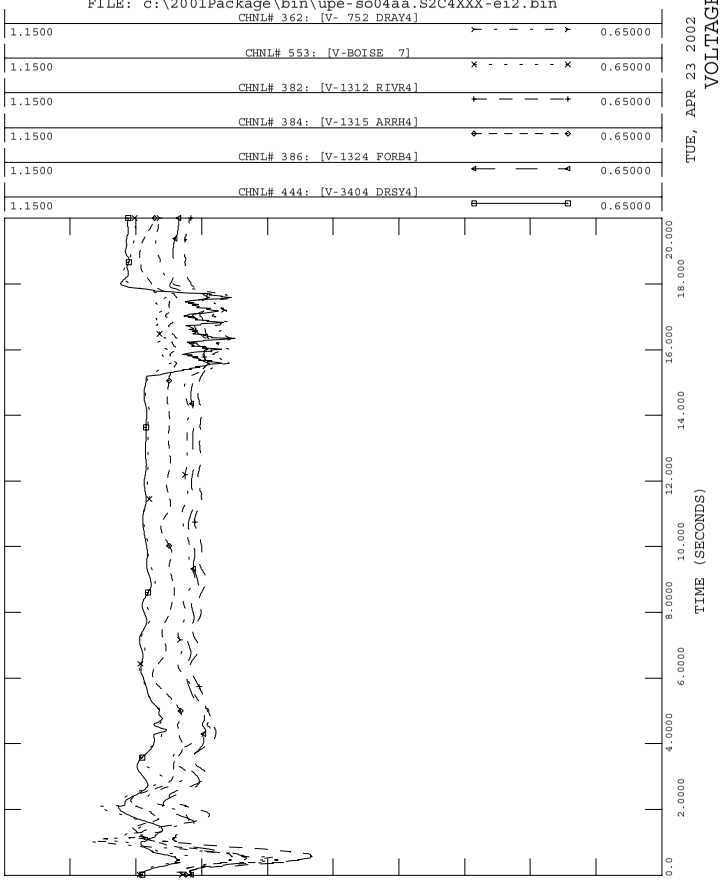
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



TUE, APR 23 2002 18:25
ROTOR ANGLES 7

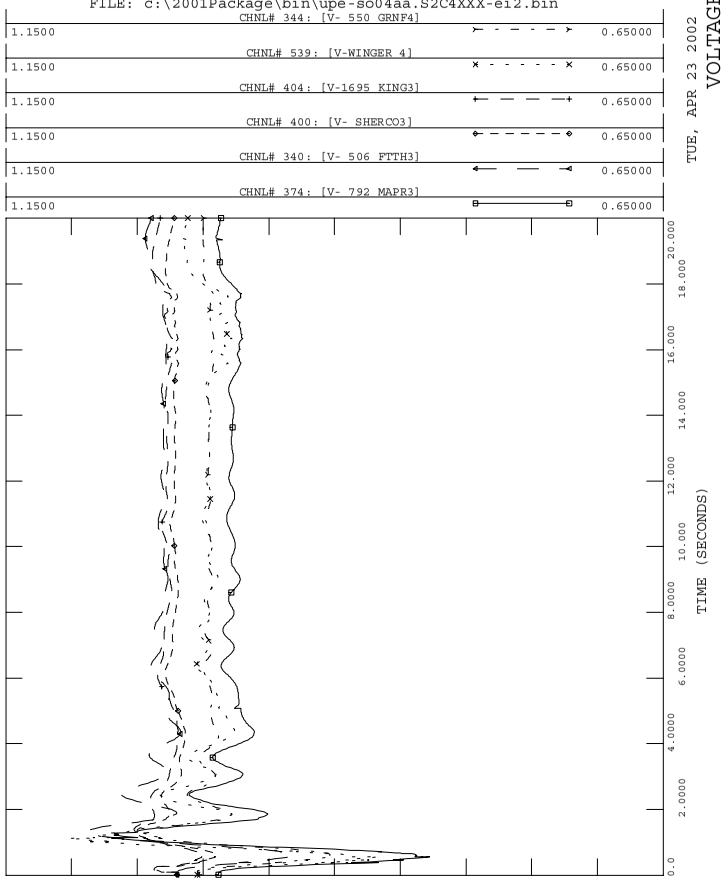
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
VOLTAGES 1



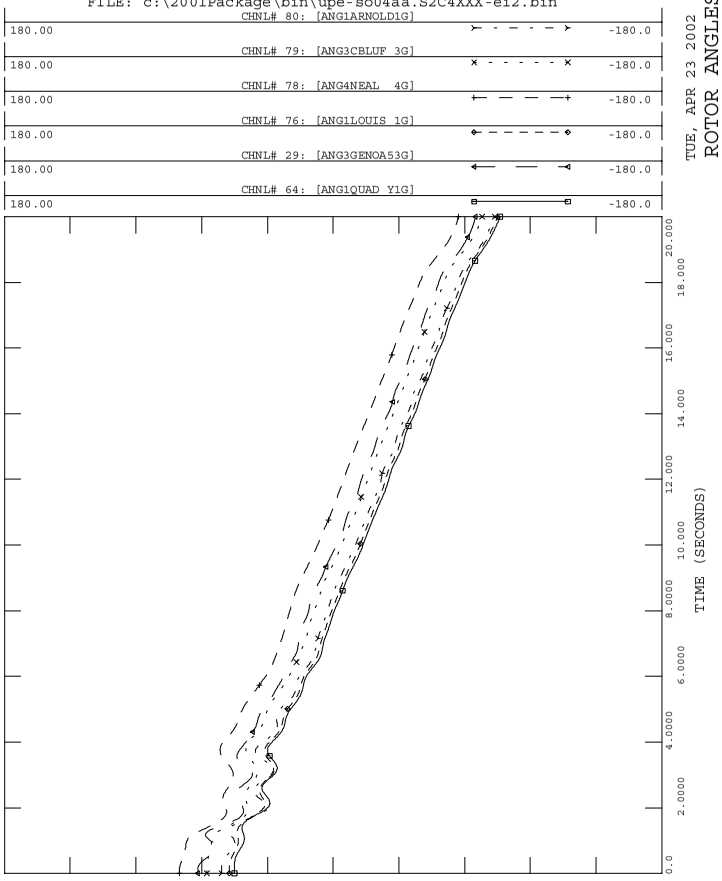
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
VOLTAGES 3



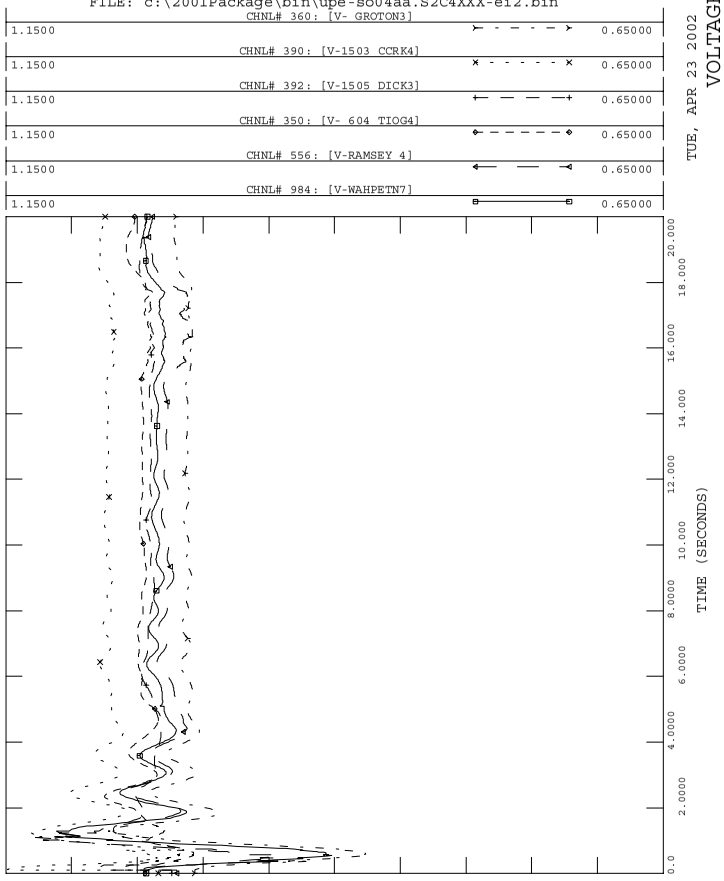
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
ROTOR ANGLES IA



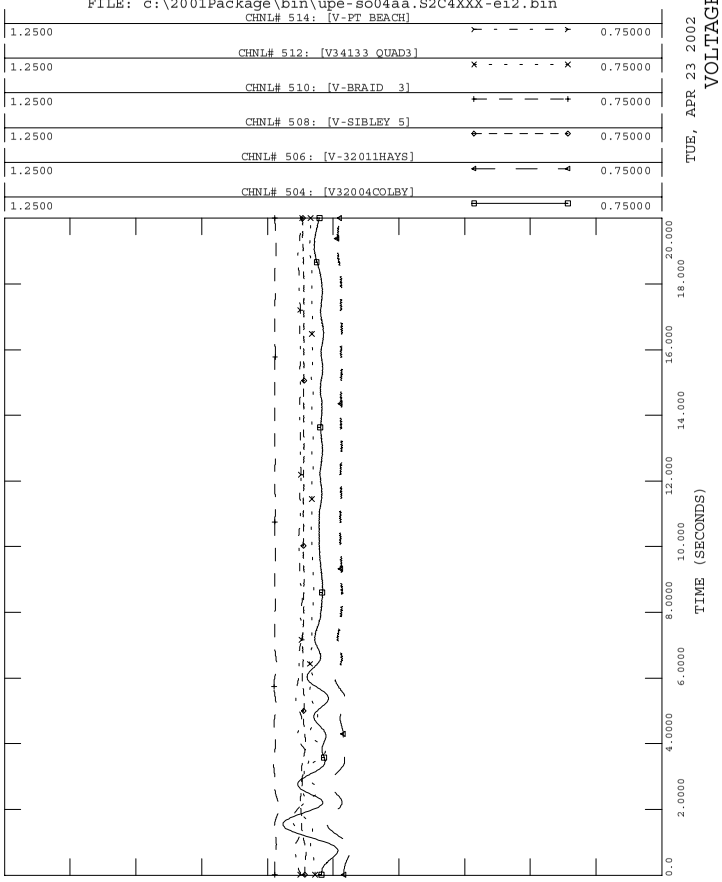
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
VOLTAGES 2



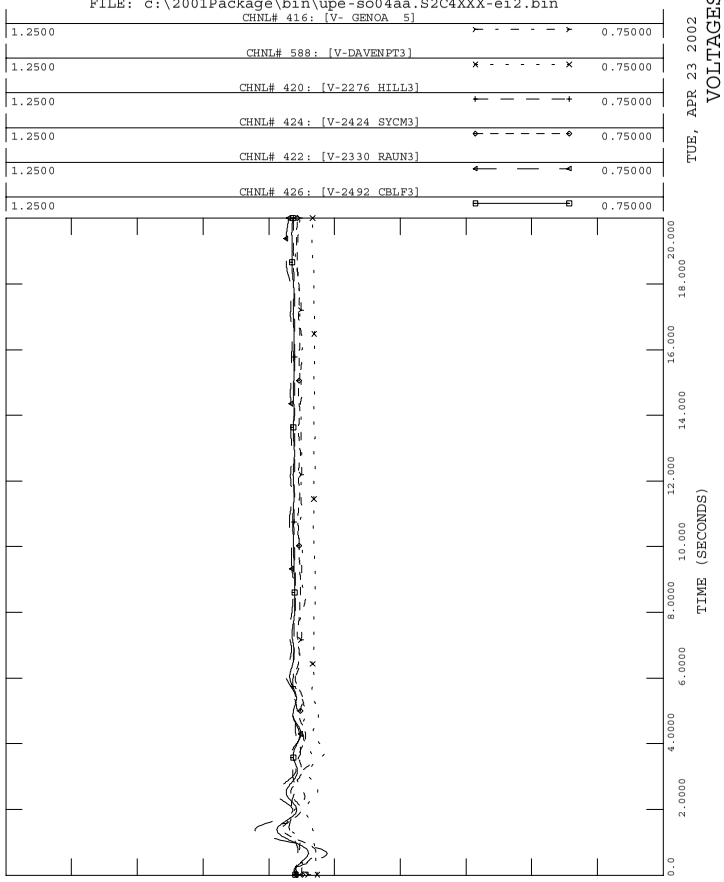
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
VOLTAGES 5



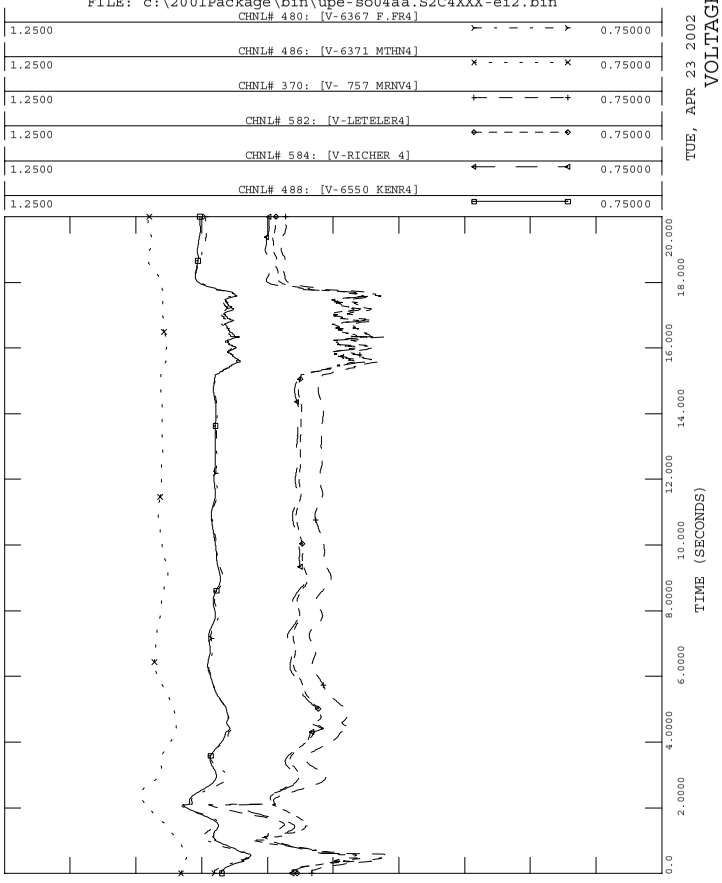
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
VOLTAGES IA



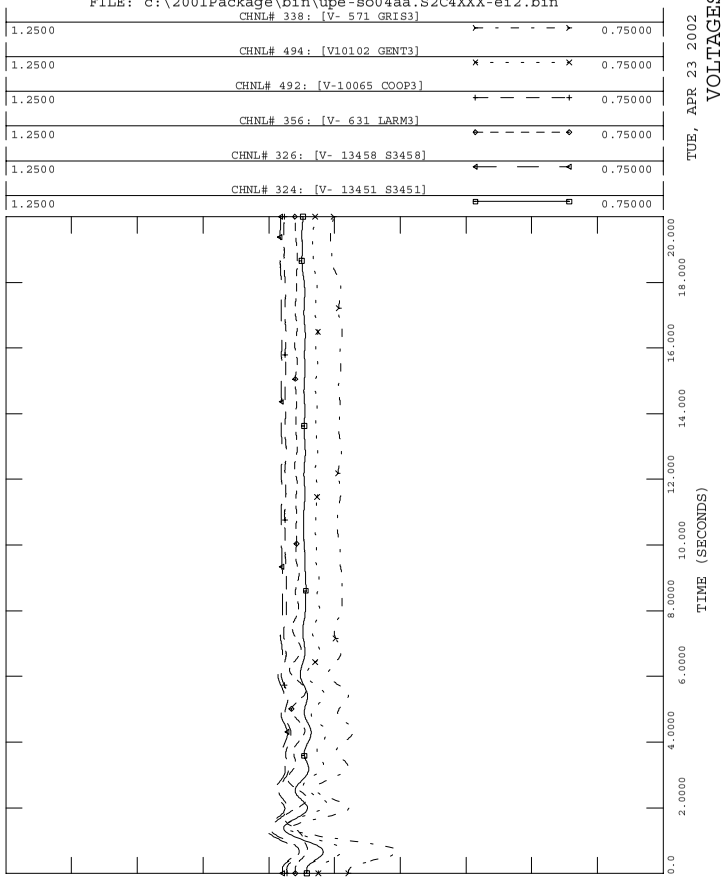
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
VOLTAGES 4

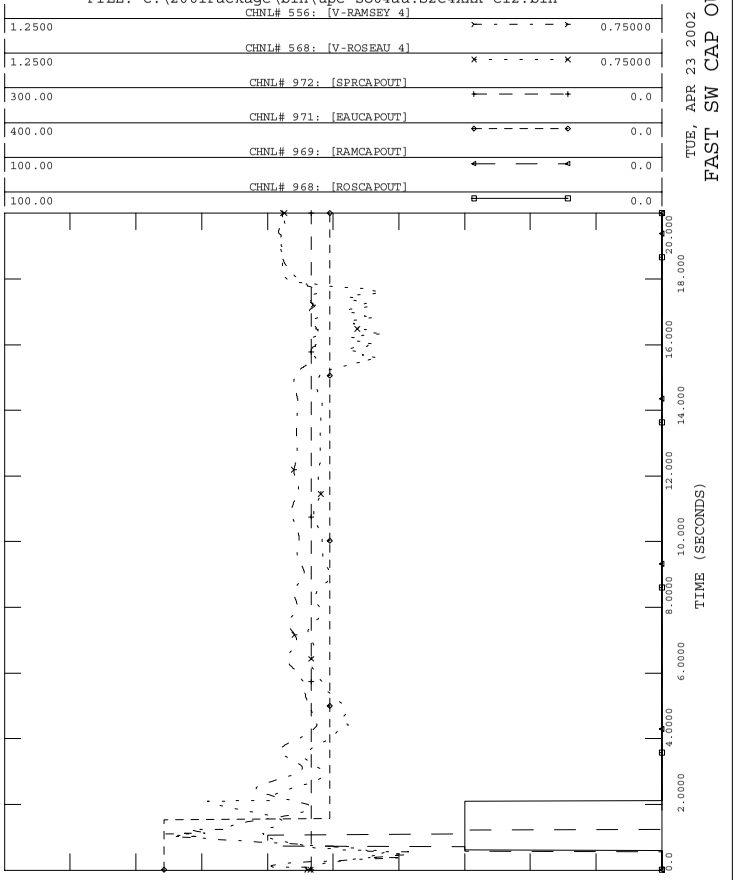


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
VOLTAGES NB

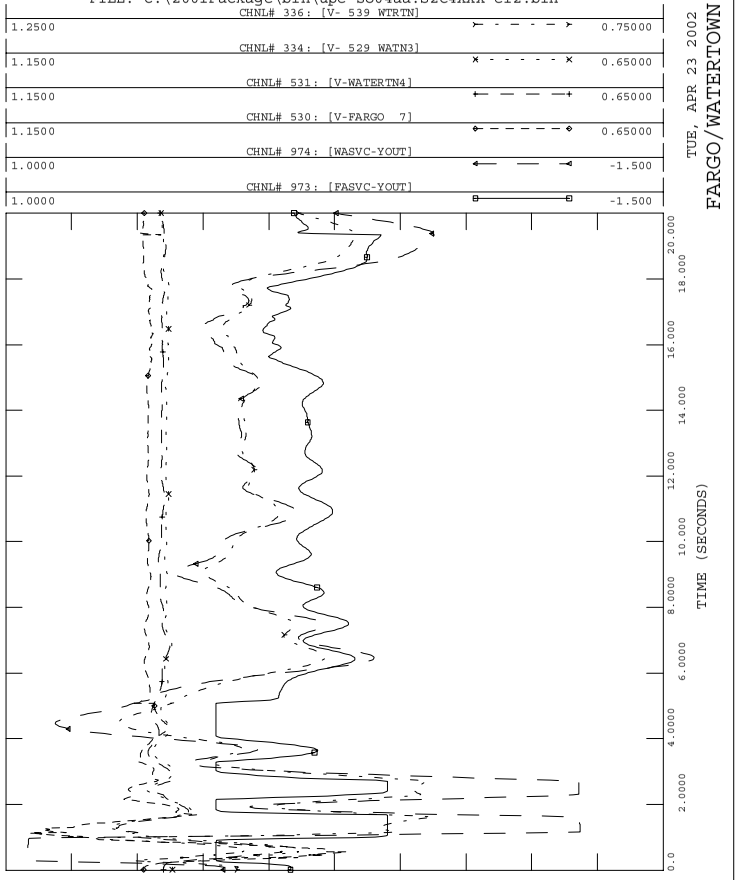


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



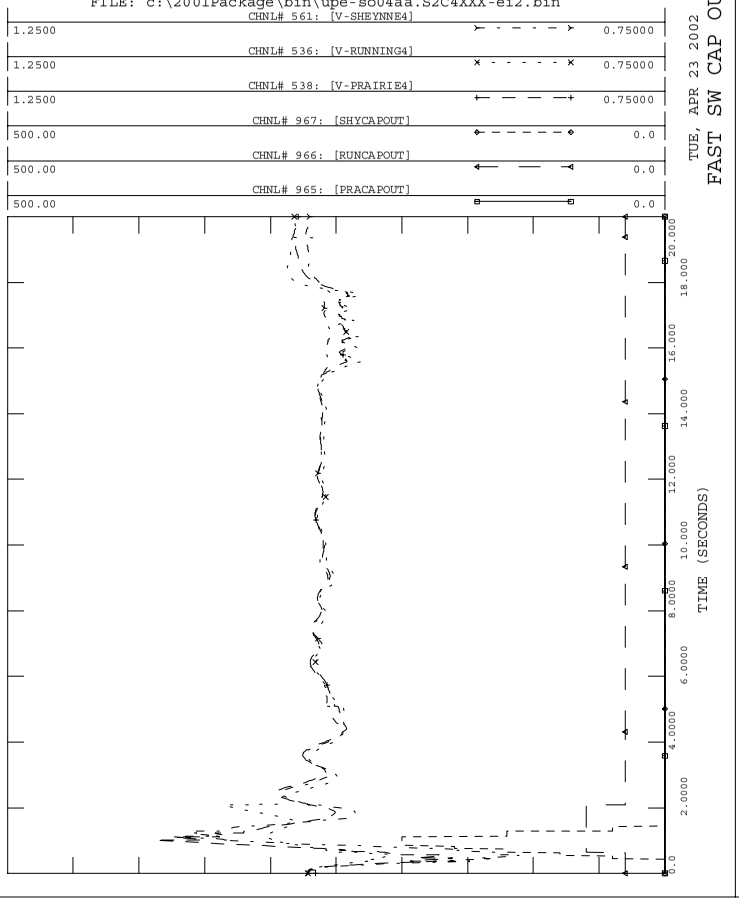
TUE, APR 23 2002 18:25
FAST SW CAP OUT 2

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



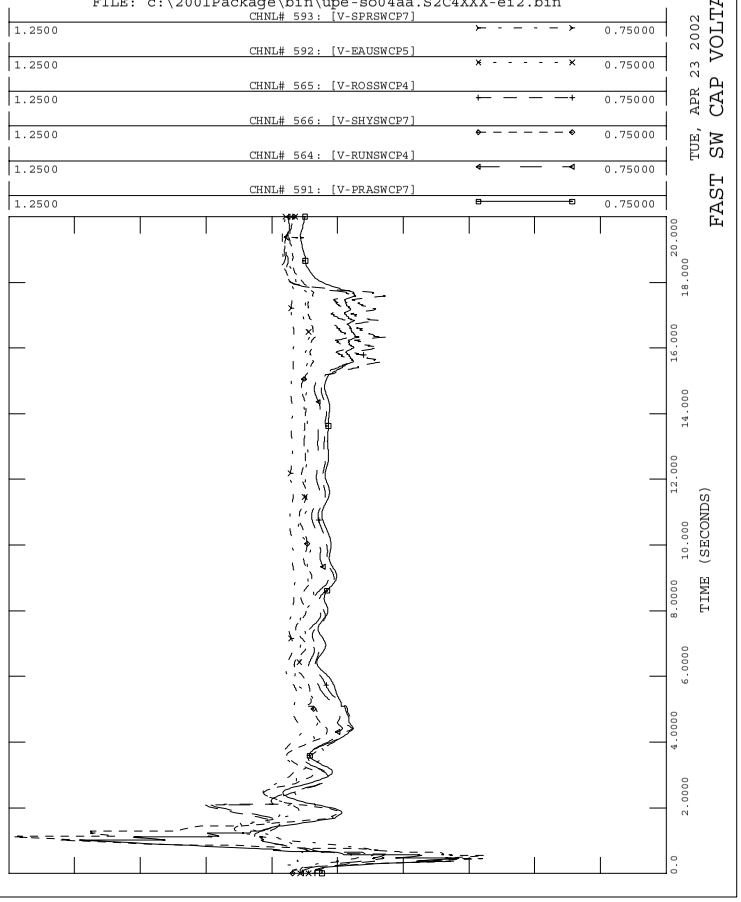
TUE, APR 23 2002 18:25
FARGO/WATERTOWN SVS

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



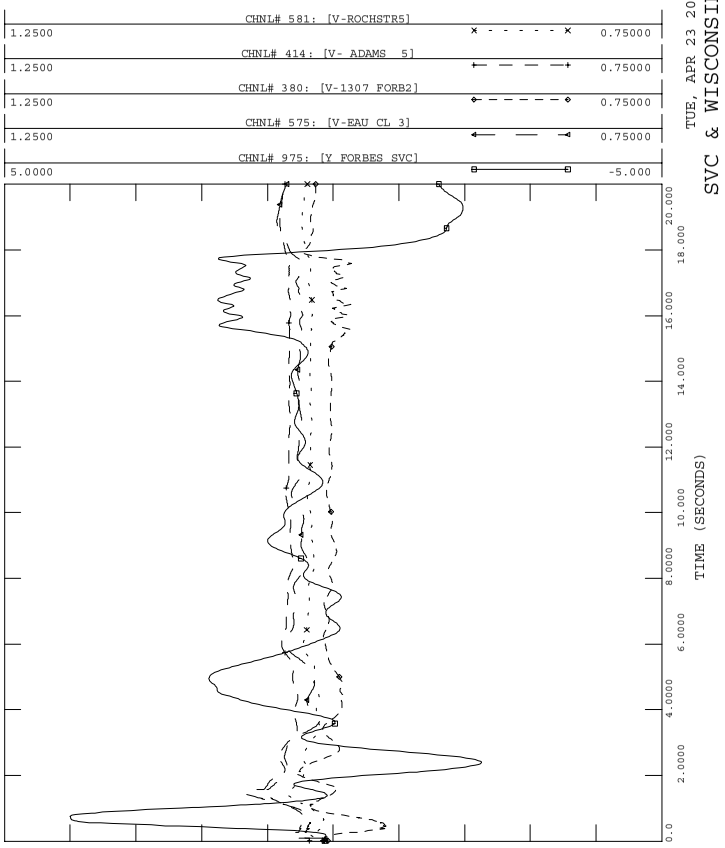
TUE, APR 23 2002 18:25
FAST SW CAP OUT 1

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



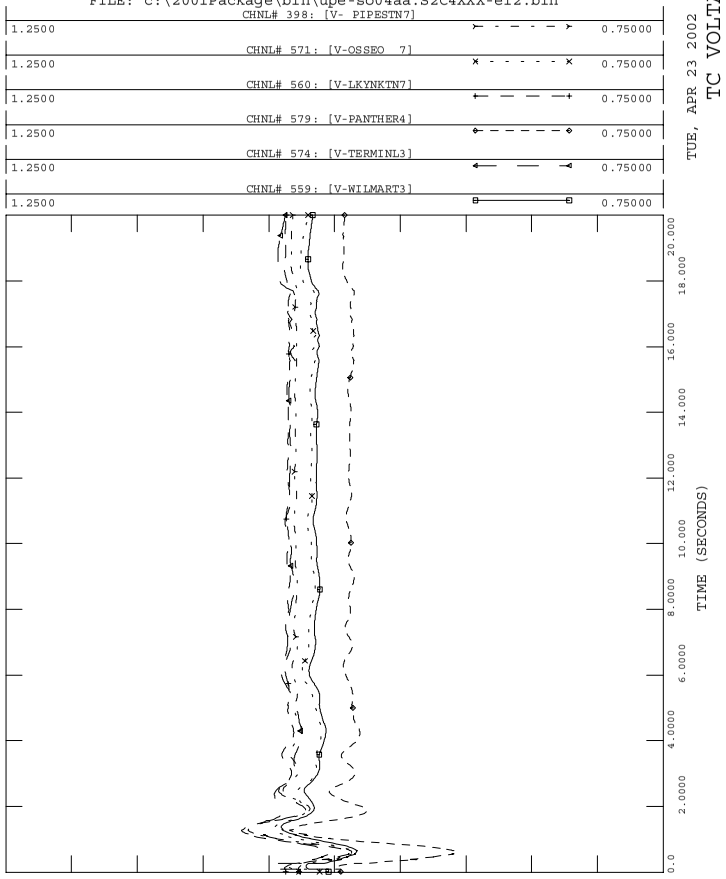
TUE, APR 23 2002 18:25
FAST SW CAP VOLTAGES

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



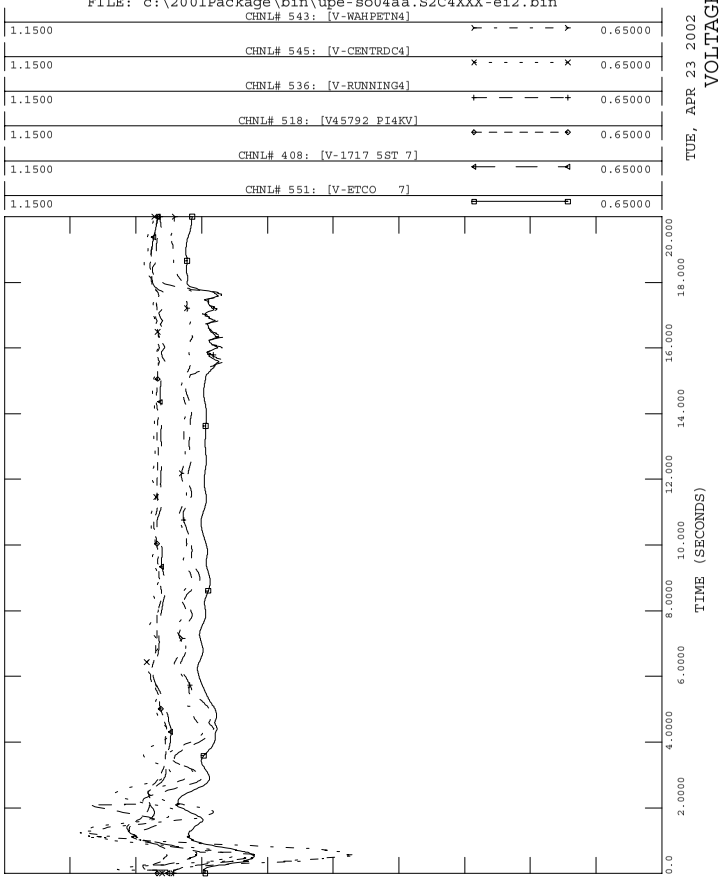
TUE, APR 23 2002 18:25
SVC & WISCONSIN VOLT

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



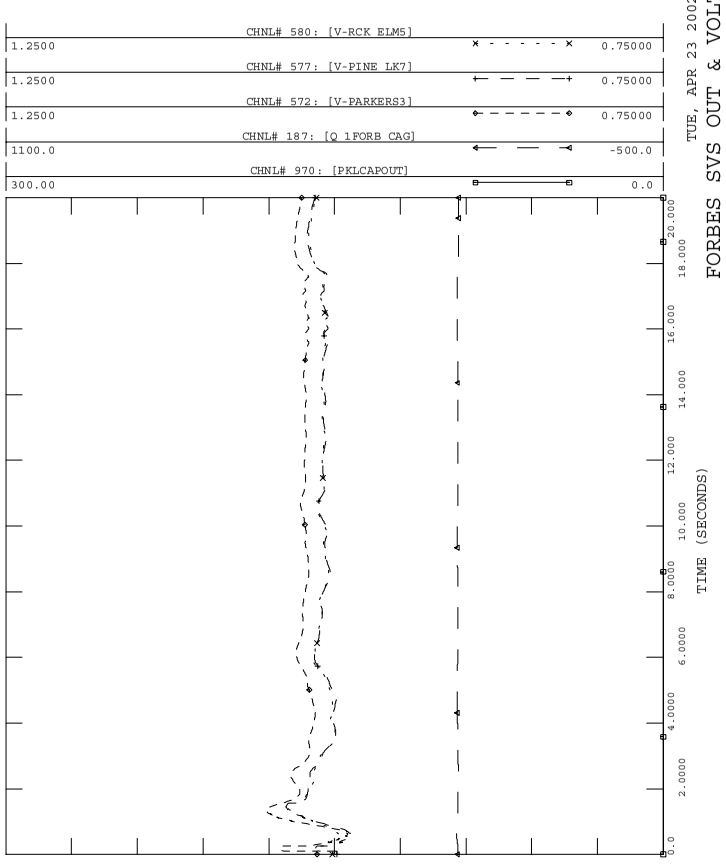
TUE, APR 23 2002 18:25
TC VOLTAGES

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



TUE, APR 23 2002 18:25
VOLTAGES 6

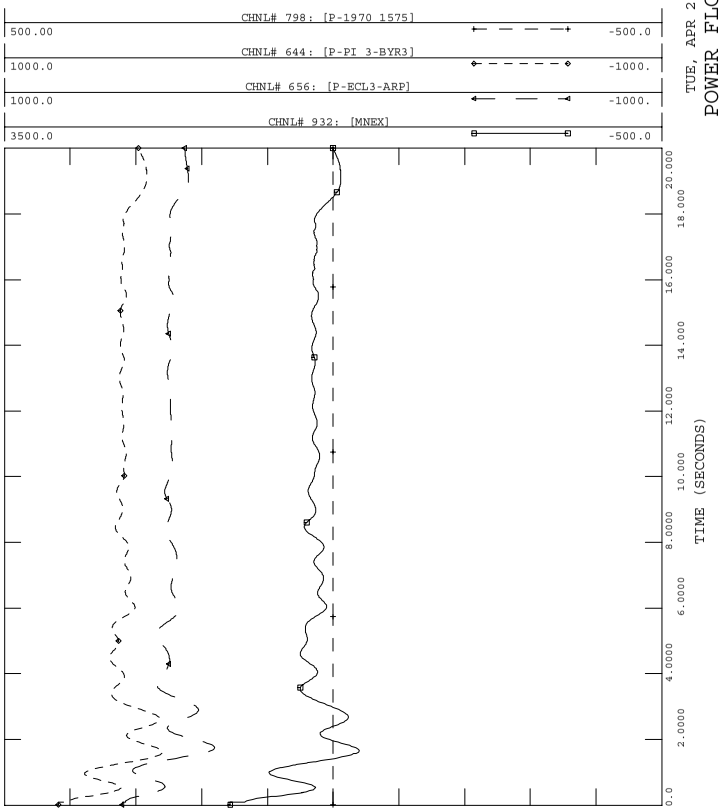
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



TUE, APR 23 2002 18:25
FORBES SVS OUT & VOLTAGES

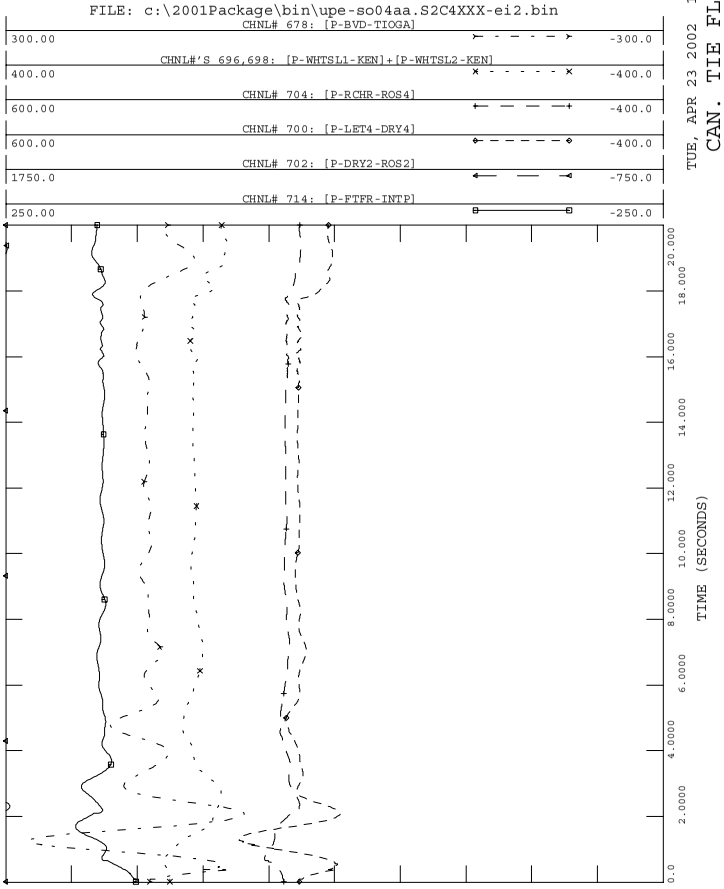
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
POWER FLOW SUMS 2



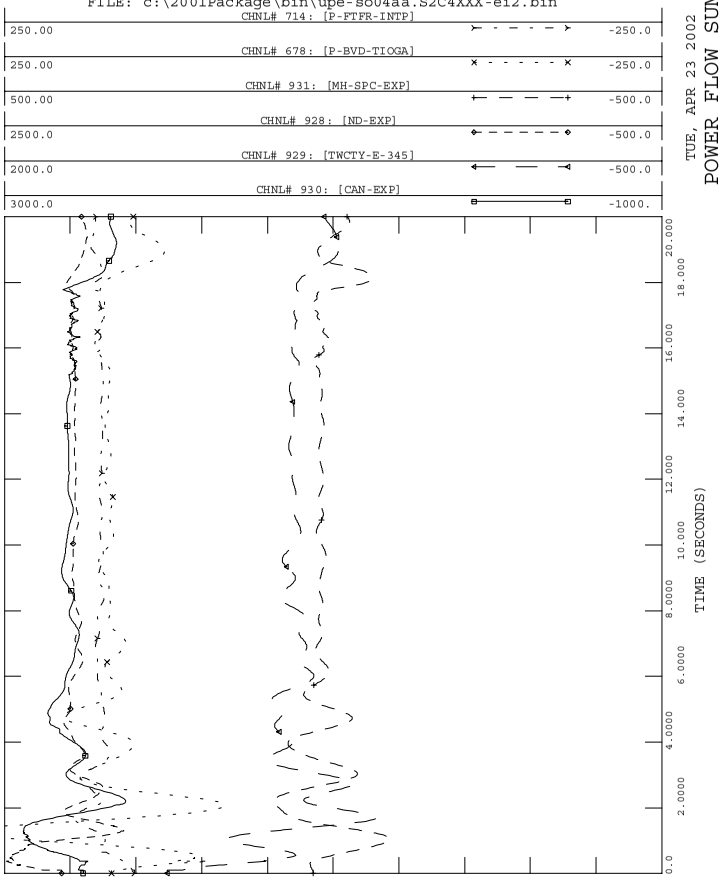
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
CAN. TIE FLOWS



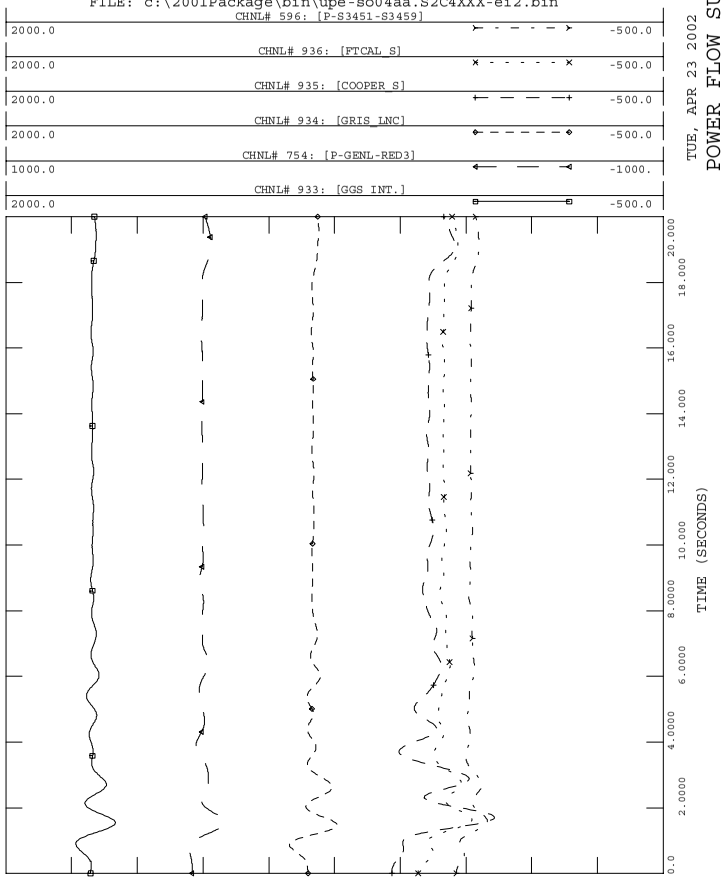
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
POWER FLOW SUMS 1



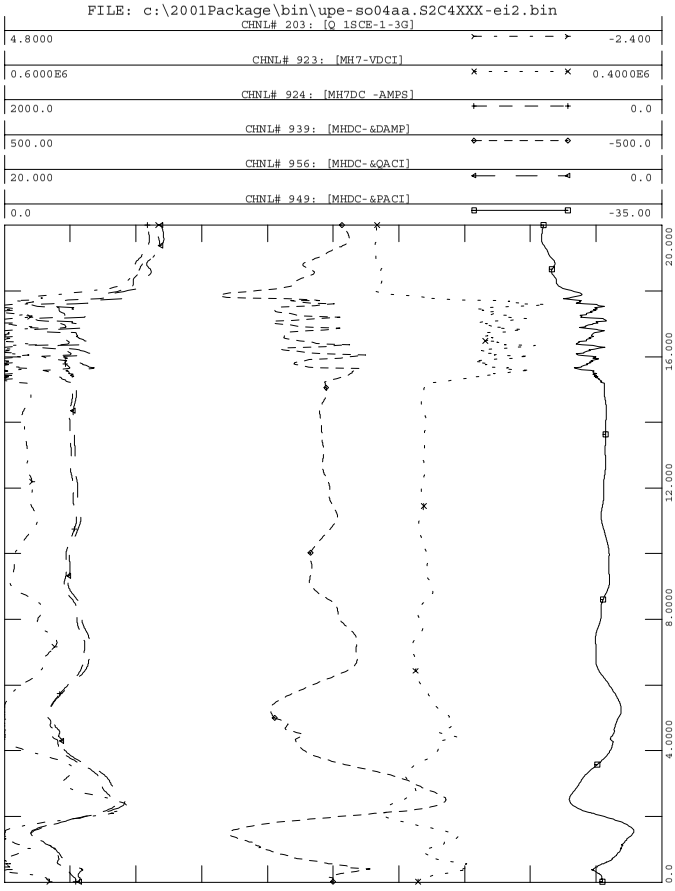
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
POWER FLOW SUM 3



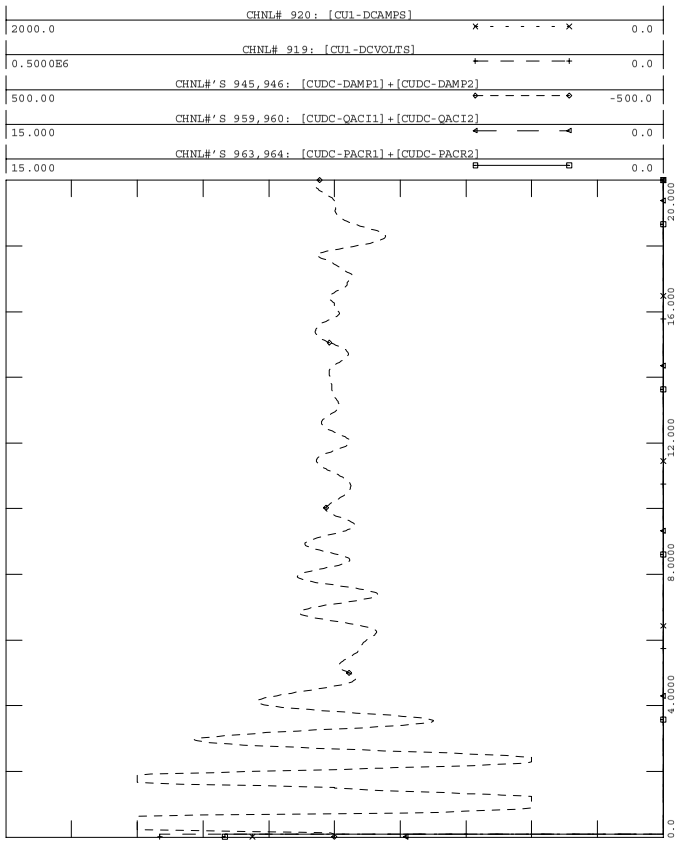
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
MH DC PARAMETERS



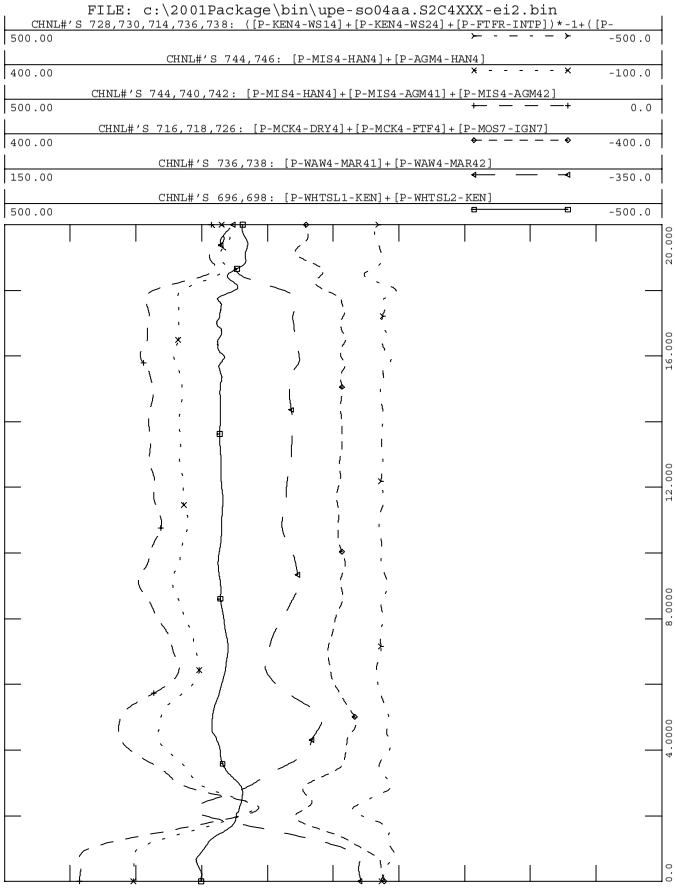
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

TUE, APR 23 2002 18:25
CU DC #1



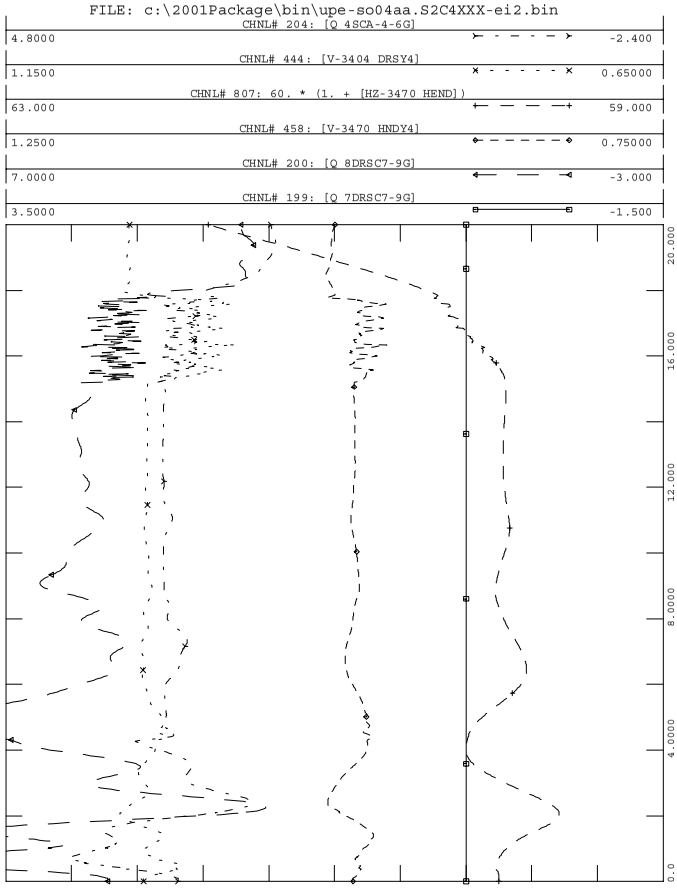
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

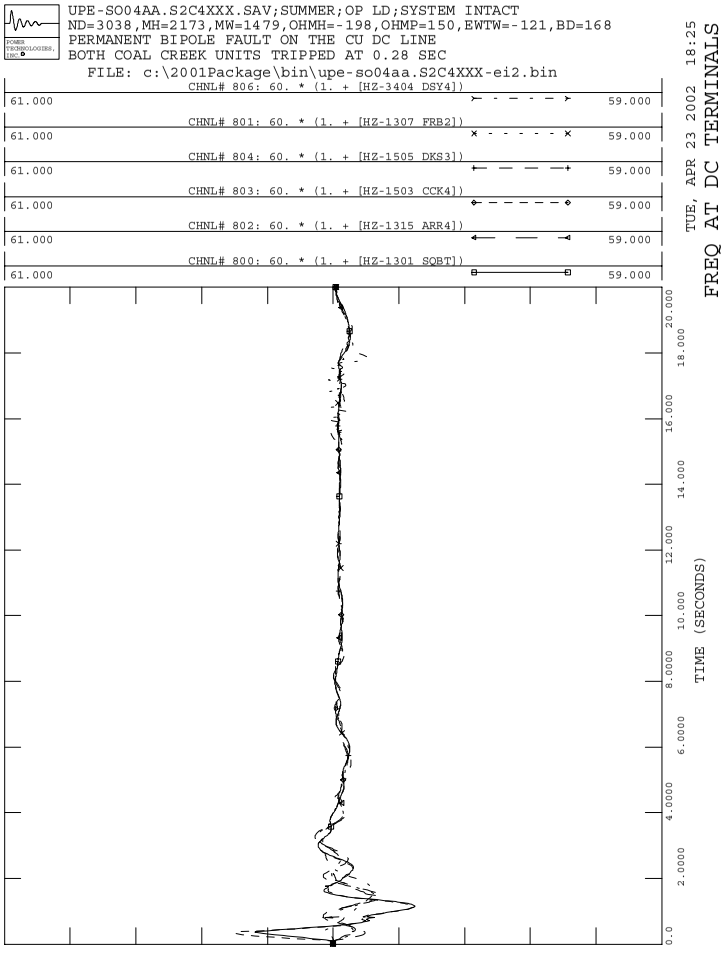
TUE, APR 23 2002 18:25
OH TIE FLOWS

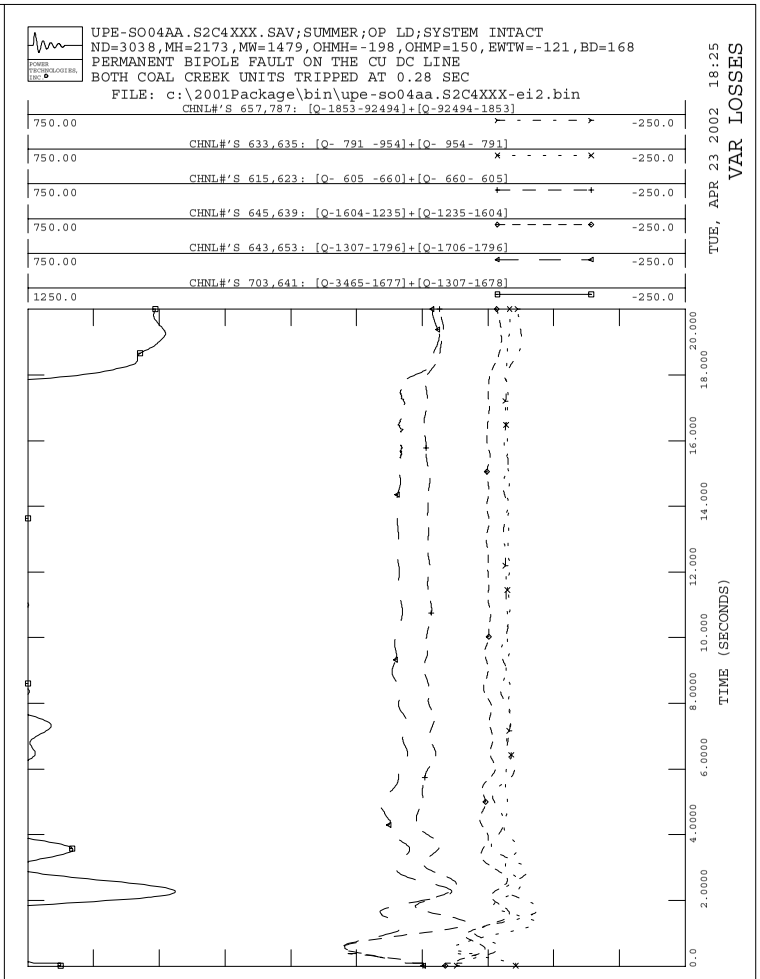


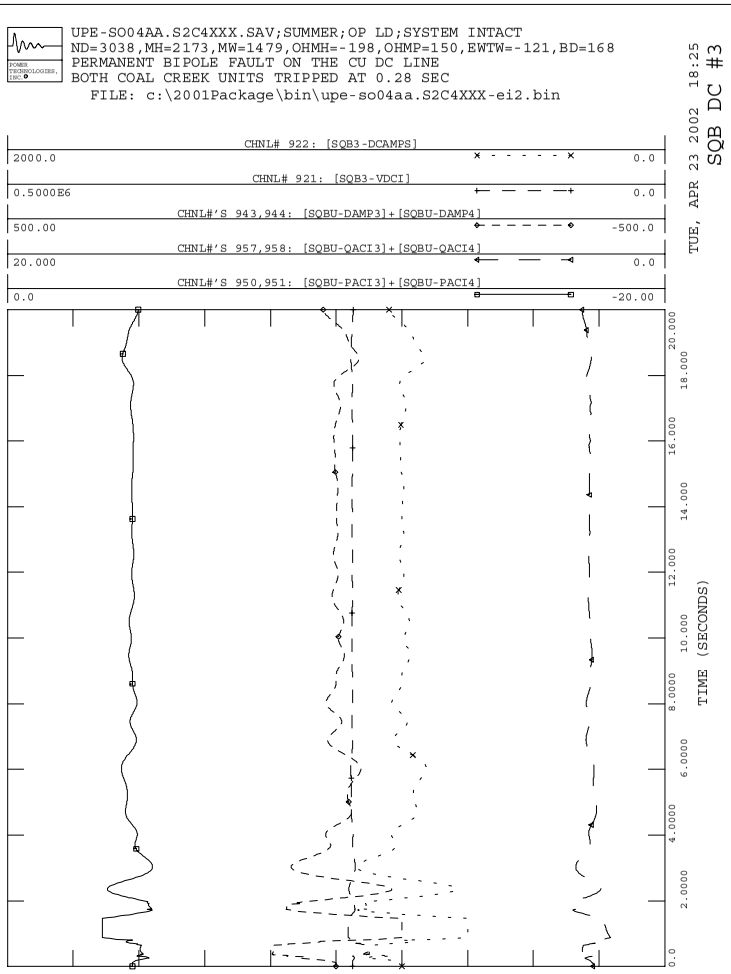
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

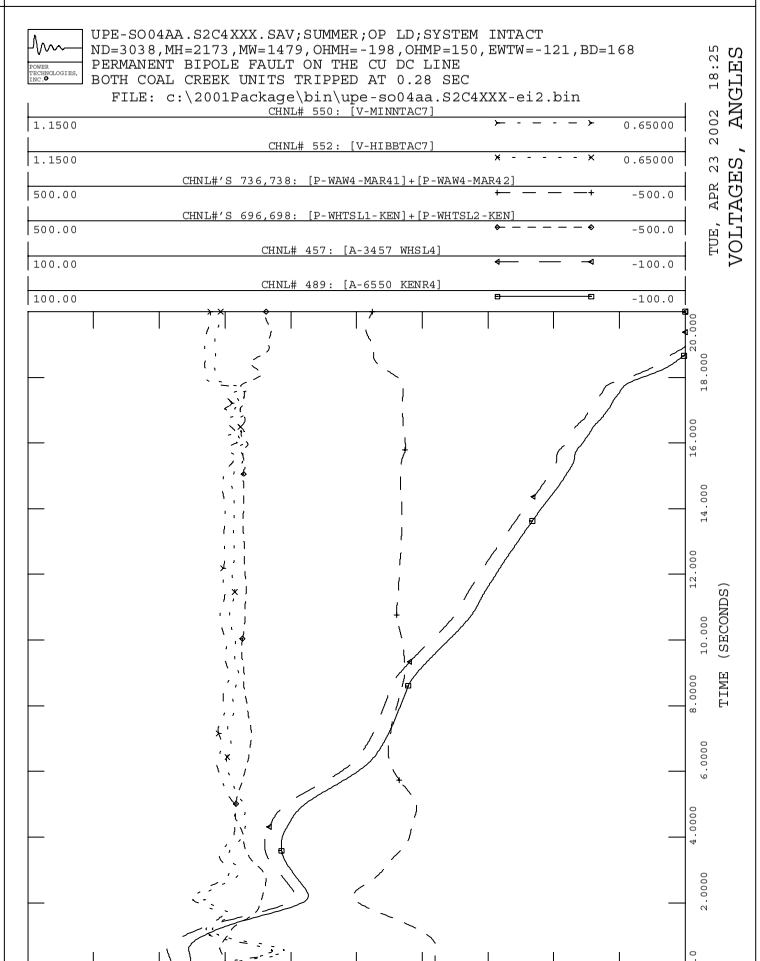
TUE, APR 23 2002 18:25
MH DC PARAMETERS




UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
TUE, APR 23 2002 18:25
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
TUE, APR 23 2002 18:25
VAR LOSSES
TIME (SECONDS)

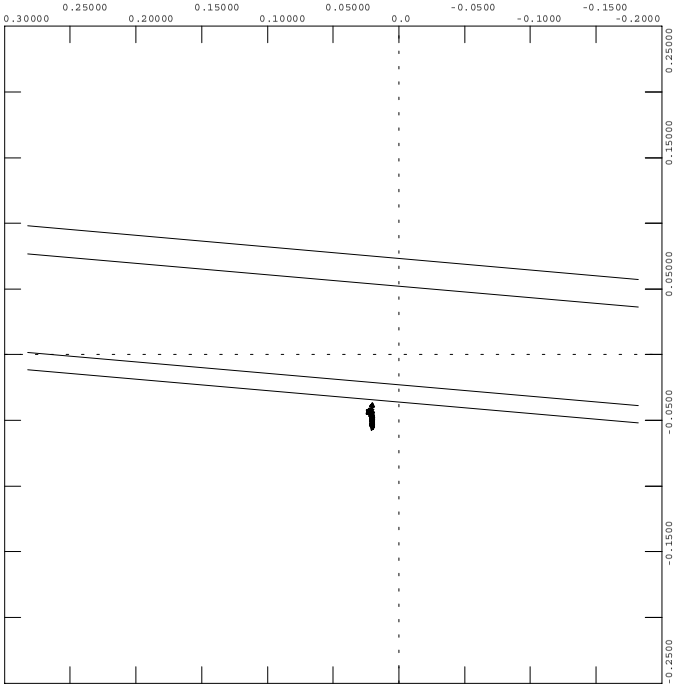

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
TUE, APR 23 2002 18:25
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
TUE, APR 23 2002 18:25
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

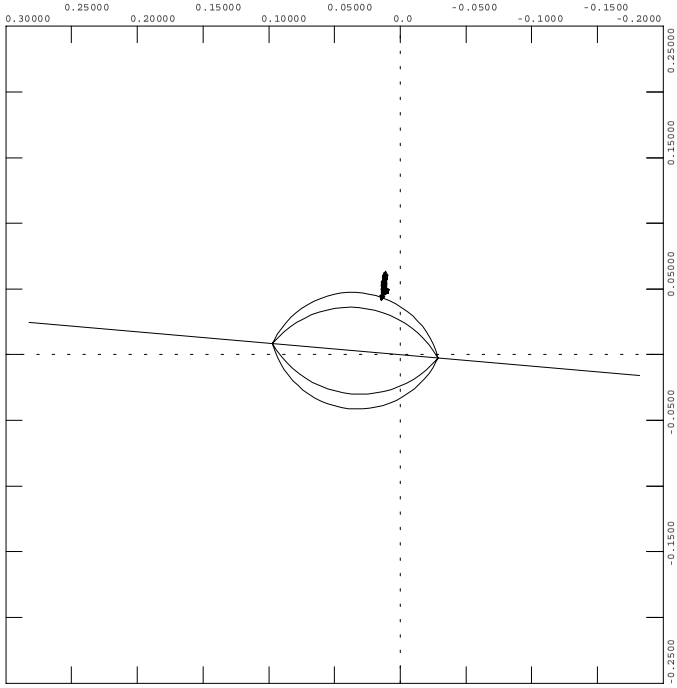


TUE, APR 23 2002 18:25
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

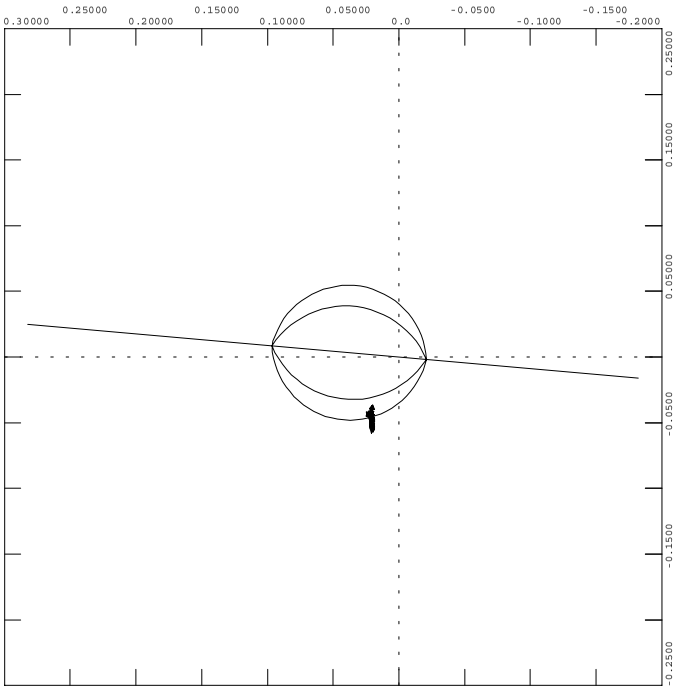


TUE, APR 23 2002 18:25
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

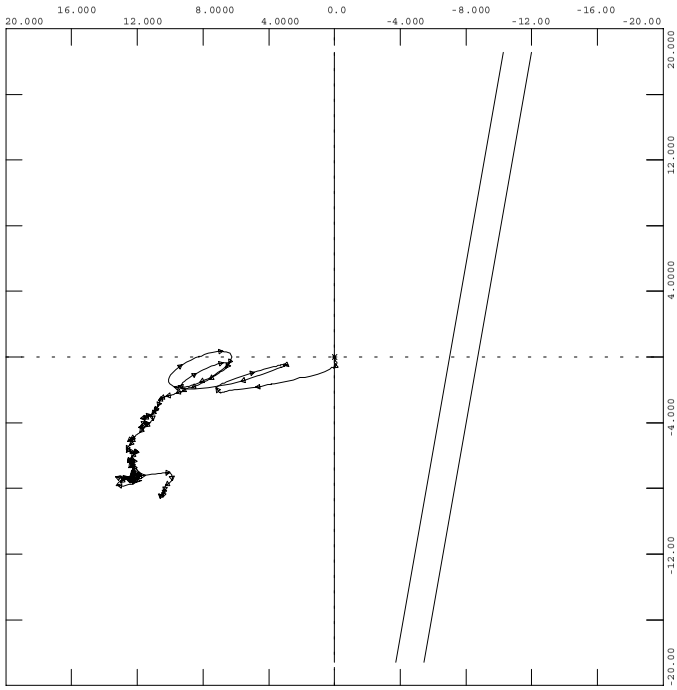


TUE, APR 23 2002 18:25
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

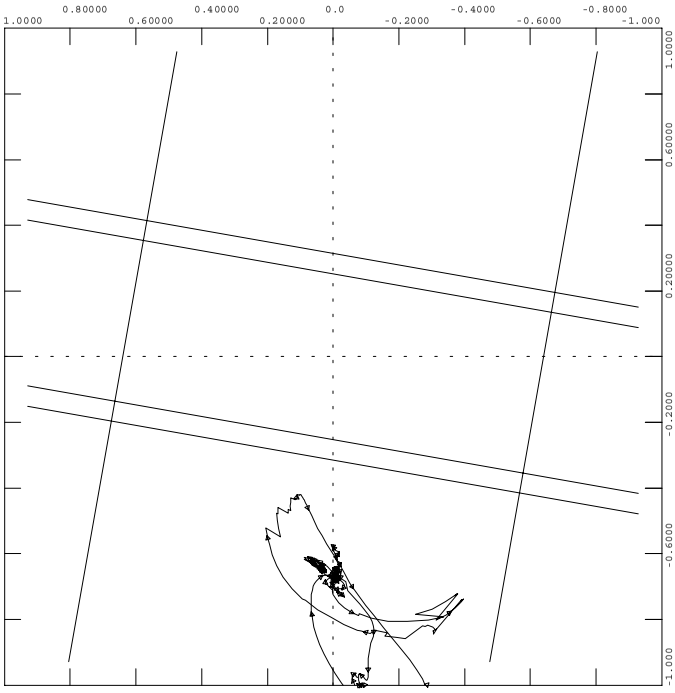


TUE, APR 23 2002 18:25
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

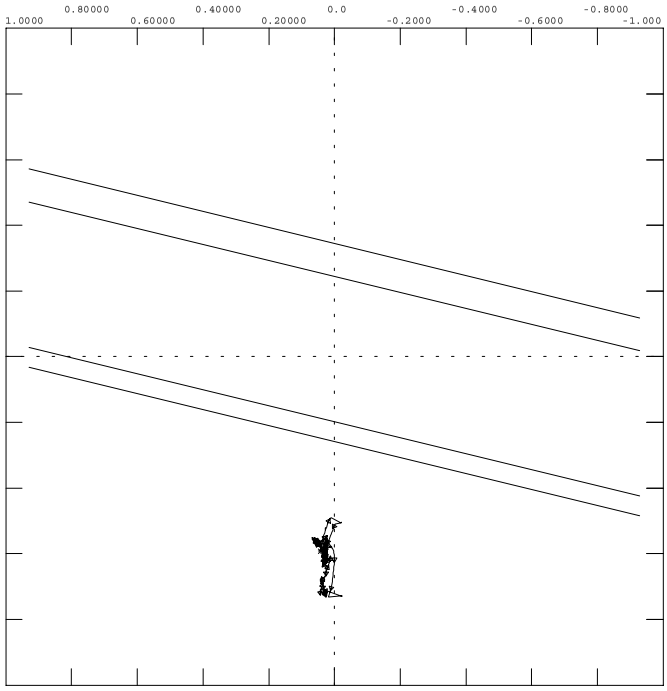
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

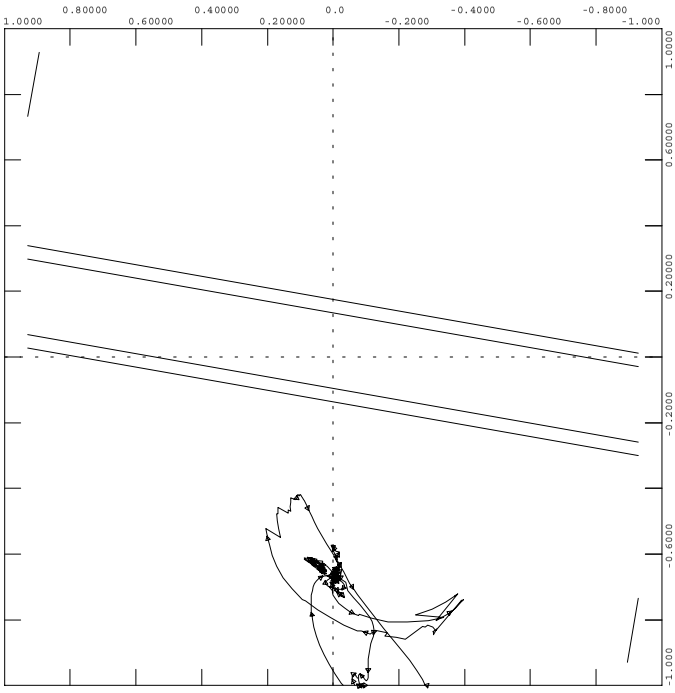
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

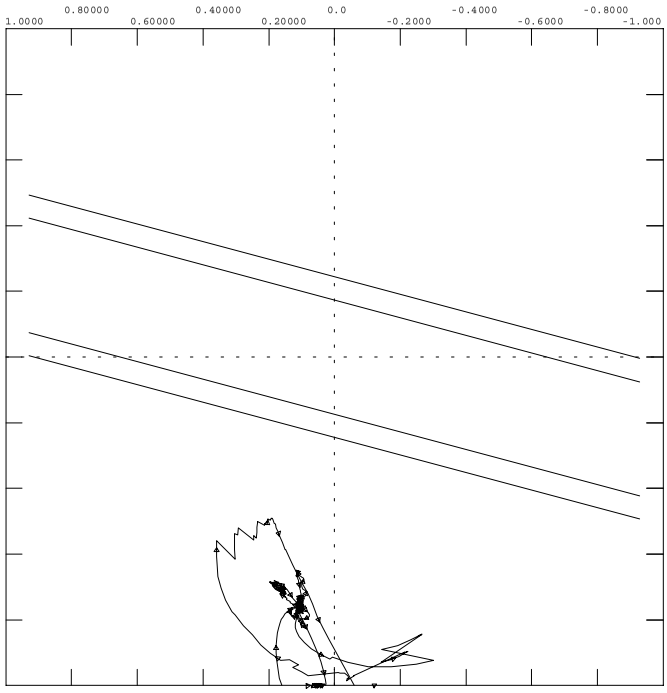
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

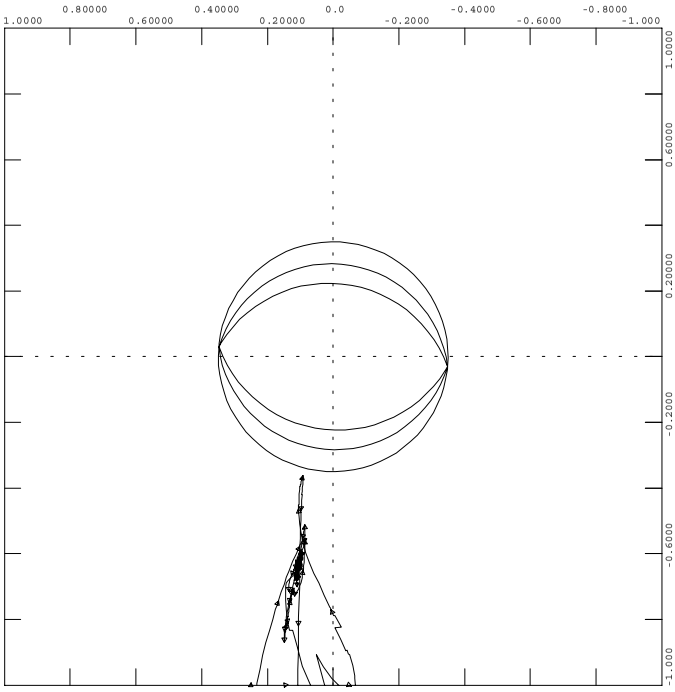
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

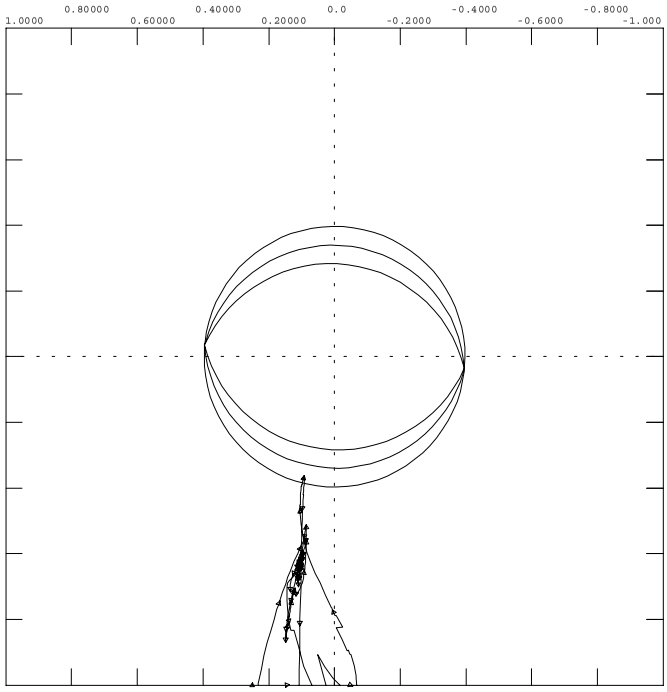
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

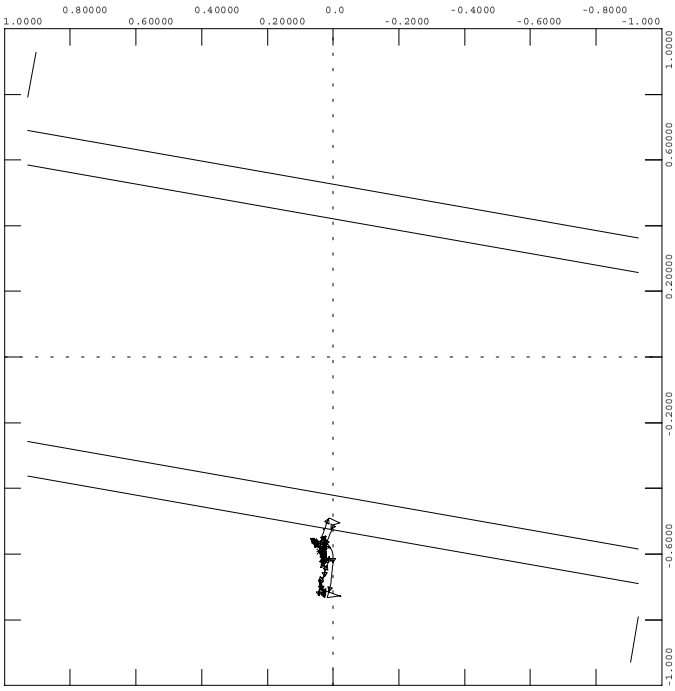
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

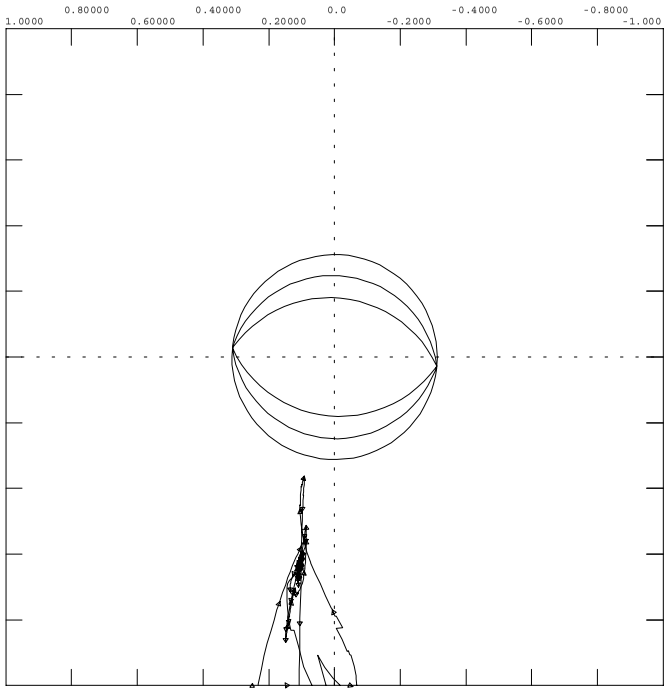
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



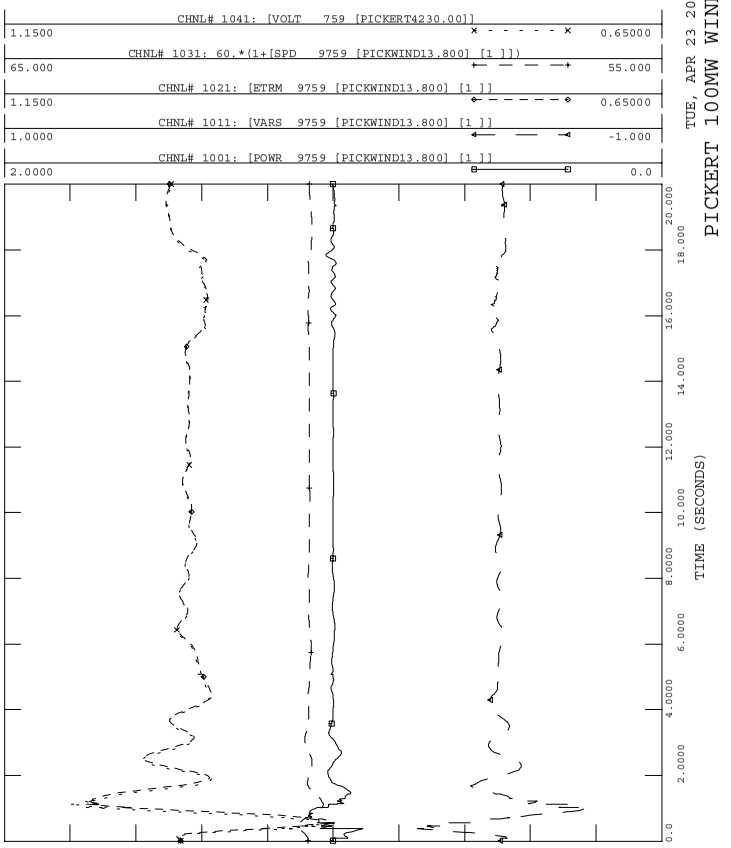
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

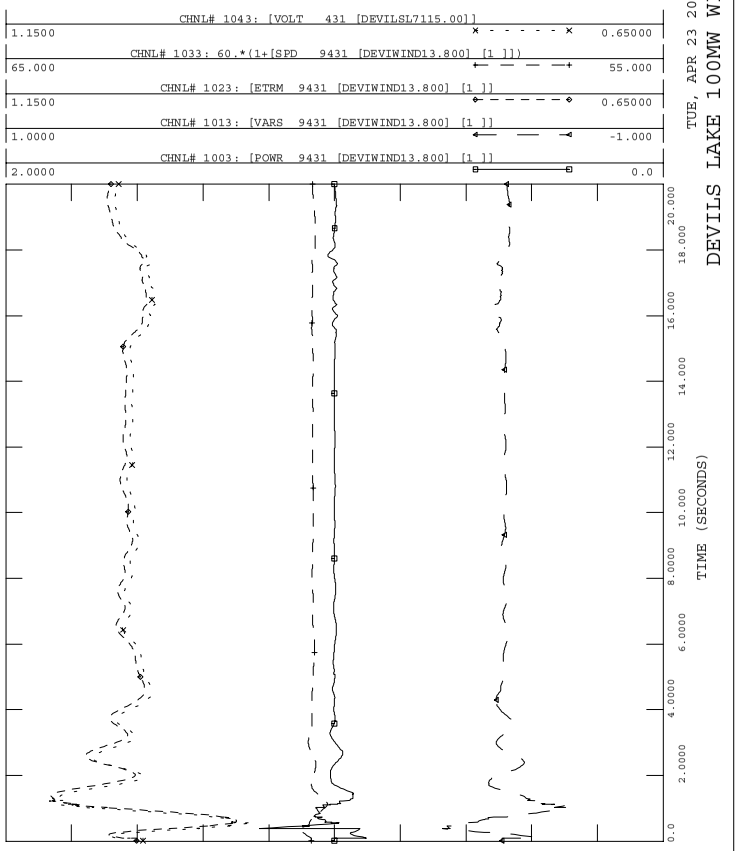


UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



PICKERT 100MW WIND UNIT
TUE, APR 23 2002 18:25

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

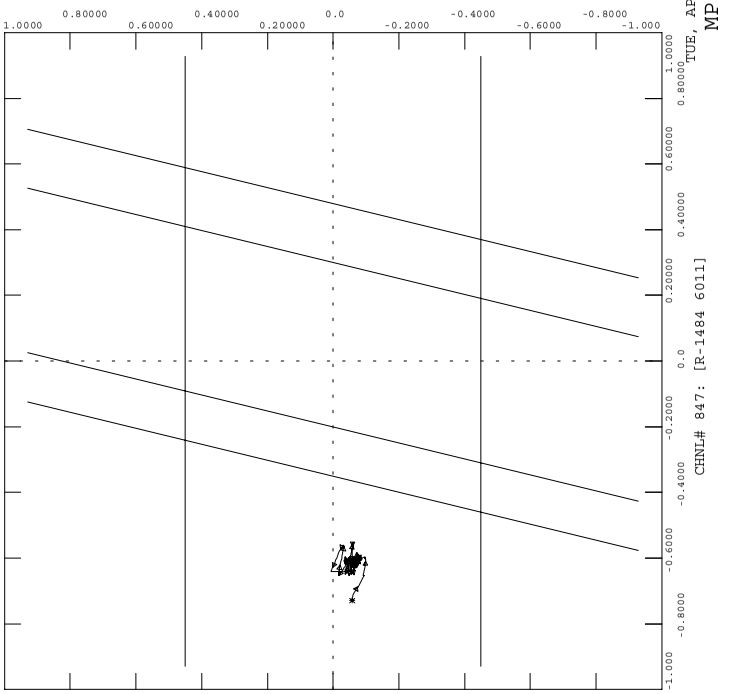


DEVILS LAKE 100MW WIND UN
TUE, APR 23 2002 18:25

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

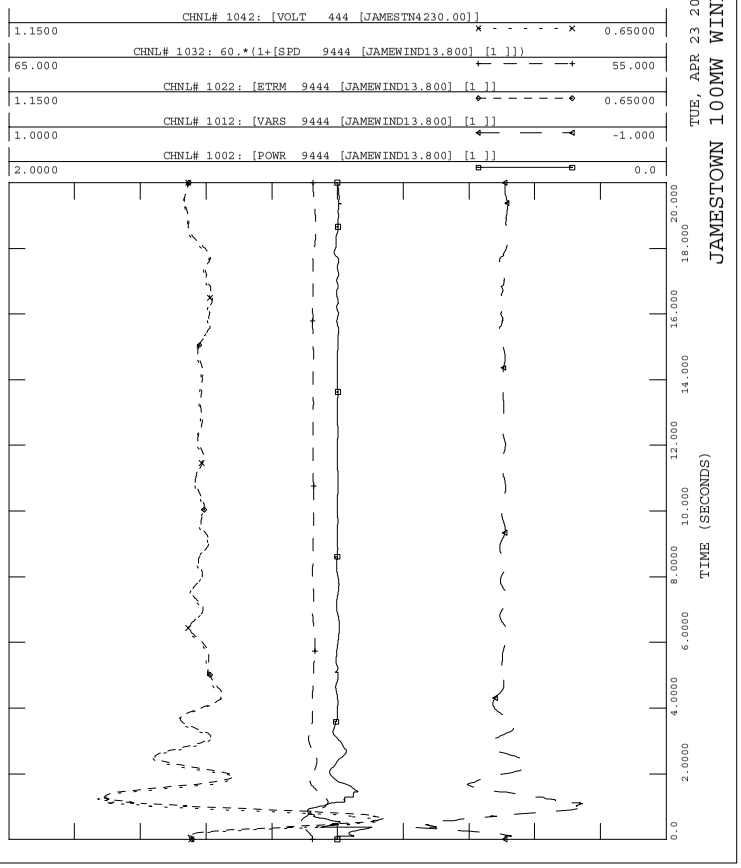
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



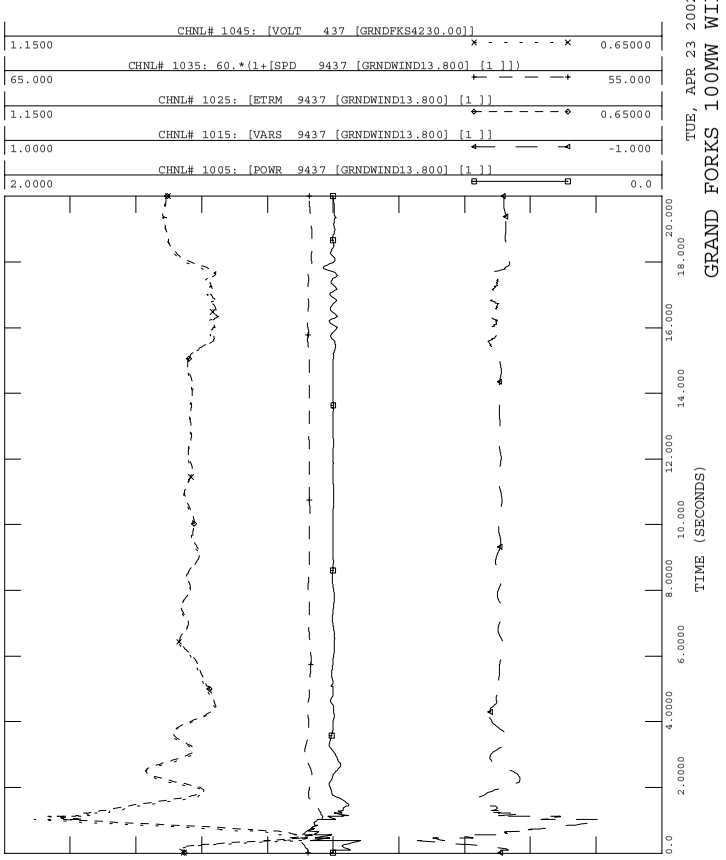
MP-OH I.FALLS (779)
TUE, APR 23 2002 18:25

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



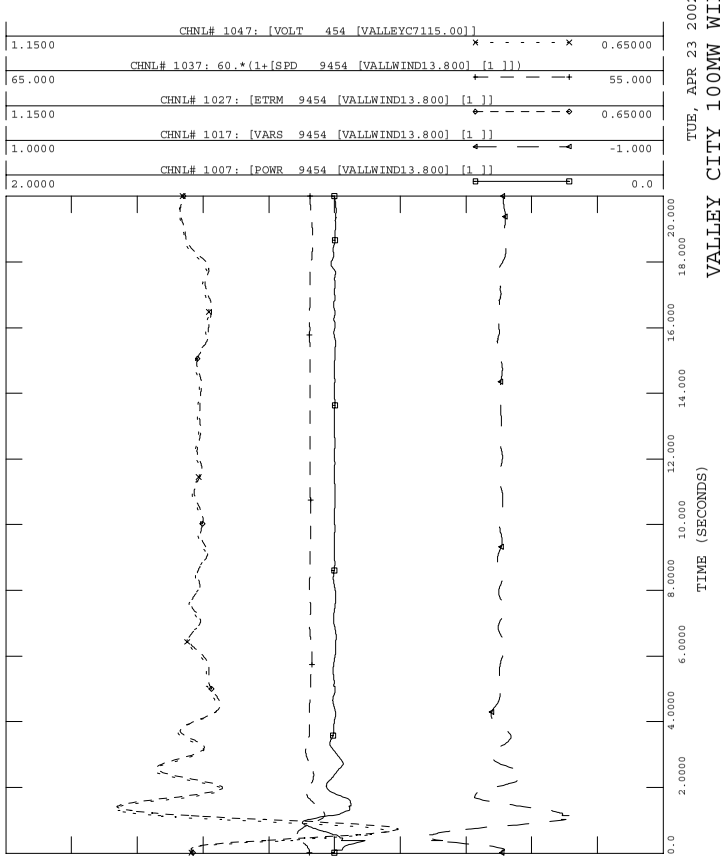
JAMESTOWN 100MW WIND UNIT
TUE, APR 23 2002 18:25

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



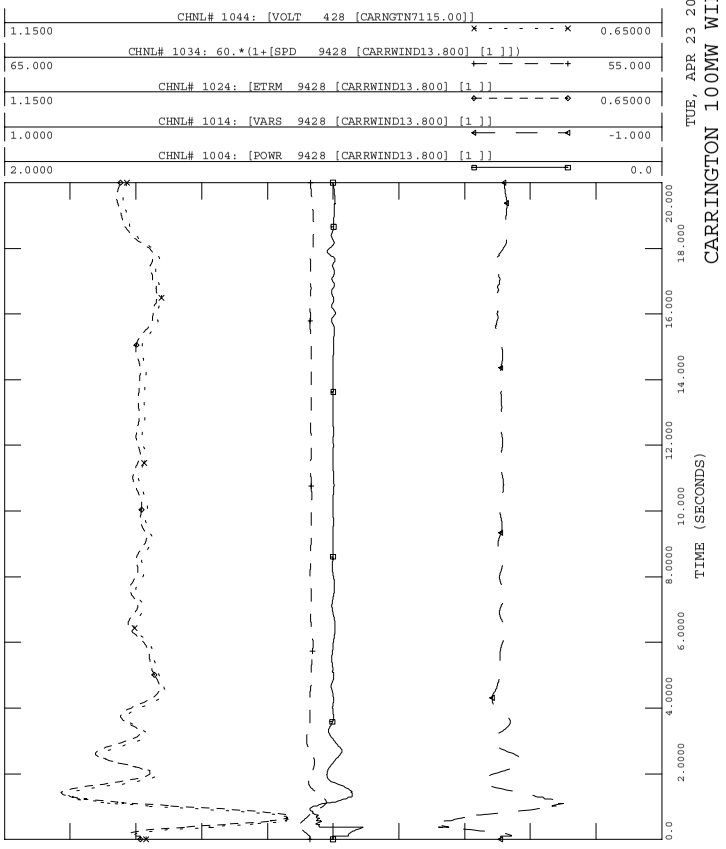
TUE, APR 23 2002 18:25
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



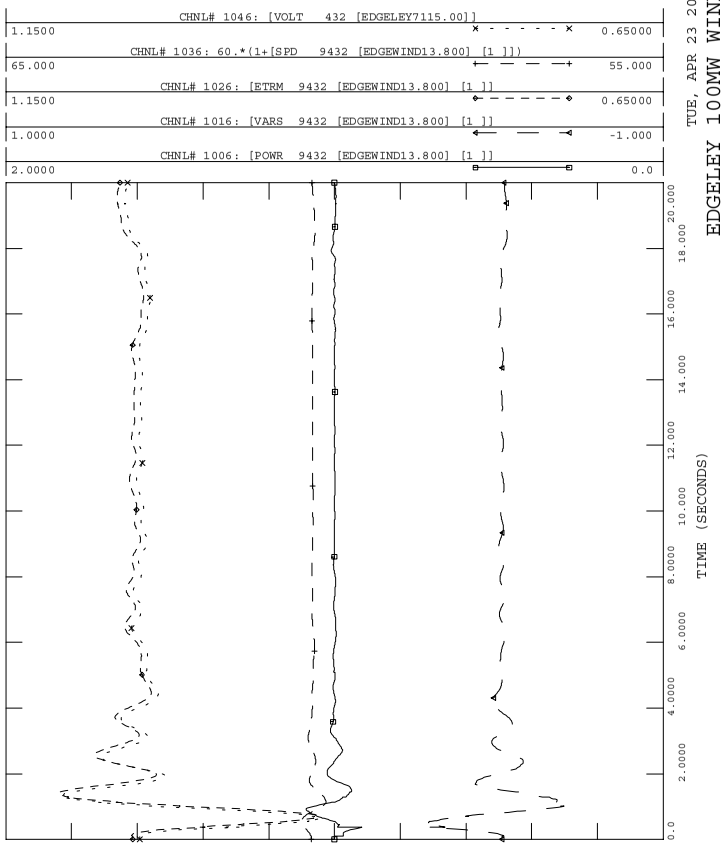
TUE, APR 23 2002 18:25
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



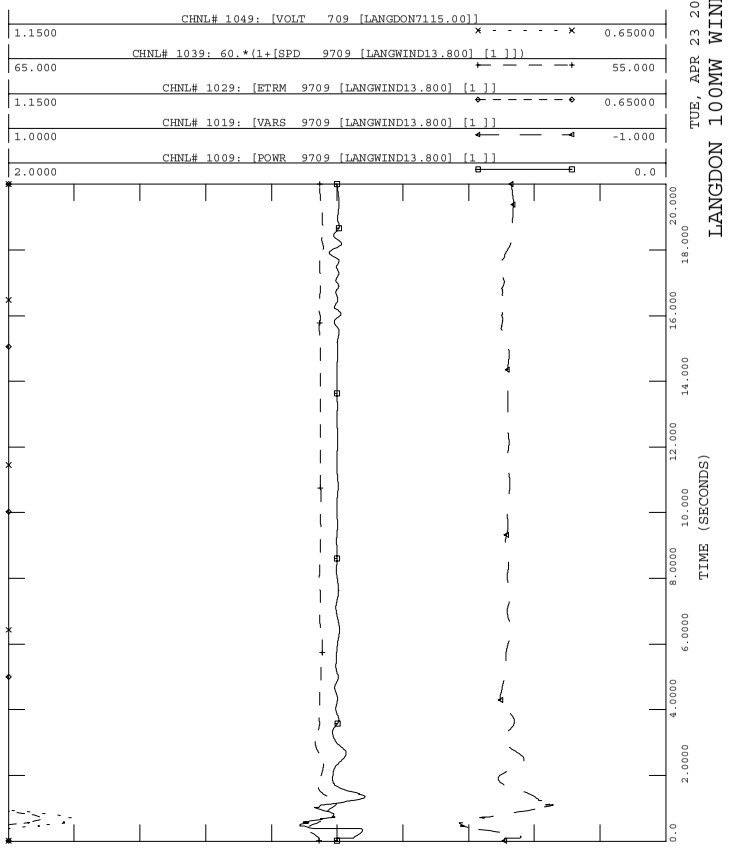
TUE, APR 23 2002 18:25
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin

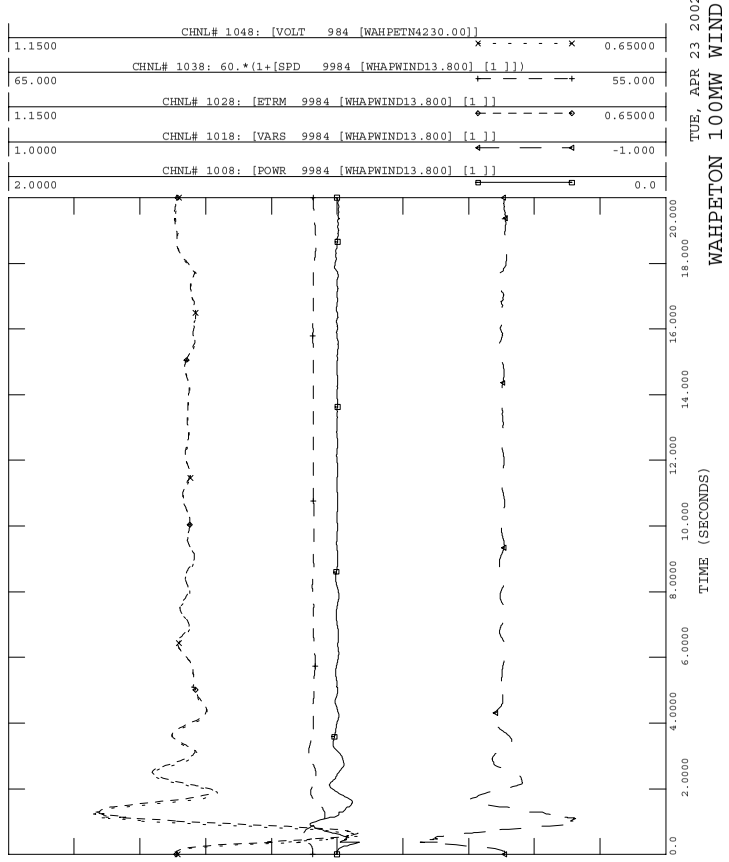


TUE, APR 23 2002 18:25
EDGELEY 100MW WIND UNIT

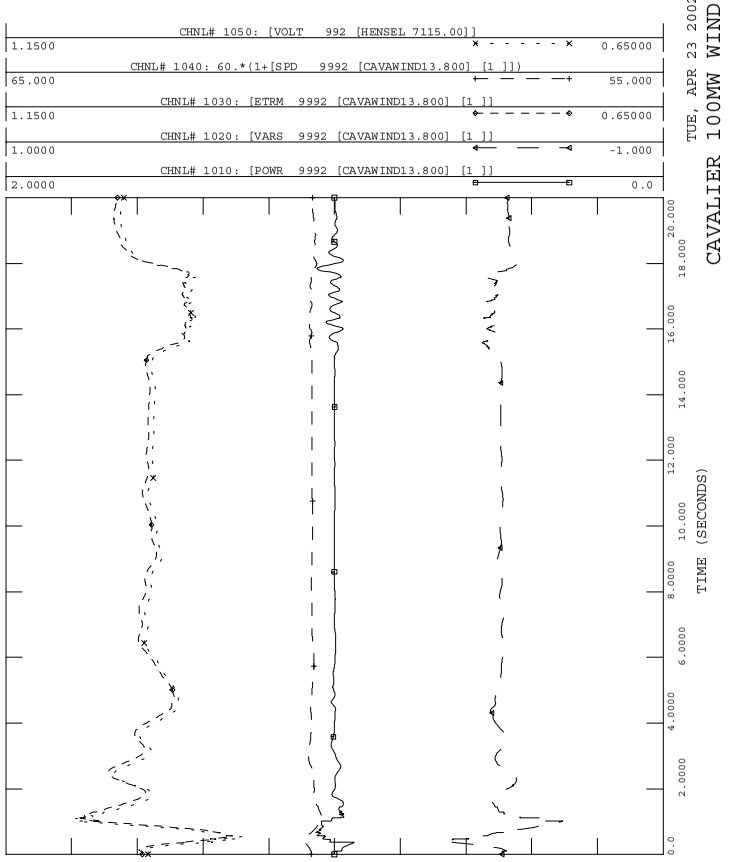
UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



UPE-SO04AA.S2C4XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XXX-ei2.bin



APPENDIX 17

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 2 (JAMESTOWN)

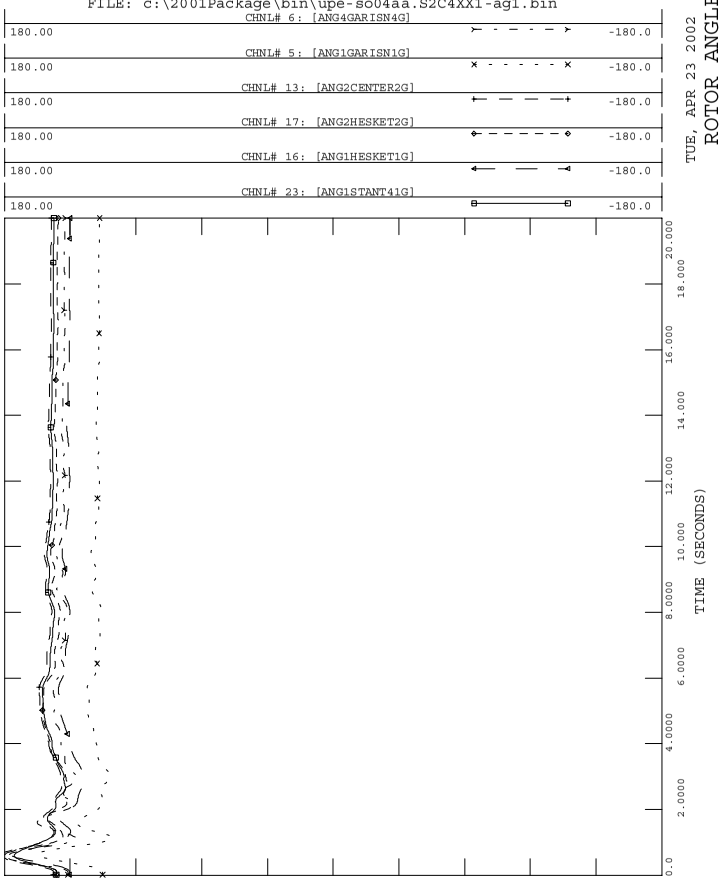
CASE S2C4XX1

CONTINGENCY AG1

Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

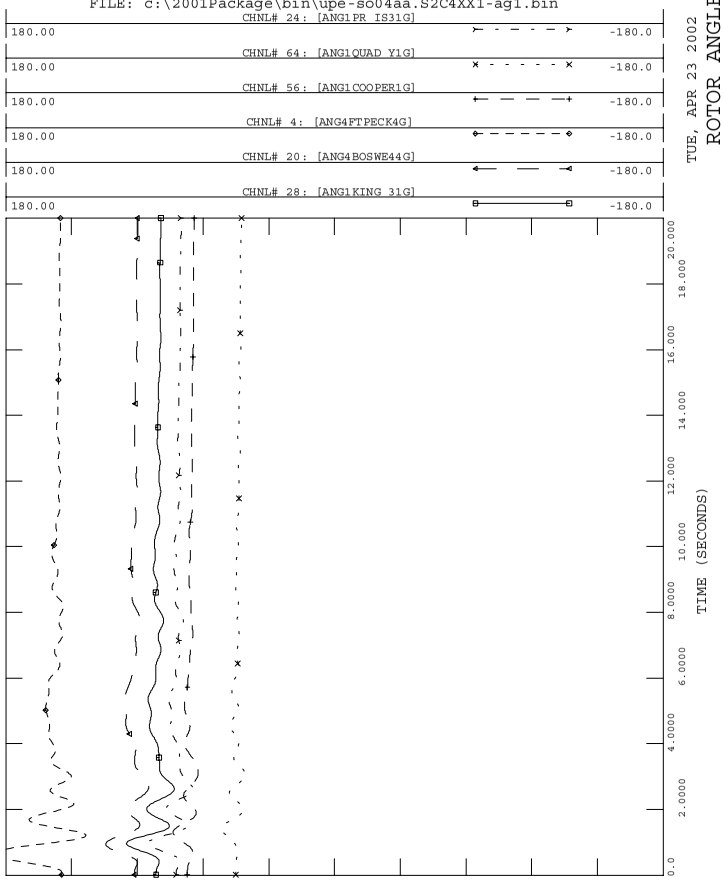
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
ROTOR ANGLES 2



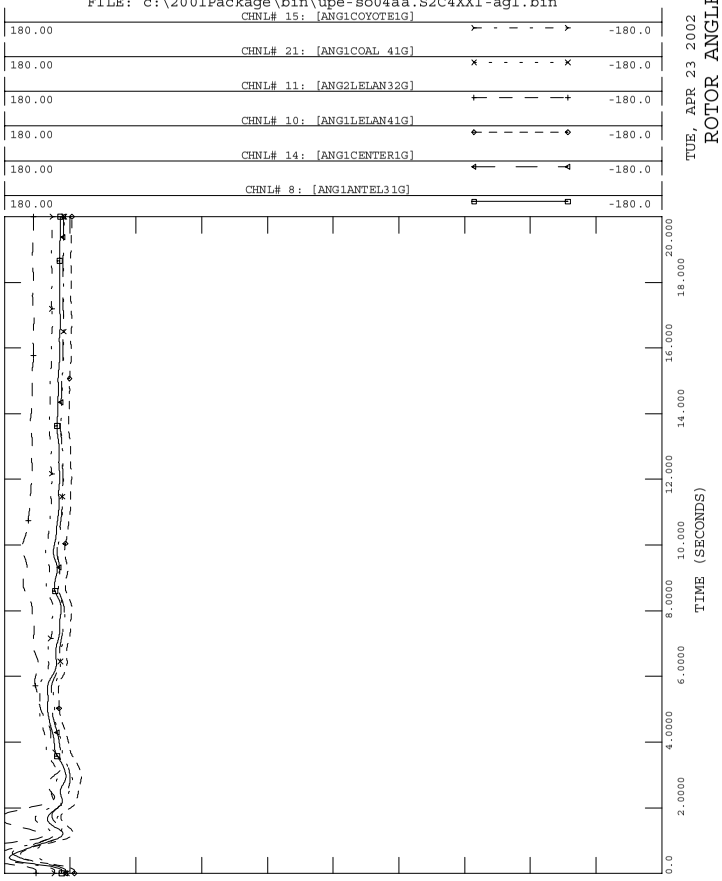
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
ROTOR ANGLES 4



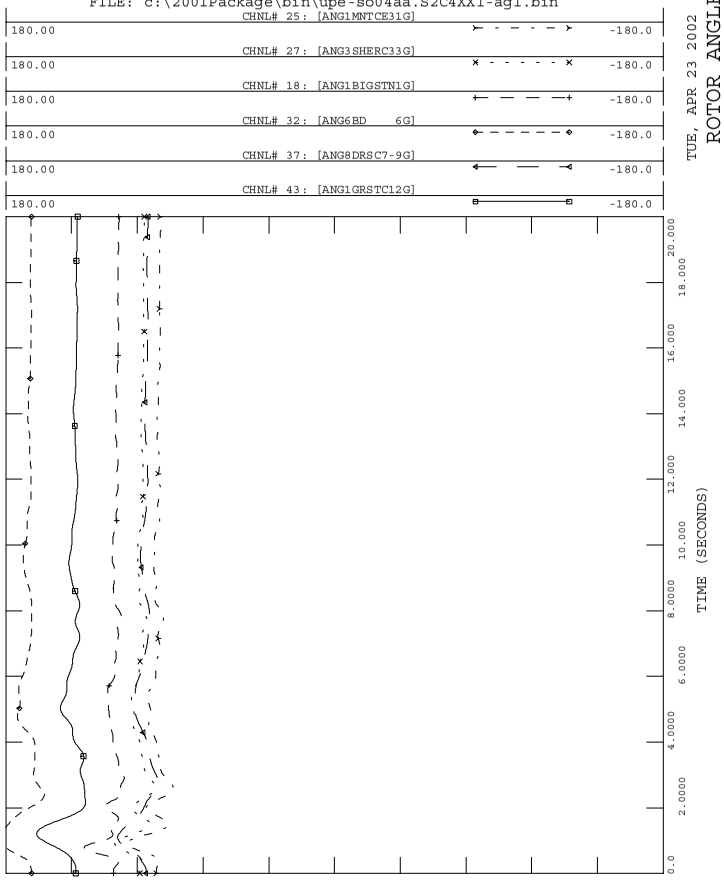
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
ROTOR ANGLES 1



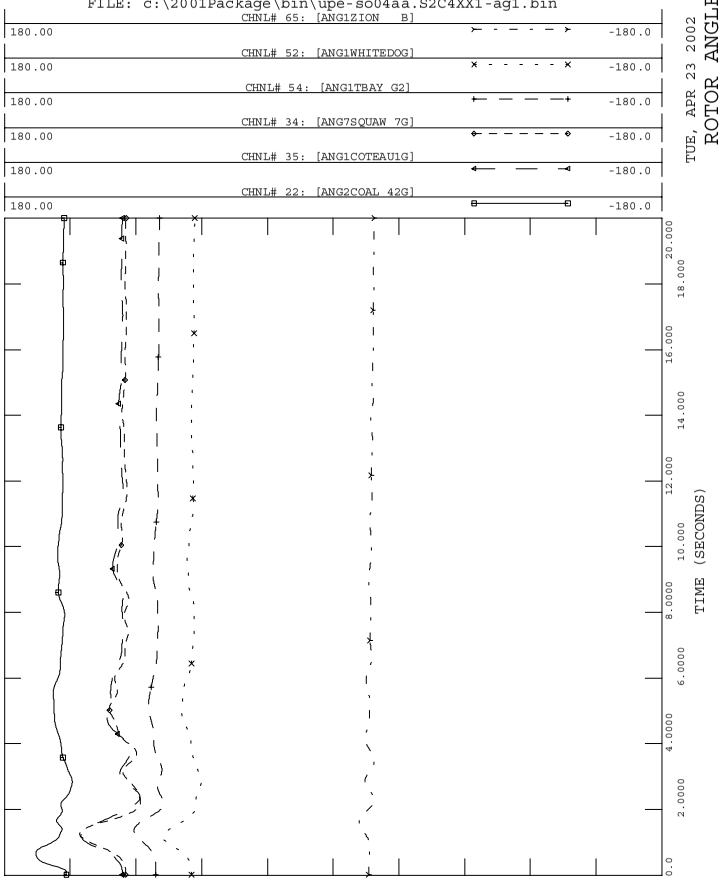
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
ROTOR ANGLES 3



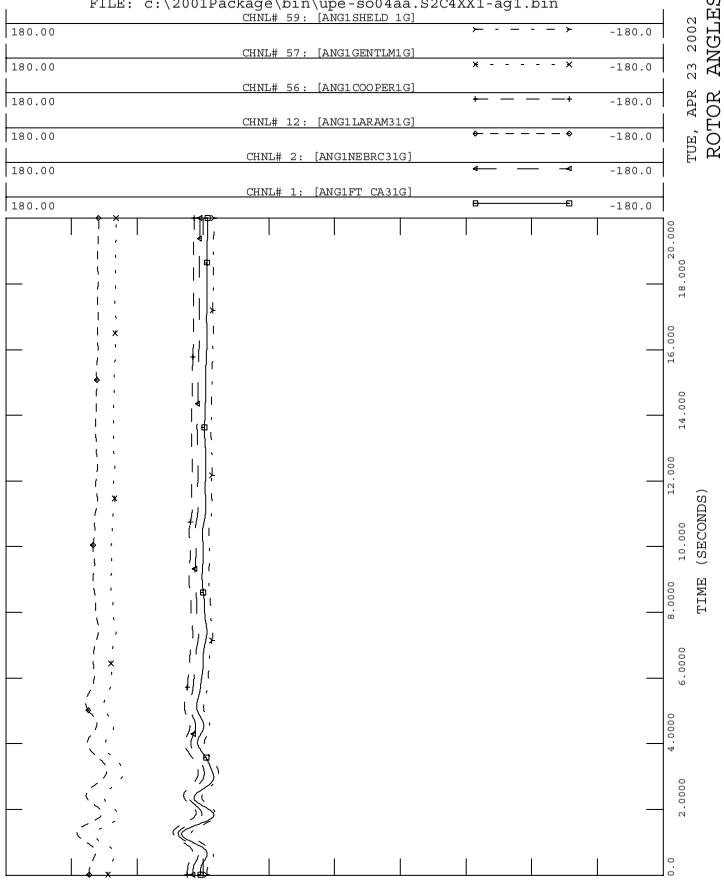
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
ROTOR ANGLES 6



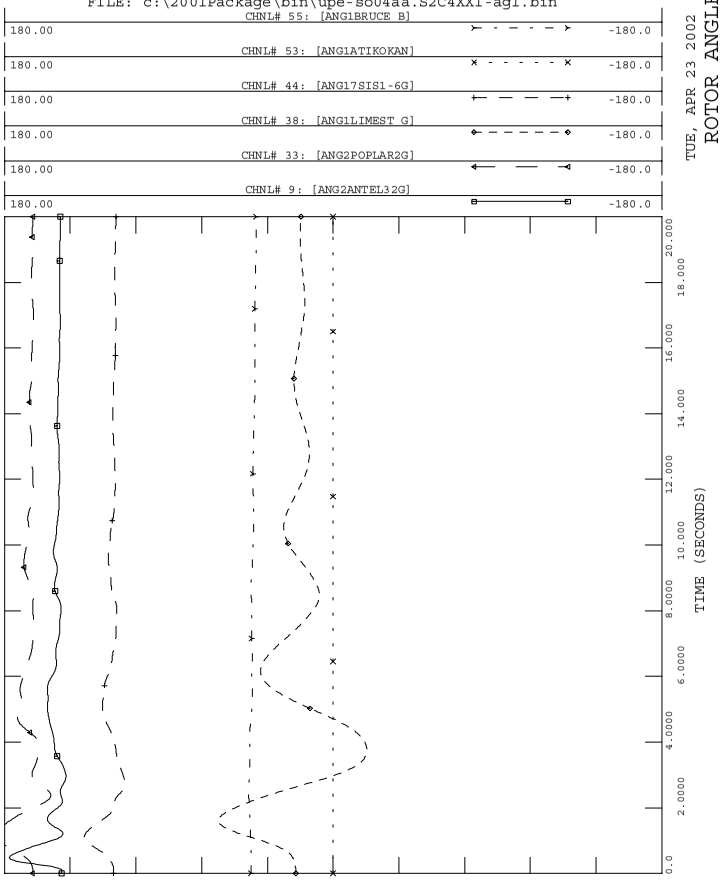
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
ROTOR ANGLES NB



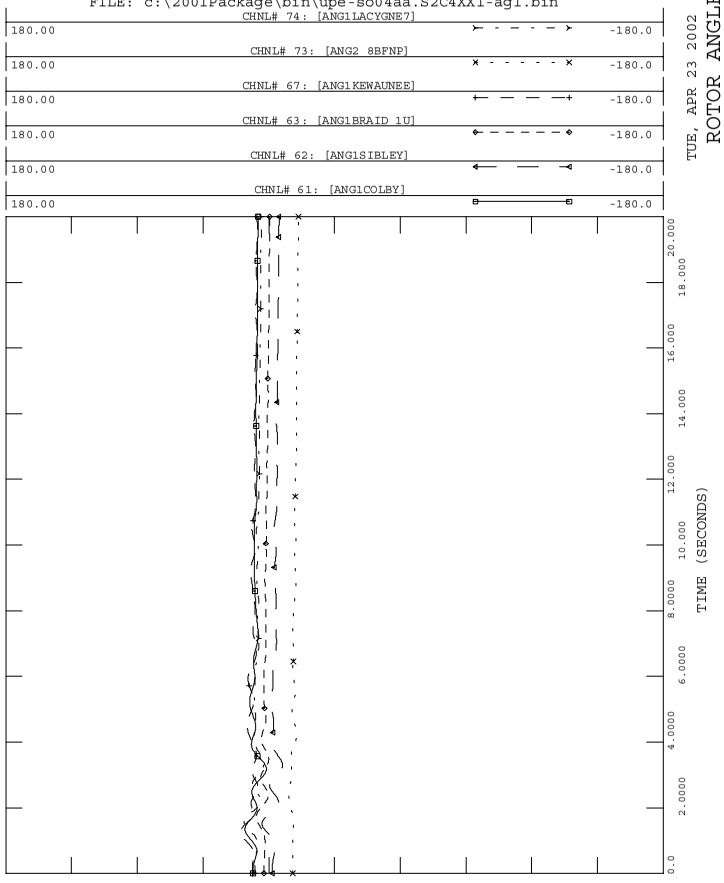
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
ROTOR ANGLES 5



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
ROTOR ANGLES 7



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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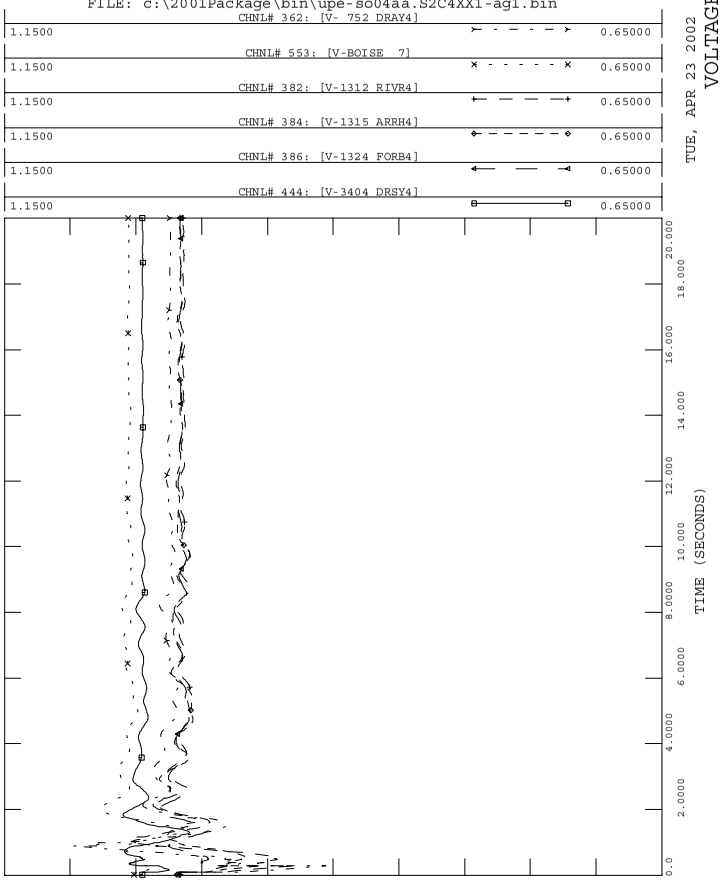
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



TUE, APR 23 2002 20:25
VOLTAGES 1

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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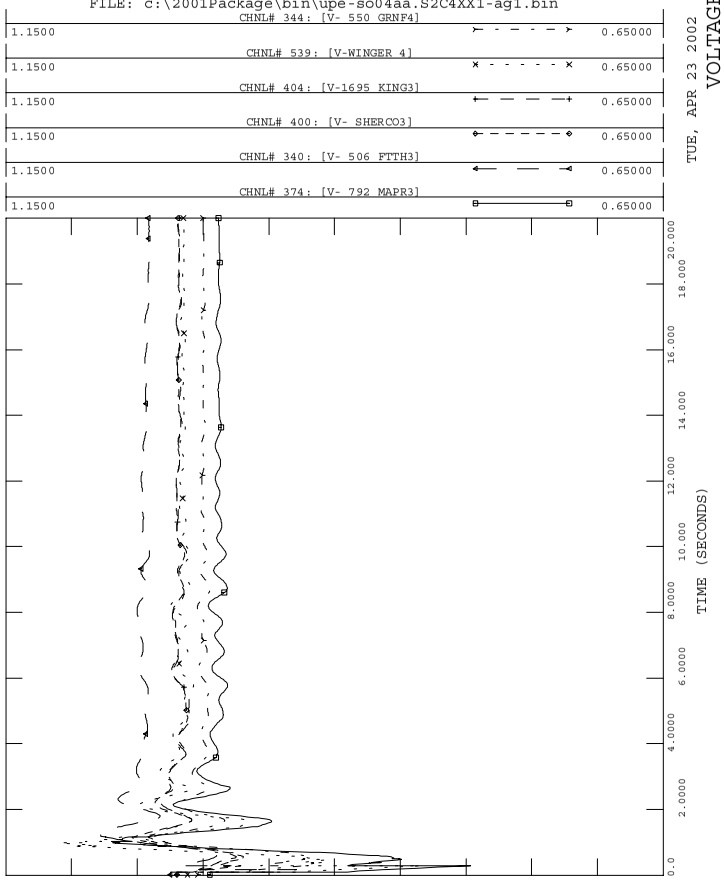
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



TUE, APR 23 2002 20:25
VOLTAGES 3

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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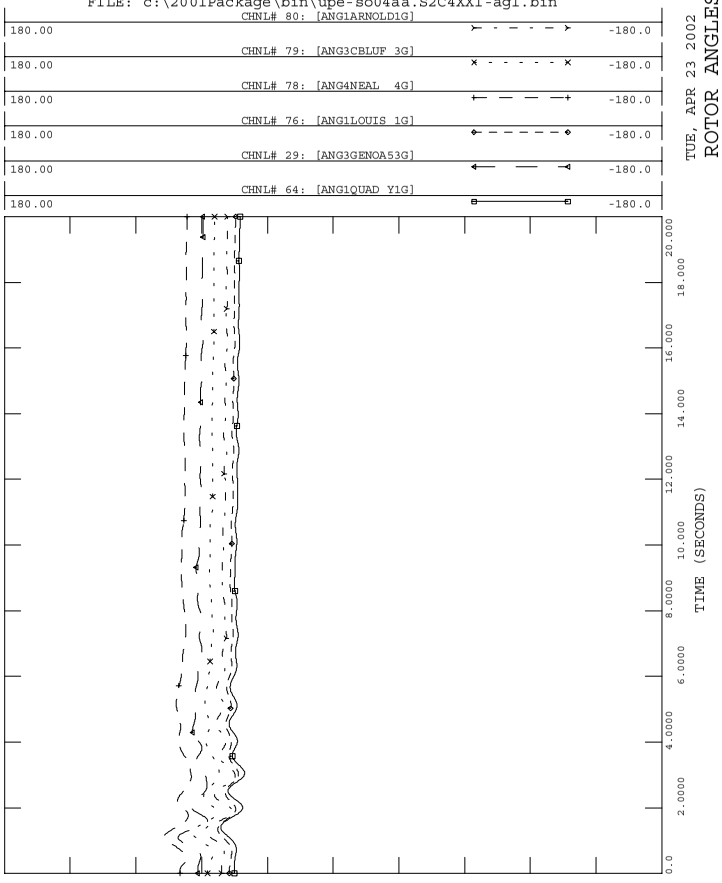
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



TUE, APR 23 2002 20:25
ROTOR ANGLES IA

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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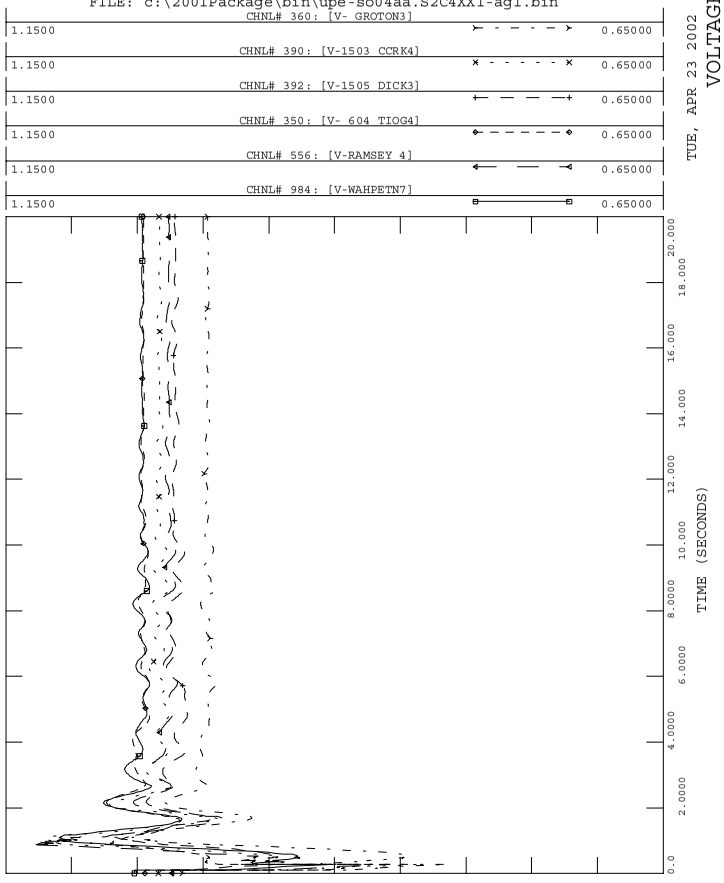
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



TUE, APR 23 2002 20:25
VOLTAGES 2

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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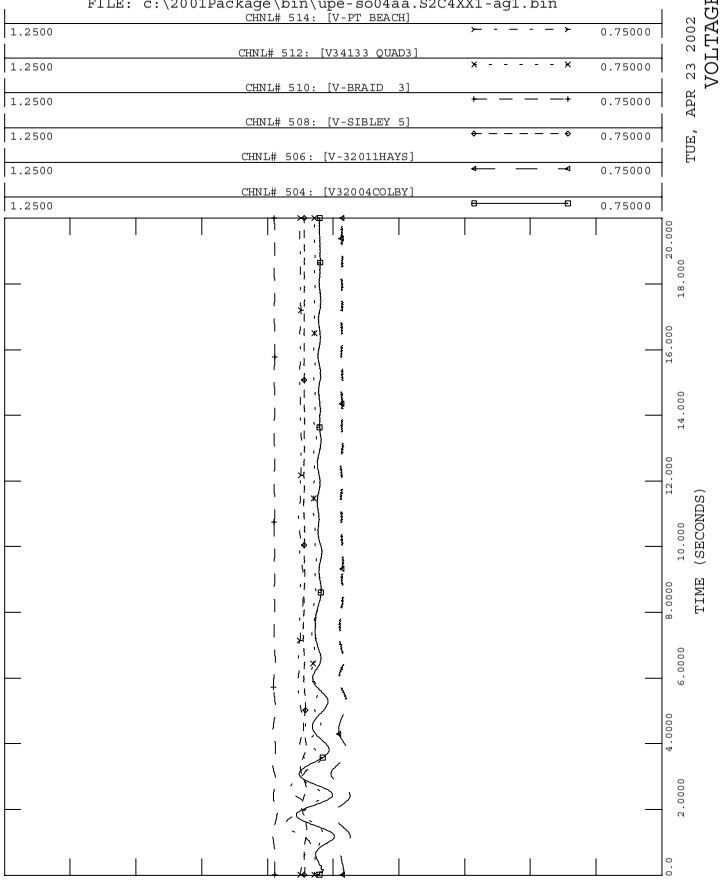
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
VOLTAGES 5



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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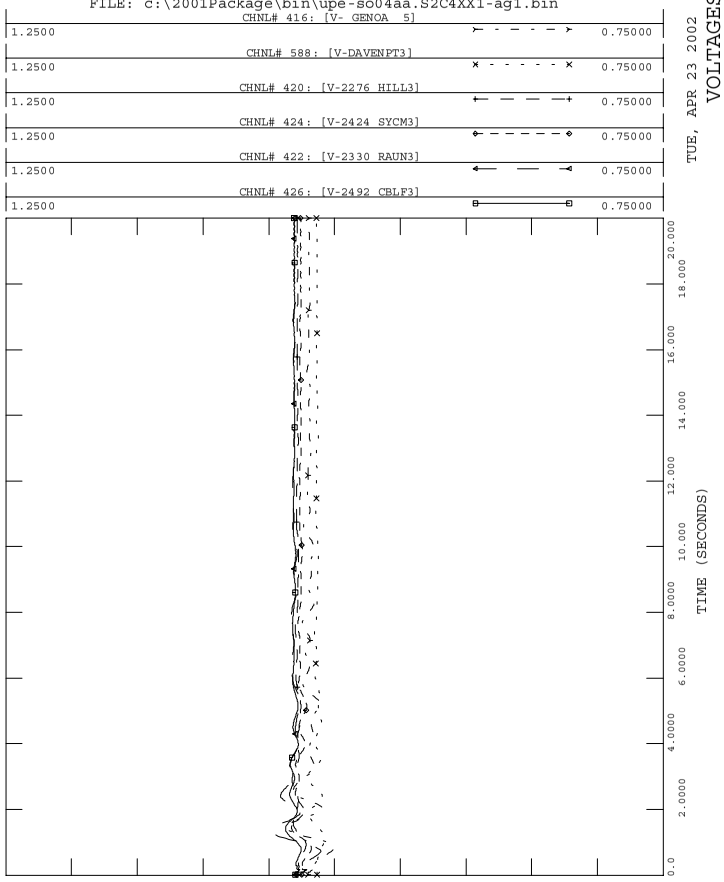
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
VOLTAGES IA



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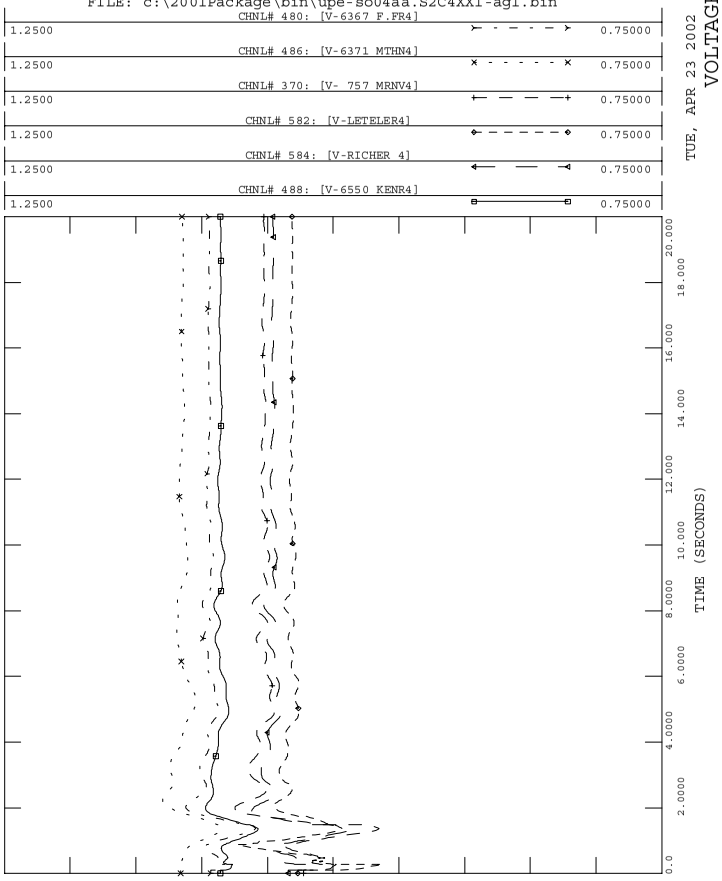
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
VOLTAGES 4



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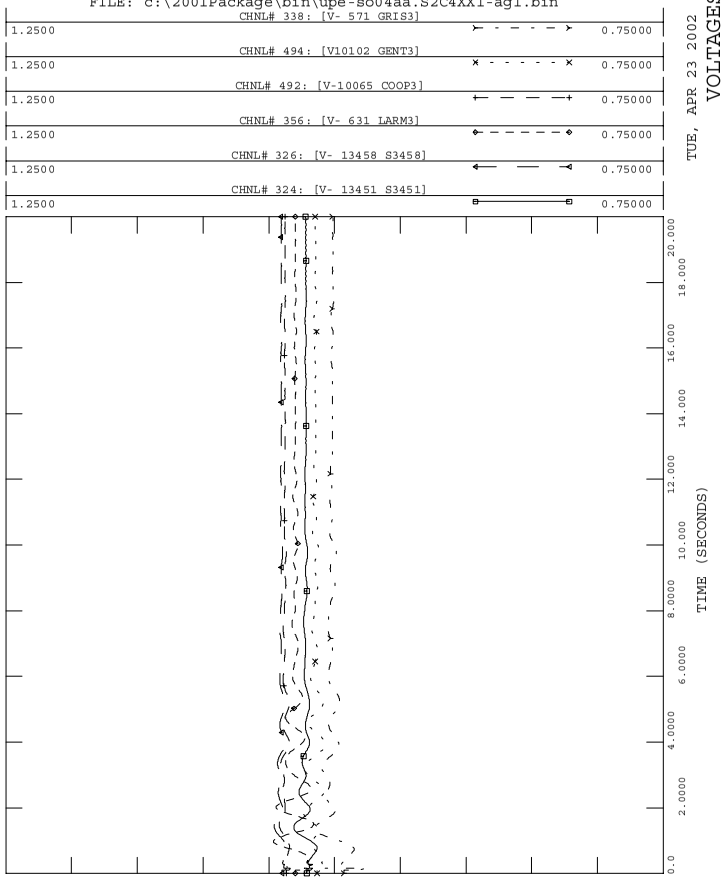
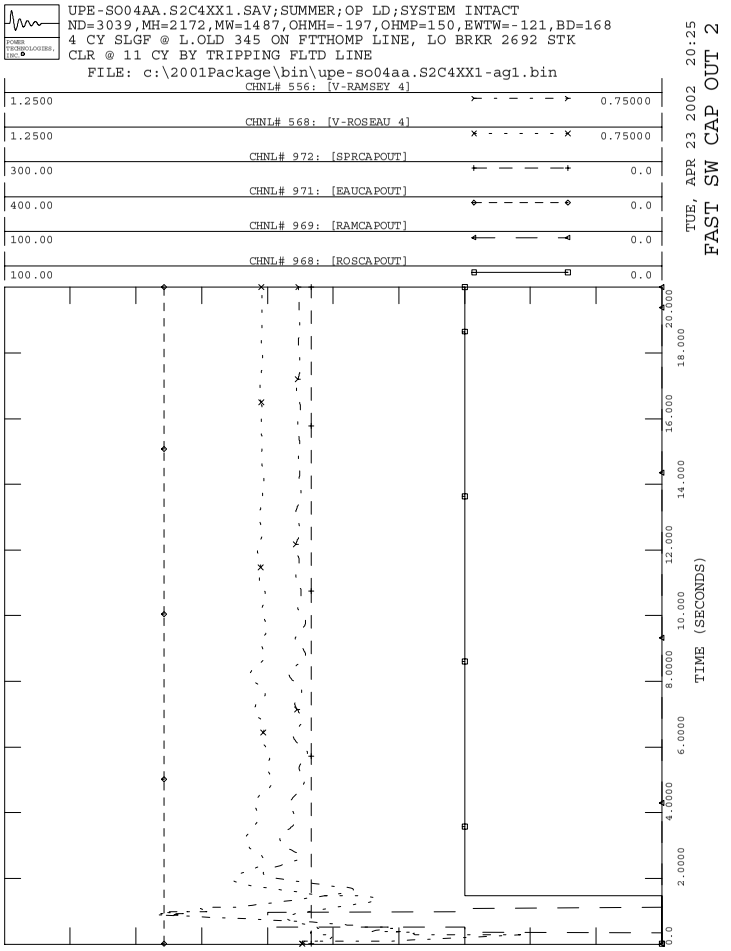
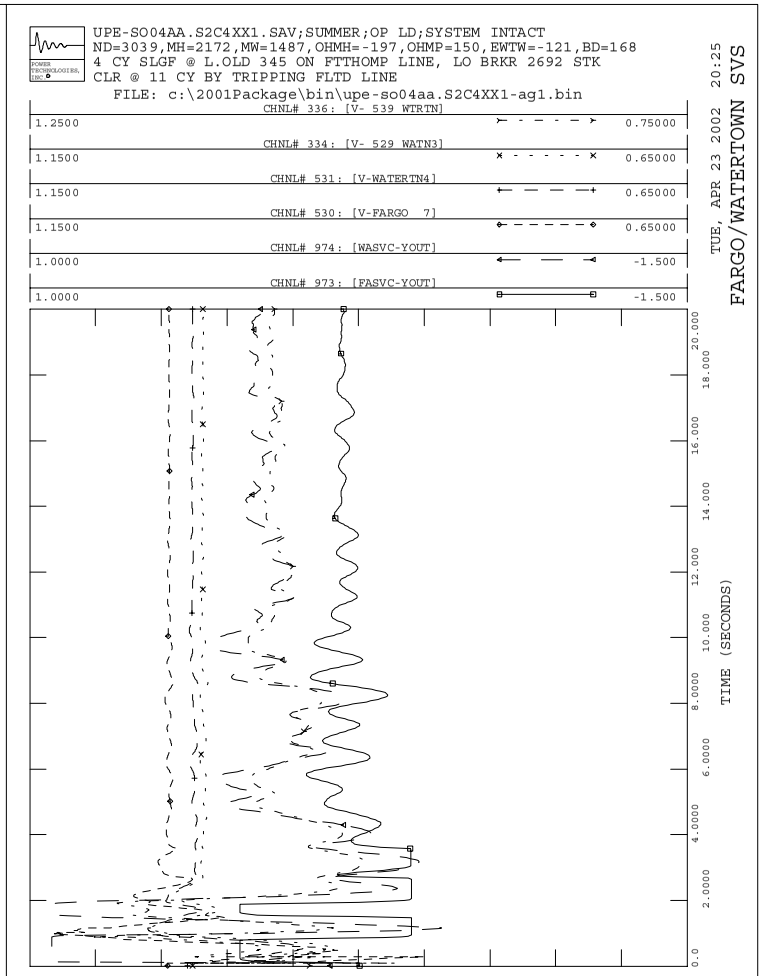
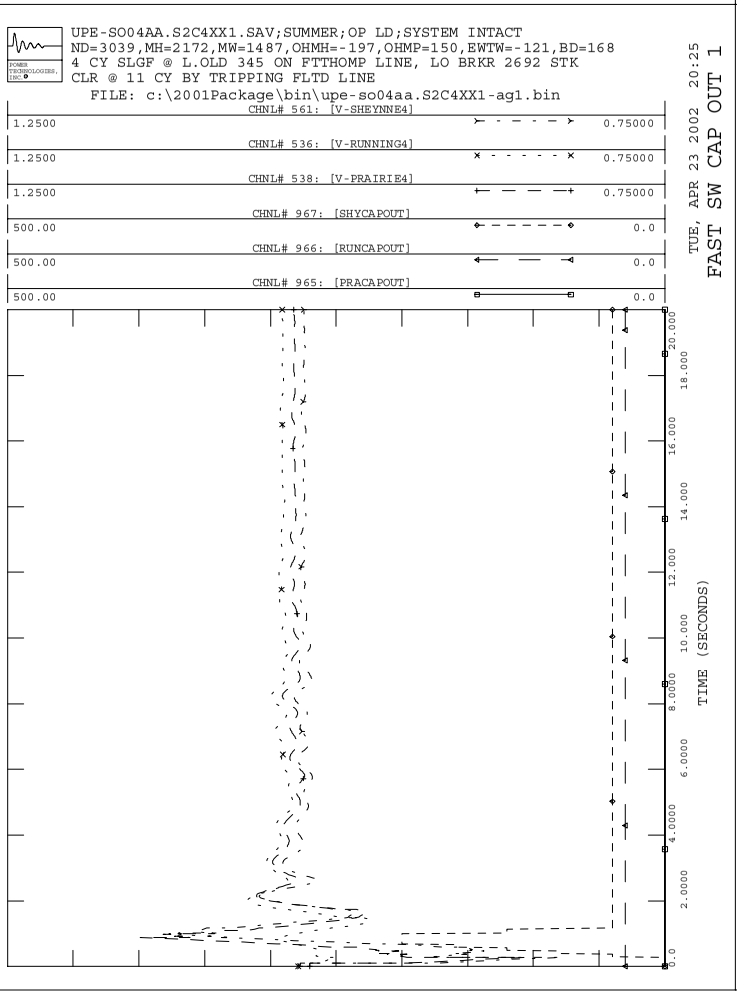
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

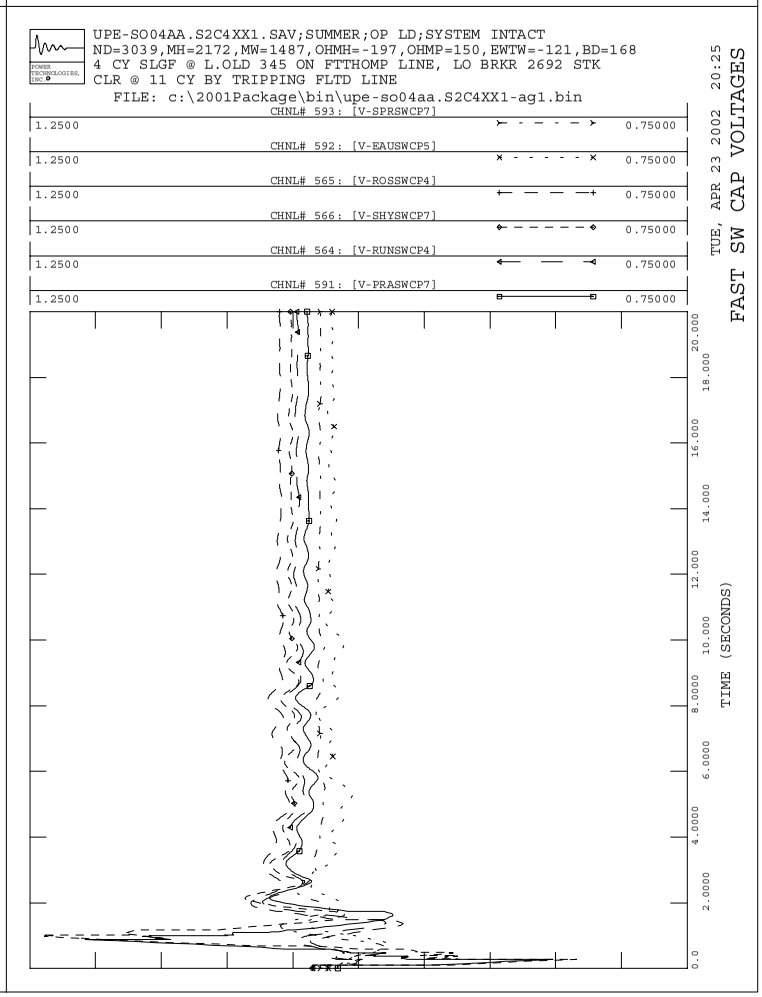
TUE, APR 23 2002 20:25
VOLTAGES NB



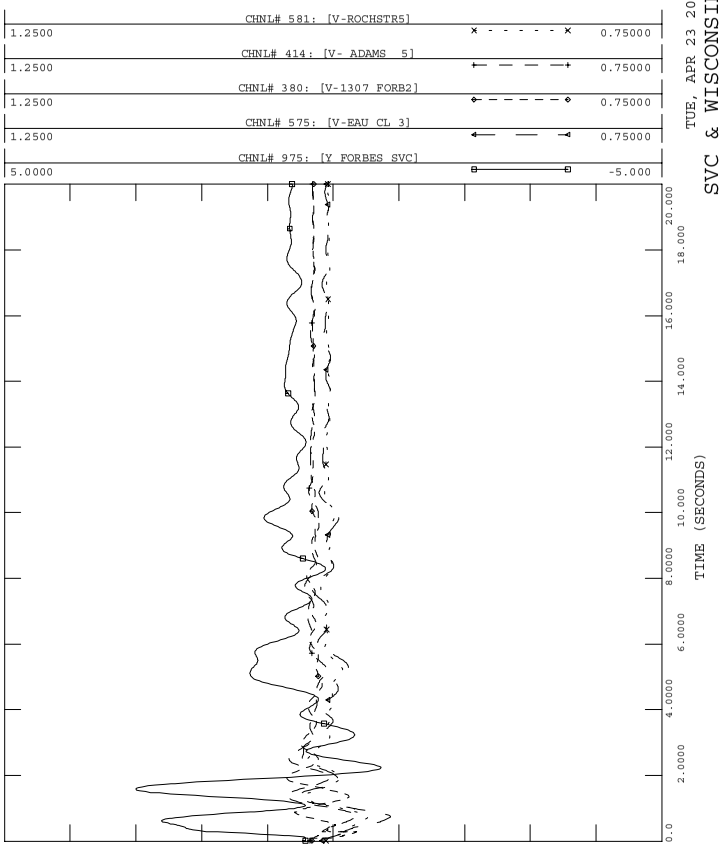

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TUE, APR 23 2002 20:25
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TUE, APR 23 2002 20:25
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TUE, APR 23 2002 20:25
FAST SW CAP OUT 1
TIME (SECONDS)

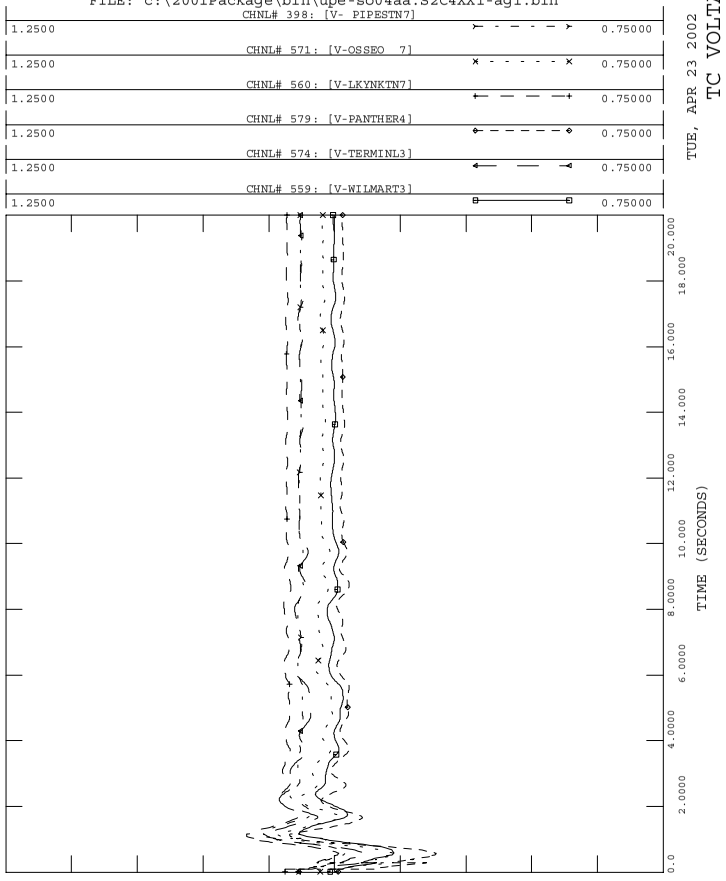

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TUE, APR 23 2002 20:25
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



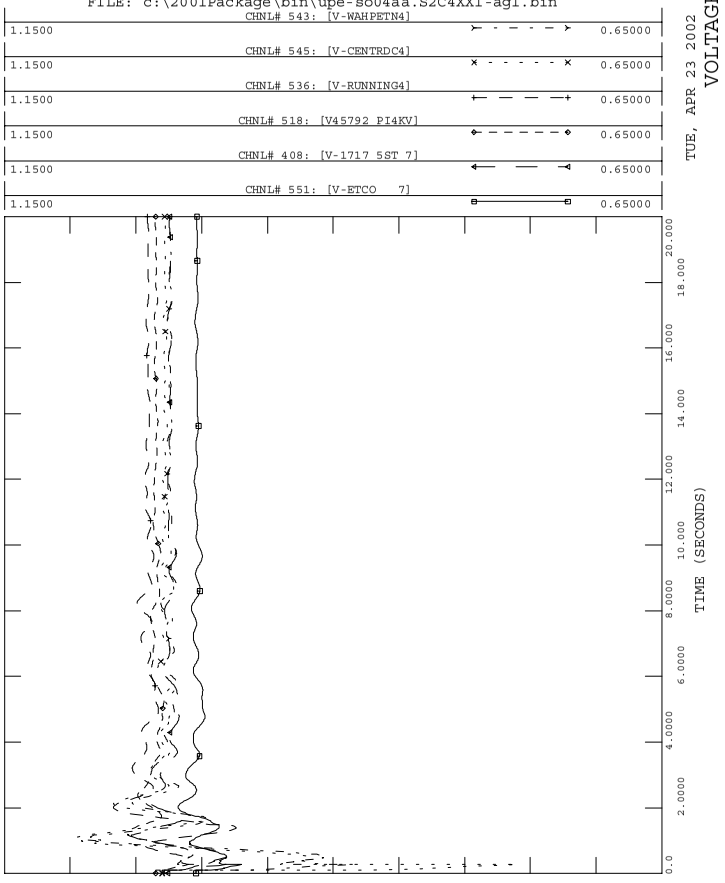
TUE, APR 23 2002 20:25
SVC & WISCONSIN VOLT

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



TUE, APR 23 2002 20:25
TC VOLTAGES

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



TUE, APR 23 2002 20:25
VOLTAGES 6

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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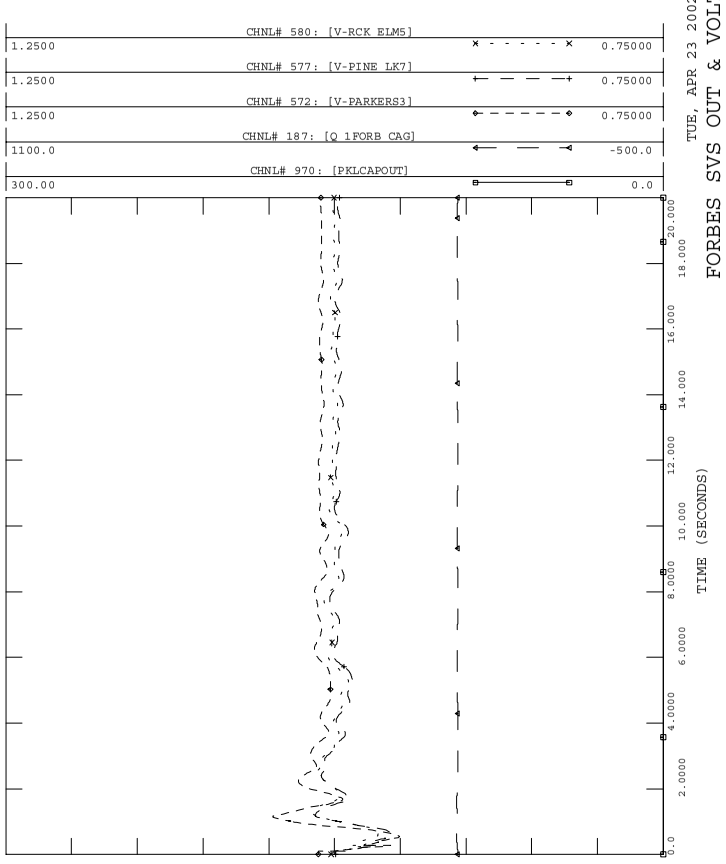
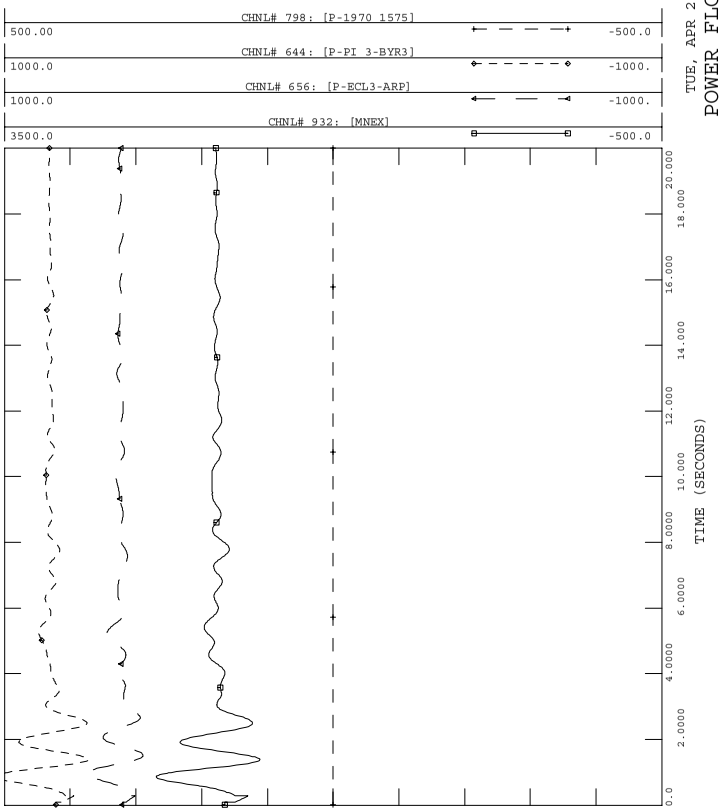
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



TUE, APR 23 2002 20:25
FORBES SVS OUT & VOLTAGES

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
POWER FLOW SUMS 2



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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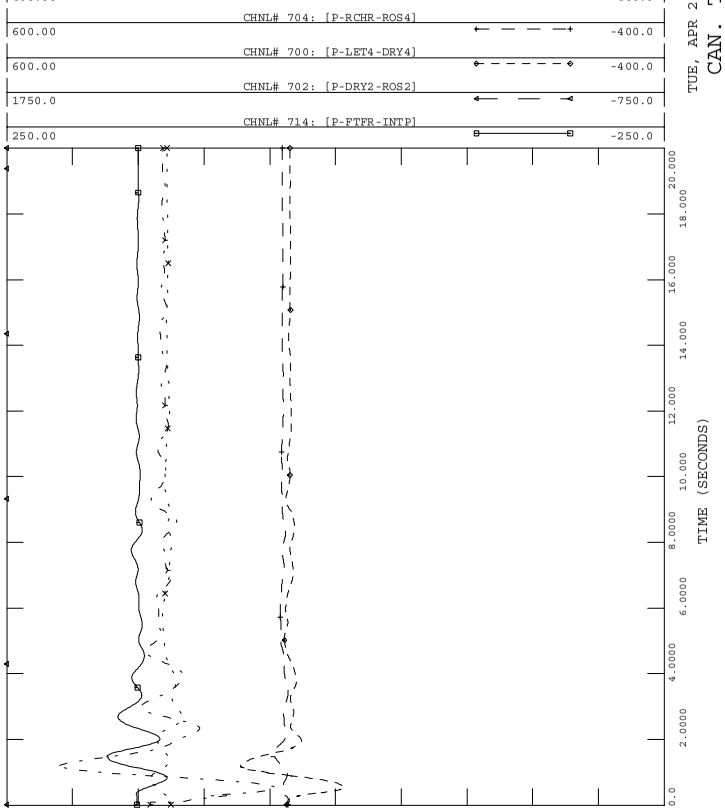
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
CAN. TIE FLOWS



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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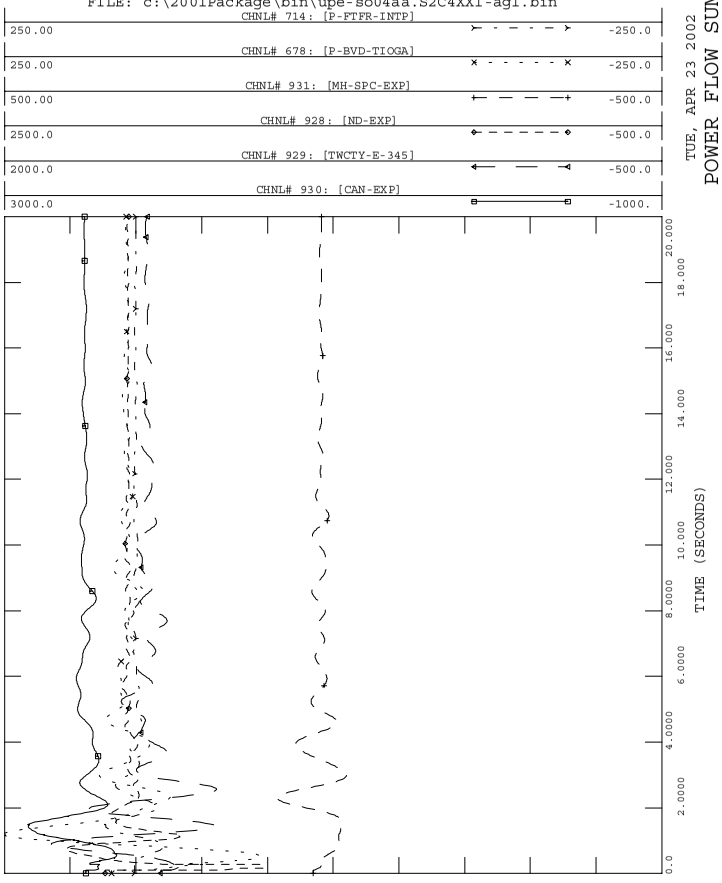
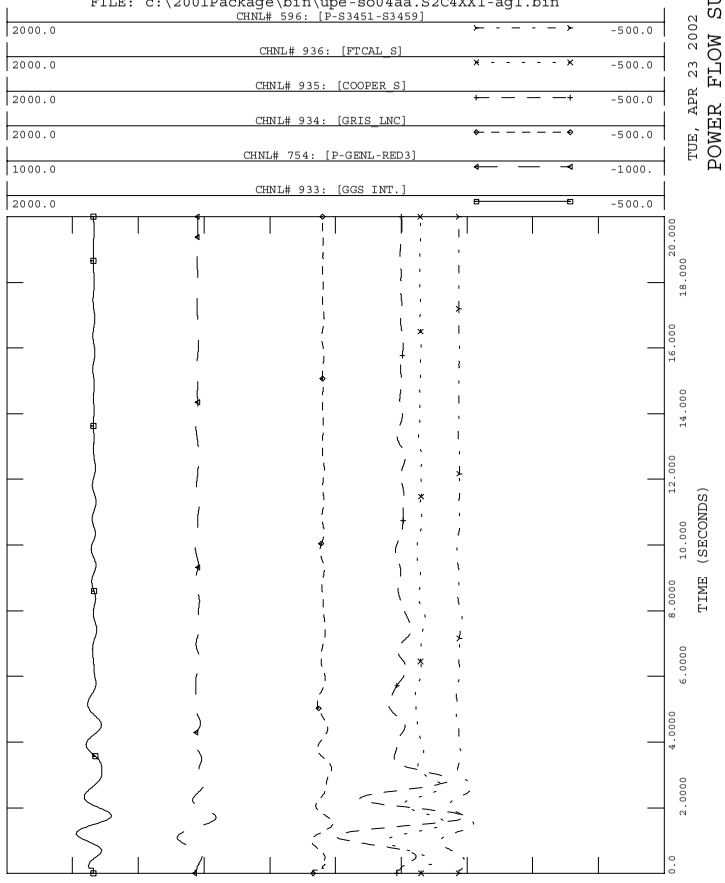
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
POWER FLOW SUMS 1



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
POWER FLOW SUM 3



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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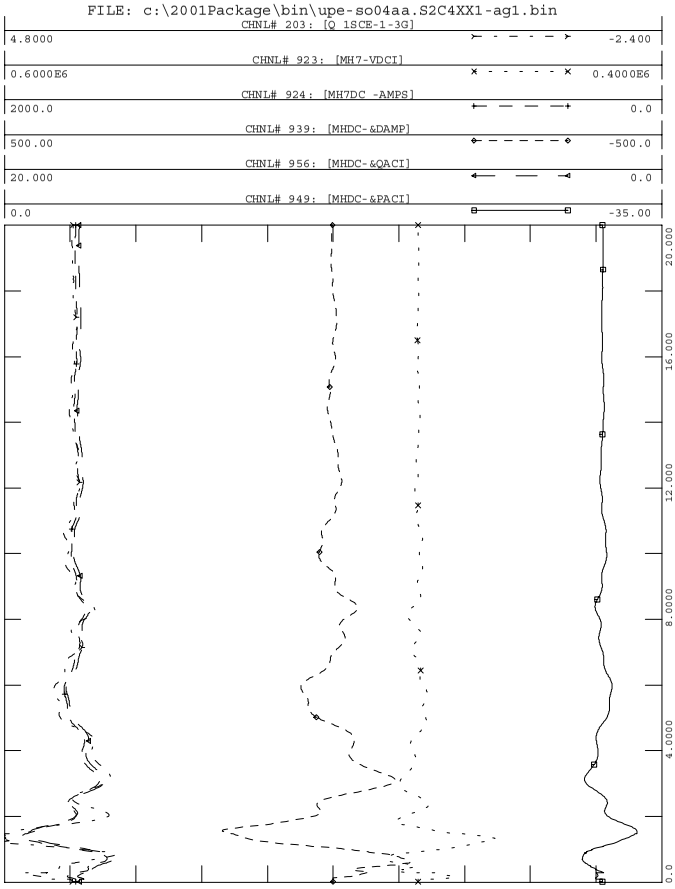
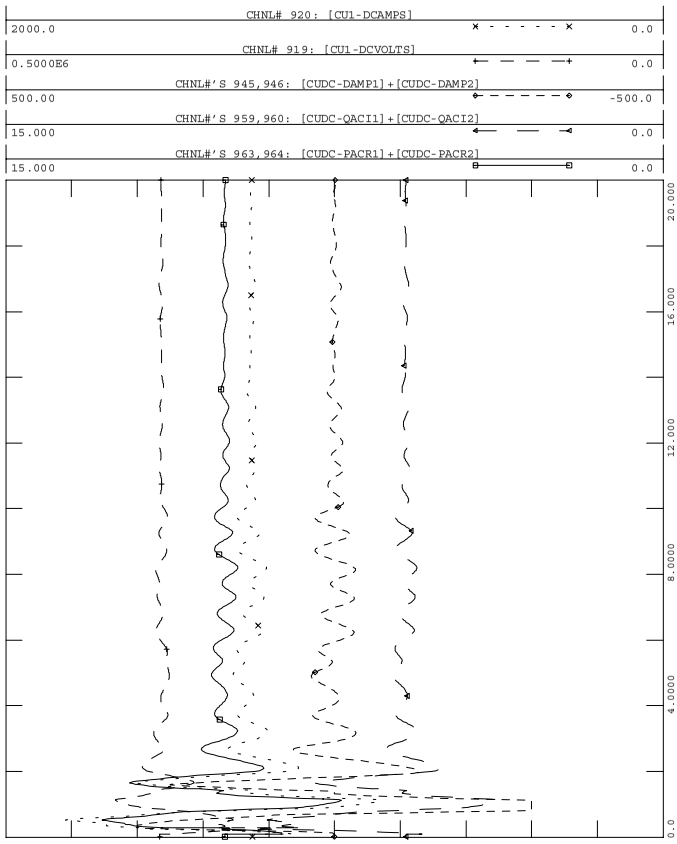
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
MH DC PARAMETERS



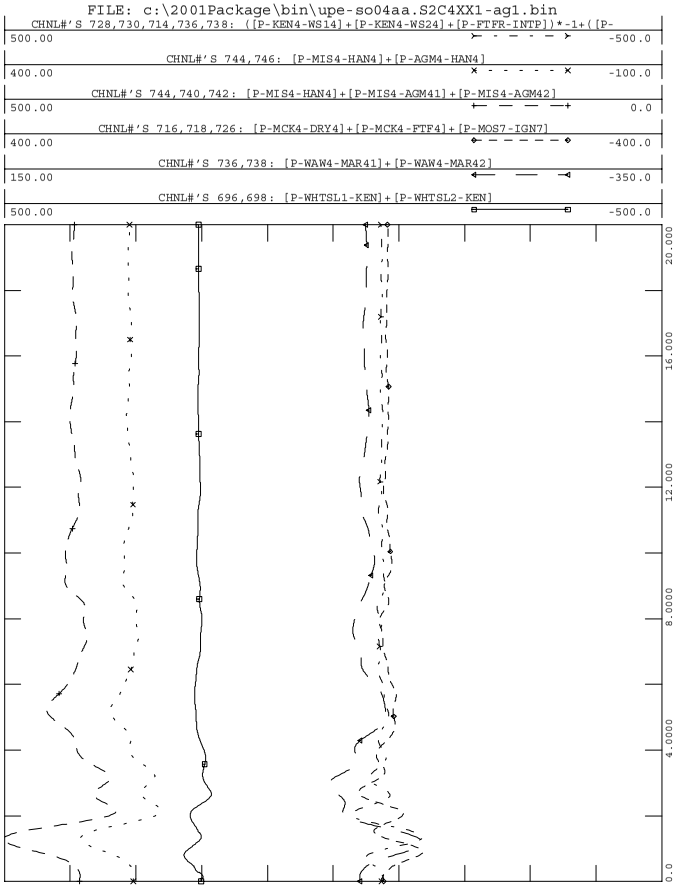
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25
CU DC #1



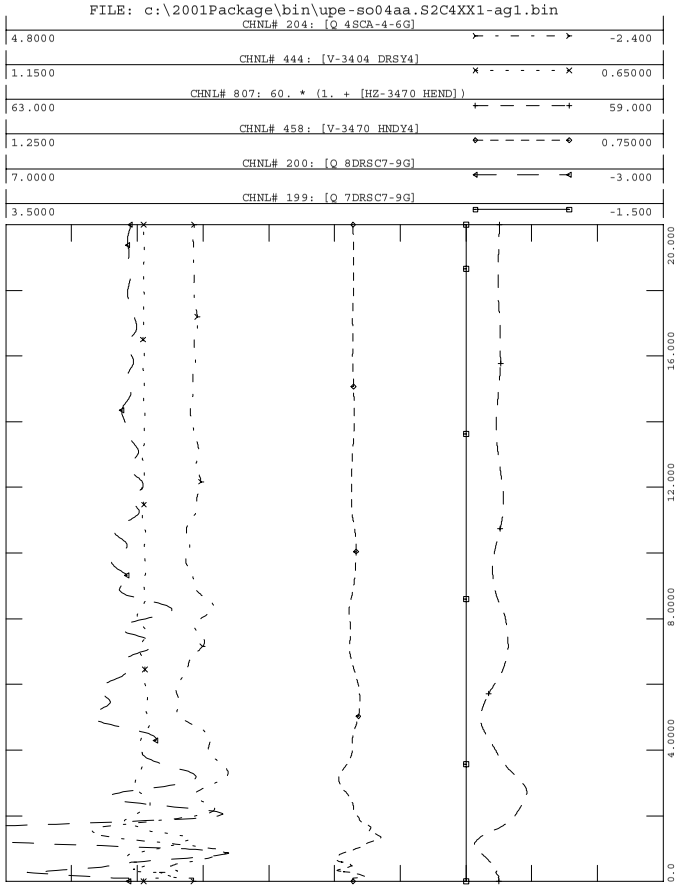
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

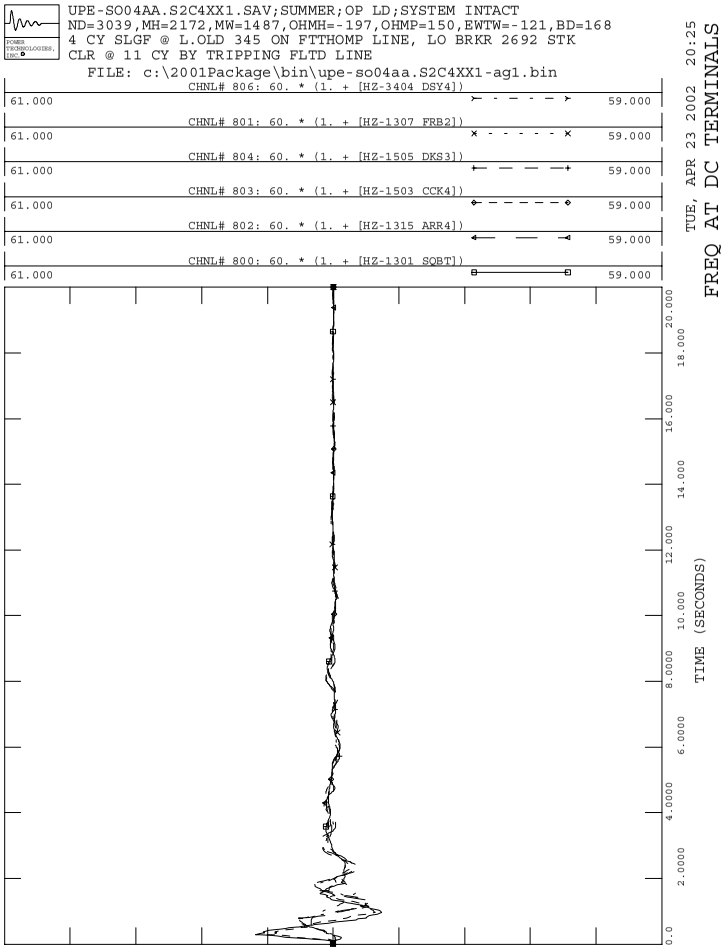
TUE, APR 23 2002 20:25
OH TIE FLOWS

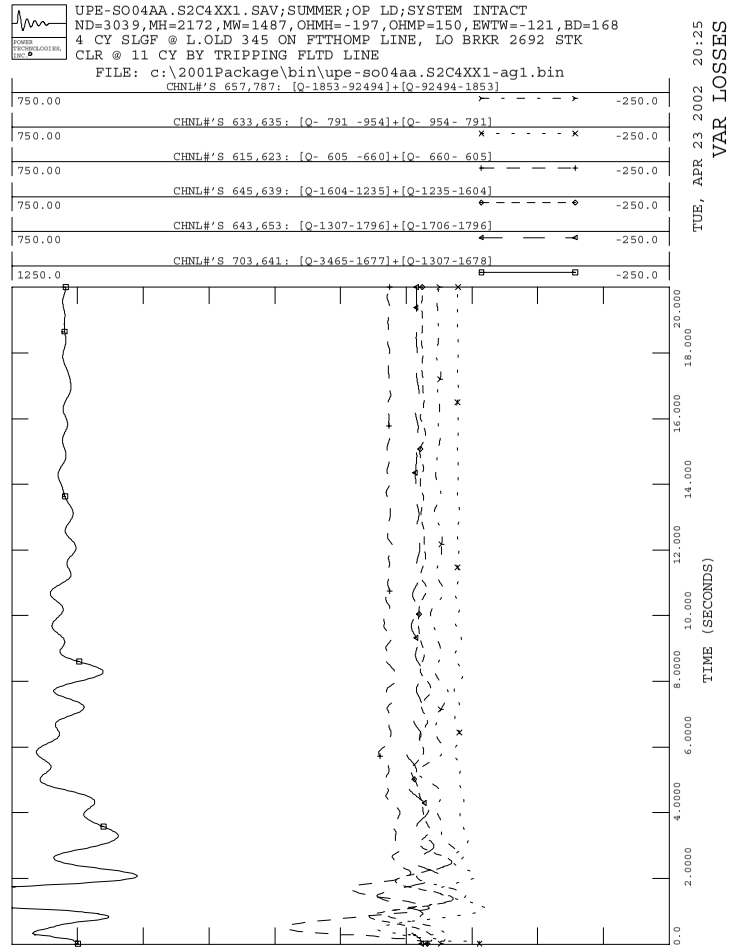


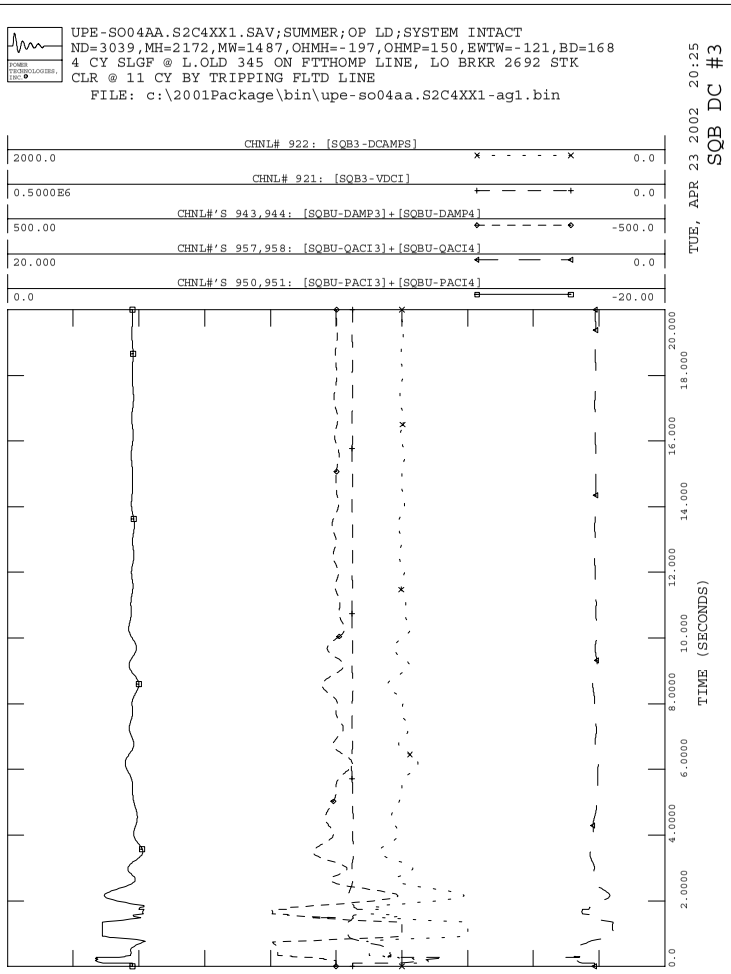
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

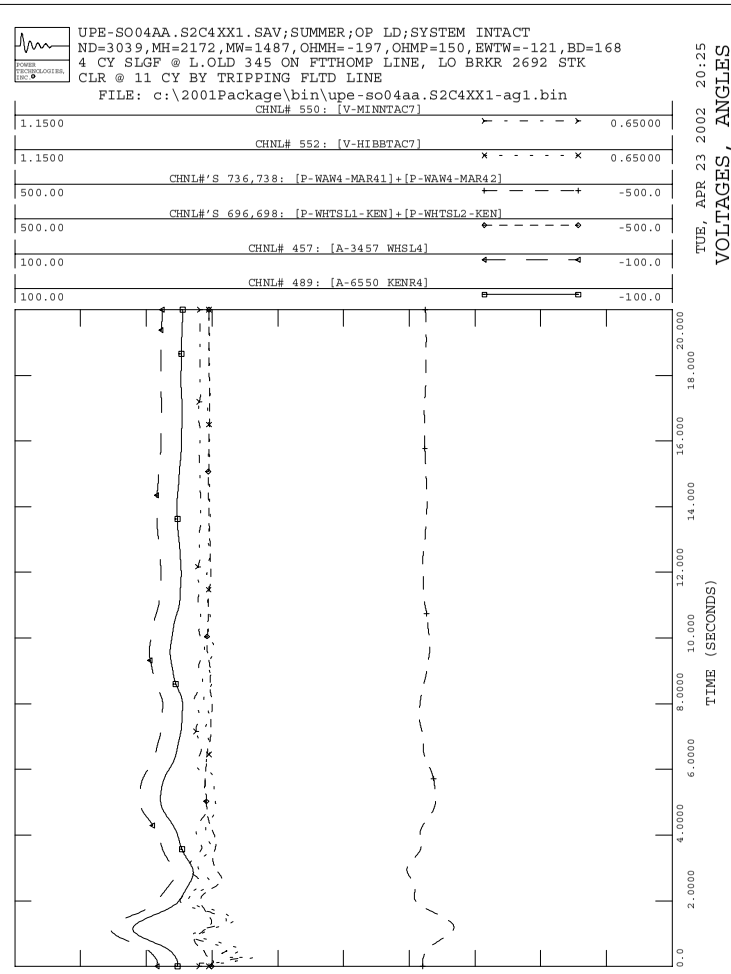
TUE, APR 23 2002 20:25
MH DC PARAMETERS




UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
TUE, APR 23 2002 20:25
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
TUE, APR 23 2002 20:25
VAR LOSSES
TIME (SECONDS)

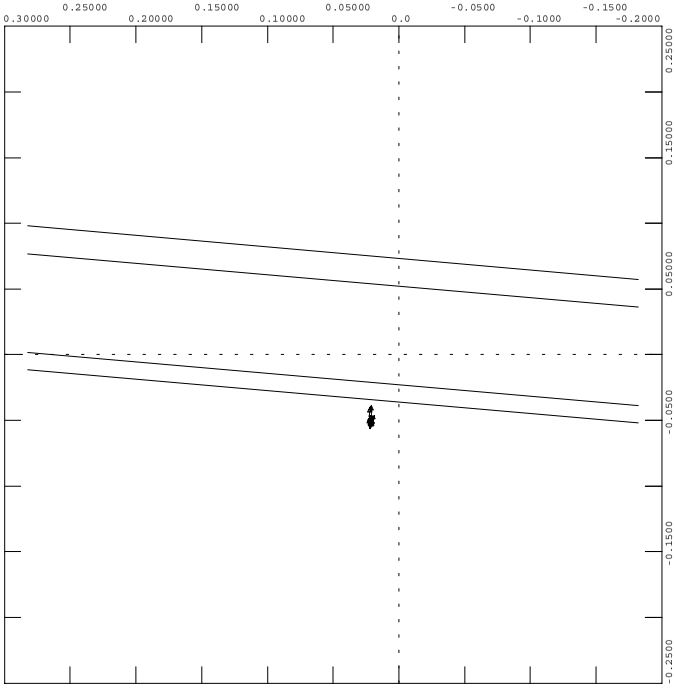

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
TUE, APR 23 2002 20:25
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
TUE, APR 23 2002 20:25
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

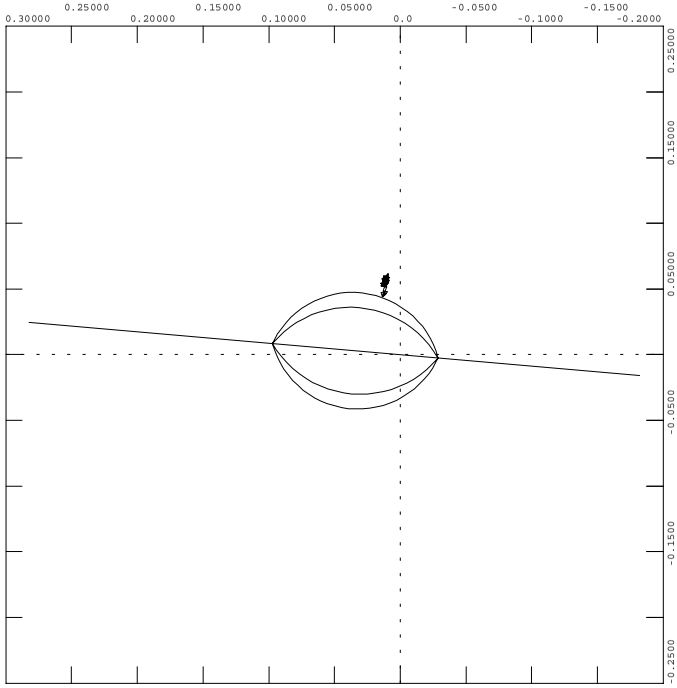


TUE, APR 23 2002 20:25
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

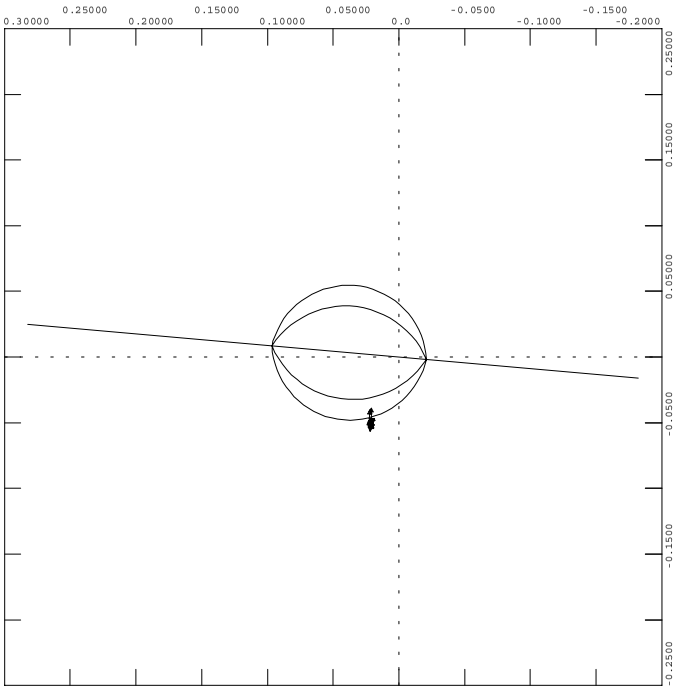


TUE, APR 23 2002 20:25
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

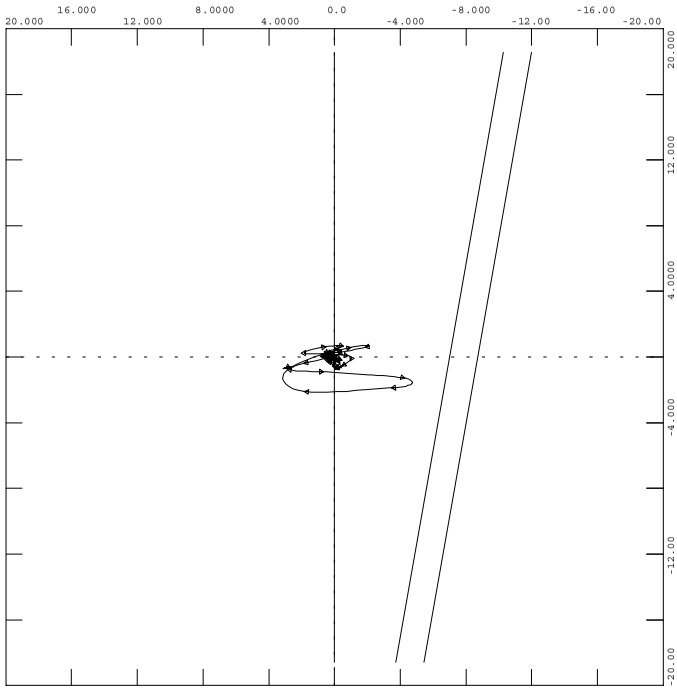


TUE, APR 23 2002 20:25
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

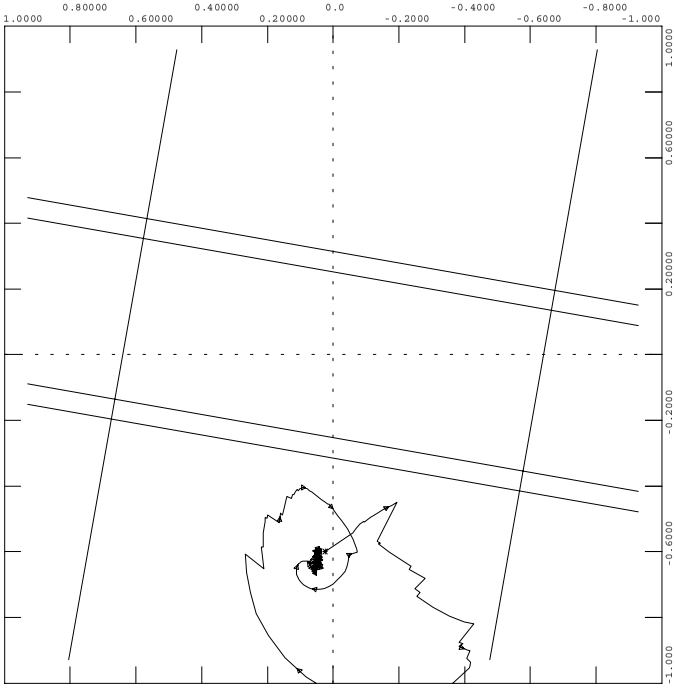


TUE, APR 23 2002 20:25
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

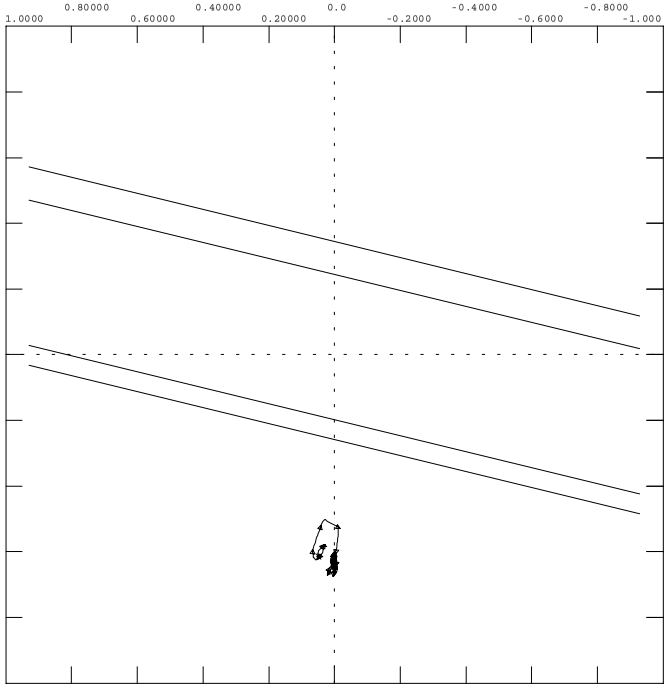
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

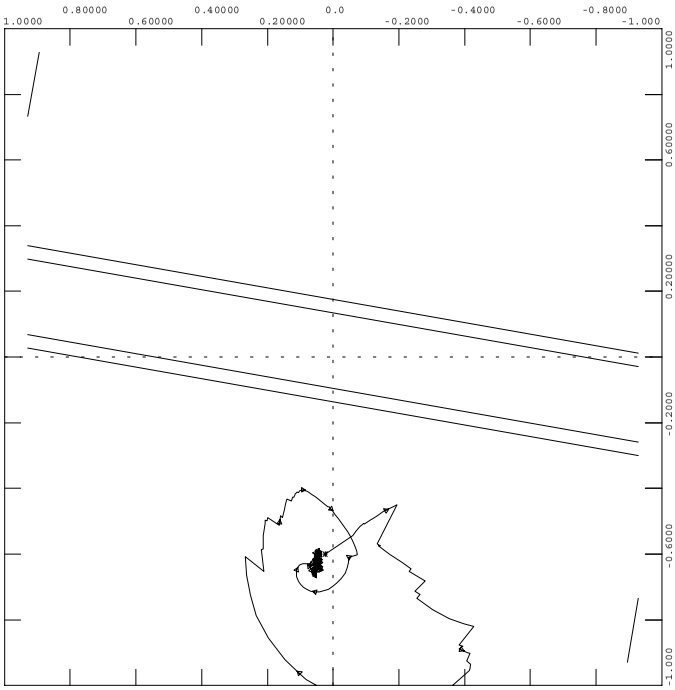
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

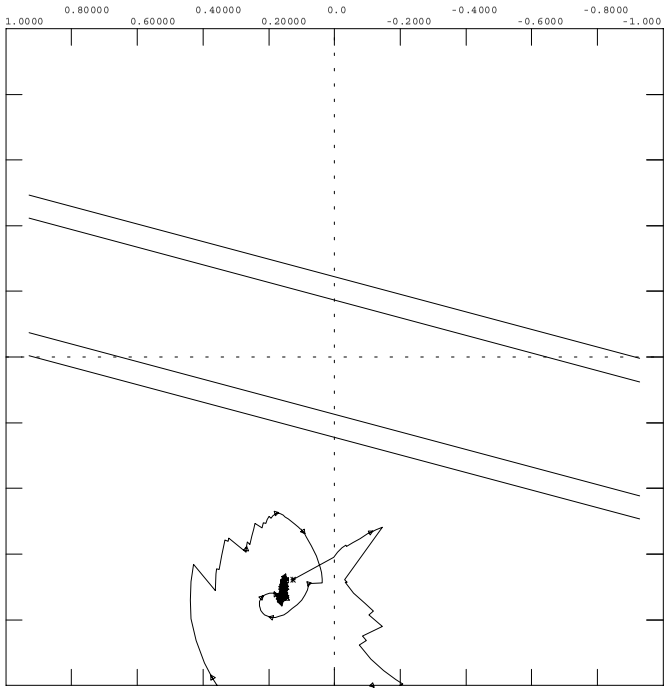
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

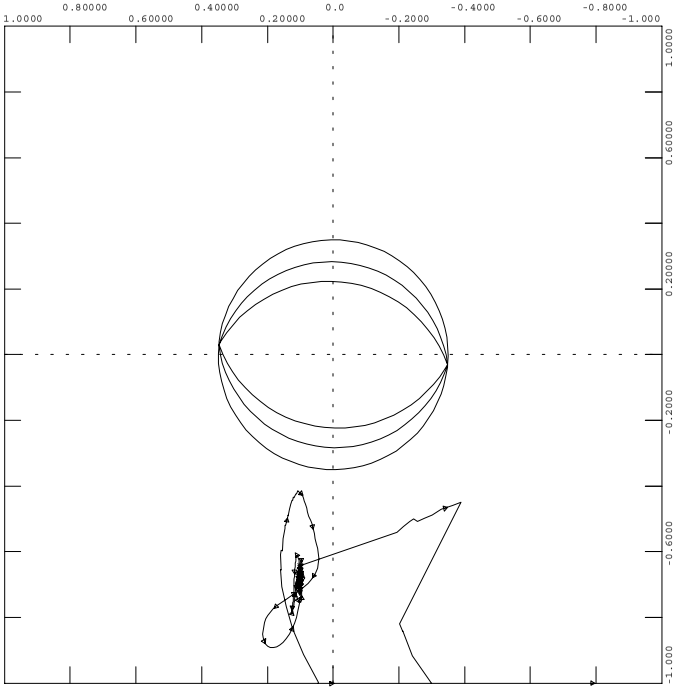
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

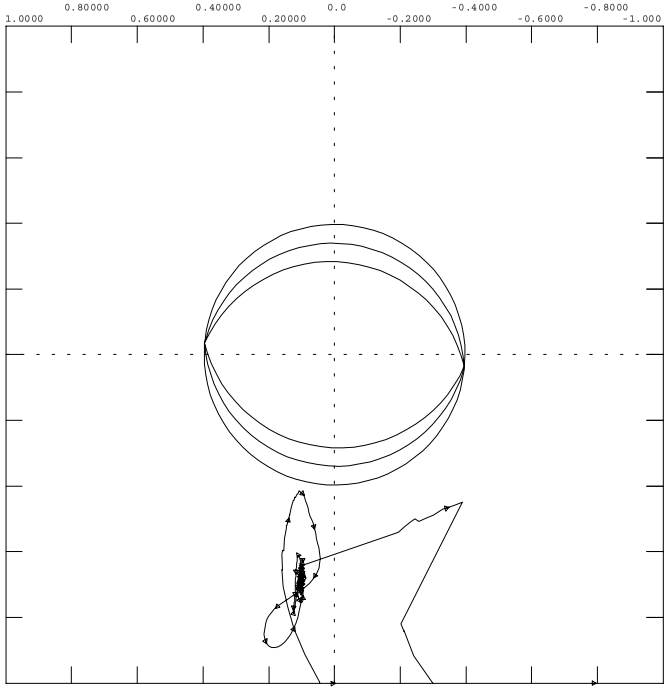
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

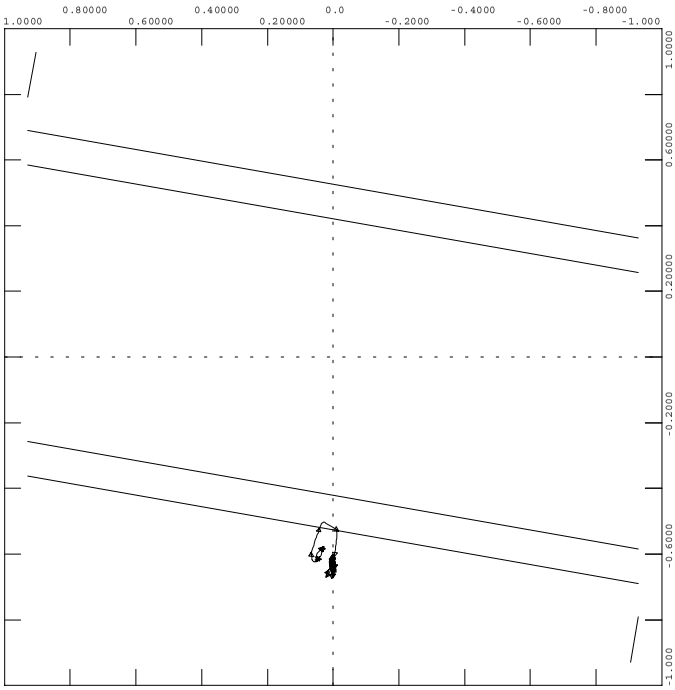
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

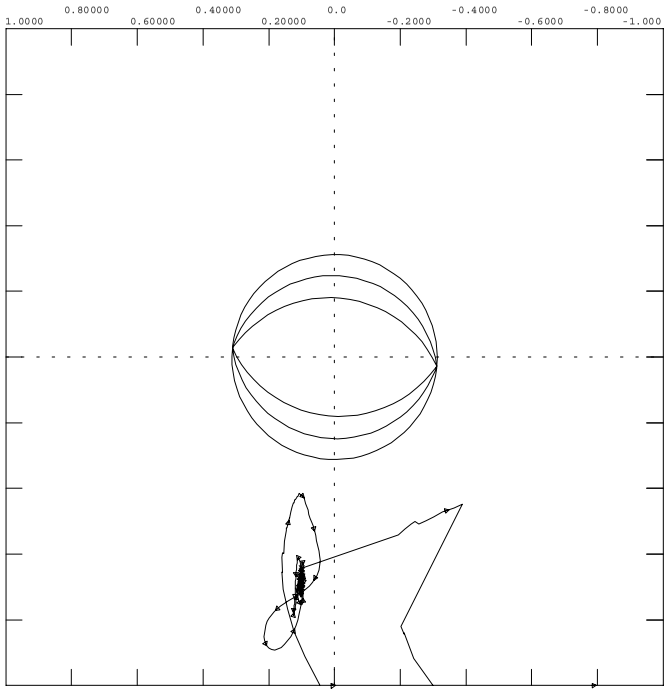
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



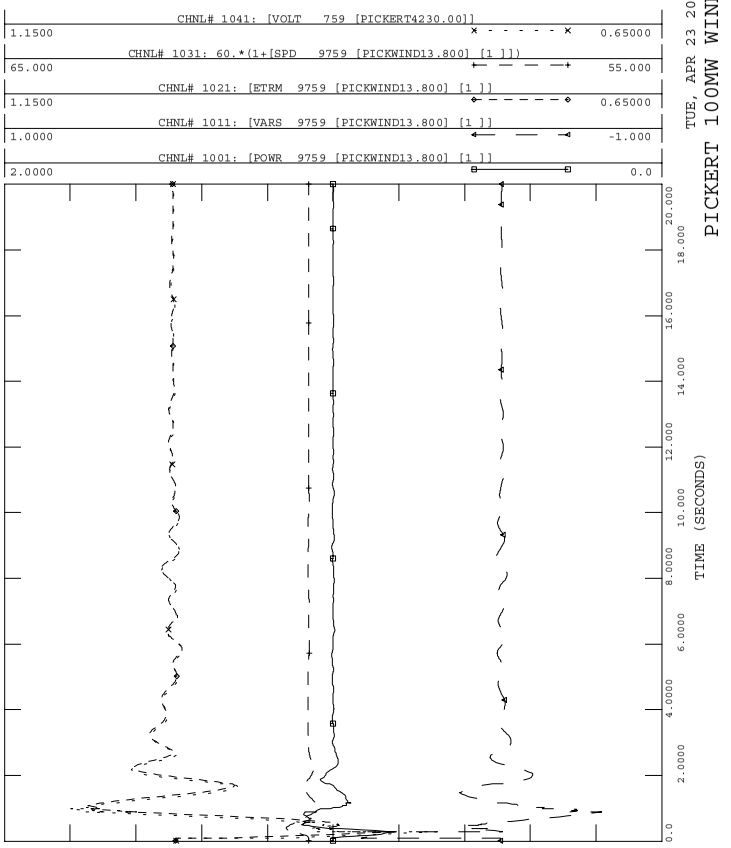
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

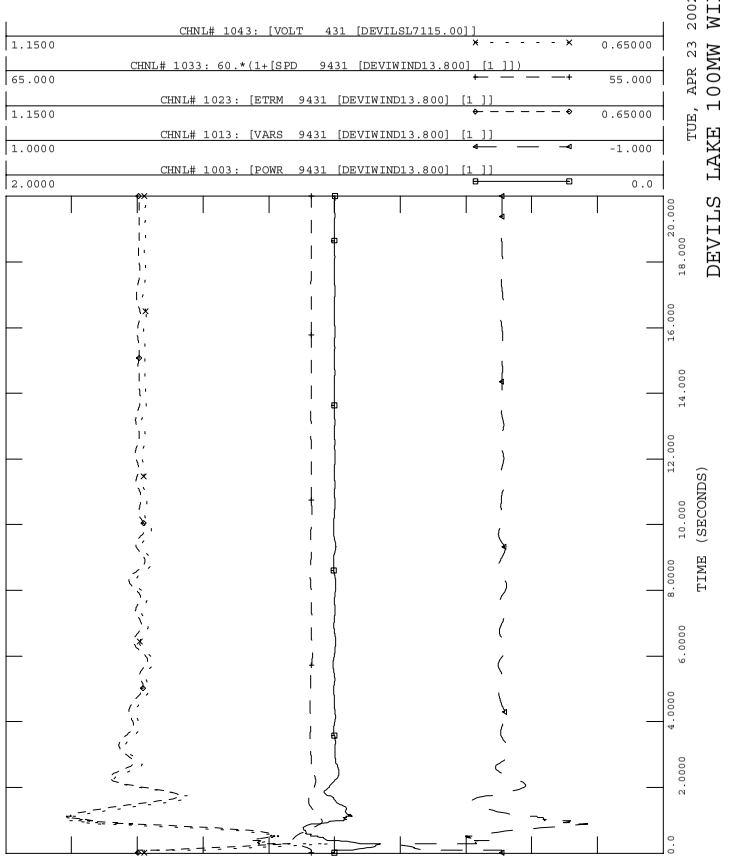


UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



TUE, APR 23 2002 20:25
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

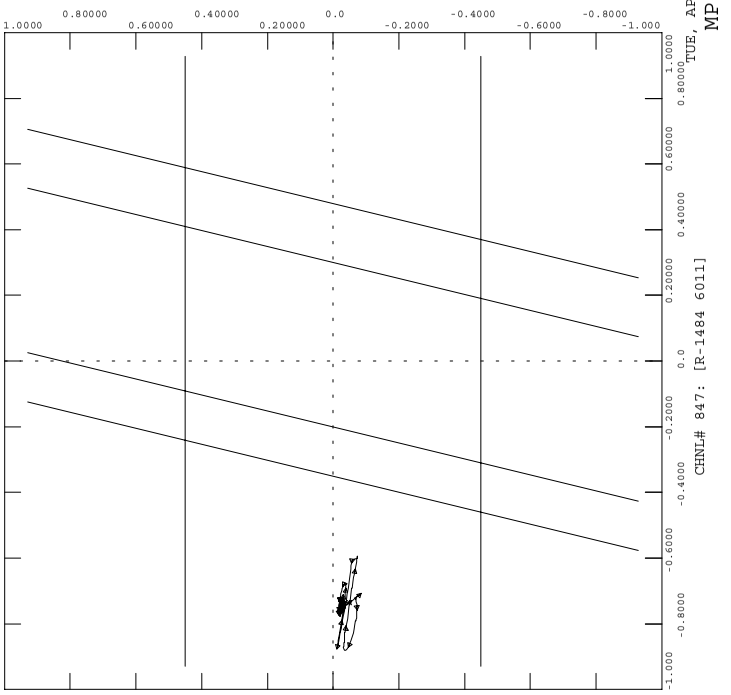


TUE, APR 23 2002 20:25
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

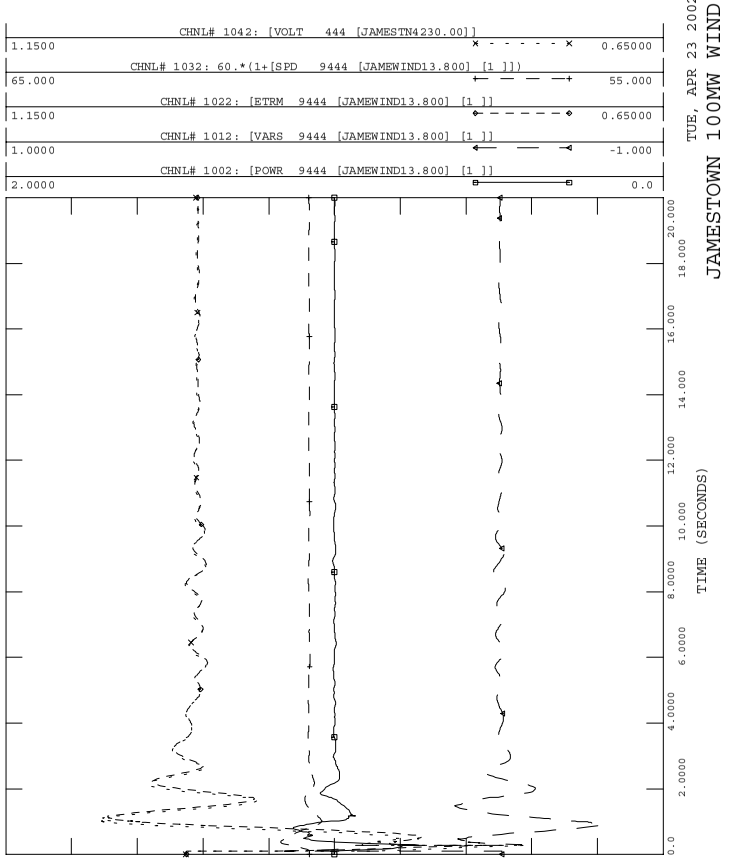
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



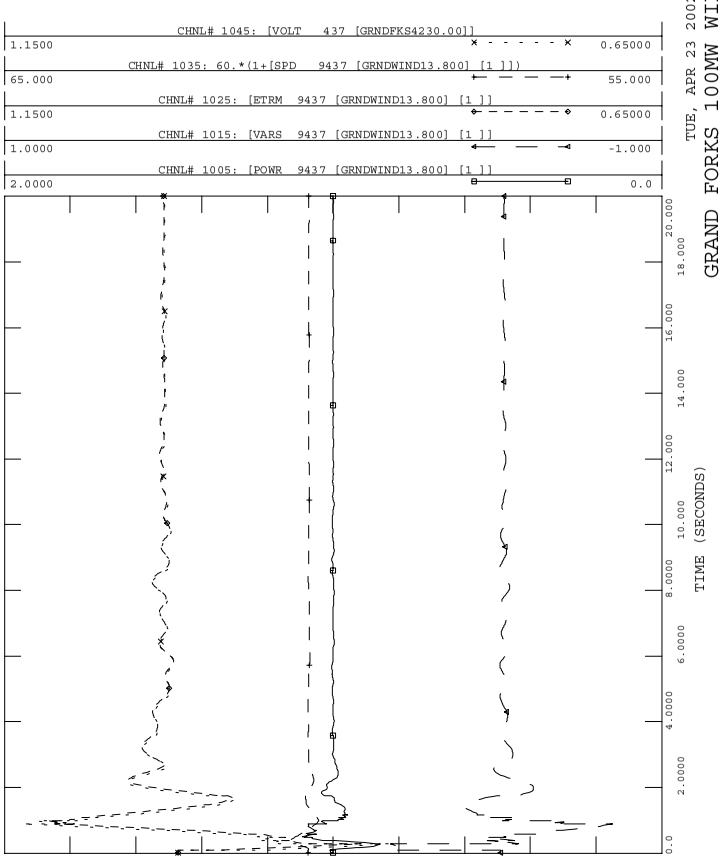
TUE, APR 23 2002 20:25
MP-OH I.FALLS (779)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



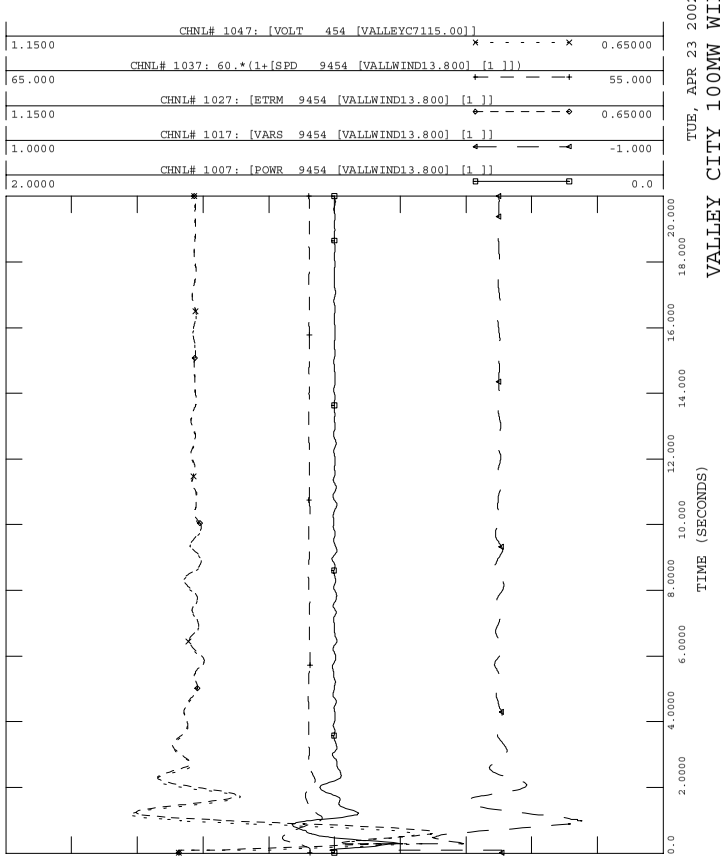
TUE, APR 23 2002 20:25
JAMESTOWN 100MW WIND UNIT

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



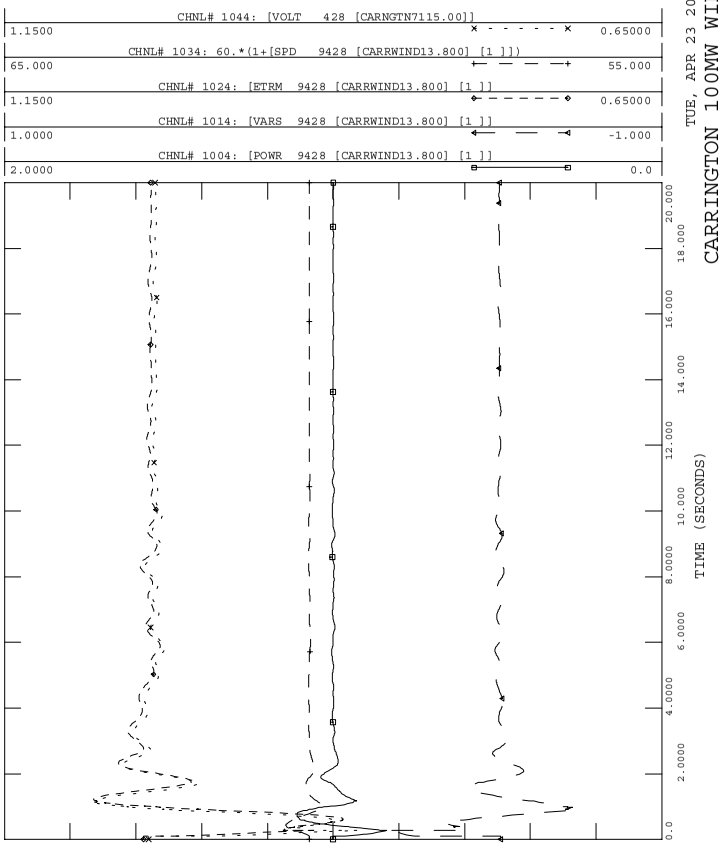
TUE, APR 23 2002 20:25
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



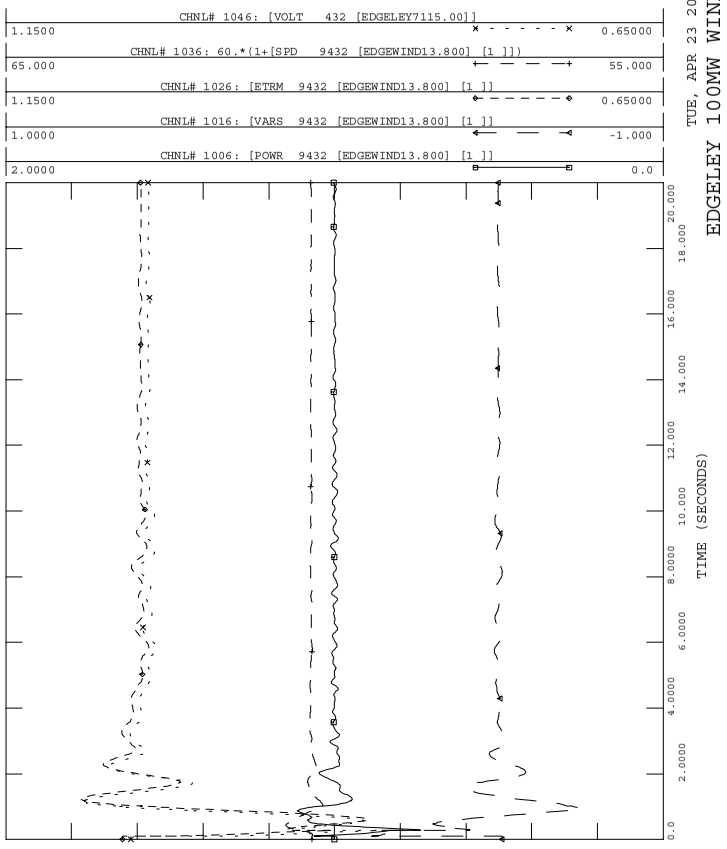
TUE, APR 23 2002 20:25
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin



TUE, APR 23 2002 20:25
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

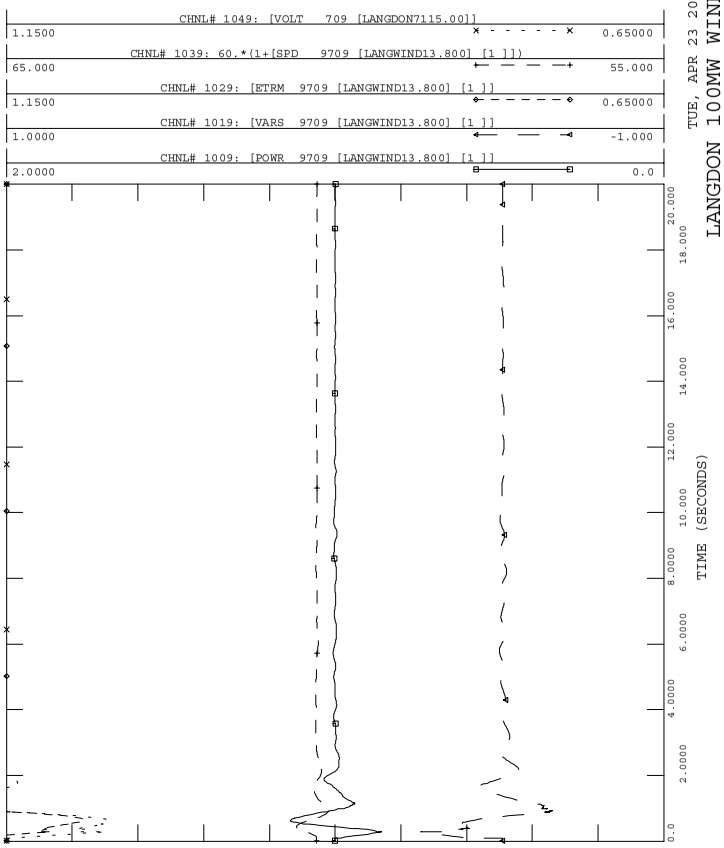


TUE, APR 23 2002 20:25
EDGELEY 100MW WIND UNIT

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25

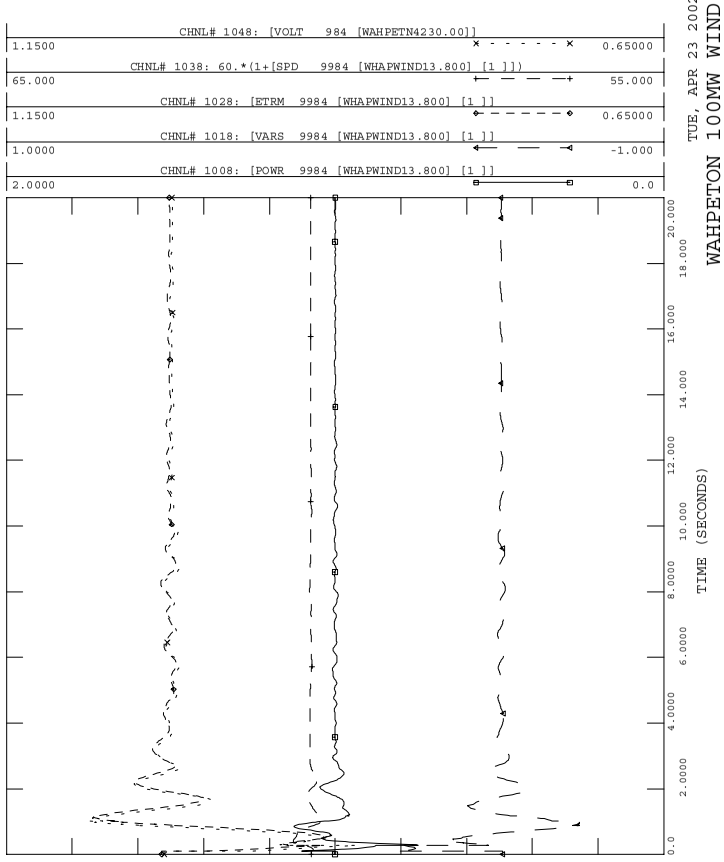
LANGDON 100MW WIND UNIT



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25

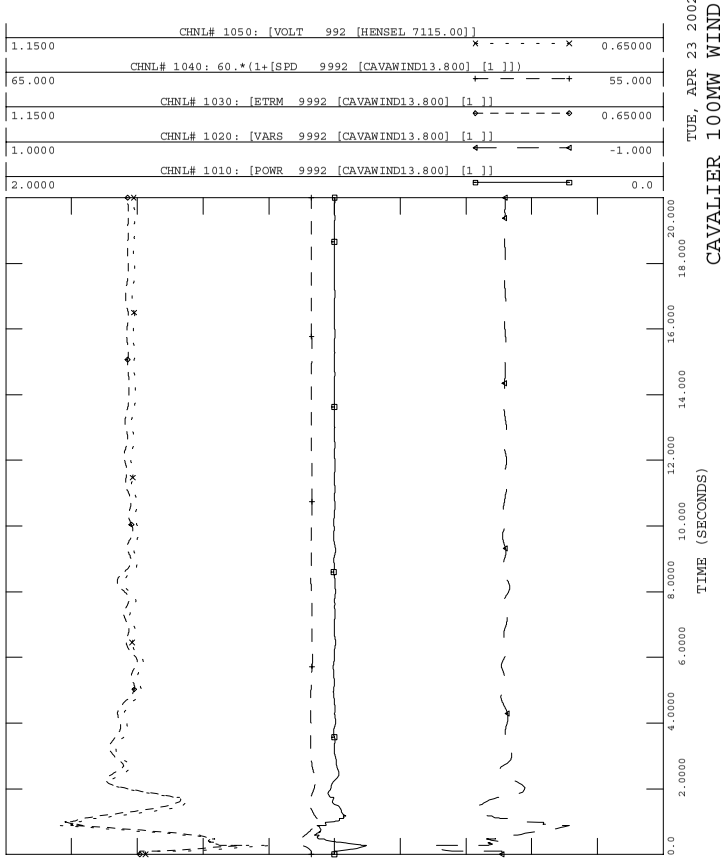
WAHPETON 100MW WIND UNIT



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag1.bin

TUE, APR 23 2002 20:25

CAVALIER 100MW WIND UNIT

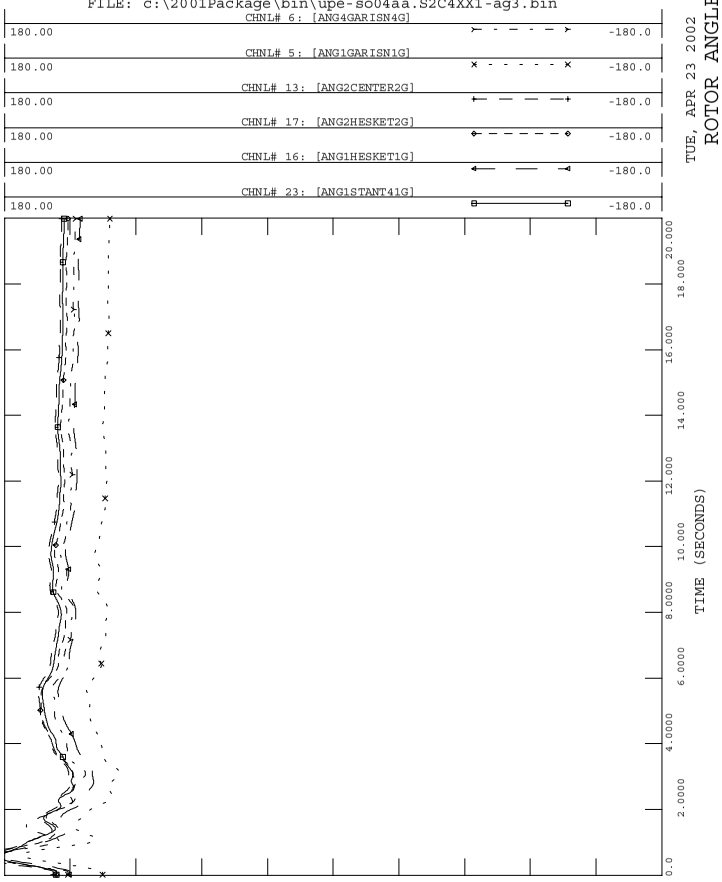


CONTINGENCY AG3

Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

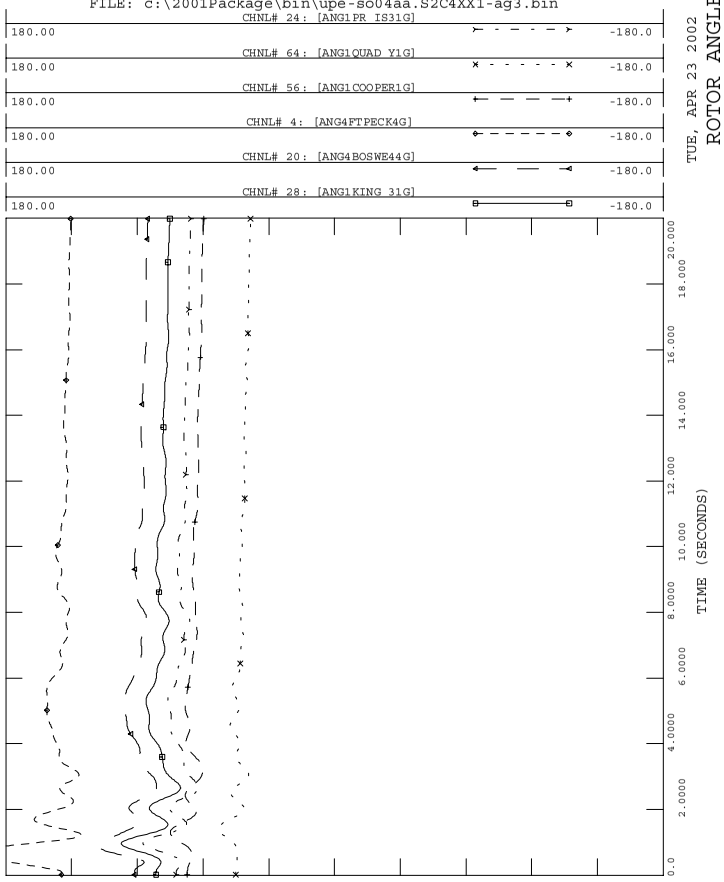
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
ROTOR ANGLES 2



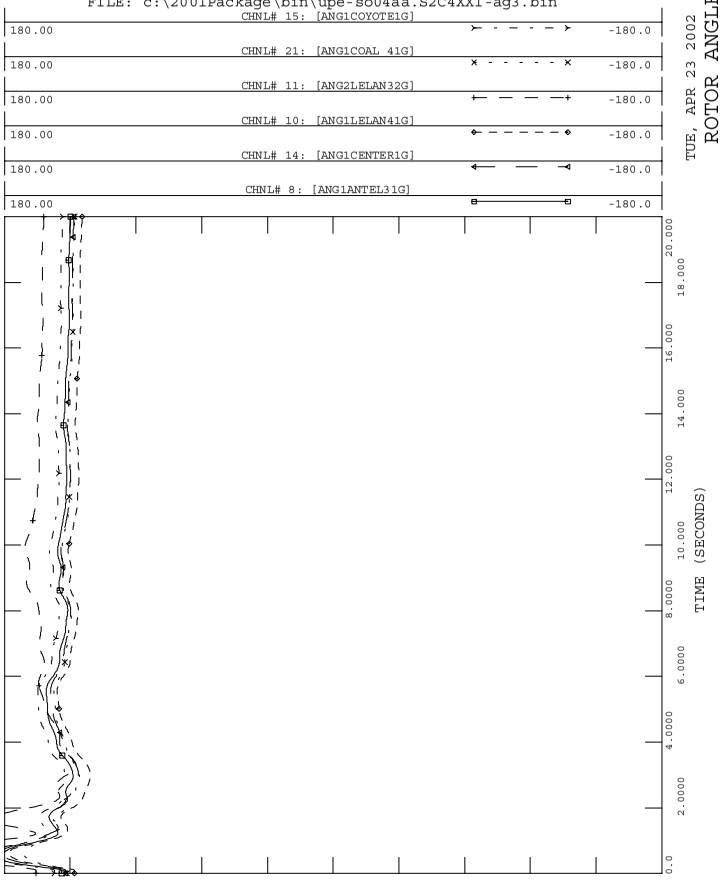
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
ROTOR ANGLES 4



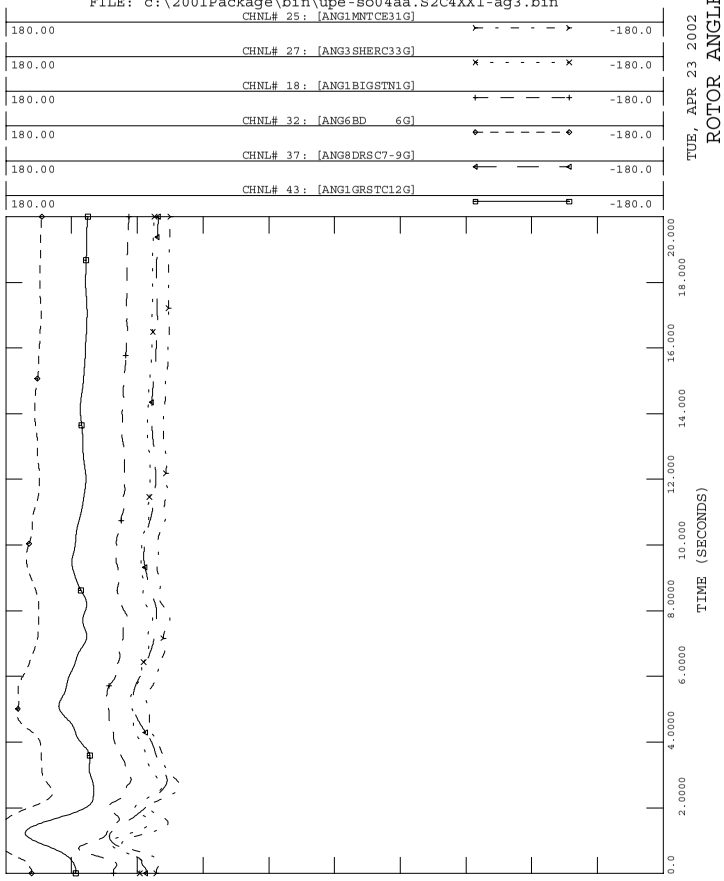
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
ROTOR ANGLES 1



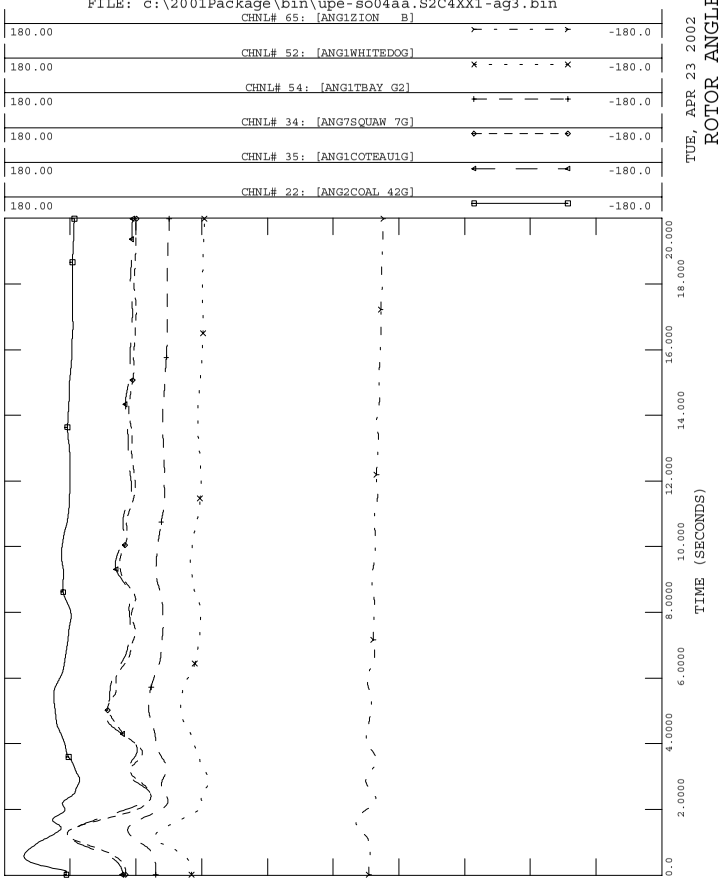
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
ROTOR ANGLES 3



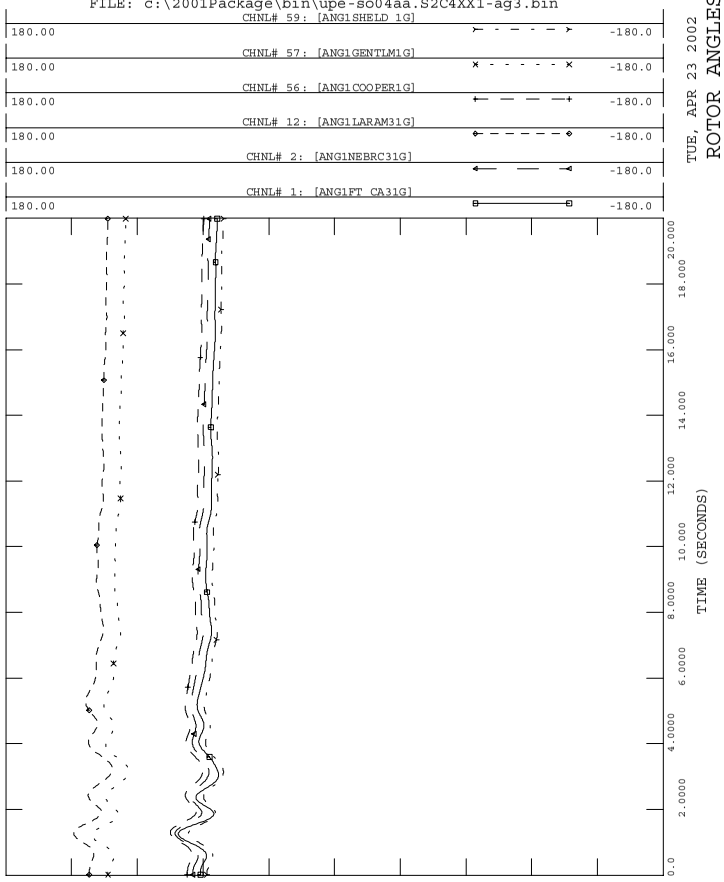
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
ROTOR ANGLES 6



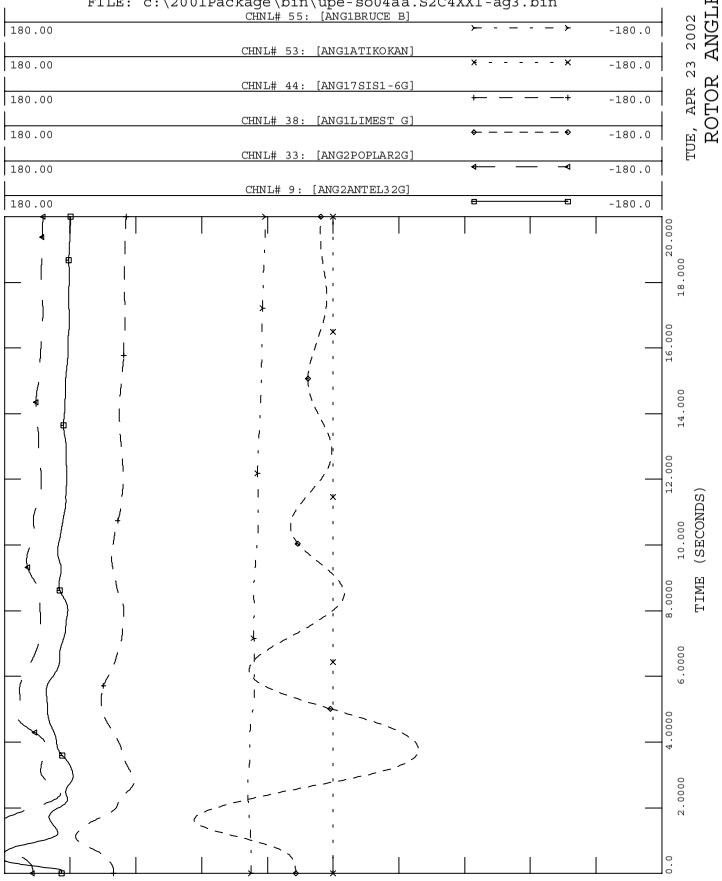
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
ROTOR ANGLES NB



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
ROTOR ANGLES 5



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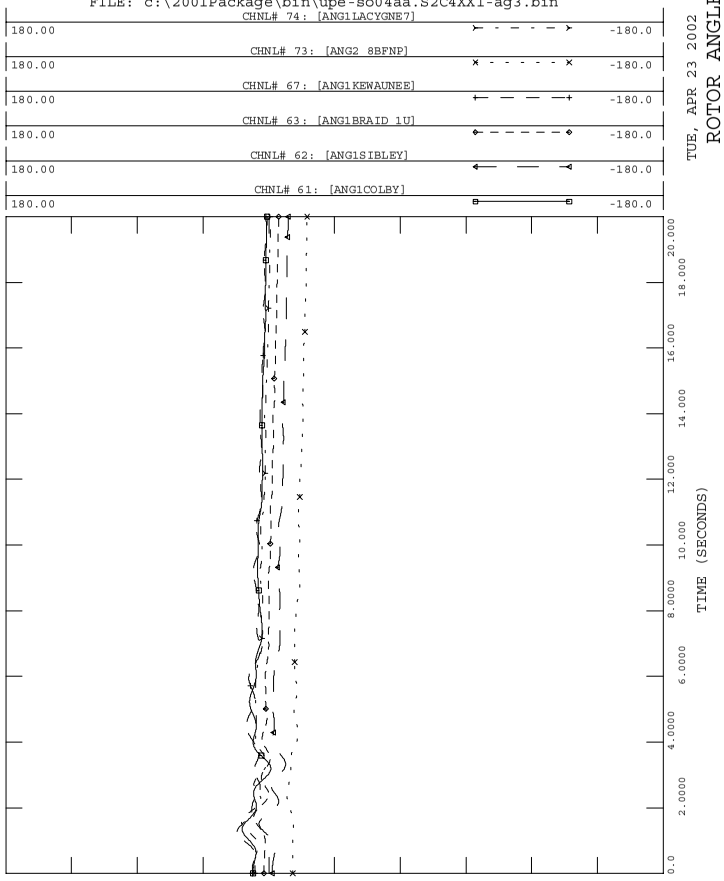
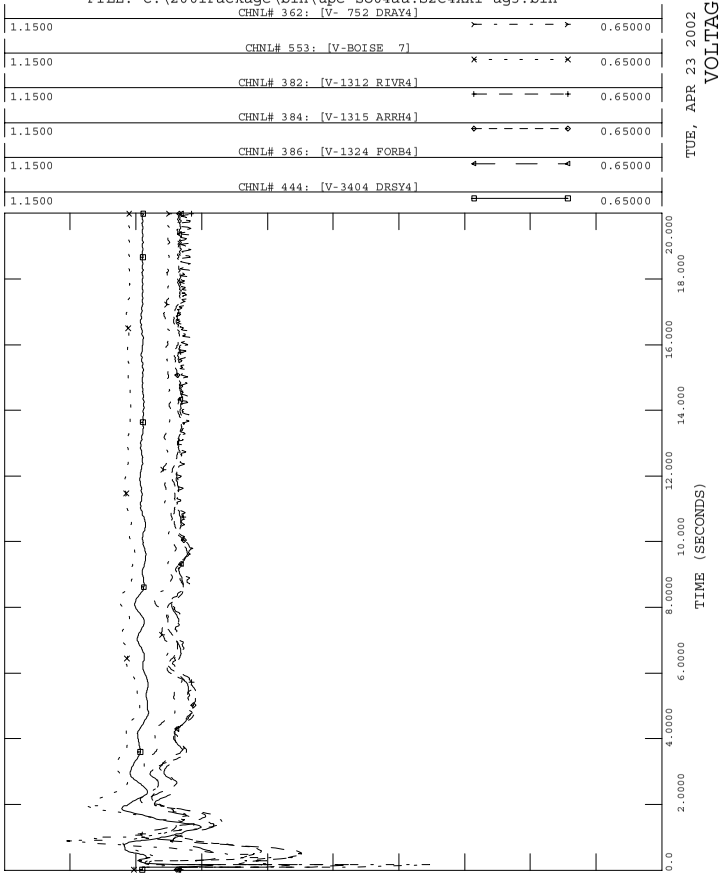
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
ROTOR ANGLES 7

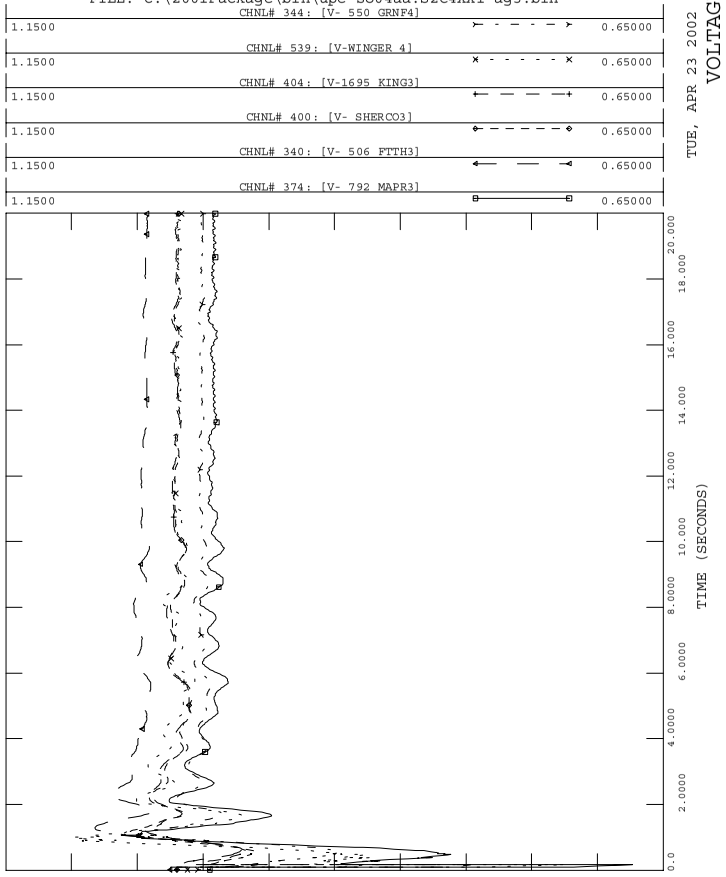


UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



TUE, APR 23 2002 20:42
VOLTAGES 1

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



TUE, APR 23 2002 20:42
VOLTAGES 3

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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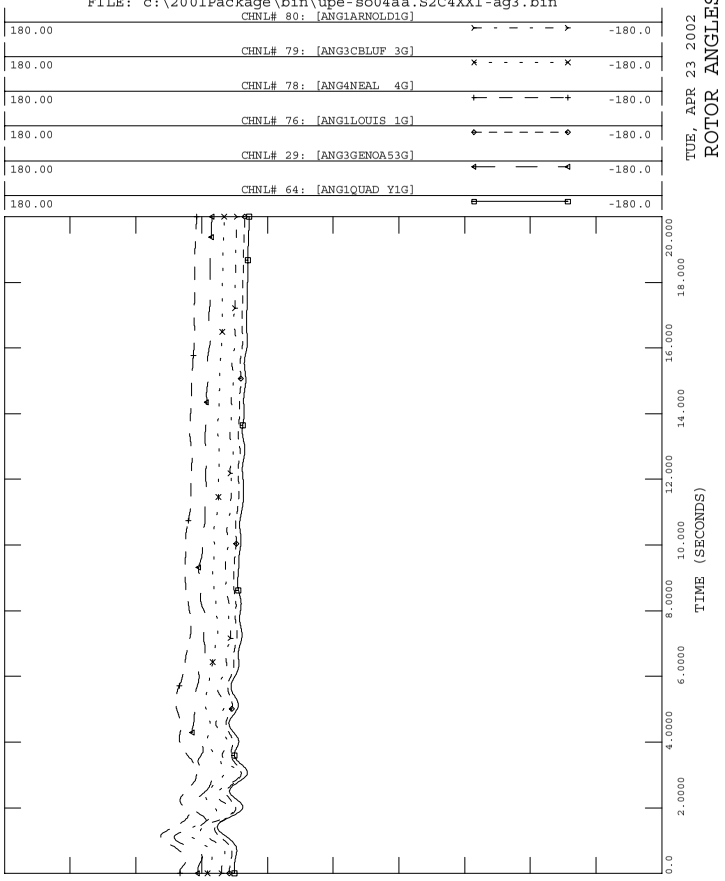
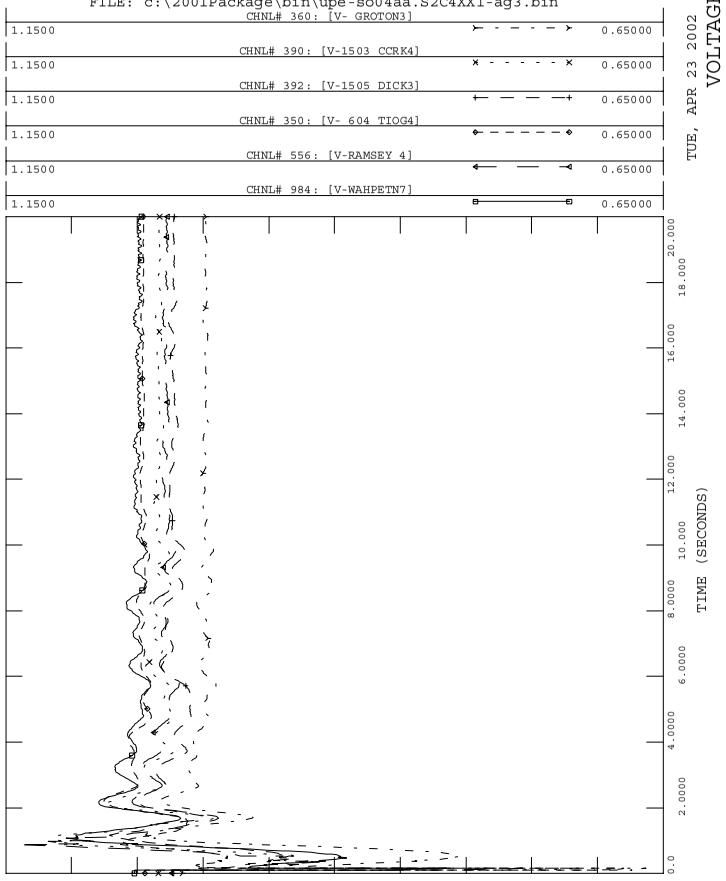
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



TUE, APR 23 2002 20:42
ROTOR ANGLES IA

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



TUE, APR 23 2002 20:42
VOLTAGES 2

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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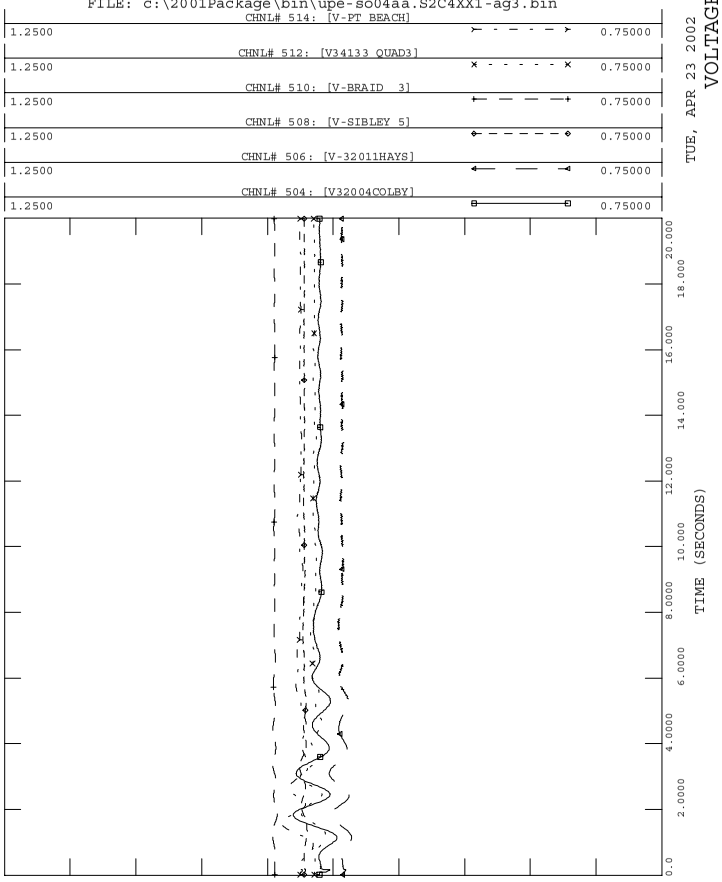
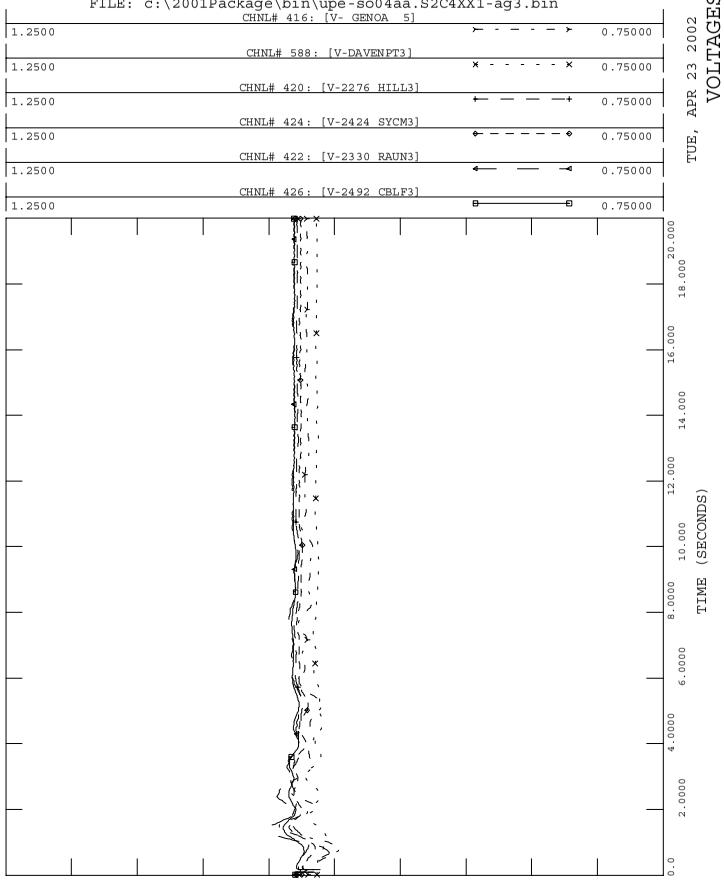
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
VOLTAGES 5



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
VOLTAGES IA



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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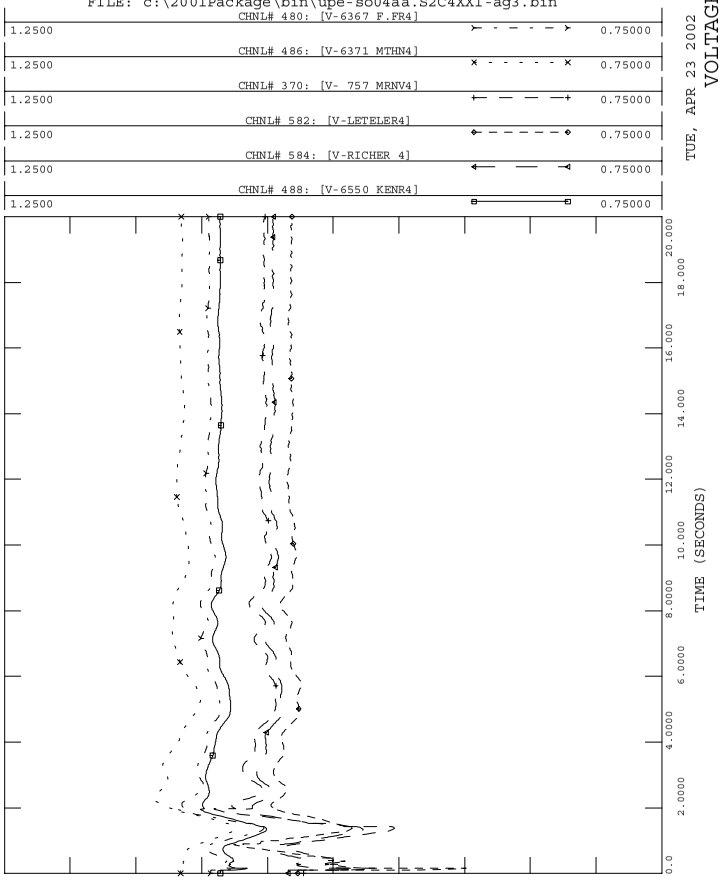
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
VOLTAGES 4



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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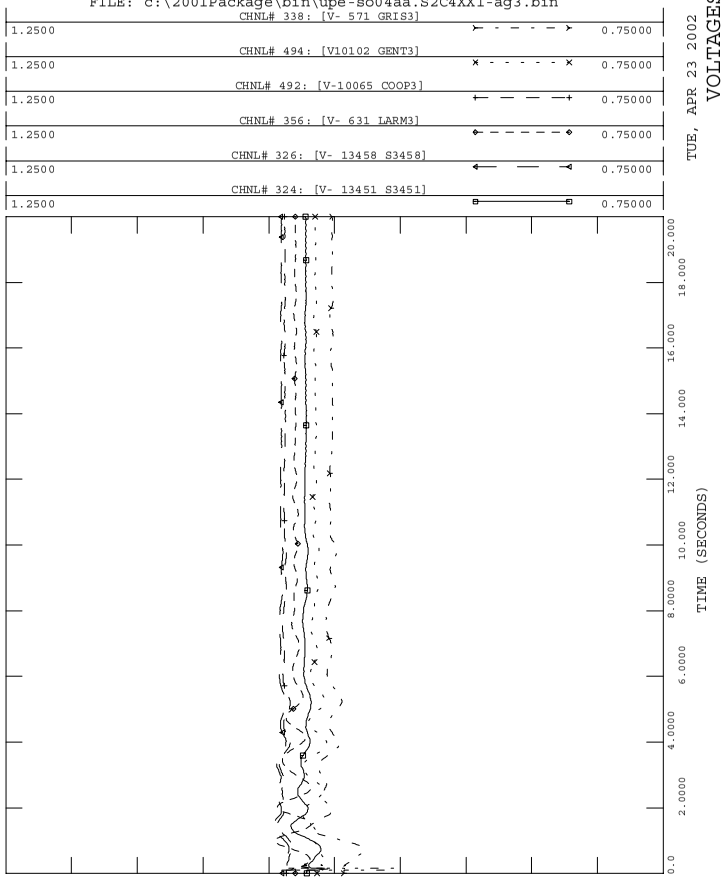
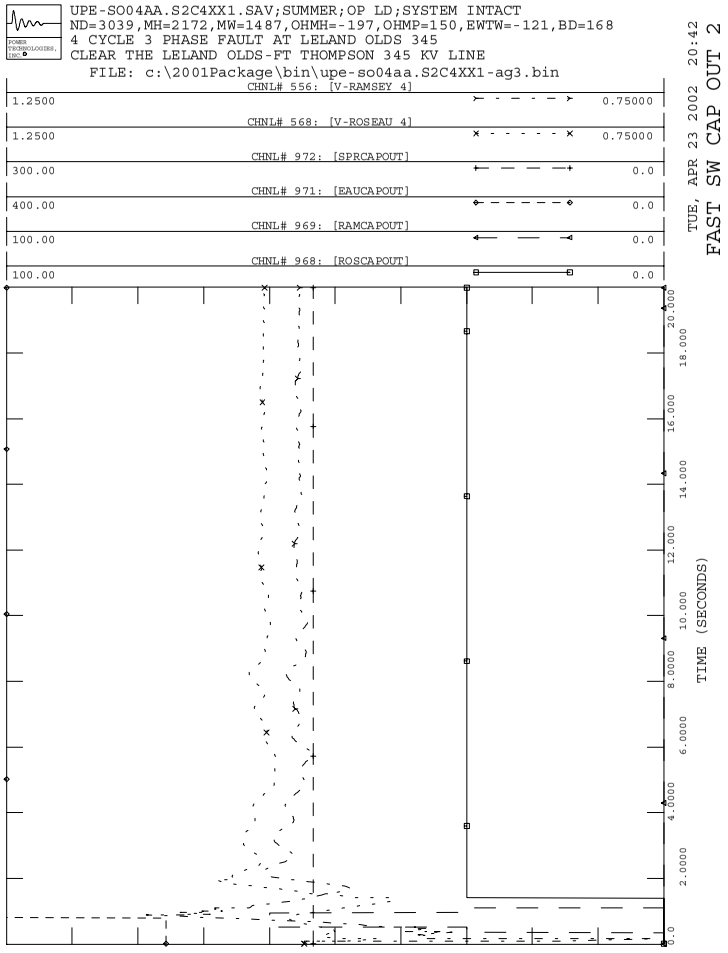
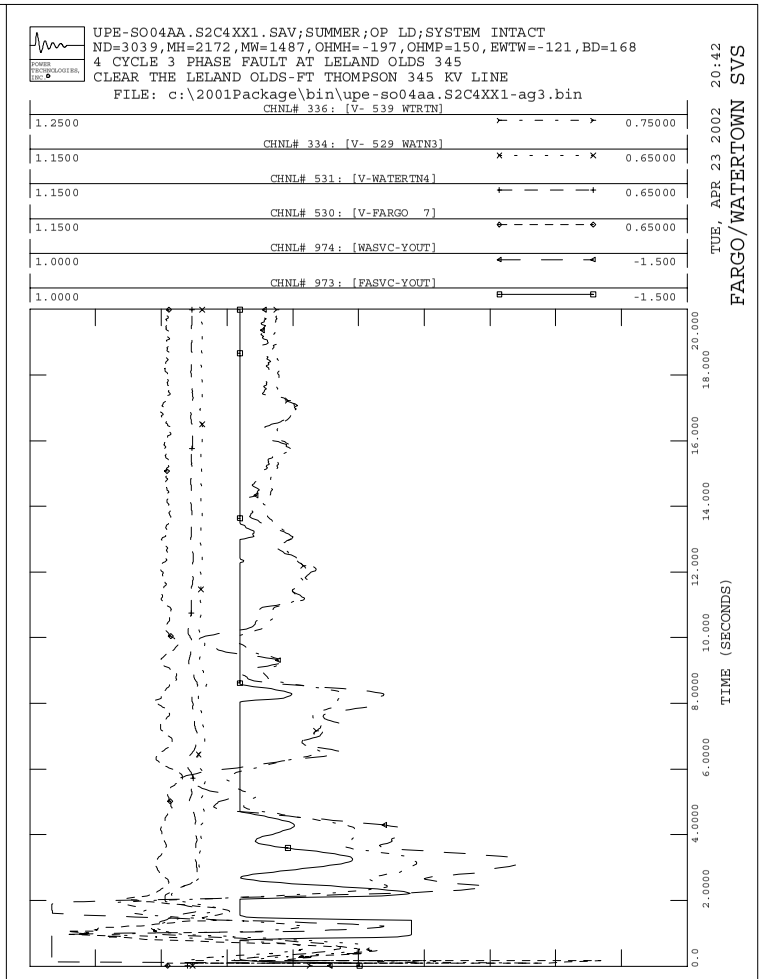
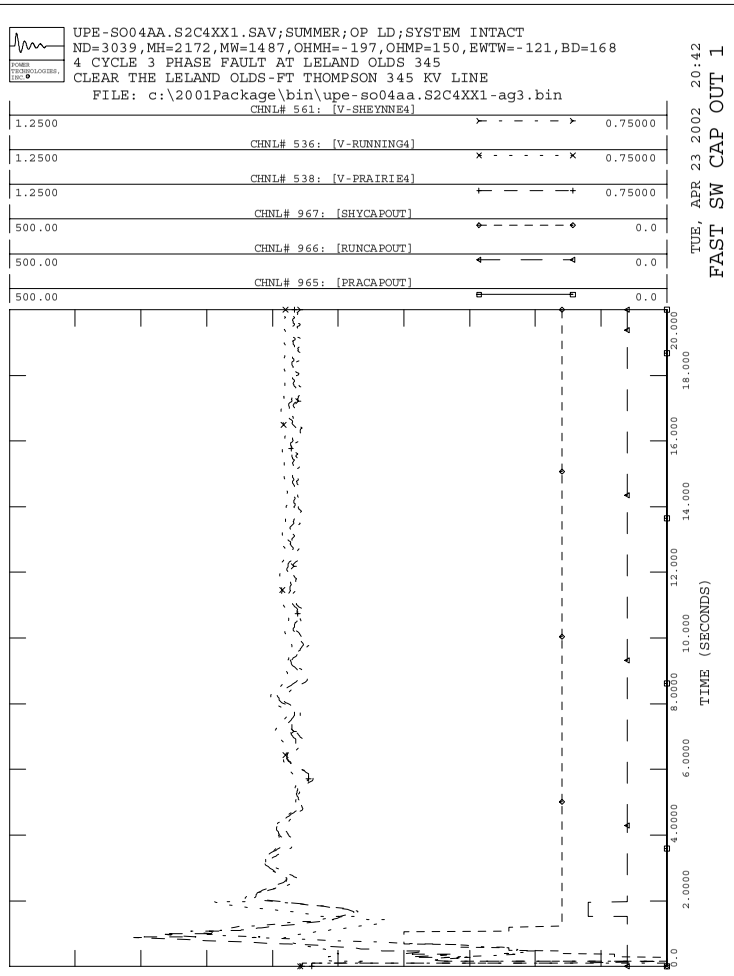
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

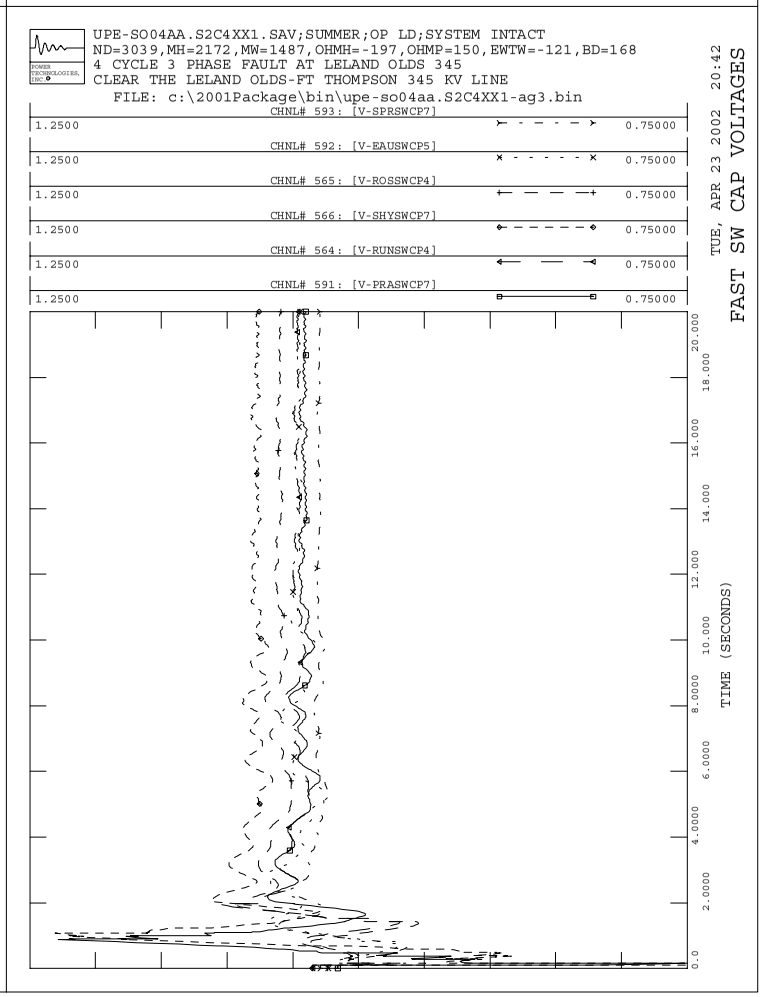
TUE, APR 23 2002 20:42
VOLTAGES NB




UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TUE, APR 23 2002 20:42
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TUE, APR 23 2002 20:42
FARGO/WATERTOWN SVS
TIME (SECONDS)

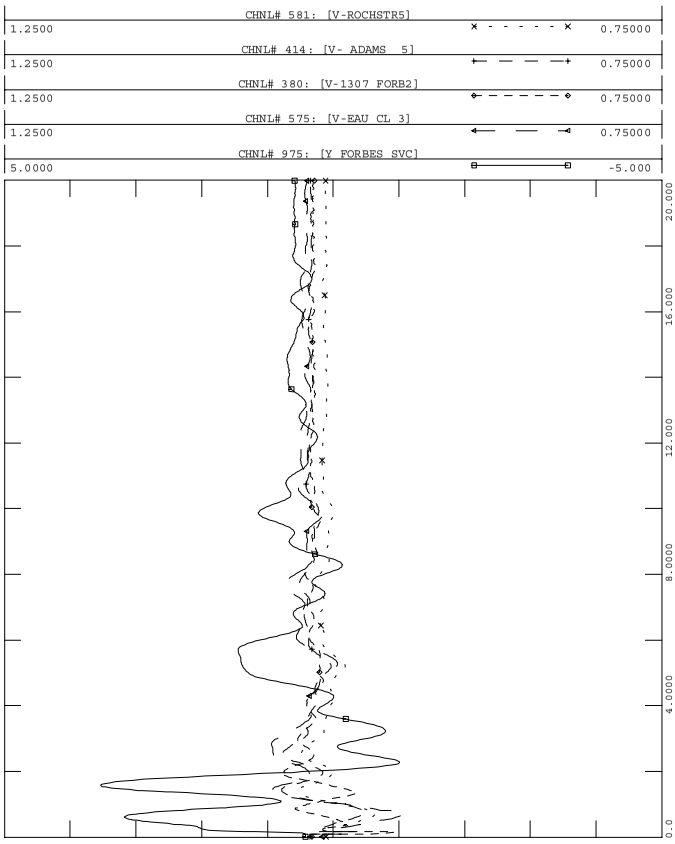

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TUE, APR 23 2002 20:42
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TUE, APR 23 2002 20:42
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42

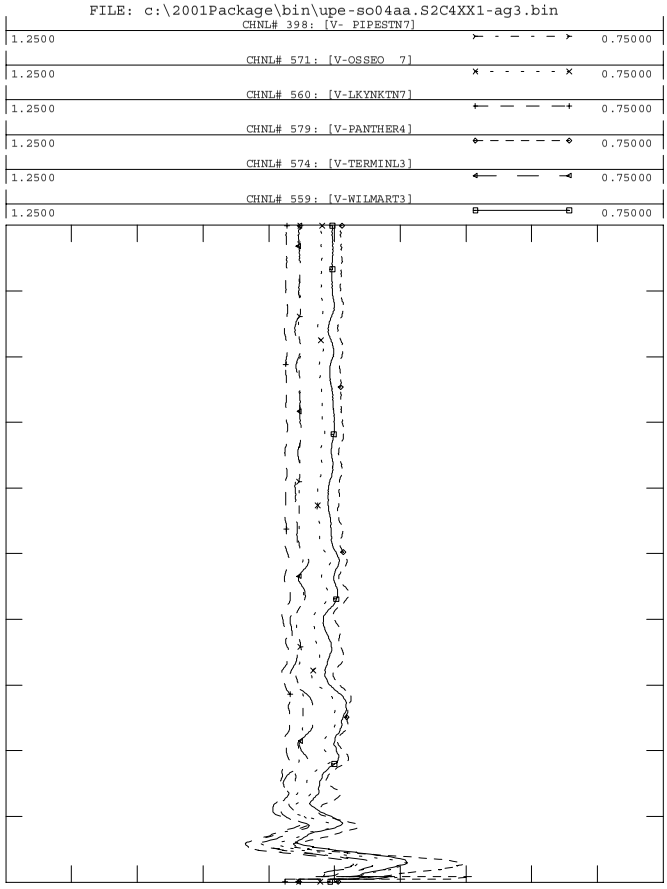
SVC & WISCONSIN VOLT



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42

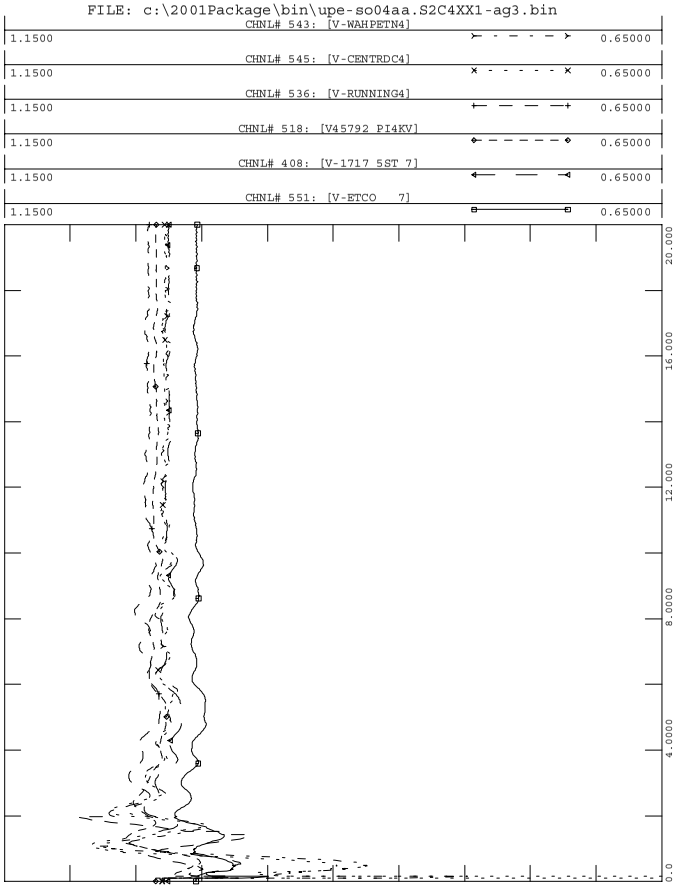
TC VOLTAGES



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42

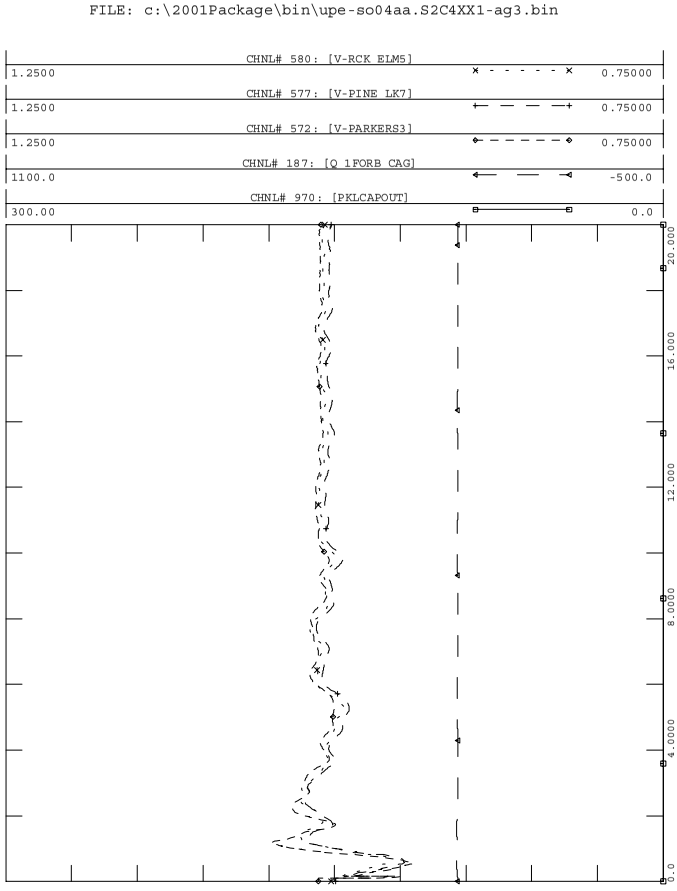
VOLTAGES 6



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

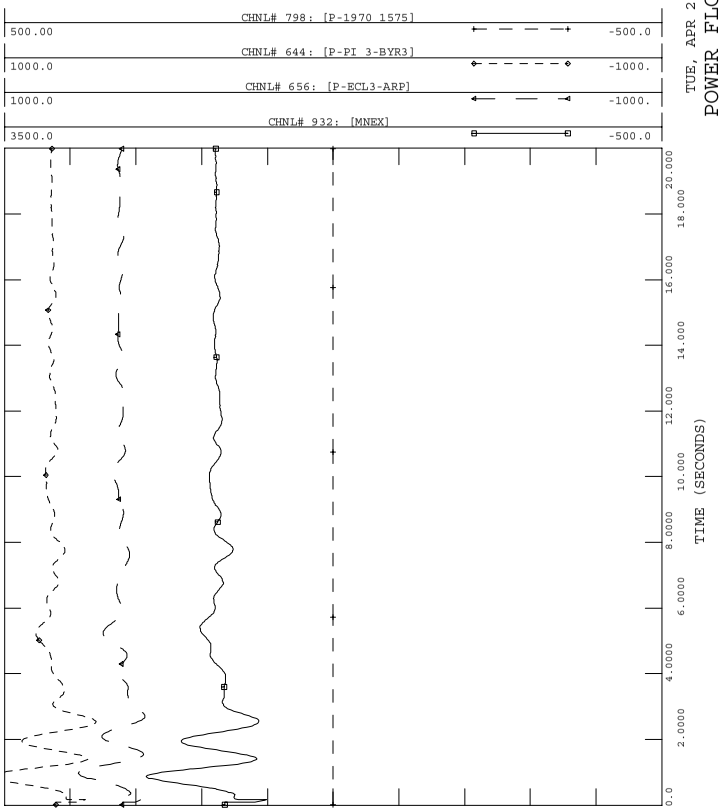
TUE, APR 23 2002 20:42

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
POWER FLOW SUMS 2



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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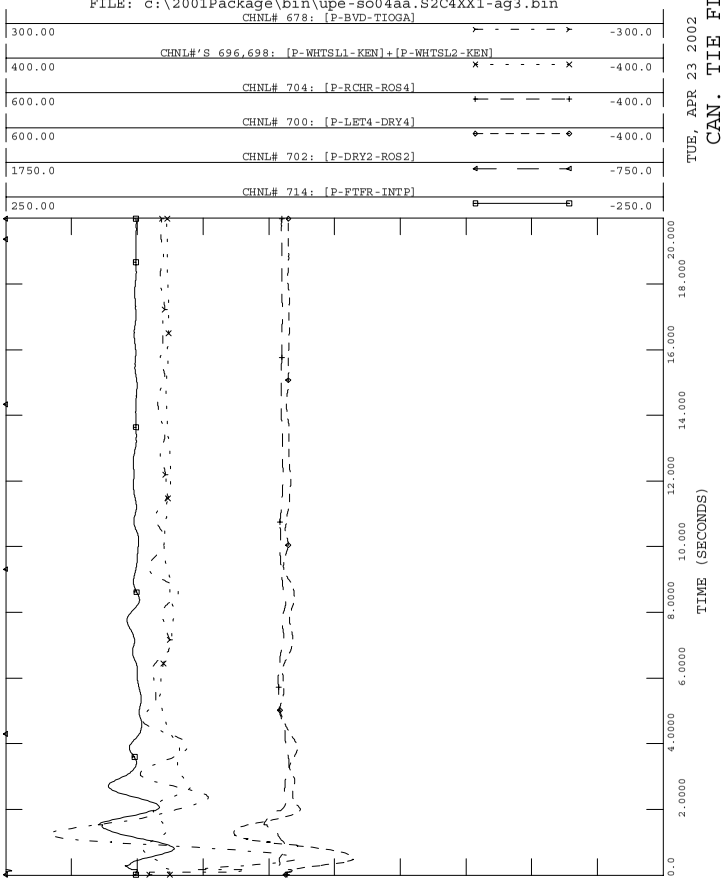
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
CAN. TIE FLOWS



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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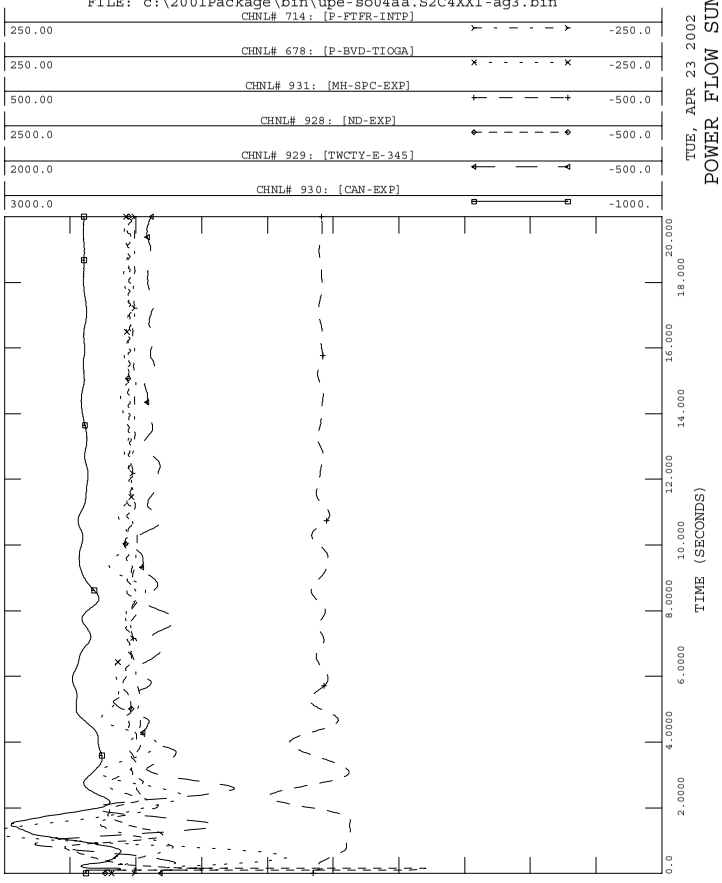
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
POWER FLOW SUMS 1



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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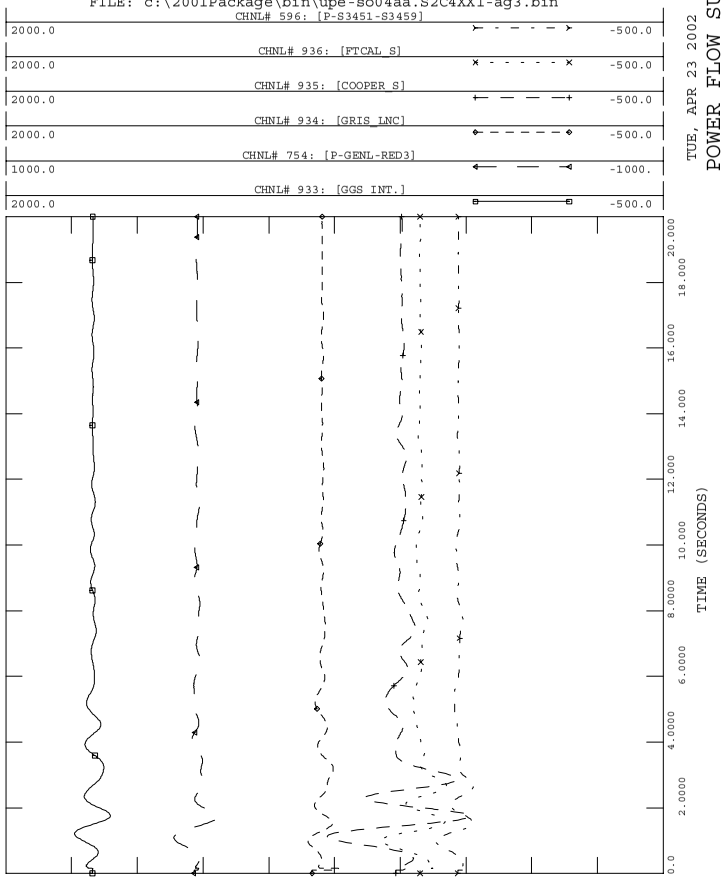
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
POWER FLOW SUM 3



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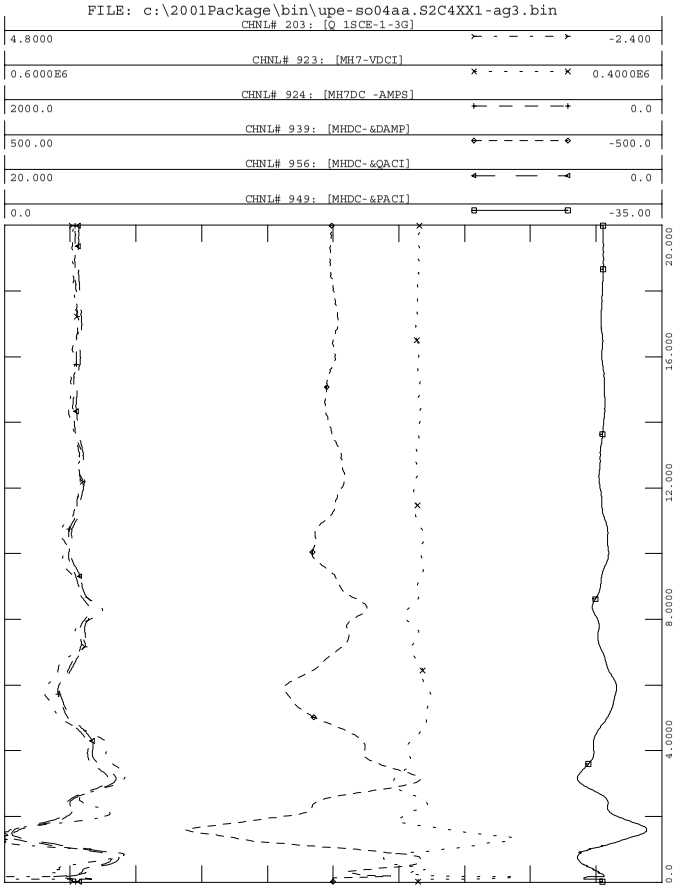
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
MH DC PARAMETERS



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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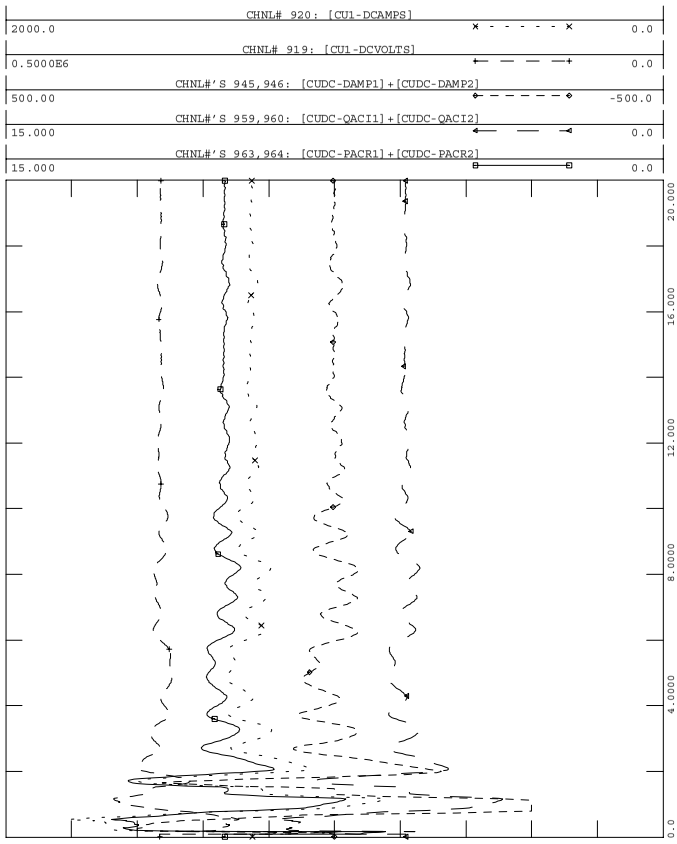
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
CU DC #1



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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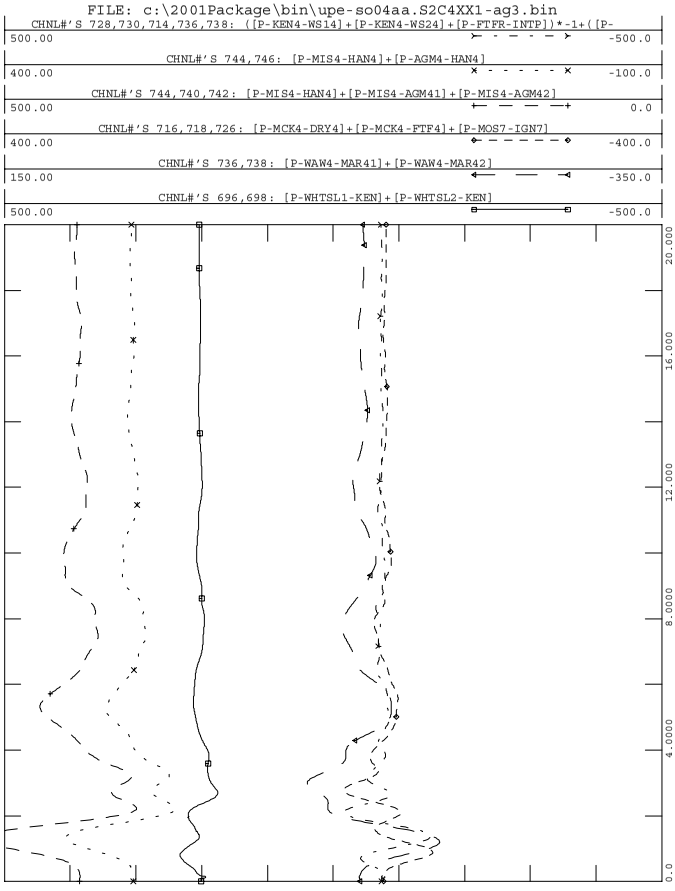
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
OH TIE FLOWS



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4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
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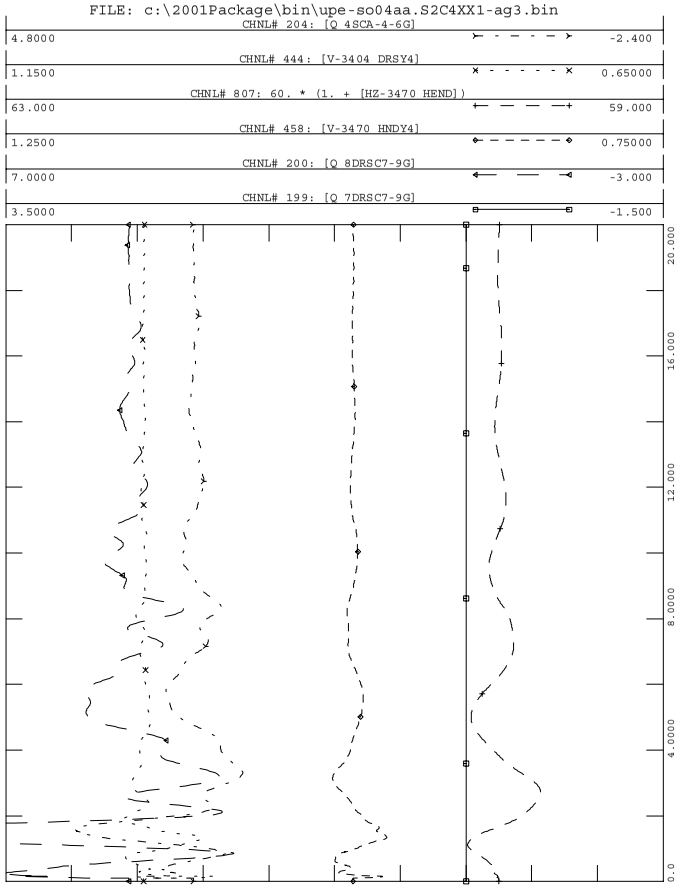
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42
MH DC PARAMETERS



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4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

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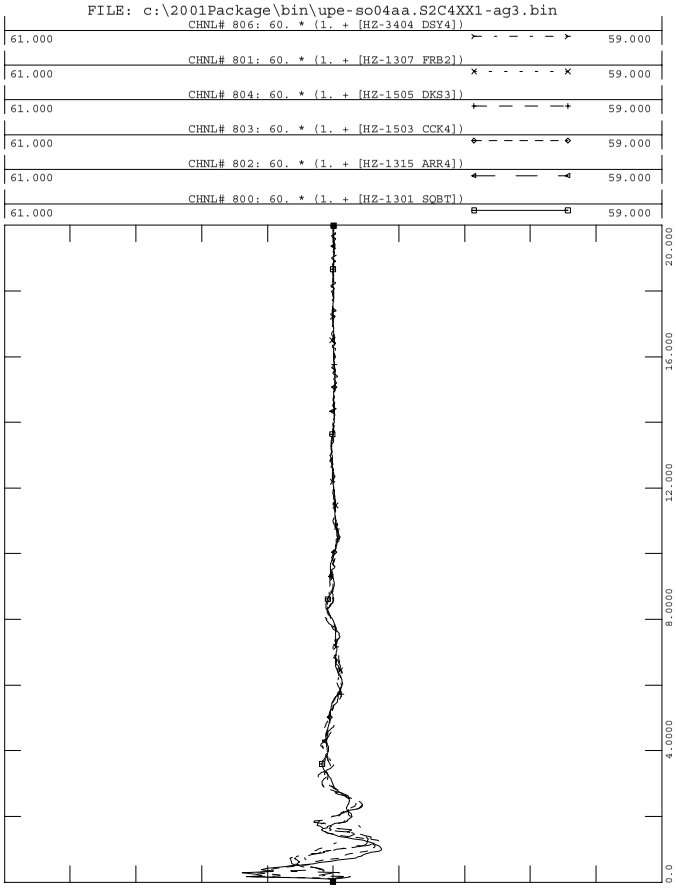
FREQ AT DC TERMINALS



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4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

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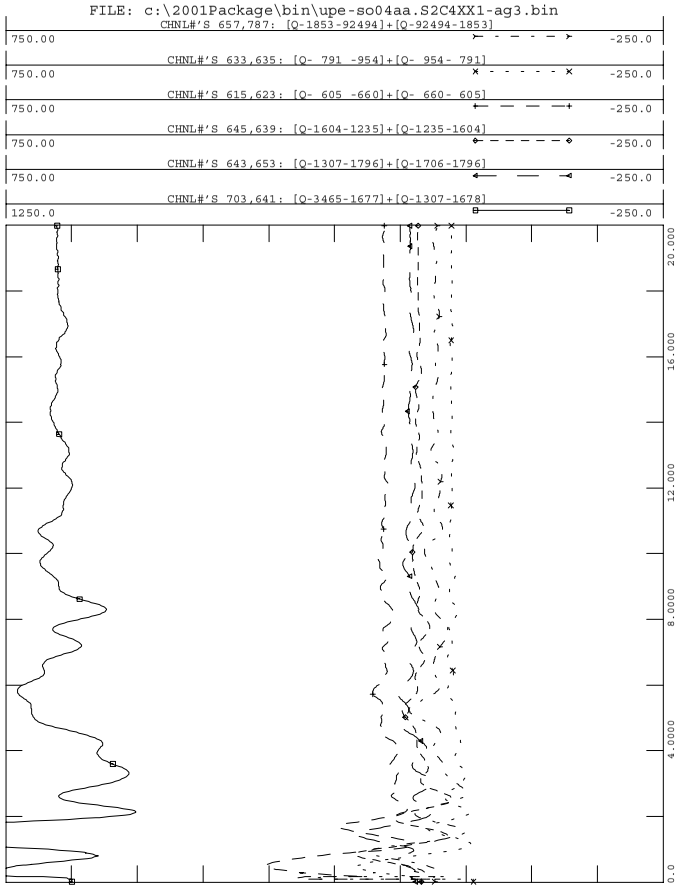
VAR LOSSES



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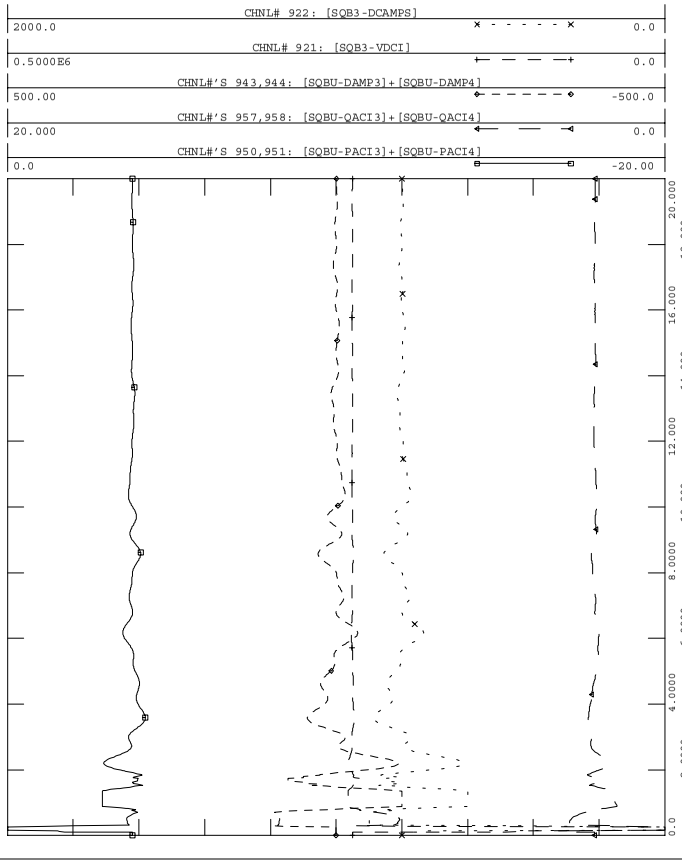
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42

SQB DC #3



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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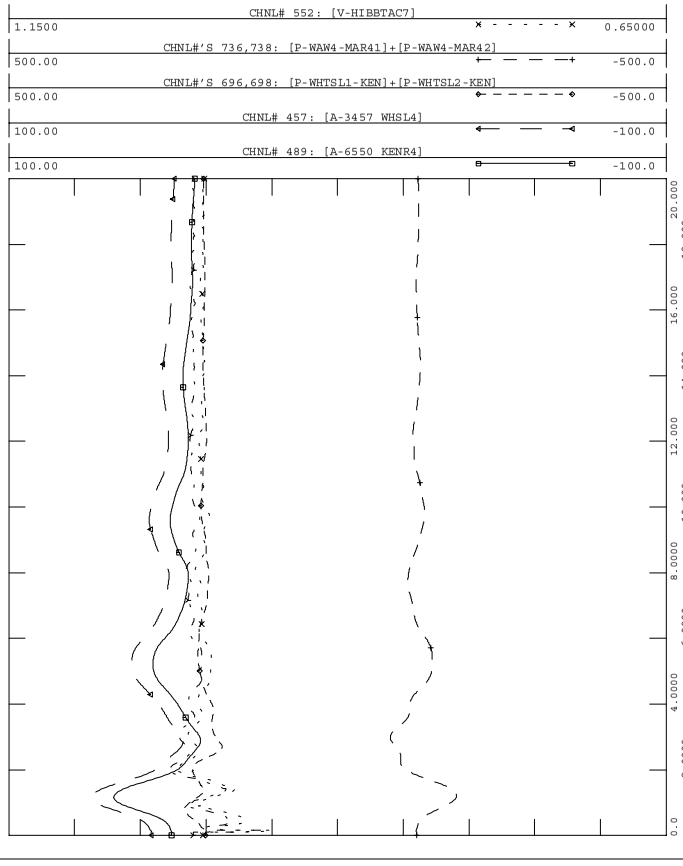
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

TUE, APR 23 2002 20:42

VOLTAGES, ANGLES



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

RELAY: SLINOS
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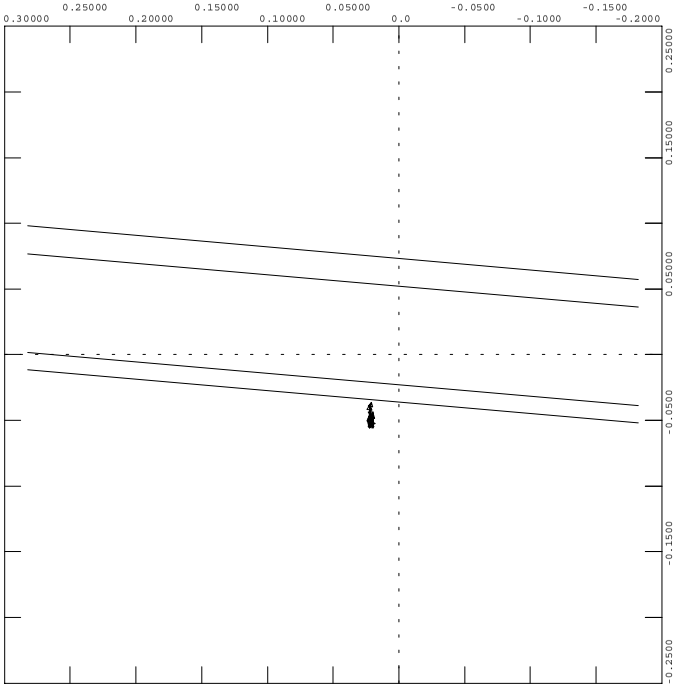
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 23 2002 20:42
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

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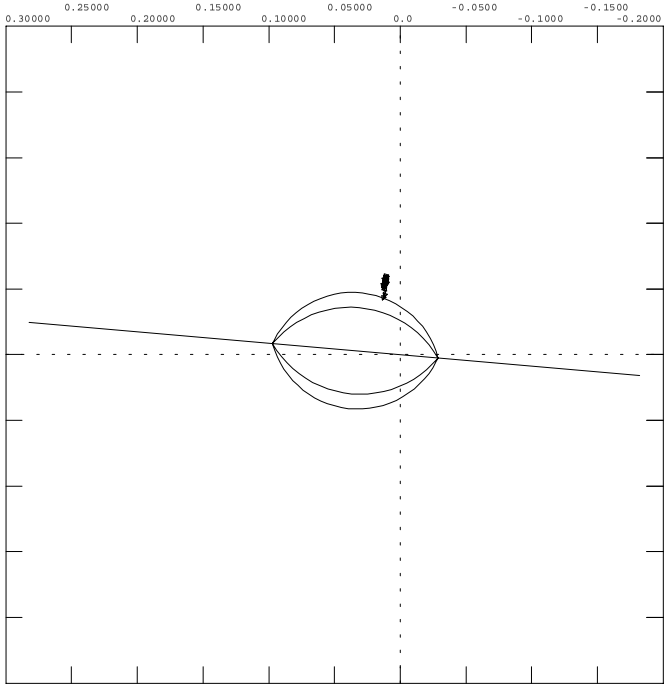
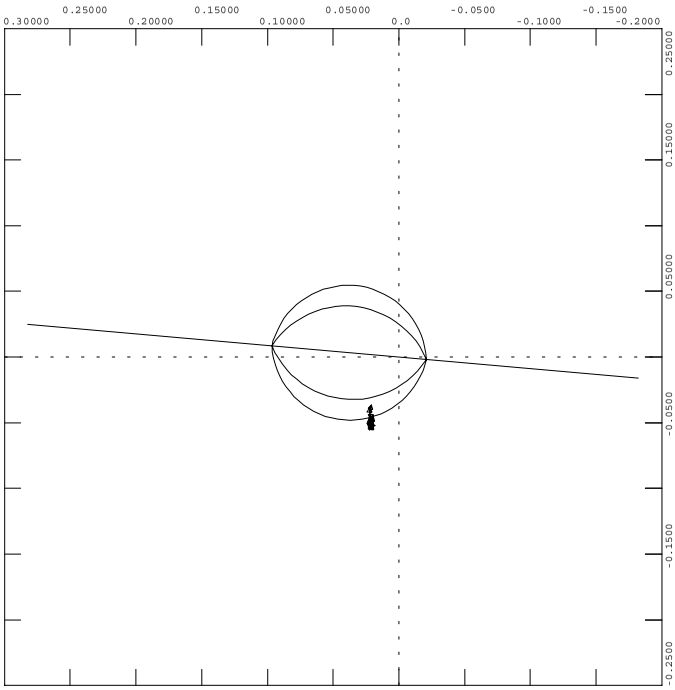


TUE, APR 23 2002 20:42
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 23 2002 20:42
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

RELAY: SLINOS
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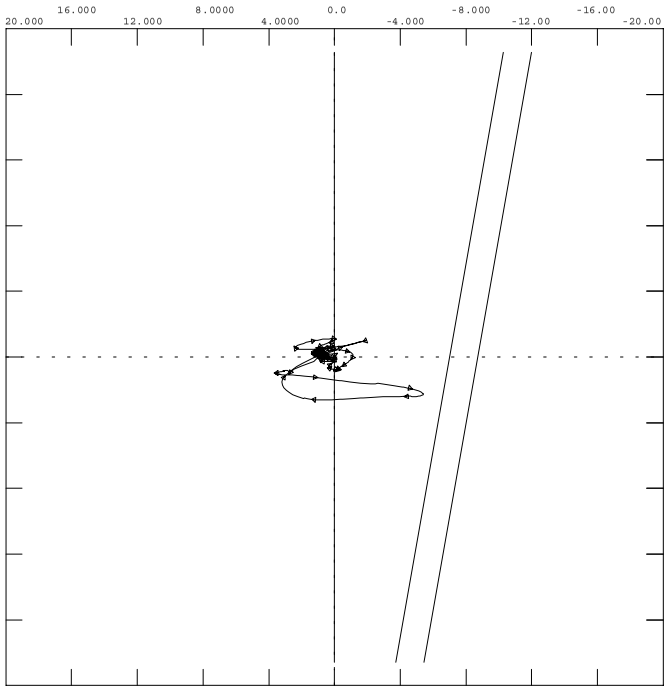
CHNL# 977: [DCAR-B]



TUE, APR 23 2002 20:42
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

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4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

RELAY: SLINOS
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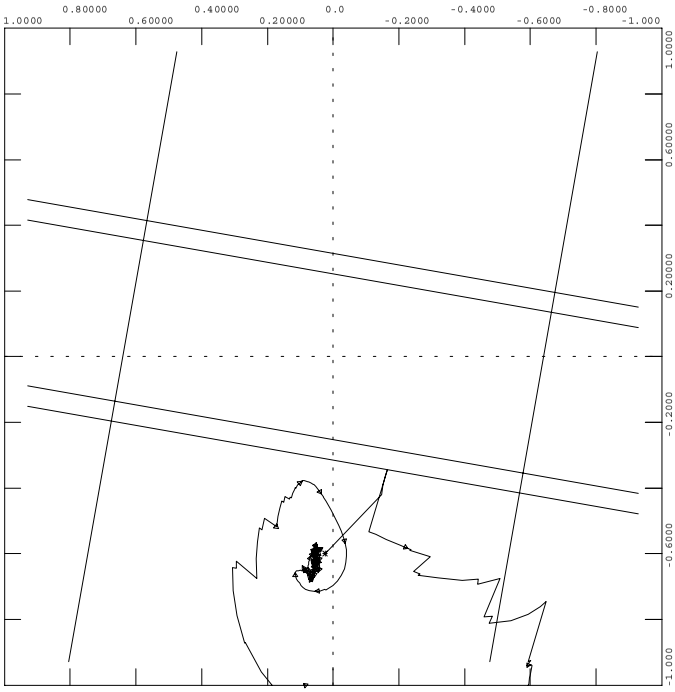
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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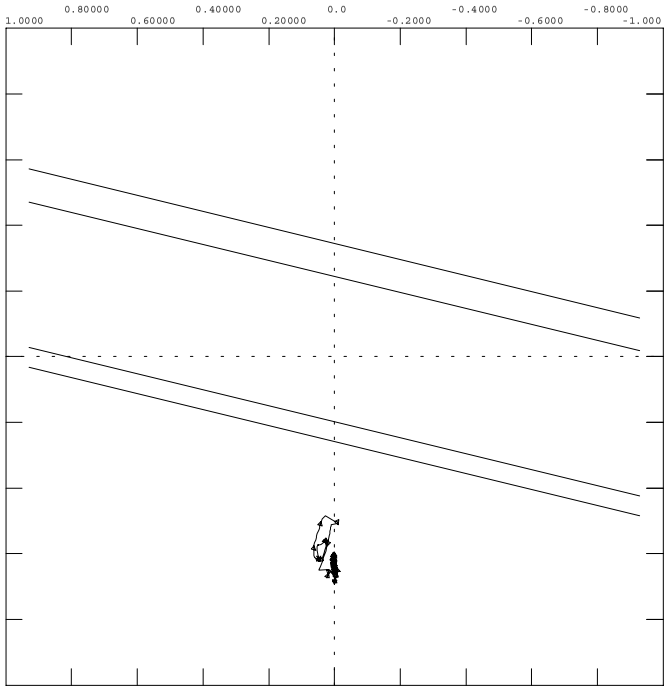
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



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4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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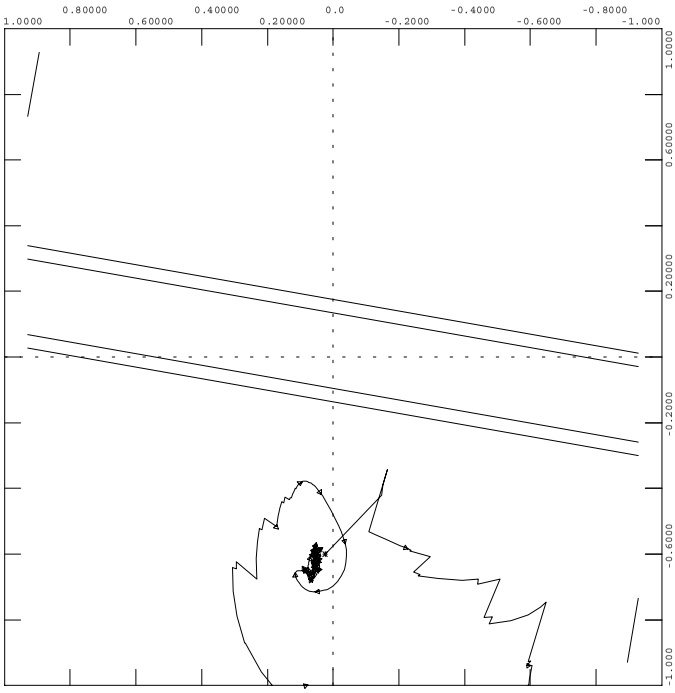

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

RELAY: SLINOS
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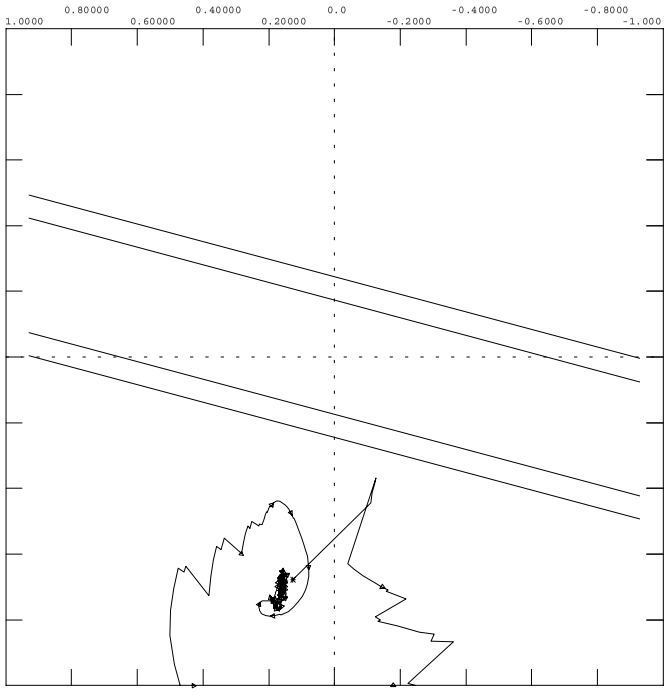

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

RELAY: SLLP
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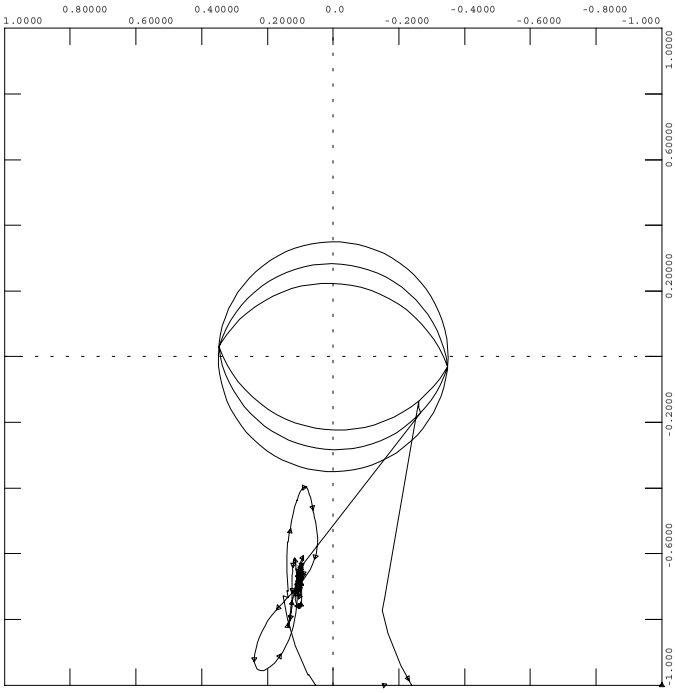
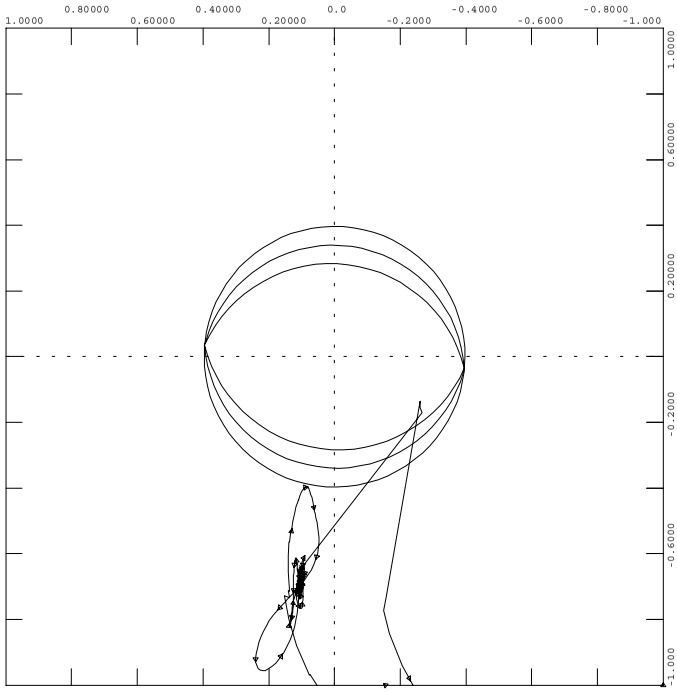
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

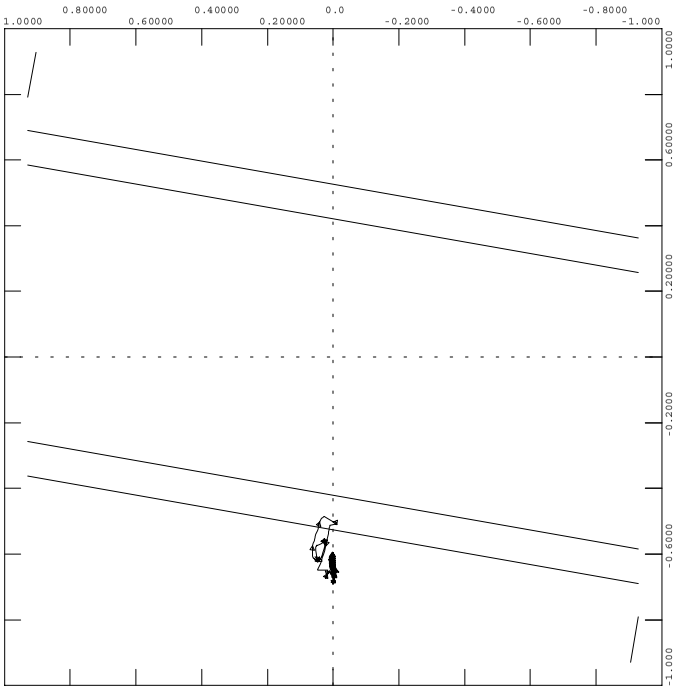
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

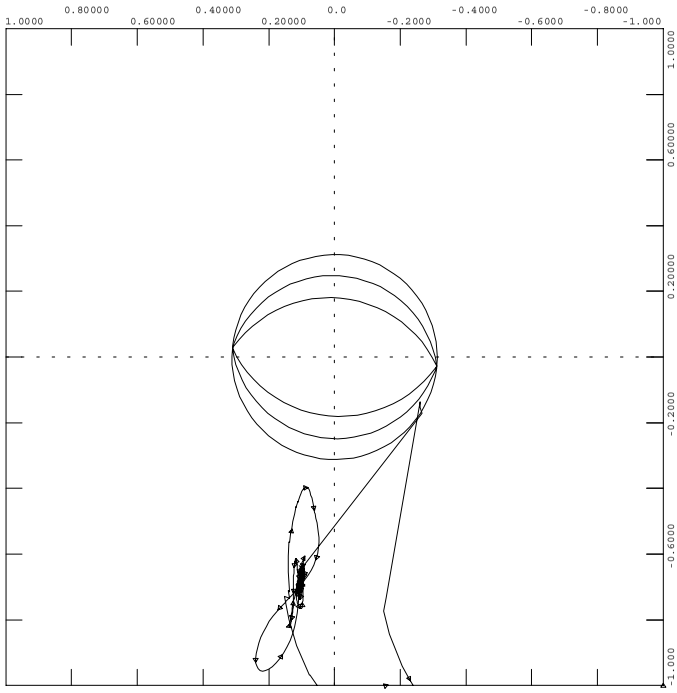
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



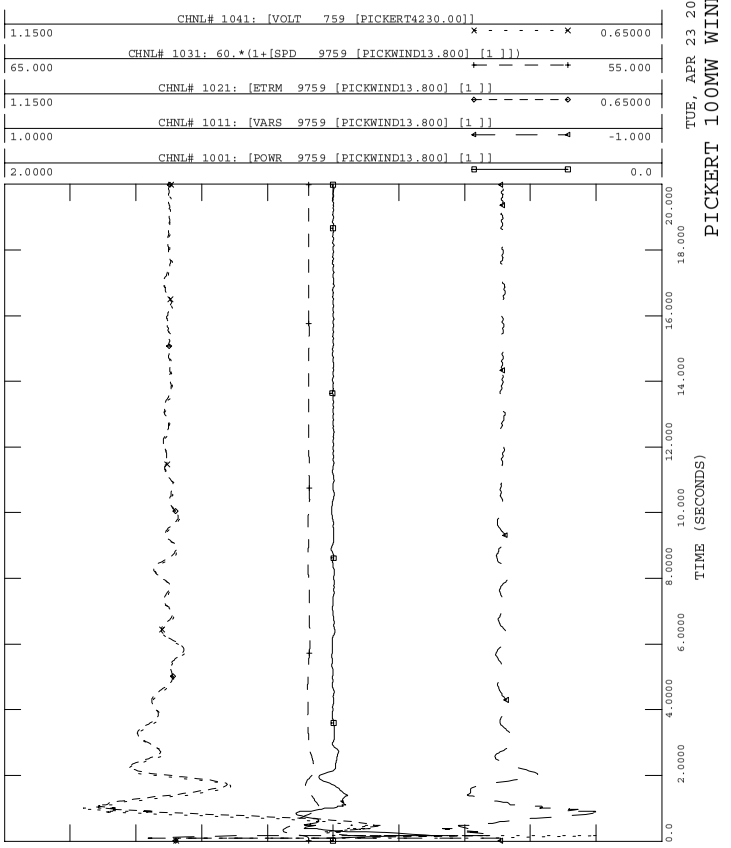
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

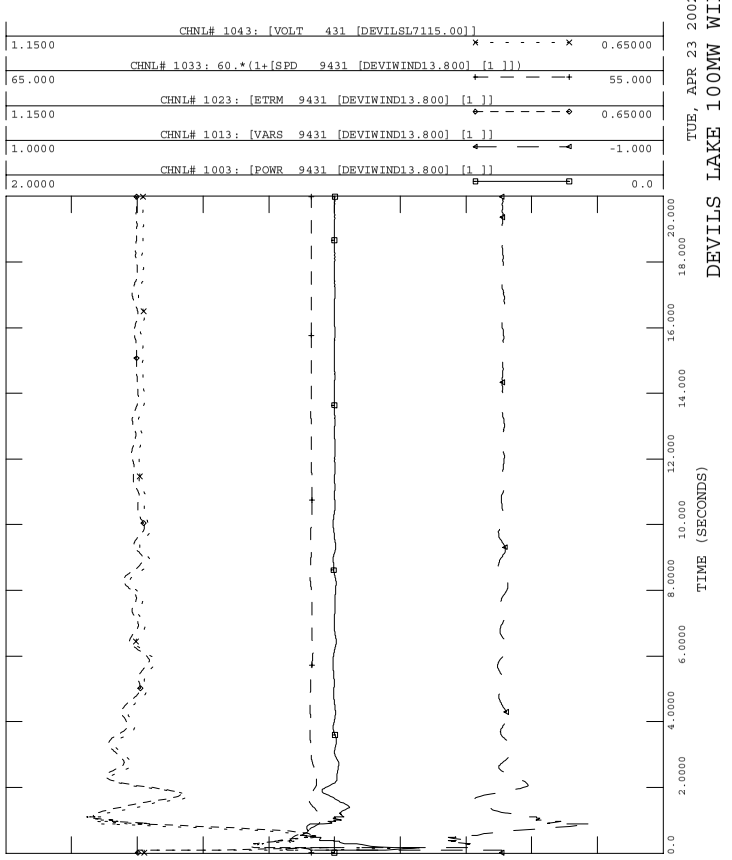


UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



TUE, APR 23 2002 20:42
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

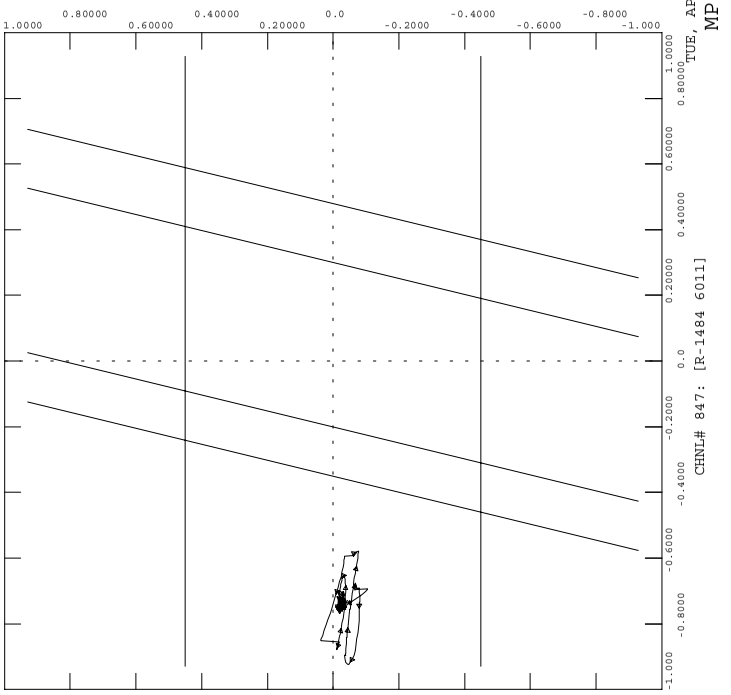


TUE, APR 23 2002 20:42
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

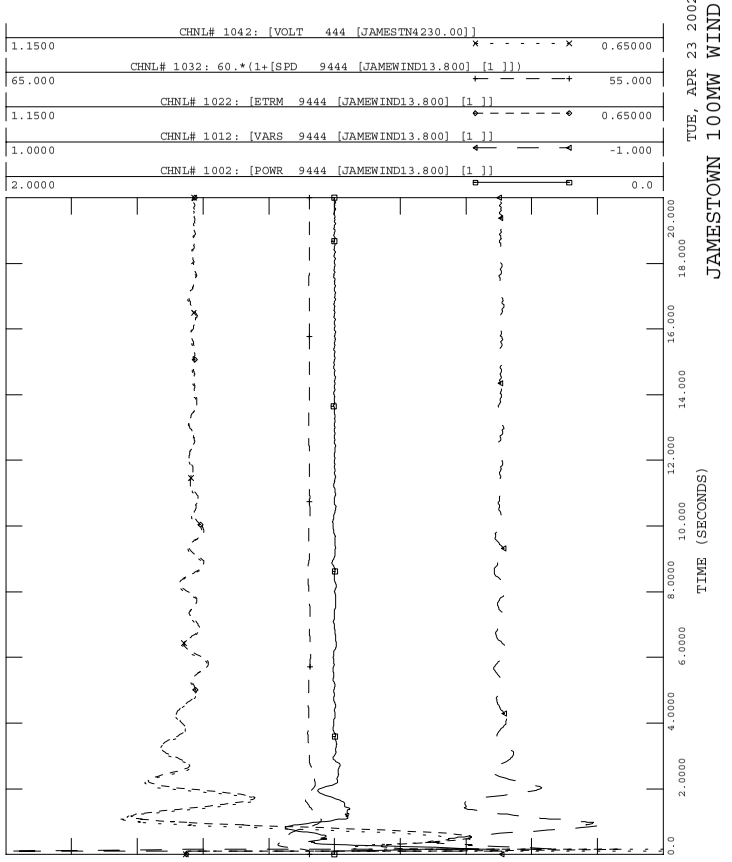
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



TUE, APR 23 2002 20:42
MP-OH I.FALLS (779)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



TUE, APR 23 2002 20:42
JAMESTOWN 100MW WIND UNIT

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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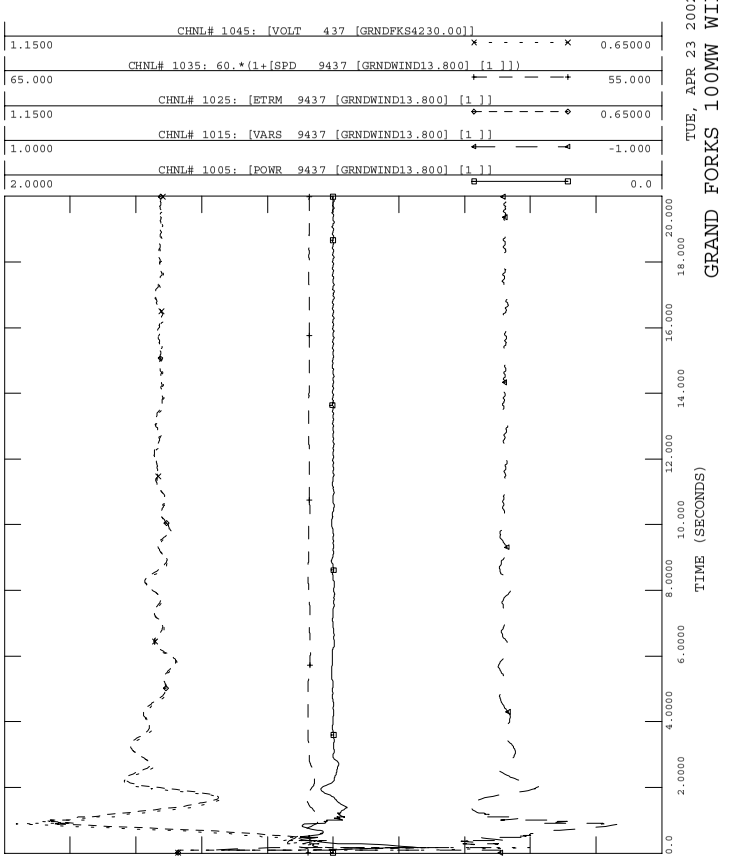
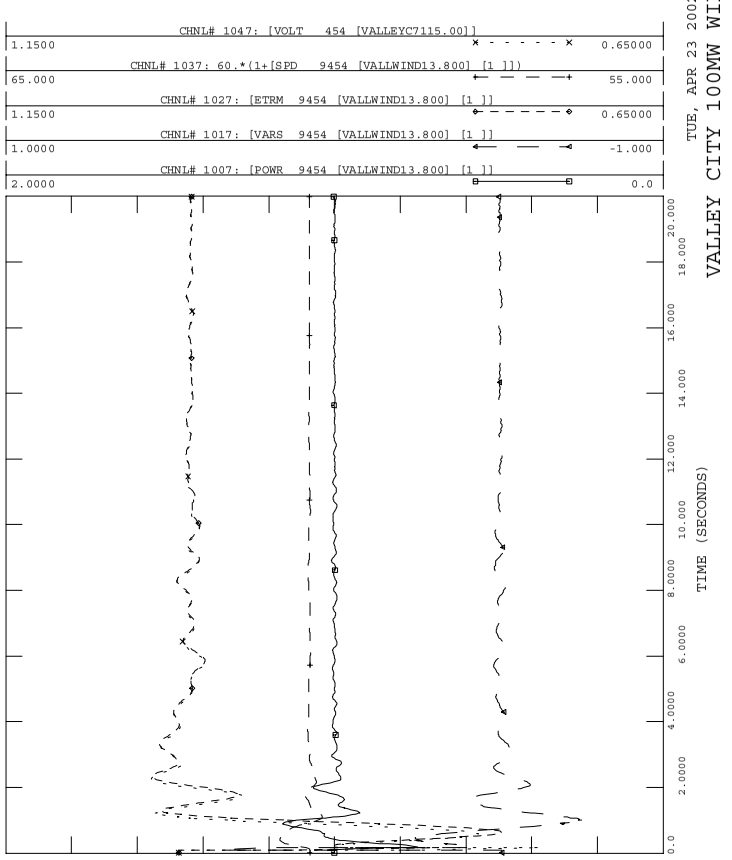
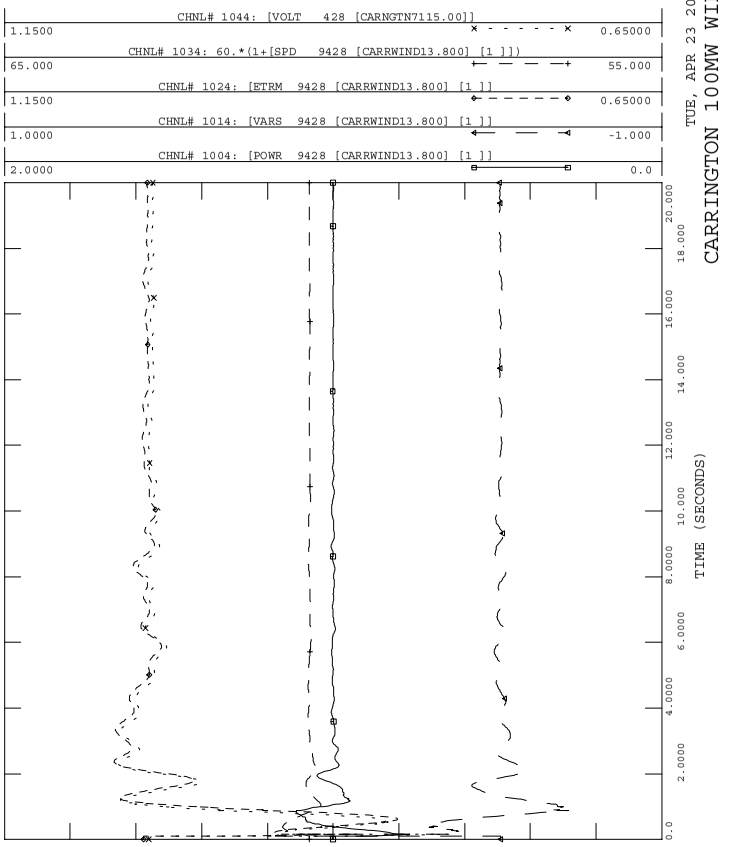
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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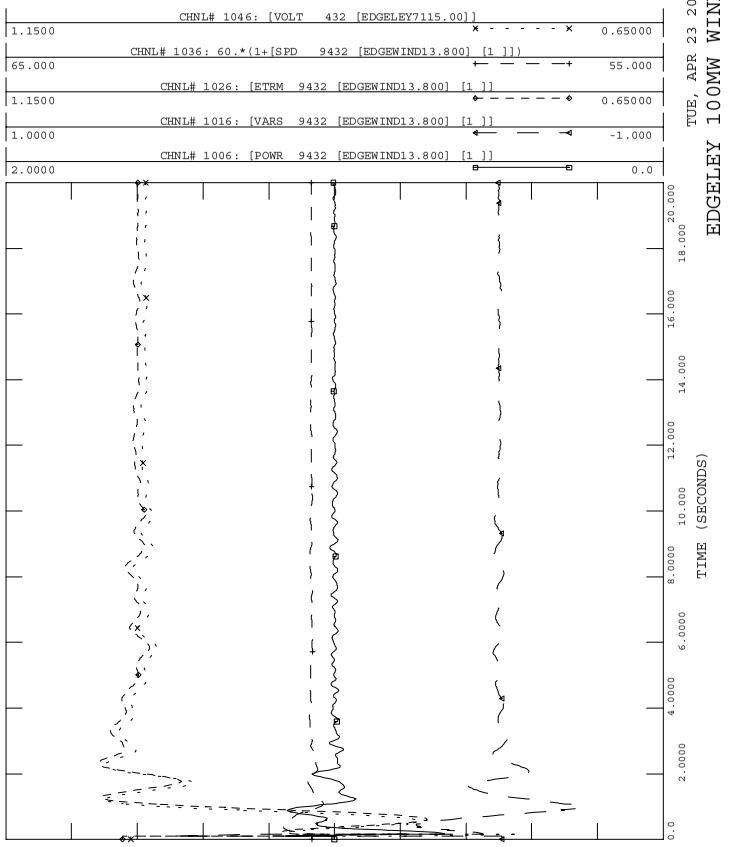
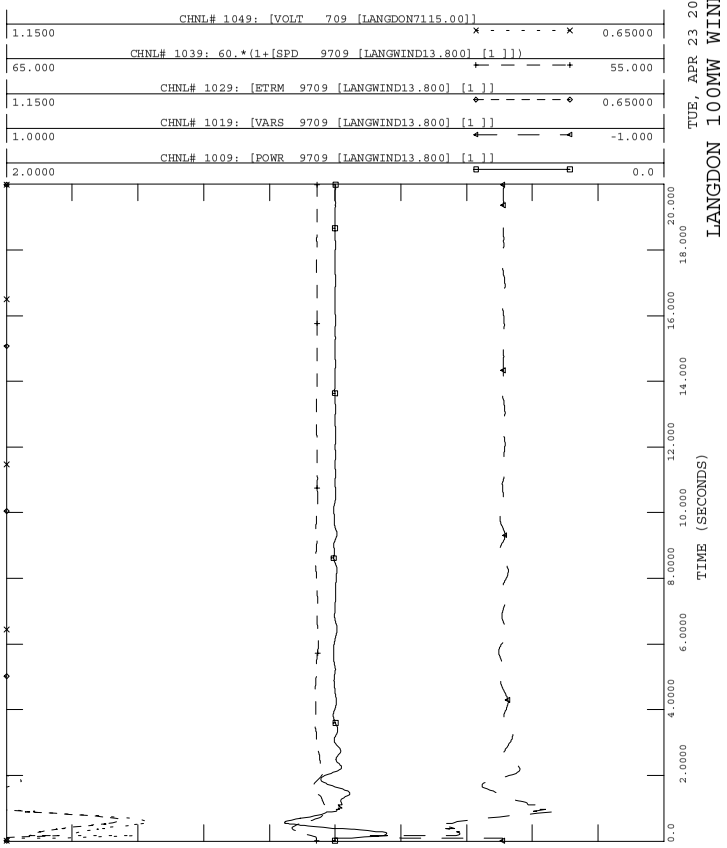
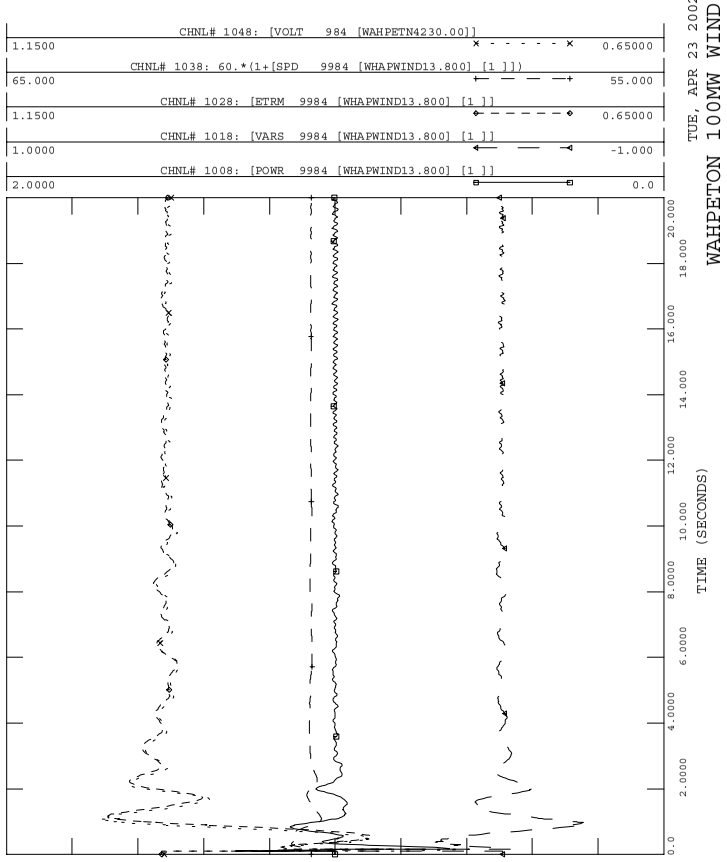
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



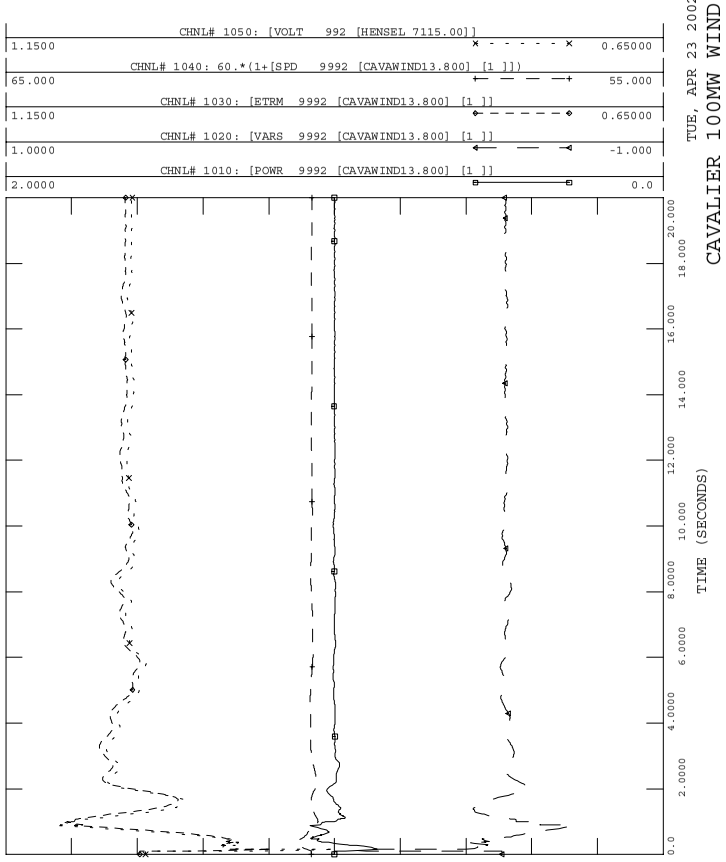
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



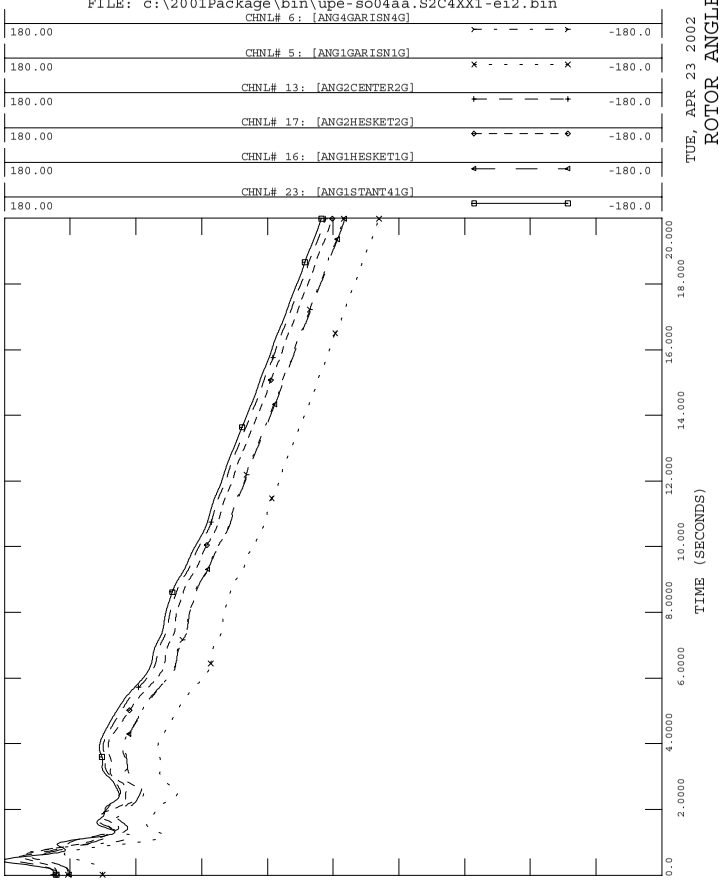
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ag3.bin



CONTINGENCY EI2

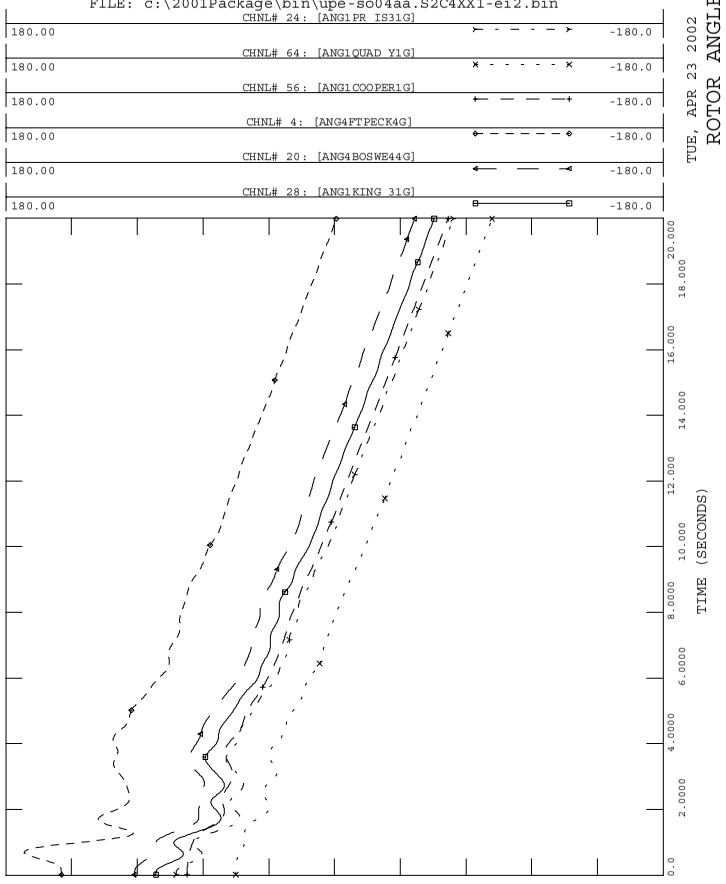
CU DC Permanent Bipole Fault with tripping of both Coal Creek units

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



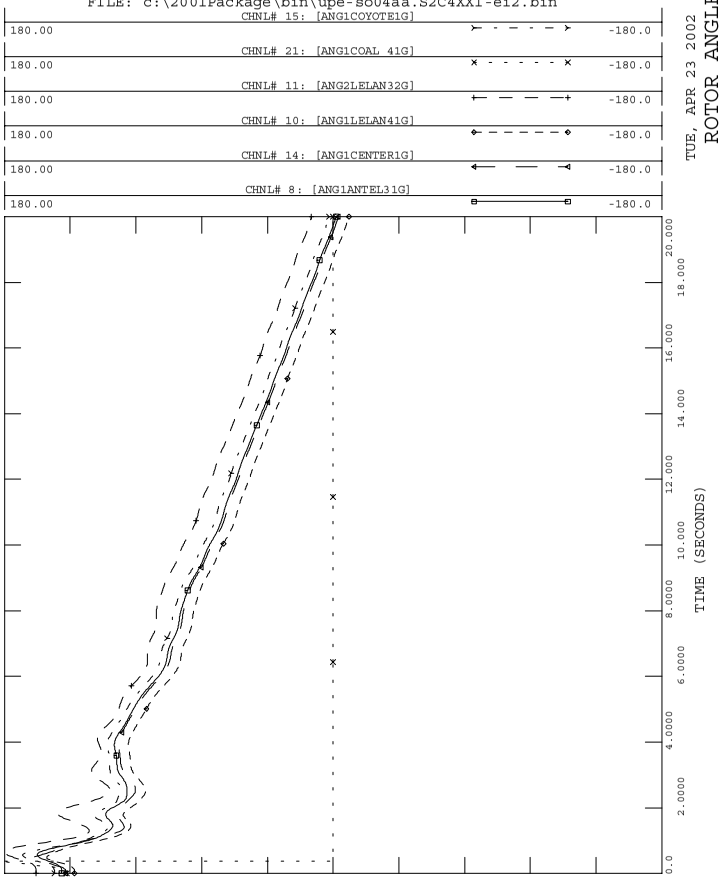
TUE, APR 23 2002 20:56
ROTOR ANGLES 2

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



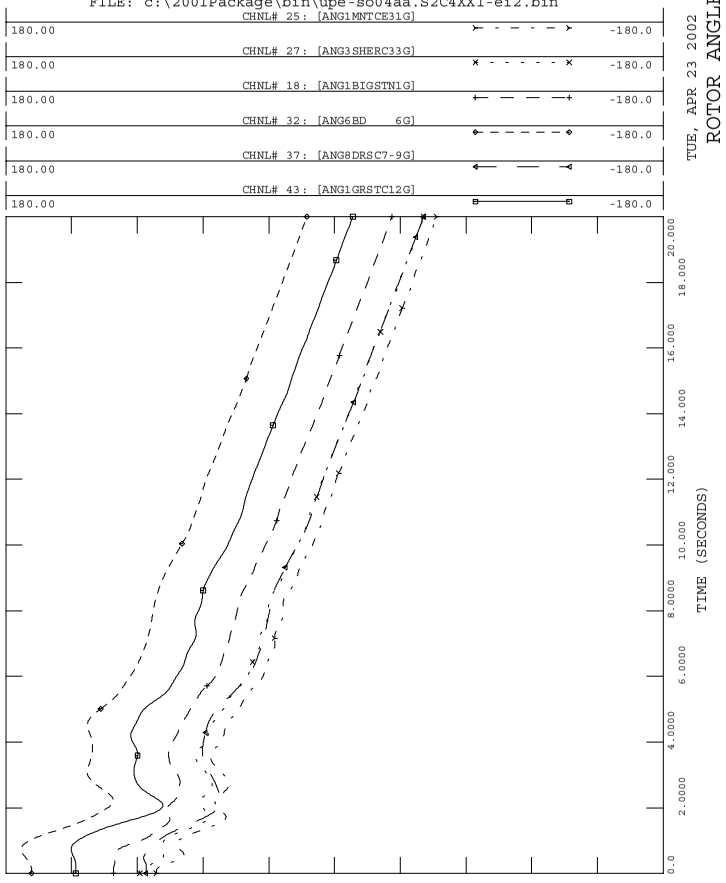
TUE, APR 23 2002 20:56
ROTOR ANGLES 4

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



TUE, APR 23 2002 20:56
ROTOR ANGLES 1

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



TUE, APR 23 2002 20:56
ROTOR ANGLES 3

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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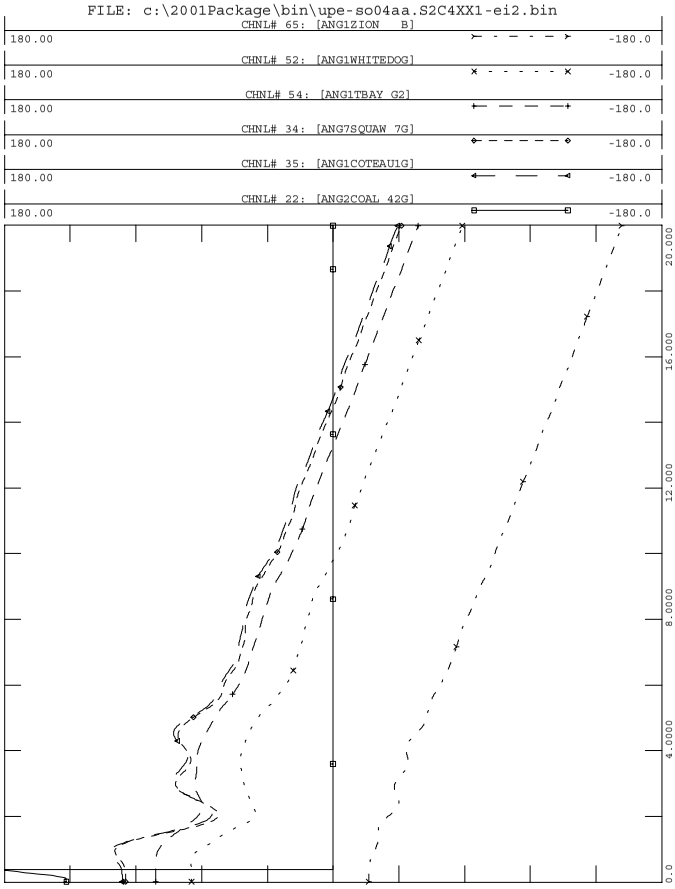
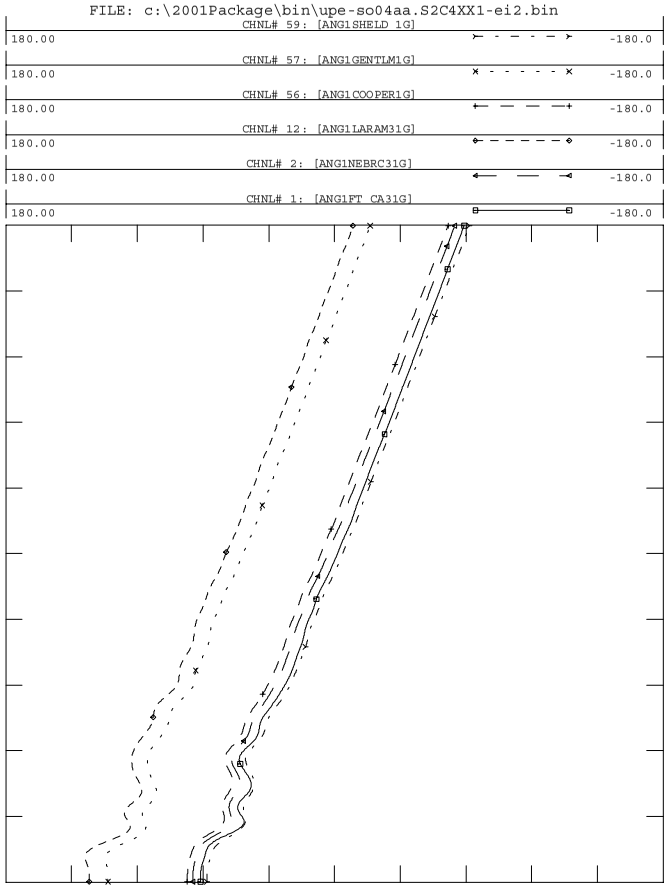
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



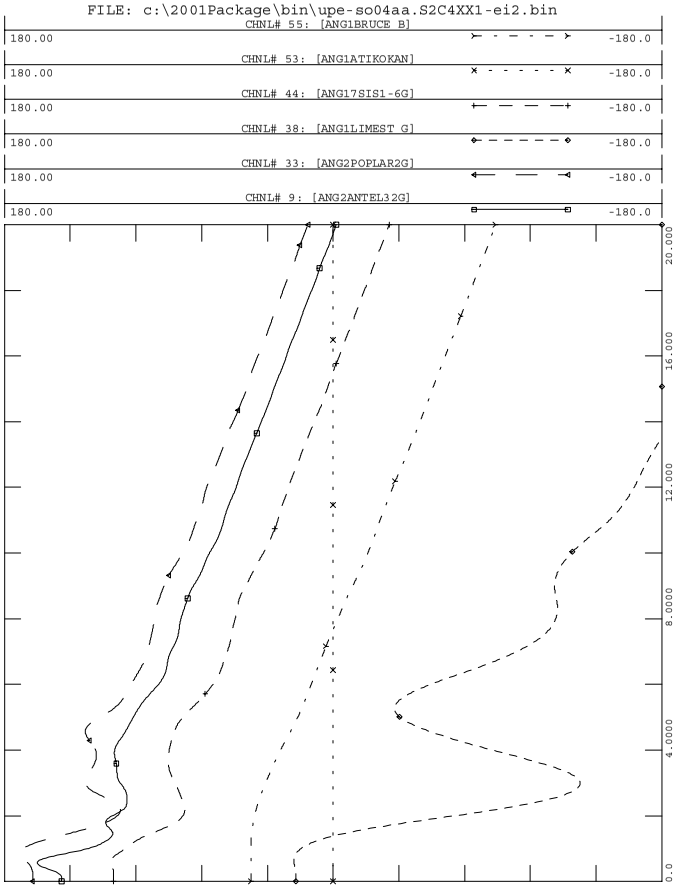
TUE, APR 23 2002 20:56
ROTOR ANGLES 6

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



TUE, APR 23 2002 20:56
ROTOR ANGLES NB

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



TUE, APR 23 2002 20:56
ROTOR ANGLES 5

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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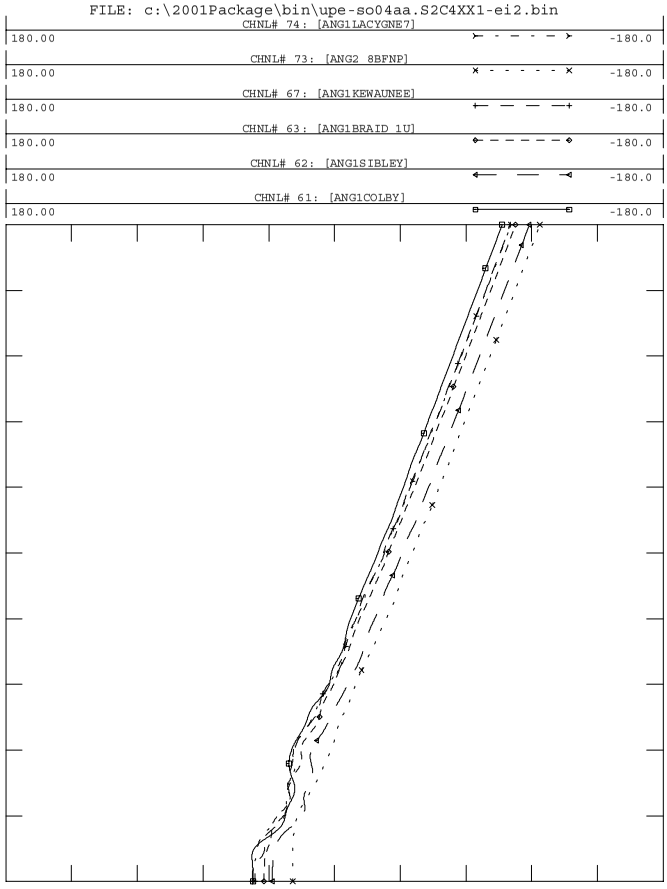
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



TUE, APR 23 2002 20:56
ROTOR ANGLES 7

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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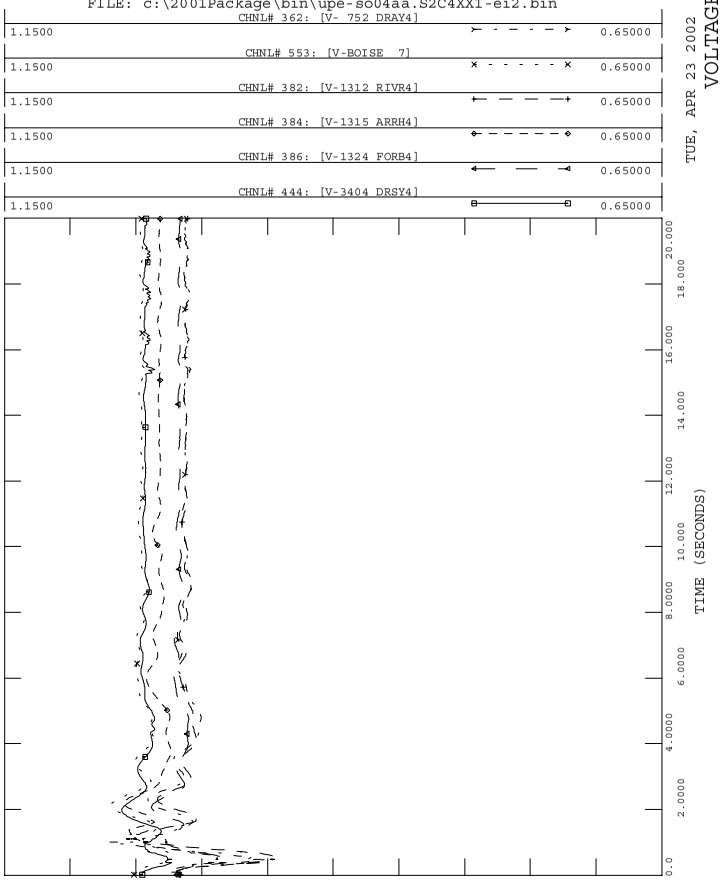
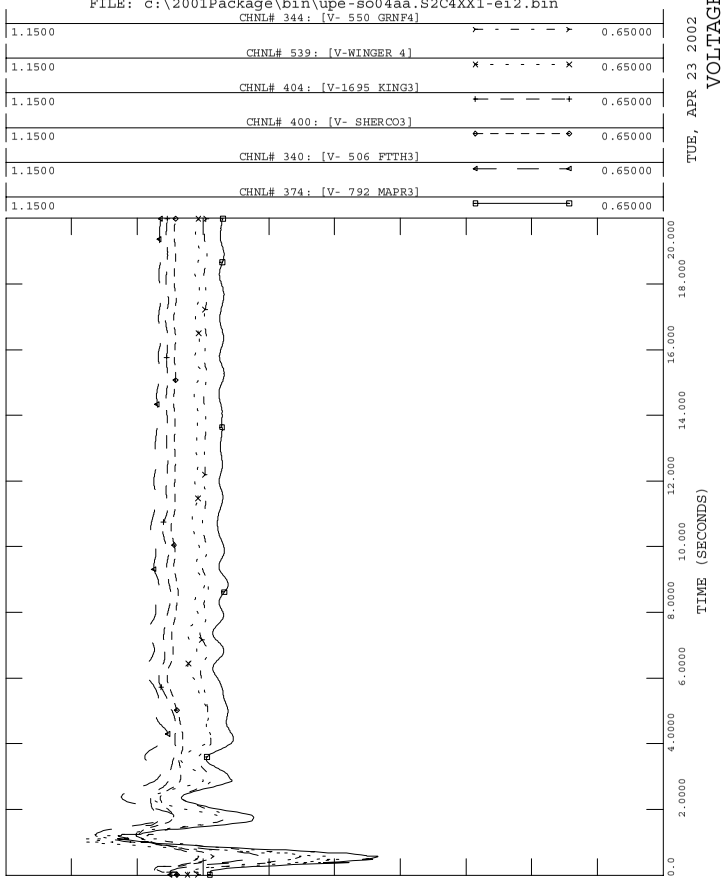
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



TUE, APR 23 2002 20:56
VOLTAGES 1

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



TUE, APR 23 2002 20:56
VOLTAGES 3

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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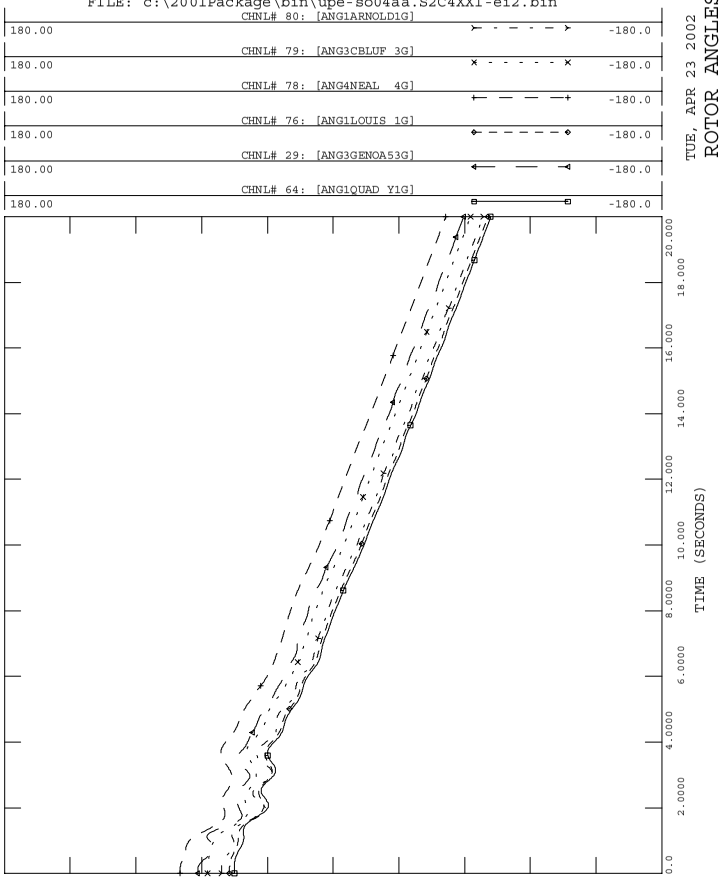
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



TUE, APR 23 2002 20:56
ROTOR ANGLES IA

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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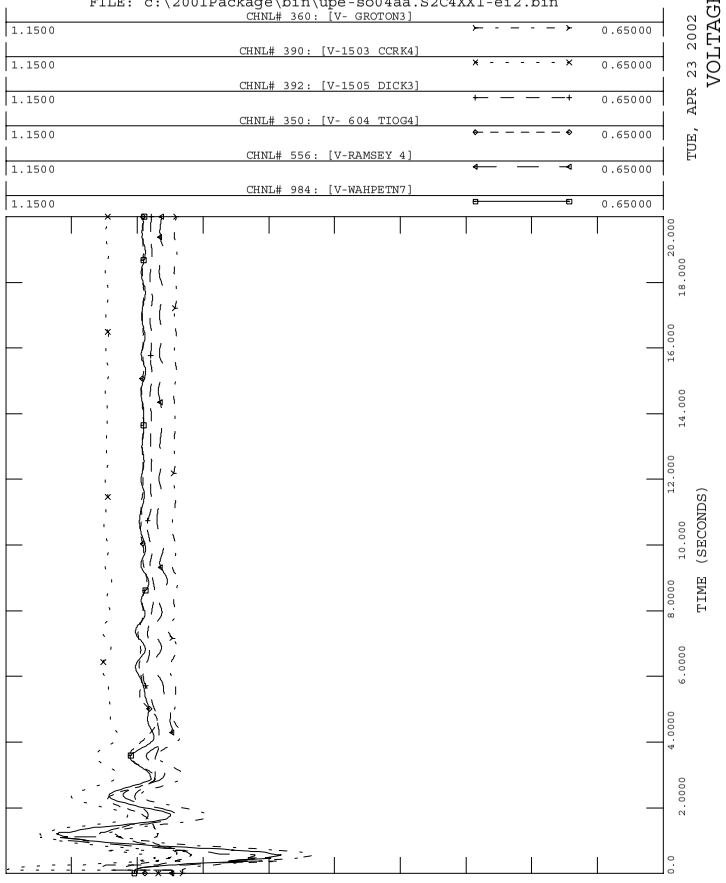
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



TUE, APR 23 2002 20:56
VOLTAGES 2

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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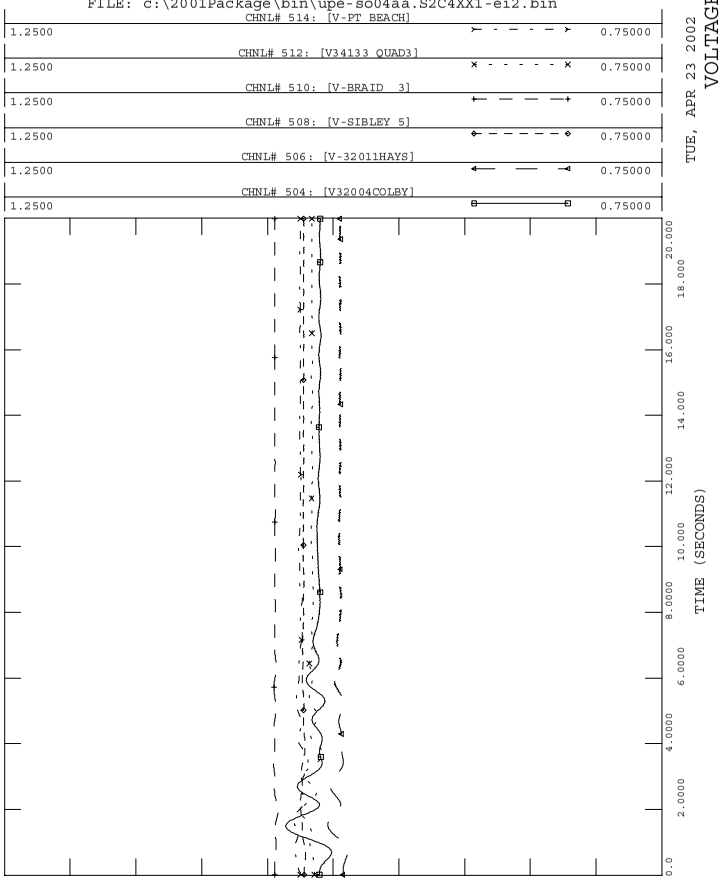
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56
VOLTAGES 5



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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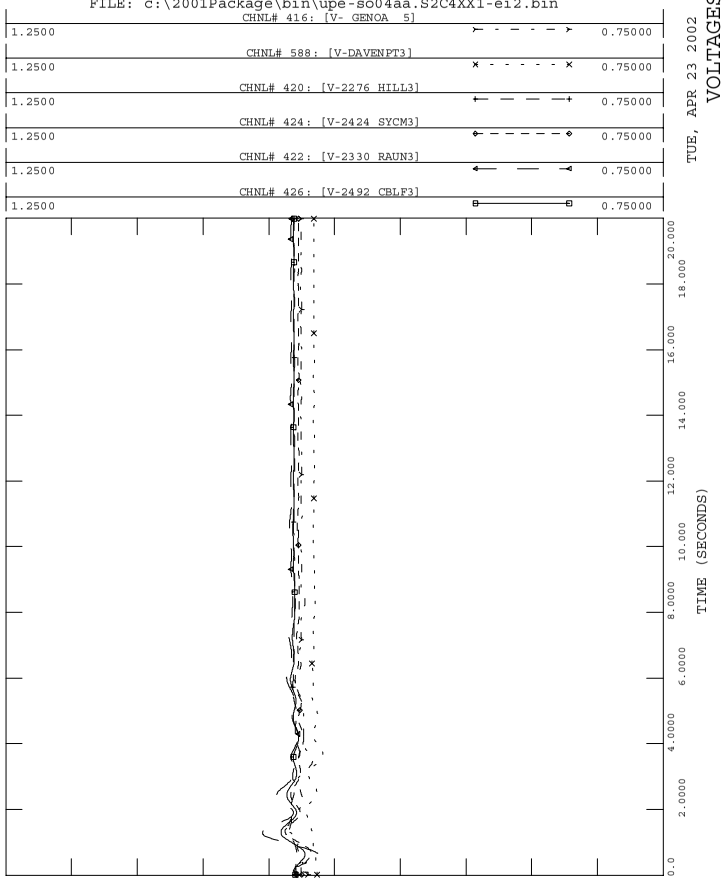
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56
VOLTAGES IA



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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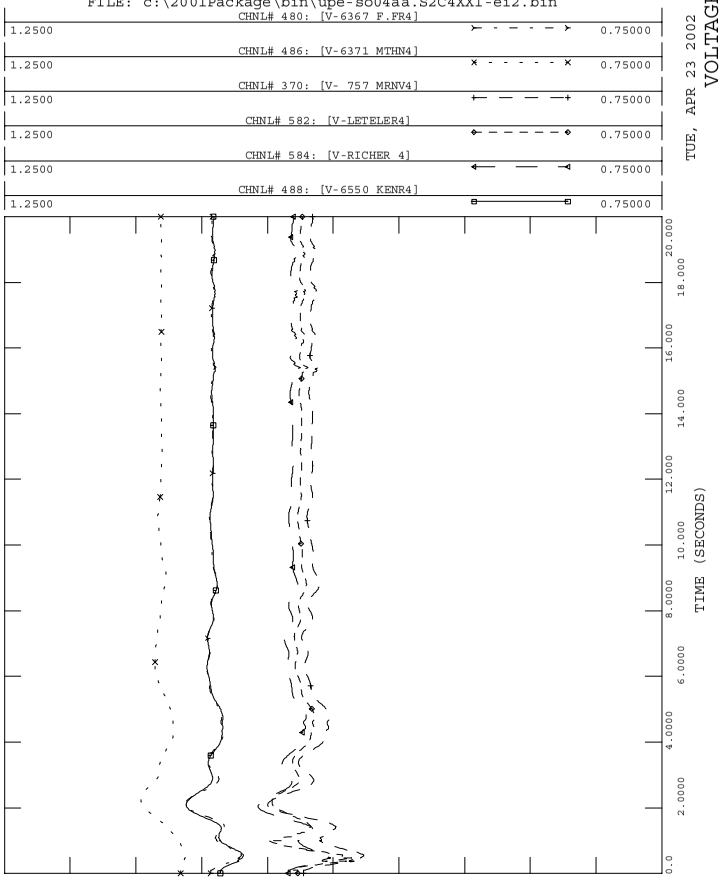
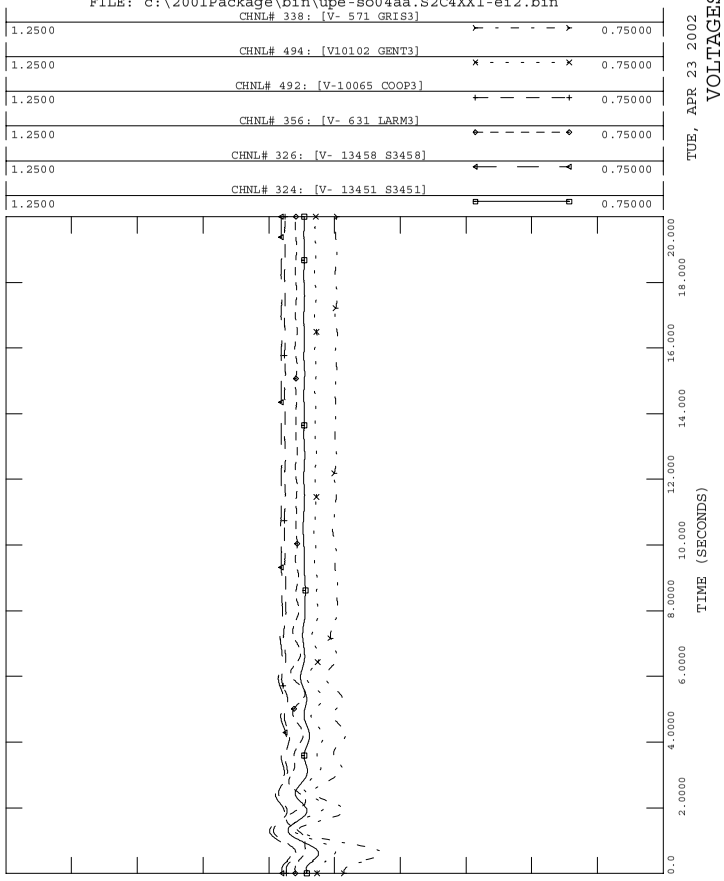
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

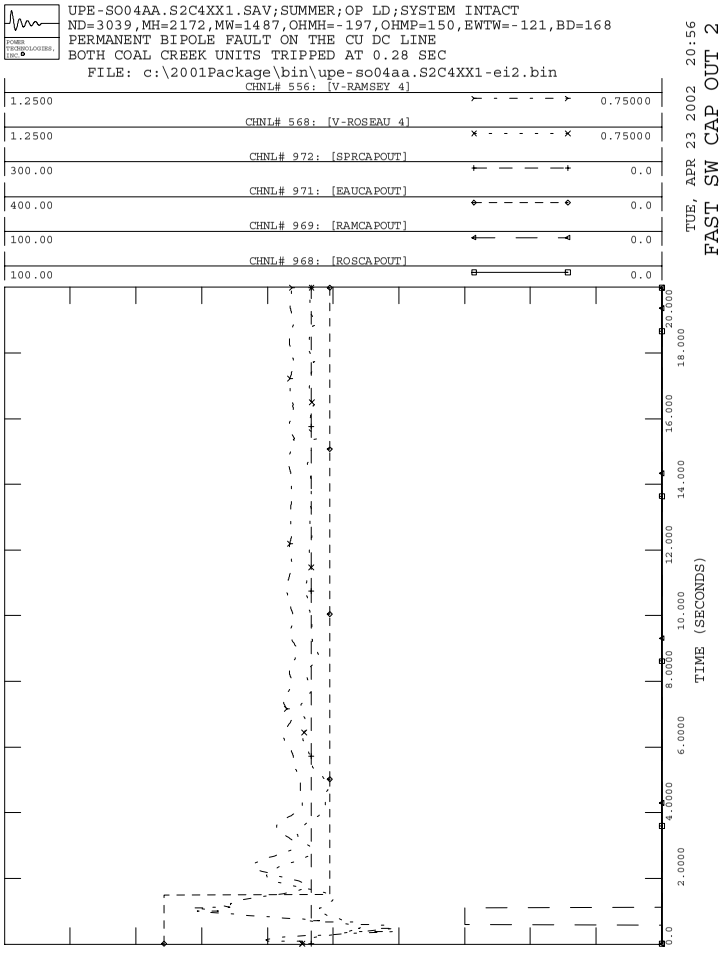
TUE, APR 23 2002 20:56
VOLTAGES 4

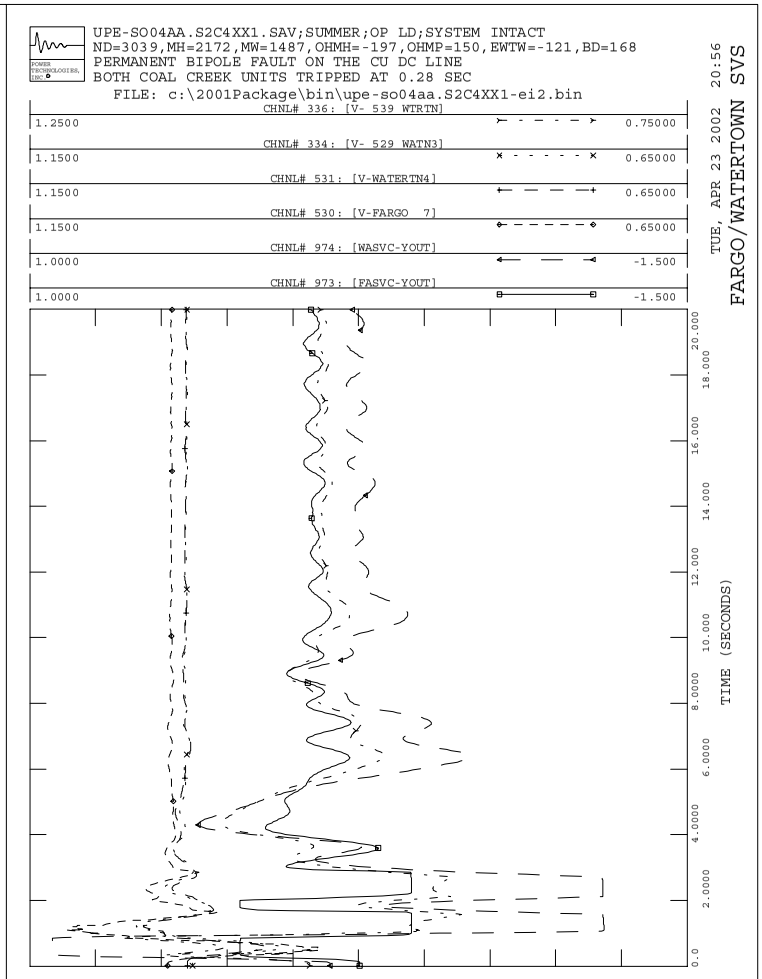


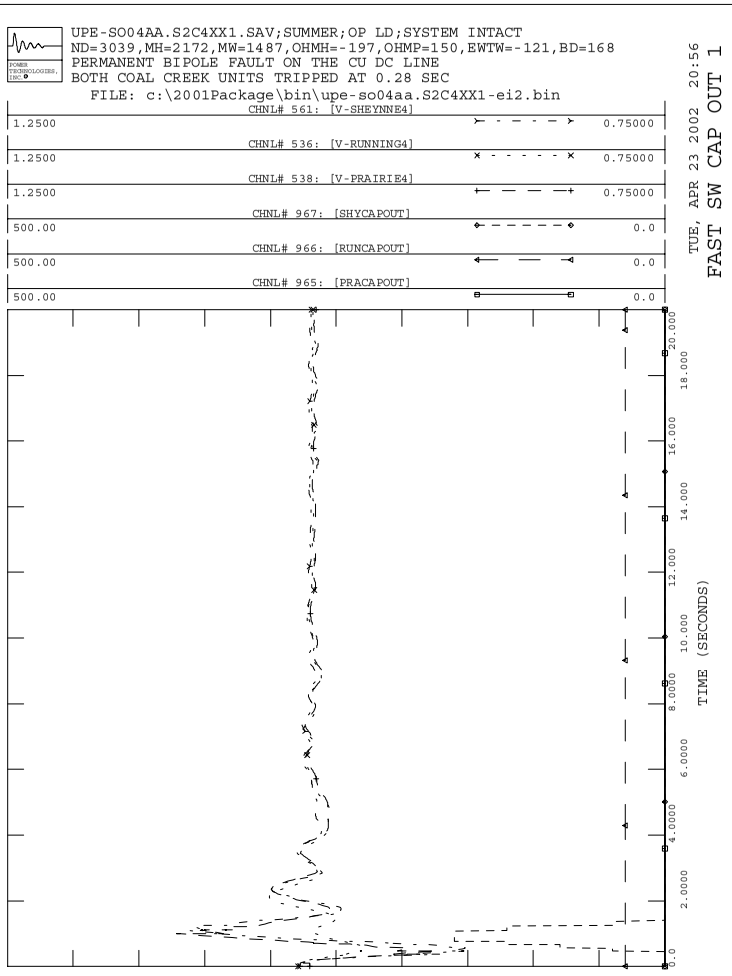
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

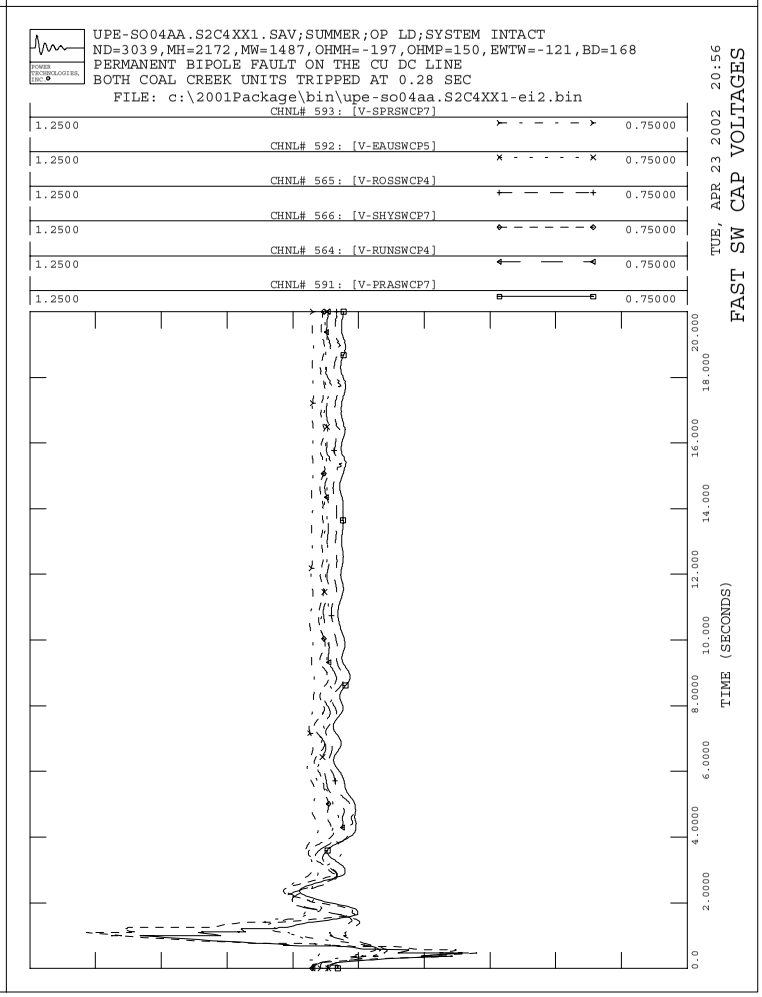
TUE, APR 23 2002 20:56
VOLTAGES NB




UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
TUE, APR 23 2002 20:56
FAST SW CAP OUT 2


UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
TUE, APR 23 2002 20:56
FARGO/WATERTOWN SVS

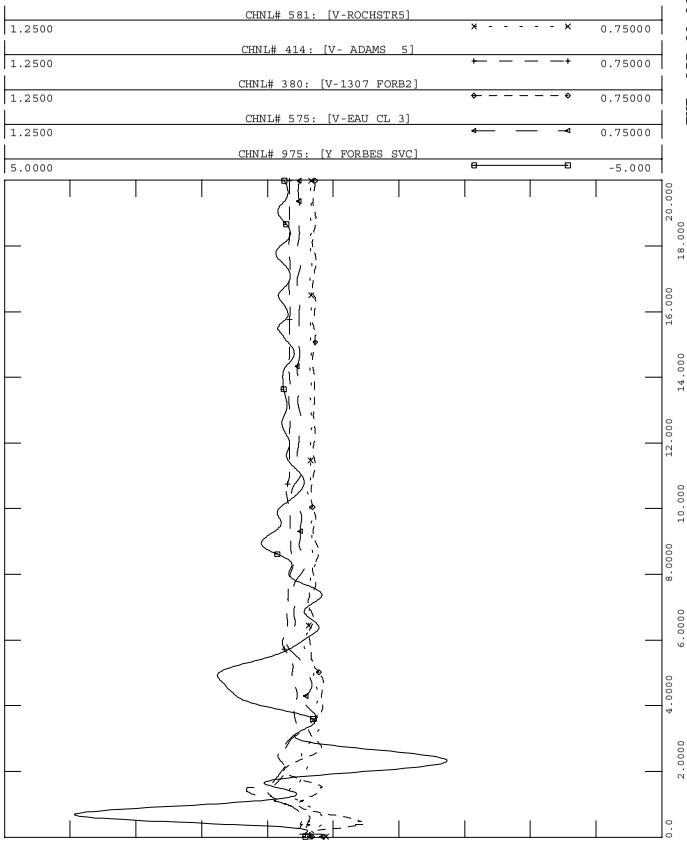

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
TUE, APR 23 2002 20:56
FAST SW CAP OUT 1


UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
TUE, APR 23 2002 20:56
FAST SW CAP VOLTAGES

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56

SVC & WISCONSIN VOLT



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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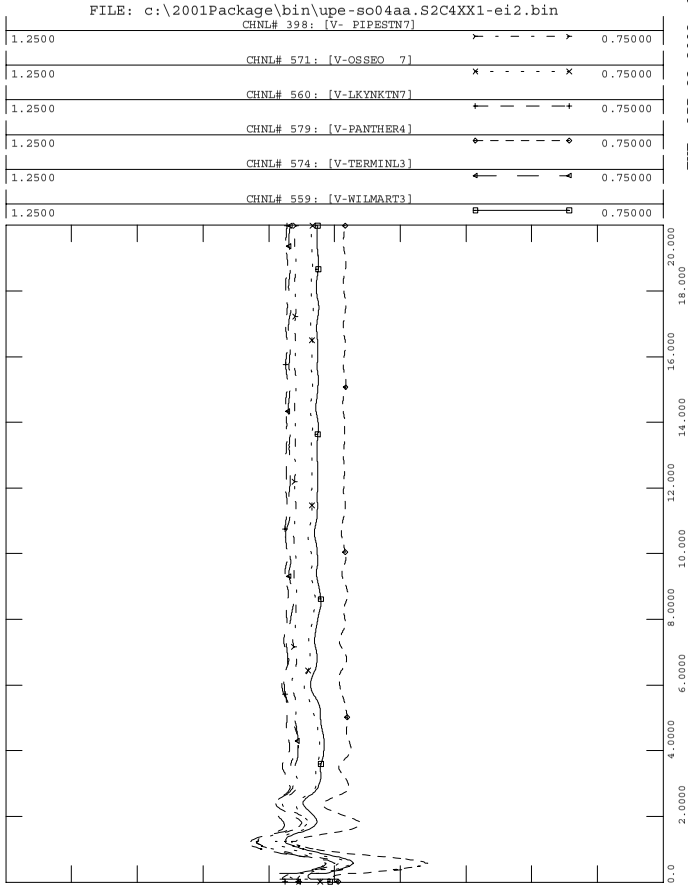
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56

TC VOLTAGES



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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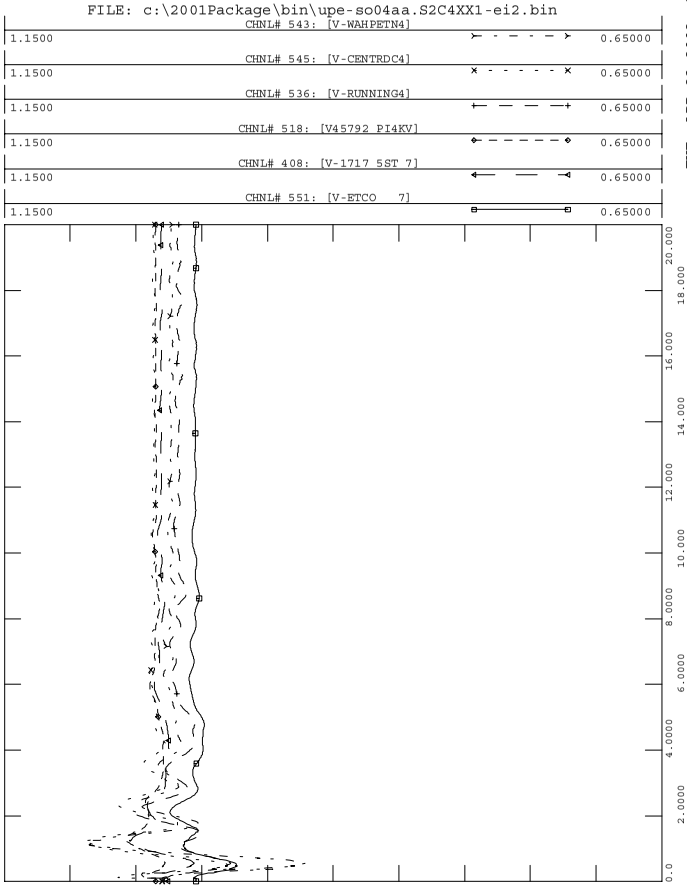
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56

VOLTAGES 6



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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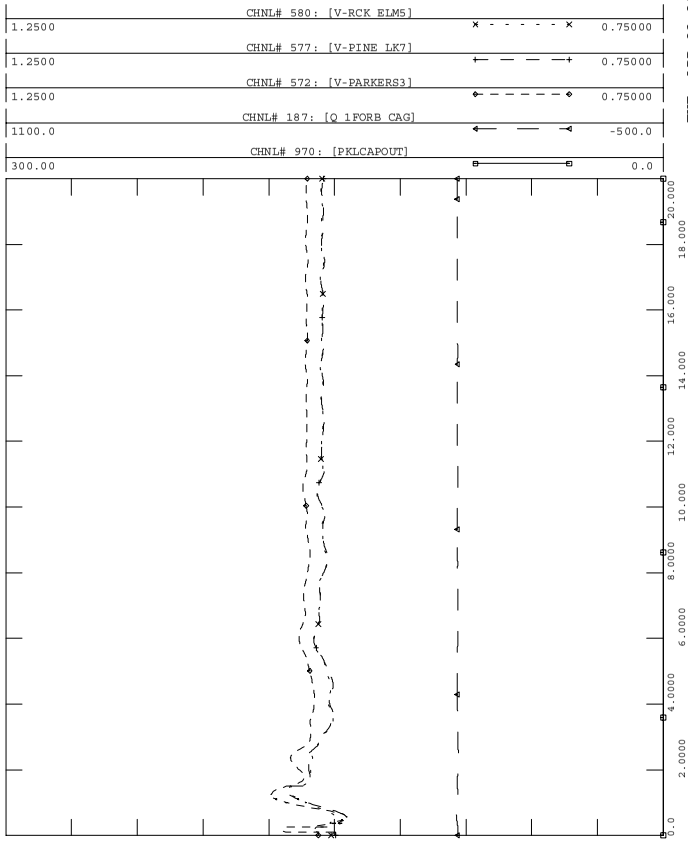
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56

FORBES SVS OUT & VOLTAGES



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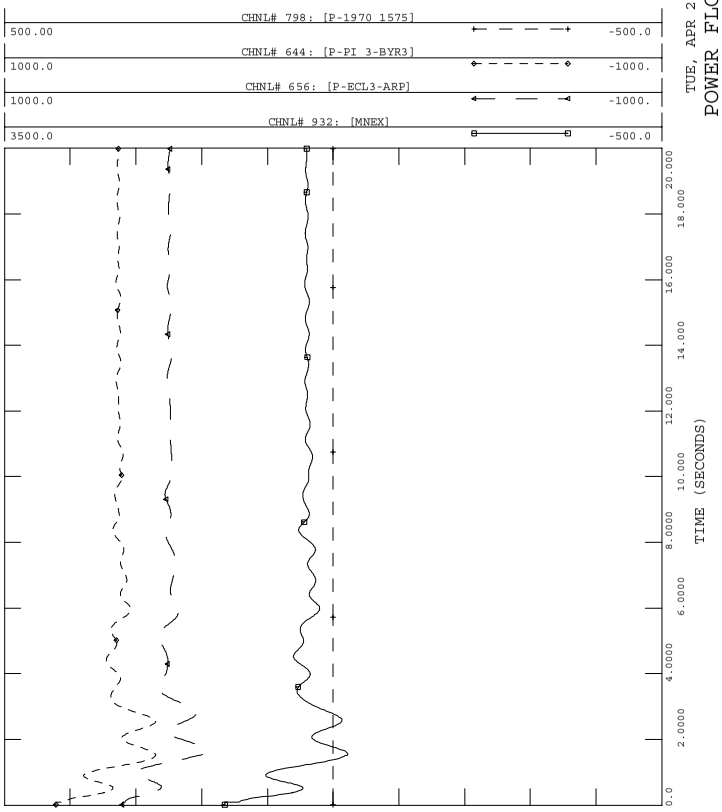
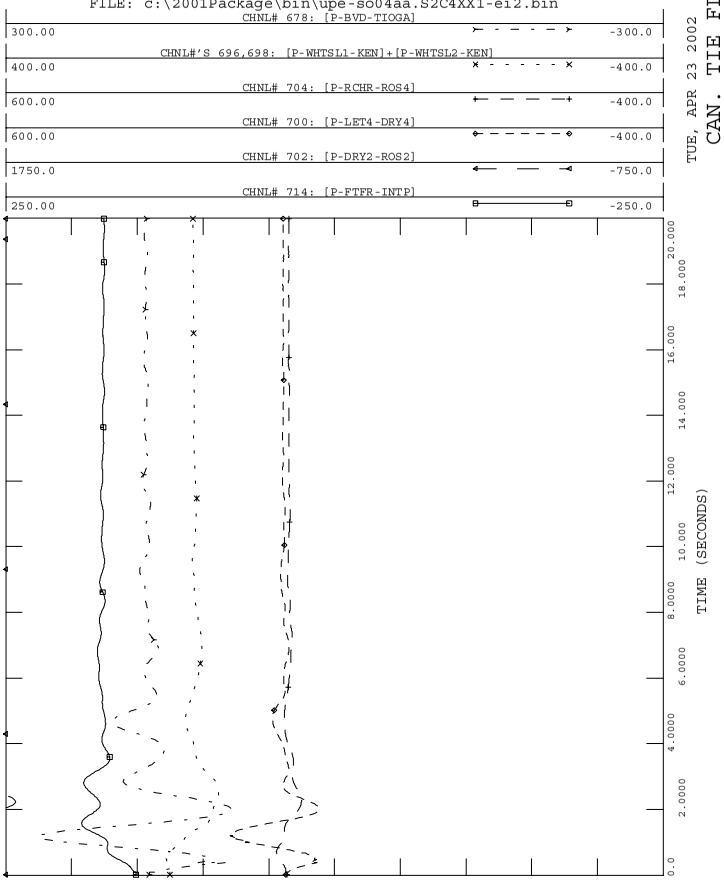
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56
POWER FLOW SUMS 2



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56
CAN. TIE FLOWS



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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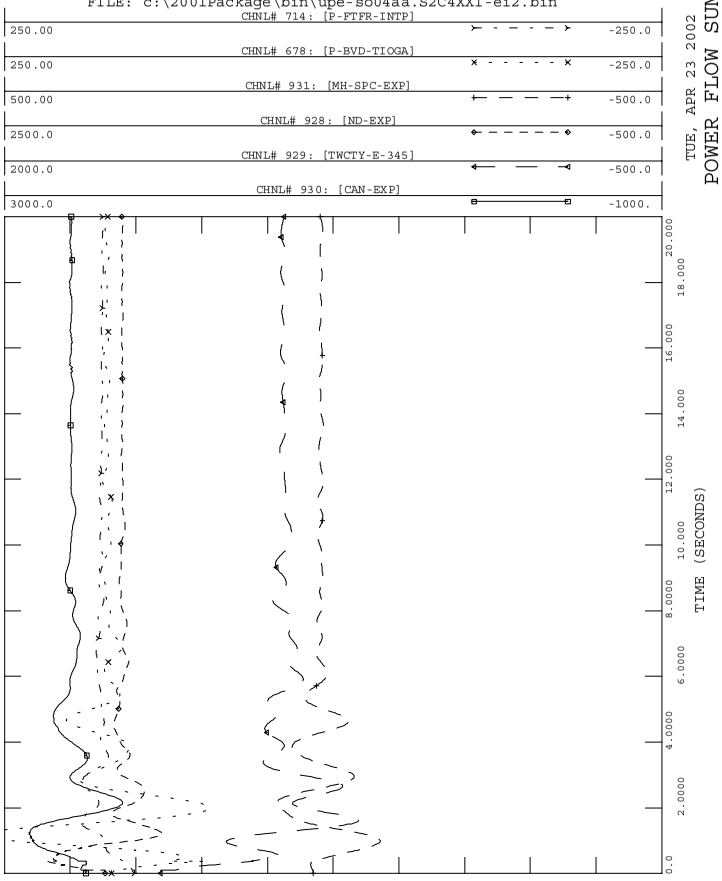
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56
POWER FLOW SUMS 1



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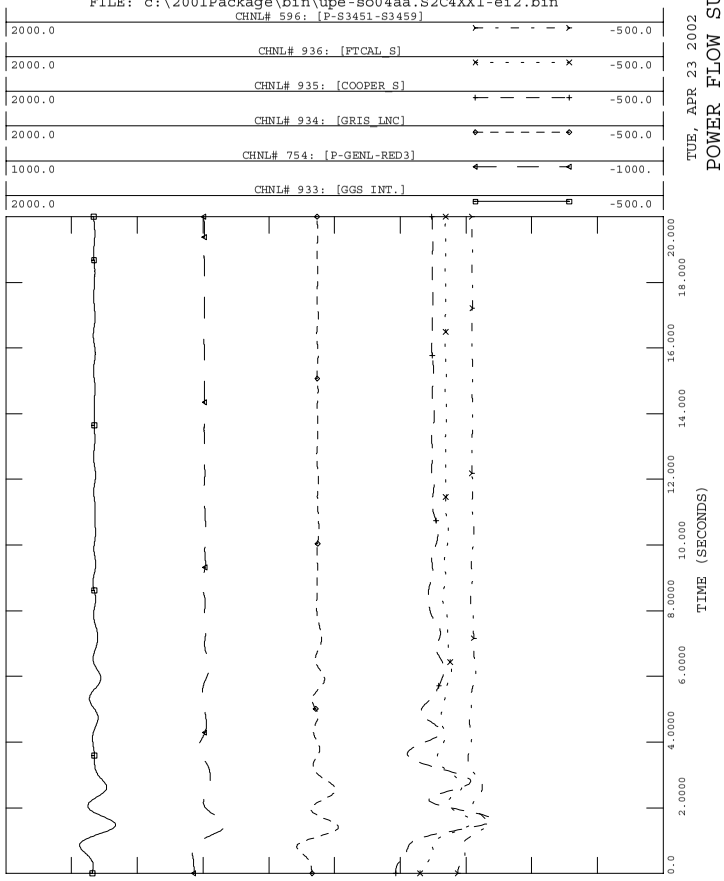
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56
POWER FLOW SUM 3



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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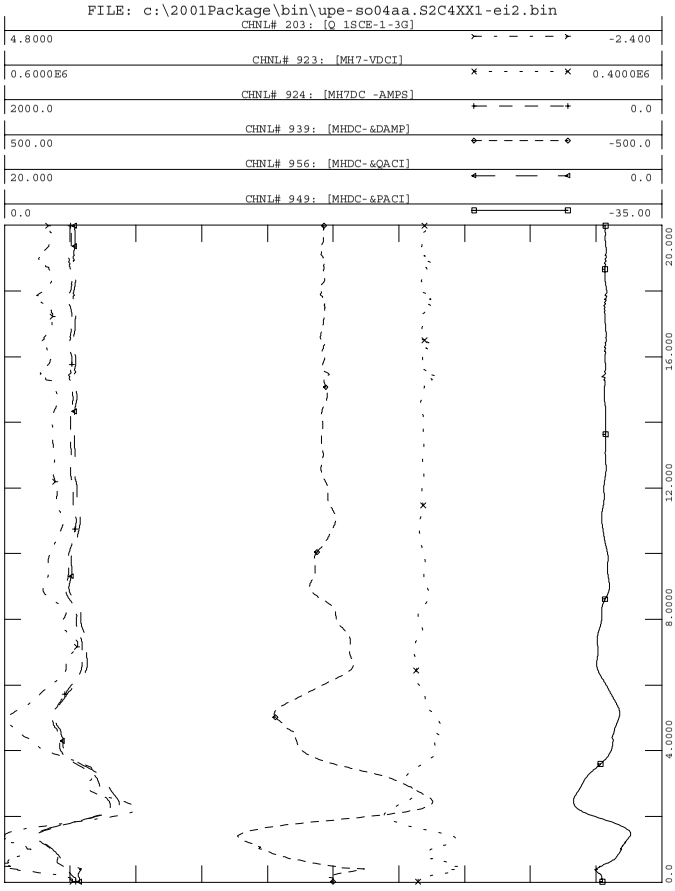
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56
MH DC PARAMETERS



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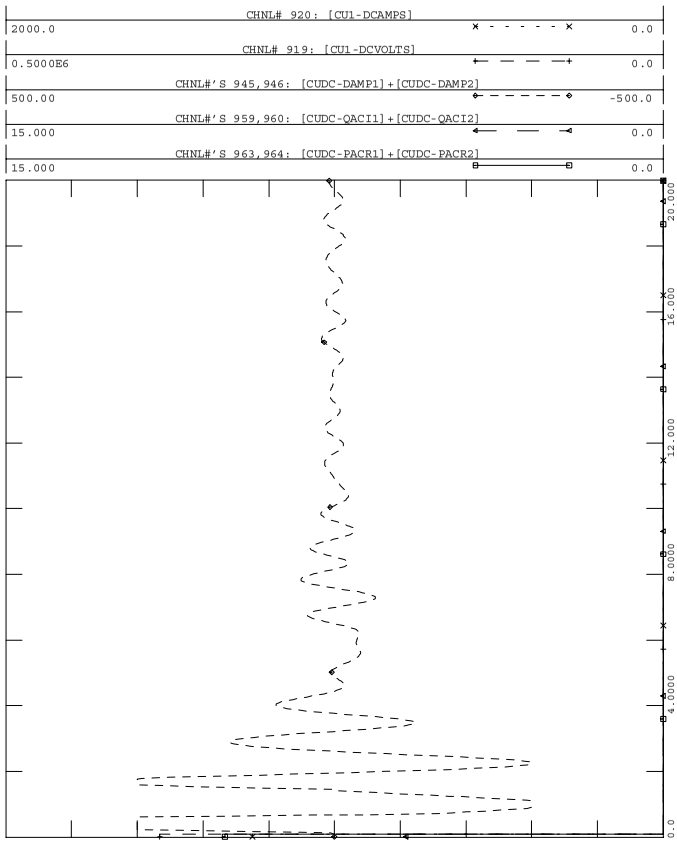
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56
CU DC #1



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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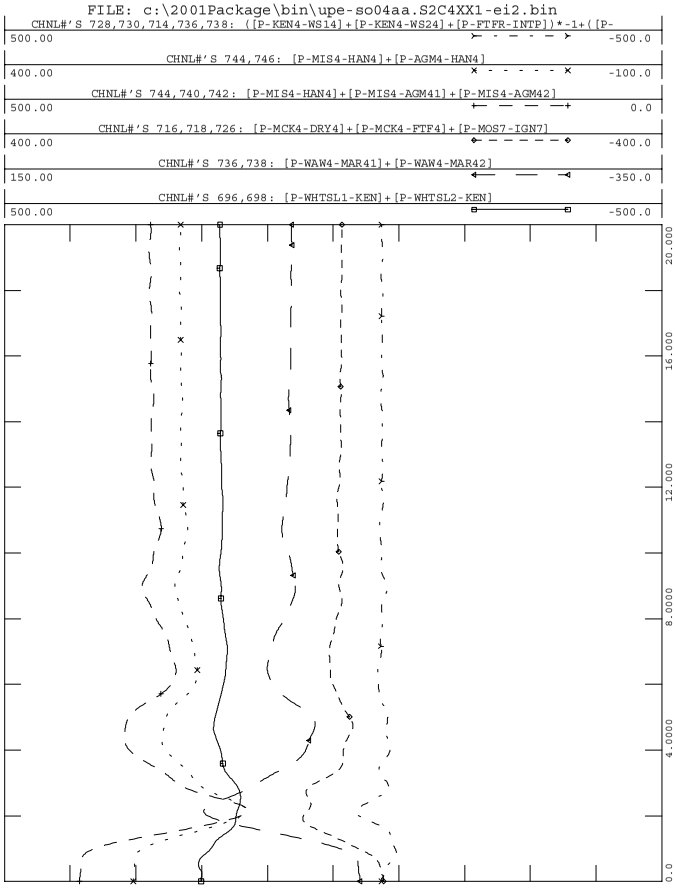
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56
OH TIE FLOWS



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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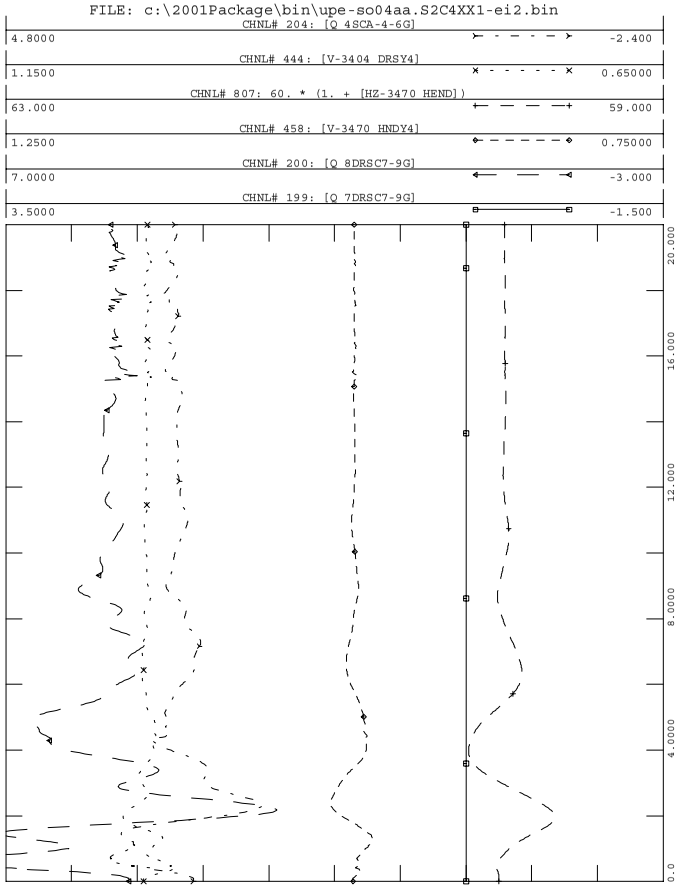
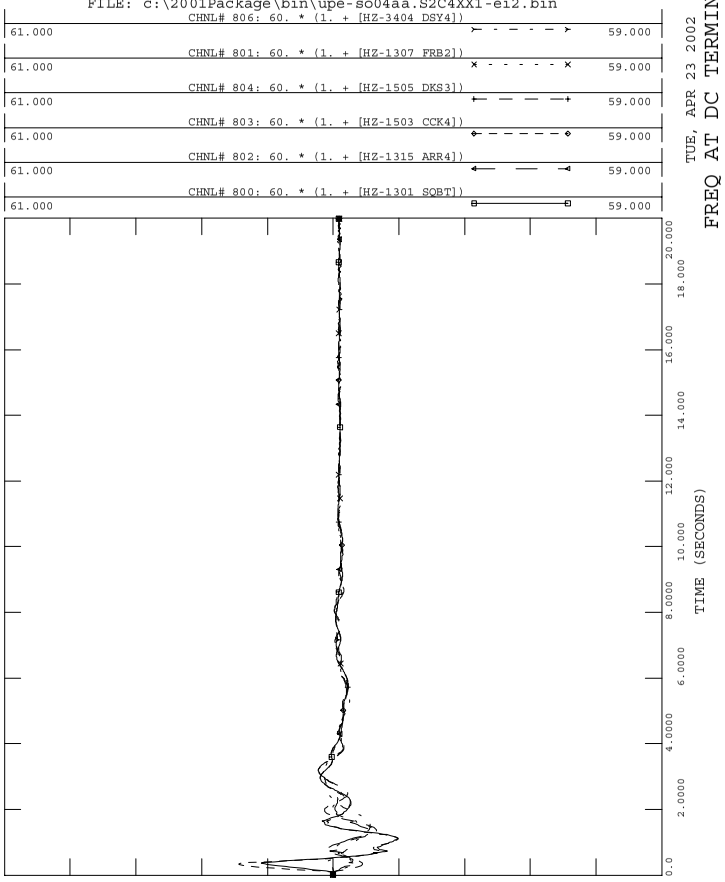
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

TUE, APR 23 2002 20:56
MH DC PARAMETERS



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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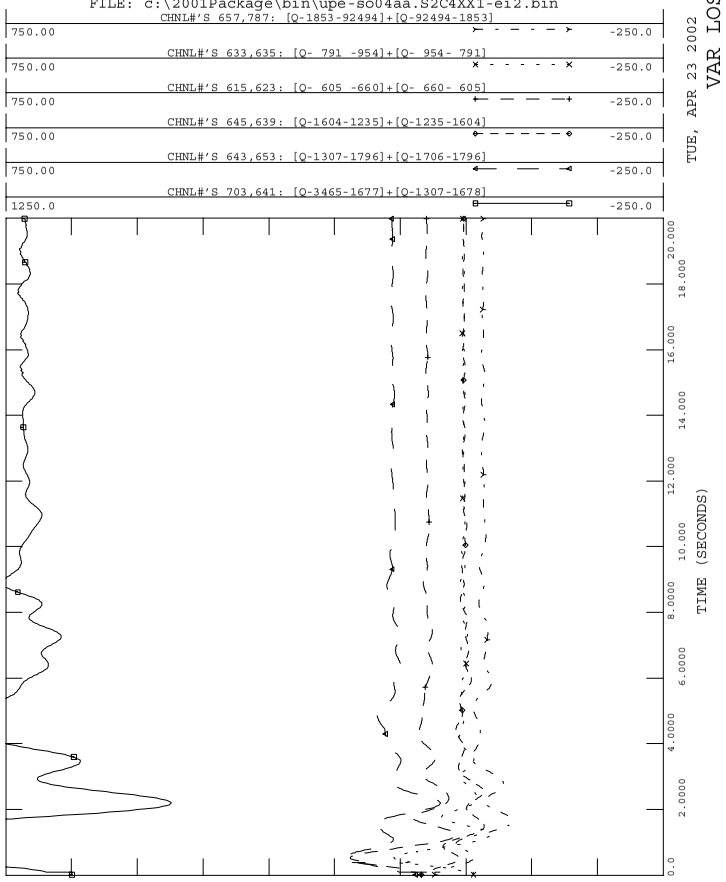
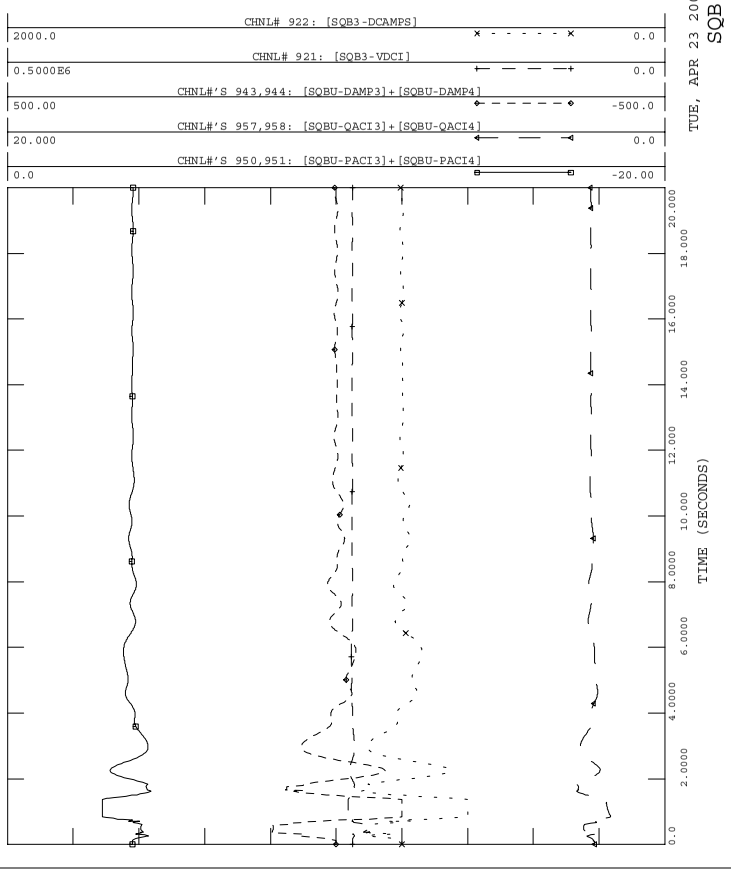
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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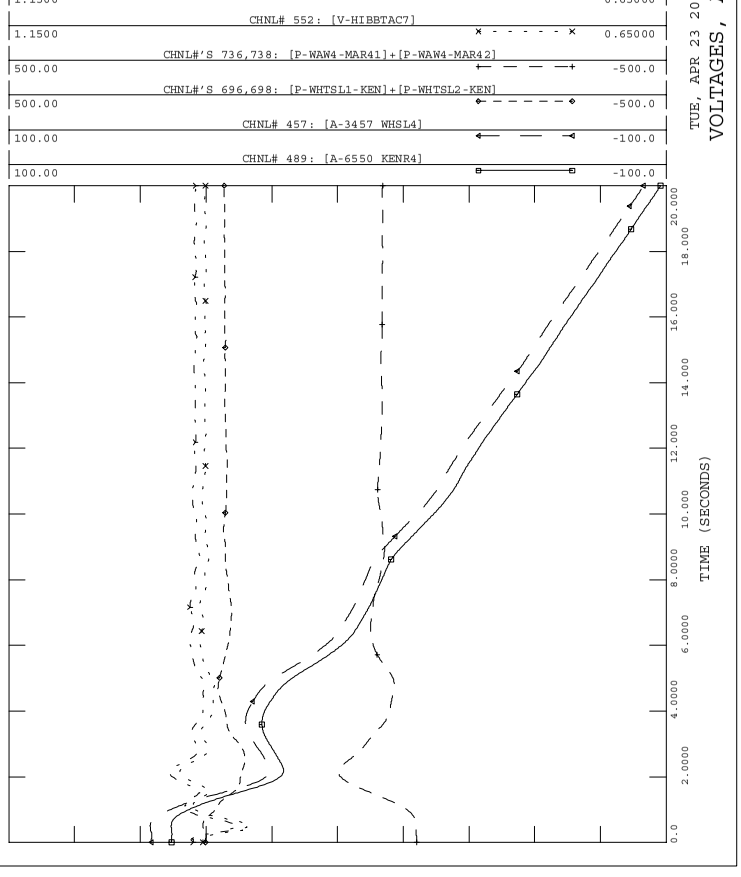
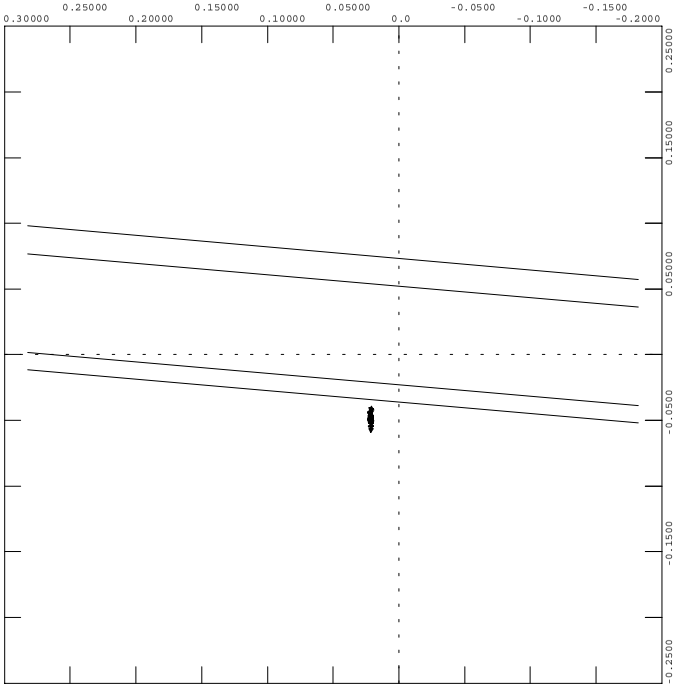
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 23 2002 20:56
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

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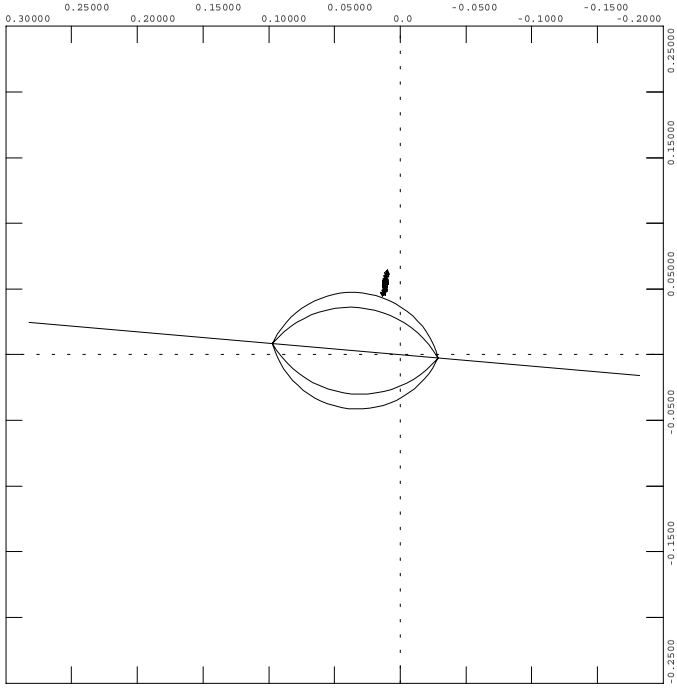
CHNL# 856: [X-DSY2-ROS2]

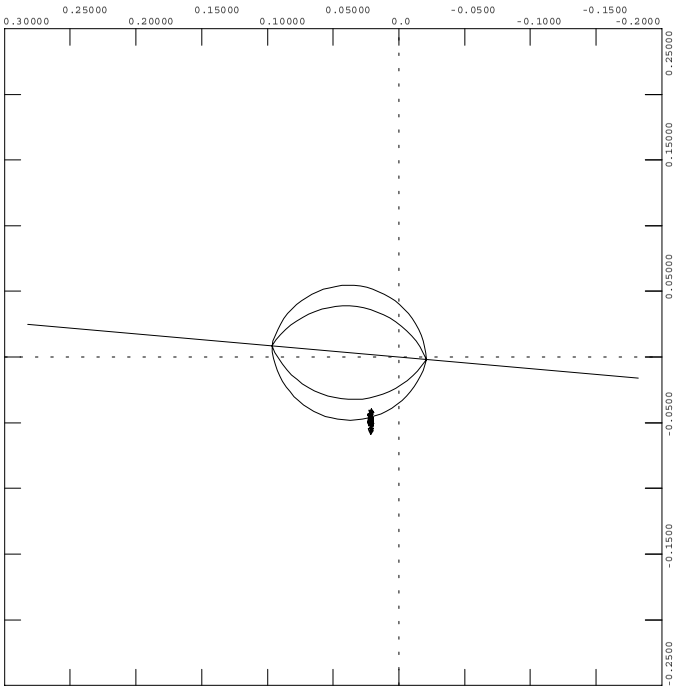


TUE, APR 23 2002 20:56
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 23 2002 20:56
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

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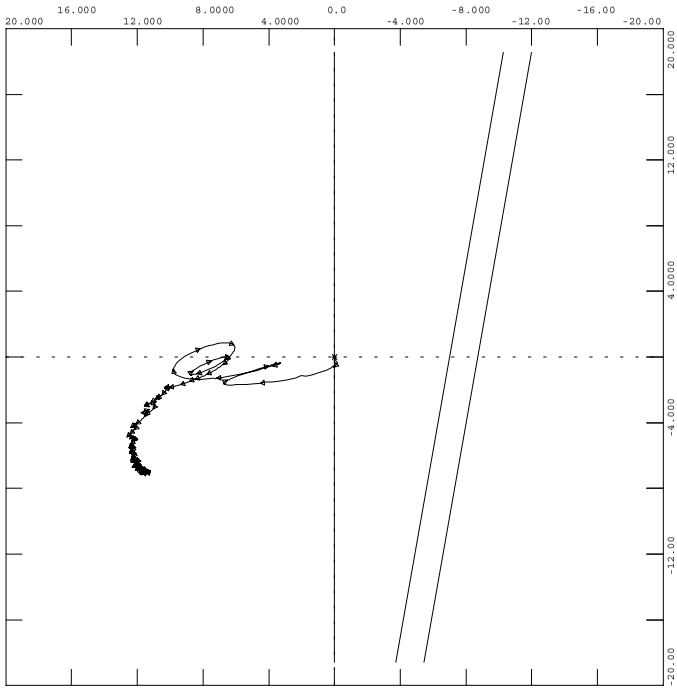
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

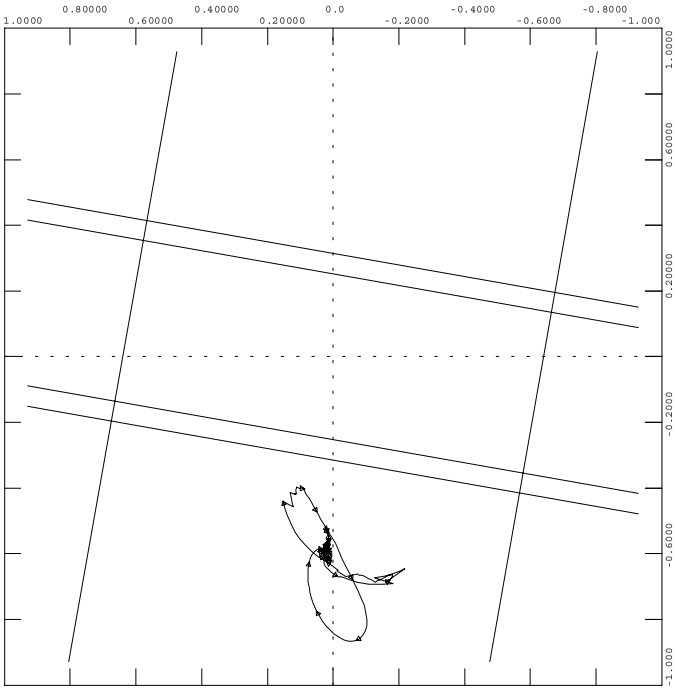


TUE, APR 23 2002 20:56
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

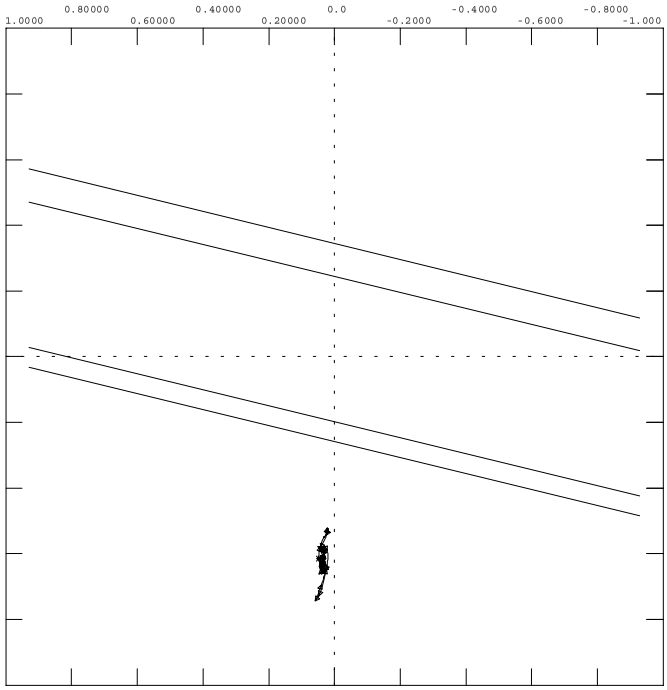


TUE, APR 23 2002 20:56
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

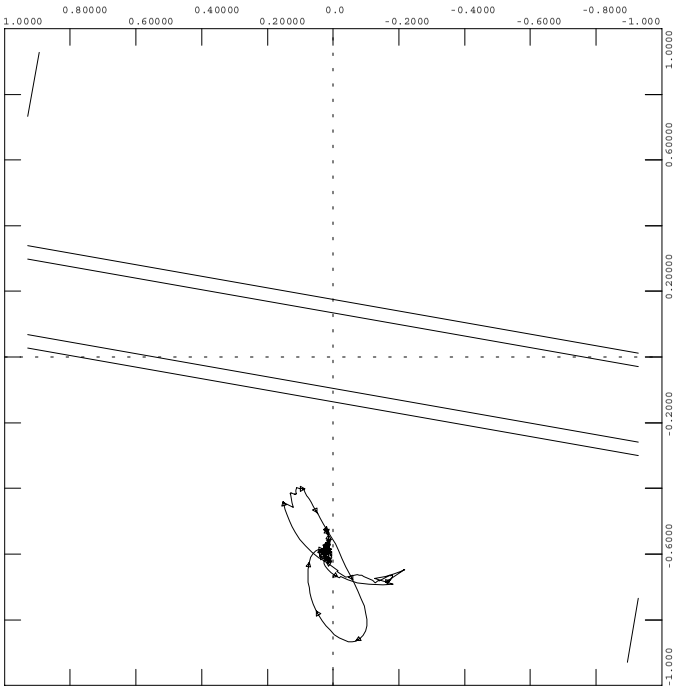


TUE, APR 23 2002 20:56
R50M AT MORANVILLE (520)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

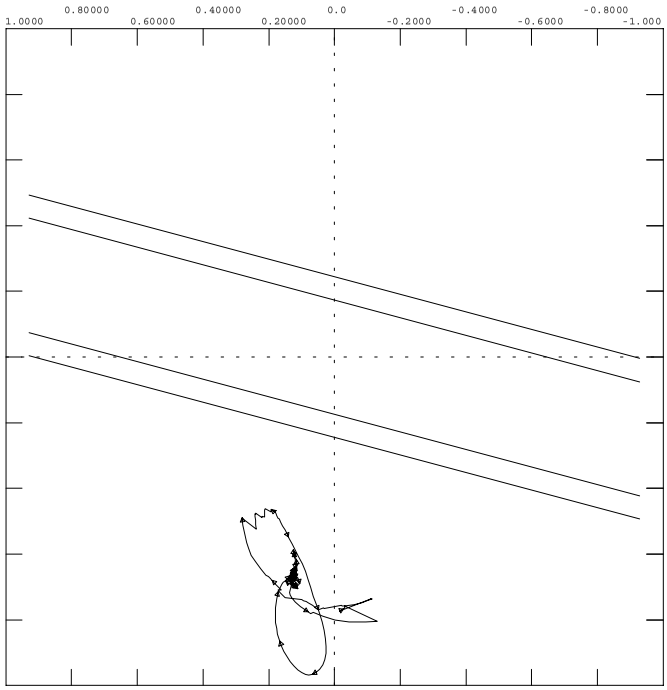


TUE, APR 23 2002 20:56
L20D AT DRAYTON (506)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

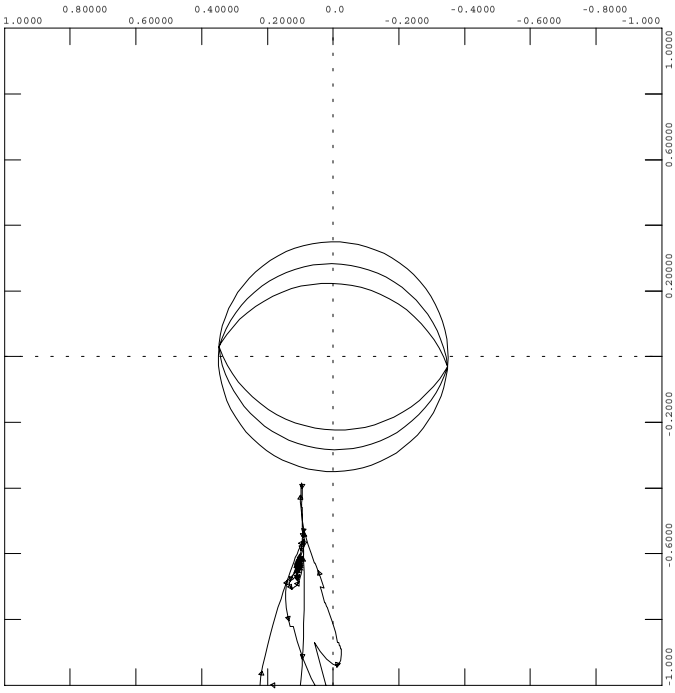


TUE, APR 23 2002 20:56
L20D-PRAIRIE (510)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

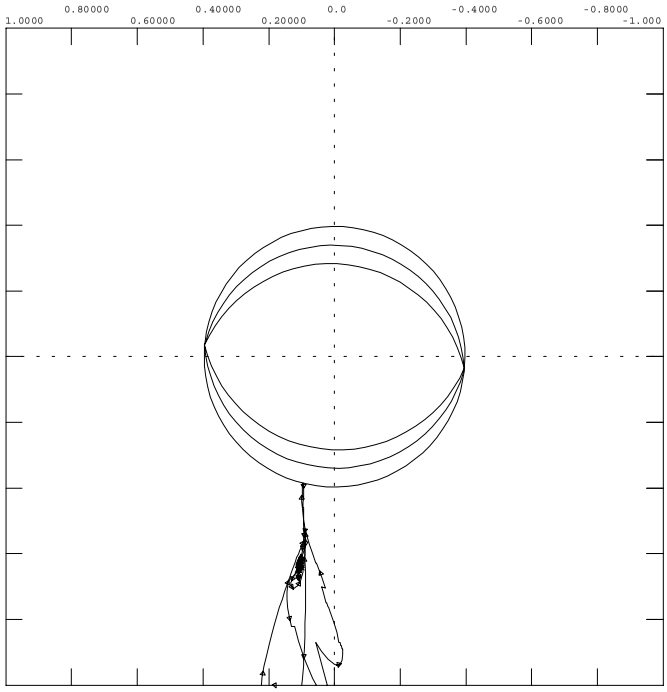


TUE, APR 23 2002 20:56
TIOGA-B.DAM-SOUTH (266)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

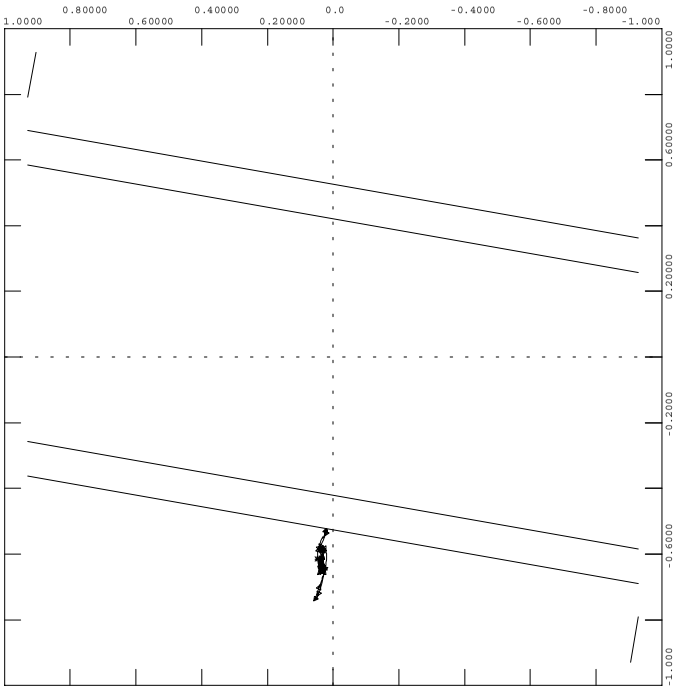


TUE, APR 23 2002 20:56
TIOGA-B.DAM-EMRG (267)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

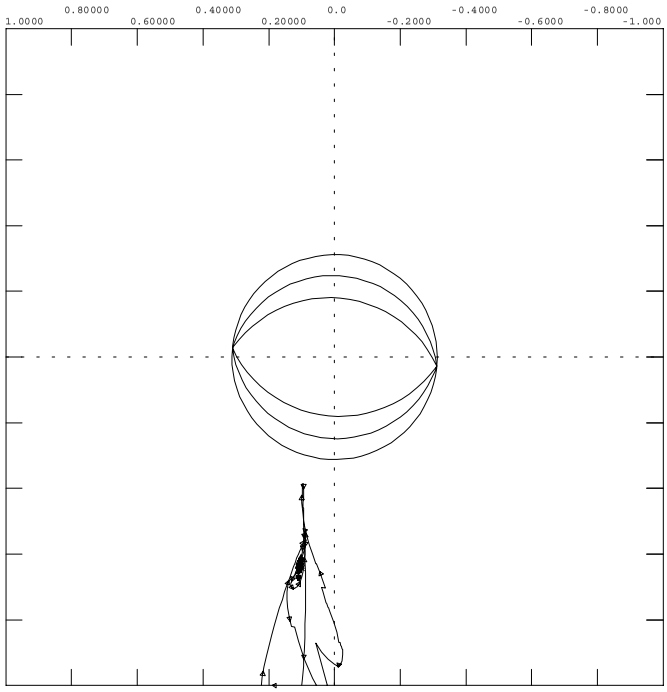


TUE, APR 23 2002 20:56
R50M-MORANVILLE-EMRG (777

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

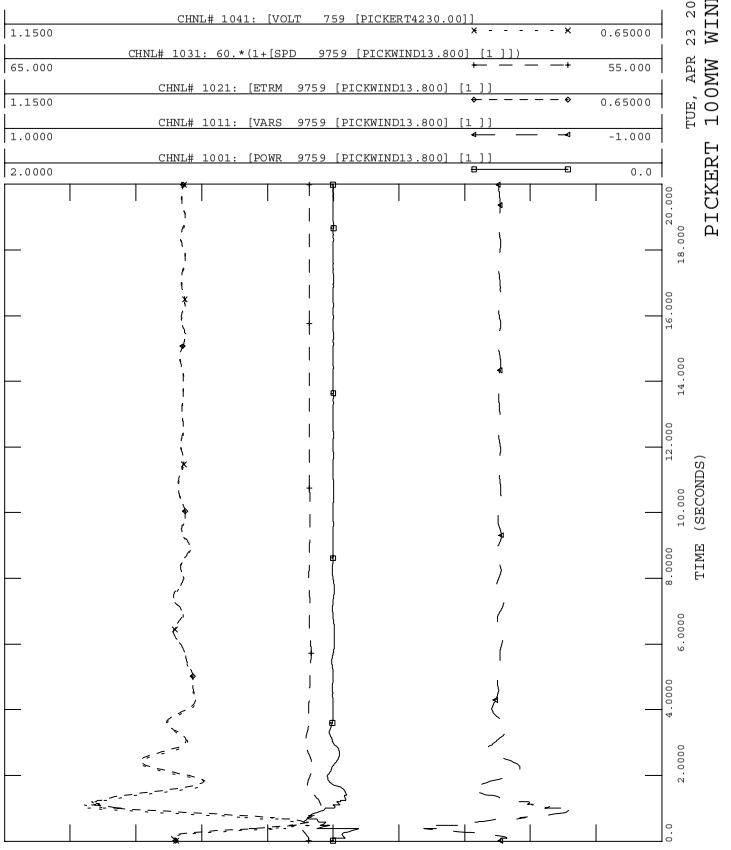
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



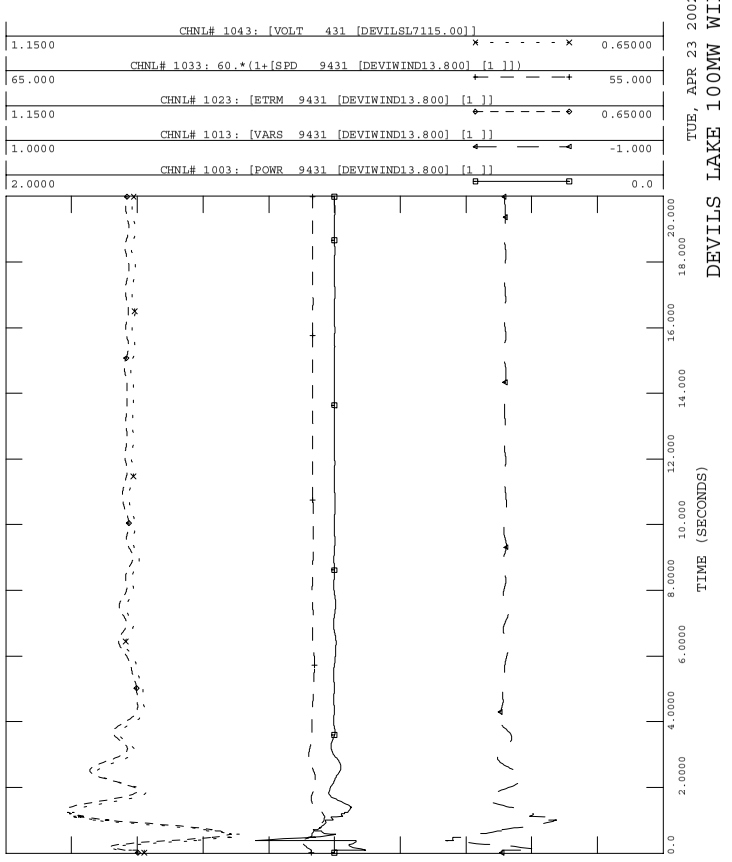
TUE, APR 23 2002 20:56
TIOGA-B.DAM-NORTH (268)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



TUE, APR 23 2002 20:56
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

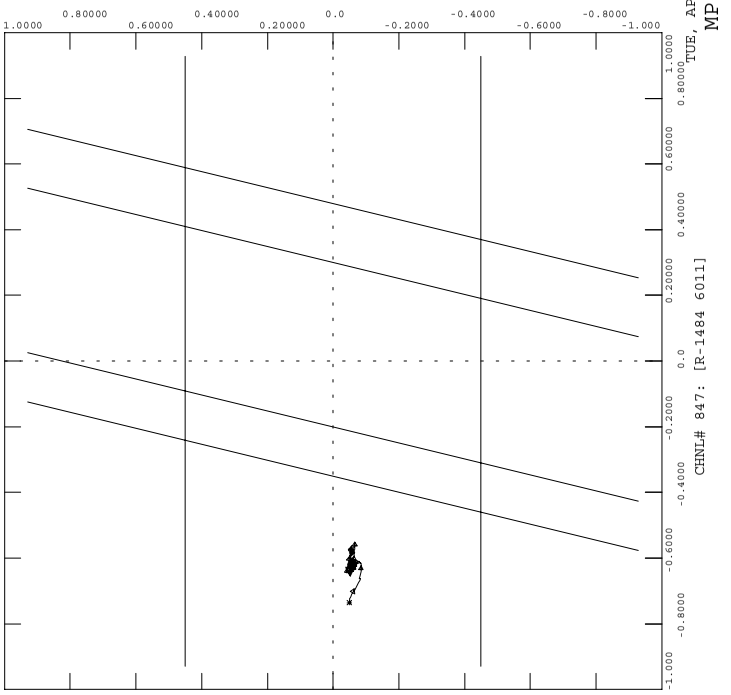


TUE, APR 23 2002 20:56
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

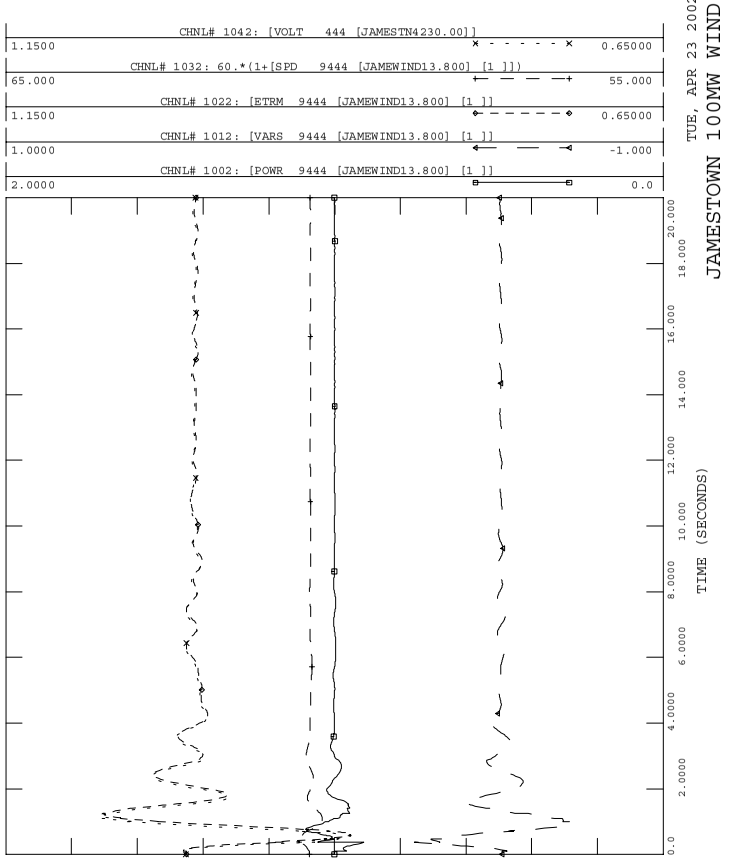
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



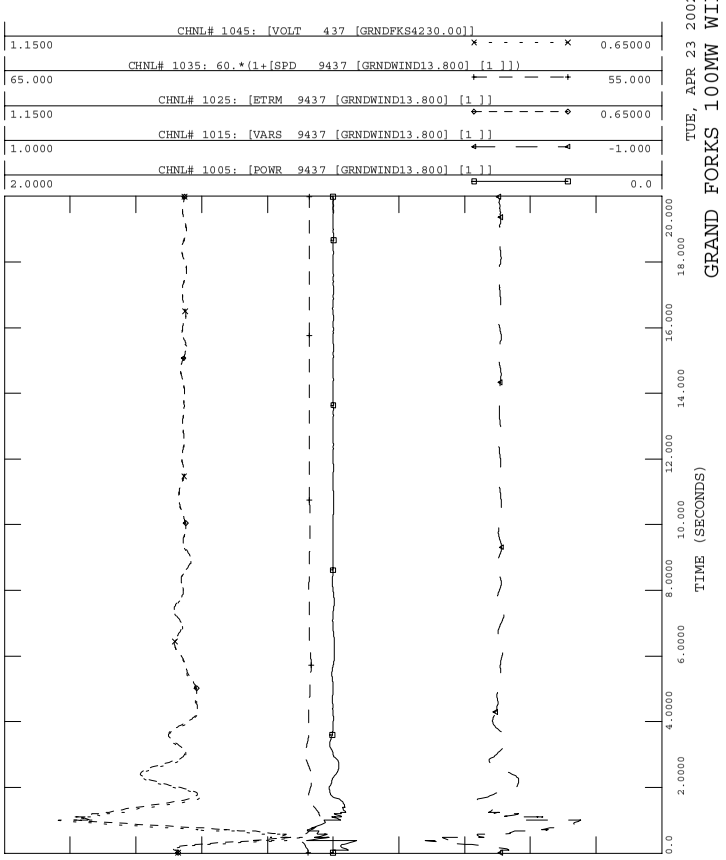
TUE, APR 23 2002 20:56
MP-OH I.FALLS (779)

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



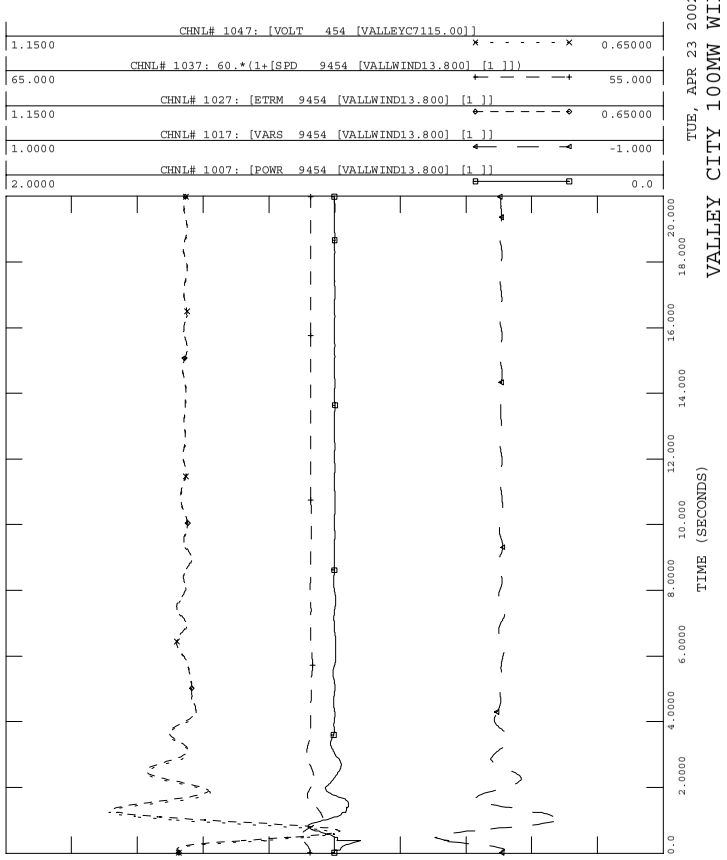
TUE, APR 23 2002 20:56
JAMESTOWN 100MW WIND UNIT

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



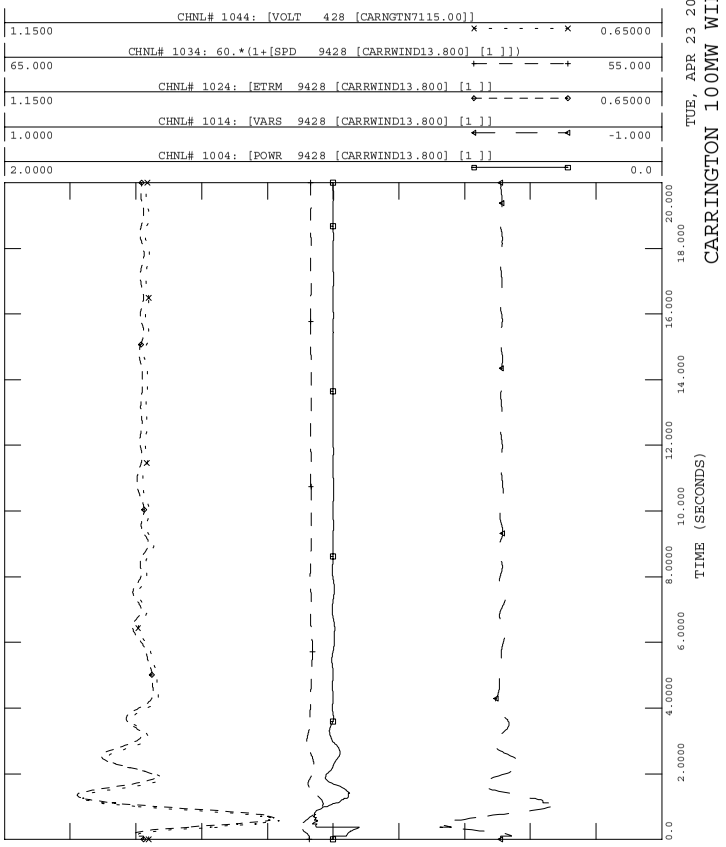
TUE, APR 23 2002 20:56
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



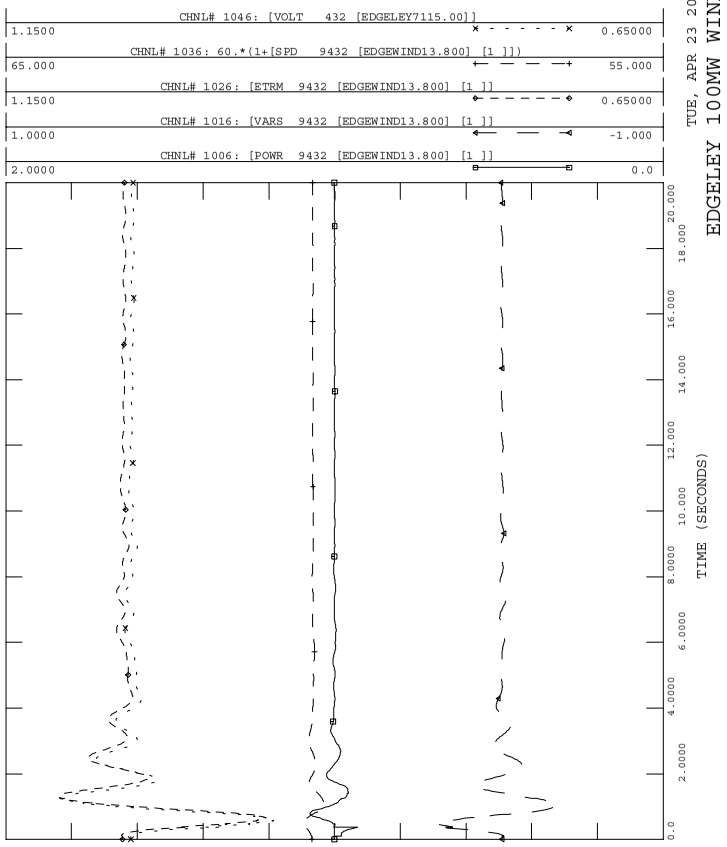
TUE, APR 23 2002 20:56
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



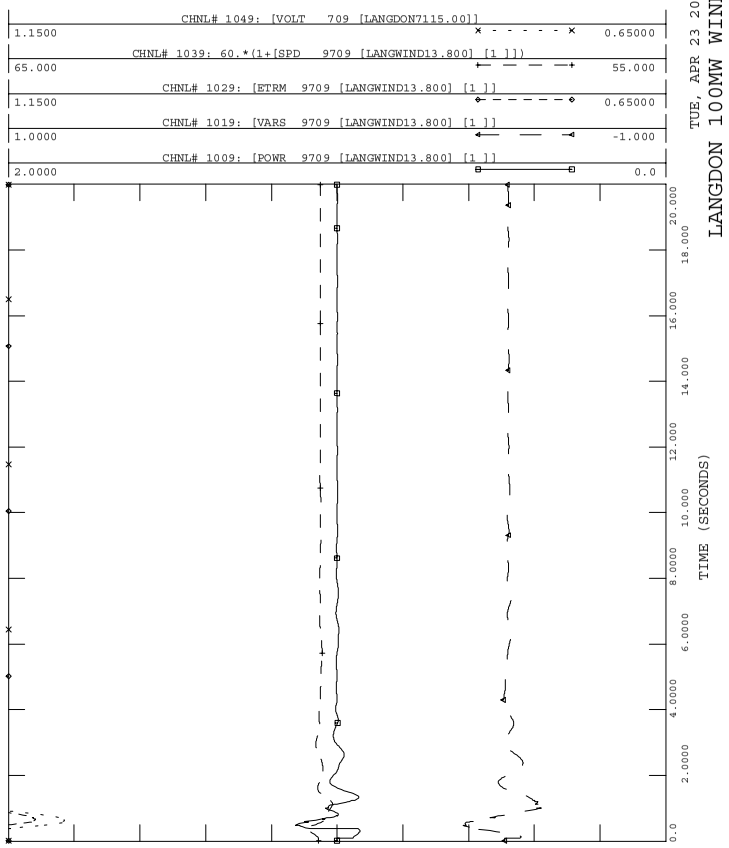
TUE, APR 23 2002 20:56
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin

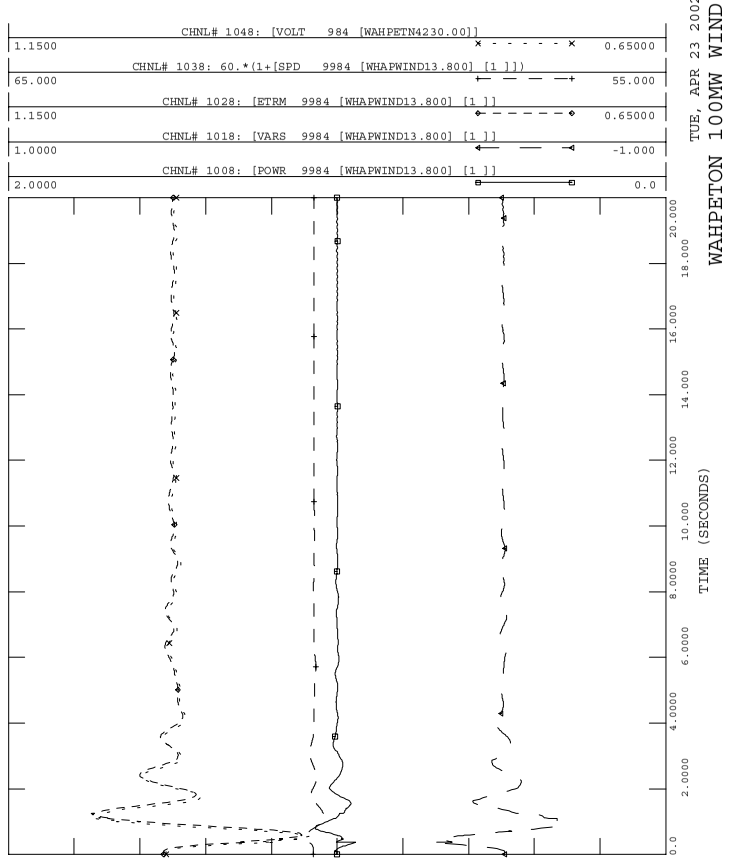


TUE, APR 23 2002 20:56
EDGELEY 100MW WIND UNIT

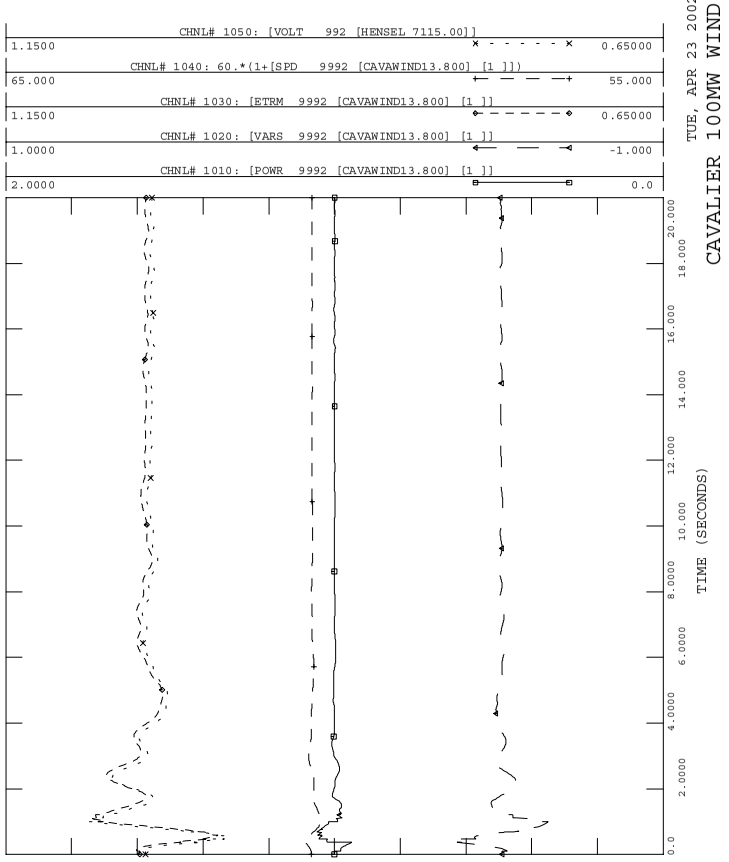
UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX1-ei2.bin



APPENDIX 18

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 2 (JAMESTOWN)

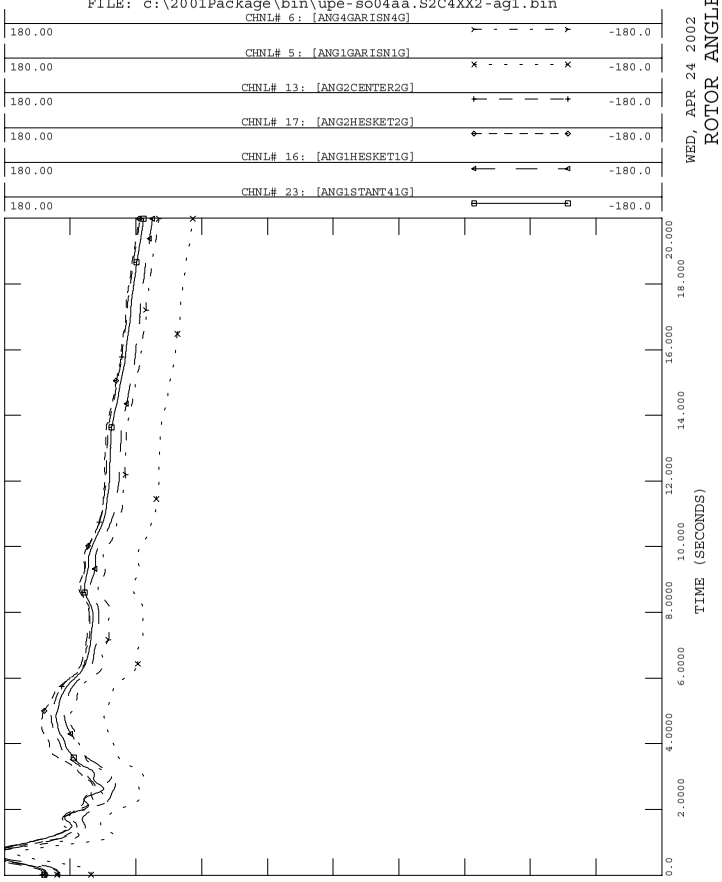
CASE S2C4XX2

CONTINGENCY AG1

Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

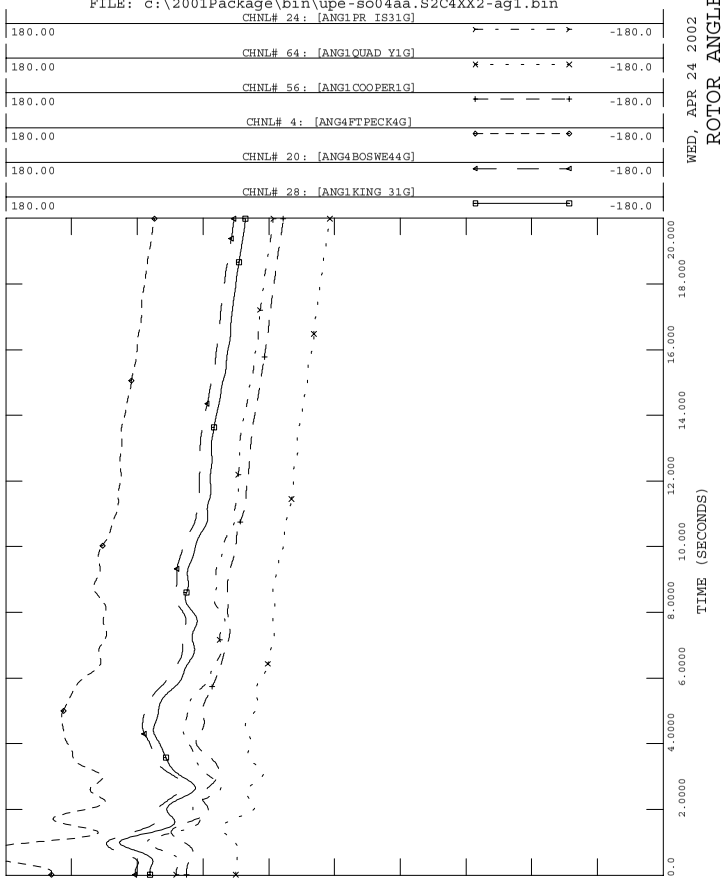
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50
ROTOR ANGLES 2



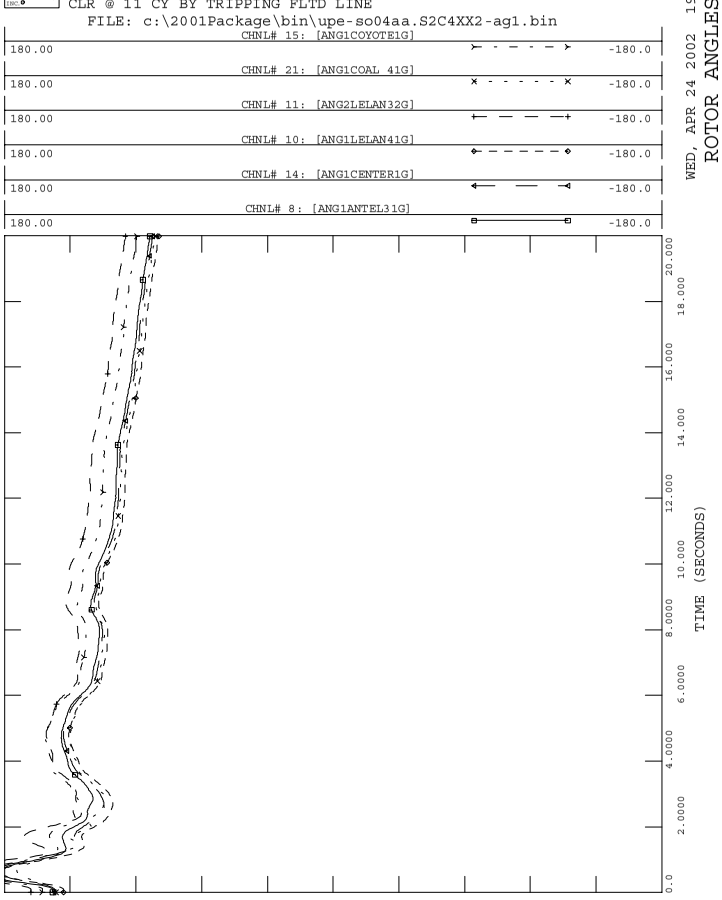
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50
ROTOR ANGLES 4



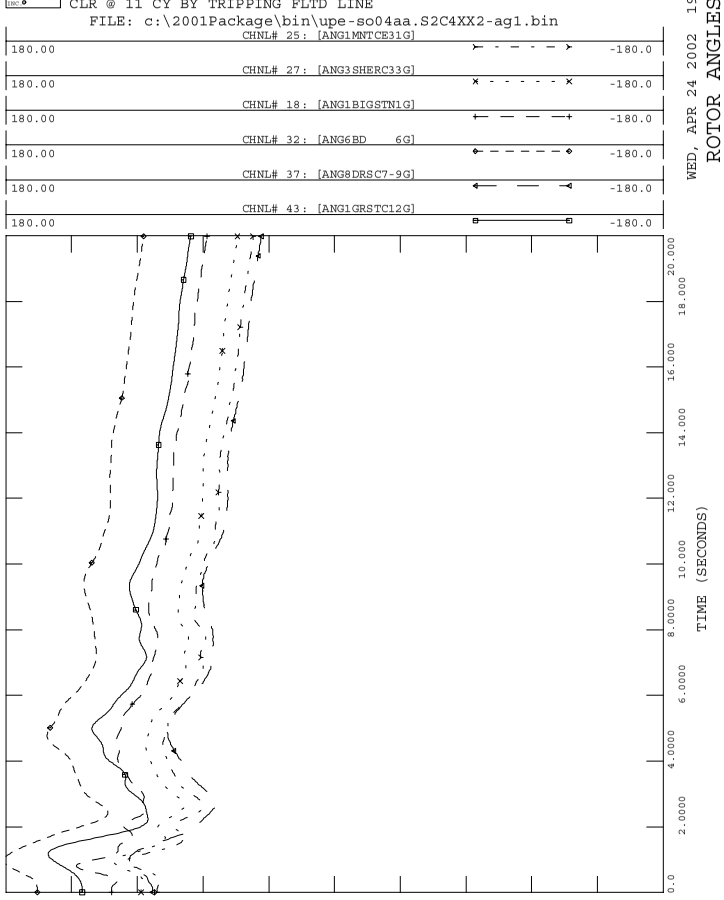
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

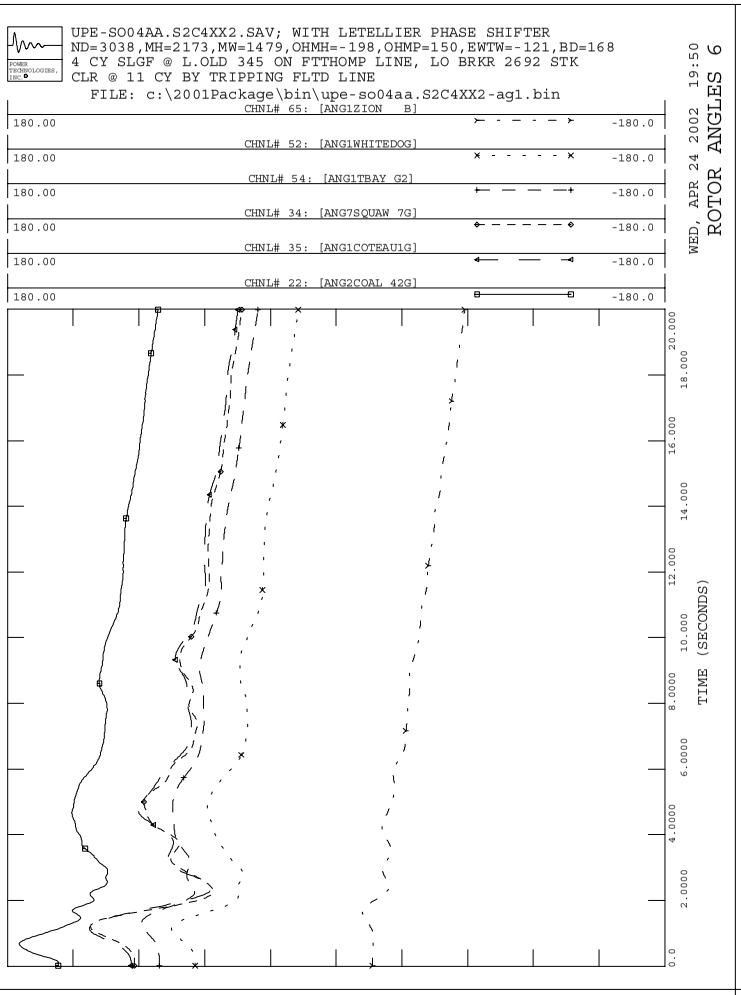
WED, APR 24 2002 19:50
ROTOR ANGLES 1

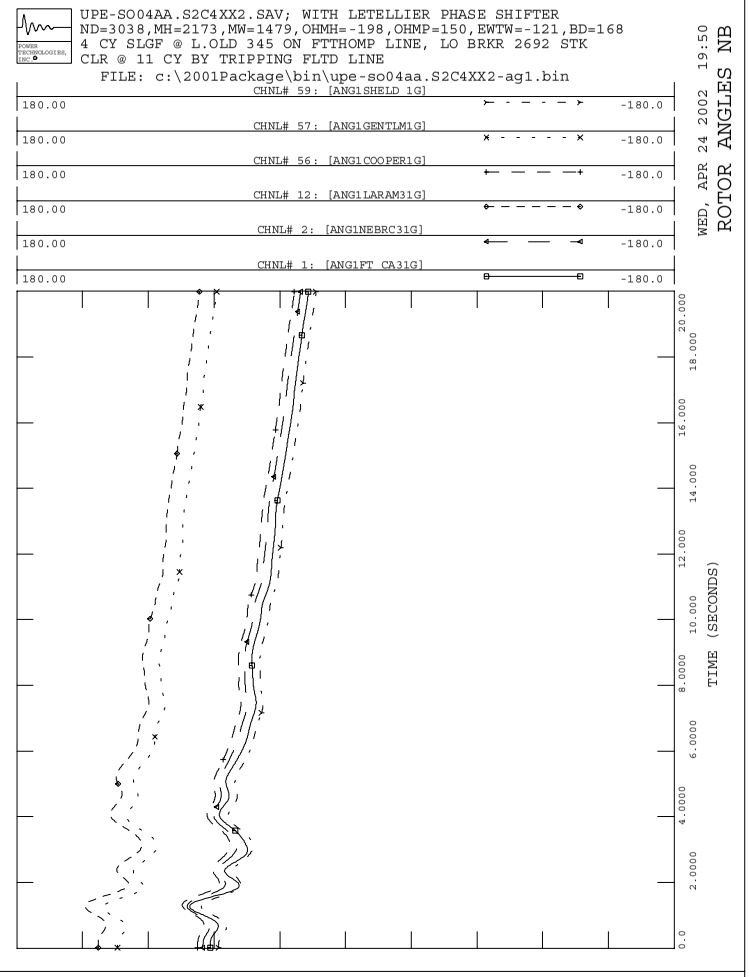


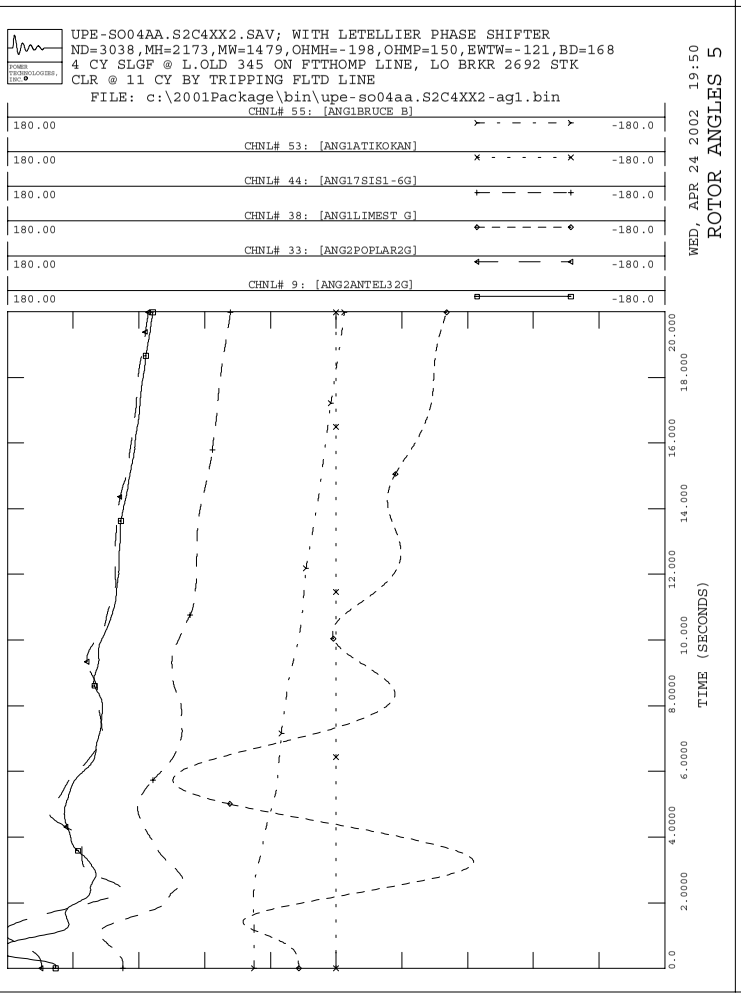
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

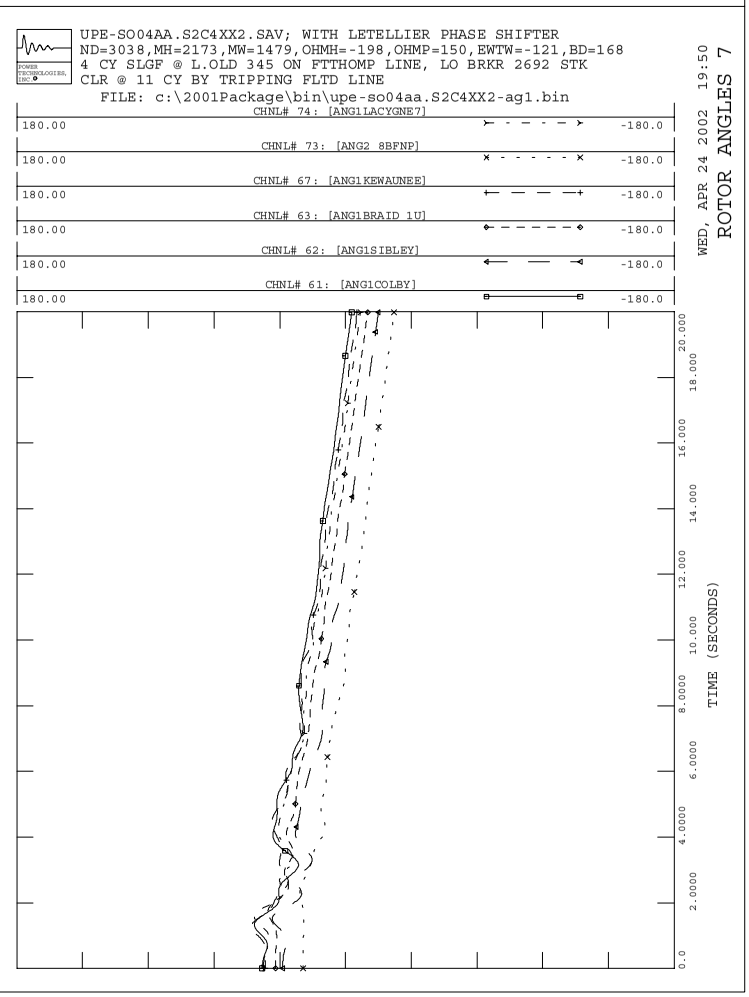
WED, APR 24 2002 19:50
ROTOR ANGLES 3




UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 19:50
ROTOR ANGLES 6

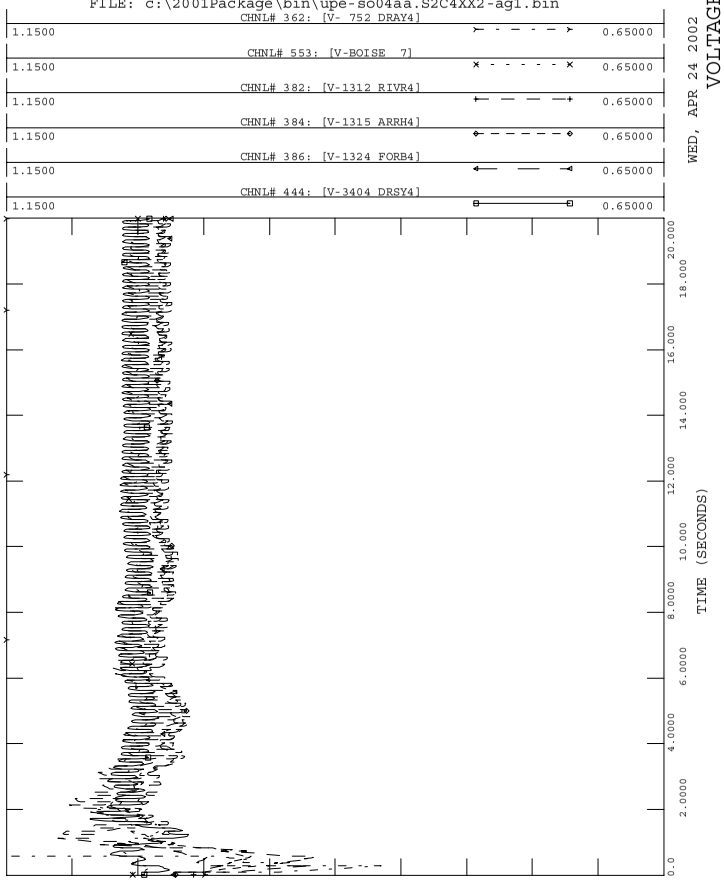

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 19:50
ROTOR ANGLES NB


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 19:50
ROTOR ANGLES 5


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 19:50
ROTOR ANGLES 7

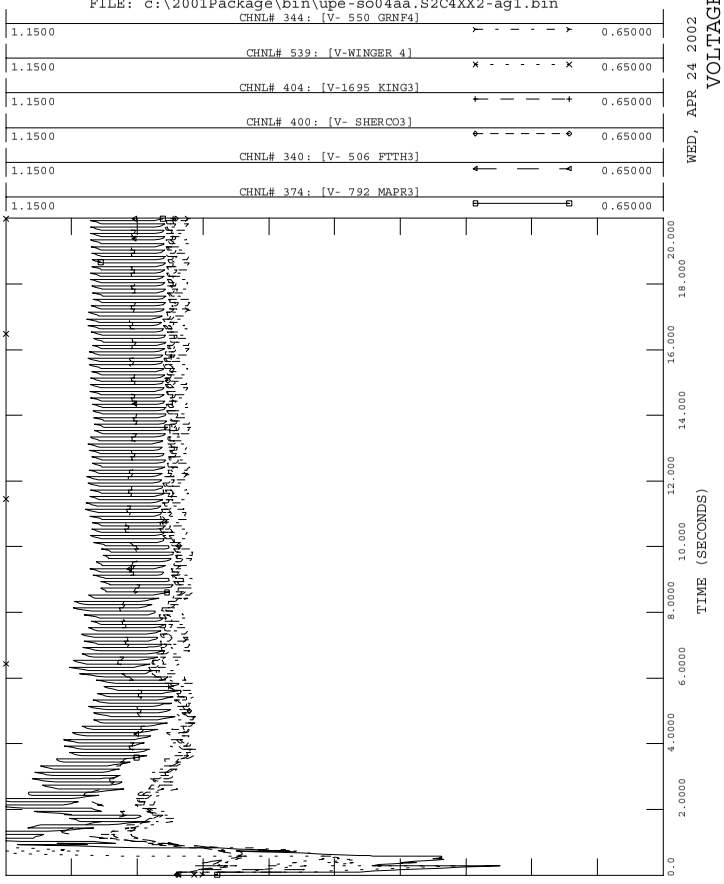
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50
VOLTAGES 1



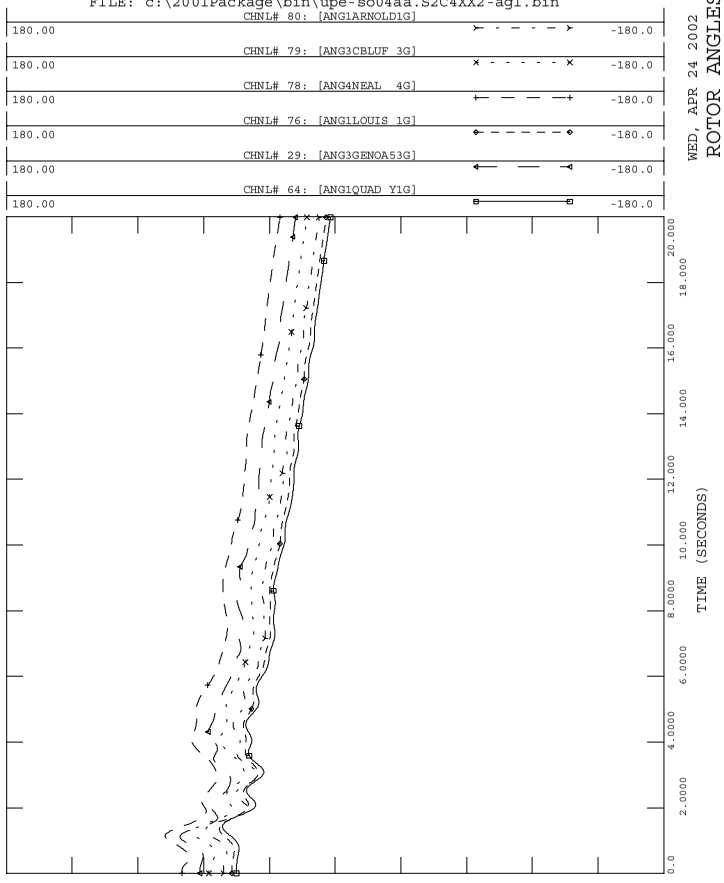
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50
VOLTAGES 3



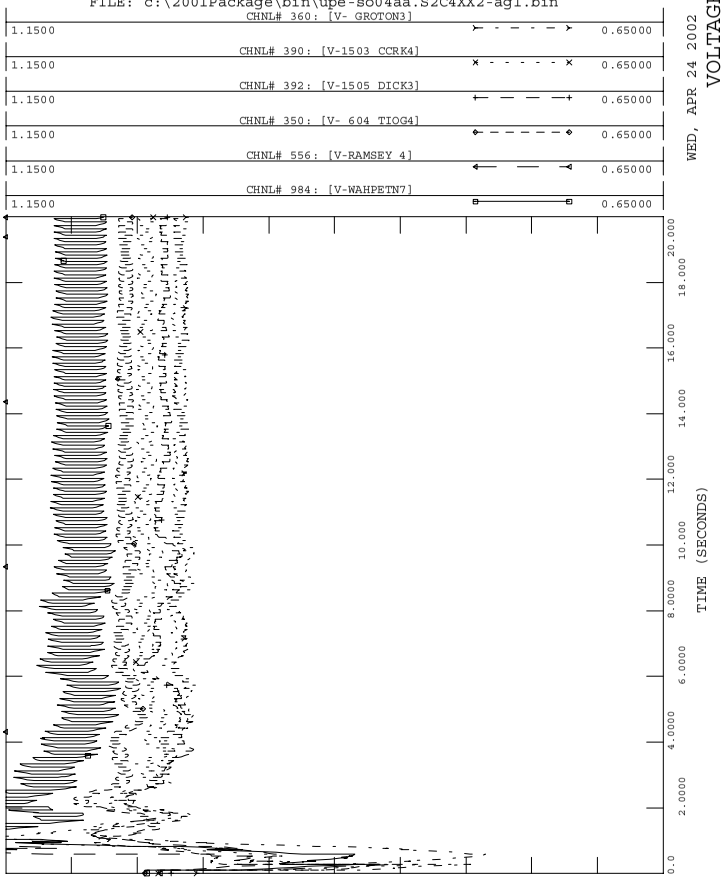
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50
ROTOR ANGLES IA



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50
VOLTAGES 2



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
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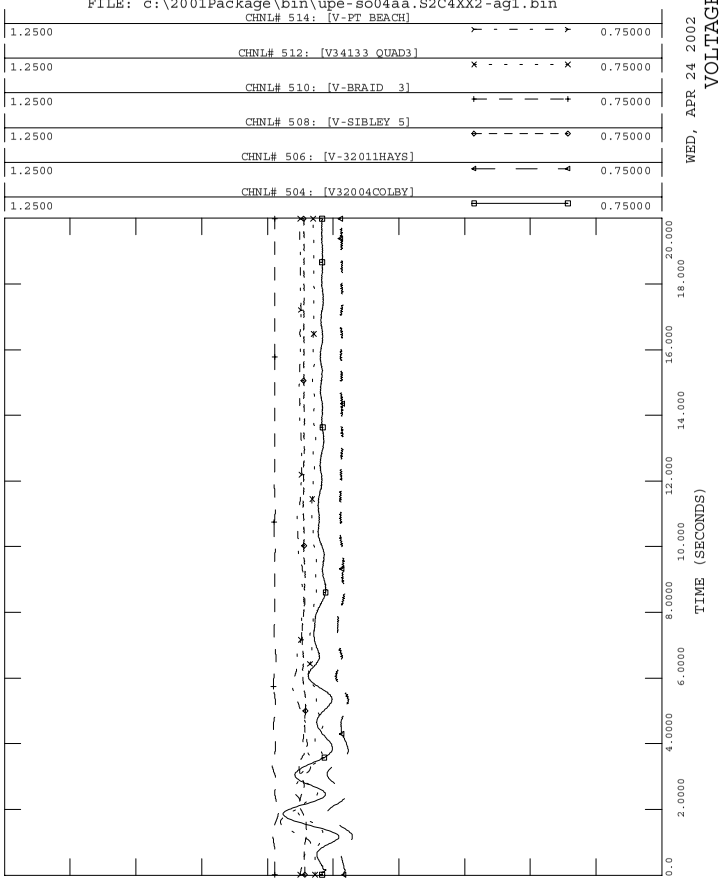
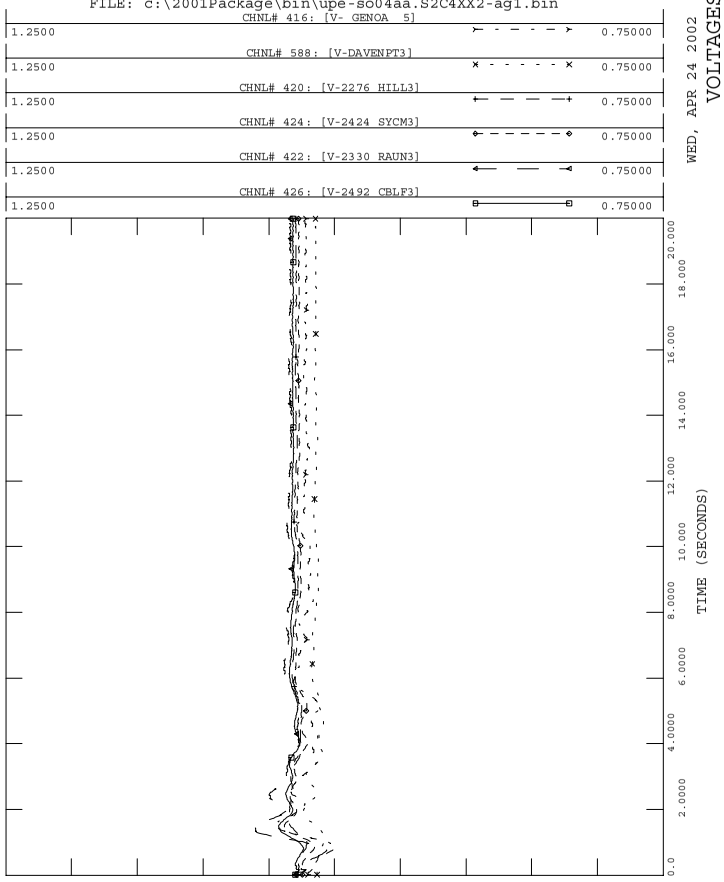
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50
VOLTAGES 5



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50
VOLTAGES IA



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
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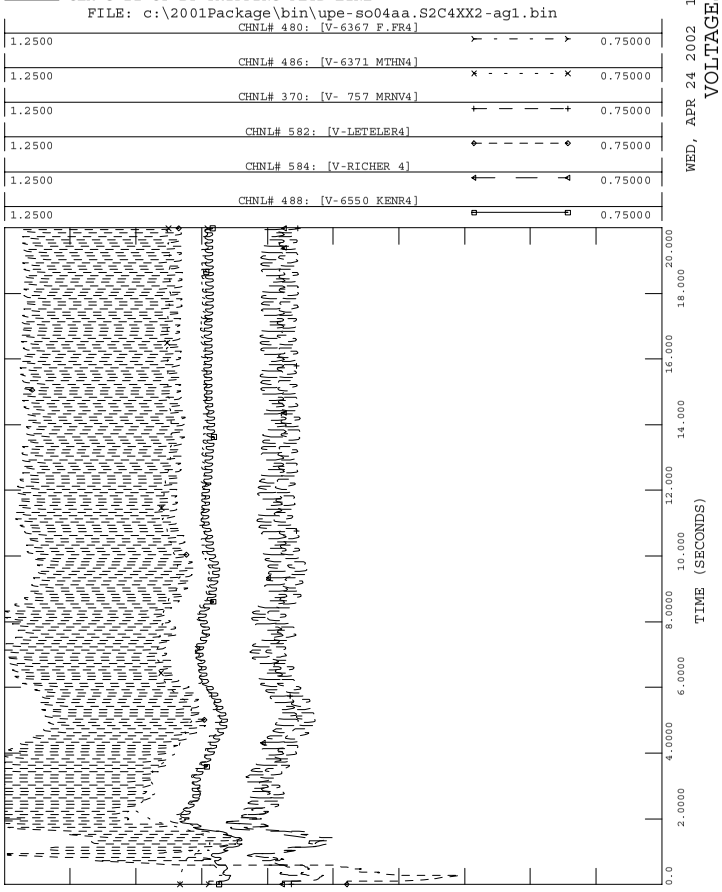
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50
VOLTAGES 4



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
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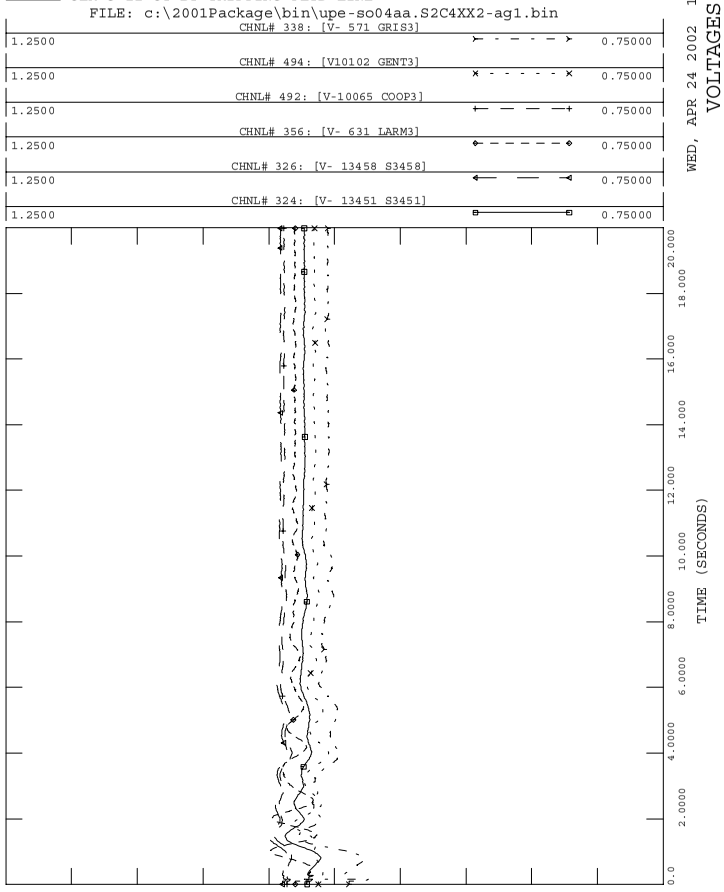
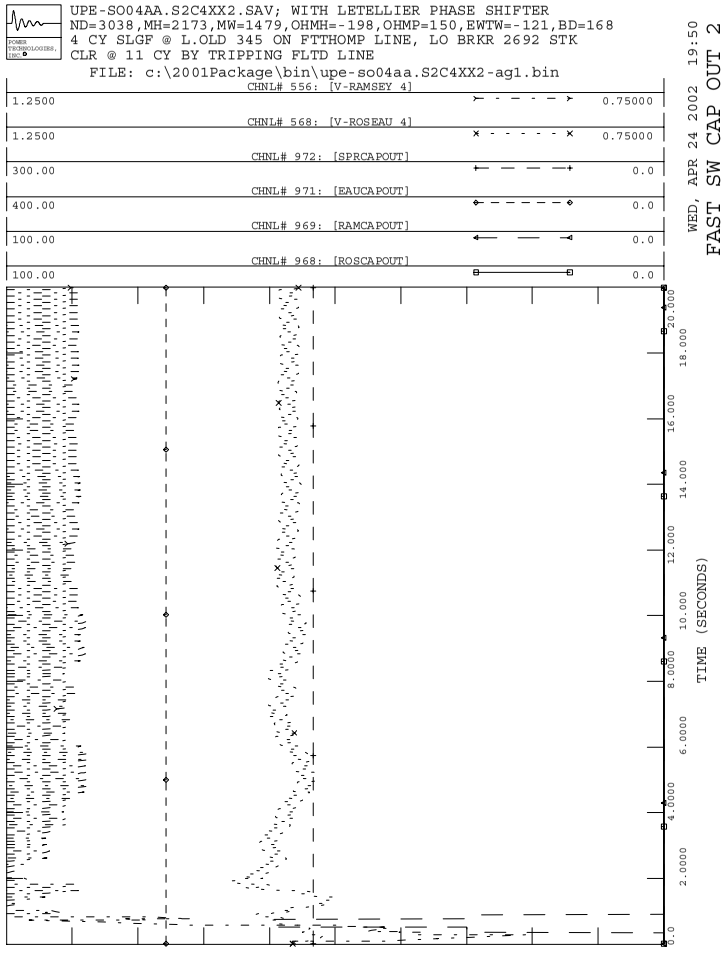
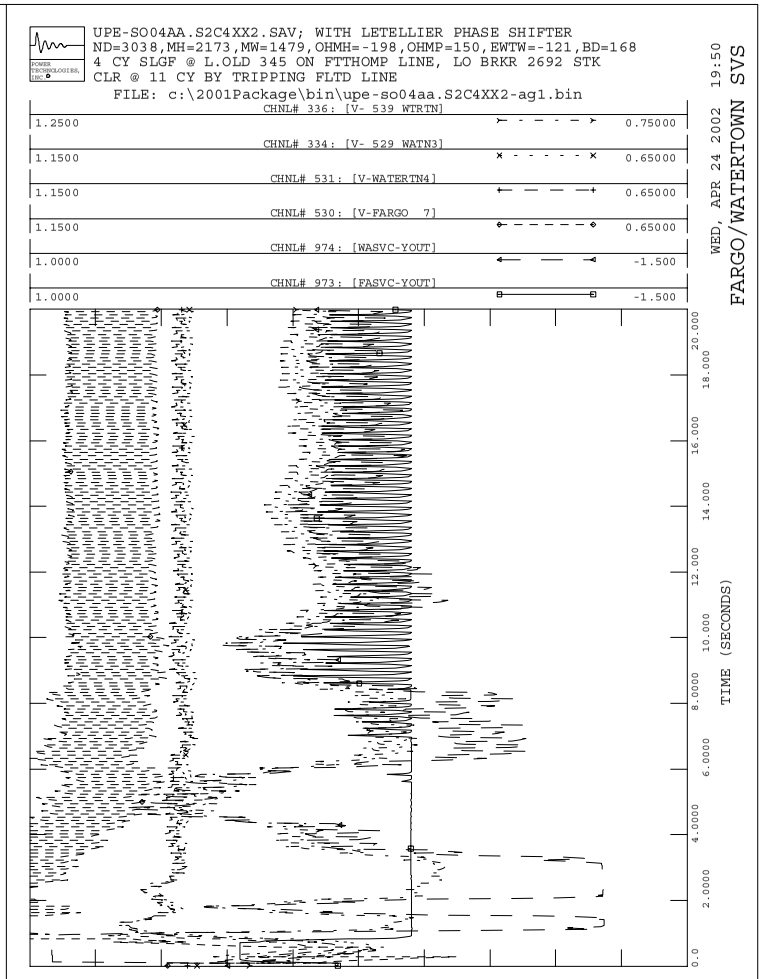
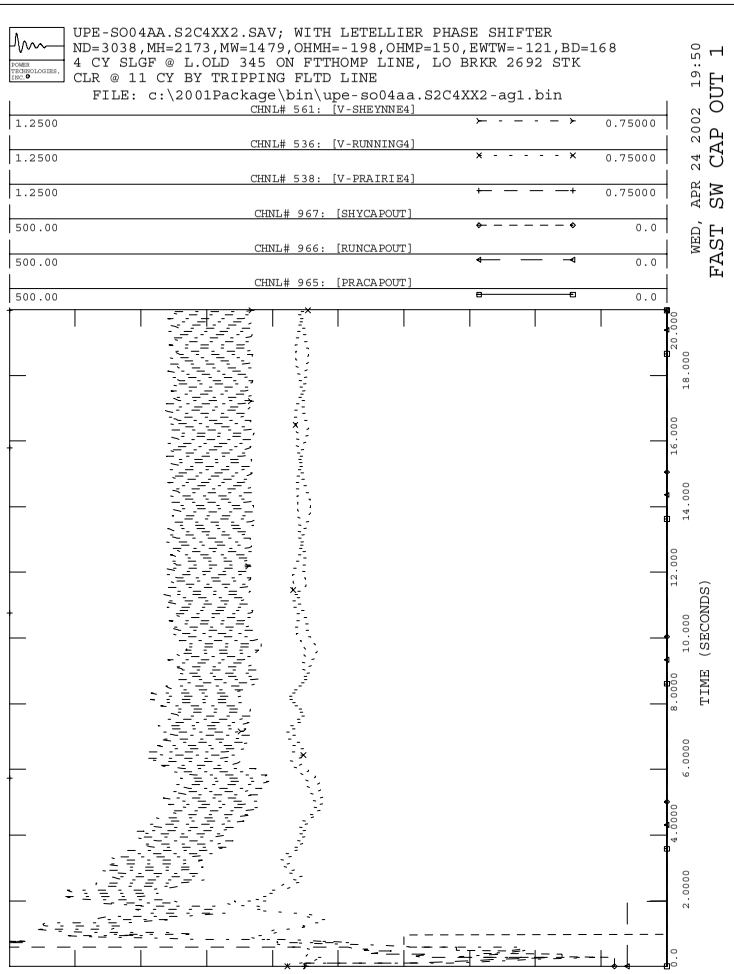
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

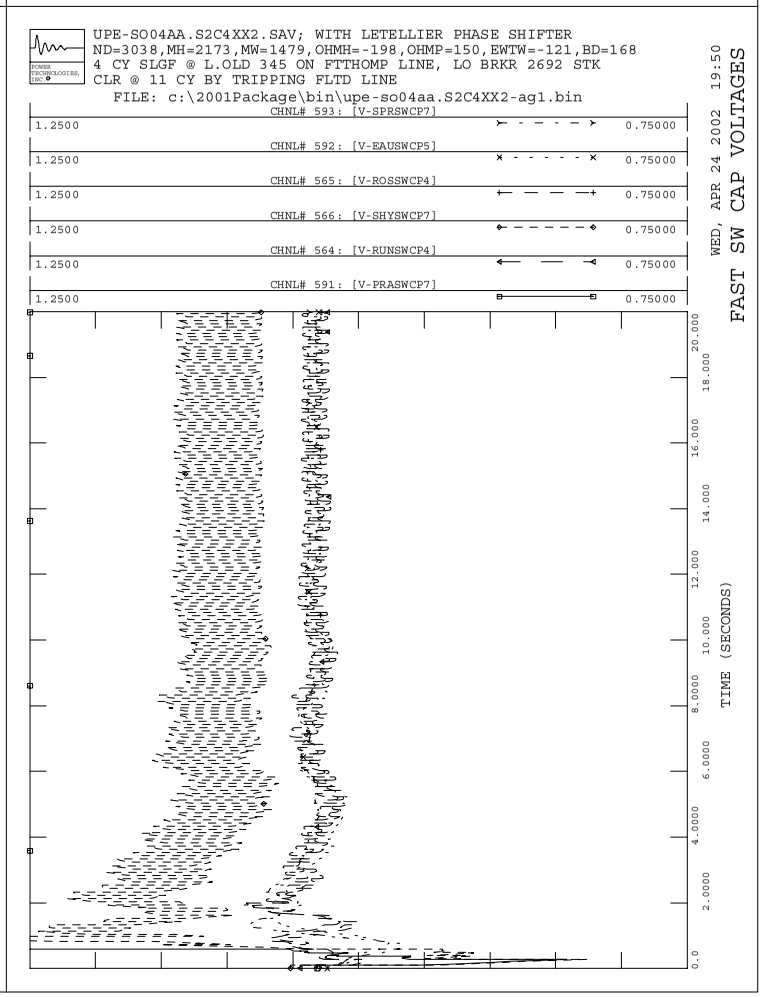
WED, APR 24 2002 19:50
VOLTAGES NB




UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
WED, APR 24 2002 19:50
FAST SW CAP OUT 2


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
WED, APR 24 2002 19:50
FARGO/WATERTOWN SVS

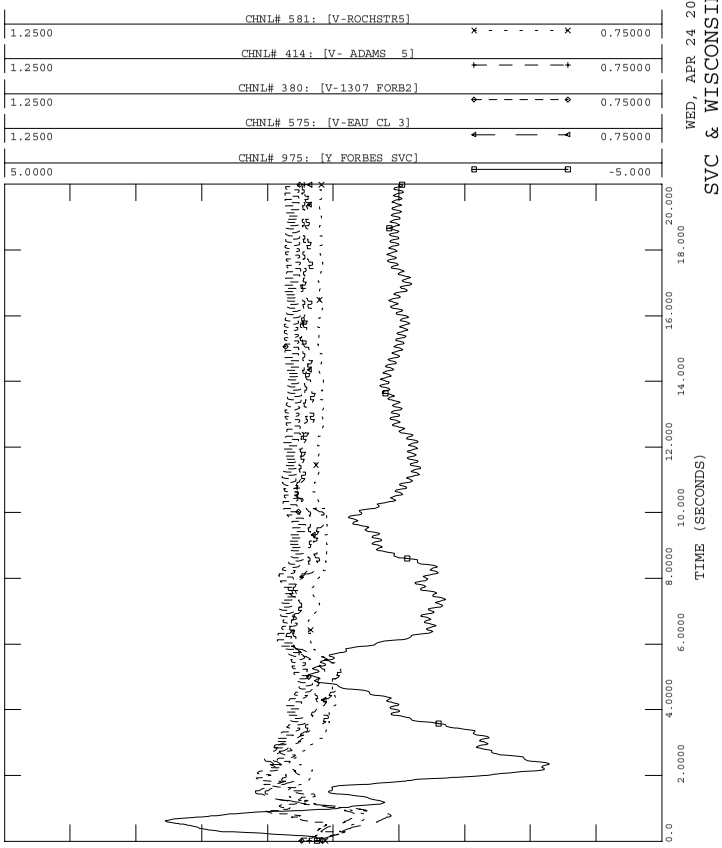

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
WED, APR 24 2002 19:50
FAST SW CAP OUT 1


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
WED, APR 24 2002 19:50
FAST SW CAP VOLTAGES

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50

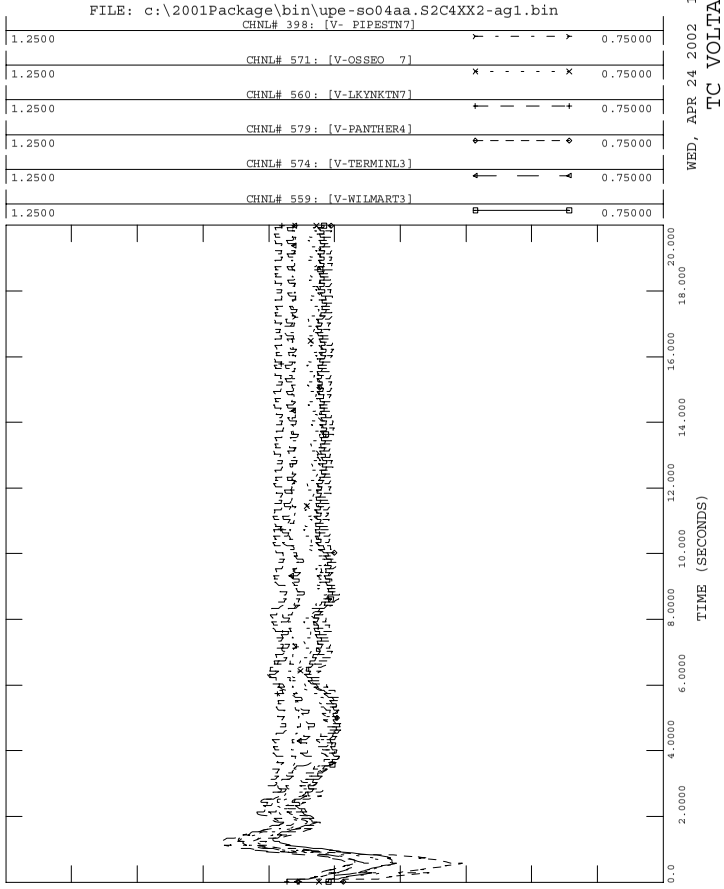
SVC & WISCONSIN VOLT



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50

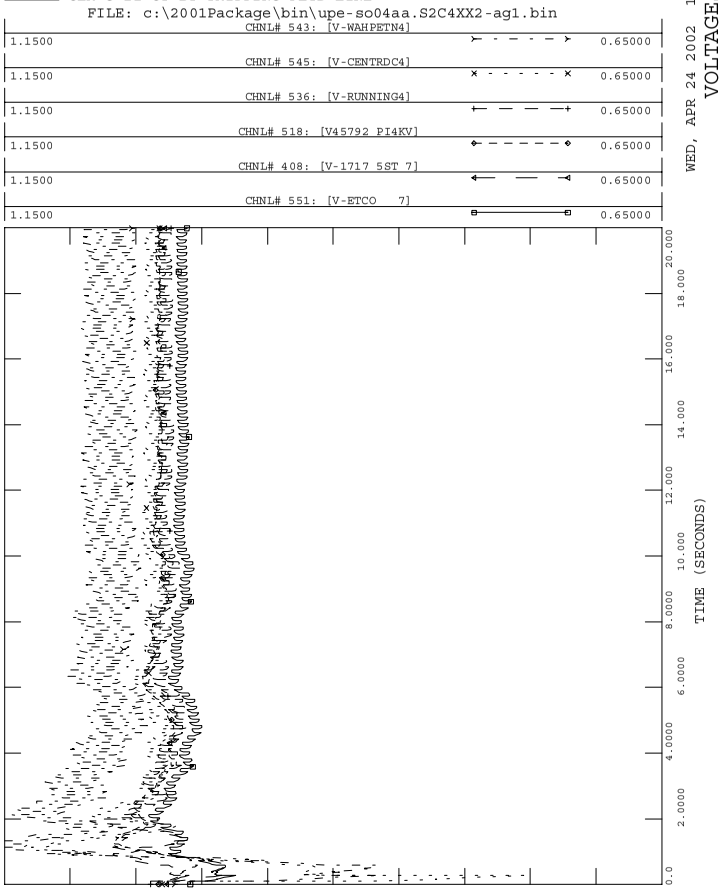
TC VOLTAGES



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50

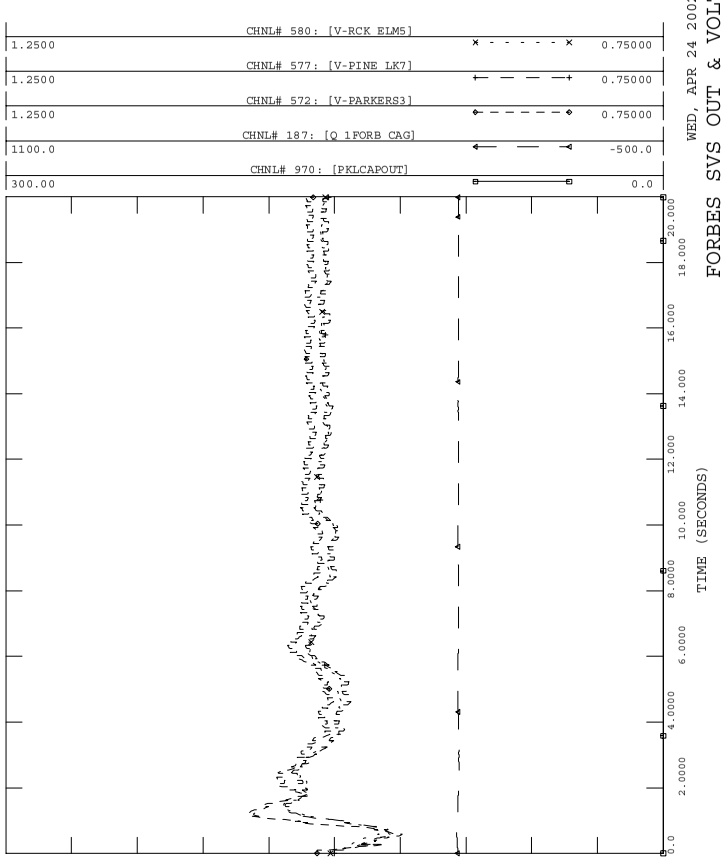
VOLTAGES 6



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

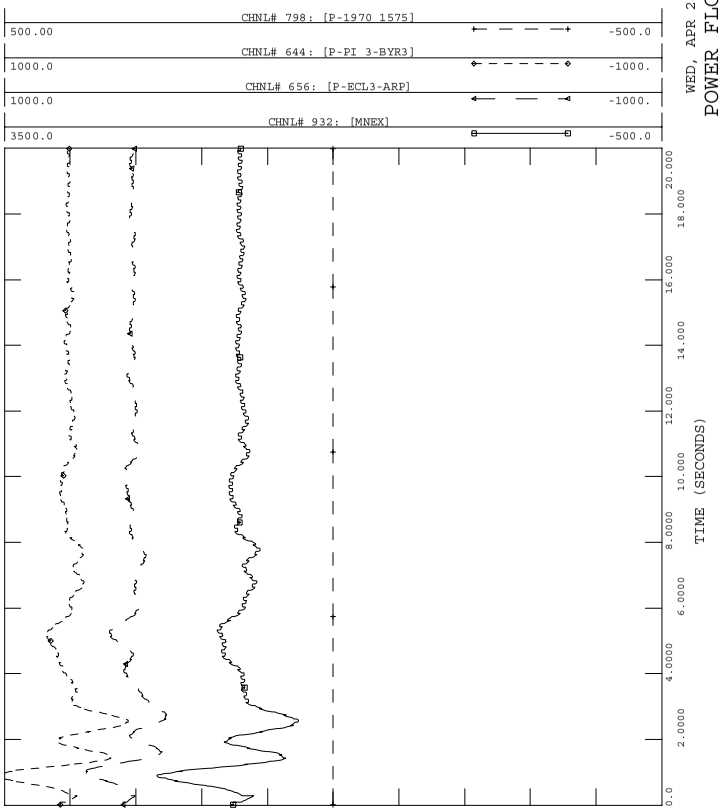
WED, APR 24 2002 19:50

FORBES SVS OUT & VOLTAGES



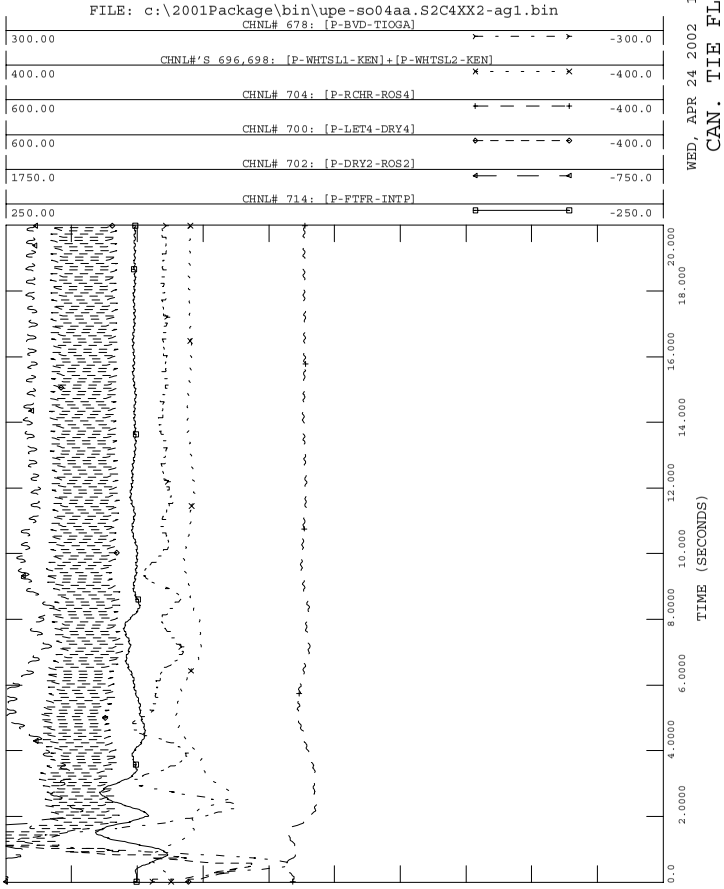
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50
POWER FLOW SUMS 2



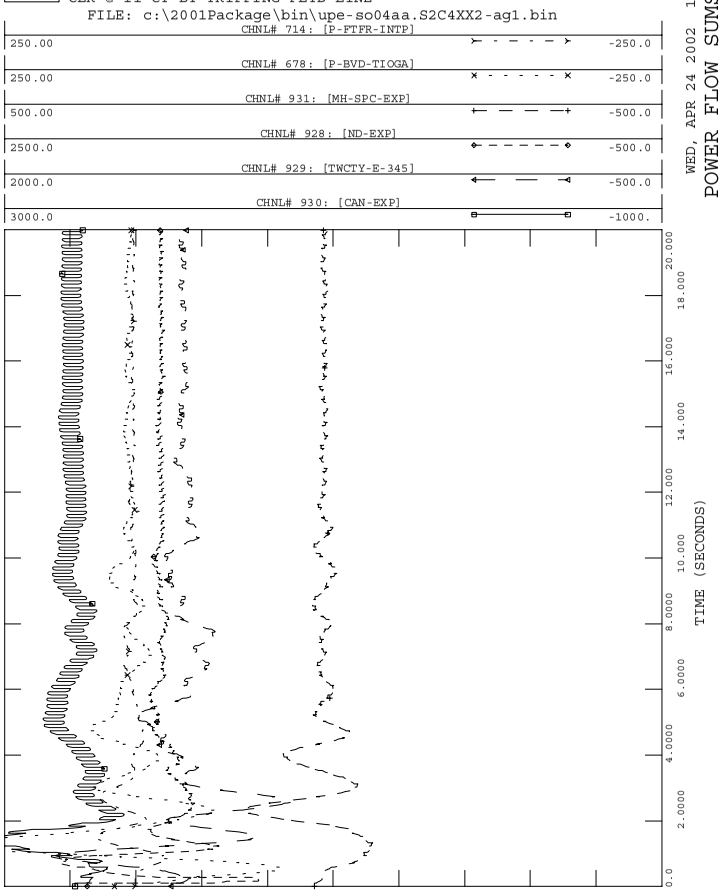
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

WED, APR 24 2002 19:50
CAN. TIE FLOWS



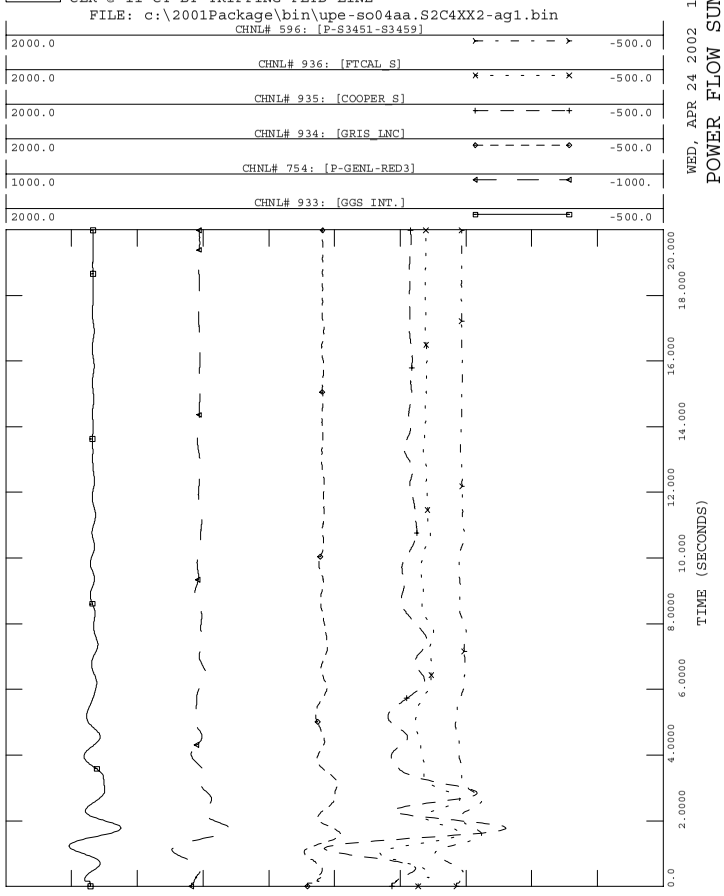
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

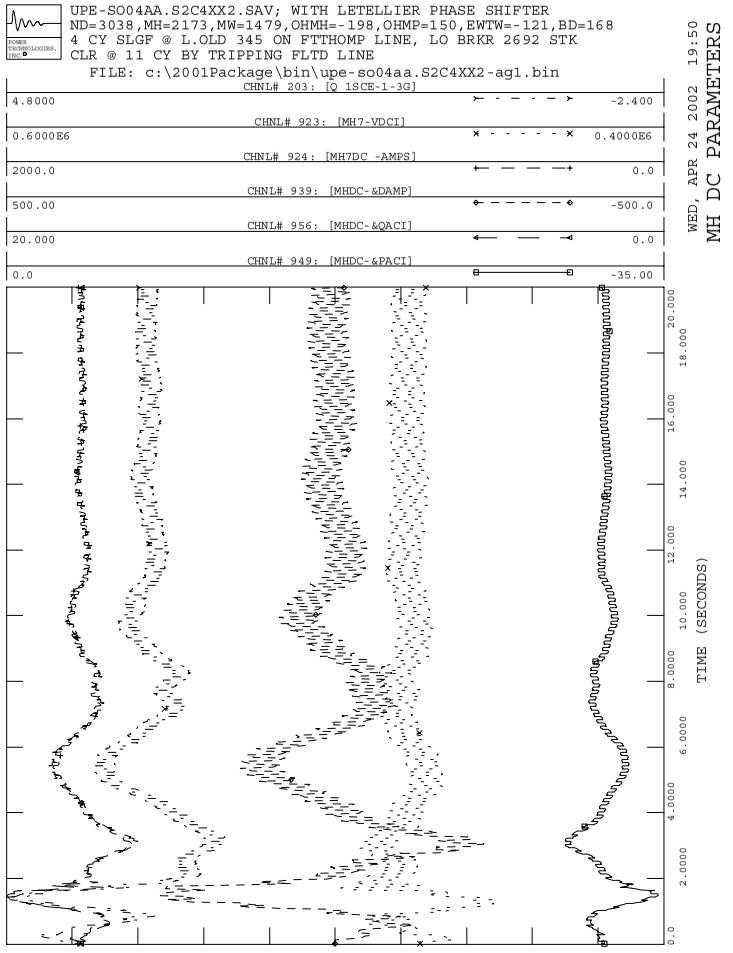
WED, APR 24 2002 19:50
POWER FLOW SUMS 1

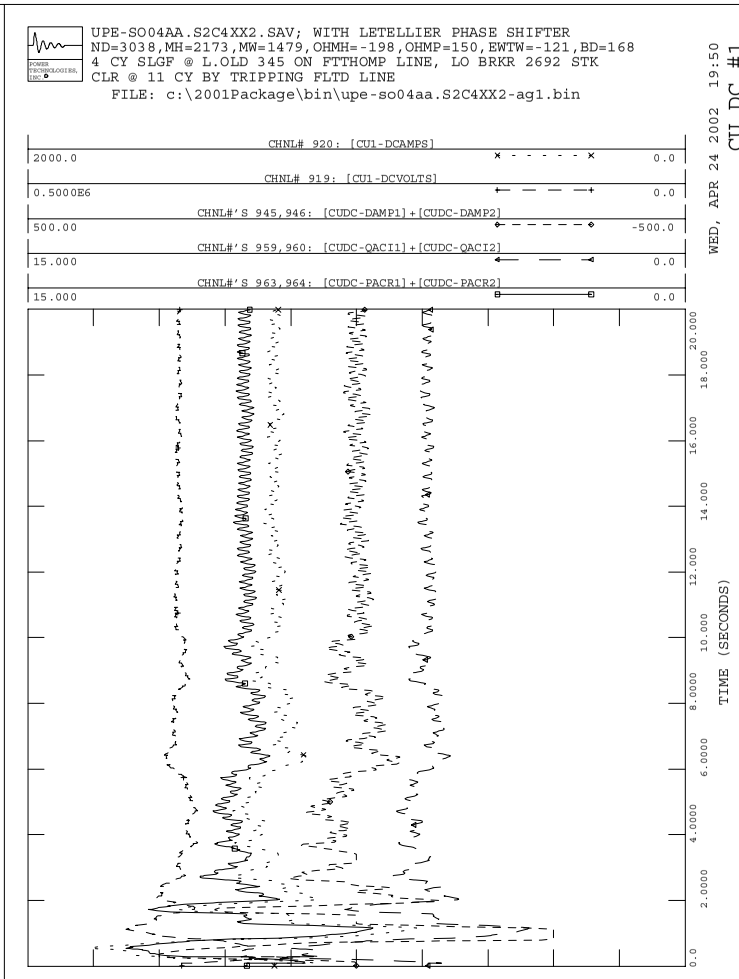


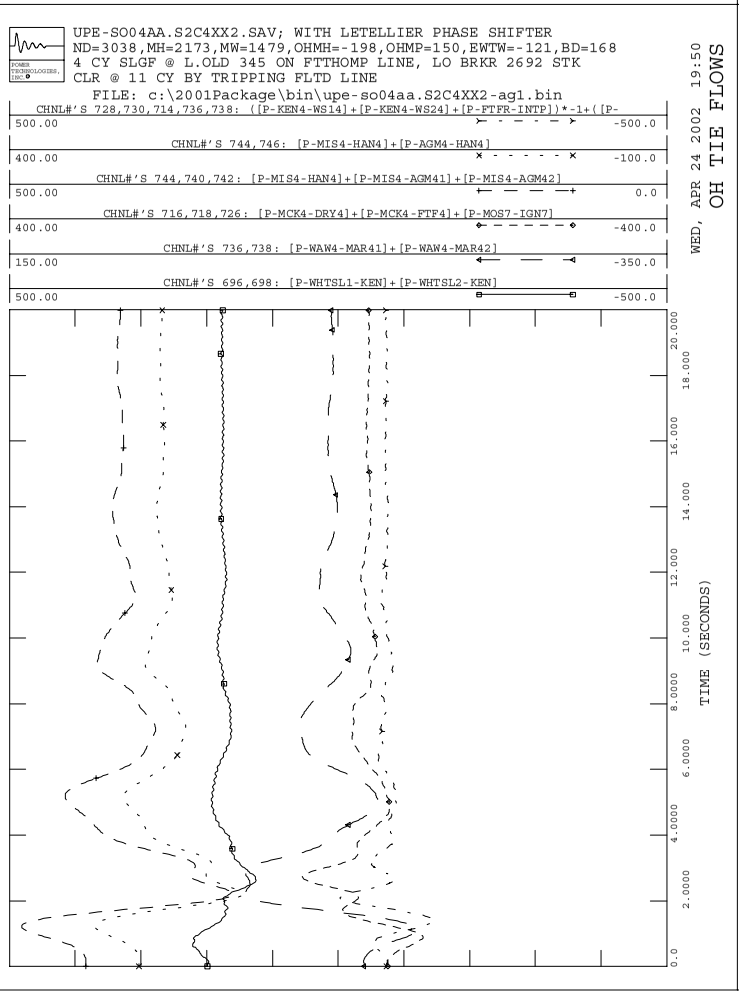
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

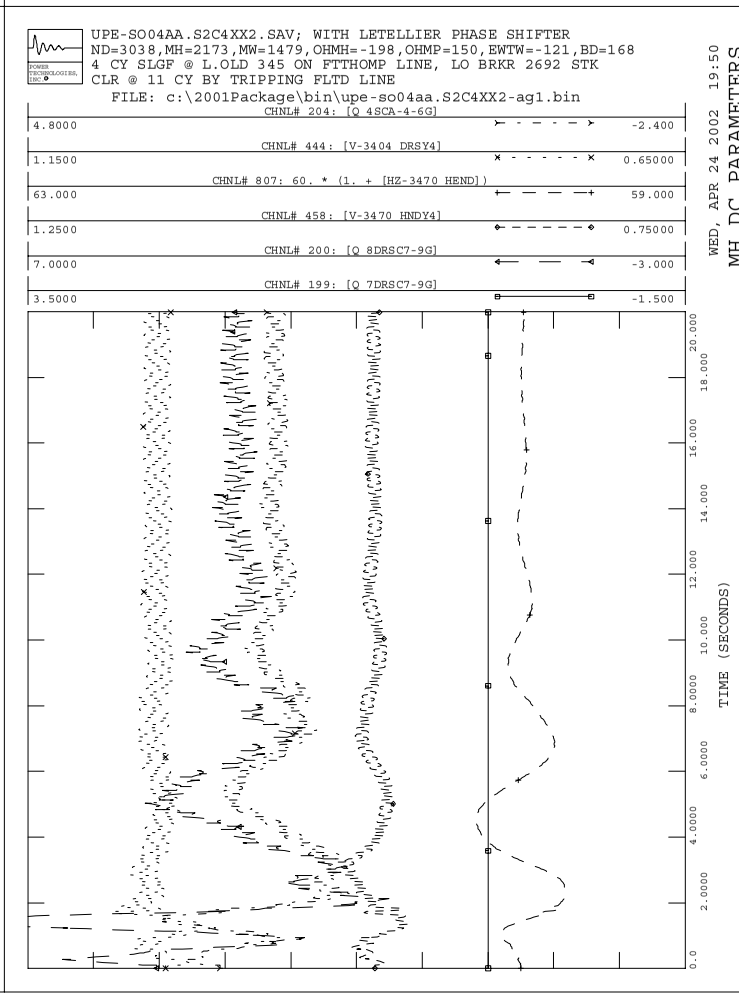
WED, APR 24 2002 19:50
POWER FLOW SUM 3

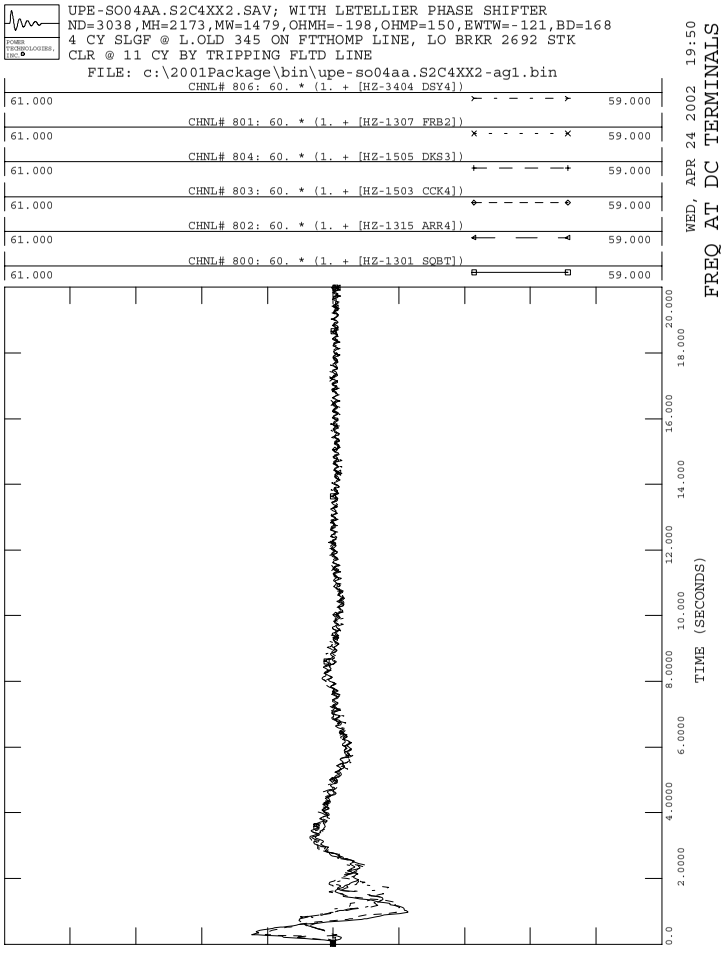


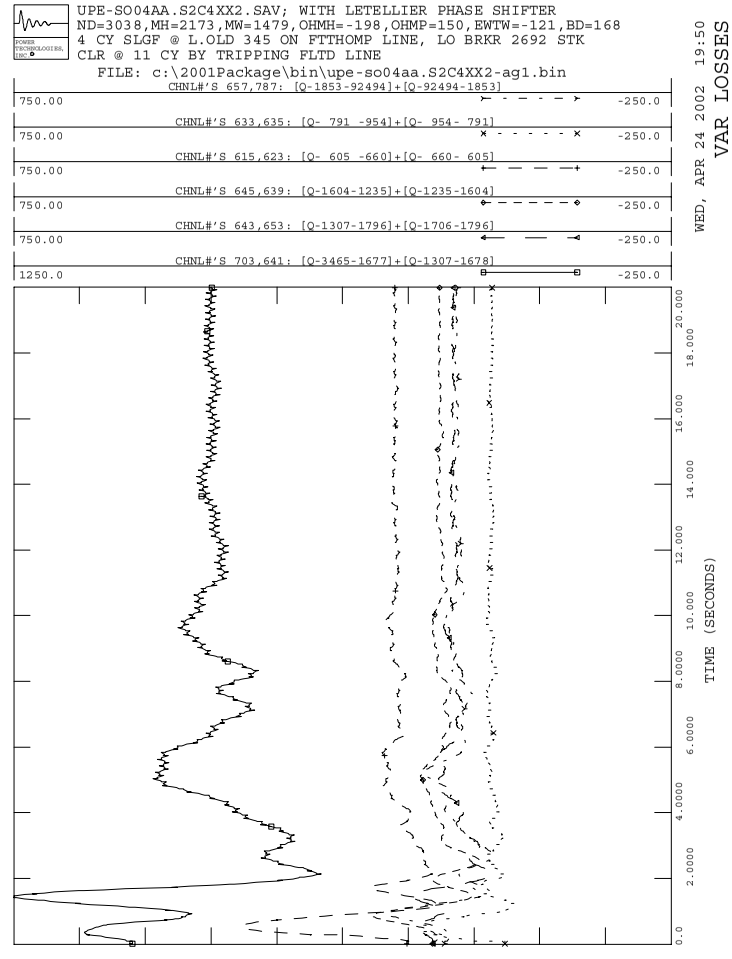

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
WED, APR 24 2002 19:50
MH DC PARAMETERS
TIME (SECONDS)

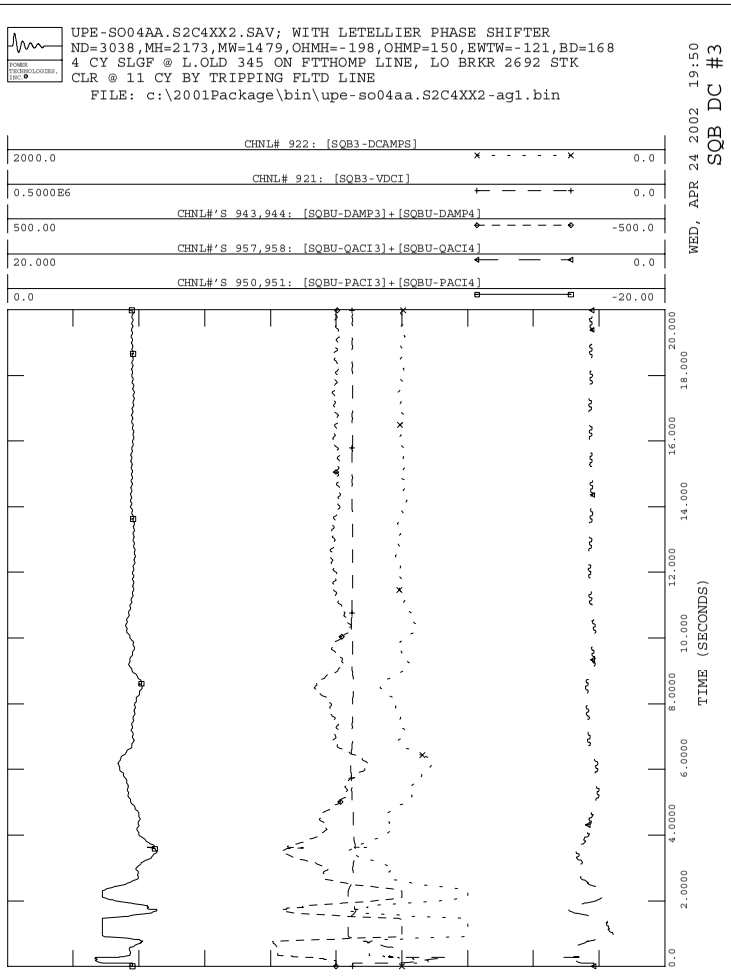

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
WED, APR 24 2002 19:50
CU DC #1
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
WED, APR 24 2002 19:50
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
WED, APR 24 2002 19:50
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
WED, APR 24 2002 19:50
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
WED, APR 24 2002 19:50
VAR LOSSES
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
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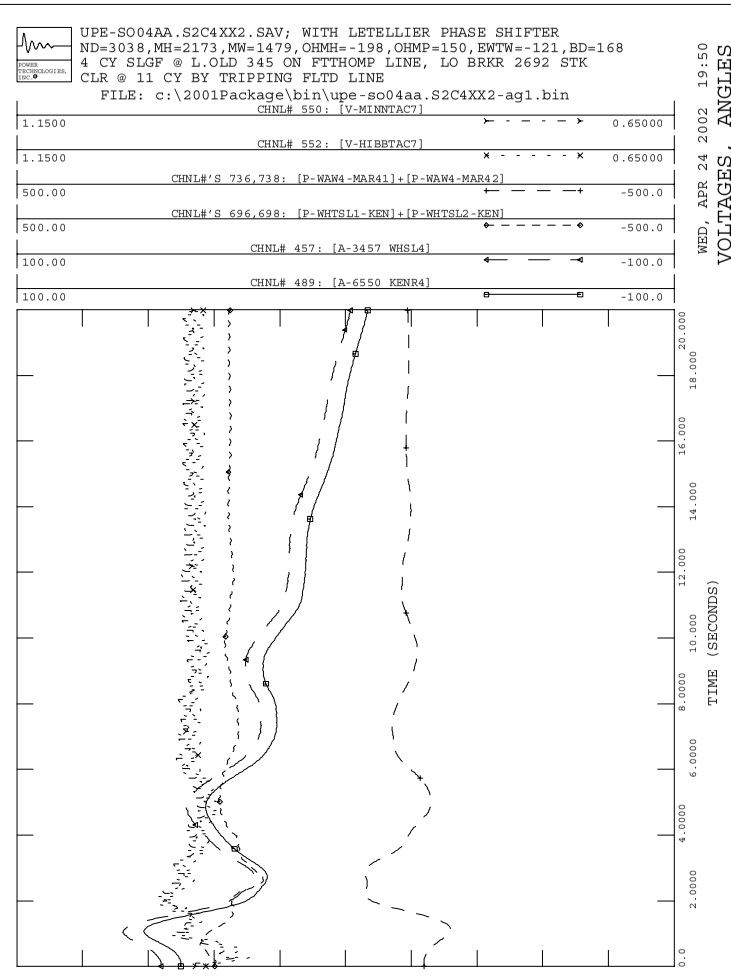
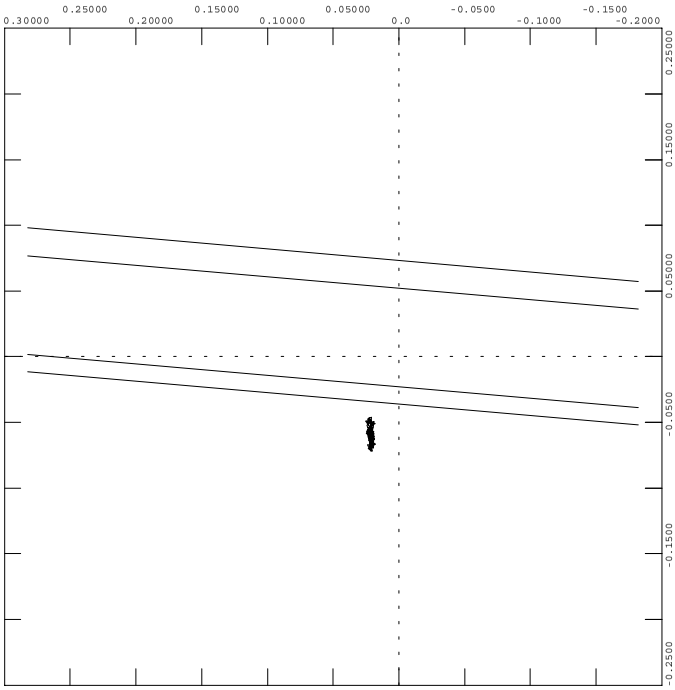
20.000
0.0
-500.0
-20.00
WED, APR 24 2002 19:50
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
WED, APR 24 2002 19:50
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

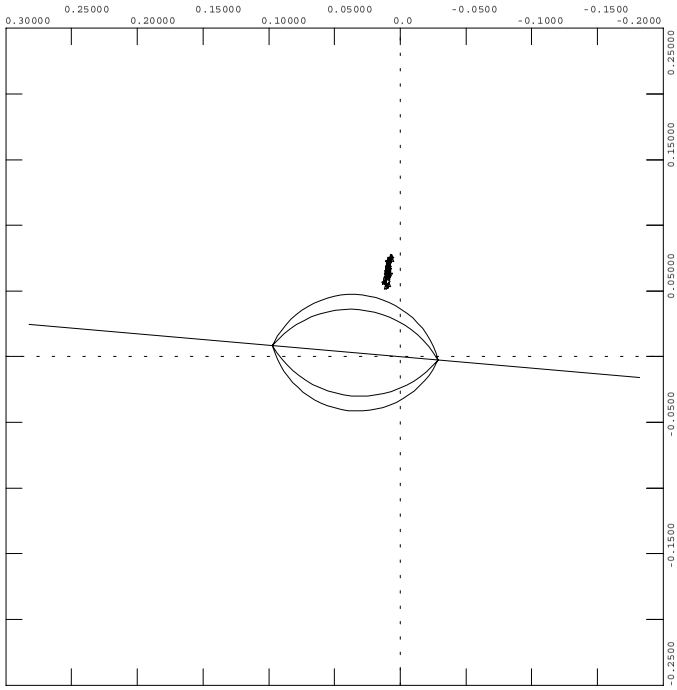


WED, APR 24 2002 19:50
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

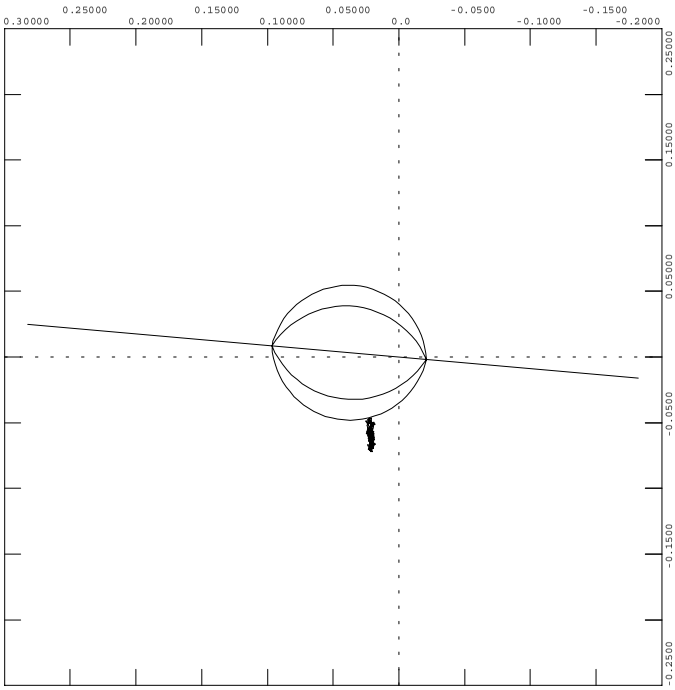


WED, APR 24 2002 19:50
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

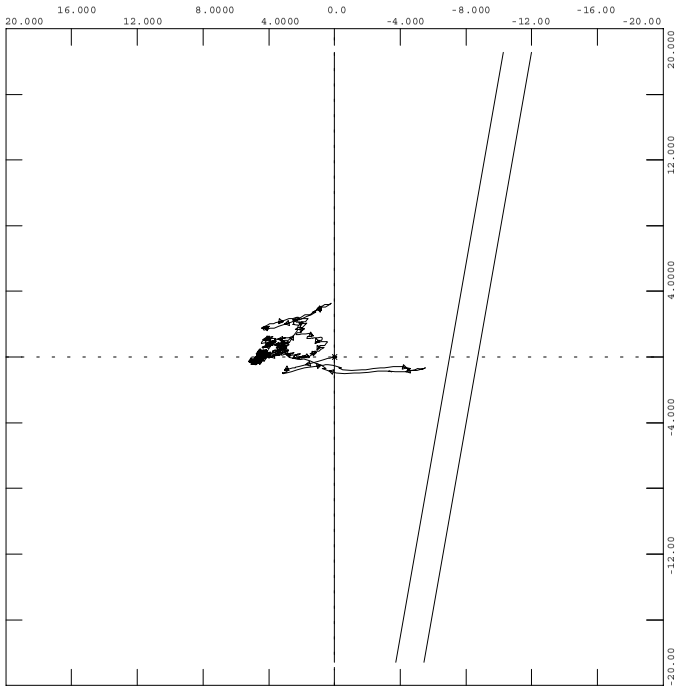


WED, APR 24 2002 19:50
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

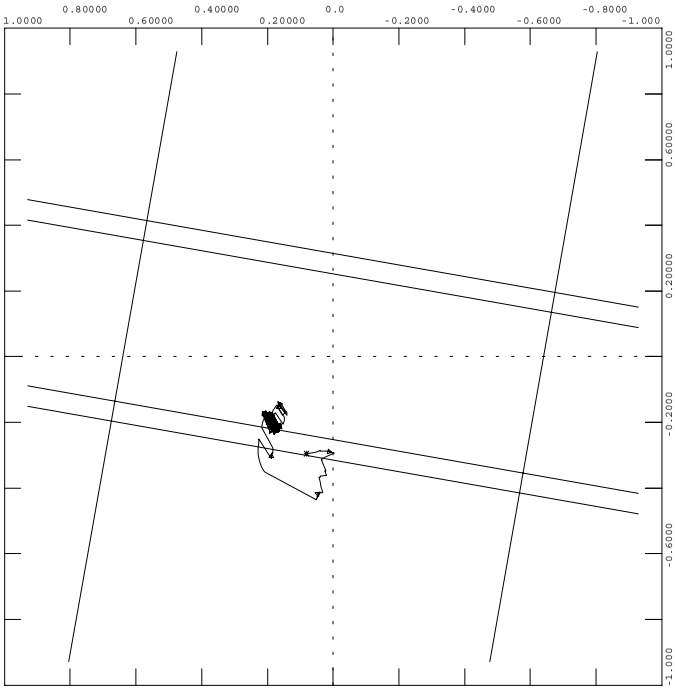


WED, APR 24 2002 19:50
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

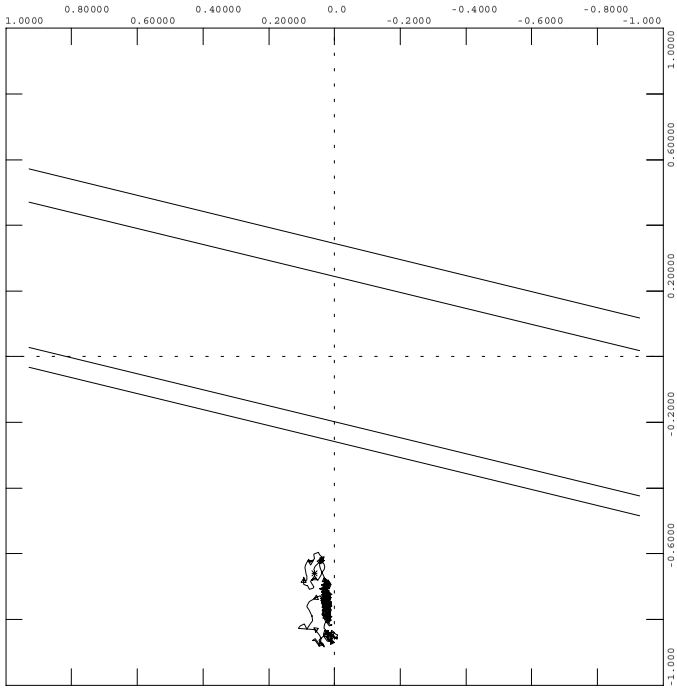
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

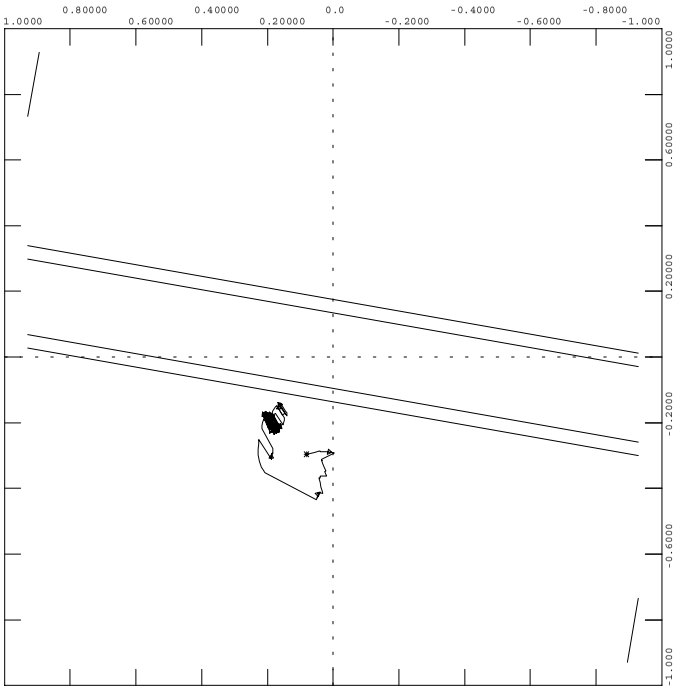
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

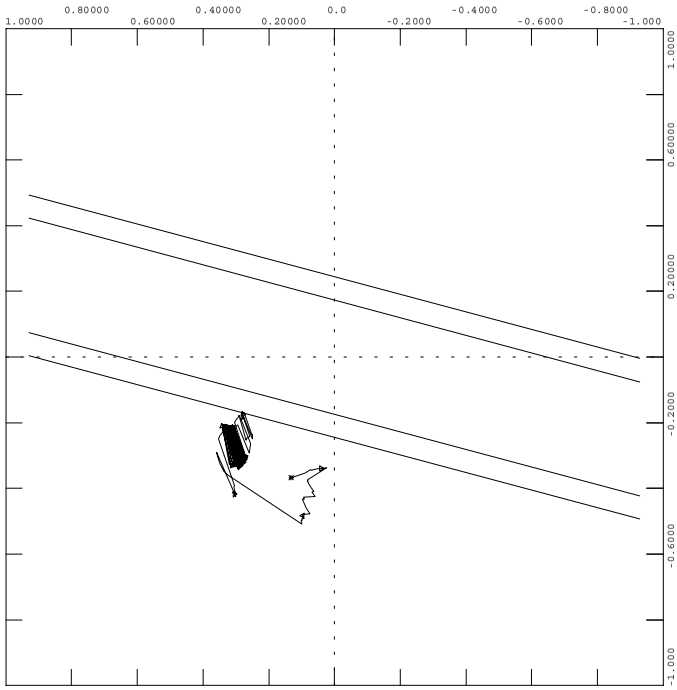
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

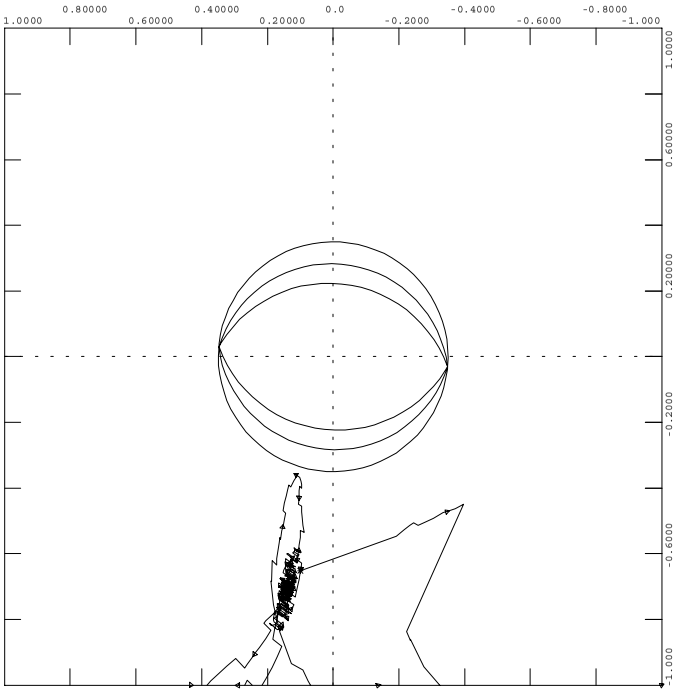
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

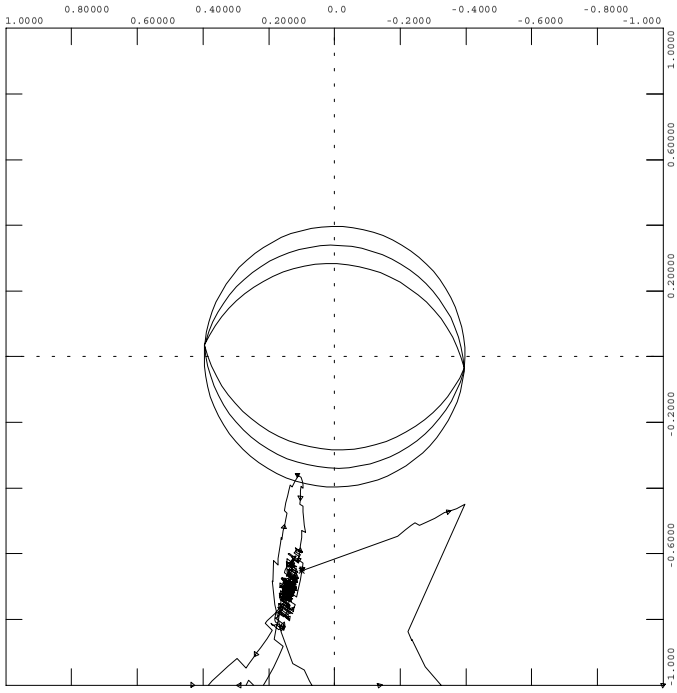
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

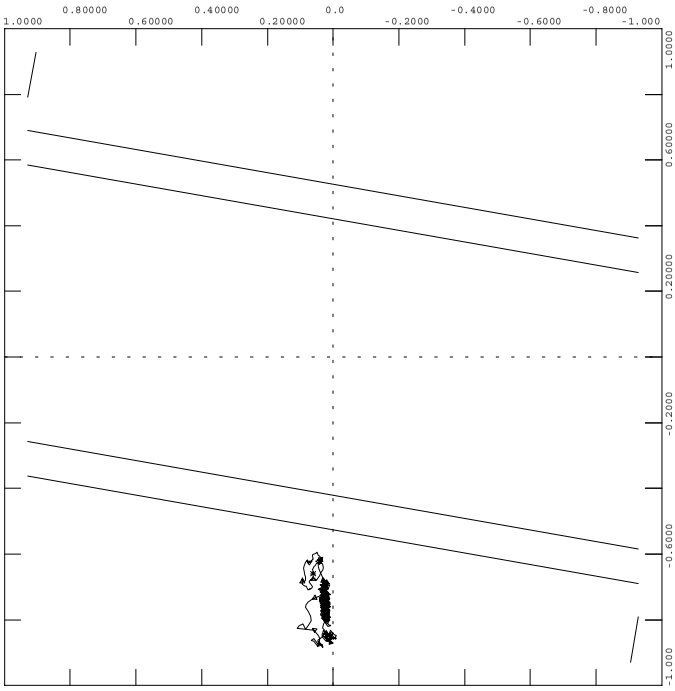
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

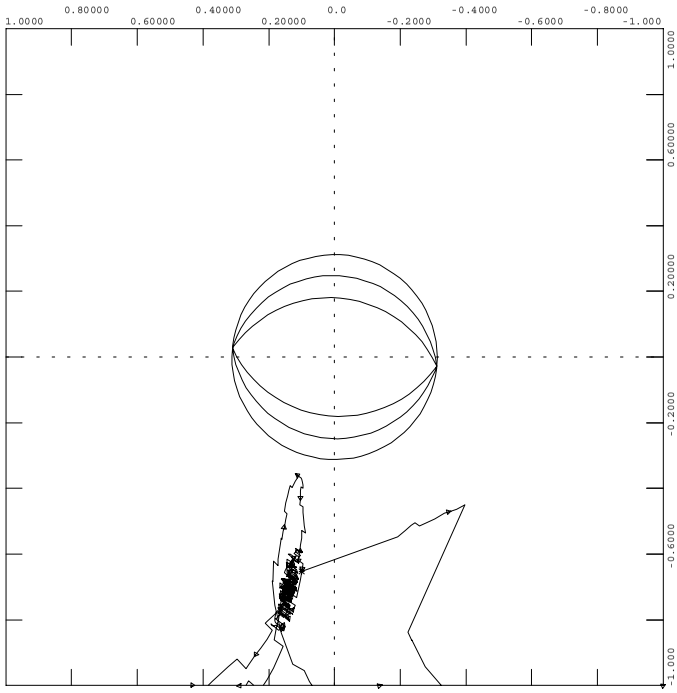
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



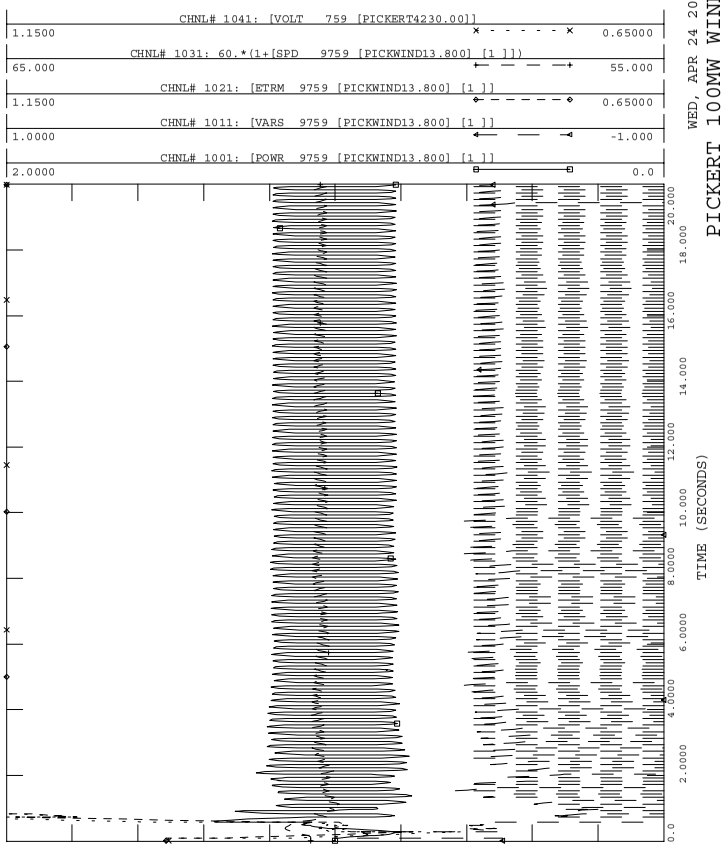
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

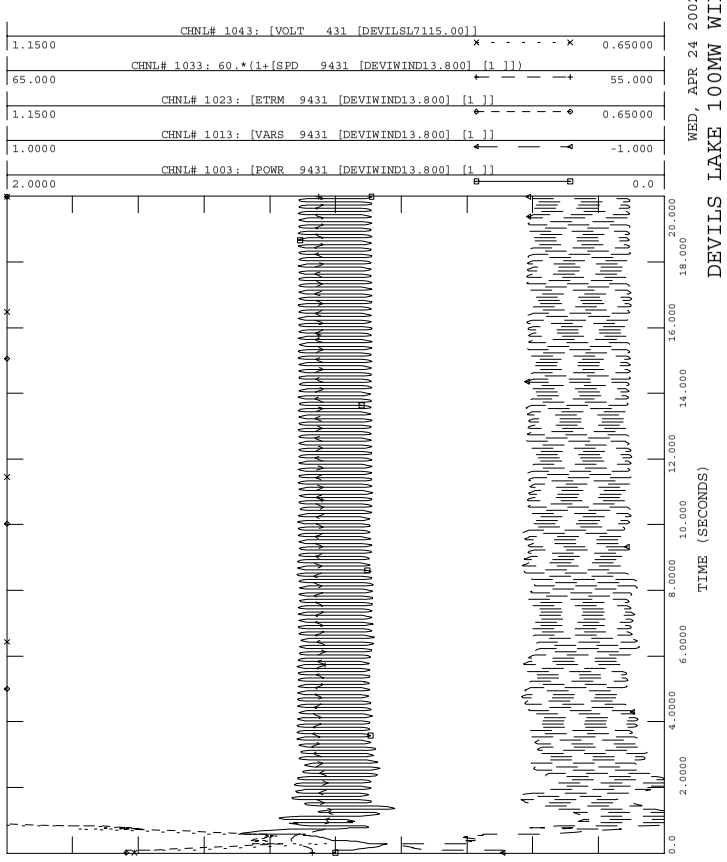
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin



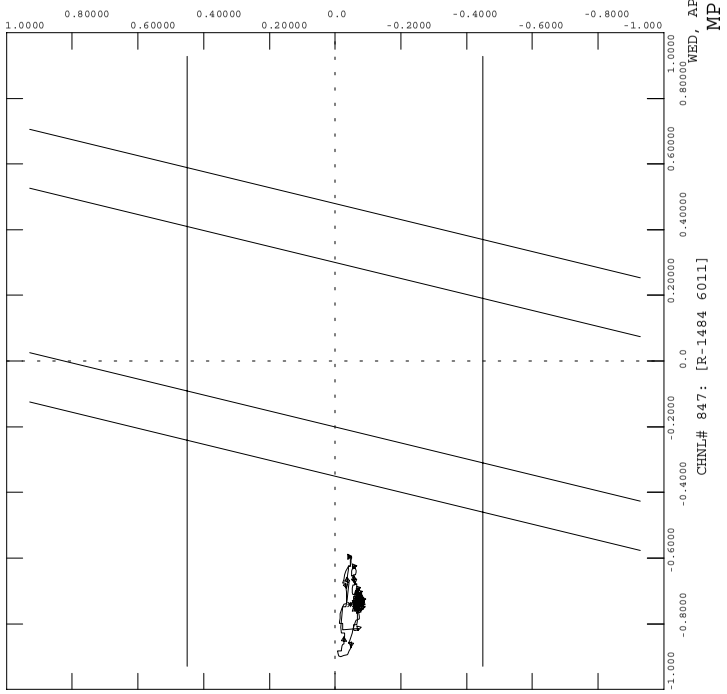
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin



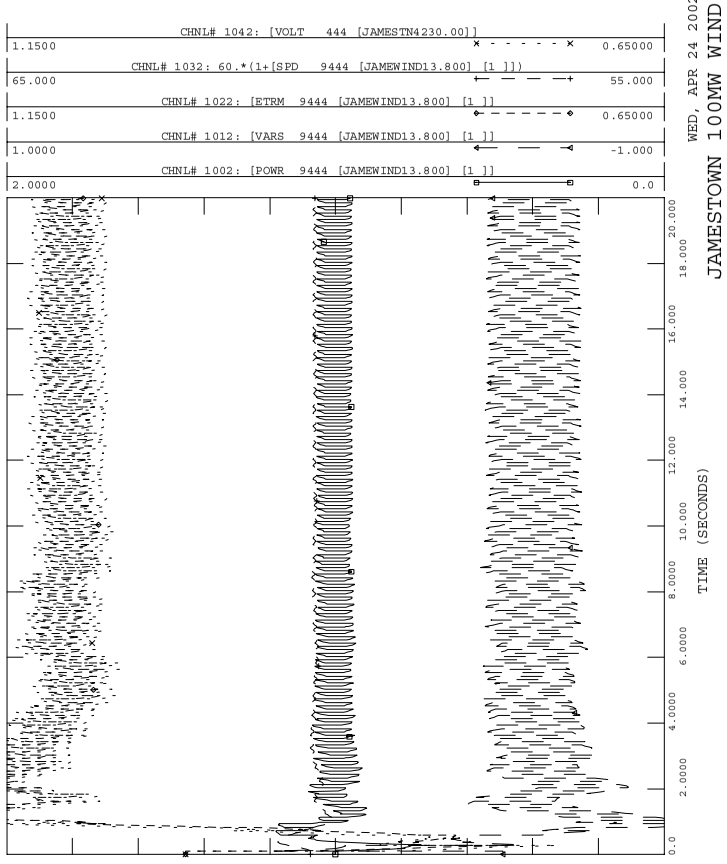
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

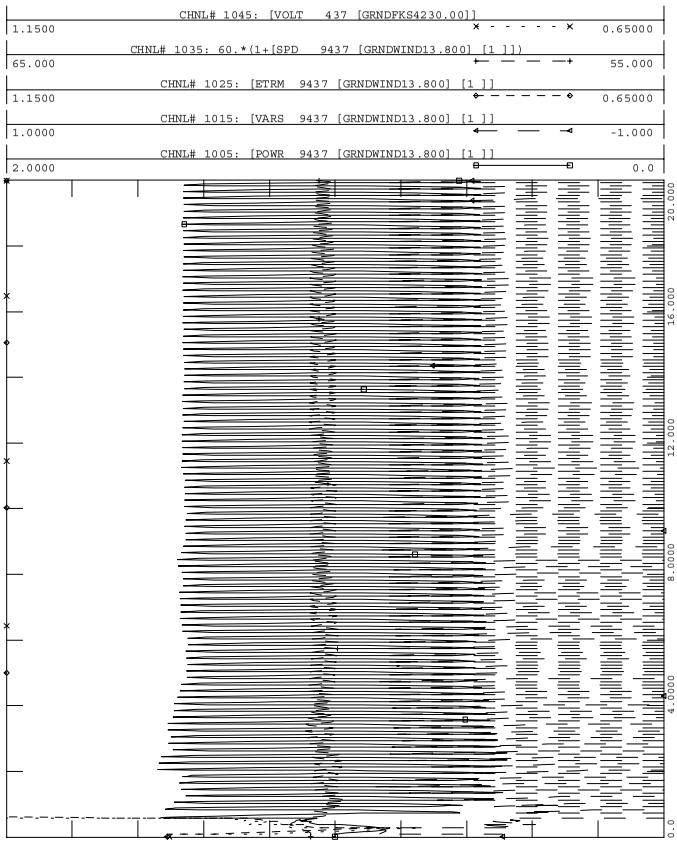
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin

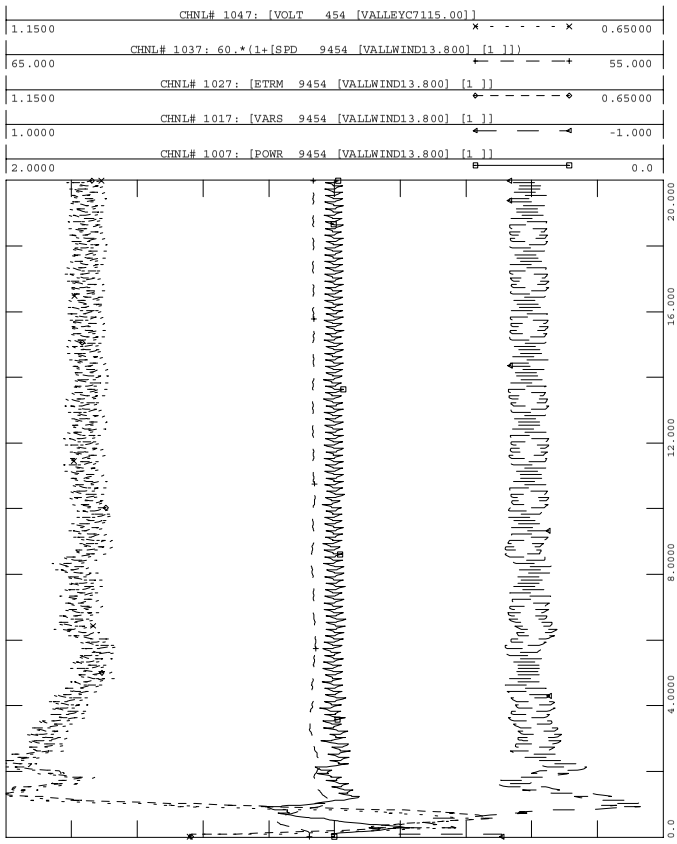


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin



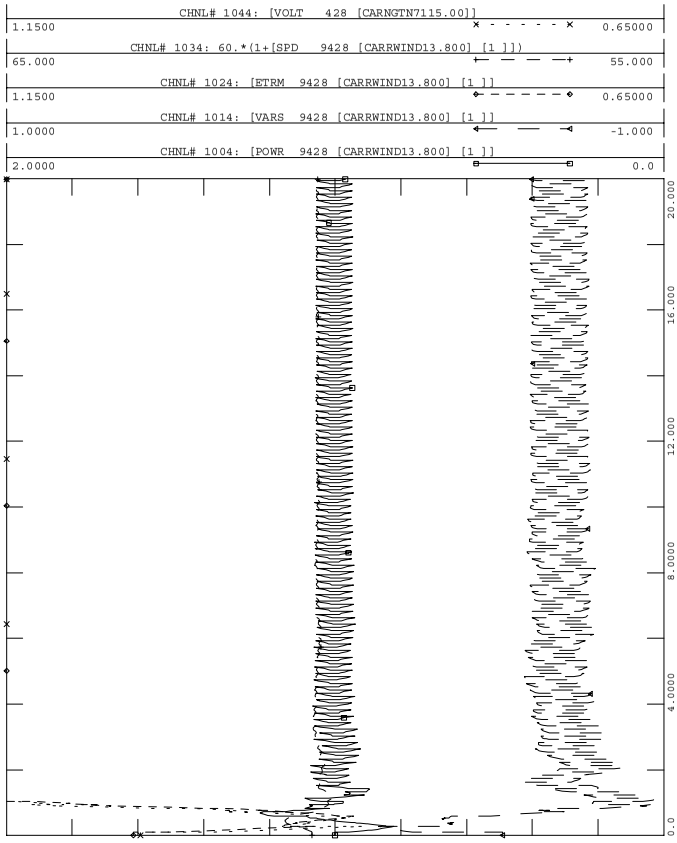
WED, APR 24 2002 19:50
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin



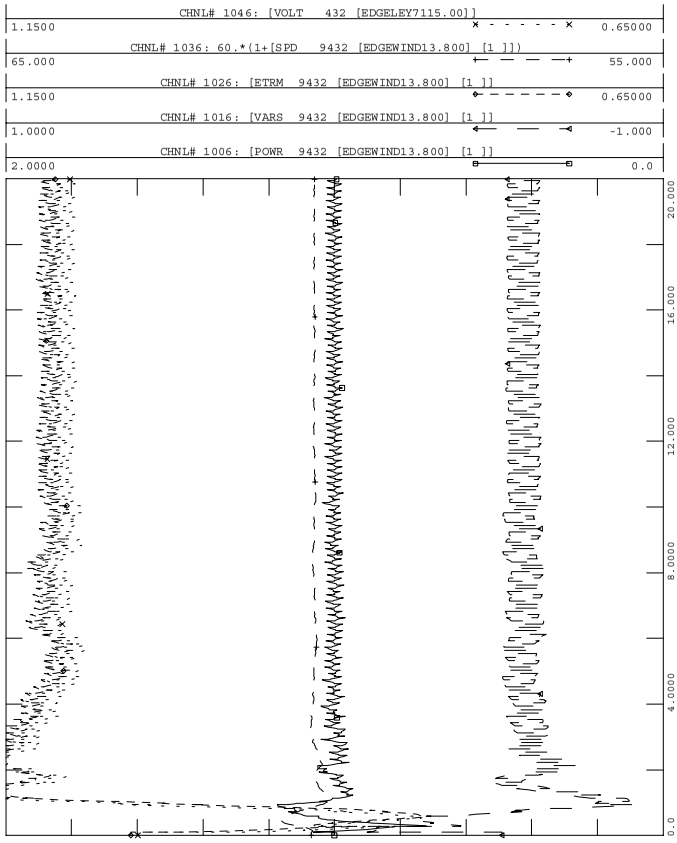
WED, APR 24 2002 19:50
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin



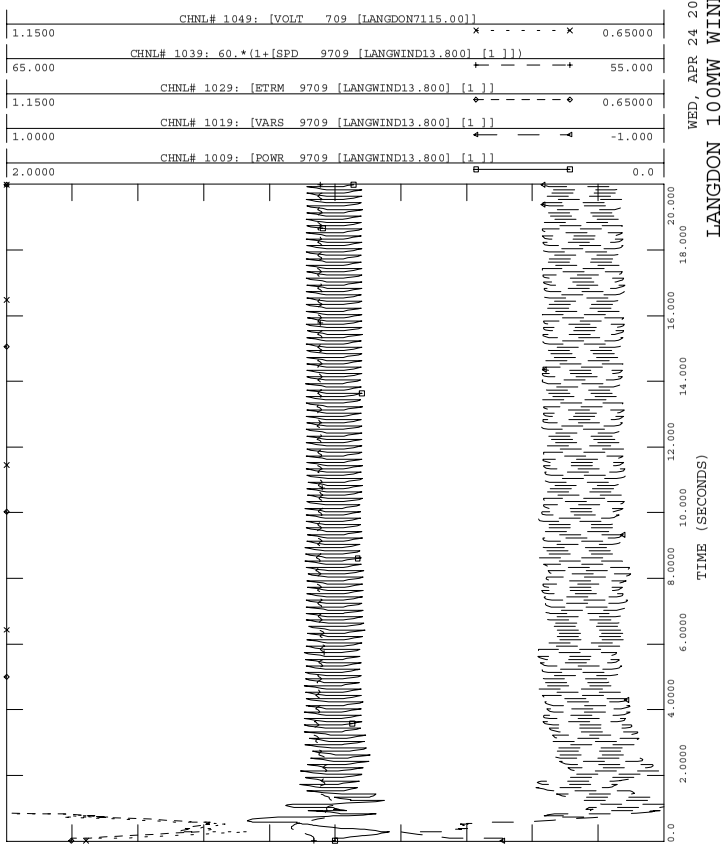
WED, APR 24 2002 19:50
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin



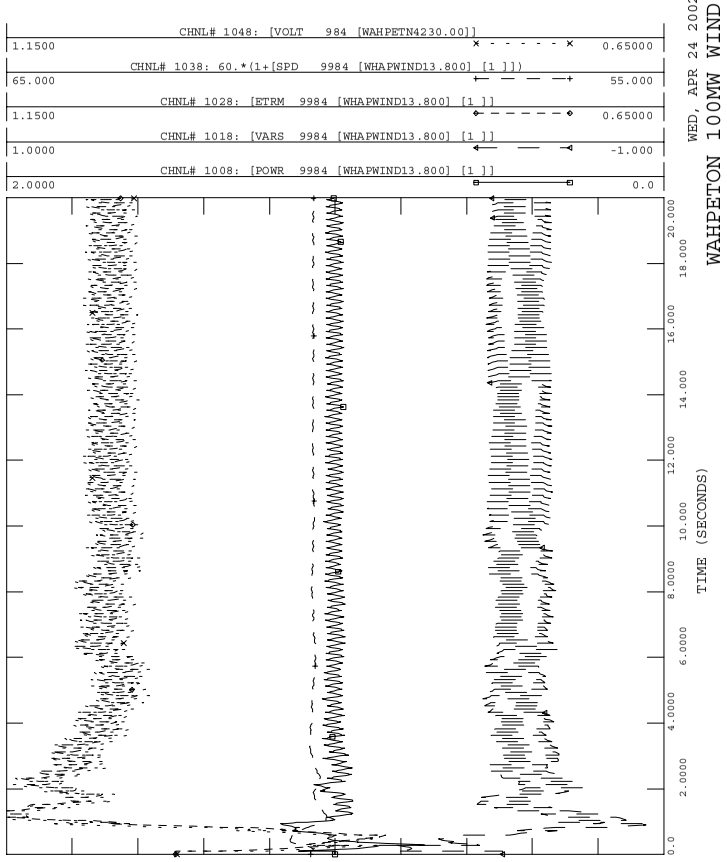
WED, APR 24 2002 19:50
EDGELEY 100MW WIND UNIT

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin



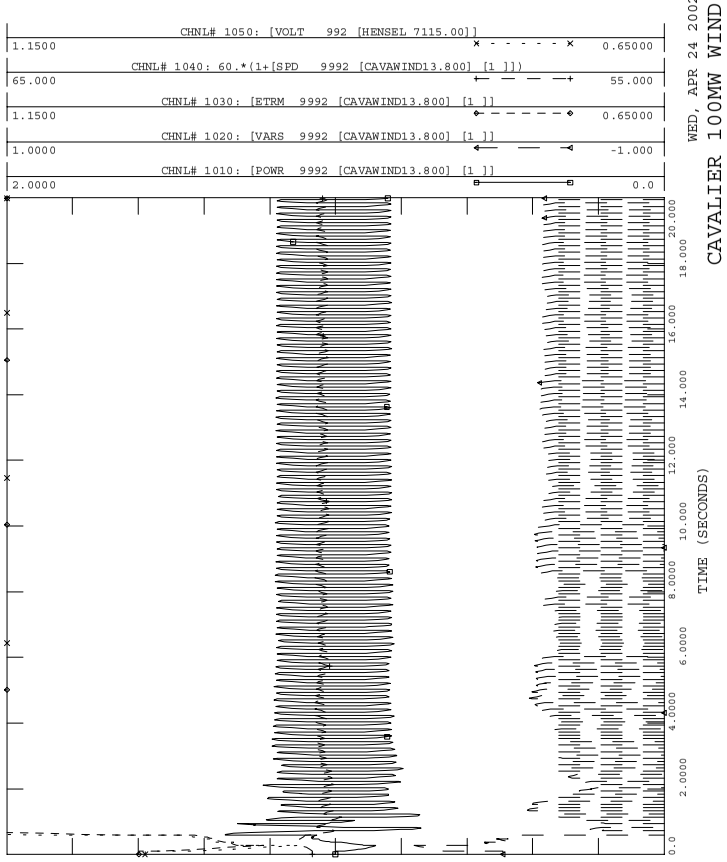
WED, APR 24 2002 19:50
LANGDON 100MW WIND UNIT

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin



WED, APR 24 2002 19:50
WAHPETON 100MW WIND UNIT

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag1.bin



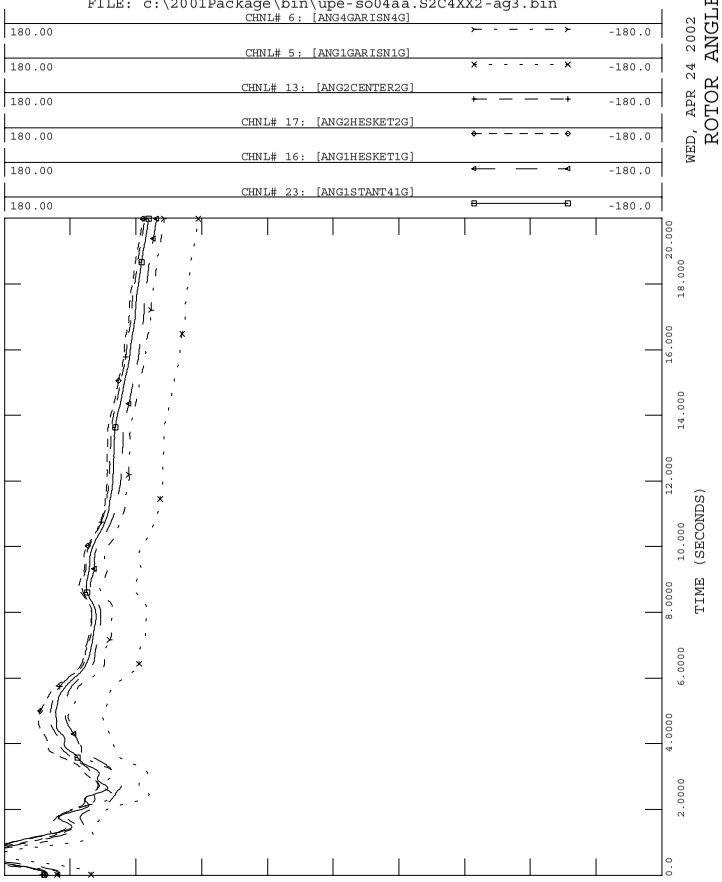
WED, APR 24 2002 19:50
CAVALIER 100MW WIND UNIT

CONTINGENCY AG3

Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

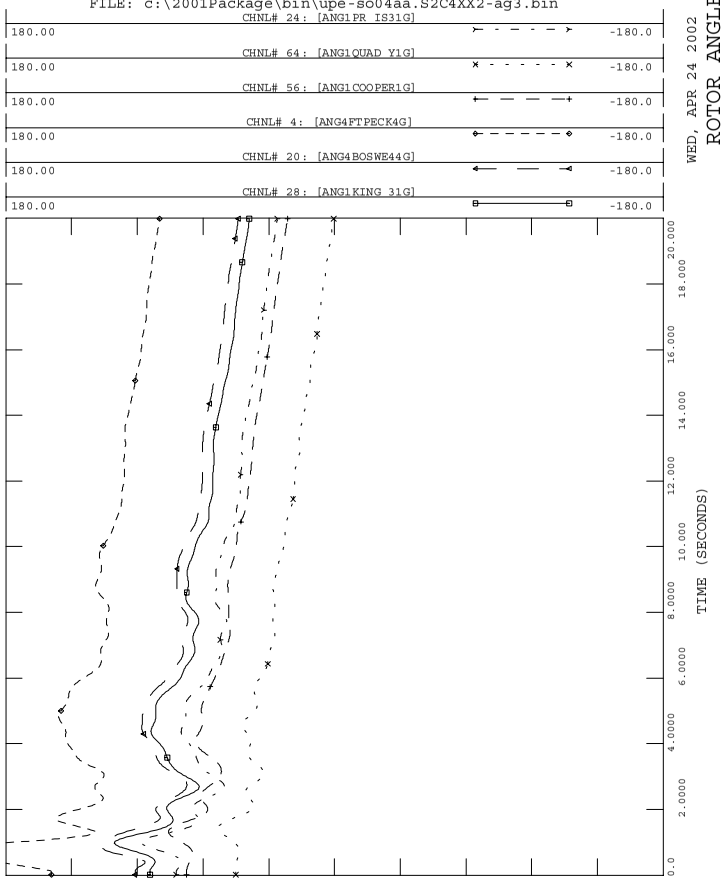
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09
ROTOR ANGLES 2



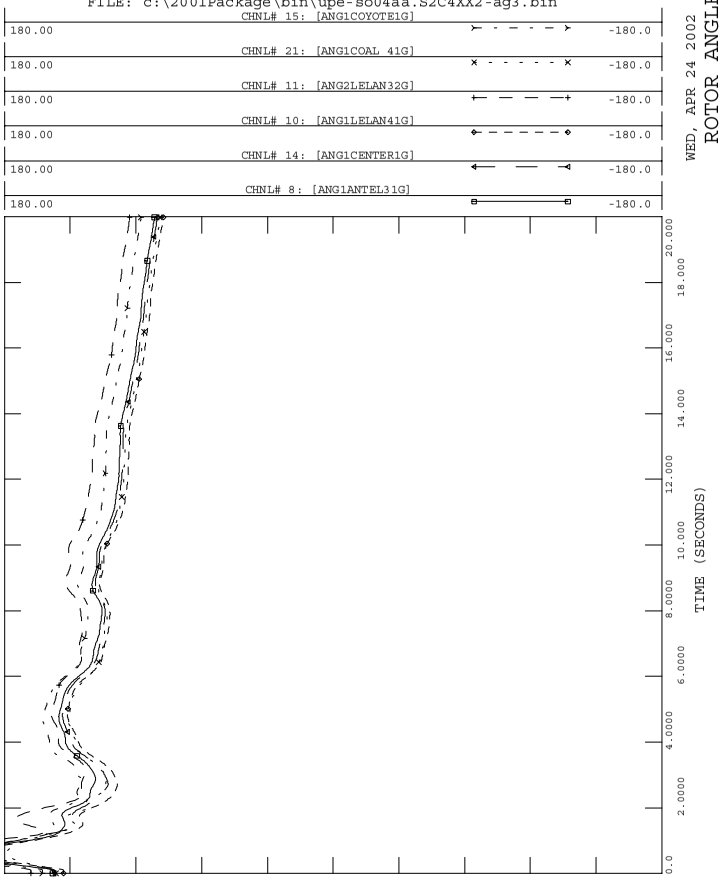
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09
ROTOR ANGLES 4



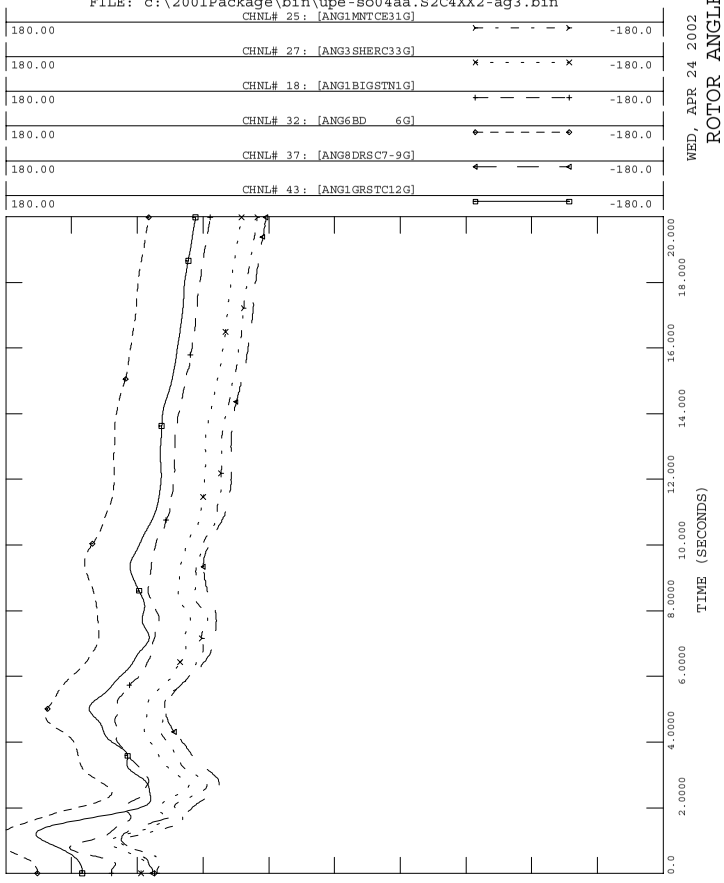
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

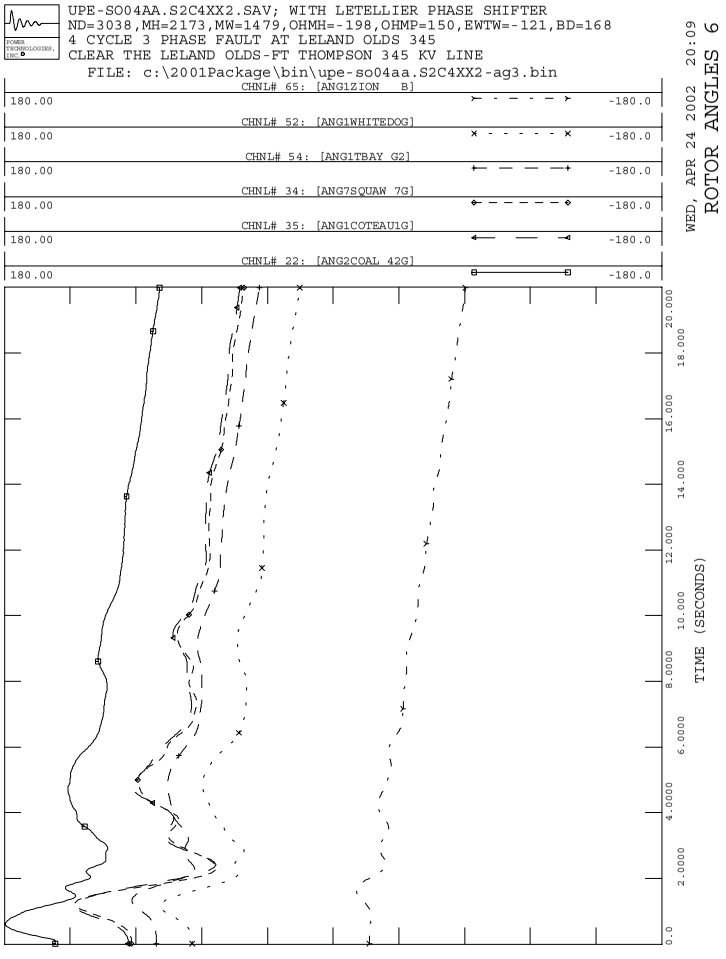
WED, APR 24 2002 20:09
ROTOR ANGLES 1

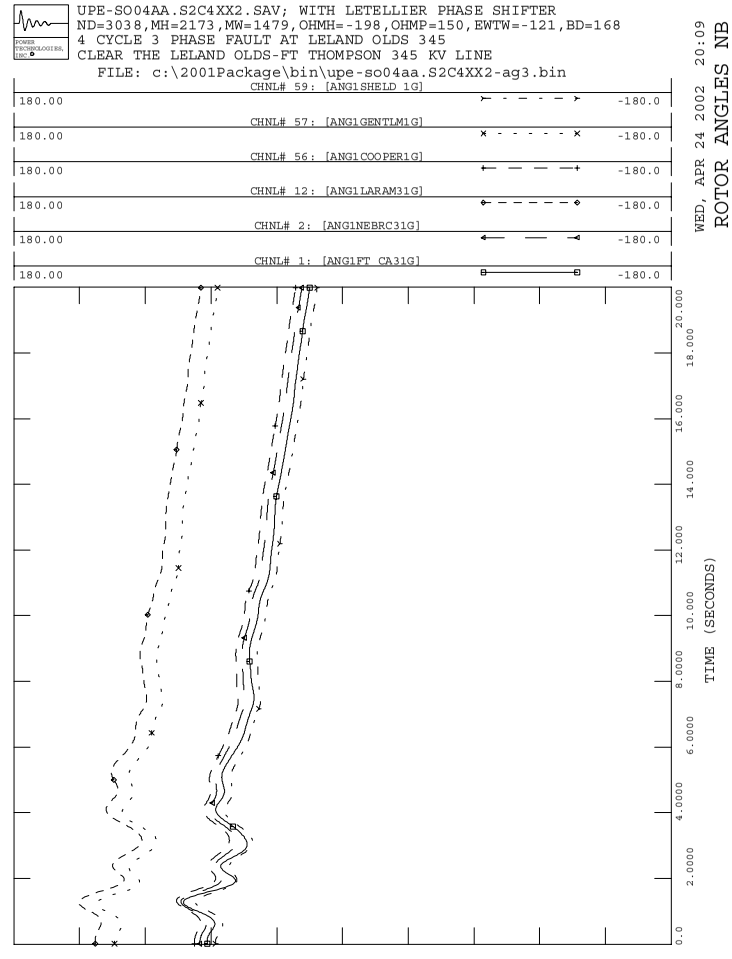


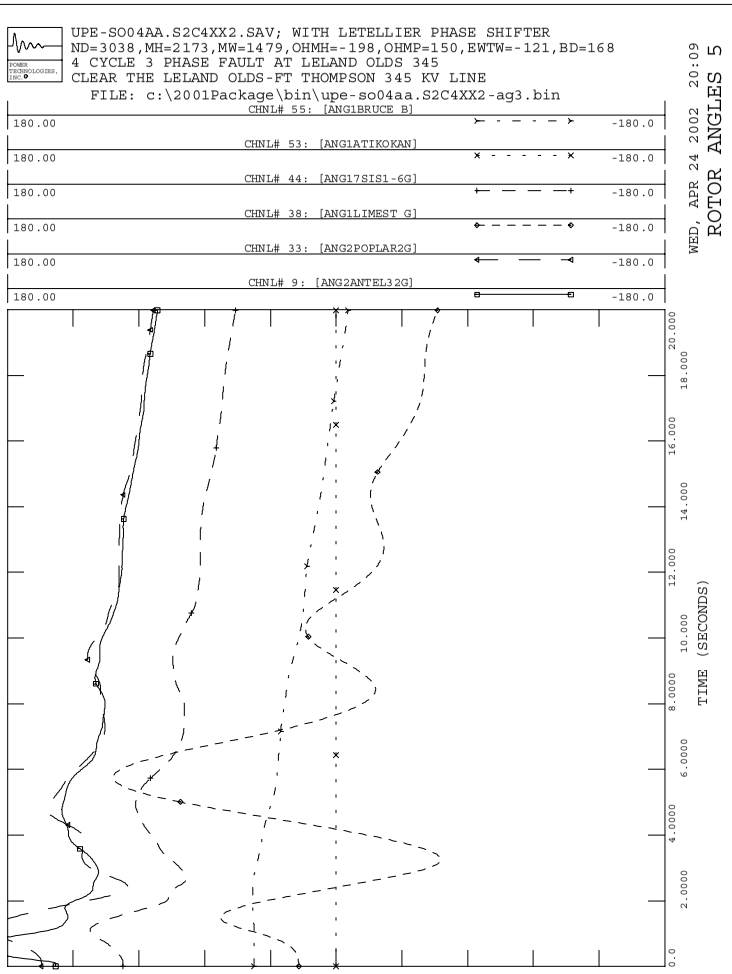
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

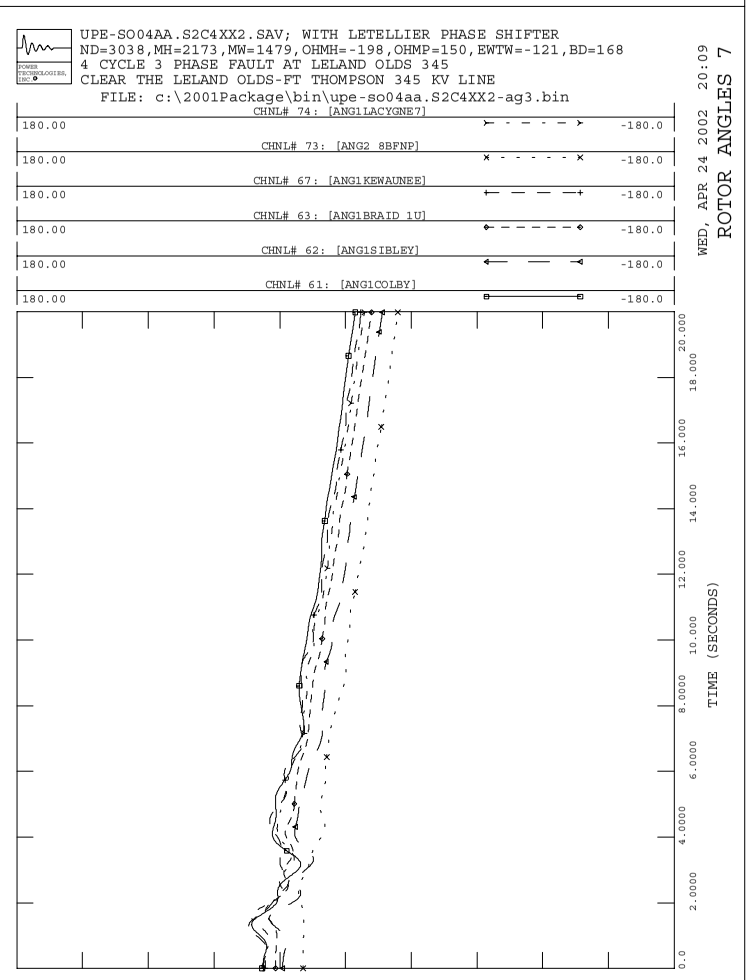
WED, APR 24 2002 20:09
ROTOR ANGLES 3




UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 20:09
ROTOR ANGLES 6

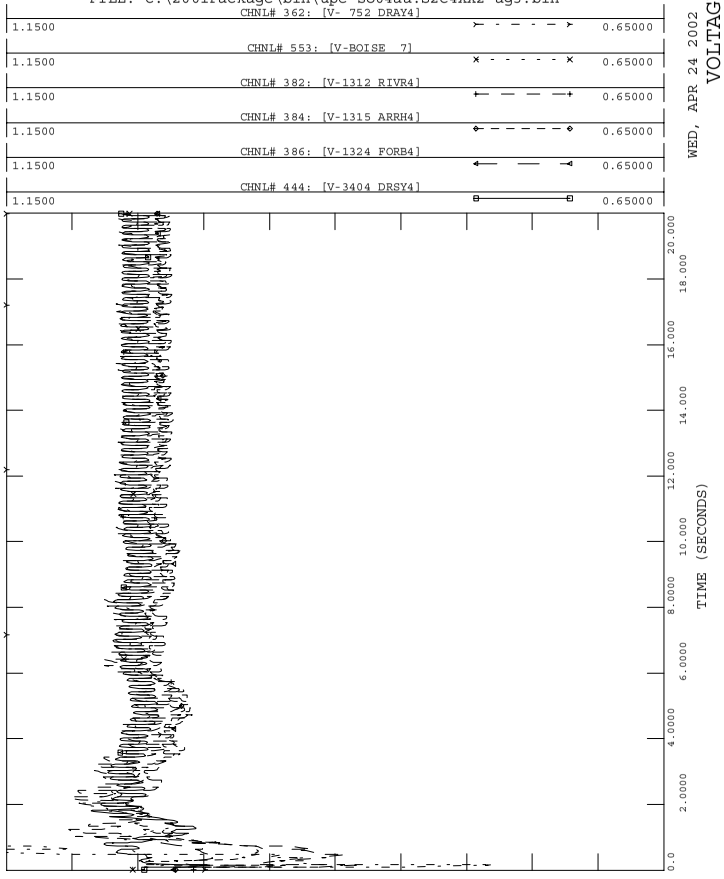

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 20:09
ROTOR ANGLES NB


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 20:09
ROTOR ANGLES 5


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
WED, APR 24 2002 20:09
ROTOR ANGLES 7

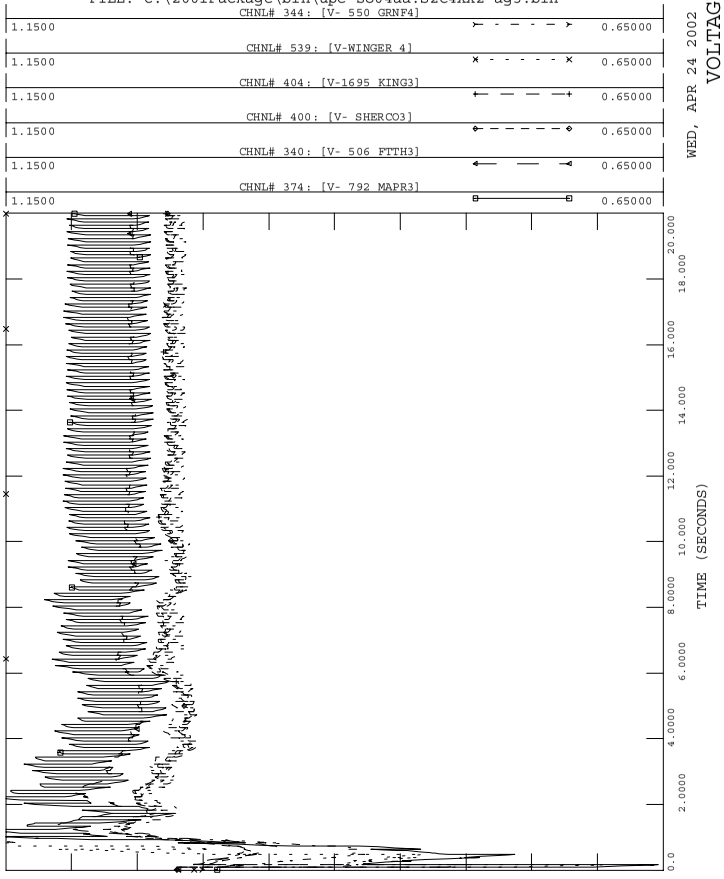
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09
VOLTAGES 1



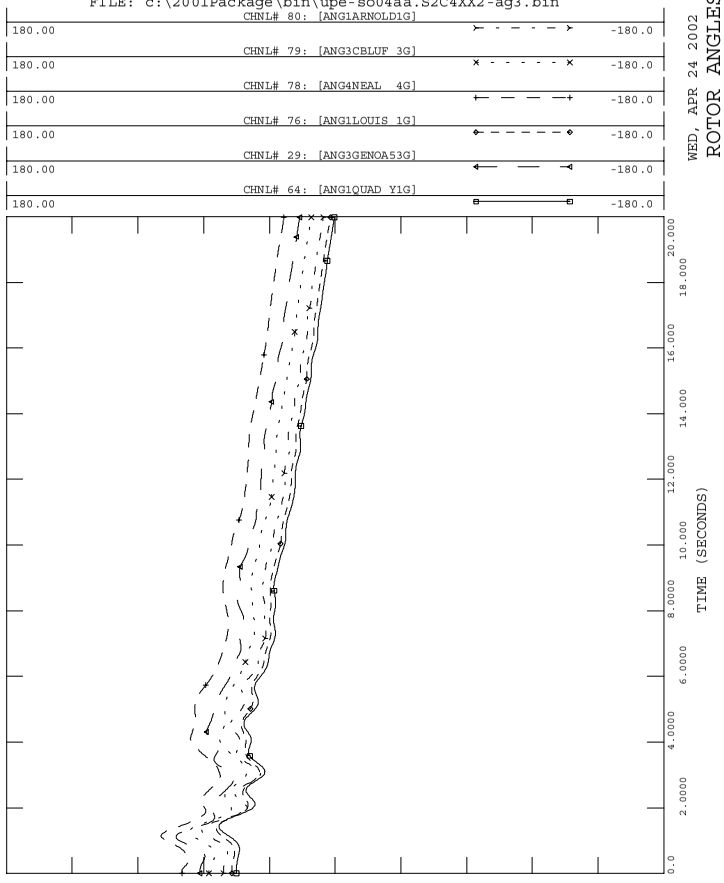
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09
VOLTAGES 3



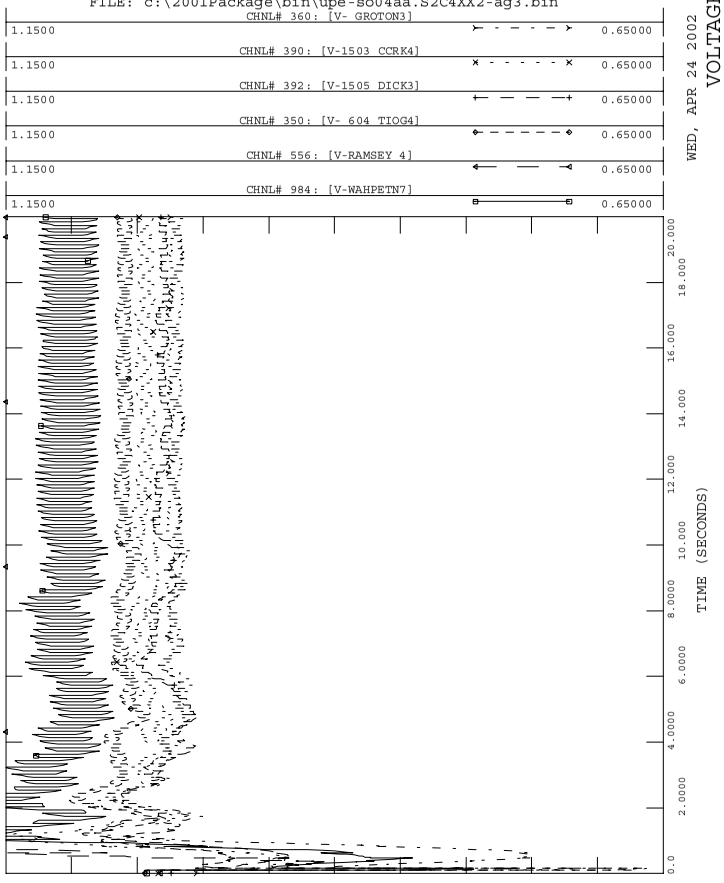
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09
ROTOR ANGLES IA



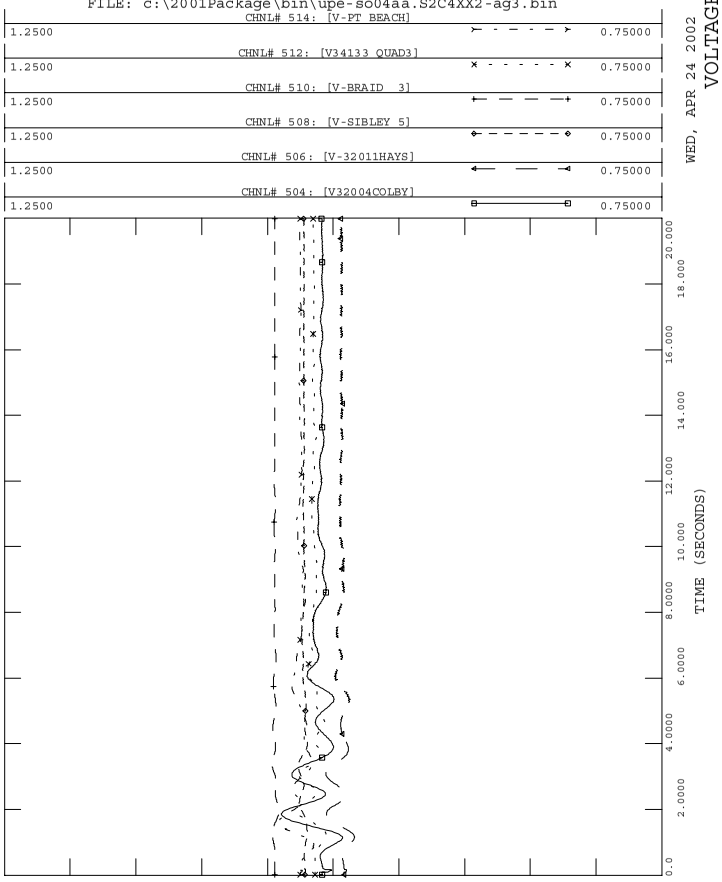
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09
VOLTAGES 2



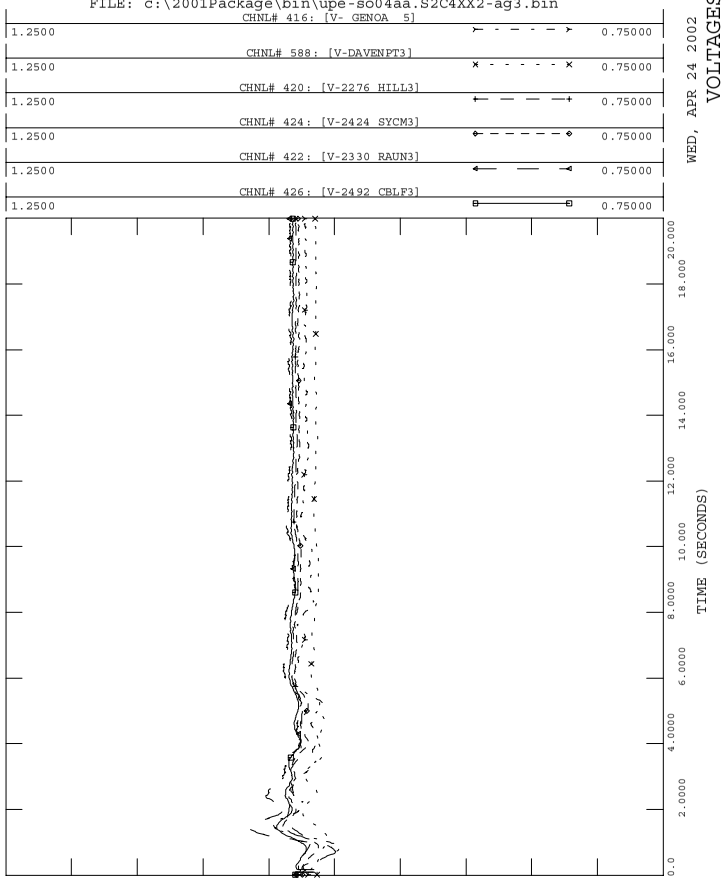
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09
VOLTAGES 5



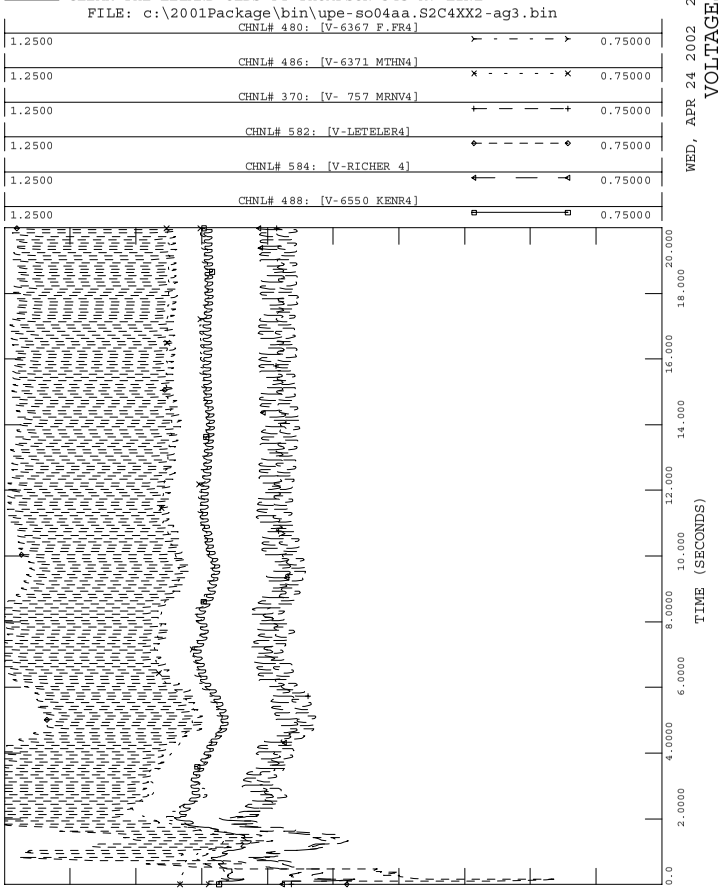
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09
VOLTAGES IA



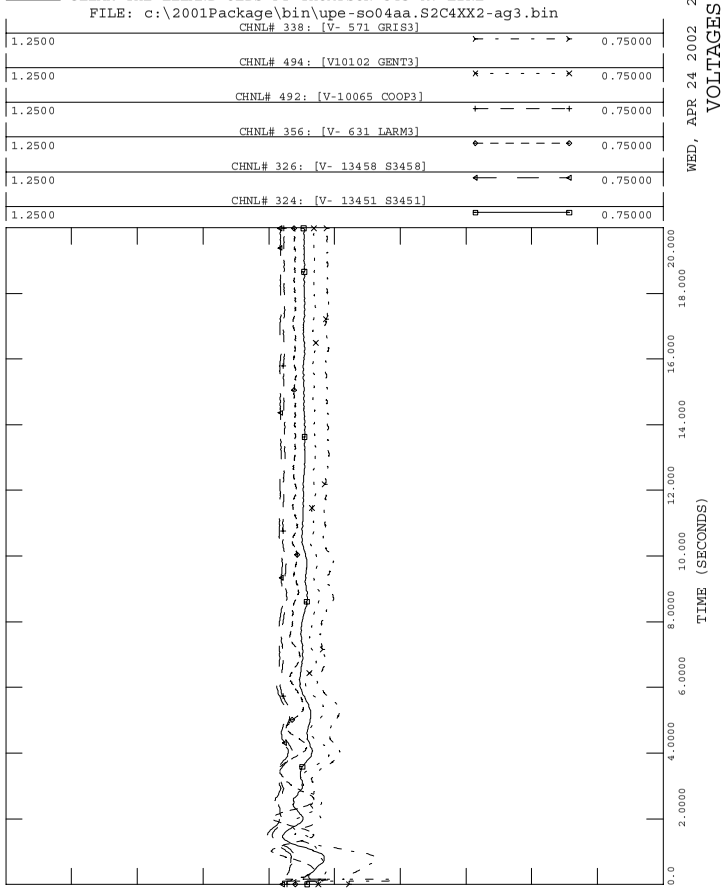
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

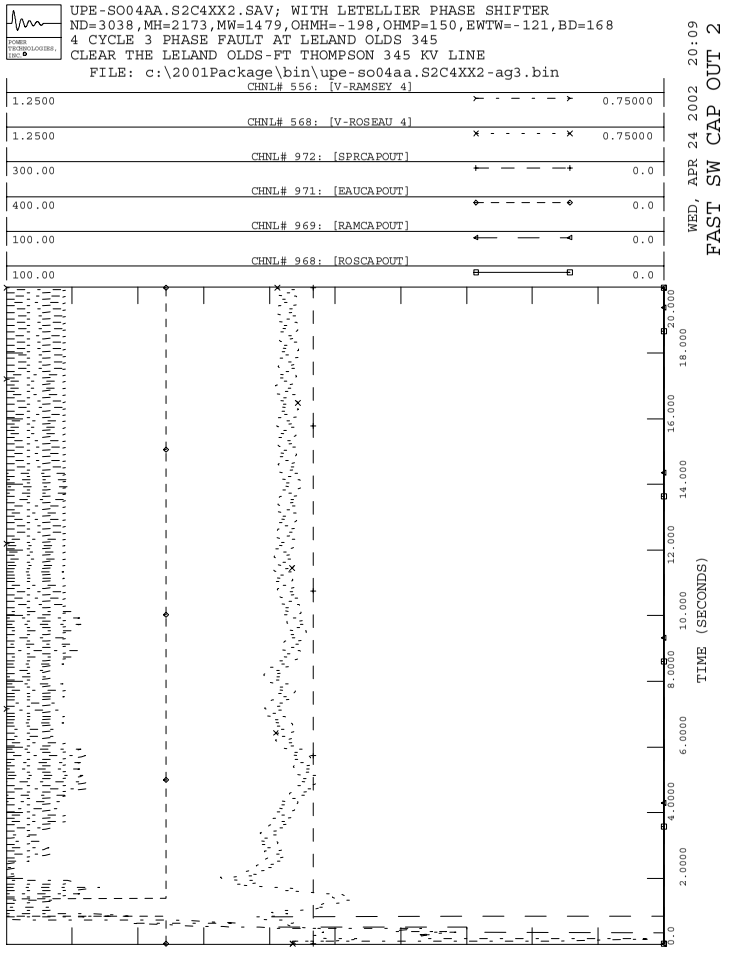
WED, APR 24 2002 20:09
VOLTAGES 4

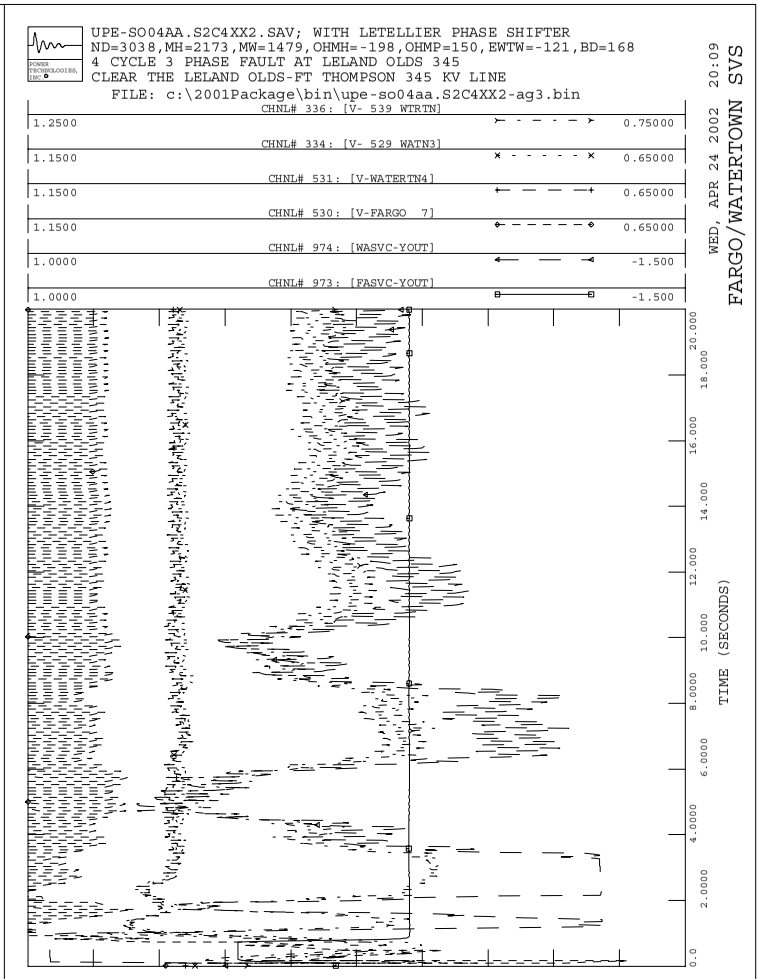


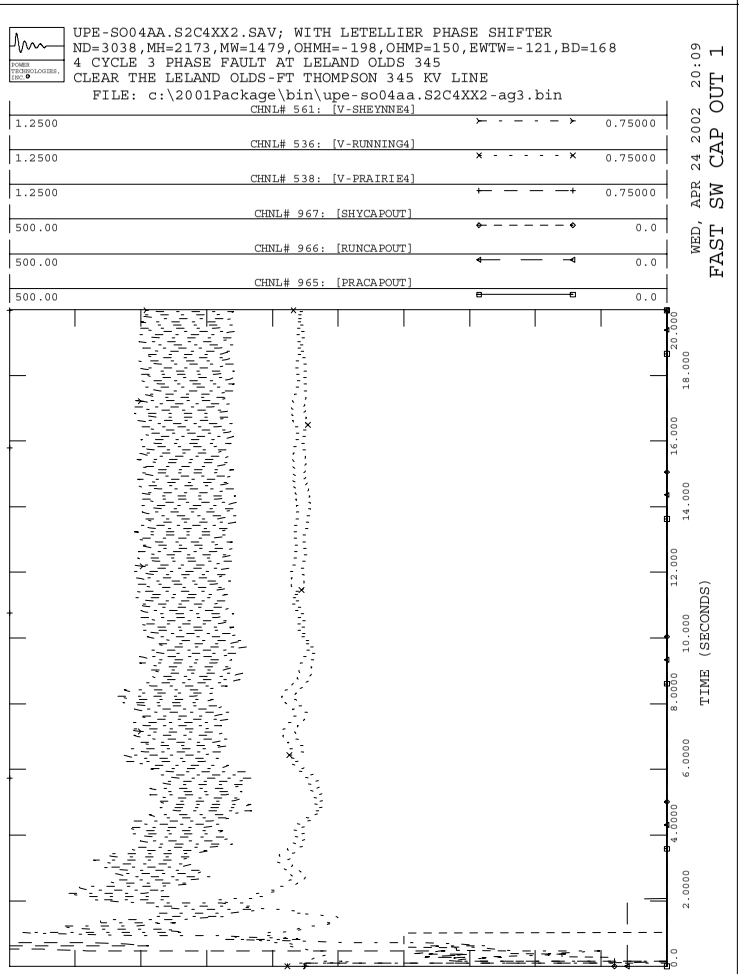
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

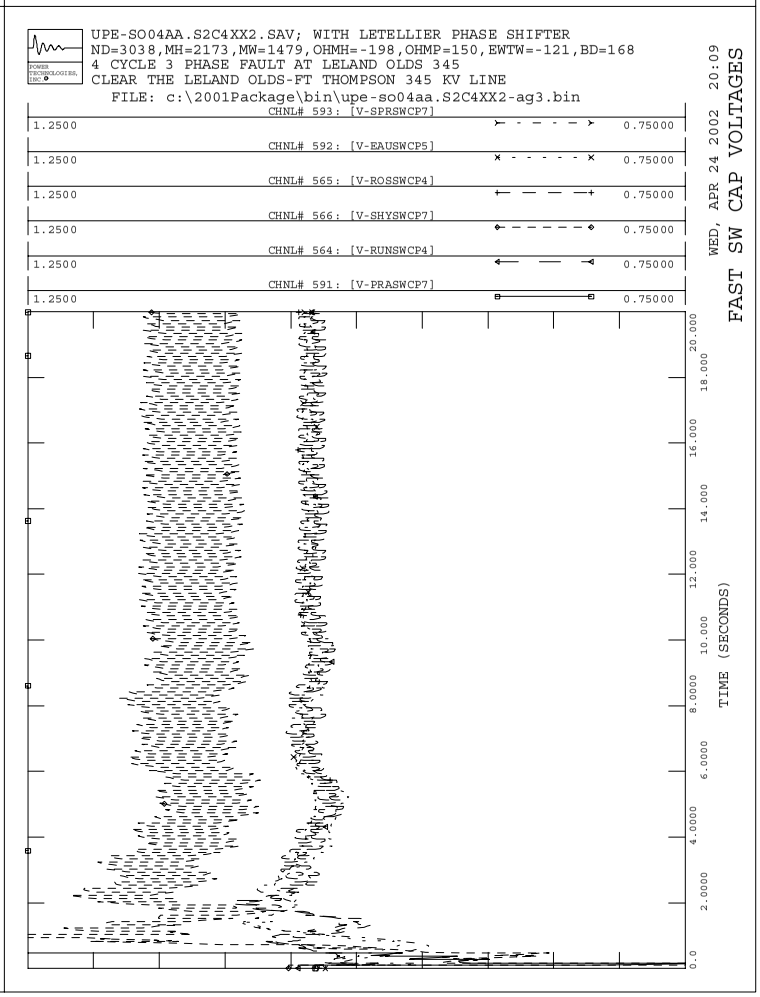
WED, APR 24 2002 20:09
VOLTAGES NB




UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
WED, APR 24 2002 20:09
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
WED, APR 24 2002 20:09
FARGO/WATERTOWN SVS
TIME (SECONDS)

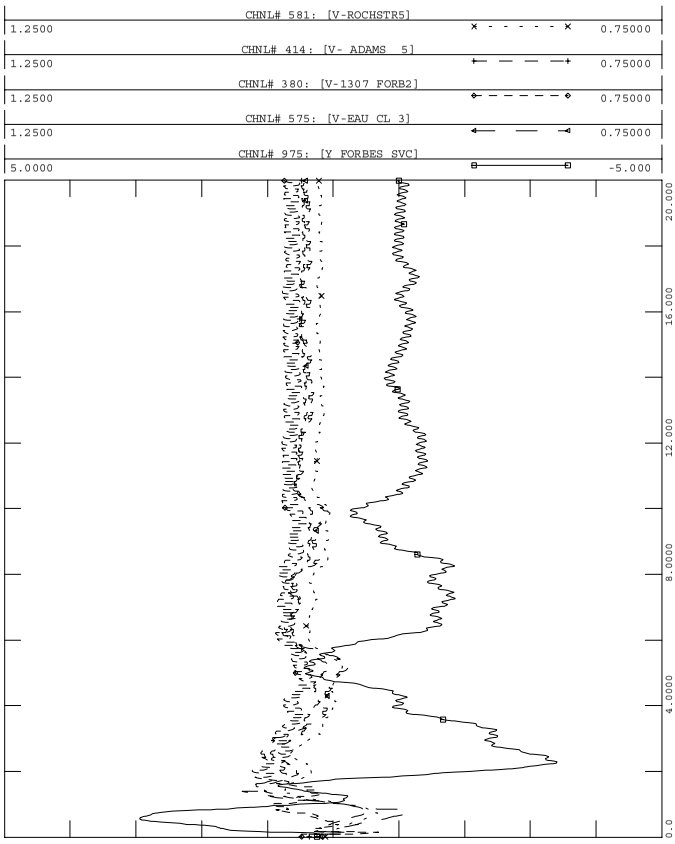

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
WED, APR 24 2002 20:09
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
WED, APR 24 2002 20:09
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09

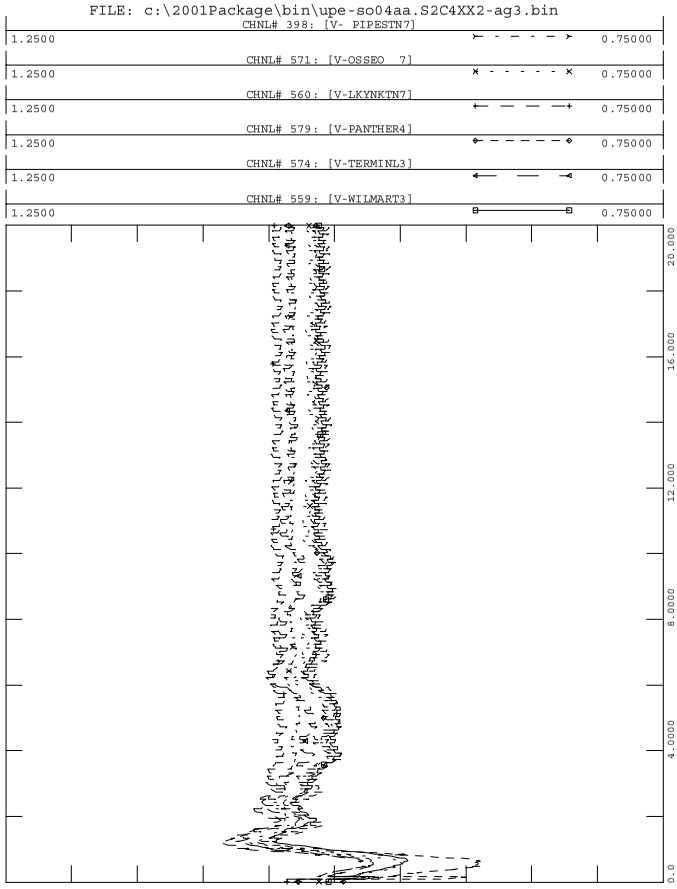
SVC & WISCONSIN VOLT



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09

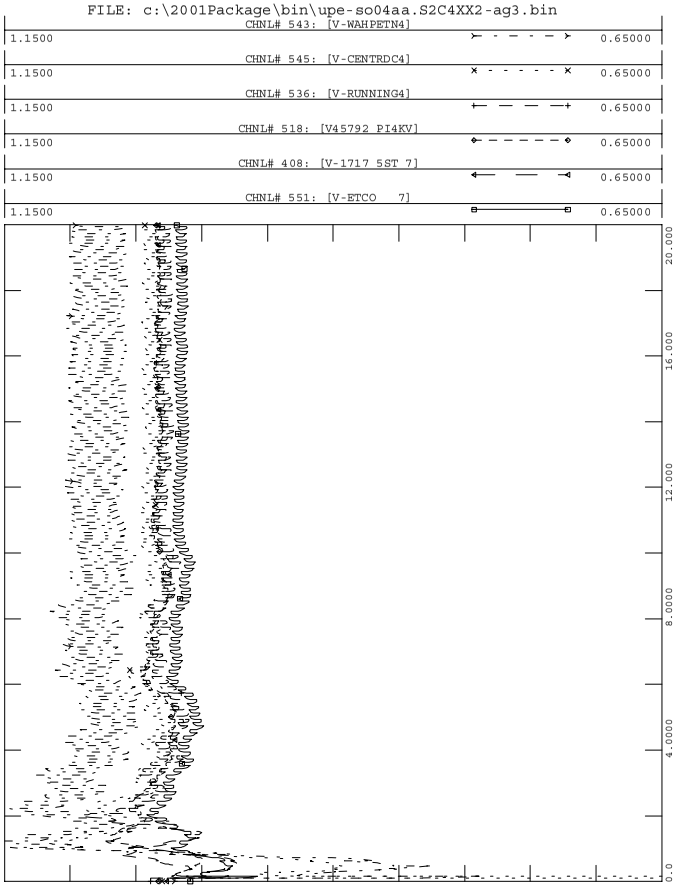
TC VOLTAGES



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09

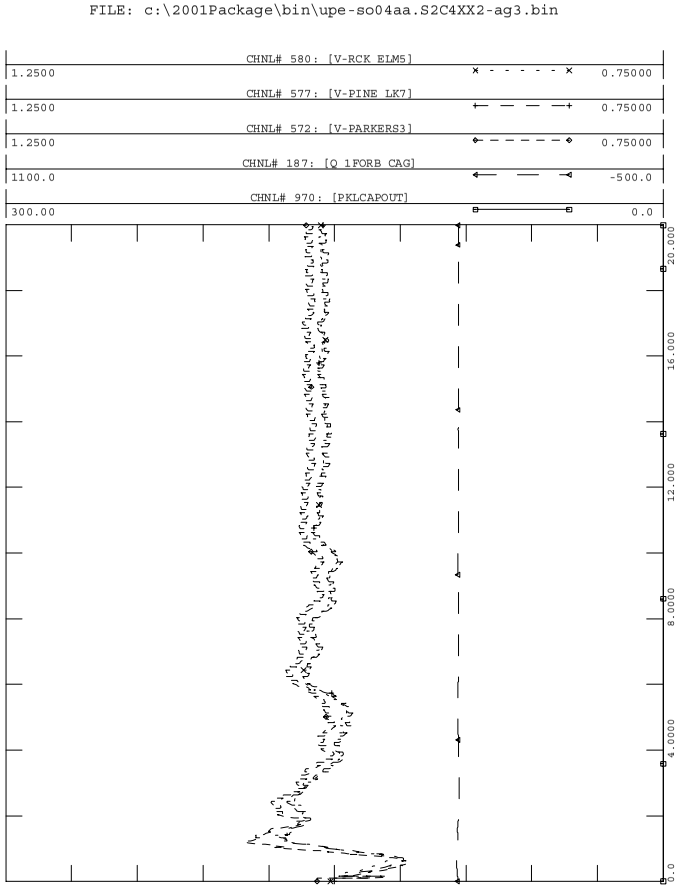
VOLTAGES 6



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

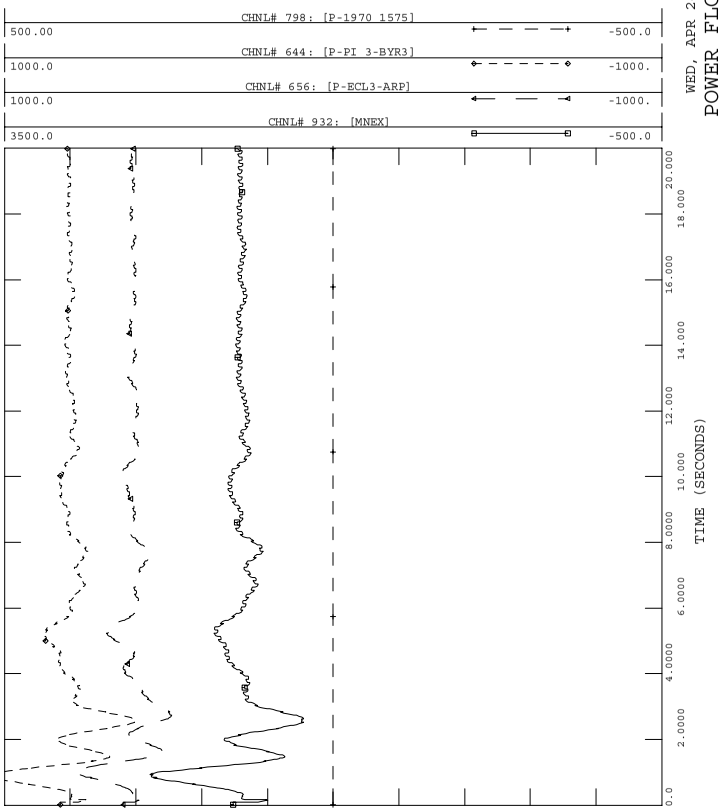
WED, APR 24 2002 20:09

FORBES SVS OUT & VOLTAGES



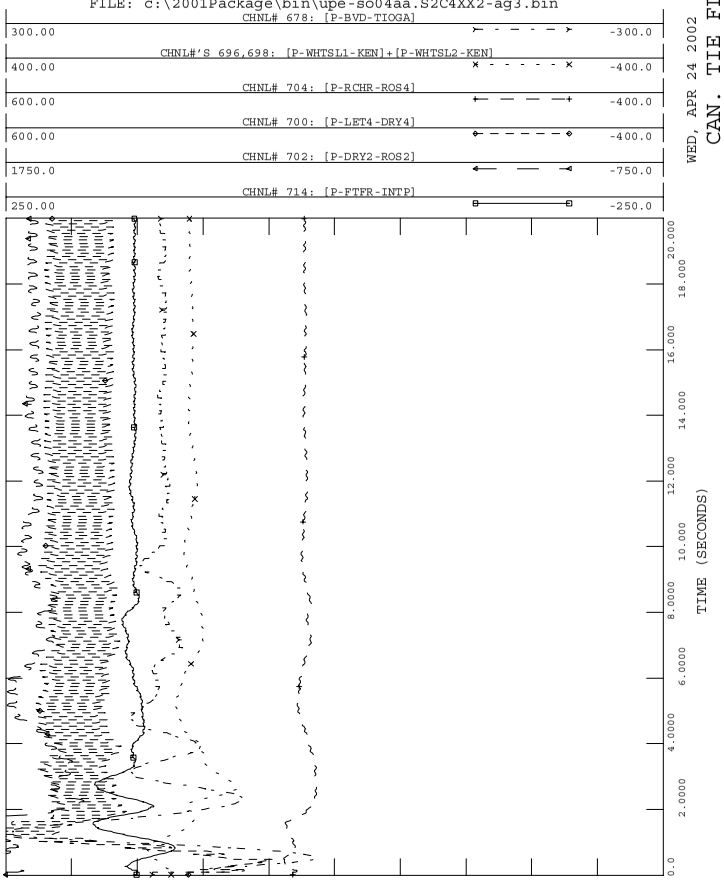
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09
POWER FLOW SUMS 2



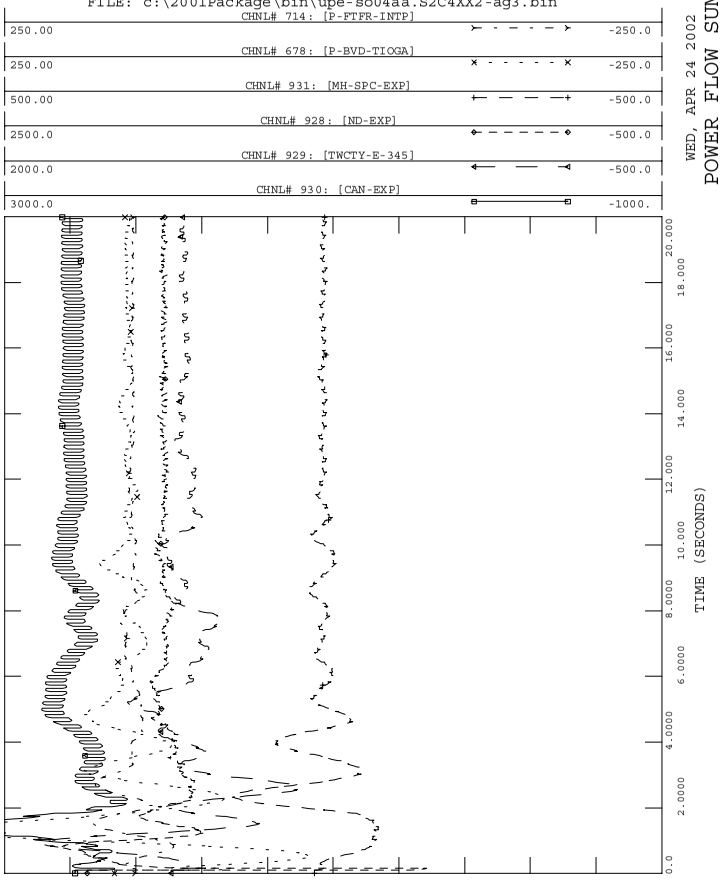
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09
CAN. TIE FLOWS



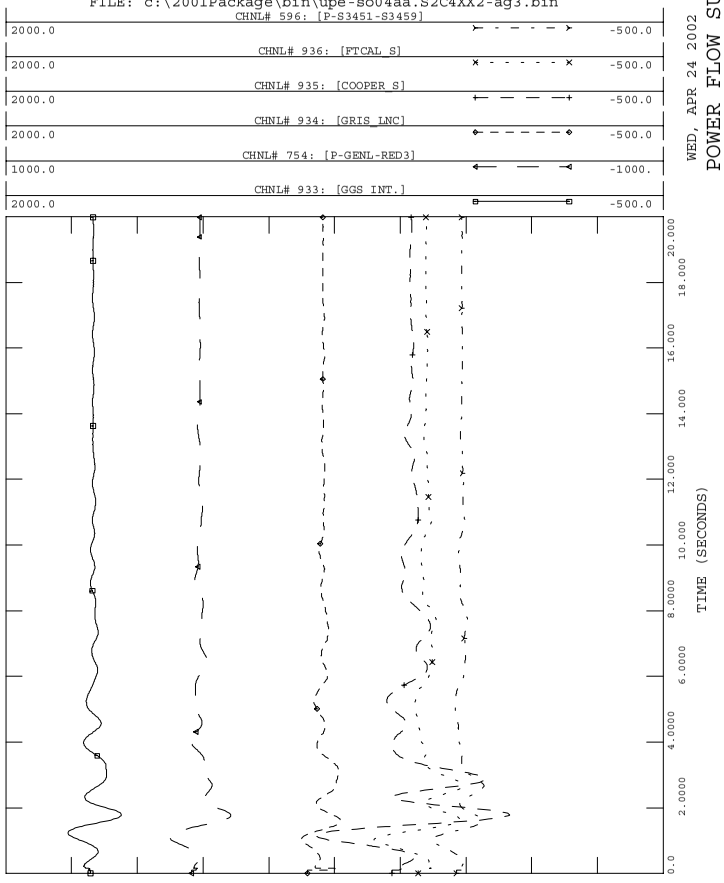
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

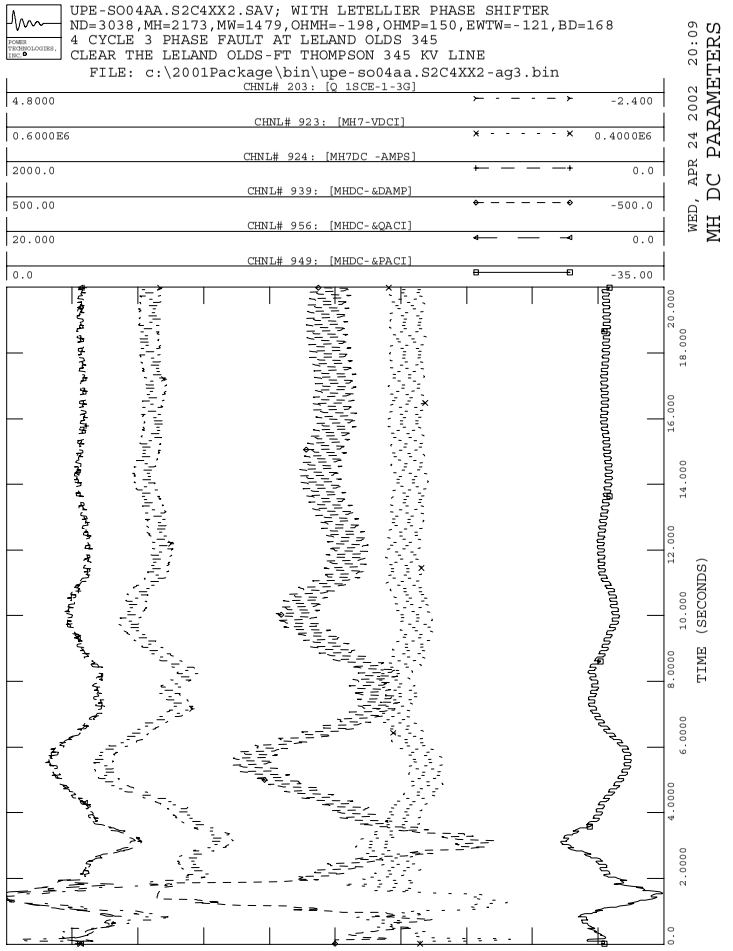
WED, APR 24 2002 20:09
POWER FLOW SUMS 1

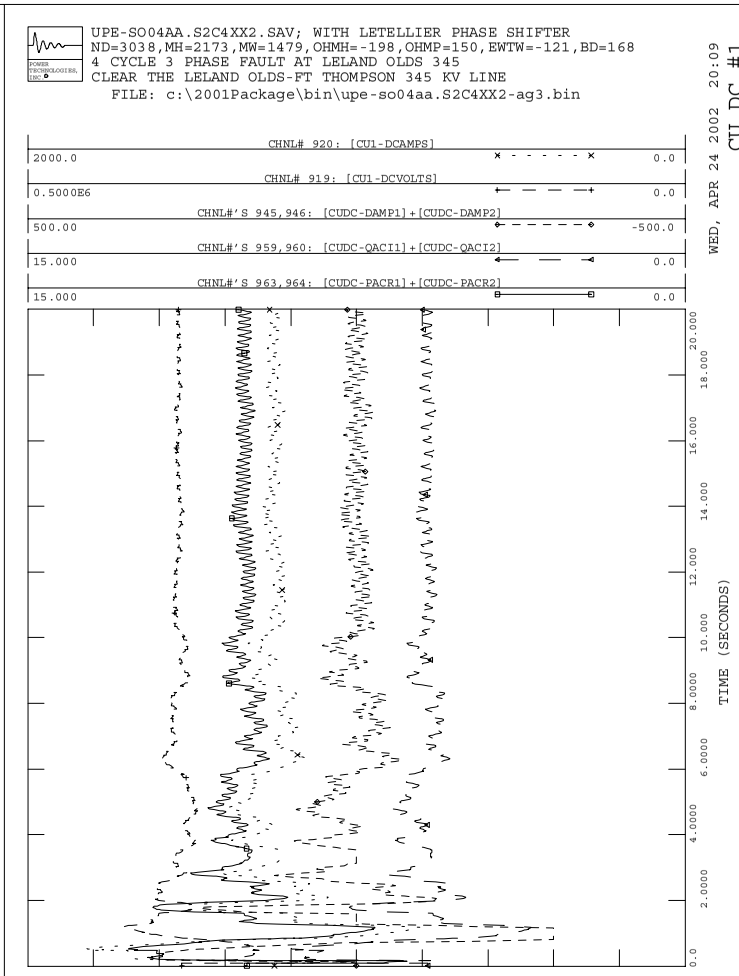


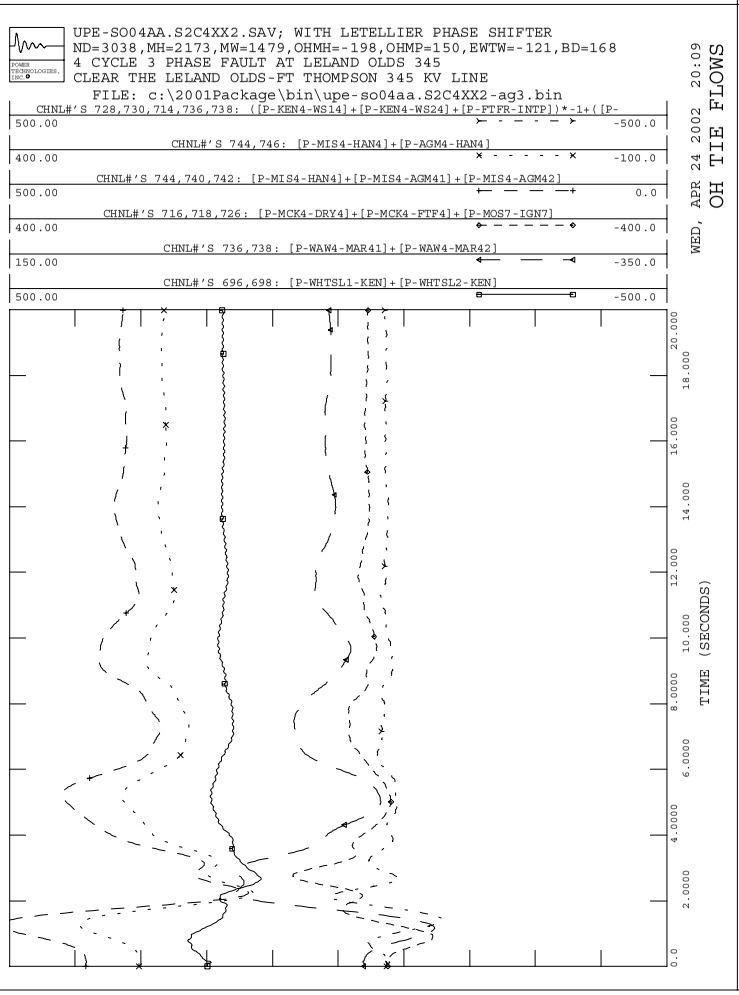
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

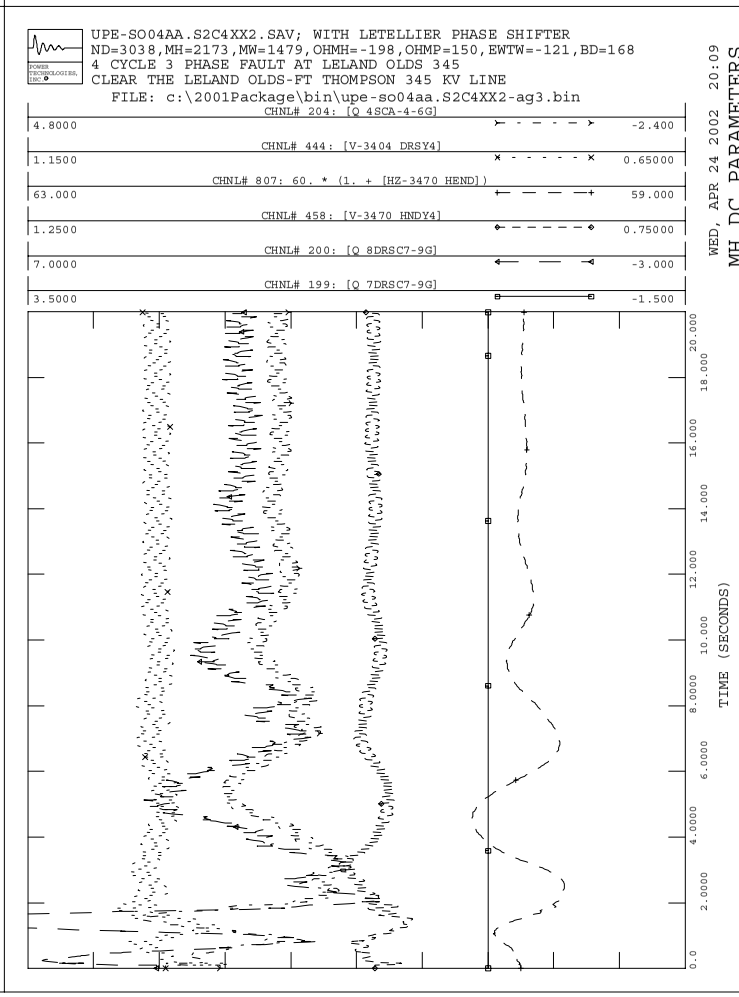
WED, APR 24 2002 20:09
POWER FLOW SUM 3

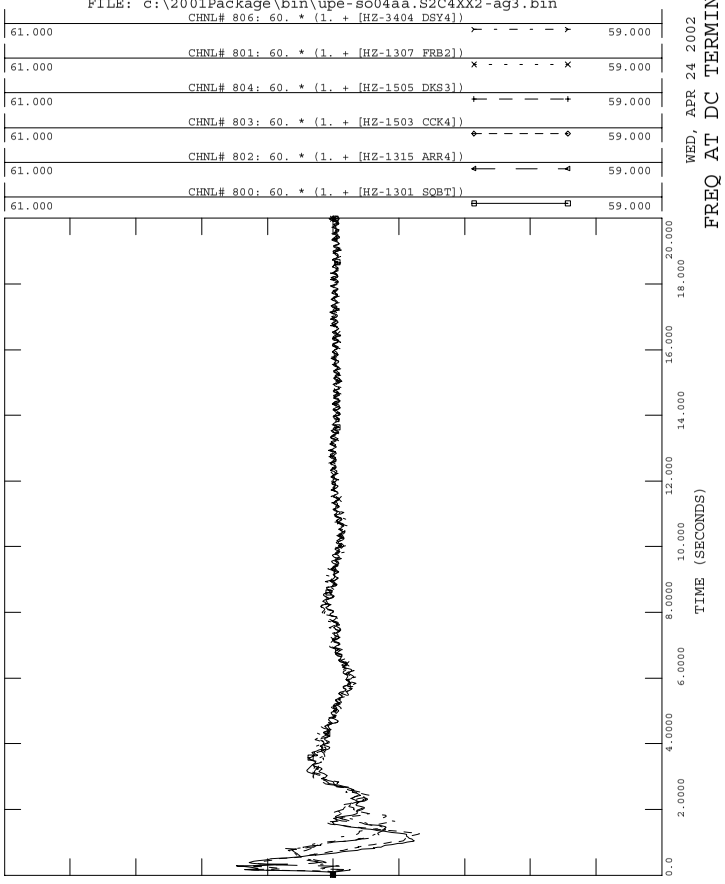


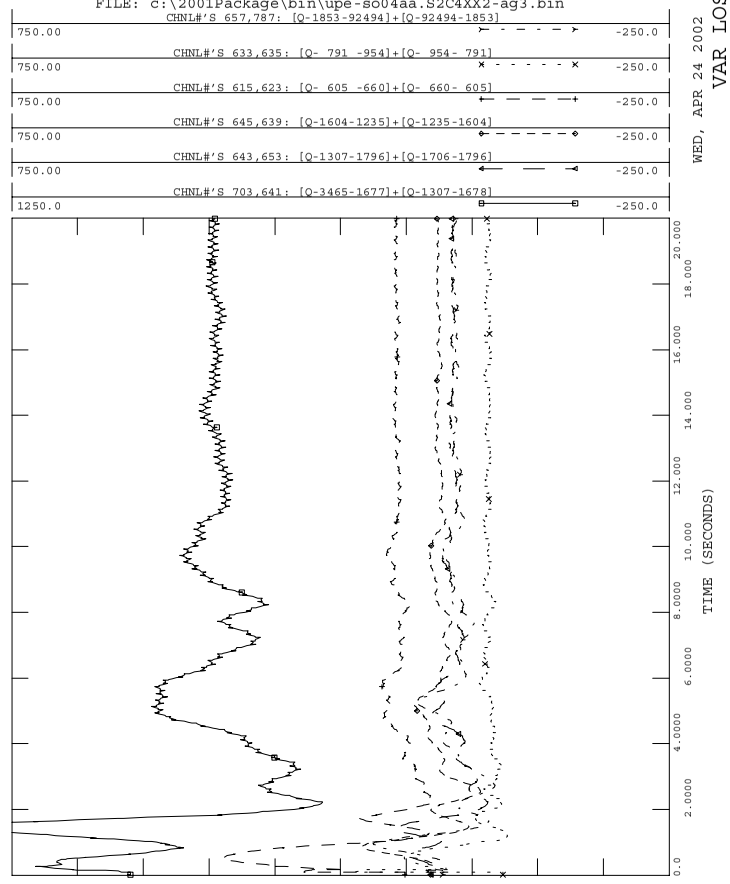

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
WED, APR 24 2002 20:09
MH DC PARAMETERS
TIME (SECONDS)

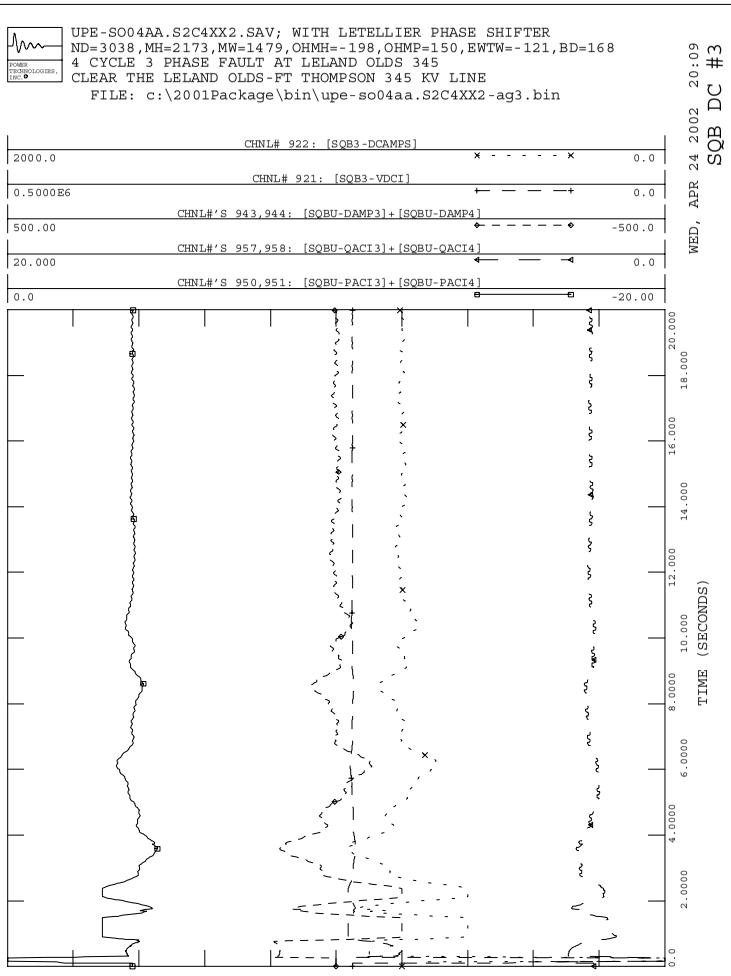

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
WED, APR 24 2002 20:09
CU DC #1
TIME (SECONDS)

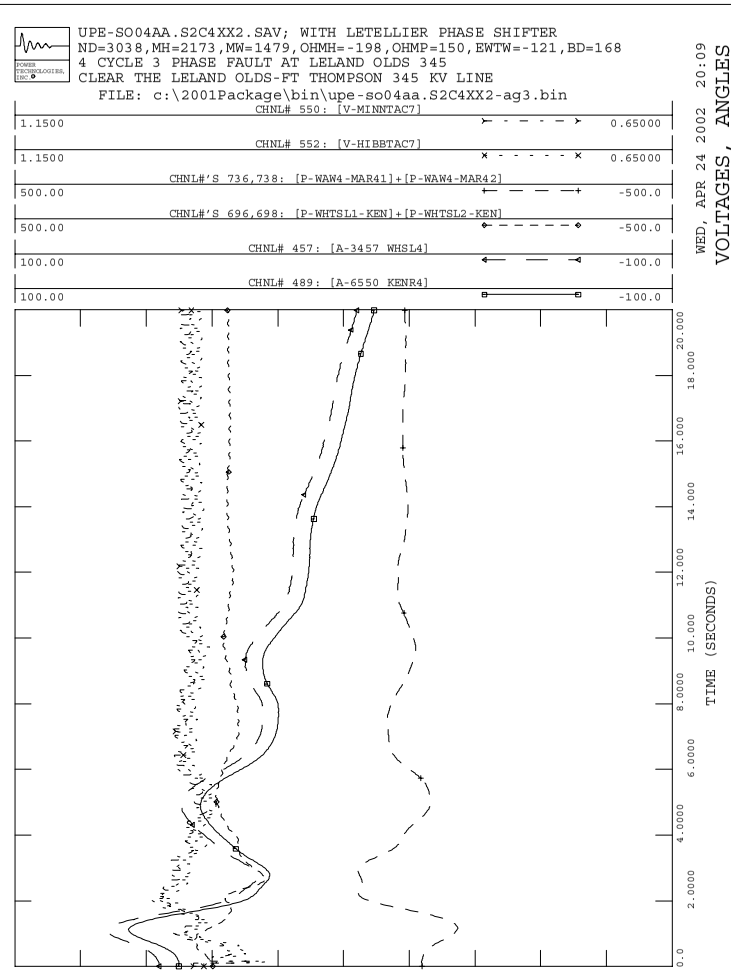

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
WED, APR 24 2002 20:09
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
WED, APR 24 2002 20:09
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
WED, APR 24 2002 20:09
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
WED, APR 24 2002 20:09
VAR LOSSES
TIME (SECONDS)

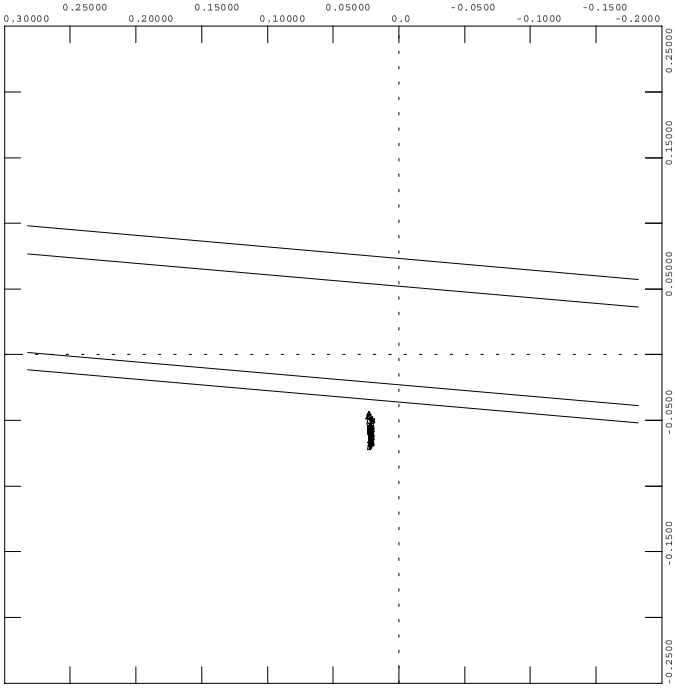

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
WED, APR 24 2002 20:09
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
100.00
-500.0
-100.0
WED, APR 24 2002 20:09
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

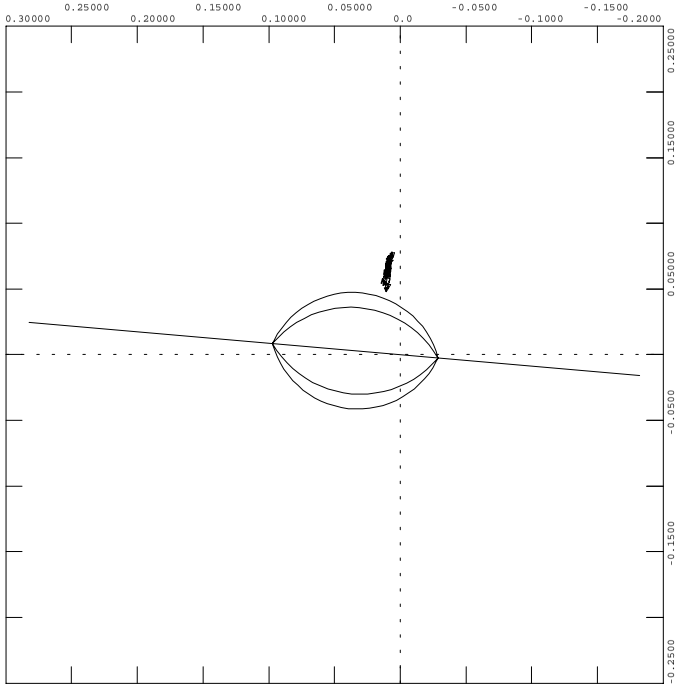


WED, APR 24 2002 20:09
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

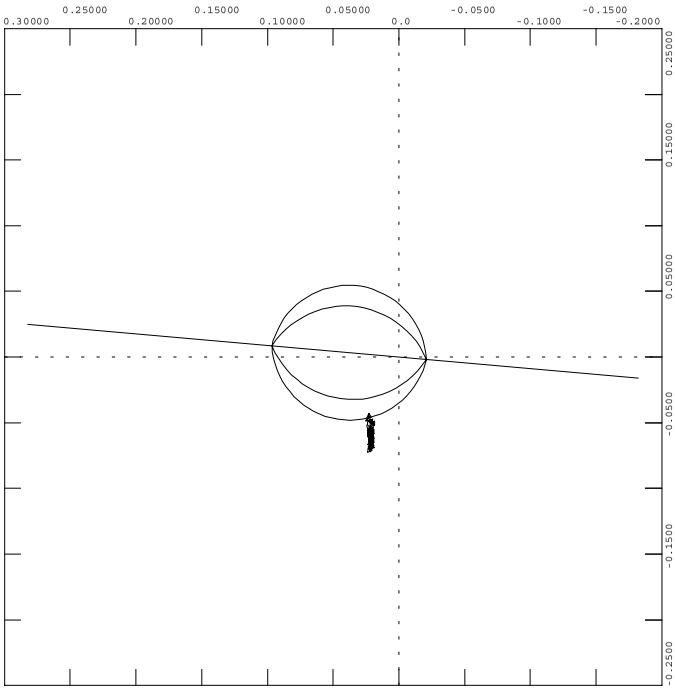


WED, APR 24 2002 20:09
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

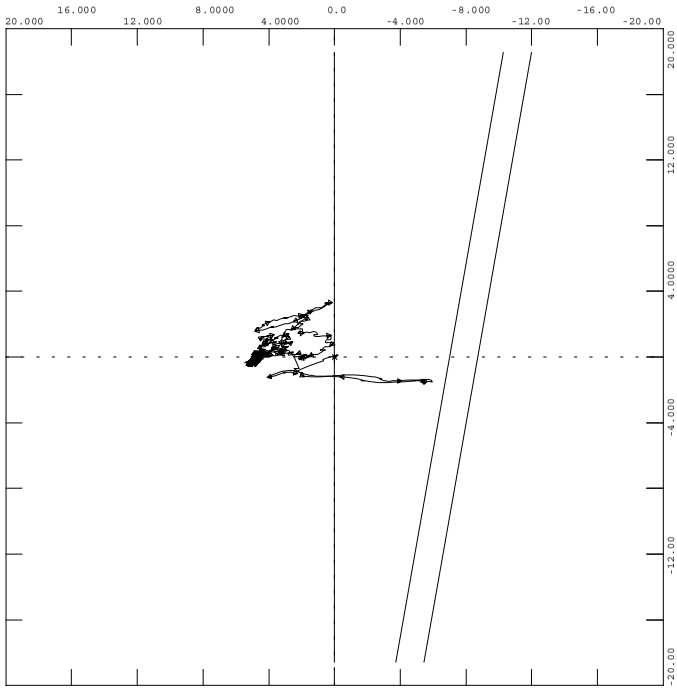


WED, APR 24 2002 20:09
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

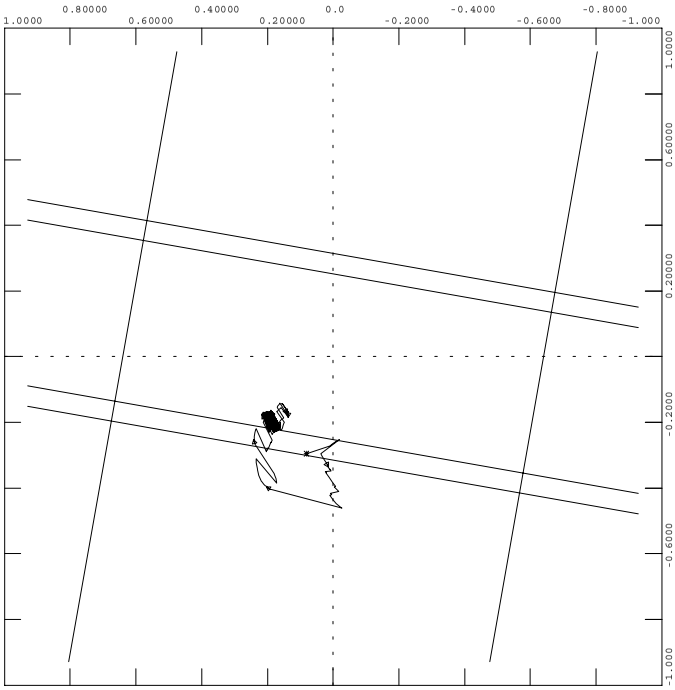


WED, APR 24 2002 20:09
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

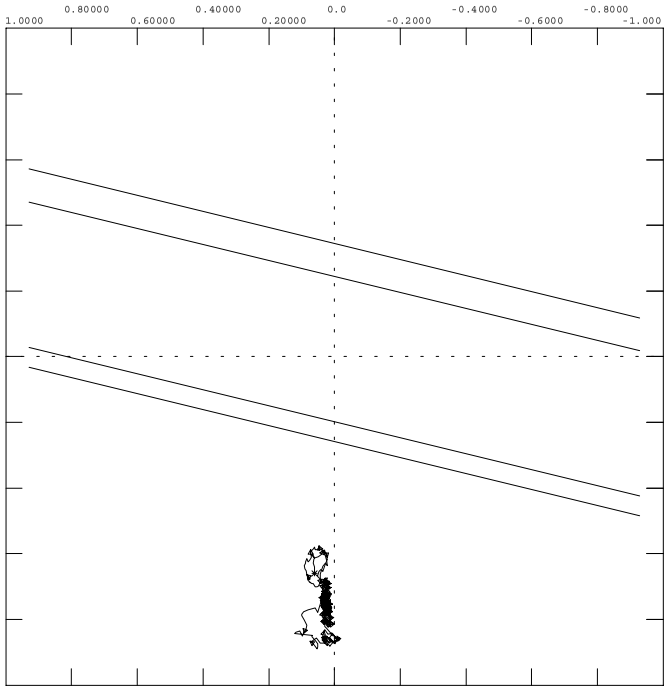
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

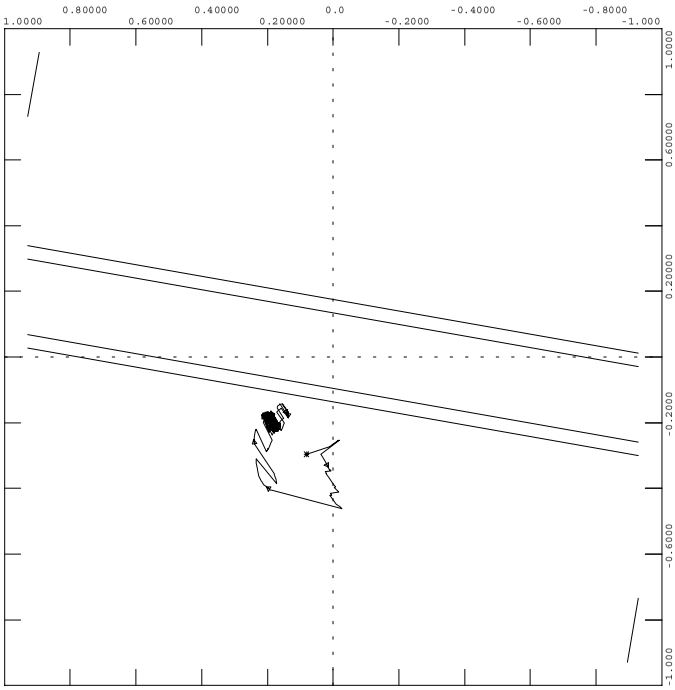
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

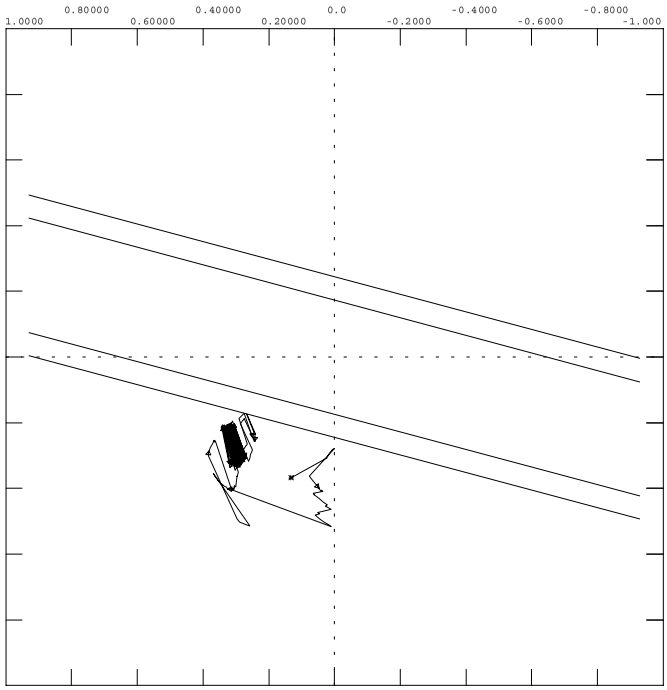
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

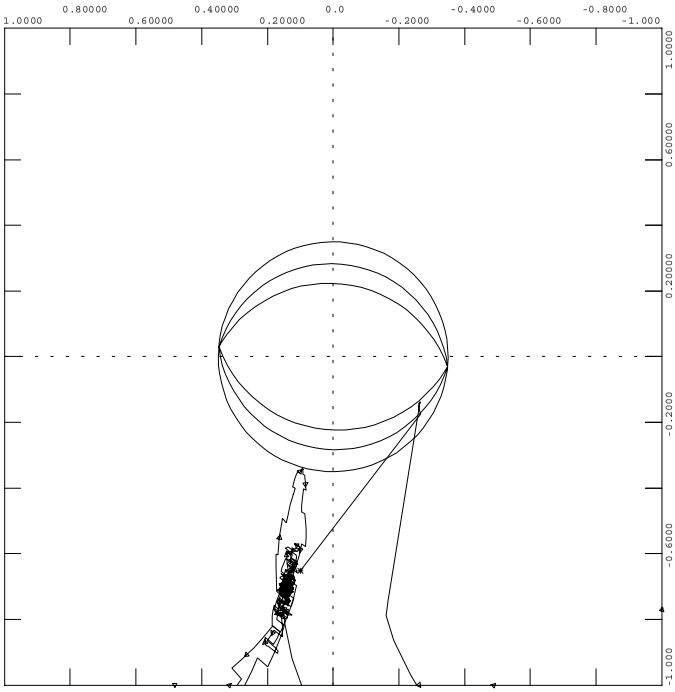
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

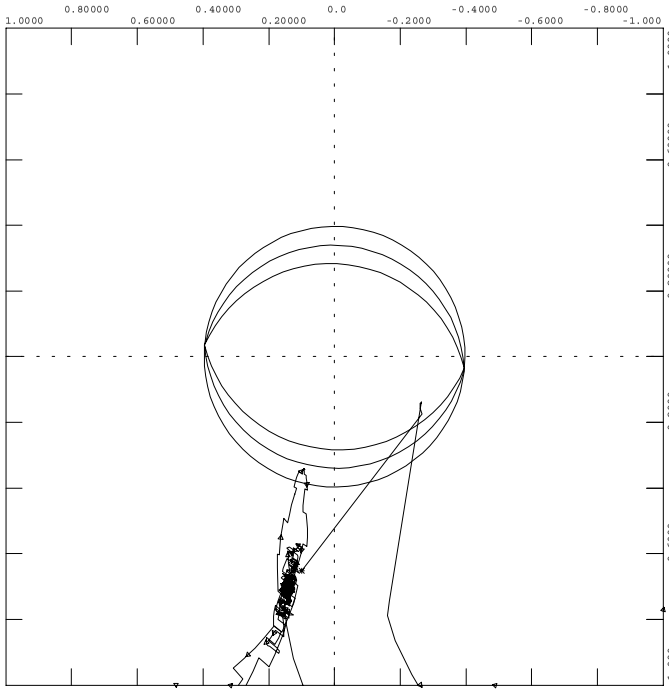
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

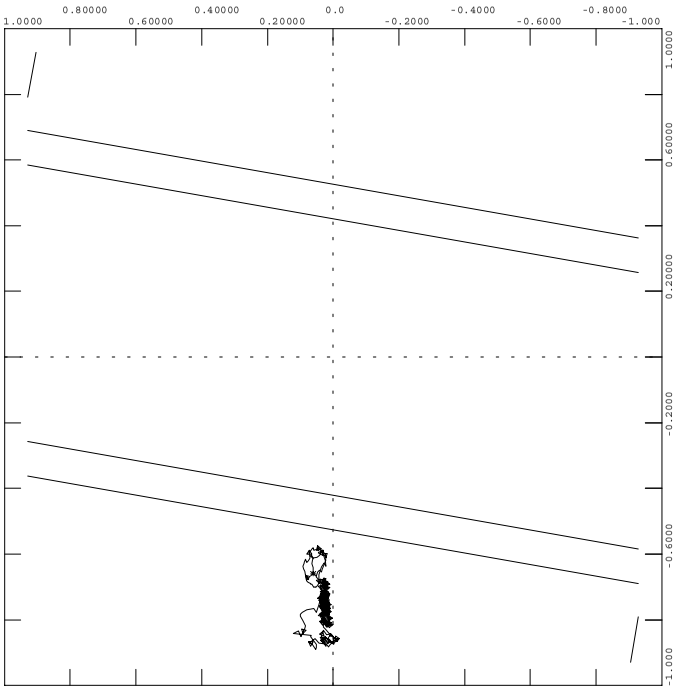
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

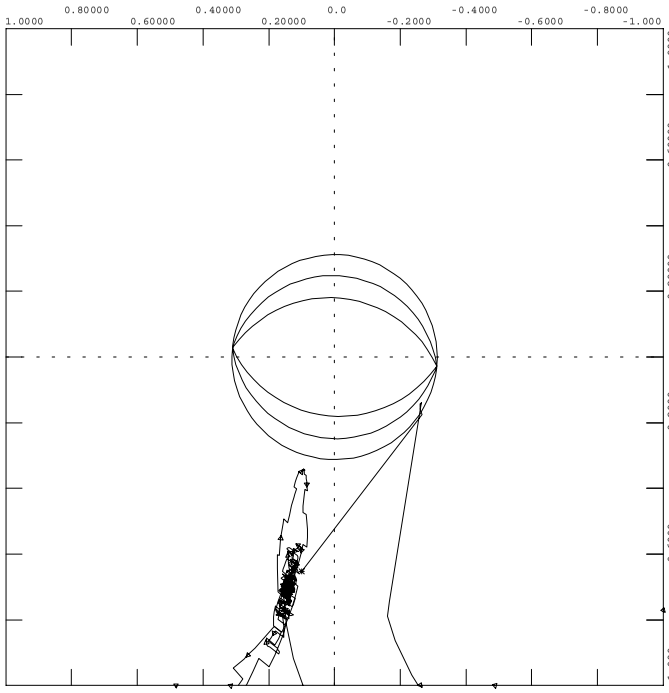
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



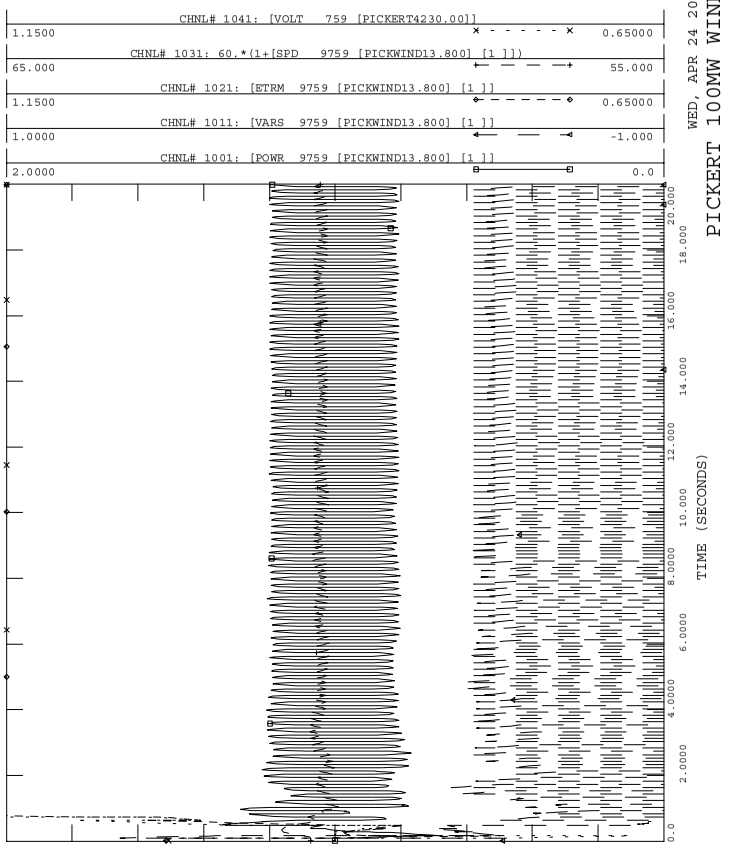
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

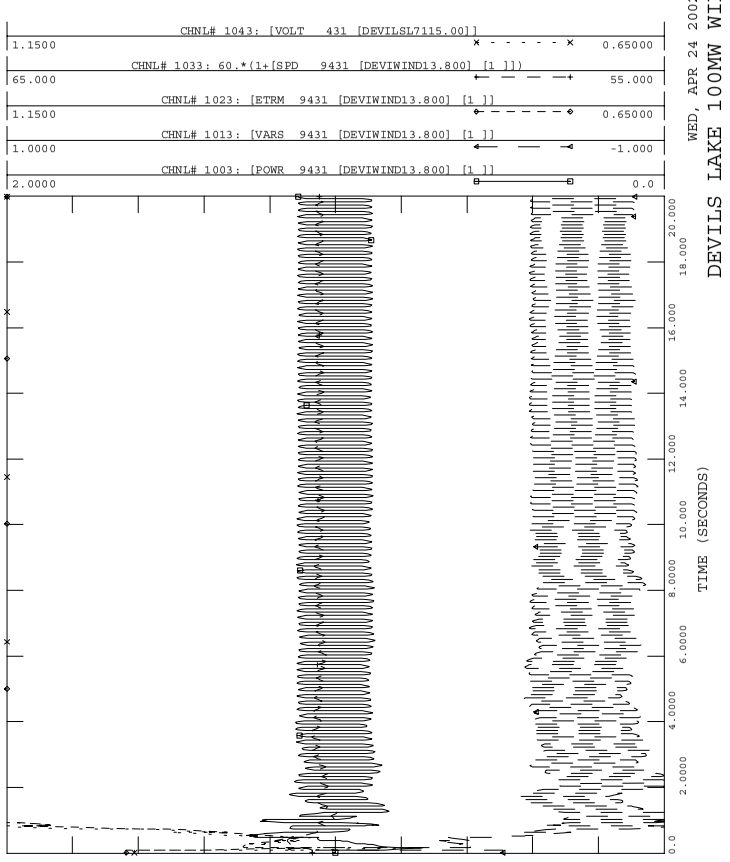
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin



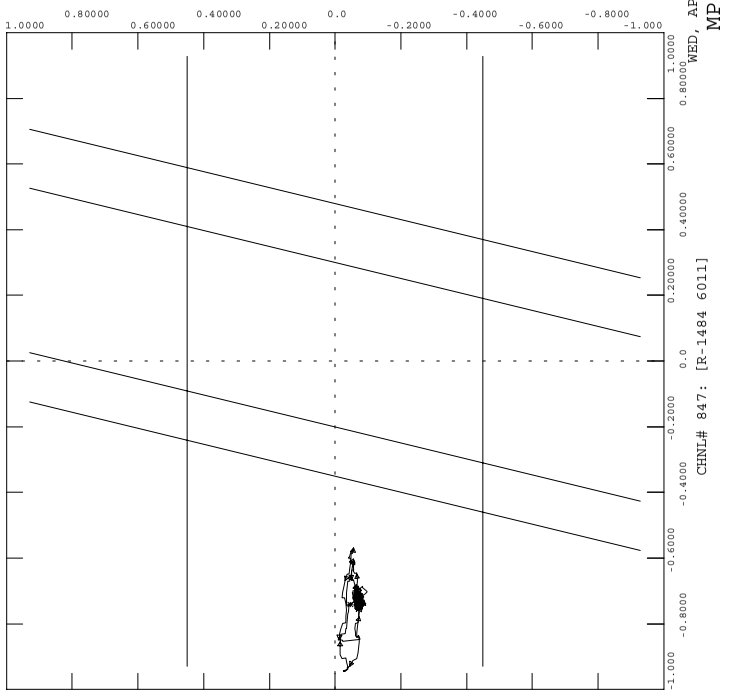
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin



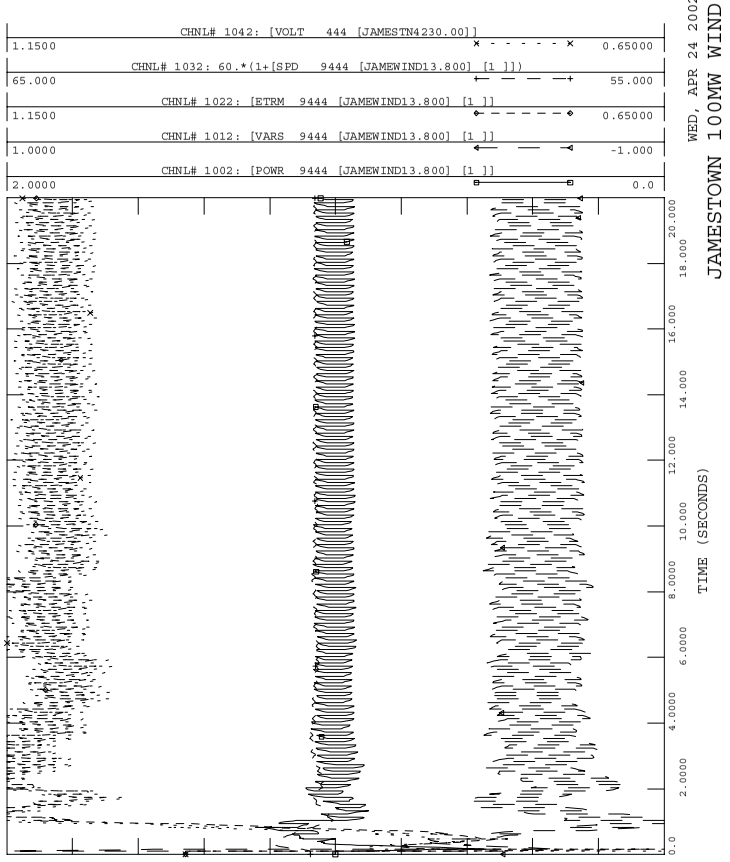
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

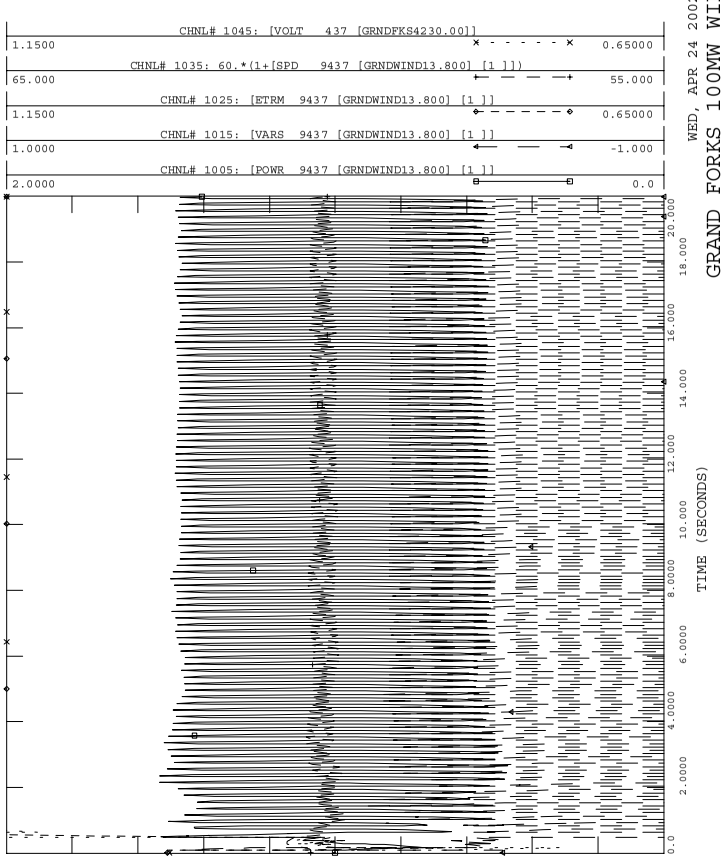
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

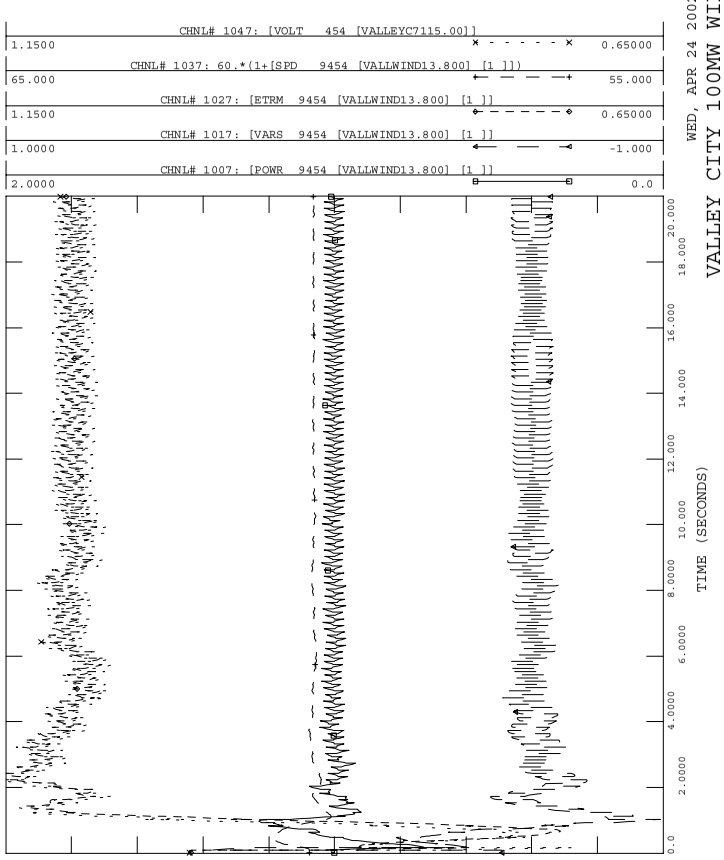


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin



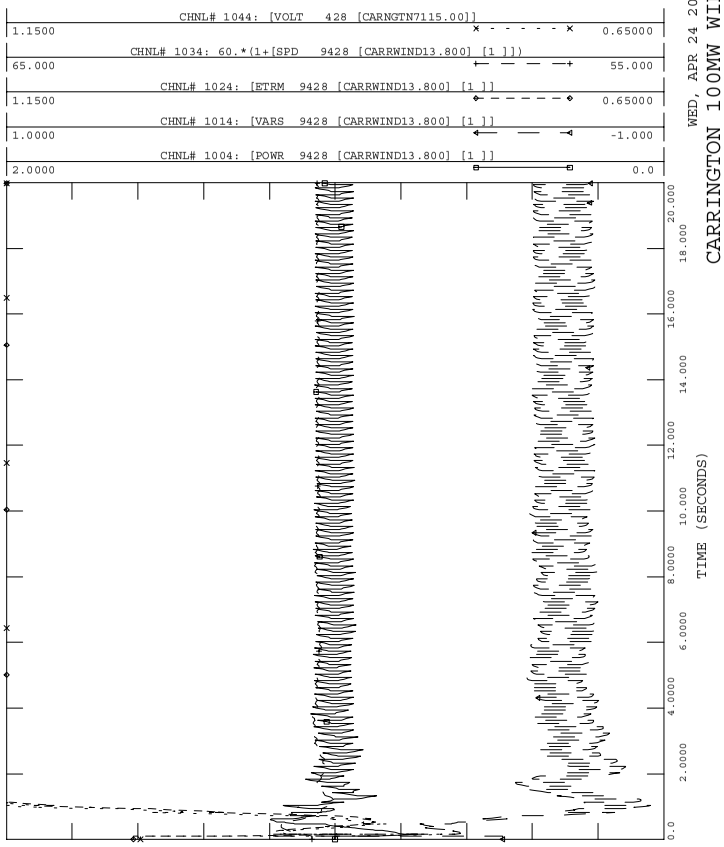
WED, APR 24 2002 20:09
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin



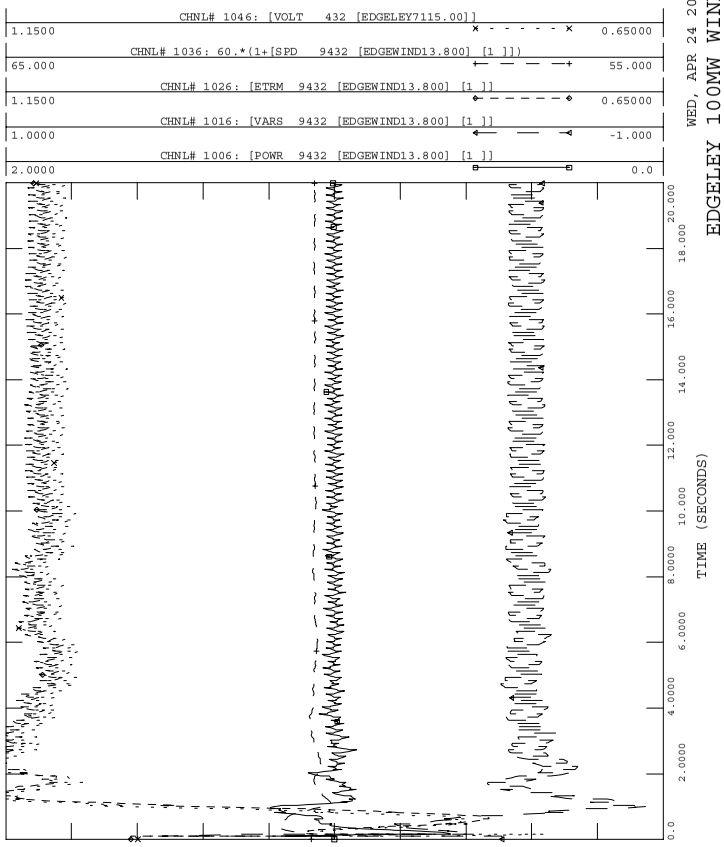
WED, APR 24 2002 20:09
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin



WED, APR 24 2002 20:09
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

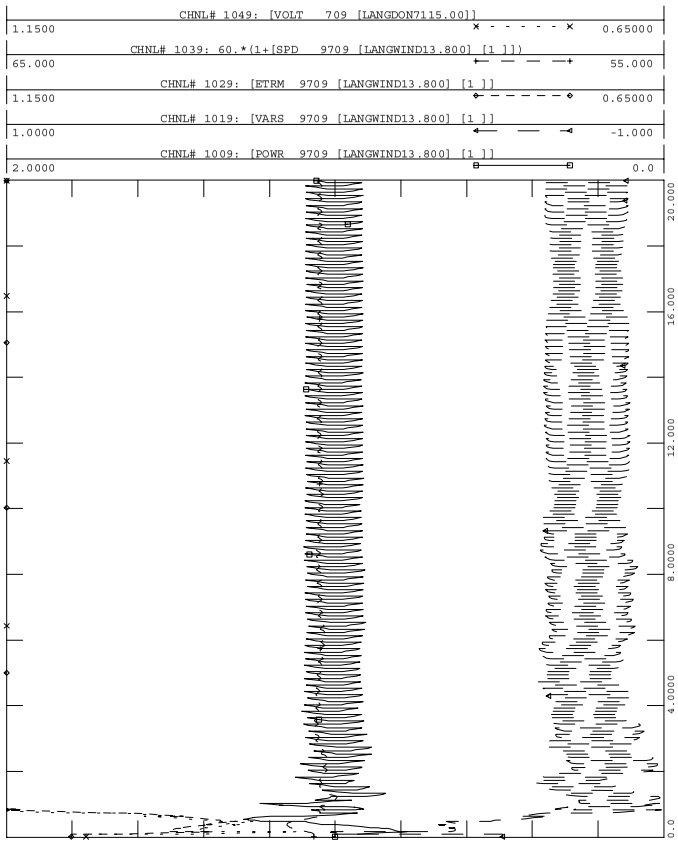


WED, APR 24 2002 20:09
EDGELEY 100MW WIND UNIT

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09

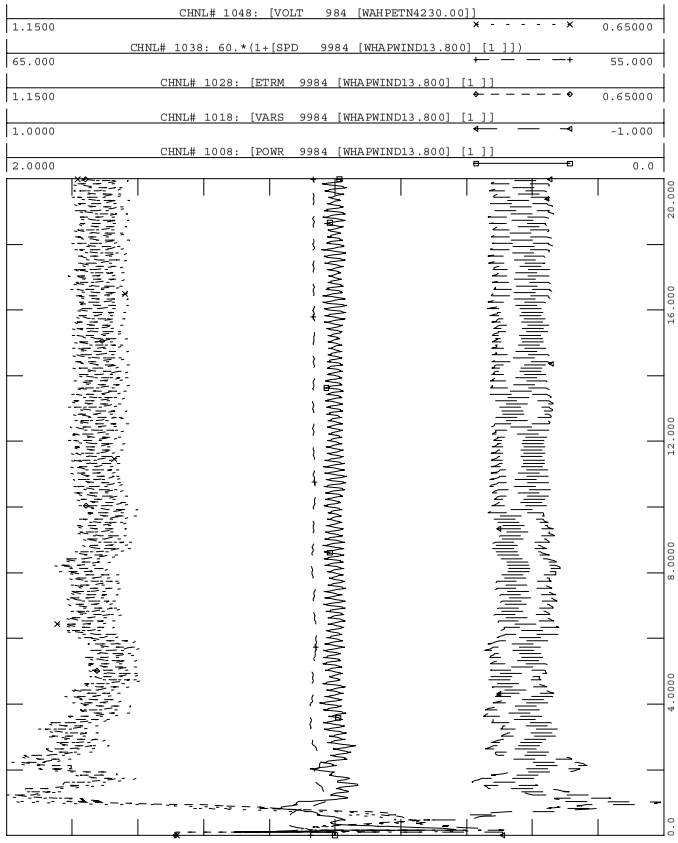
LANGDON 100MW WIND UNIT



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09

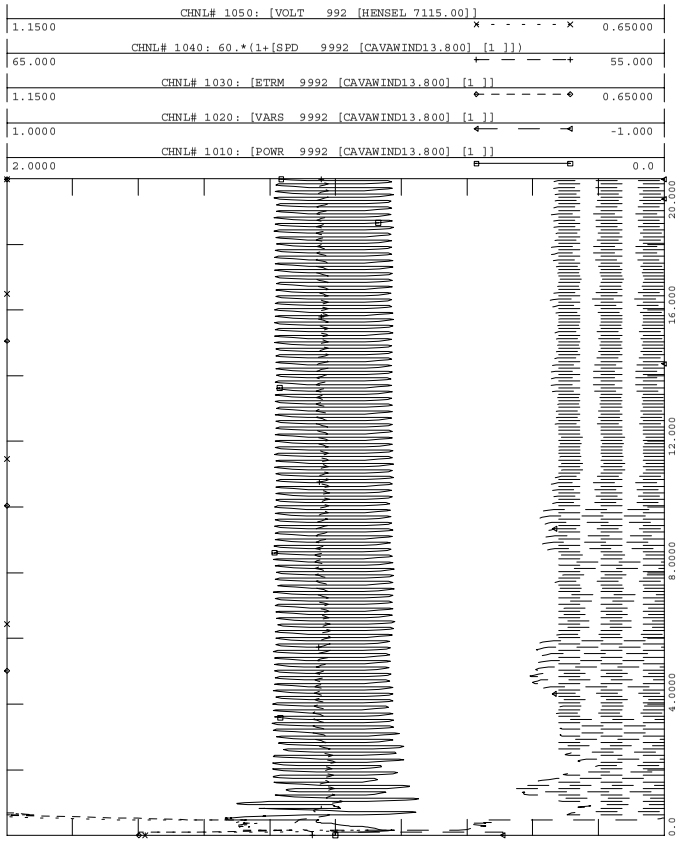
WAHPETON 100MW WIND UNIT



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ag3.bin

WED, APR 24 2002 20:09

CAVALIER 100MW WIND UNIT

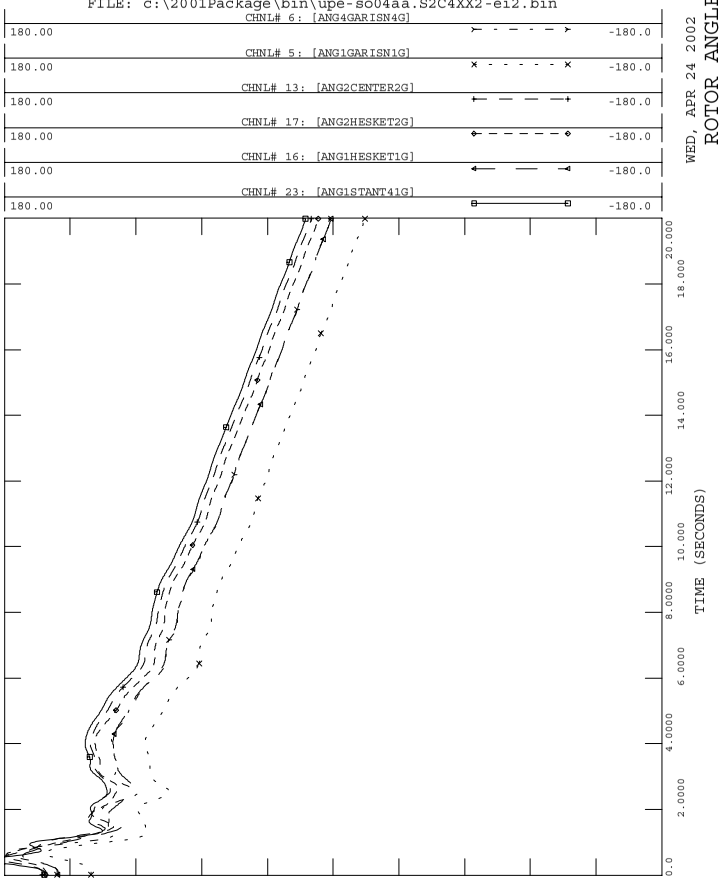


CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

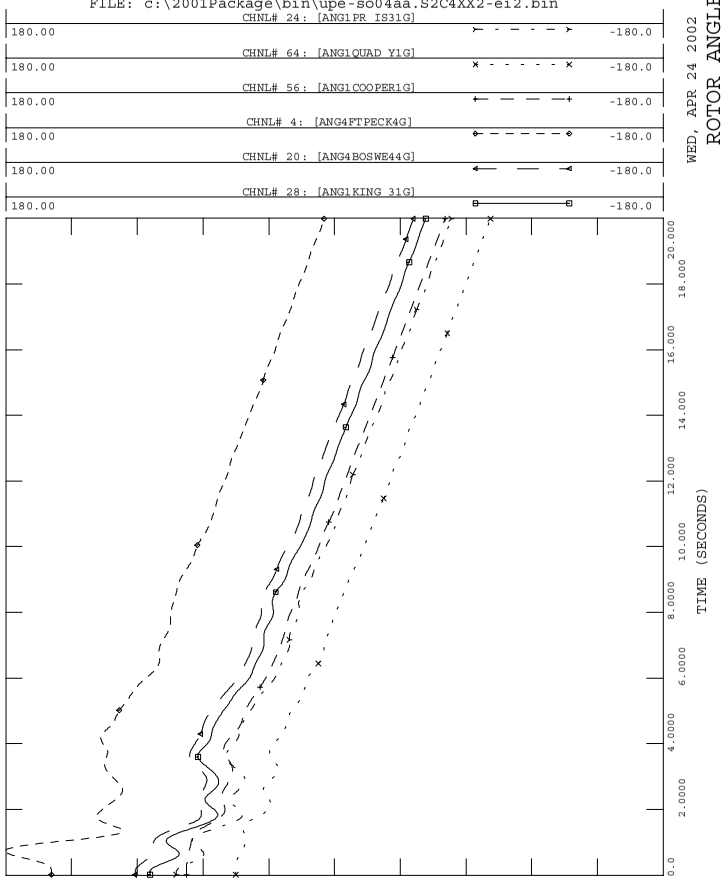
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

WED, APR 24 2002 20:24
ROTOR ANGLES 2



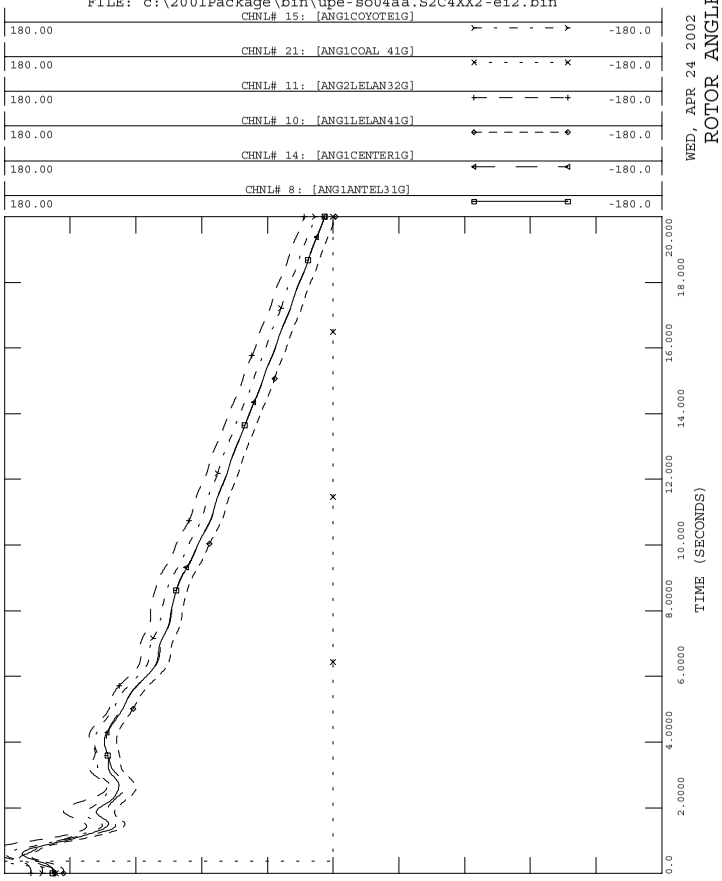
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

WED, APR 24 2002 20:24
ROTOR ANGLES 4



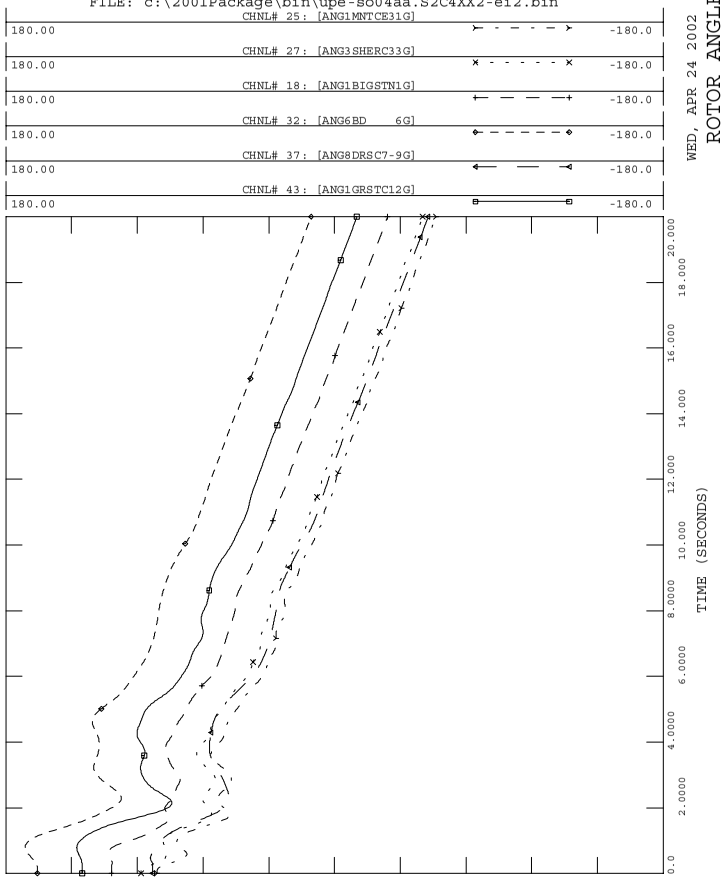
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

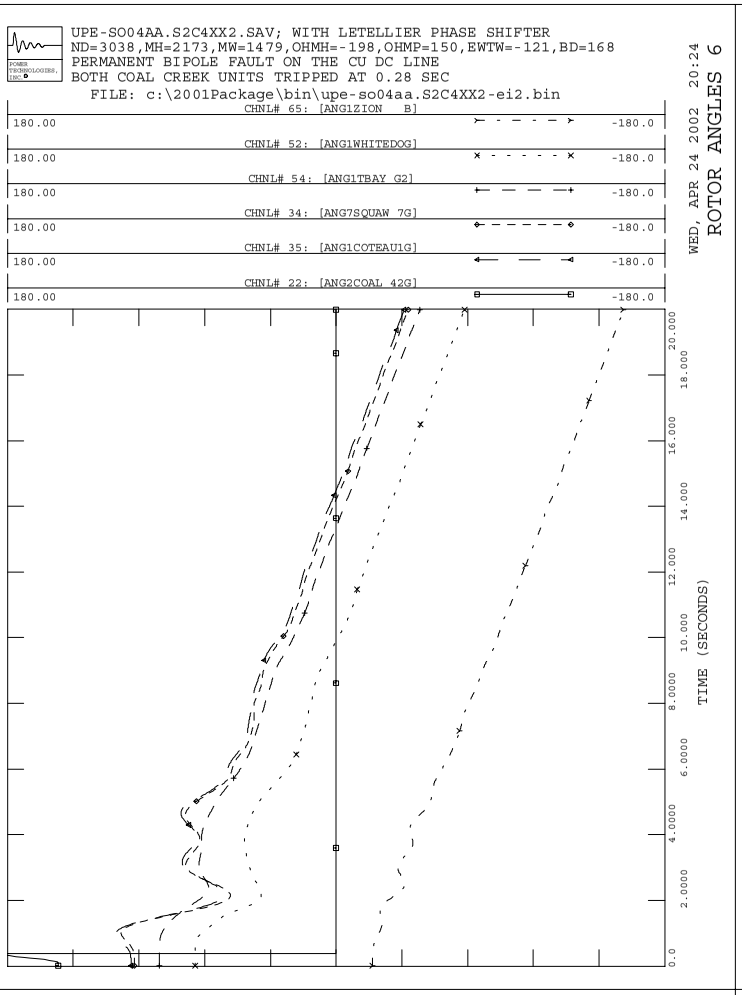
WED, APR 24 2002 20:24
ROTOR ANGLES 1

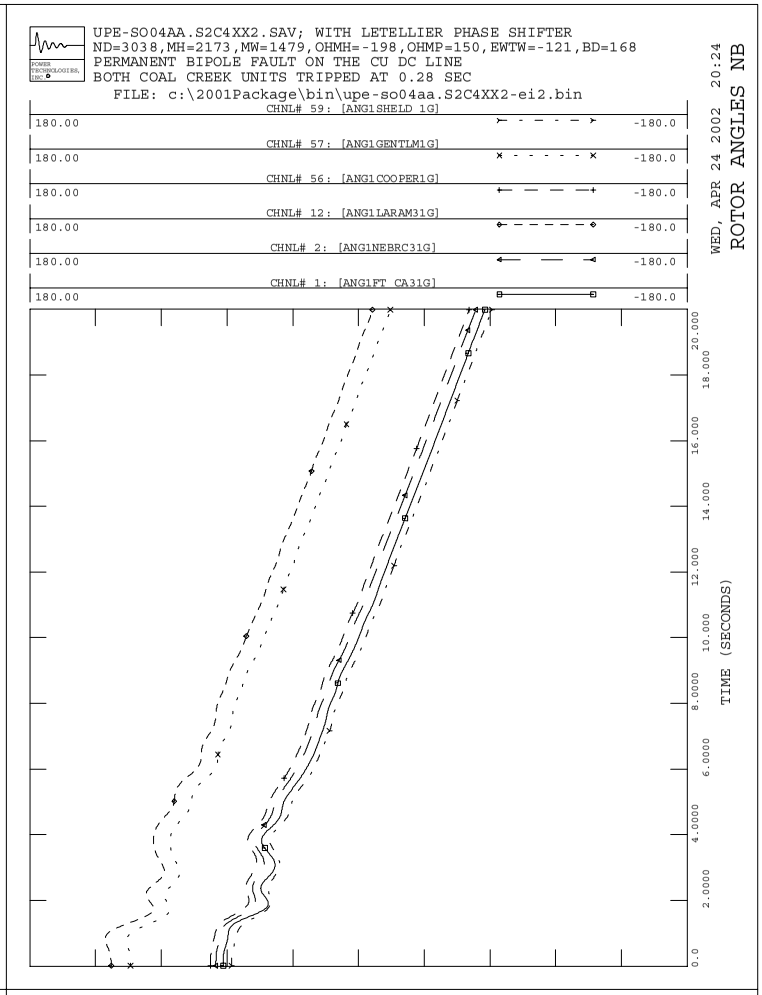


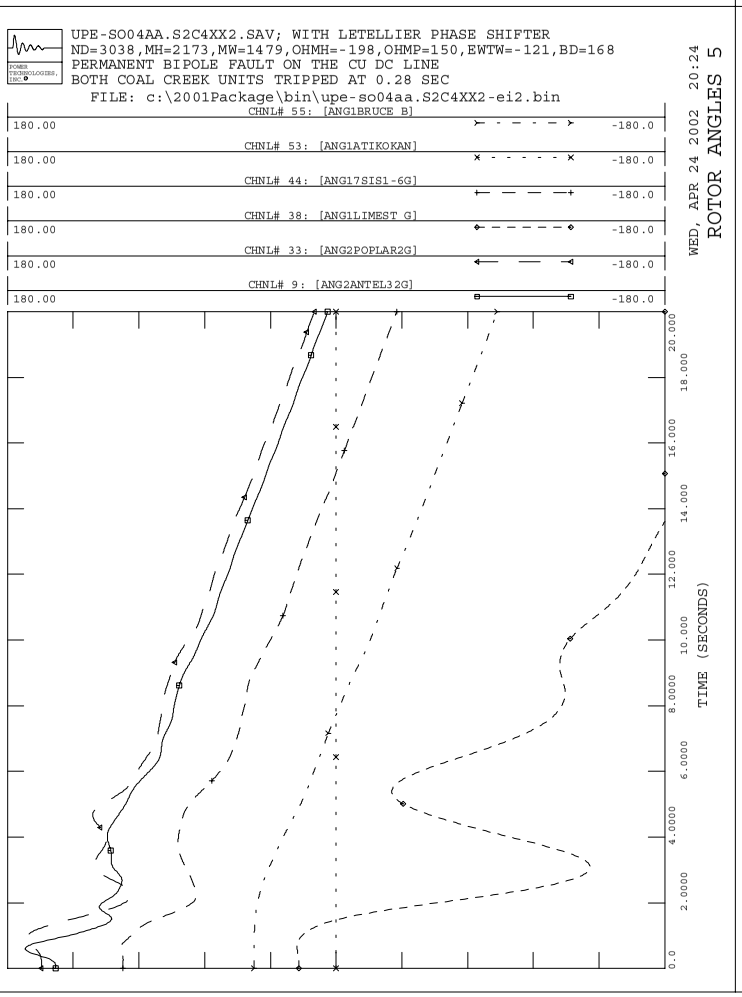
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

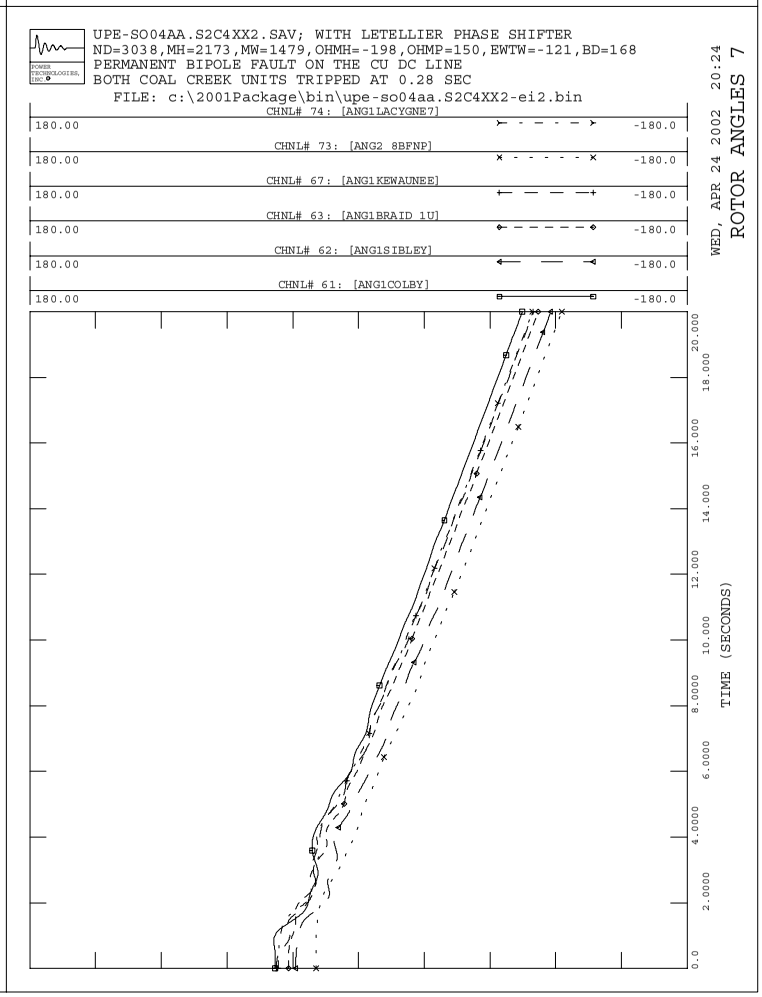
WED, APR 24 2002 20:24
ROTOR ANGLES 3




UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
WED, APR 24 2002 20:24
ROTOR ANGLES 6
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

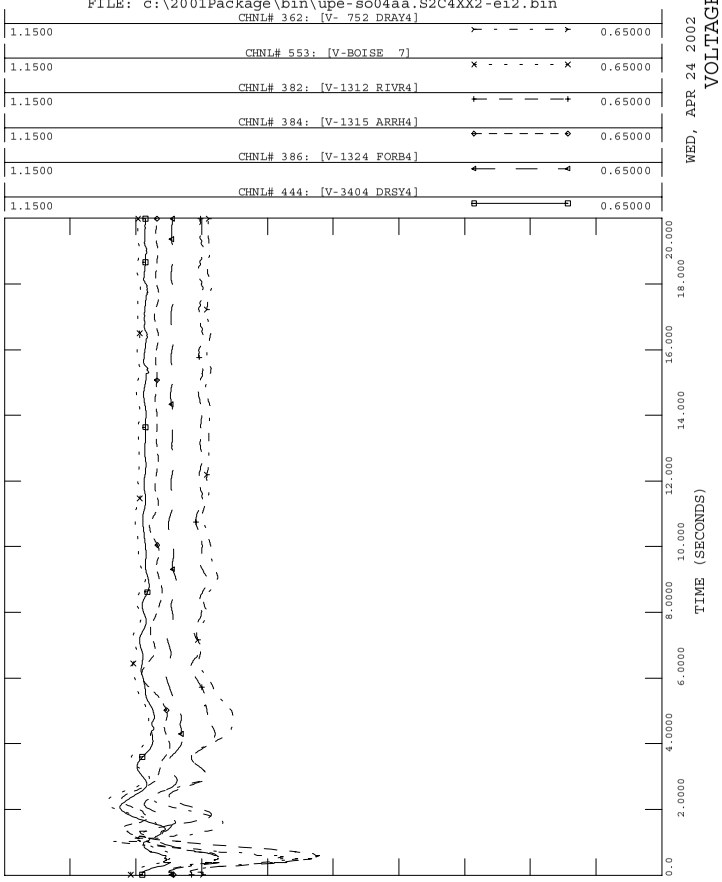

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
WED, APR 24 2002 20:24
ROTOR ANGLES NB
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
WED, APR 24 2002 20:24
ROTOR ANGLES 5
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
WED, APR 24 2002 20:24
ROTOR ANGLES 7
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

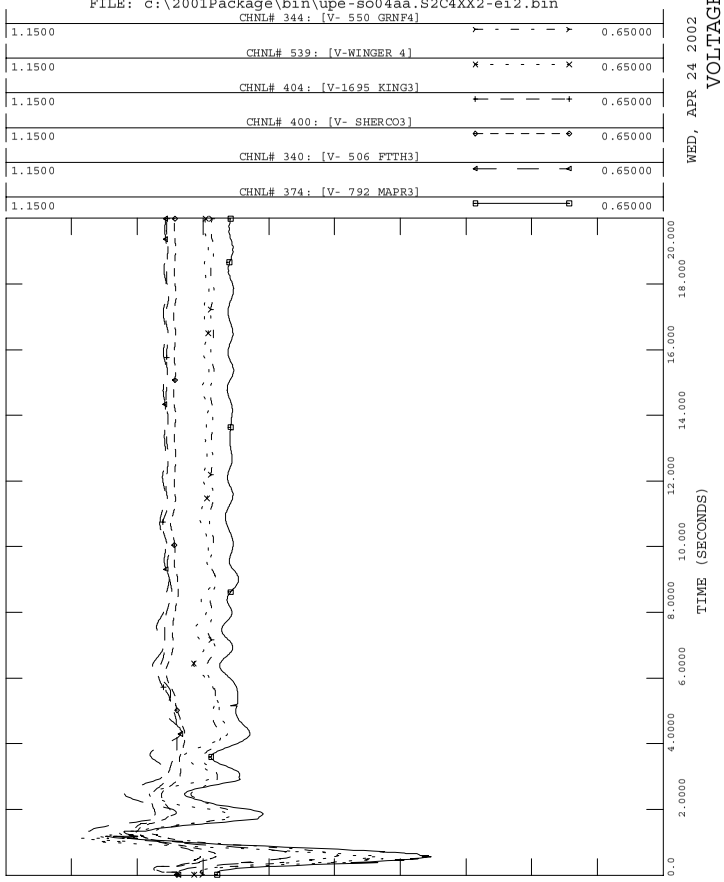
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

WED, APR 24 2002 20:24
VOLTAGES 1



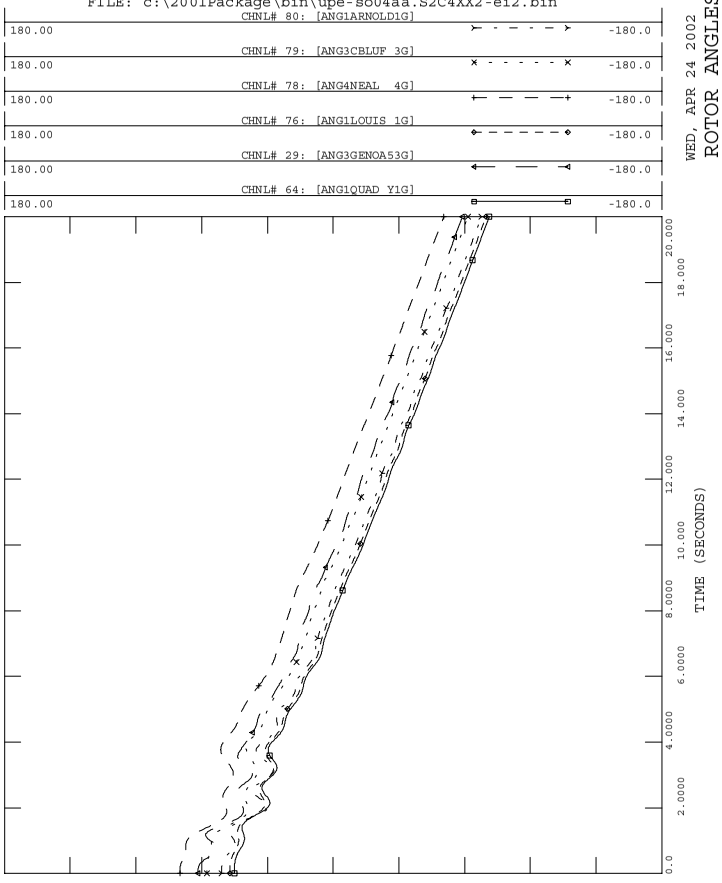
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

WED, APR 24 2002 20:24
VOLTAGES 3



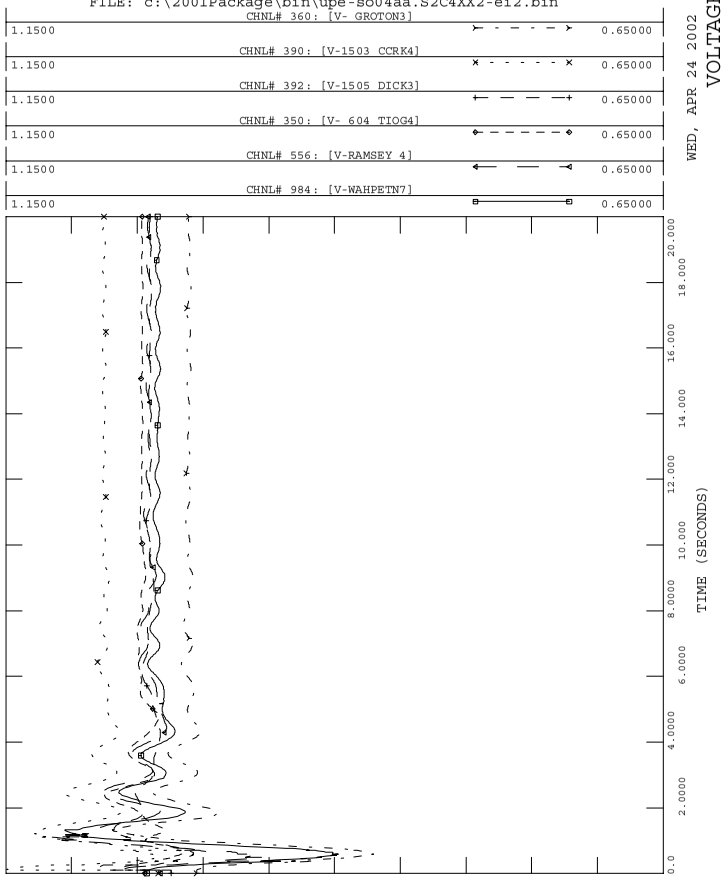
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

WED, APR 24 2002 20:24
ROTOR ANGLES IA



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

WED, APR 24 2002 20:24
VOLTAGES 2



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
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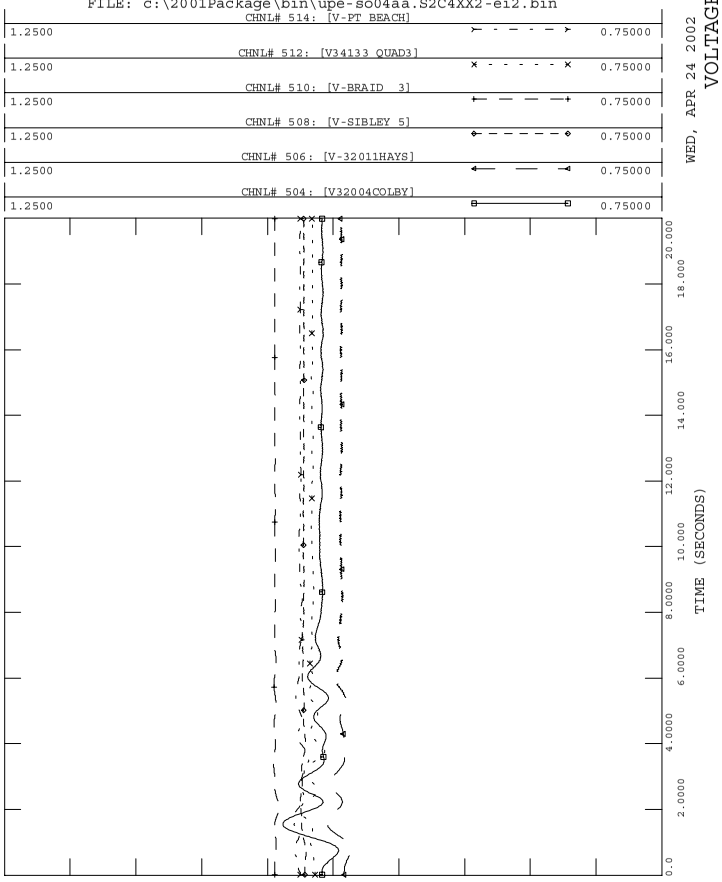
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

WED, APR 24 2002 20:24
VOLTAGES 5



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
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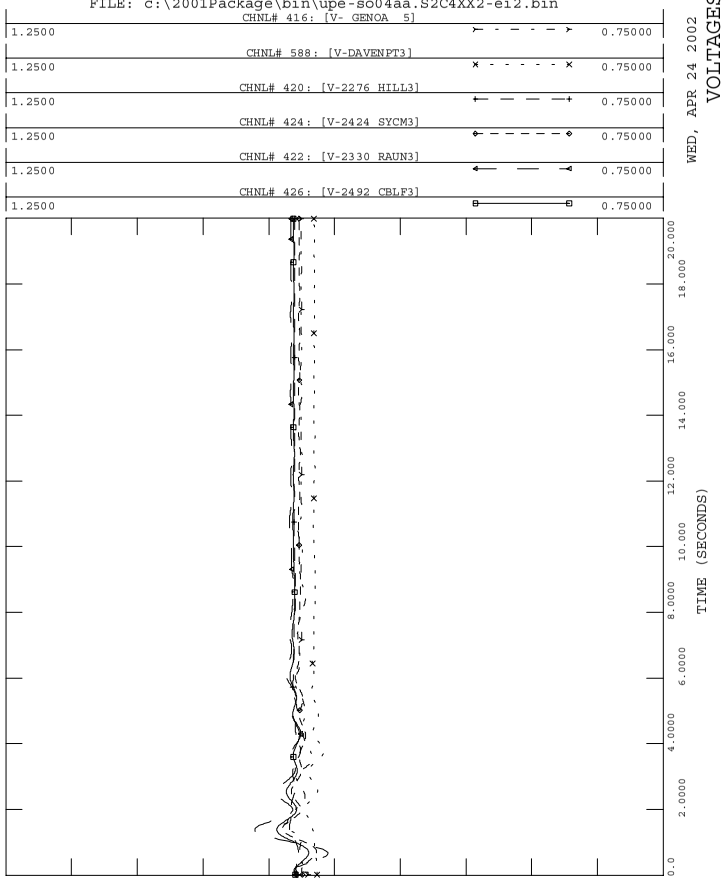
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

WED, APR 24 2002 20:24
VOLTAGES IA



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
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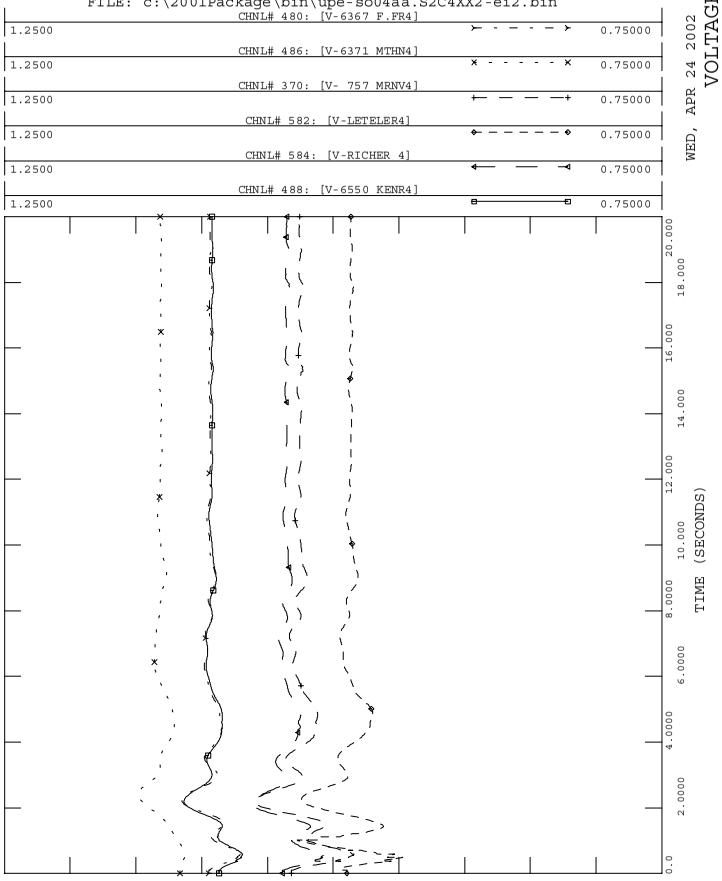
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

WED, APR 24 2002 20:24
VOLTAGES 4



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
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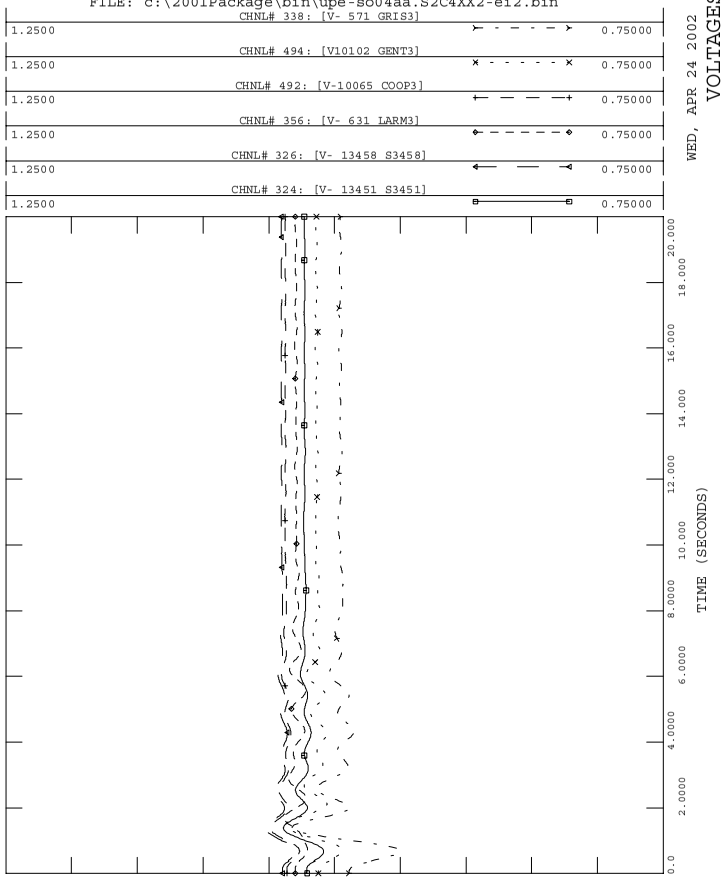
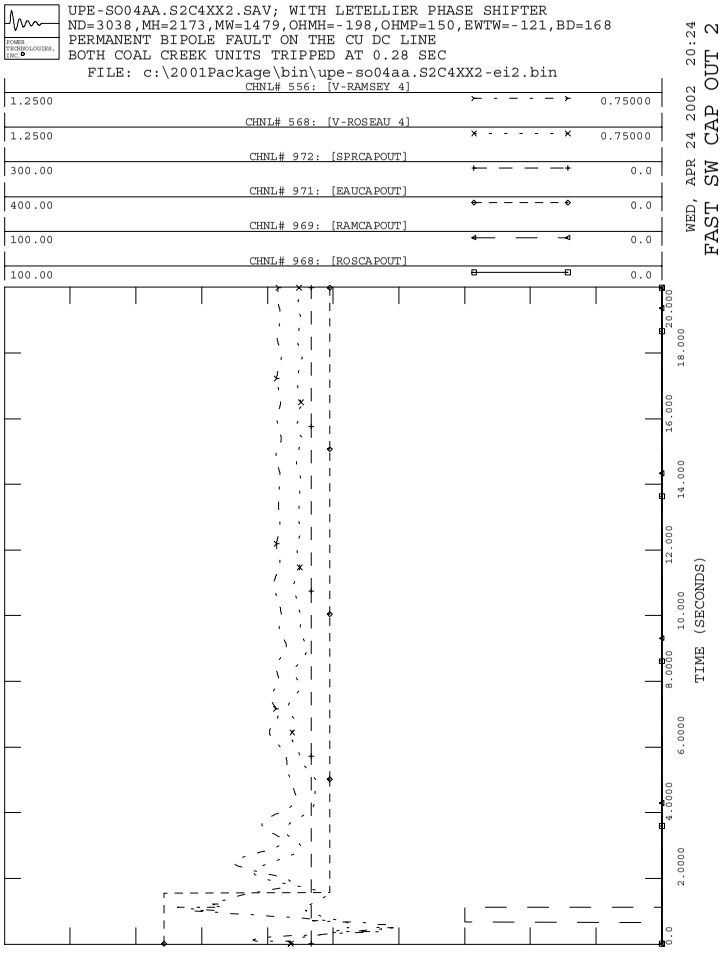
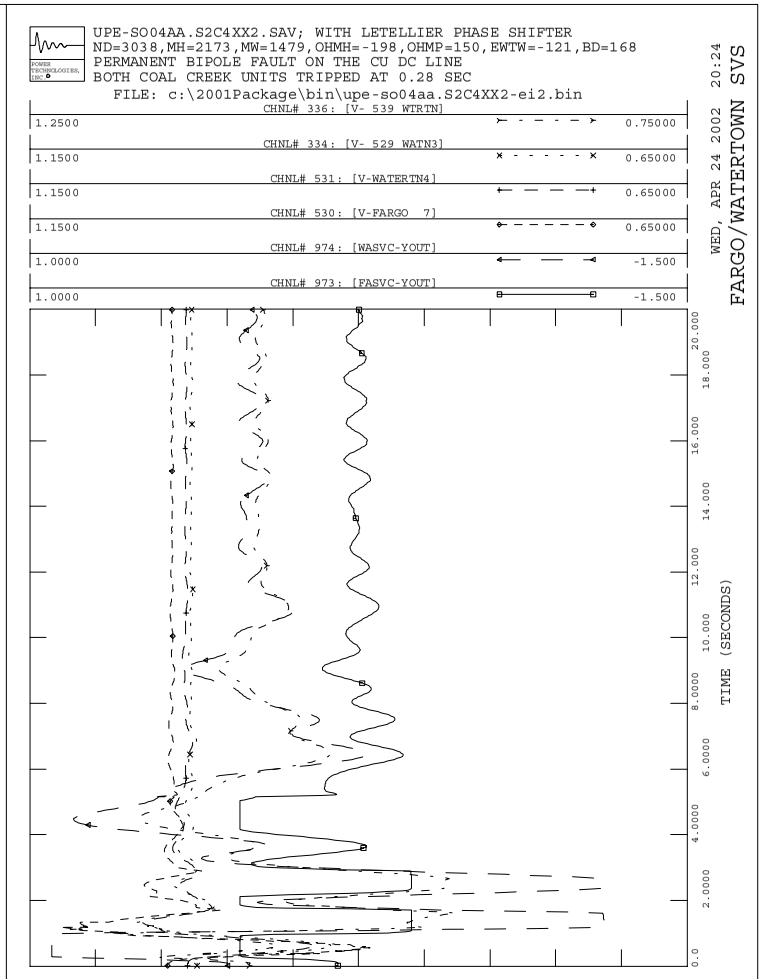
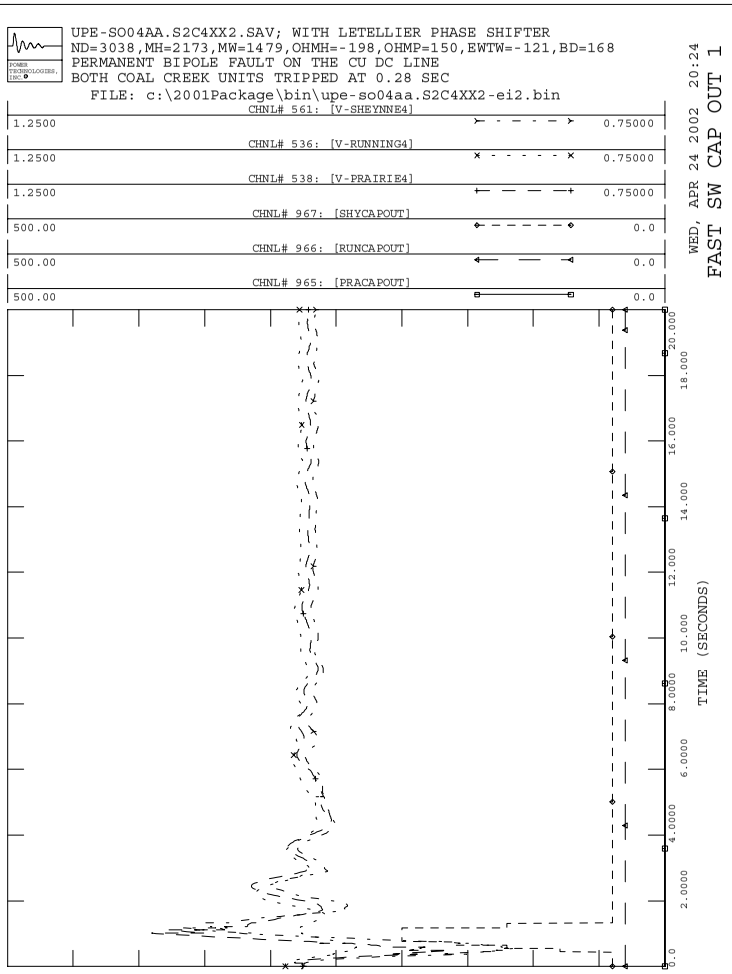
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

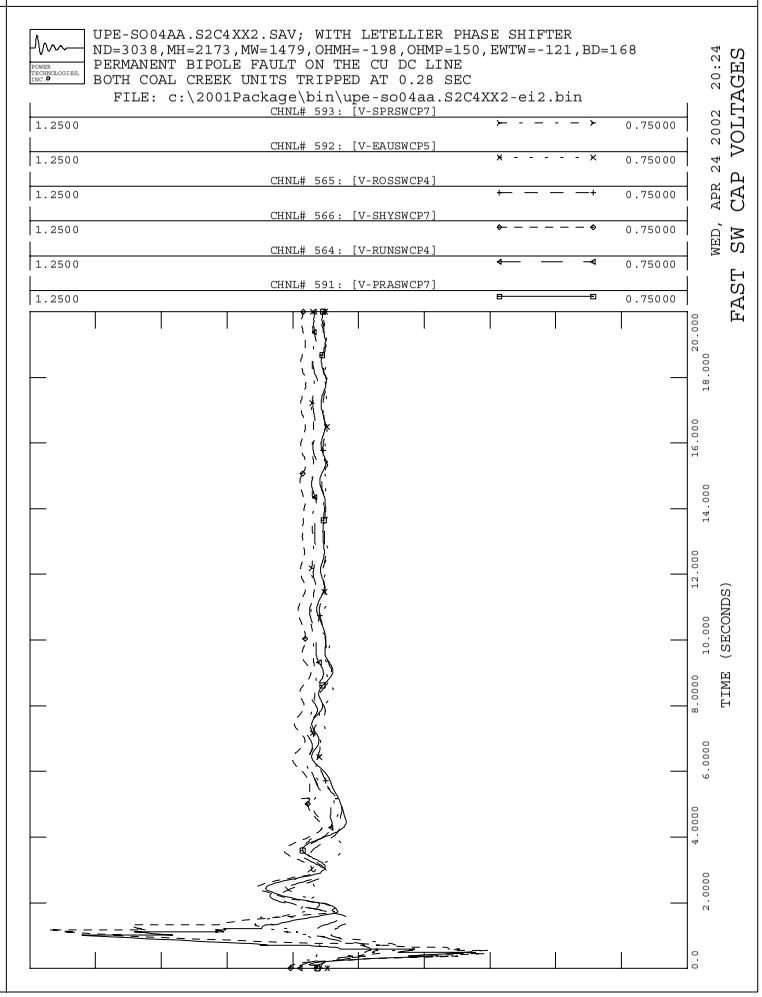
WED, APR 24 2002 20:24
VOLTAGES NB



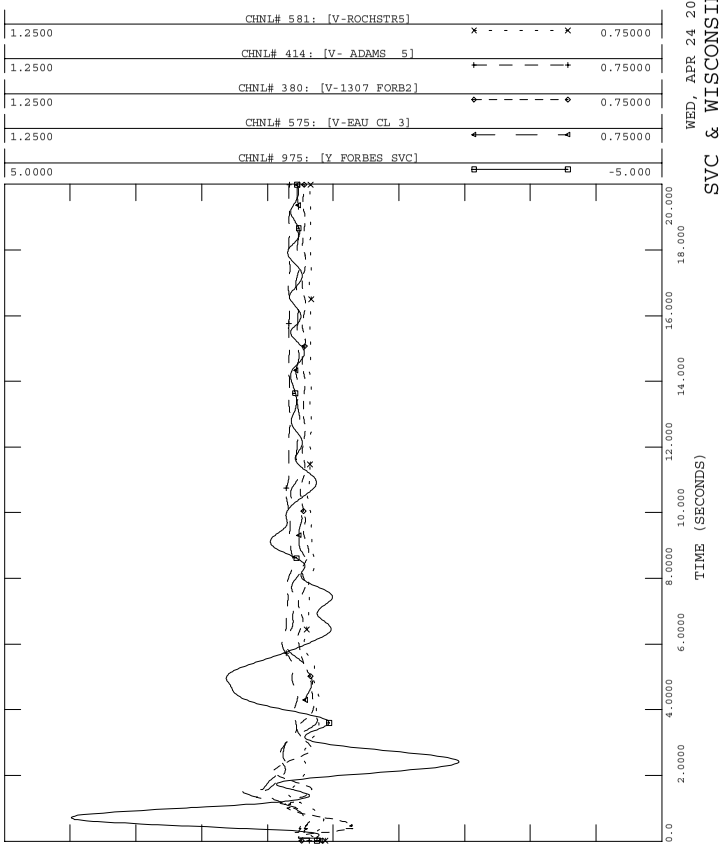

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
WED, APR 24 2002 20:24
FAST SW CAP OUT 2


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
WED, APR 24 2002 20:24
FARGO/WATERTOWN SVS


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
WED, APR 24 2002 20:24
FAST SW CAP OUT 1

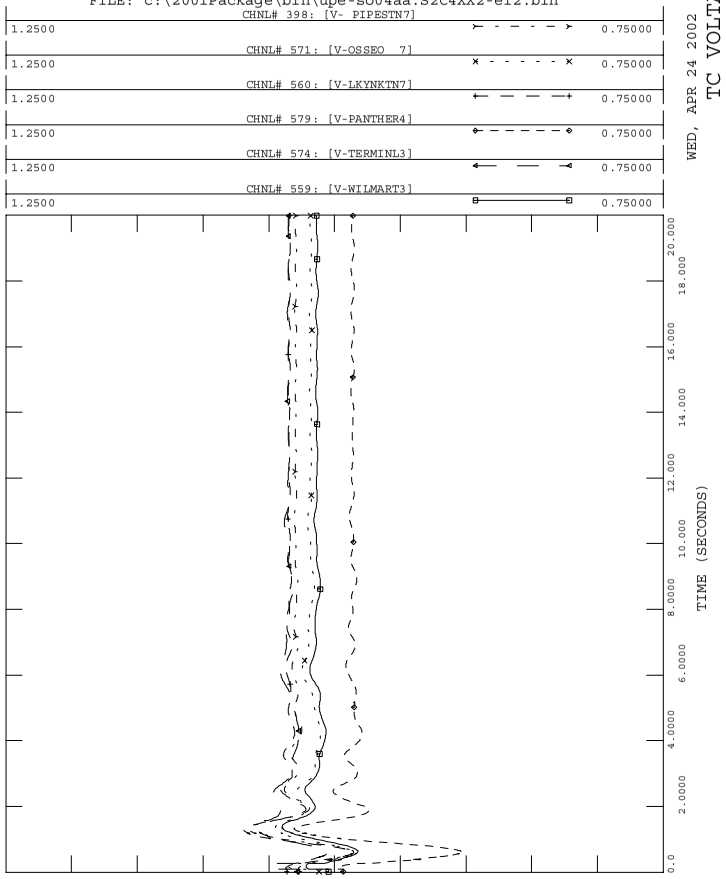

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
WED, APR 24 2002 20:24
FAST SW CAP VOLTAGES

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin



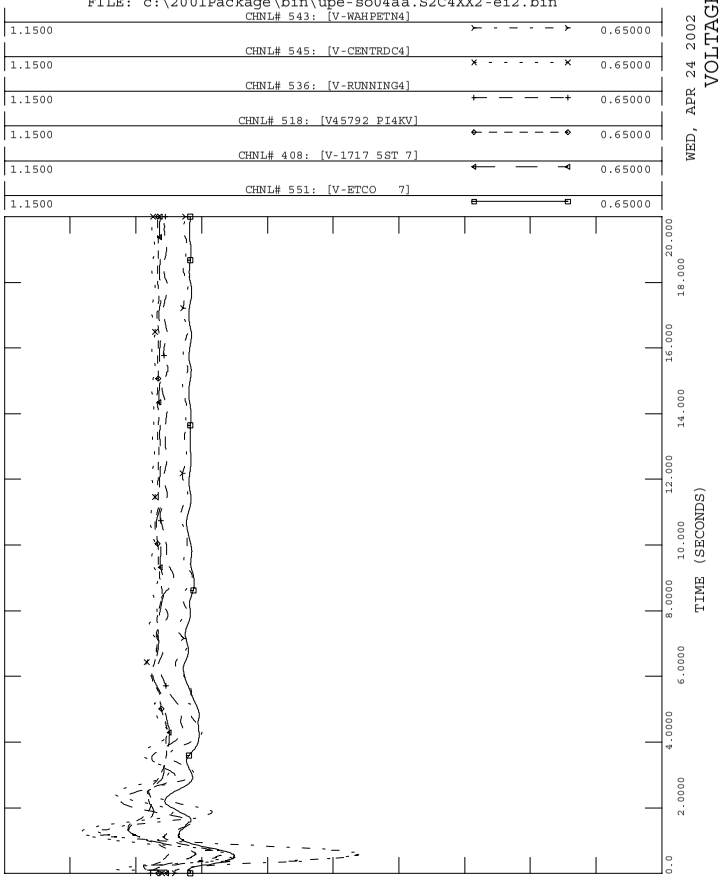
WED, APR 24 2002 20:24
SVC & WISCONSIN VOLT

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin



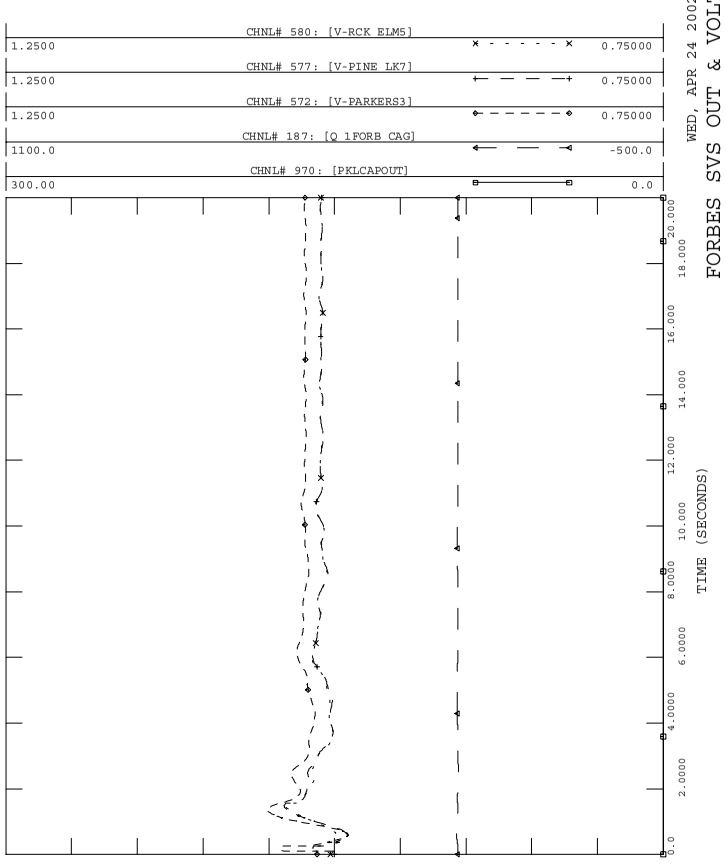
WED, APR 24 2002 20:24
TC VOLTAGES

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin



WED, APR 24 2002 20:24
VOLTAGES 6

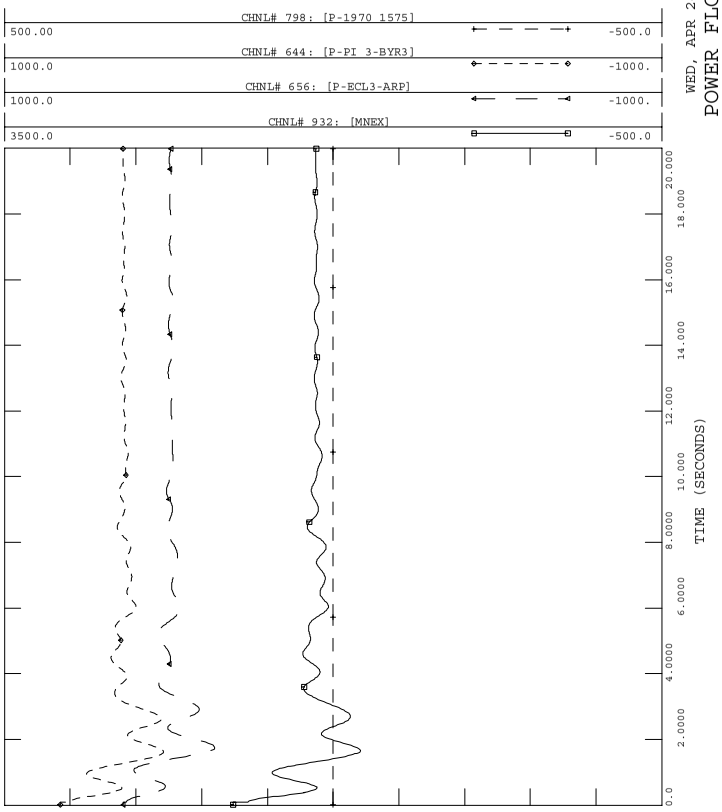
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin



WED, APR 24 2002 20:24
FORBES SVS OUT & VOLTAGES

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

WED, APR 24 2002 20:24
POWER FLOW SUMS 2



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
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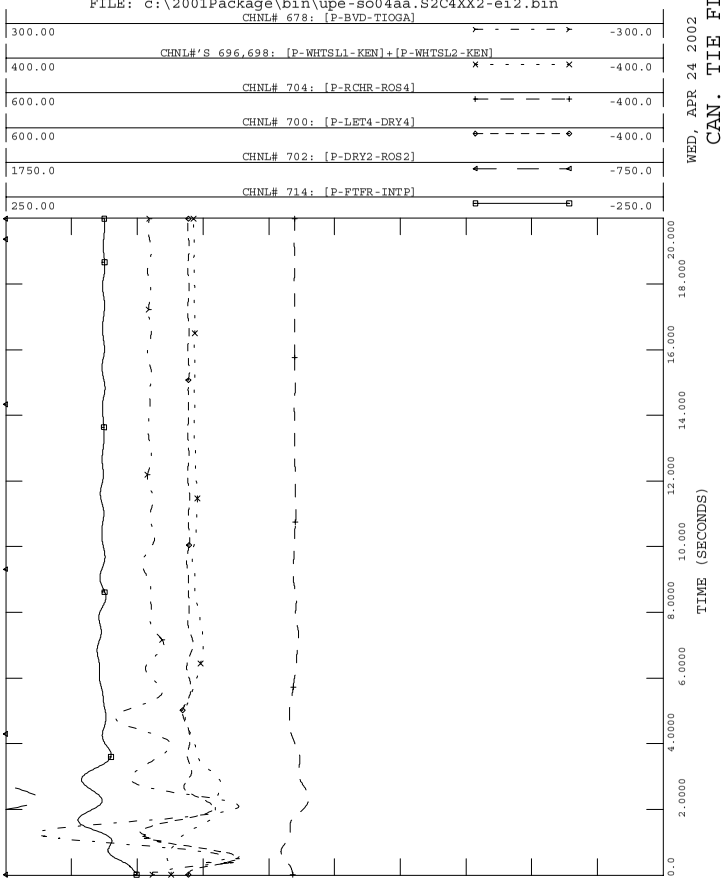
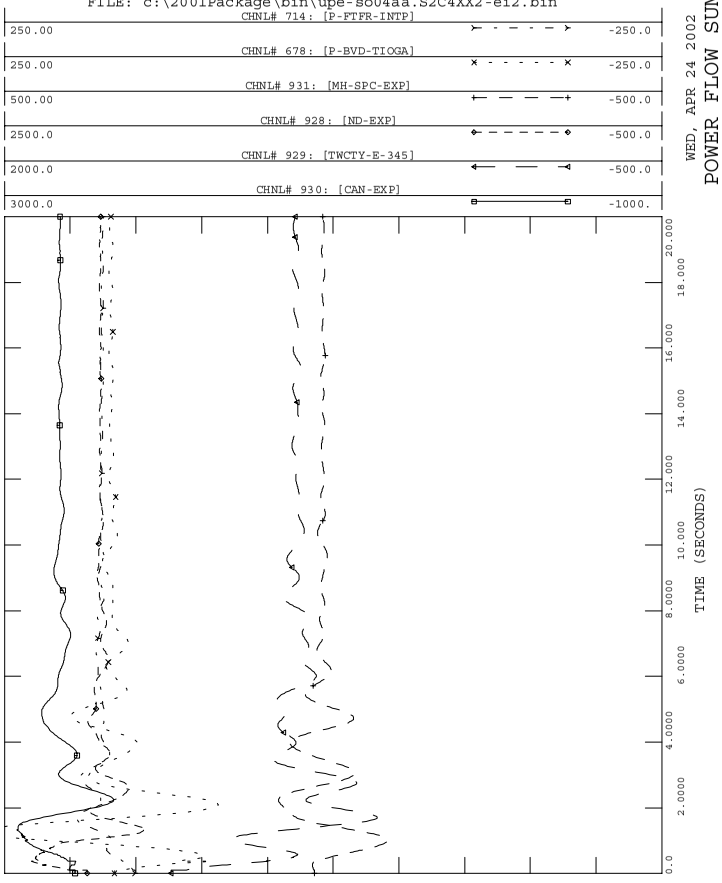
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

WED, APR 24 2002 20:24
CAN. TIE FLOWS



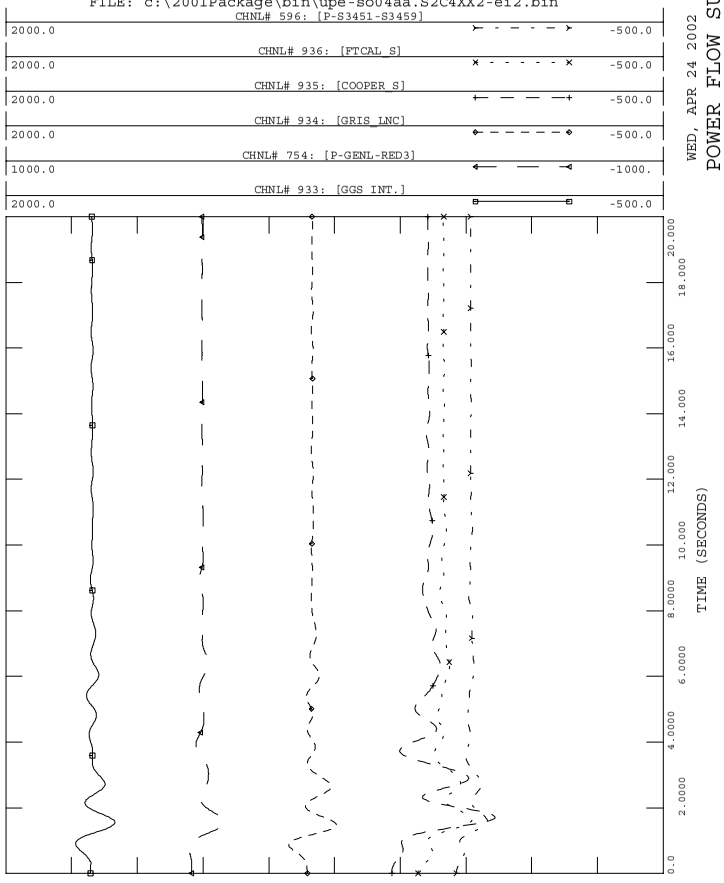
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

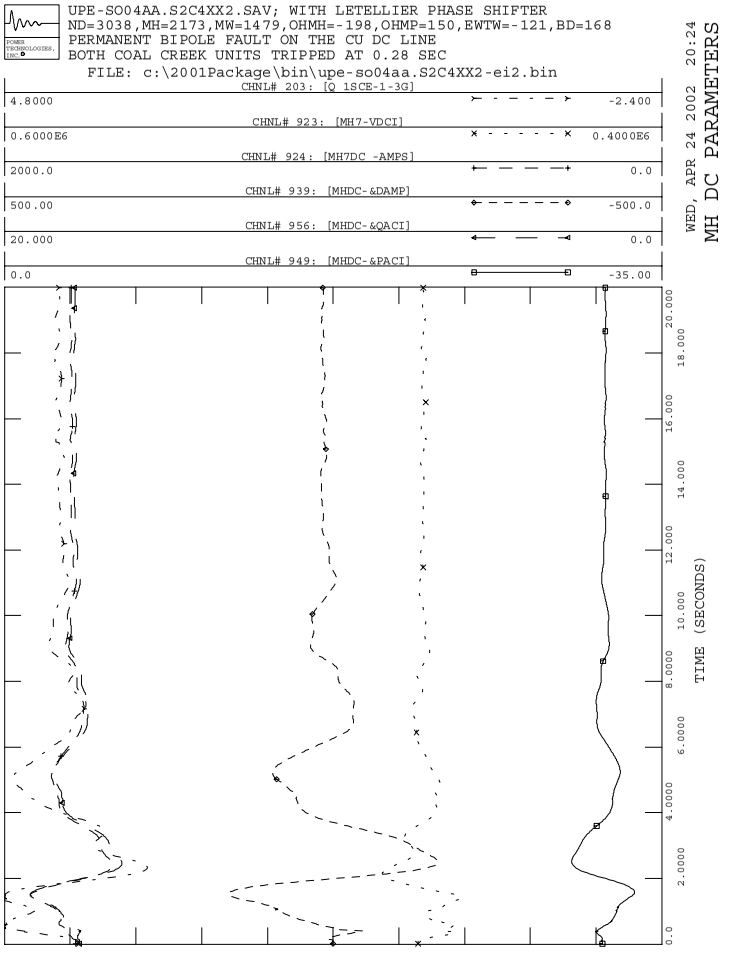
WED, APR 24 2002 20:24
POWER FLOW SUMS 1

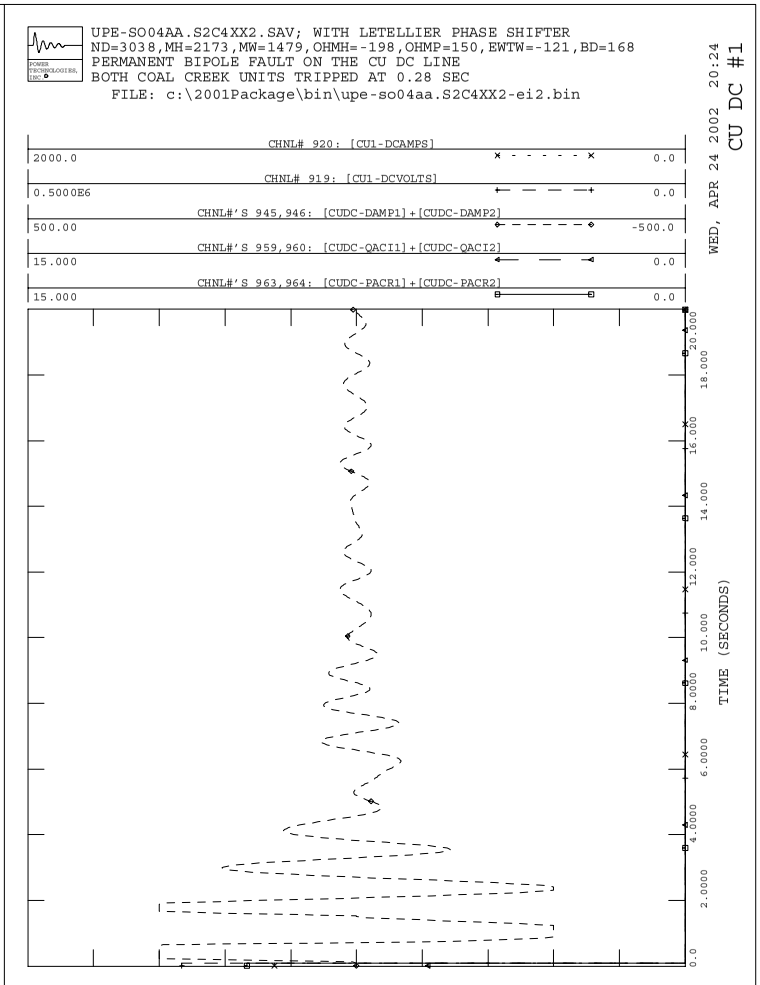


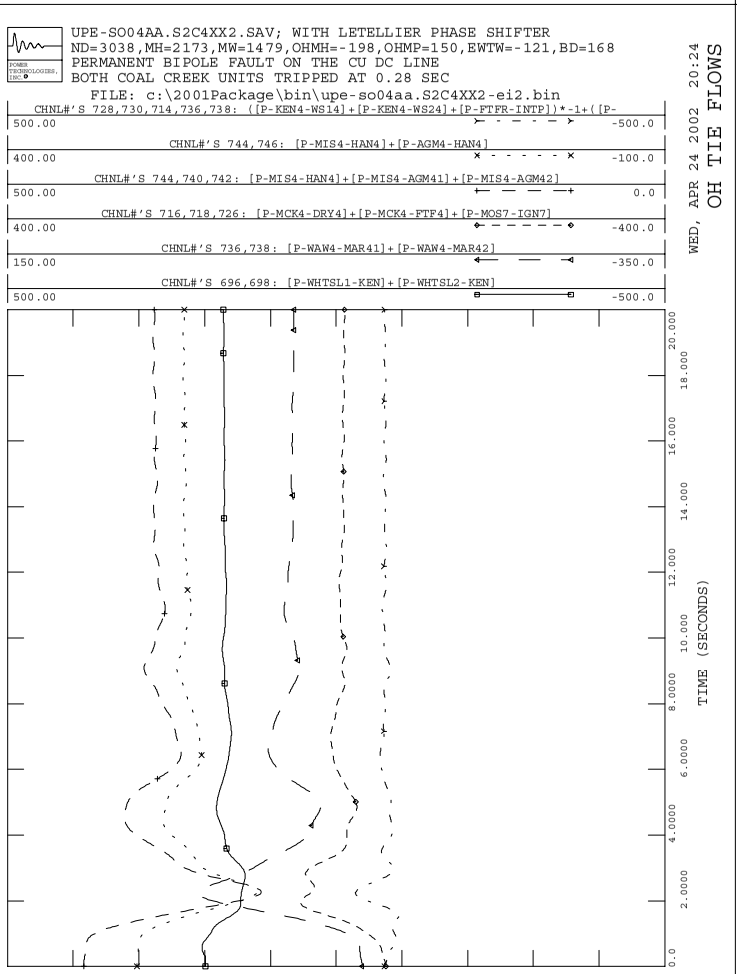
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

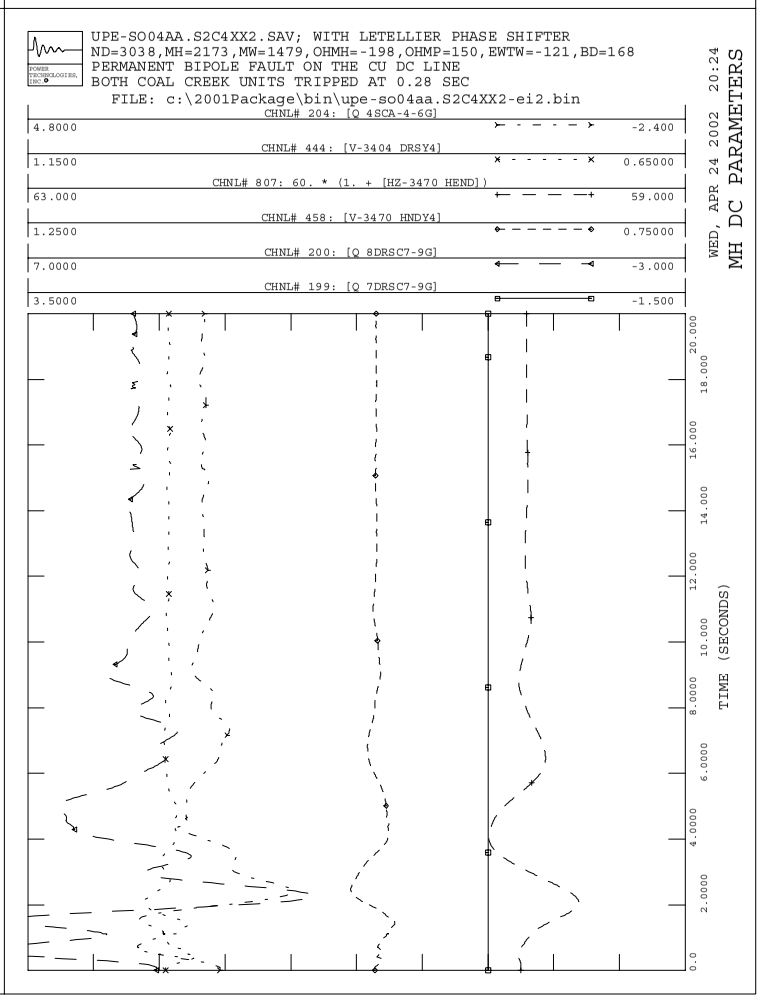
WED, APR 24 2002 20:24
POWER FLOW SUM 3

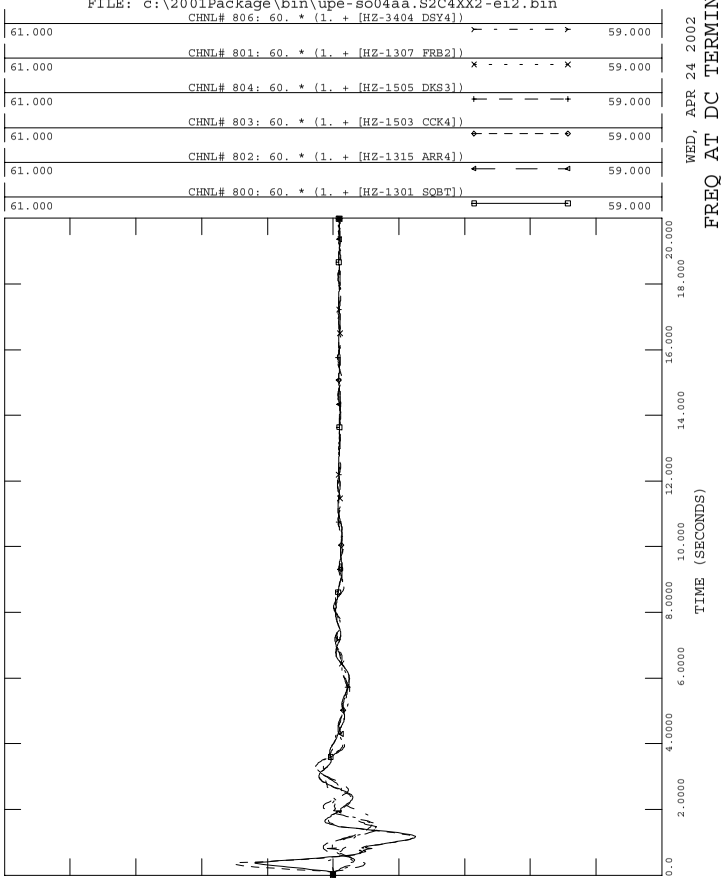


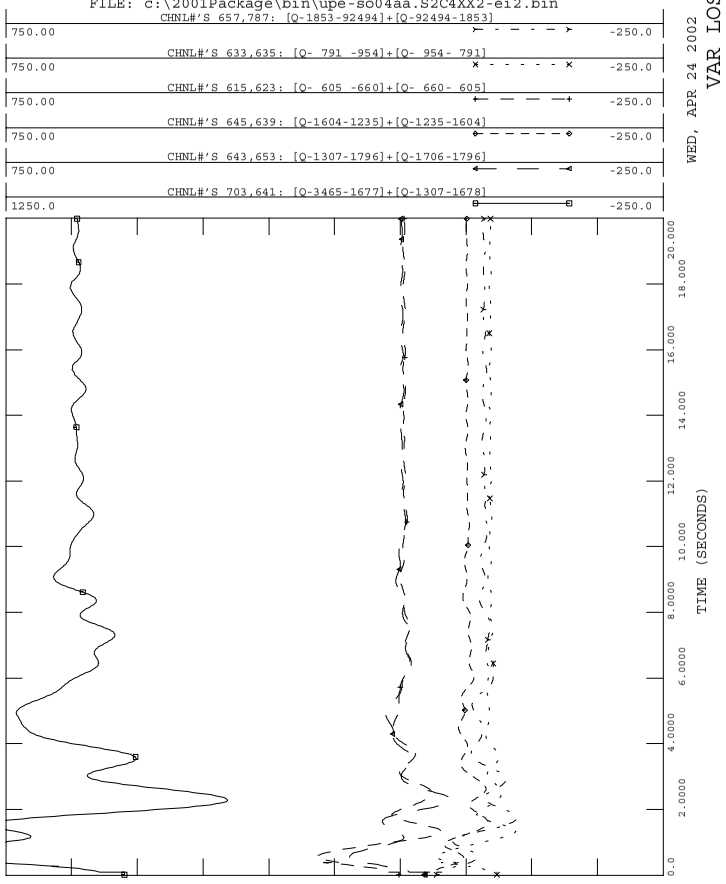

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TIME (SECONDS)
WED, APR 24 2002 20:24
MH DC PARAMETERS

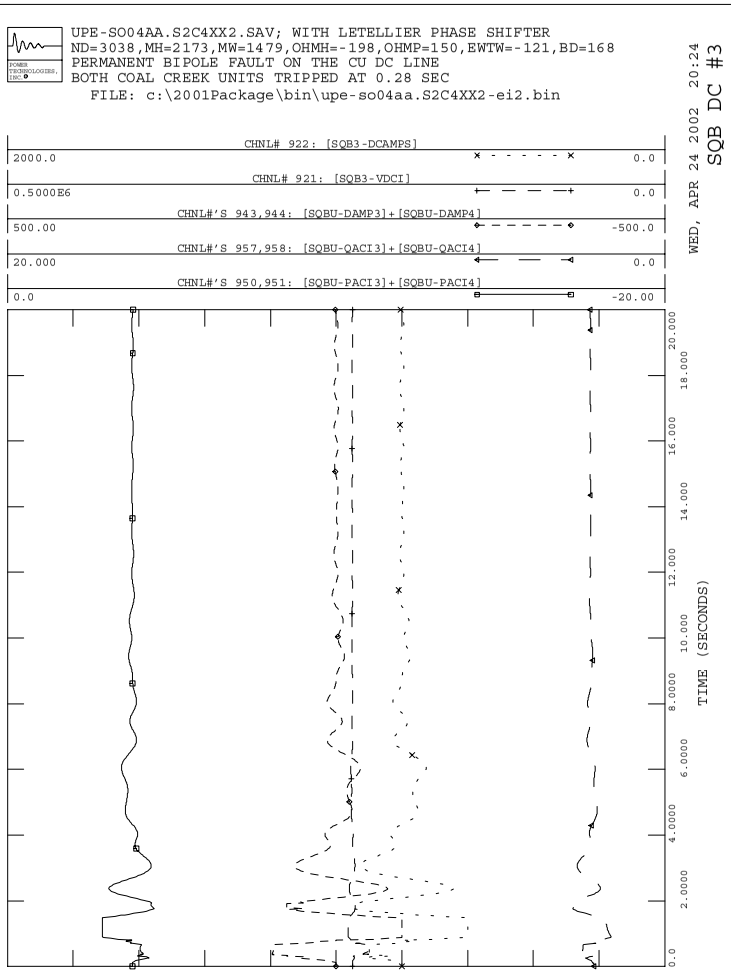

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TIME (SECONDS)
WED, APR 24 2002 20:24
CU DC #1

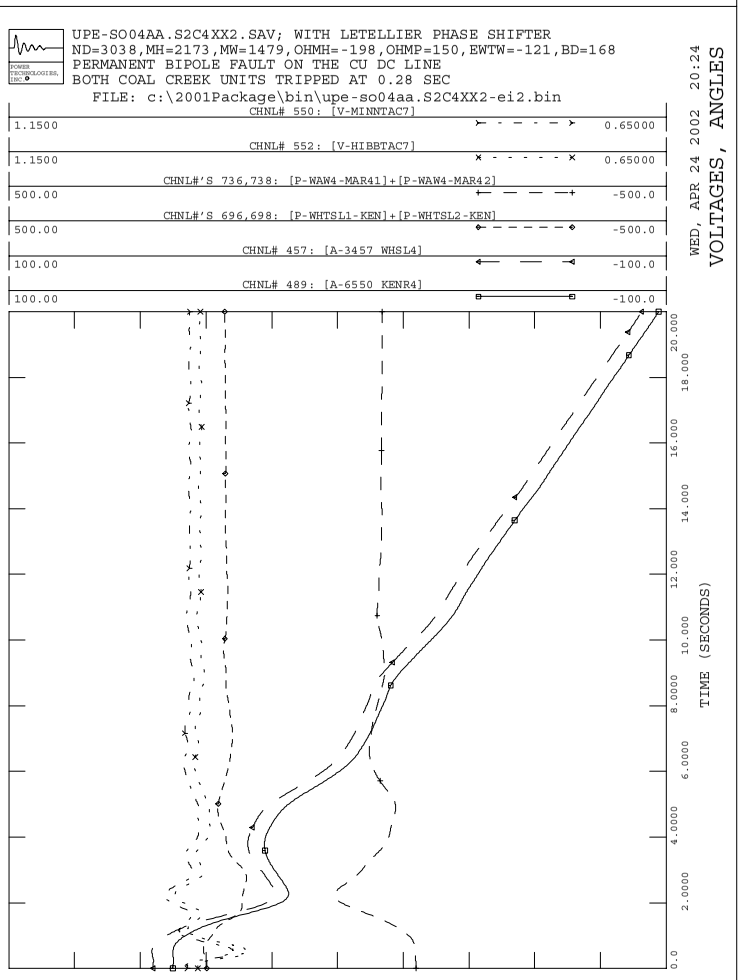

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TIME (SECONDS)
WED, APR 24 2002 20:24
OH TIE FLOWS


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TIME (SECONDS)
WED, APR 24 2002 20:24
MH DC PARAMETERS


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
WED, APR 24 2002 20:24
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
WED, APR 24 2002 20:24
VAR LOSSES
TIME (SECONDS)

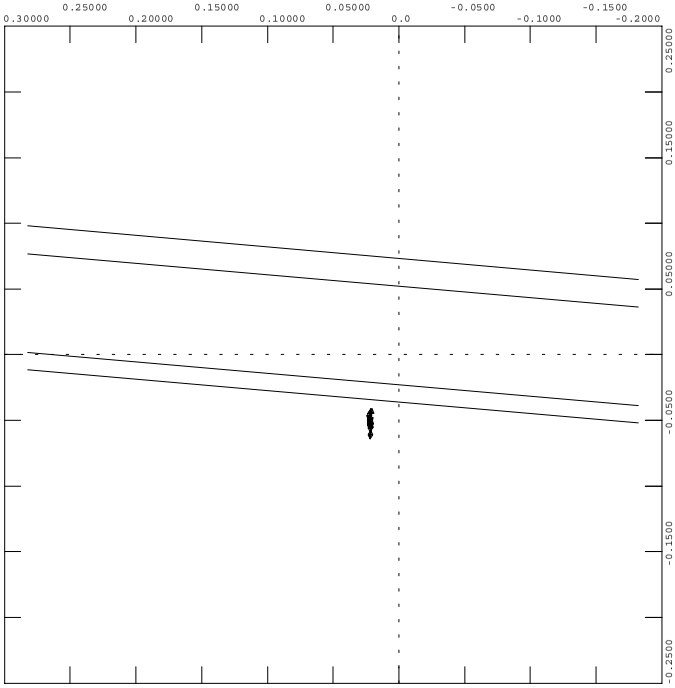

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
WED, APR 24 2002 20:24
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
WED, APR 24 2002 20:24
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

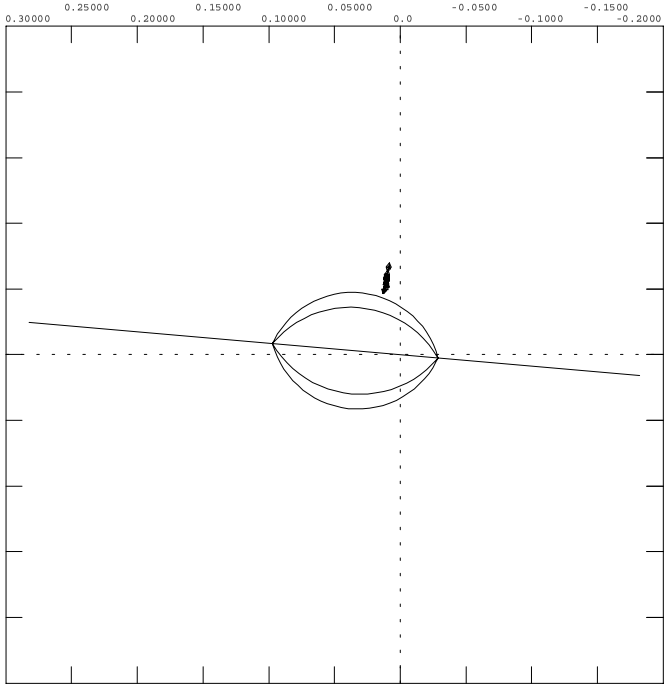


WED, APR 24 2002 20:24
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

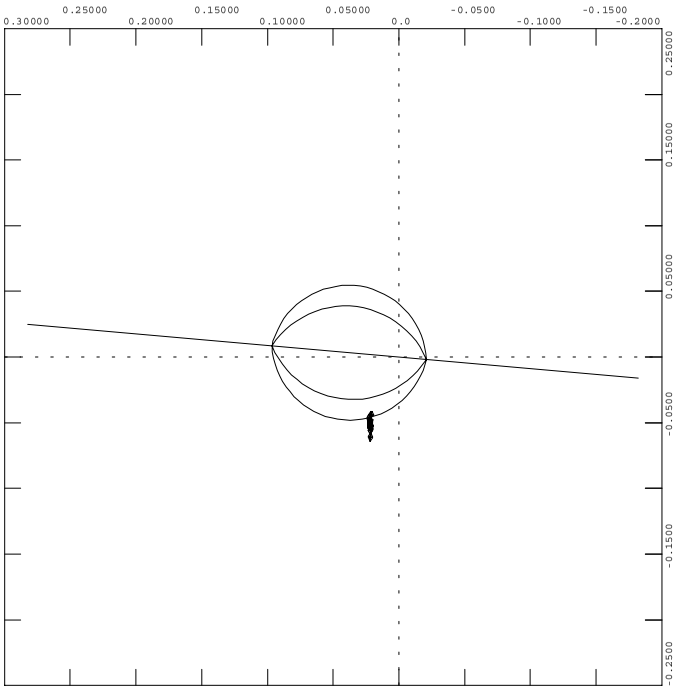


WED, APR 24 2002 20:24
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

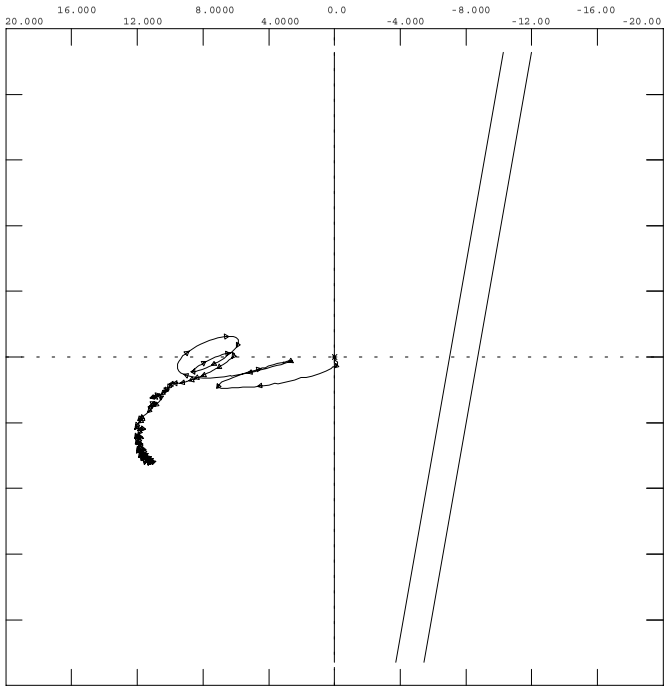


WED, APR 24 2002 20:24
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

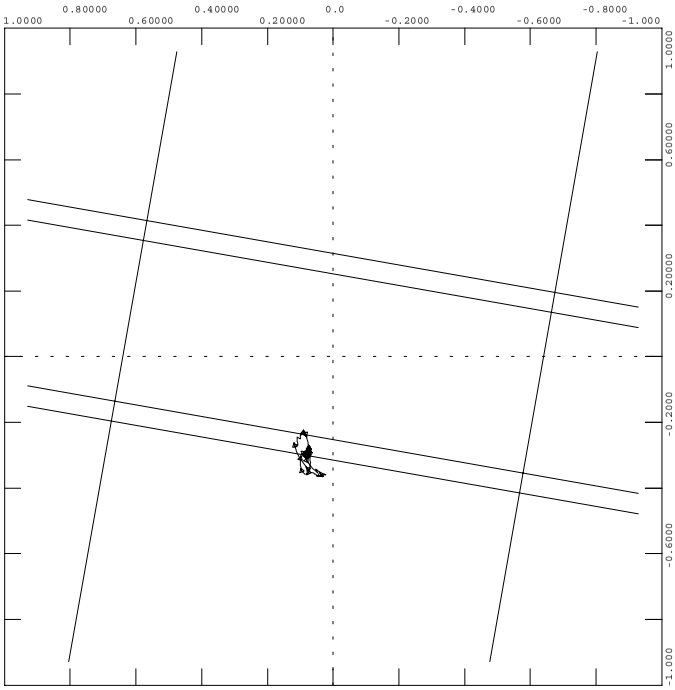


WED, APR 24 2002 20:24
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

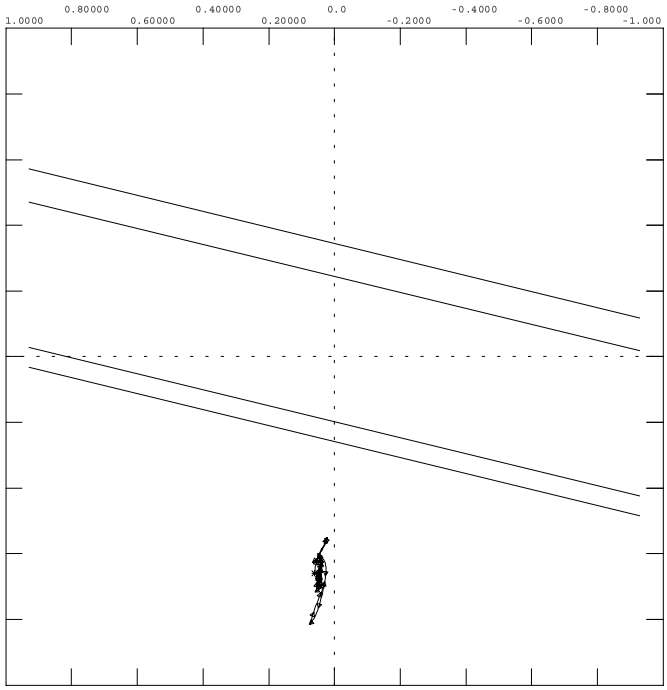
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

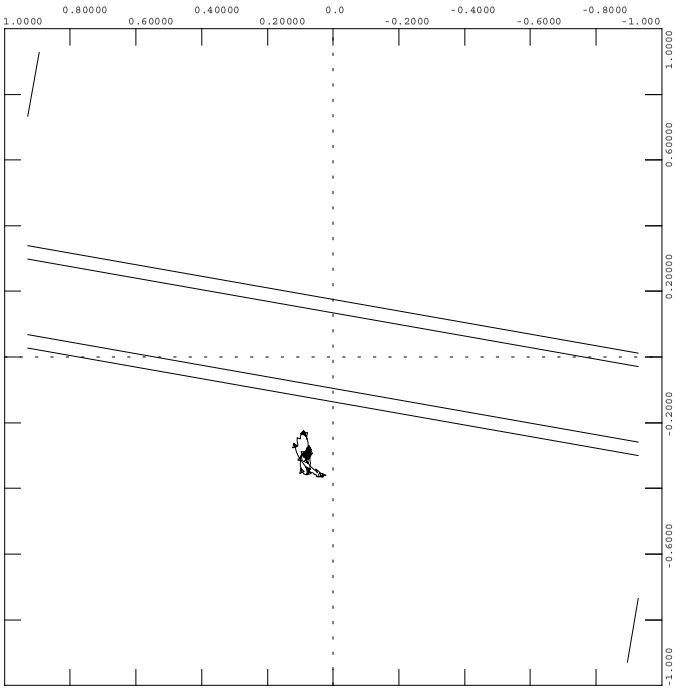
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

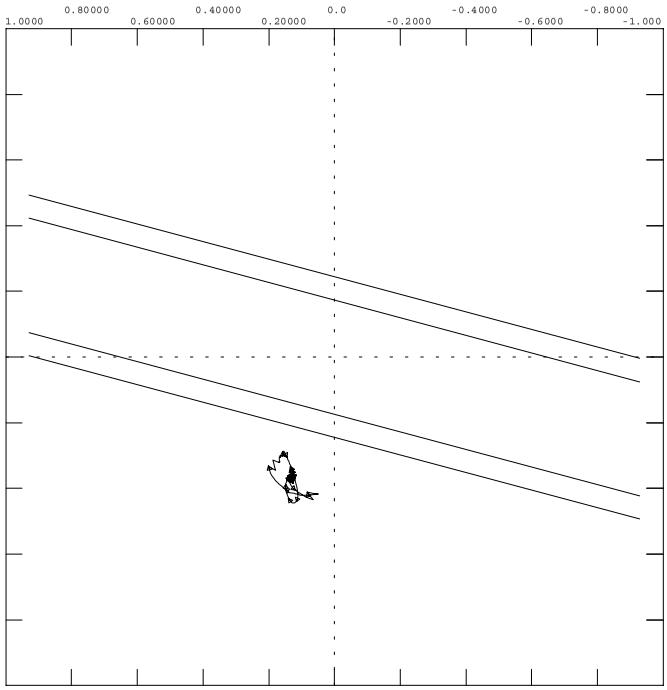
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

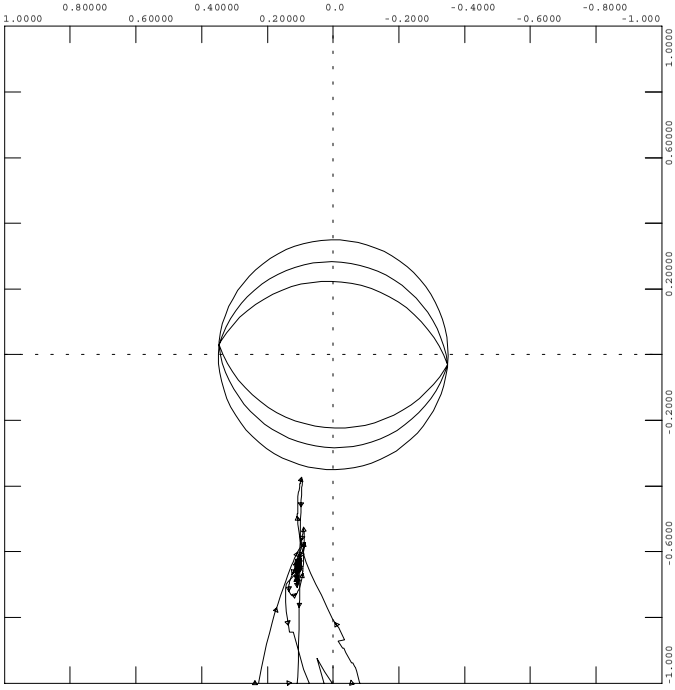
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

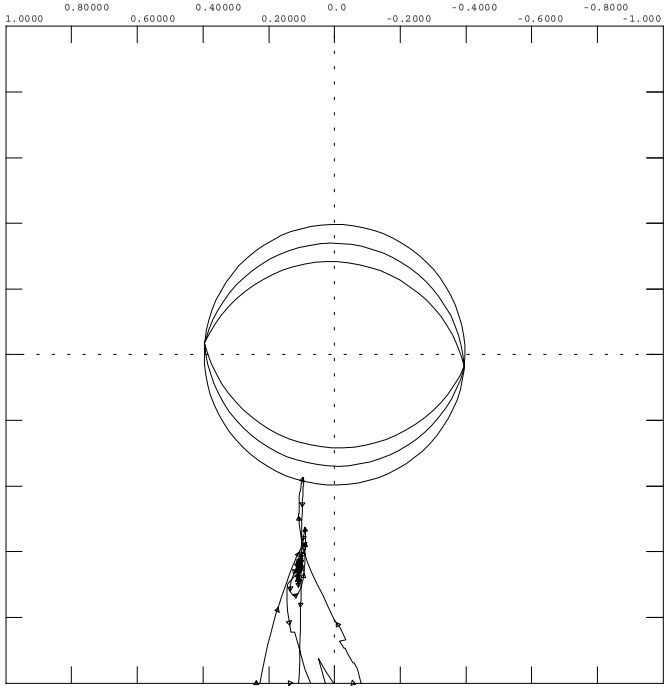
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

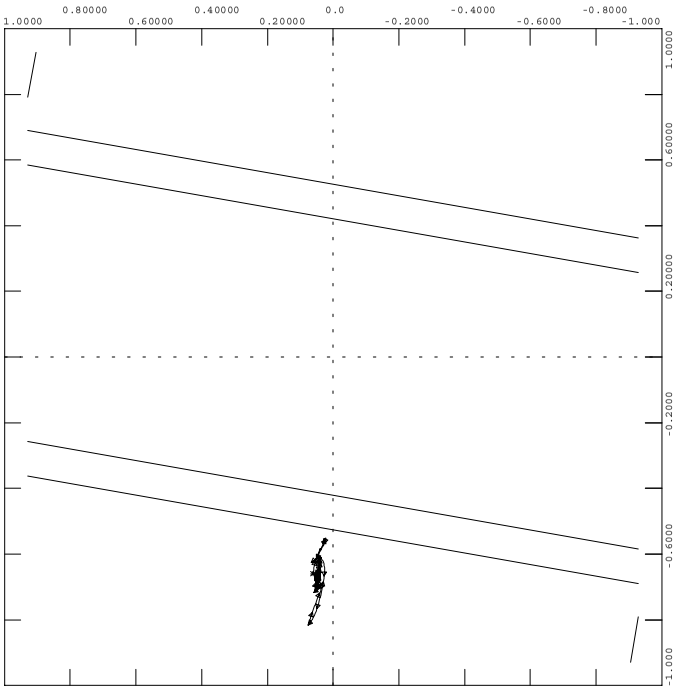
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

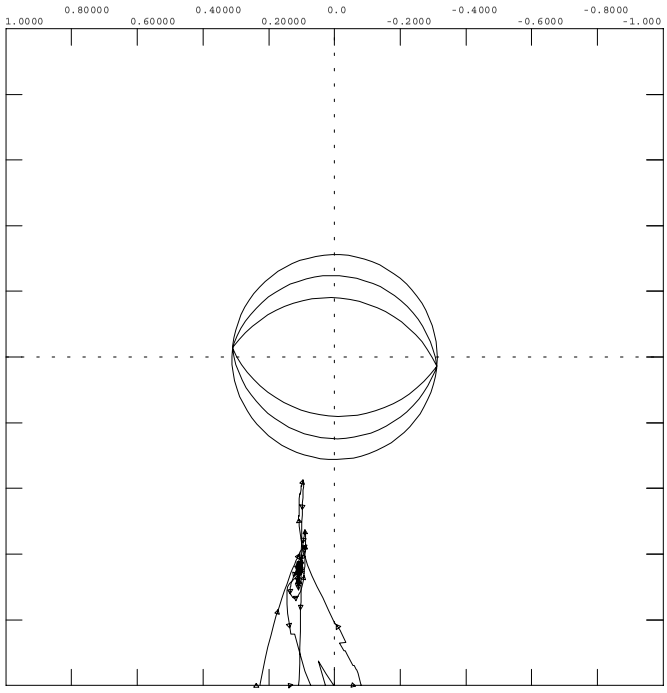
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



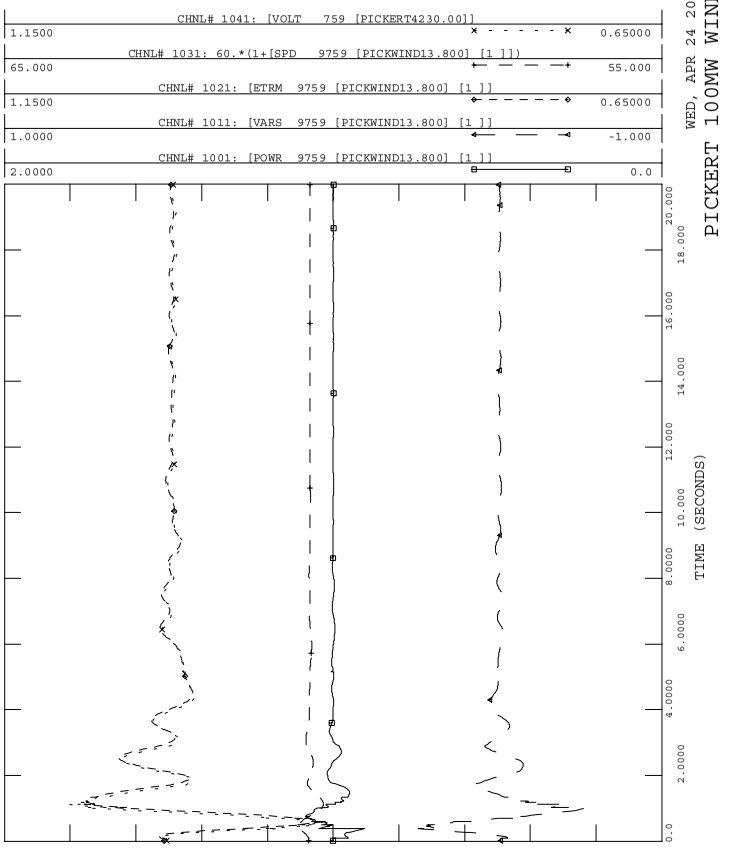
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

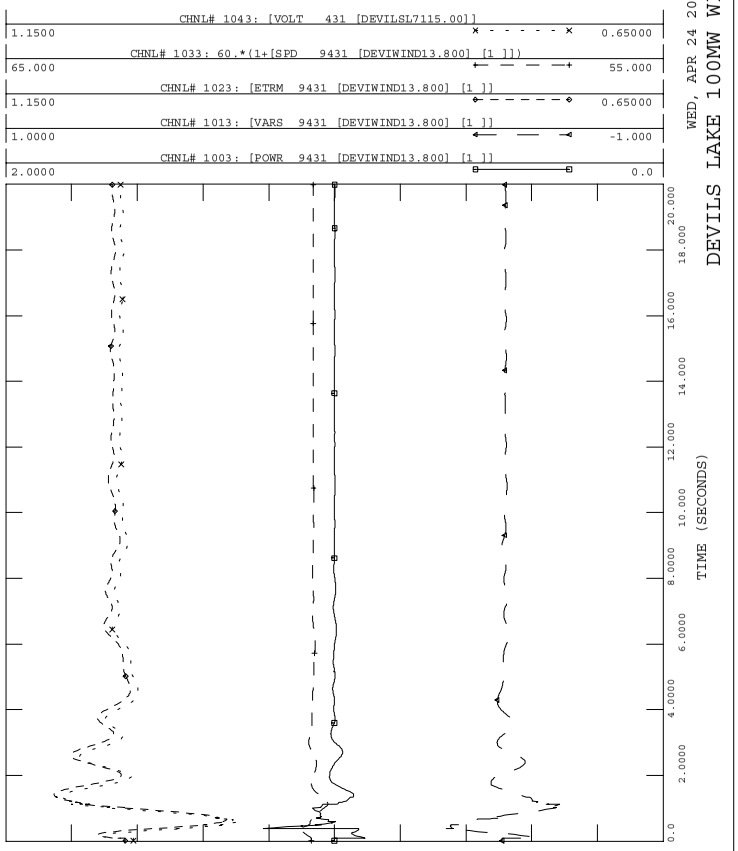


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin



WED, APR 24 2002 20:24
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

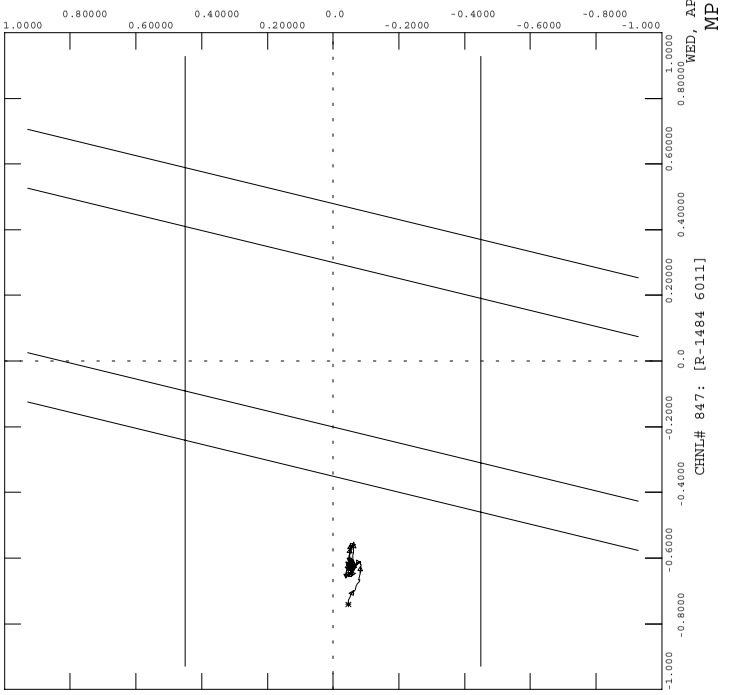


WED, APR 24 2002 20:24
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

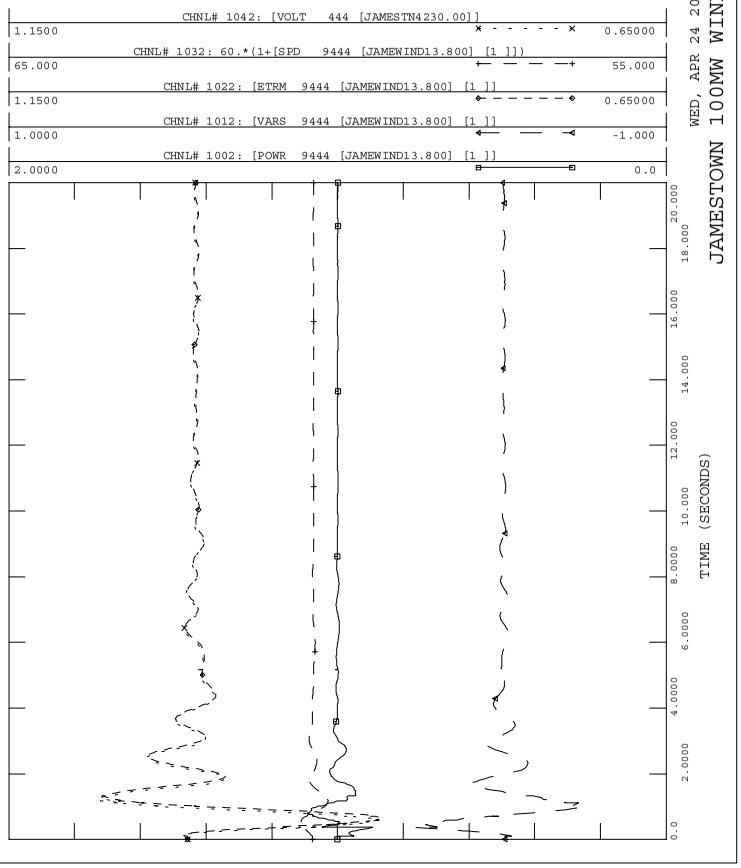
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



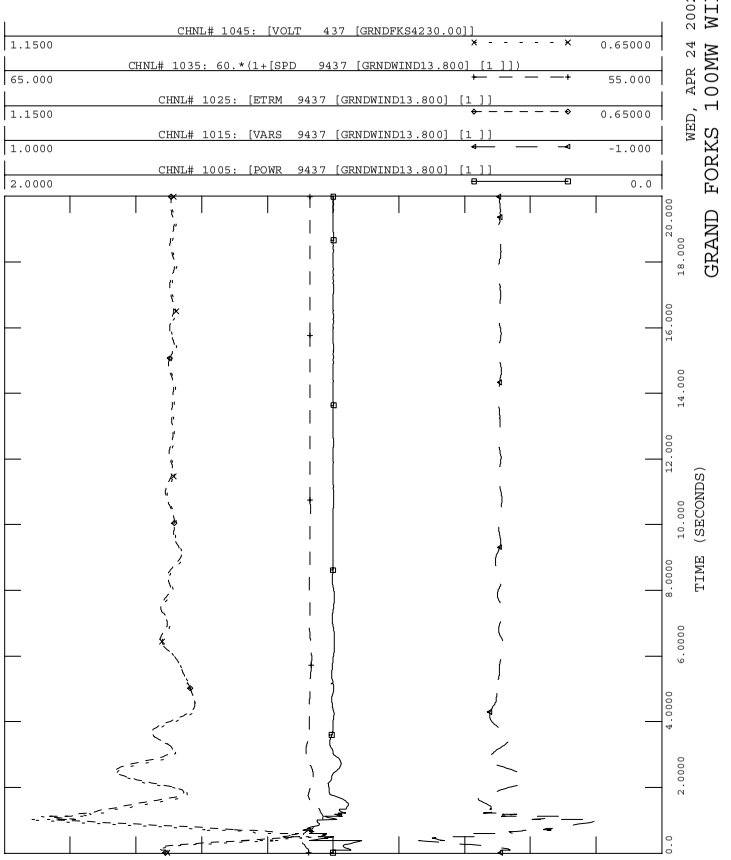
WED, APR 24 2002 20:24
MP-OH I.FALLS (779)

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

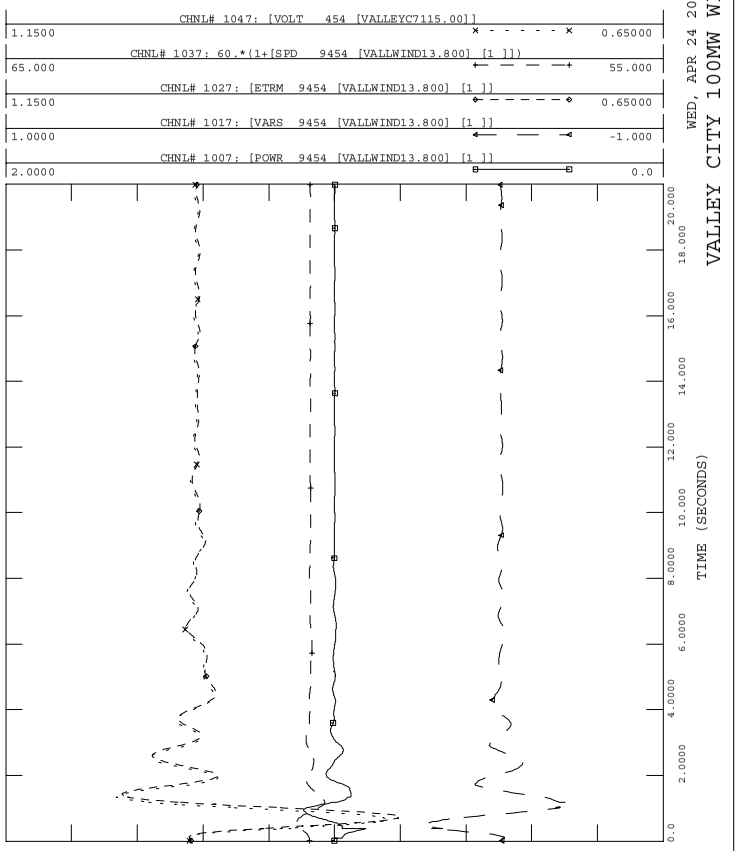


WED, APR 24 2002 20:24
JAMESTOWN 100MW WIND UNIT

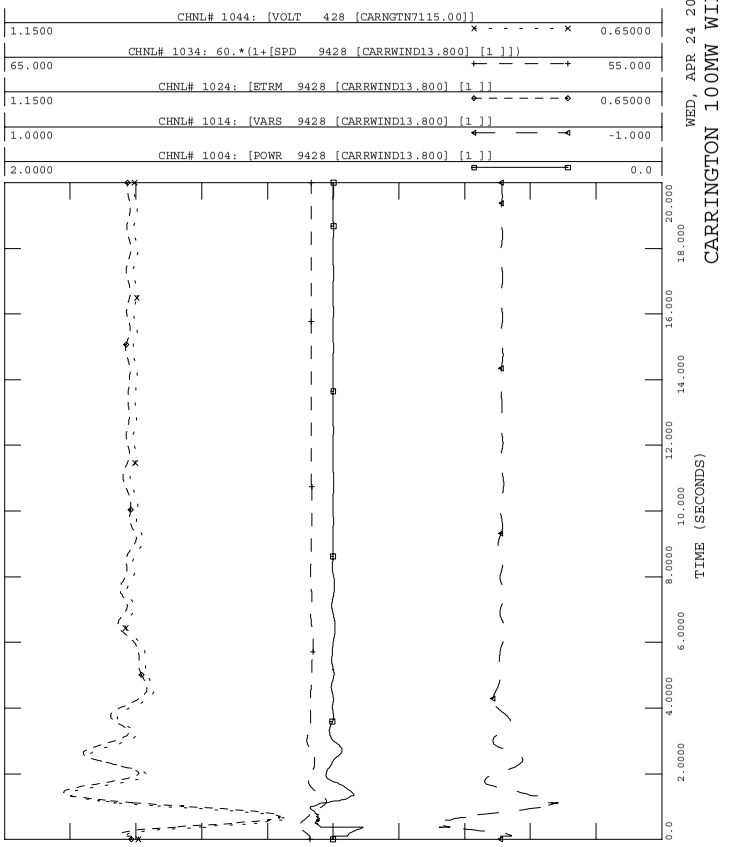
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin



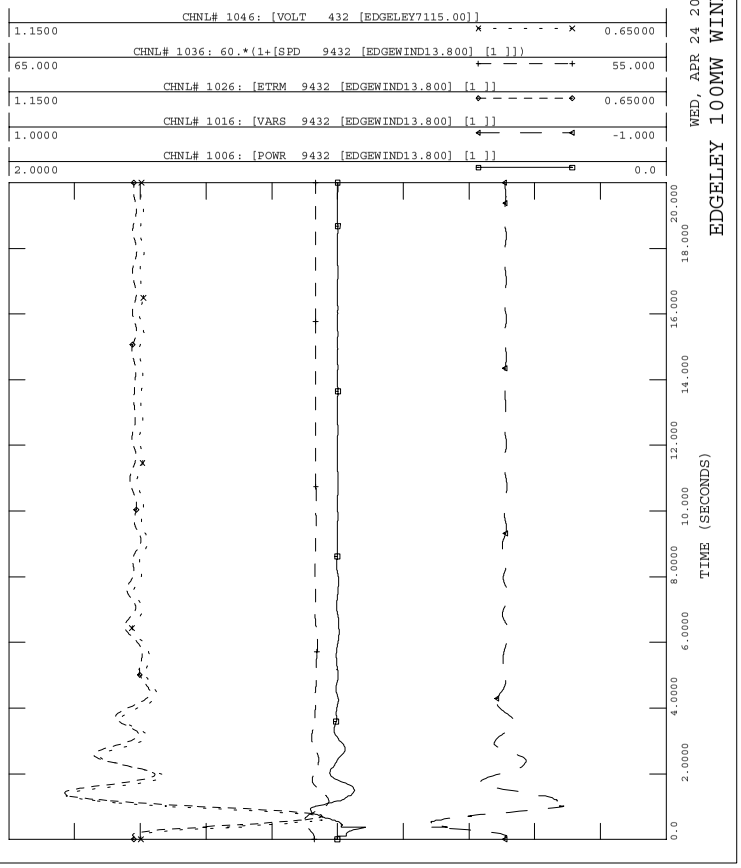
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin



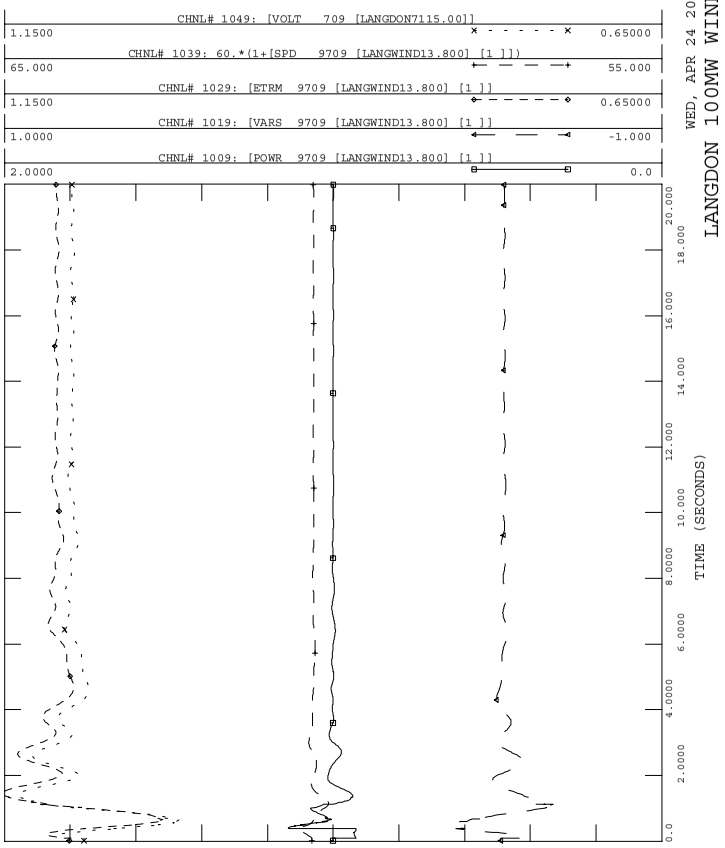
UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin



UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin

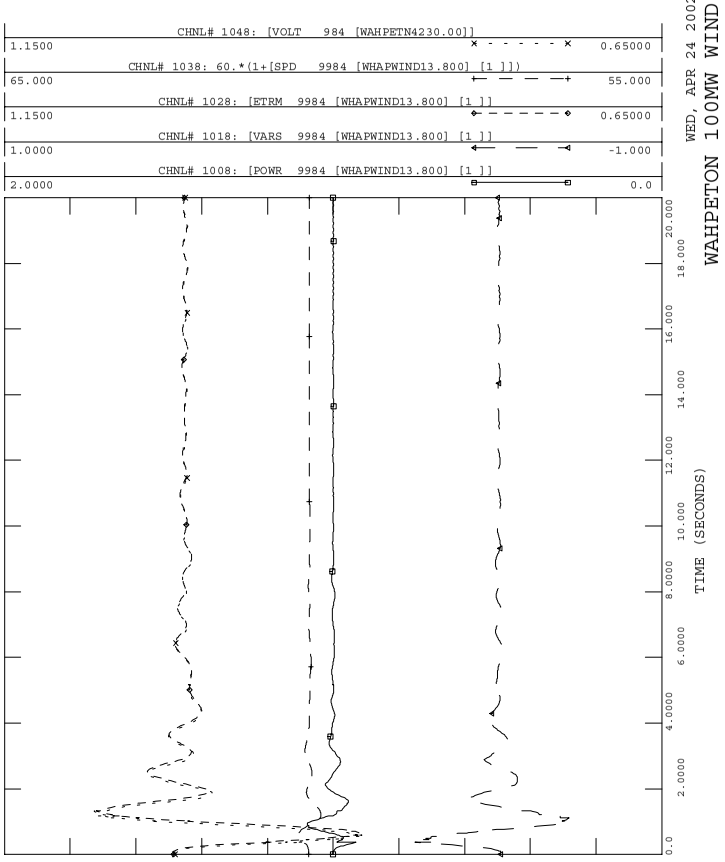


UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin



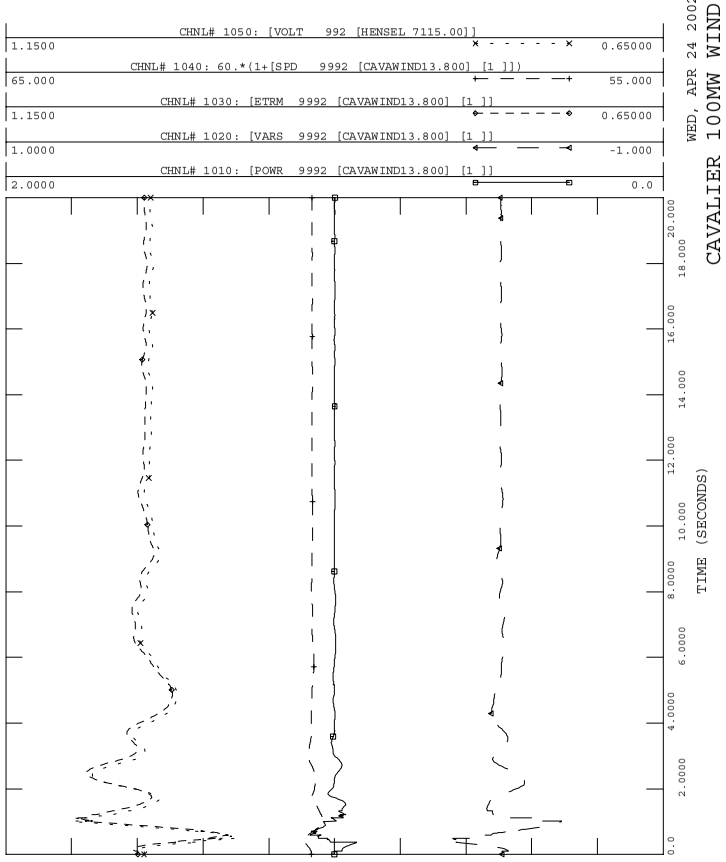
WED, APR 24 2002 20:24
LANGDON 100MW WIND UNIT

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin



WED, APR 24 2002 20:24
WAHPETON 100MW WIND UNIT

UPE-SO04AA.S2C4XX2.SAV; WITH LETELLIER PHASE SHIFTER
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX2-ei2.bin



WED, APR 24 2002 20:24
CAVALIER 100MW WIND UNIT

APPENDIX 19

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 2 (JAMESTOWN)

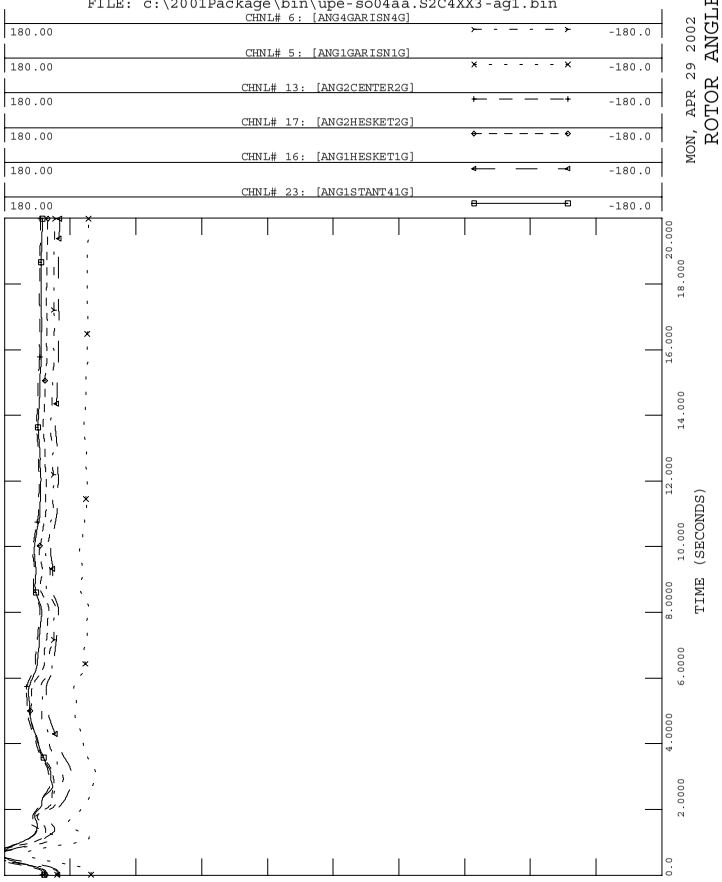
CASE S2C4XX3

CONTINGENCY AG1

Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28
ROTOR ANGLES 2



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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MON, APR 29 2002 18:28
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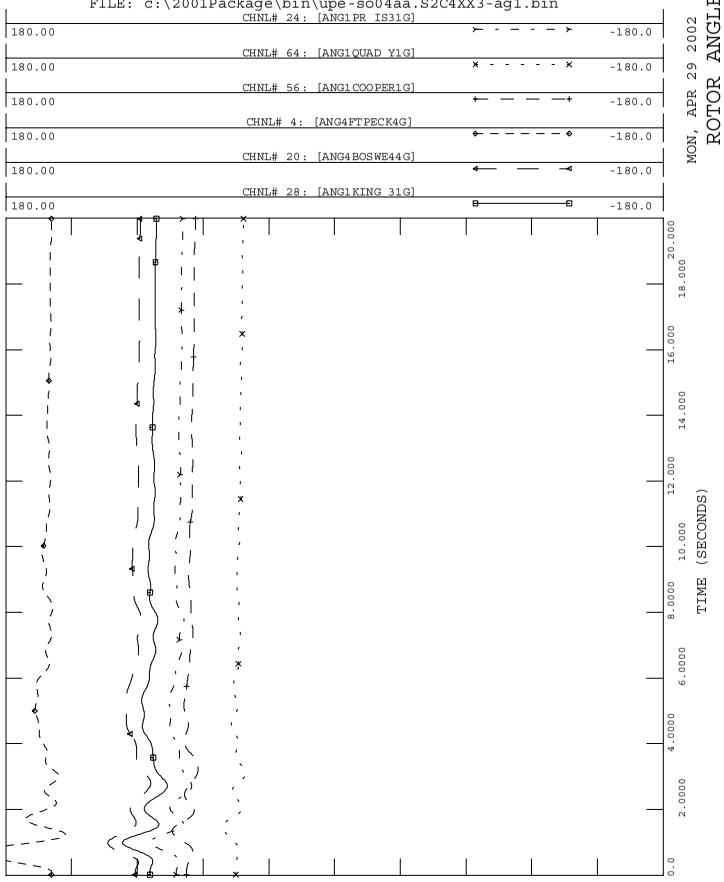

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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MON, APR 29 2002 18:28
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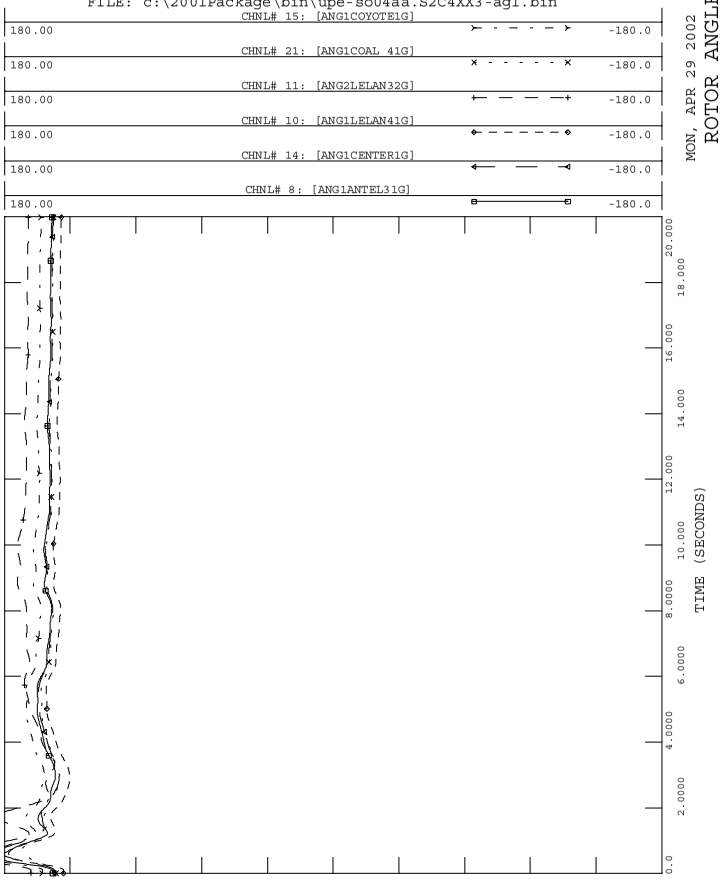

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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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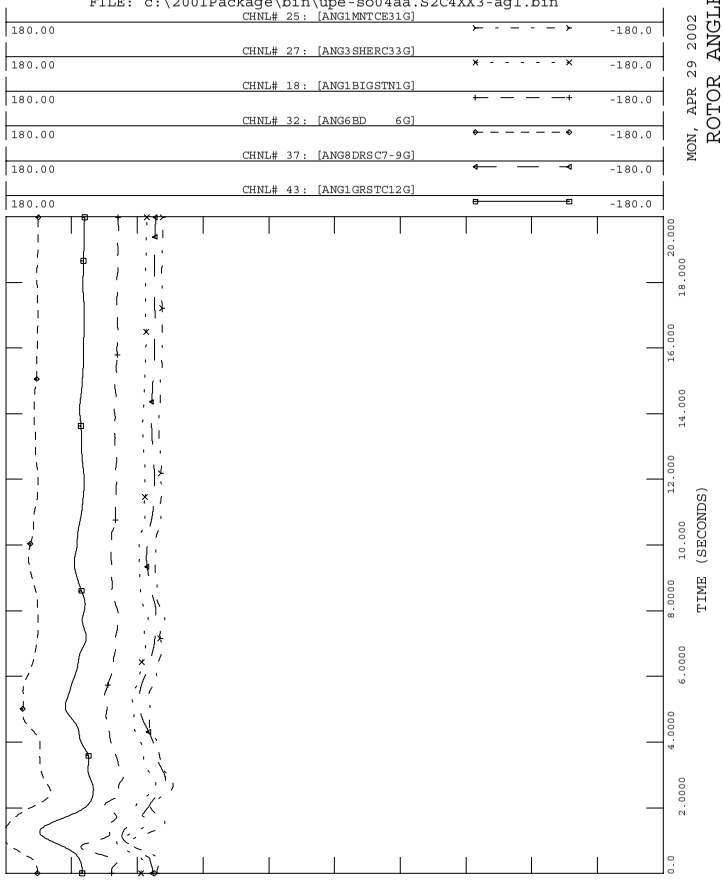
MON, APR 29 2002 18:28
ROTOR ANGLES 3



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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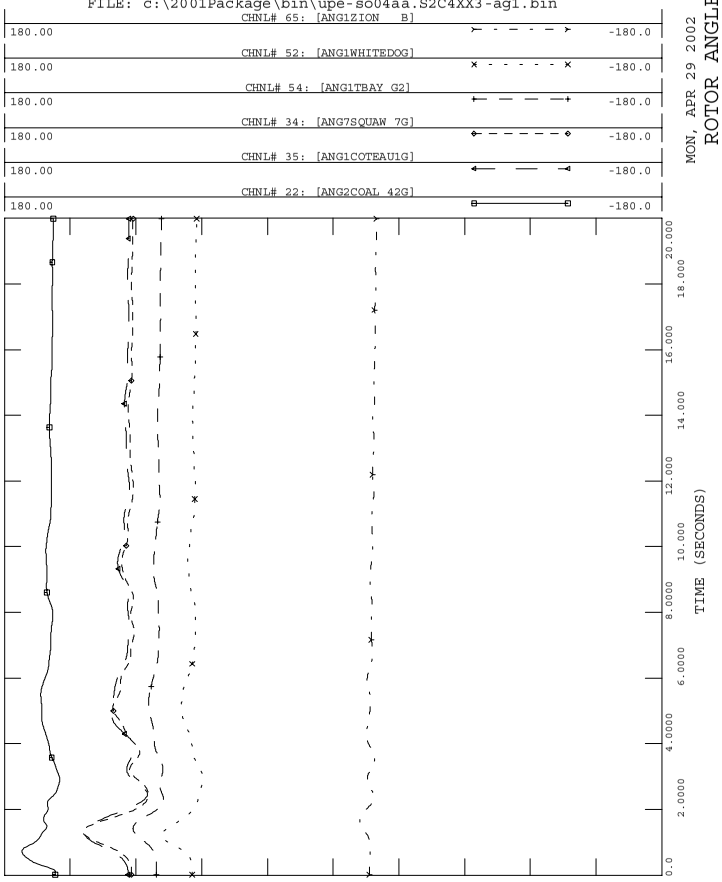
MON, APR 29 2002 18:28
ROTOR ANGLES 6



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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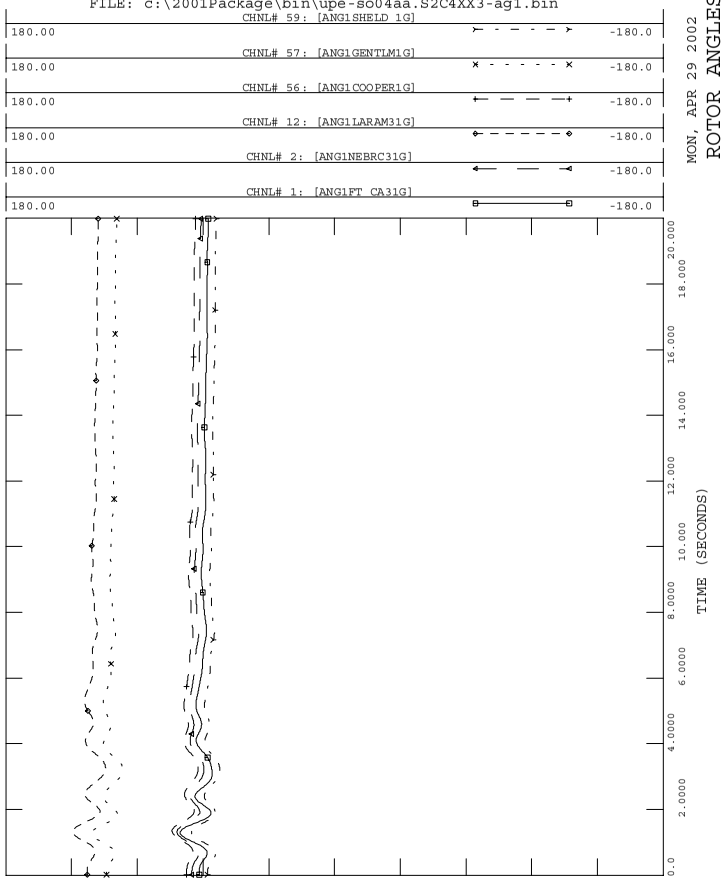
MON, APR 29 2002 18:28
ROTOR ANGLES NB



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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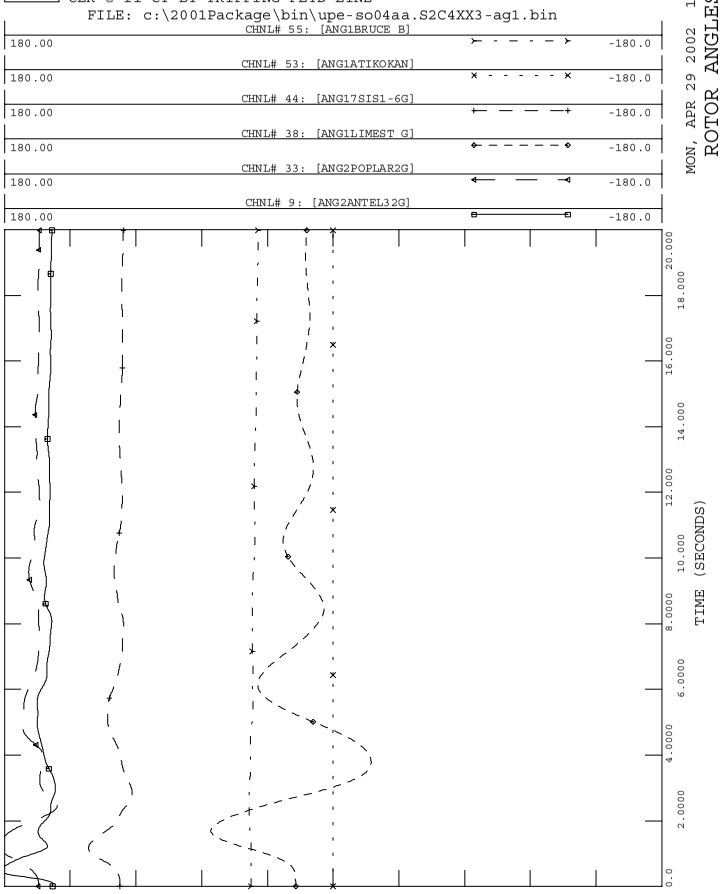
MON, APR 29 2002 18:28
ROTOR ANGLES 5



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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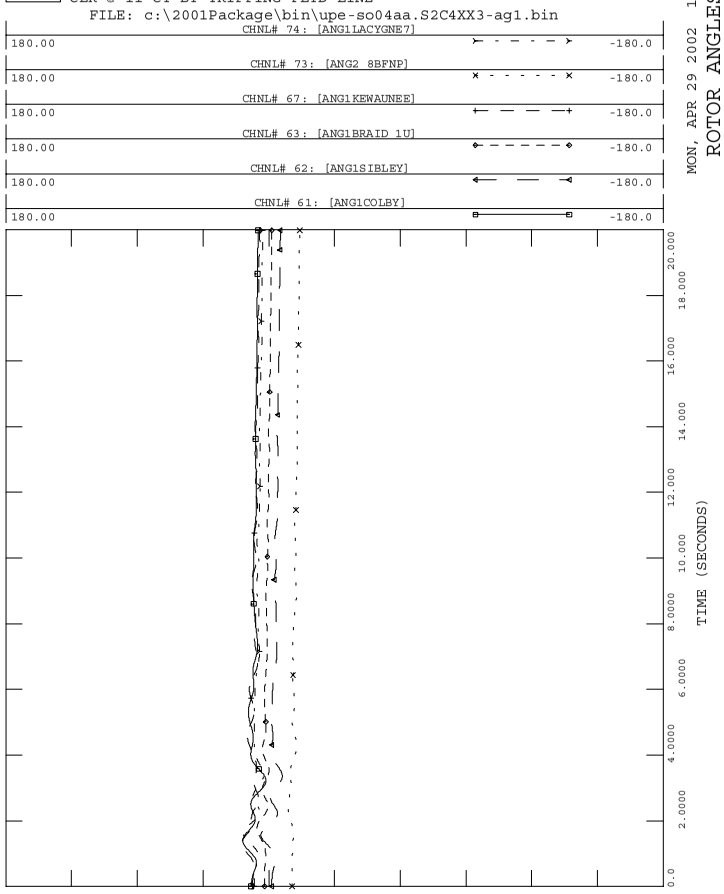
MON, APR 29 2002 18:28
ROTOR ANGLES 7



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28
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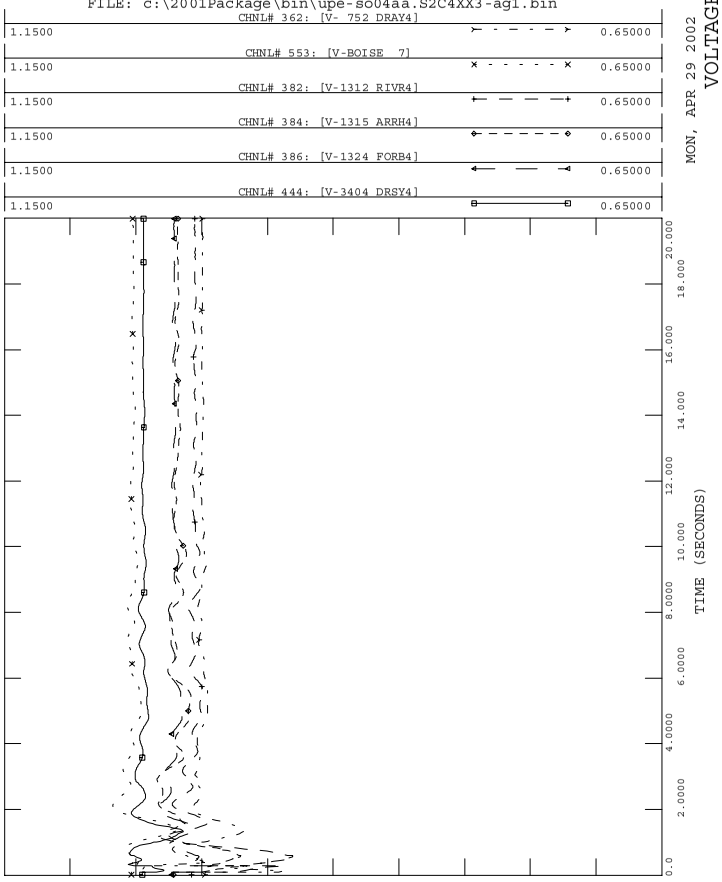

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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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MON, APR 29 2002 18:28
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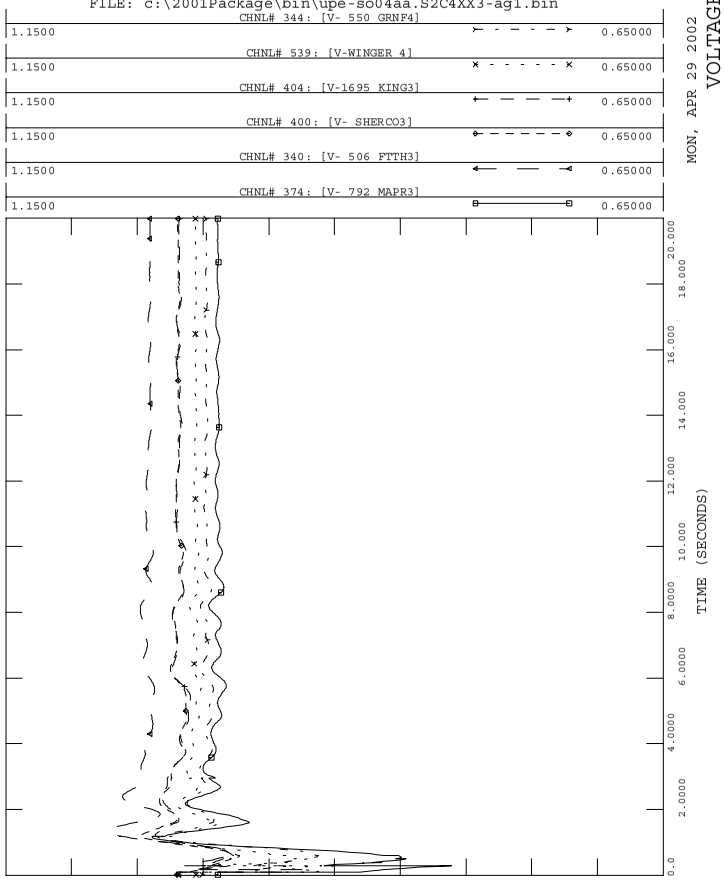

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CLR @ 11 CY BY TRIPPING FLTD LINE
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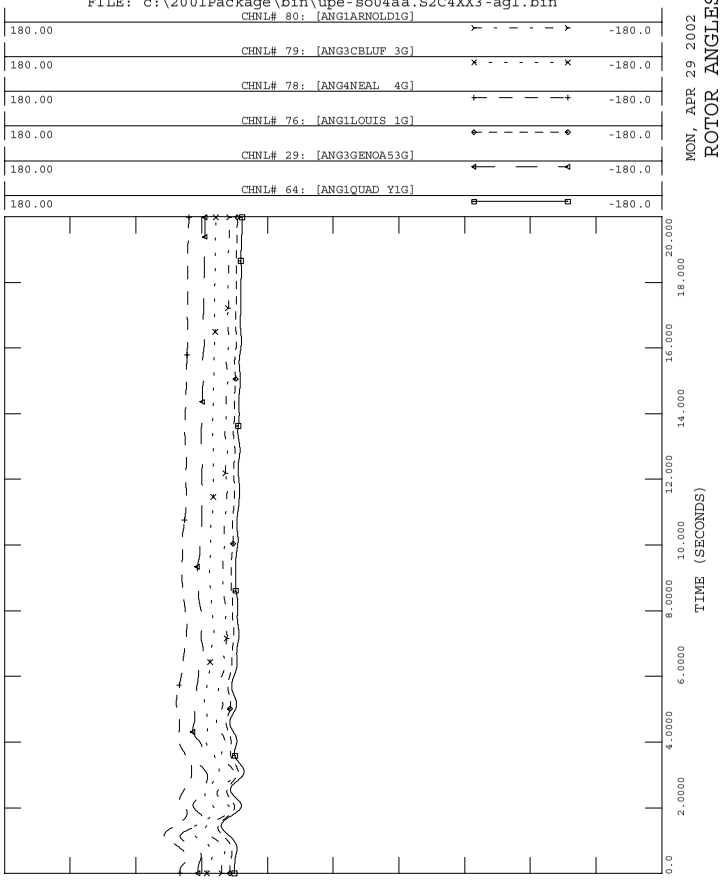
MON, APR 29 2002 18:28
ROTOR ANGLES IA



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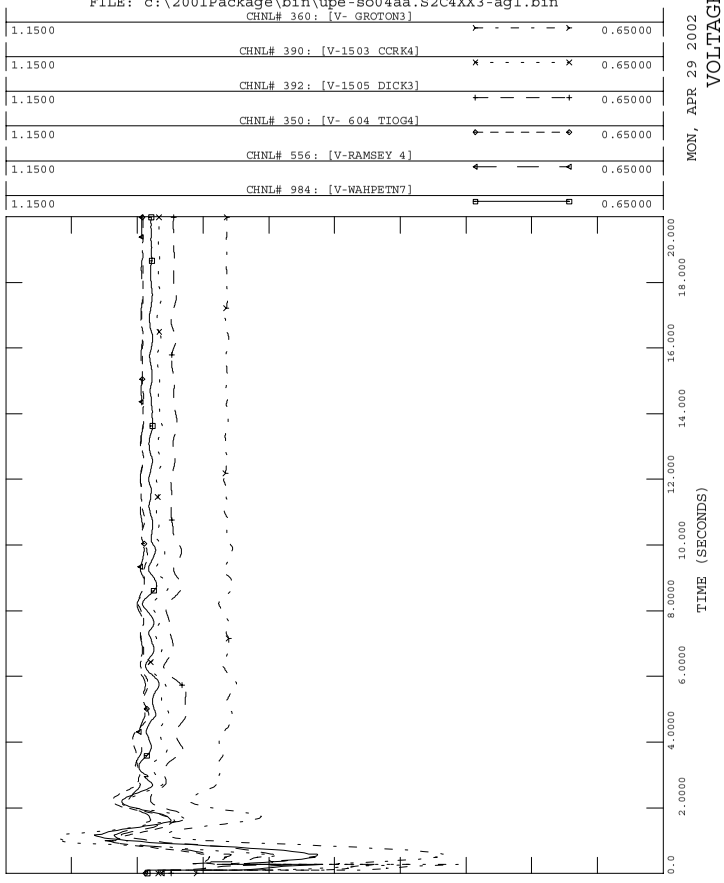
MON, APR 29 2002 18:28
VOLTAGES 2



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MON, APR 29 2002 18:28
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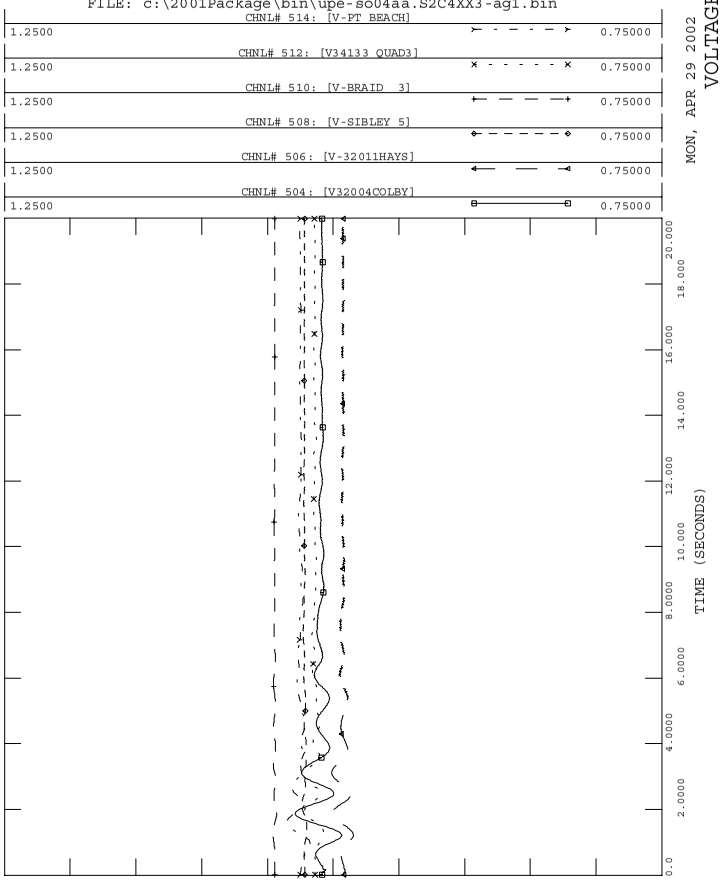

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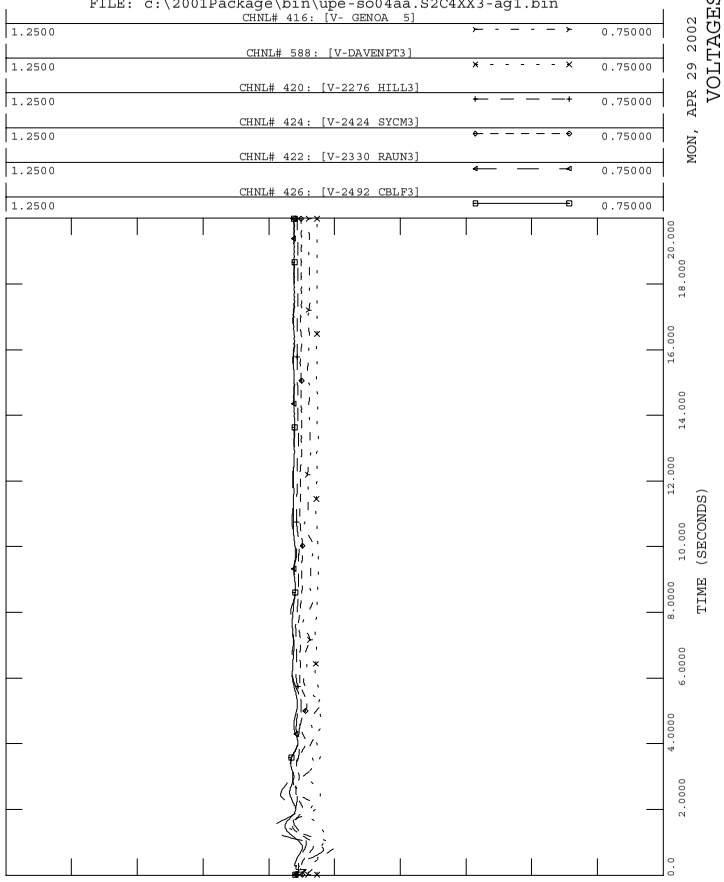
VOLTAGES IA



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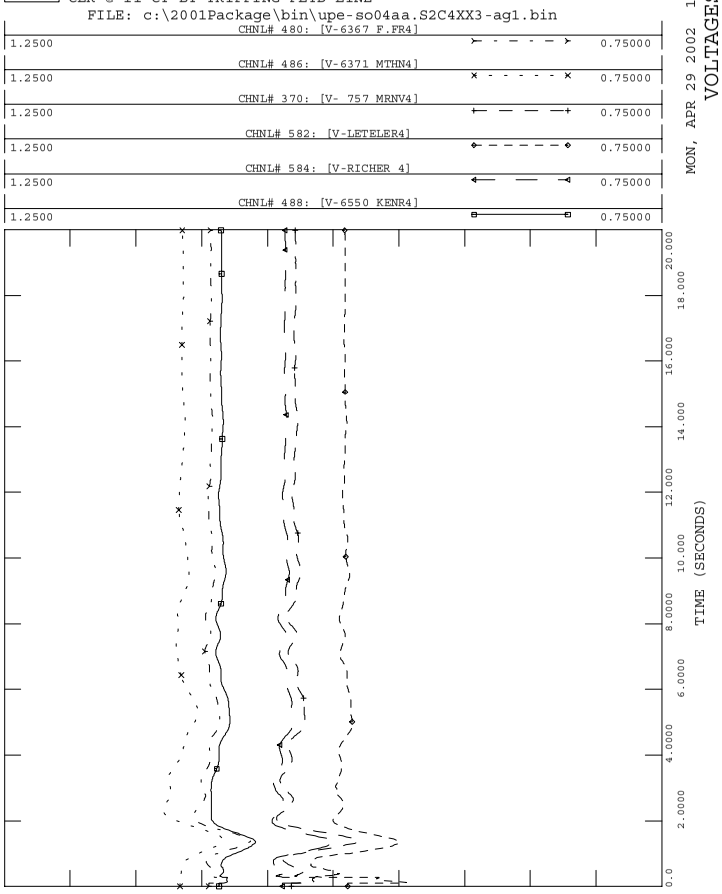

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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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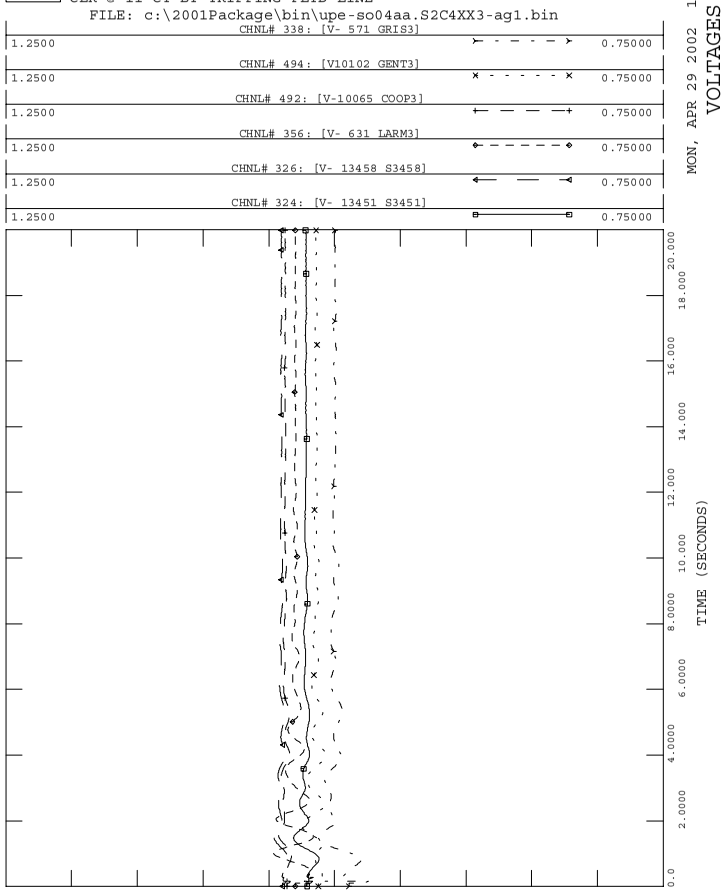
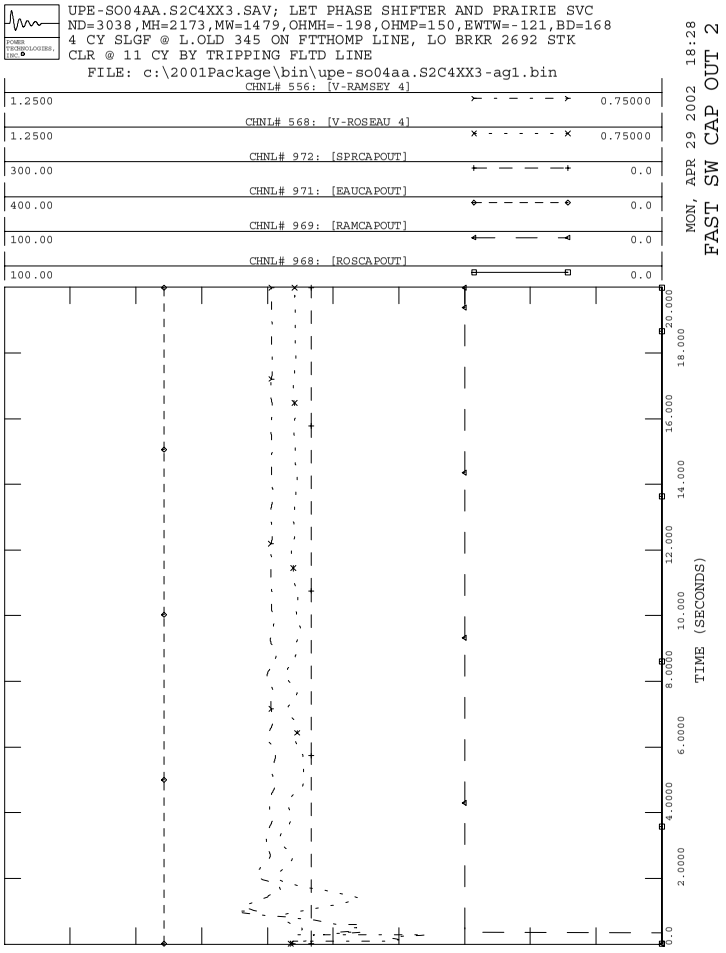
MON, APR 29 2002 18:28
VOLTAGES NB

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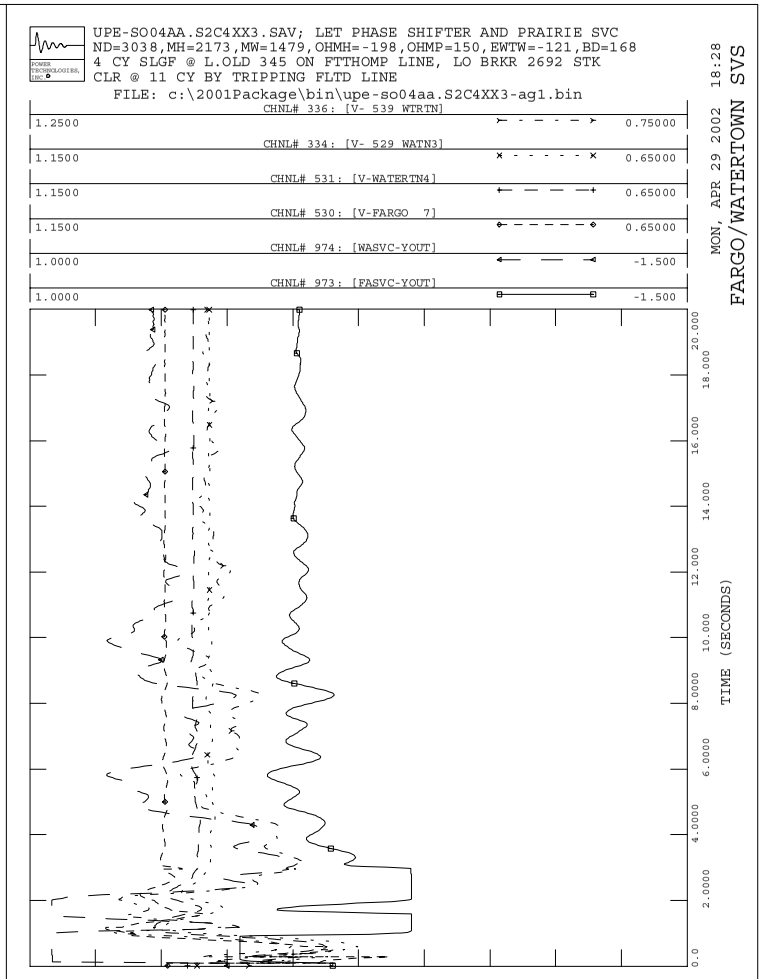
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
MON, APR 29 2002 18:28
FAST SW CAP OUT 2
TIME (SECONDS)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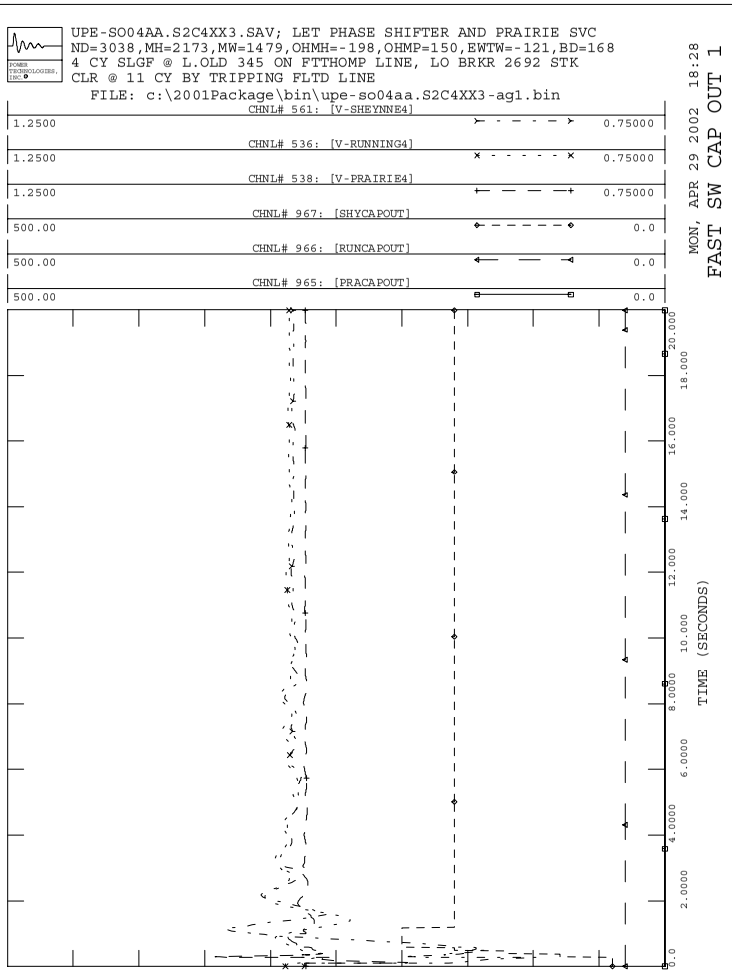
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
MON, APR 29 2002 18:28
FARGO/WATERTOWN SVS
TIME (SECONDS)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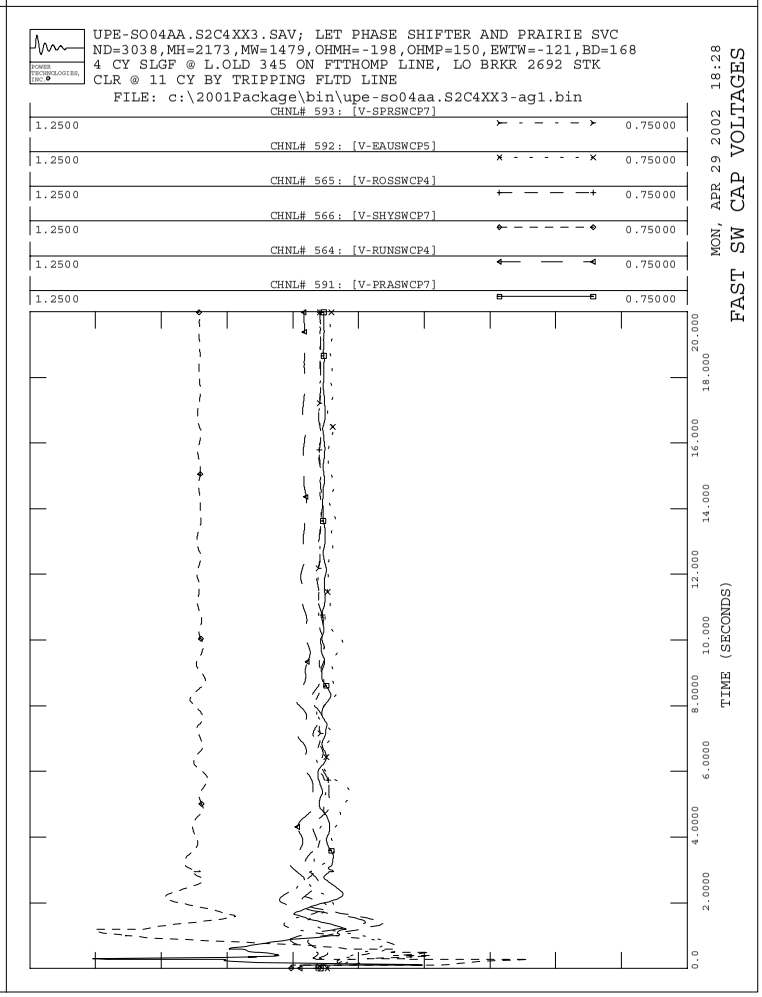
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
MON, APR 29 2002 18:28
FAST SW CAP OUT 1
TIME (SECONDS)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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
MON, APR 29 2002 18:28
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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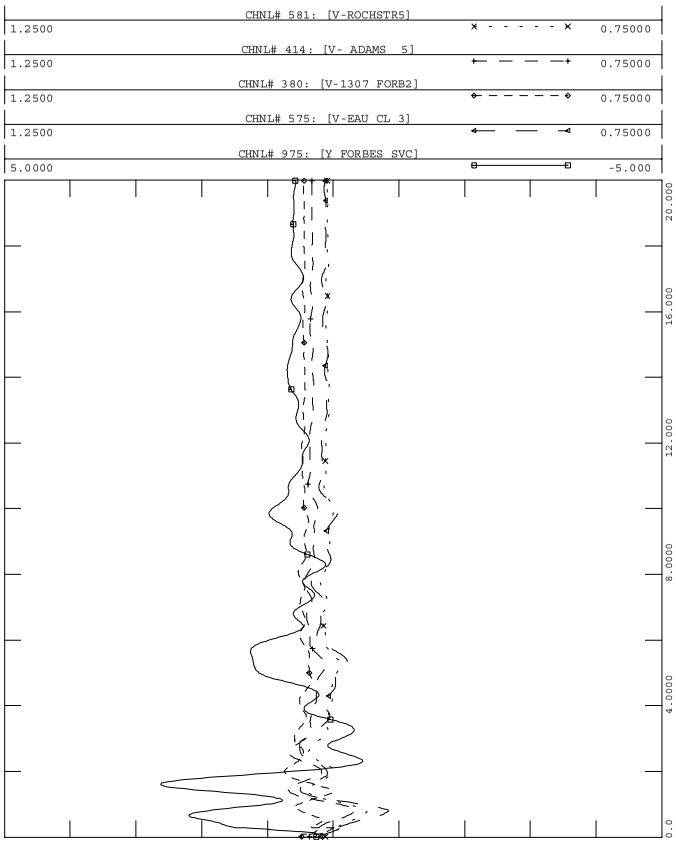
MON, APR 29 2002 18:28

SVC & WISCONSIN VOLT



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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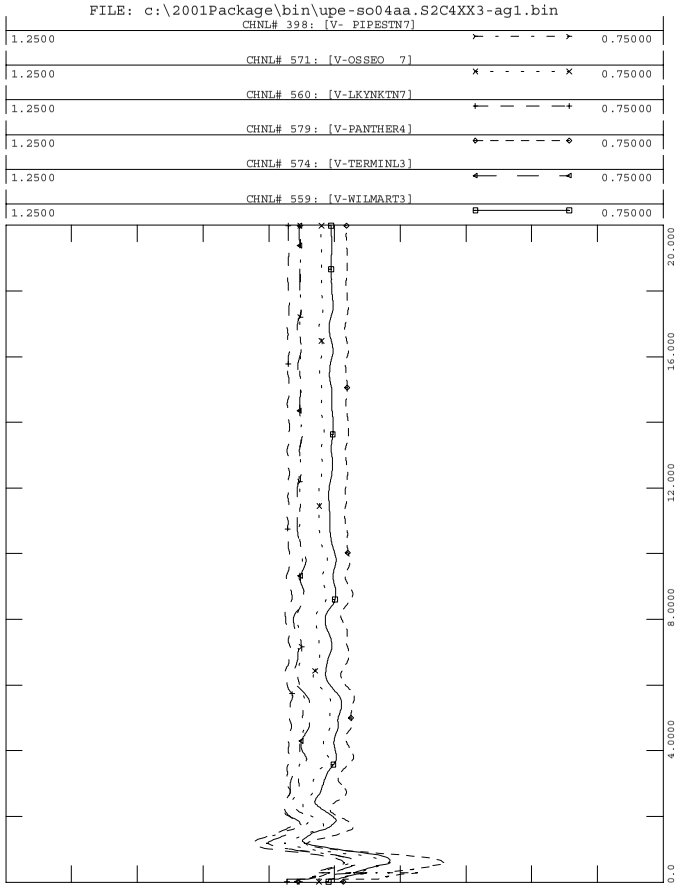
MON, APR 29 2002 18:28

TC VOLTAGES



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ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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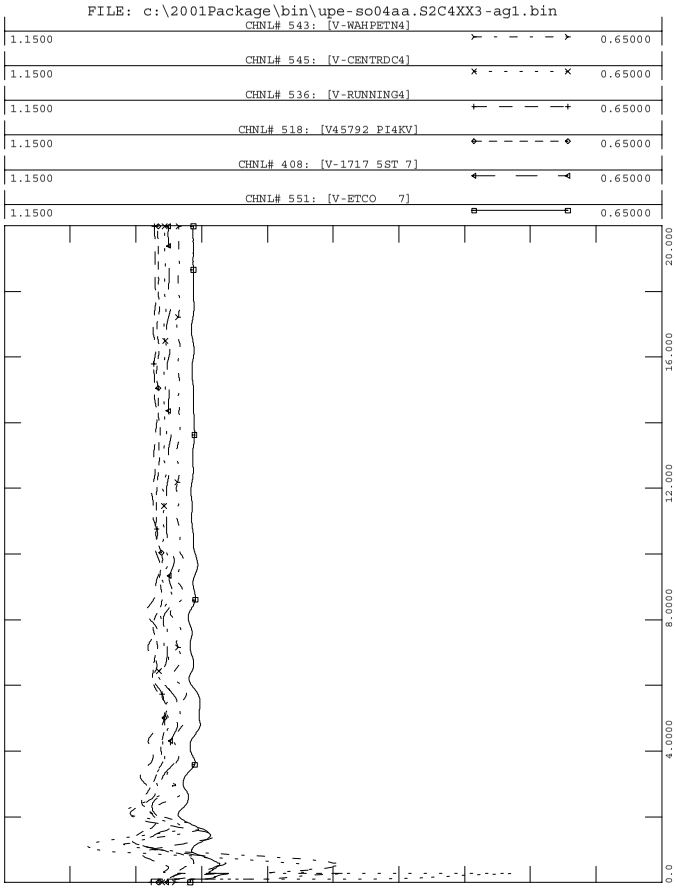
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28

VOLTAGES 6



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ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
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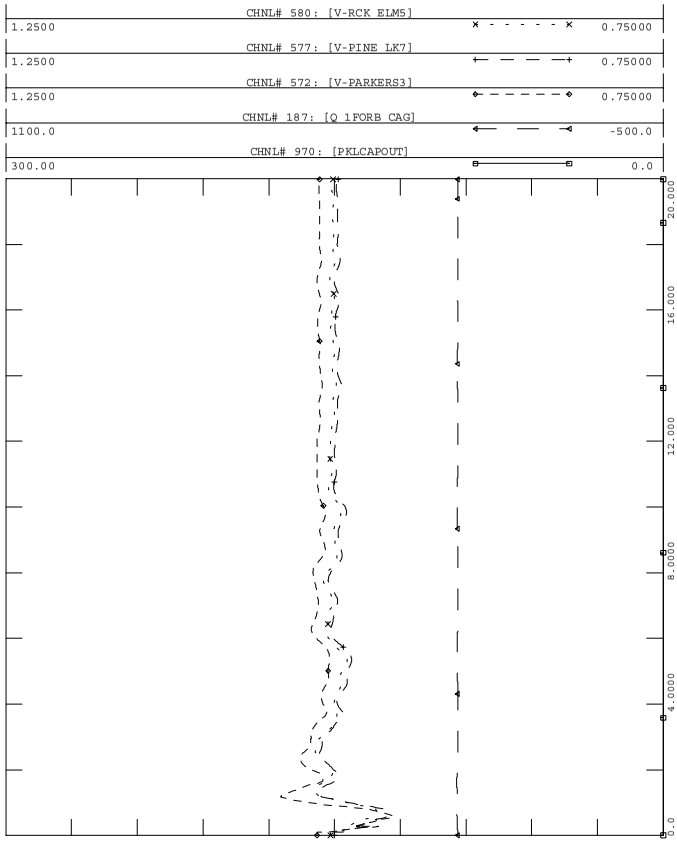
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28

FORBES SVS OUT & VOLTAGES



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ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
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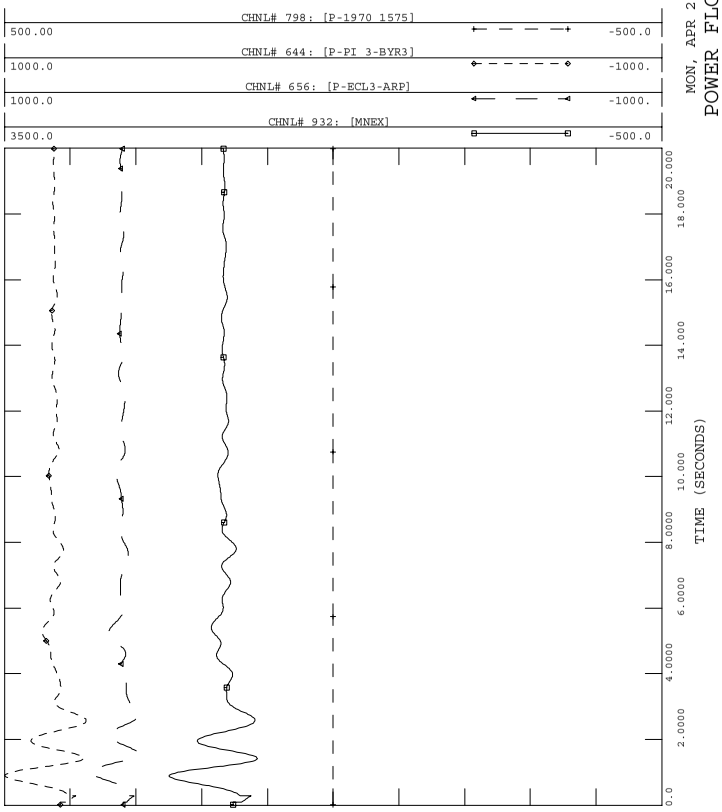
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28
POWER FLOW SUMS 2



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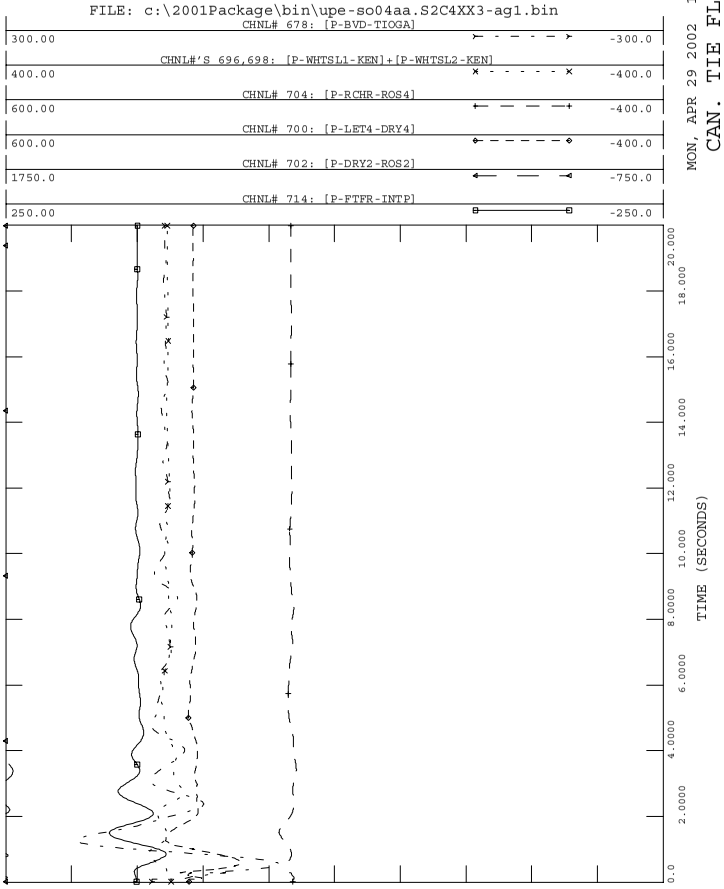
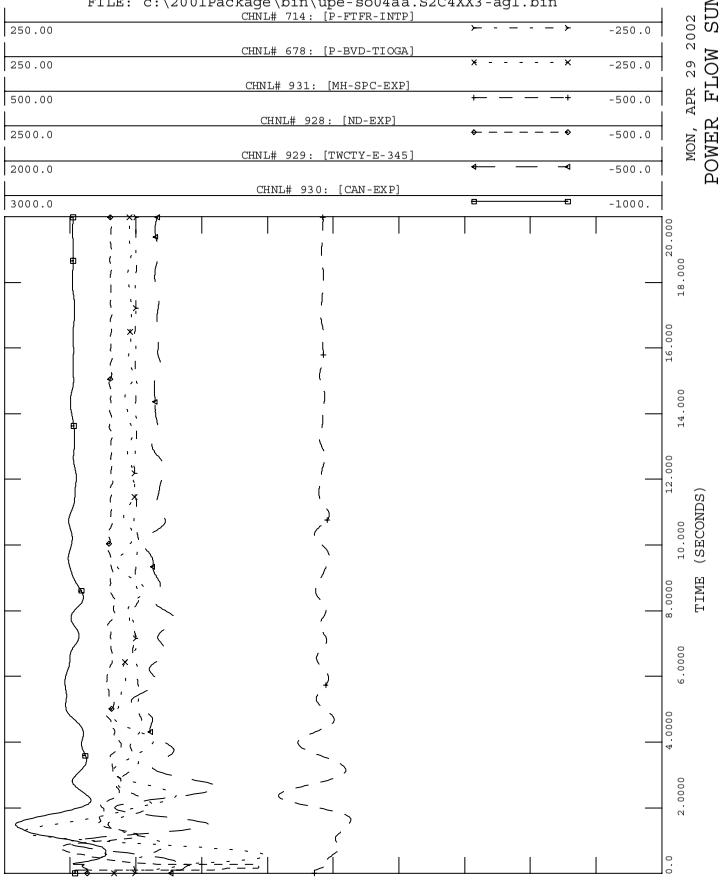
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28
CAN. TIE FLOWS



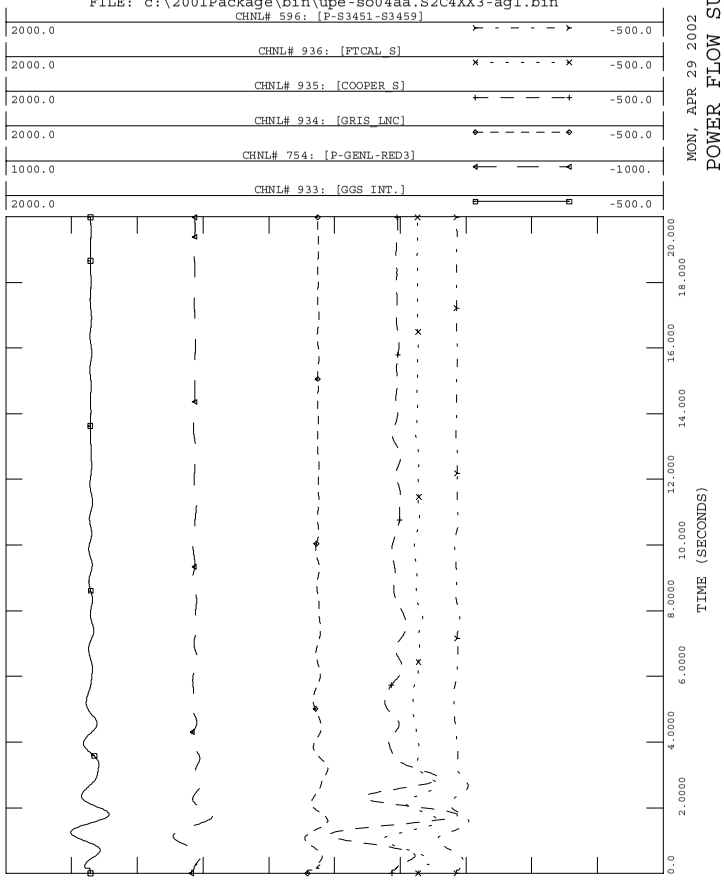
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28
POWER FLOW SUMS 1



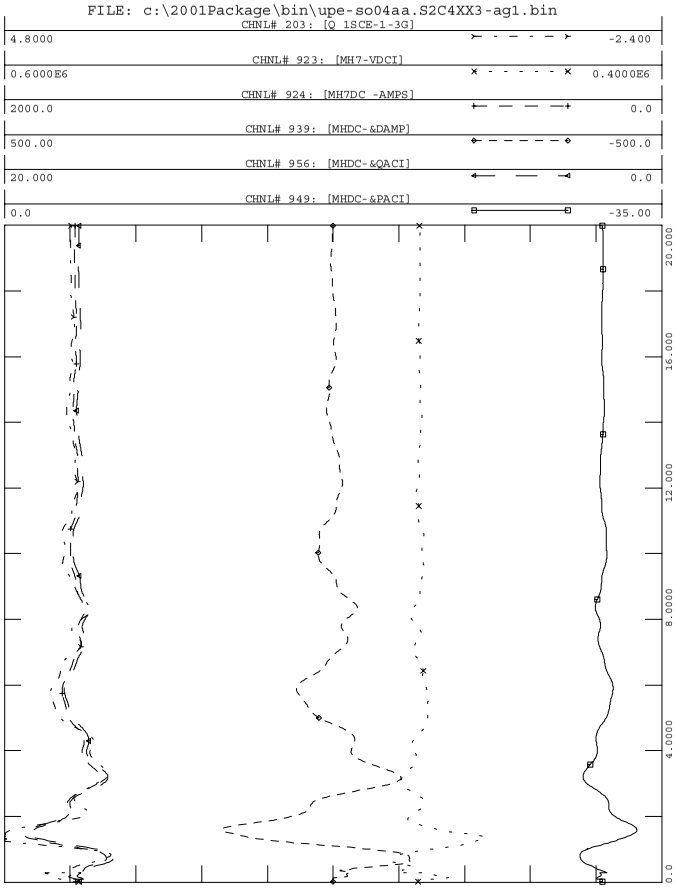
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28
POWER FLOW SUM 3



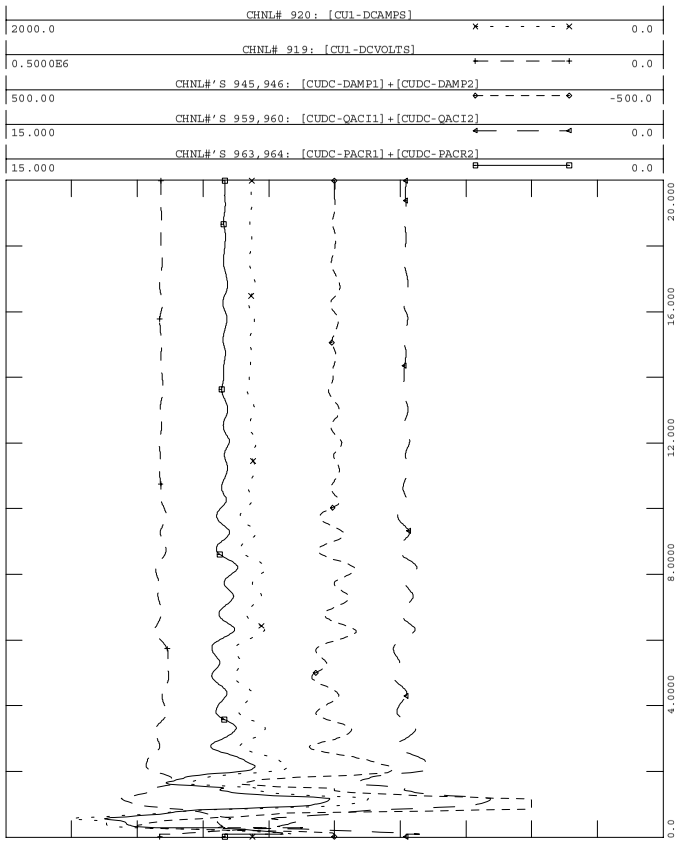
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28
MH DC PARAMETERS



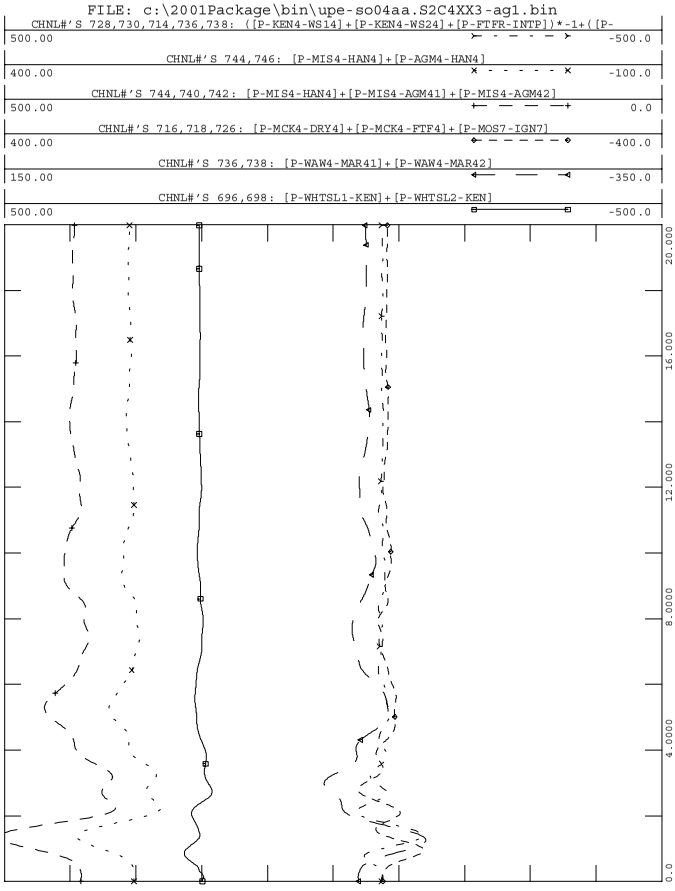
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28
CU DC #1



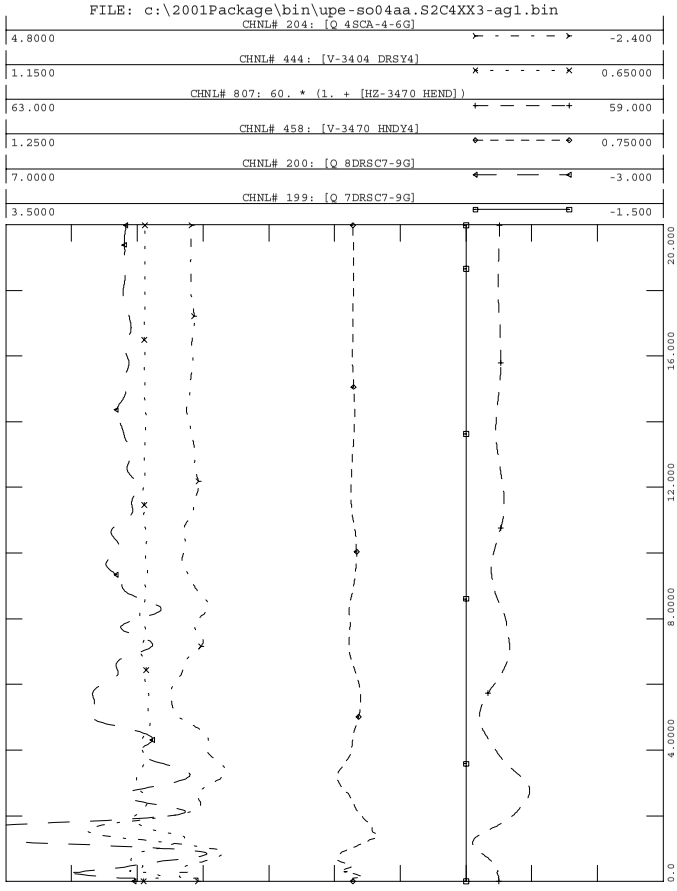
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

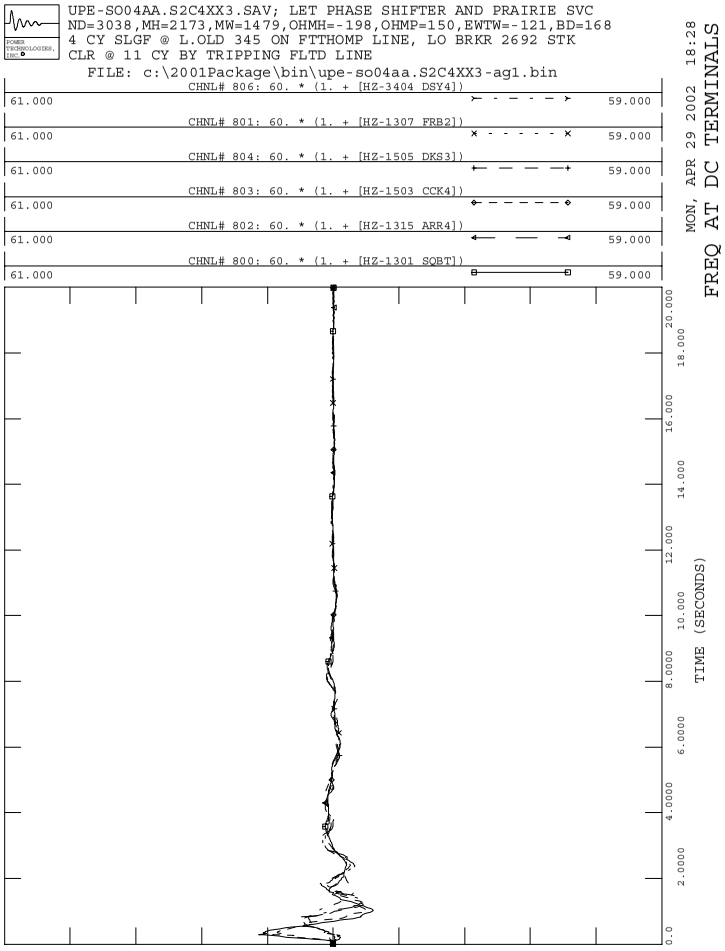
MON, APR 29 2002 18:28
OH TIE FLOWS

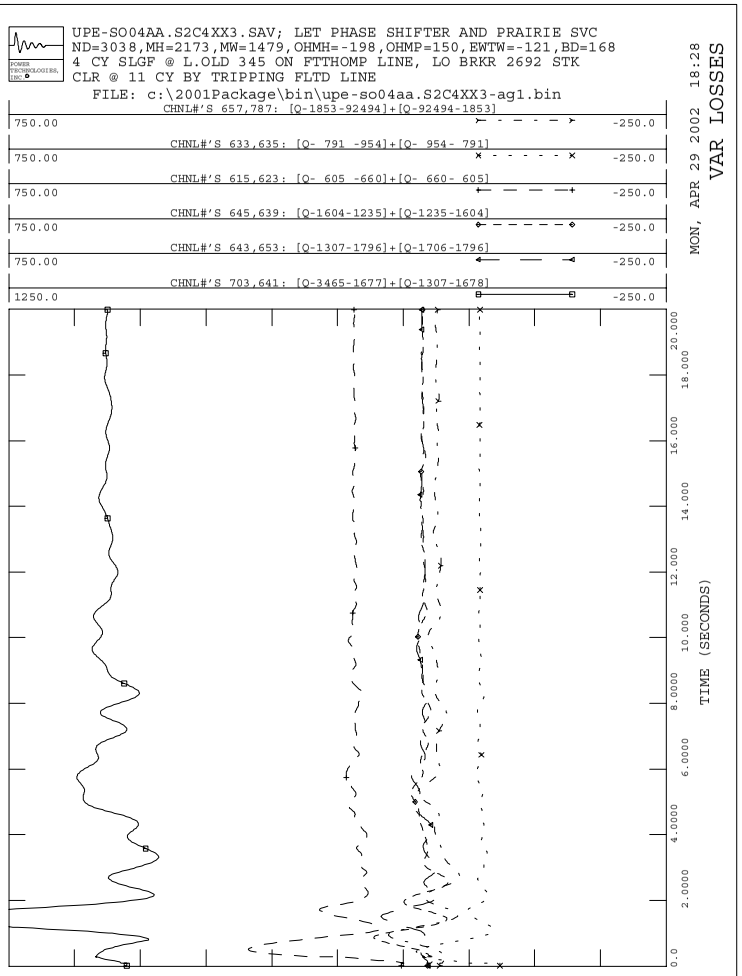


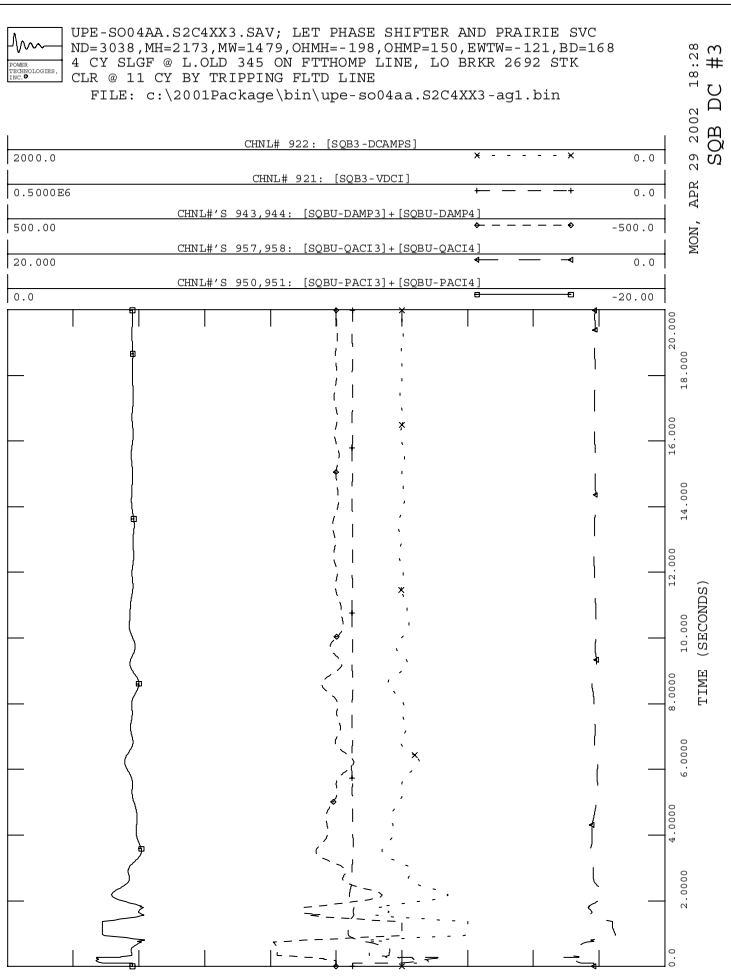
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

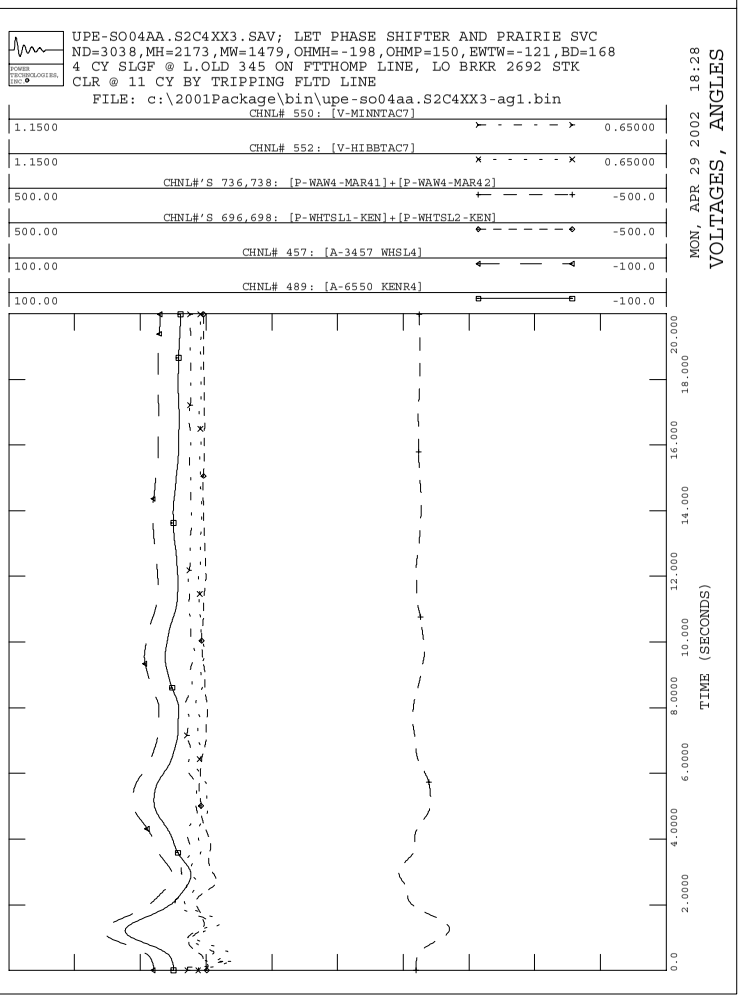
MON, APR 29 2002 18:28
MH DC PARAMETERS




UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
MON, APR 29 2002 18:28
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
MON, APR 29 2002 18:28
VAR LOSSES
TIME (SECONDS)

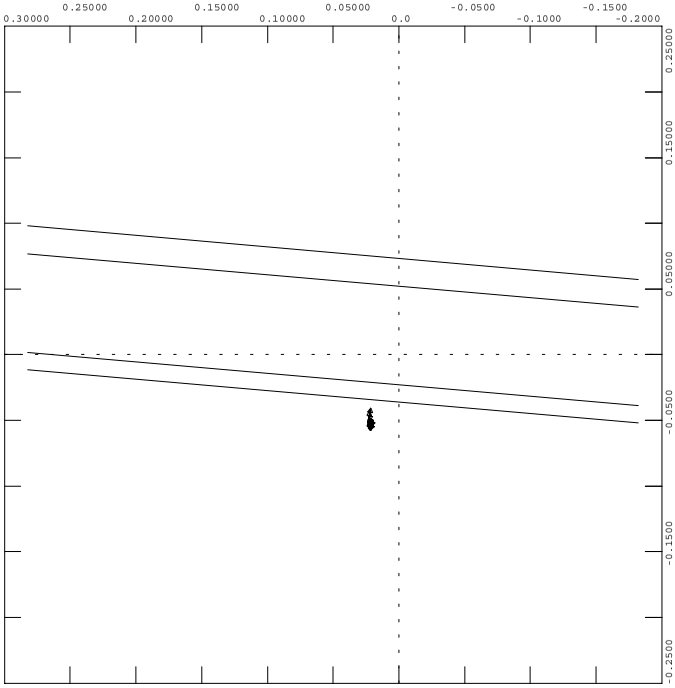

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
MON, APR 29 2002 18:28
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
MON, APR 29 2002 18:28
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

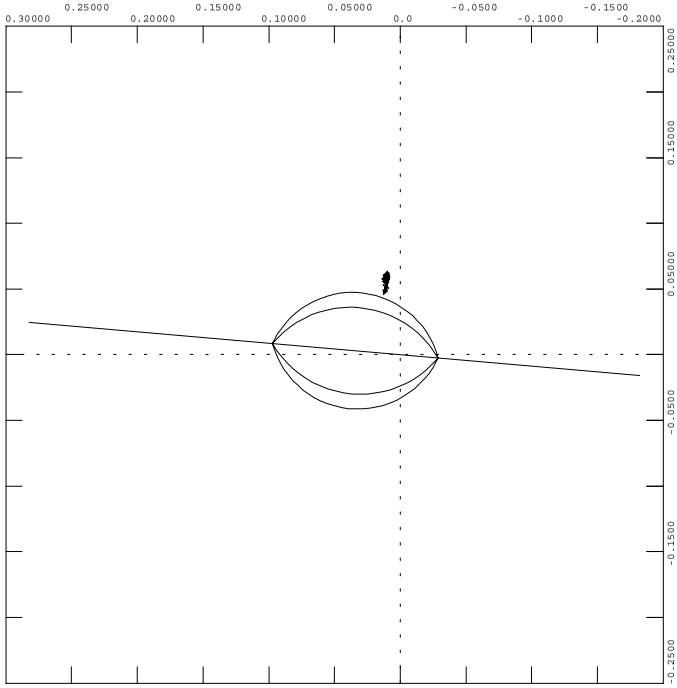


MON, APR 29 2002 18:28
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

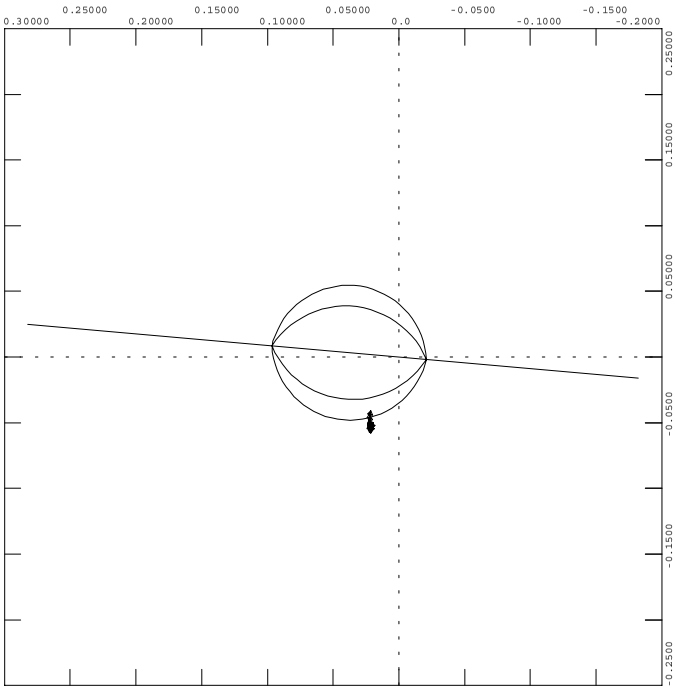


MON, APR 29 2002 18:28
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

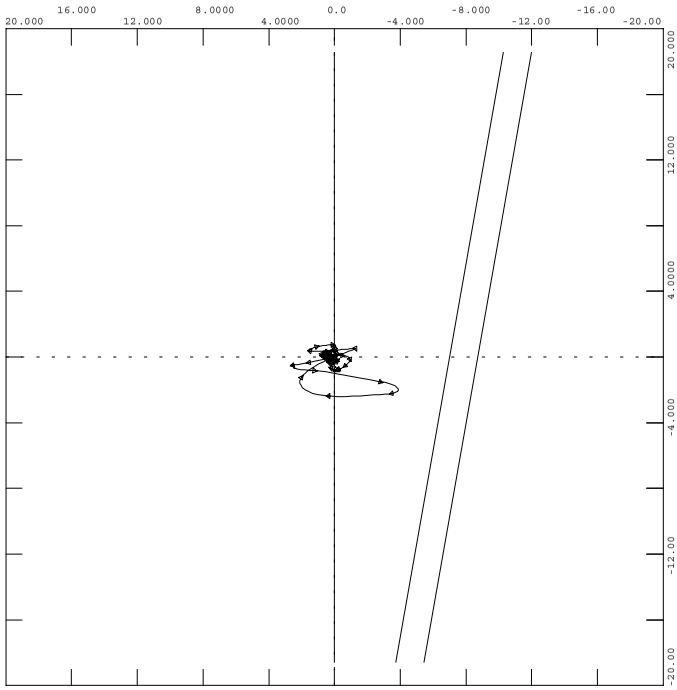


MON, APR 29 2002 18:28
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

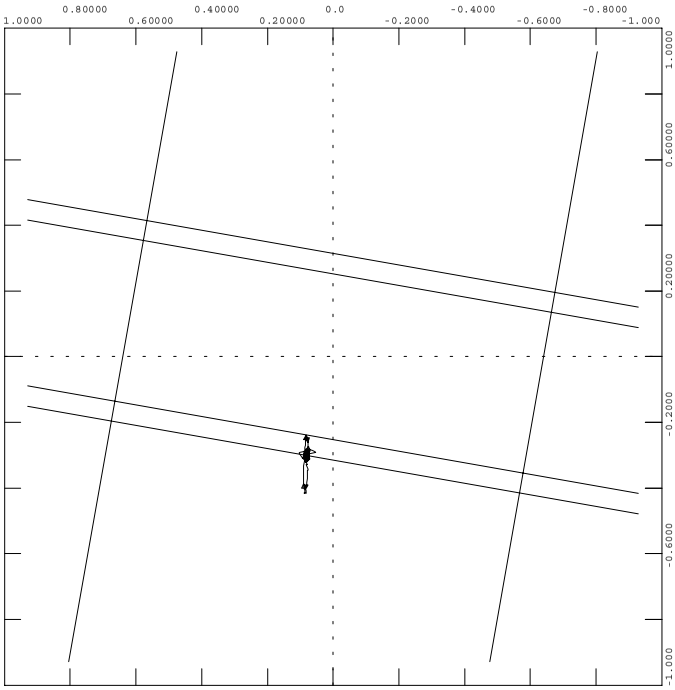


MON, APR 29 2002 18:28
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

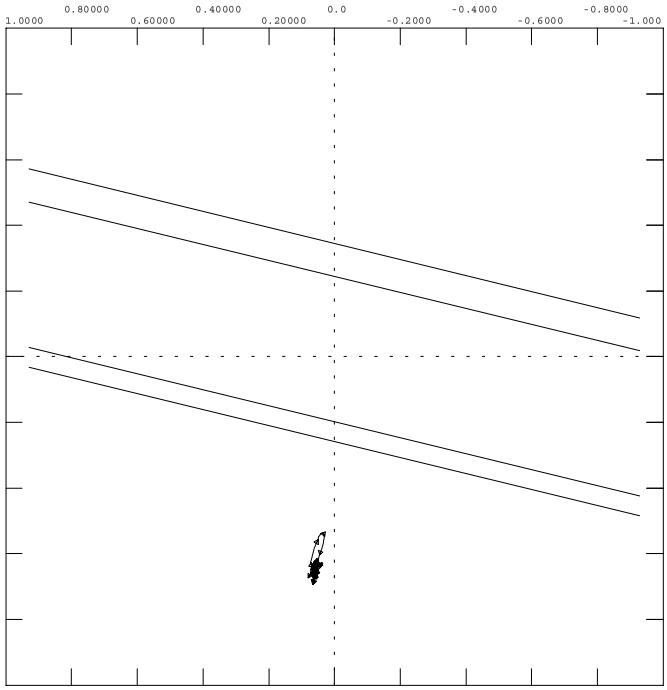
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

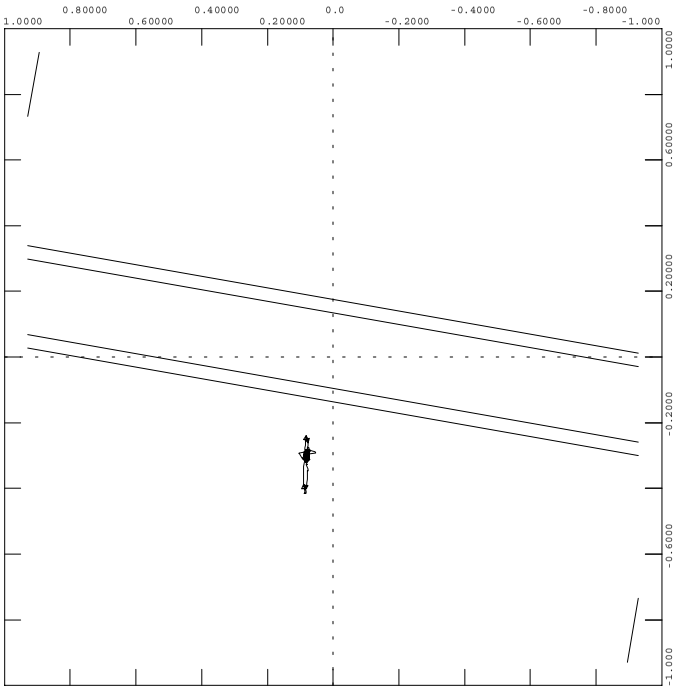
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

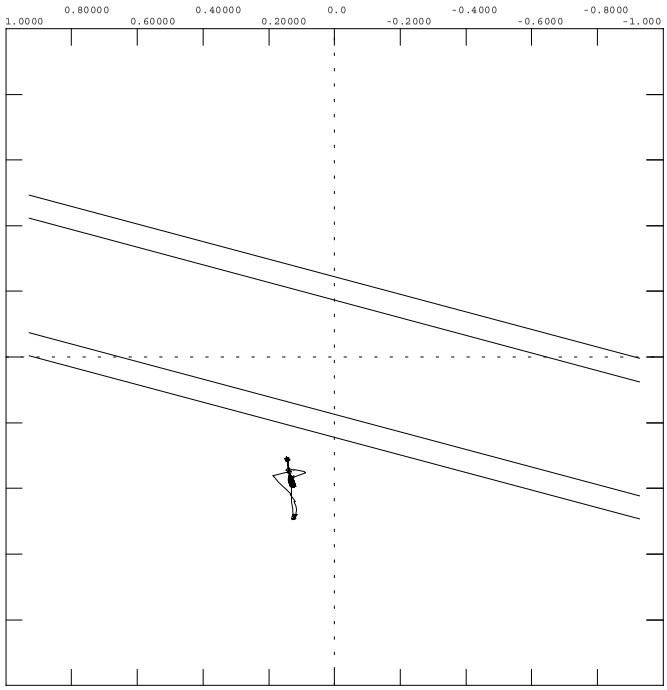
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

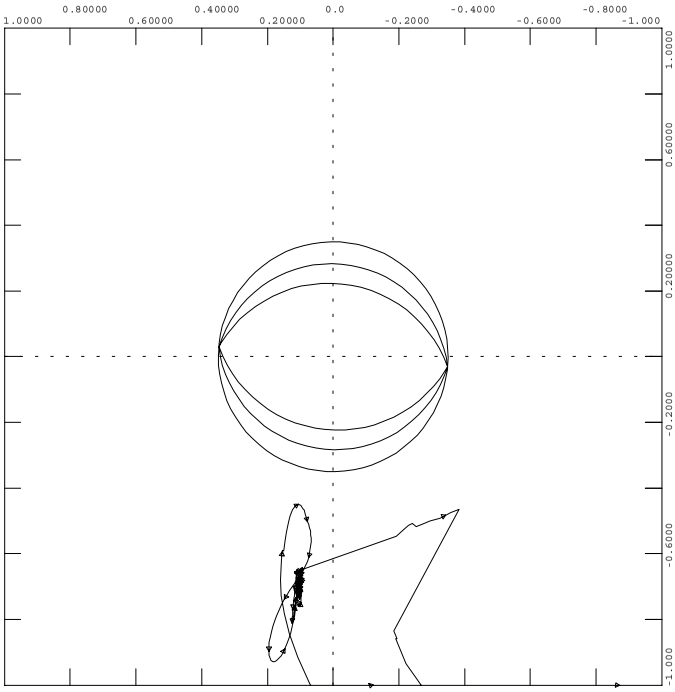
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

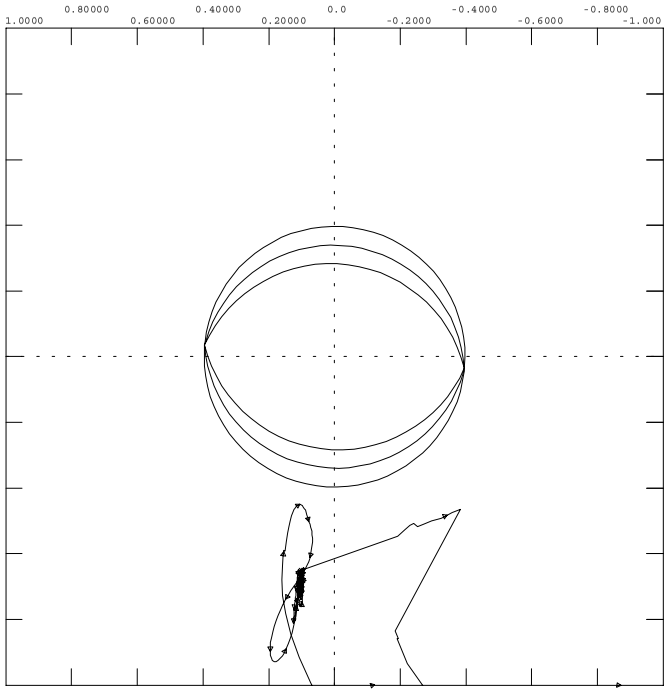
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

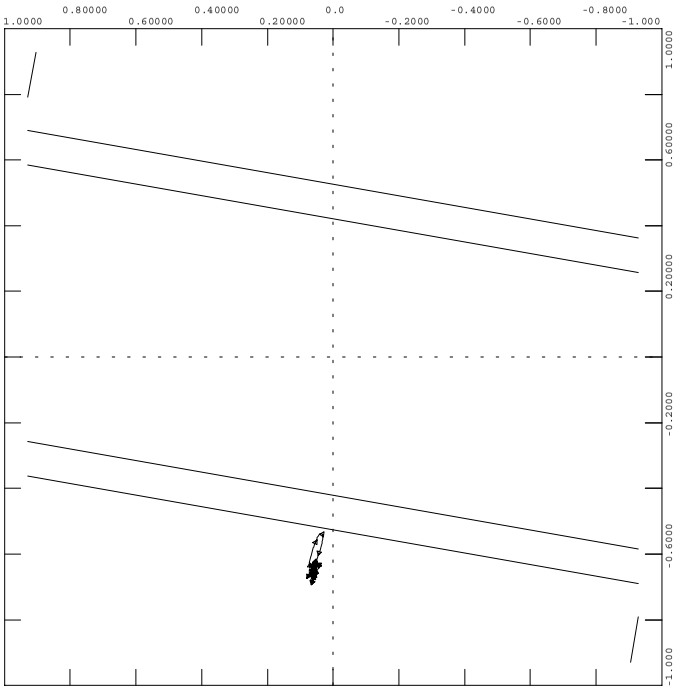
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

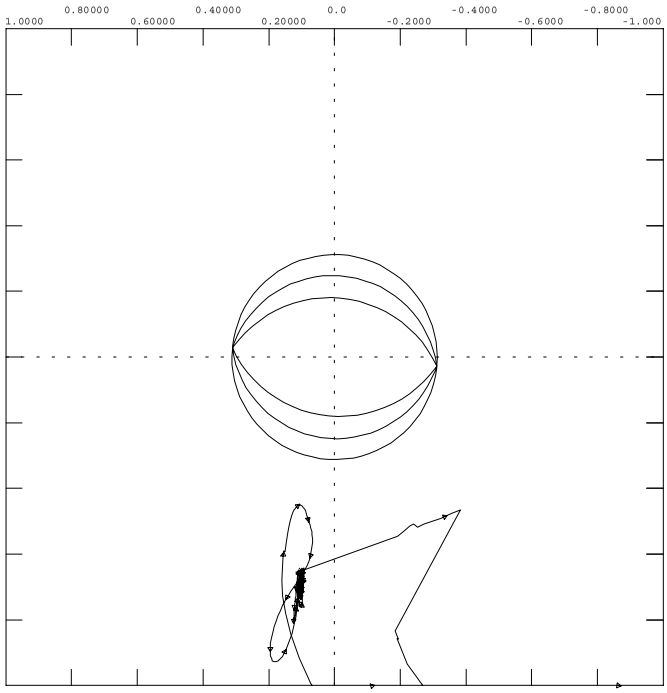
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



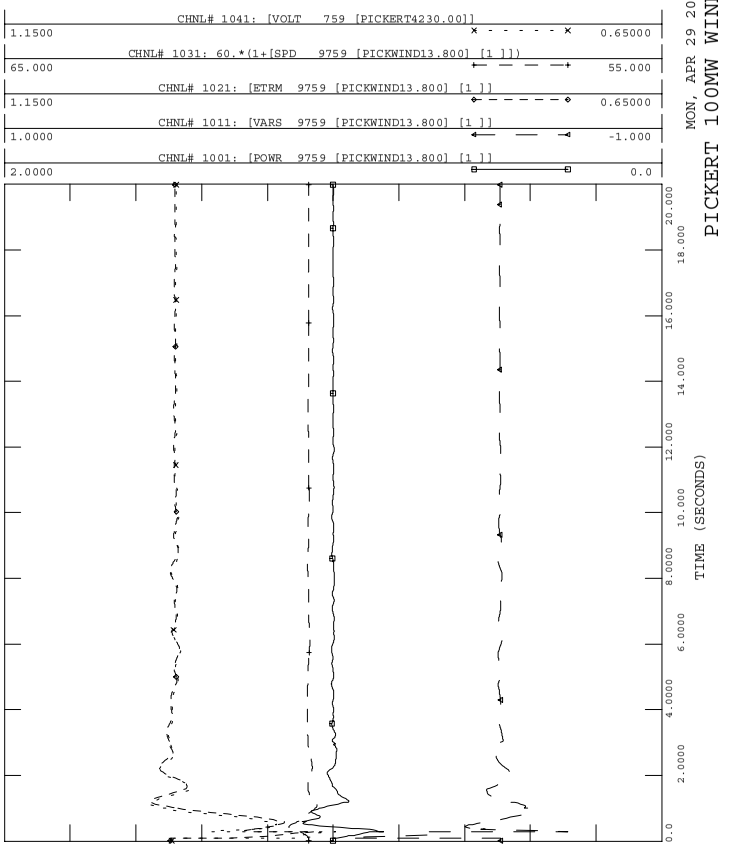
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

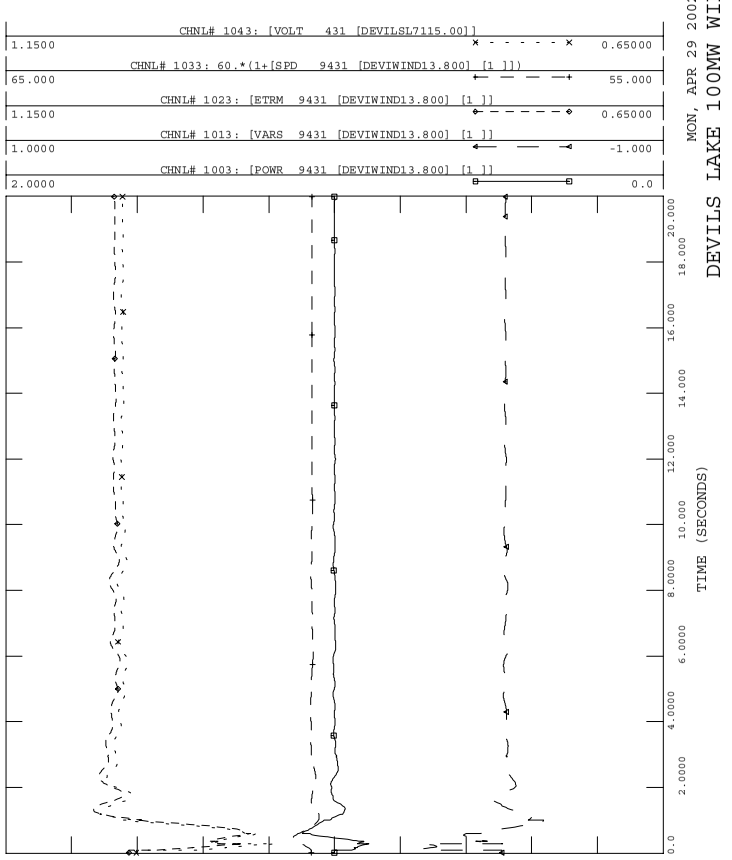
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin



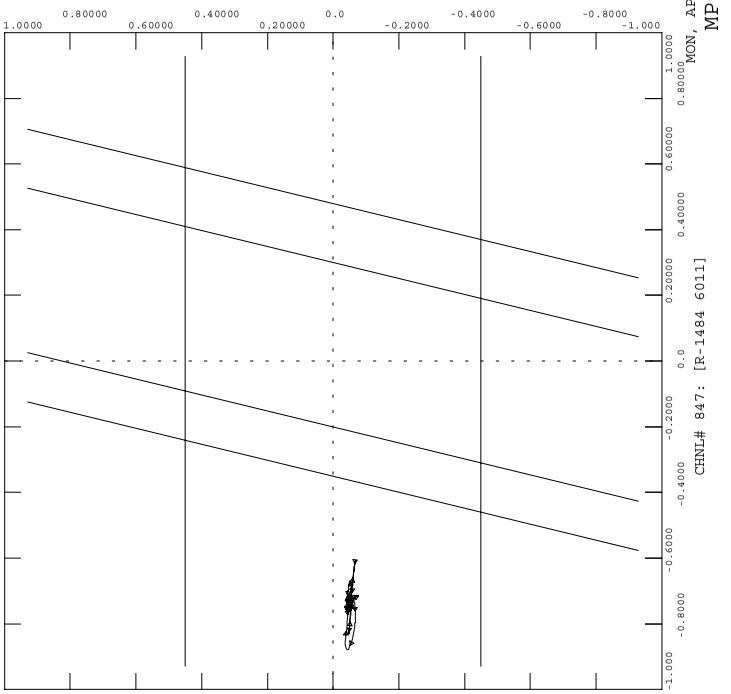
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin



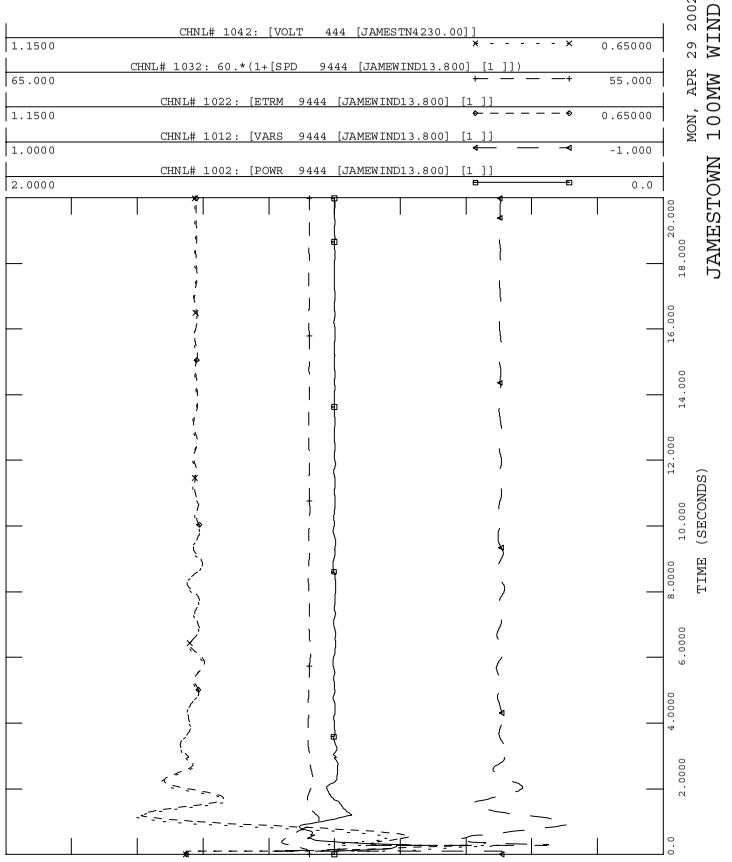
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

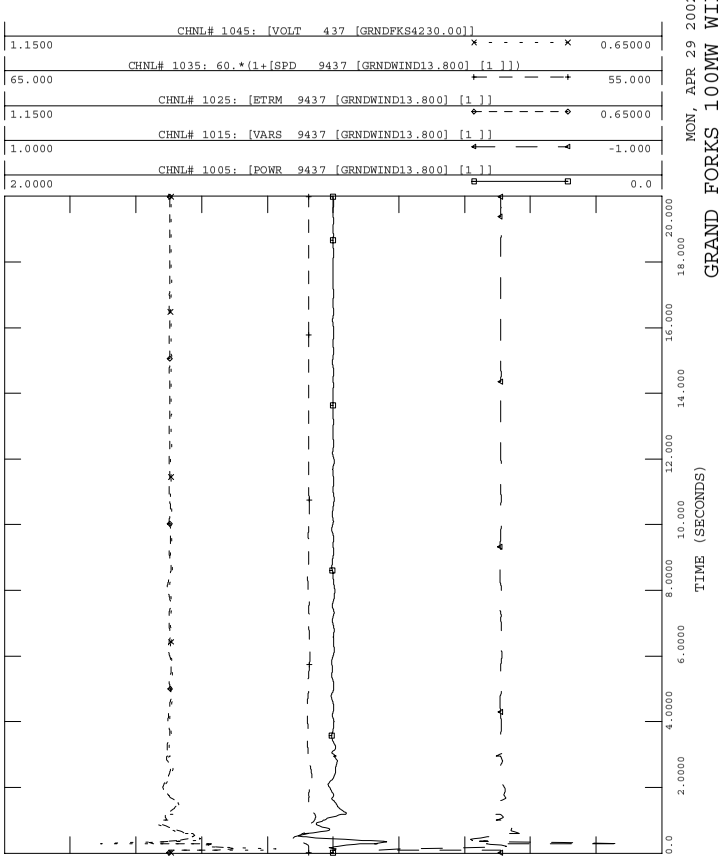
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

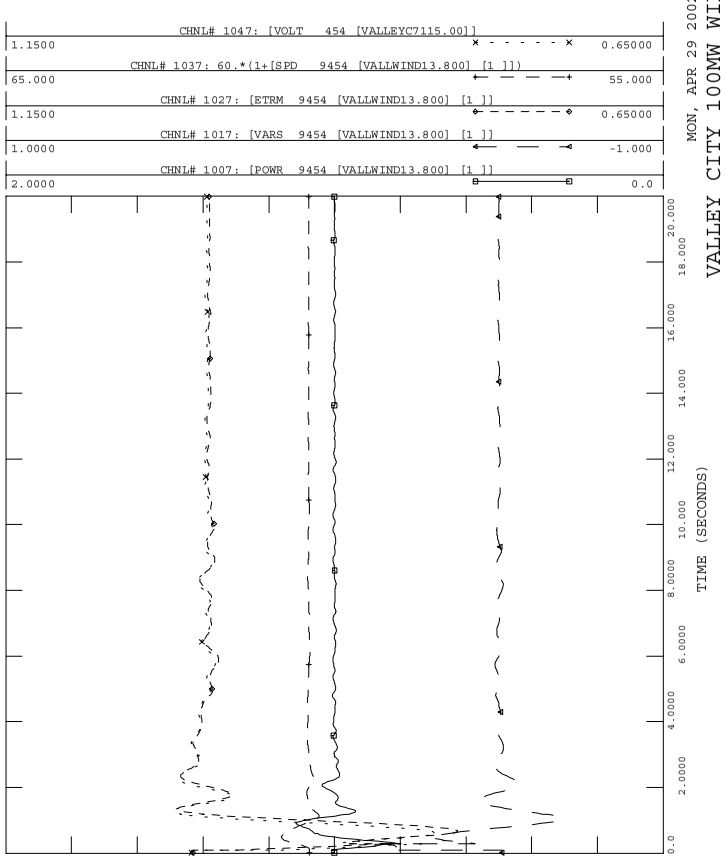


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin



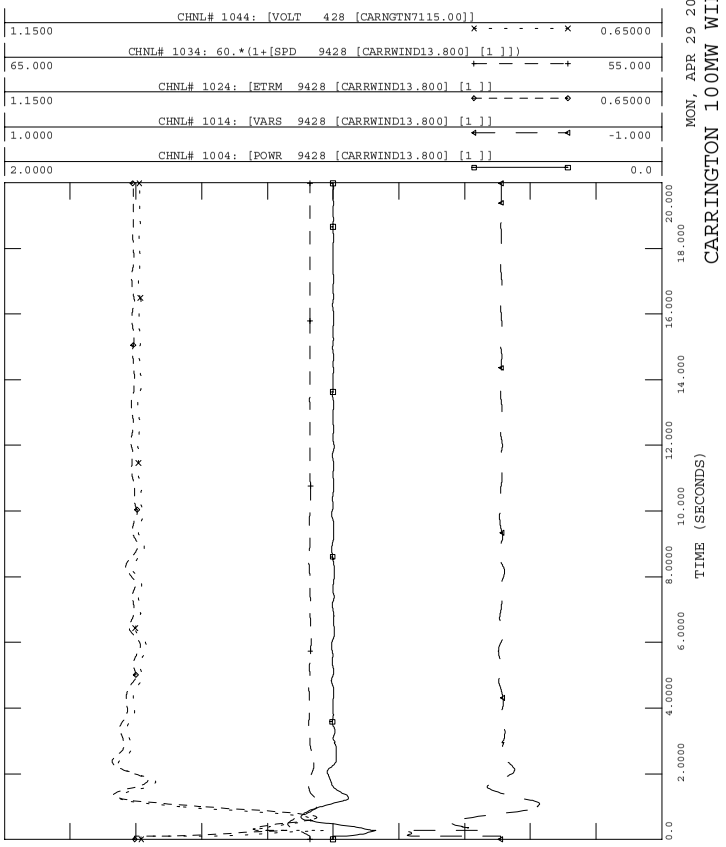
MON, APR 29 2002 18:28
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin



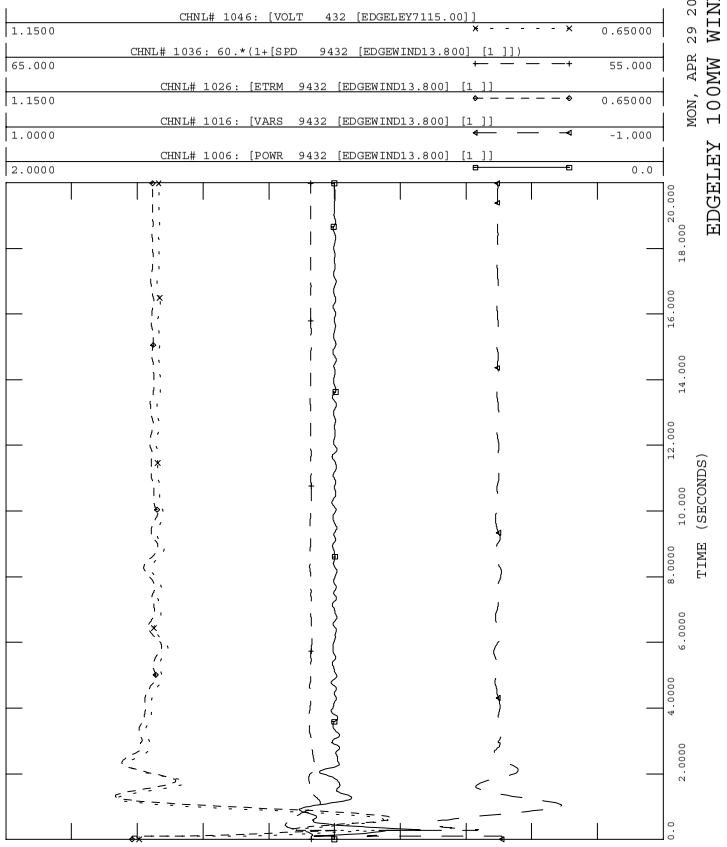
MON, APR 29 2002 18:28
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin



MON, APR 29 2002 18:28
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

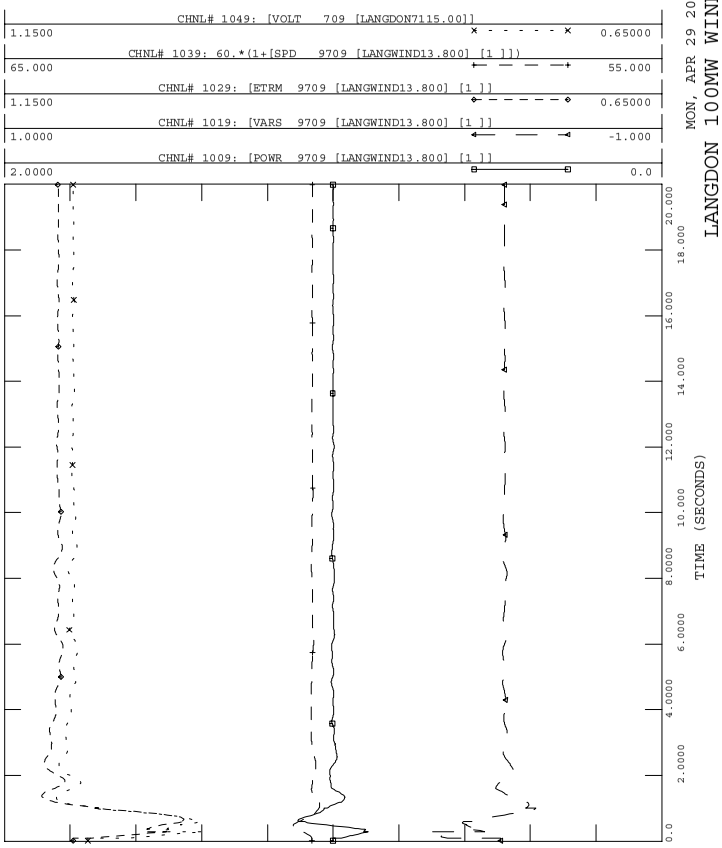


MON, APR 29 2002 18:28
EDGELEY 100MW WIND UNIT

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28

LANGDON 100MW WIND UNIT



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

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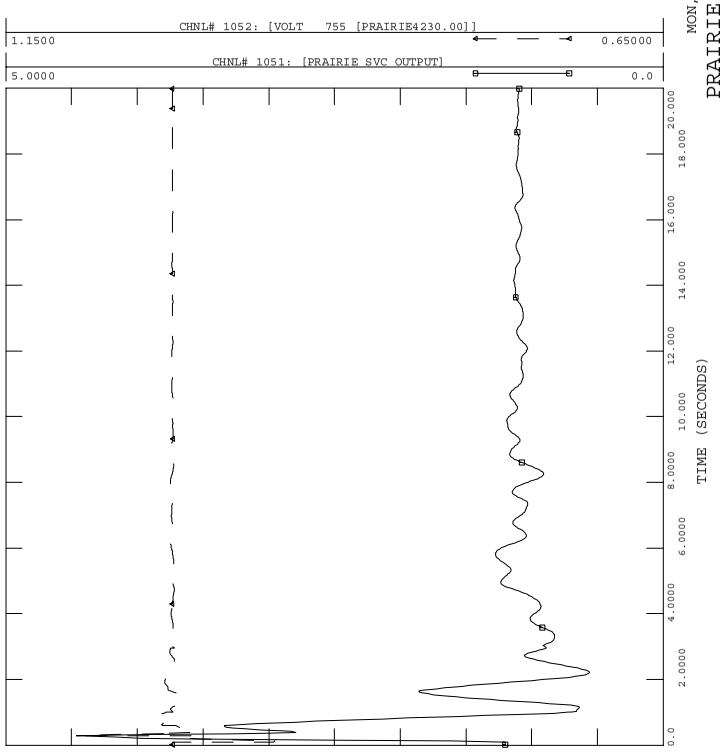
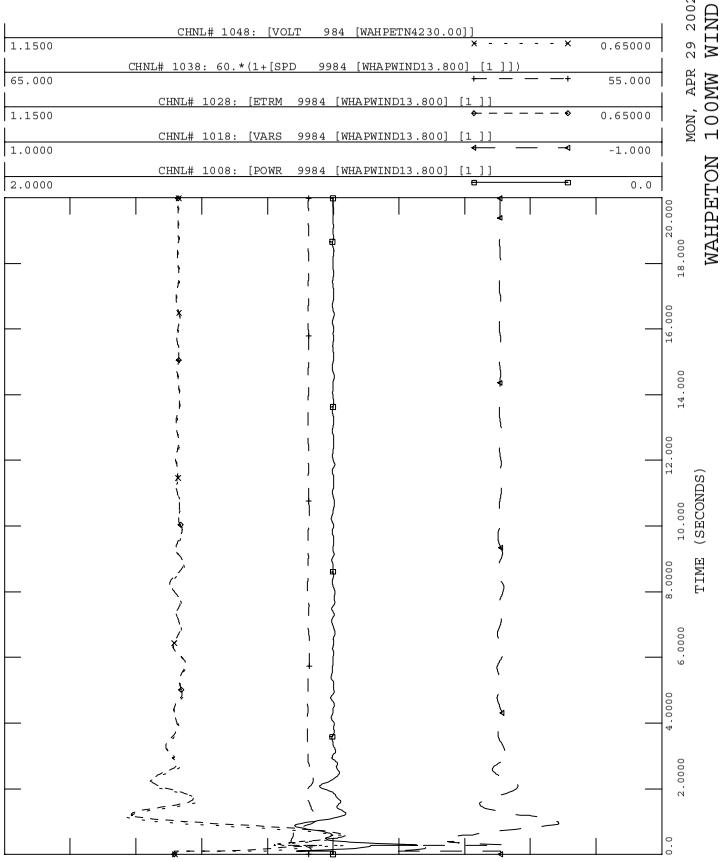
PRAIRIE SVC RESPONSE



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28

WAHPETON 100MW WIND UNIT



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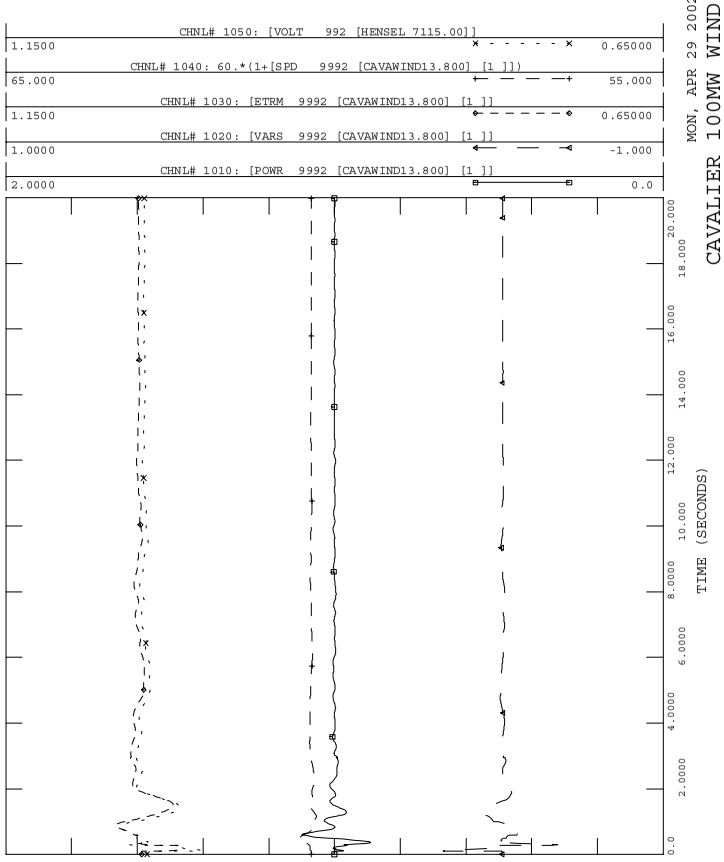
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag1.bin

MON, APR 29 2002 18:28

CAVALIER 100MW WIND UNIT

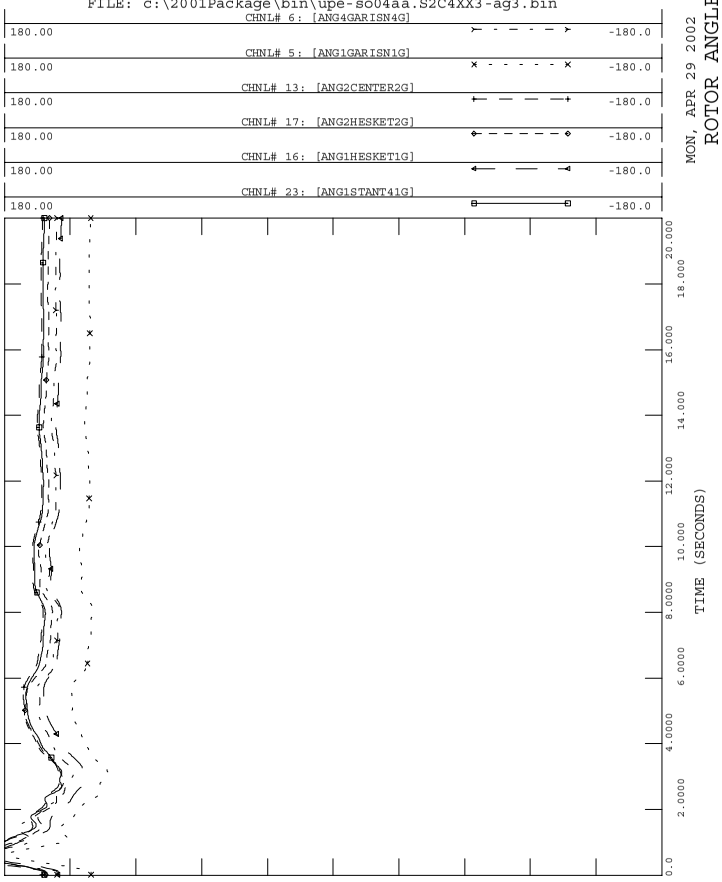


CONTINGENCY AG3

Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

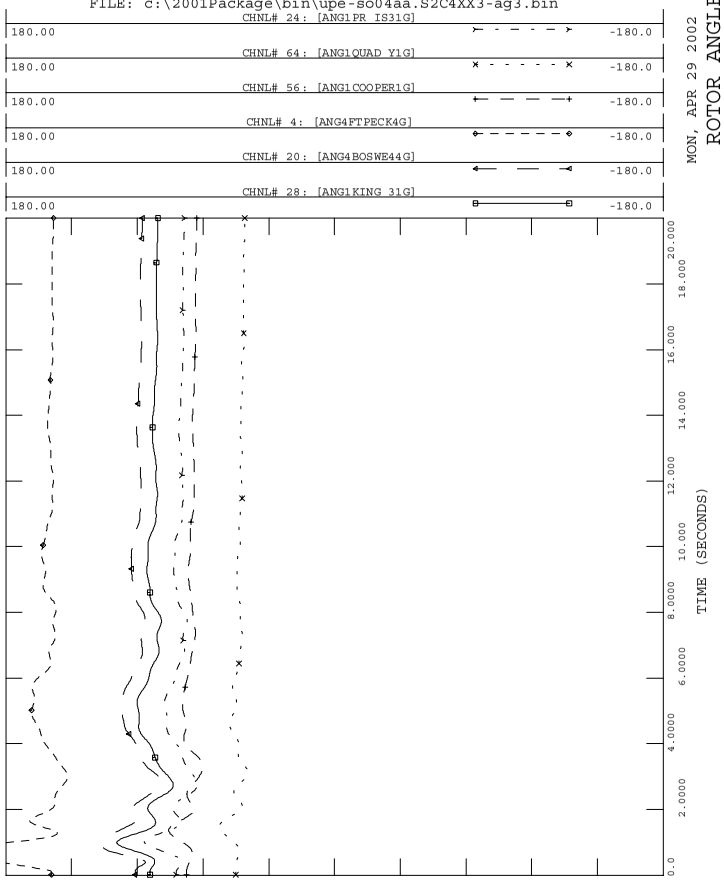
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
ROTOR ANGLES 2



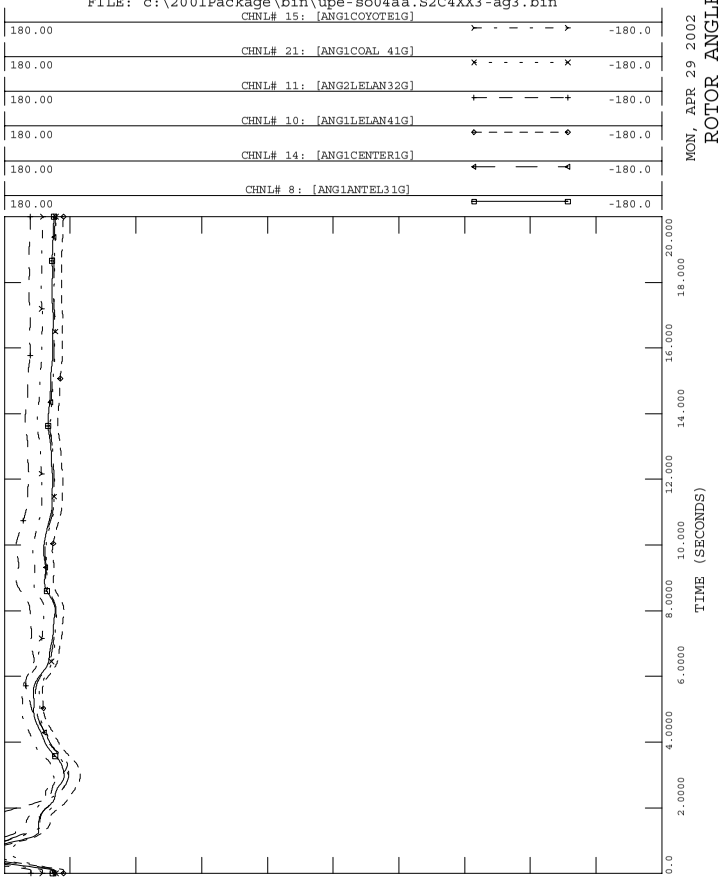
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
ROTOR ANGLES 4



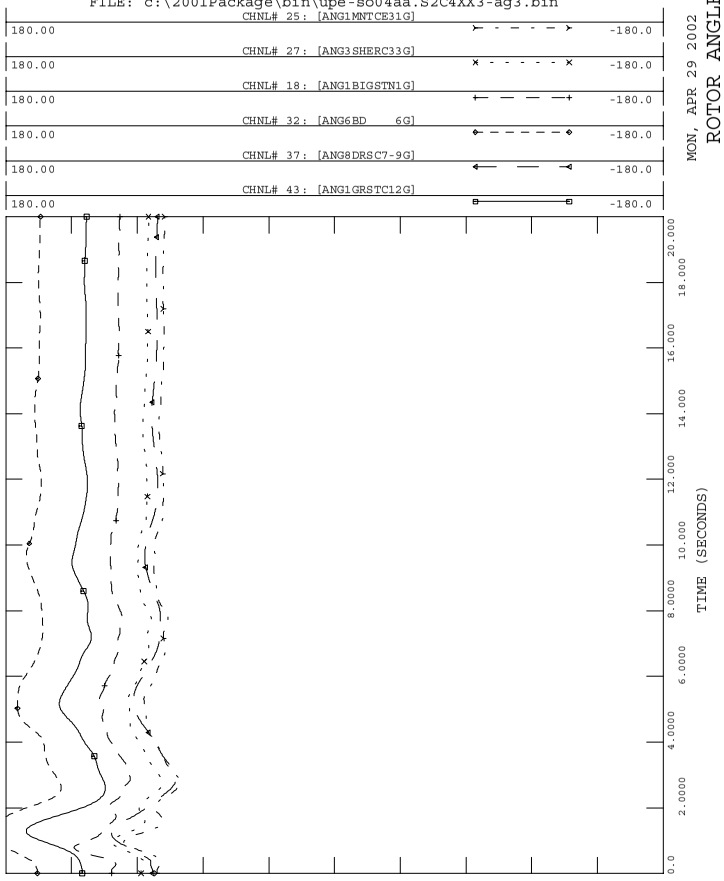
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

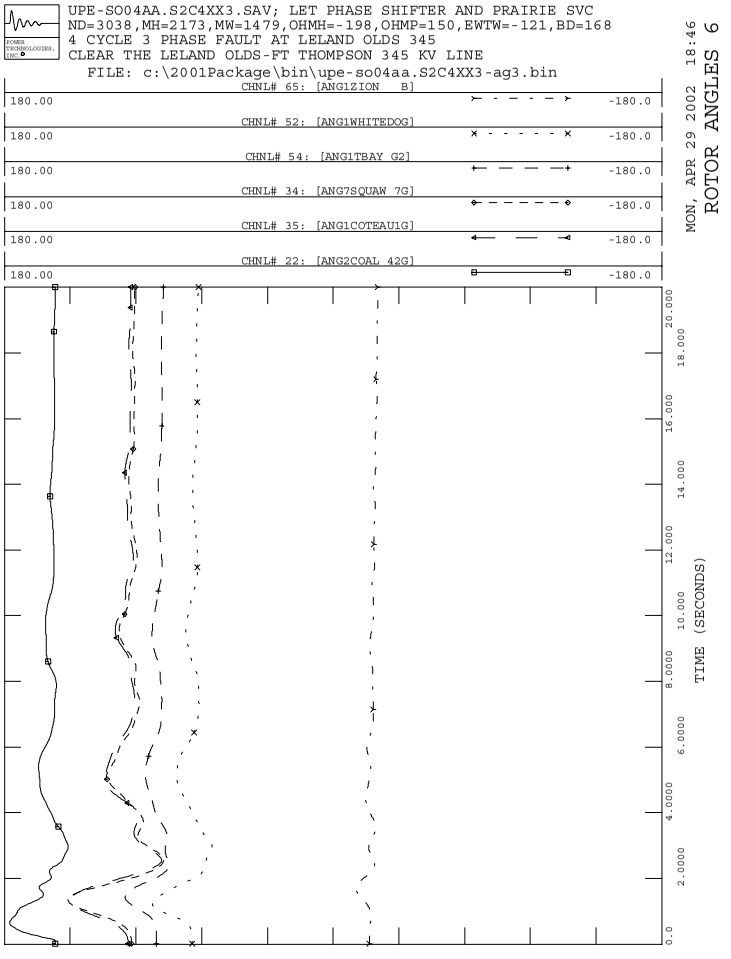
MON, APR 29 2002 18:45
ROTOR ANGLES 1

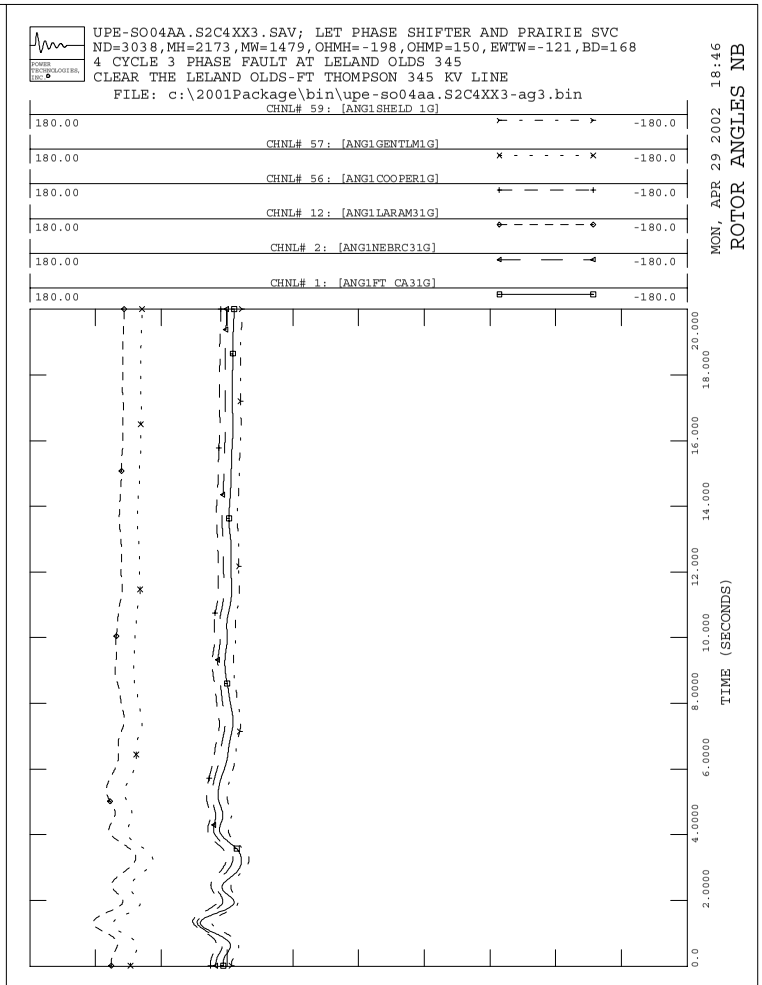


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
ROTOR ANGLES 3




UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
MON, APR 29 2002 18:46
ROTOR ANGLES 6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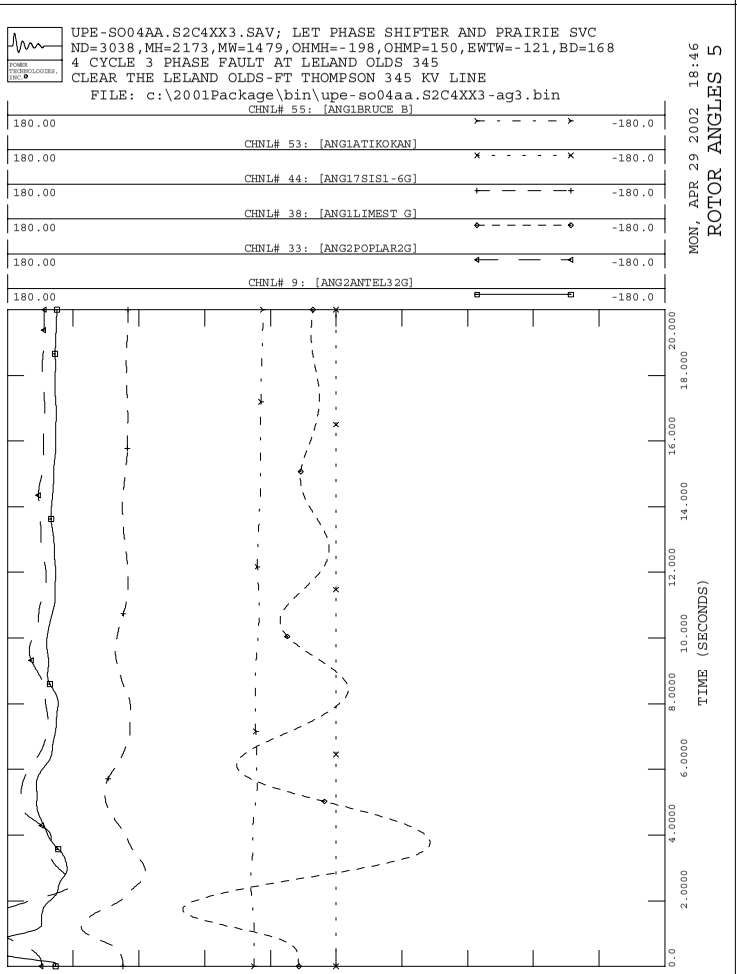
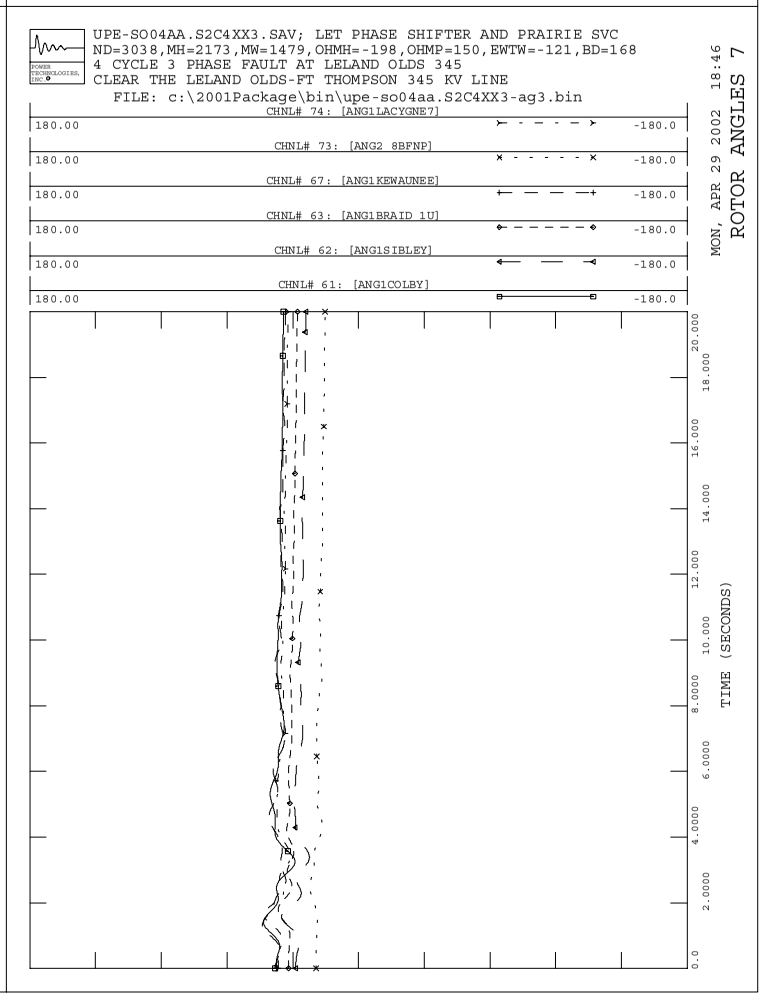
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
MON, APR 29 2002 18:46
ROTOR ANGLES NB


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
MON, APR 29 2002 18:46
ROTOR ANGLES 5


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
MON, APR 29 2002 18:46
ROTOR ANGLES 7

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

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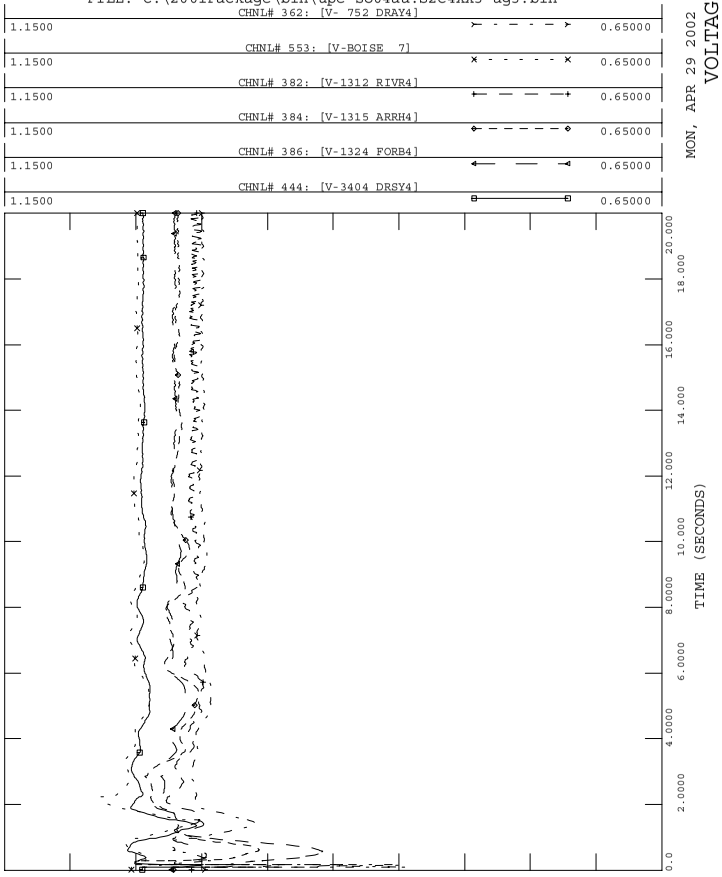
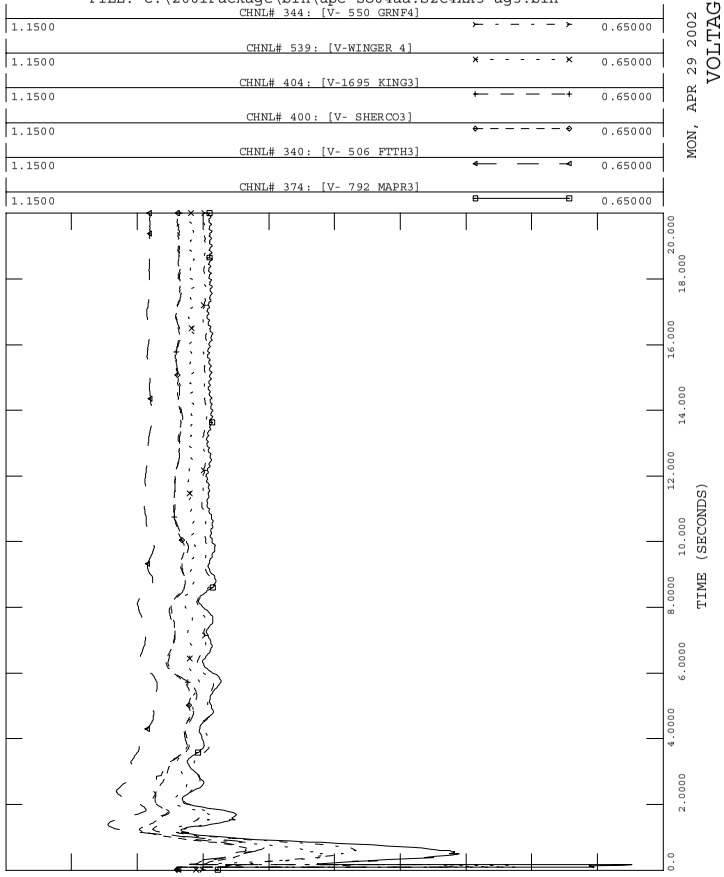
VOLTAGES 1



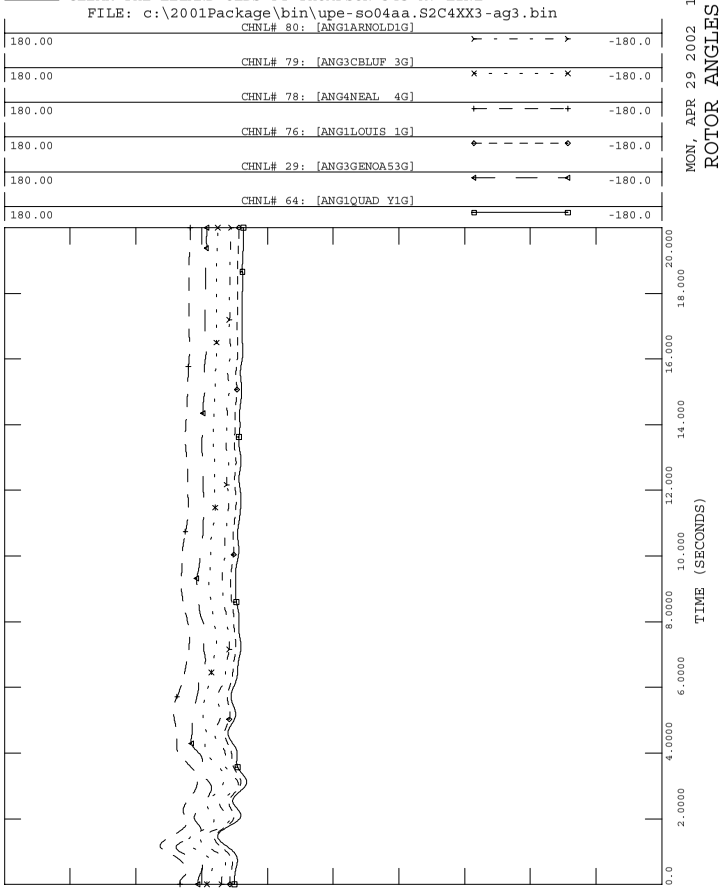
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
VOLTAGES 3



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
ROTOR ANGLES IA



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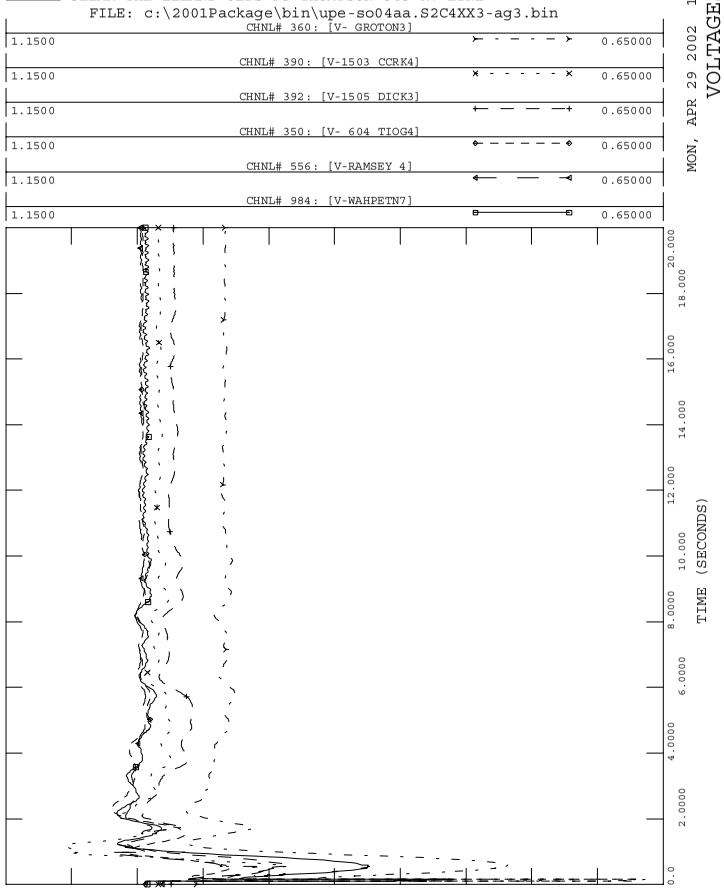
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
VOLTAGES 2



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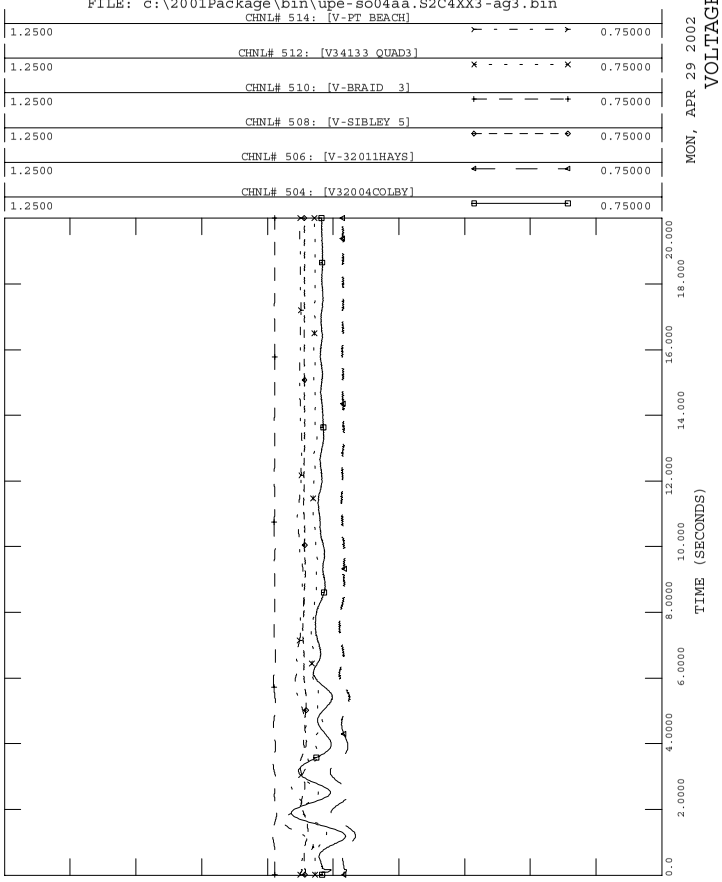
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
VOLTAGES 5



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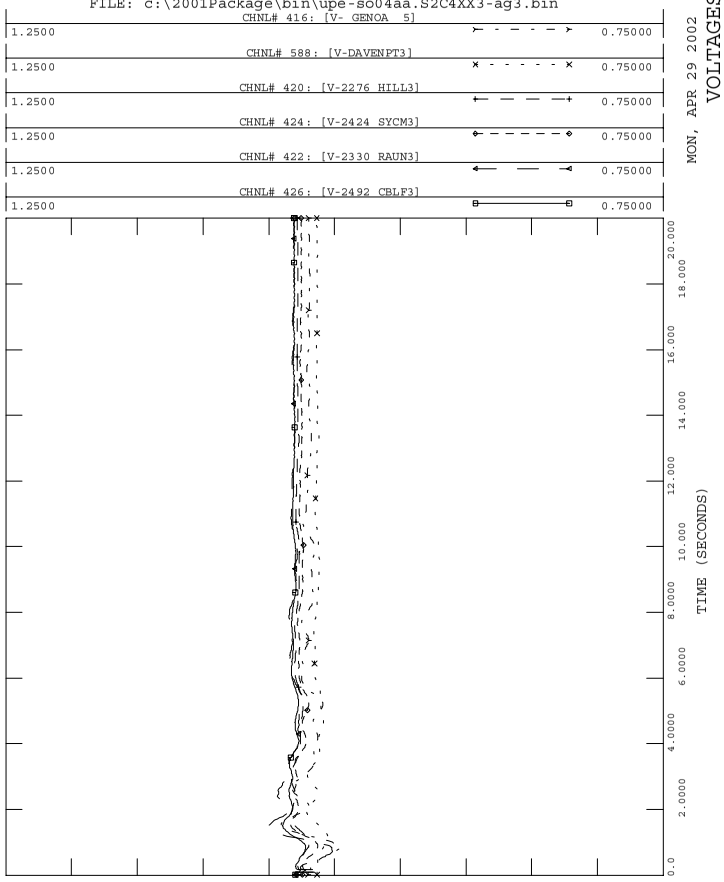
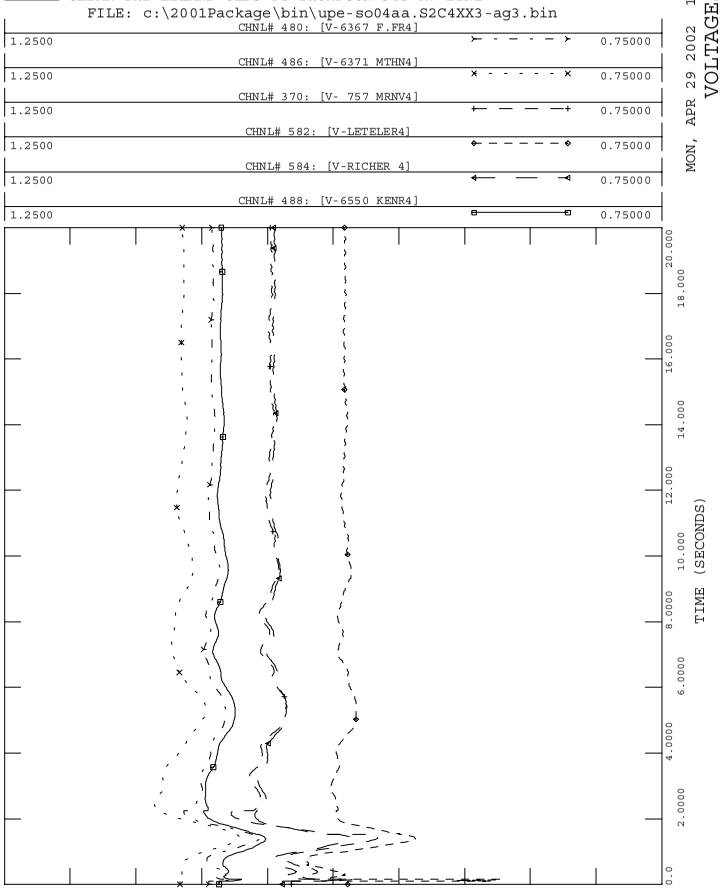
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
VOLTAGES IA



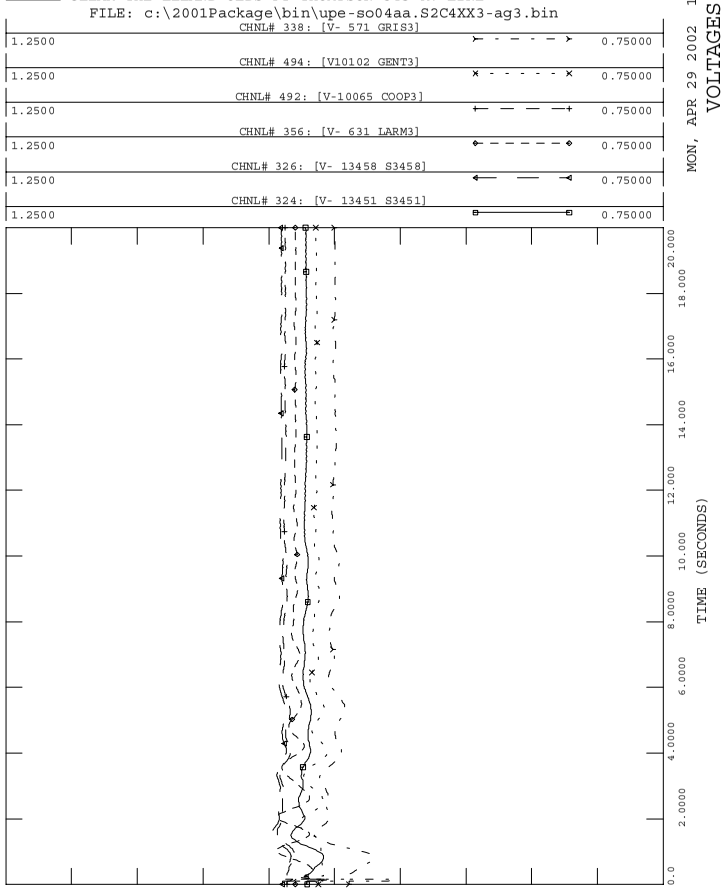
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

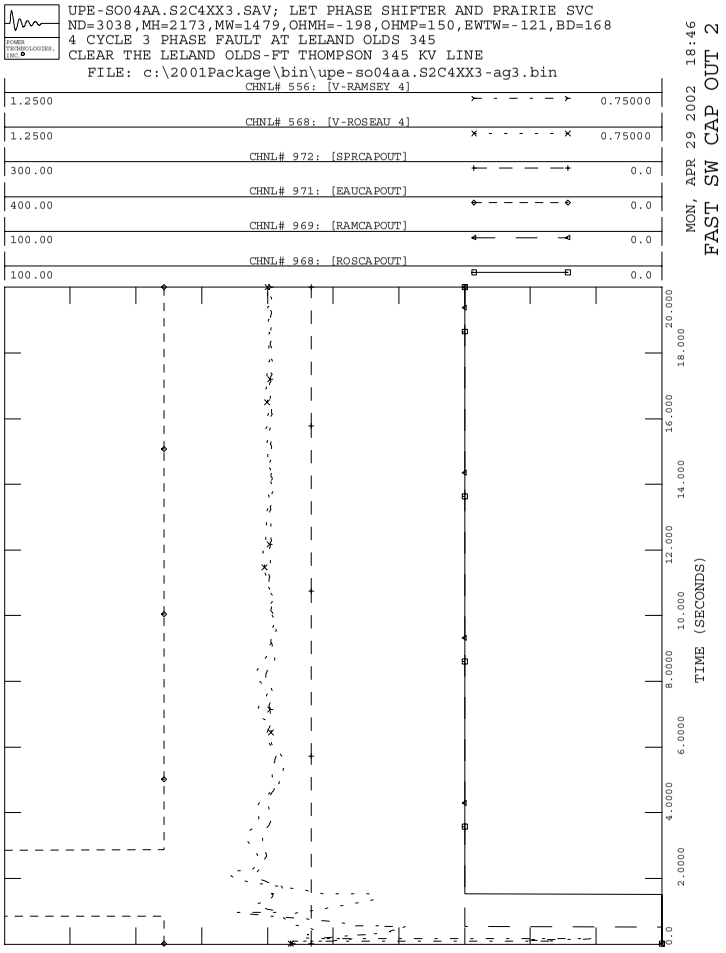
MON, APR 29 2002 18:46
VOLTAGES 4

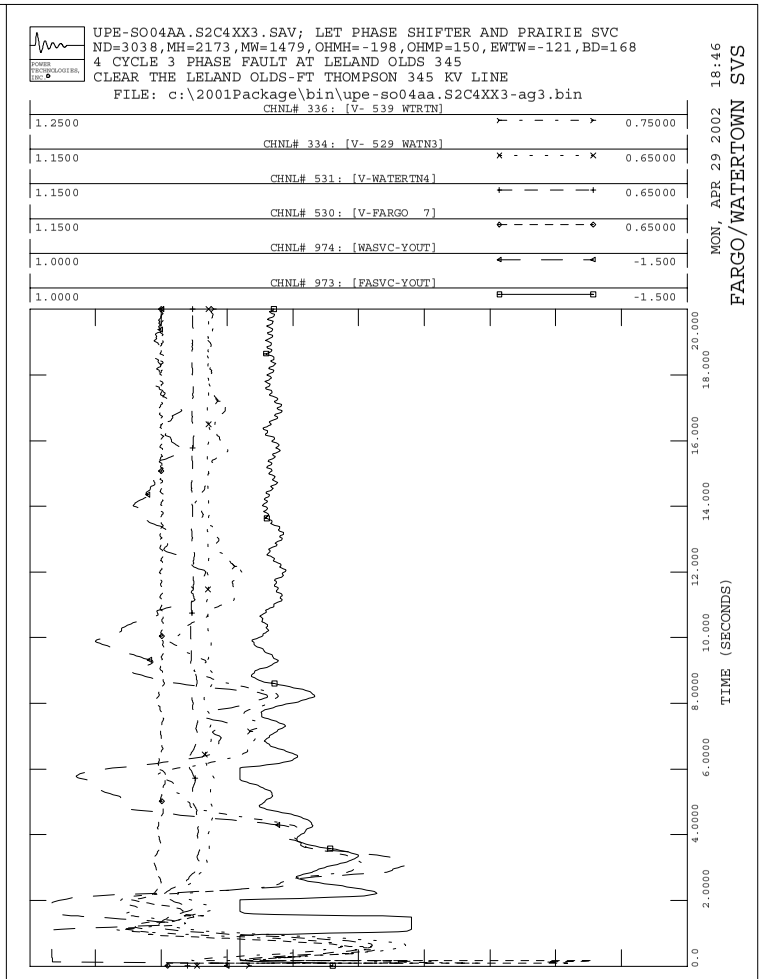


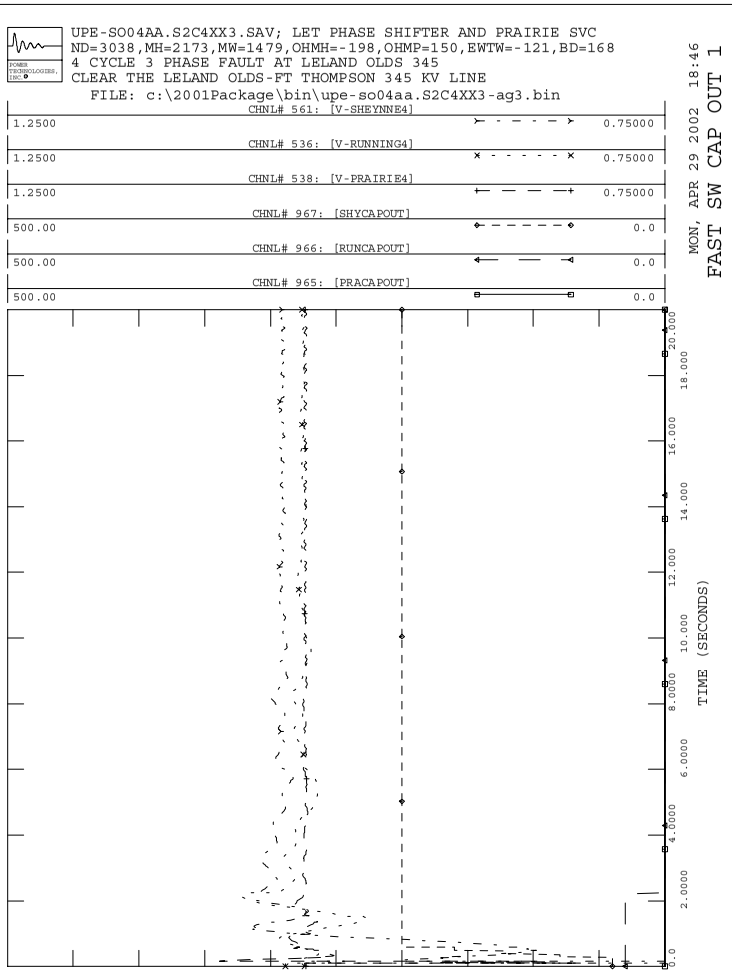
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
VOLTAGES NB




UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
MON, APR 29 2002 18:46
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
MON, APR 29 2002 18:46
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
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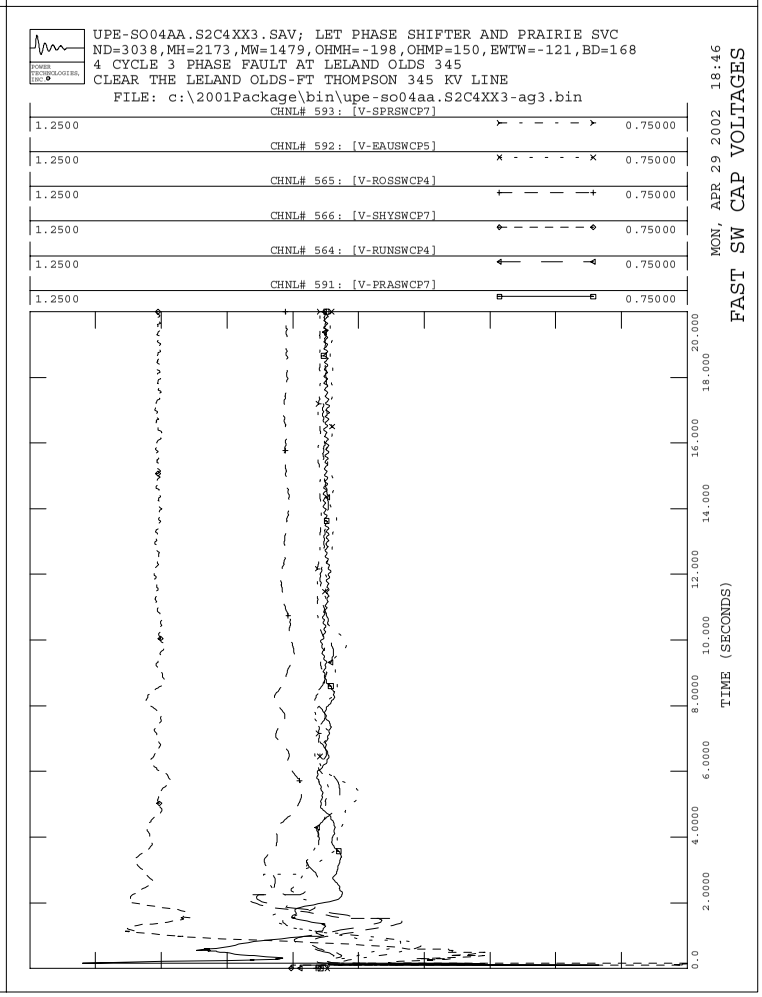
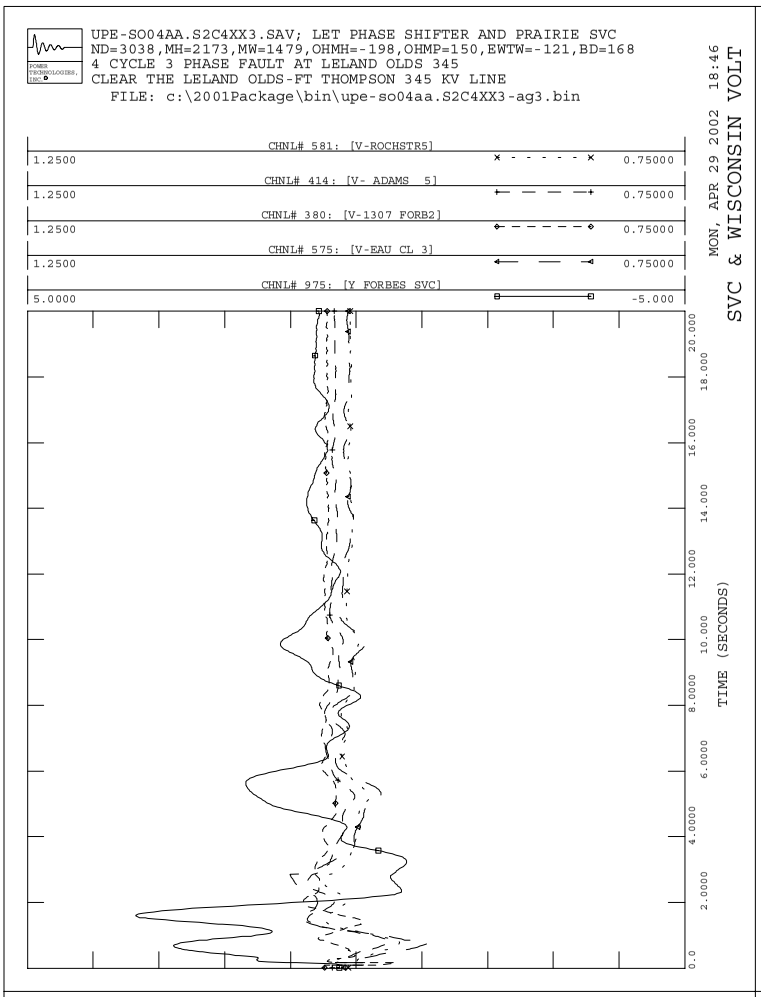
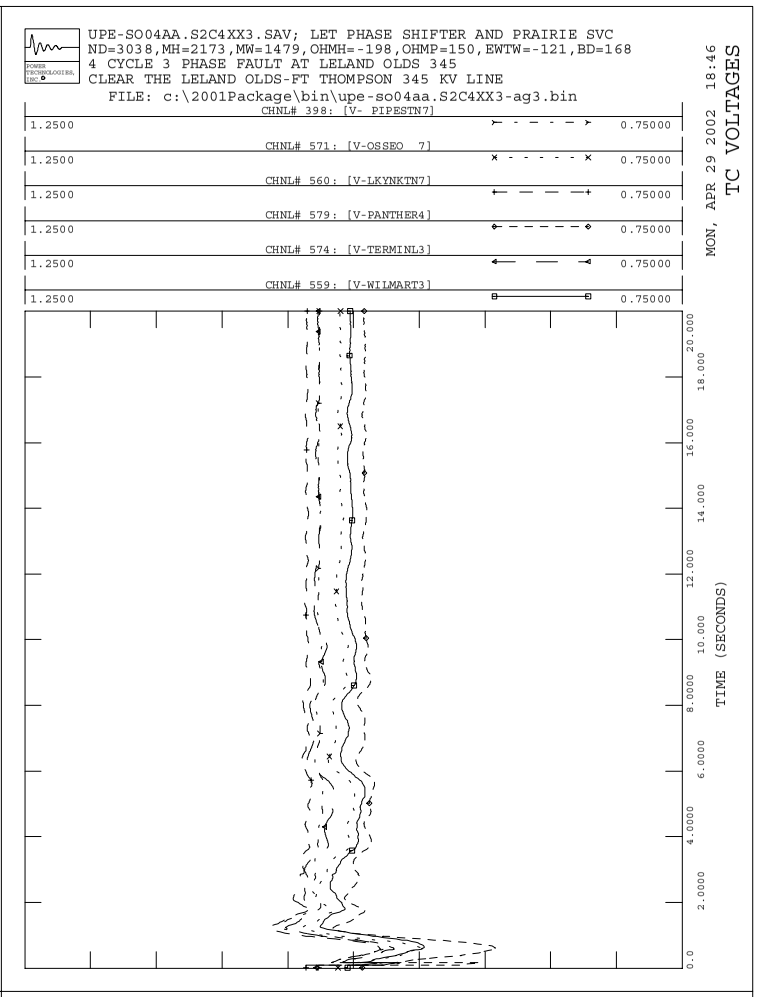
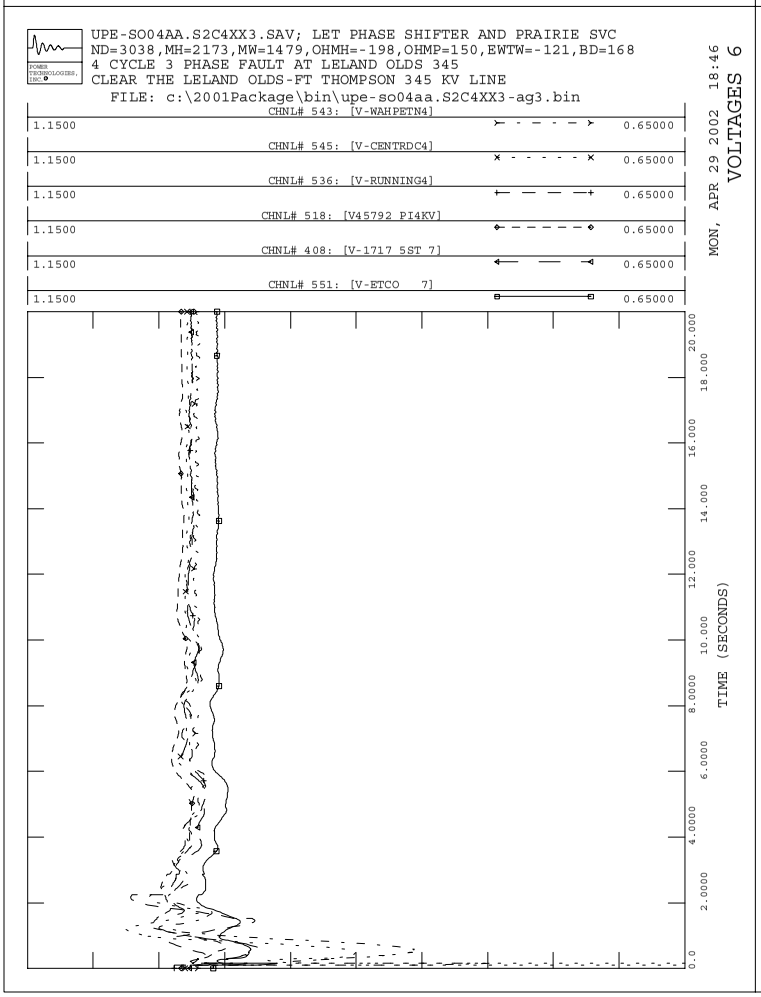
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
MON, APR 29 2002 18:46
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
MON, APR 29 2002 18:46
FAST SW CAP VOLTAGES
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 581: [V-ROCHSTR5]
CHNL# 414: [V- ADAMS 5]
CHNL# 380: [V-1307 FORB2]
CHNL# 575: [V-EAU CL 3]
CHNL# 975: [Y FORBES SVC]
MON, APR 29 2002 18:46
SVC & WISCONSIN VOLT
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 398: [V- PIPESTN7]
CHNL# 571: [V-OSSEO 7]
CHNL# 560: [V-LKYNKTN7]
CHNL# 579: [V-PANTHER4]
CHNL# 574: [V-TERMINL3]
CHNL# 559: [V-WILMART3]
MON, APR 29 2002 18:46
TC VOLTAGES
TIME (SECONDS)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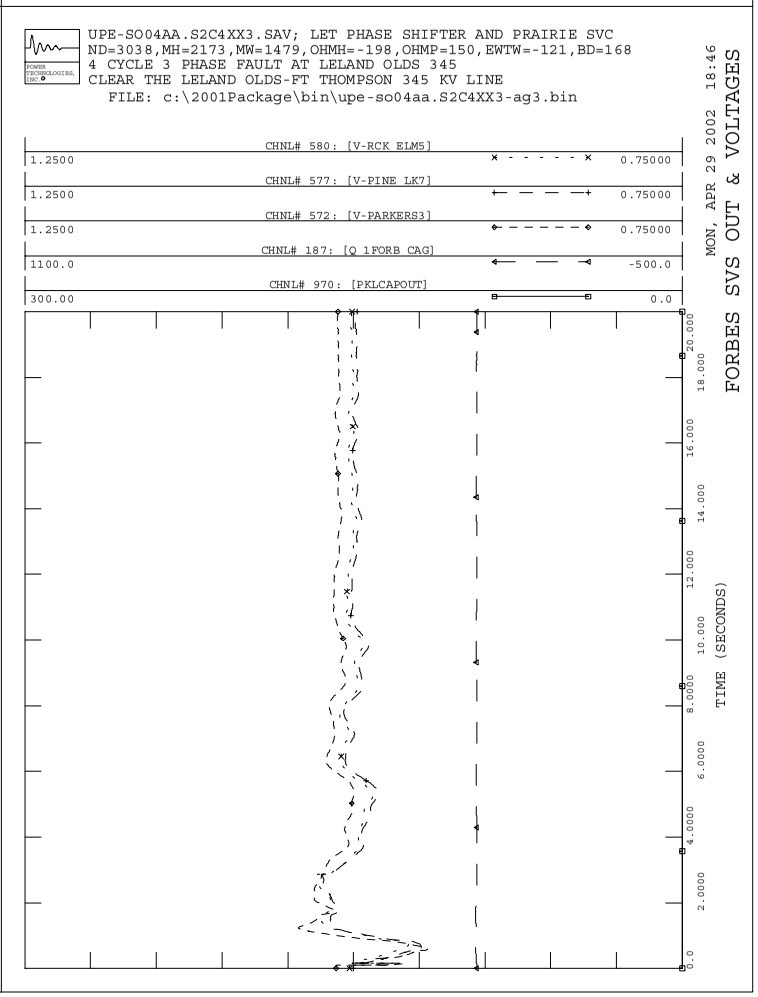
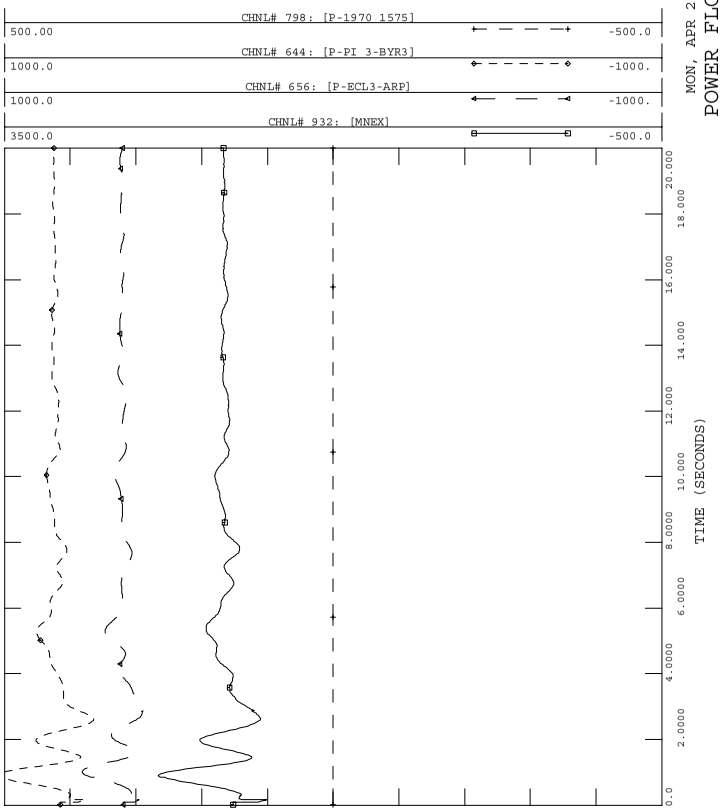
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 543: [V-WAHPETN4]
CHNL# 545: [V-CENTRDC4]
CHNL# 536: [V-RUNNING4]
CHNL# 518: [V45792 PI4KV]
CHNL# 408: [V-1717 5ST 7]
CHNL# 551: [V-ETCO 7]
MON, APR 29 2002 18:46
VOLTAGES 6
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 580: [V-RCK ELM5]
CHNL# 577: [V-PINE LK7]
CHNL# 572: [V-PARKERS3]
CHNL# 187: [Q 1FORB CAG]
CHNL# 970: [PKLCAPOUT]
MON, APR 29 2002 18:46
FORBES SVS OUT & VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
POWER FLOW SUMS 2



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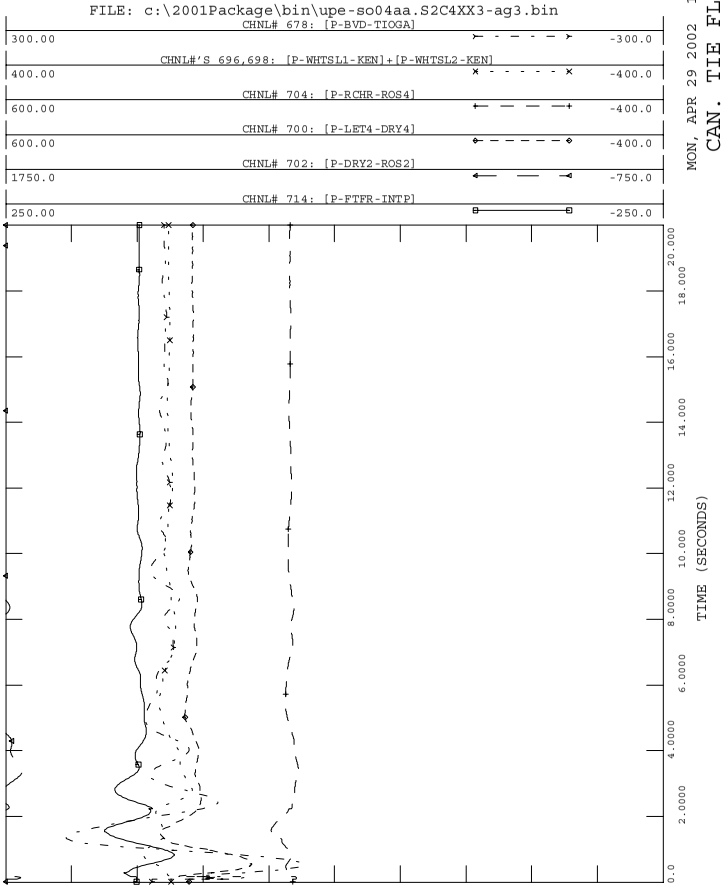
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
CAN. TIE FLOWS



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
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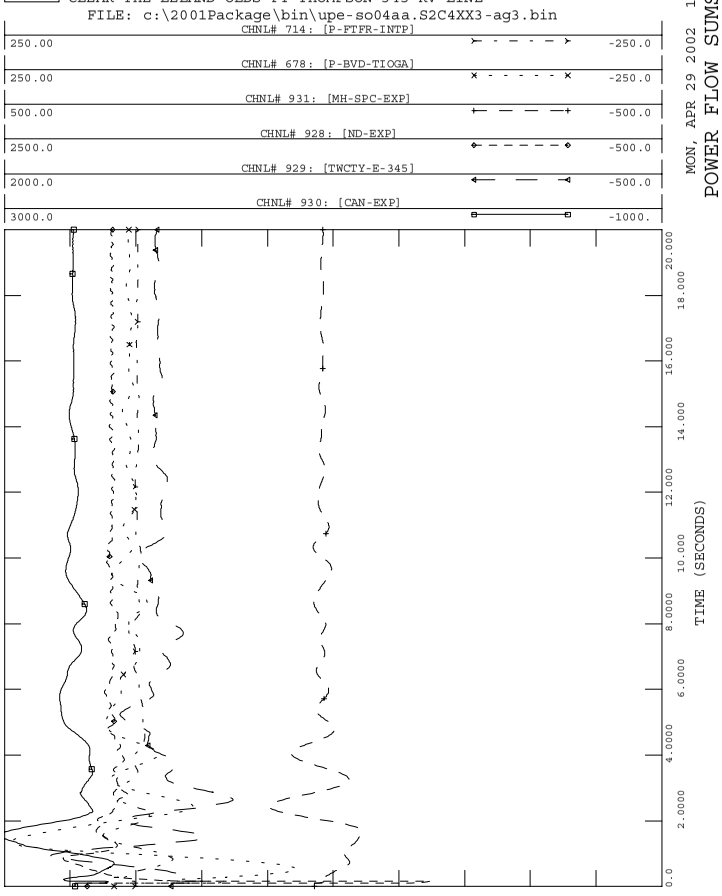
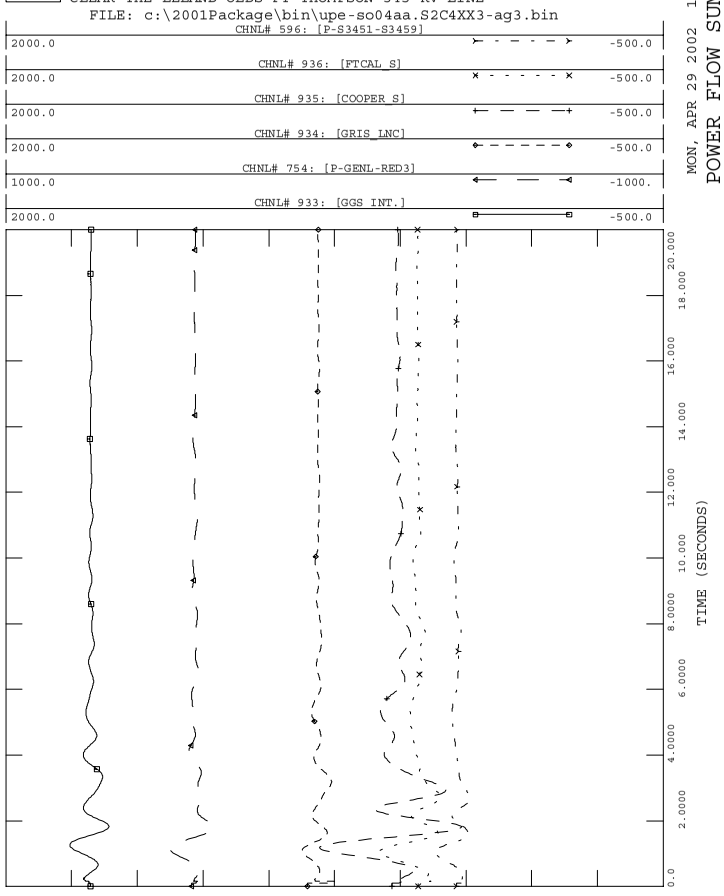
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
POWER FLOW SUMS 1



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
POWER FLOW SUM 3



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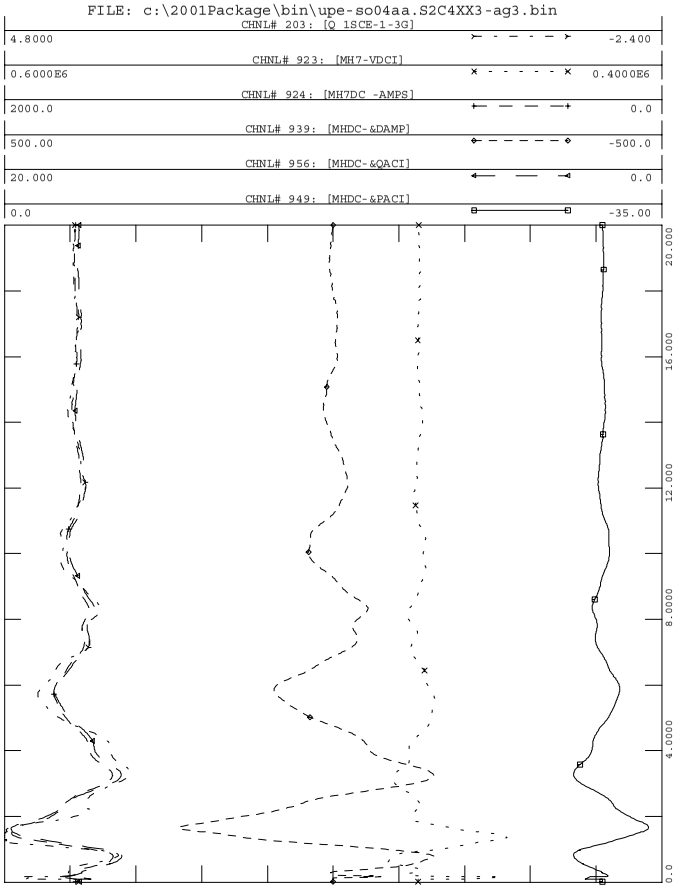
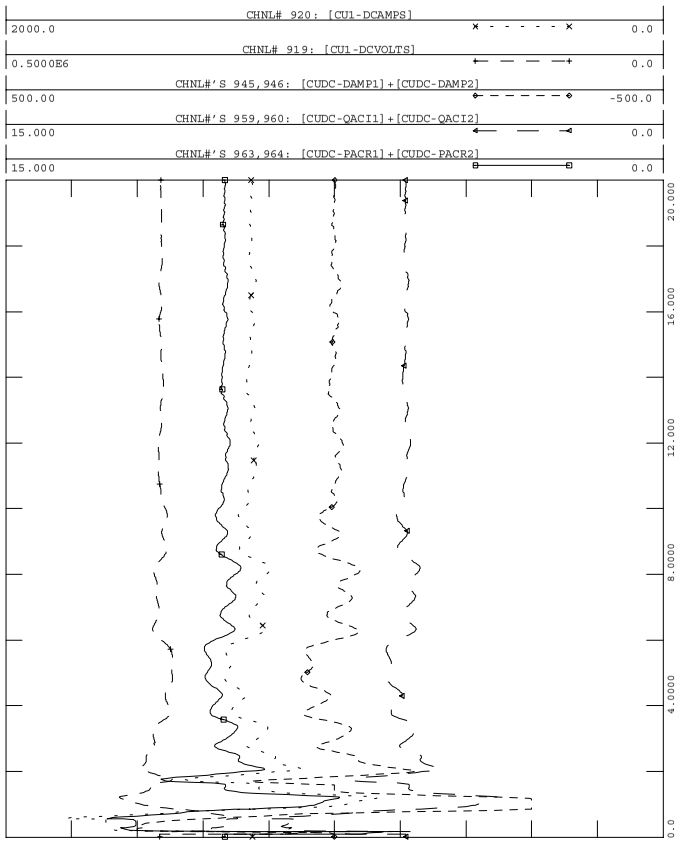
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
MH DC PARAMETERS



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46
CU DC #1



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
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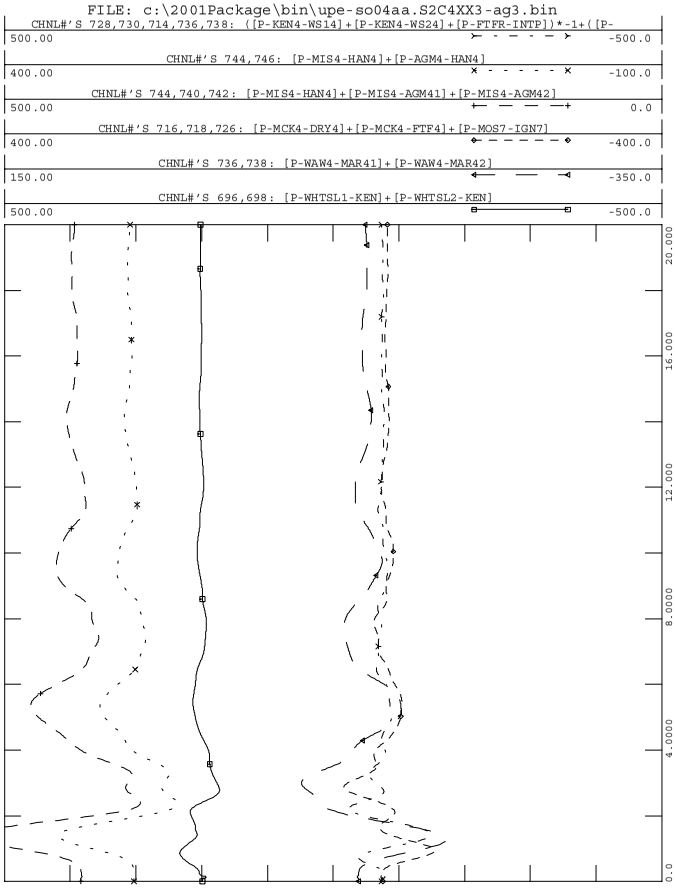
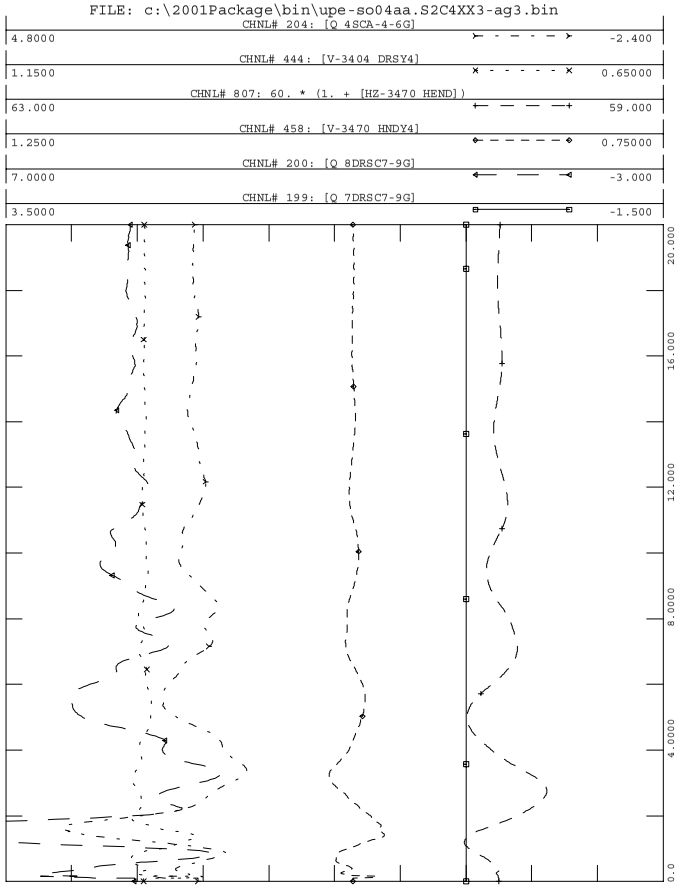
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

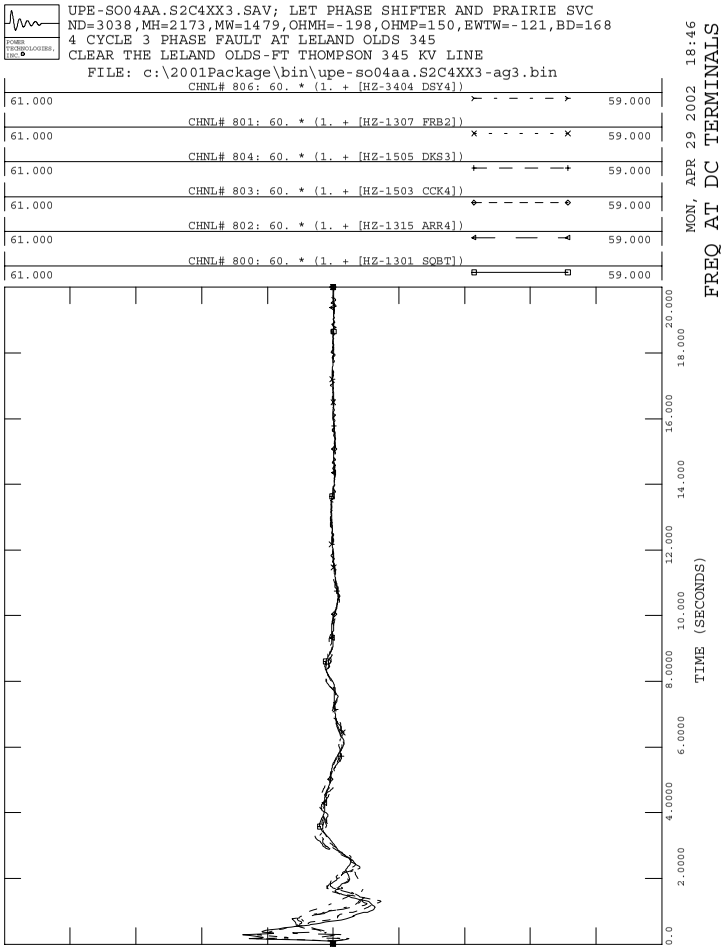
MON, APR 29 2002 18:46
OH TIE FLOWS

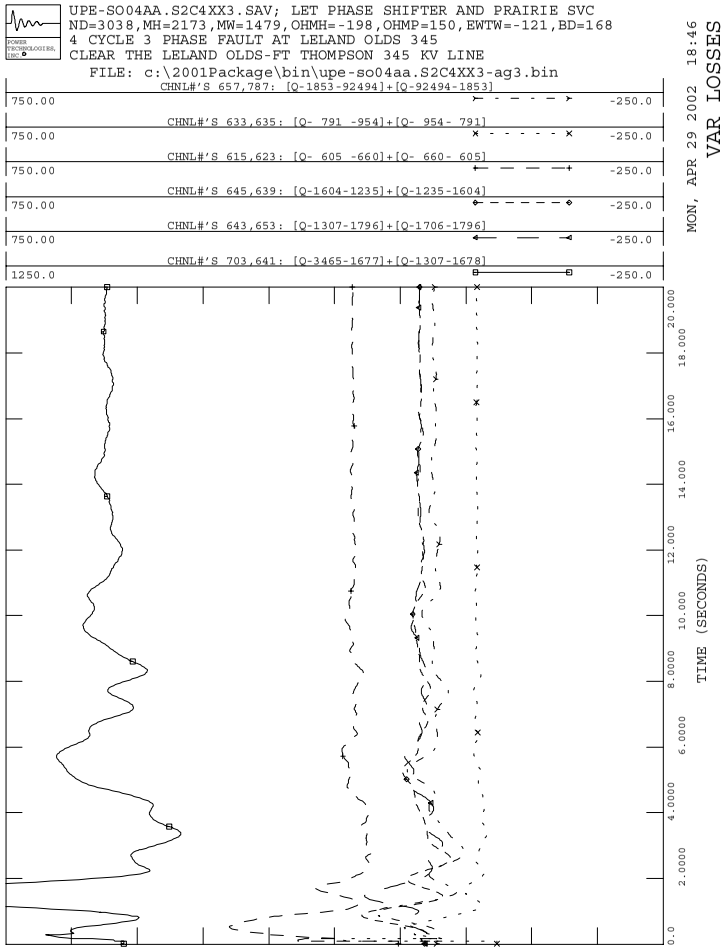


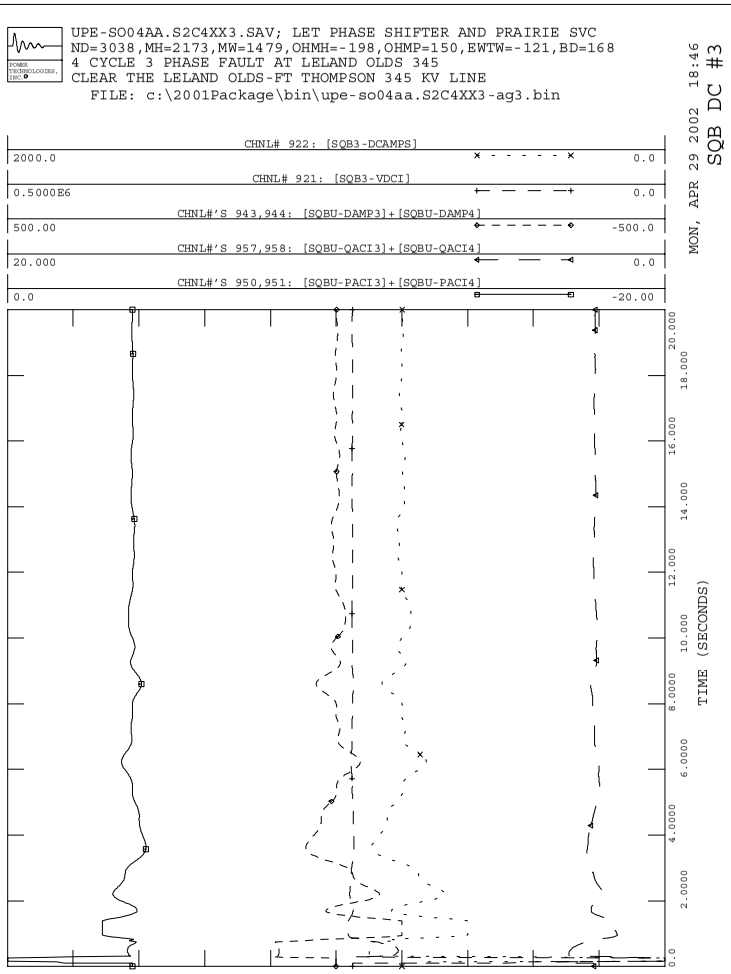
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

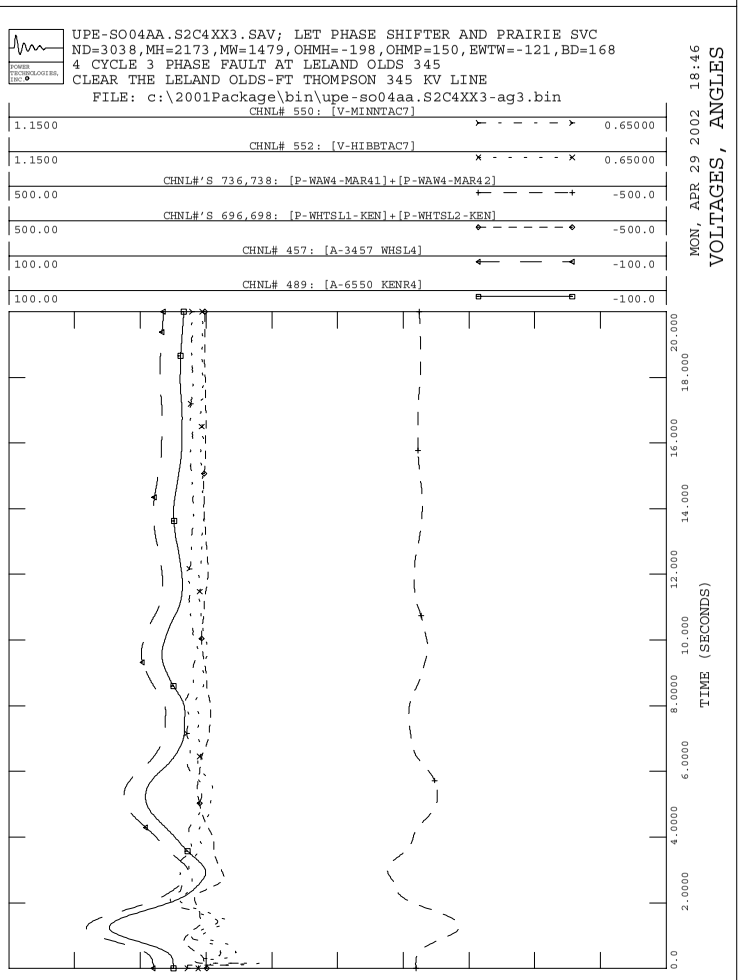
MON, APR 29 2002 18:46
MH DC PARAMETERS




UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
MON, APR 29 2002 18:46
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
MON, APR 29 2002 18:46
VAR LOSSES
TIME (SECONDS)

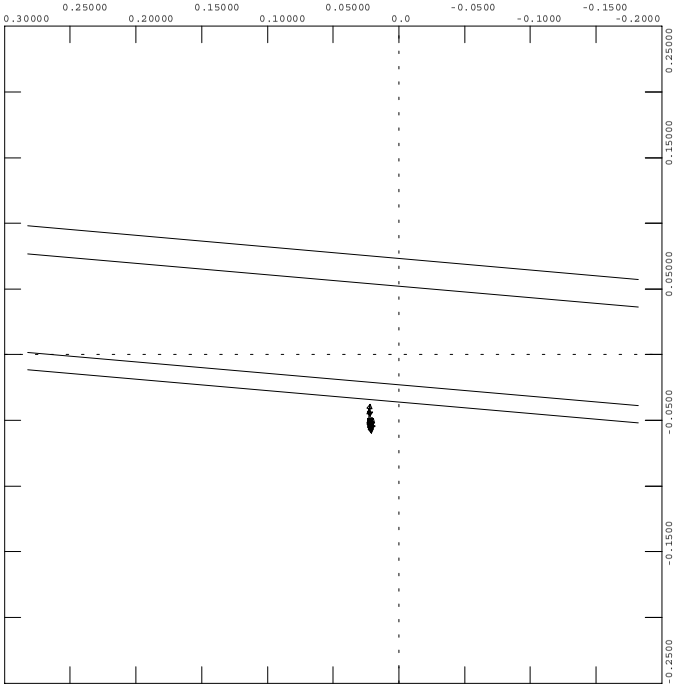

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
MON, APR 29 2002 18:46
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
MON, APR 29 2002 18:46
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

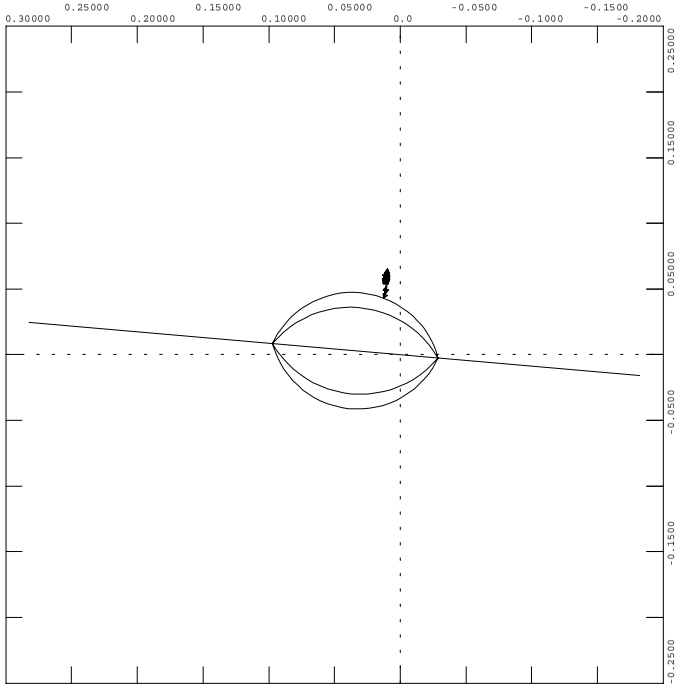


MON, APR 29 2002 18:46
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

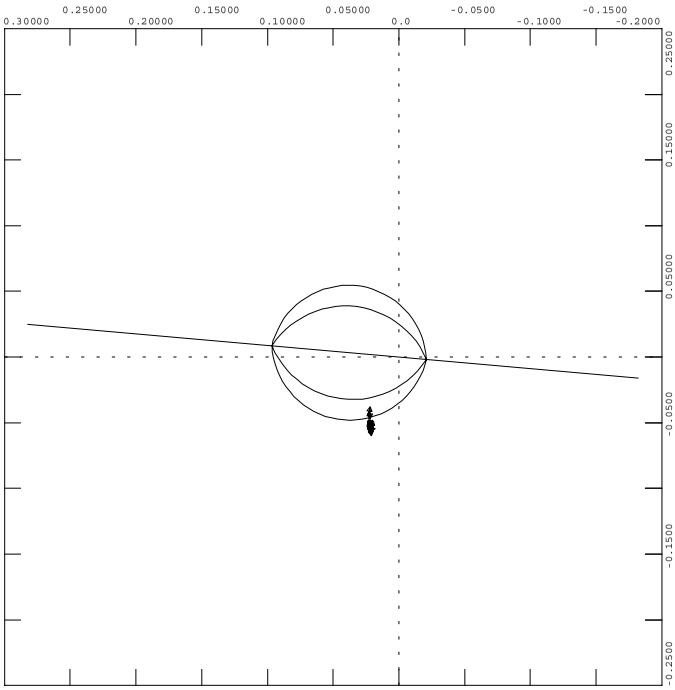


MON, APR 29 2002 18:46
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

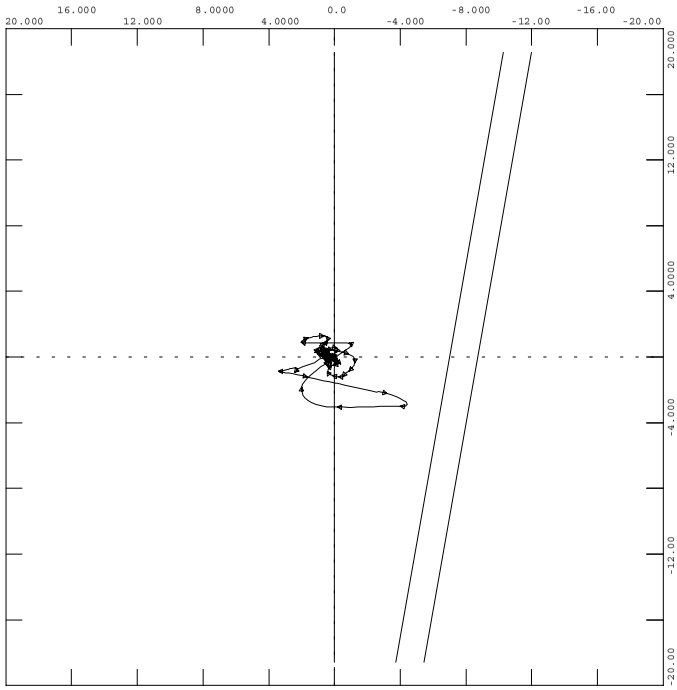


MON, APR 29 2002 18:46
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

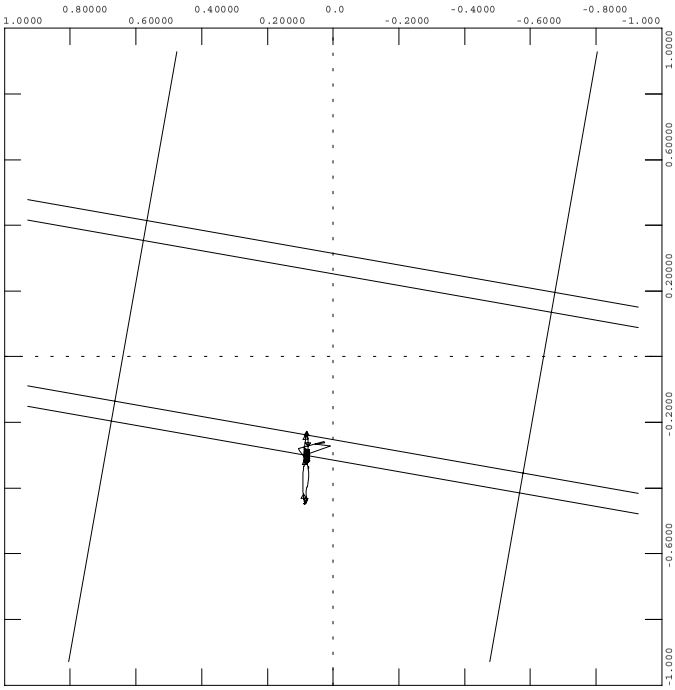


MON, APR 29 2002 18:46
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

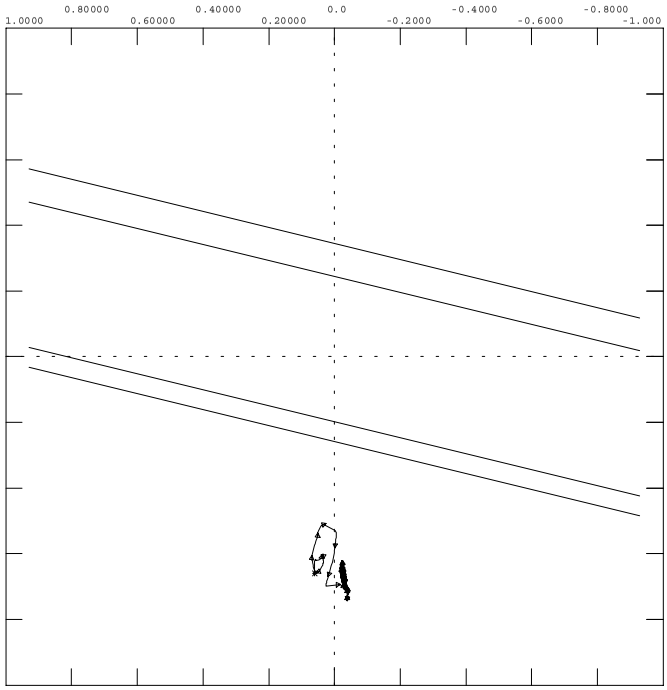
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

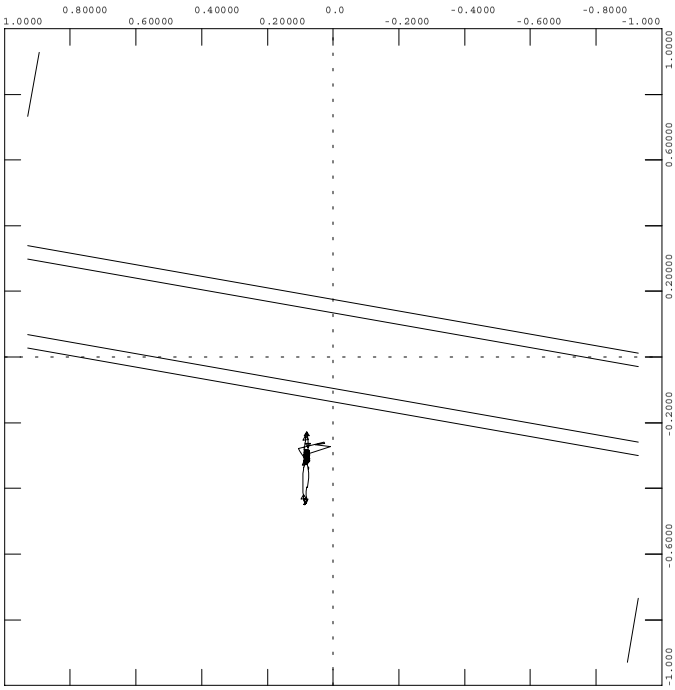
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

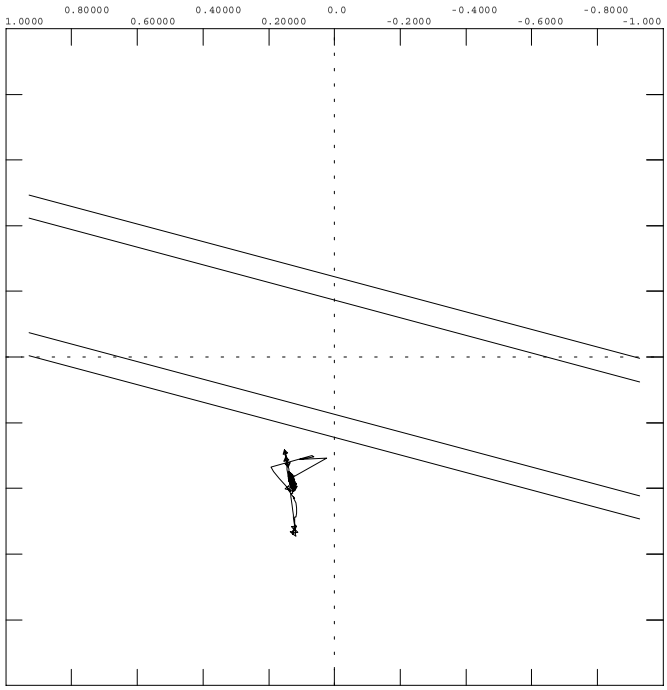
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

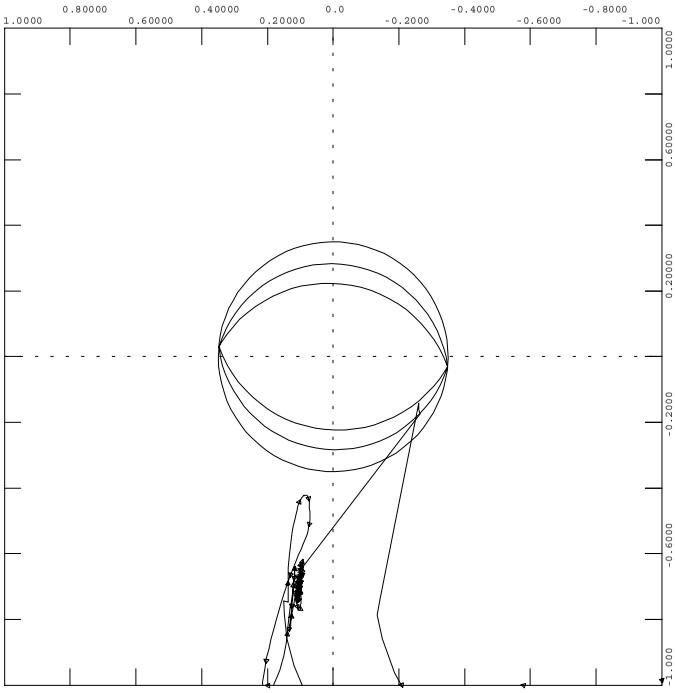
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

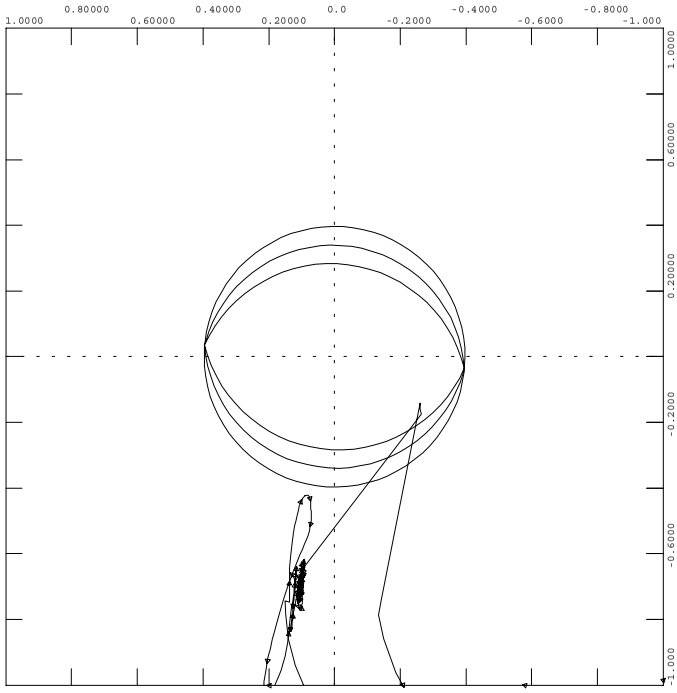
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

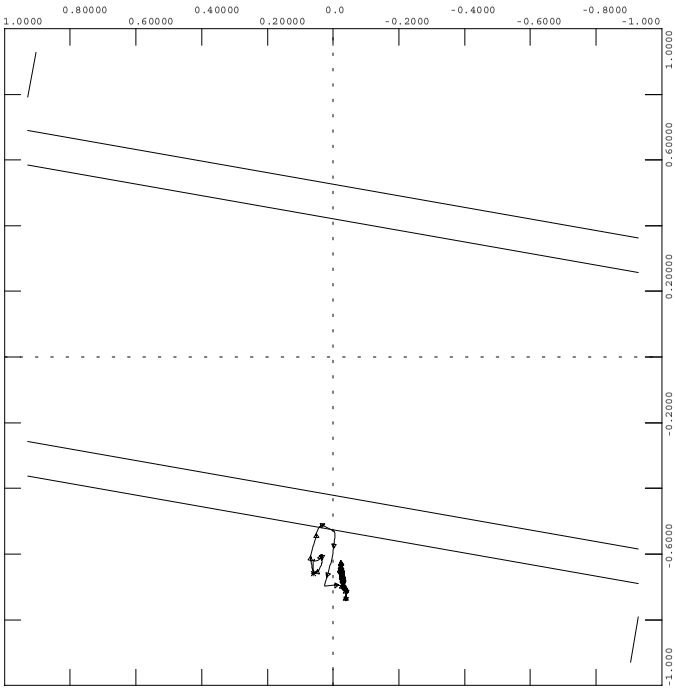
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

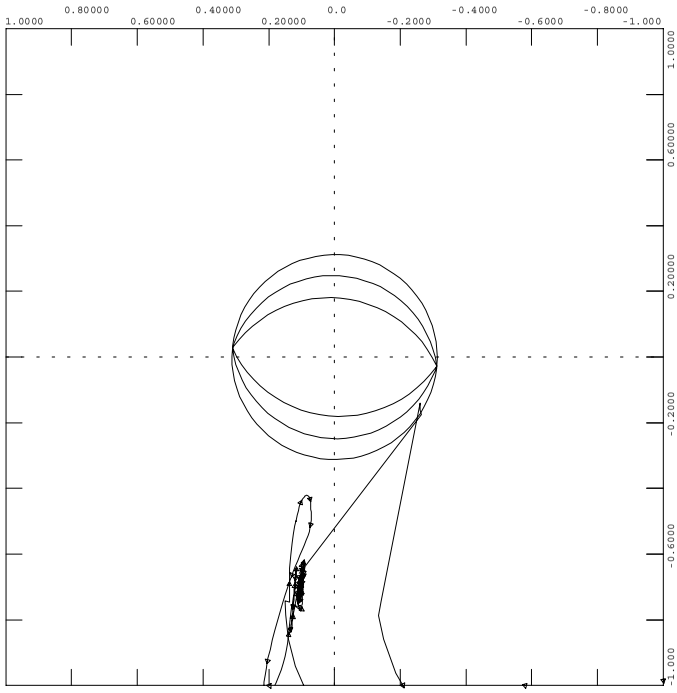
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



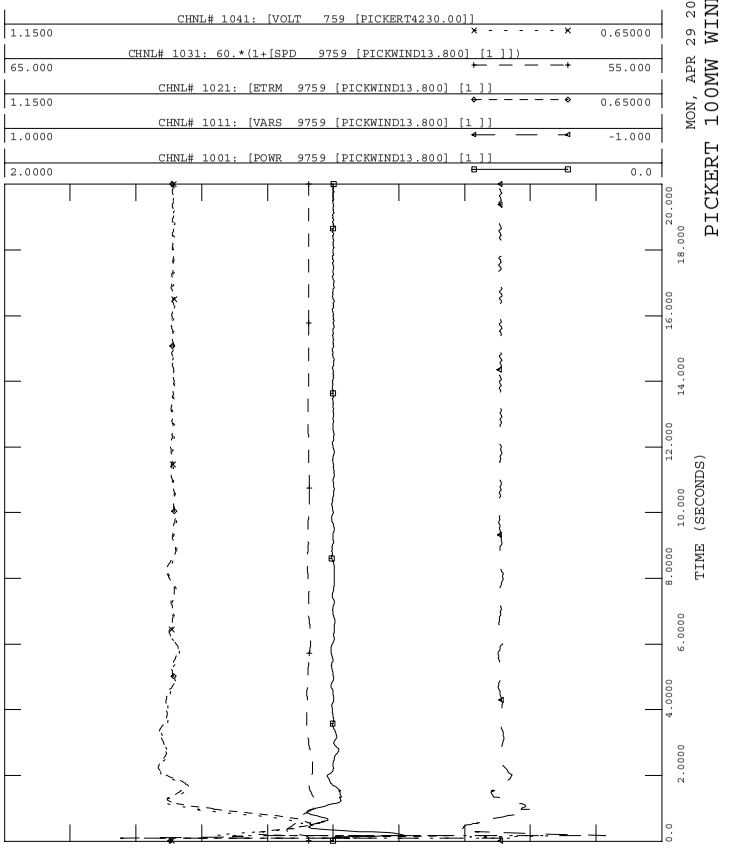
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

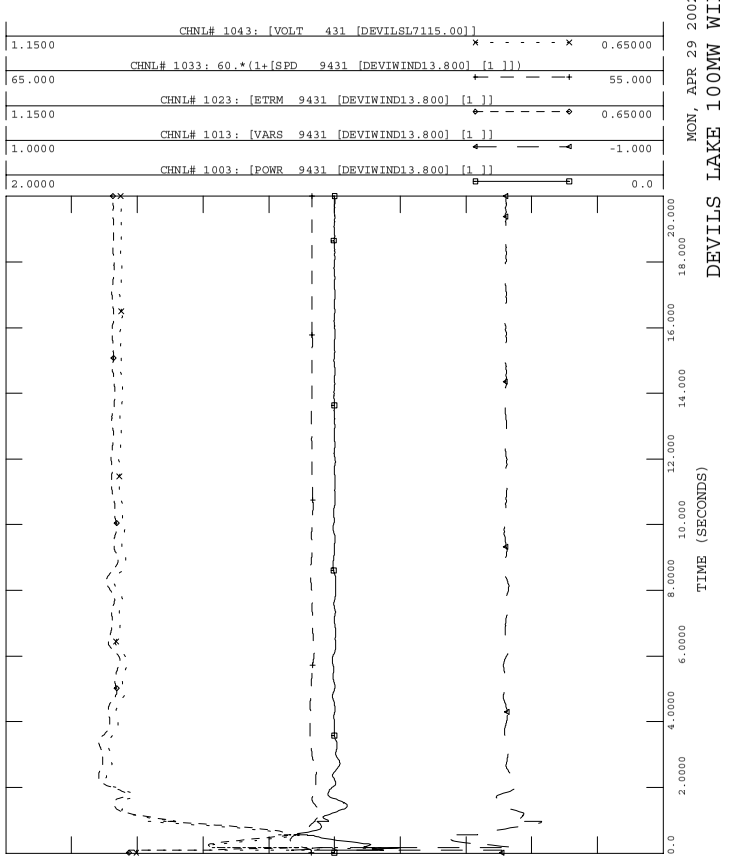


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin



MON, APR 29 2002 18:46
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

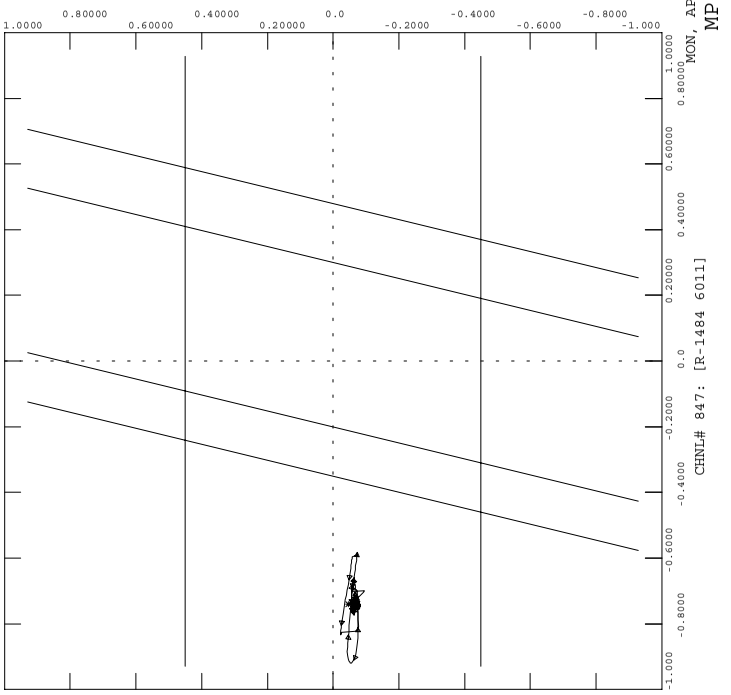


MON, APR 29 2002 18:46
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

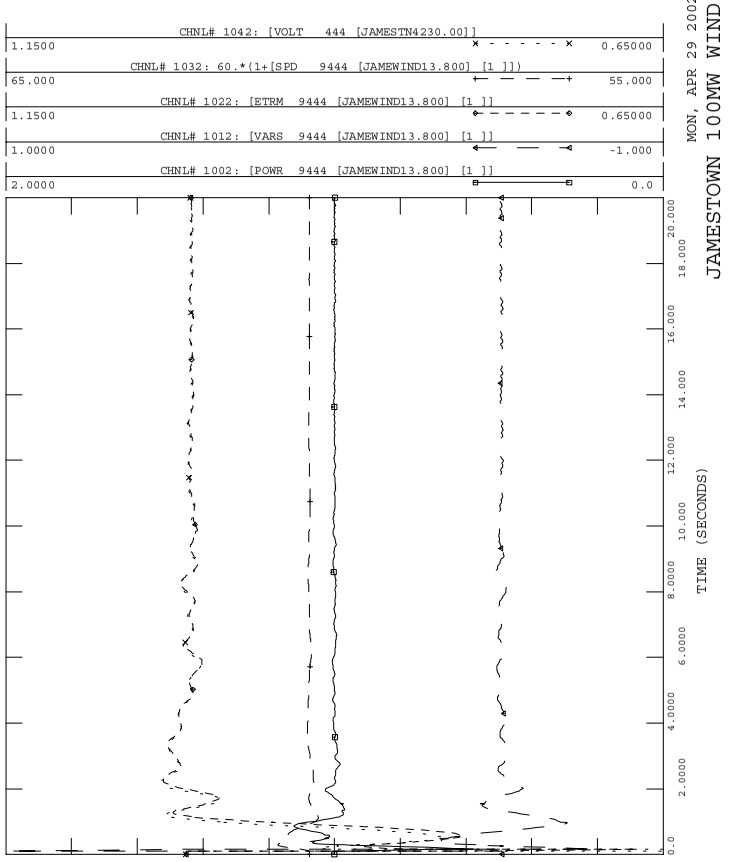
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, APR 29 2002 18:46
MP-OH I.FALLS (779)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

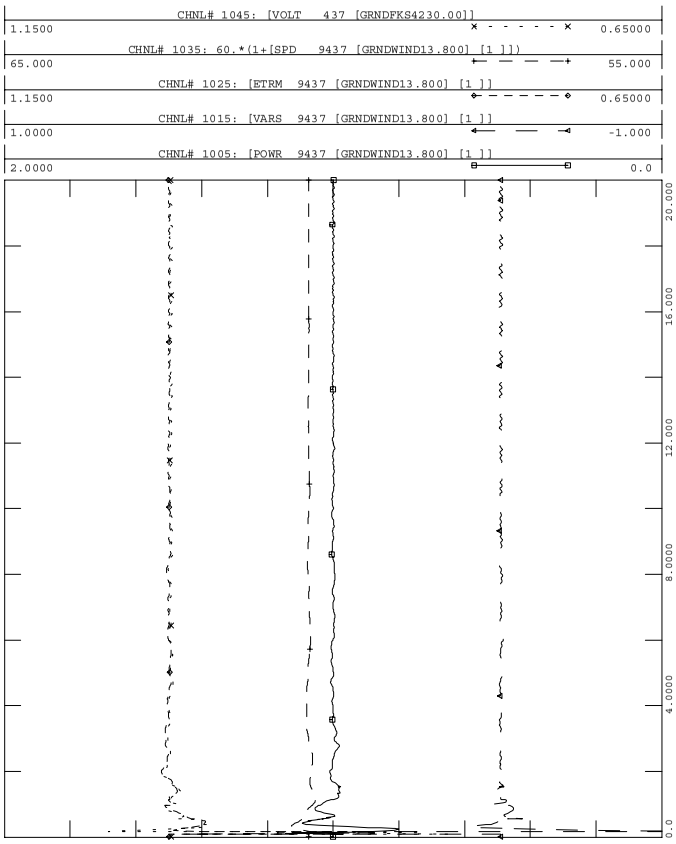


MON, APR 29 2002 18:46
JAMESTOWN 100MW WIND UNIT

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46

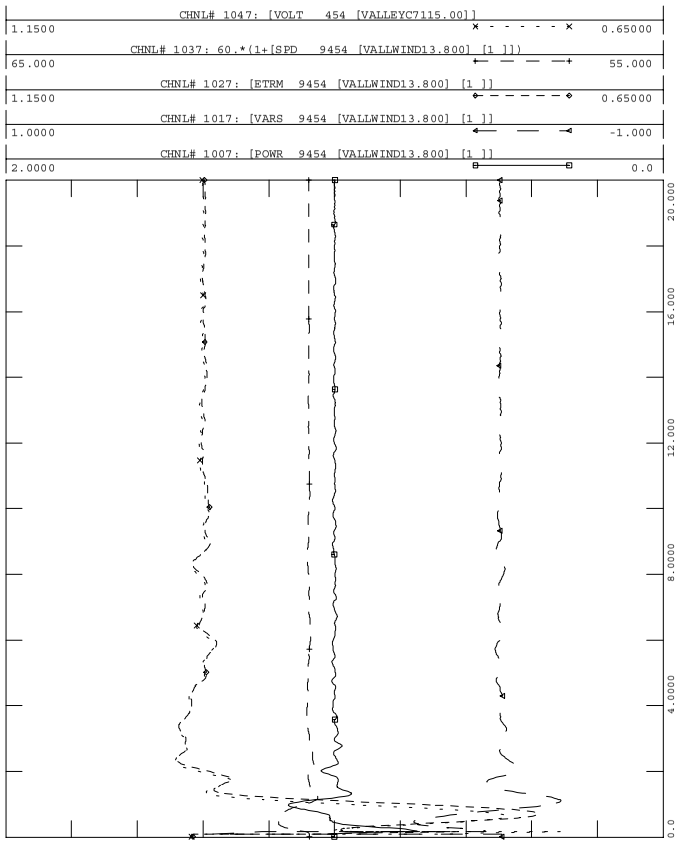
GRAND FORKS 100MW WIND UN



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46

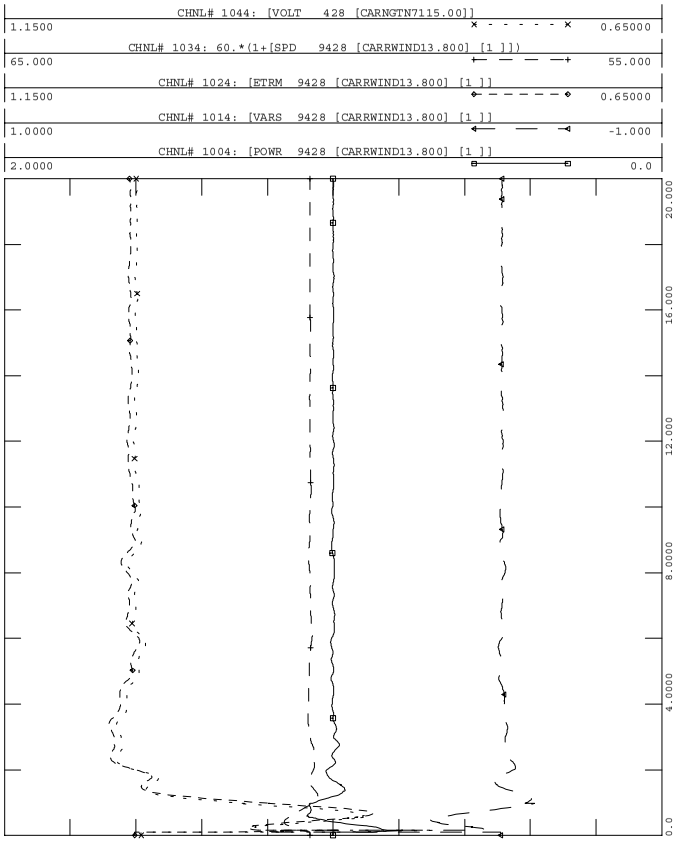
VALLEY CITY 100MW WIND UN



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46

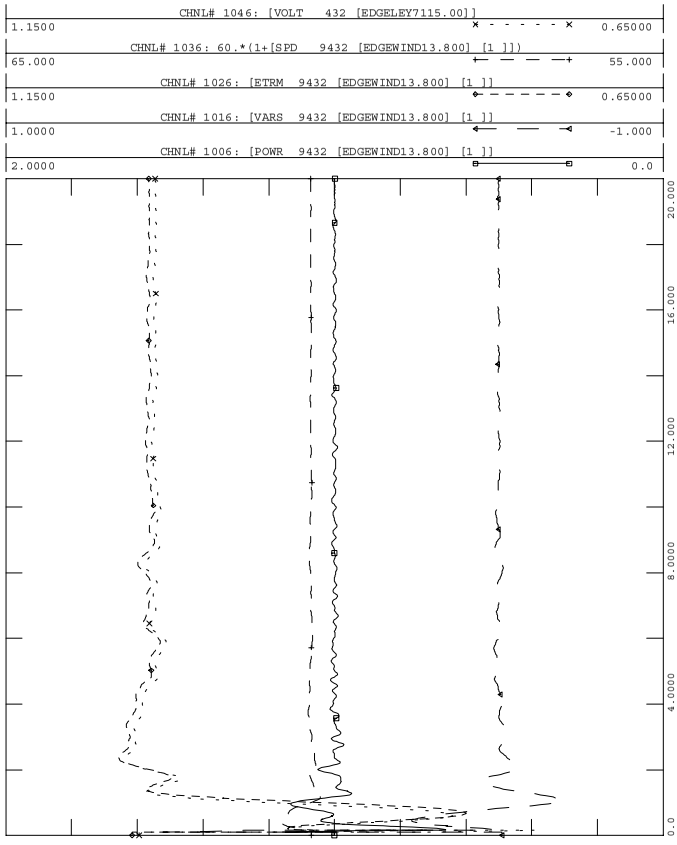
CARRINGTON 100MW WIND UNI



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46

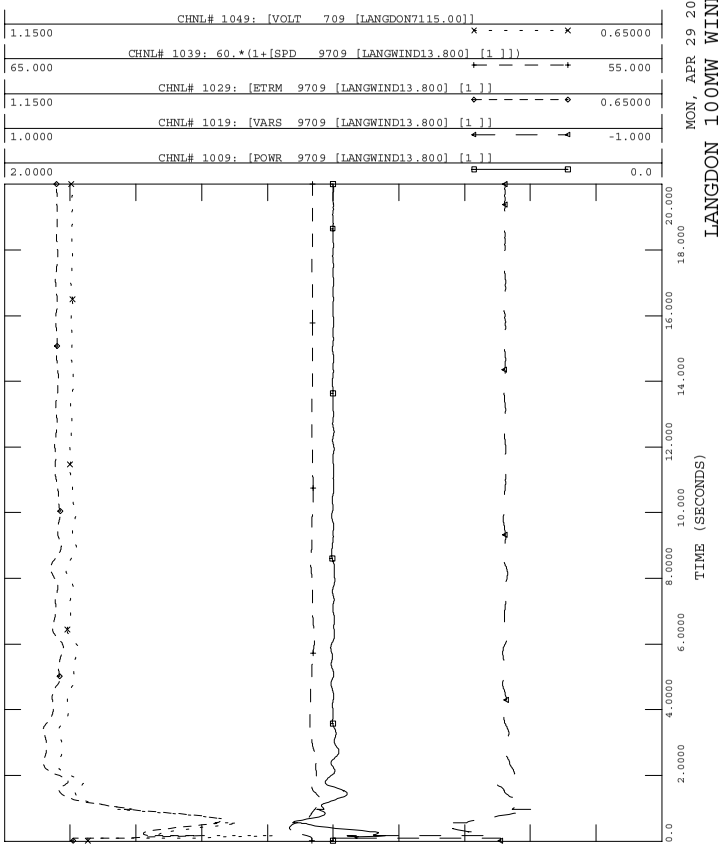
EDGELEY 100MW WIND UNIT



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46

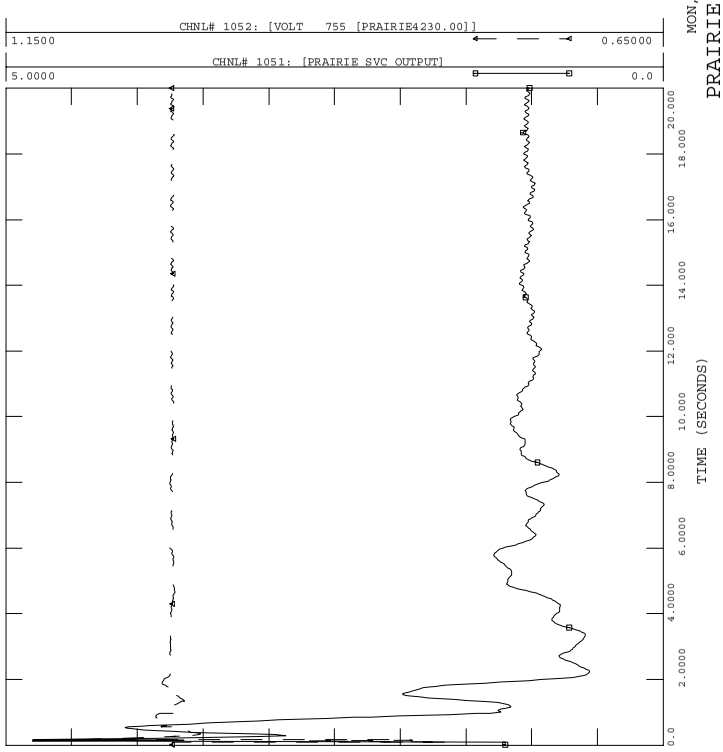
LANGDON 100MW WIND UNIT



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46

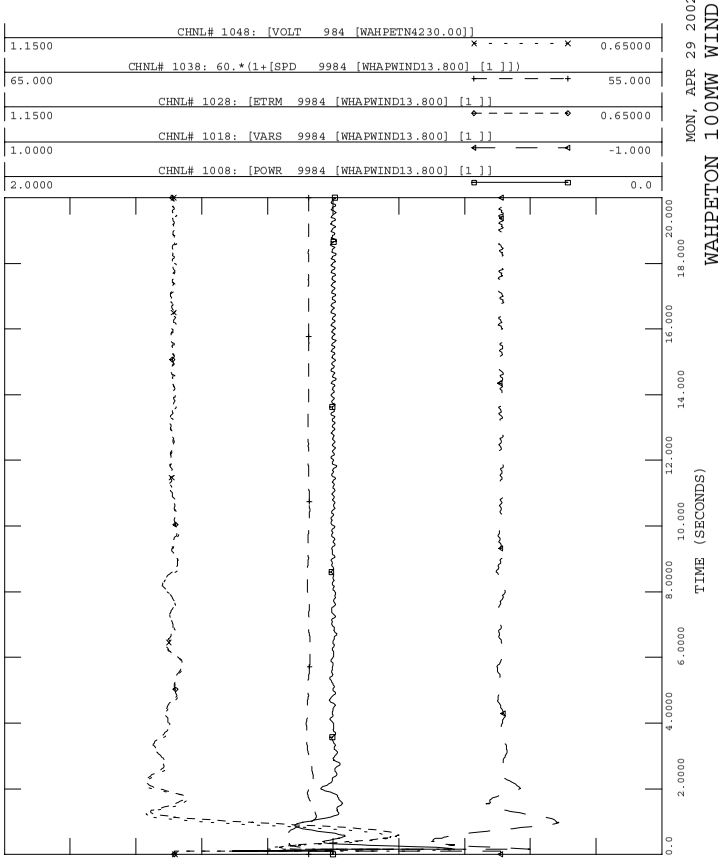
PRAIRIE SVC RESPONSE



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

MON, APR 29 2002 18:46

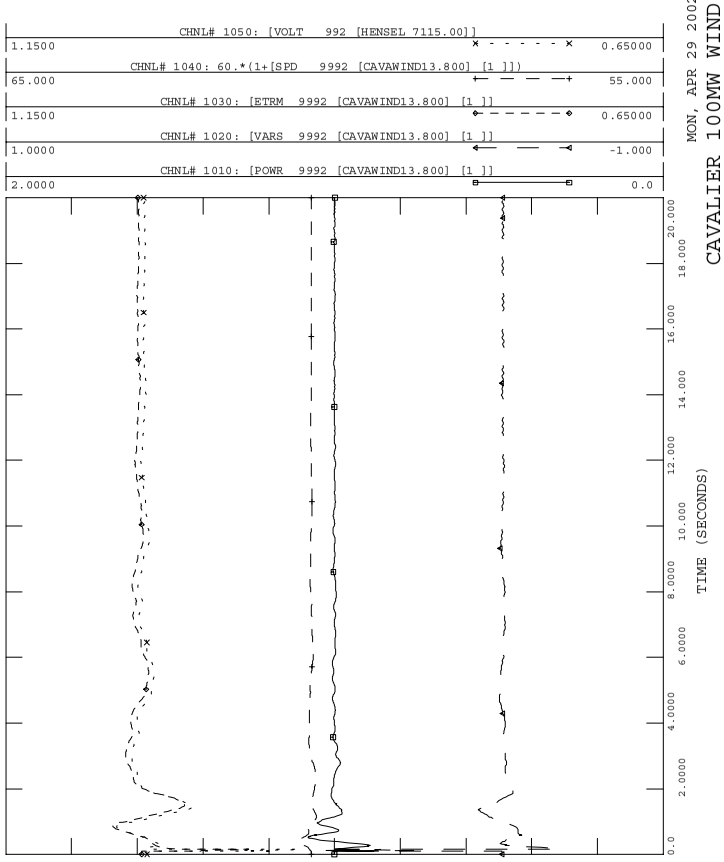
WAHPETON 100MW WIND UNIT



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ag3.bin

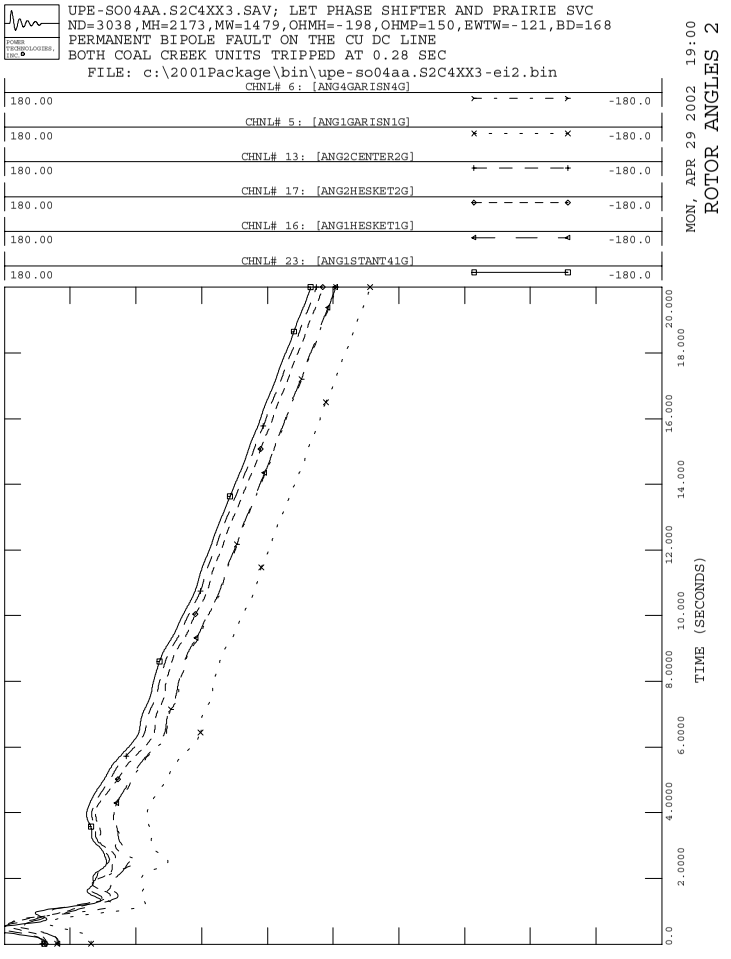
MON, APR 29 2002 18:46

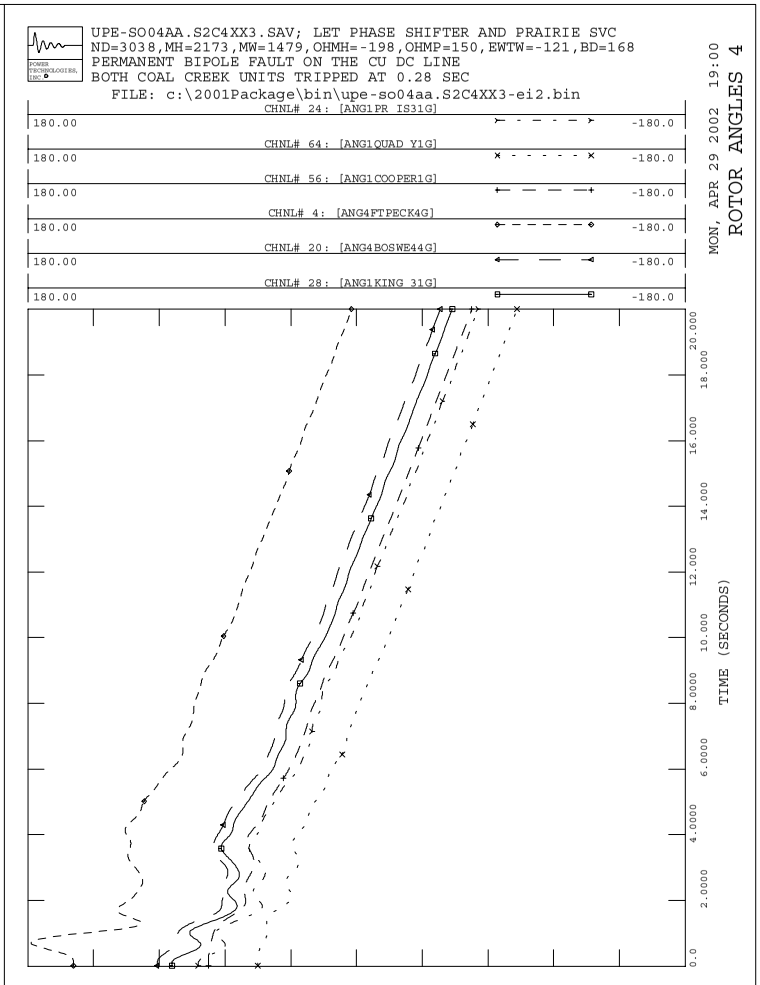
CAVALIER 100MW WIND UNIT

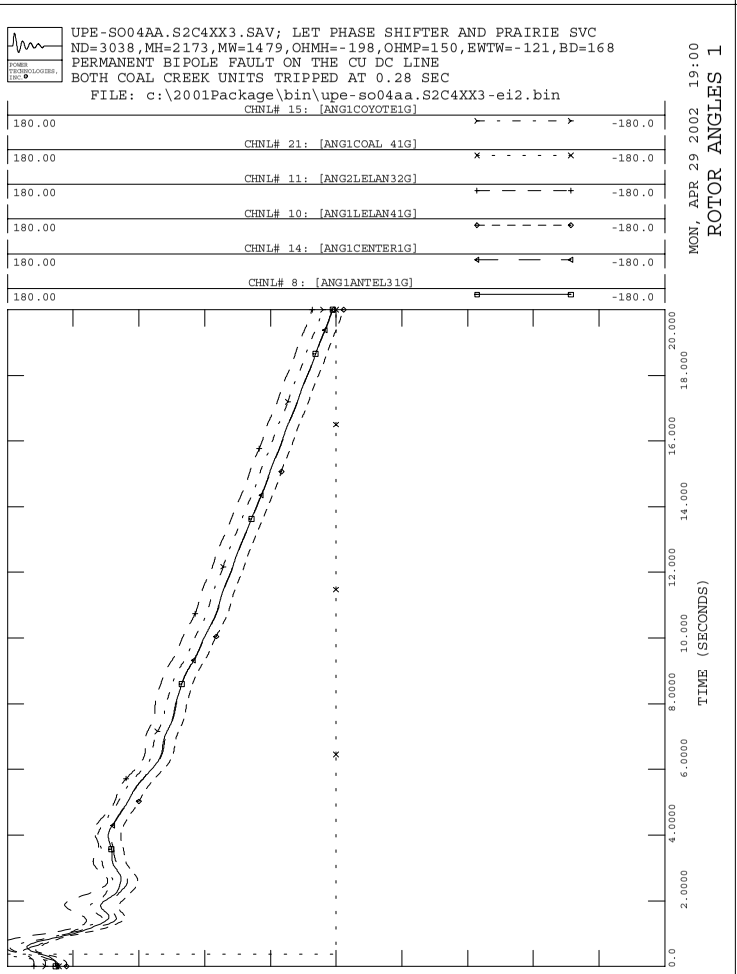


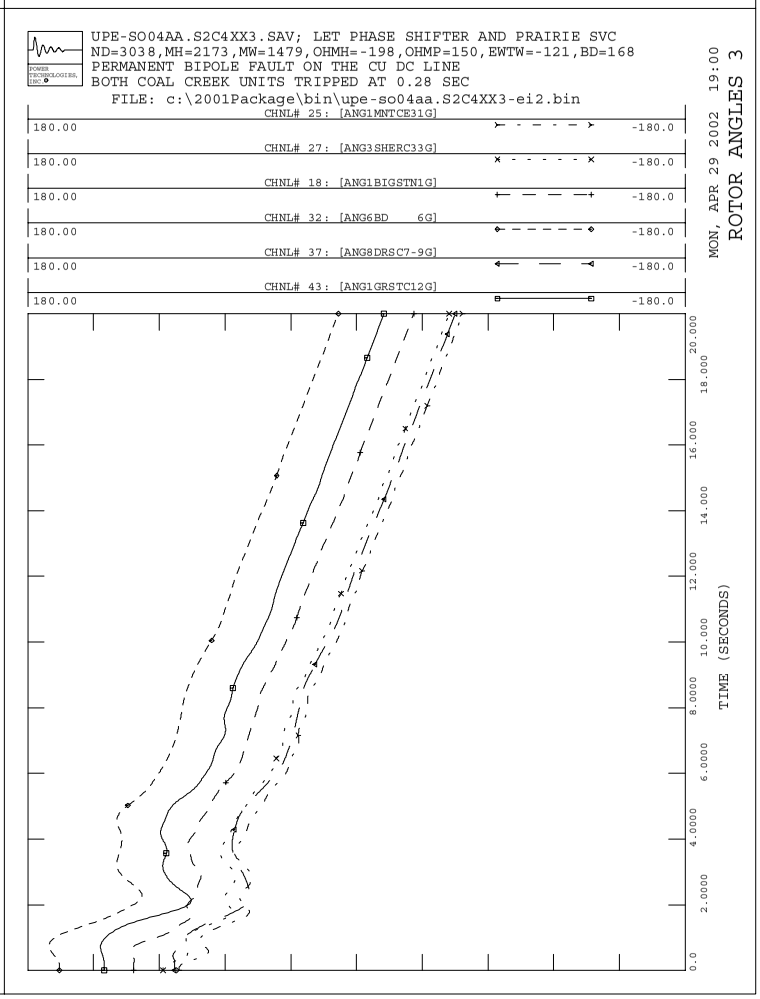
CONTINGENCY EI2

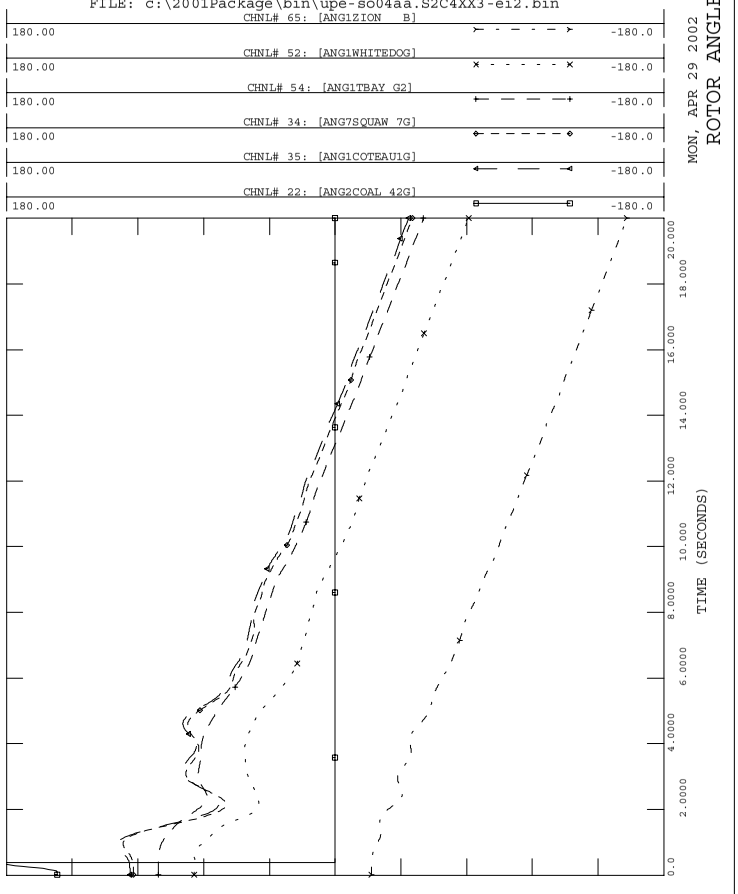
CU DC Permanent Bipole Fault with tripping of both Coal Creek units

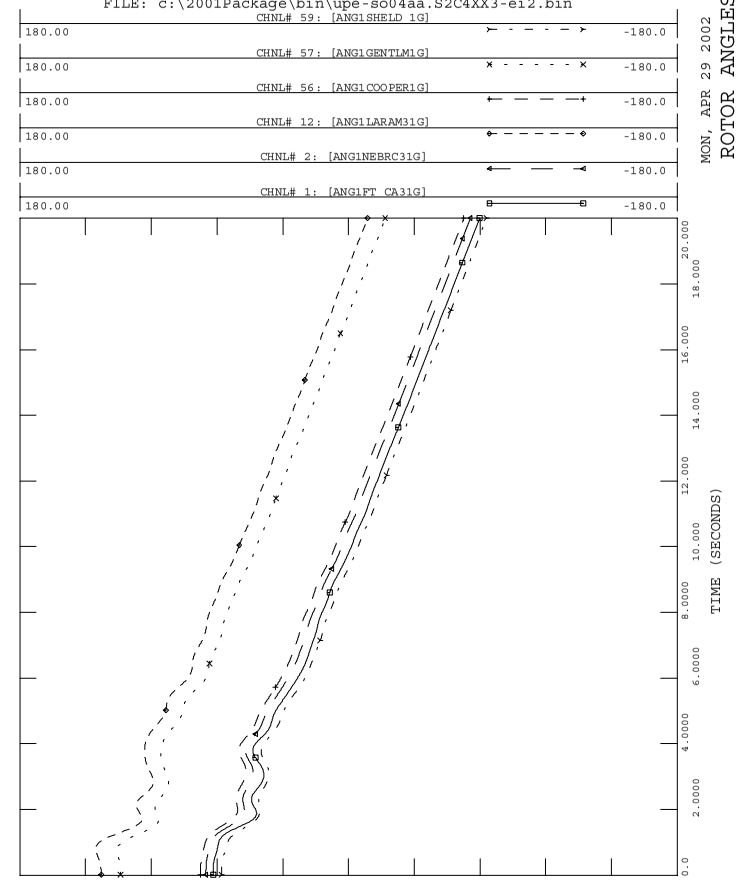

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
MON, APR 29 2002 19:00
ROTOR ANGLES 2
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

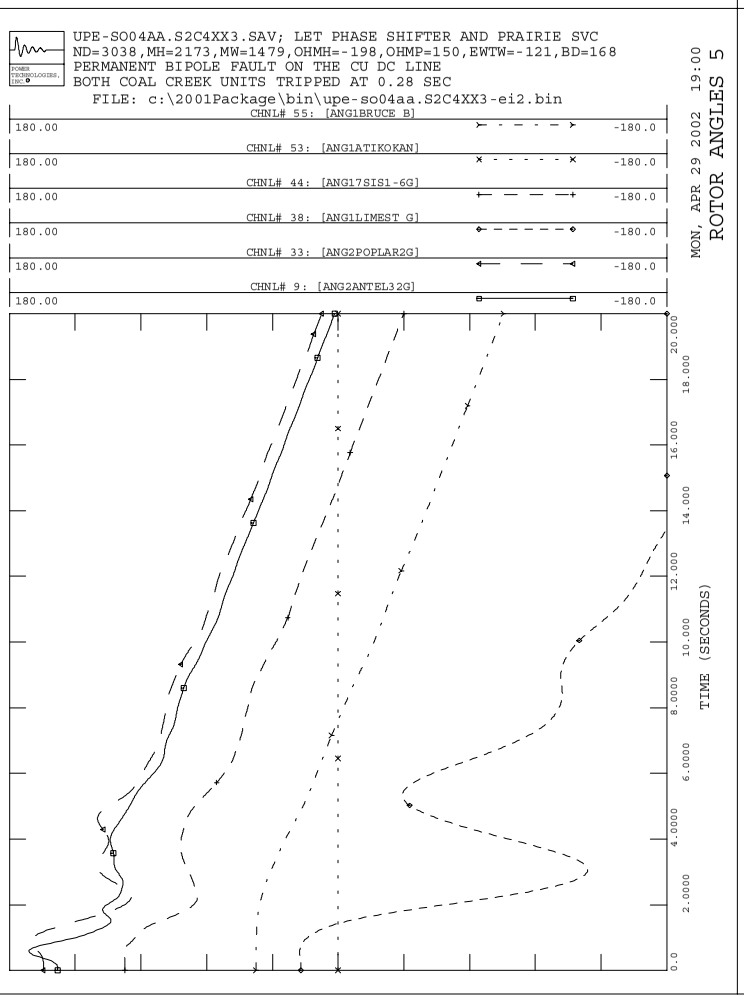

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
MON, APR 29 2002 19:00
ROTOR ANGLES 4
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

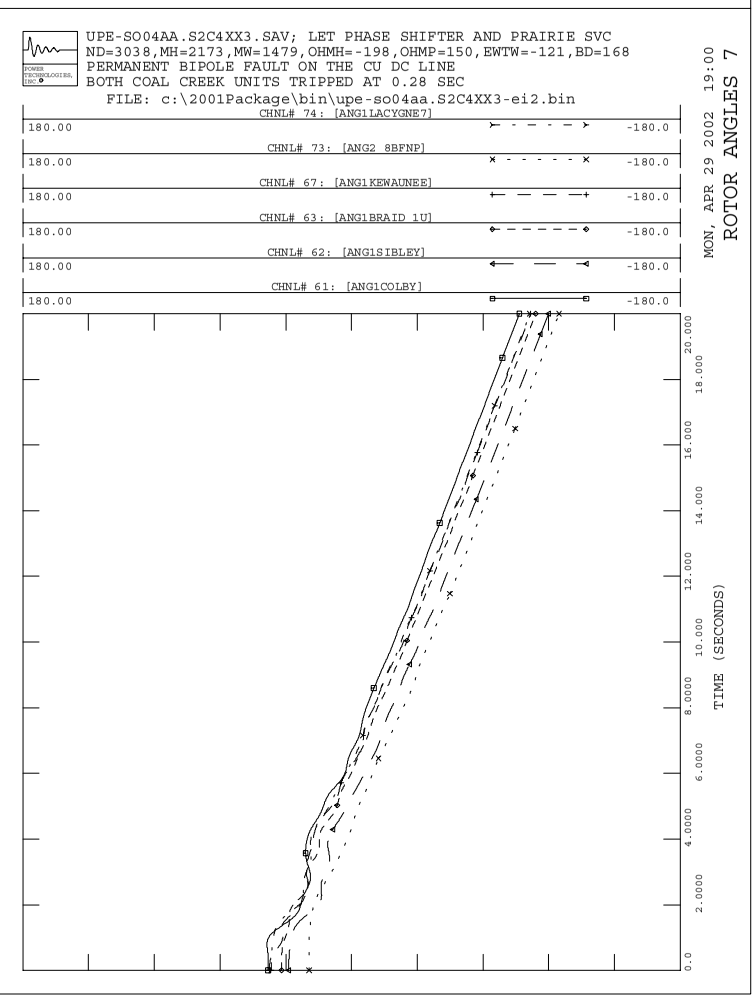

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
MON, APR 29 2002 19:00
ROTOR ANGLES 1
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

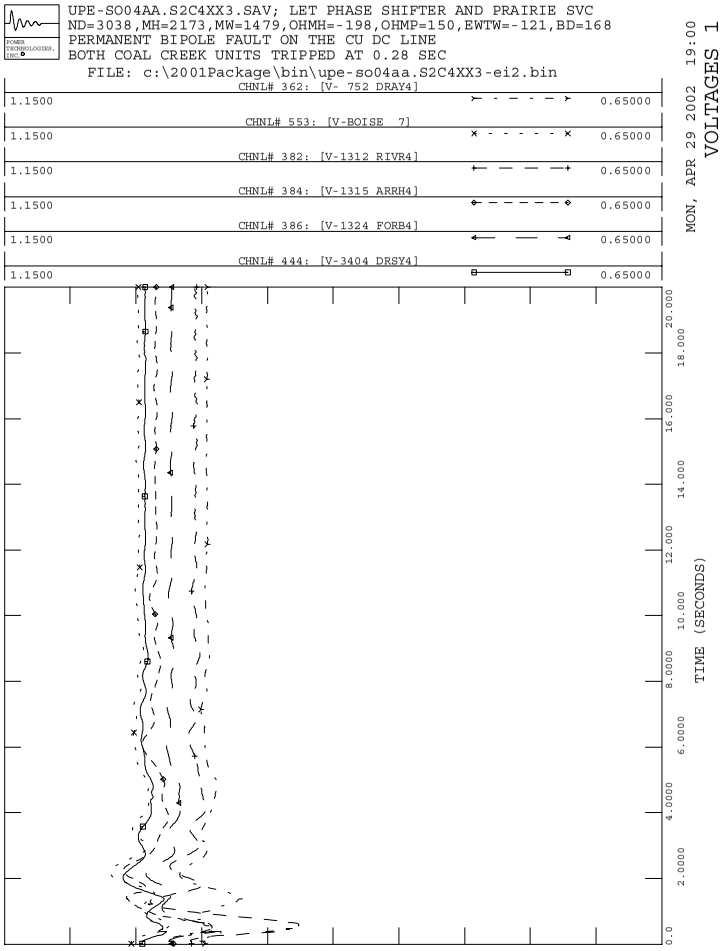

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
MON, APR 29 2002 19:00
ROTOR ANGLES 3
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

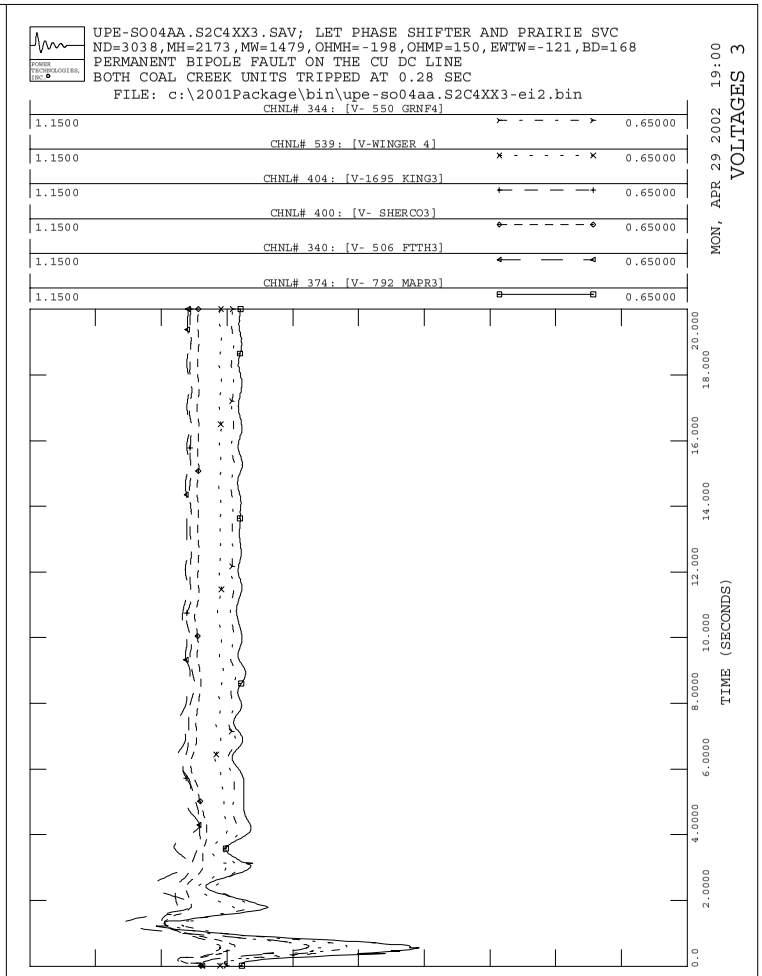

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
MON, APR 29 2002 19:00
ROTOR ANGLES 6
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

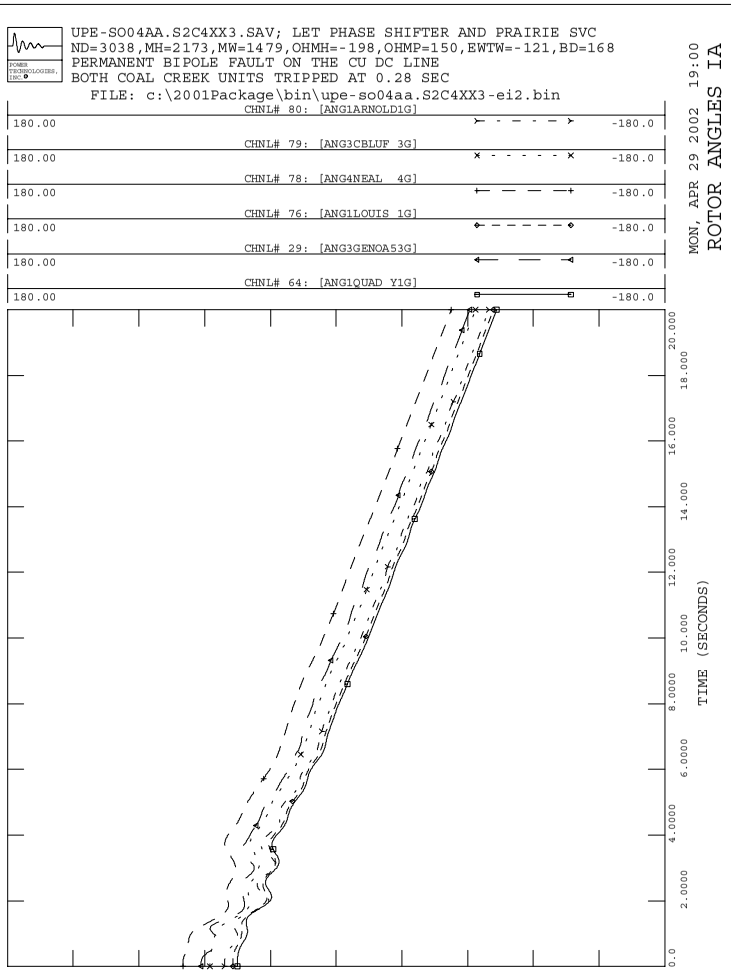

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
MON, APR 29 2002 19:00
ROTOR ANGLES NB
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

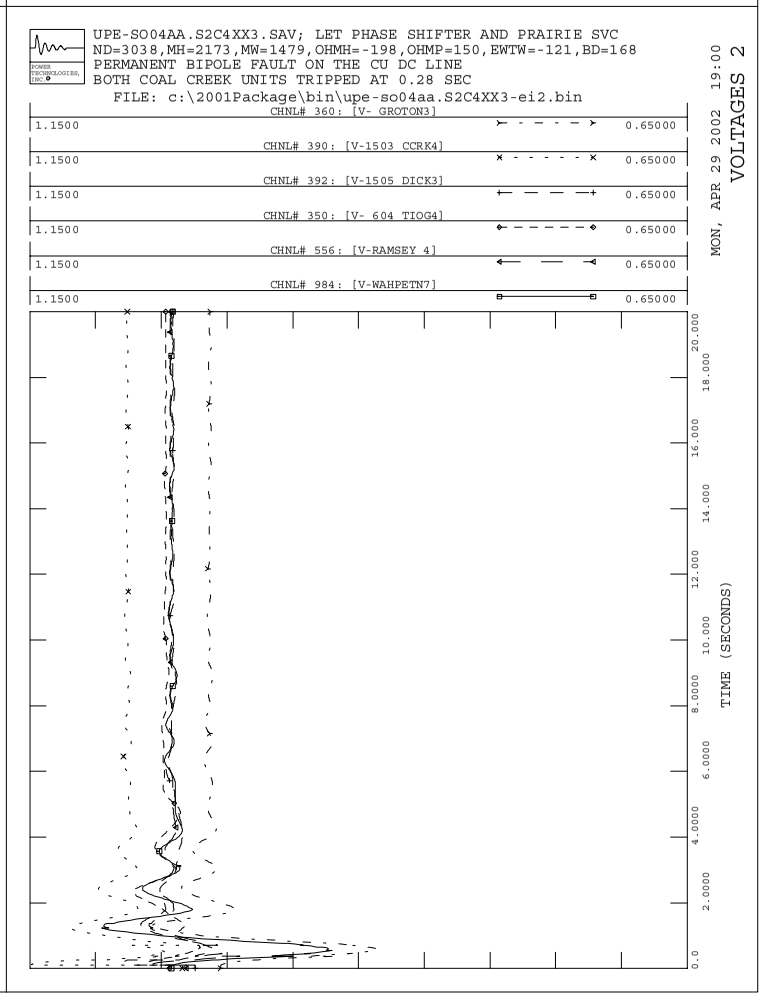

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
MON, APR 29 2002 19:00
ROTOR ANGLES 5
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
MON, APR 29 2002 19:00
ROTOR ANGLES 7
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

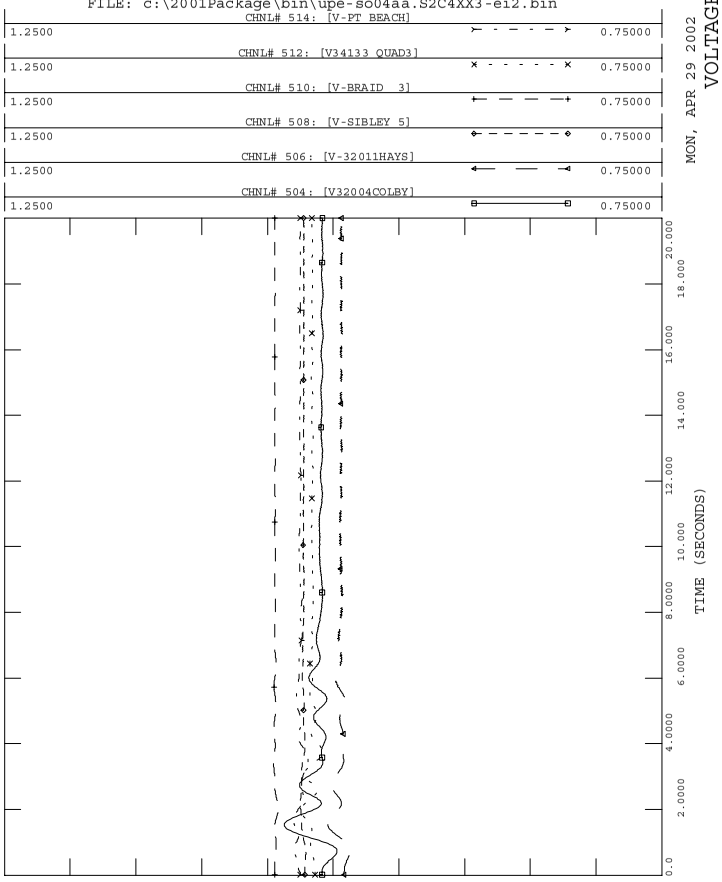

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 362: [V- 752 DRAY4]
CHNL# 553: [V-BOISE 7]
CHNL# 382: [V-1312 RIVR4]
CHNL# 384: [V-1315 ARRH4]
CHNL# 386: [V-1324 FORB4]
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
MON, APR 29 2002 19:00
VOLTAGES 1
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 344: [V- 550 GRNF4]
CHNL# 539: [V-WINGER 4]
CHNL# 404: [V-1695 KING3]
CHNL# 400: [V- SHERCO3]
CHNL# 340: [V- 506 FTTH3]
CHNL# 374: [V- 792 MAPR3]
1.1500
0.65000
MON, APR 29 2002 19:00
VOLTAGES 3
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 80: [ANG1ARNOLD1G]
CHNL# 79: [ANG3CBLUF 3G]
CHNL# 78: [ANG4NEAL 4G]
CHNL# 76: [ANG1LOUIS 1G]
CHNL# 29: [ANG3GENOA53G]
CHNL# 64: [ANG1QUAD Y1G]
180.00
-180.0
MON, APR 29 2002 19:00
ROTOR ANGLES IA
TIME (SECONDS)

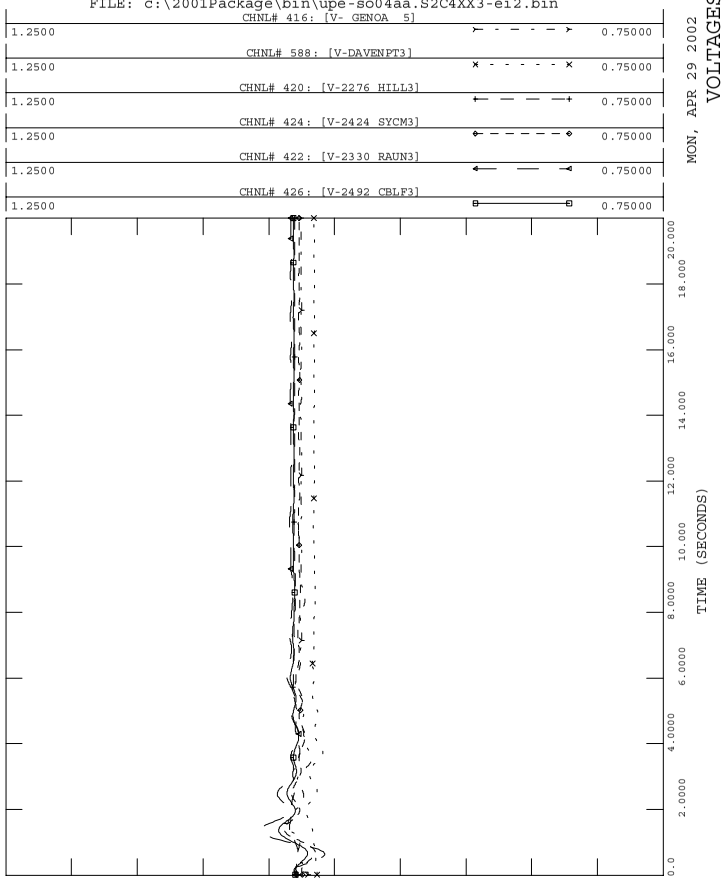

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 360: [V- GROTON3]
CHNL# 390: [V-1503 CCRK4]
CHNL# 392: [V-1505 DICK3]
CHNL# 350: [V- 604 TIOG4]
CHNL# 556: [V-RAMSEY 4]
CHNL# 984: [V-WAHPETN7]
1.1500
0.65000
MON, APR 29 2002 19:00
VOLTAGES 2
TIME (SECONDS)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



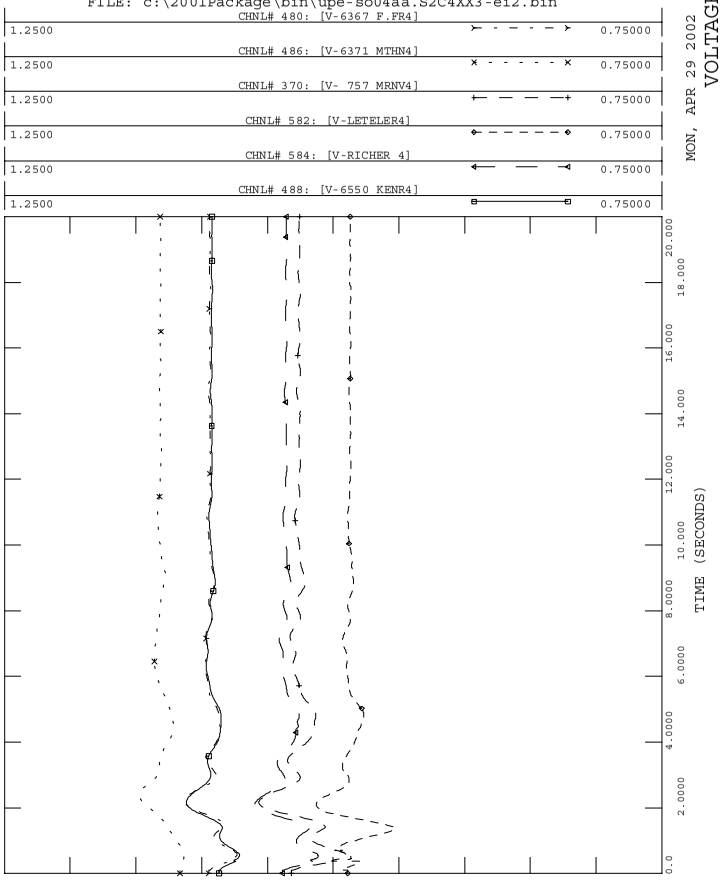
MON, APR 29 2002 19:00
VOLTAGES 5

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



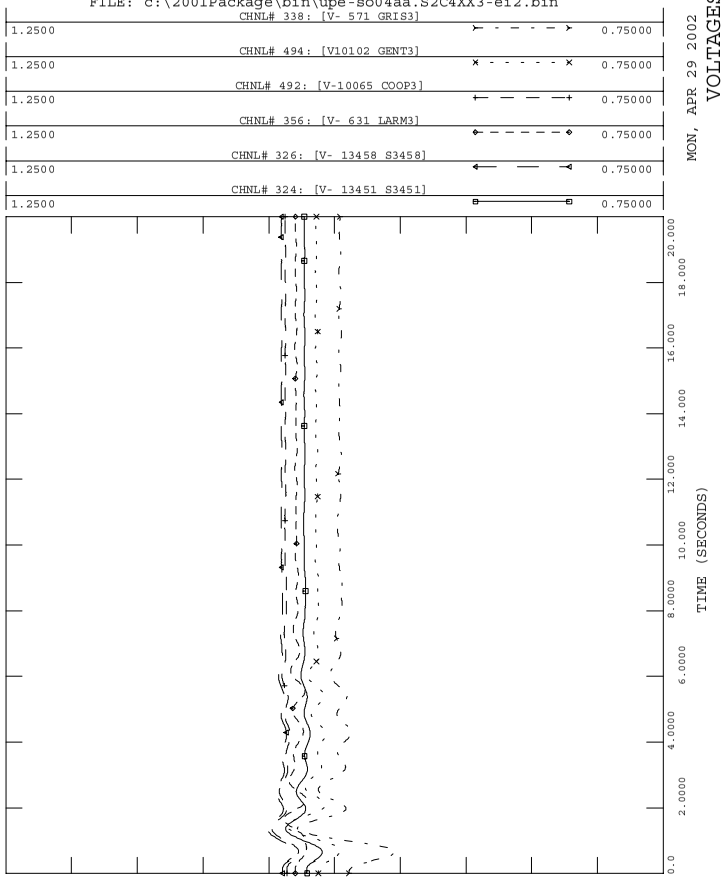
MON, APR 29 2002 19:00
VOLTAGES IA

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

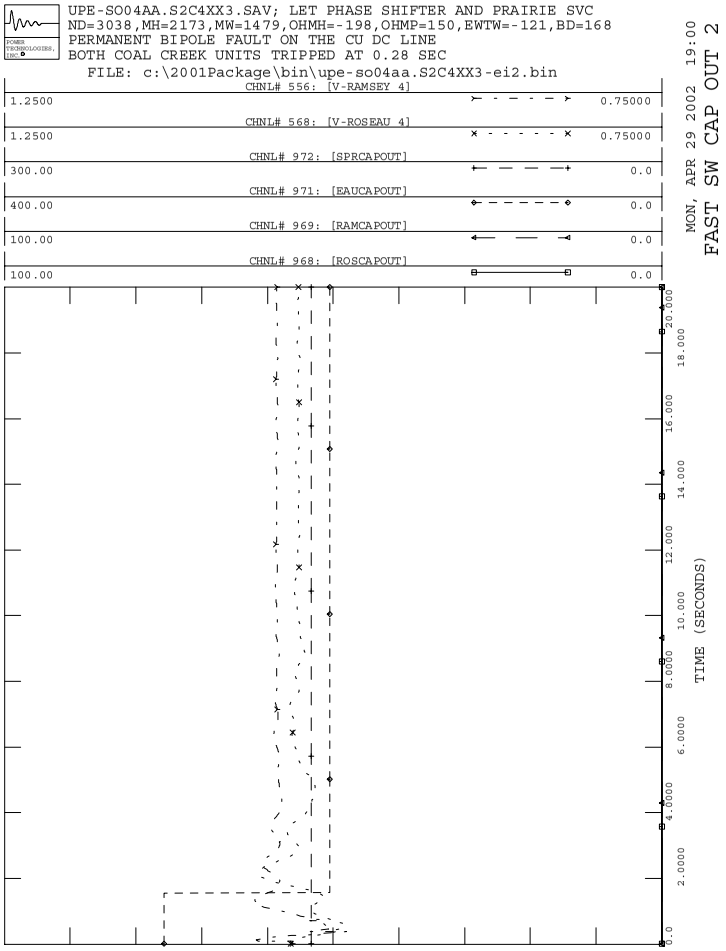


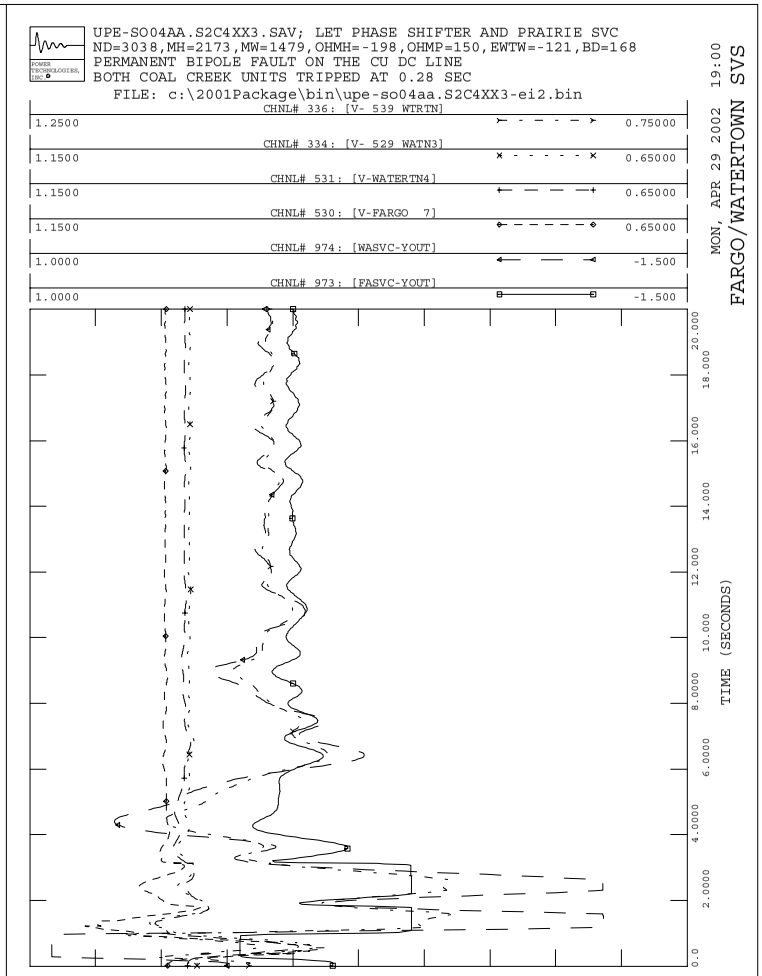
MON, APR 29 2002 19:00
VOLTAGES 4

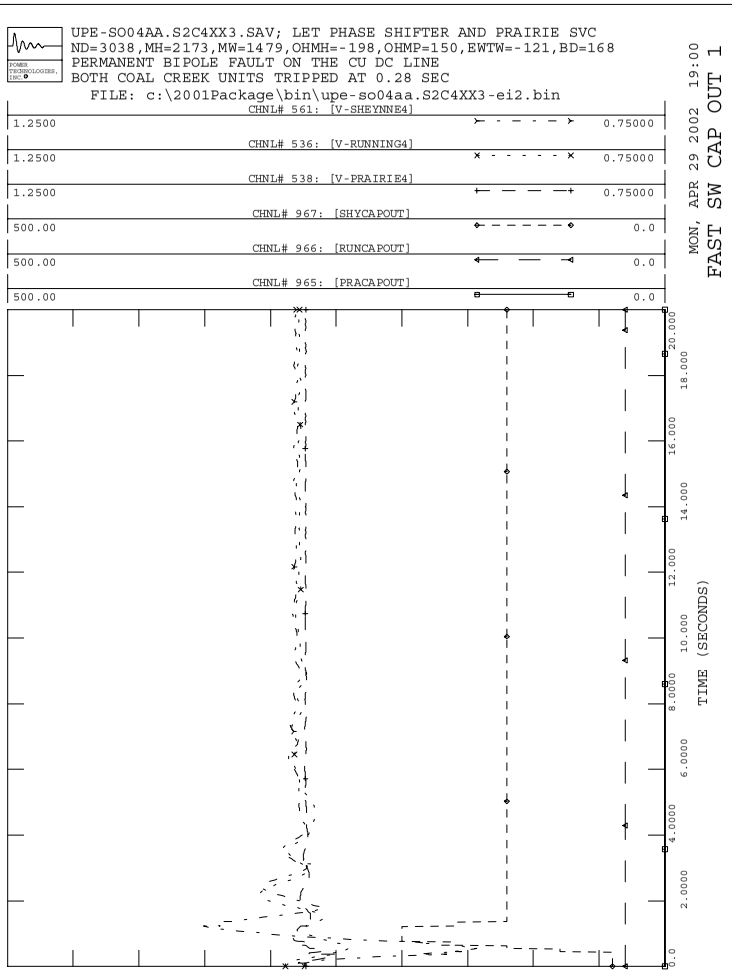
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

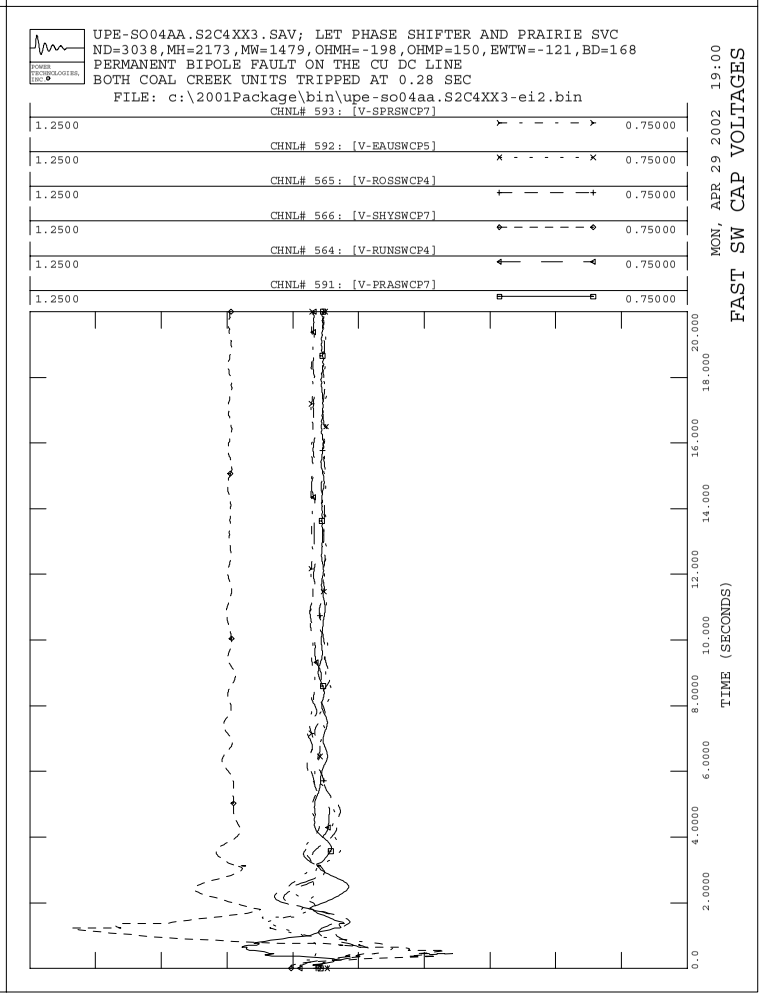


MON, APR 29 2002 19:00
VOLTAGES NB

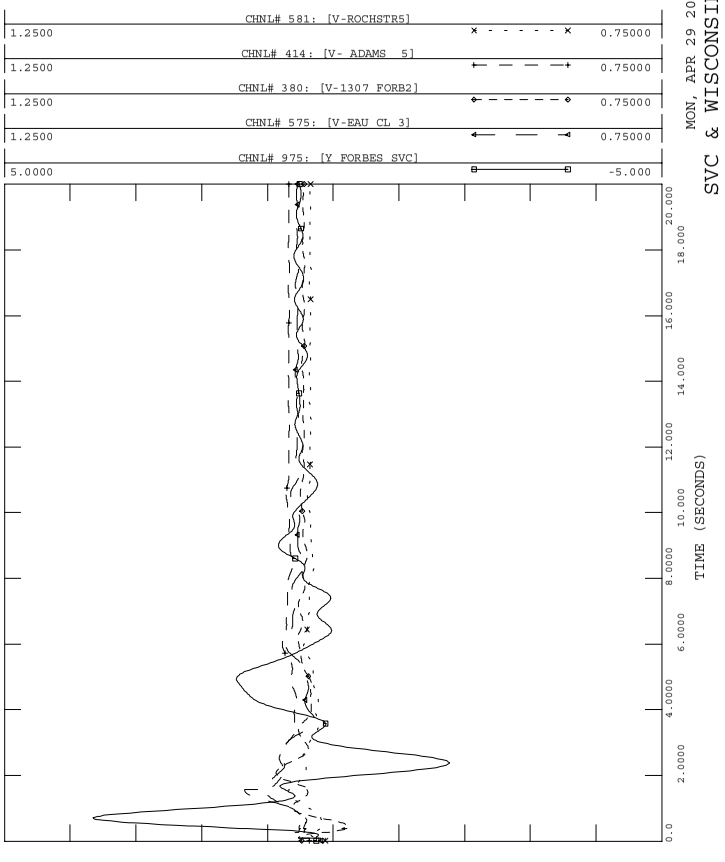

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
MON, APR 29 2002 19:00
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
MON, APR 29 2002 19:00
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
MON, APR 29 2002 19:00
FAST SW CAP OUT 1
TIME (SECONDS)

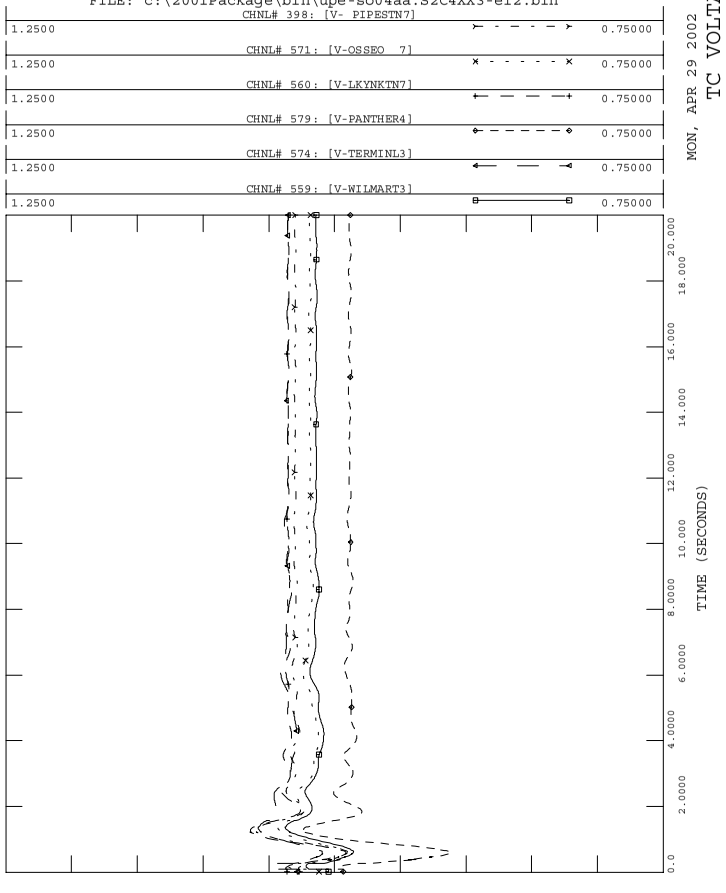

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
MON, APR 29 2002 19:00
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



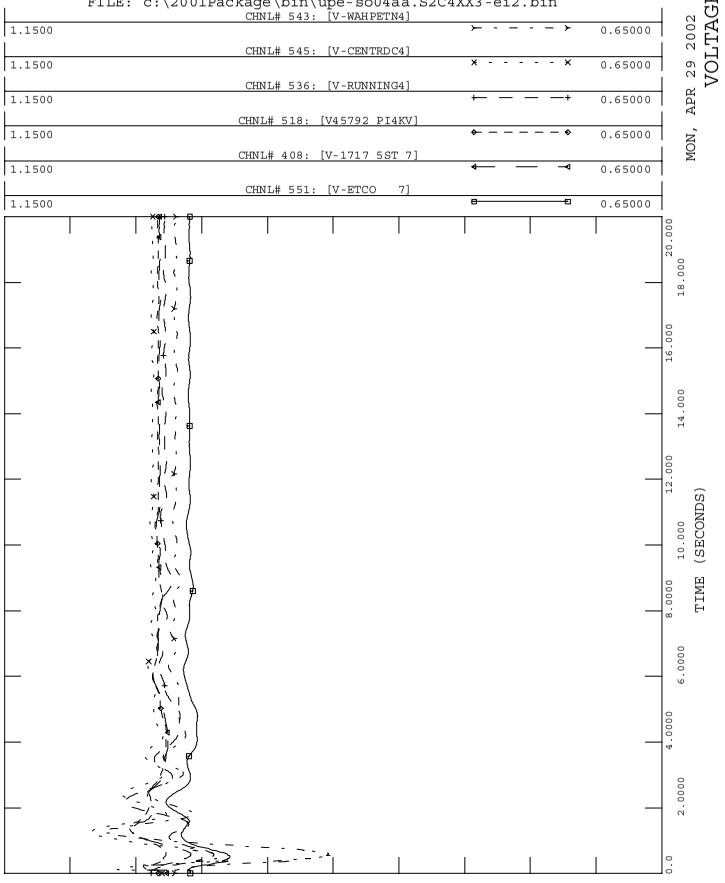
MON, APR 29 2002 19:00
SVC & WISCONSIN VOLT

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



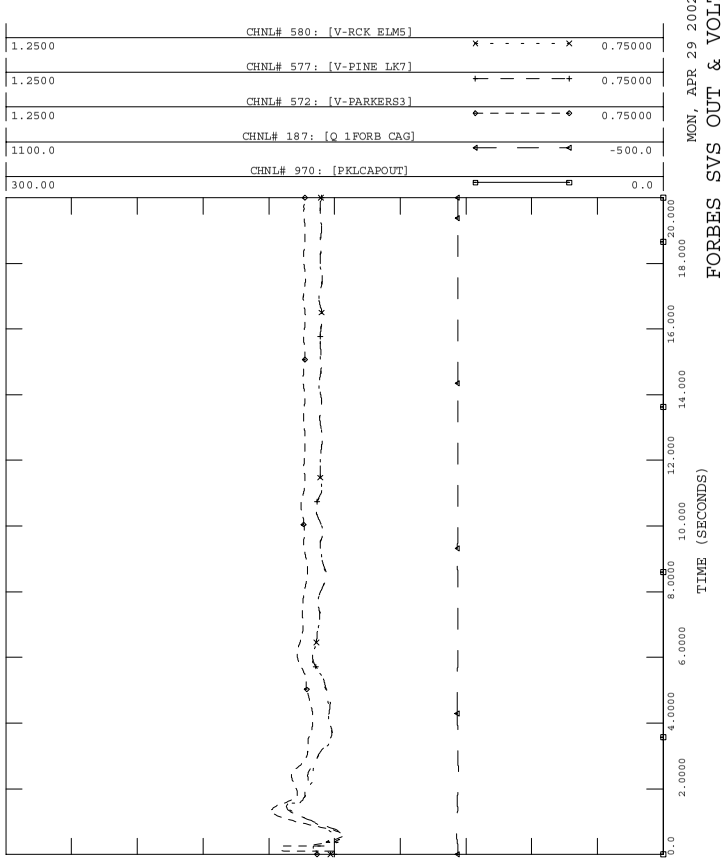
MON, APR 29 2002 19:00
TC VOLTAGES

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

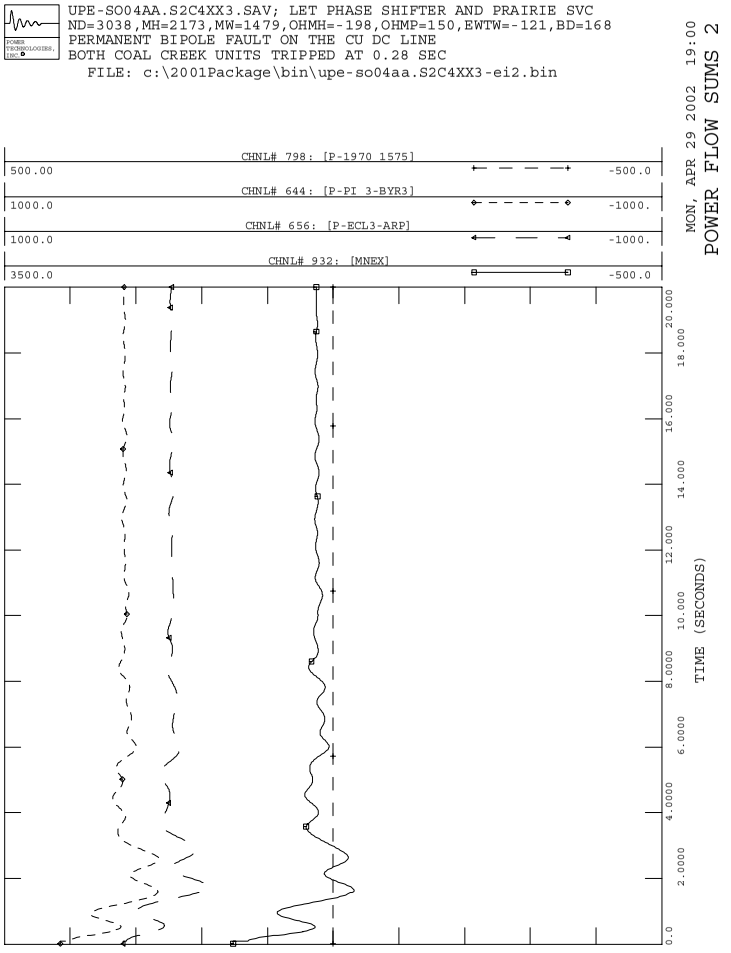


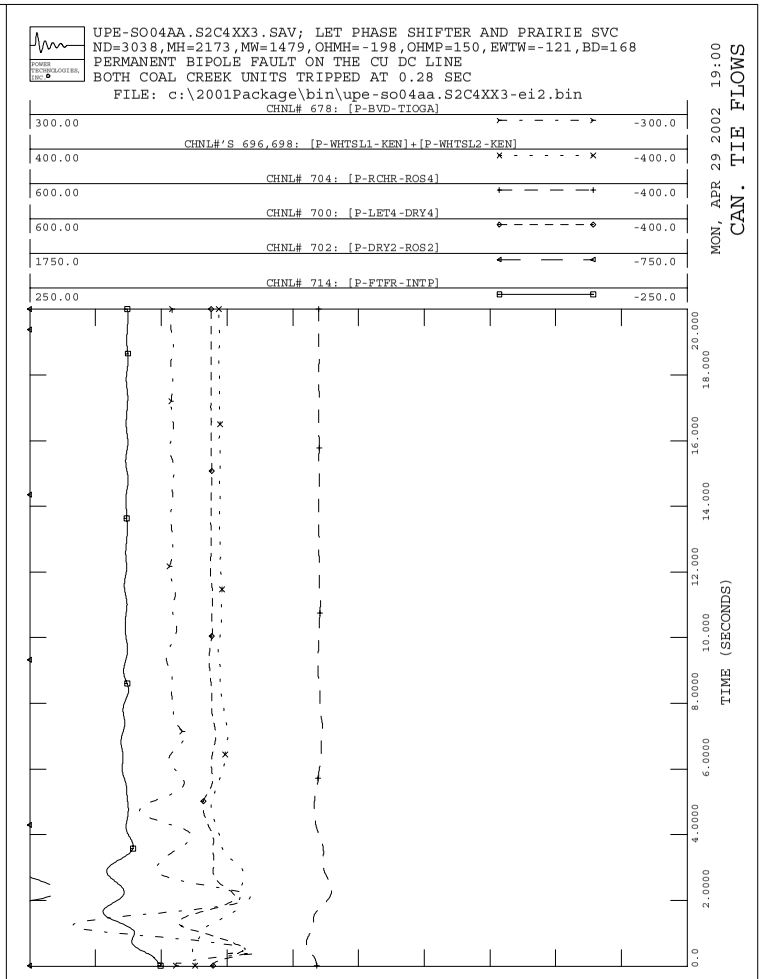
MON, APR 29 2002 19:00
VOLTAGES 6

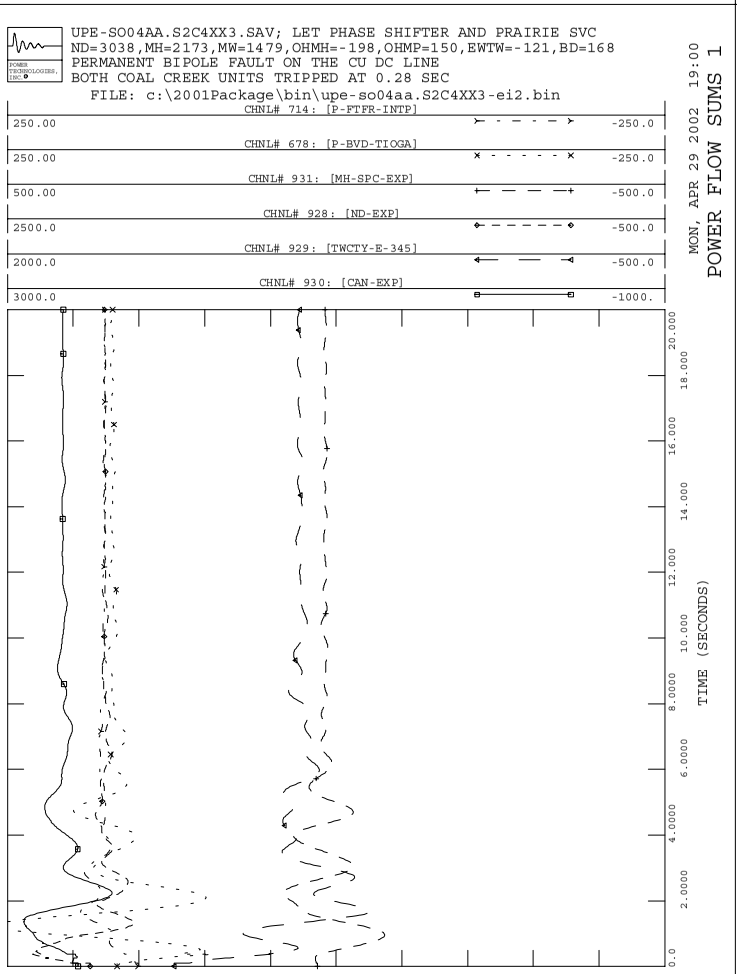
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

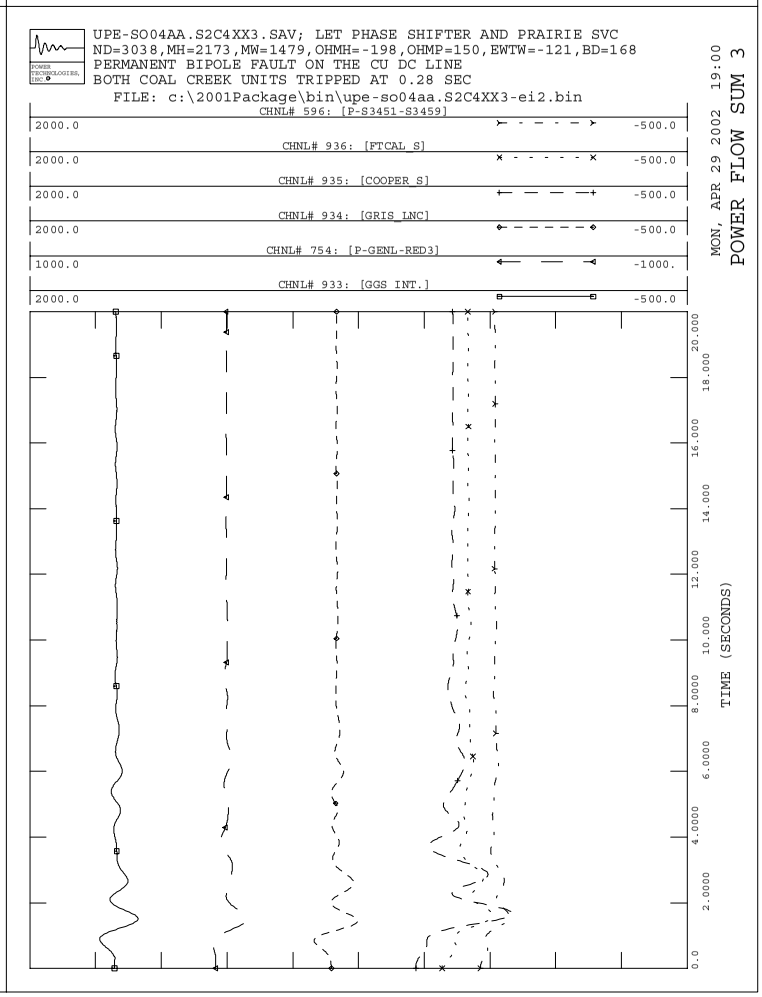


MON, APR 29 2002 19:00
FORBES SVS OUT & VOLTAGES

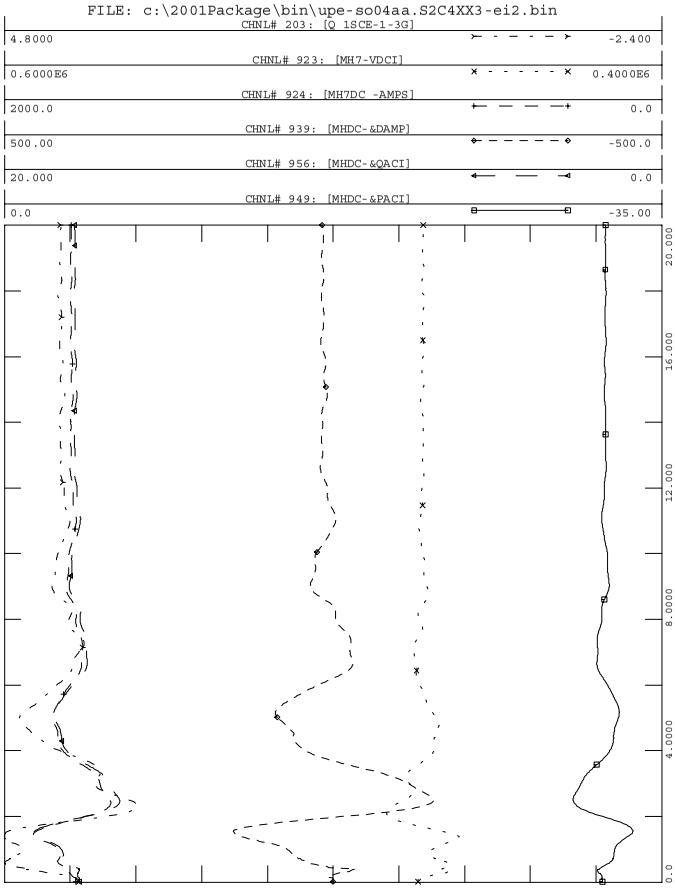

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 798: [P-1970 1575]
500.00
-500.0
CHNL# 644: [P-PI 3-BYR3]
1000.0
-1000.
CHNL# 656: [P-ECL3-ARP]
1000.0
-1000.
CHNL# 932: [MNEX]
3500.0
-500.0
MON, APR 29 2002 19:00
POWER FLOW SUMS 2
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 678: [P-BVD-TIOGA]
300.00
-300.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
400.00
-400.0
CHNL# 704: [P-RCHR-ROS4]
600.00
-400.0
CHNL# 700: [P-LET4-DRY4]
600.00
-400.0
CHNL# 702: [P-DRY2-ROS2]
1750.0
-750.0
CHNL# 714: [P-FTFR-INTP]
250.00
-250.0
MON, APR 29 2002 19:00
CAN. TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 714: [P-FTFR-INTP]
250.00
-250.0
CHNL# 678: [P-BVD-TIOGA]
250.00
-250.0
CHNL# 931: [MH-SPC-EXP]
500.00
-500.0
CHNL# 928: [ND-EXP]
2500.0
-500.0
CHNL# 929: [TWCTY-E-345]
2000.0
-500.0
CHNL# 930: [CAN-EXP]
3000.0
-1000.
MON, APR 29 2002 19:00
POWER FLOW SUMS 1
TIME (SECONDS)

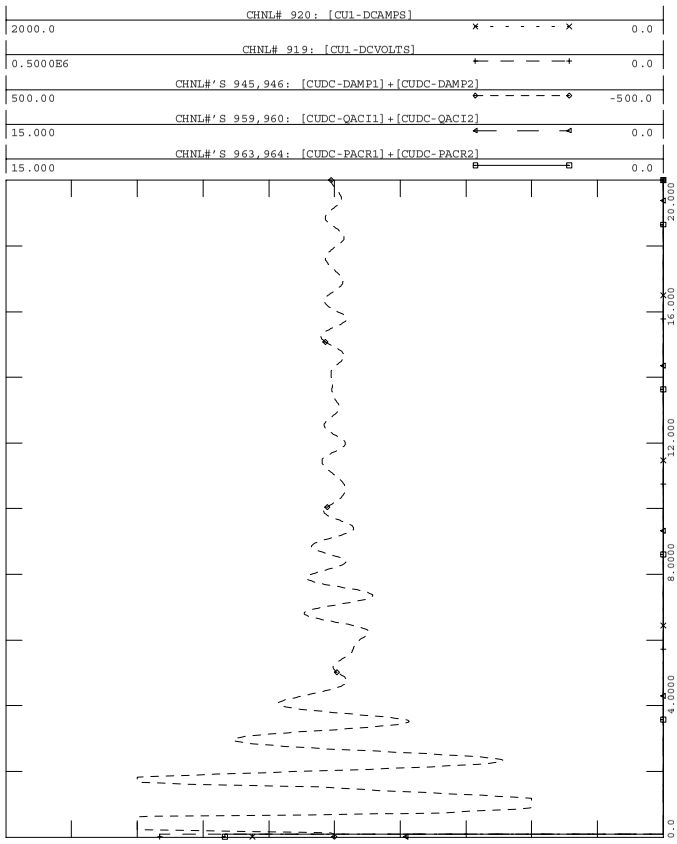

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 596: [P-S3451-S3459]
2000.0
-500.0
CHNL# 936: [FTCAL_S]
2000.0
-500.0
CHNL# 935: [COOPER_S]
2000.0
-500.0
CHNL# 934: [GRIS_LNC]
2000.0
-500.0
CHNL# 754: [P-GENL-RED3]
1000.0
-1000.
CHNL# 933: [GGS INT.]
2000.0
-500.0
MON, APR 29 2002 19:00
POWER FLOW SUM 3
TIME (SECONDS)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



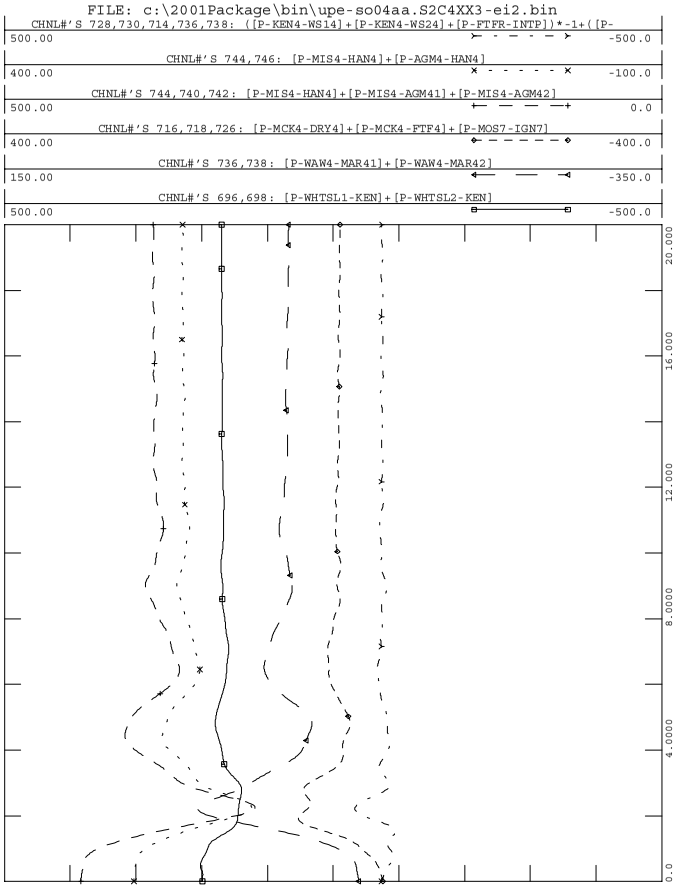
MON, APR 29 2002 19:00
MH DC PARAMETERS

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



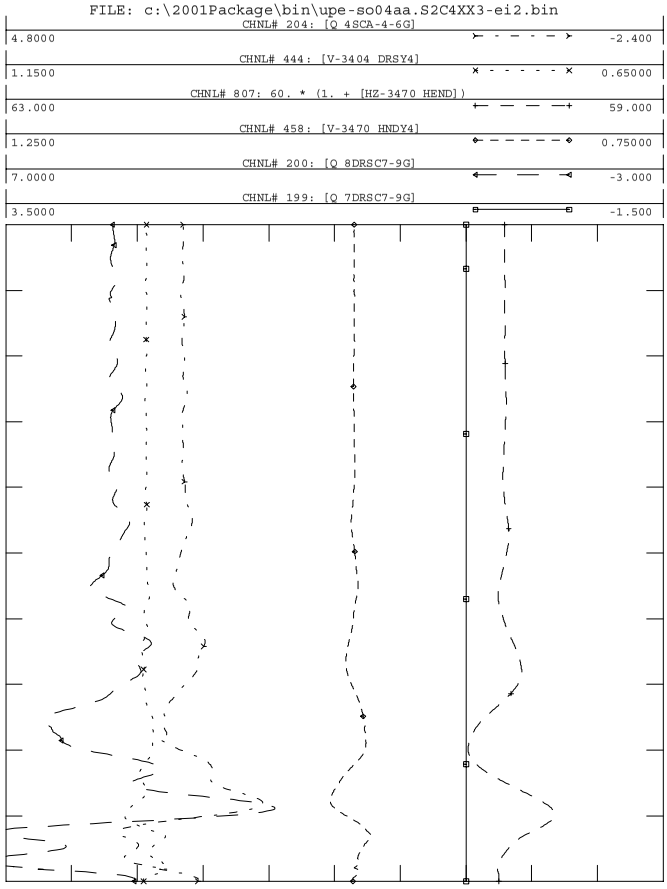
MON, APR 29 2002 19:00
CU DC #1

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

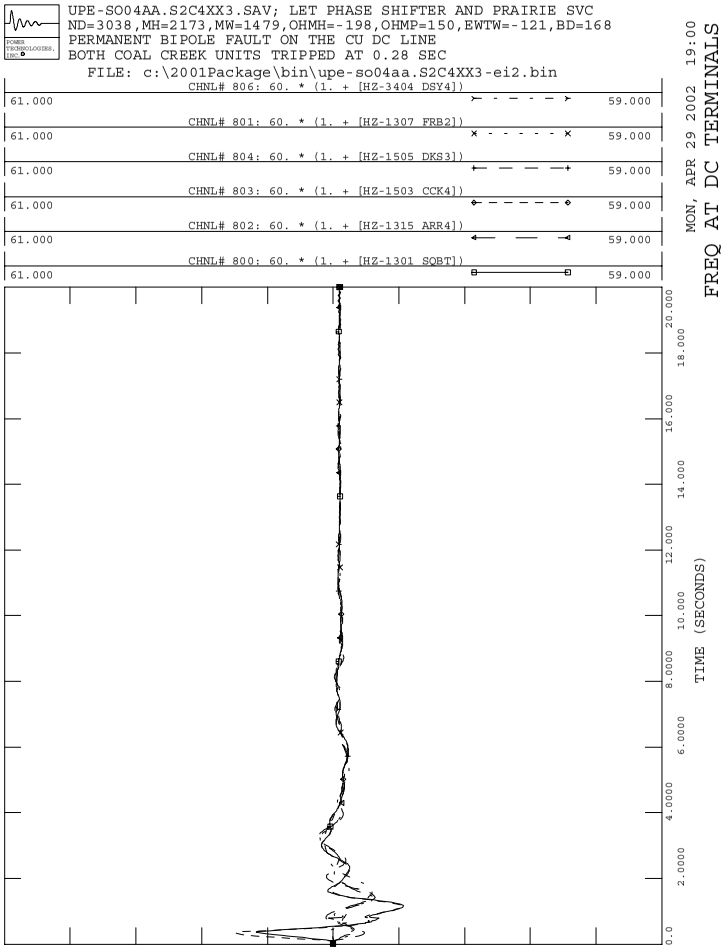


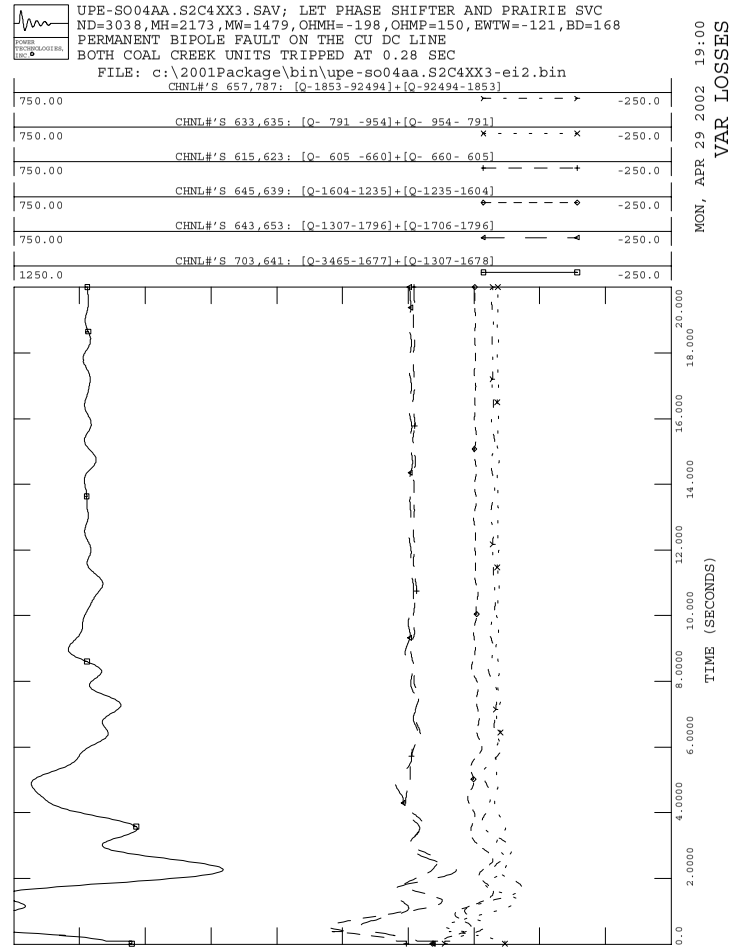
MON, APR 29 2002 19:00
OH TIE FLOWS

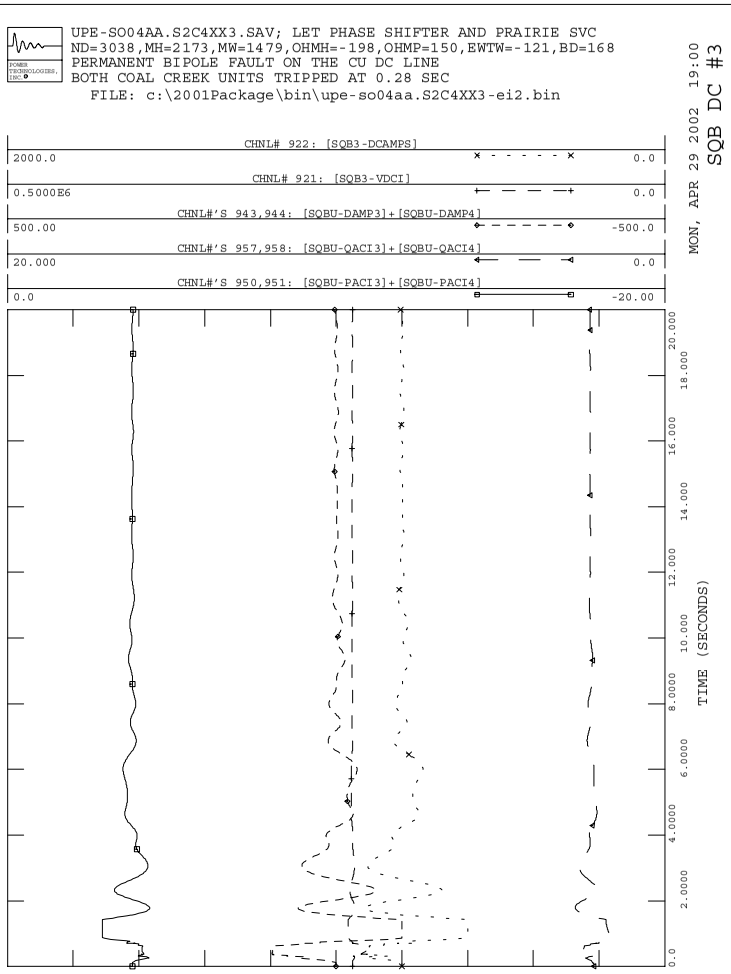
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

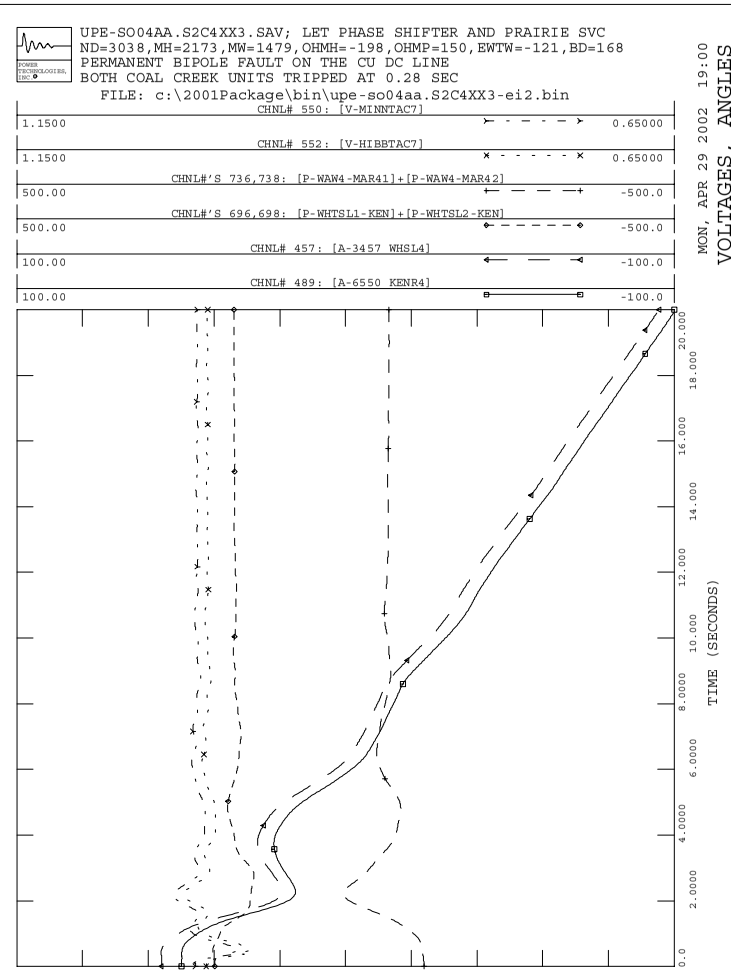


MON, APR 29 2002 19:00
MH DC PARAMETERS


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
MON, APR 29 2002 19:00
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
MON, APR 29 2002 19:00
VAR LOSSES
TIME (SECONDS)

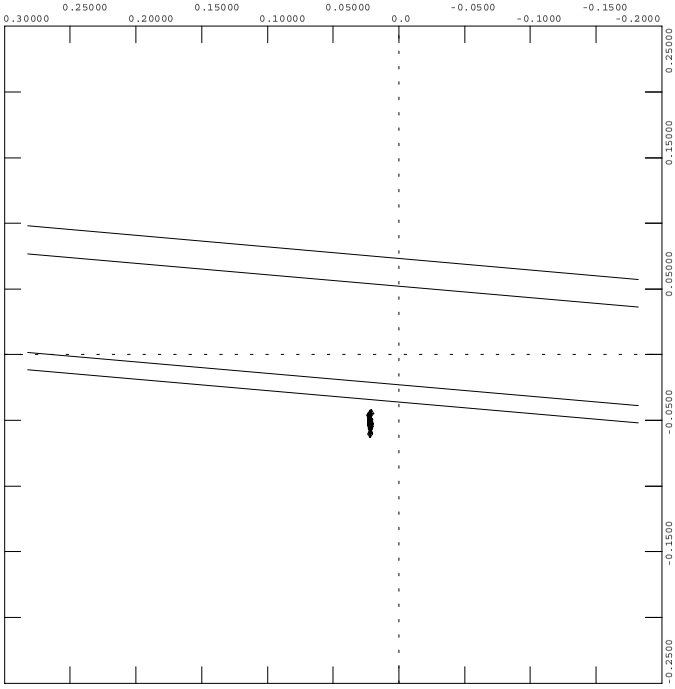

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
MON, APR 29 2002 19:00
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
MON, APR 29 2002 19:00
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

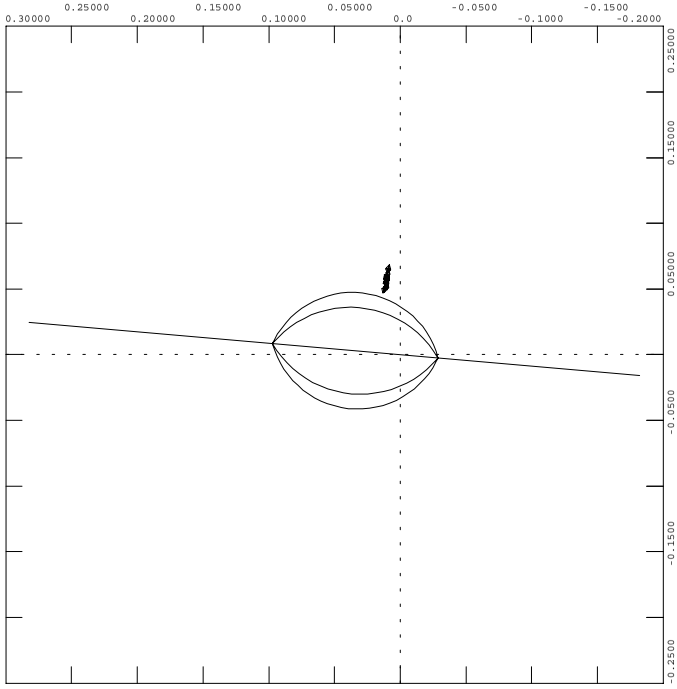


MON, APR 29 2002 19:00
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

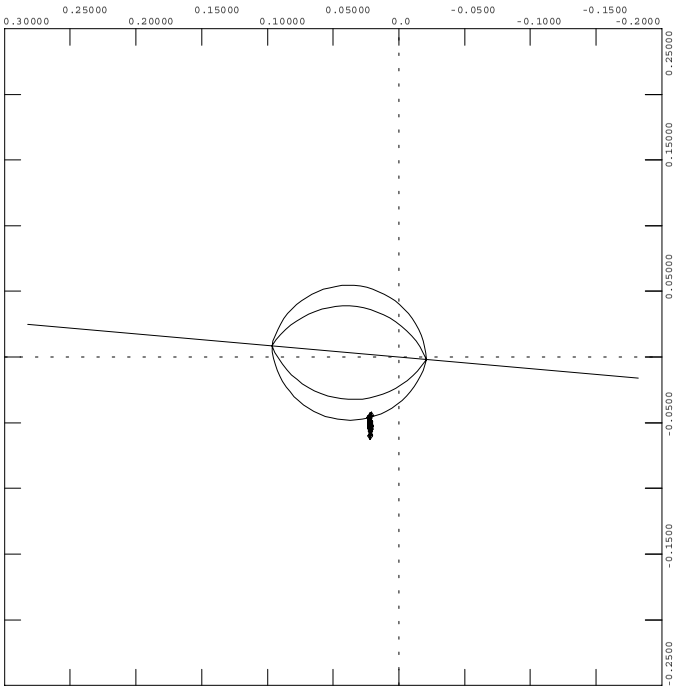


MON, APR 29 2002 19:00
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

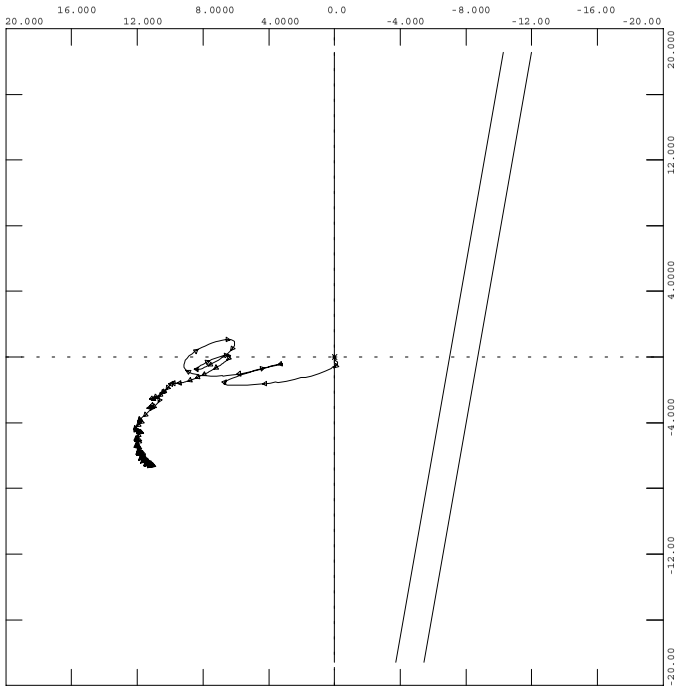


MON, APR 29 2002 19:00
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

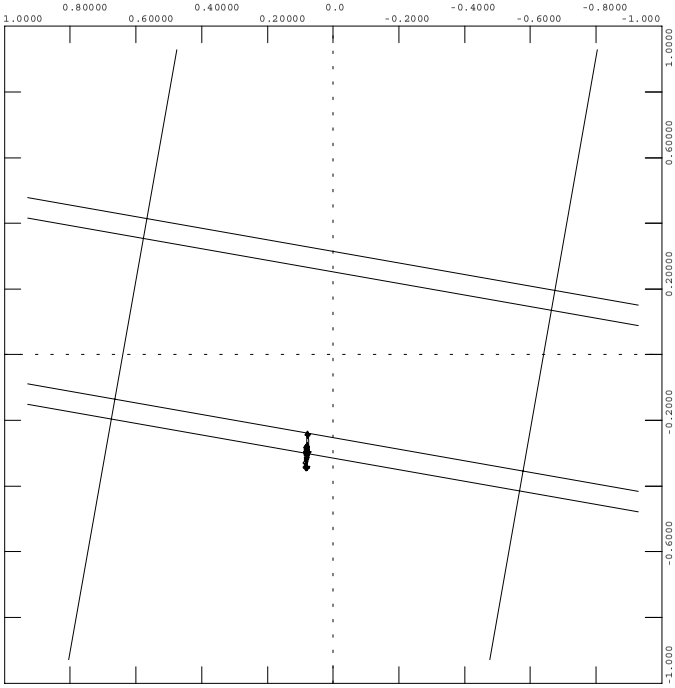


MON, APR 29 2002 19:00
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

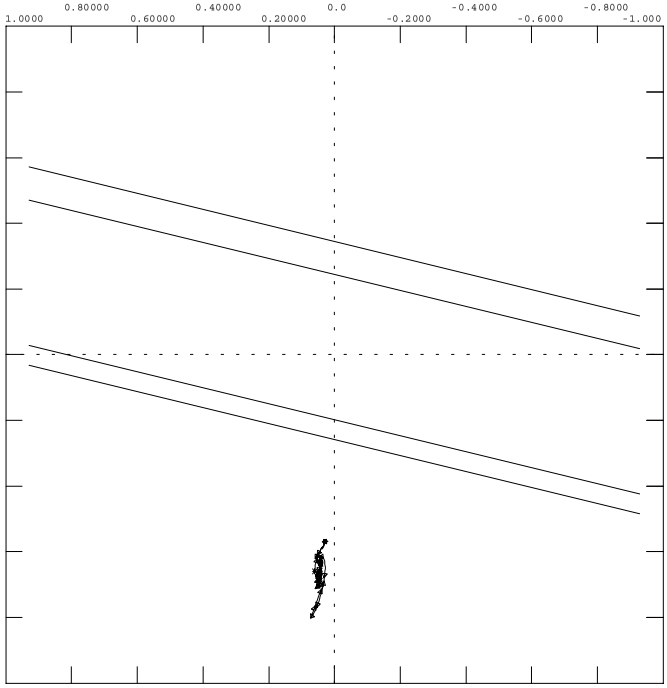


MON, APR 29 2002 19:00
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

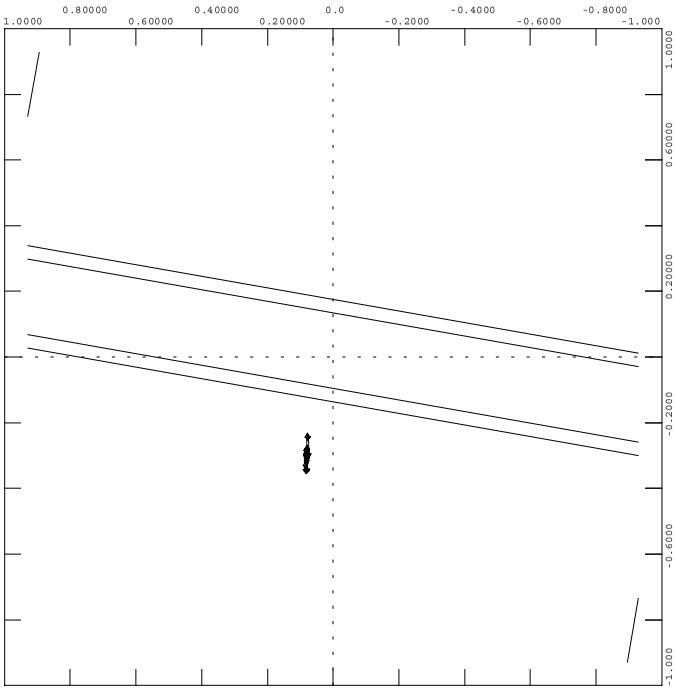


MON, APR 29 2002 19:00
R50M AT MORANVILLE (520)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

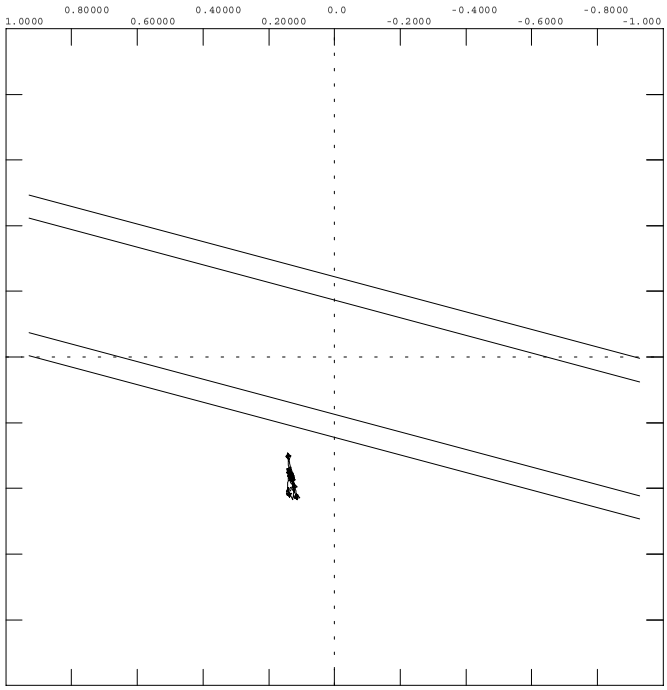


MON, APR 29 2002 19:00
L20D AT DRAYTON (506)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

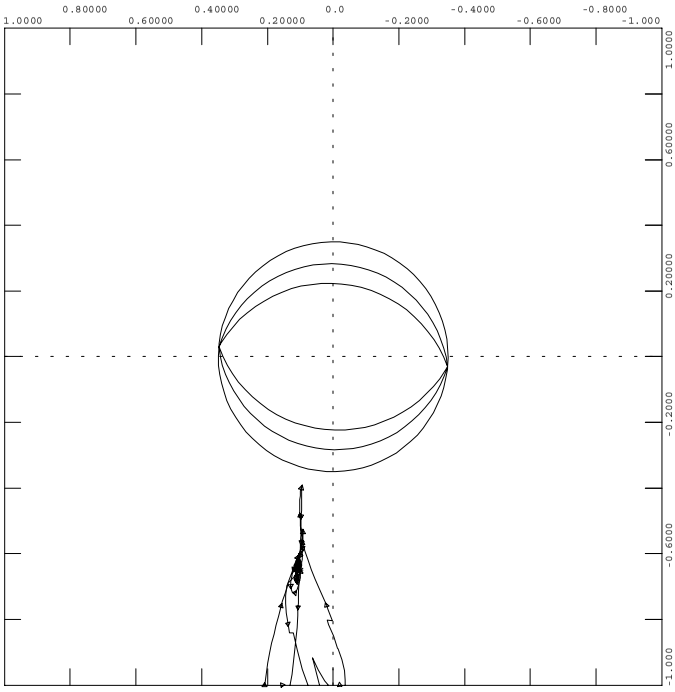


MON, APR 29 2002 19:00
L20D-PRAIRIE (510)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

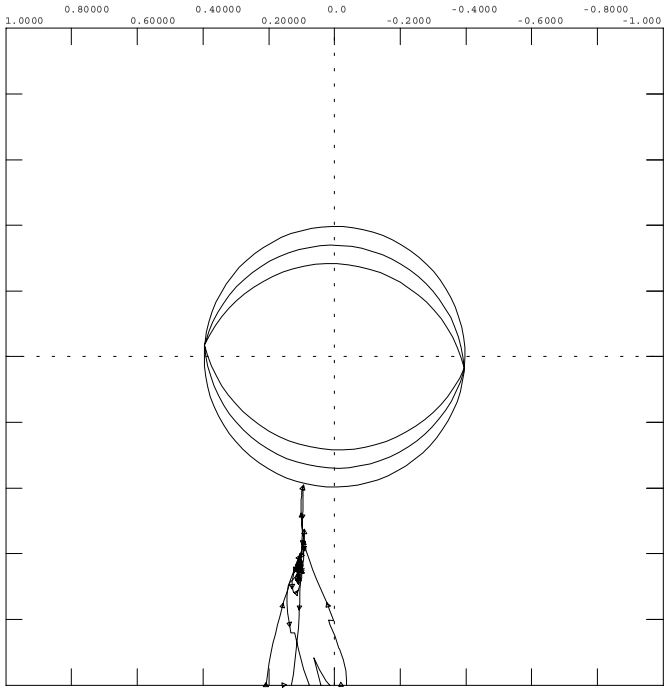
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

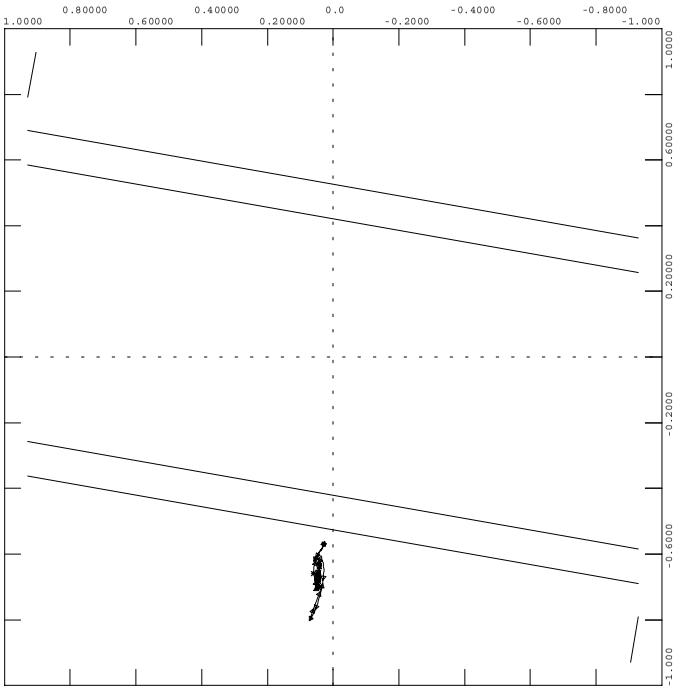
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

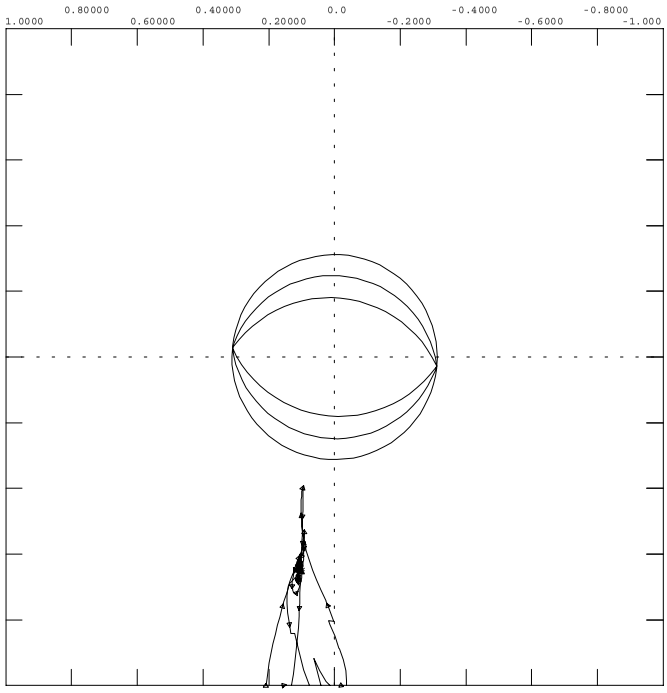
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



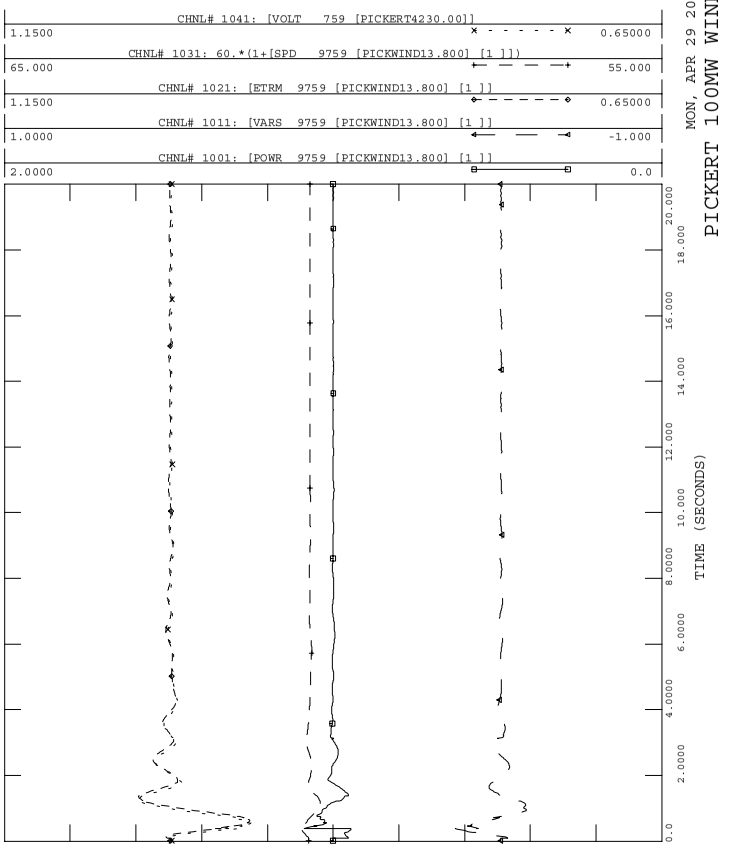
UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

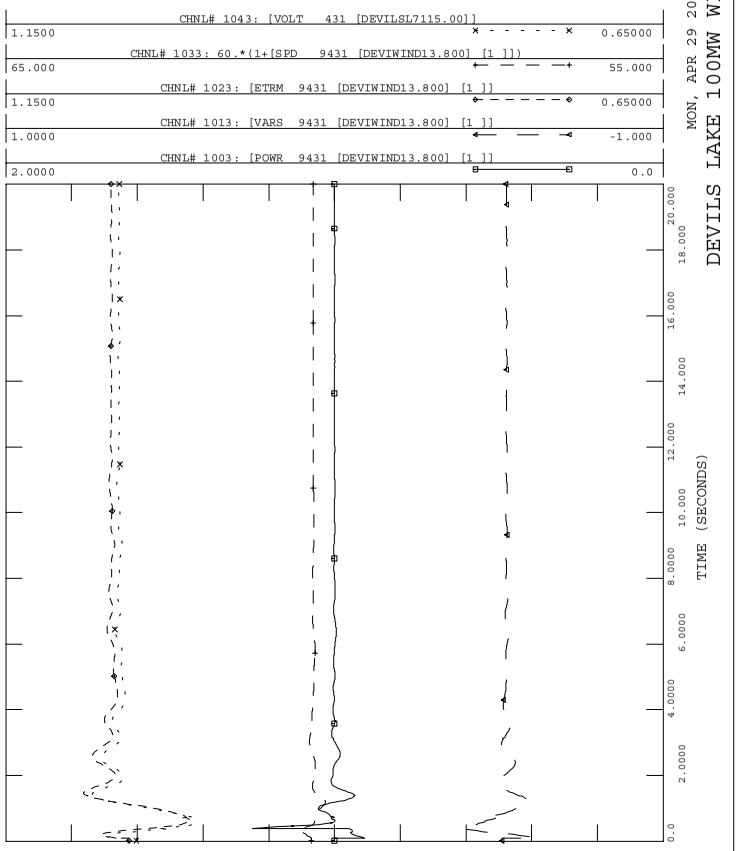


UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



MON, APR 29 2002 19:00
PICKERT 100MW WIND UNIT

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

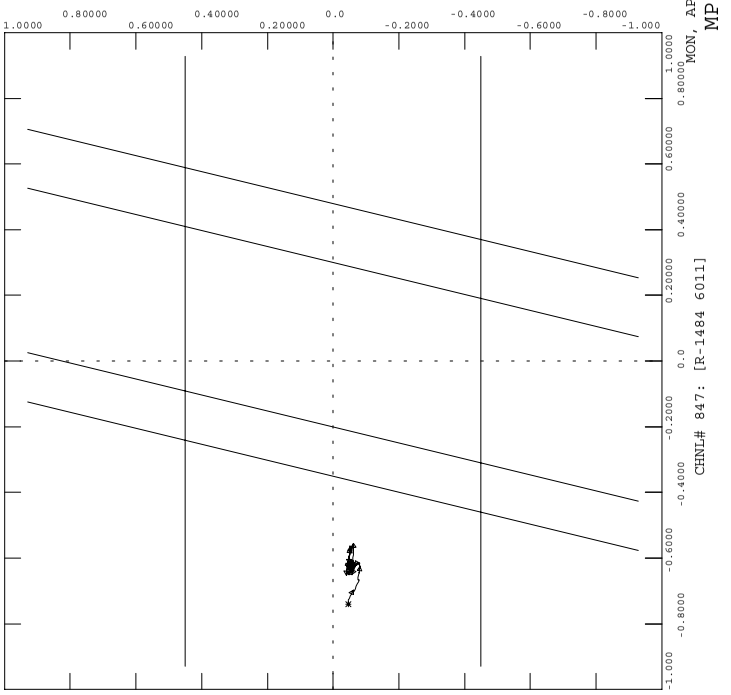


MON, APR 29 2002 19:00
DEVILS LAKE 100MW WIND UN

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

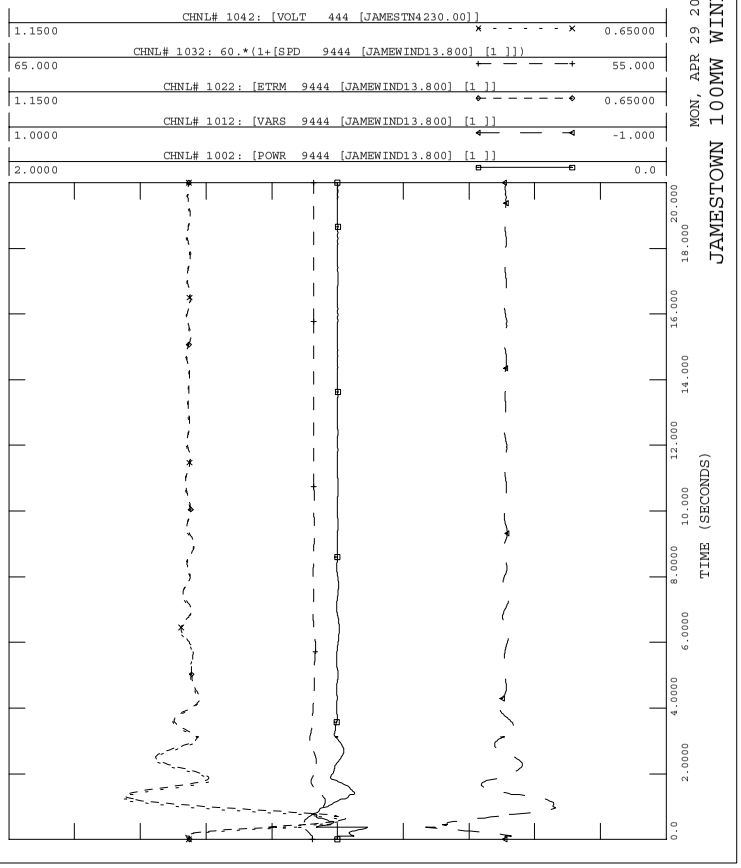
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



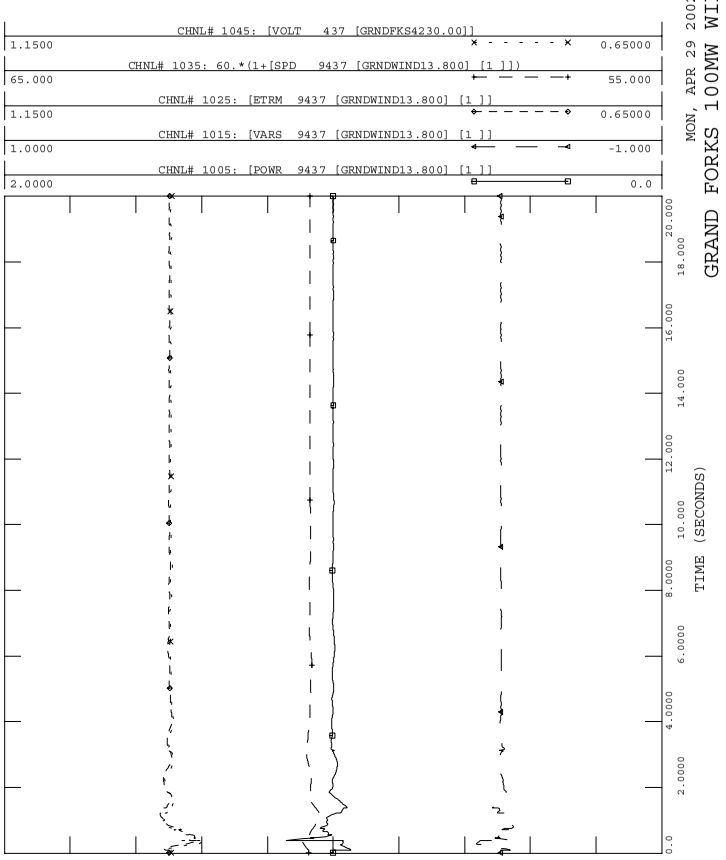
MON, APR 29 2002 19:00
MP-OH I.FALLS (779)

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



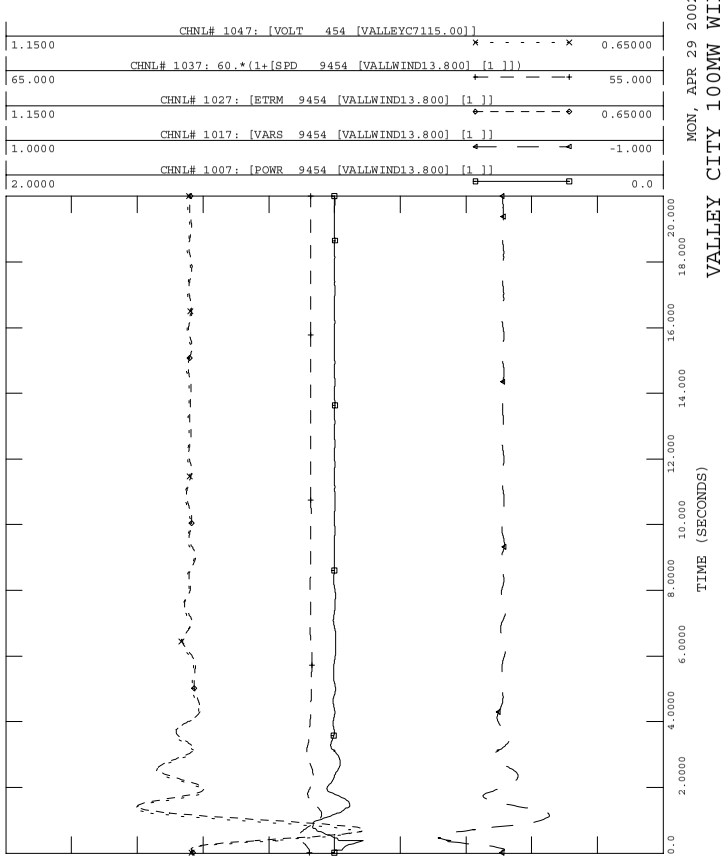
MON, APR 29 2002 19:00
JAMESTOWN 100MW WIND UNIT

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



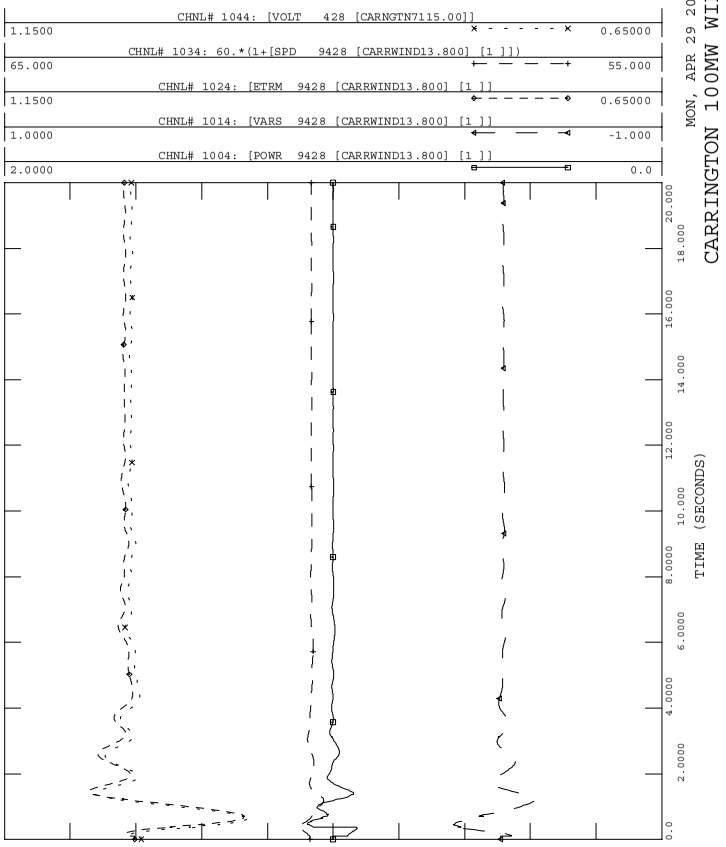
MON, APR 29 2002 19:00
GRAND FORKS 100MW WIND UN

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



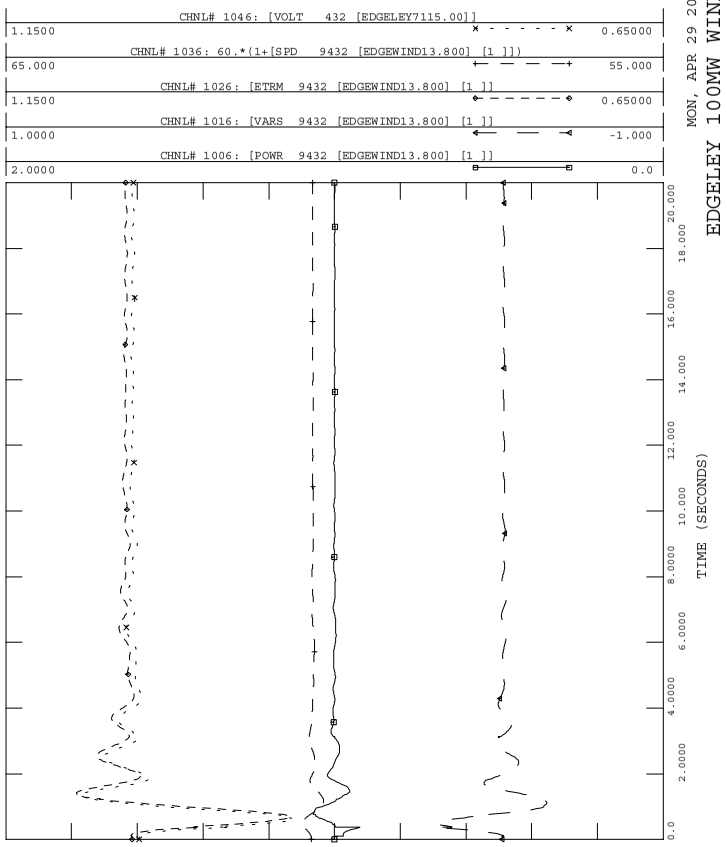
MON, APR 29 2002 19:00
VALLEY CITY 100MW WIND UN

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



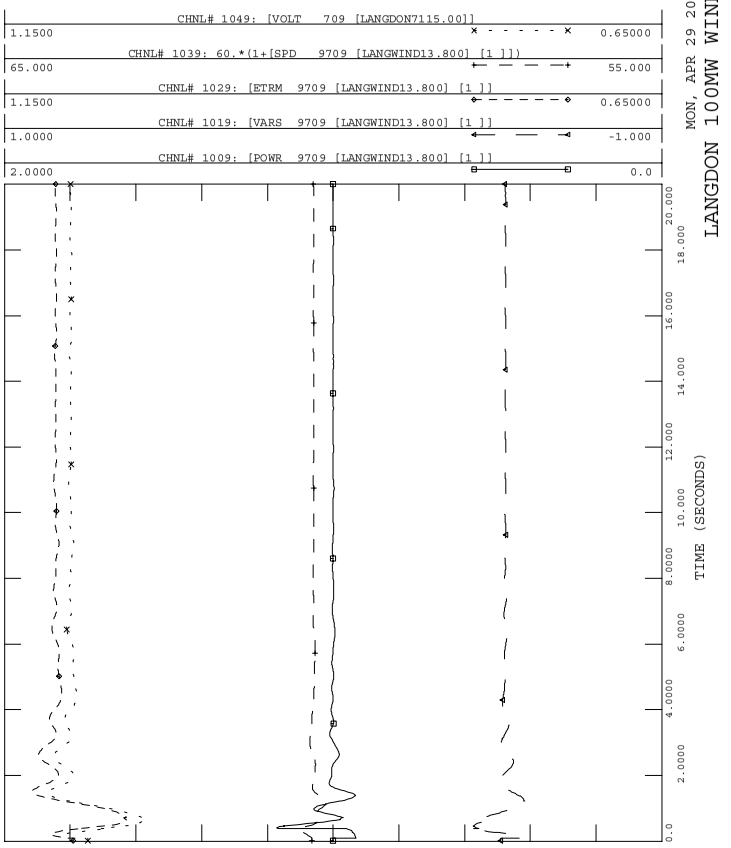
MON, APR 29 2002 19:00
CARRINGTON 100MW WIND UNI

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



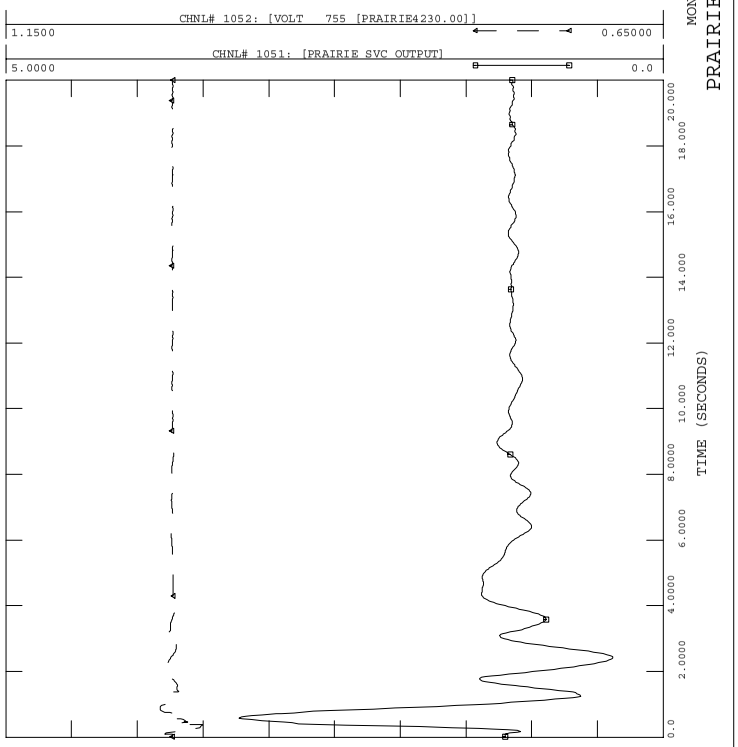
MON, APR 29 2002 19:00
EDGELEY 100MW WIND UNIT

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



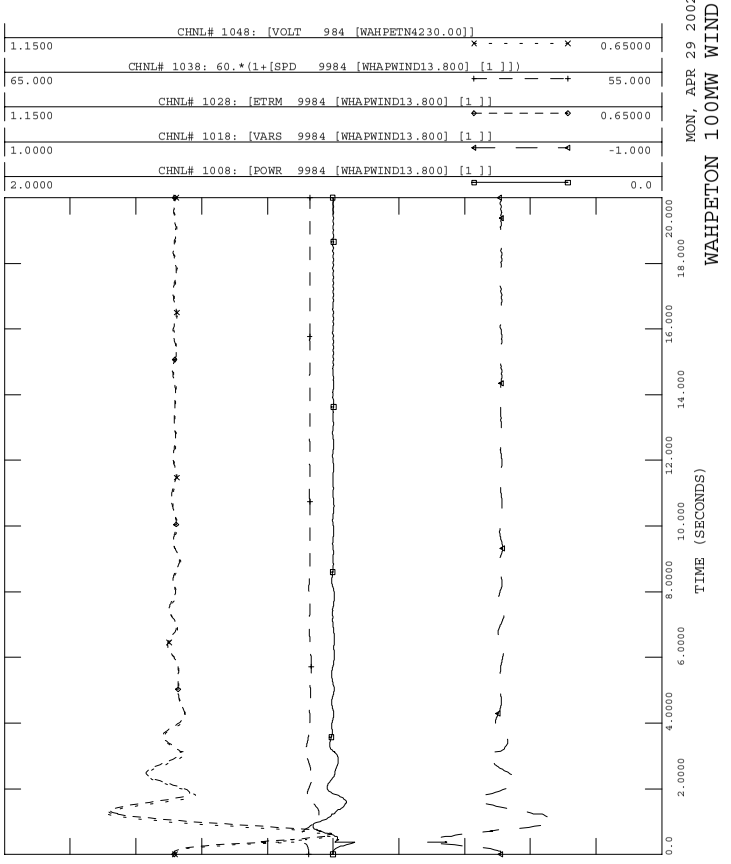
MON, APR 29 2002 19:00
LANGDON 100MW WIND UNIT

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



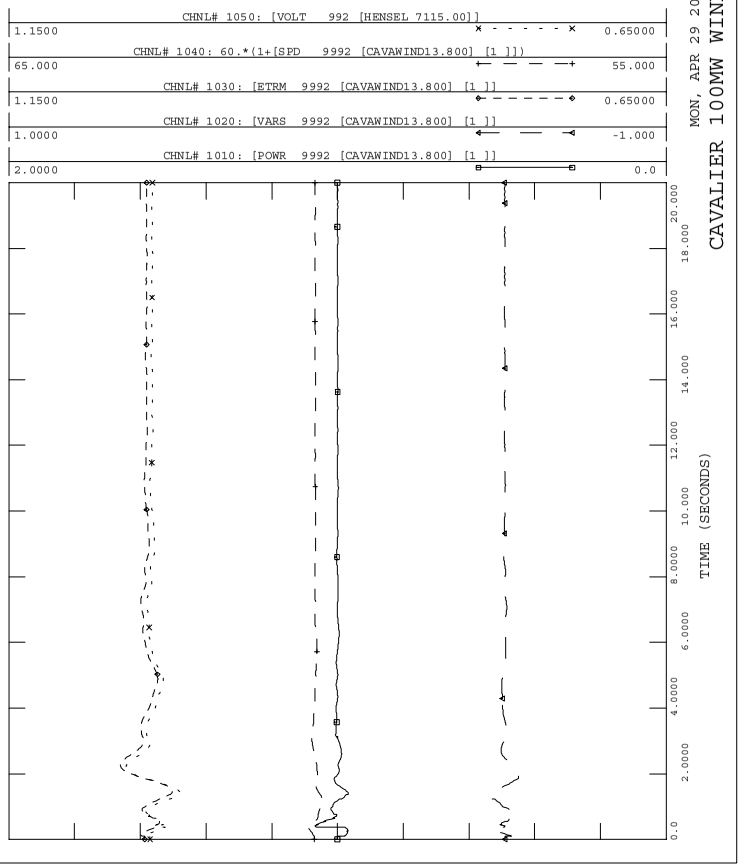
MON, APR 29 2002 19:00
PRAIRIE SVC RESPONSE

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



MON, APR 29 2002 19:00
WAHPETON 100MW WIND UNIT

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S2C4XX3-ei2.bin



MON, APR 29 2002 19:00
CAVALIER 100MW WIND UNIT

APPENDIX 20

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 3 (MINOT)

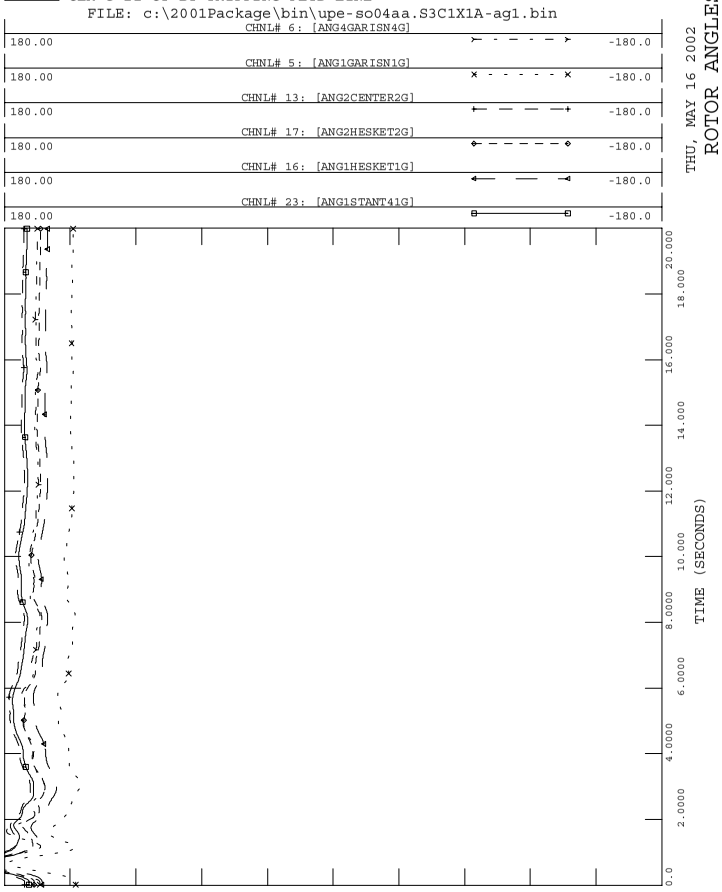
CASE S3C1X1A

CONTINGENCY AG1

Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

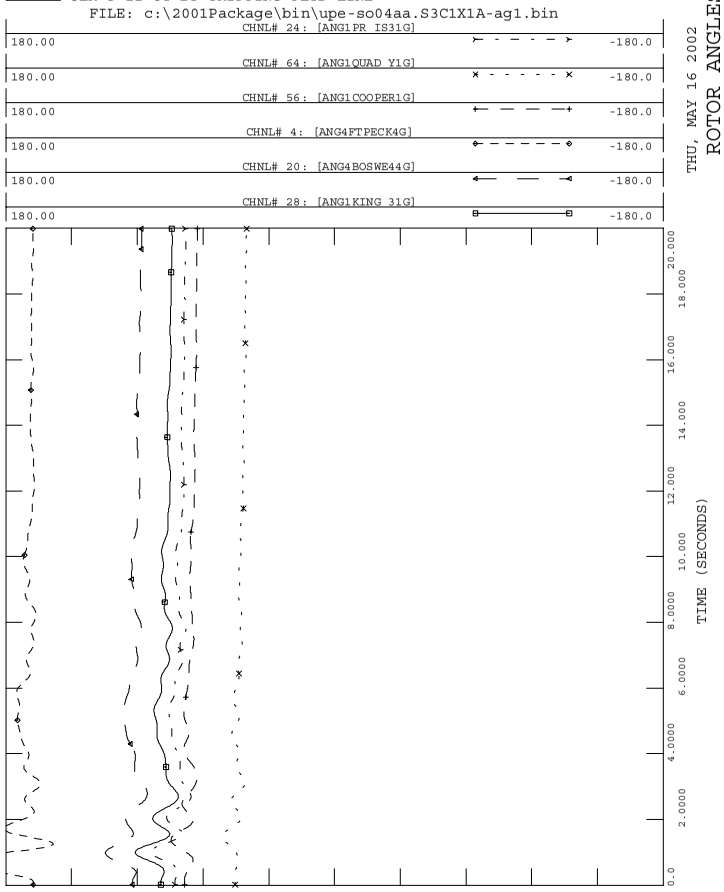
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20
ROTOR ANGLES 2



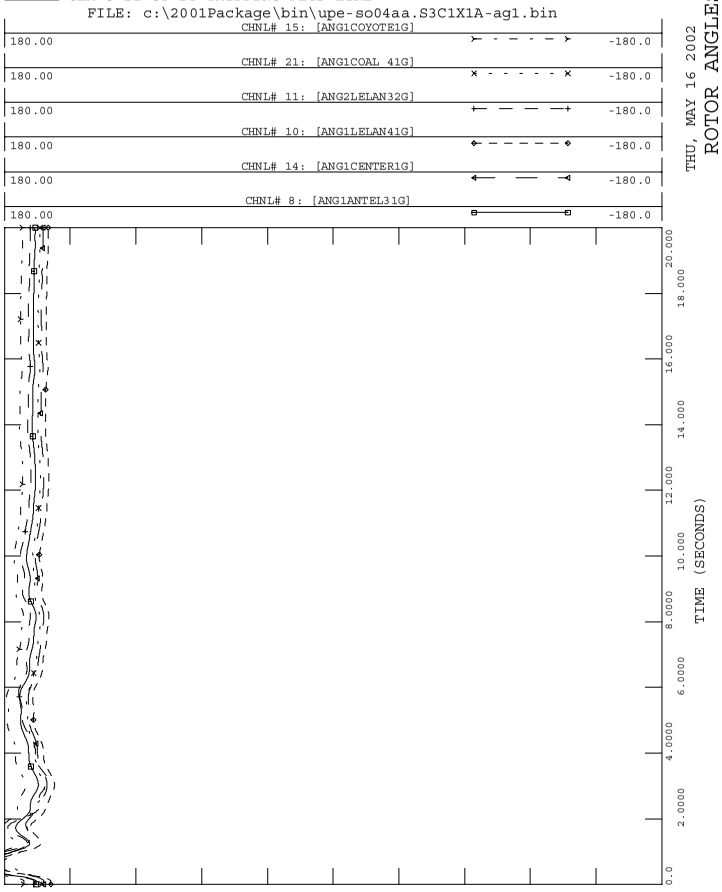
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20
ROTOR ANGLES 4



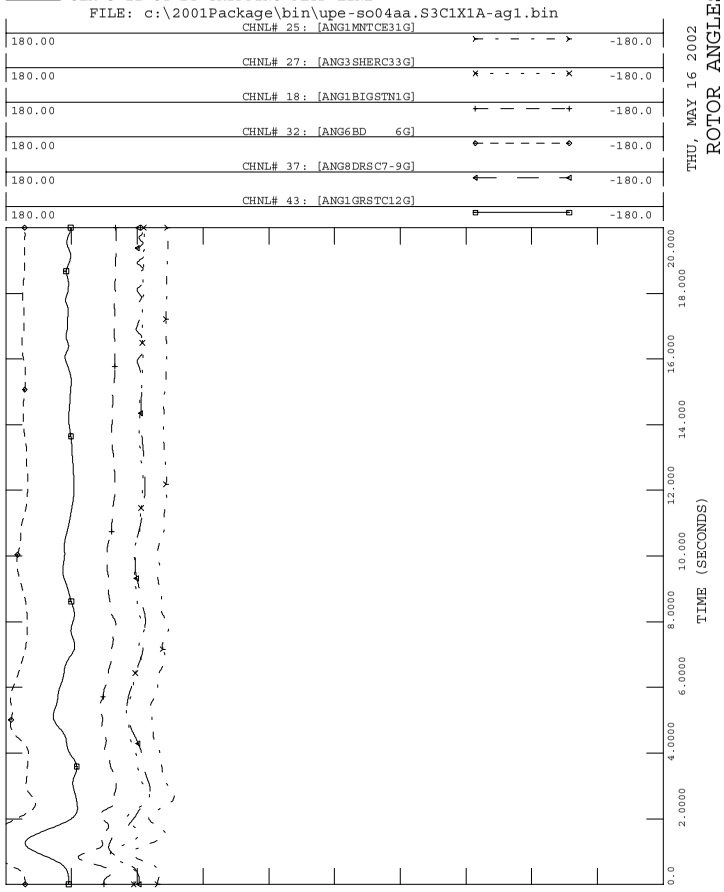
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20
ROTOR ANGLES 1



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

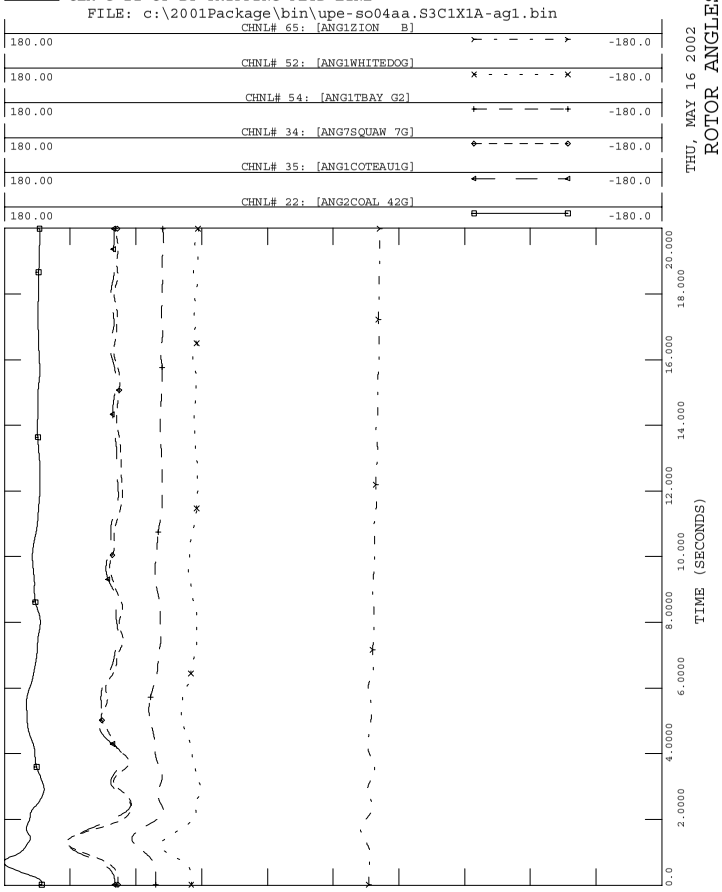
THU, MAY 16 2002 8:20
ROTOR ANGLES 3



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20

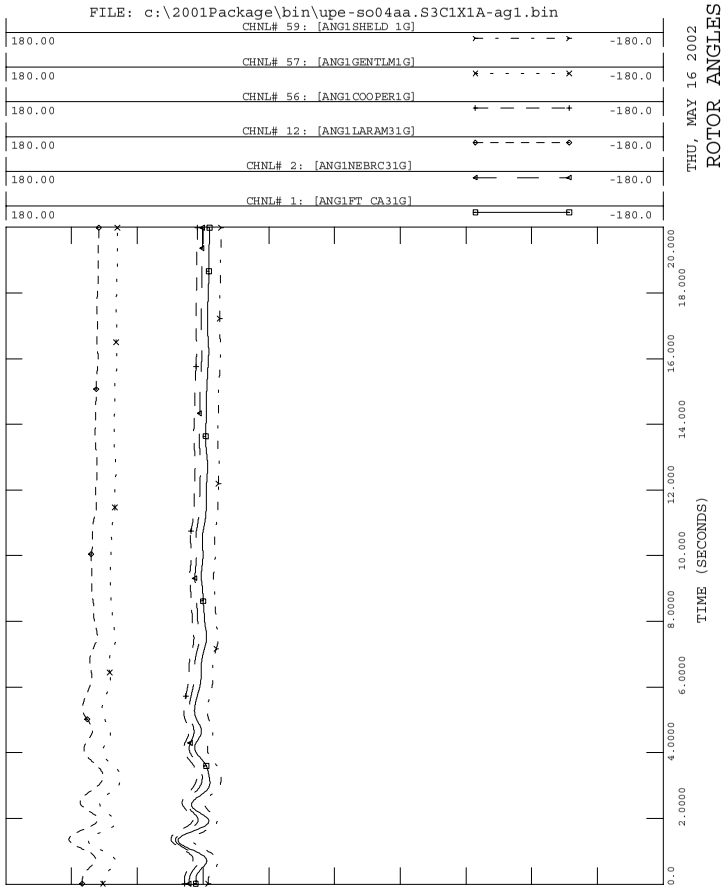
ROTOR ANGLES 6



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20

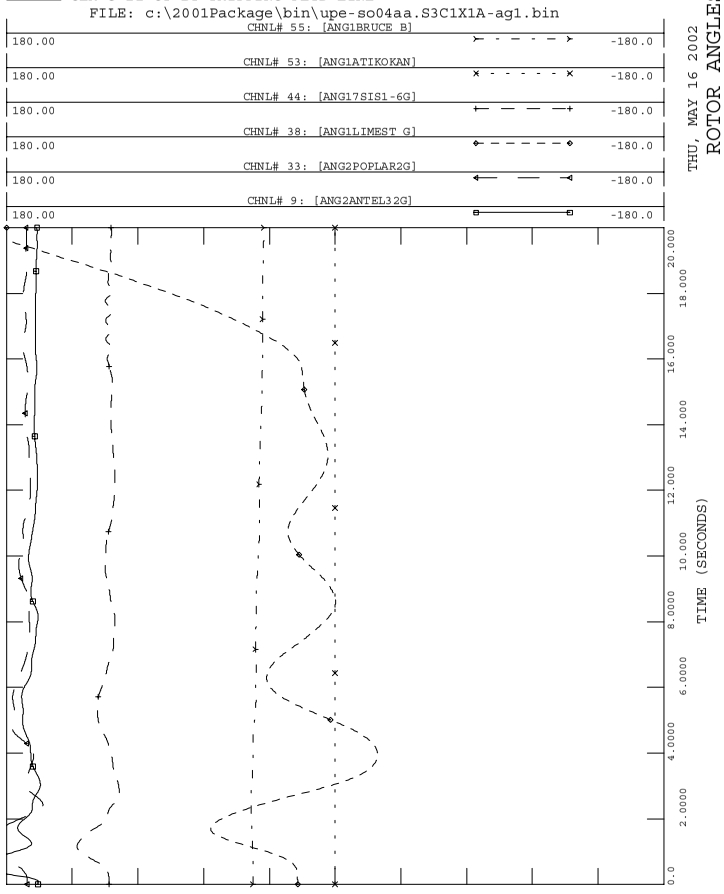
ROTOR ANGLES NB



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20

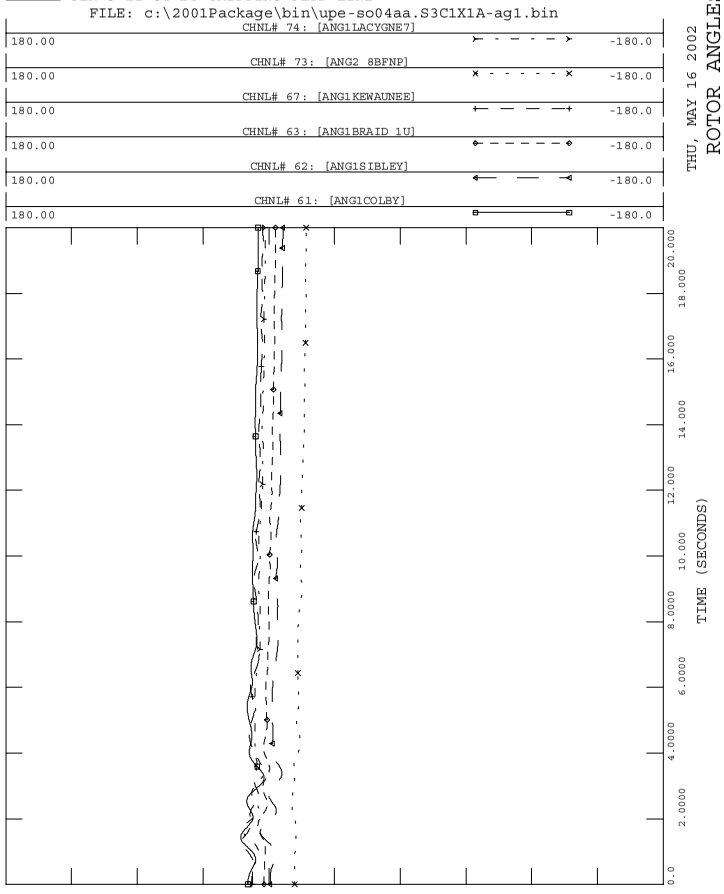
ROTOR ANGLES 5



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

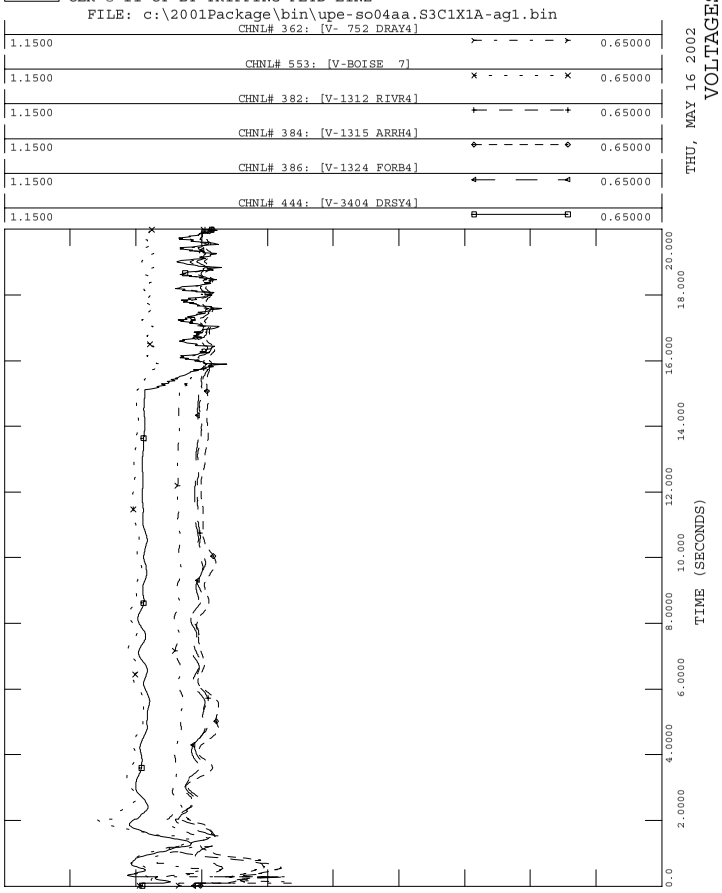
THU, MAY 16 2002 8:20

ROTOR ANGLES 7



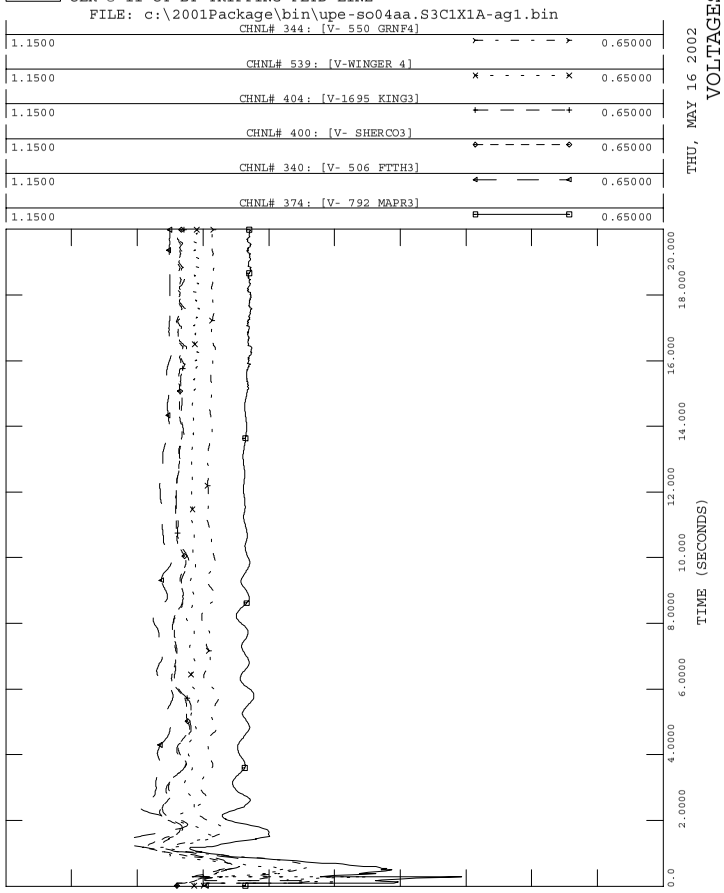
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20
VOLTAGES 1



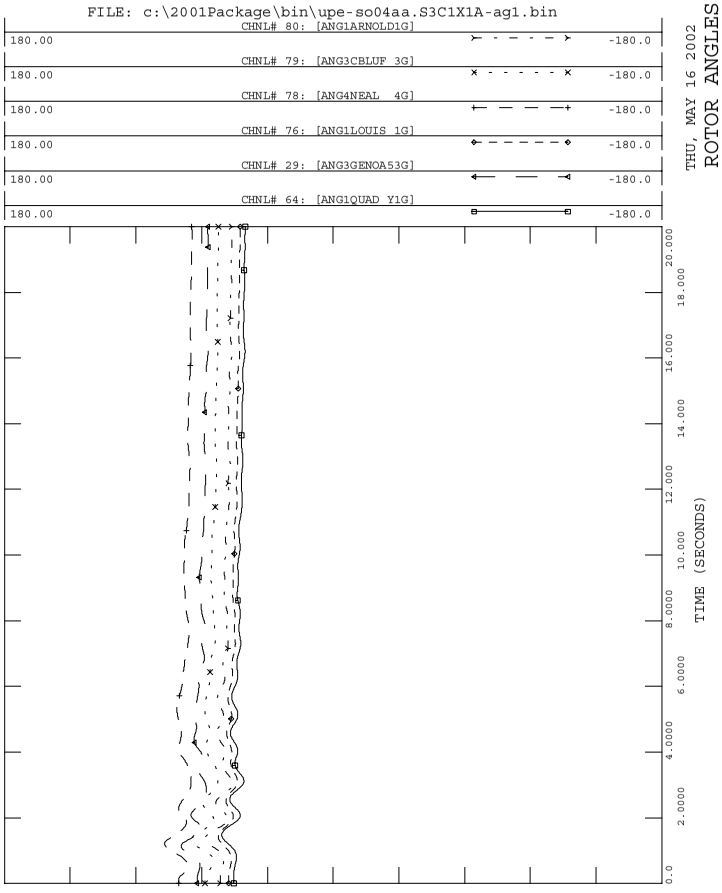
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20
VOLTAGES 3



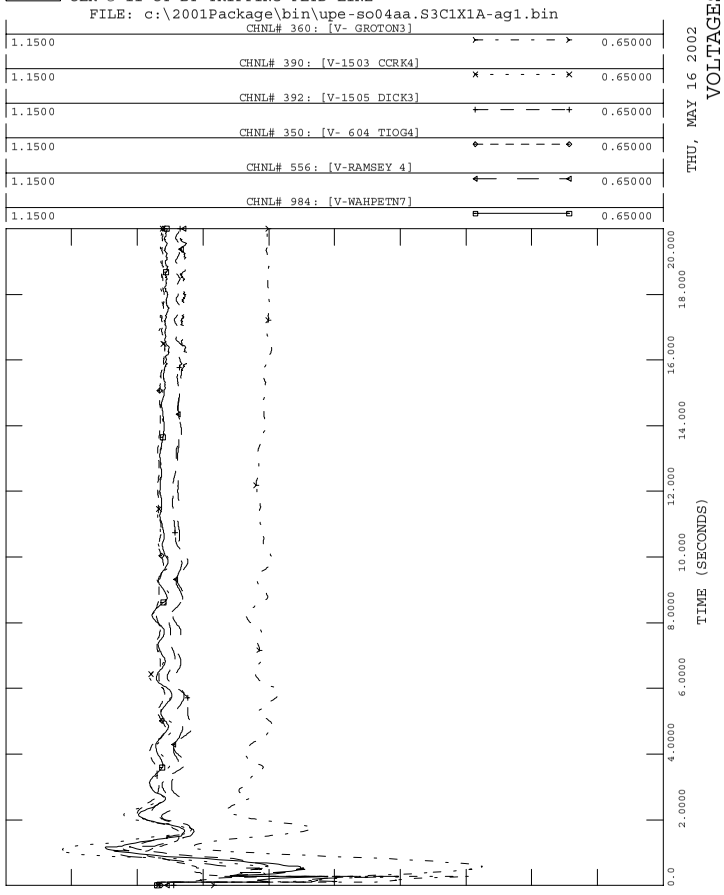
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20
ROTOR ANGLES IA



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

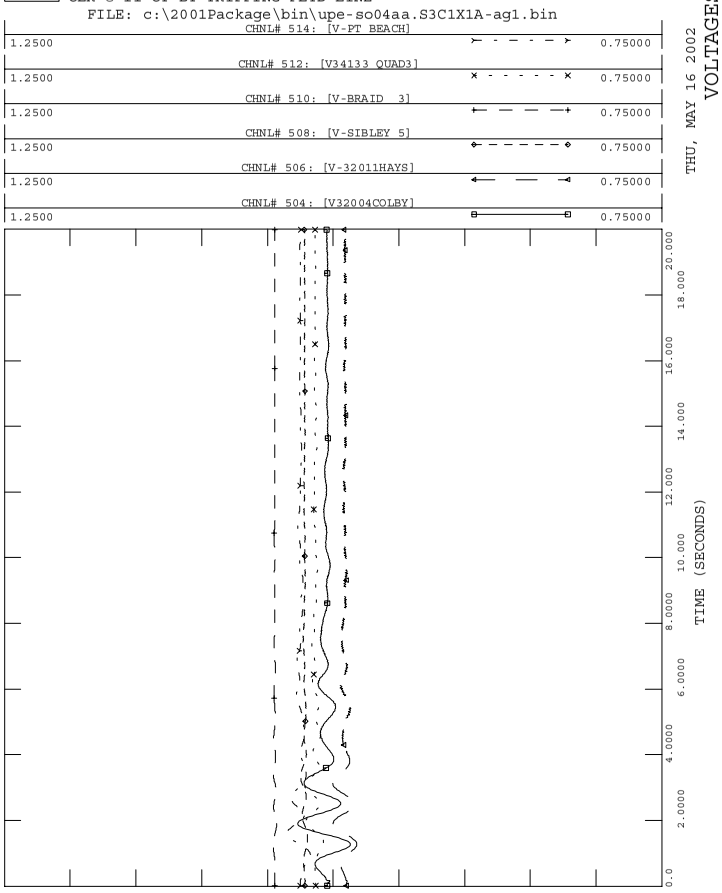
THU, MAY 16 2002 8:20
VOLTAGES 2



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20

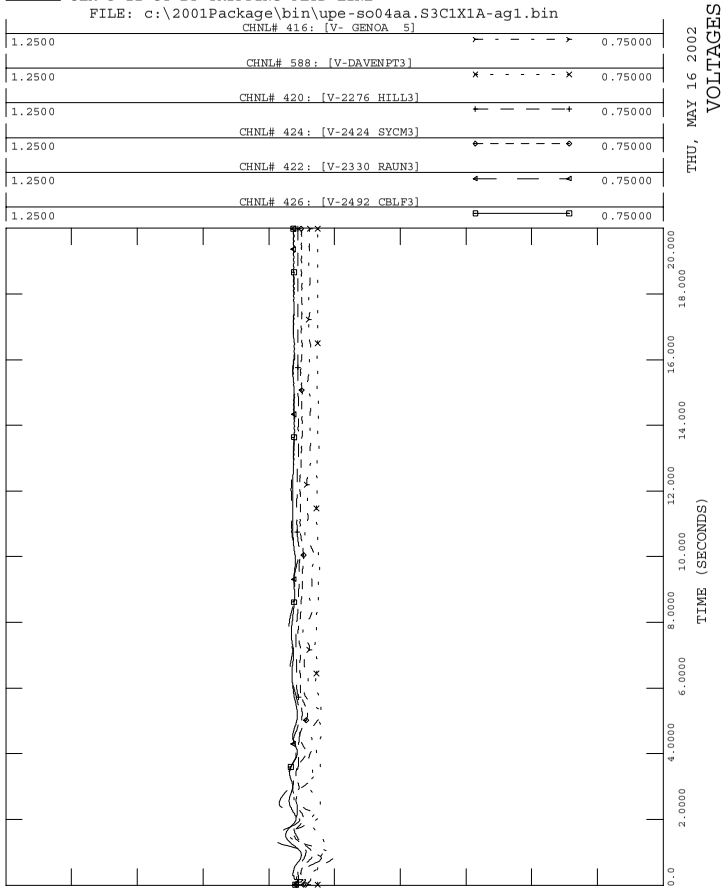
VOLTAGES 5



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20

VOLTAGES IA



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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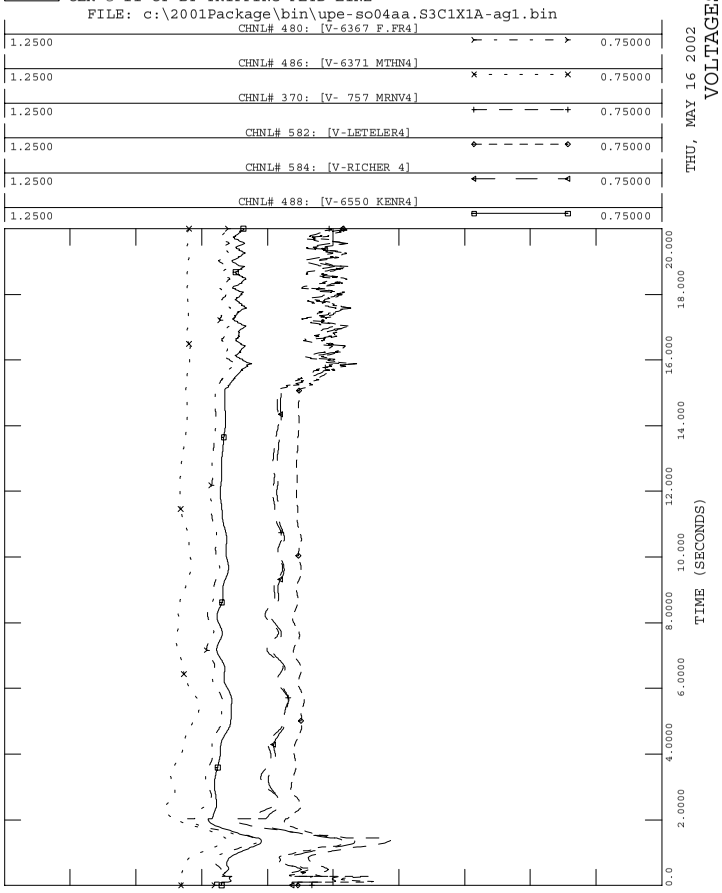
THU, MAY 16 2002 8:20

VOLTAGES 4



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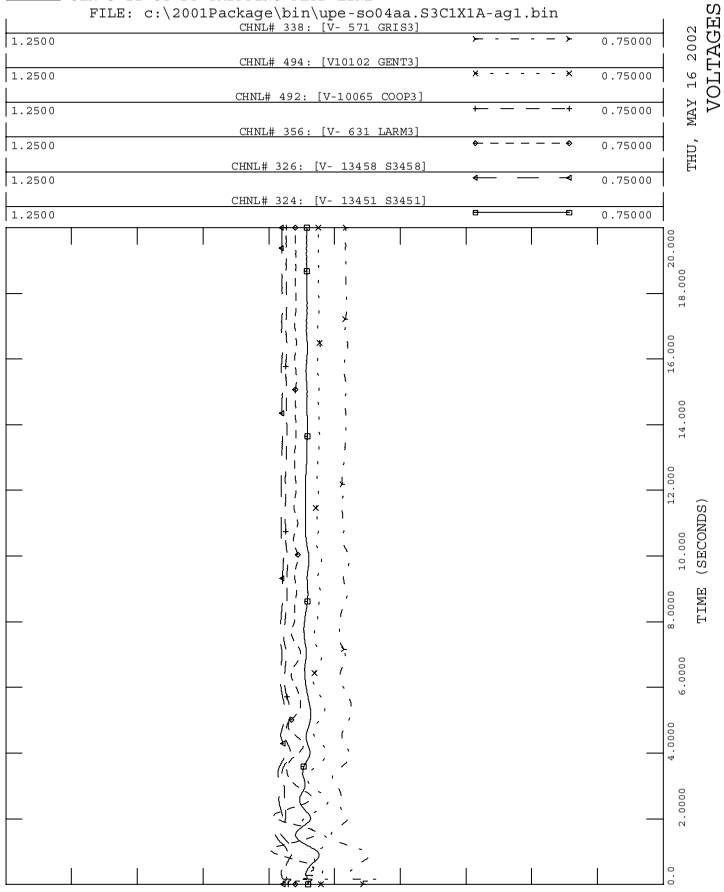
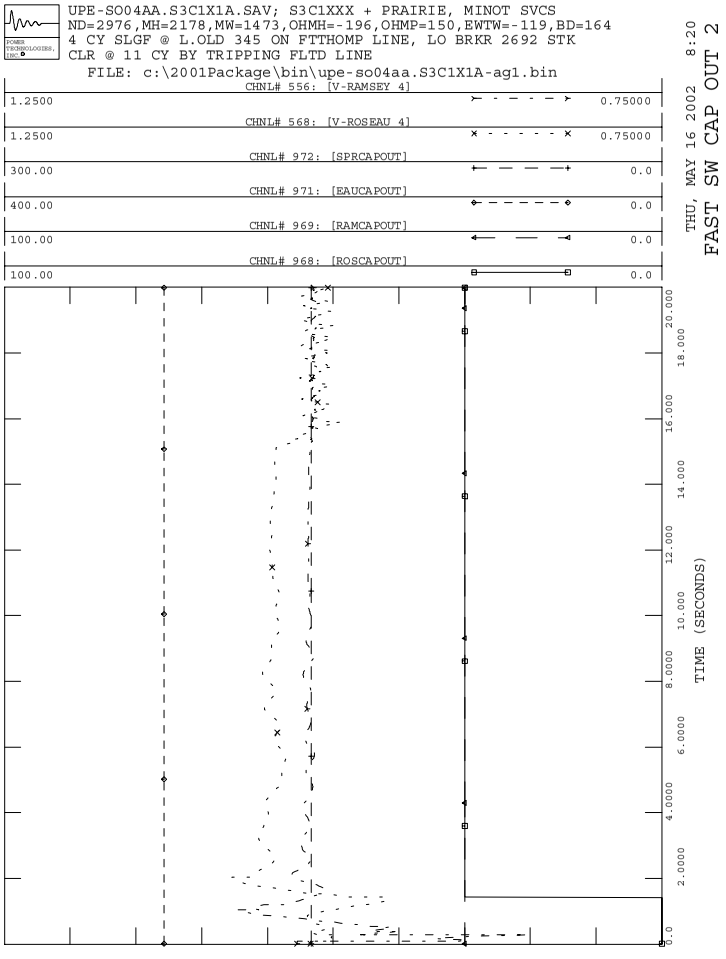
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20

VOLTAGES NB

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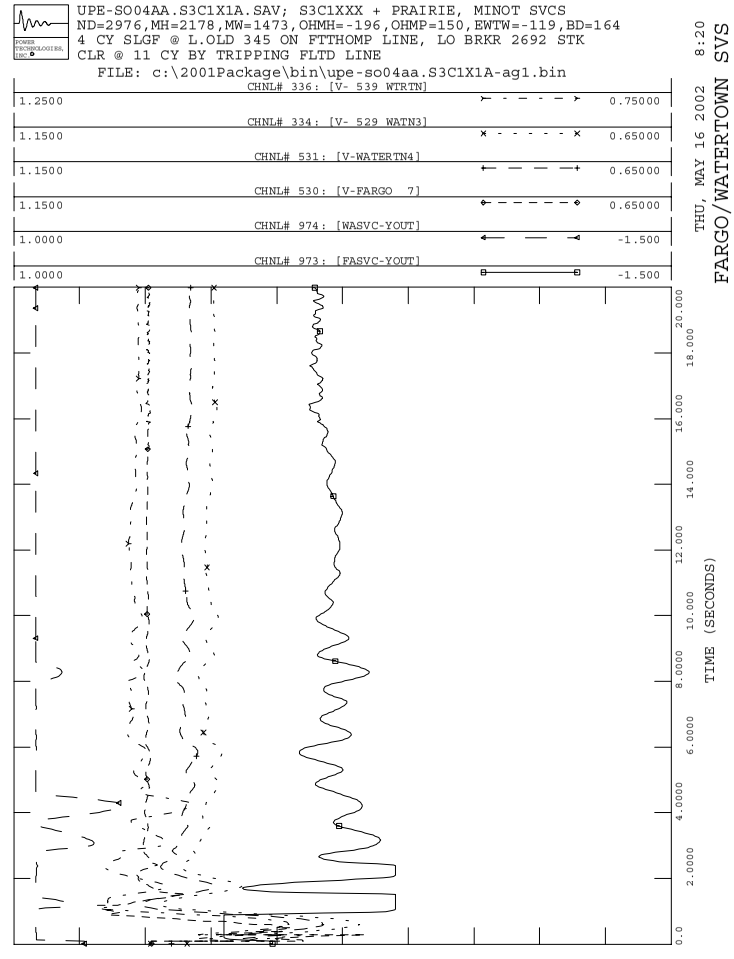
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
THU, MAY 16 2002 8:20
FAST SW CAP OUT 2
TIME (SECONDS)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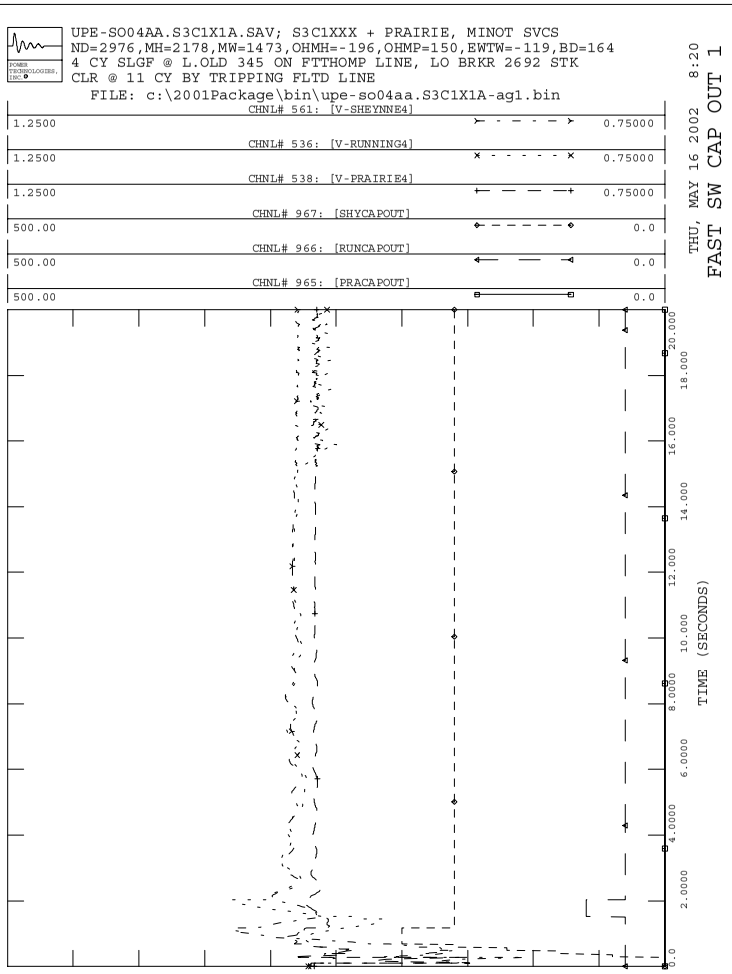
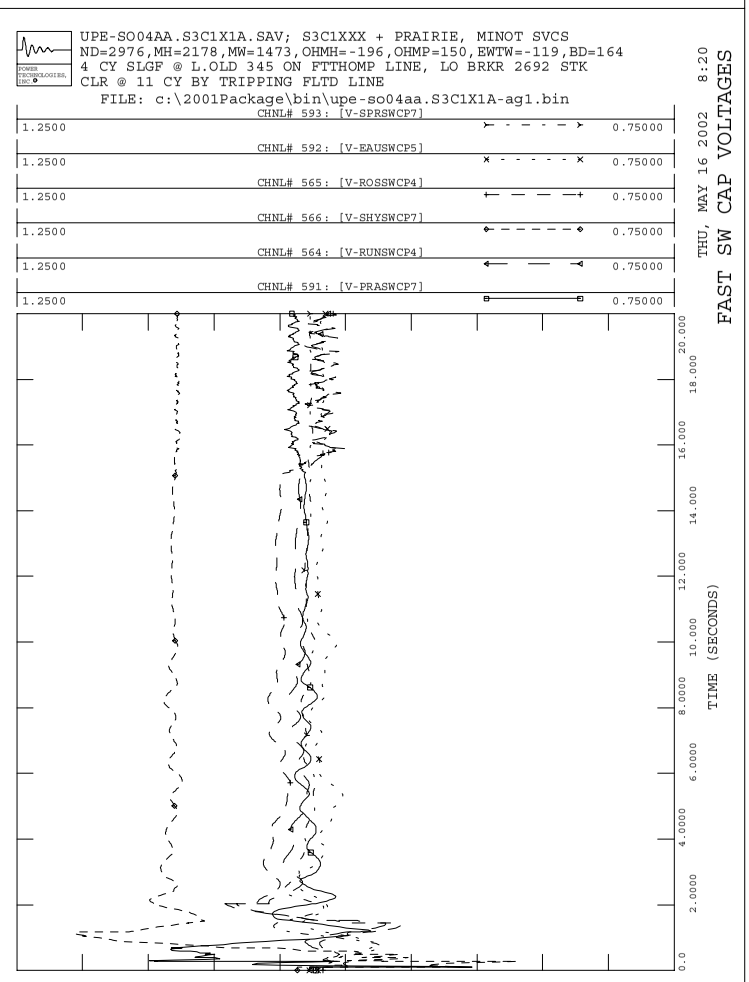
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
THU, MAY 16 2002 8:20
FARGO/WATERTOWN SVS
TIME (SECONDS)

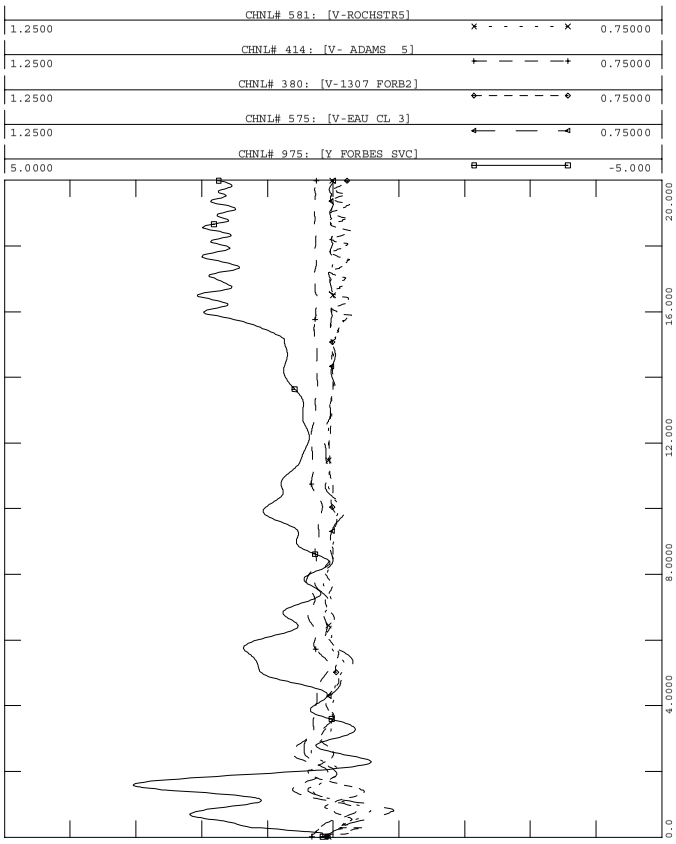

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
THU, MAY 16 2002 8:20
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
THU, MAY 16 2002 8:20
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20

SVC & WISCONSIN VOLT



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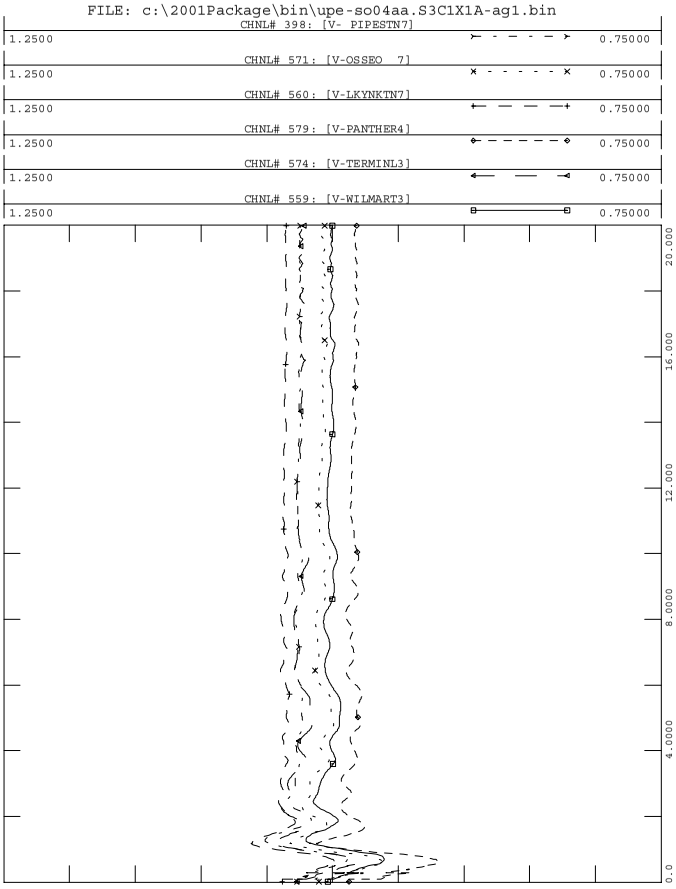
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20

TC VOLTAGES



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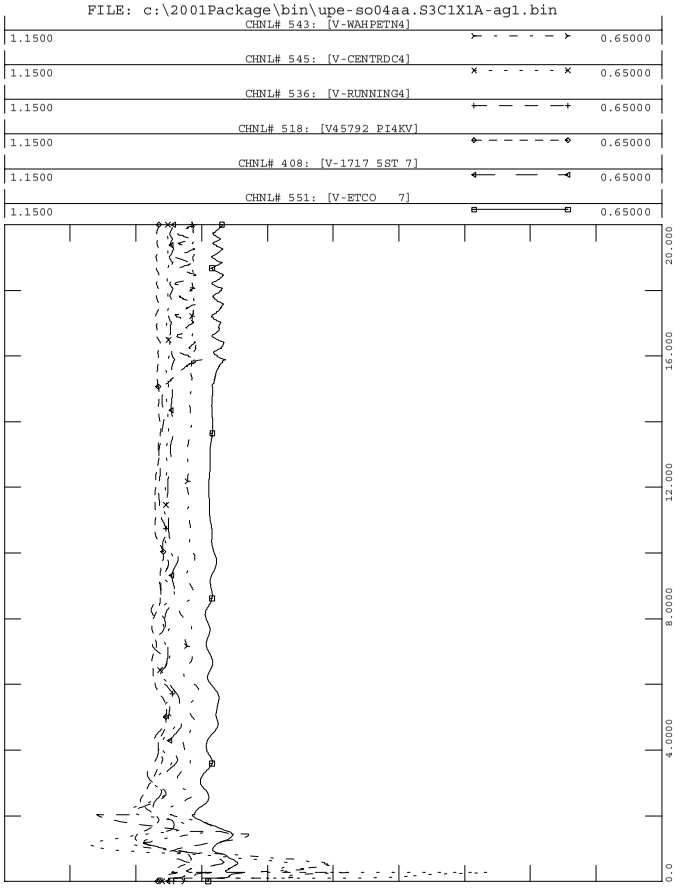
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20

VOLTAGES 6



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ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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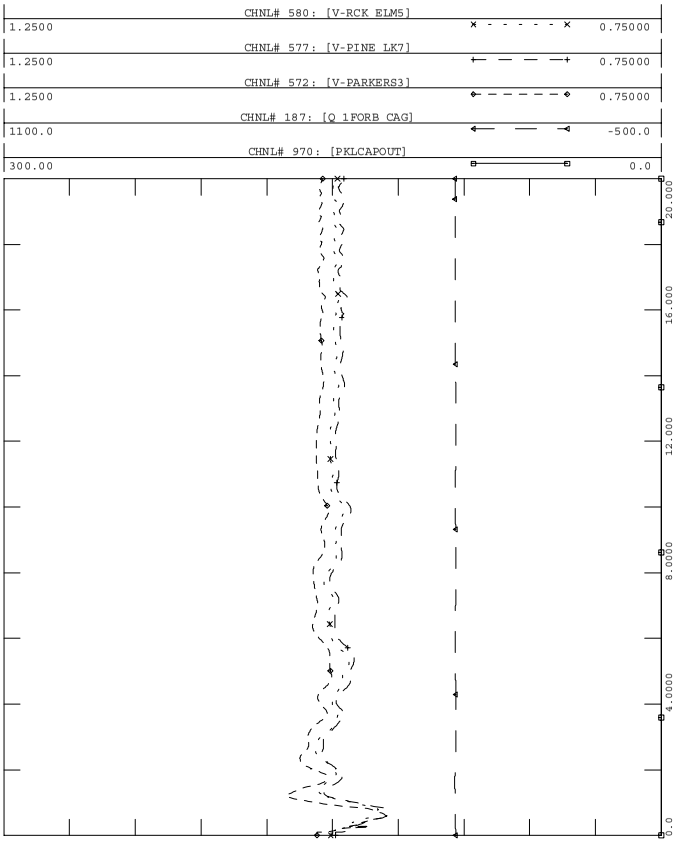
THU, MAY 16 2002 8:20

FORBES SVS OUT & VOLTAGES



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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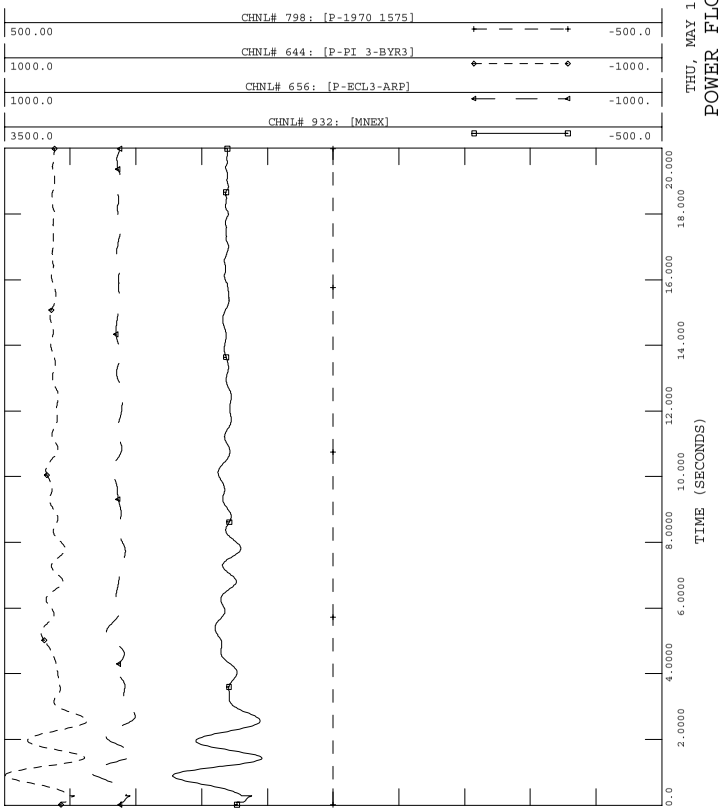
THU, MAY 16 2002 8:20
POWER FLOW SUMS 2



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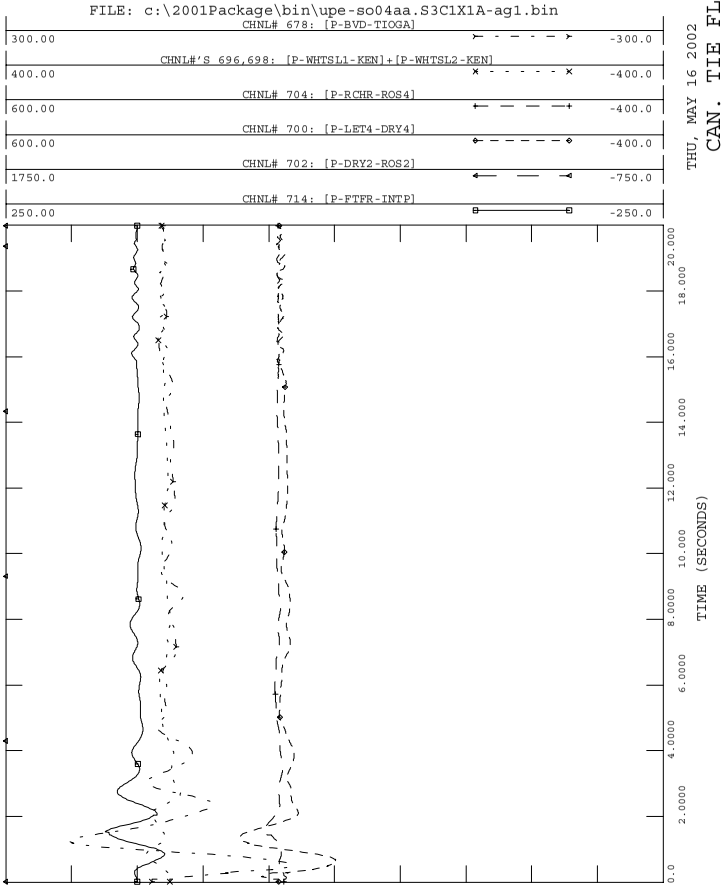
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20
CAN. TIE FLOWS



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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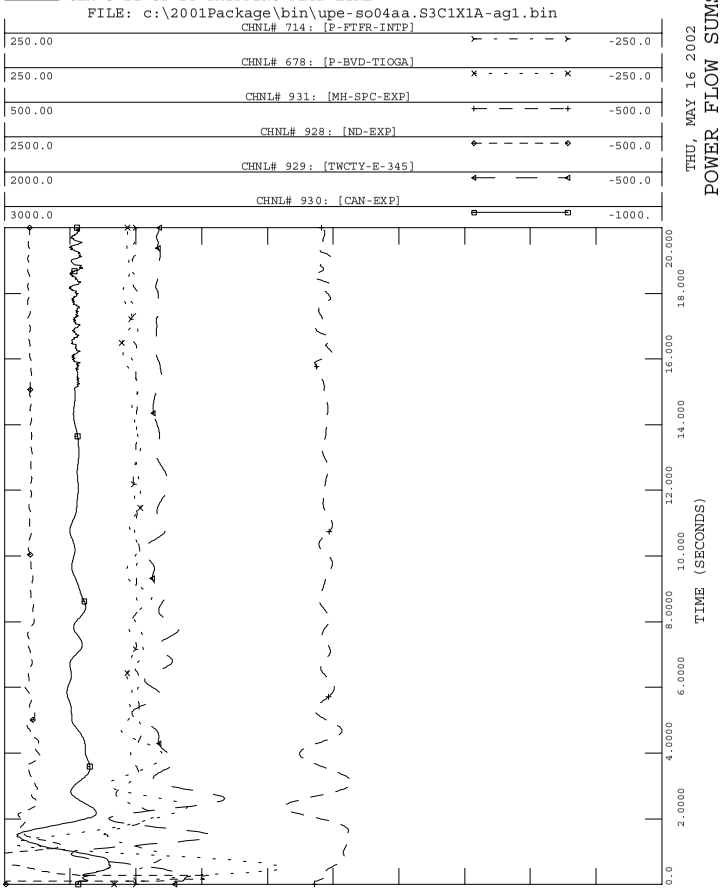
THU, MAY 16 2002 8:20
POWER FLOW SUMS 1



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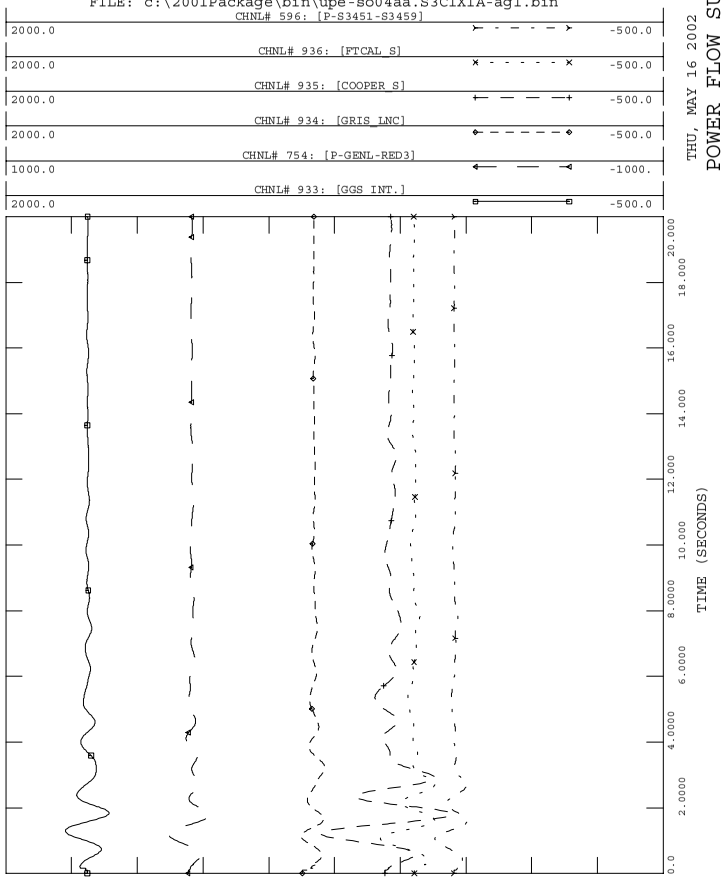
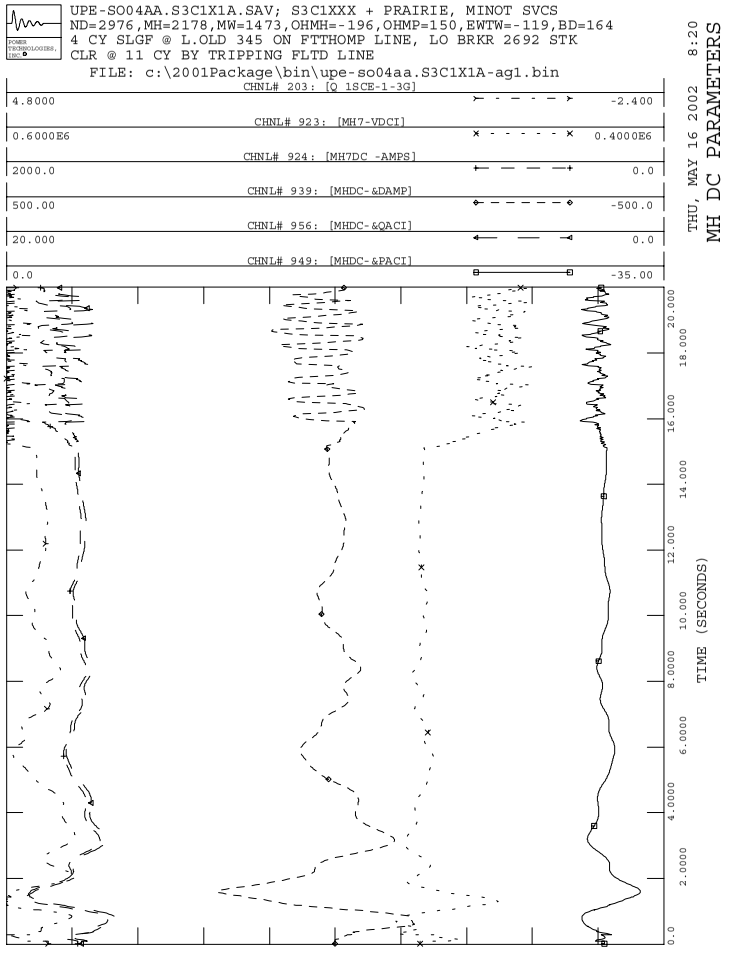
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

THU, MAY 16 2002 8:20
POWER FLOW SUM 3

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ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
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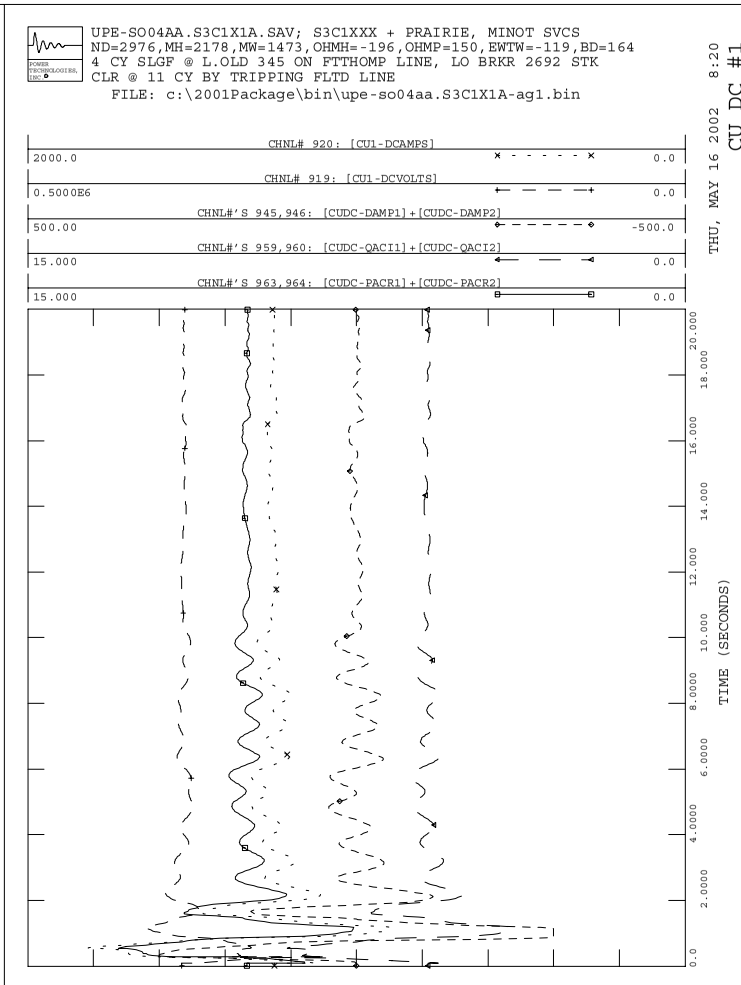
TIME (SECONDS)
THU, MAY 16 2002 8:20
MH DC PARAMETERS


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
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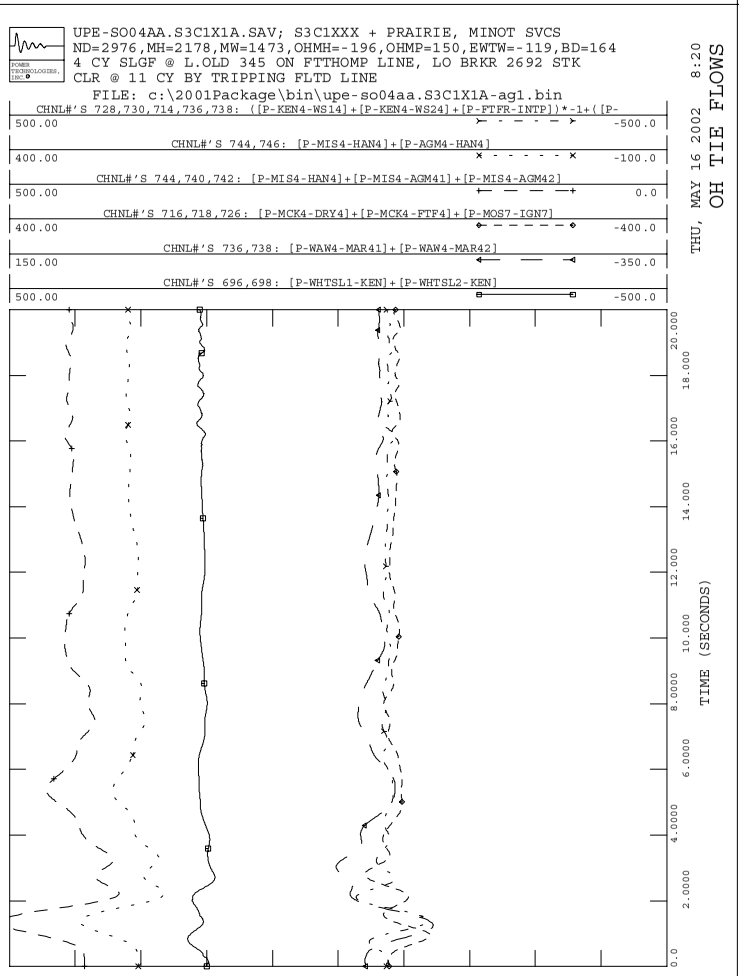
TIME (SECONDS)
THU, MAY 16 2002 8:20
CU DC #1


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
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CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
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-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
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CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
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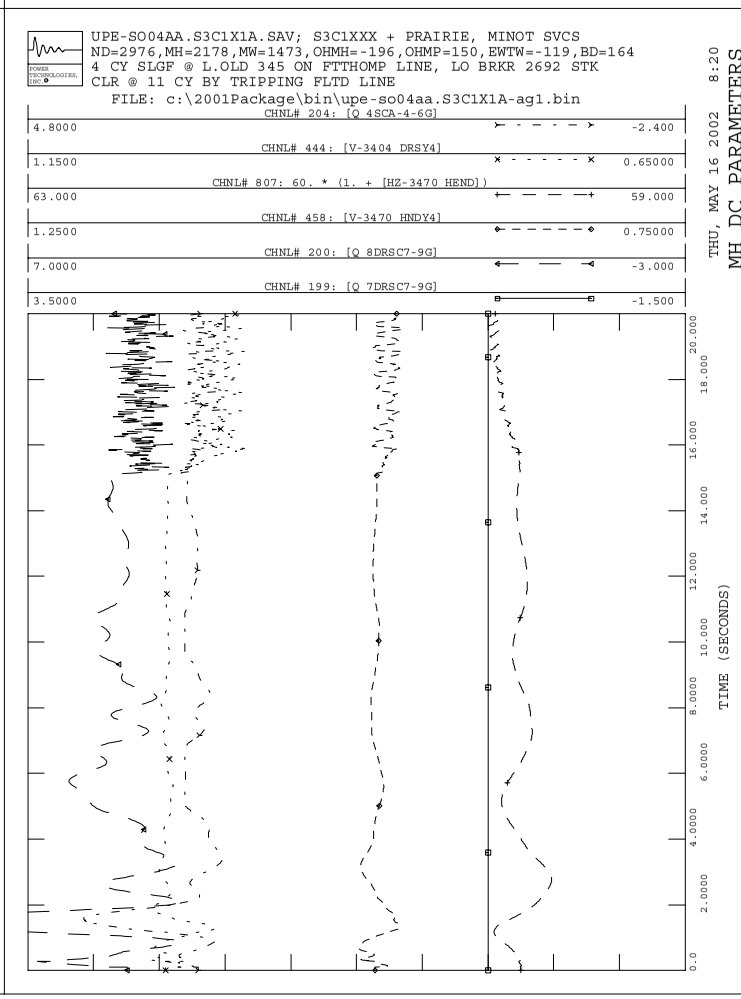
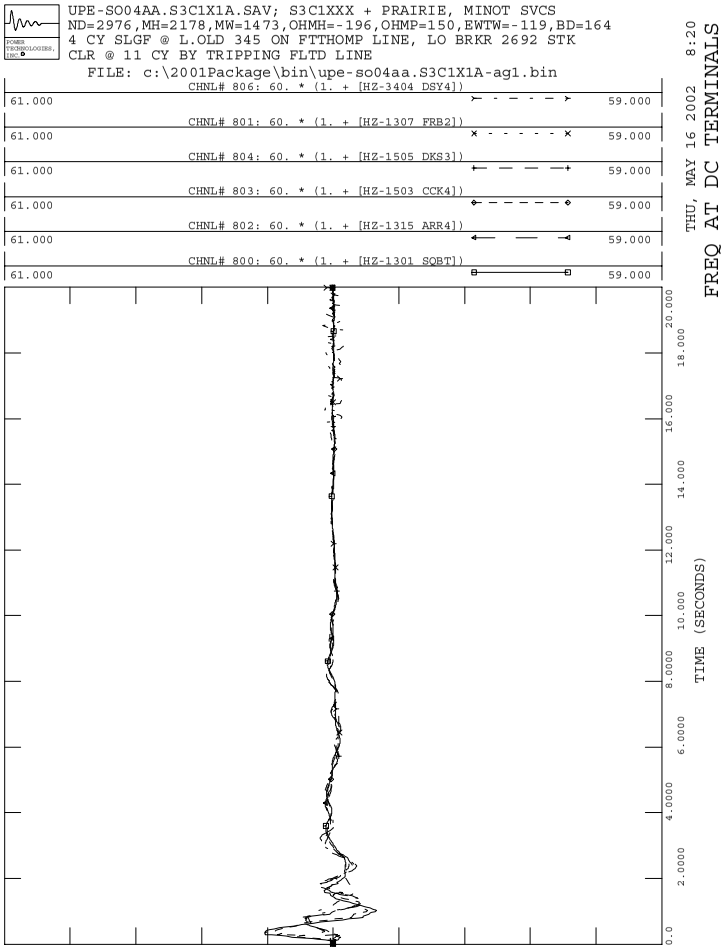
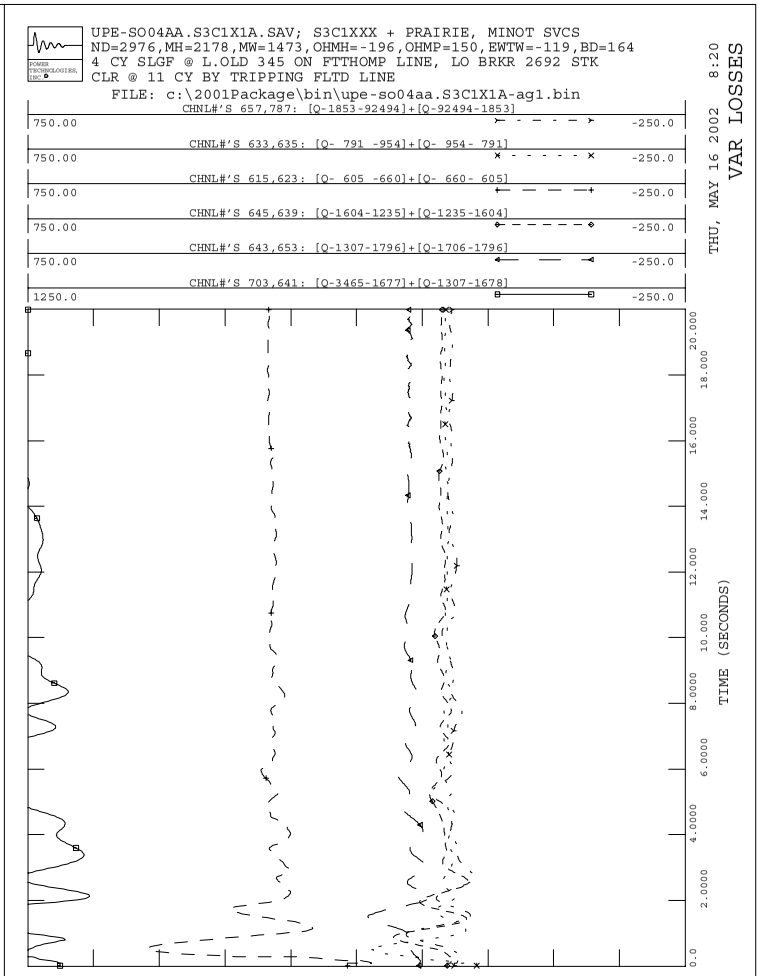
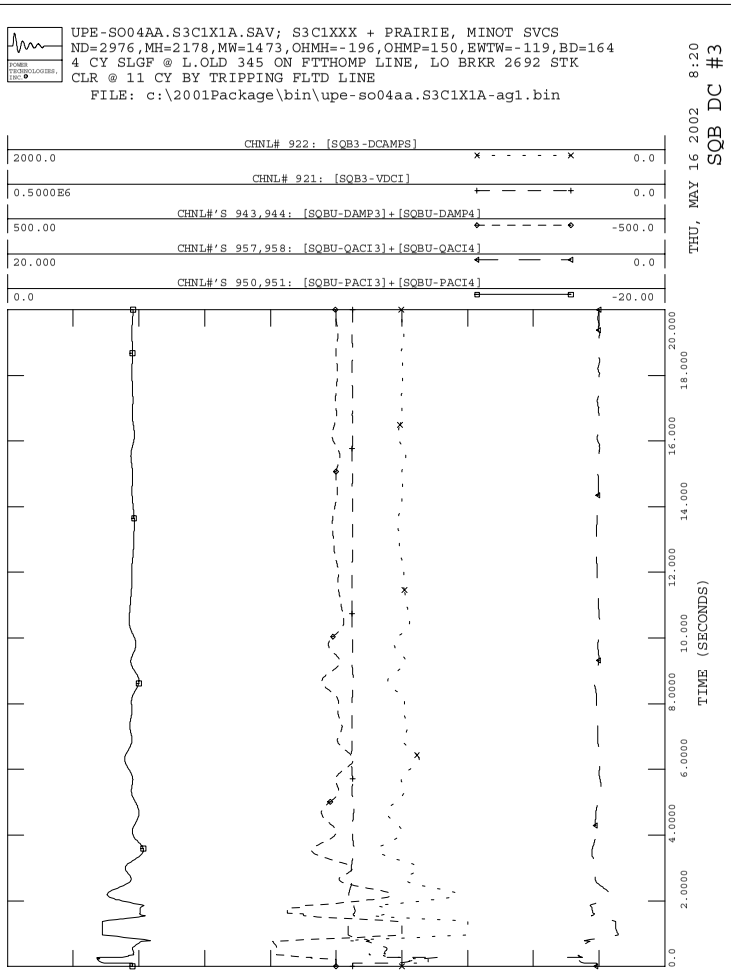
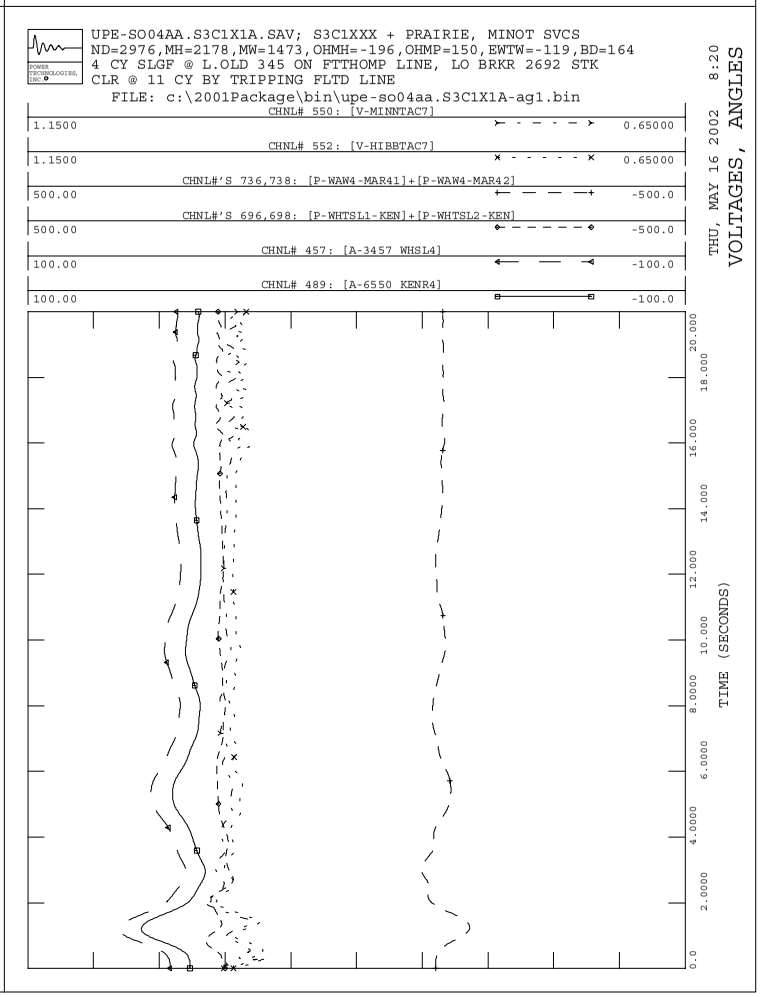
TIME (SECONDS)
THU, MAY 16 2002 8:20
OH TIE FLOWS


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TIME (SECONDS)
THU, MAY 16 2002 8:20
MH DC PARAMETERS


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
THU, MAY 16 2002 8:20
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
THU, MAY 16 2002 8:20
VAR LOSSES
TIME (SECONDS)

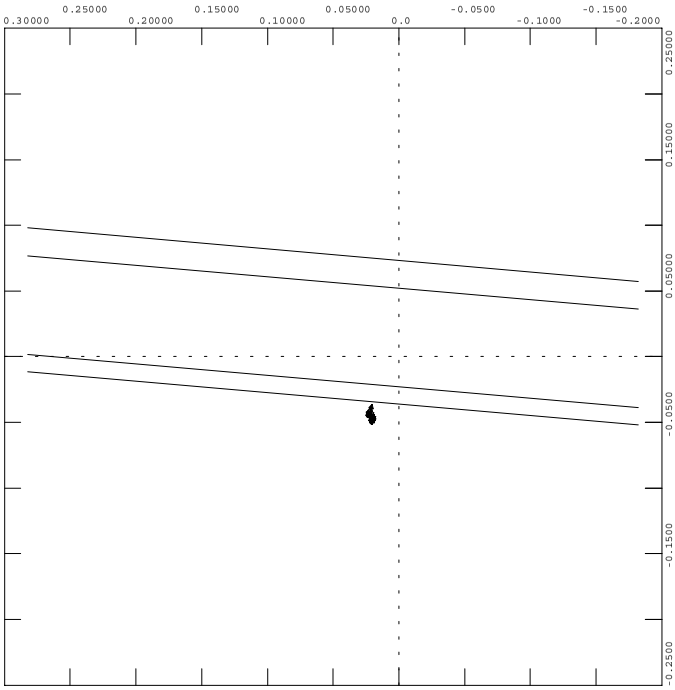

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
THU, MAY 16 2002 8:20
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
THU, MAY 16 2002 8:20
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

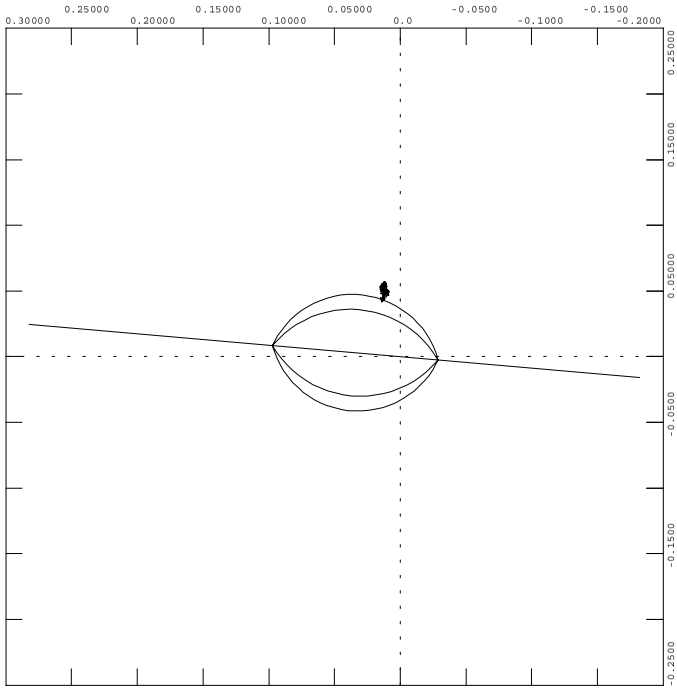


THU, MAY 16 2002 8:20
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

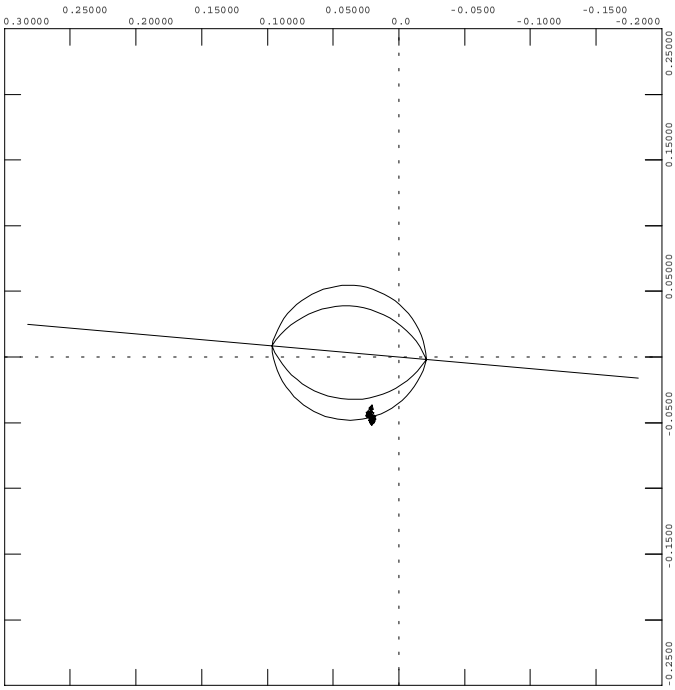


THU, MAY 16 2002 8:20
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

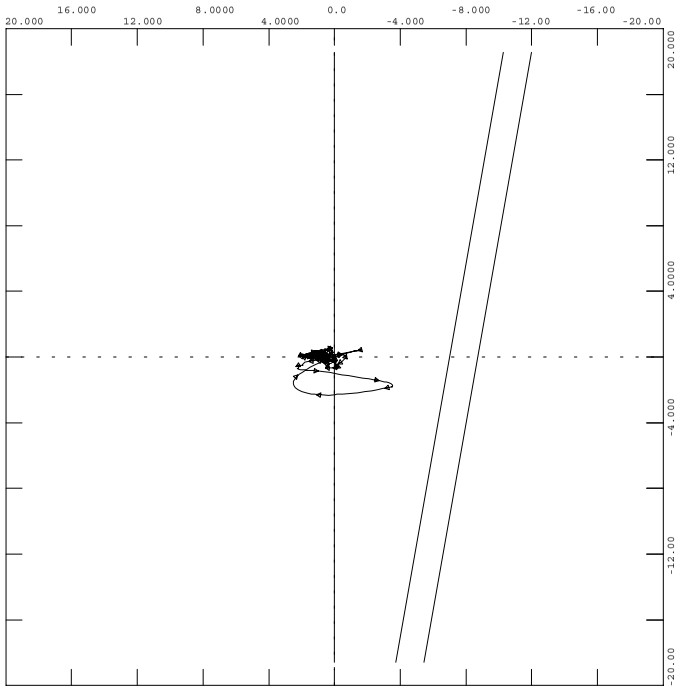


THU, MAY 16 2002 8:20
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

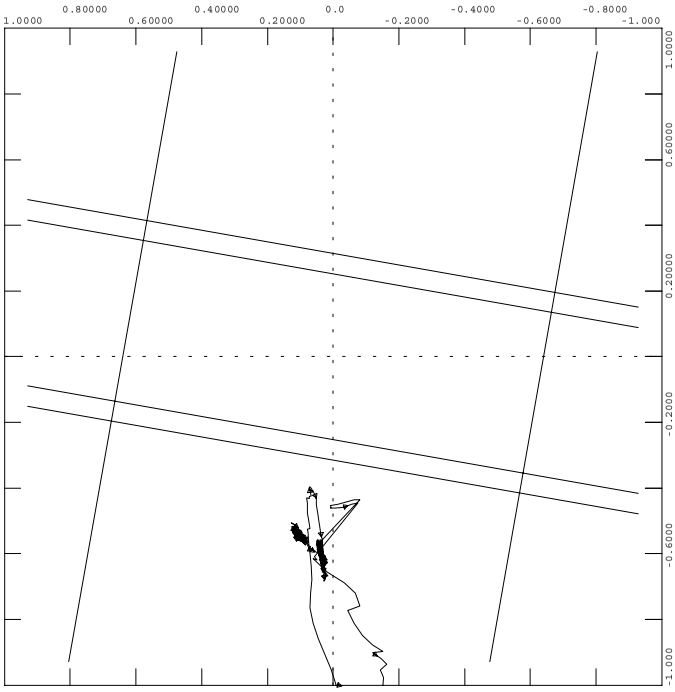


THU, MAY 16 2002 8:20
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

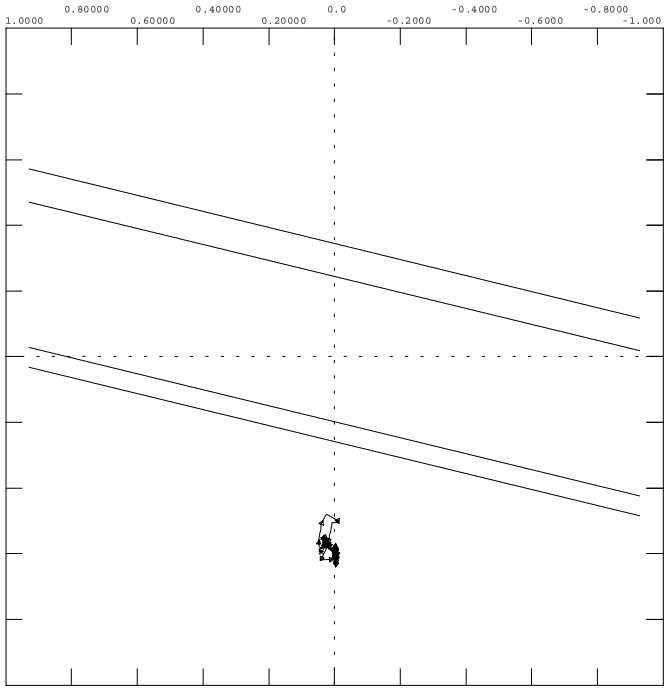
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

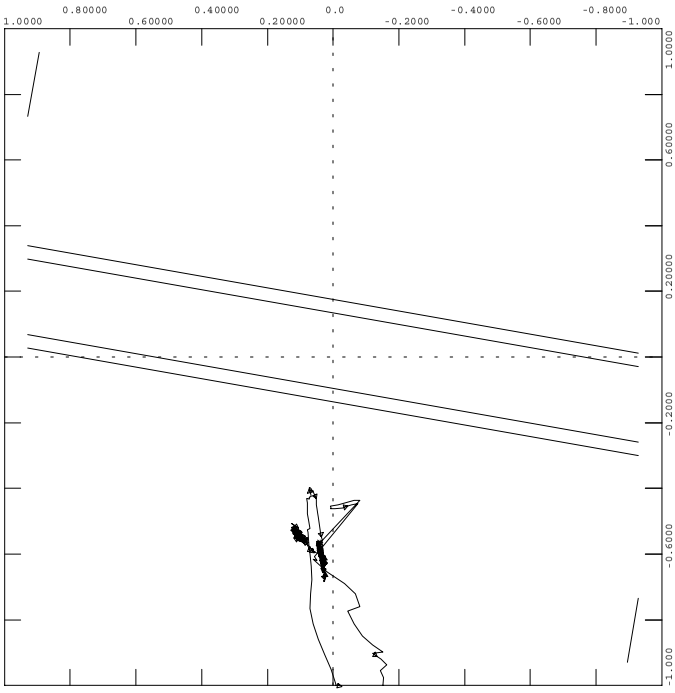
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

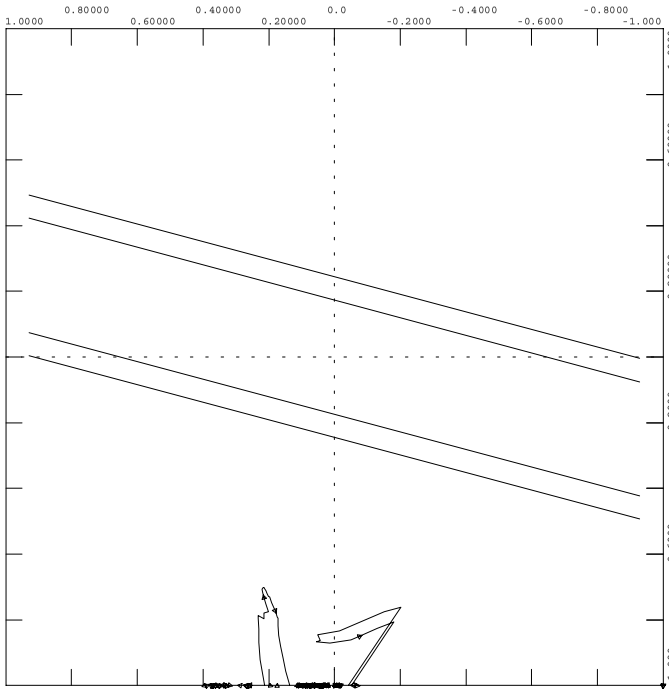
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

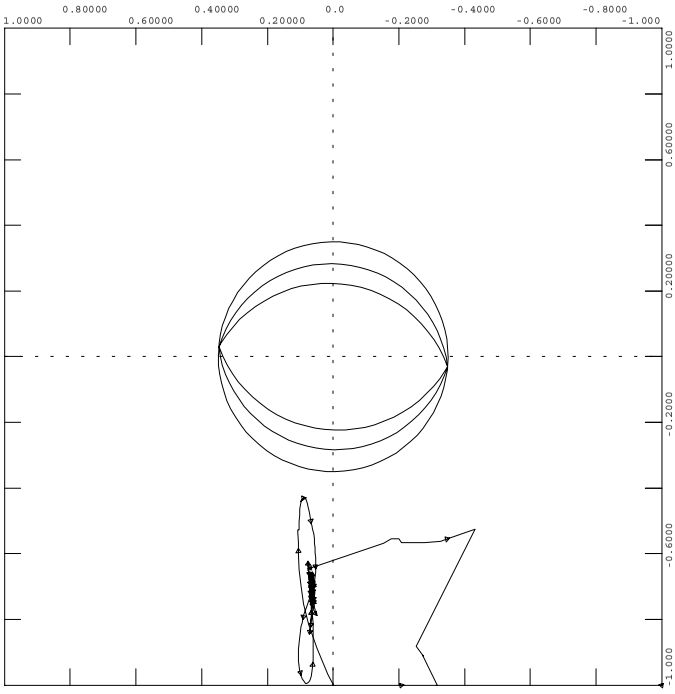
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

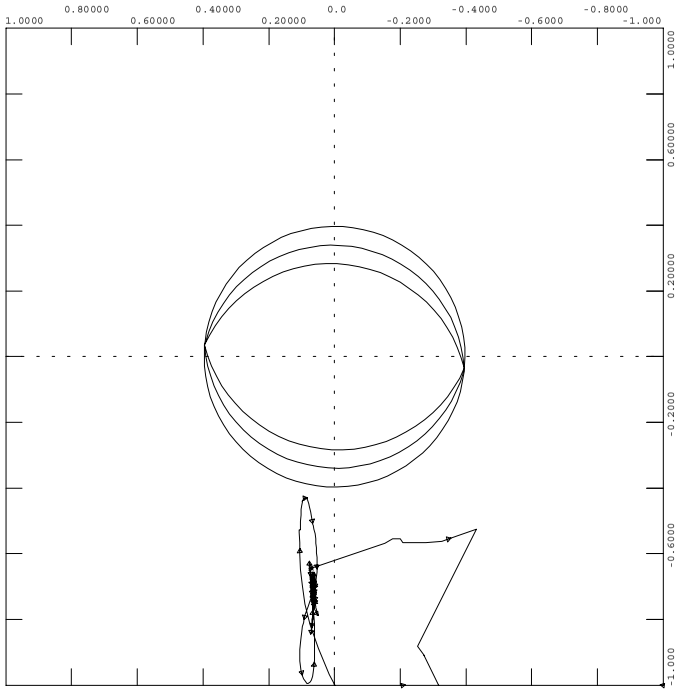


THU, MAY 16 2002 8:20
TIOGA-B.DAM-SOUTH (266)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

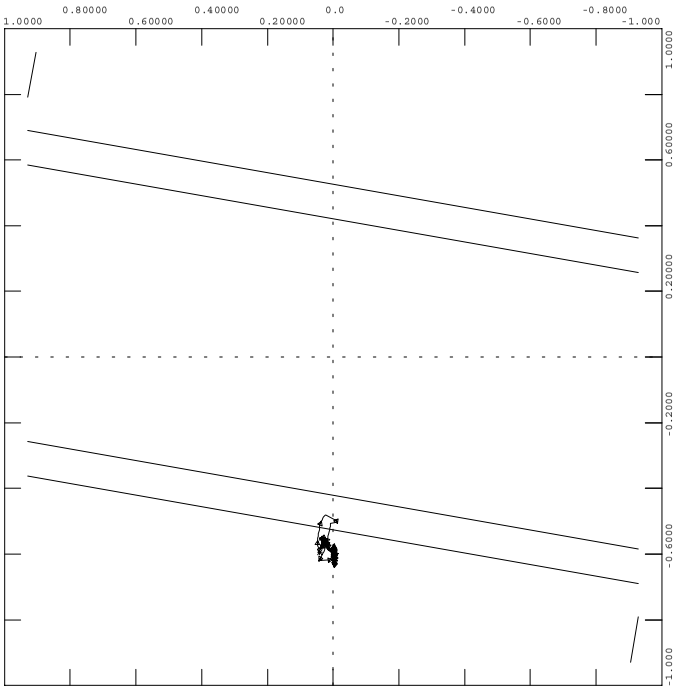


THU, MAY 16 2002 8:20
TIOGA-B.DAM-EMRG (267)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

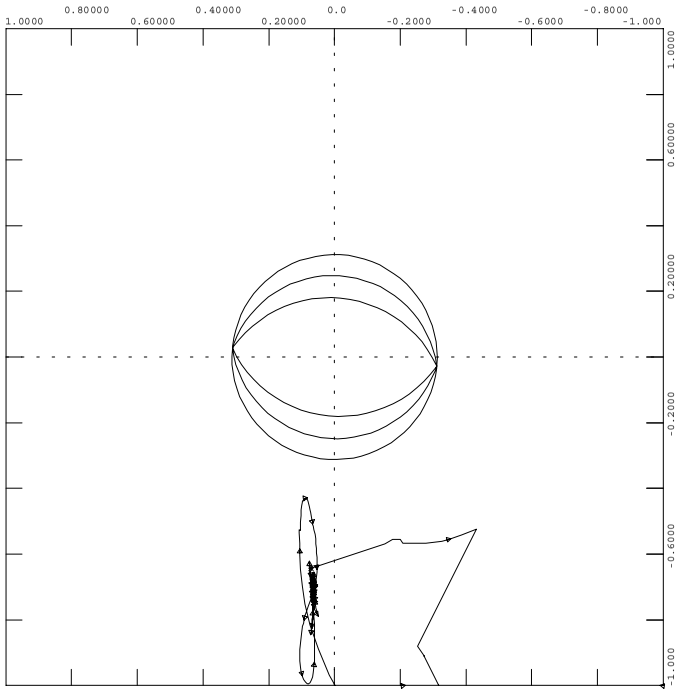


THU, MAY 16 2002 8:20
R50M-MORANVILLE-EMRG (777

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

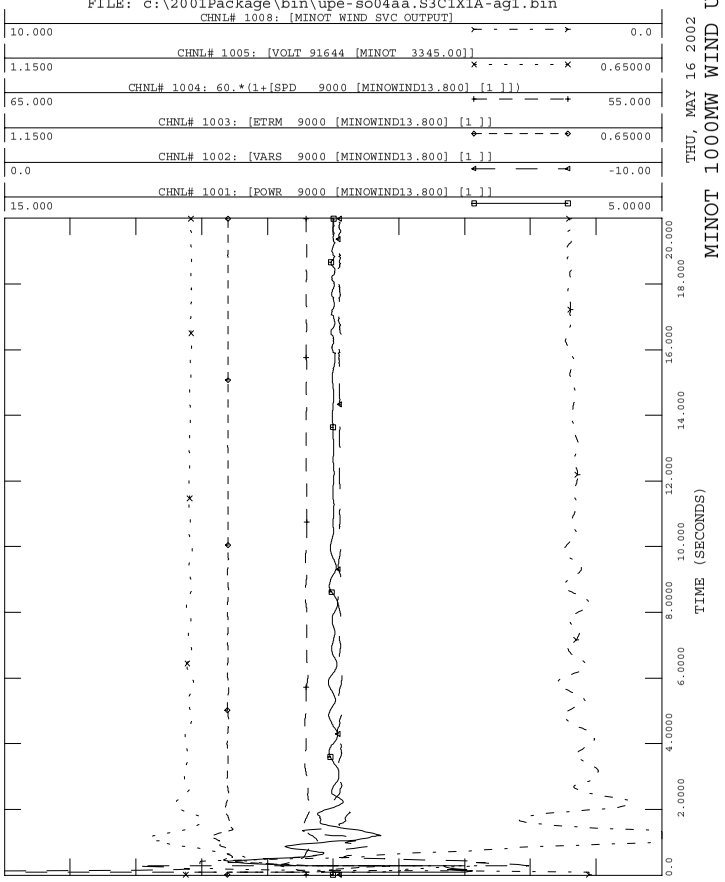
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



THU, MAY 16 2002 8:20
TIOGA-B.DAM-NORTH (268)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

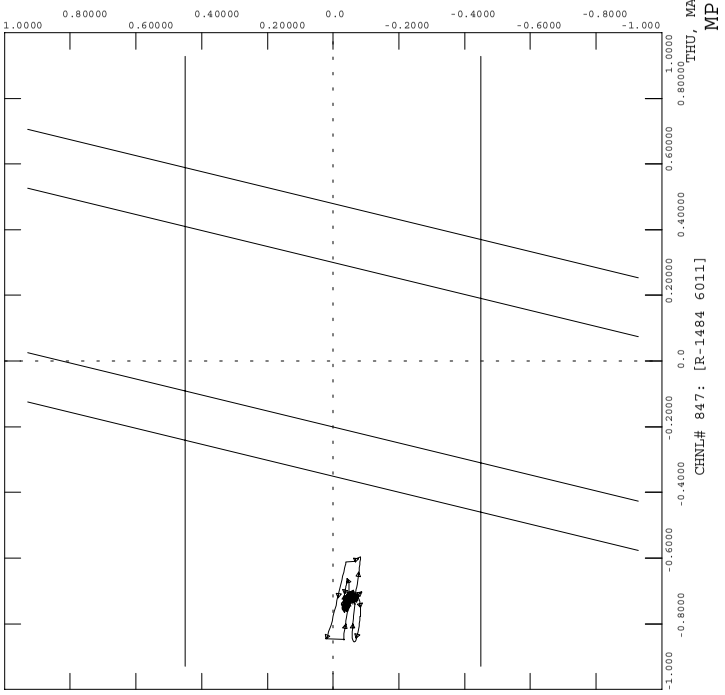


THU, MAY 16 2002 8:20
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

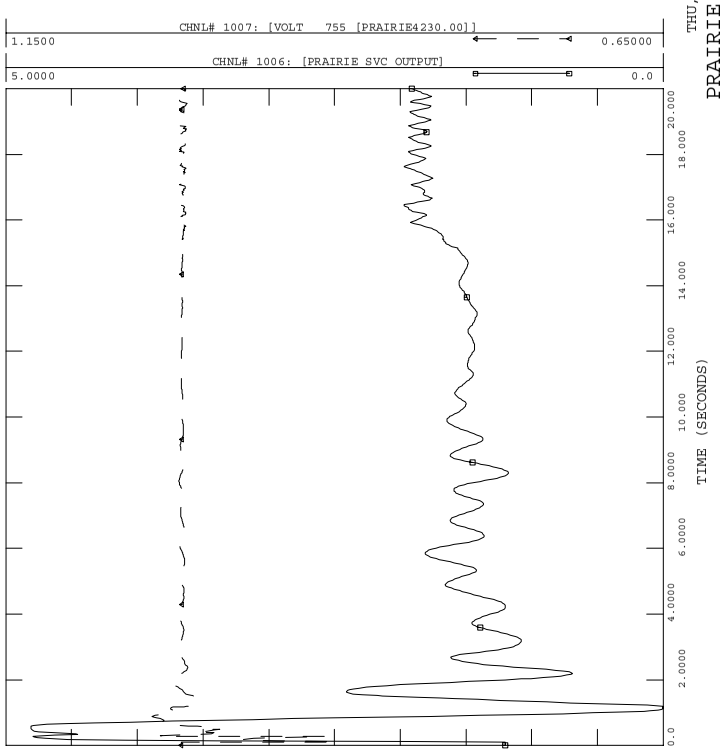
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



THU, MAY 16 2002 8:20
MP-OH I.FALLS (779)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag1.bin



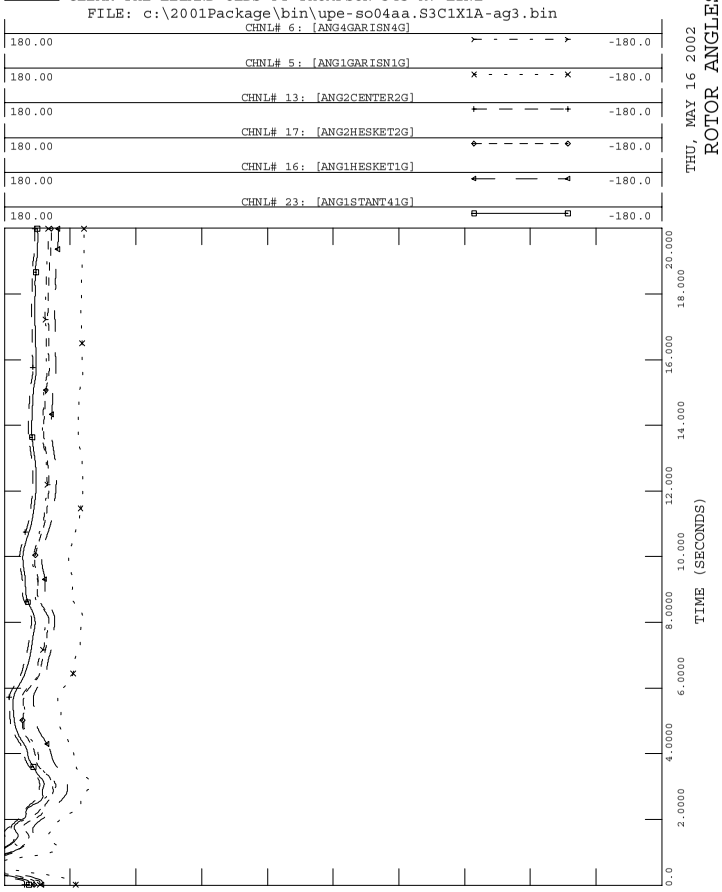
THU, MAY 16 2002 8:20
PRAIRIE SVC RESPONSE

CONTINGENCY AG3

Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

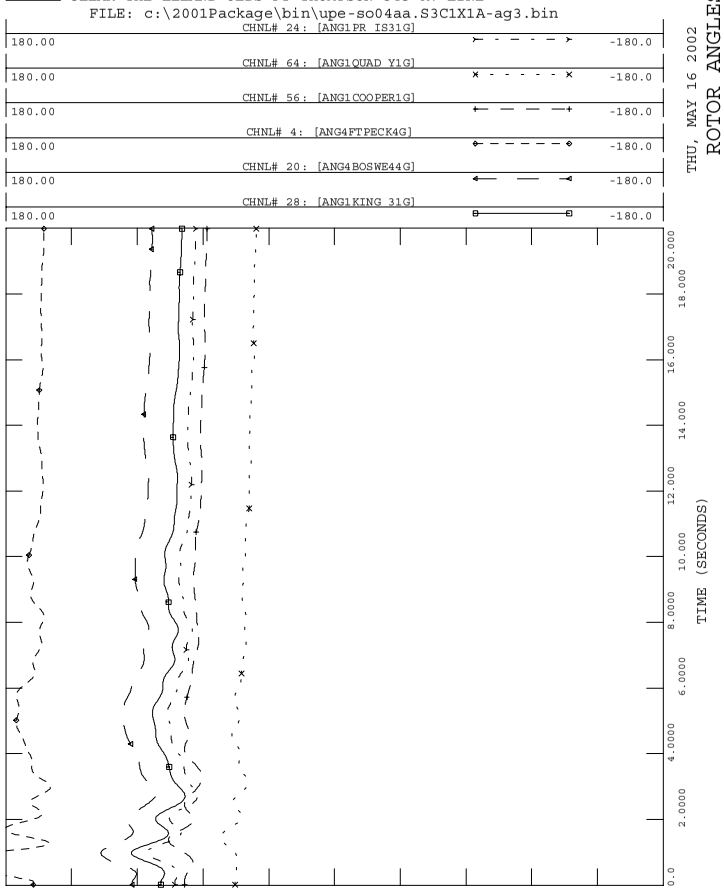
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
ROTOR ANGLES 2



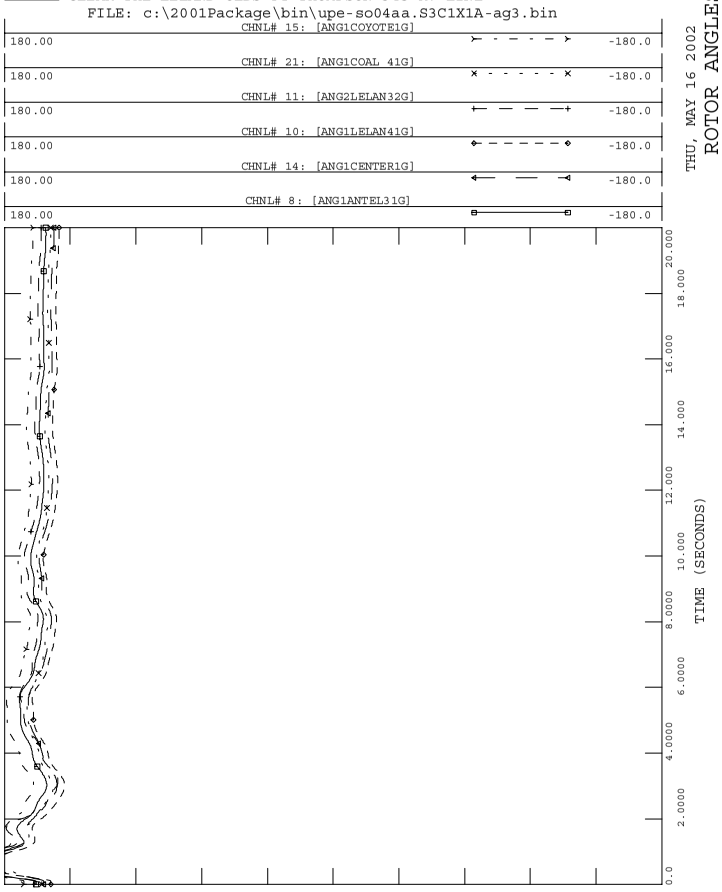
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
ROTOR ANGLES 4



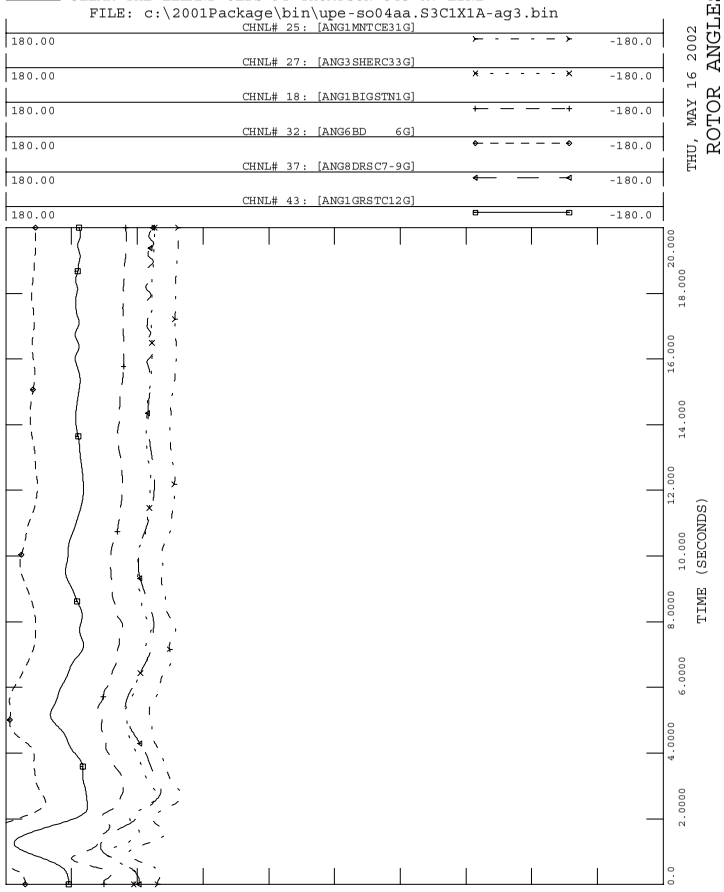
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

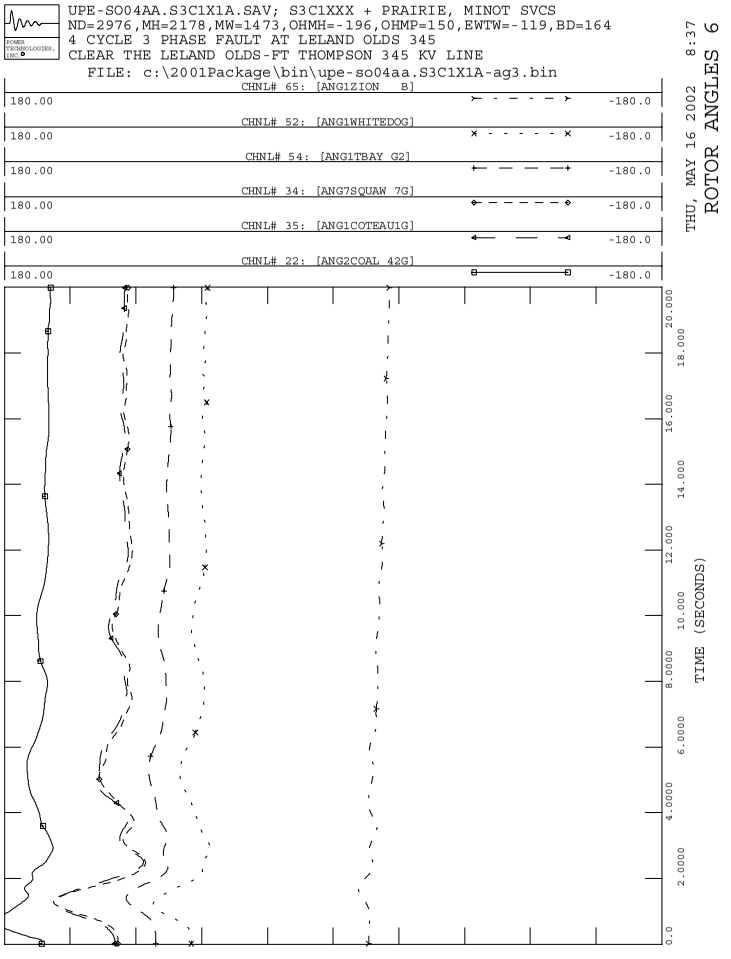
THU, MAY 16 2002 8:37
ROTOR ANGLES 1

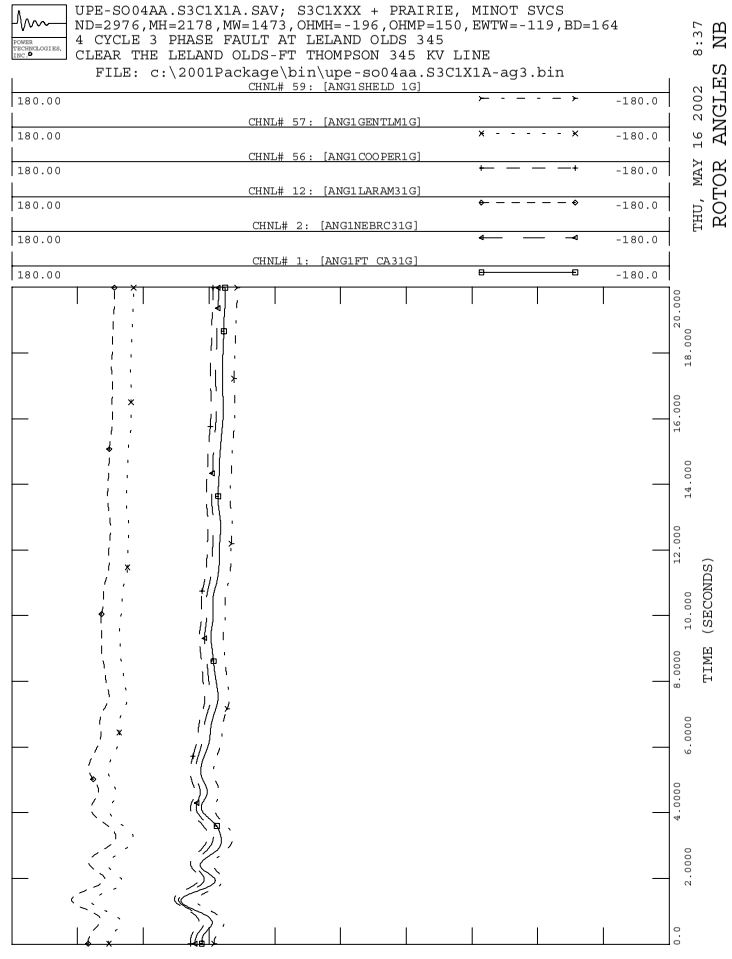


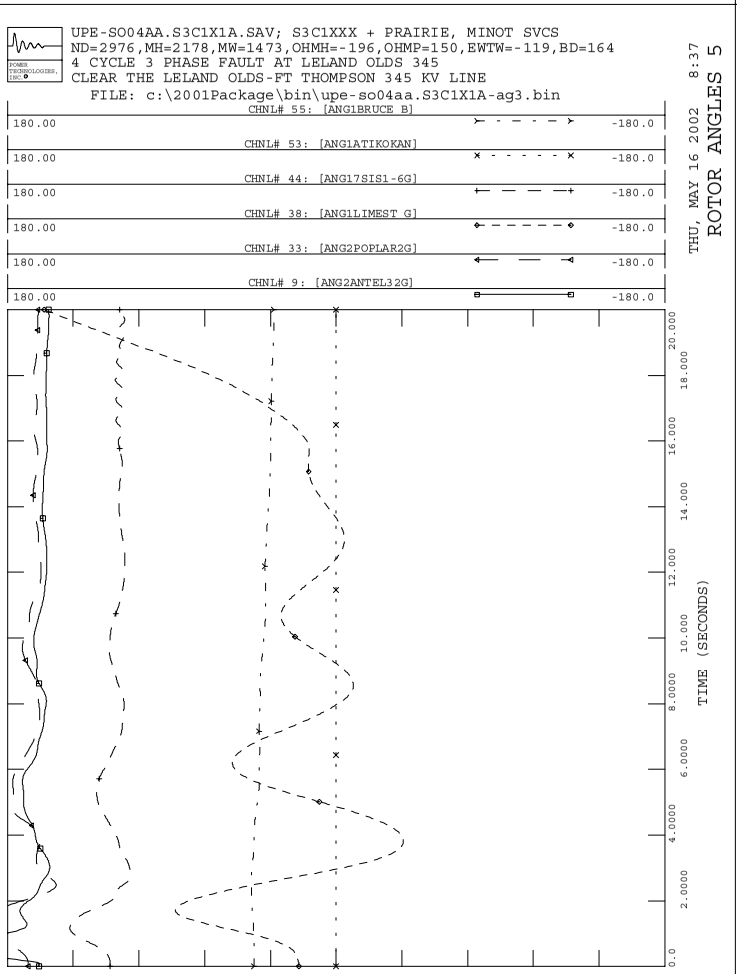
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

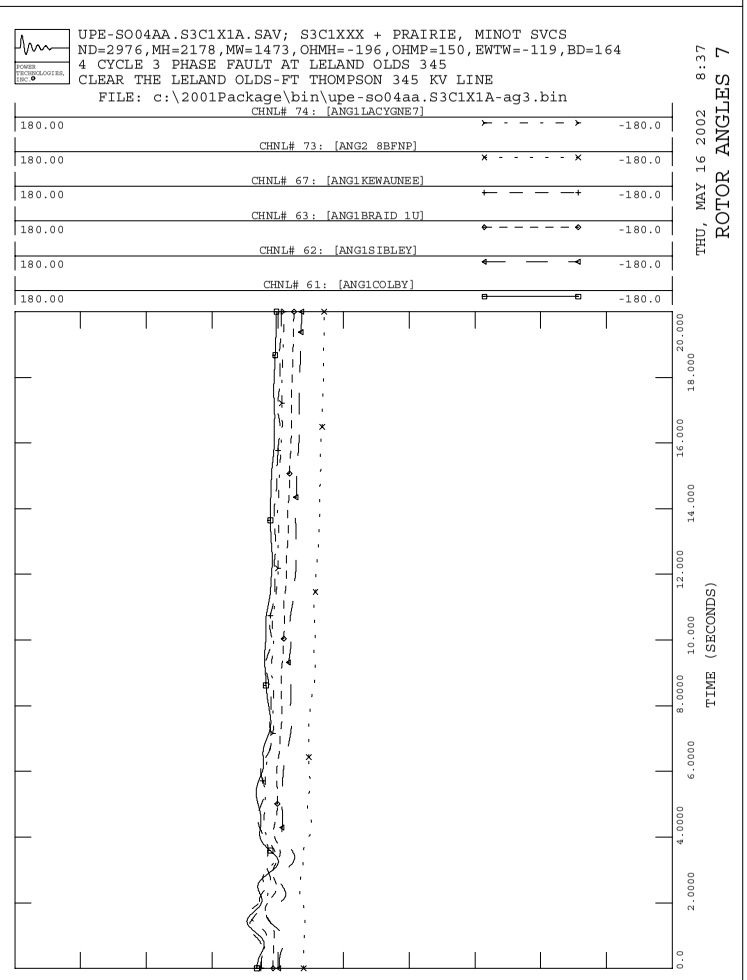
THU, MAY 16 2002 8:37
ROTOR ANGLES 3




UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 8:37
ROTOR ANGLES 6

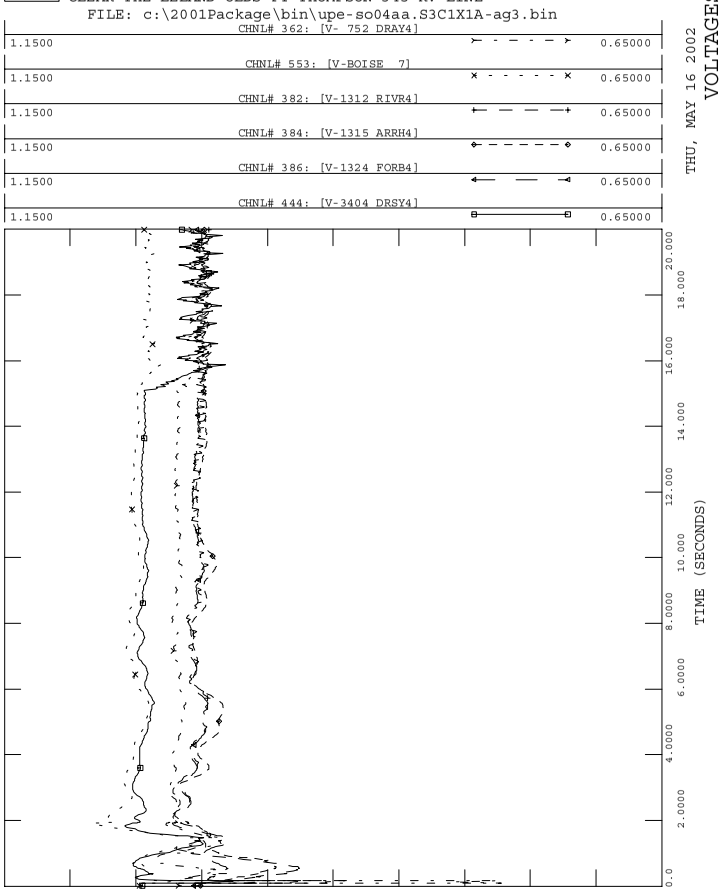

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 8:37
ROTOR ANGLES NB


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 8:37
ROTOR ANGLES 5


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
THU, MAY 16 2002 8:37
ROTOR ANGLES 7

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
VOLTAGES 1



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
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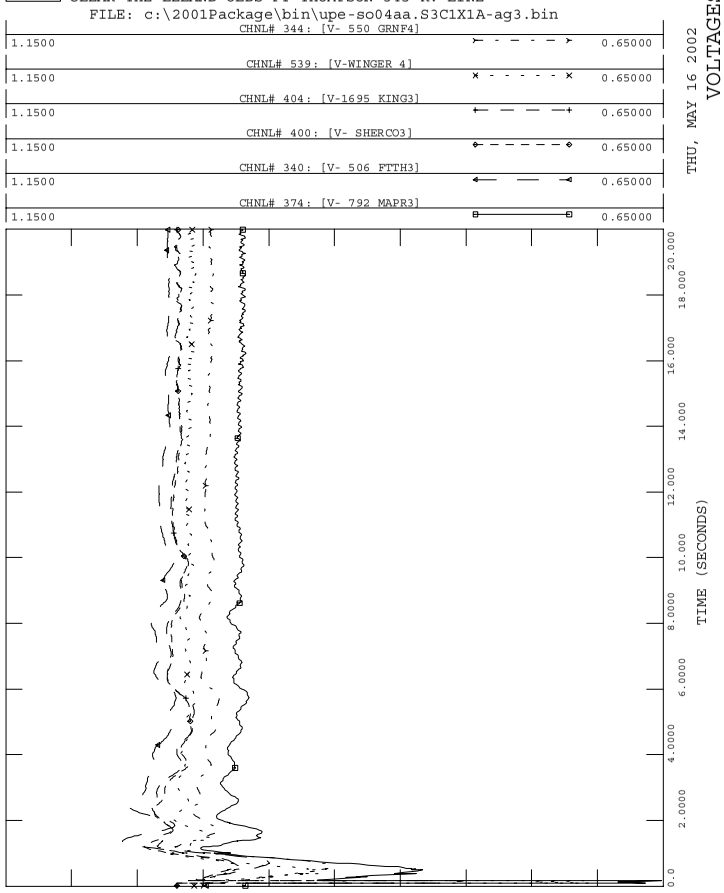
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
VOLTAGES 3



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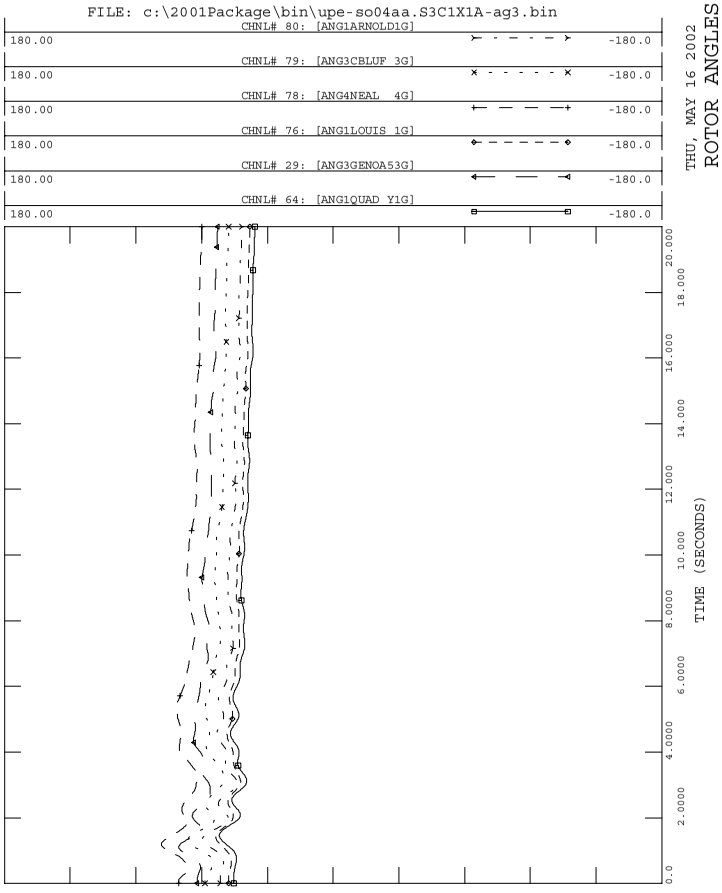
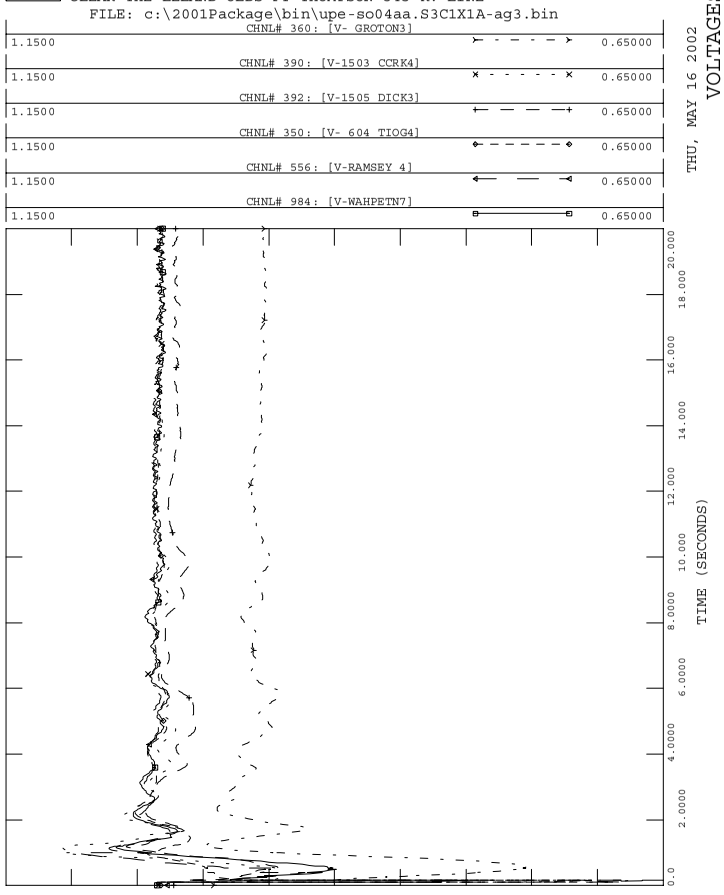
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
ROTOR ANGLES IA



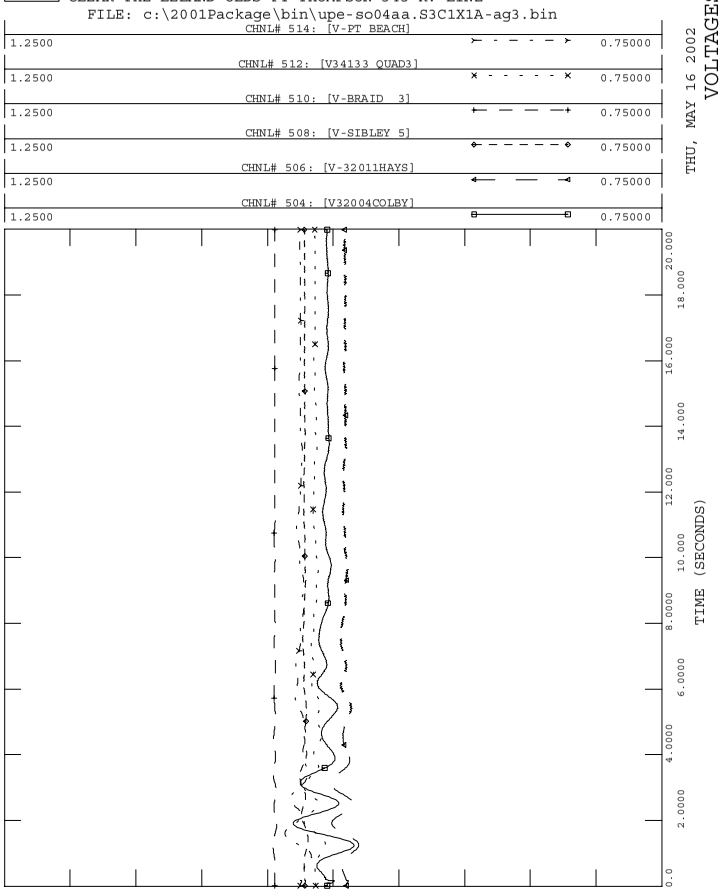
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
VOLTAGES 2



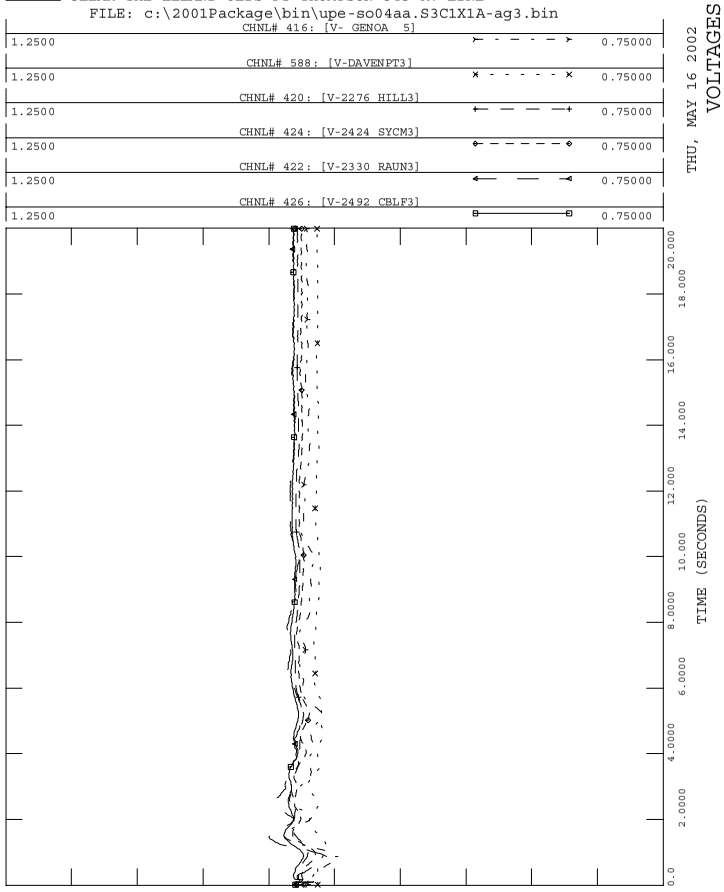
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
VOLTAGES 5



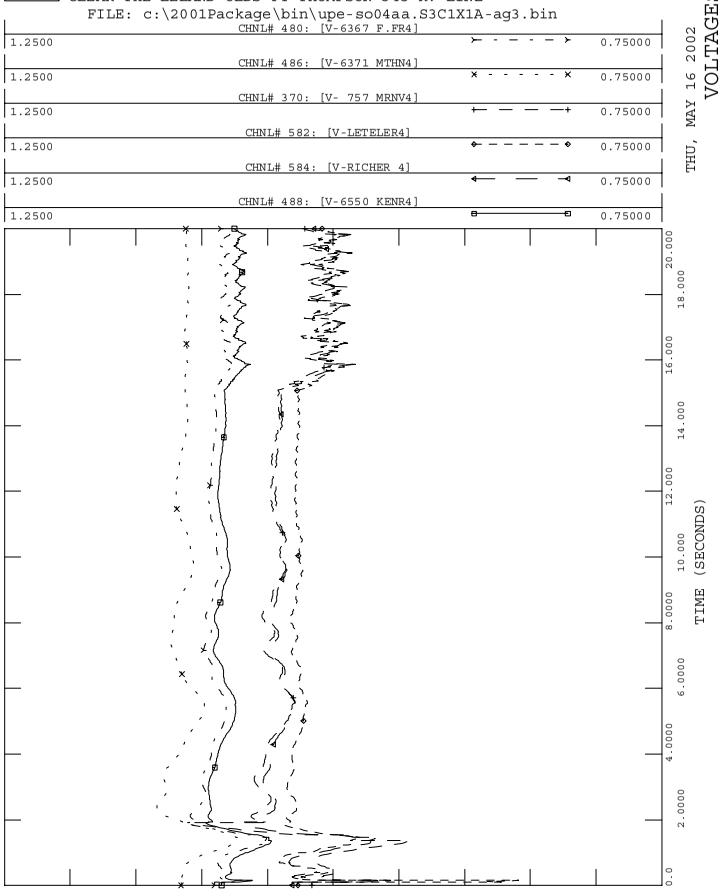
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
VOLTAGES IA



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
VOLTAGES 4



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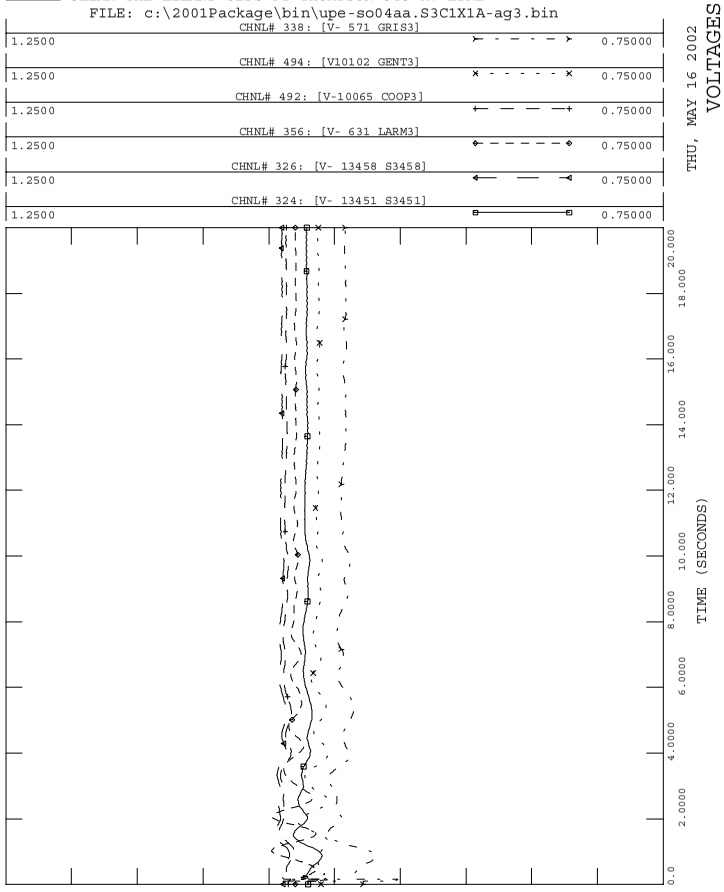
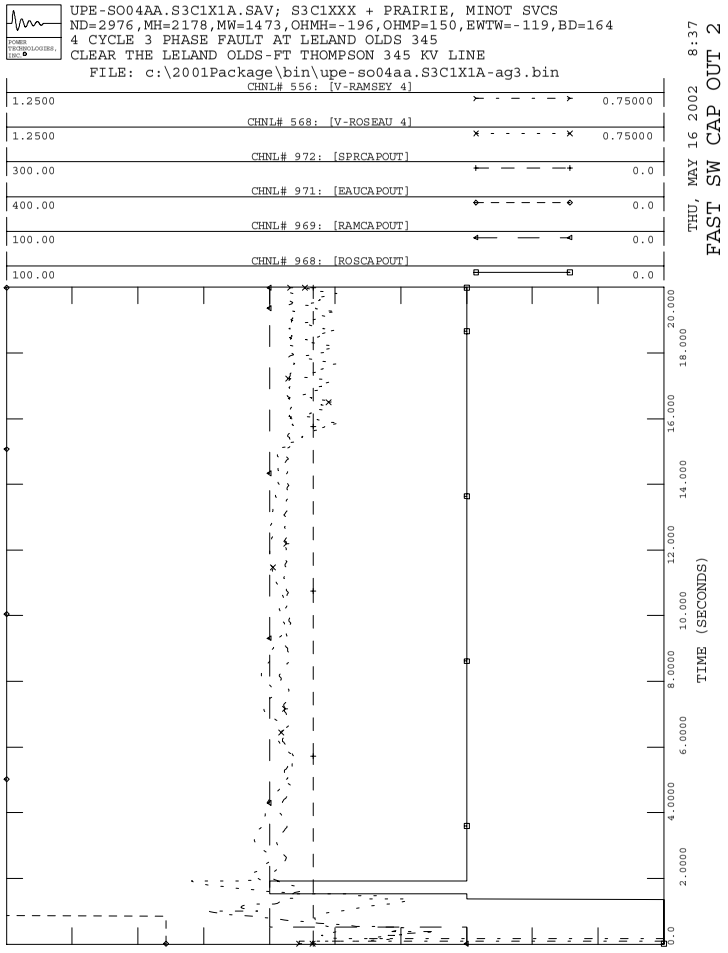
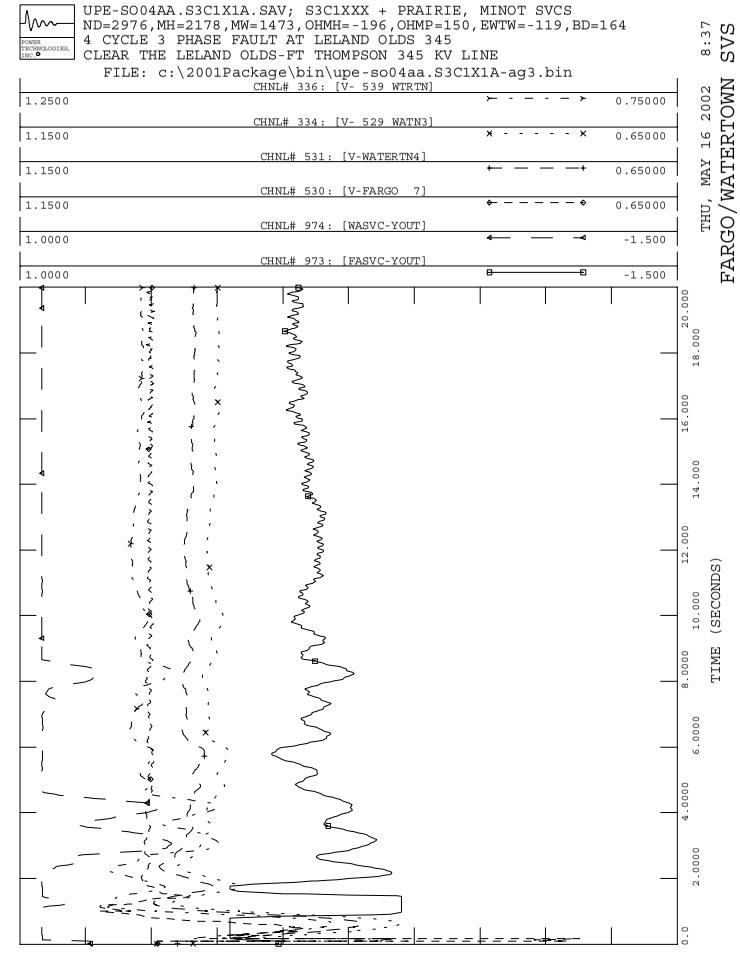
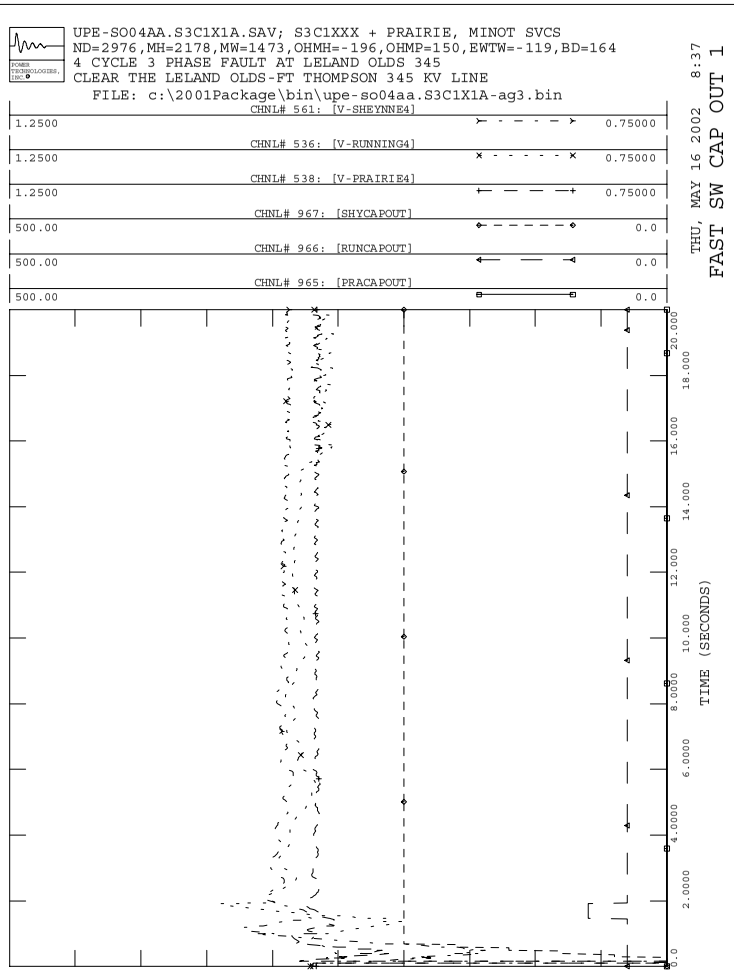
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
VOLTAGES NB




UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
THU, MAY 16 2002 8:37
FAST SW CAP OUT 2


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
THU, MAY 16 2002 8:37
FARGO/WATERTOWN SVS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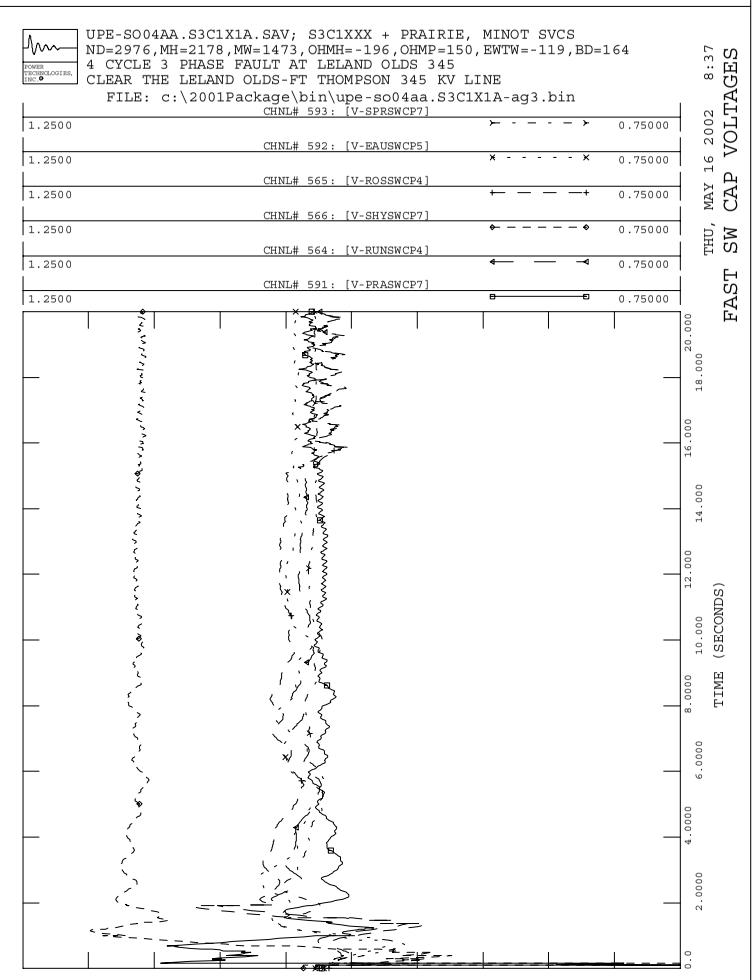
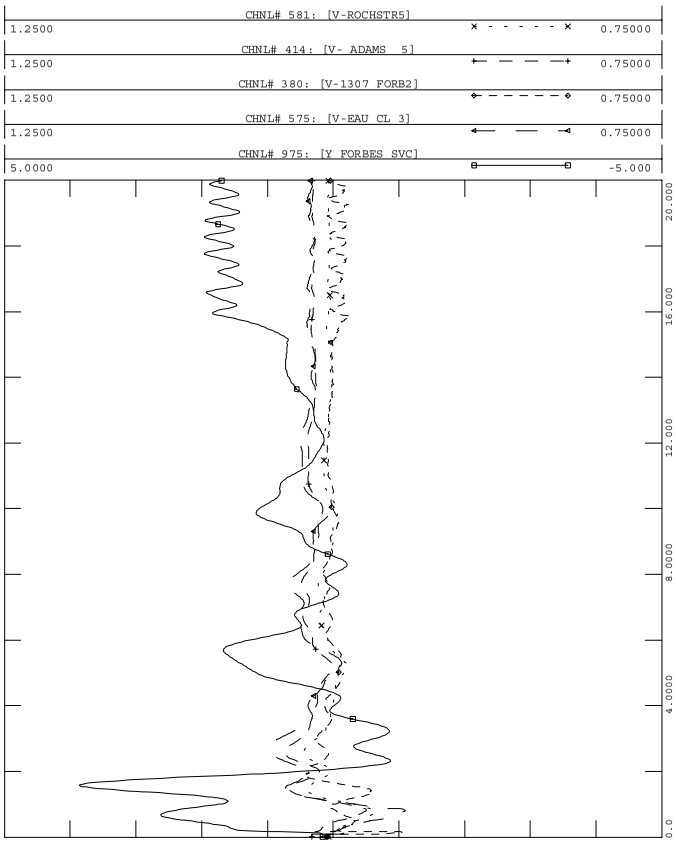
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
THU, MAY 16 2002 8:37
FAST SW CAP OUT 1


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
THU, MAY 16 2002 8:37
FAST SW CAP VOLTAGES

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37

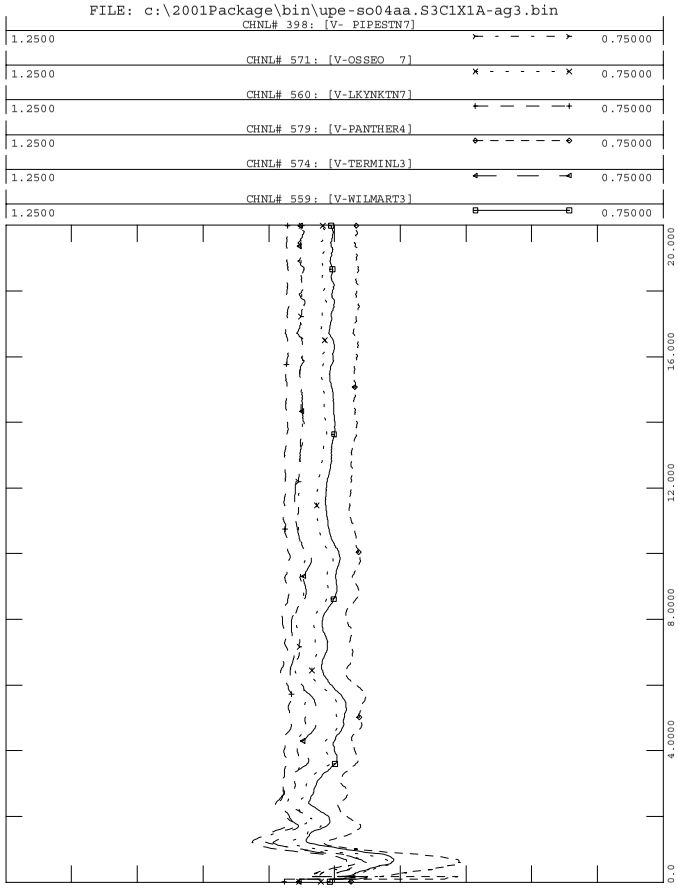
SVC & WISCONSIN VOLT



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37

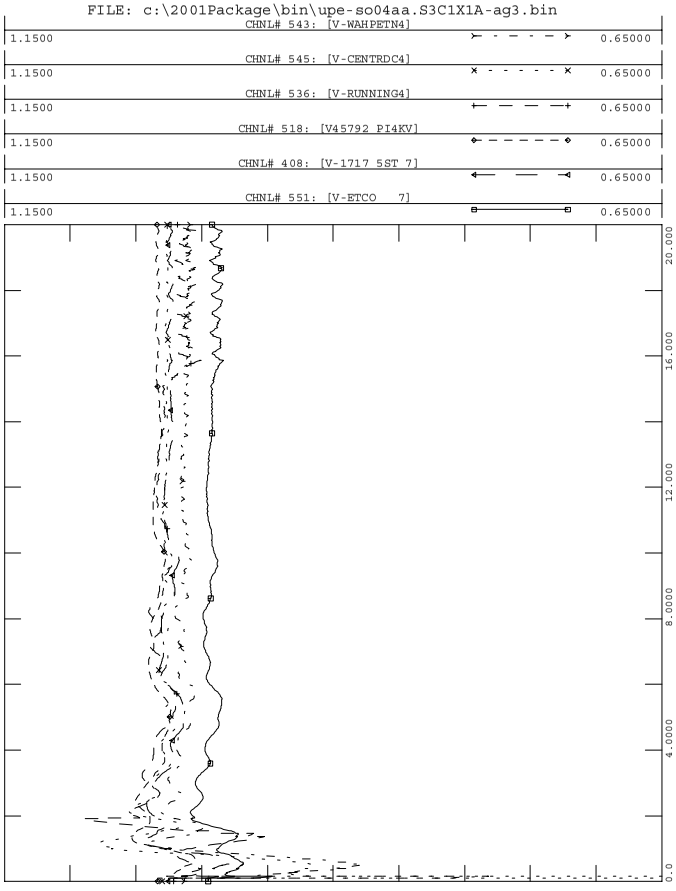
TC VOLTAGES



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37

VOLTAGES 6



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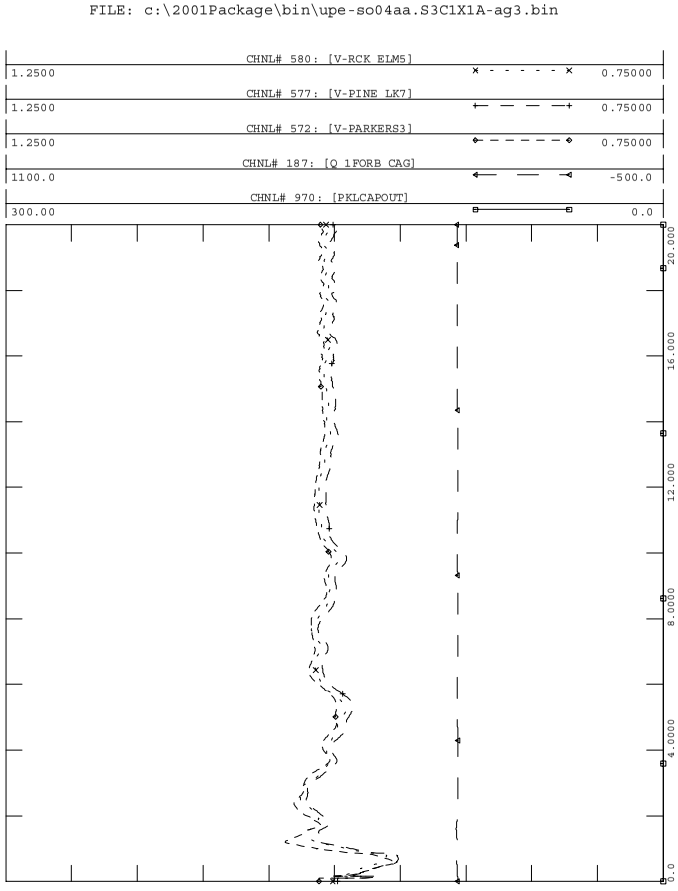
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
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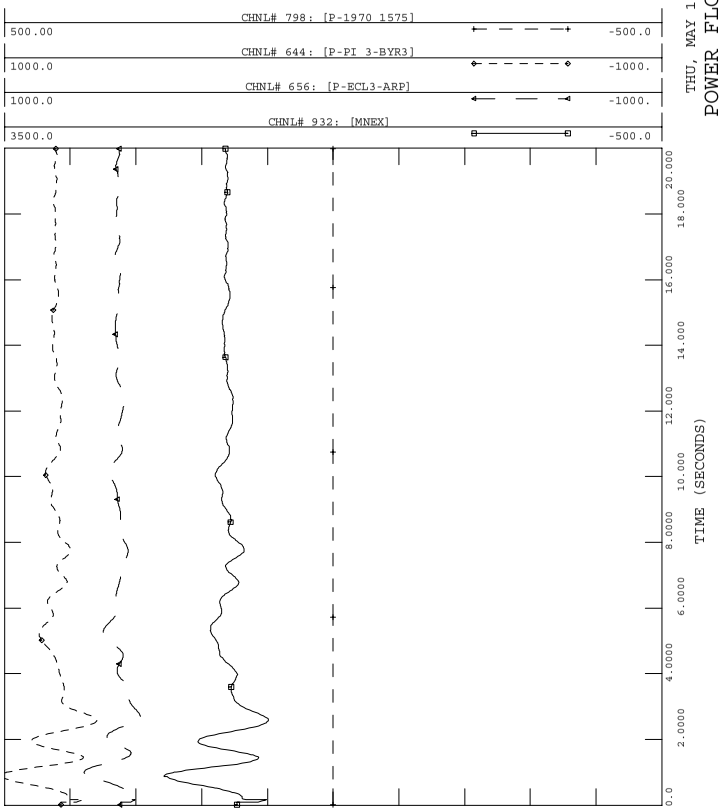
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
POWER FLOW SUMS 2



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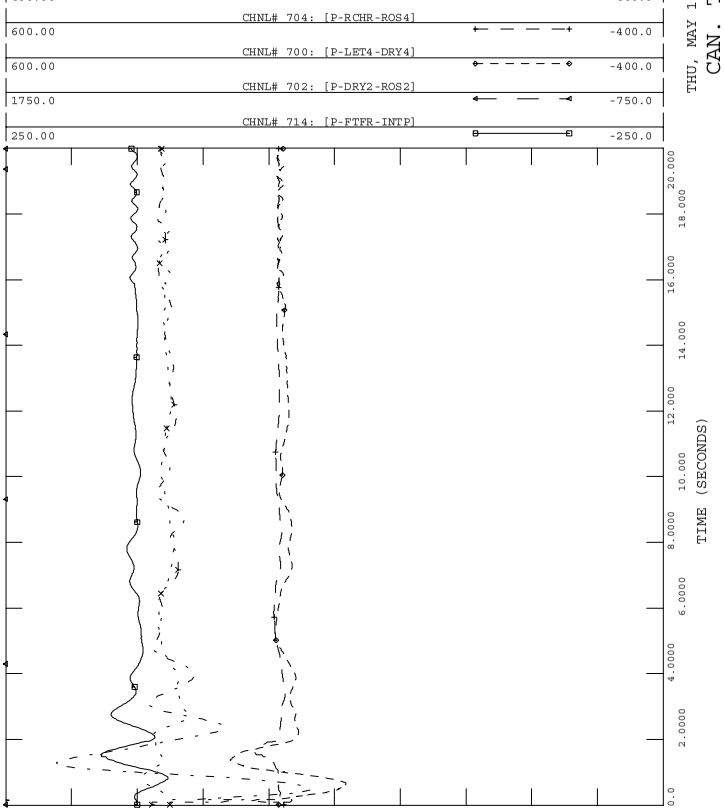
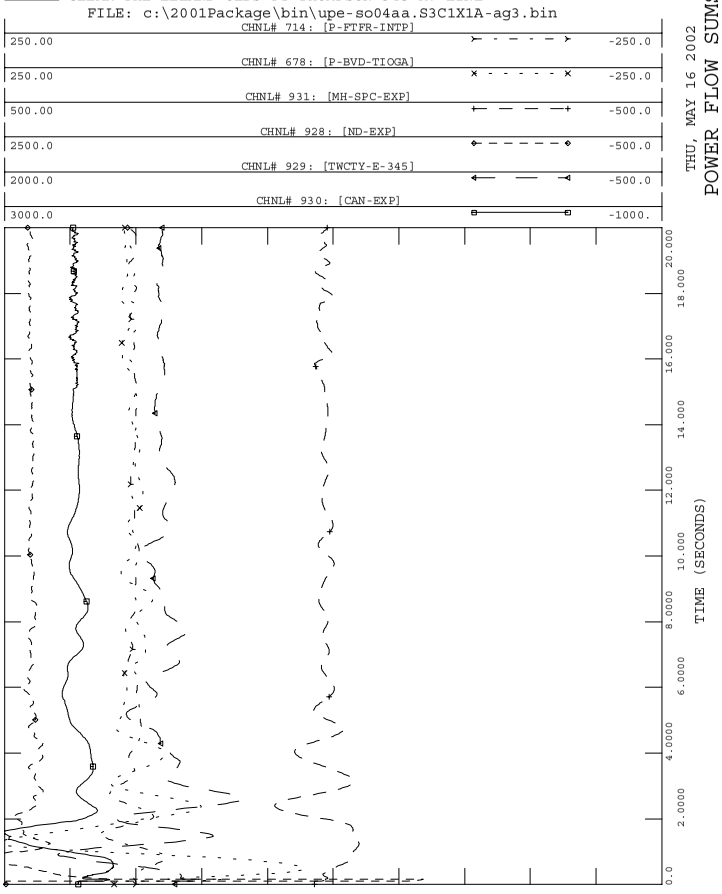
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
CAN. TIE FLOWS



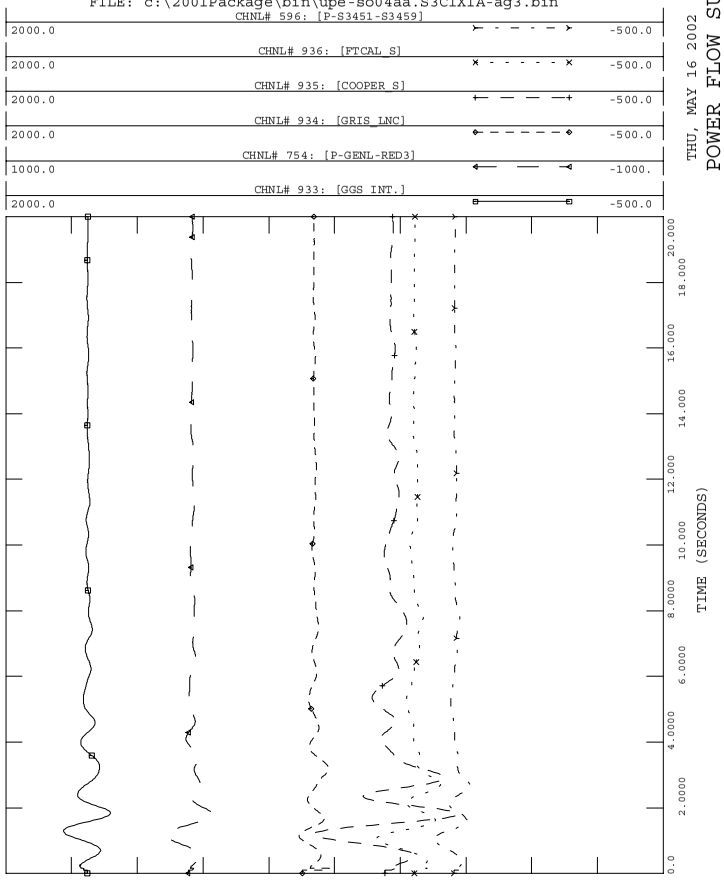
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

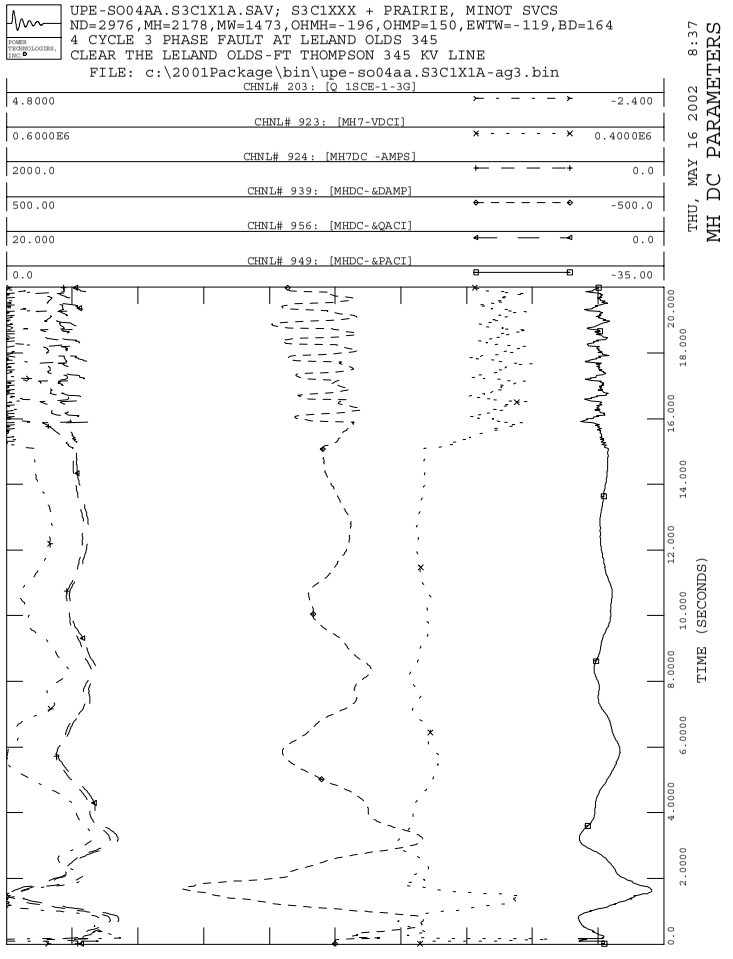
THU, MAY 16 2002 8:37
POWER FLOW SUMS 1



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

THU, MAY 16 2002 8:37
POWER FLOW SUM 3




UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
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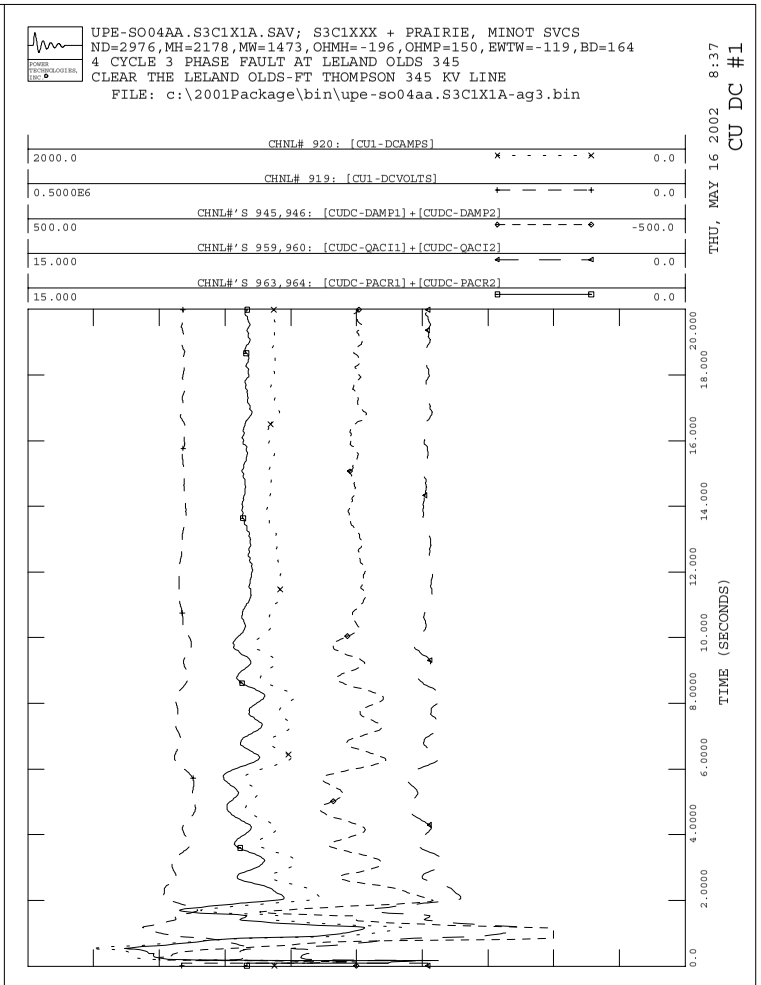
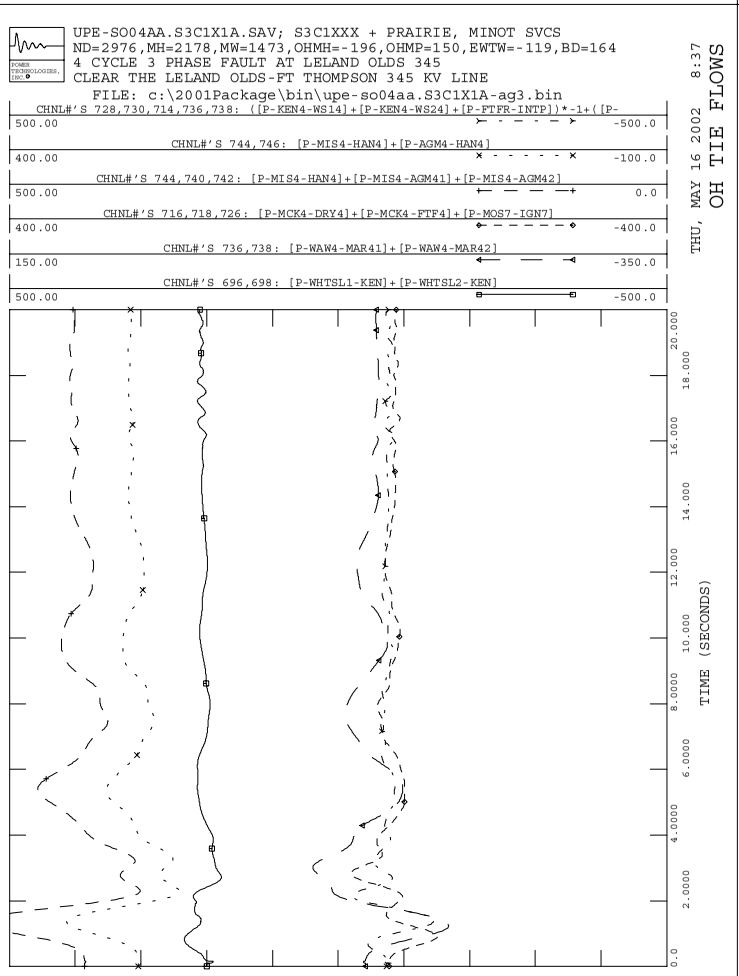
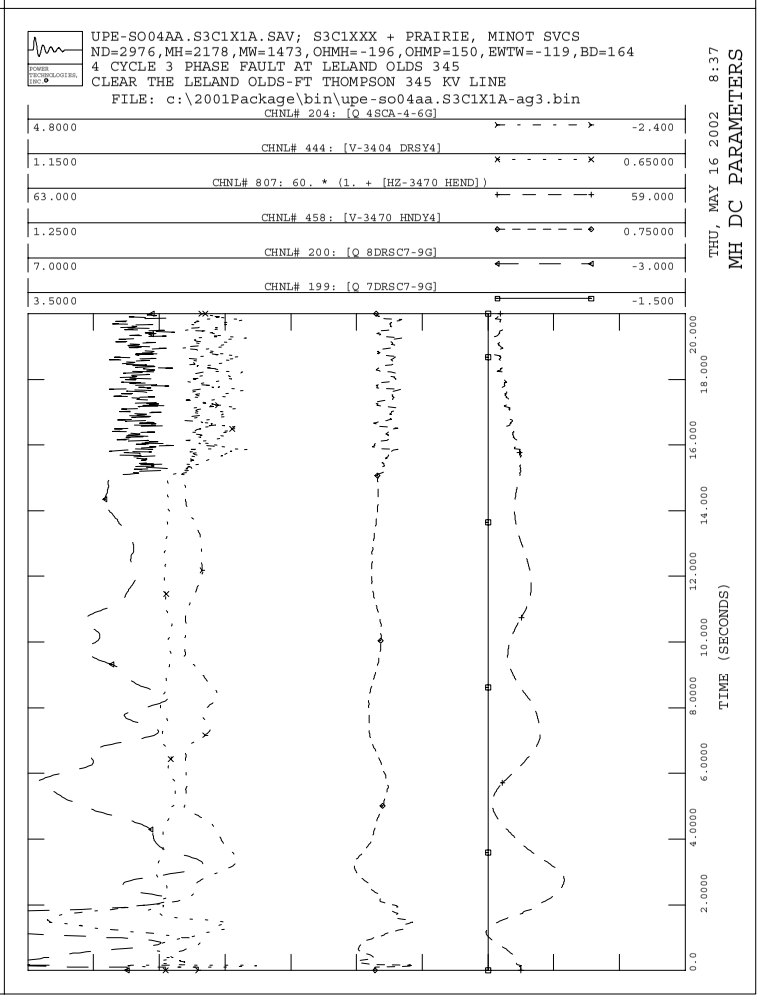
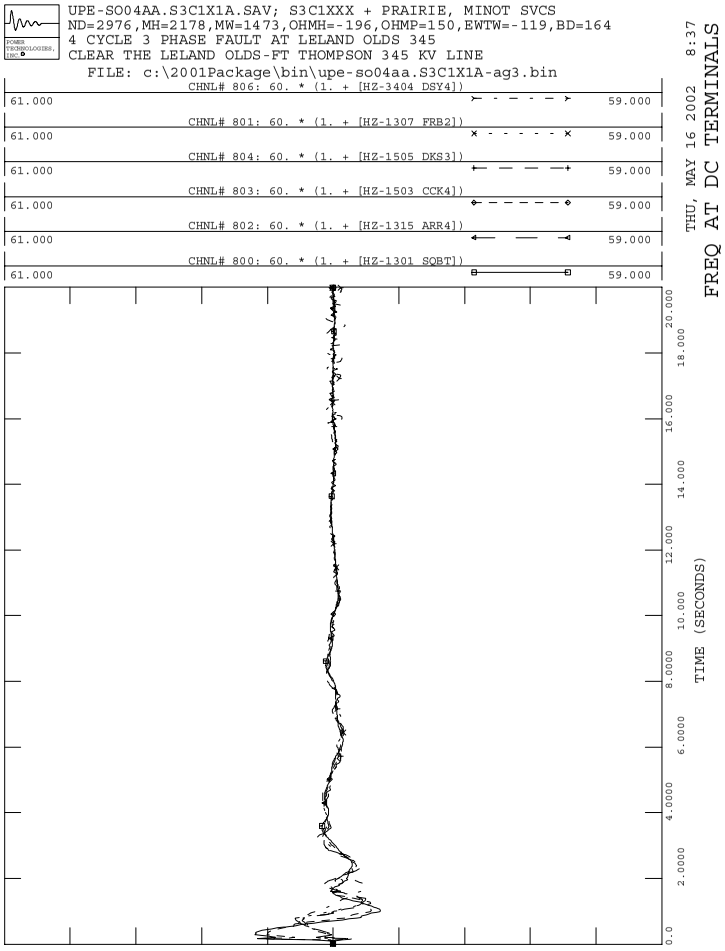
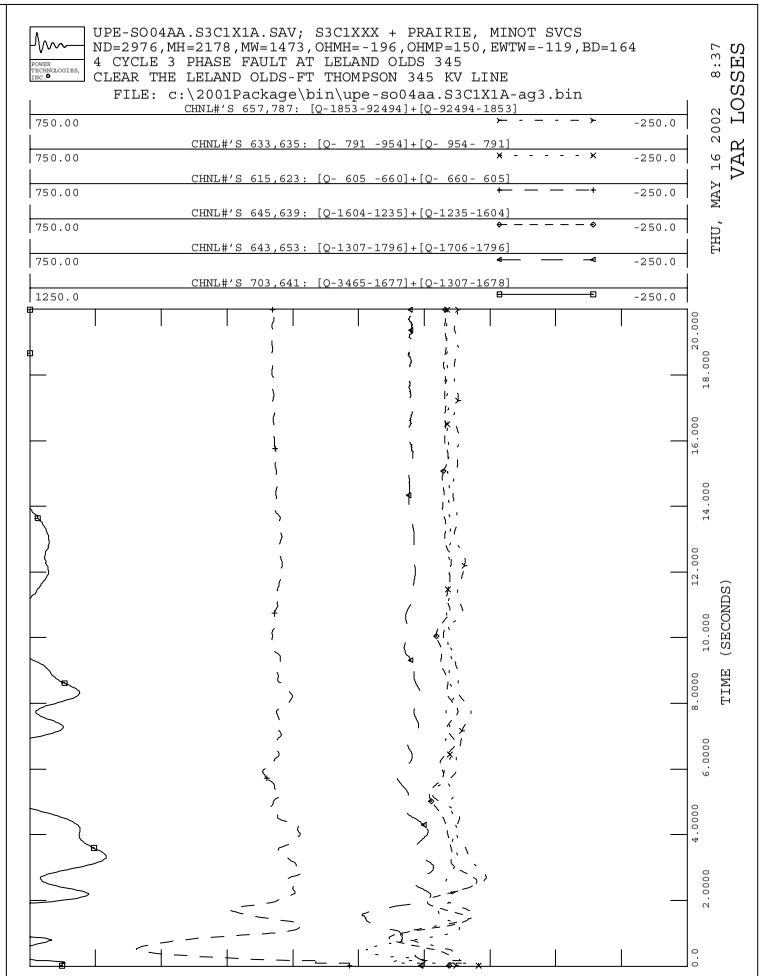
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TIME (SECONDS)
THU, MAY 16 2002 8:37
MH DC PARAMETERS

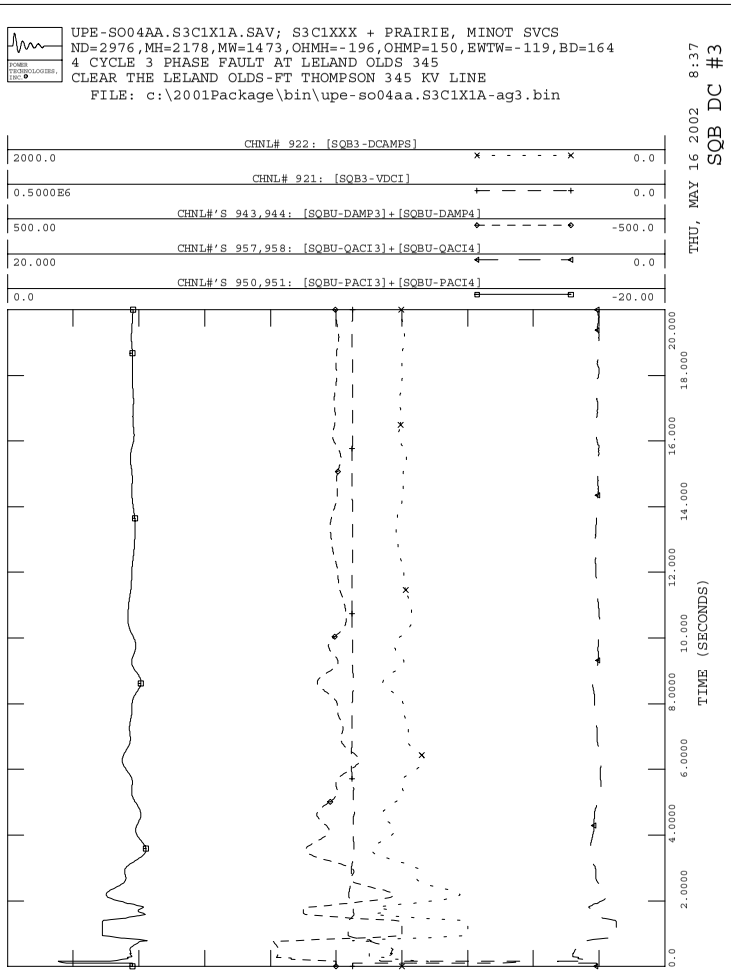

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TIME (SECONDS)
THU, MAY 16 2002 8:37
CU DC #1

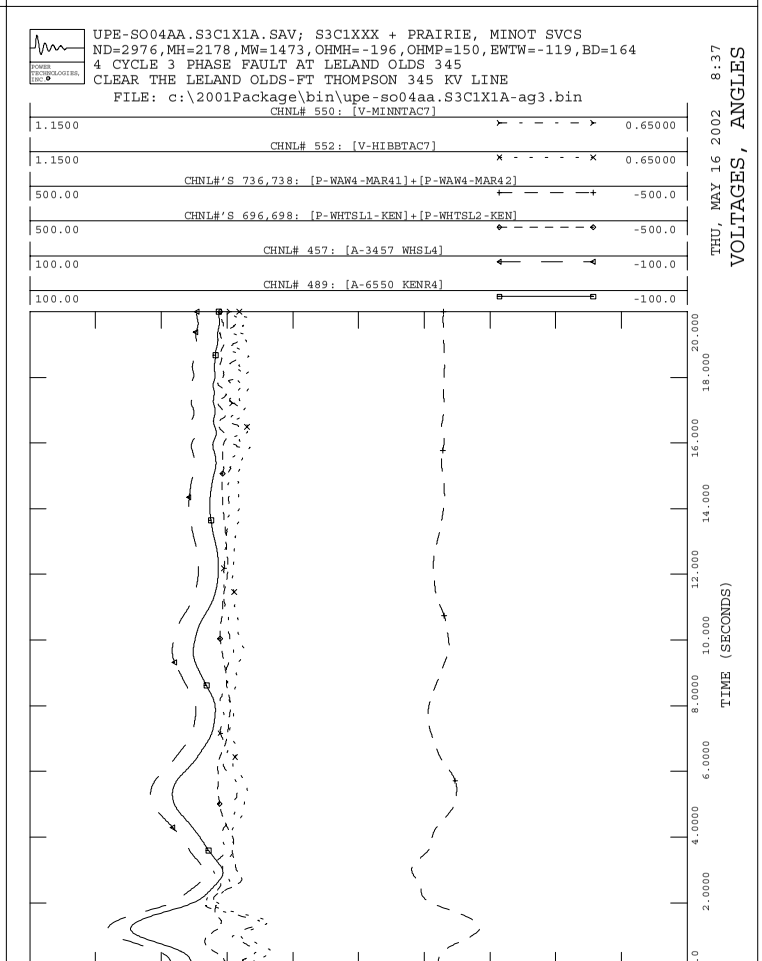

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TIME (SECONDS)
THU, MAY 16 2002 8:37
OH TIE FLOWS


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TIME (SECONDS)
THU, MAY 16 2002 8:37
MH DC PARAMETERS


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
THU, MAY 16 2002 8:37
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
THU, MAY 16 2002 8:37
VAR LOSSES
TIME (SECONDS)

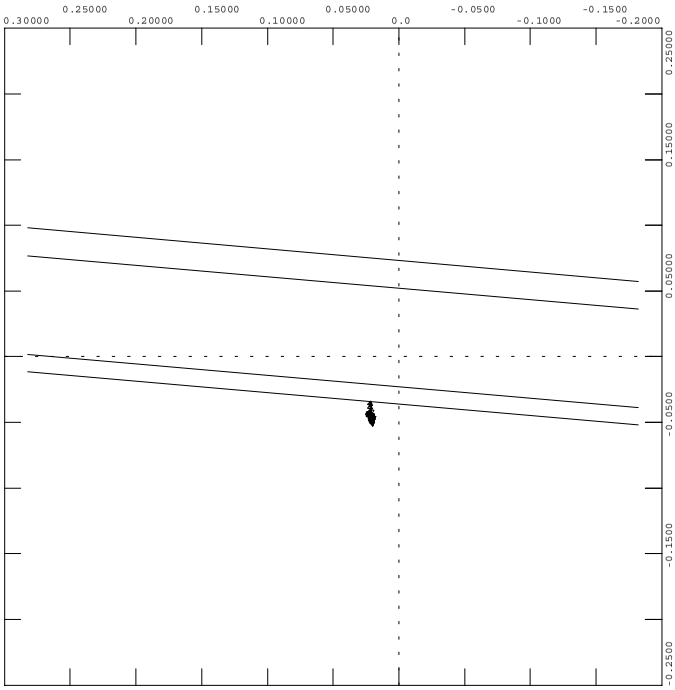

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
THU, MAY 16 2002 8:37
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
THU, MAY 16 2002 8:37
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

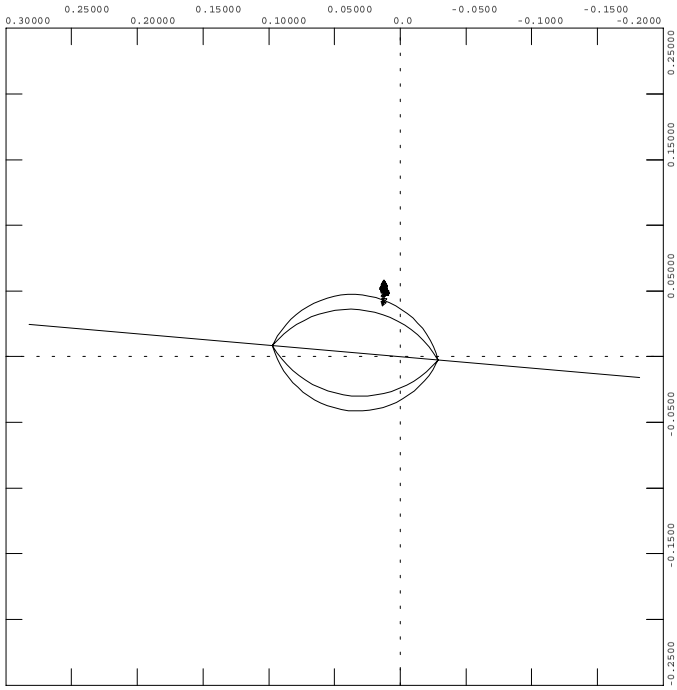


THU, MAY 16 2002 8:37
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

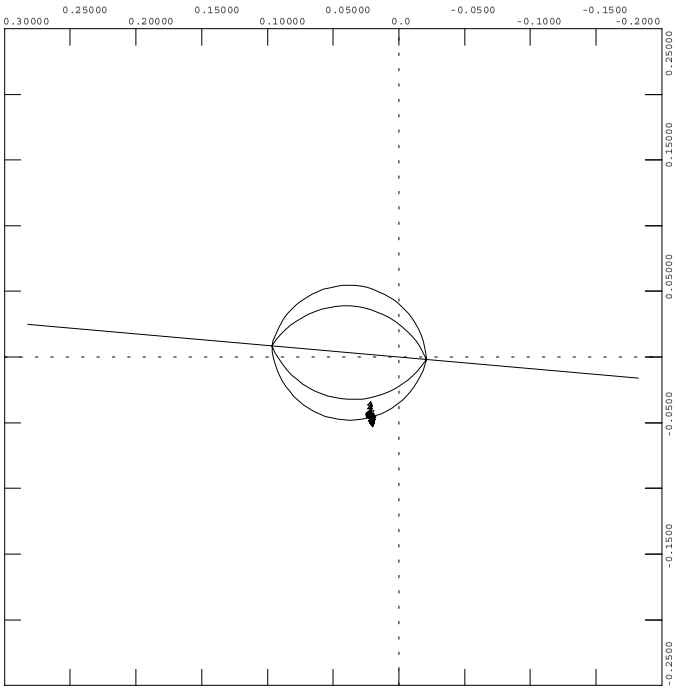


THU, MAY 16 2002 8:37
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

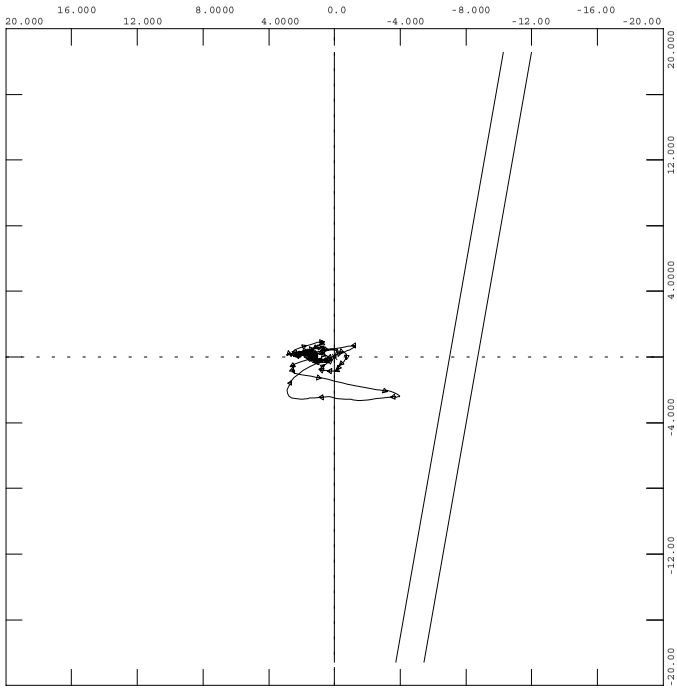


THU, MAY 16 2002 8:37
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

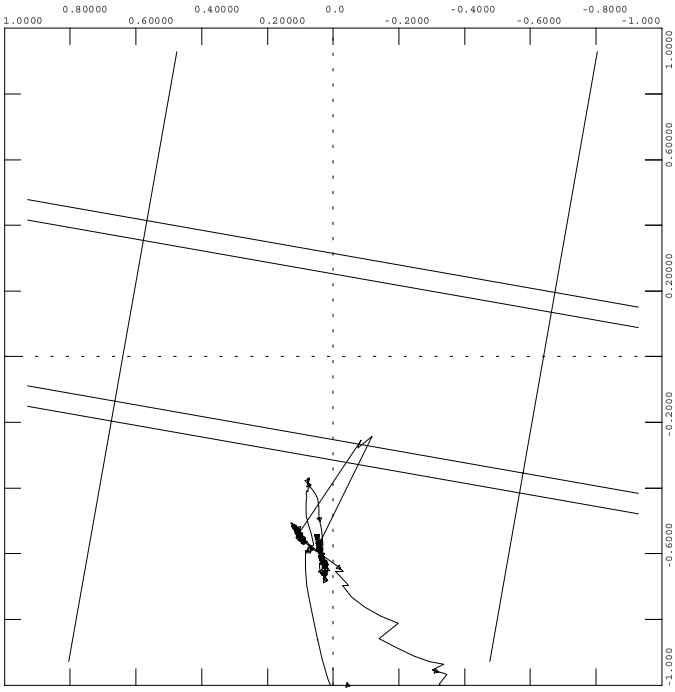


THU, MAY 16 2002 8:37
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

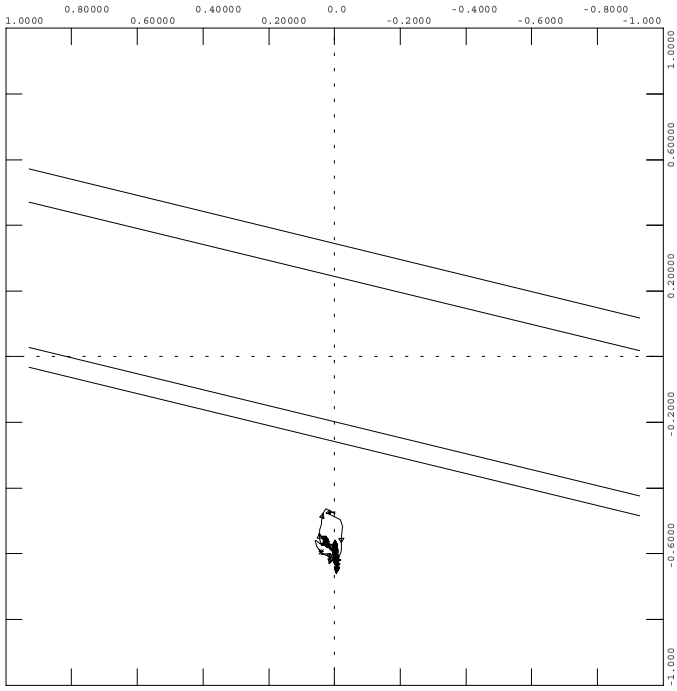


THU, MAY 16 2002 8:37
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

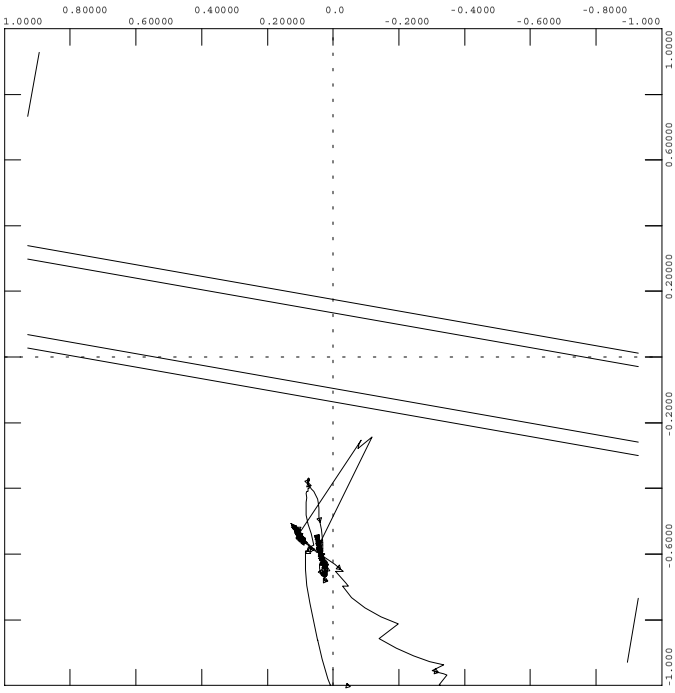


THU, MAY 16 2002 8:37
R50M AT MORANVILLE (520)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

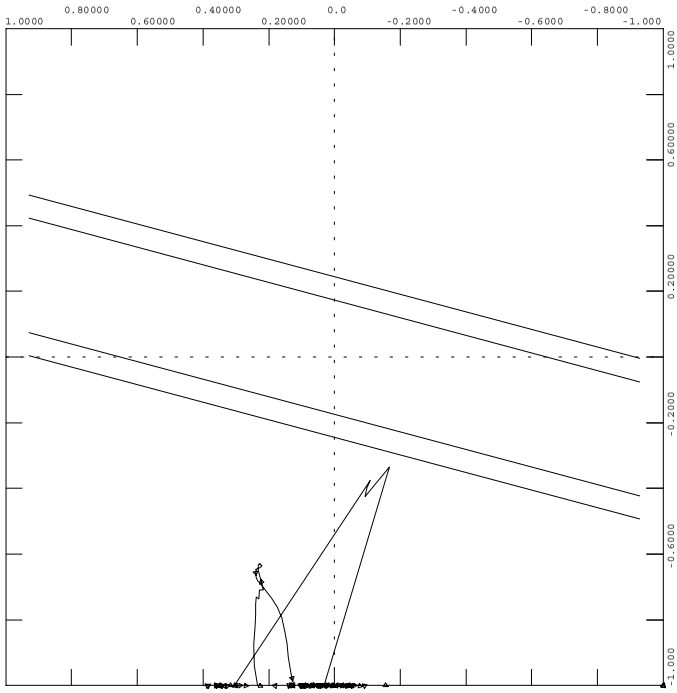


THU, MAY 16 2002 8:37
L20D AT DRAYTON (506)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

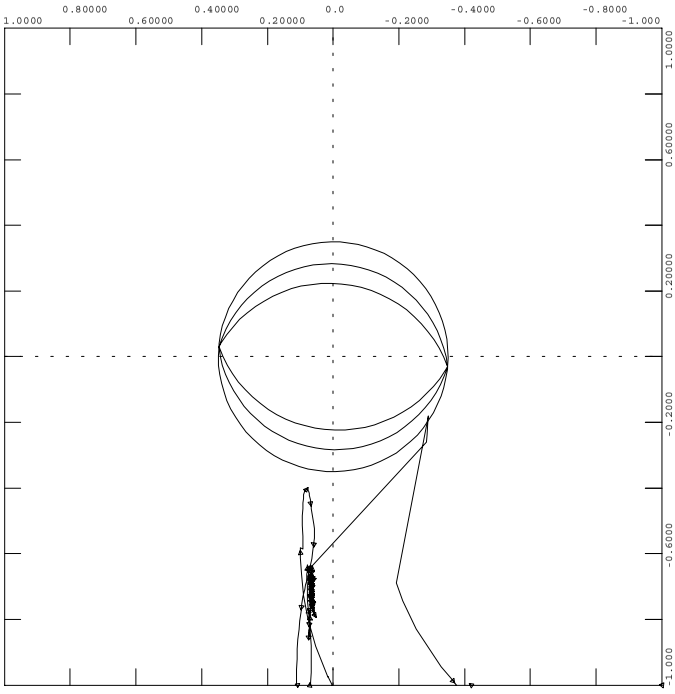


THU, MAY 16 2002 8:37
L20D-PRAIRIE (510)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

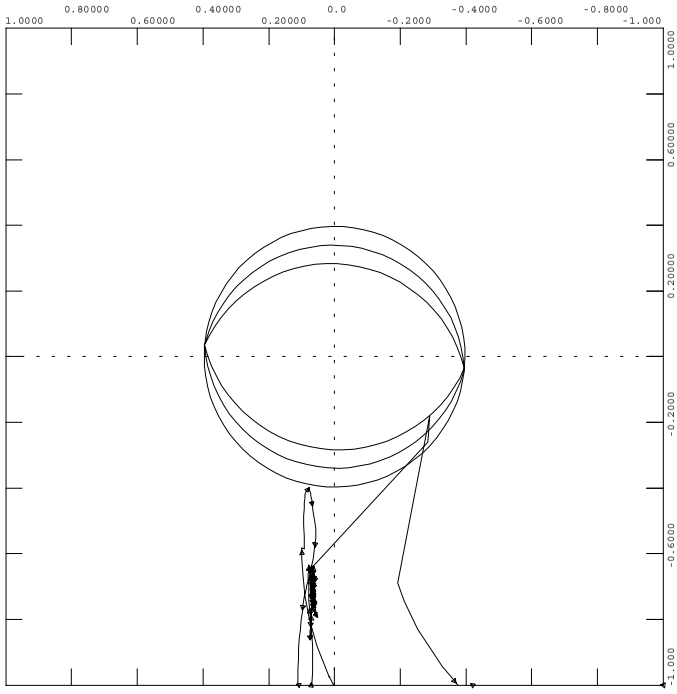
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

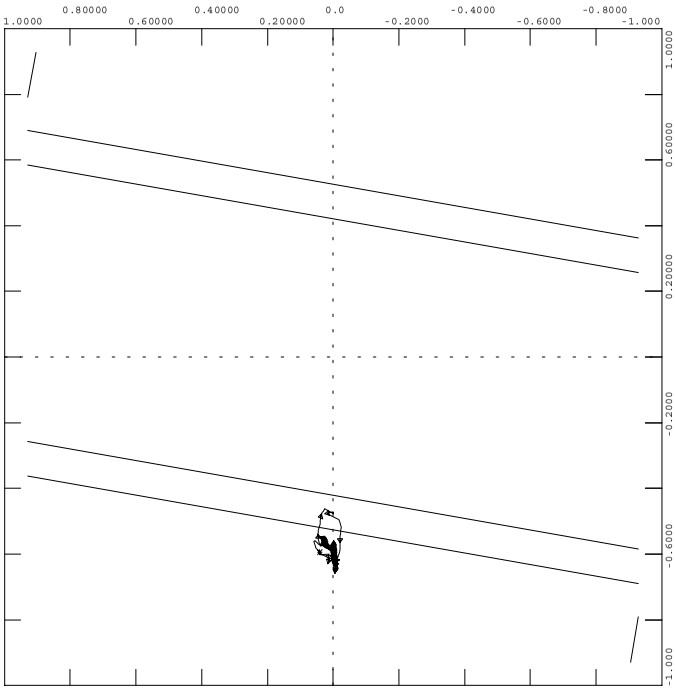
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

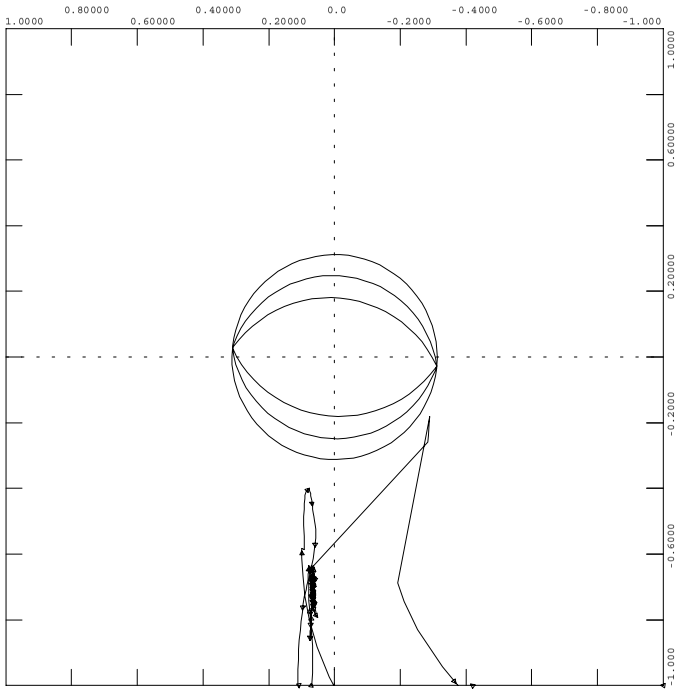
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



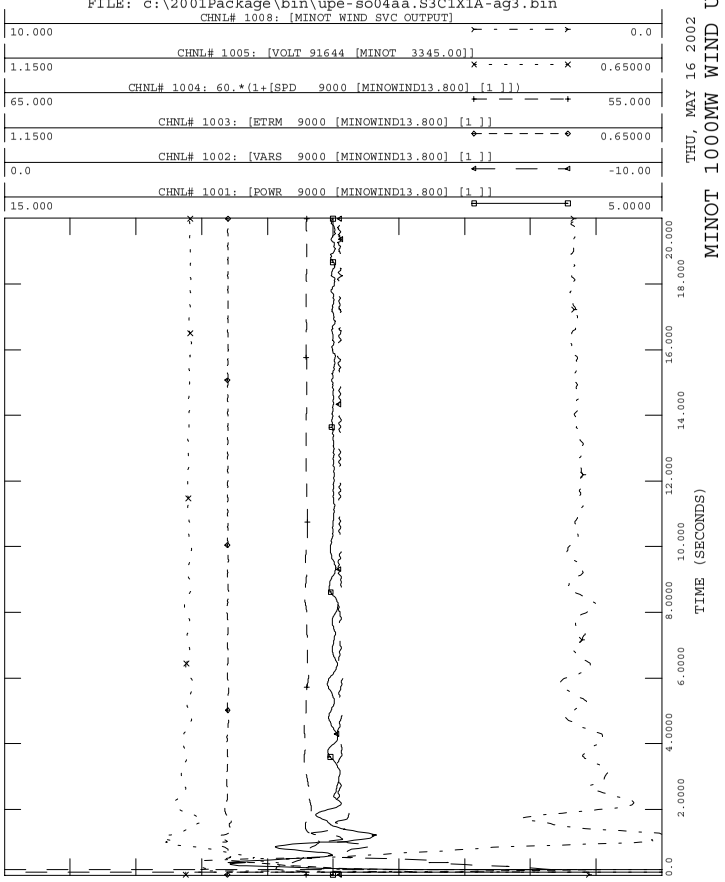
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

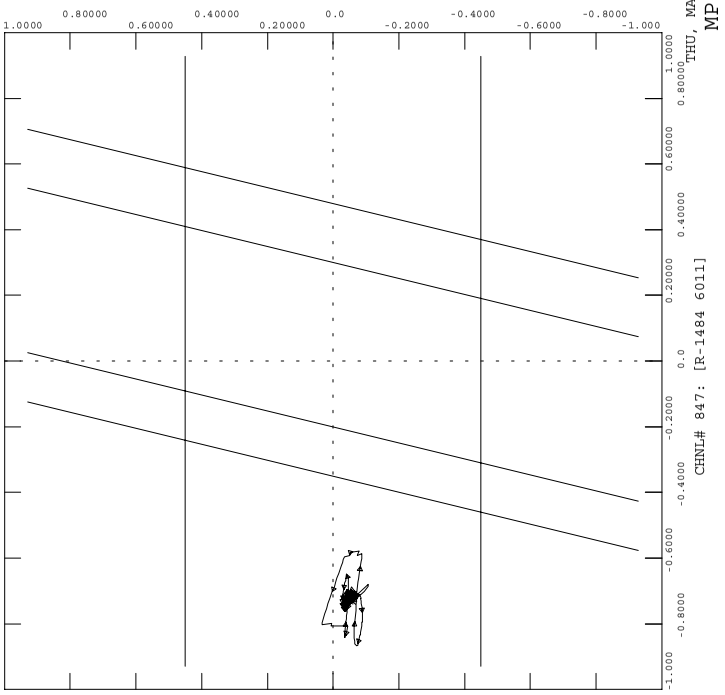


THU, MAY 16 2002 8:37
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

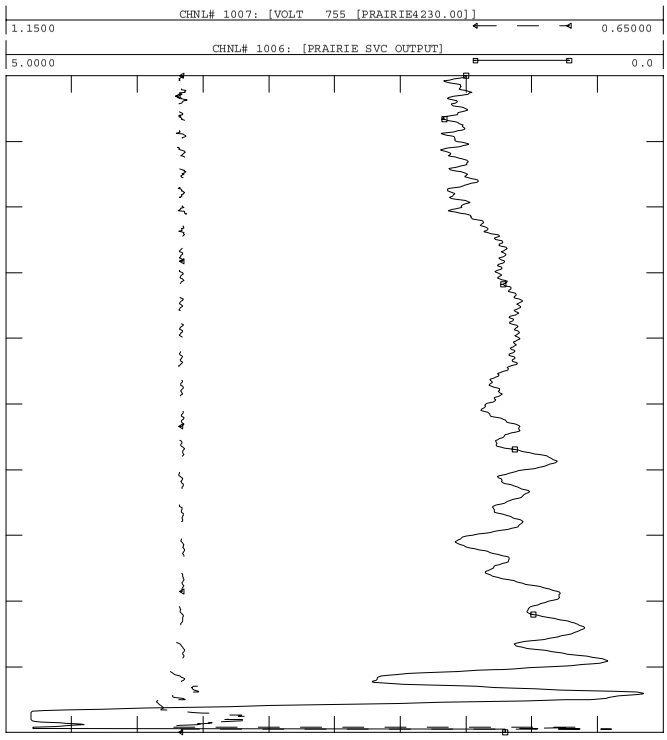
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



THU, MAY 16 2002 8:37
MP-OH I.FALLS (779)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ag3.bin



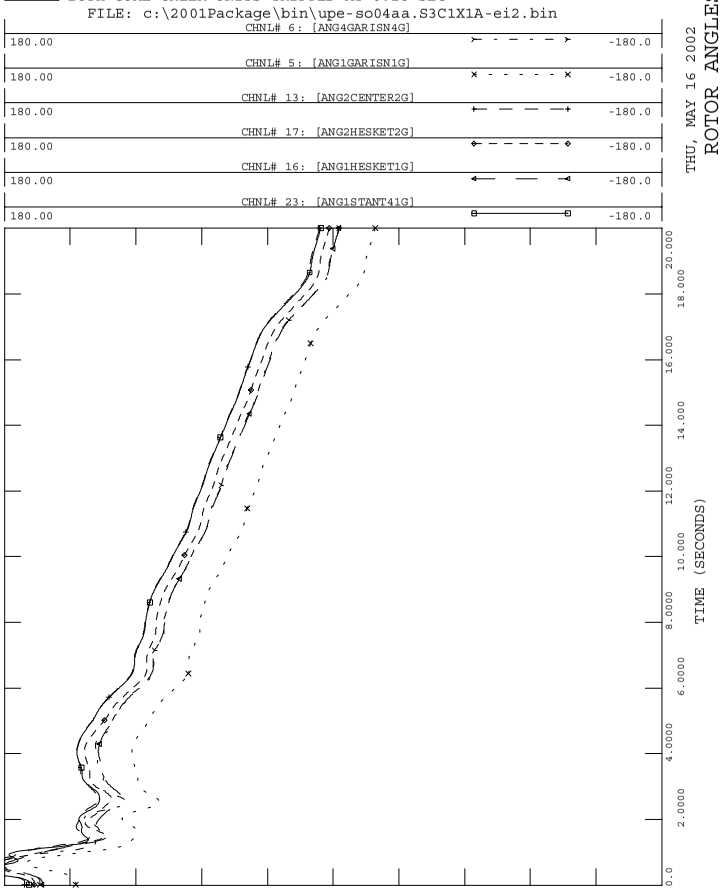
THU, MAY 16 2002 8:37
PRAIRIE SVC RESPONSE

CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

THU, MAY 16 2002 8:53
ROTOR ANGLES 2



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
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THU, MAY 16 2002 8:53
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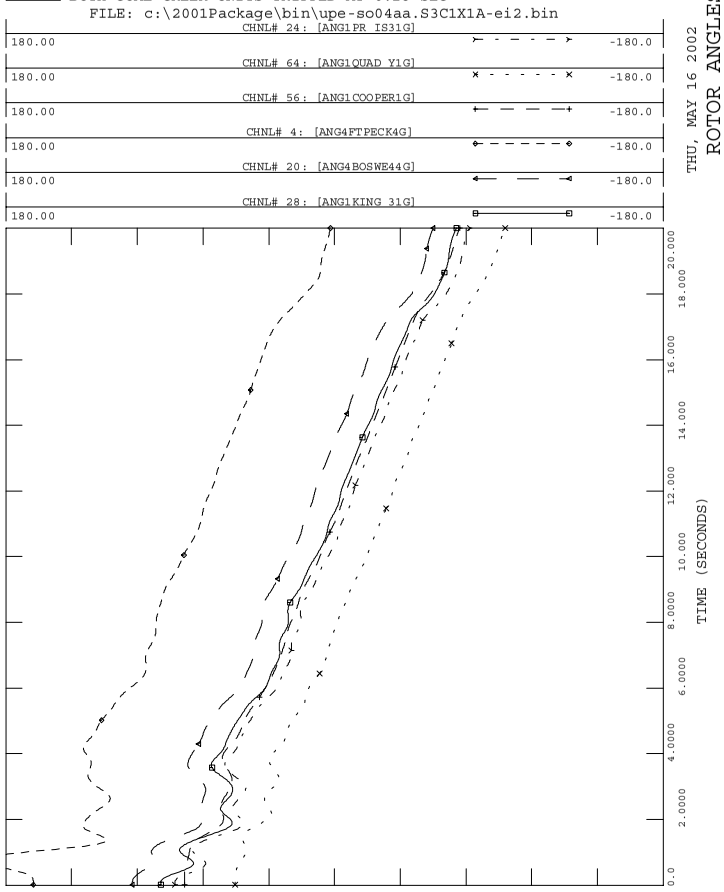

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

THU, MAY 16 2002 8:53
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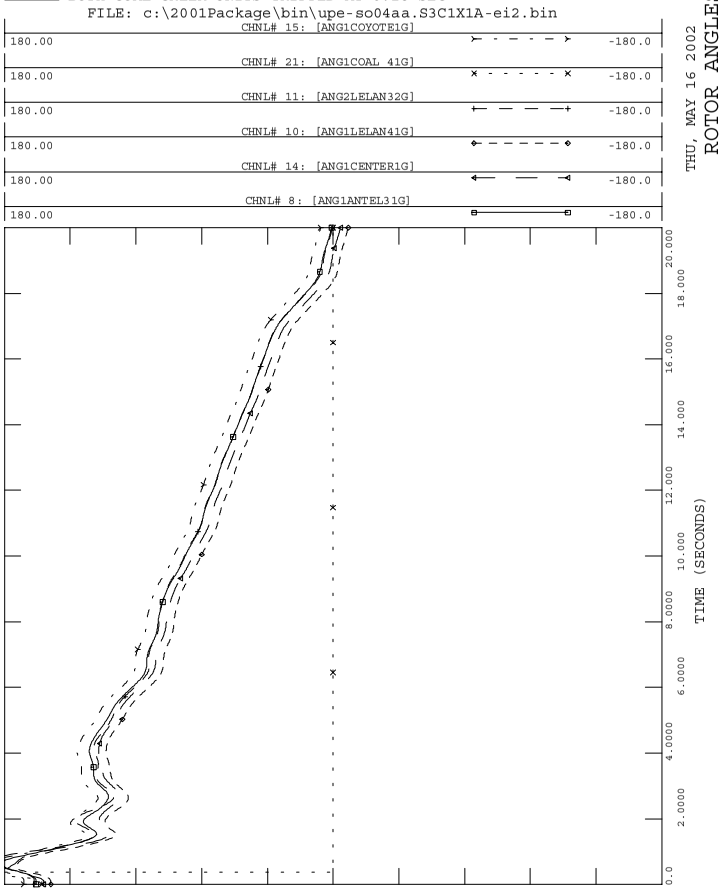

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
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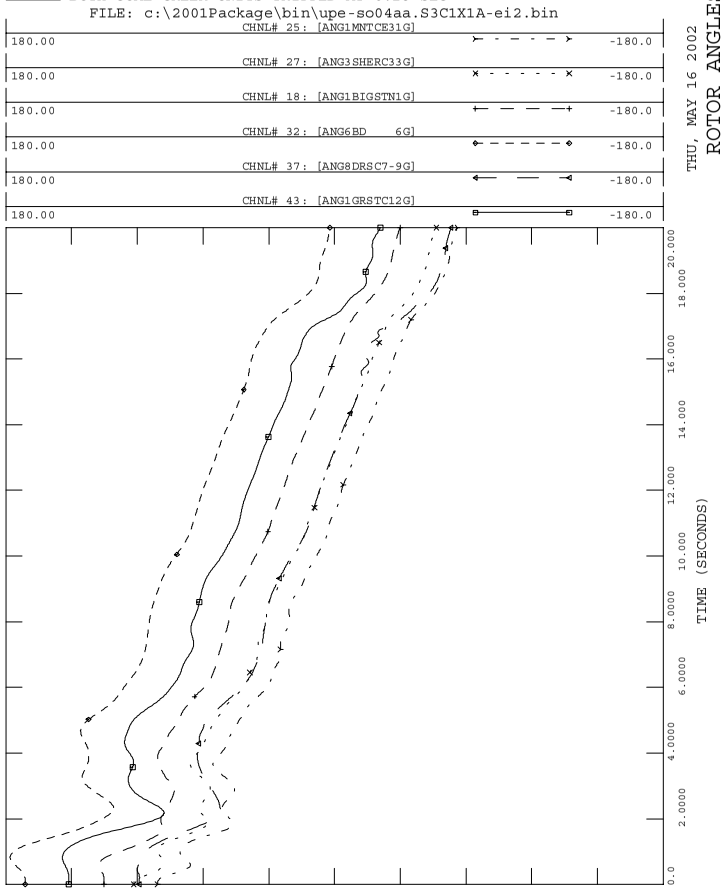
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

THU, MAY 16 2002 8:53
ROTOR ANGLES 3



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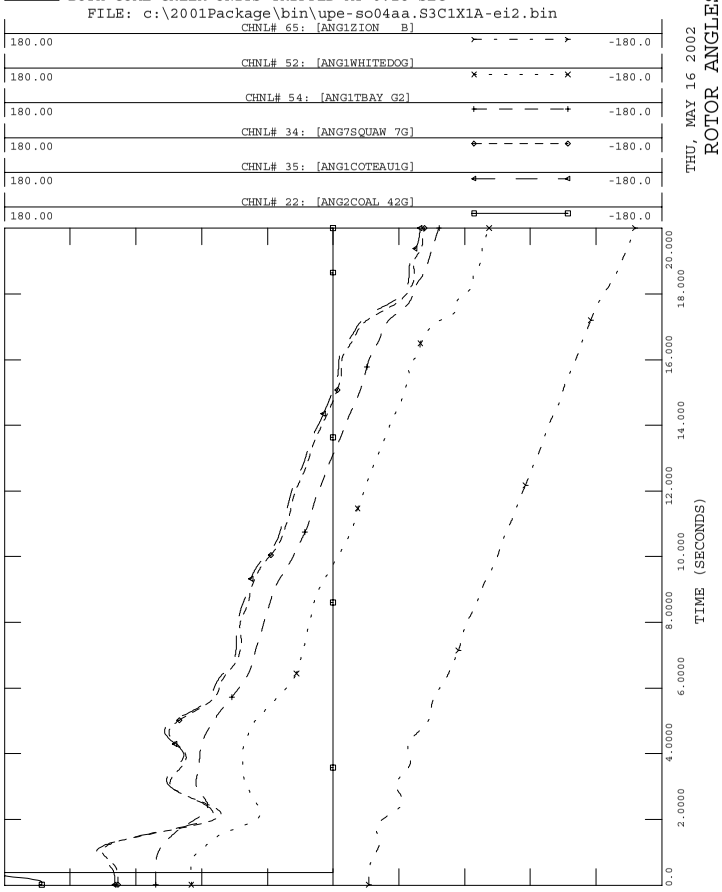
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

THU, MAY 16 2002 8:53
ROTOR ANGLES 6



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PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
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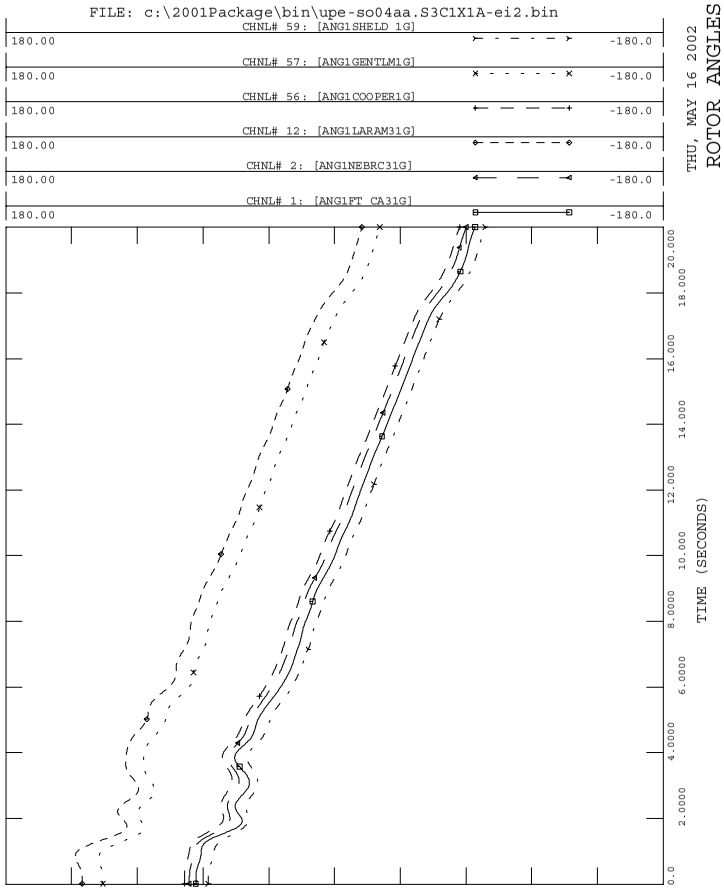
THU, MAY 16 2002 8:53
ROTOR ANGLES NB



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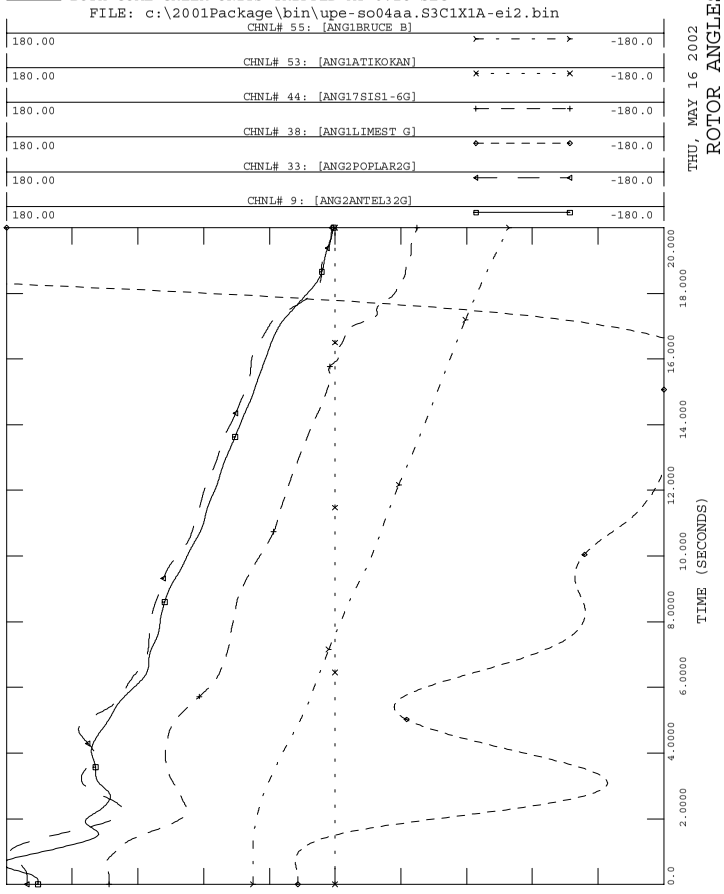
THU, MAY 16 2002 8:53
ROTOR ANGLES 5



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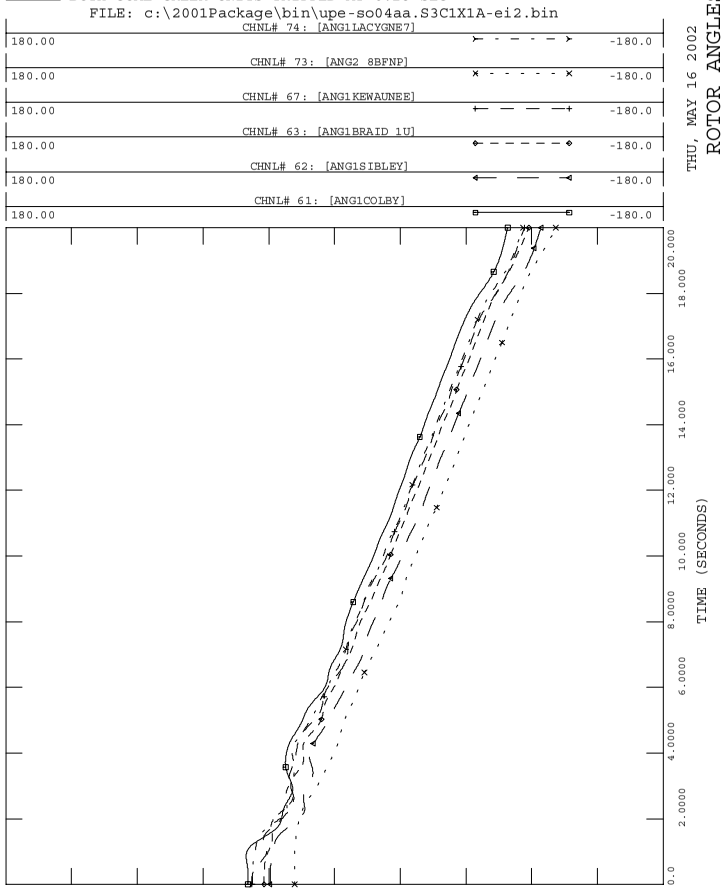
THU, MAY 16 2002 8:53
ROTOR ANGLES 7



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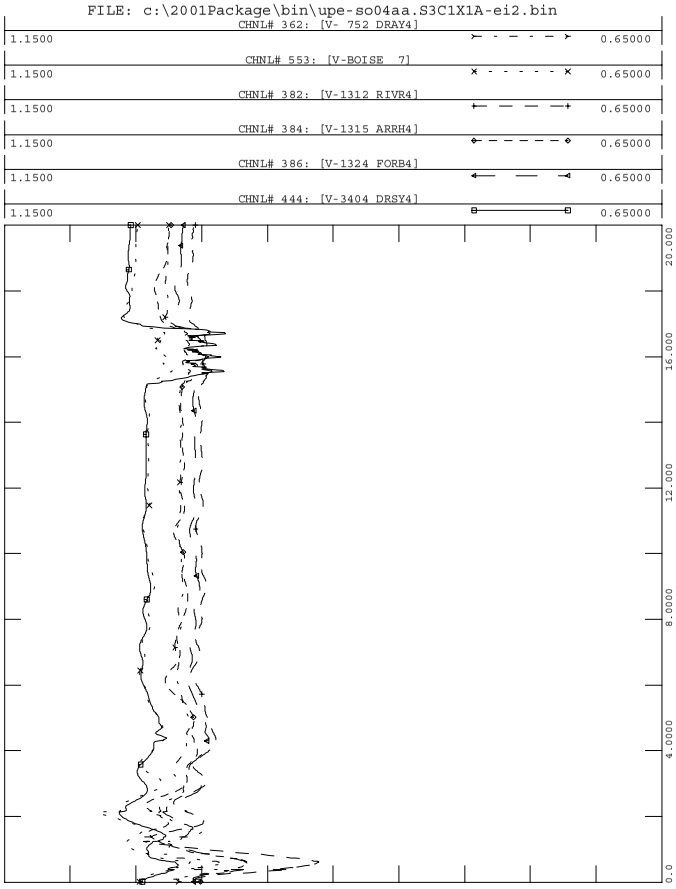
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

THU, MAY 16 2002 8:53
VOLTAGES 1



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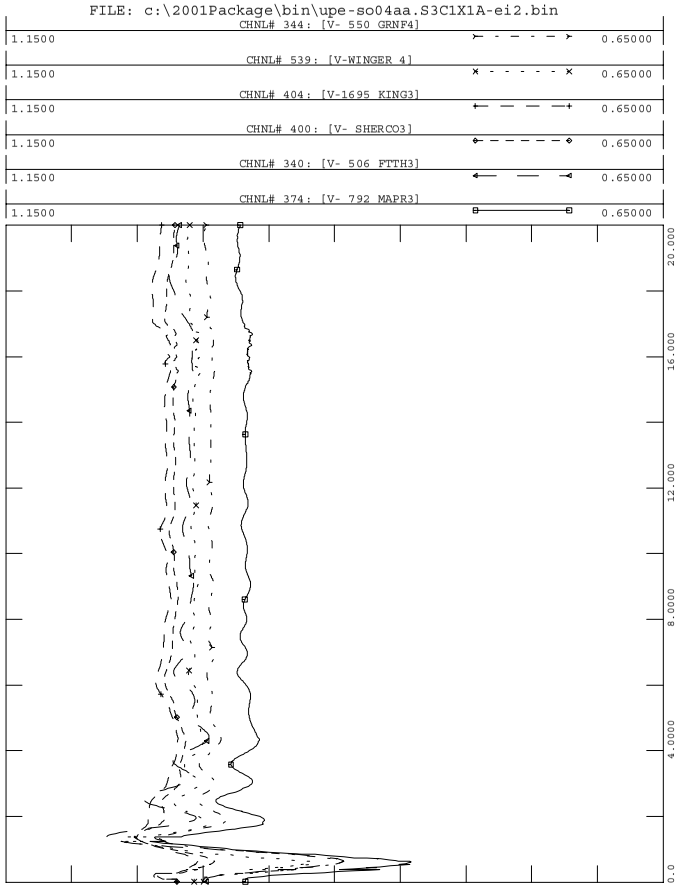
THU, MAY 16 2002 8:53
VOLTAGES 3



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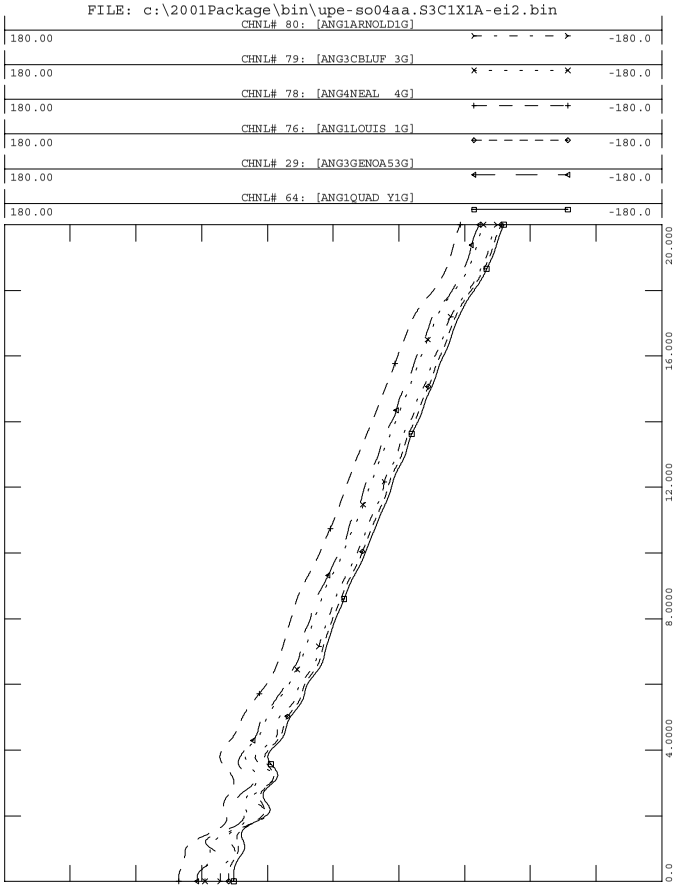
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

THU, MAY 16 2002 8:53
ROTOR ANGLES IA



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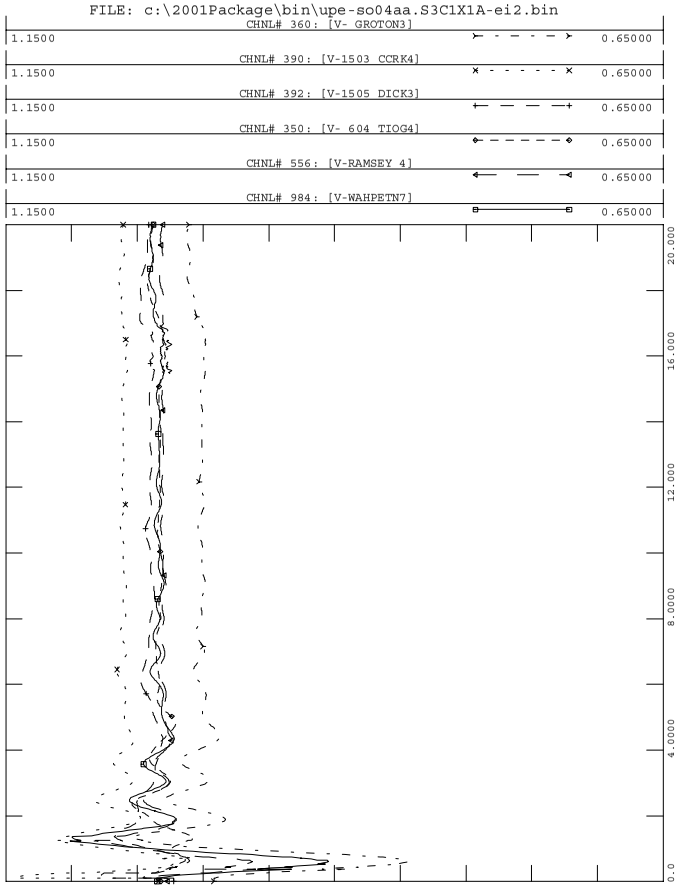
THU, MAY 16 2002 8:53
VOLTAGES 2



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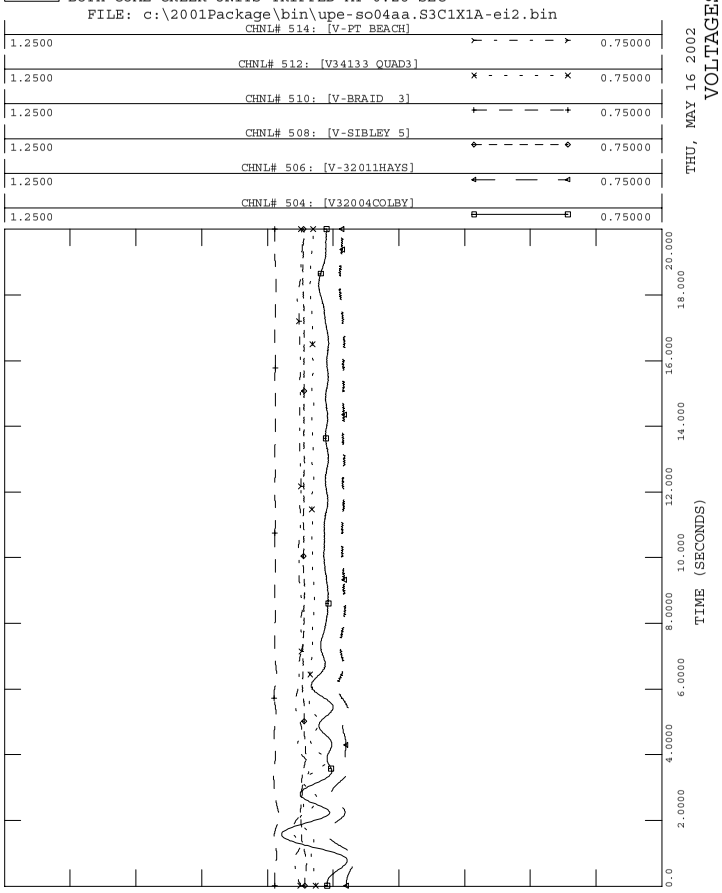
THU, MAY 16 2002 8:53
VOLTAGES 5



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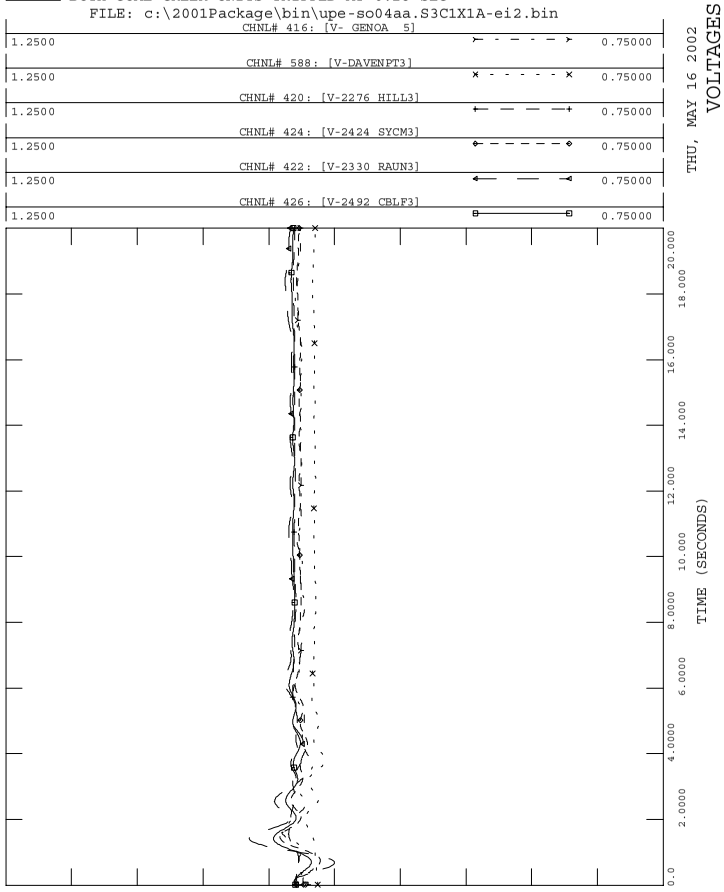
THU, MAY 16 2002 8:53
VOLTAGES IA



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BOTH COAL COREK UNITS TRIPPED AT 0.28 SEC
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THU, MAY 16 2002 8:53
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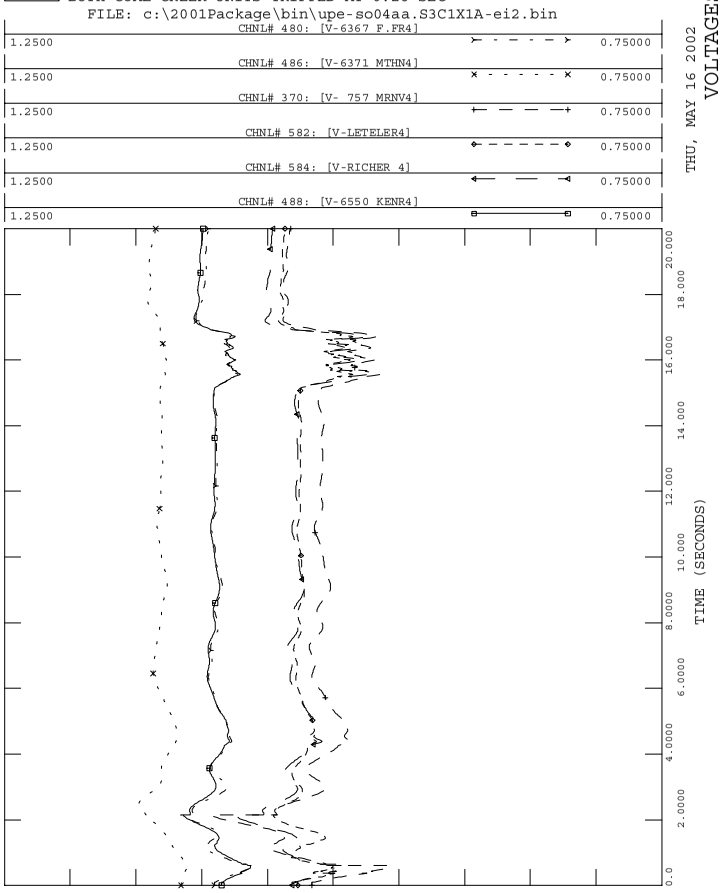

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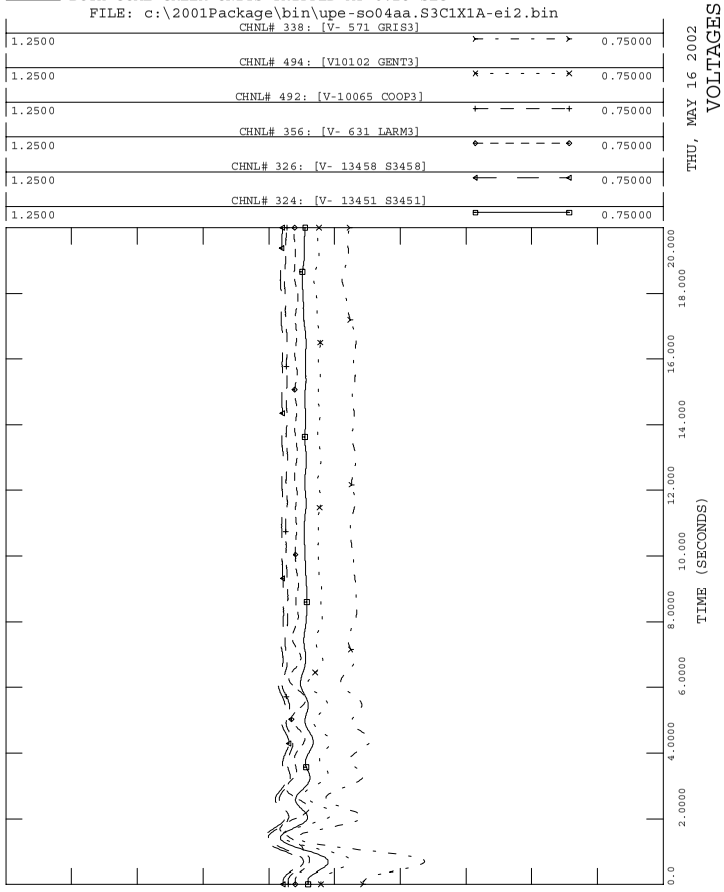
THU, MAY 16 2002 8:53
VOLTAGES NB



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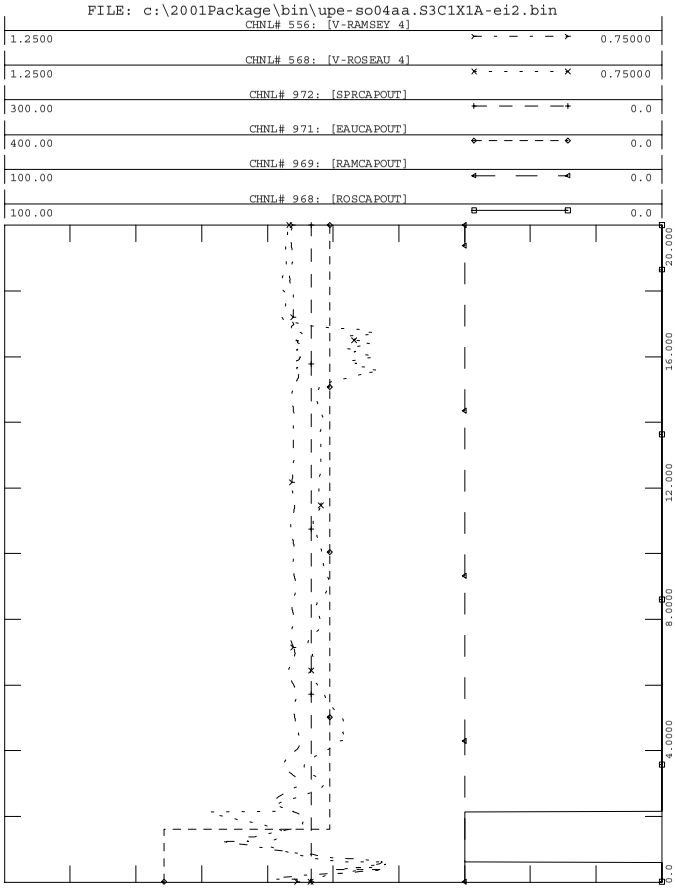

THU, MAY 16 2002 8:53
FAST SW CAP OUT 2

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
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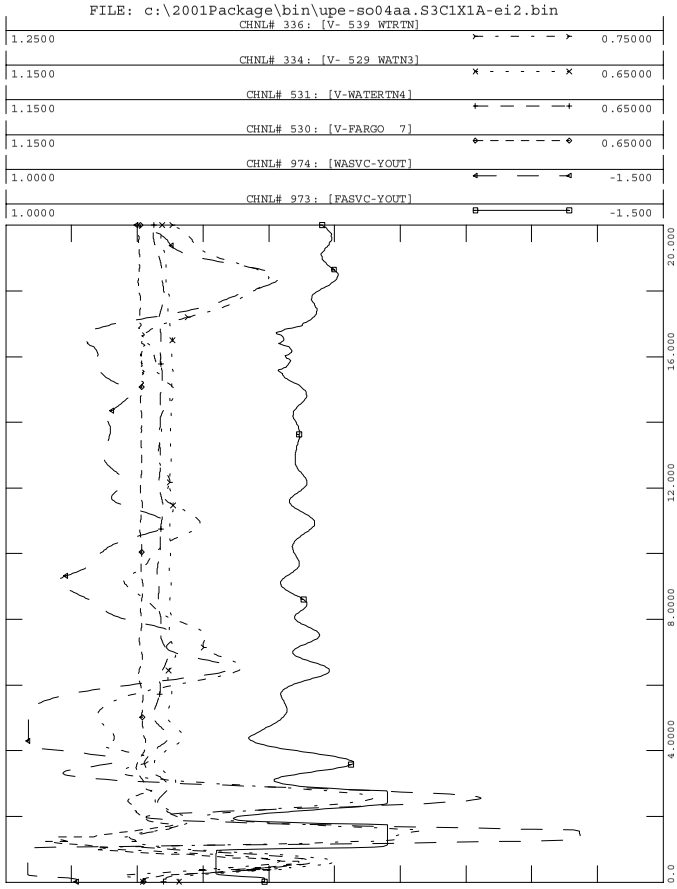

THU, MAY 16 2002 8:53
FARGO/WATERTOWN SVS

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ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
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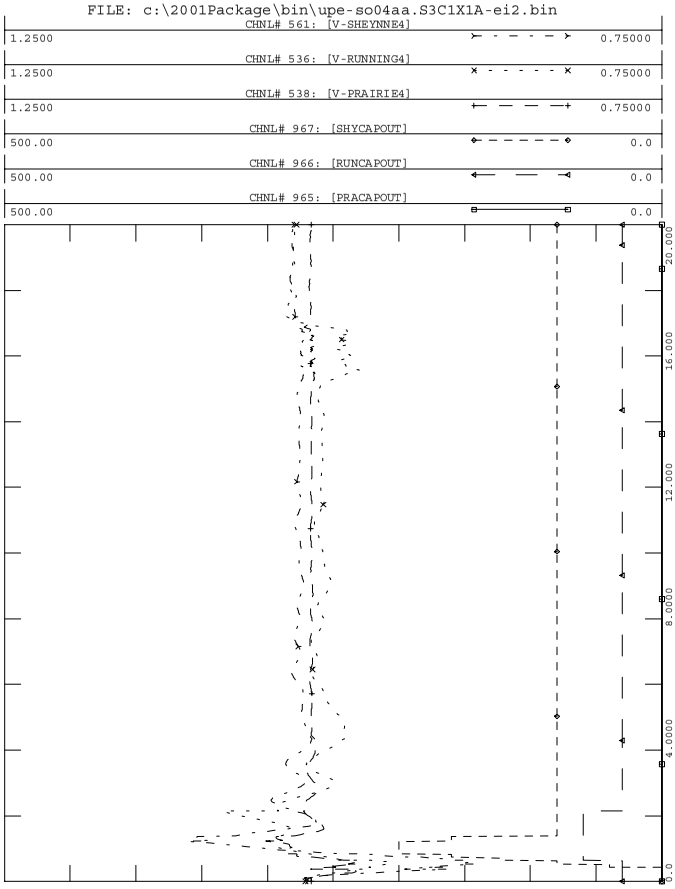

THU, MAY 16 2002 8:53
FAST SW CAP OUT 1

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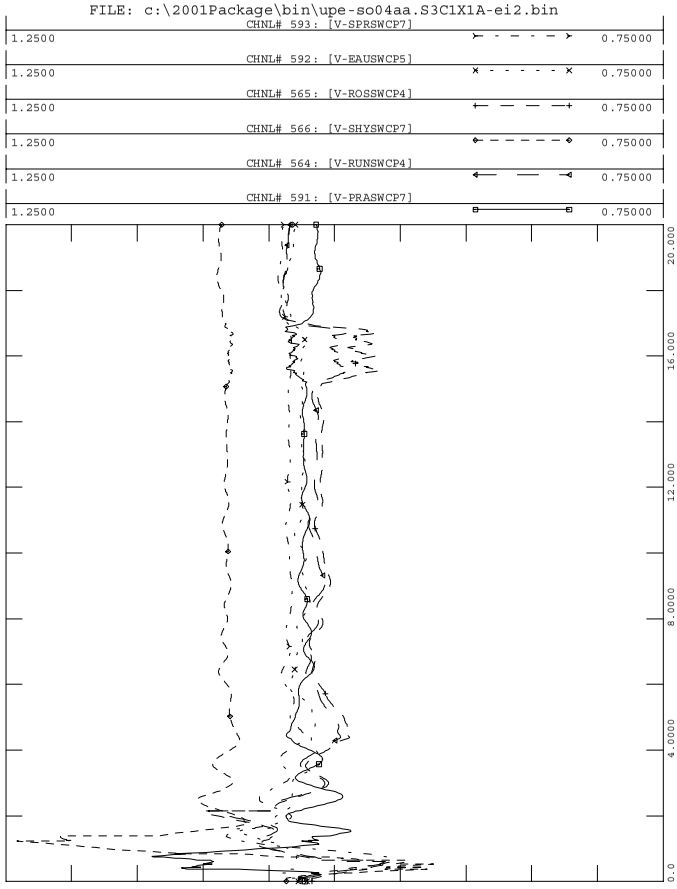

THU, MAY 16 2002 8:53
FAST SW CAP VOLTAGES

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
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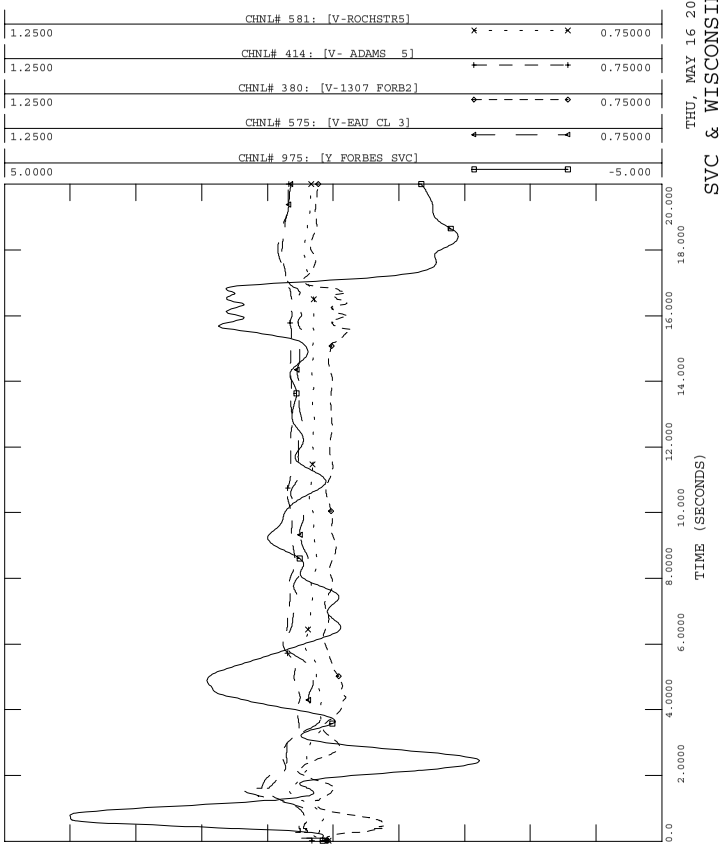
THU, MAY 16 2002 8:53

SVC & WISCONSIN VOLT



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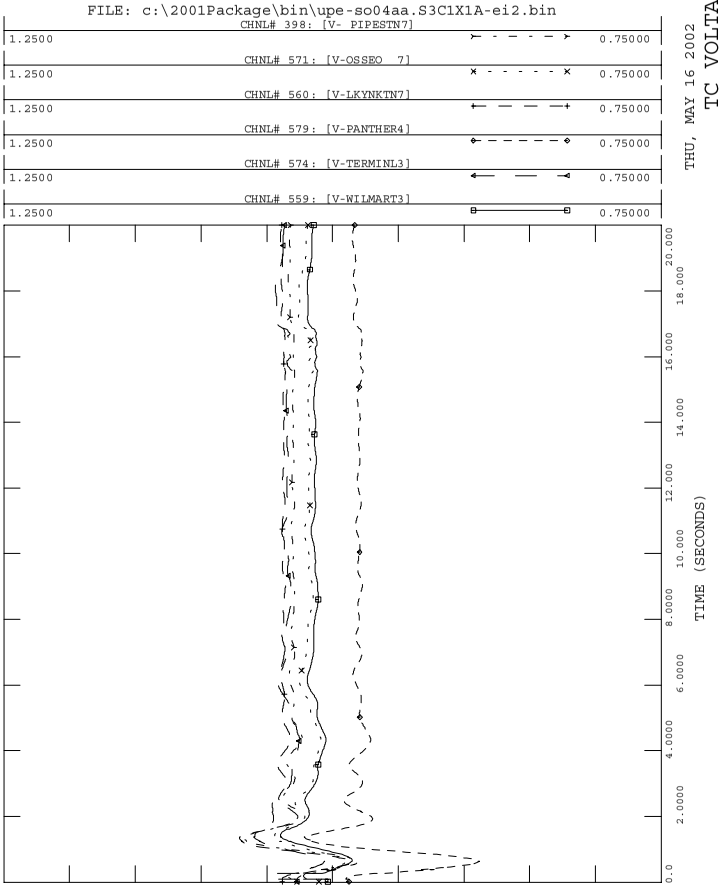
THU, MAY 16 2002 8:53

TC VOLTAGES



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PERMANENT BIPOLE FAULT ON THE CU DC LINE
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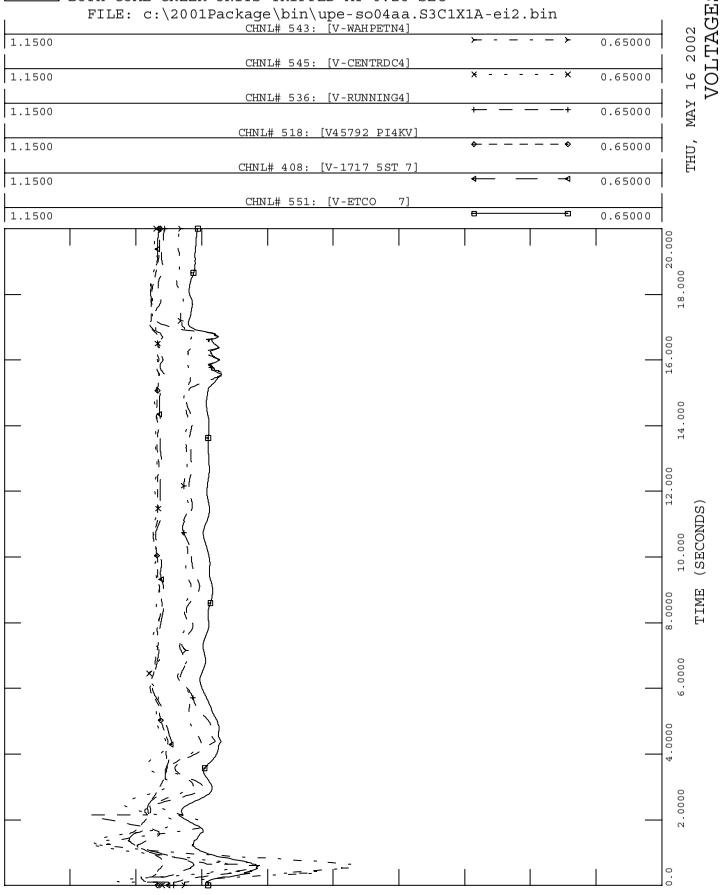
THU, MAY 16 2002 8:53

VOLTAGES 6



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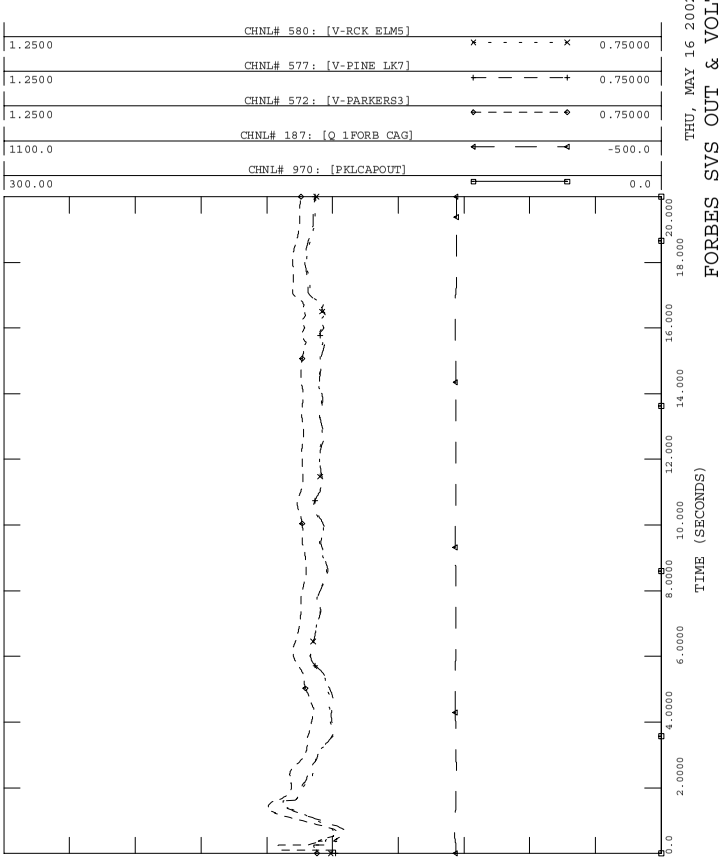
THU, MAY 16 2002 8:53

FORBES SVS OUT & VOLTAGES



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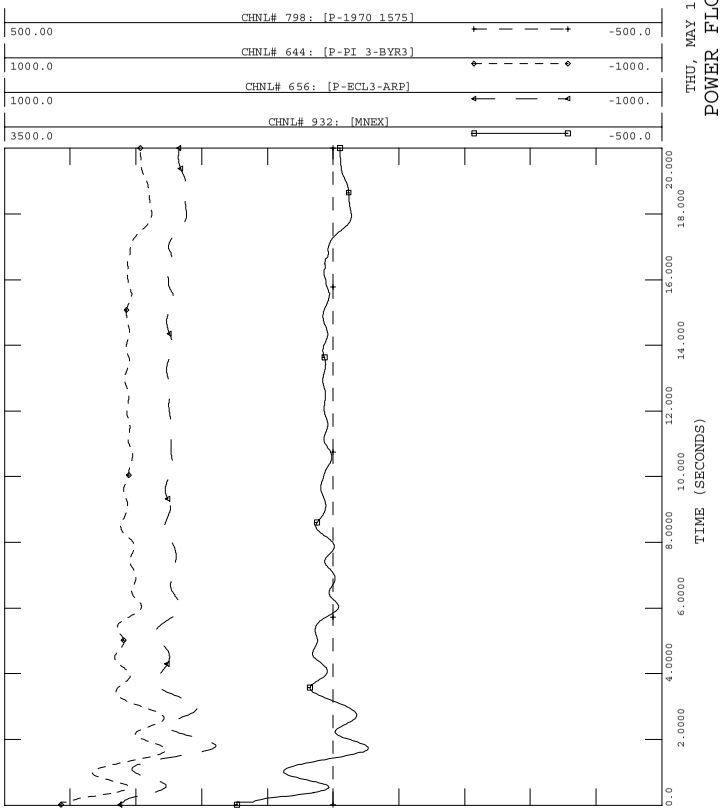
THU, MAY 16 2002 8:53
POWER FLOW SUMS 2



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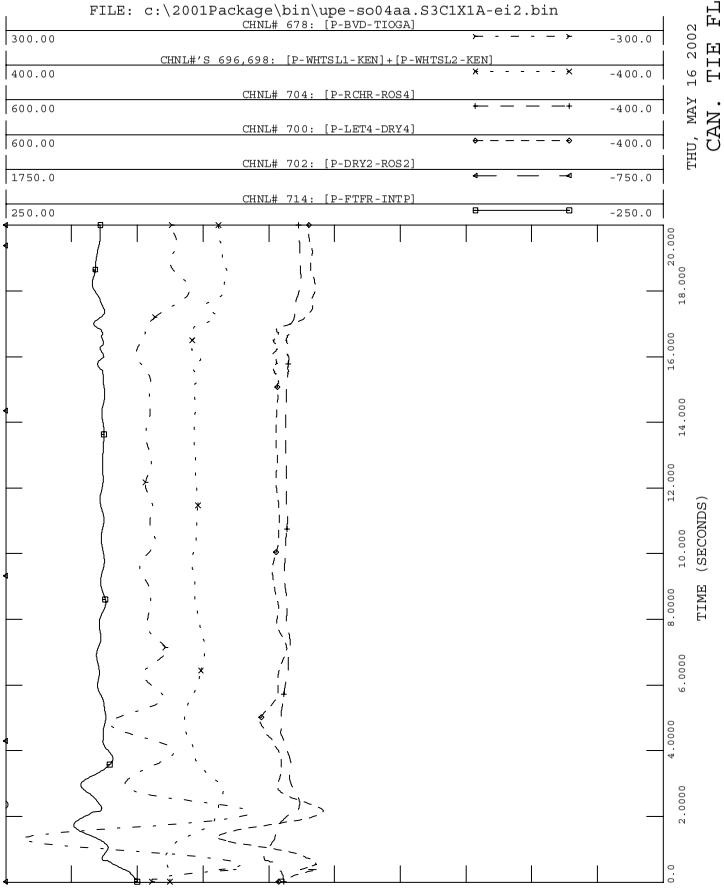
THU, MAY 16 2002 8:53
CAN. TIE FLOWS



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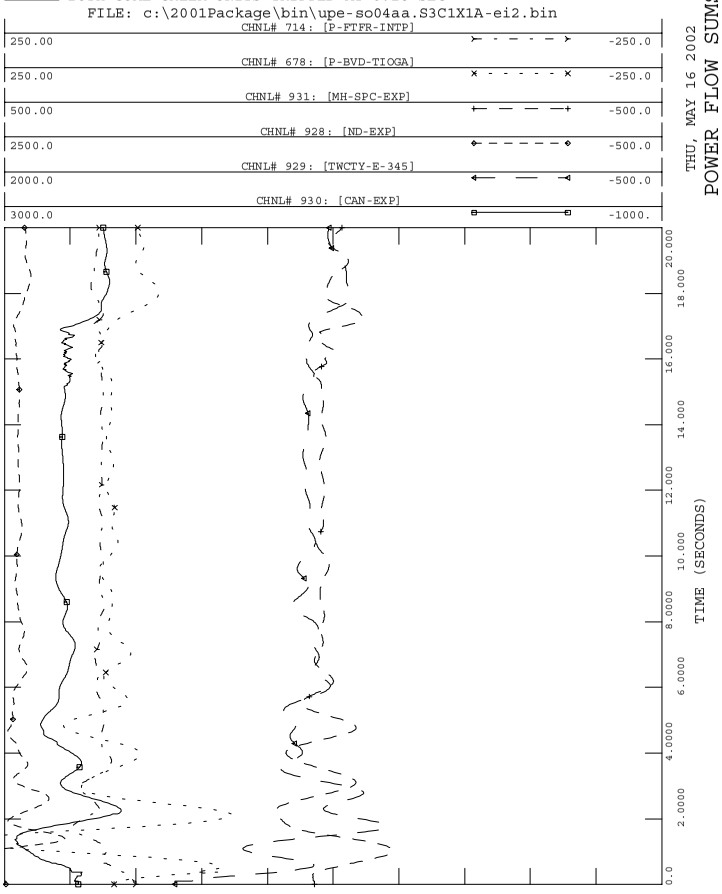
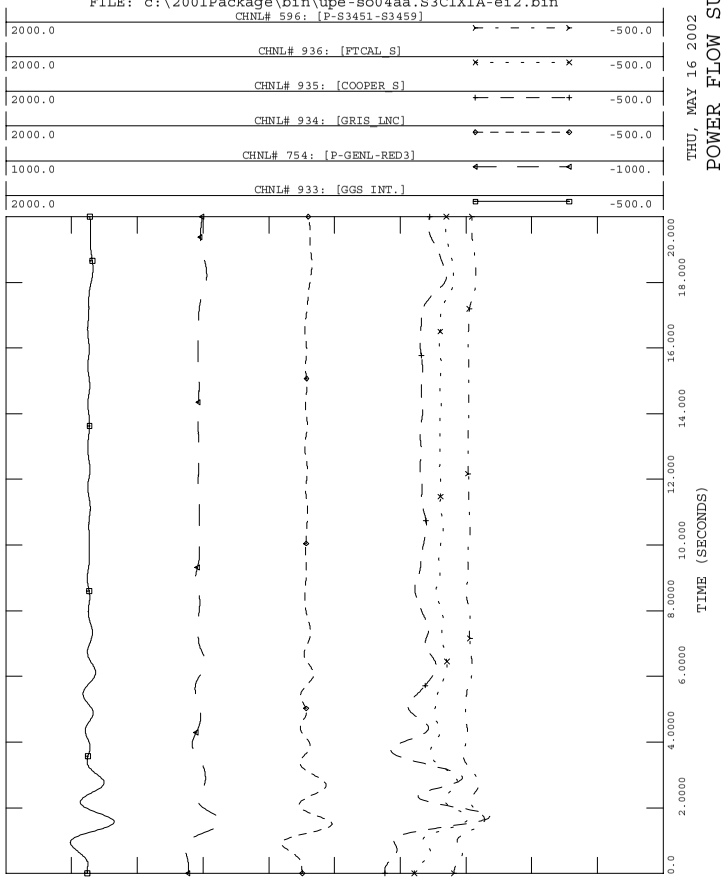
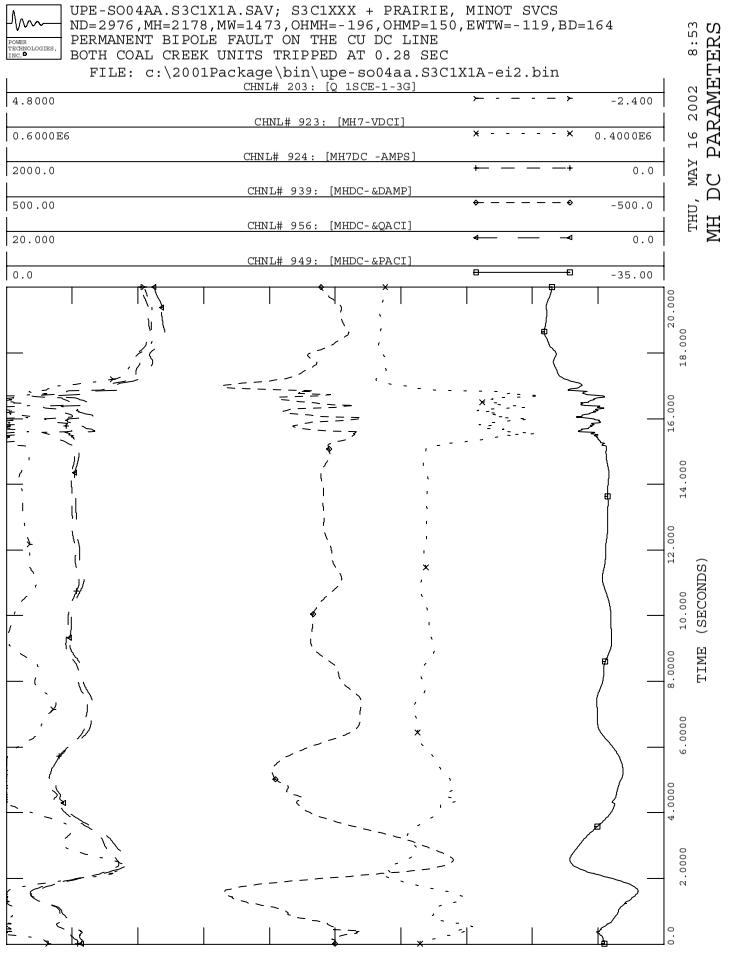
THU, MAY 16 2002 8:53
POWER FLOW SUMS 1

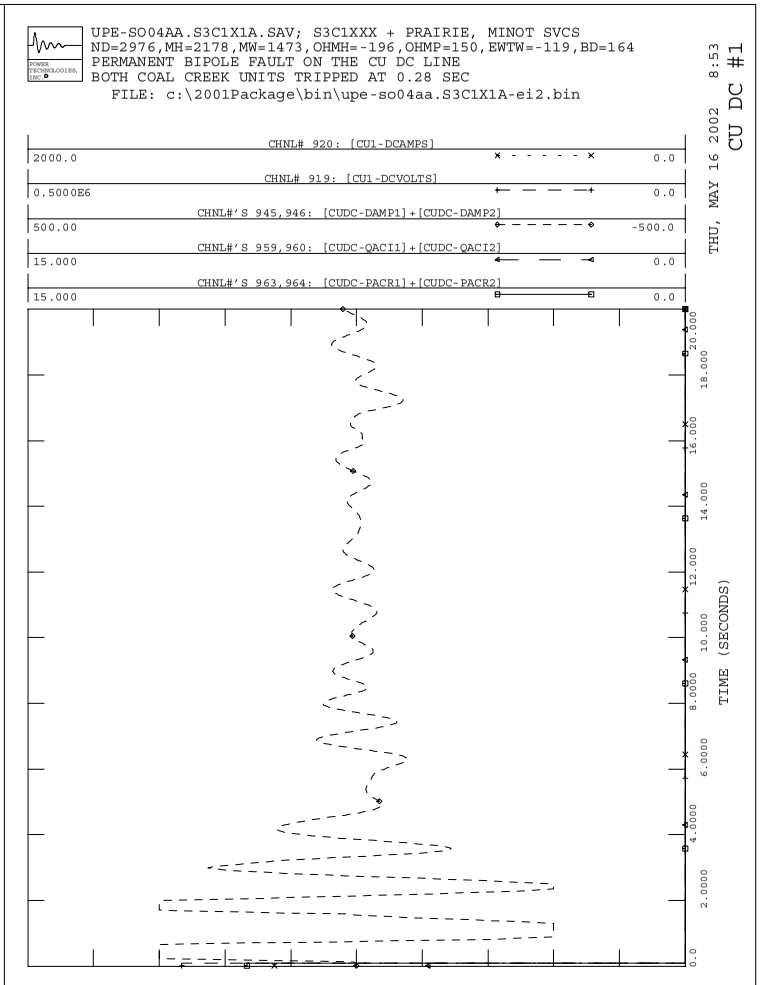


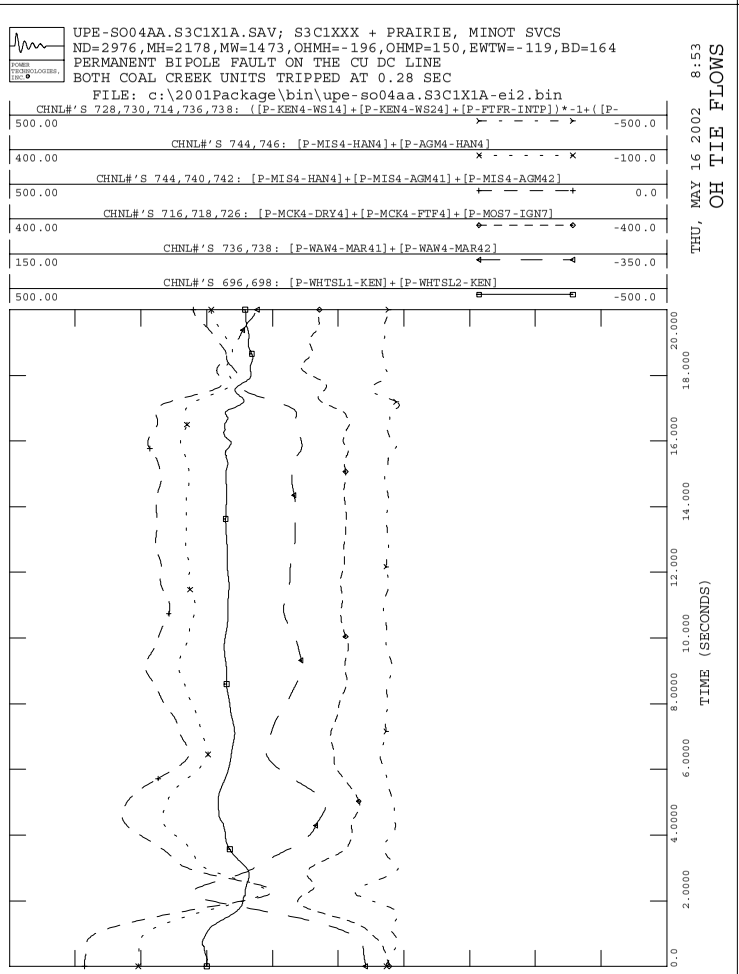
UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

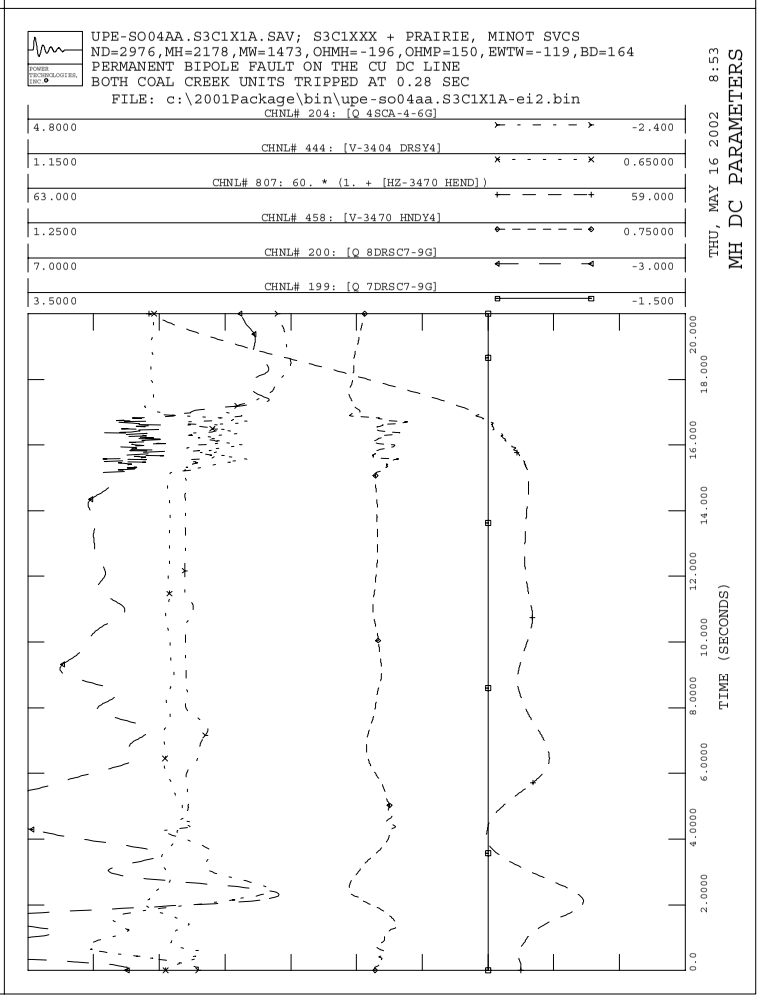
THU, MAY 16 2002 8:53
POWER FLOW SUM 3

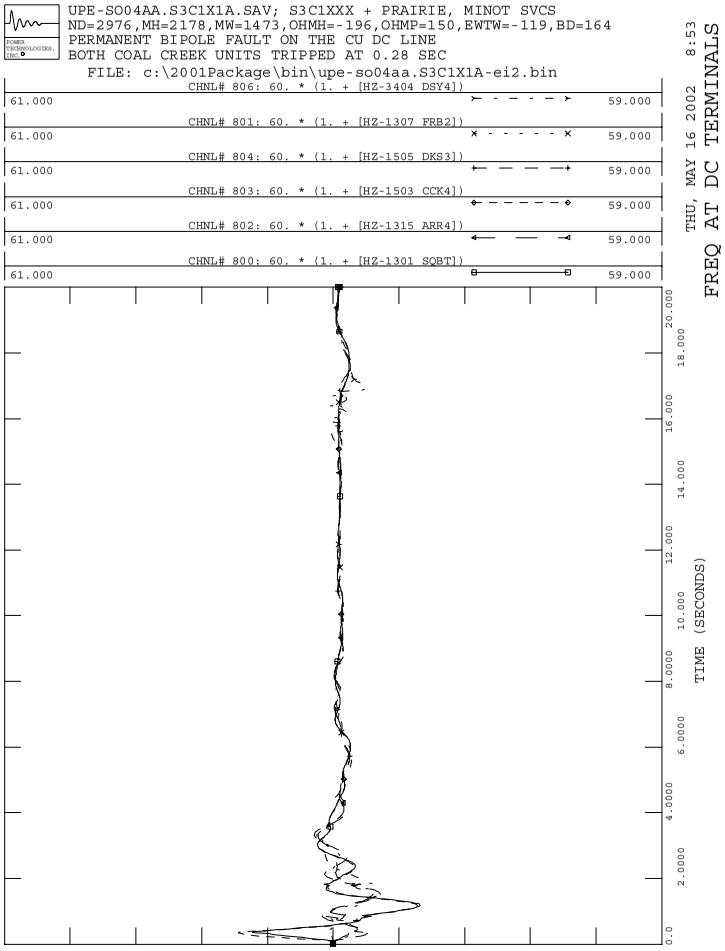


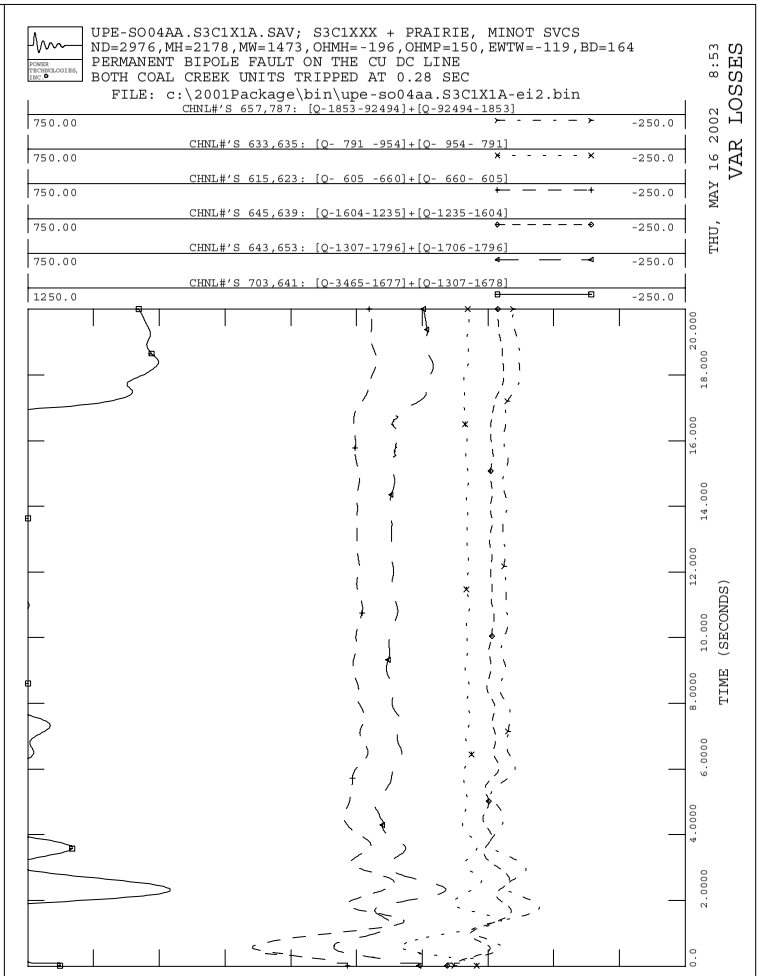

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TIME (SECONDS)
THU, MAY 16 2002 8:53
MH DC PARAMETERS

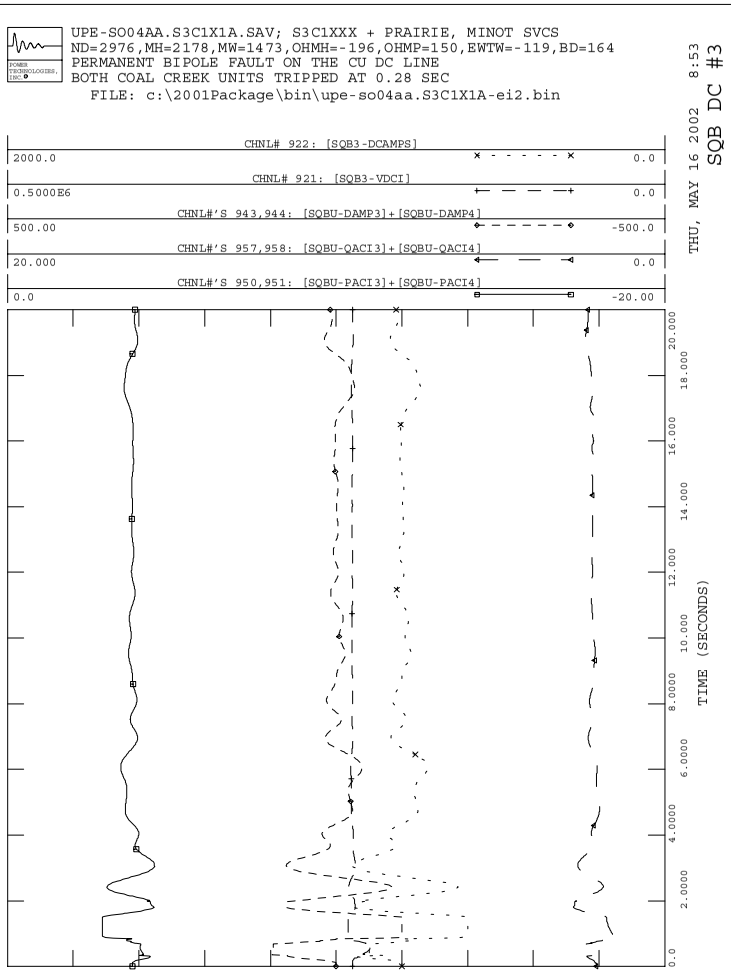

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TIME (SECONDS)
THU, MAY 16 2002 8:53
CU DC #1

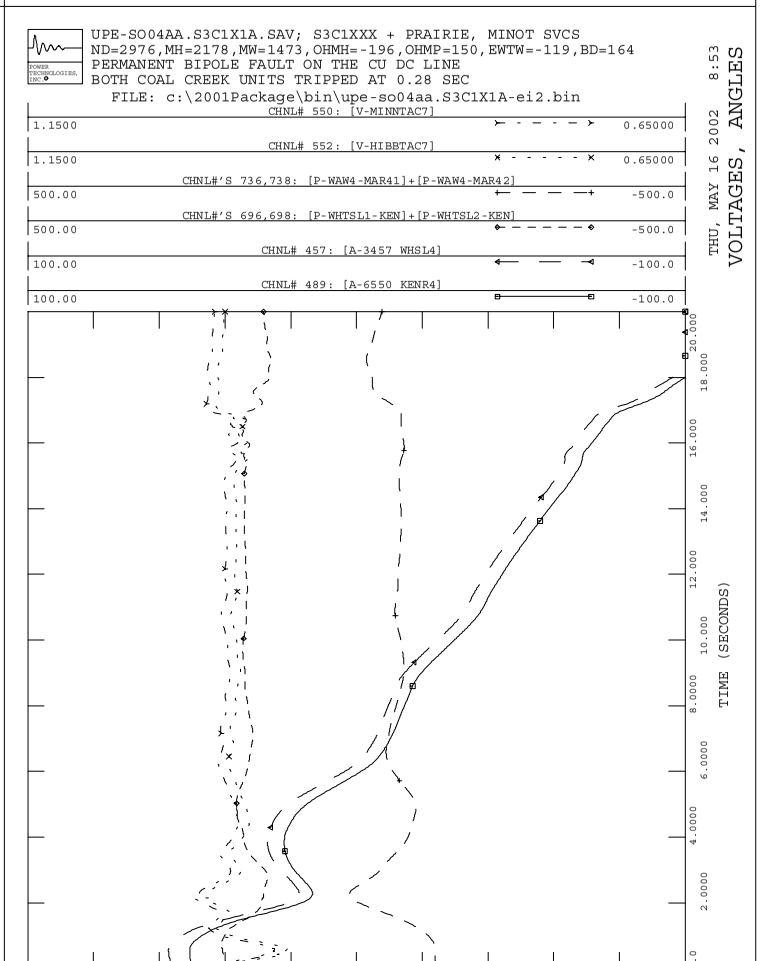

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TIME (SECONDS)
THU, MAY 16 2002 8:53
OH TIE FLOWS


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TIME (SECONDS)
THU, MAY 16 2002 8:53
MH DC PARAMETERS


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
THU, MAY 16 2002 8:53
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
THU, MAY 16 2002 8:53
VAR LOSSES
TIME (SECONDS)

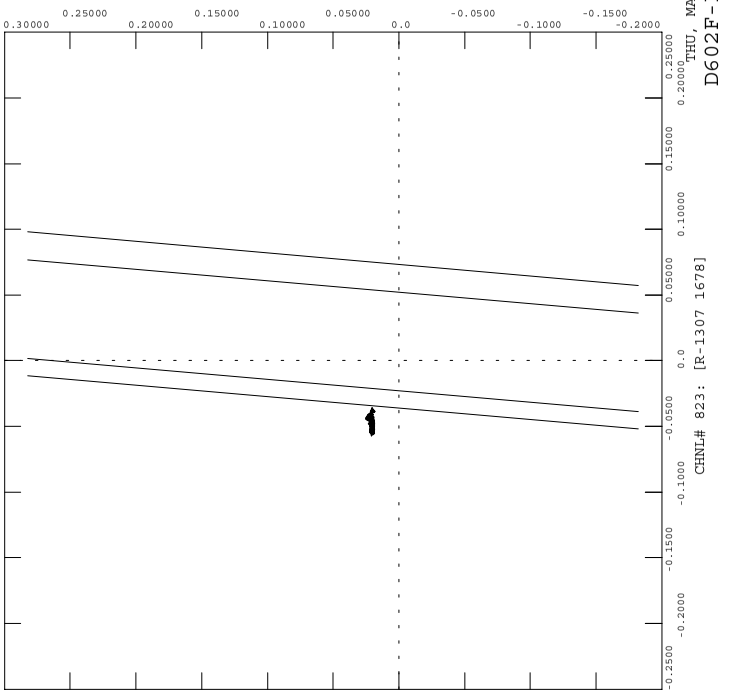

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
THU, MAY 16 2002 8:53
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
THU, MAY 16 2002 8:53
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

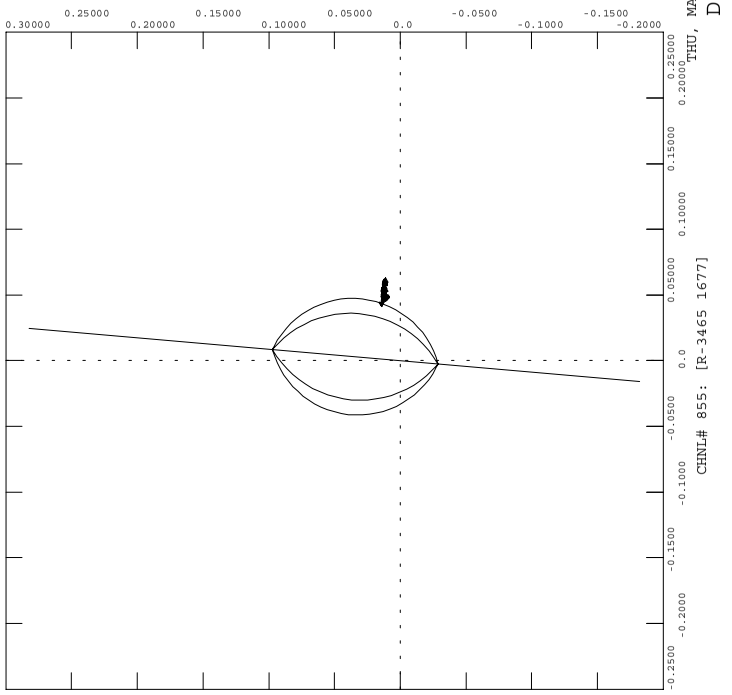


THU, MAY 16 2002 8:53
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

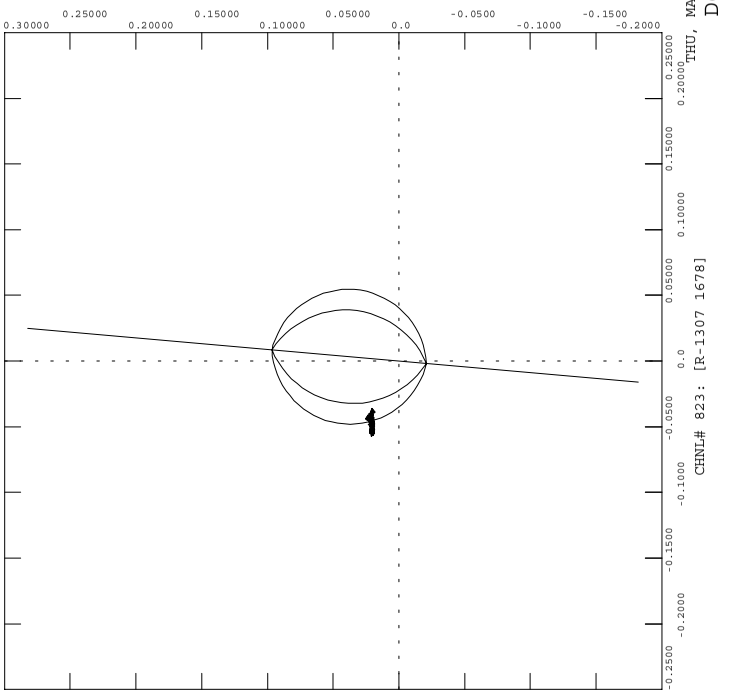


THU, MAY 16 2002 8:53
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

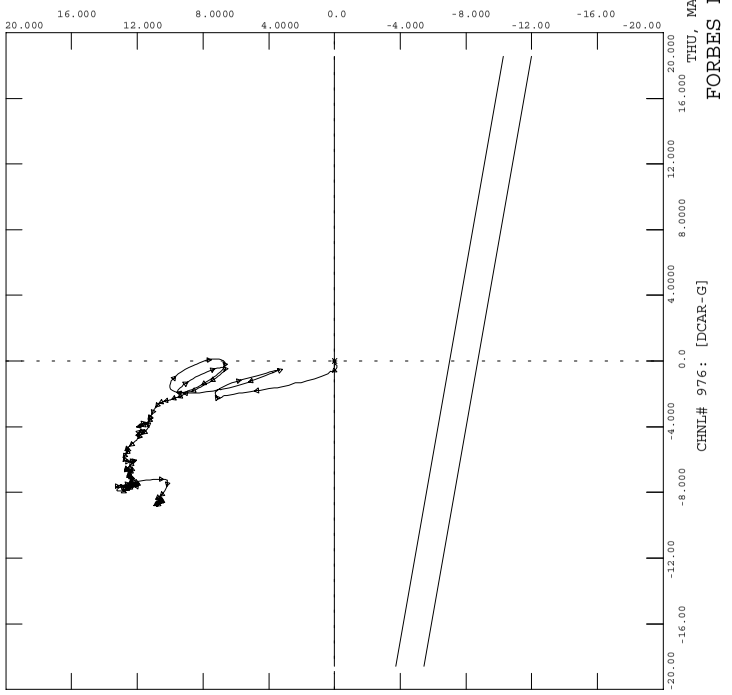


THU, MAY 16 2002 8:53
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

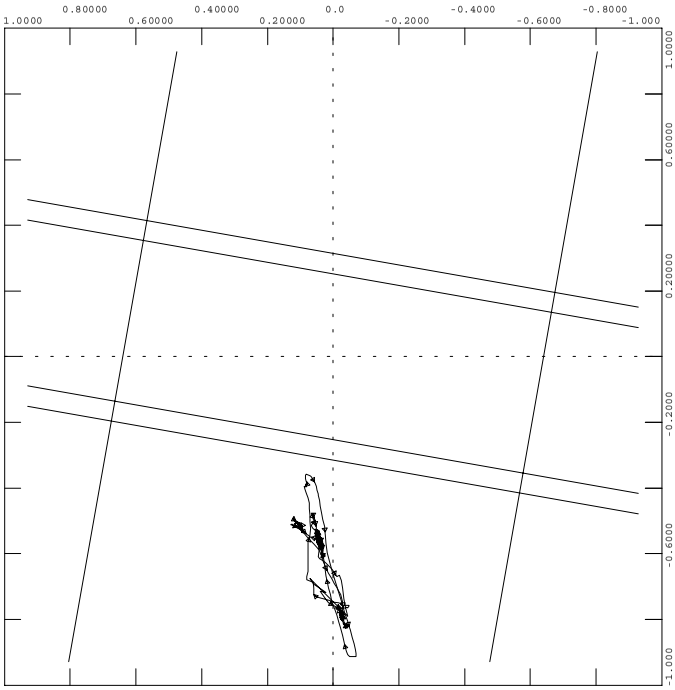


THU, MAY 16 2002 8:53
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

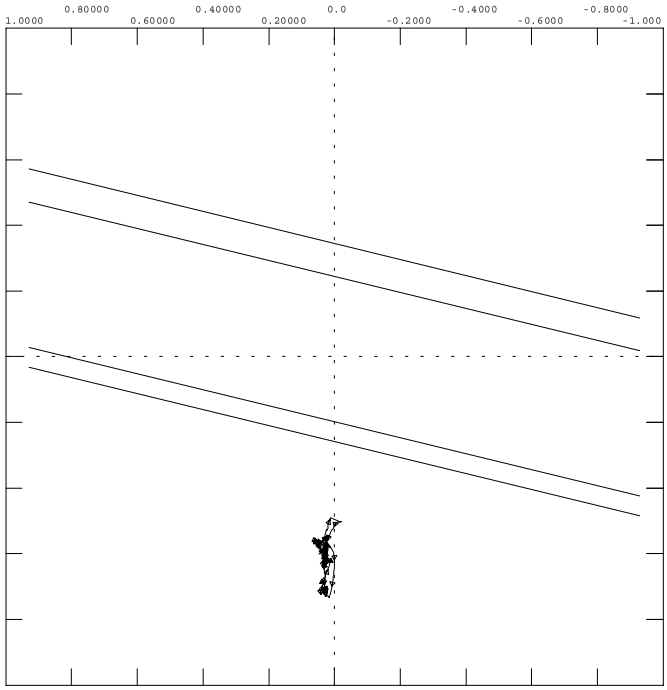


THU, MAY 16 2002 8:53
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

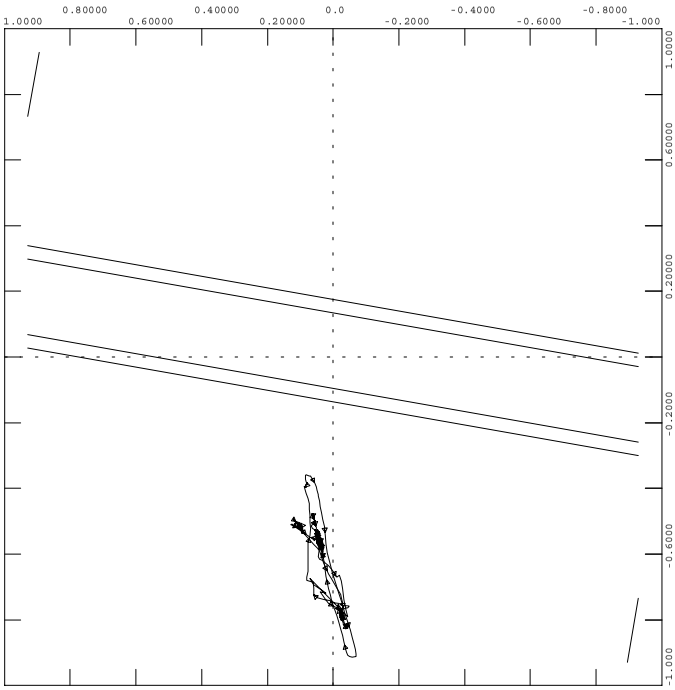


THU, MAY 16 2002 8:53
R50M AT MORANVILLE (520)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

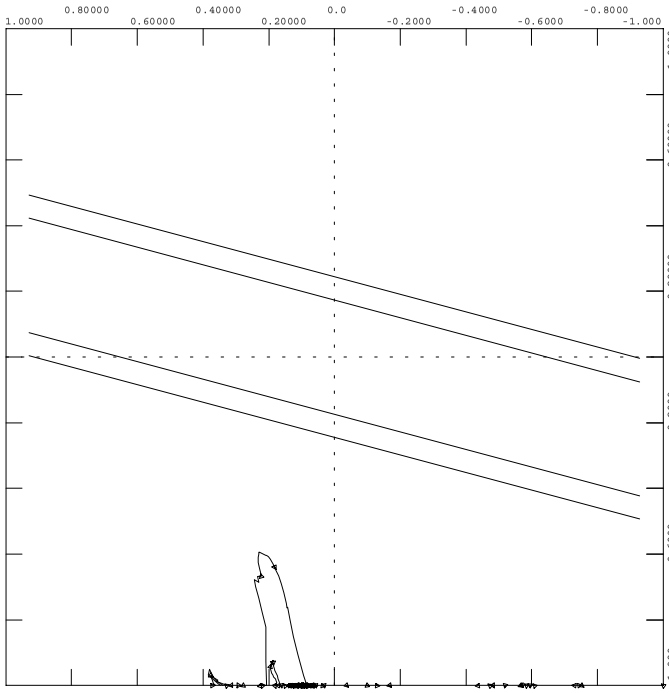


THU, MAY 16 2002 8:53
L20D AT DRAYTON (506)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

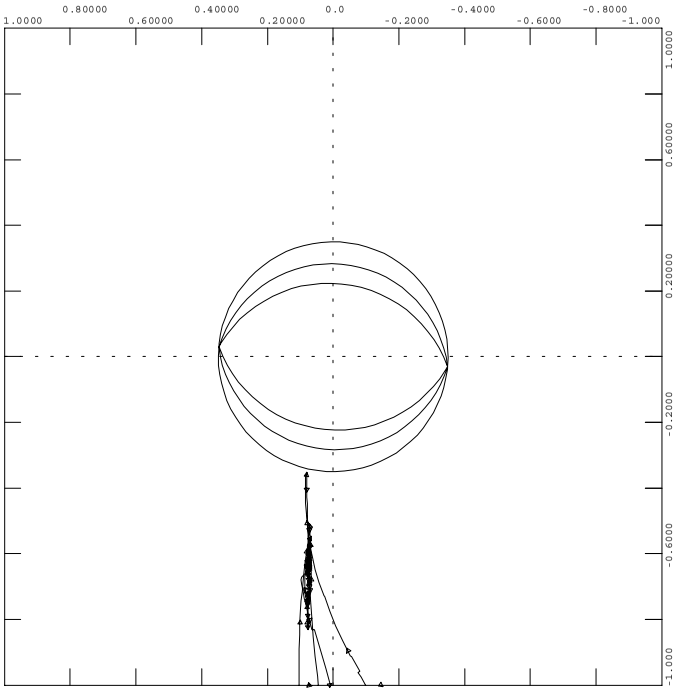


THU, MAY 16 2002 8:53
L20D-PRAIRIE (510)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

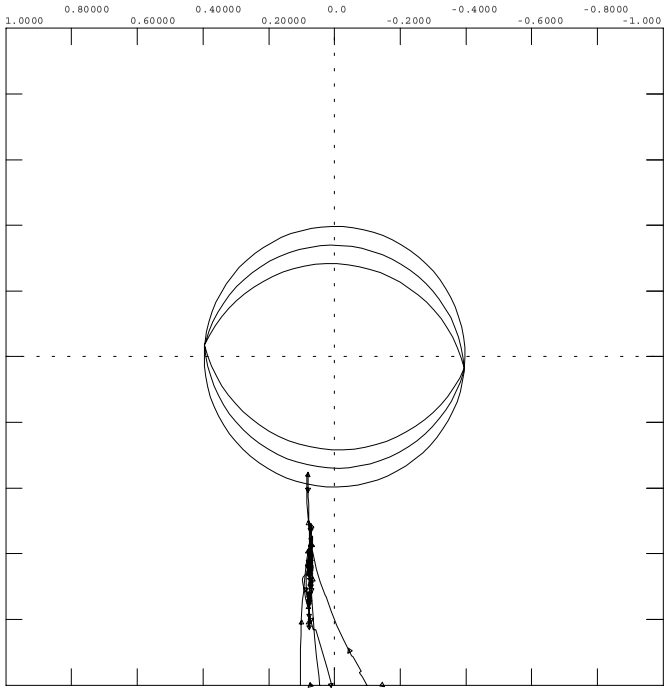
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

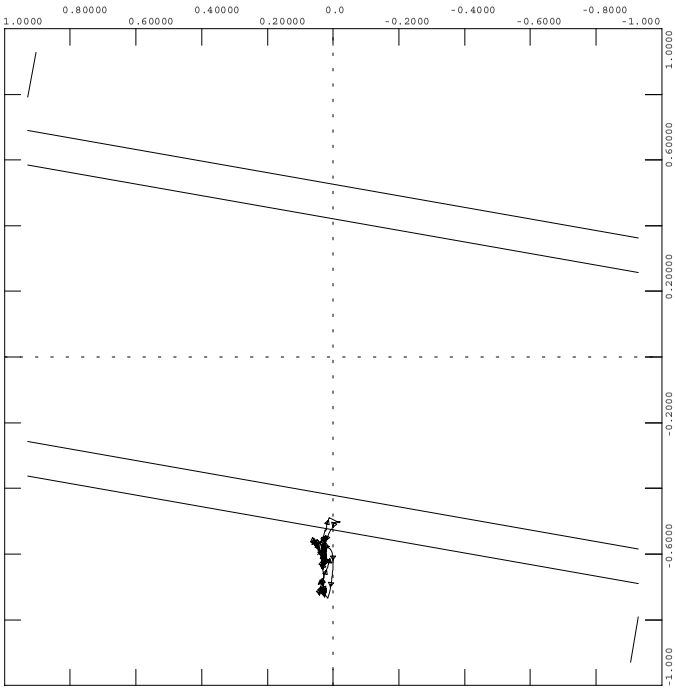
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

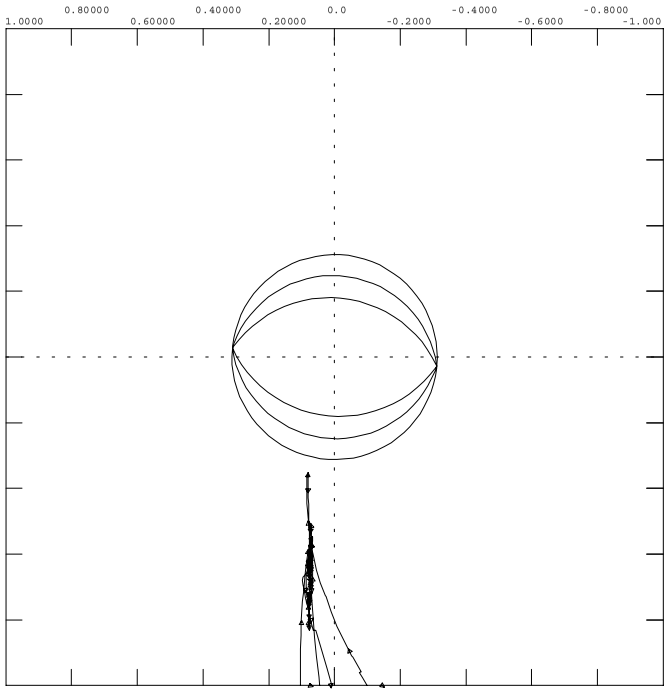
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



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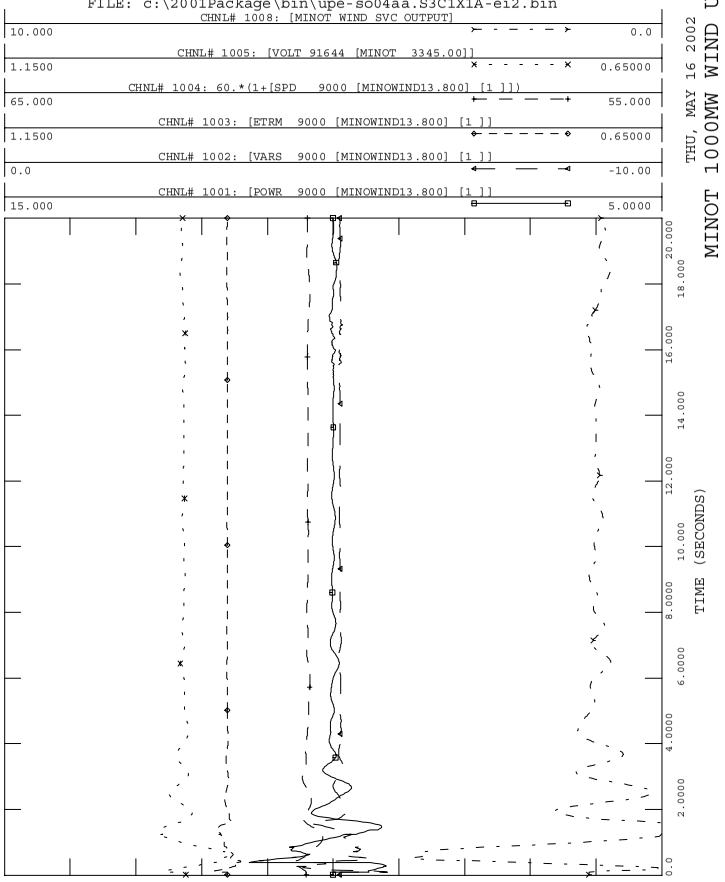
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

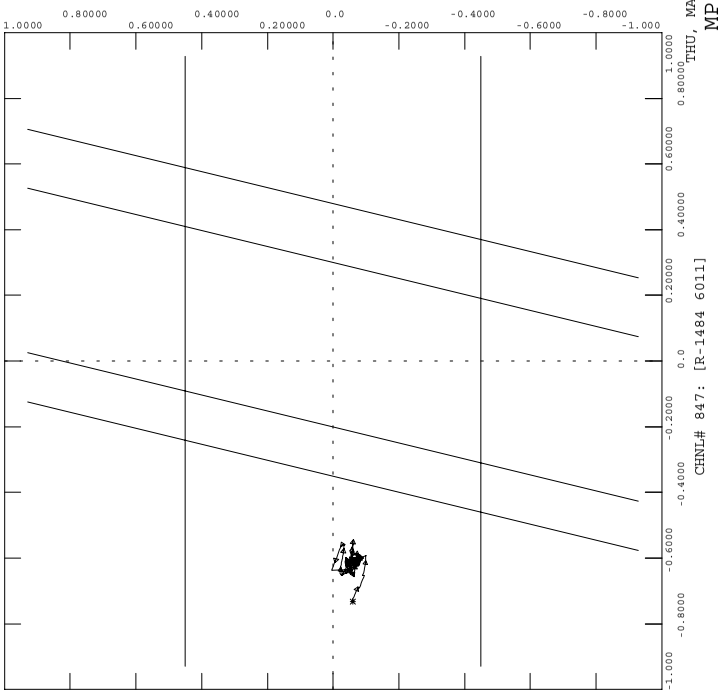


THU, MAY 16 2002 8:53
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

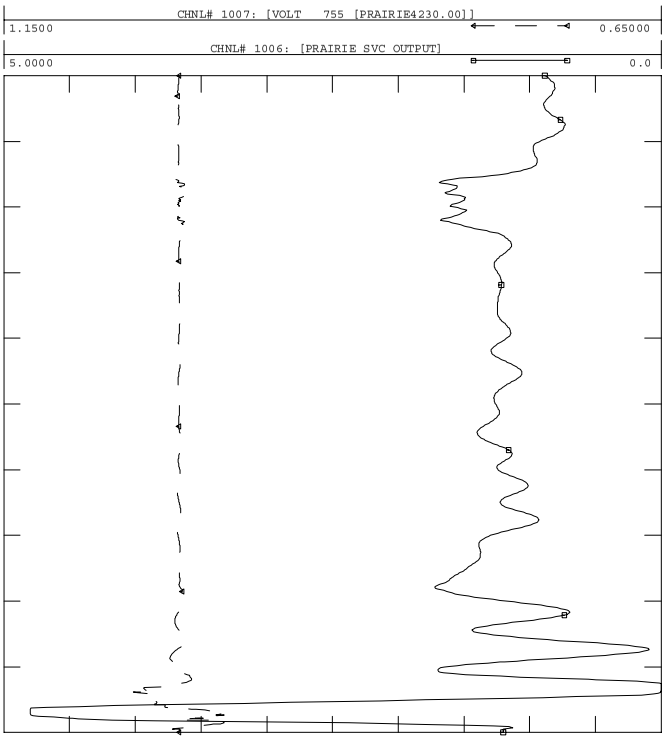
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



THU, MAY 16 2002 8:53
MP-OH I.FALLS (779)

UPE-SO04AA.S3C1X1A.SAV; S3C1XXX + PRAIRIE, MINOT SVCS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C1X1A-ei2.bin



THU, MAY 16 2002 8:53
PRAIRIE SVC RESPONSE

APPENDIX 21

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 3 (MINOT)

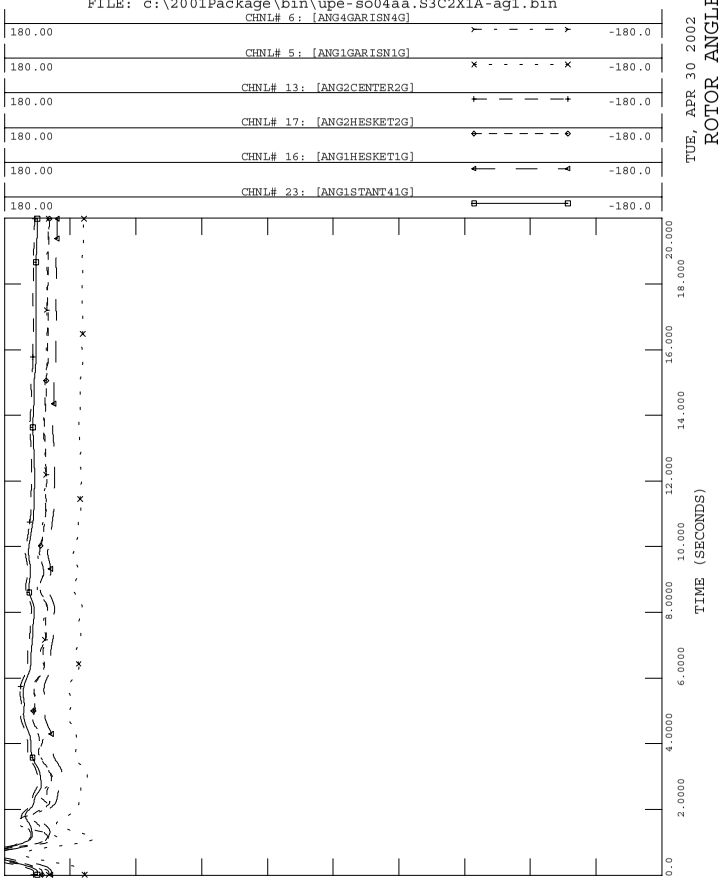
CASE S3C2X1A

CONTINGENCY AG1

Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

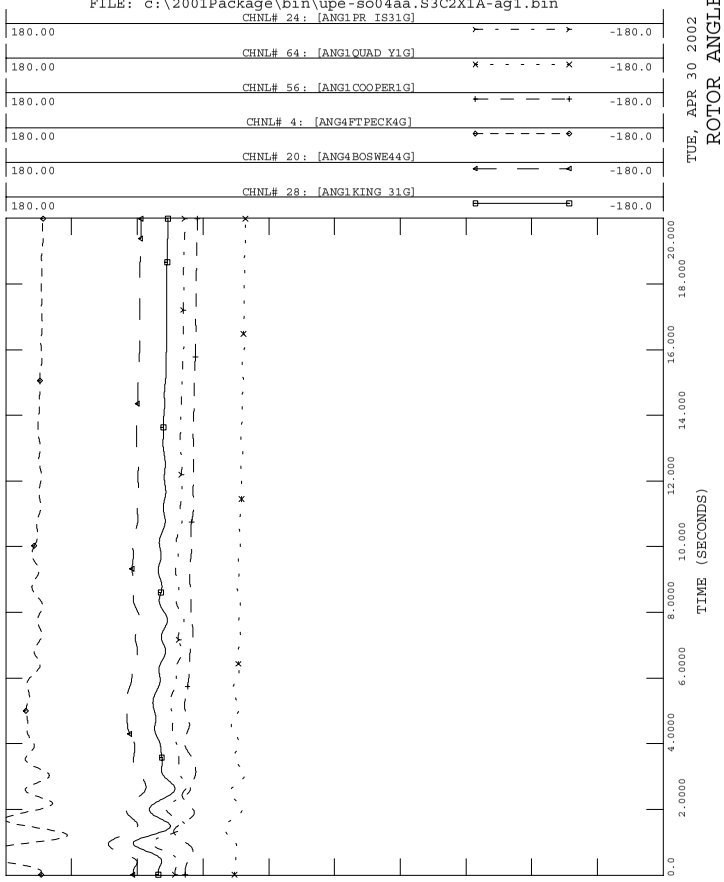
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
ROTOR ANGLES 2



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
ROTOR ANGLES 4



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ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
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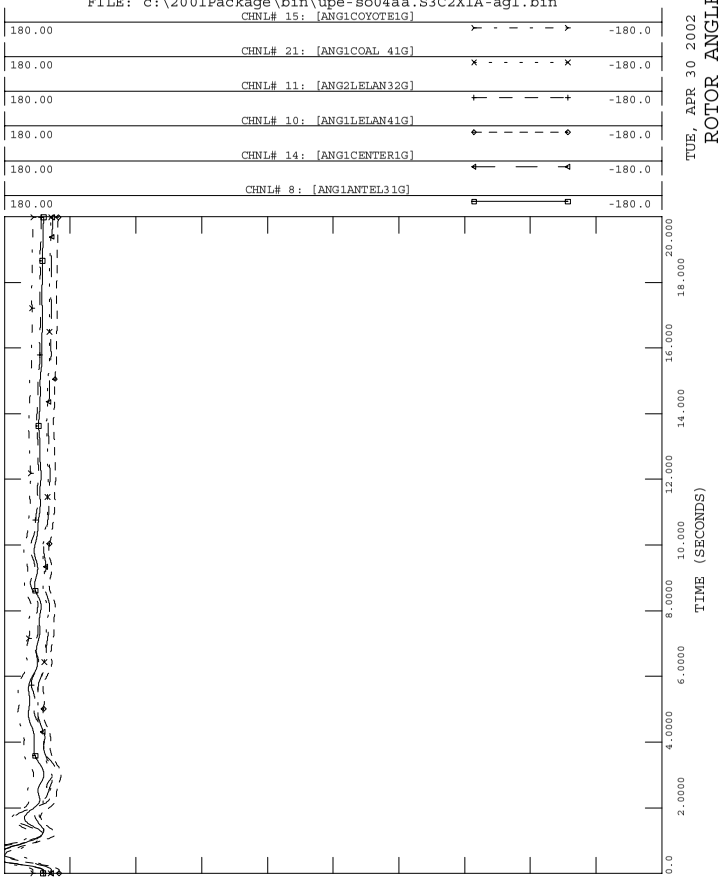
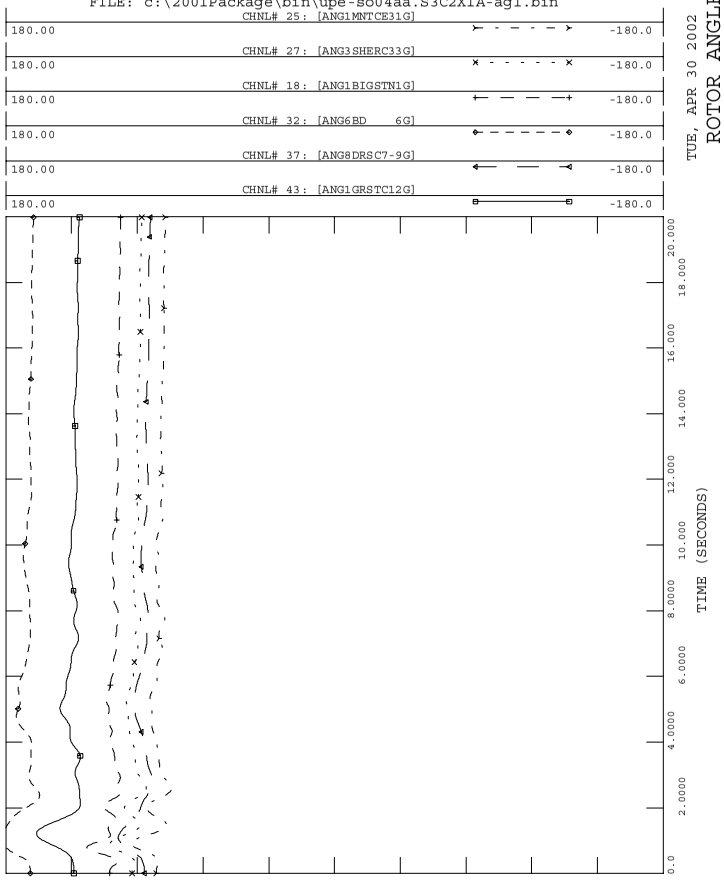


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
ROTOR ANGLES 3



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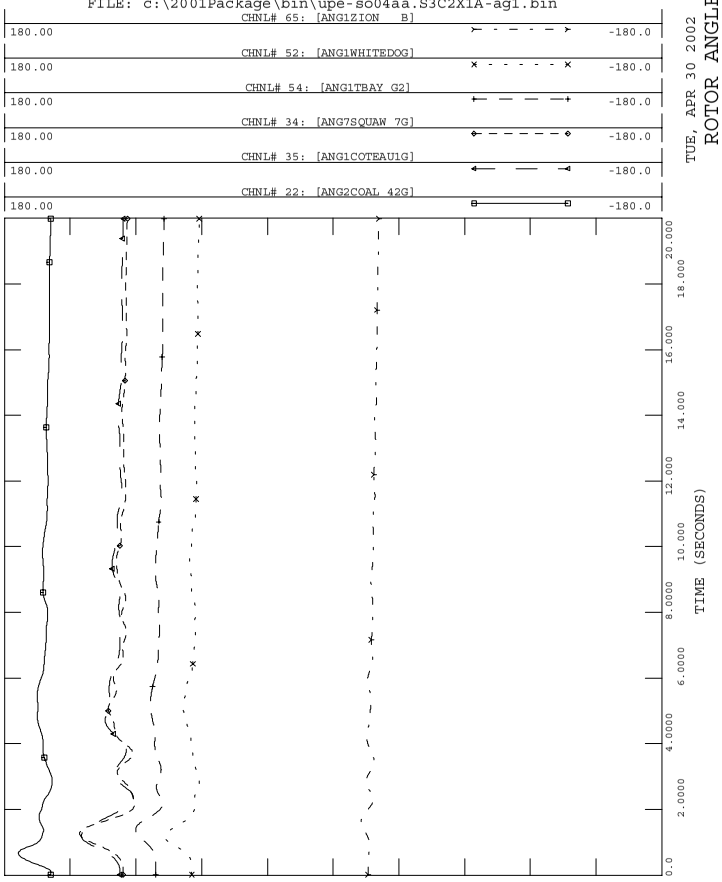
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
ROTOR ANGLES 6



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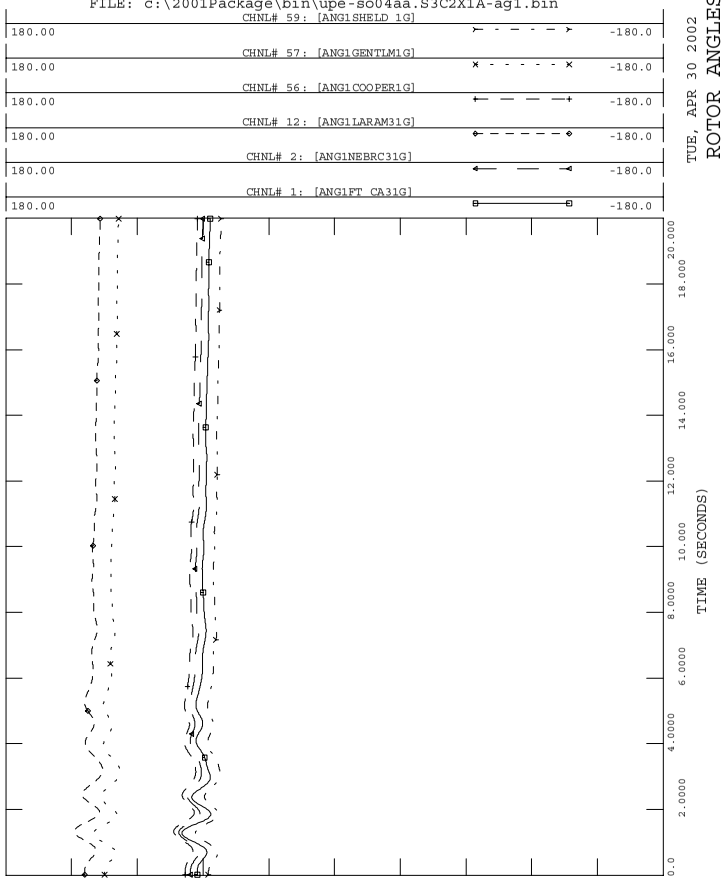
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
ROTOR ANGLES NB



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ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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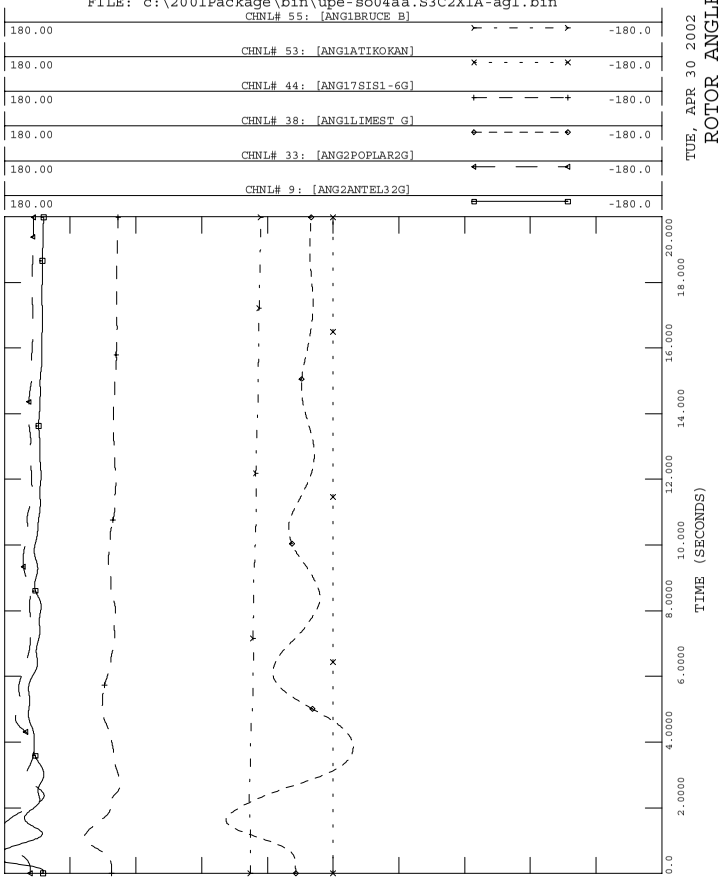
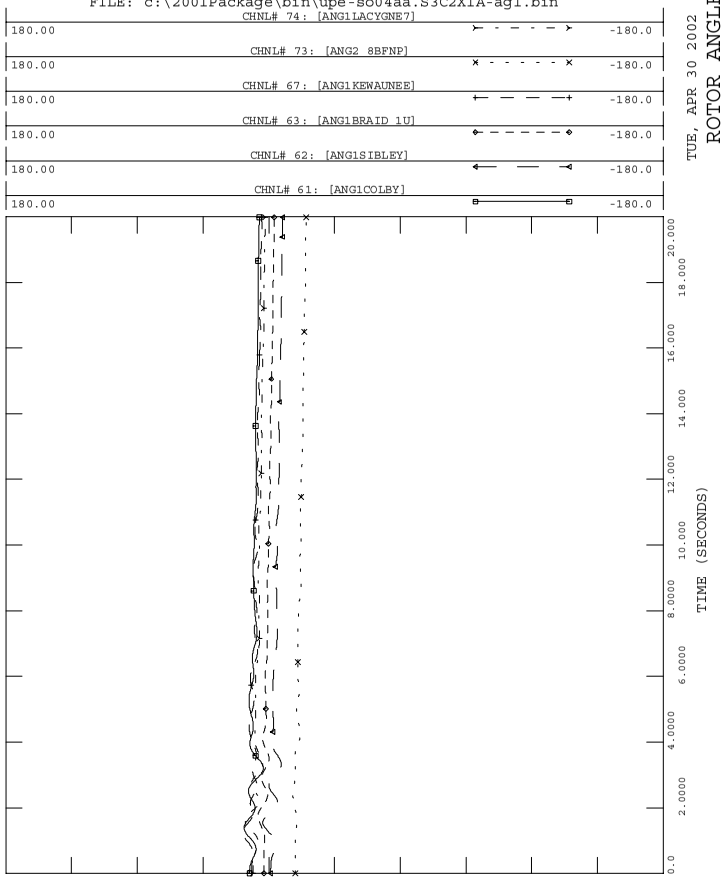
TUE, APR 30 2002 17:36
ROTOR ANGLES 5



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
ROTOR ANGLES 7



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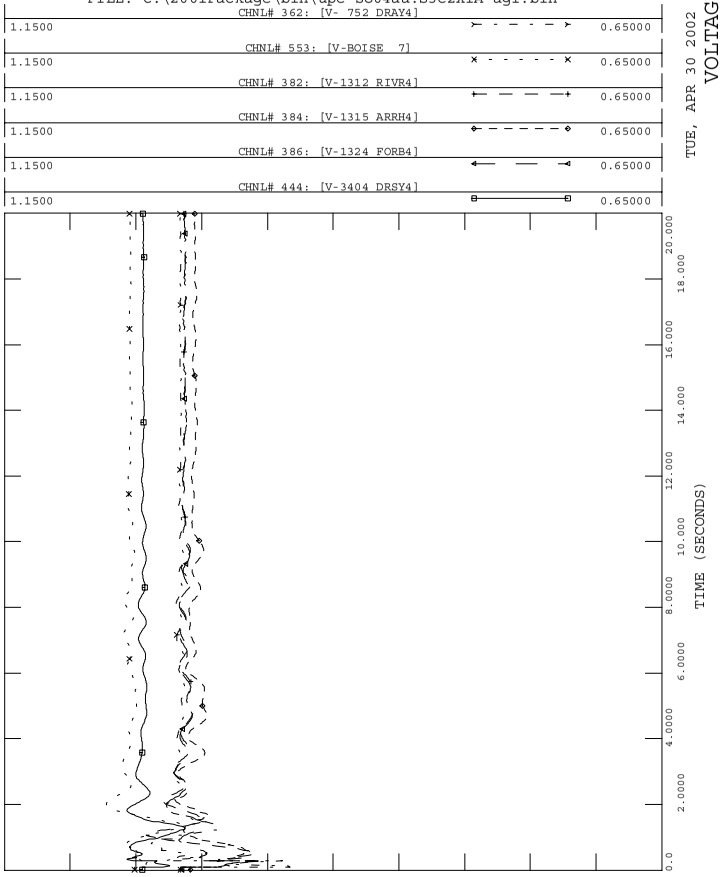
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin



TUE, APR 30 2002 17:36
VOLTAGES 1

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
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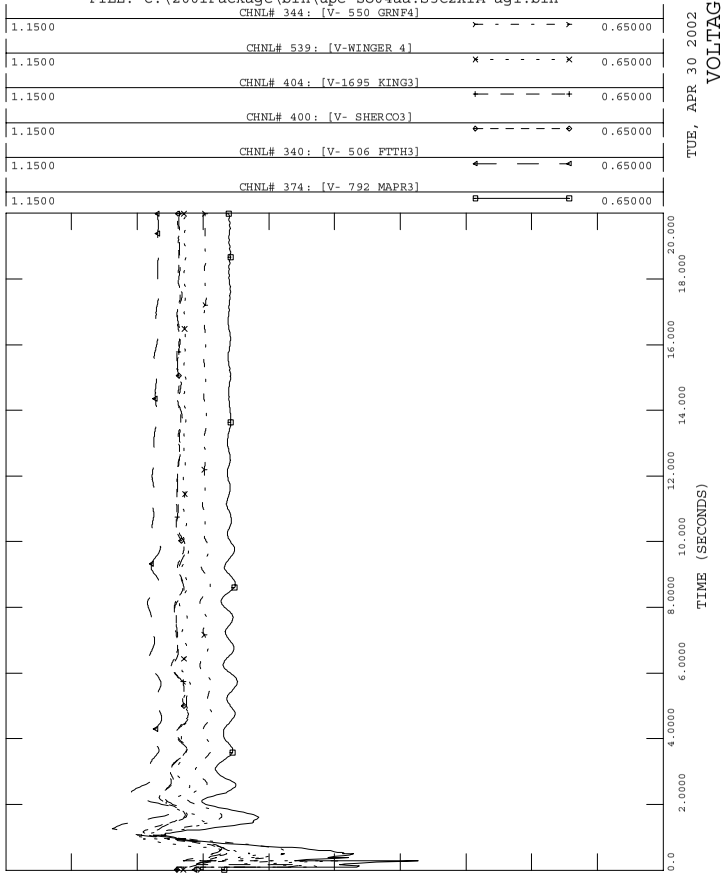
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin



TUE, APR 30 2002 17:36
VOLTAGES 3

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
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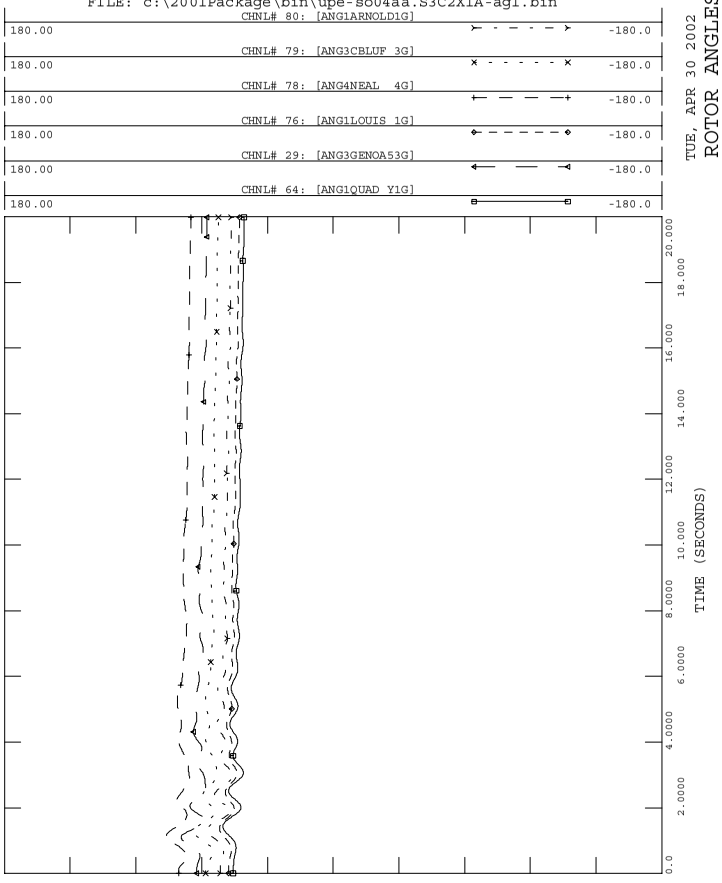
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin



TUE, APR 30 2002 17:36
ROTOR ANGLES IA

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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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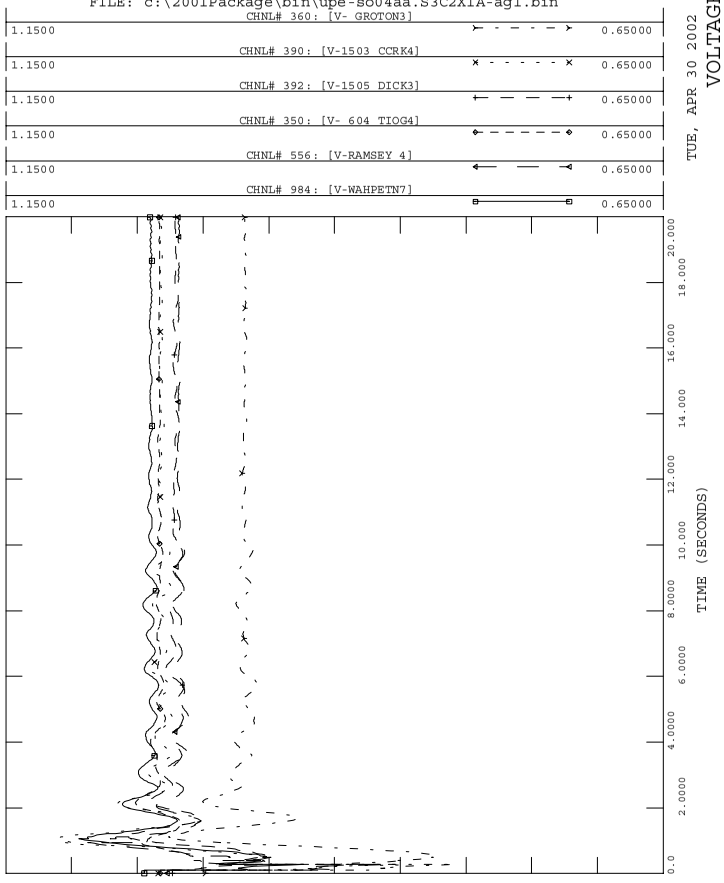

TUE, APR 30 2002 17:36
VOLTAGES 2

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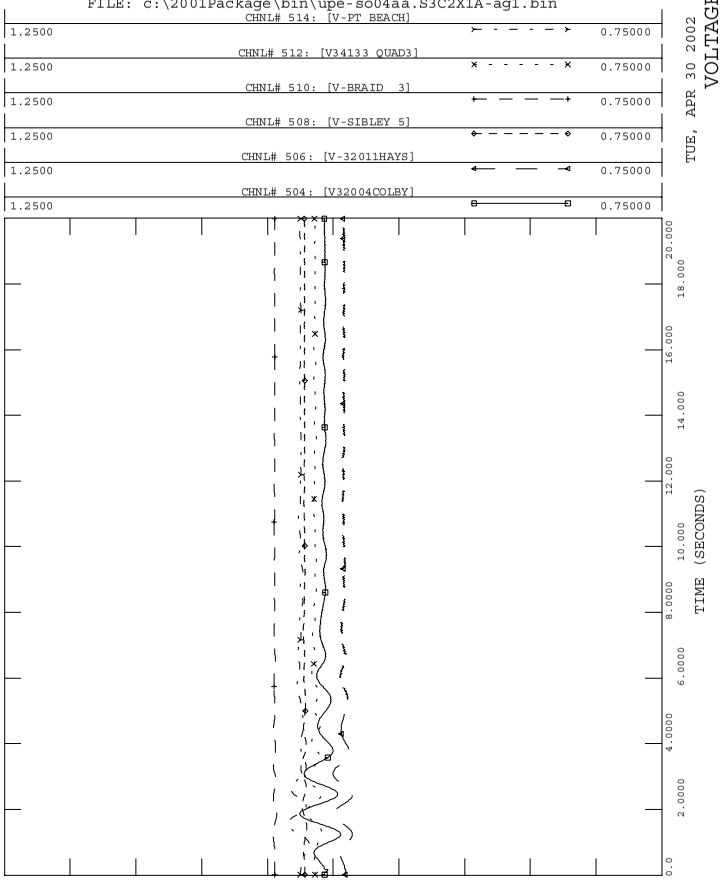
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
VOLTAGES 5



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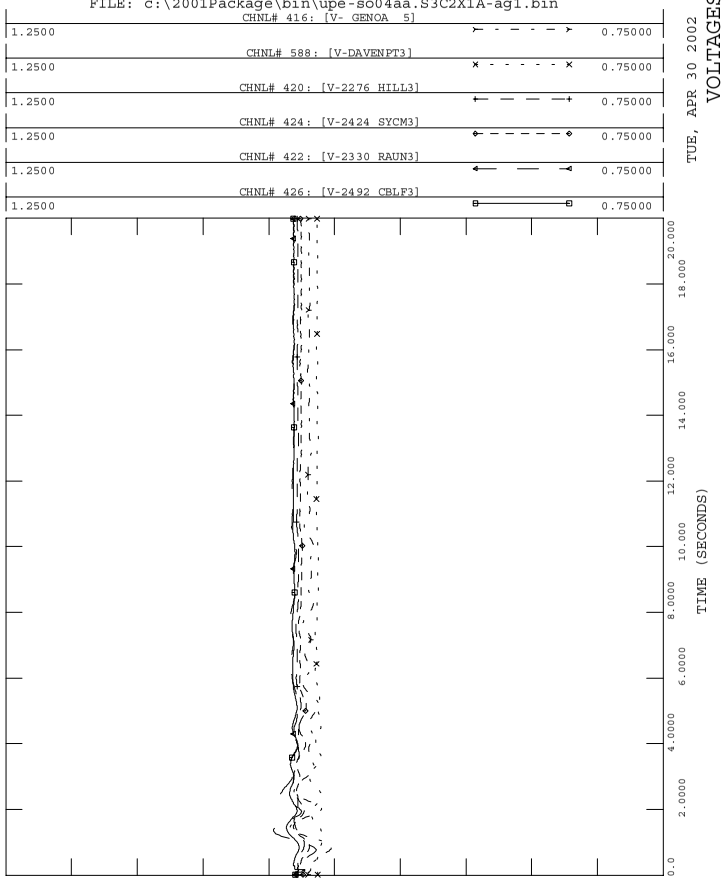
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
VOLTAGES IA



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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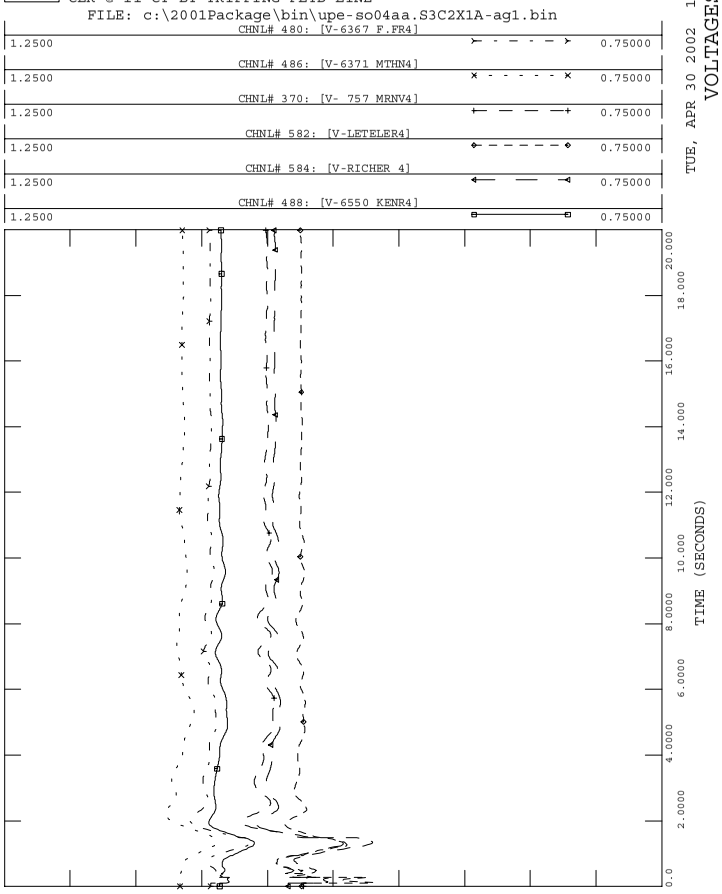
TUE, APR 30 2002 17:36
VOLTAGES 4



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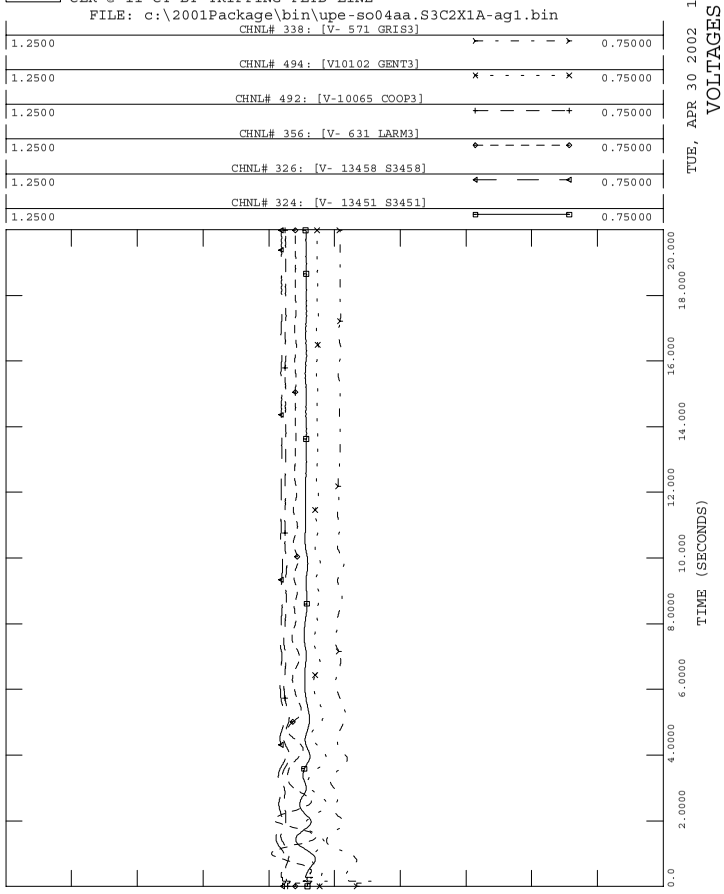
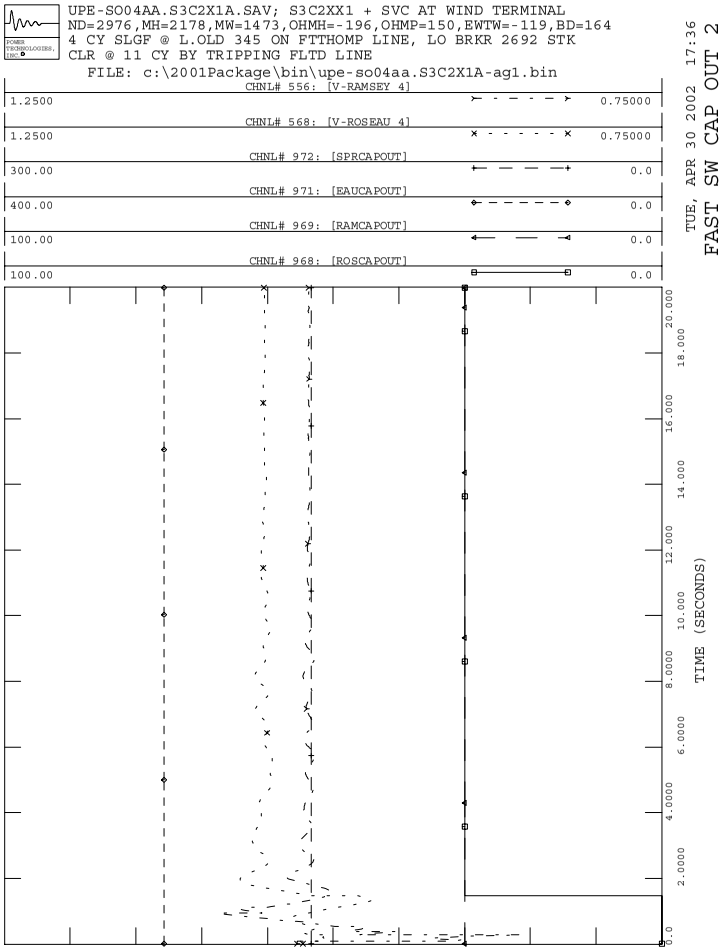
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
VOLTAGES NB

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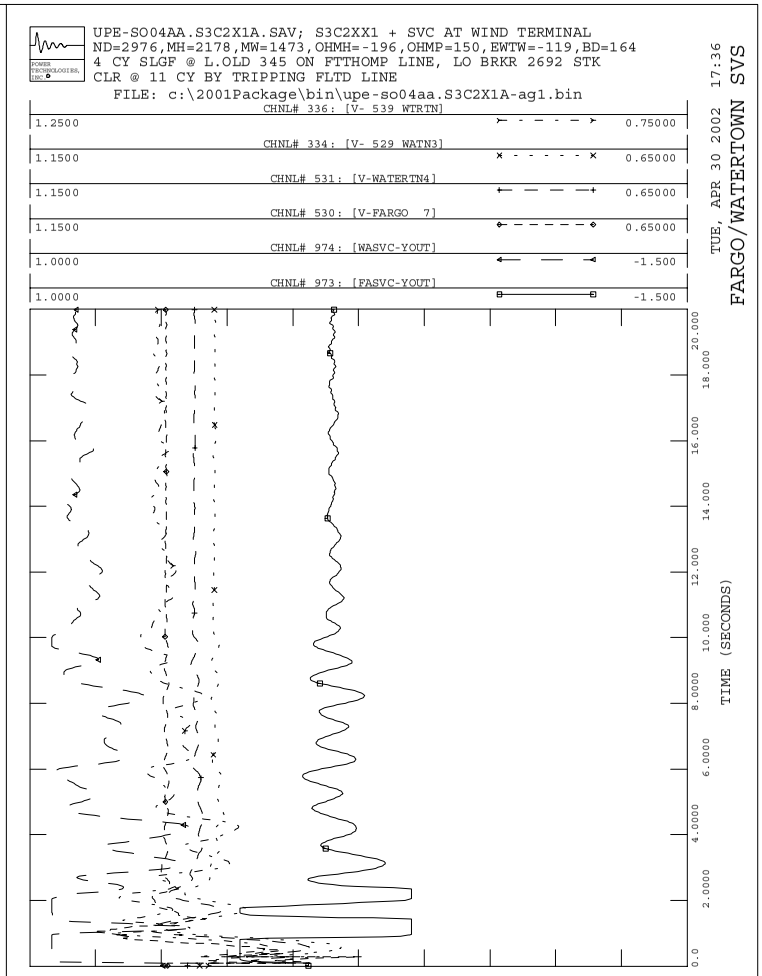
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
TUE, APR 30 2002 17:36
FAST SW CAP OUT 2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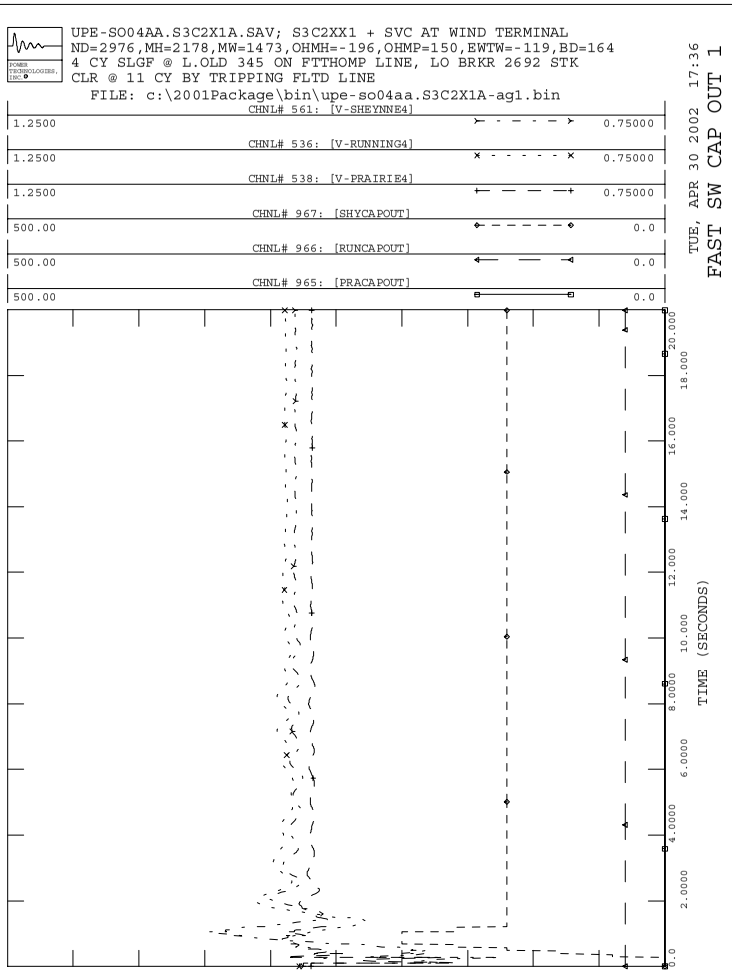
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
TUE, APR 30 2002 17:36
FARGO/WATERTOWN SVS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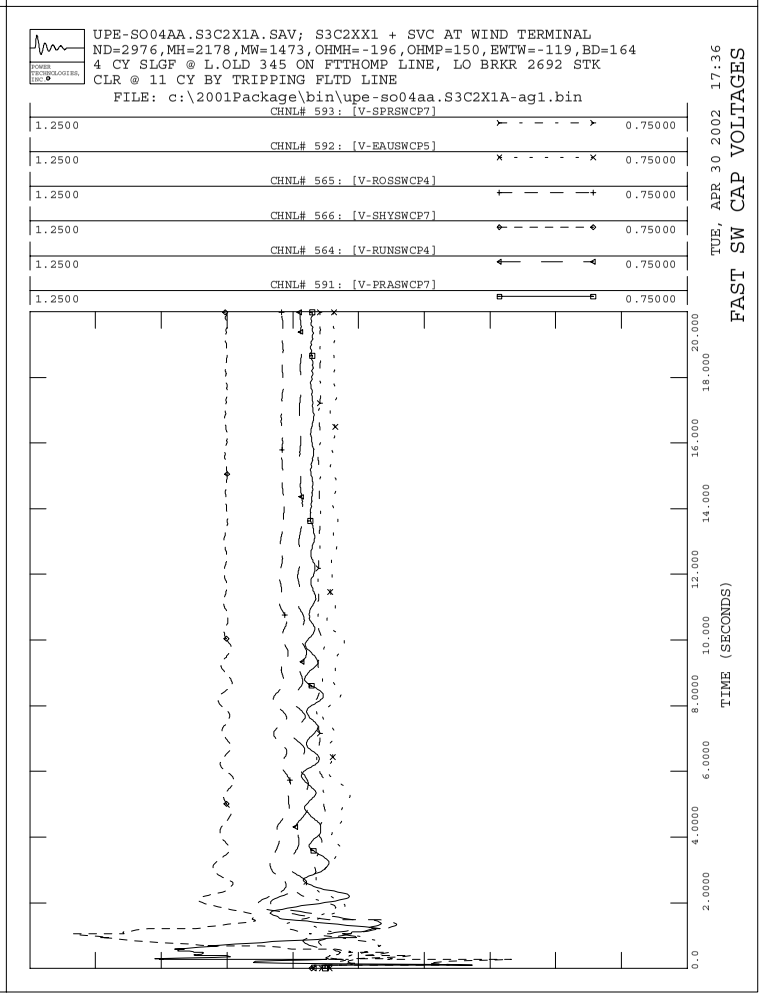
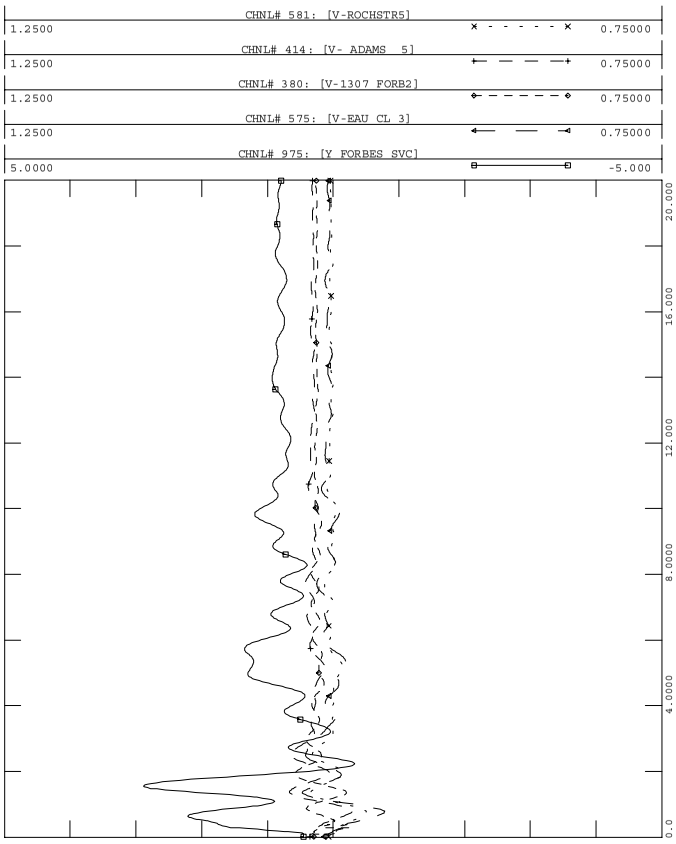
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
TUE, APR 30 2002 17:36
FAST SW CAP OUT 1


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
TUE, APR 30 2002 17:36
FAST SW CAP VOLTAGES

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36

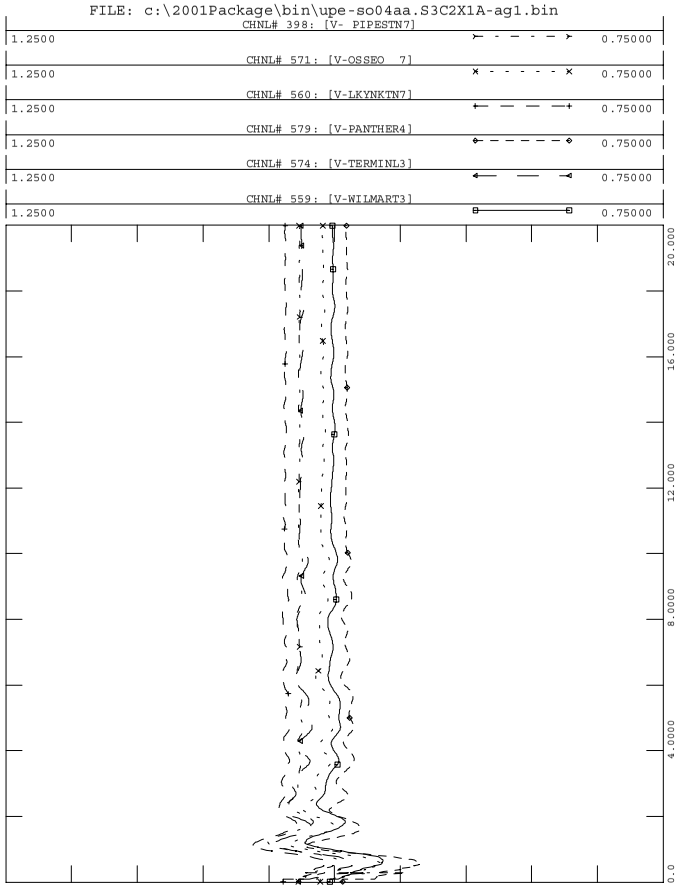
SVC & WISCONSIN VOLT



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36

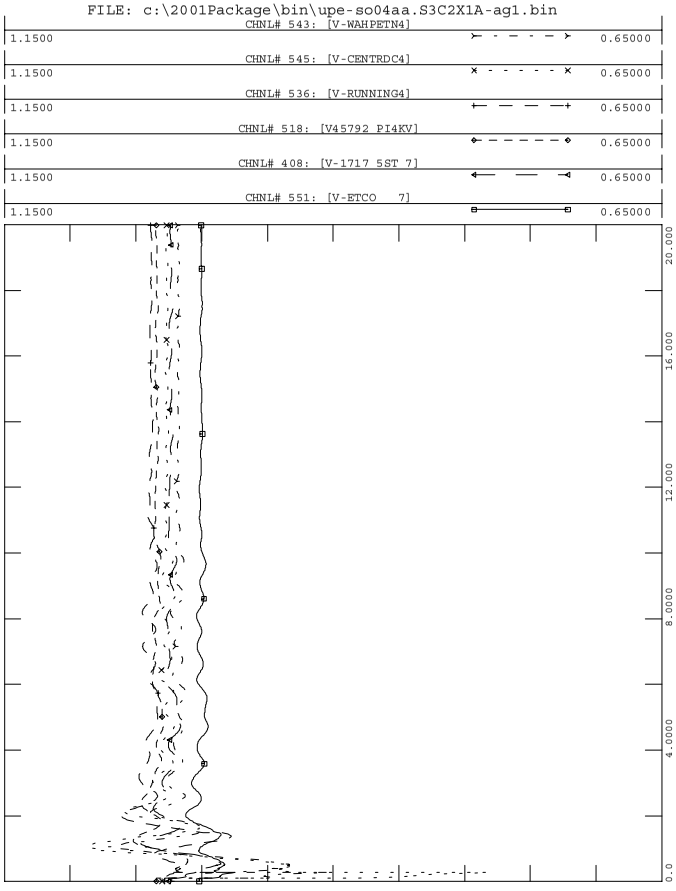
TC VOLTAGES



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36

VOLTAGES 6



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

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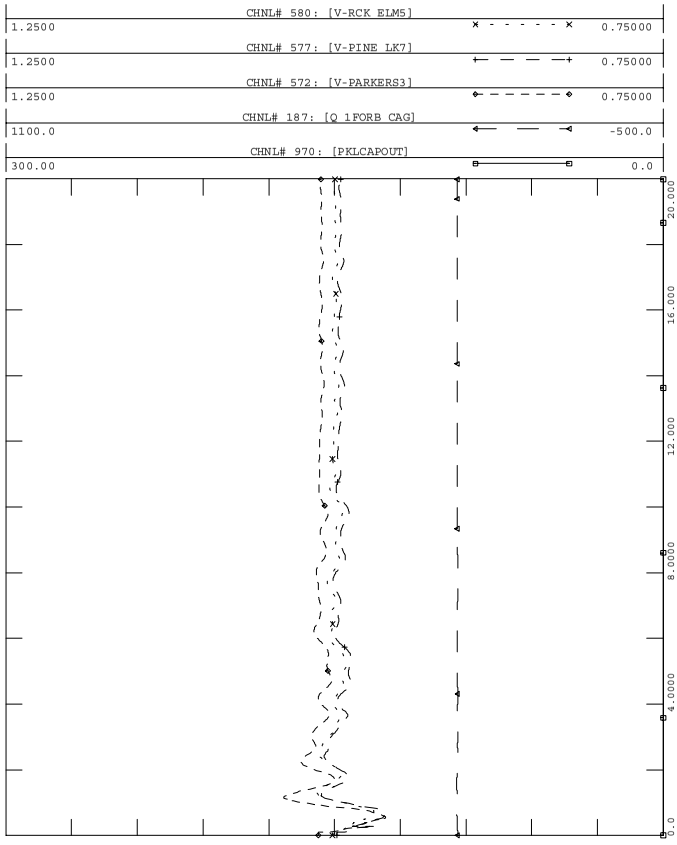
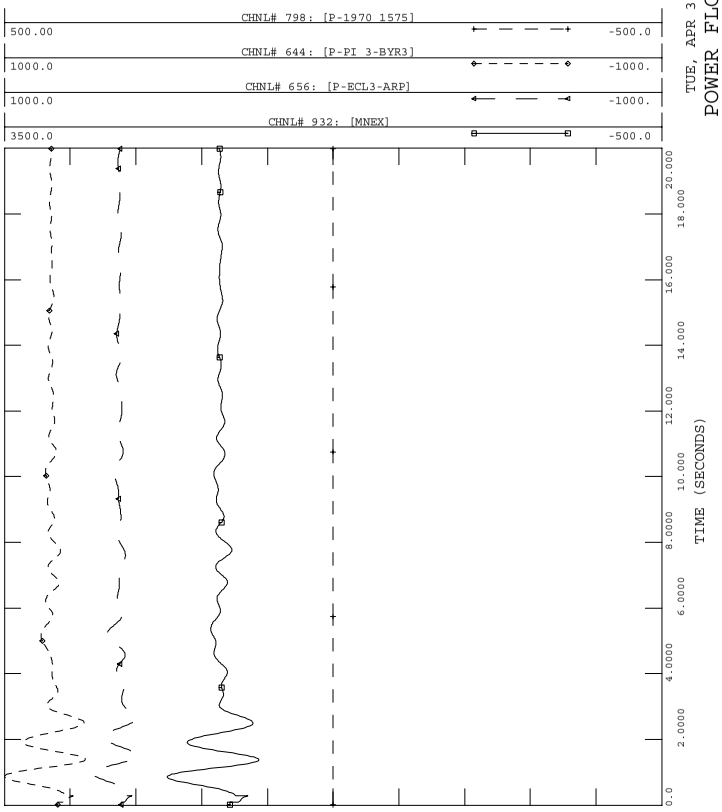
FORBES SVS OUT & VOLTAGES



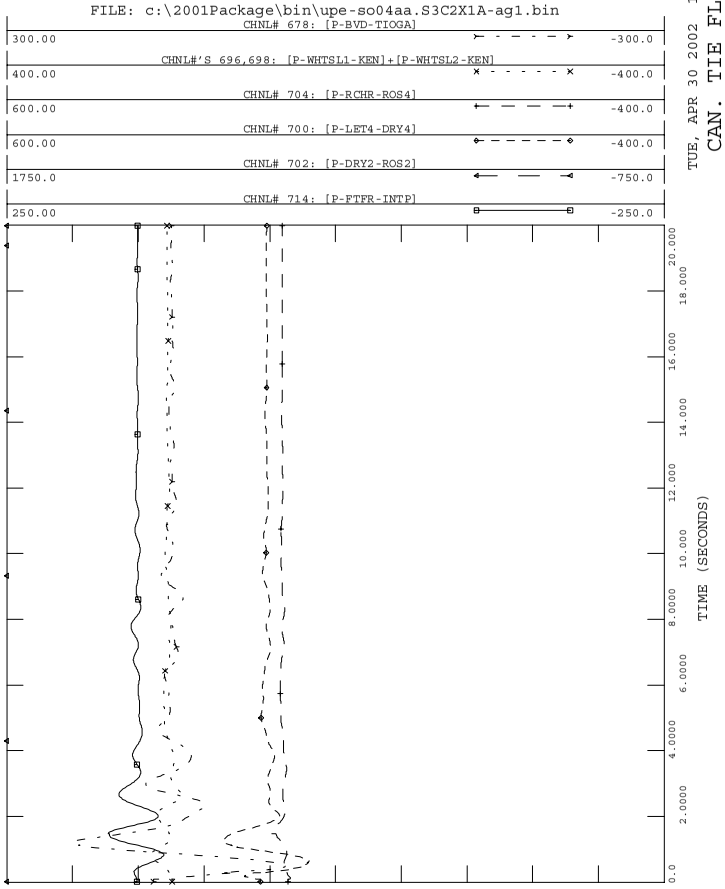
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
POWER FLOW SUMS 2



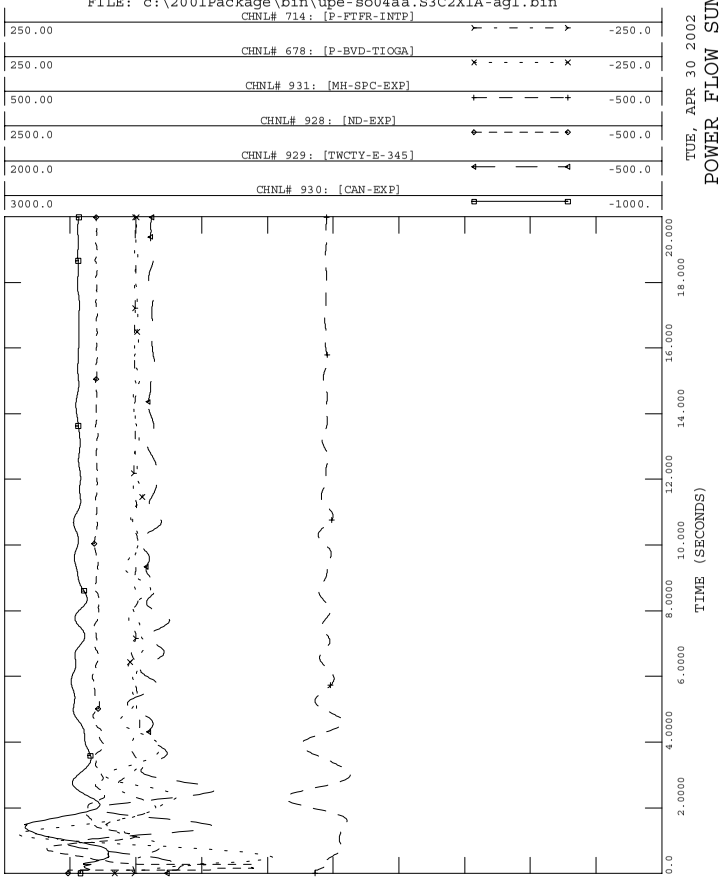
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36
CAN. TIE FLOWS



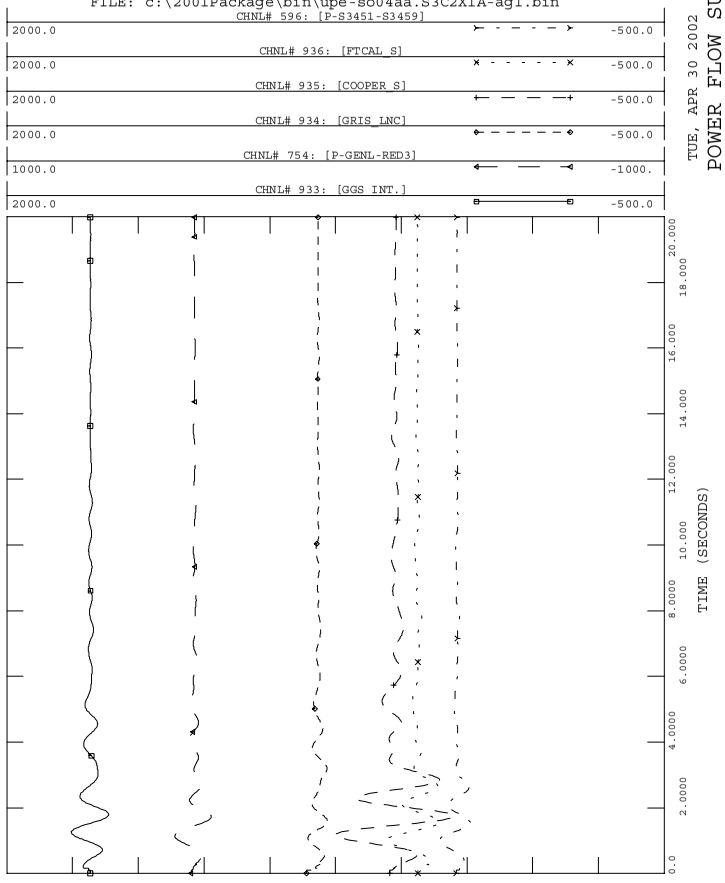
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

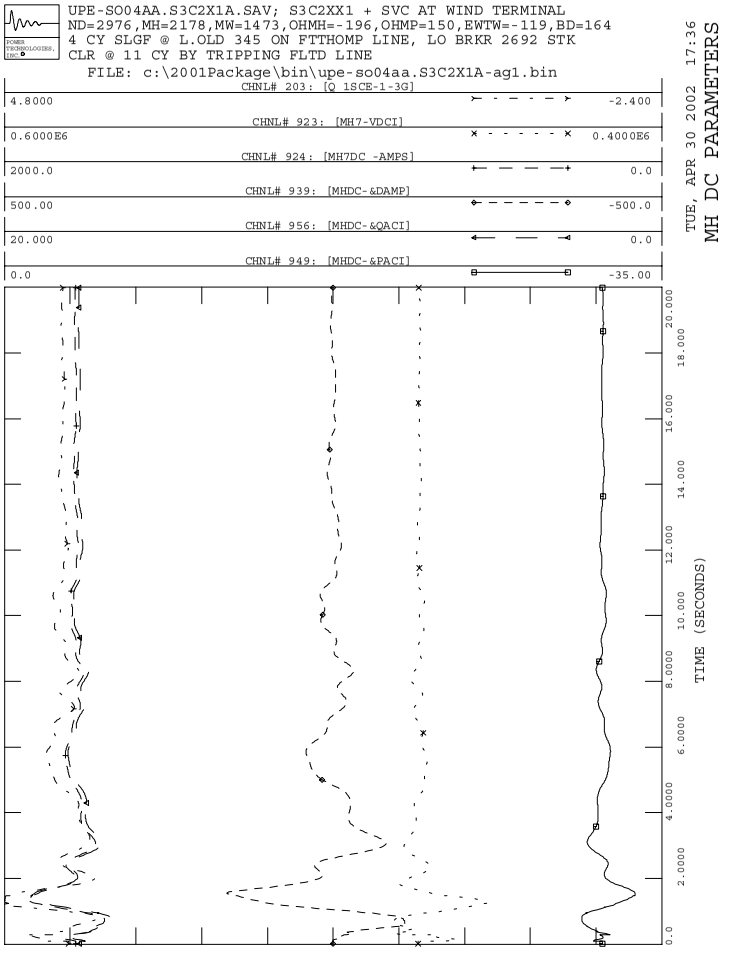
TUE, APR 30 2002 17:36
POWER FLOW SUMS 1

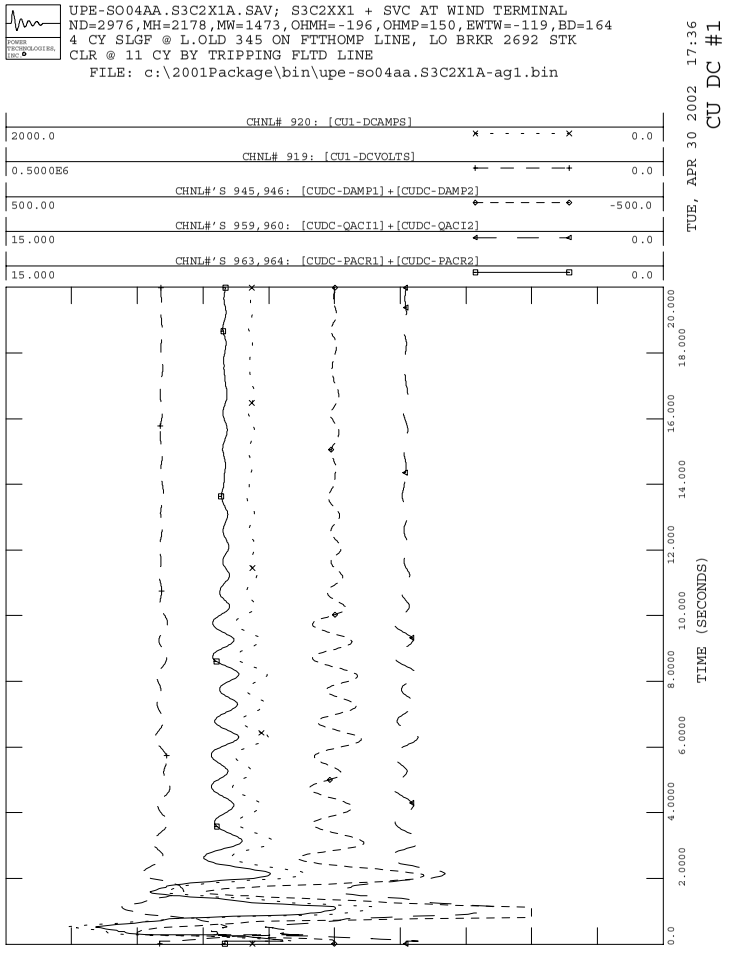


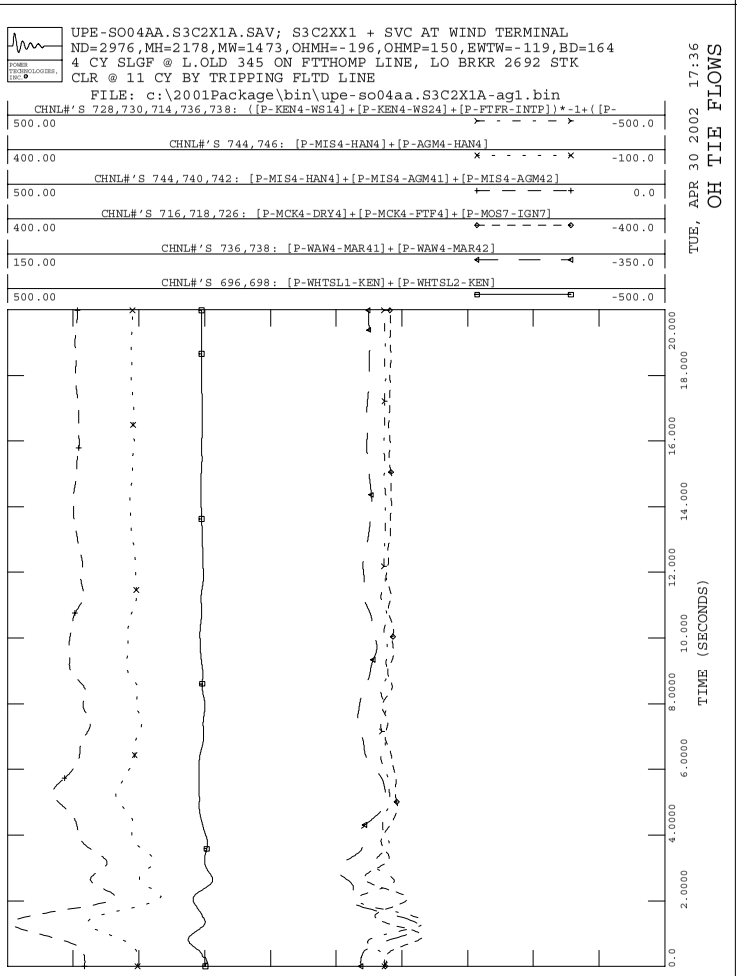
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

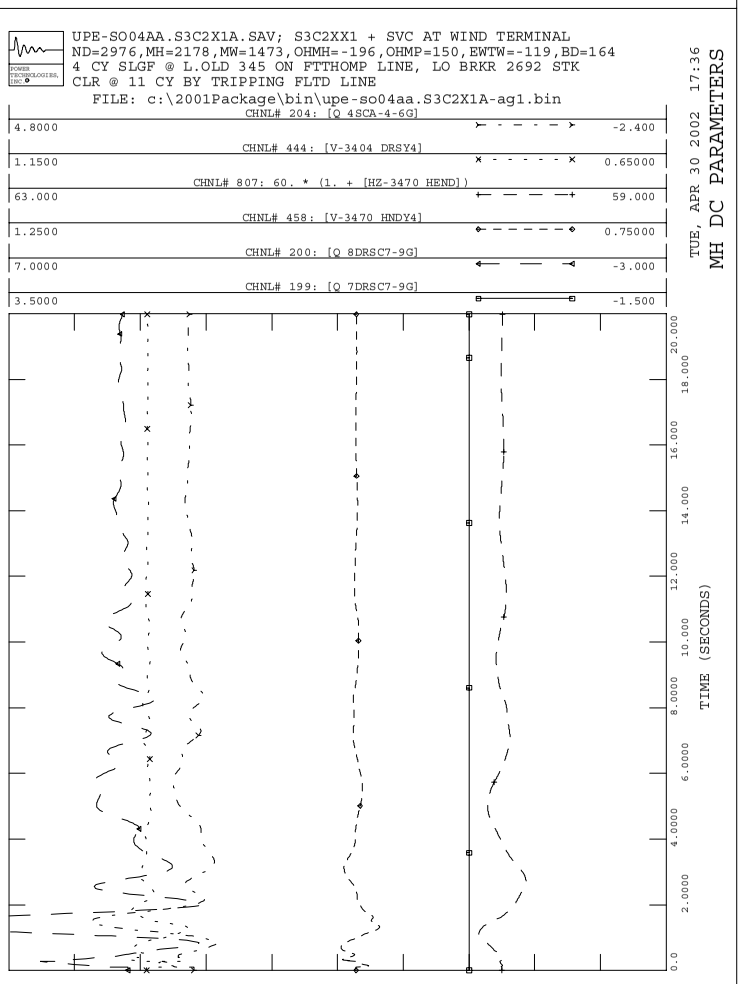
TUE, APR 30 2002 17:36
POWER FLOW SUM 3




UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TUE, APR 30 2002 17:36
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TUE, APR 30 2002 17:36
CU DC #1
TIME (SECONDS)

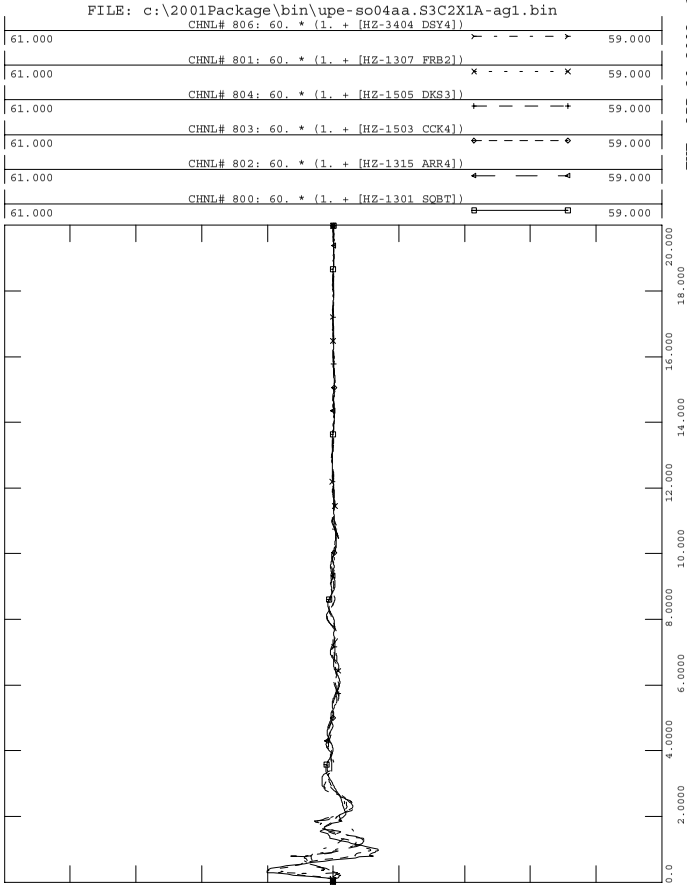

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TUE, APR 30 2002 17:36
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TUE, APR 30 2002 17:36
MH DC PARAMETERS
TIME (SECONDS)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36

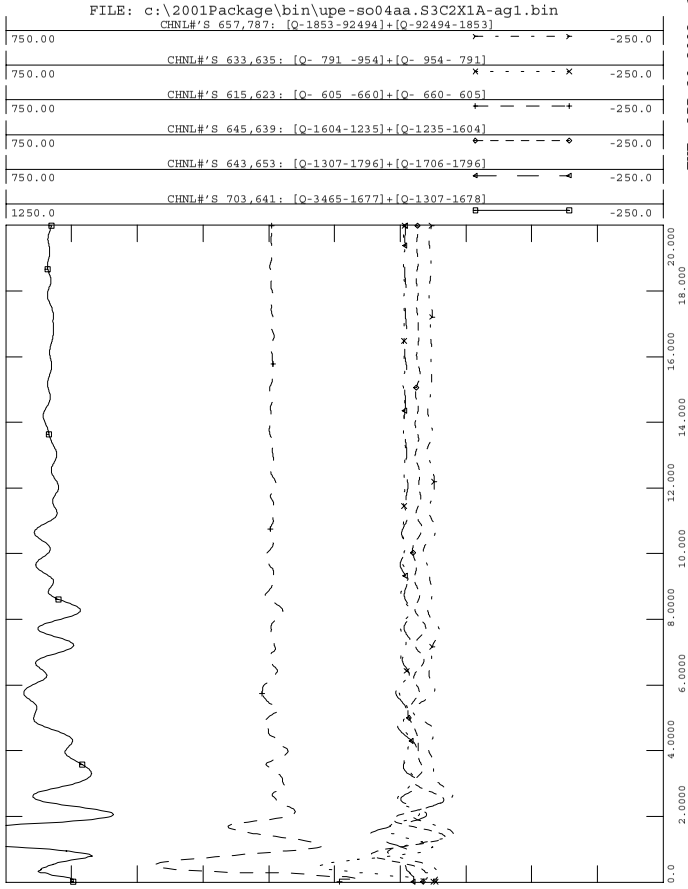
FREQ AT DC TERMINALS



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36

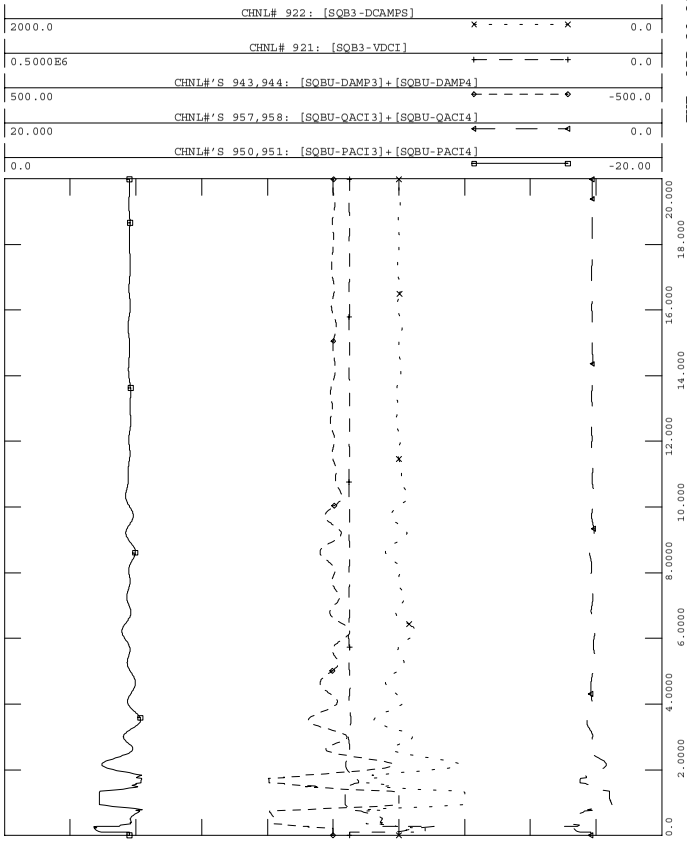
VAR LOSSES



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36

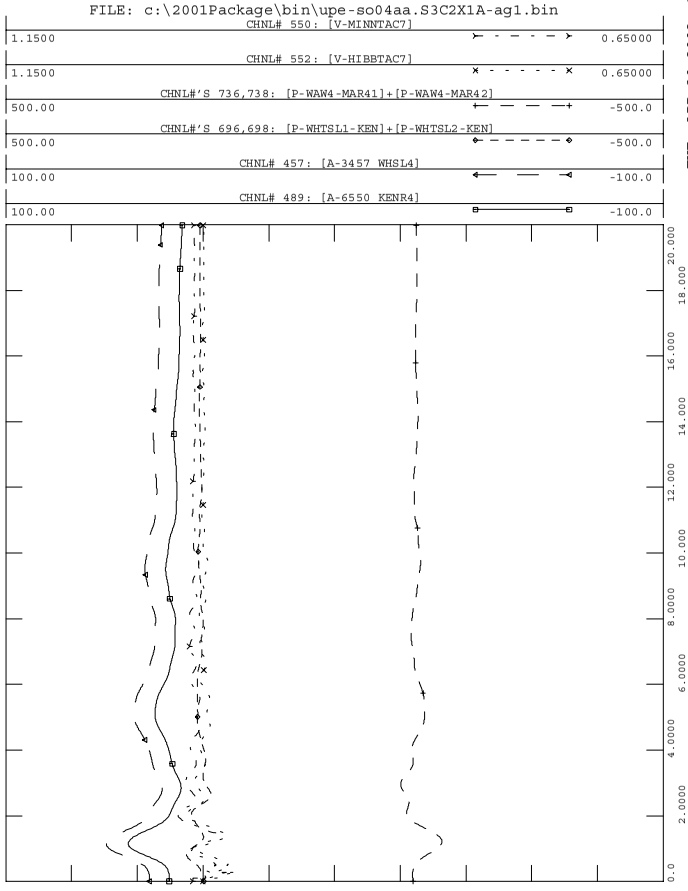
SQB DC #3



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

TUE, APR 30 2002 17:36

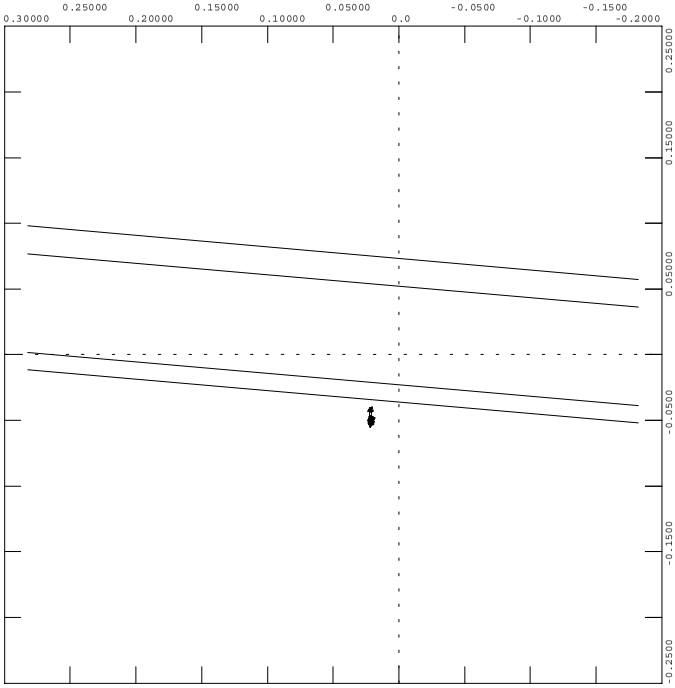
VOLTAGES, ANGLES



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

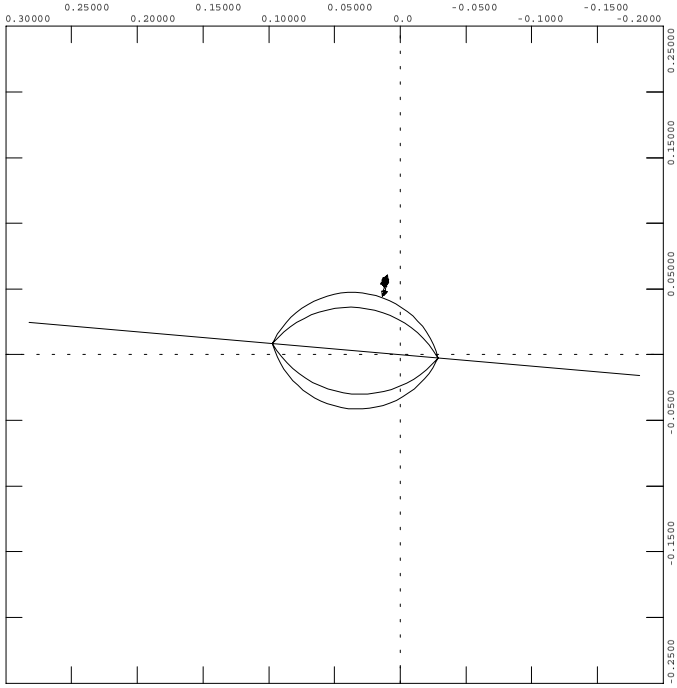


TUE, APR 30 2002 17:36
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

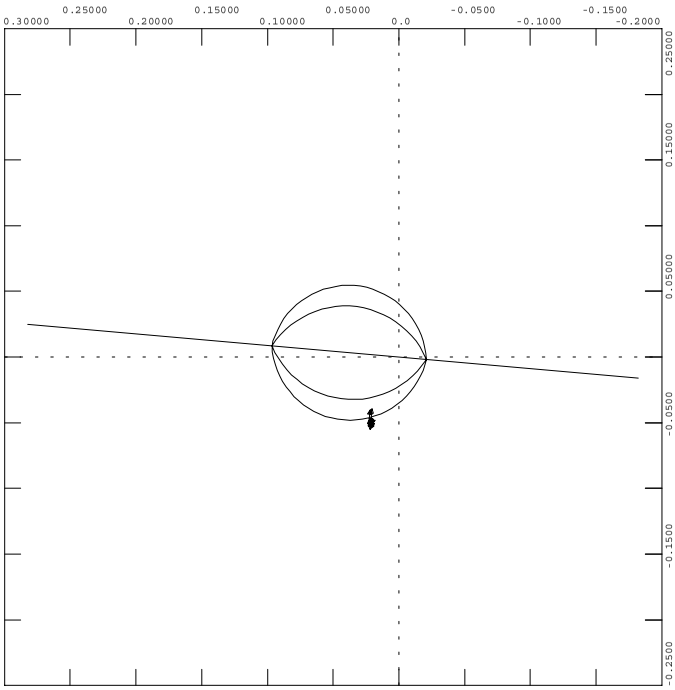


TUE, APR 30 2002 17:36
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

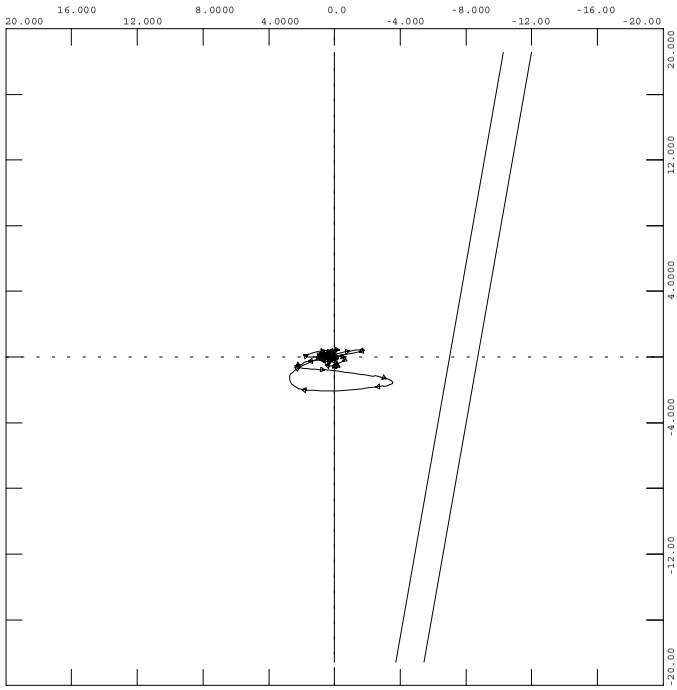


TUE, APR 30 2002 17:36
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

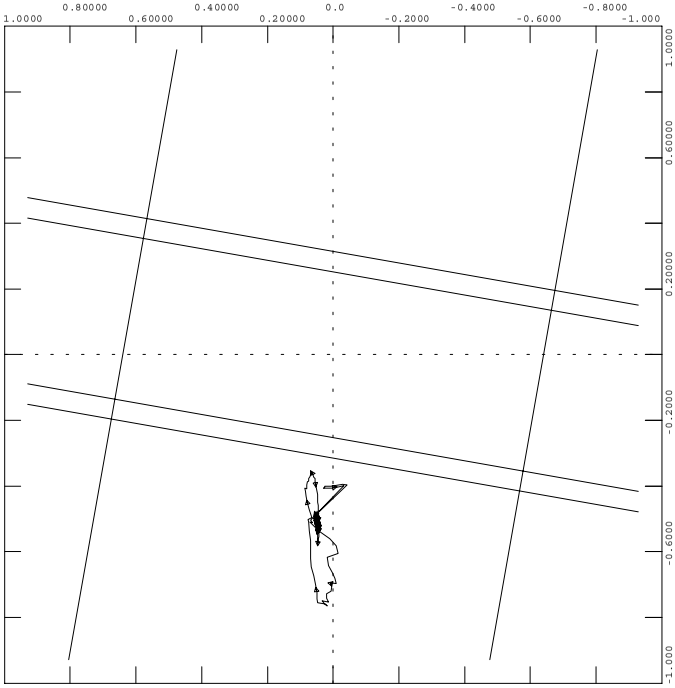


TUE, APR 30 2002 17:36
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

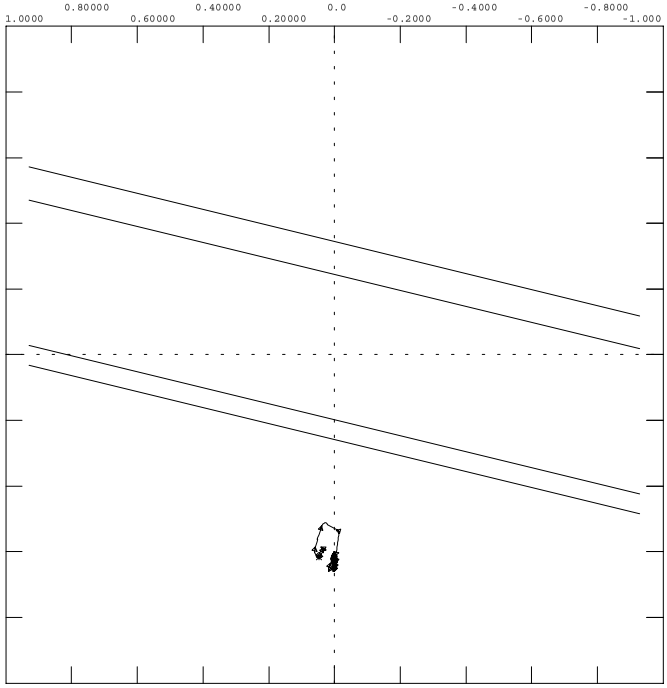
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

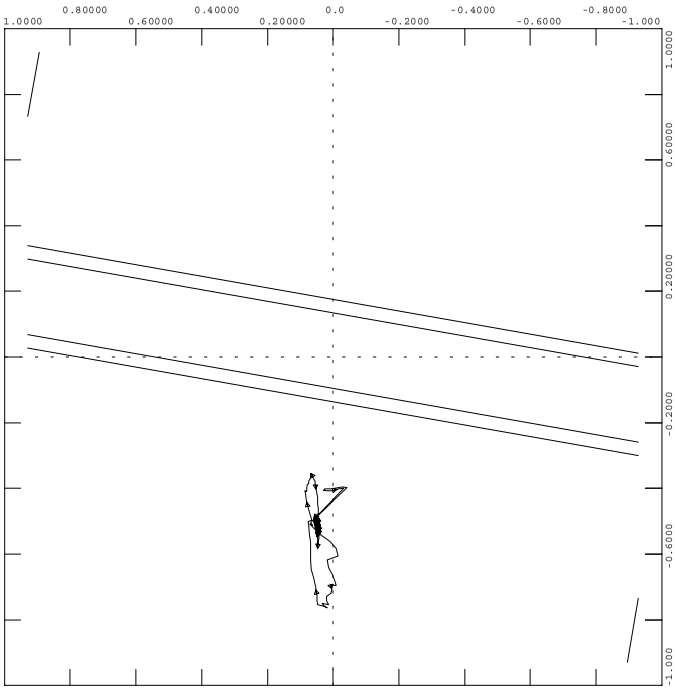
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

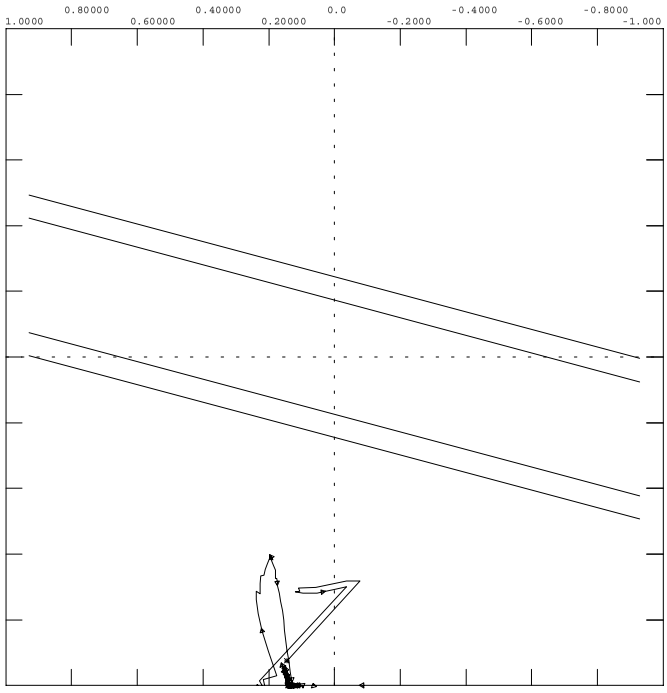
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

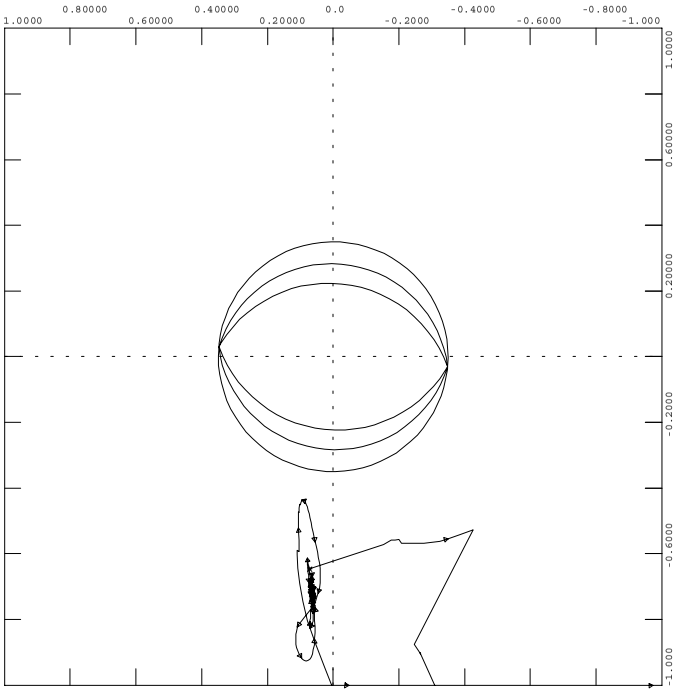
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

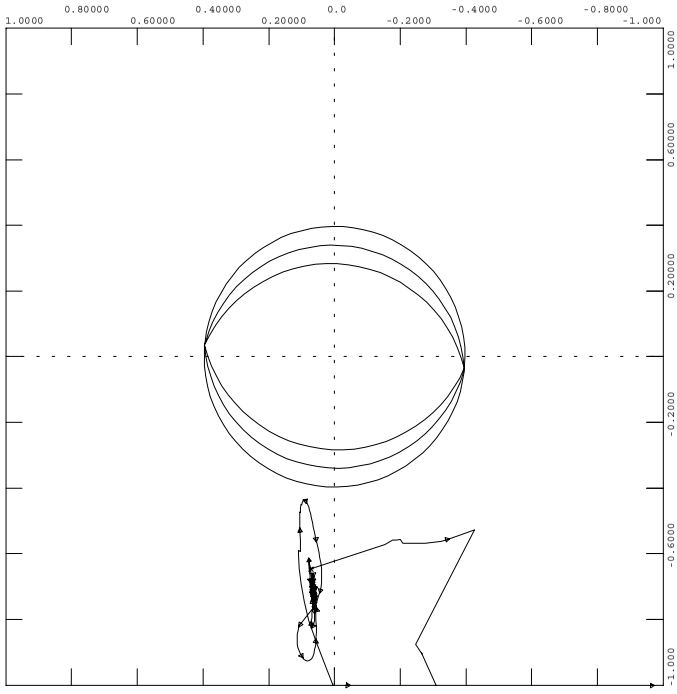


TUE, APR 30 2002 17:36
TIOGA-B.DAM-SOUTH (266)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

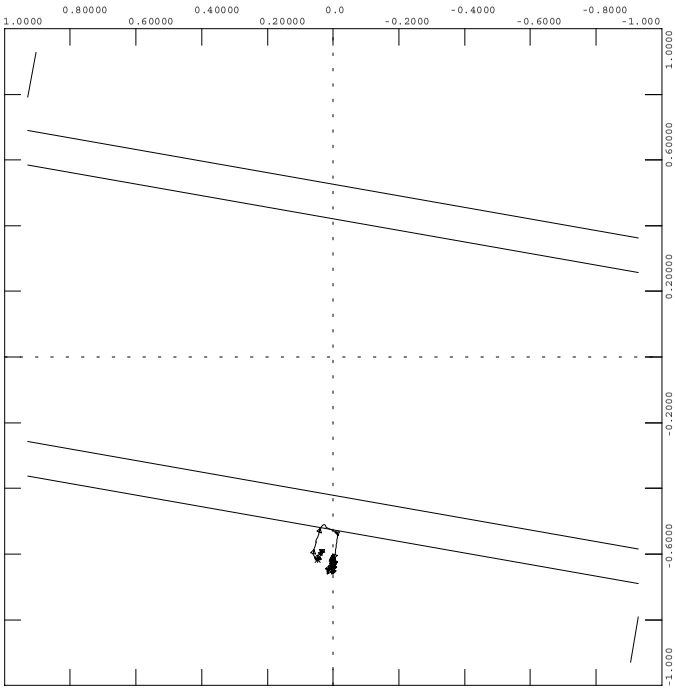


TUE, APR 30 2002 17:36
TIOGA-B.DAM-EMRG (267)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

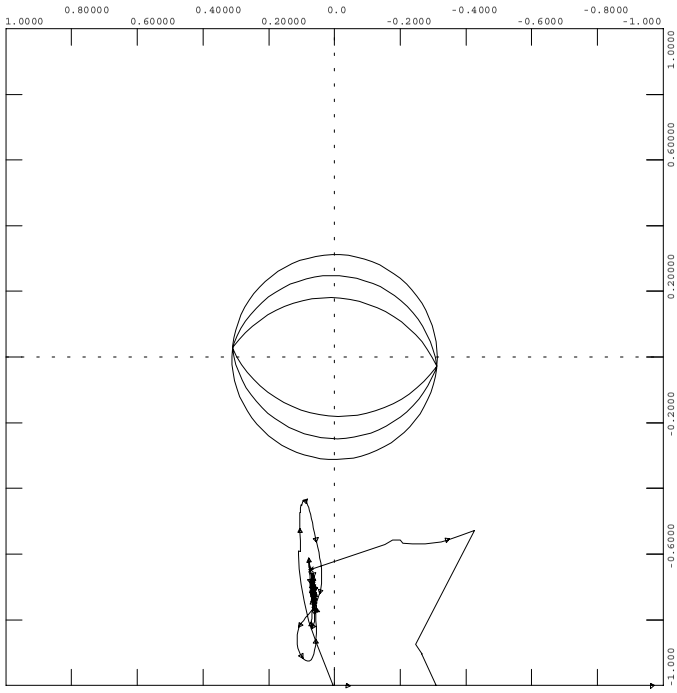


TUE, APR 30 2002 17:36
R50M-MORANVILLE-EMRG (777

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

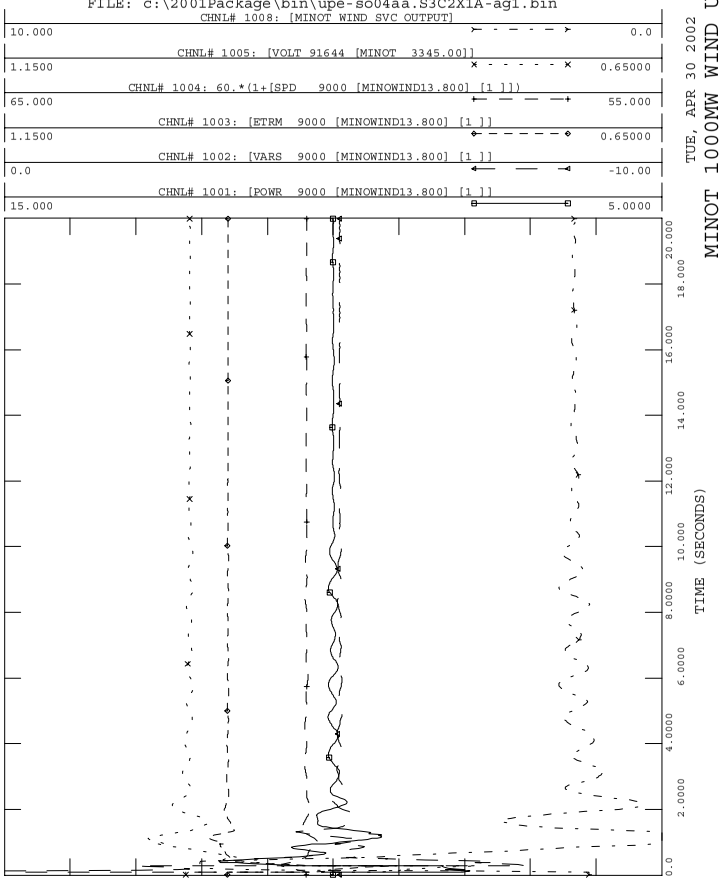
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



TUE, APR 30 2002 17:36
TIOGA-B.DAM-NORTH (268)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

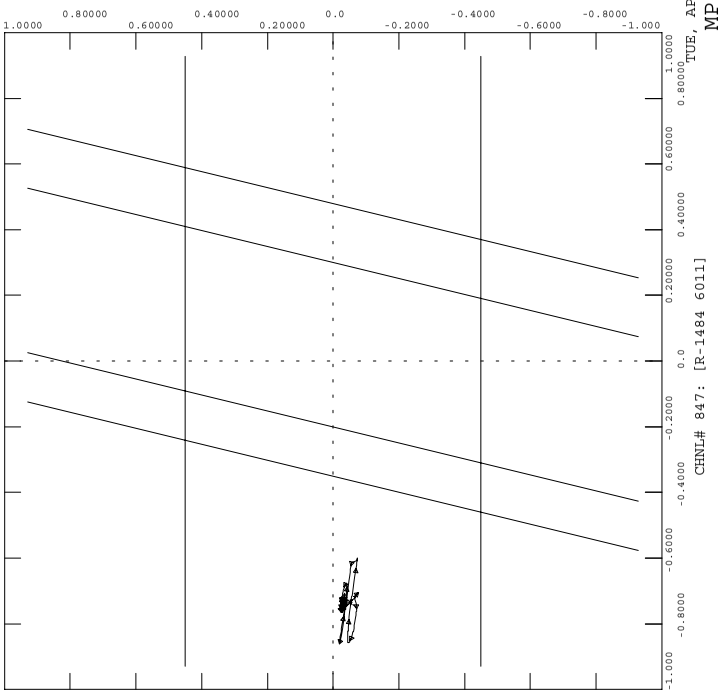


TUE, APR 30 2002 17:36
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

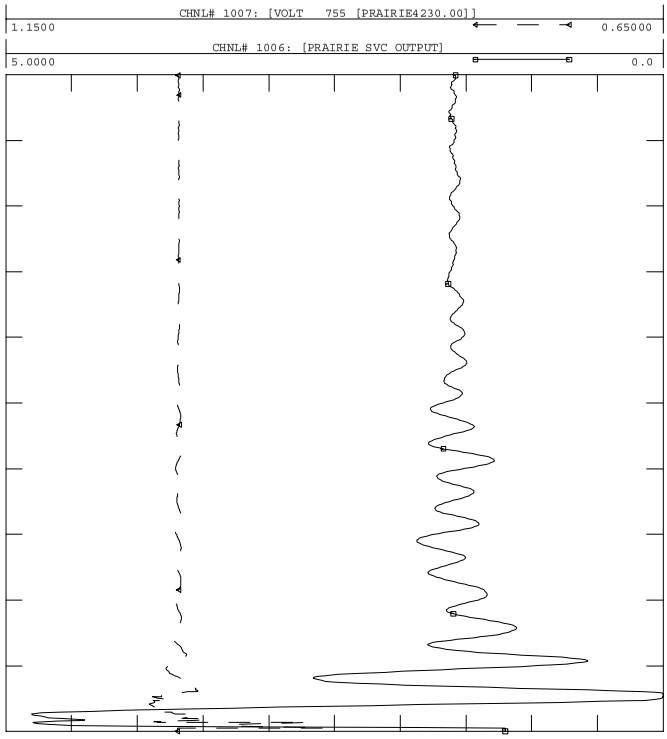
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



TUE, APR 30 2002 17:36
MP-OH I.FALLS (779)

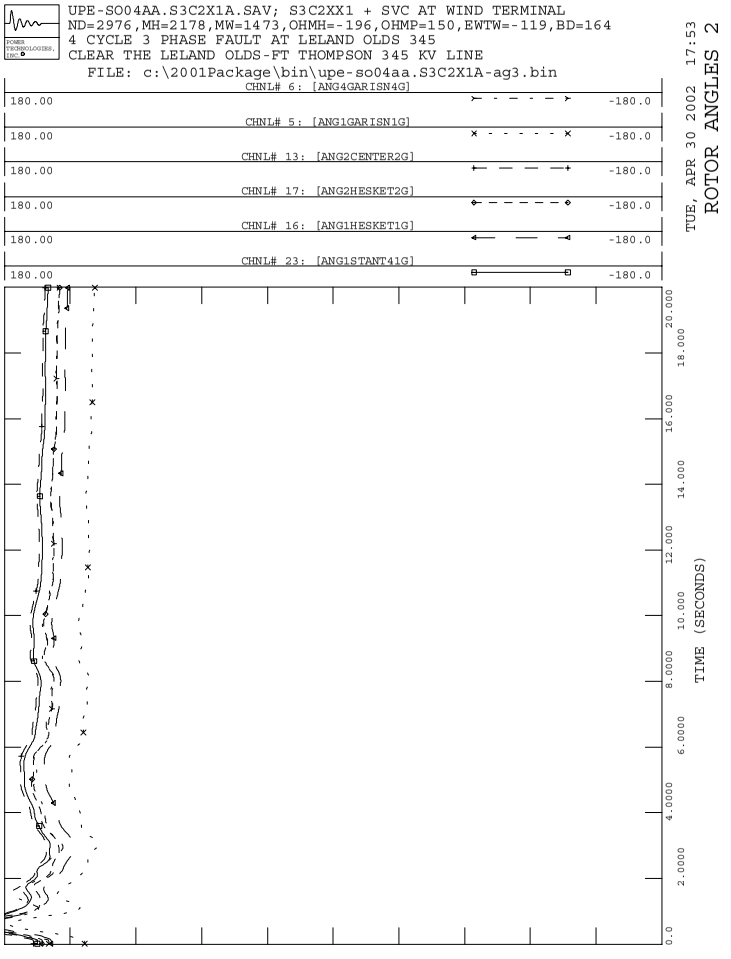
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag1.bin

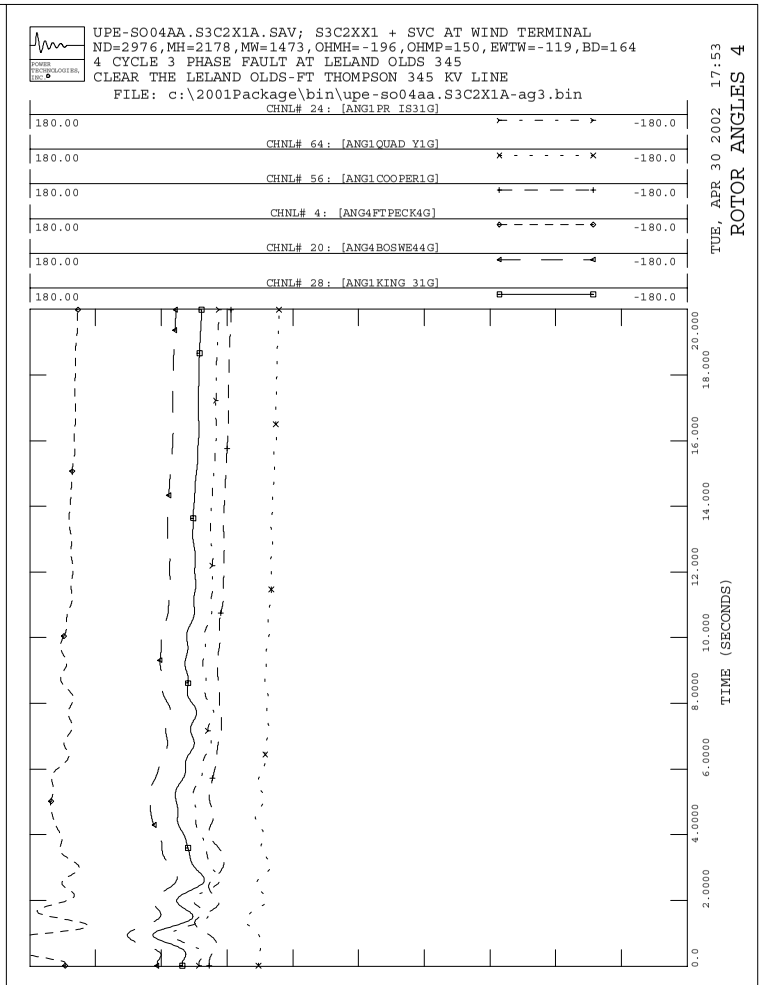


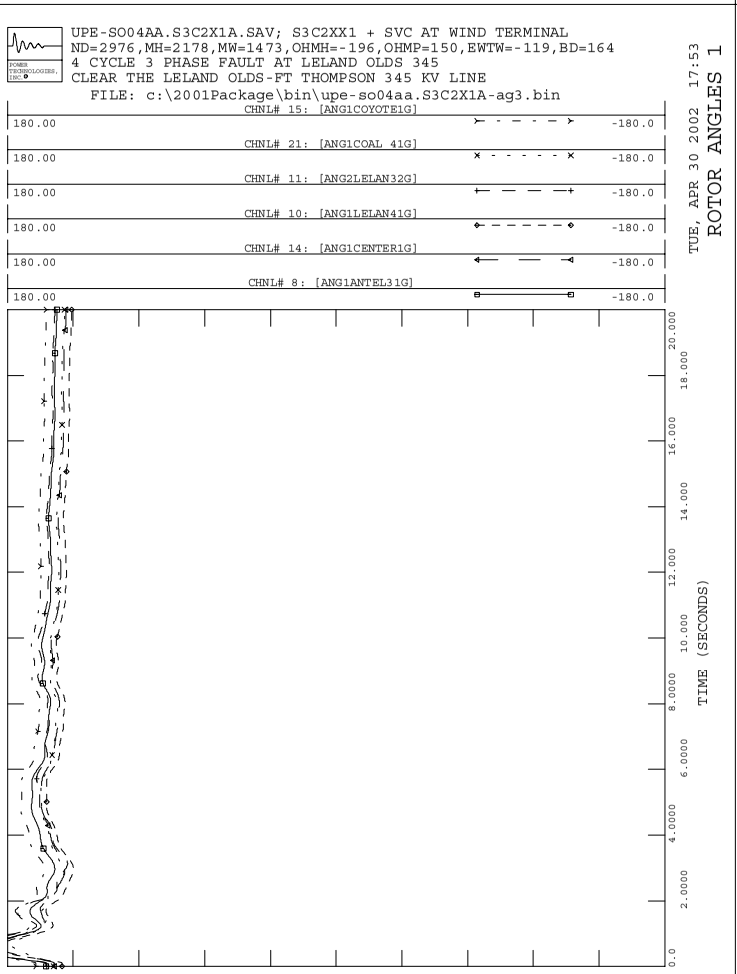
TUE, APR 30 2002 17:36
PRAIRIE SVC RESPONSE

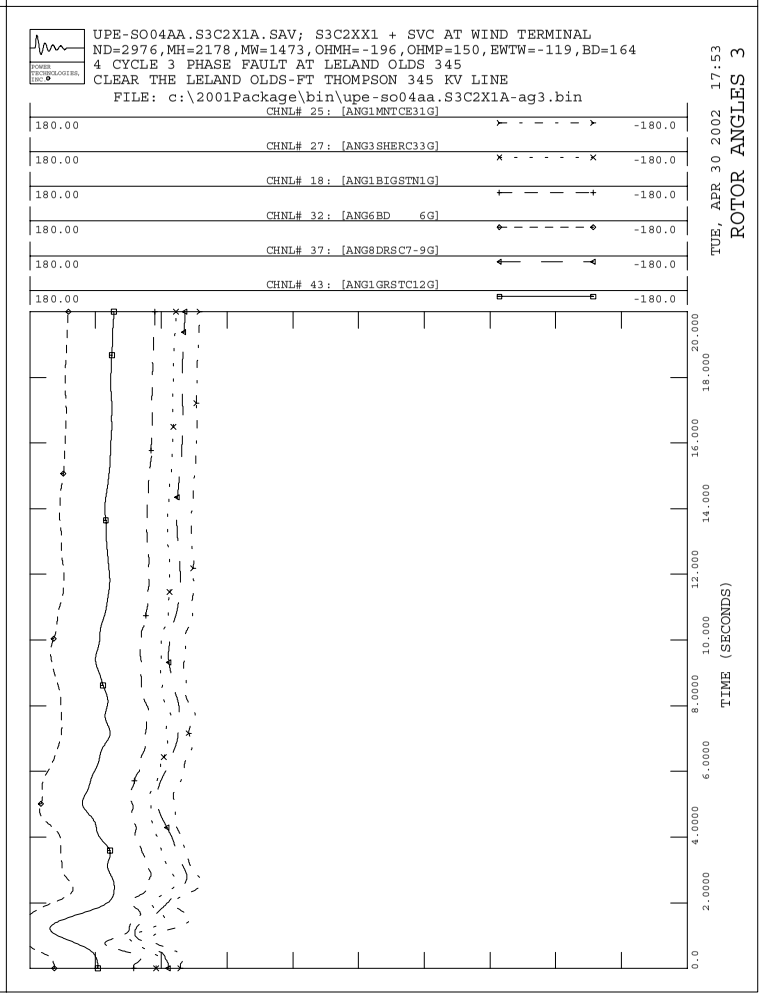
CONTINGENCY AG3

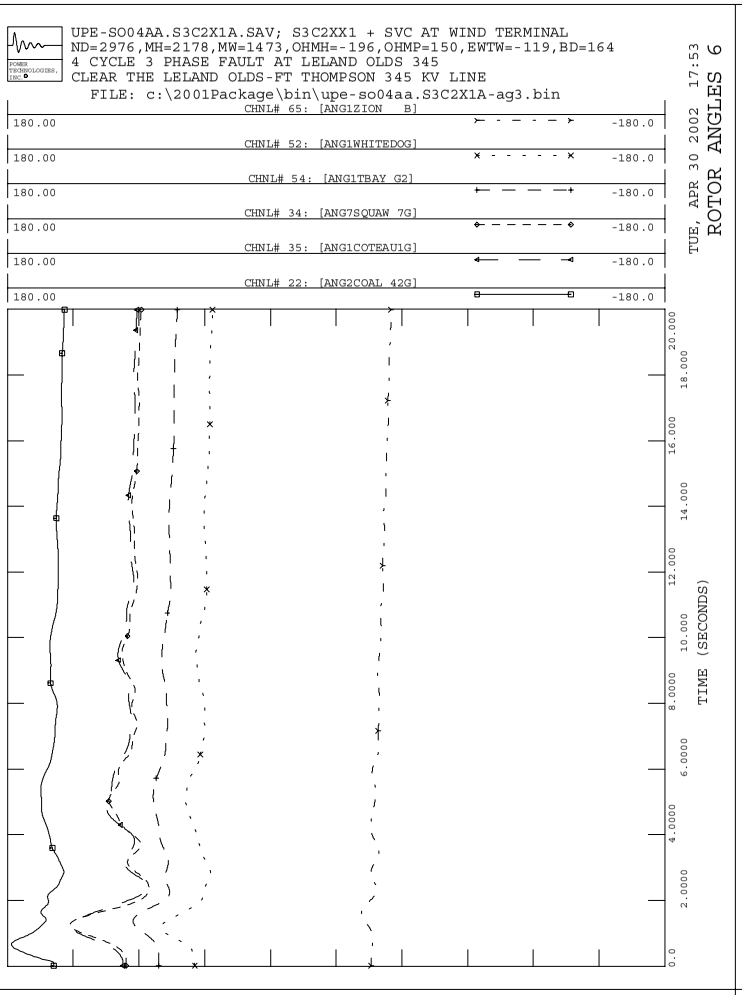
Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

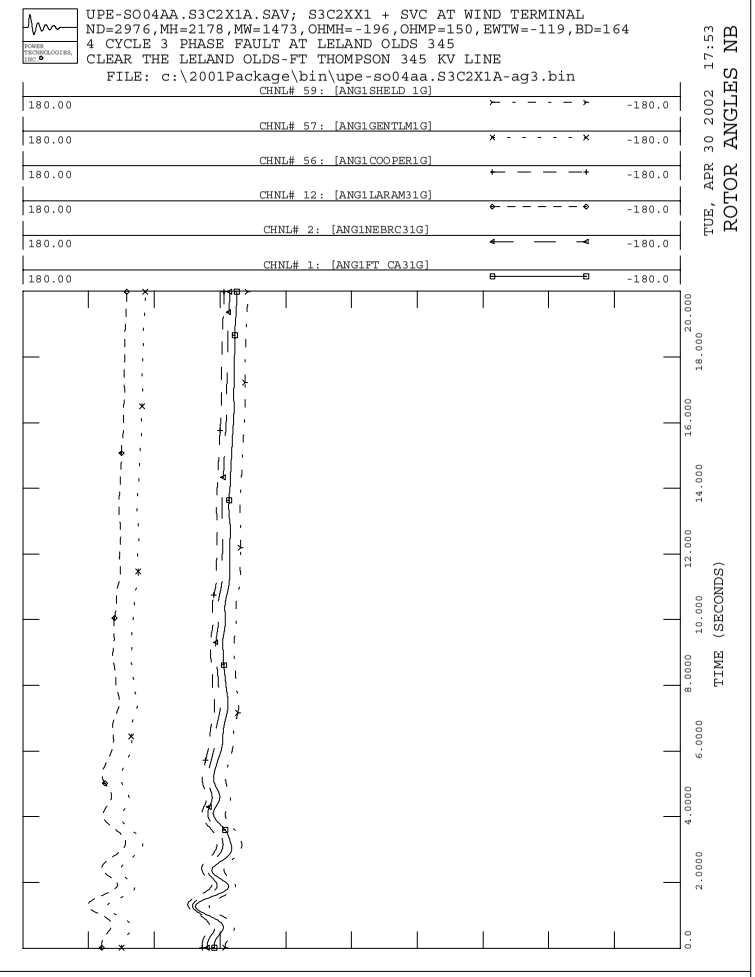

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 17:53
ROTOR ANGLES 2

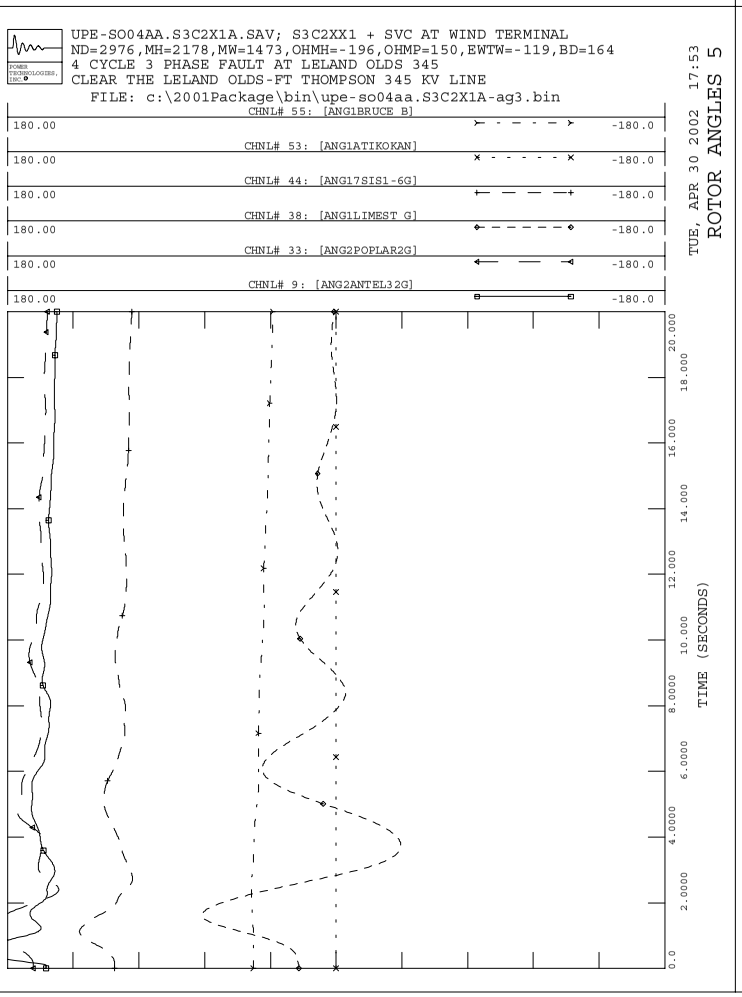

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 17:53
ROTOR ANGLES 4

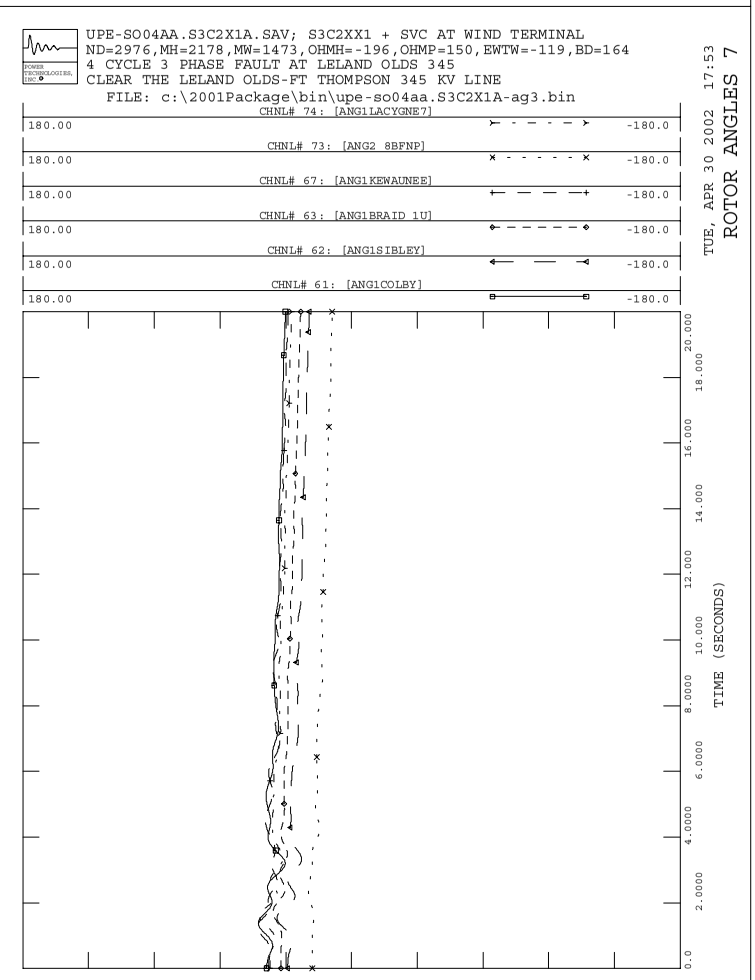

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 17:53
ROTOR ANGLES 1


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 17:53
ROTOR ANGLES 3


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 17:53
ROTOR ANGLES 6


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 17:53
ROTOR ANGLES NB


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 17:53
ROTOR ANGLES 5


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 17:53
ROTOR ANGLES 7

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

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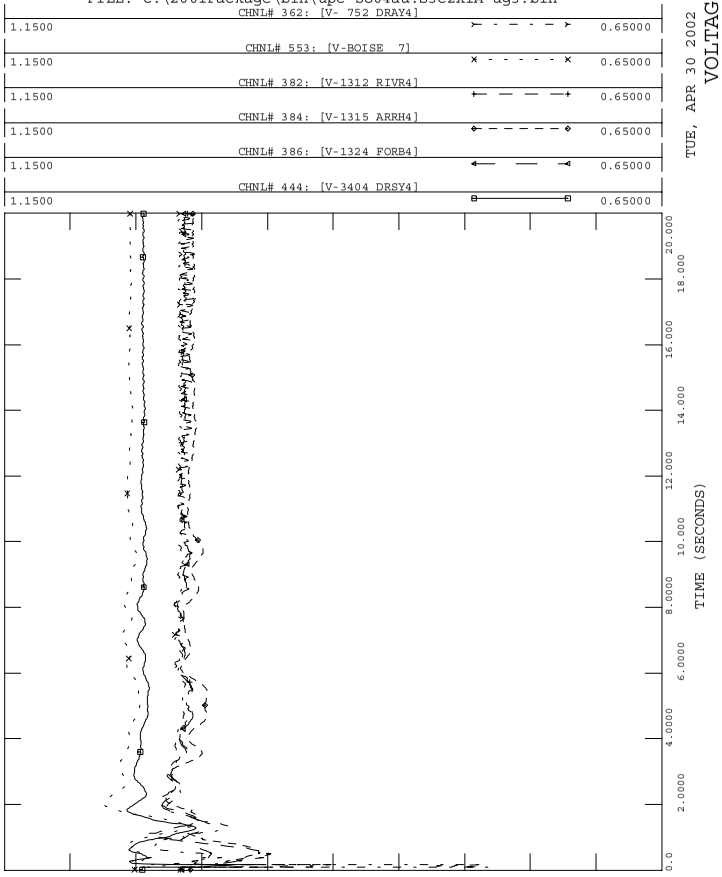
VOLTAGES 1



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

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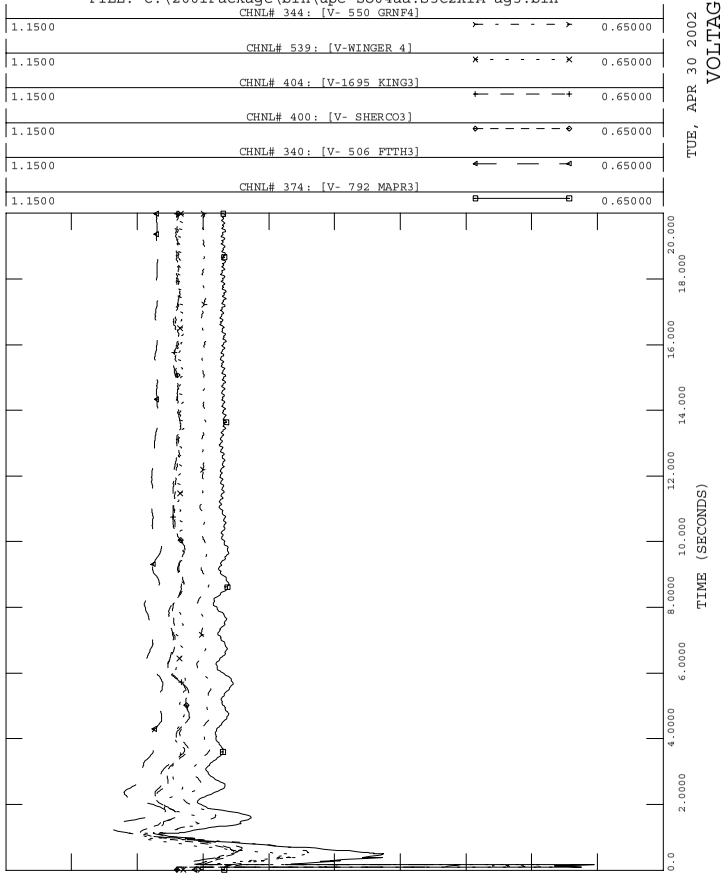
VOLTAGES 3



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

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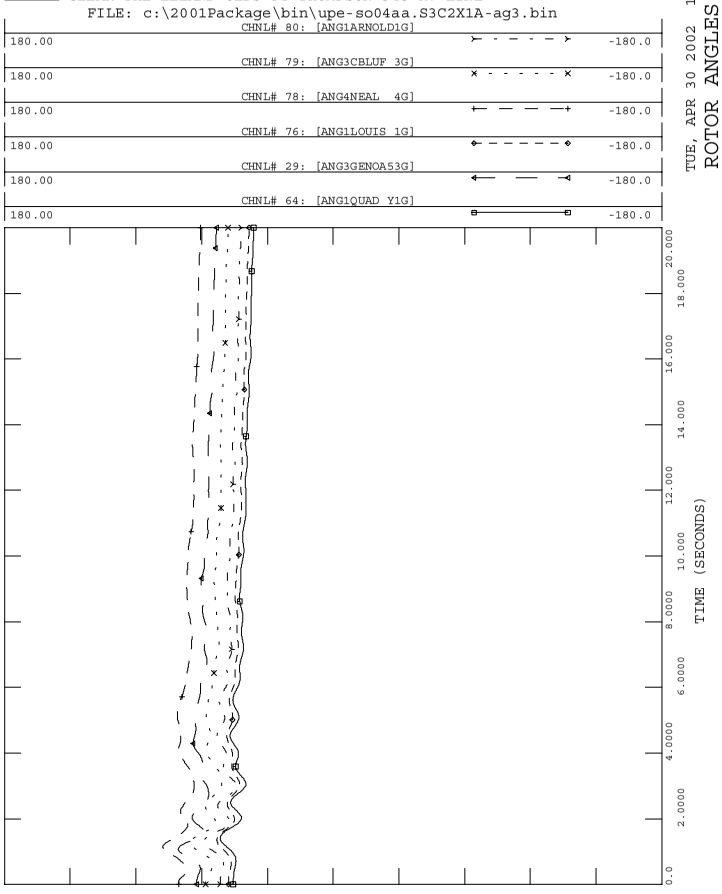
ROTOR ANGLES IA



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

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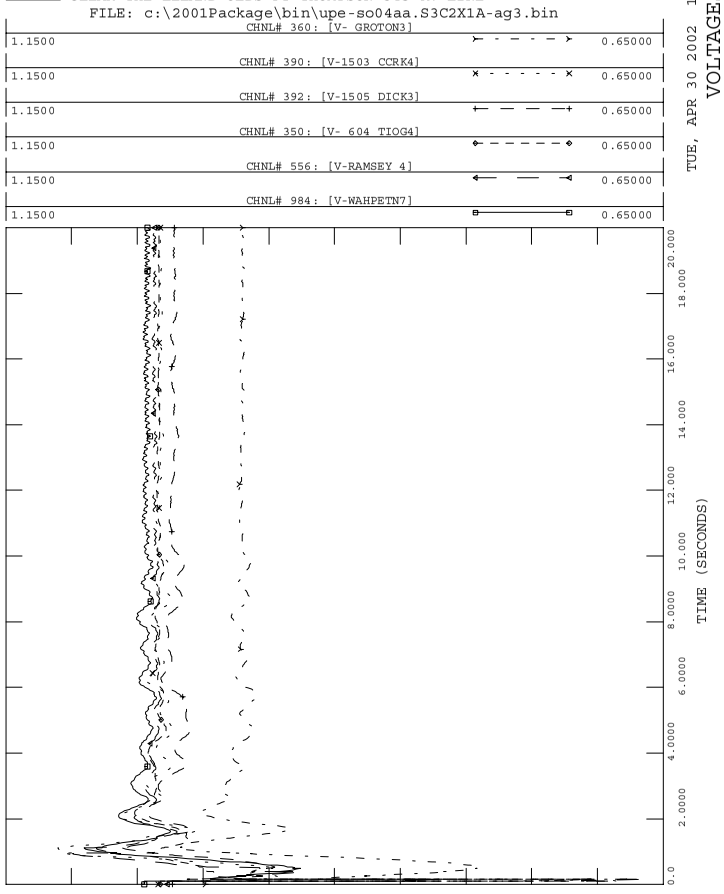
VOLTAGES 2



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

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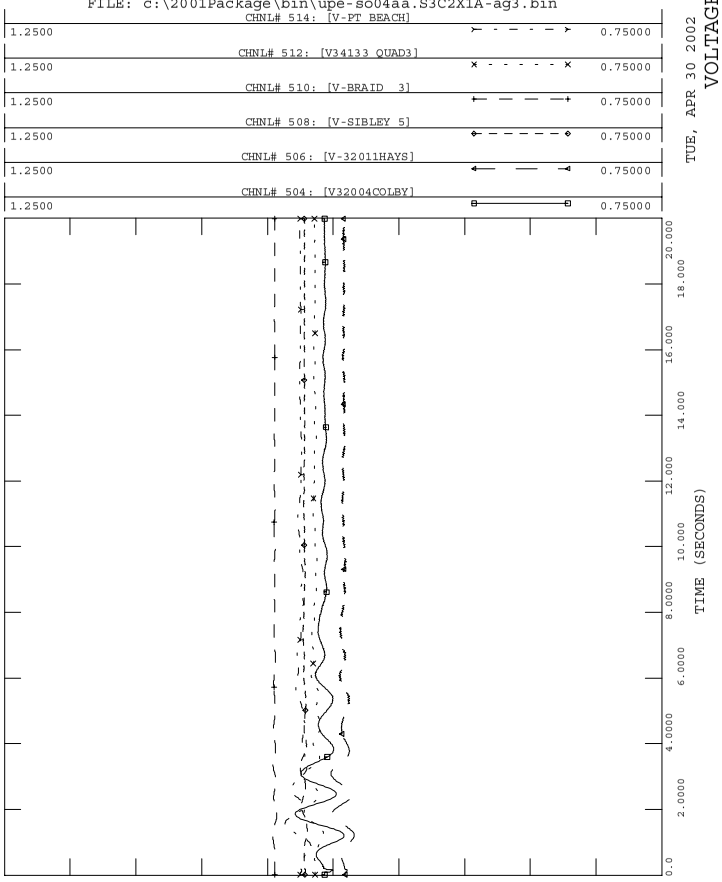
VOLTAGES 5



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

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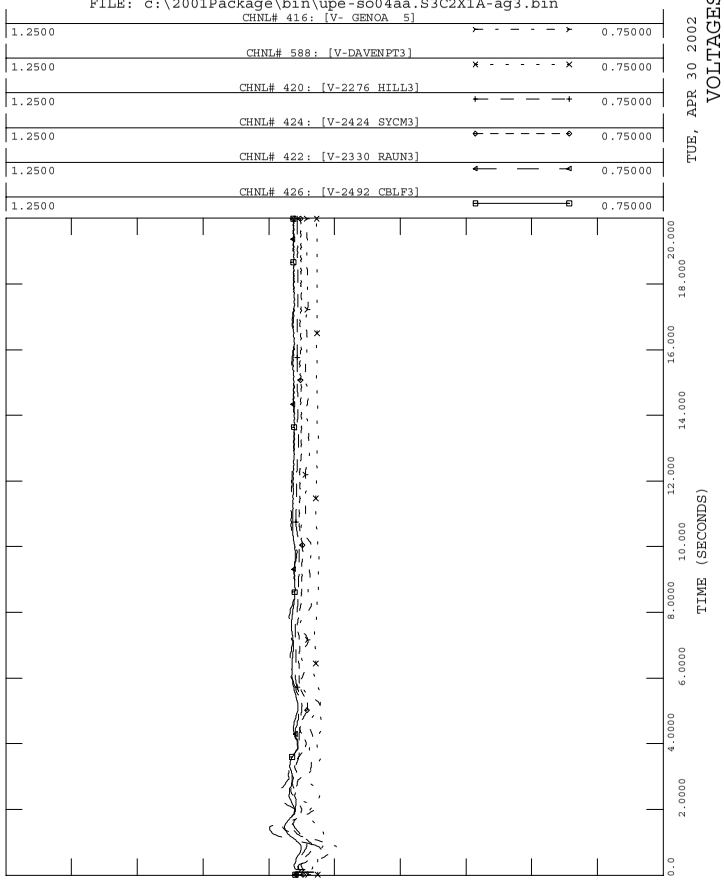
VOLTAGES IA



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

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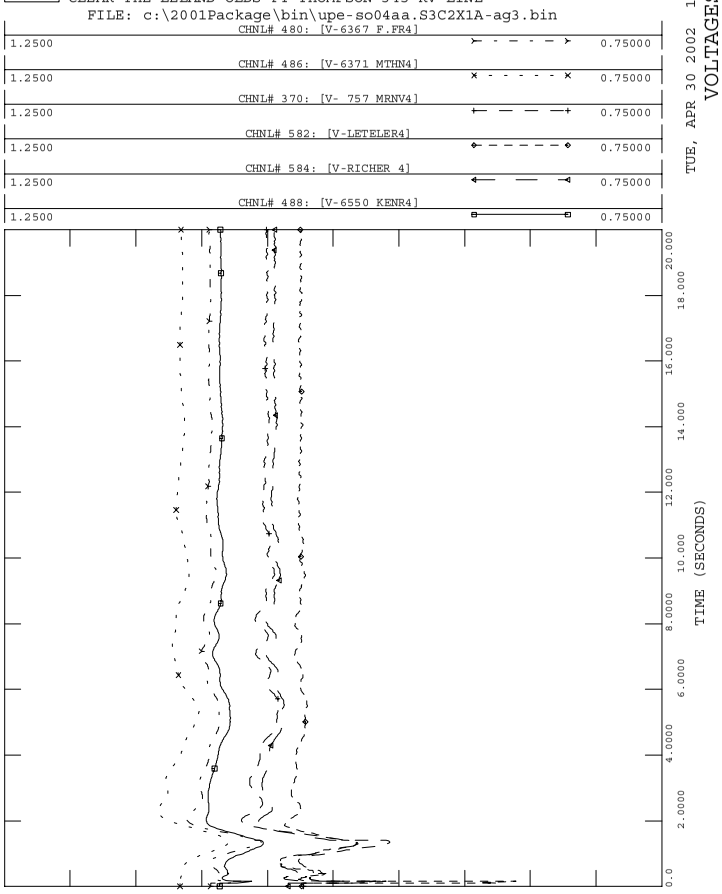
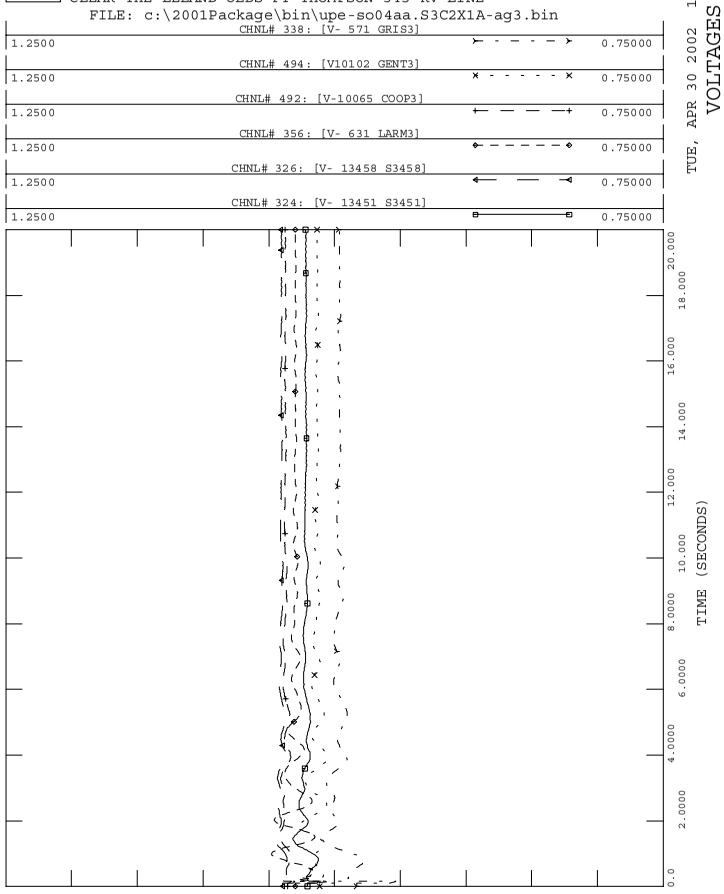
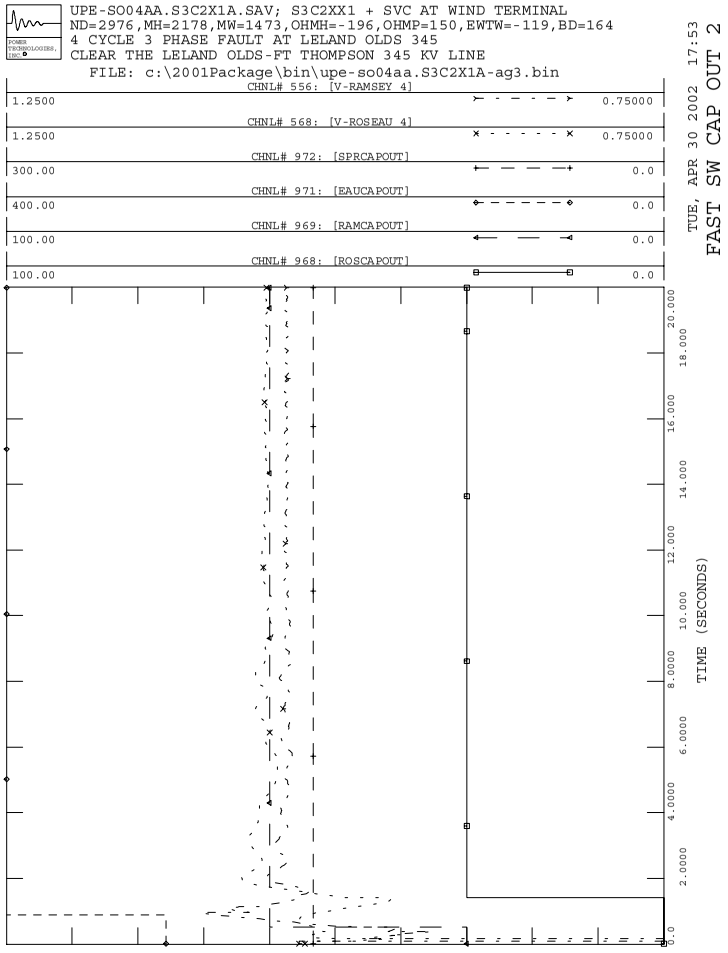
VOLTAGES 4

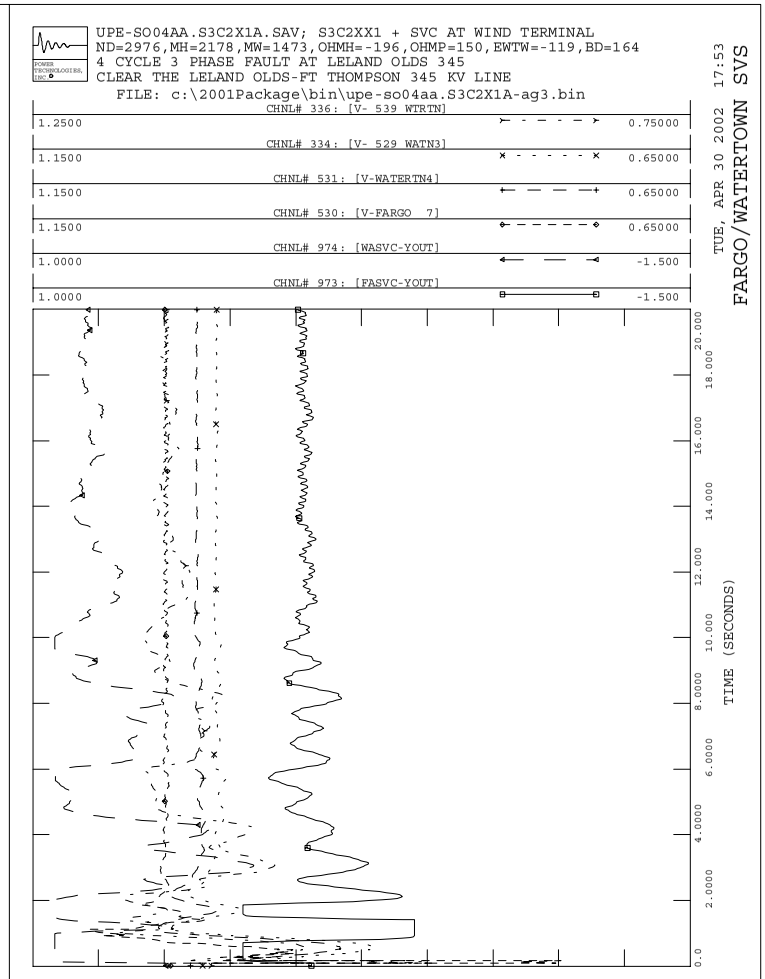


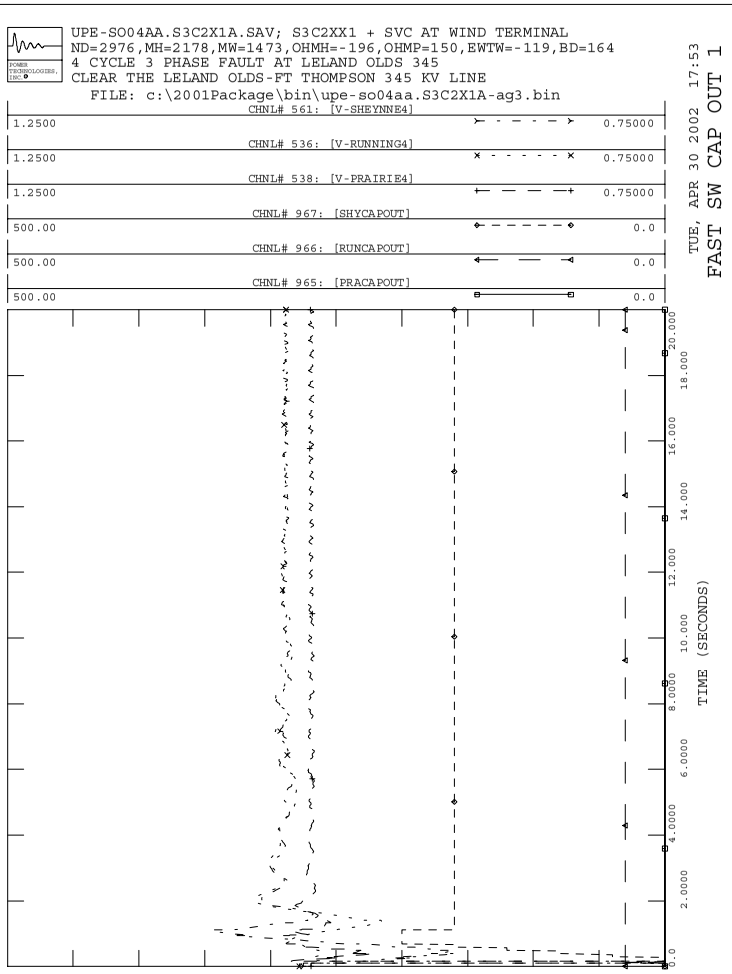
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

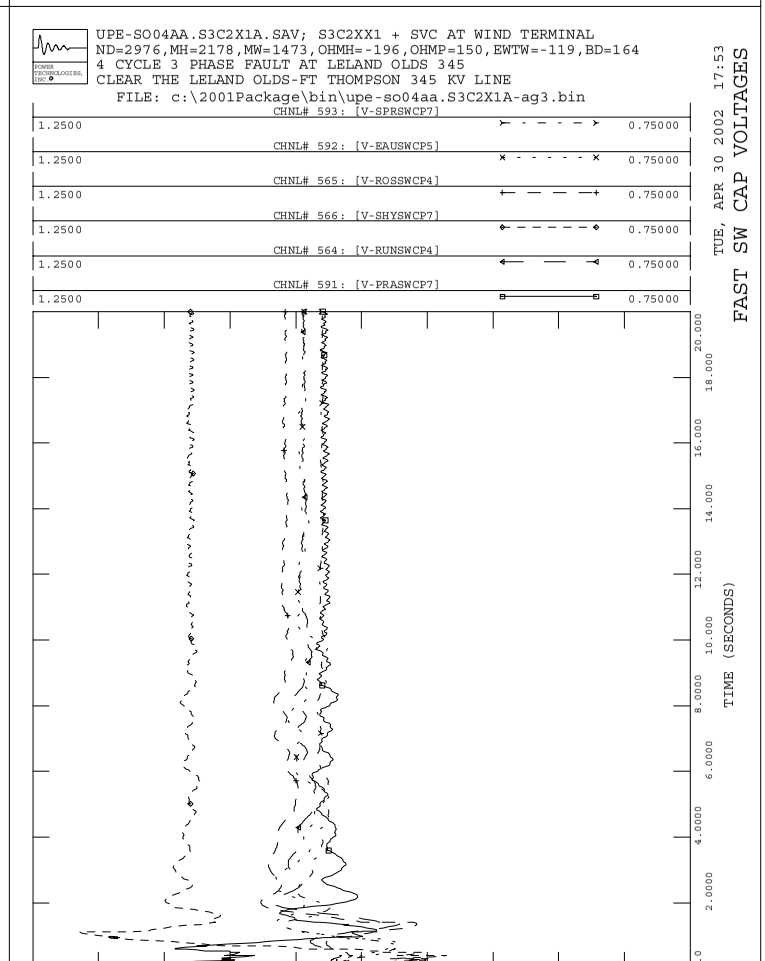
TUE, APR 30 2002 17:53
VOLTAGES NB




UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
TUE, APR 30 2002 17:53
FAST SW CAP OUT 2


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
TUE, APR 30 2002 17:53
FARGO/WATERTOWN SVS

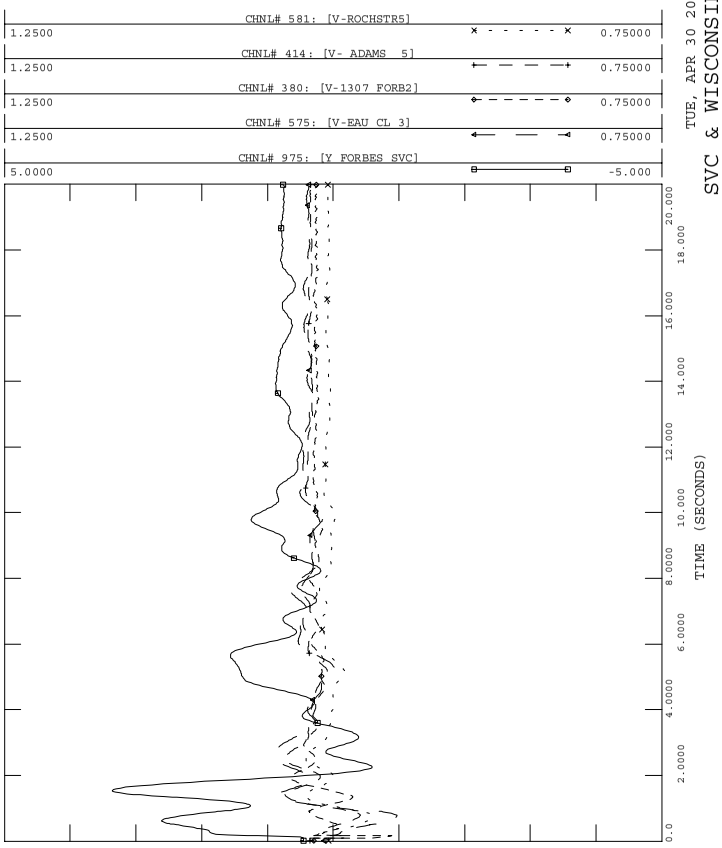

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
TUE, APR 30 2002 17:53
FAST SW CAP OUT 1


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
TUE, APR 30 2002 17:53
FAST SW CAP VOLTAGES

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

TUE, APR 30 2002 17:53

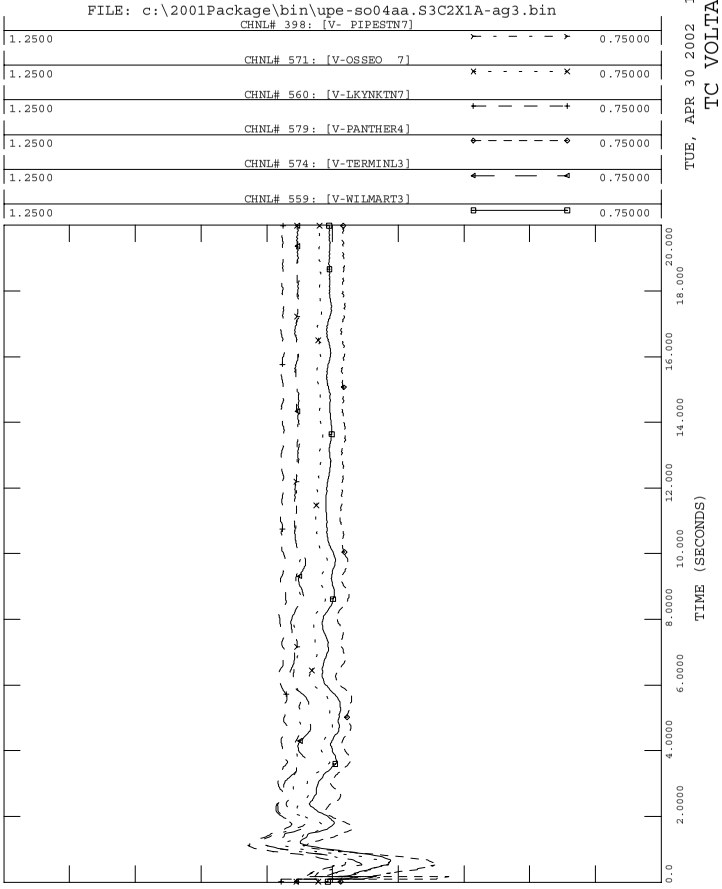
SVC & WISCONSIN VOLT



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

TUE, APR 30 2002 17:53

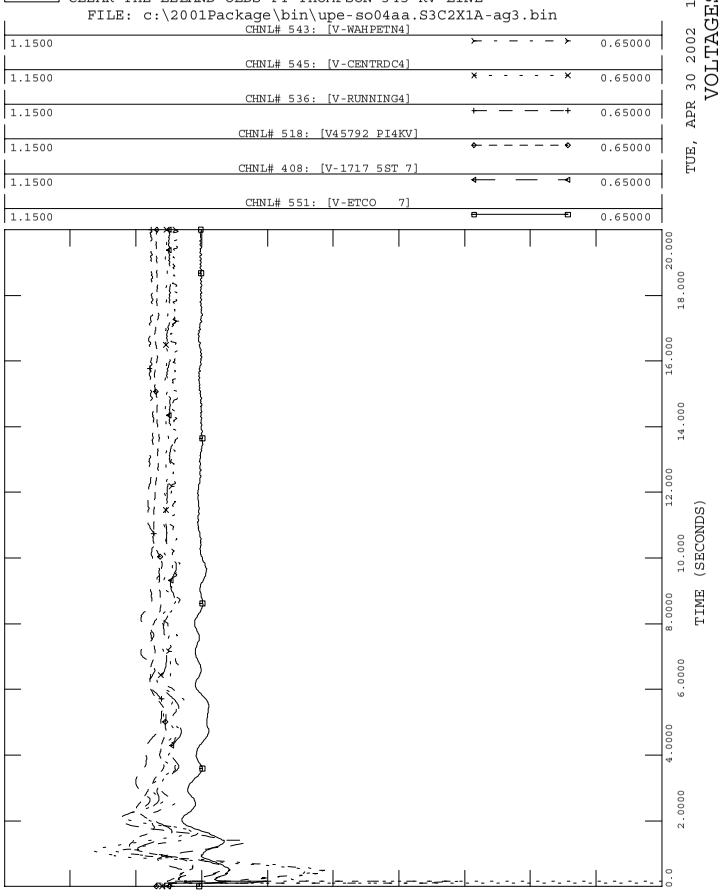
TC VOLTAGES



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

TUE, APR 30 2002 17:53

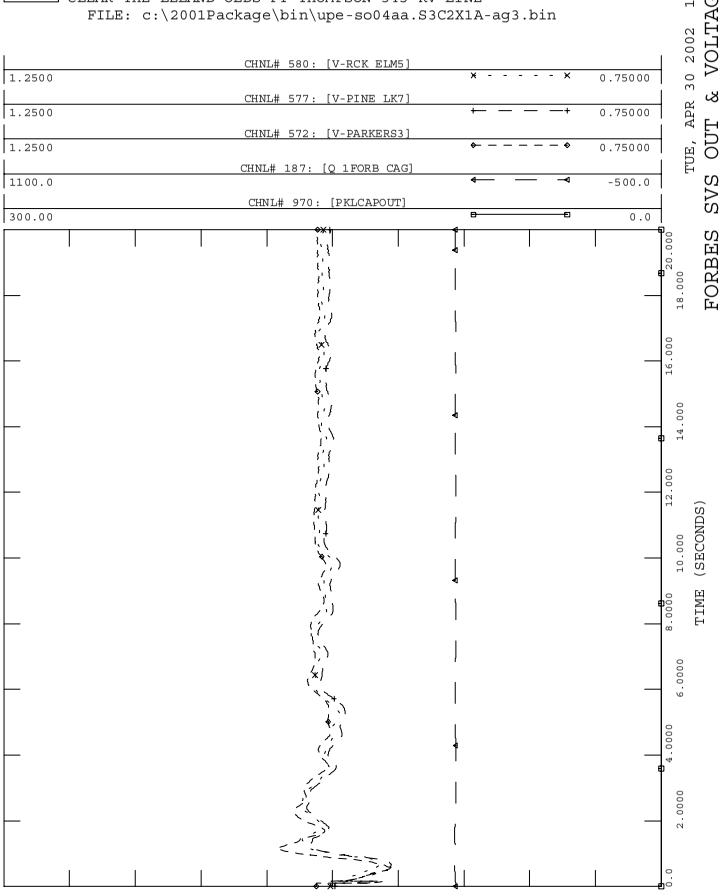
VOLTAGES 6



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

TUE, APR 30 2002 17:53

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
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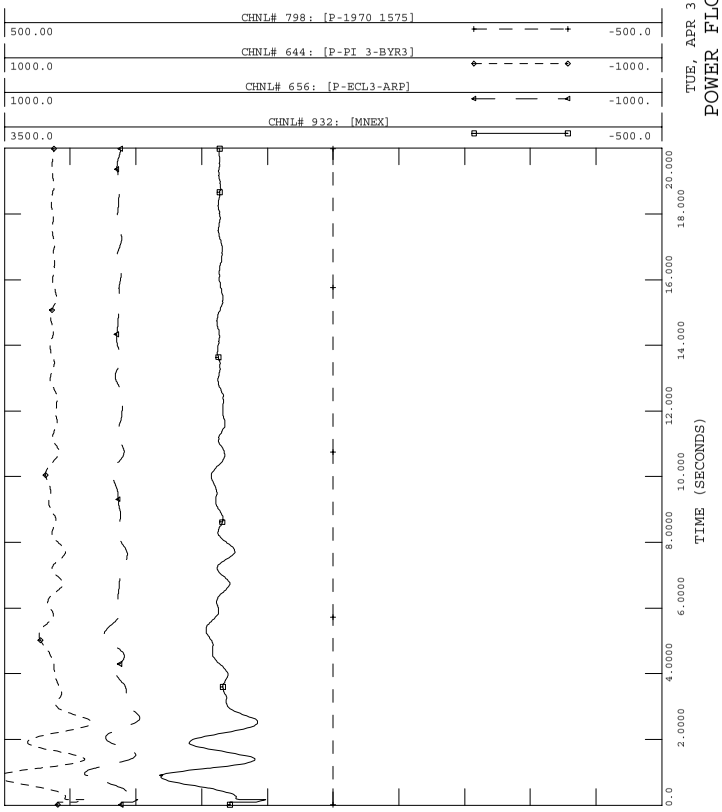
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

TUE, APR 30 2002 17:53
POWER FLOW SUMS 2



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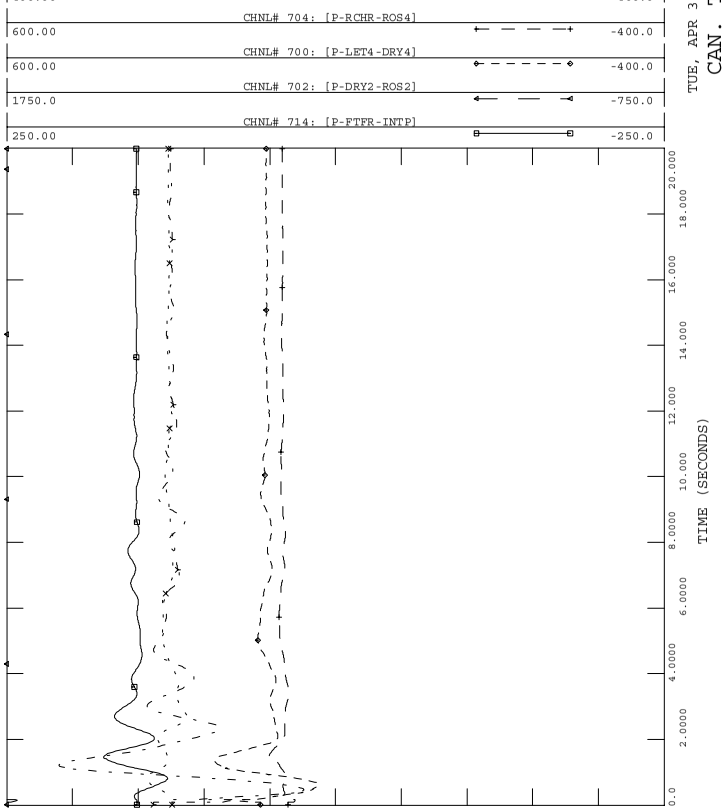
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

TUE, APR 30 2002 17:53
CAN. TIE FLOWS



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
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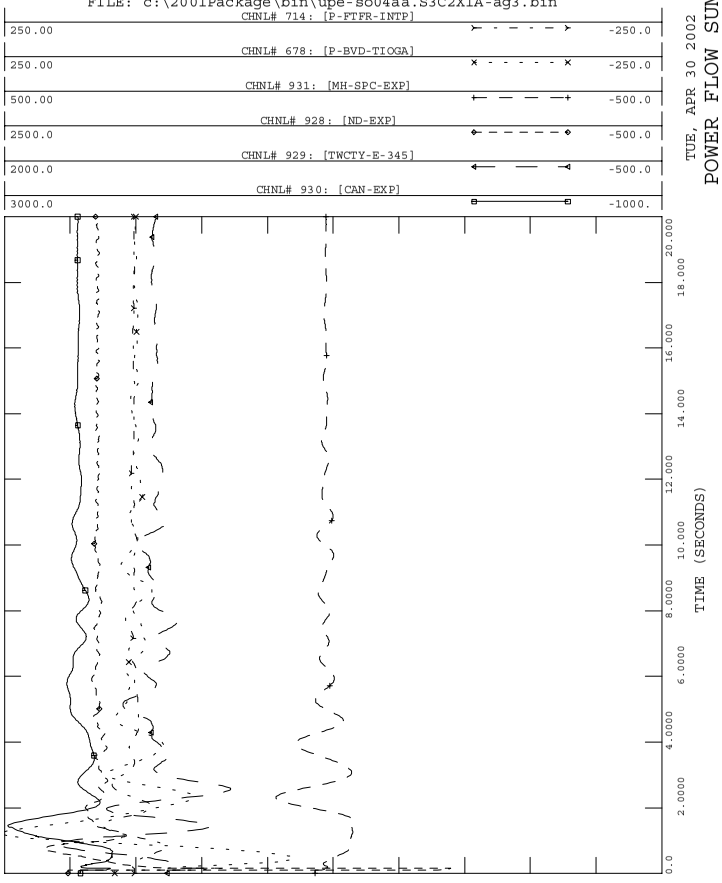
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

TUE, APR 30 2002 17:53
POWER FLOW SUMS 1



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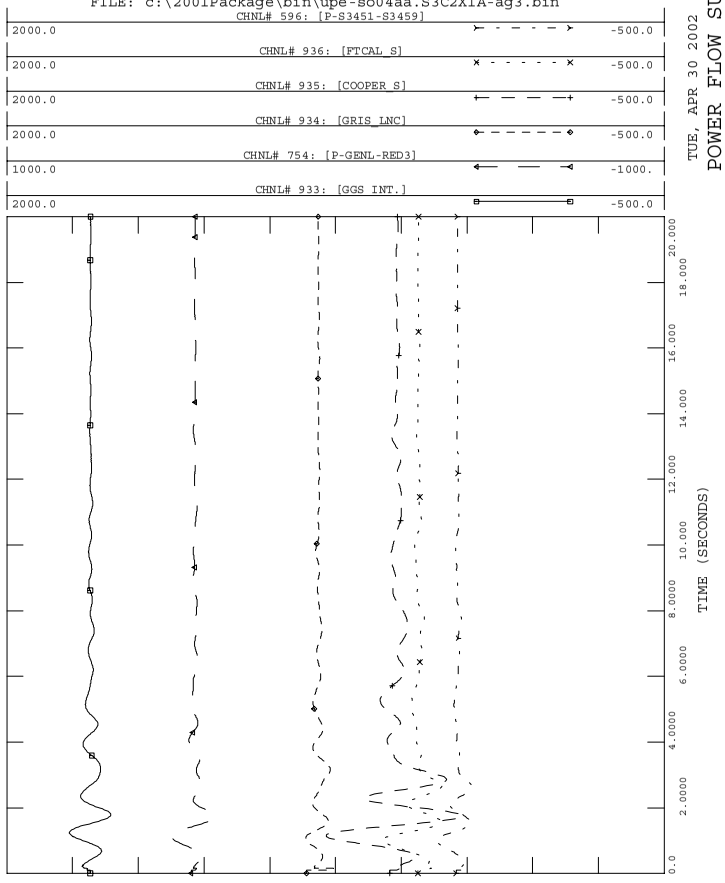
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

TUE, APR 30 2002 17:53
POWER FLOW SUM 3



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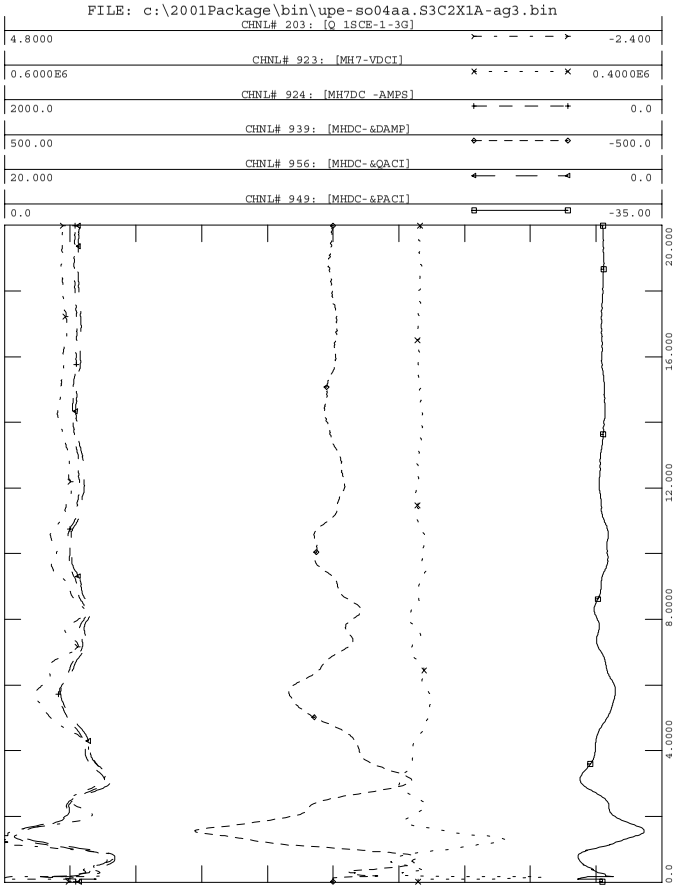
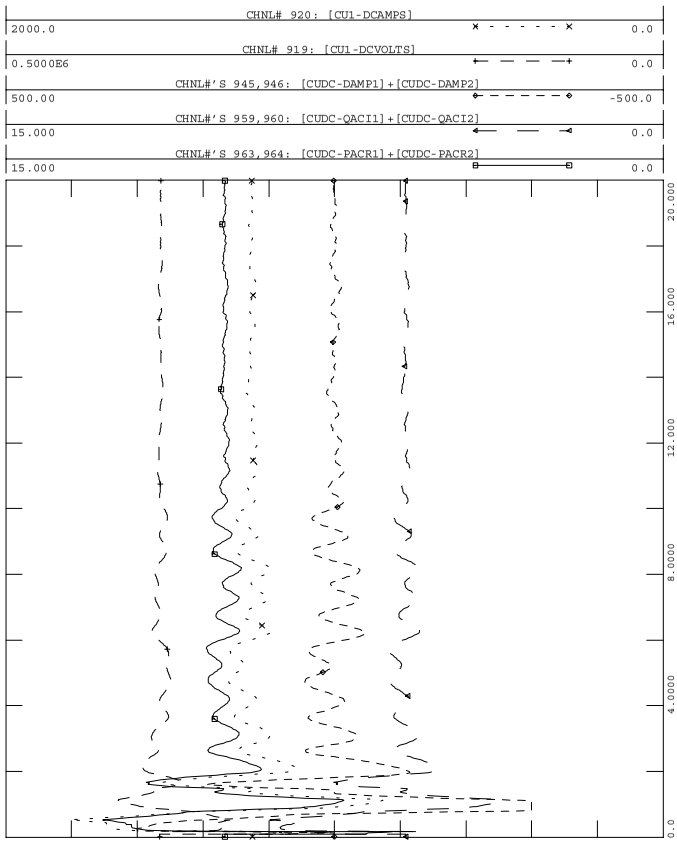
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

TUE, APR 30 2002 17:53
MH DC PARAMETERS



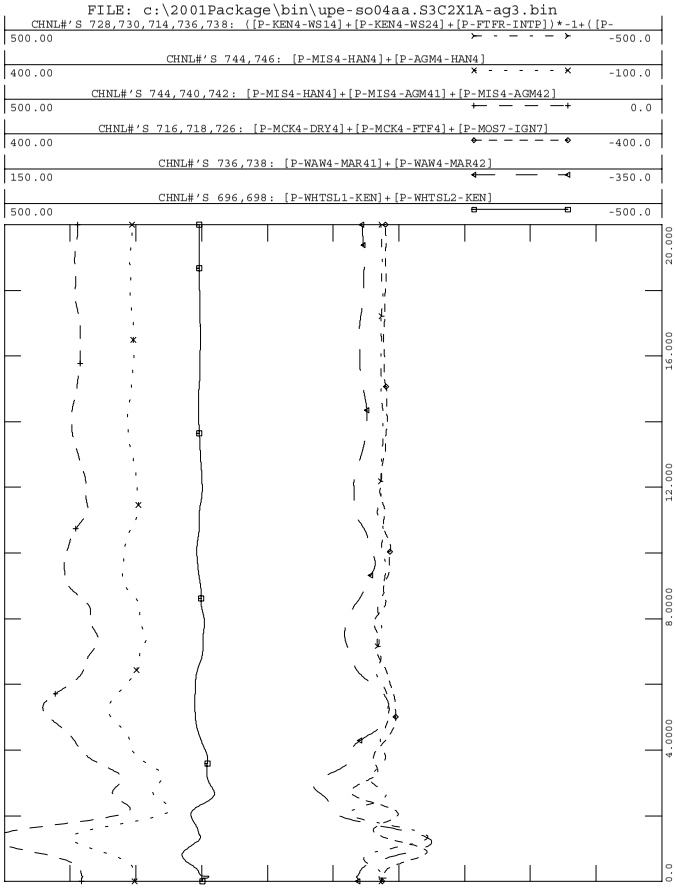
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

TUE, APR 30 2002 17:53
CU DC #1



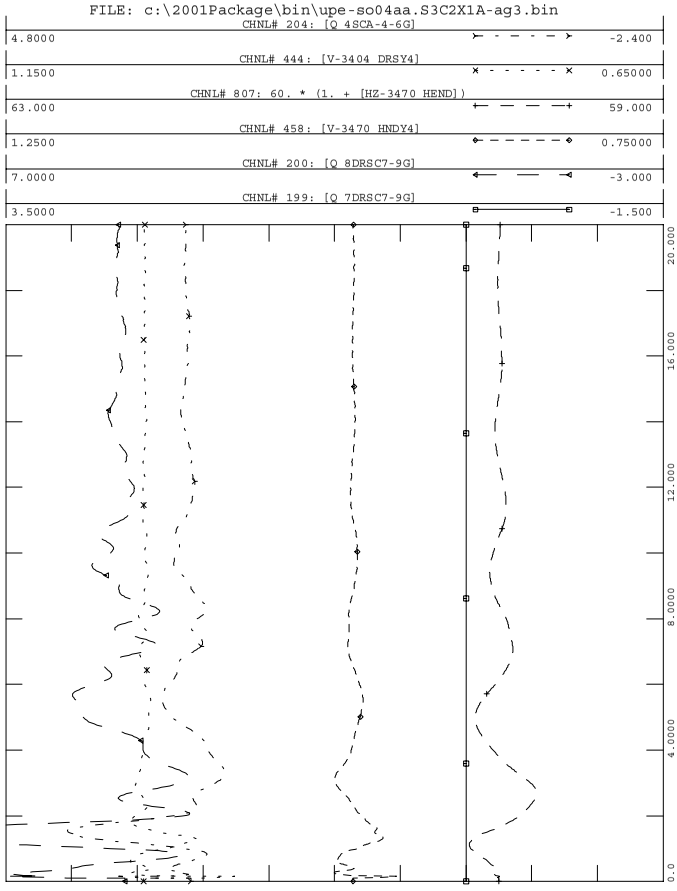
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

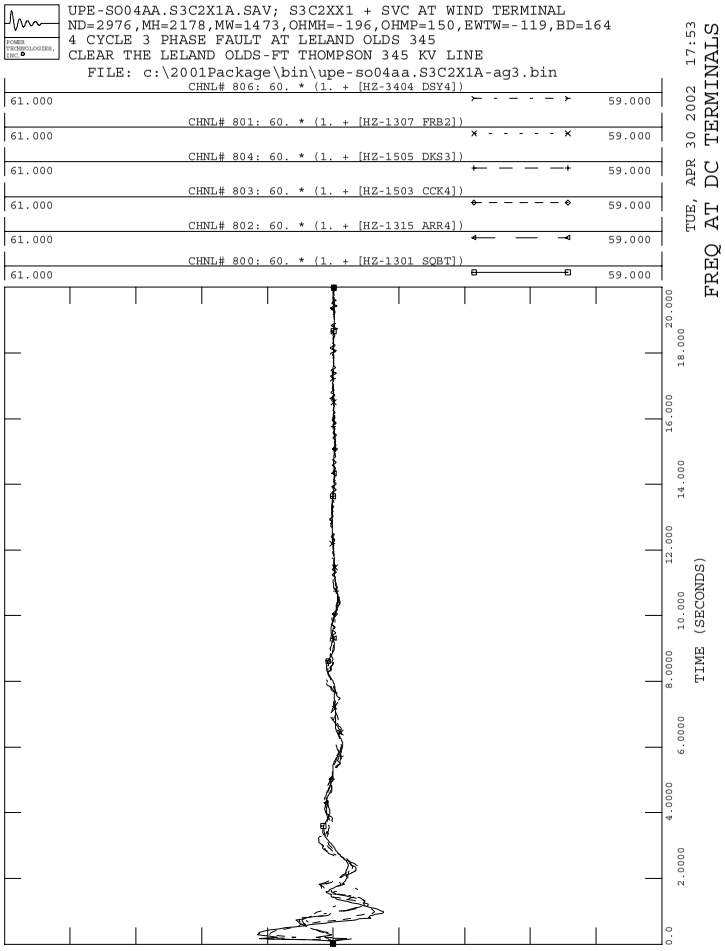
TUE, APR 30 2002 17:53
OH TIE FLOWS

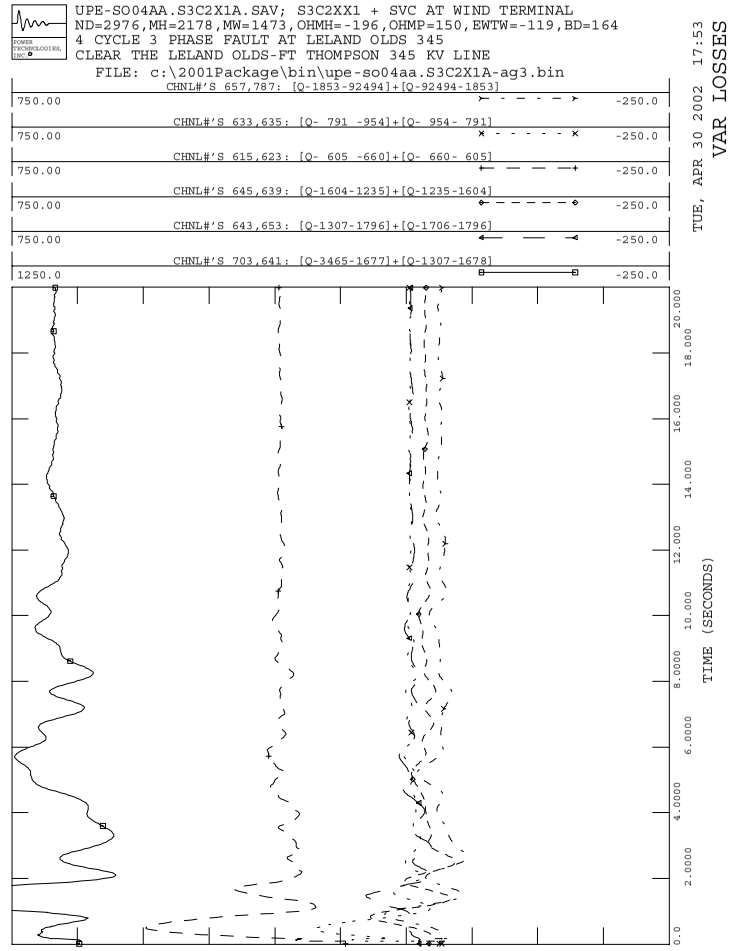


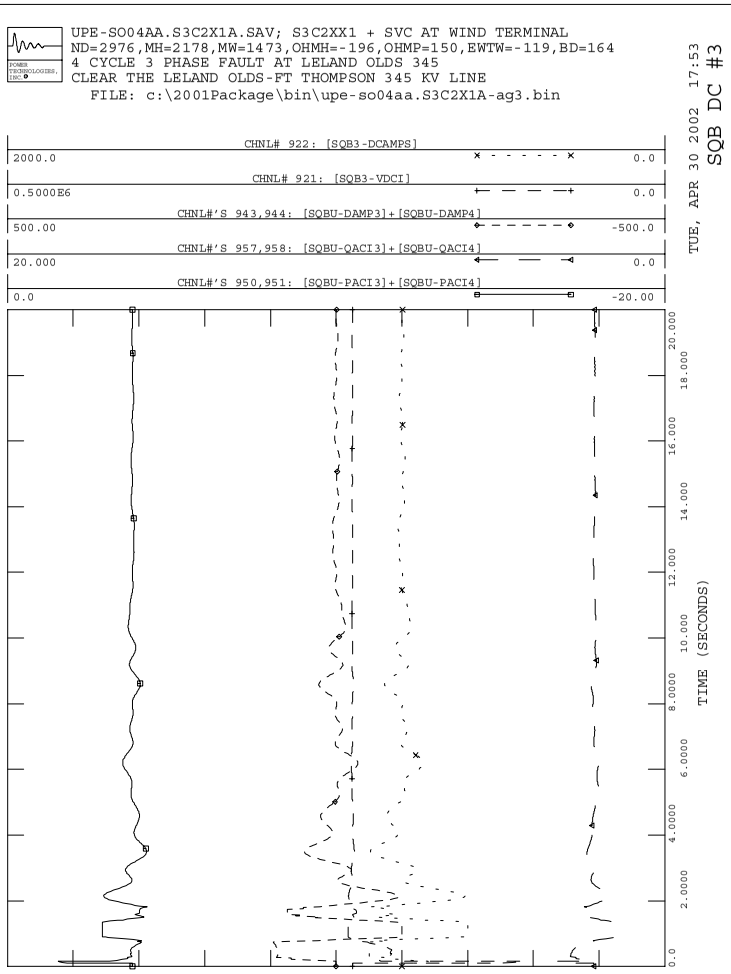
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

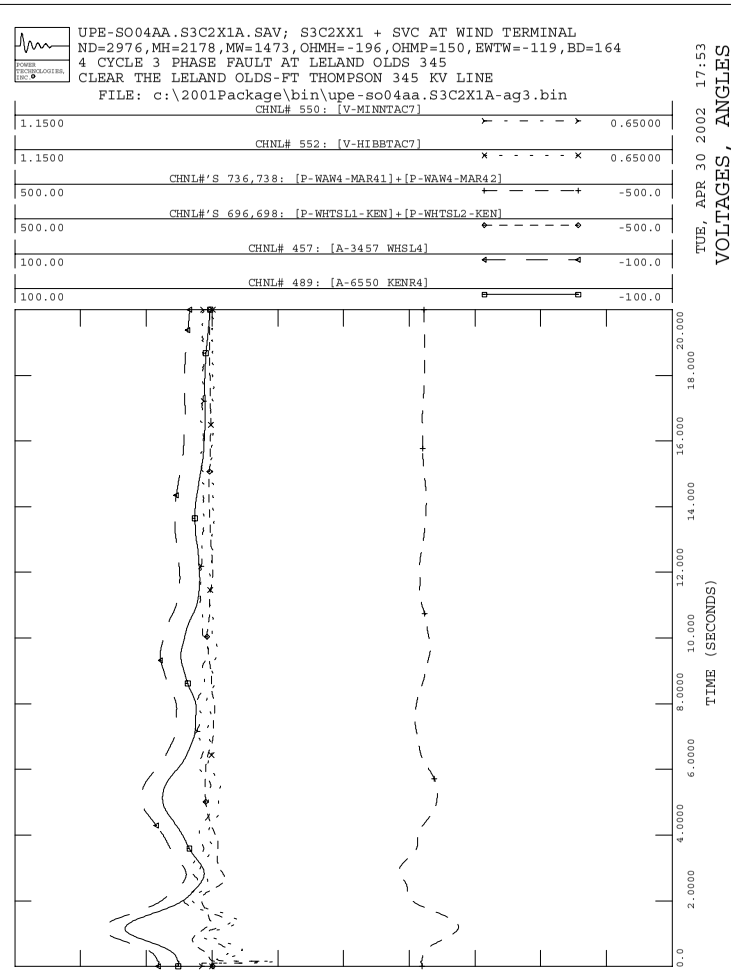
TUE, APR 30 2002 17:53
MH DC PARAMETERS




UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
TUE, APR 30 2002 17:53
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
TUE, APR 30 2002 17:53
VAR LOSSES
TIME (SECONDS)

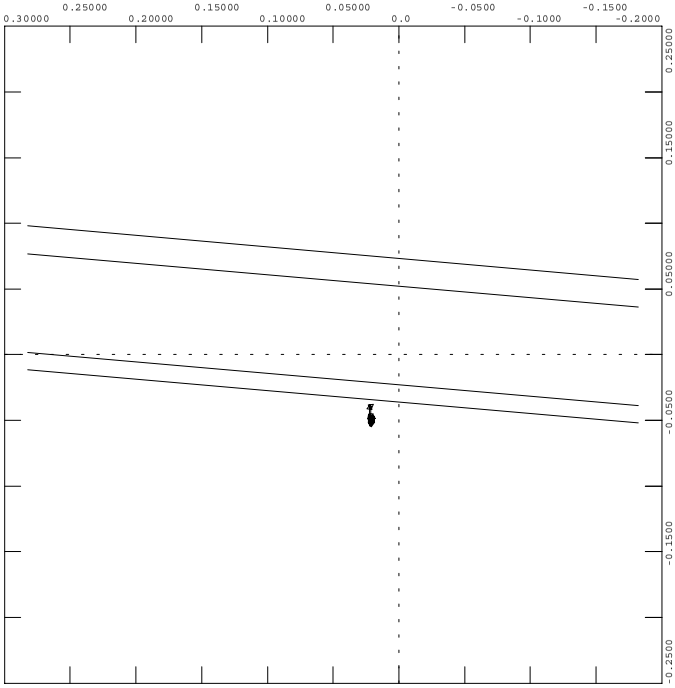

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
0.0
-20.00
TUE, APR 30 2002 17:53
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
TUE, APR 30 2002 17:53
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

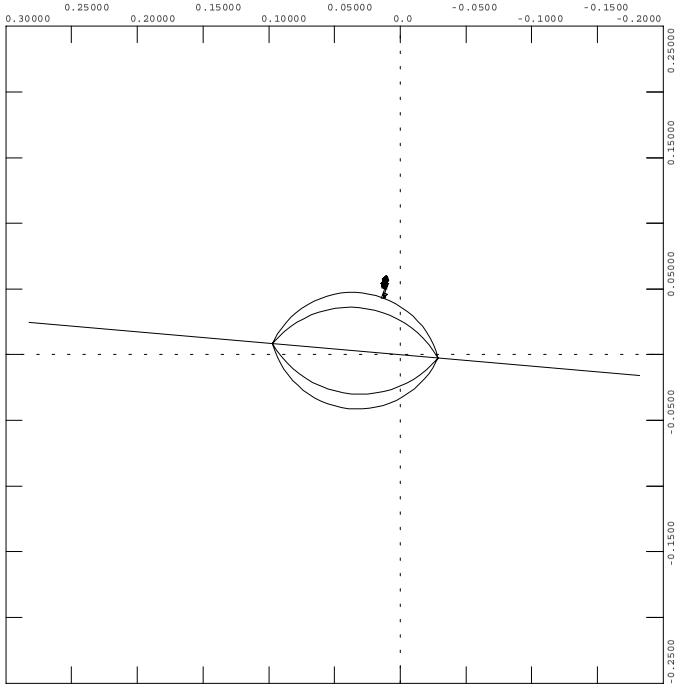


TUE, APR 30 2002 17:53
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

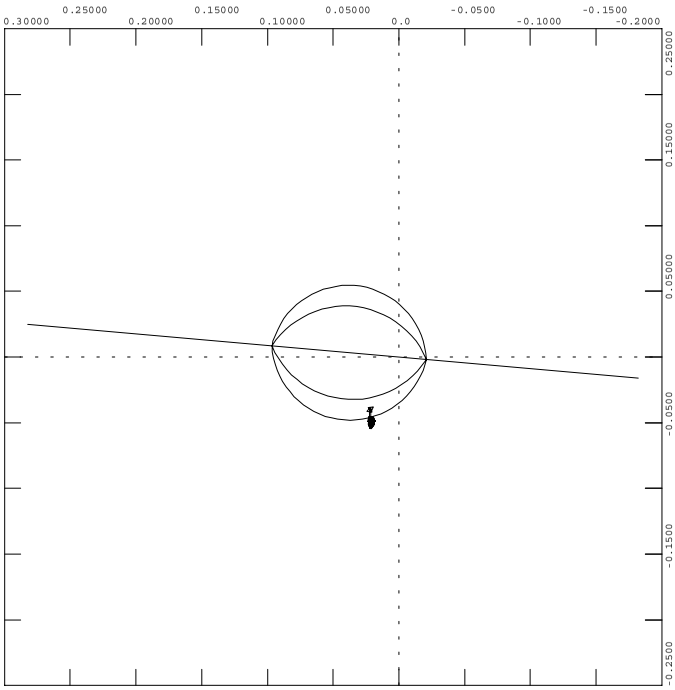


TUE, APR 30 2002 17:53
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

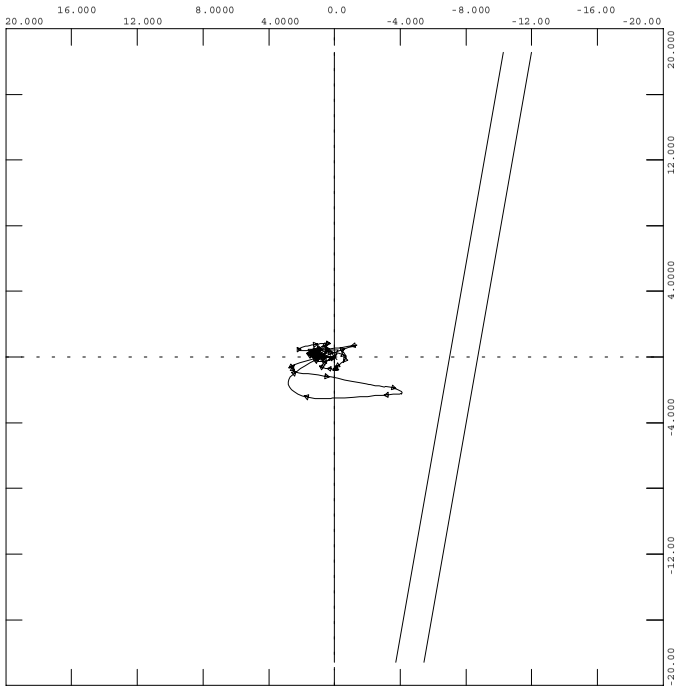


TUE, APR 30 2002 17:53
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

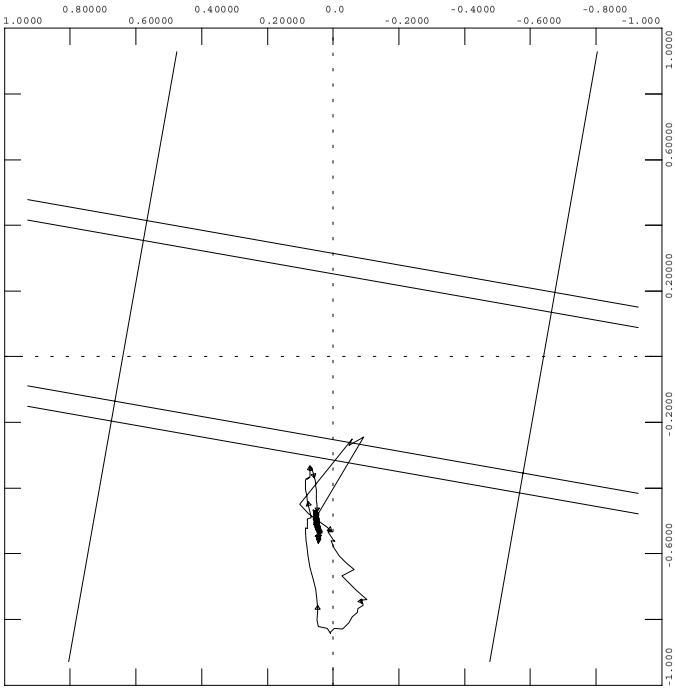


TUE, APR 30 2002 17:53
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

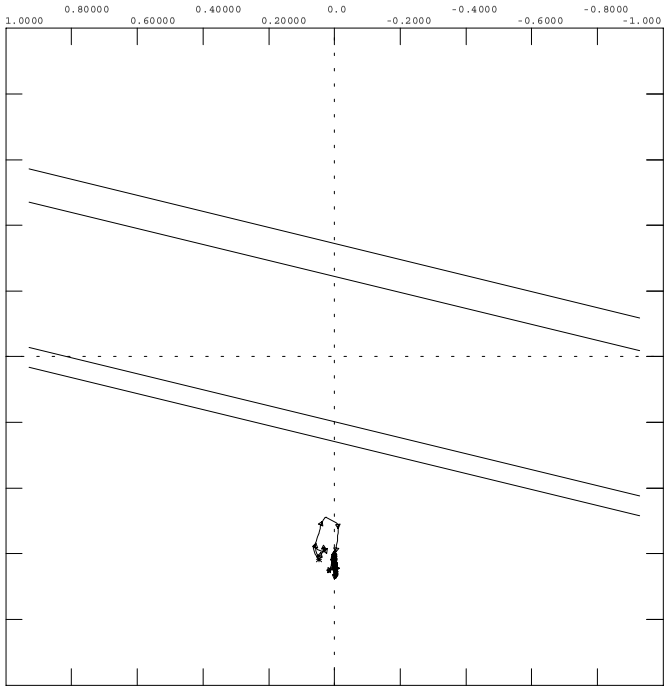
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

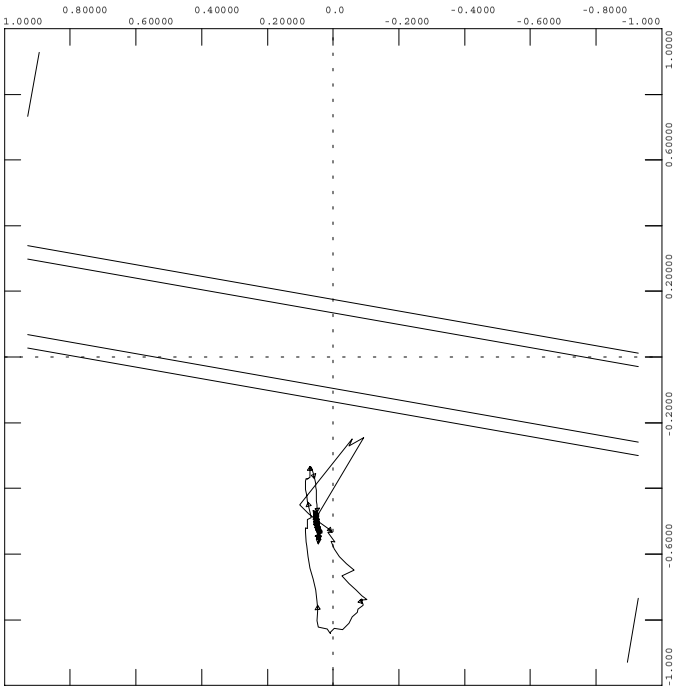
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

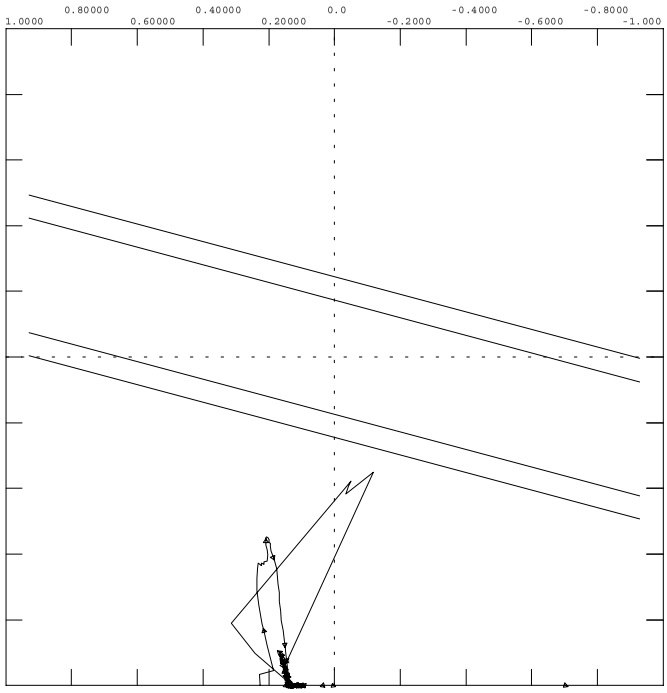
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

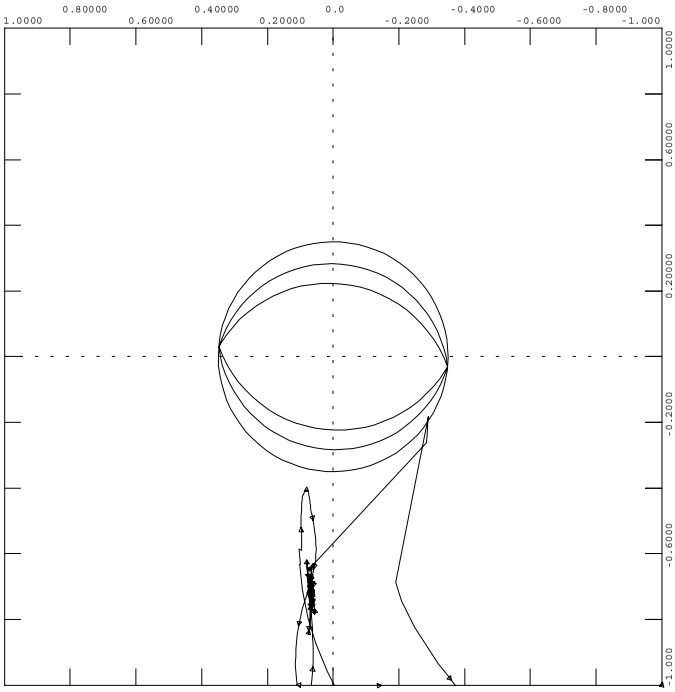
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

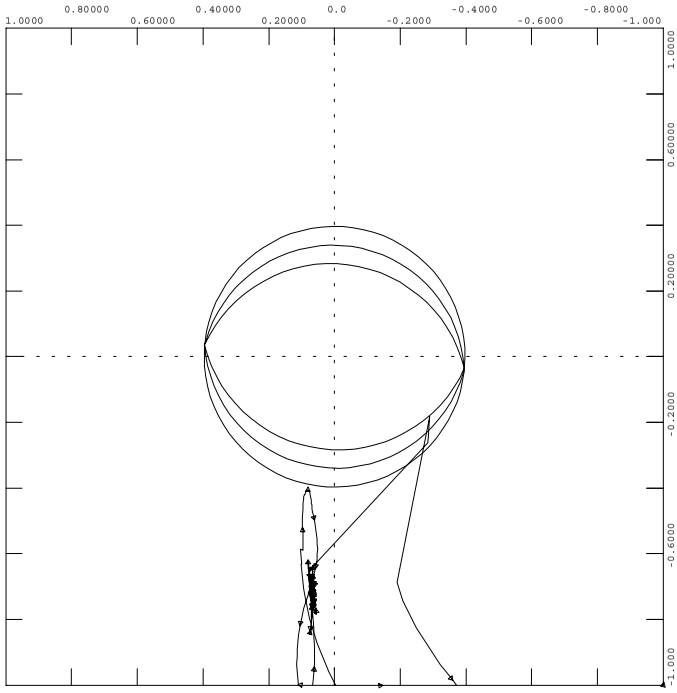


TUE, APR 30 2002 17:53
TIOGA-B.DAM-SOUTH (266)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

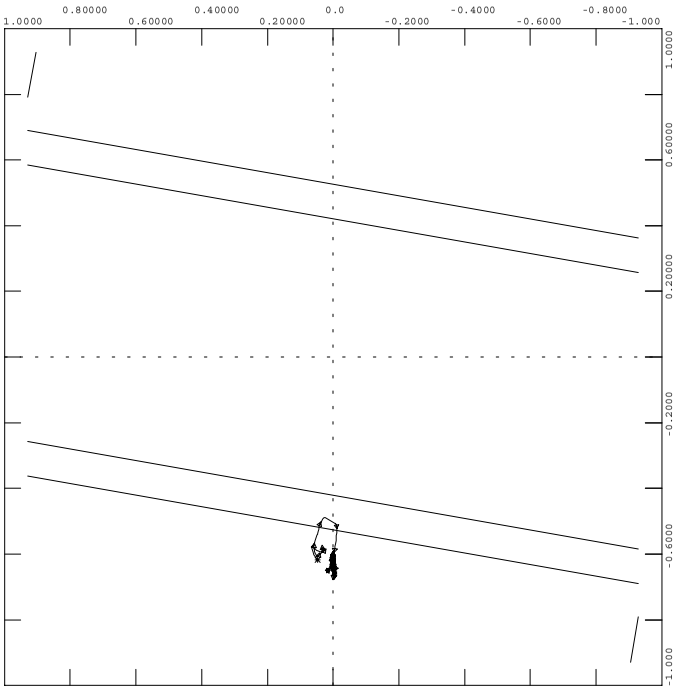


TUE, APR 30 2002 17:53
TIOGA-B.DAM-EMRG (267)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

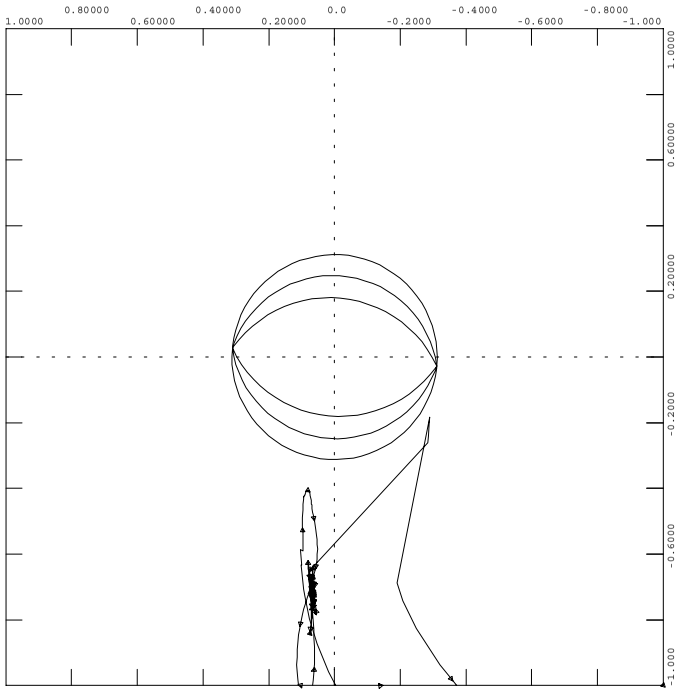


TUE, APR 30 2002 17:53
R50M-MORANVILLE-EMRG (777

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

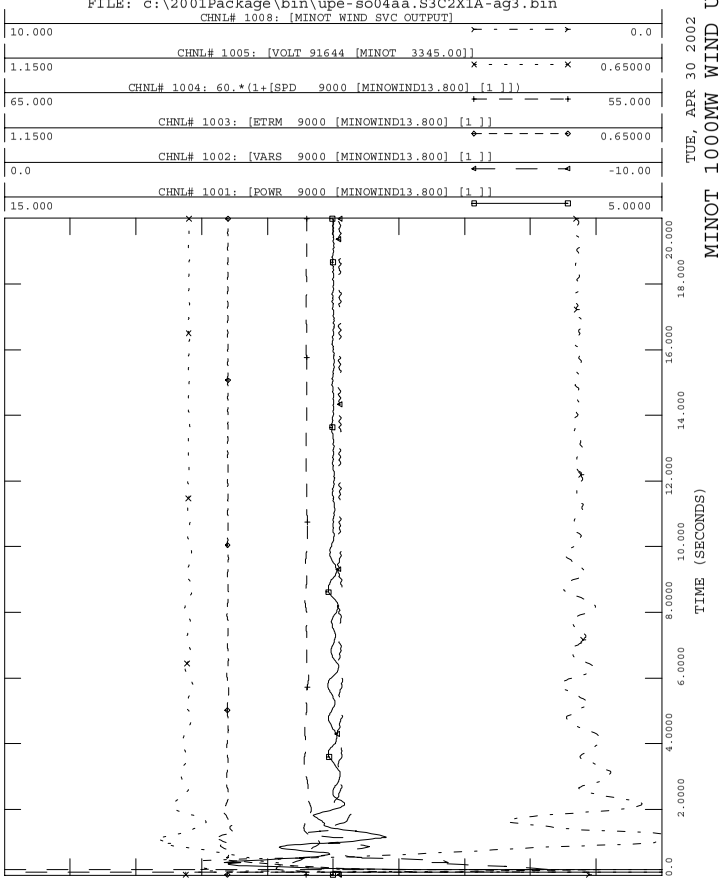
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



TUE, APR 30 2002 17:53
TIOGA-B.DAM-NORTH (268)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

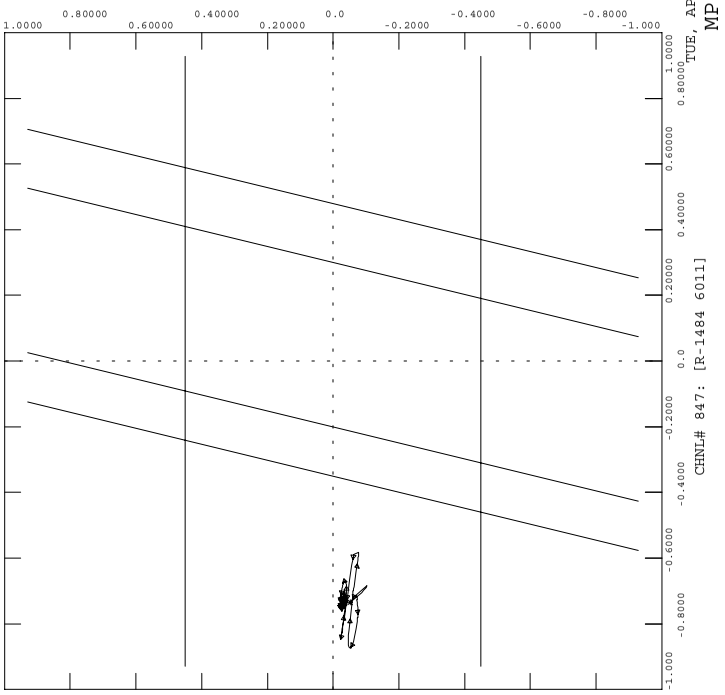


TUE, APR 30 2002 17:53
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

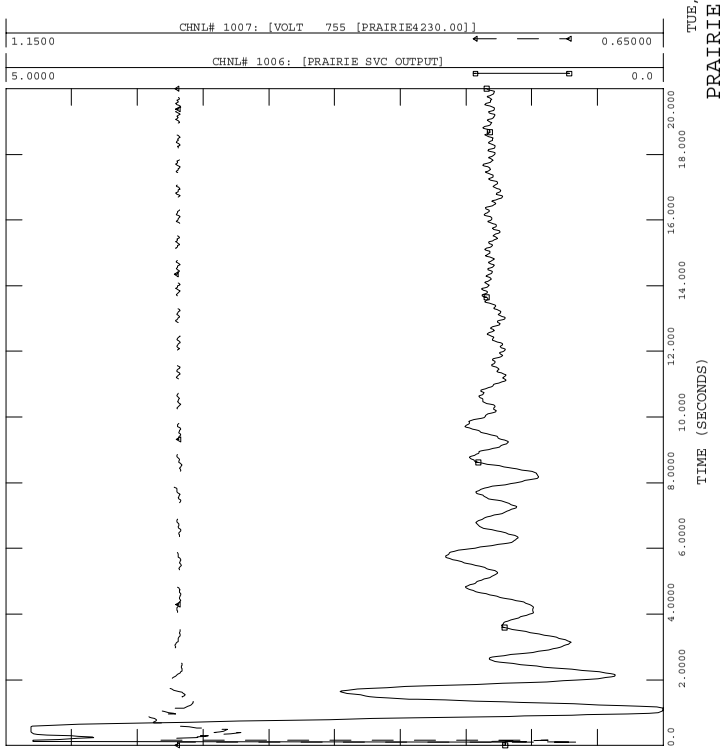
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



TUE, APR 30 2002 17:53
MP-OH I.FALLS (779)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ag3.bin



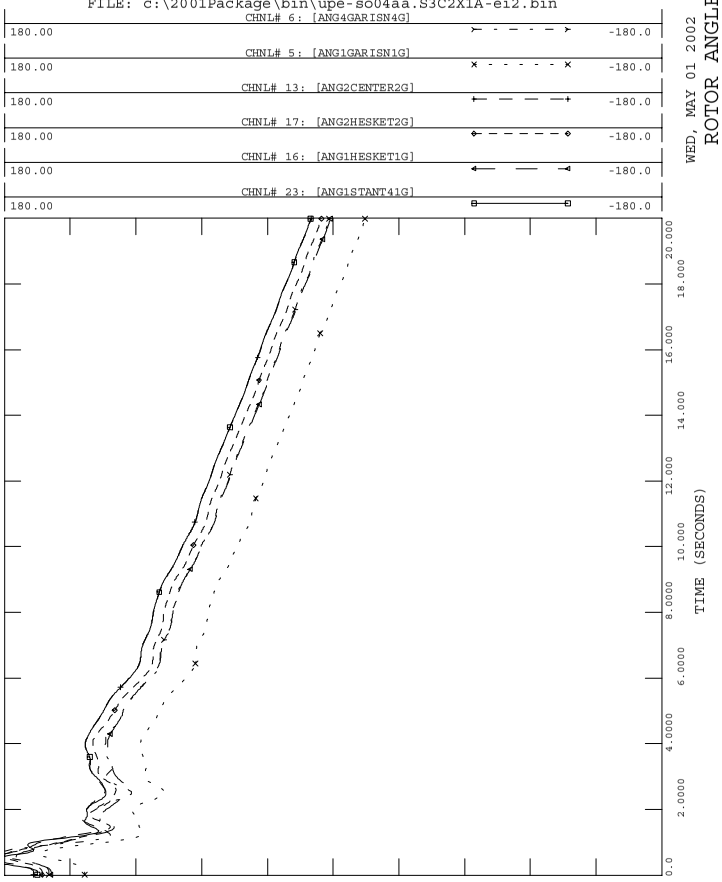
TUE, APR 30 2002 17:53
PRAIRIE SVC RESPONSE

CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

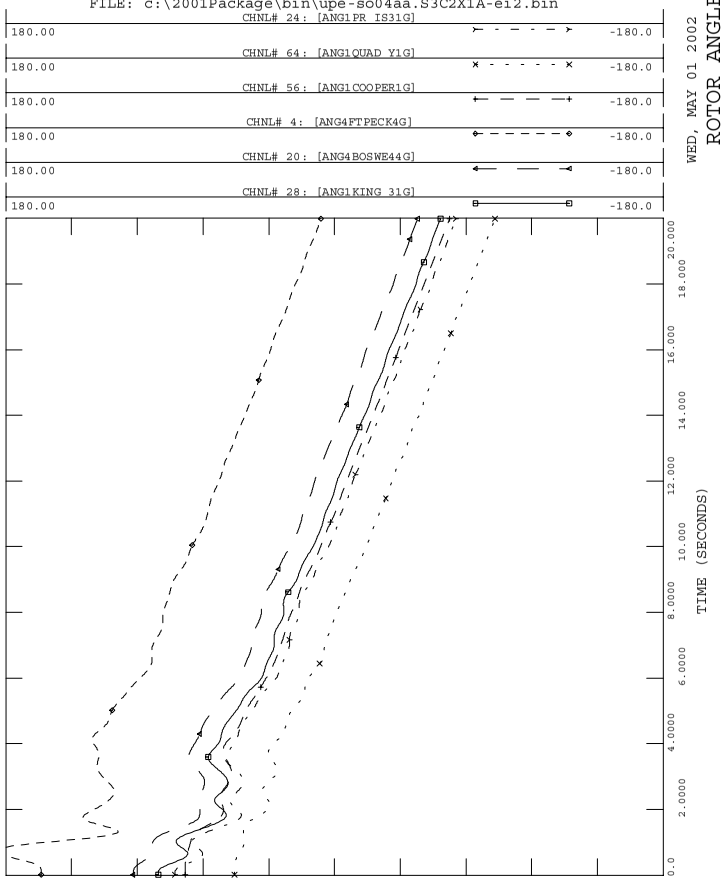
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
ROTOR ANGLES 2



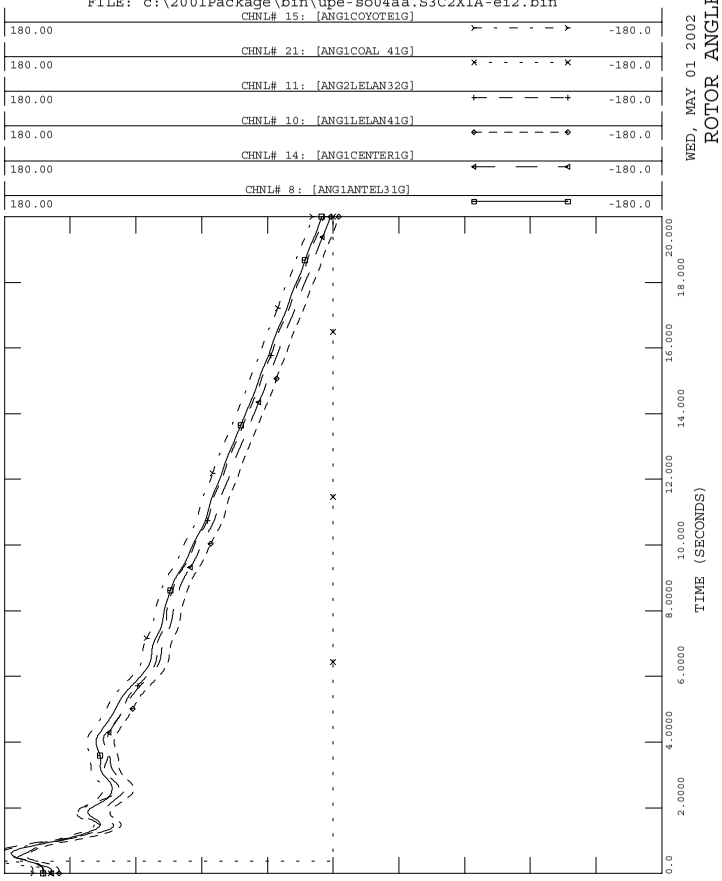
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
ROTOR ANGLES 4



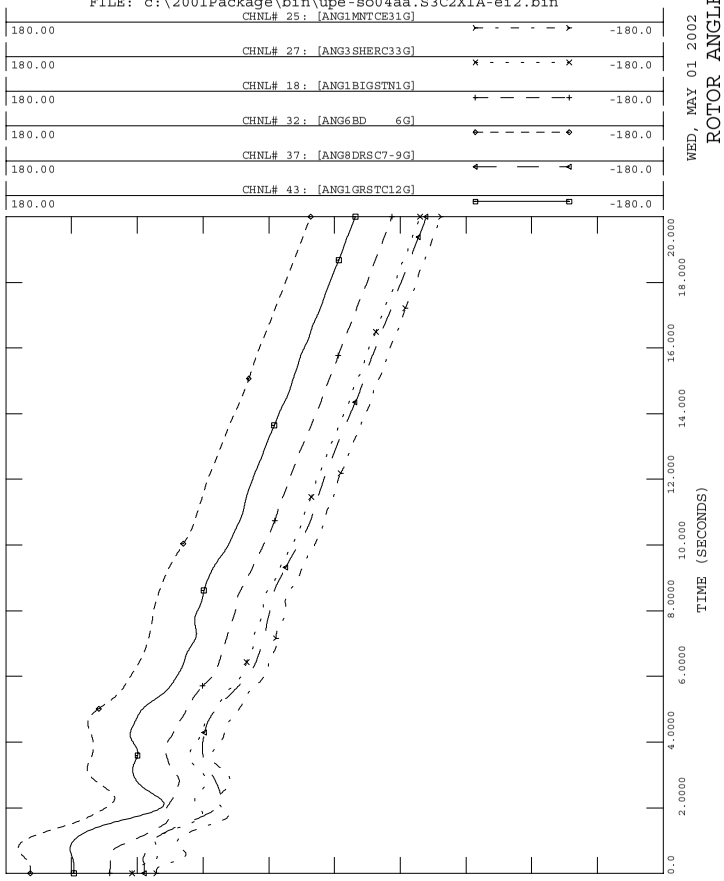
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

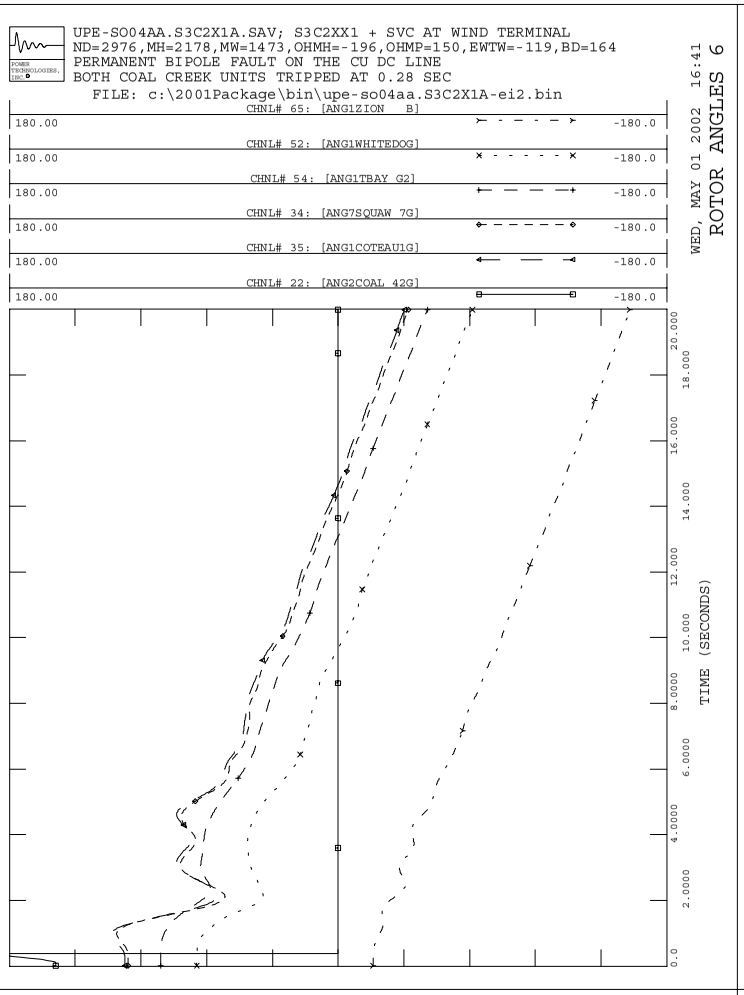
WED, MAY 01 2002 16:41
ROTOR ANGLES 1

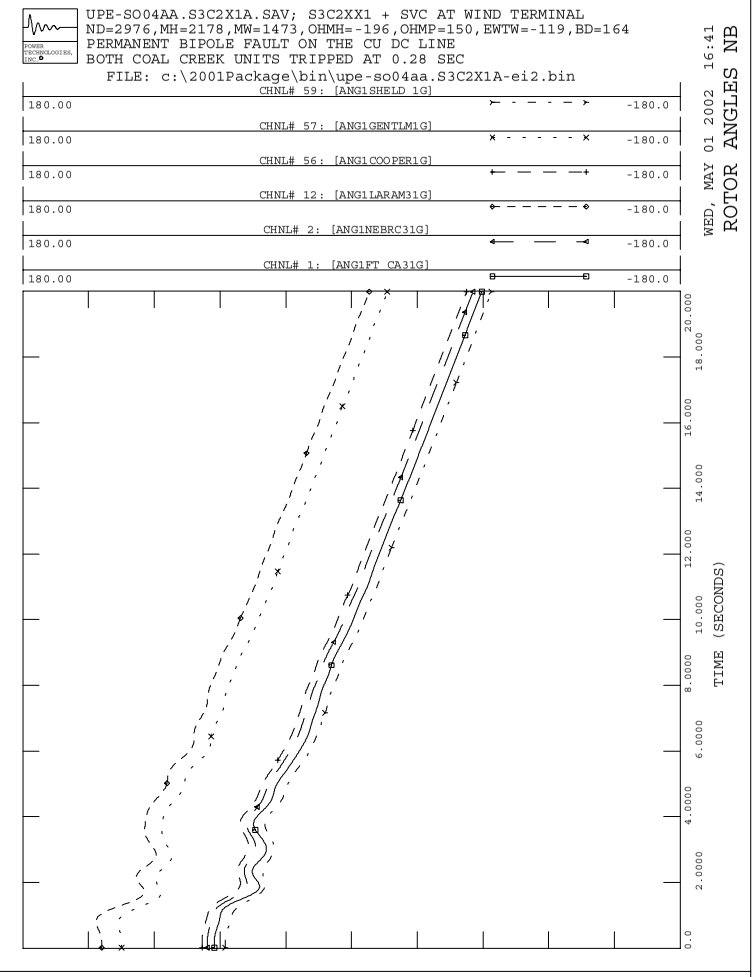


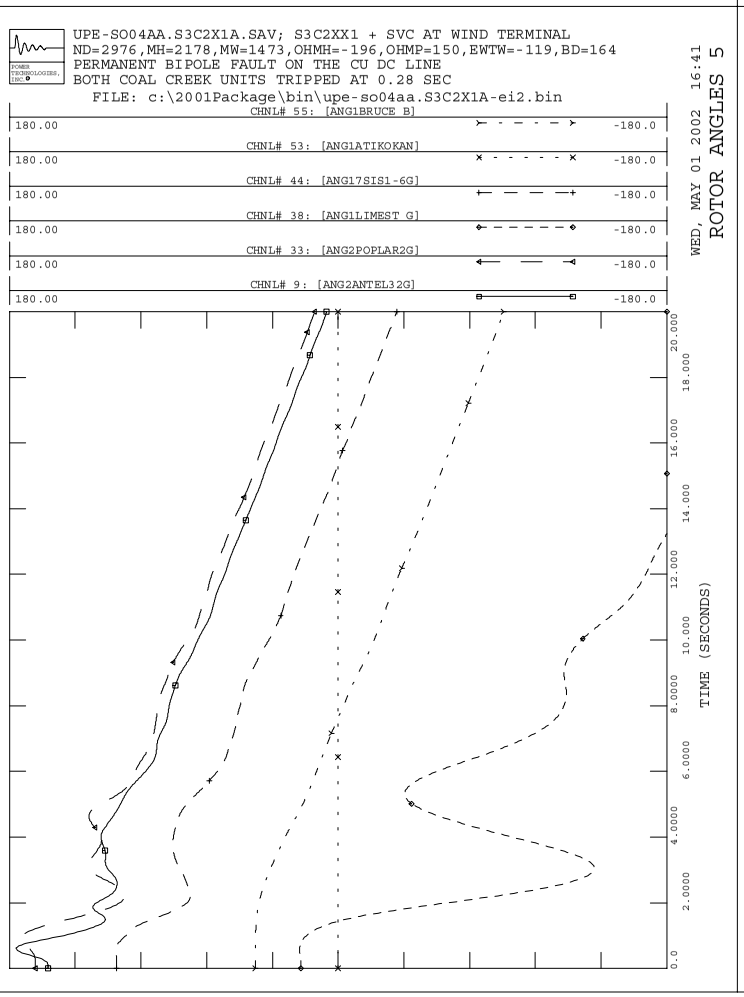
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

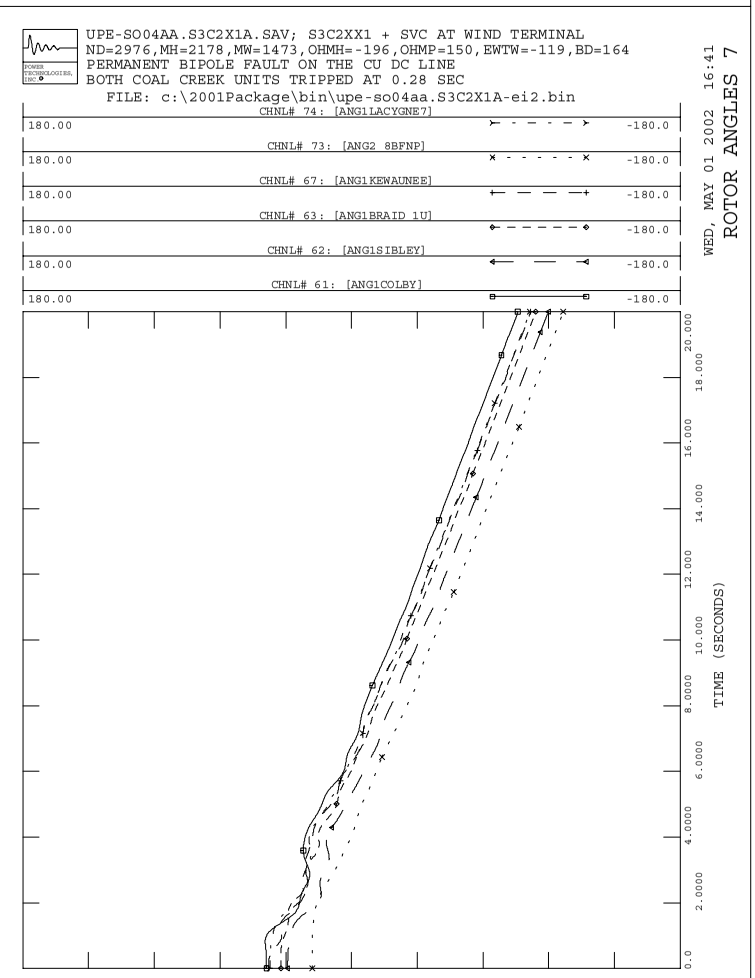
WED, MAY 01 2002 16:41
ROTOR ANGLES 3




UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
WED, MAY 01 2002 16:41
ROTOR ANGLES 6

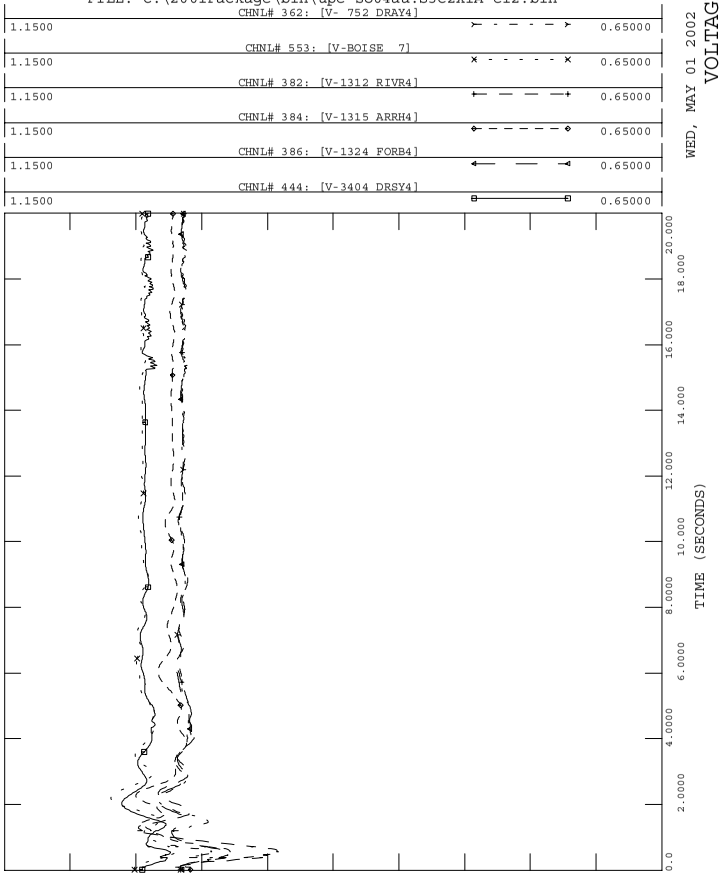

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
WED, MAY 01 2002 16:41
ROTOR ANGLES NB


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
WED, MAY 01 2002 16:41
ROTOR ANGLES 5


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
WED, MAY 01 2002 16:41
ROTOR ANGLES 7

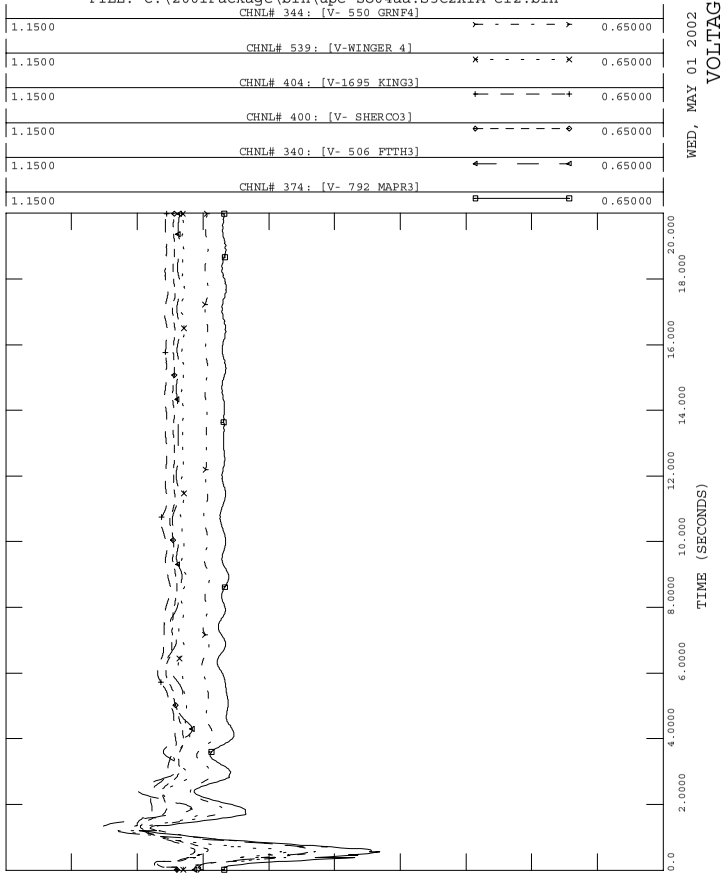
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
VOLTAGES 1



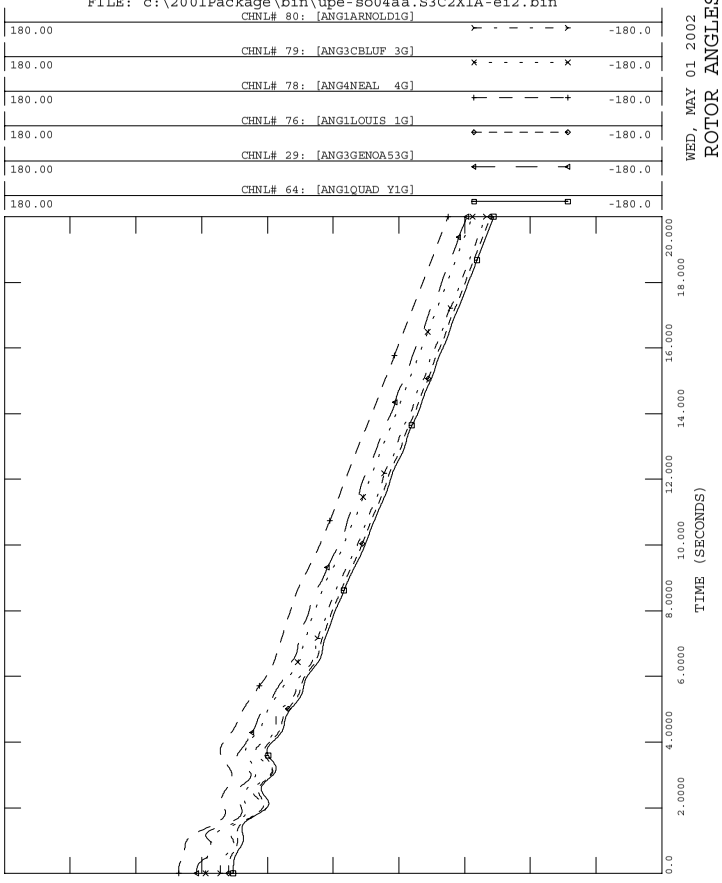
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
VOLTAGES 3



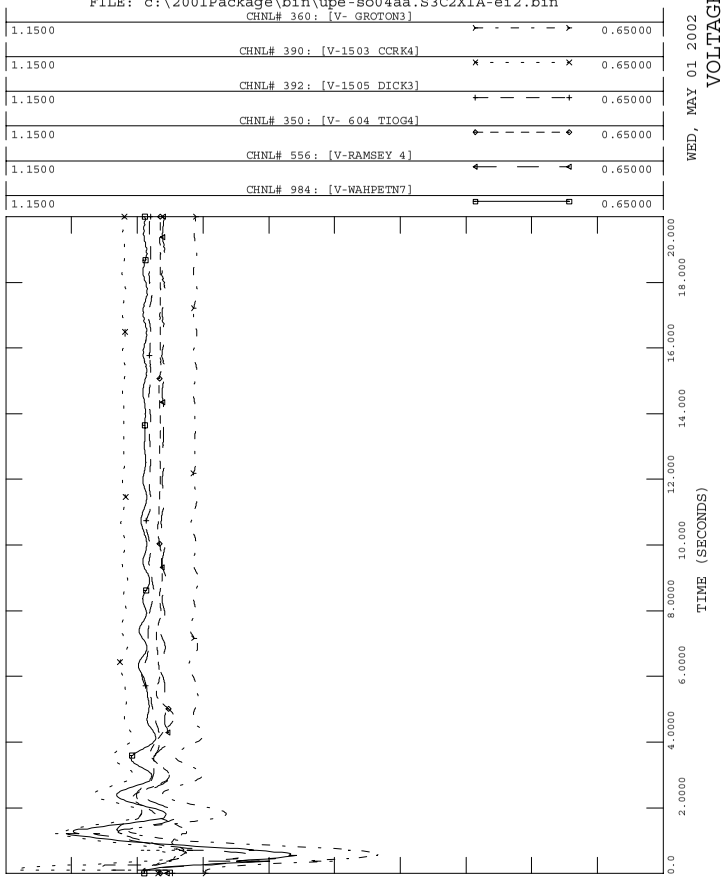
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
ROTOR ANGLES IA



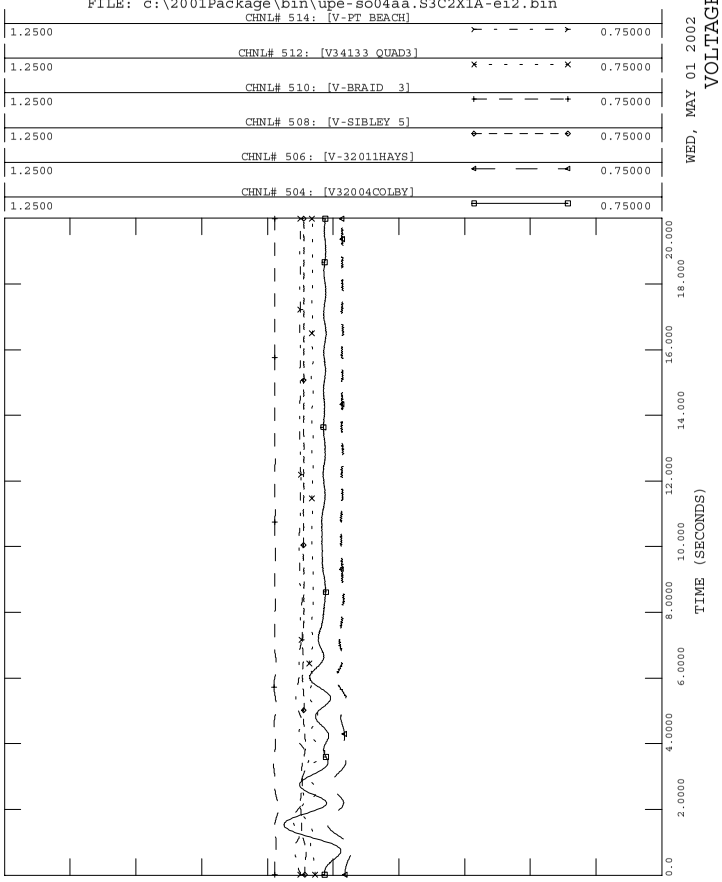
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
VOLTAGES 2



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
VOLTAGES 5



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
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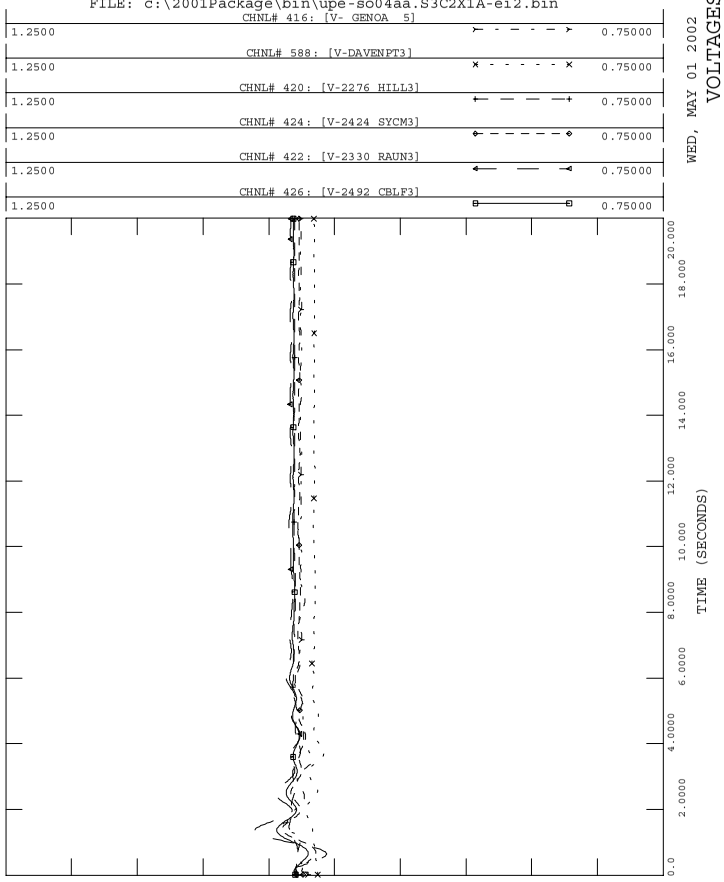
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
VOLTAGES IA



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
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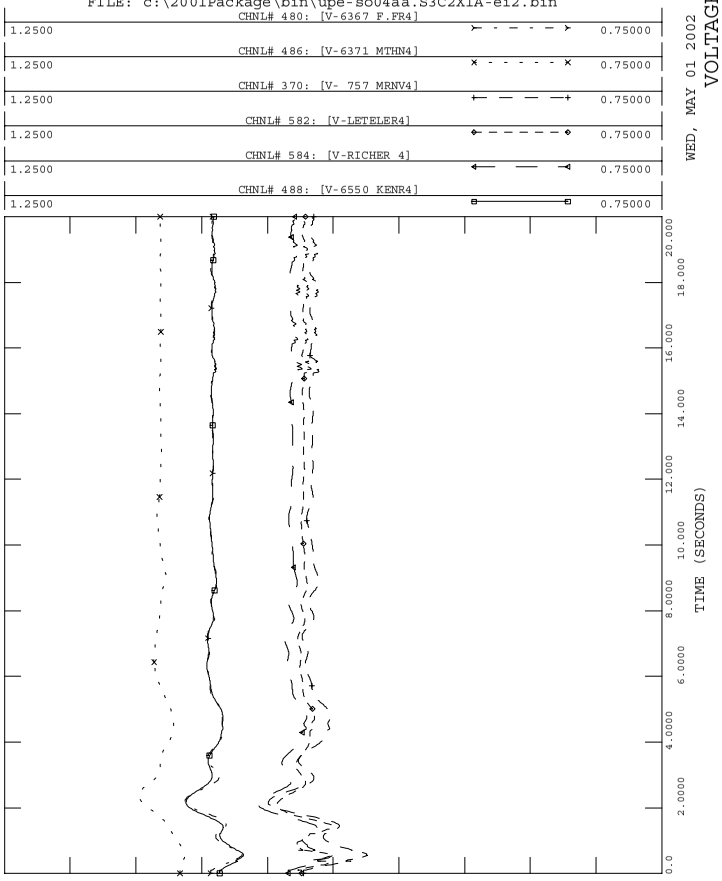
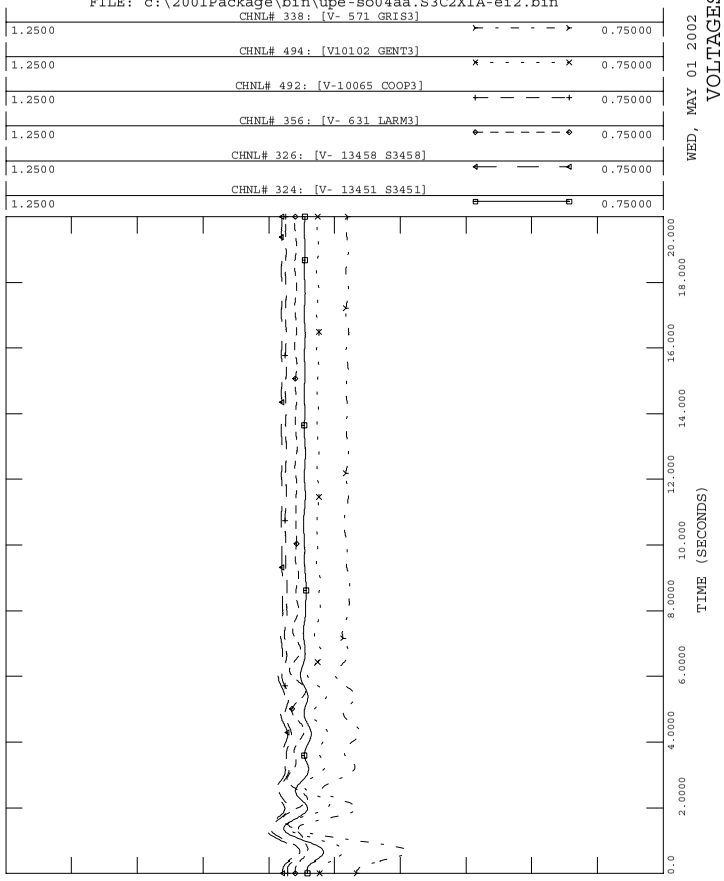
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

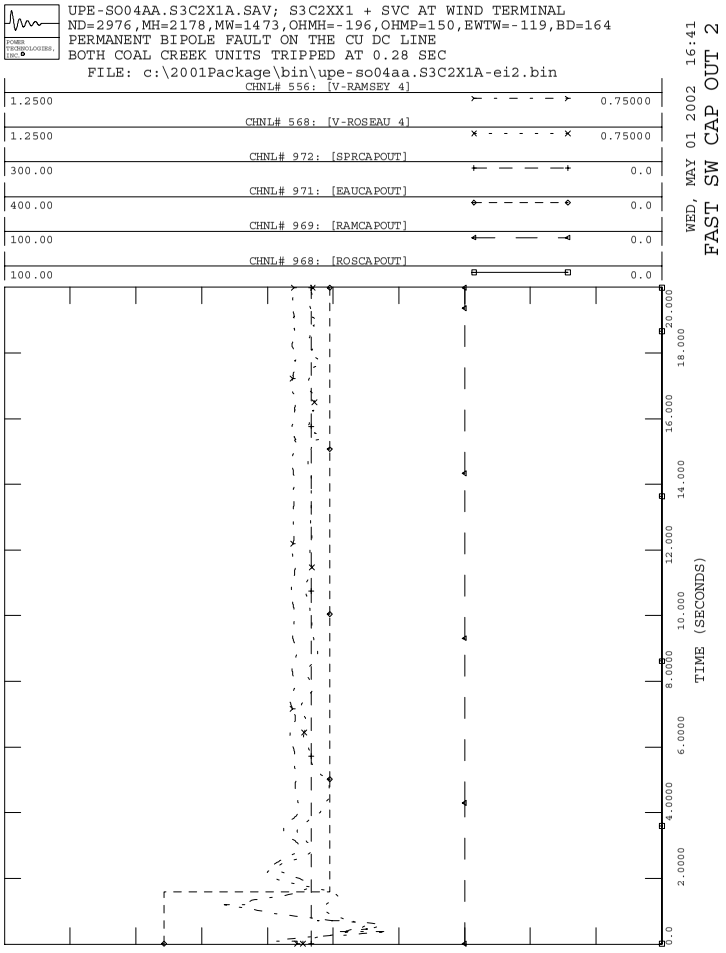
WED, MAY 01 2002 16:41
VOLTAGES 4



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
VOLTAGES NB

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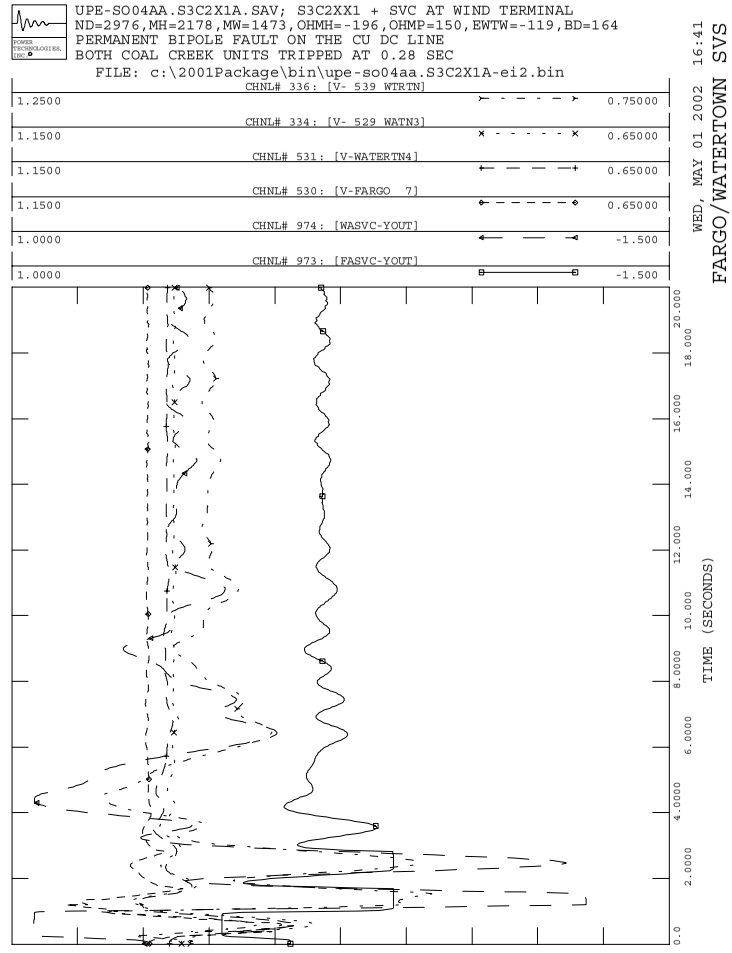
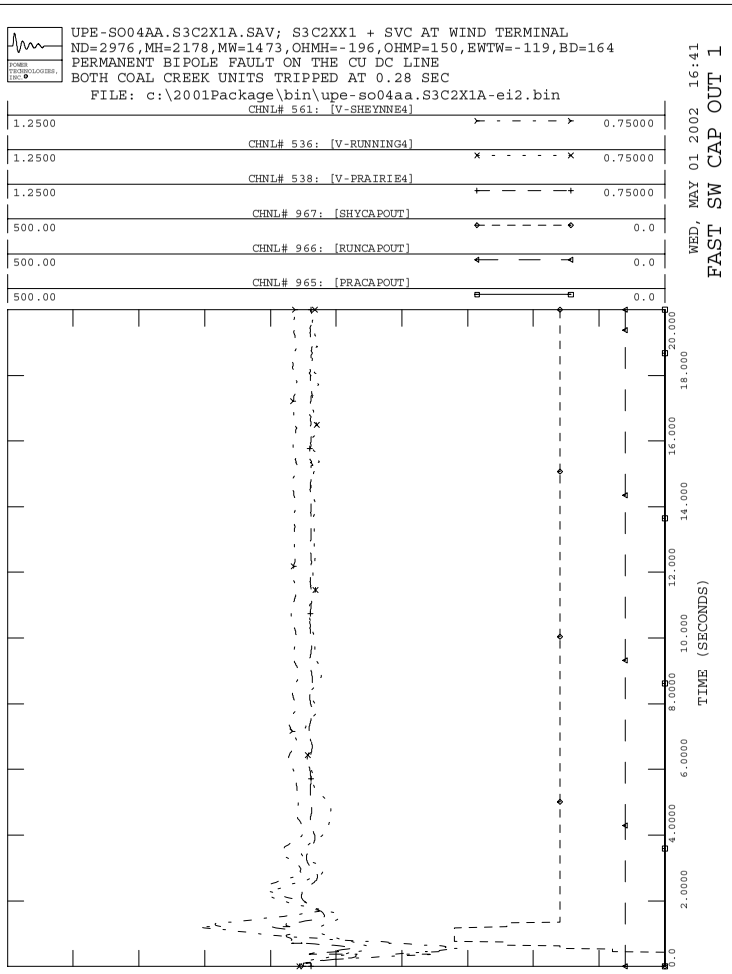
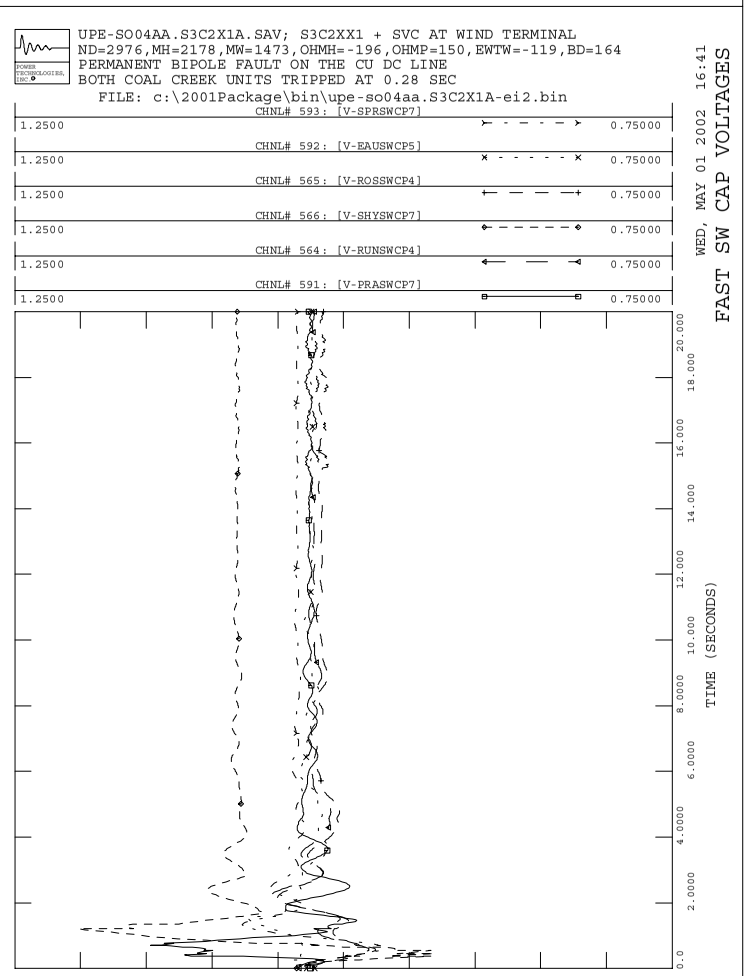
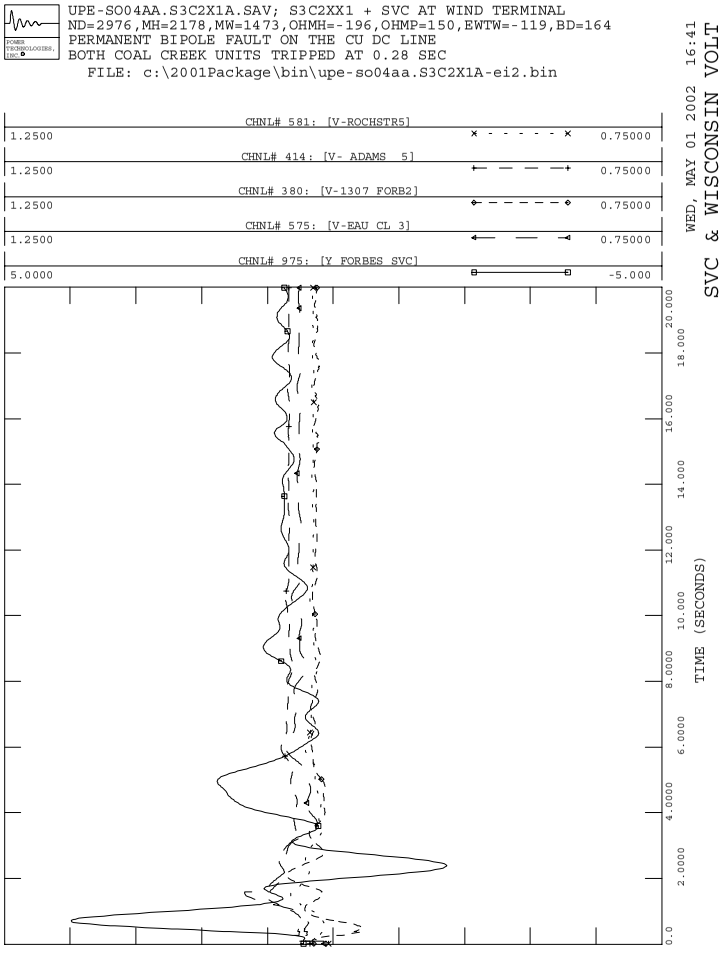
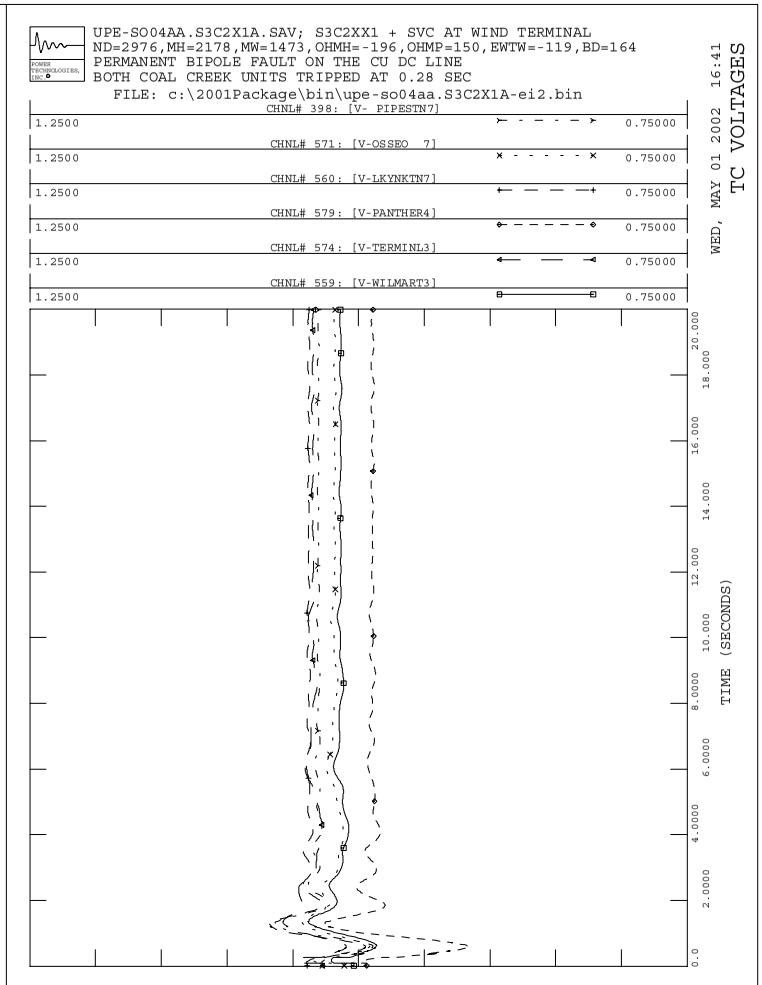
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
WED, MAY 01 2002 16:41
FAST SW CAP OUT 2

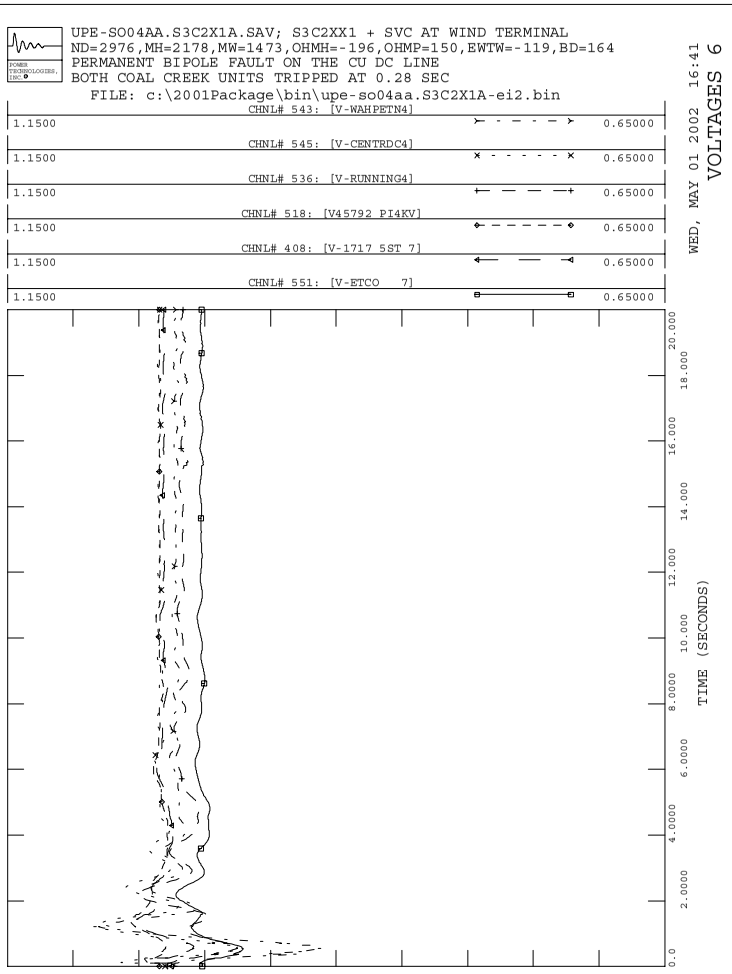

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
WED, MAY 01 2002 16:41
FARGO/WATERTOWN SVS


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
WED, MAY 01 2002 16:41
FAST SW CAP OUT 1


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
WED, MAY 01 2002 16:41
FAST SW CAP VOLTAGES


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 581: [V-ROCHSTR5]
CHNL# 414: [V- ADAMS 5]
CHNL# 380: [V-1307 FORB2]
CHNL# 575: [V-EAU CL 3]
CHNL# 975: [Y FORBES SVC]
WED, MAY 01 2002 16:41
SVC & WISCONSIN VOLT
TIME (SECONDS)


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 398: [V- PIPESTN7]
CHNL# 571: [V-OSSEO 7]
CHNL# 560: [V-LKYNKTN7]
CHNL# 579: [V-PANTHER4]
CHNL# 574: [V-TERMINL3]
CHNL# 559: [V-WILMART3]
WED, MAY 01 2002 16:41
TC VOLTAGES
TIME (SECONDS)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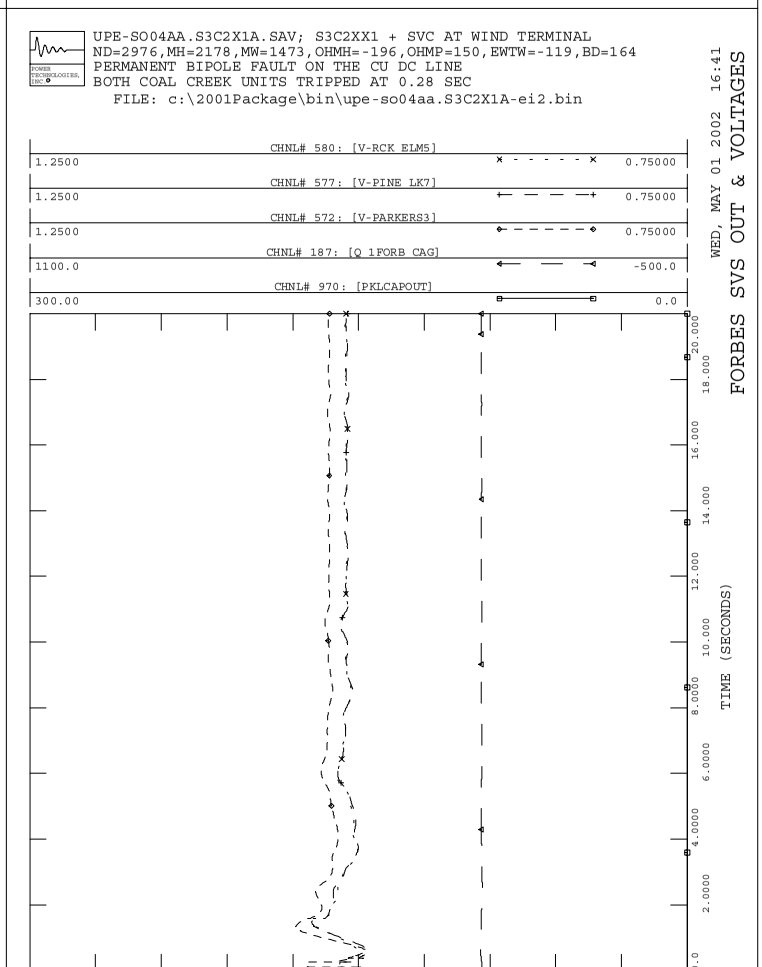
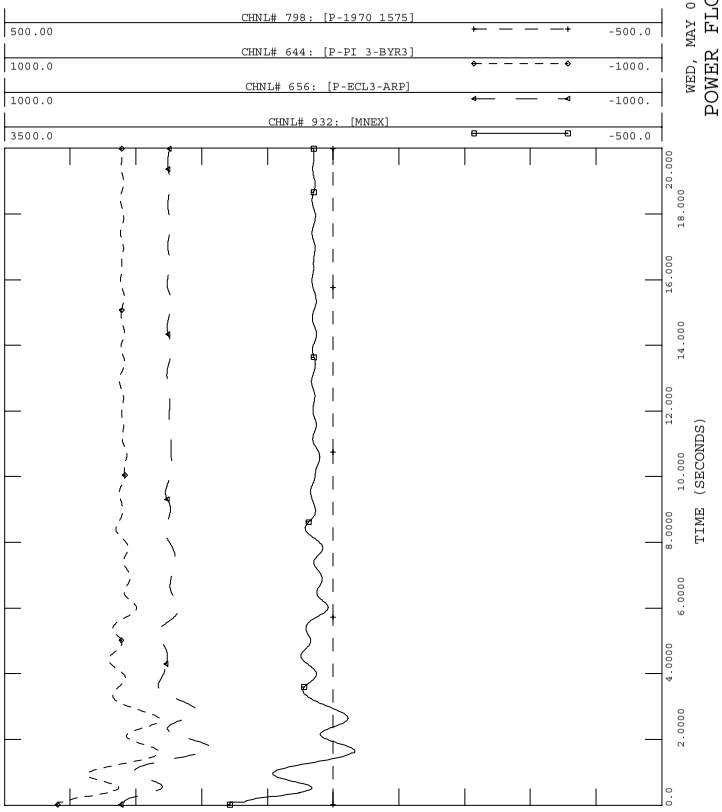
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 543: [V-WAHPETN4]
CHNL# 545: [V-CENTRDC4]
CHNL# 536: [V-RUNNING4]
CHNL# 518: [V45792 PI4KV]
CHNL# 408: [V-1717 5ST 7]
CHNL# 551: [V-ETCO 7]
WED, MAY 01 2002 16:41
VOLTAGES 6
TIME (SECONDS)


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 580: [V-RCK ELM5]
CHNL# 577: [V-PINE LK7]
CHNL# 572: [V-PARKERS3]
CHNL# 187: [Q 1FORB CAG]
CHNL# 970: [PKLCAPOUT]
WED, MAY 01 2002 16:41
FORBES SVS OUT & VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
POWER FLOW SUMS 2



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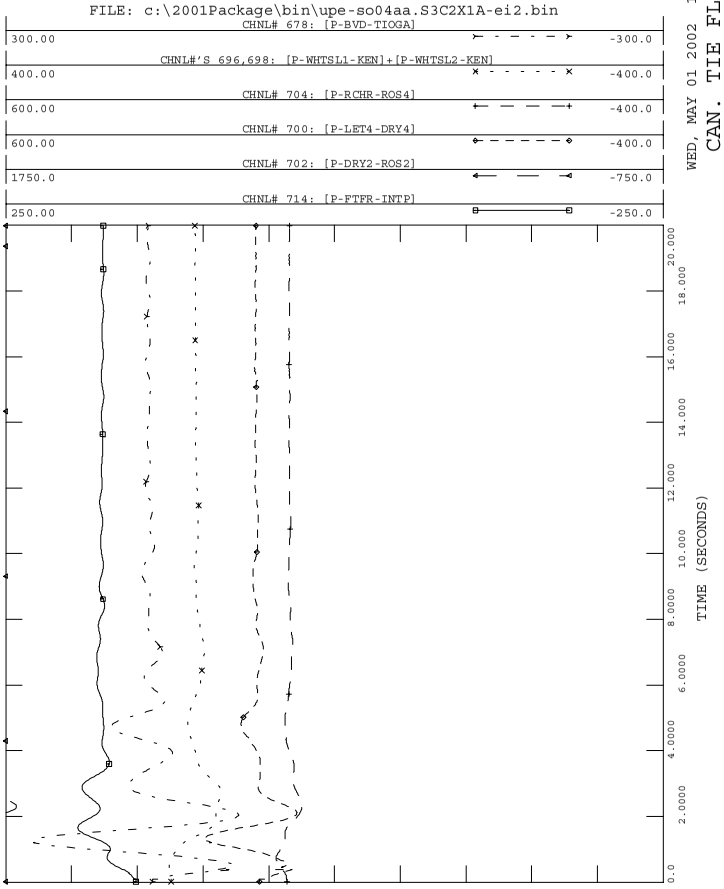
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
CAN. TIE FLOWS



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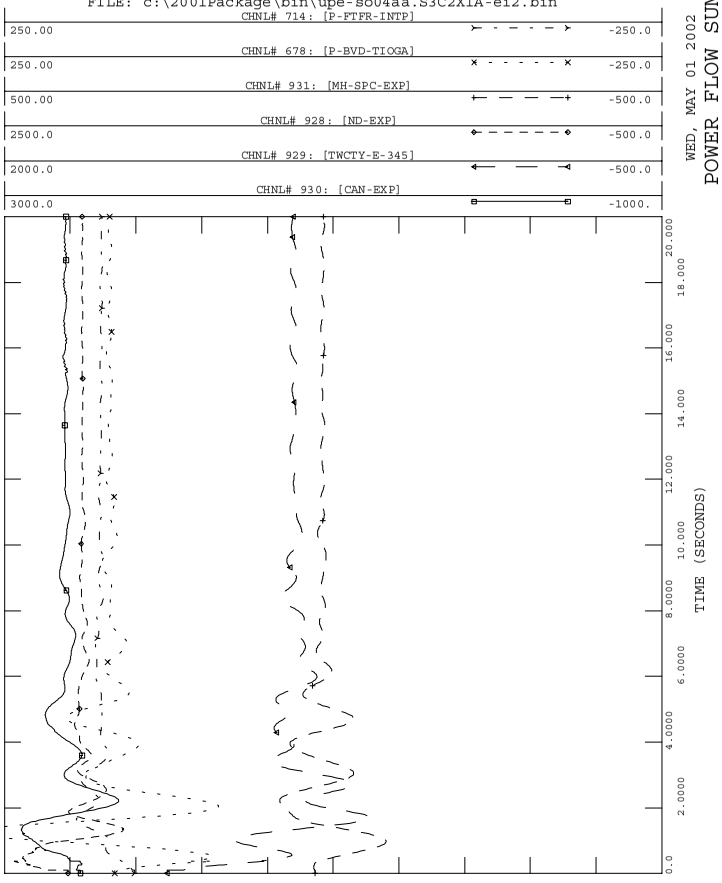
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

WED, MAY 01 2002 16:41
POWER FLOW SUMS 1



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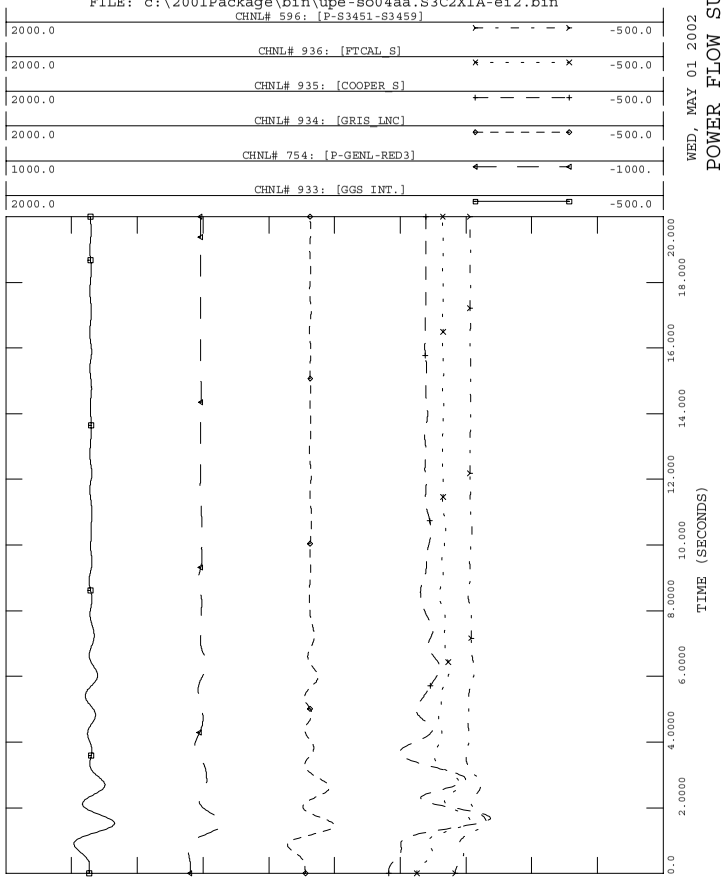
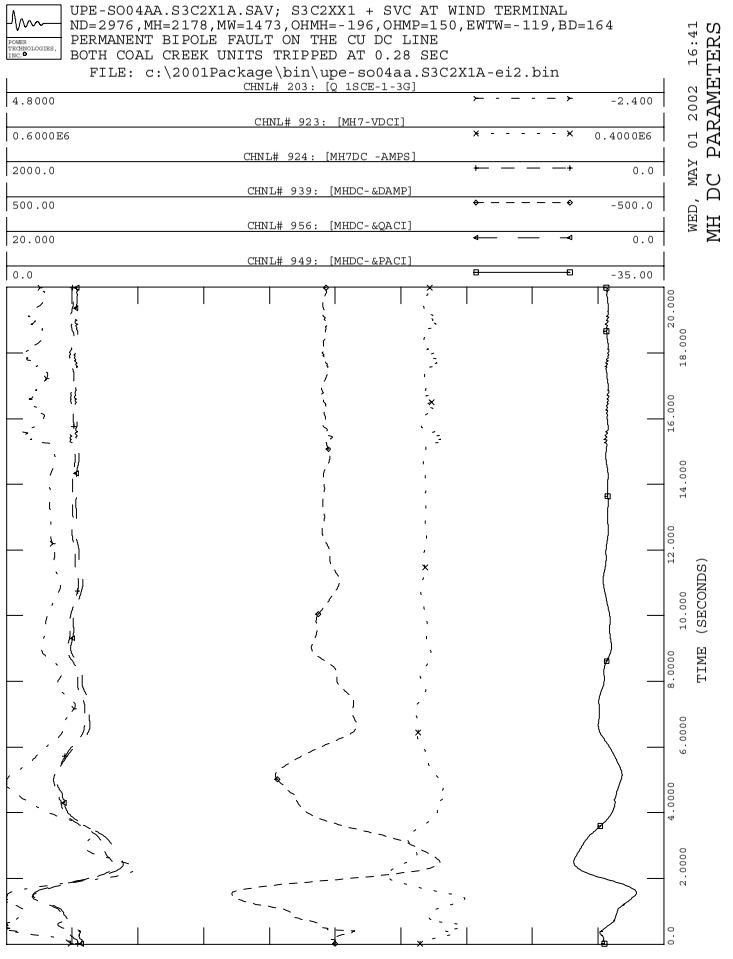
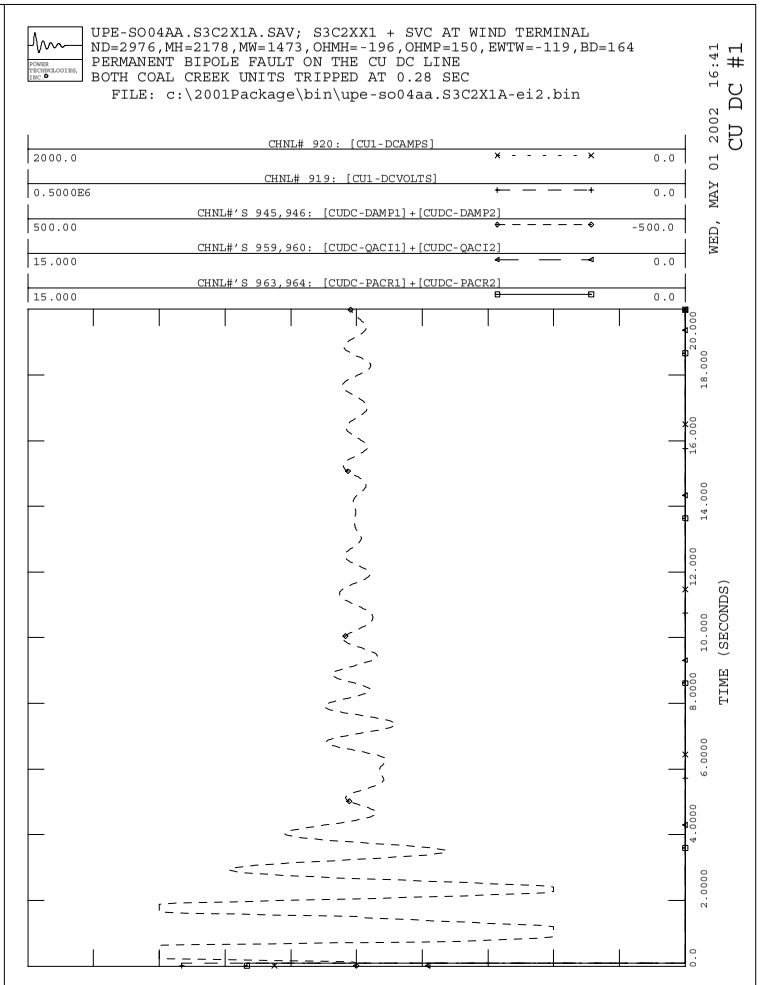
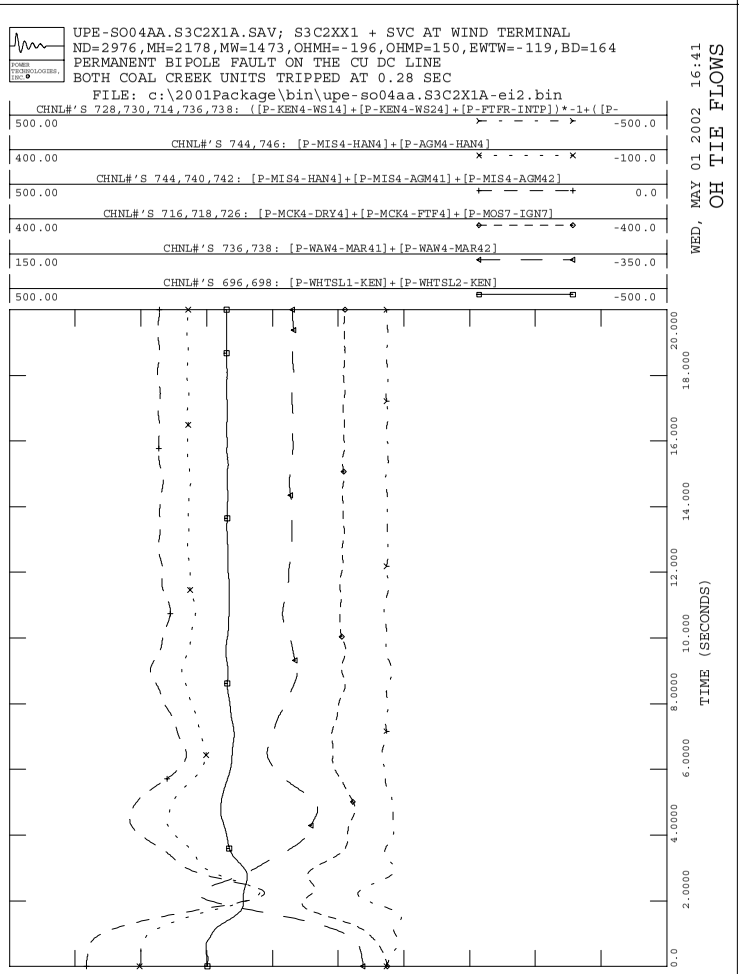
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

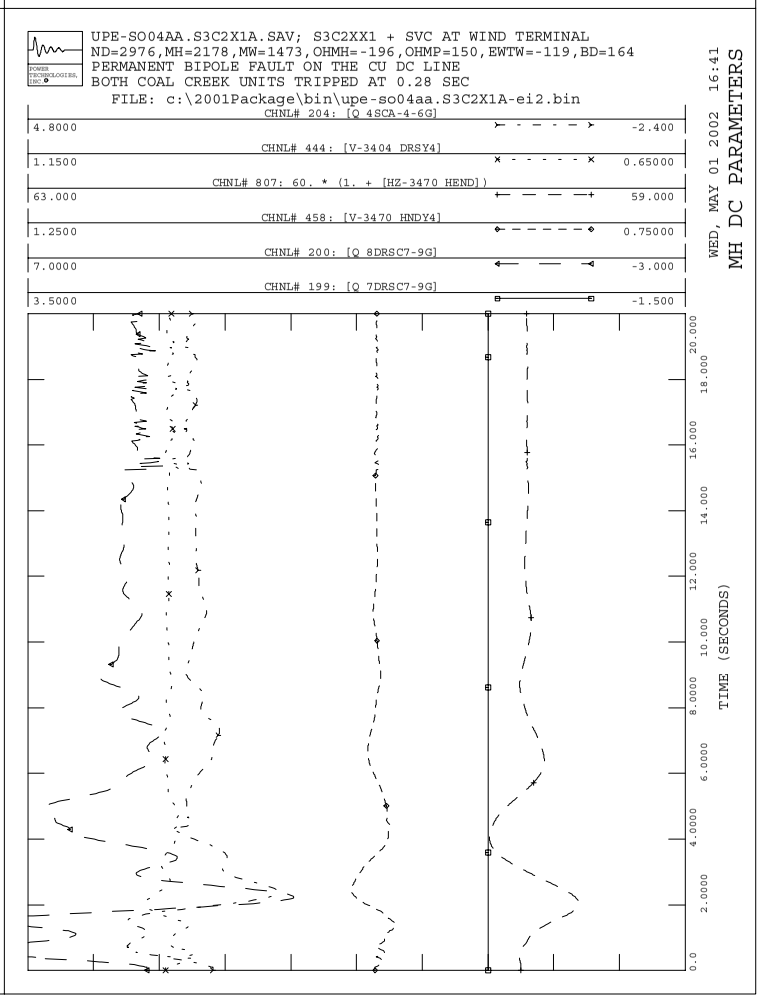
WED, MAY 01 2002 16:41
POWER FLOW SUM 3

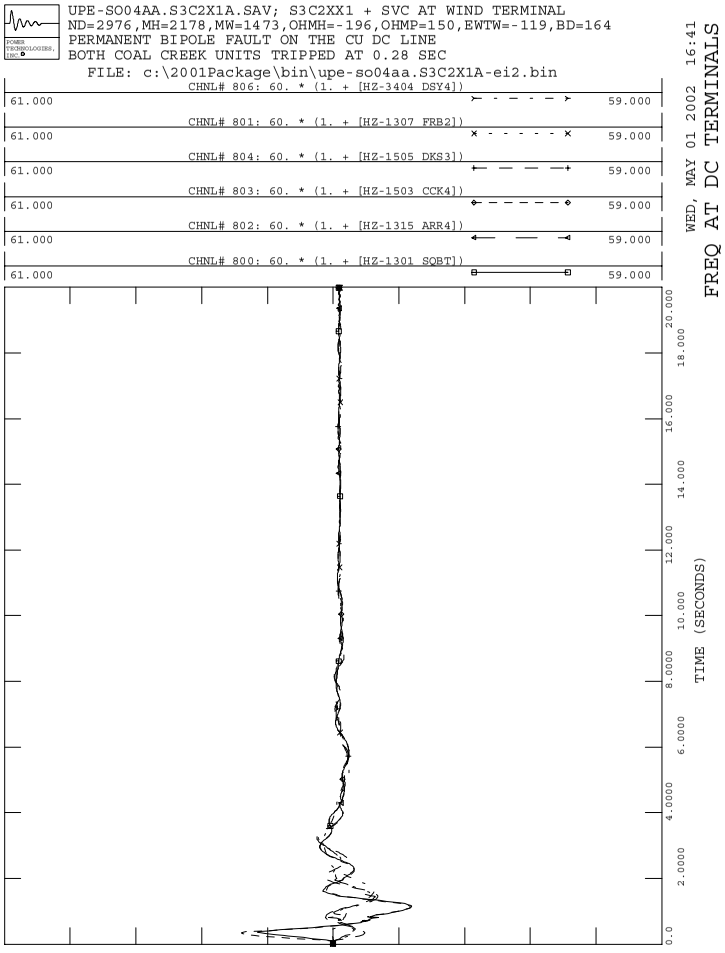


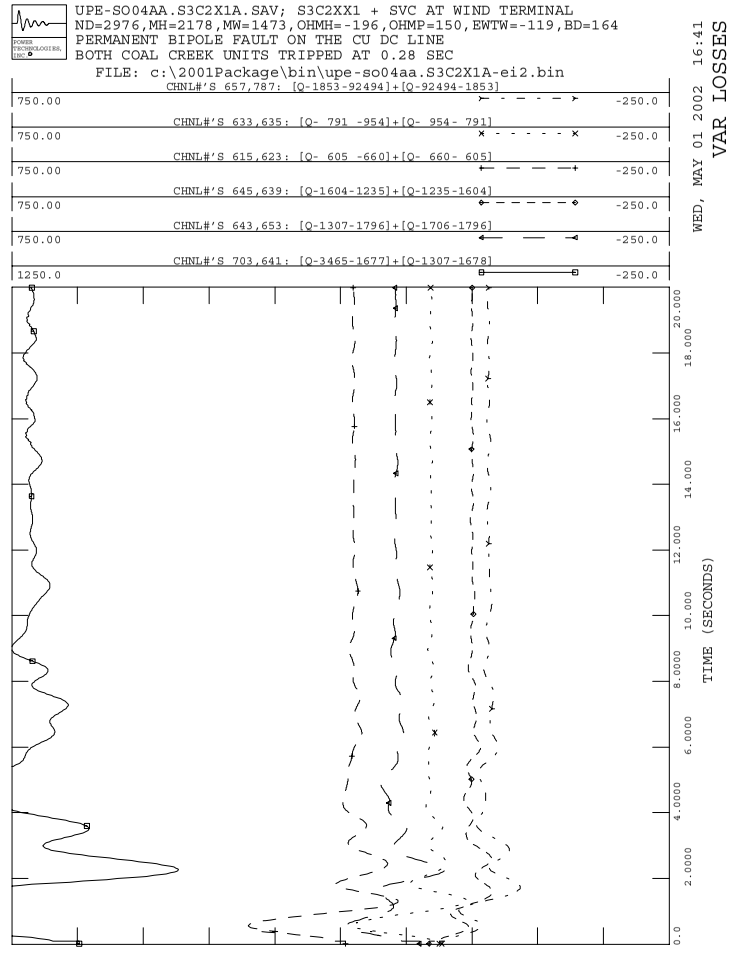

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TIME (SECONDS)
WED, MAY 01 2002 16:41
MH DC PARAMETERS

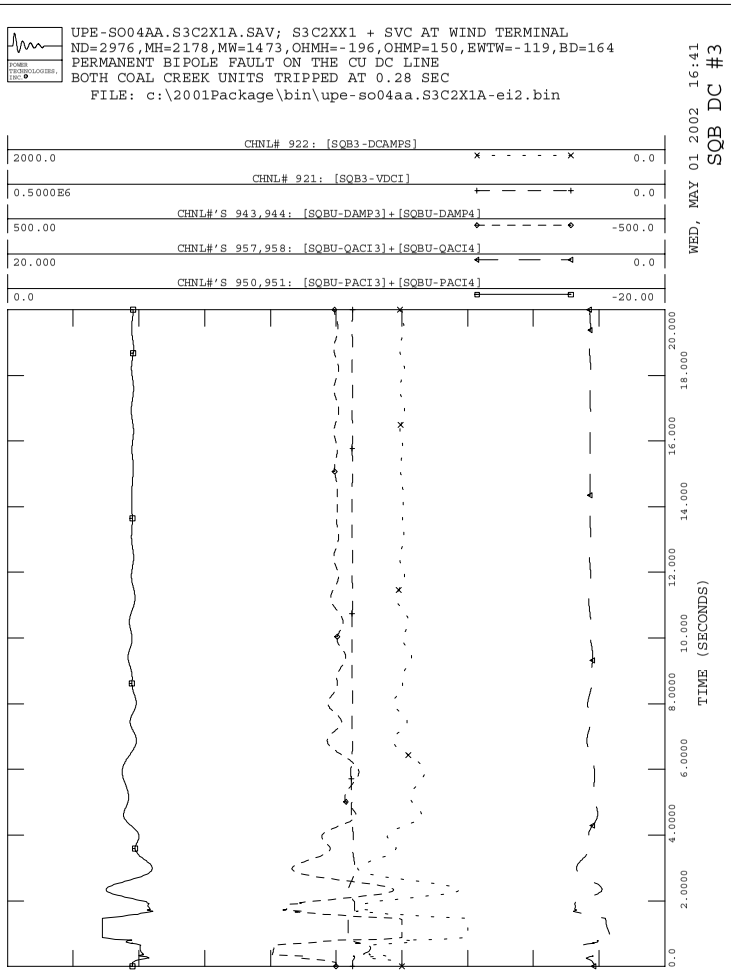

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TIME (SECONDS)
WED, MAY 01 2002 16:41
CU DC #1

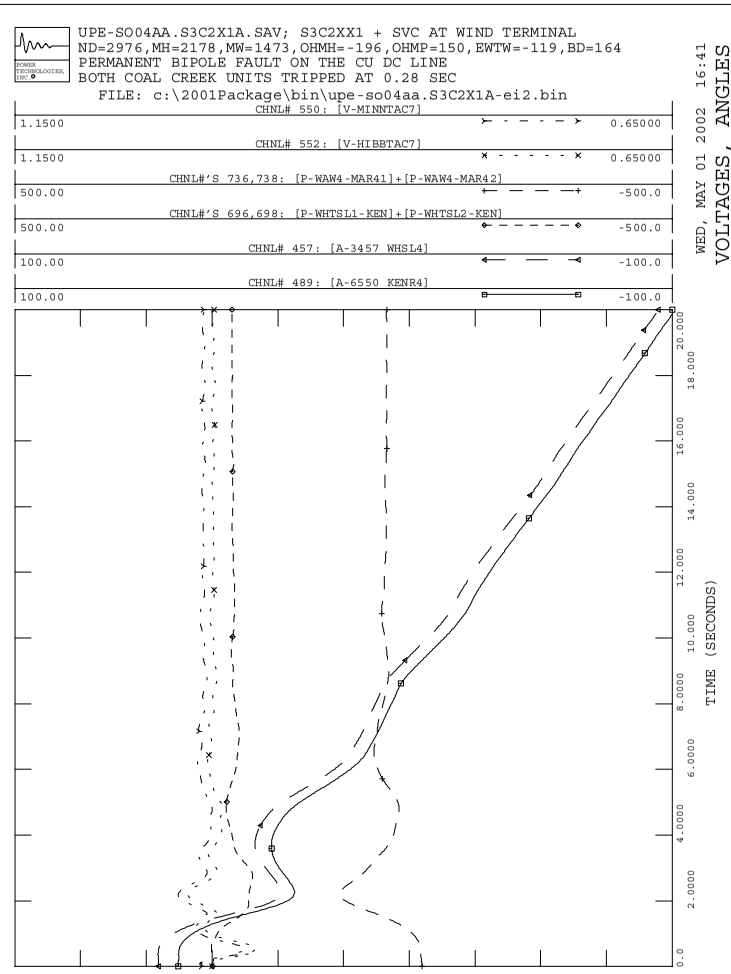

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TIME (SECONDS)
WED, MAY 01 2002 16:41
OH TIE FLOWS


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TIME (SECONDS)
WED, MAY 01 2002 16:41
MH DC PARAMETERS


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
WED, MAY 01 2002 16:41
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
WED, MAY 01 2002 16:41
VAR LOSSES
TIME (SECONDS)

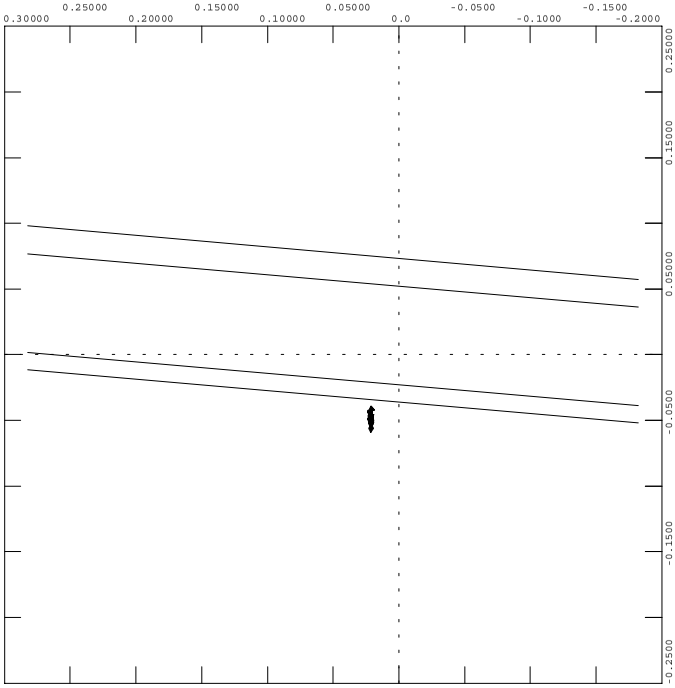

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
WED, MAY 01 2002 16:41
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
WED, MAY 01 2002 16:41
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

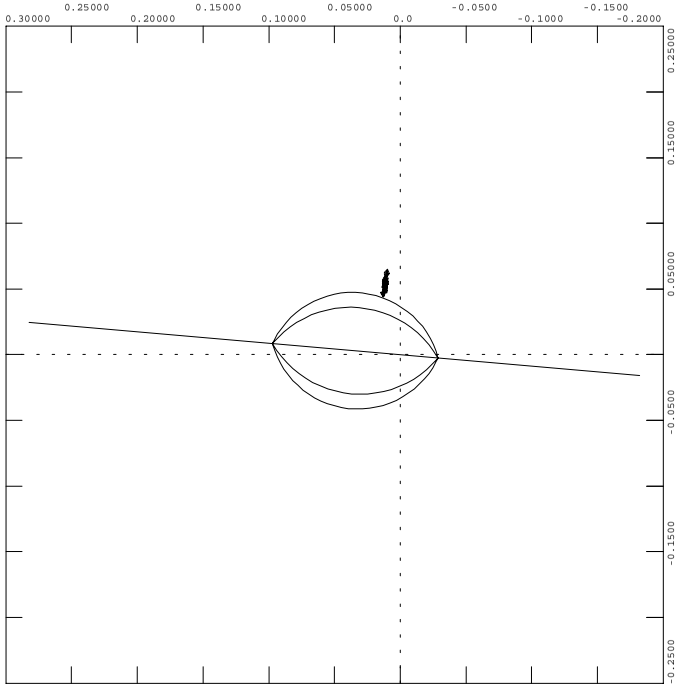


WED, MAY 01 2002 16:41
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

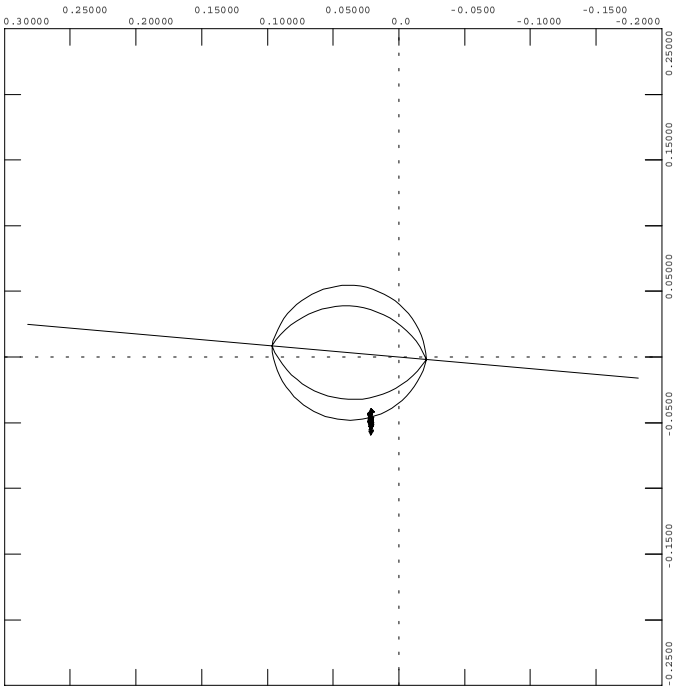


WED, MAY 01 2002 16:41
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

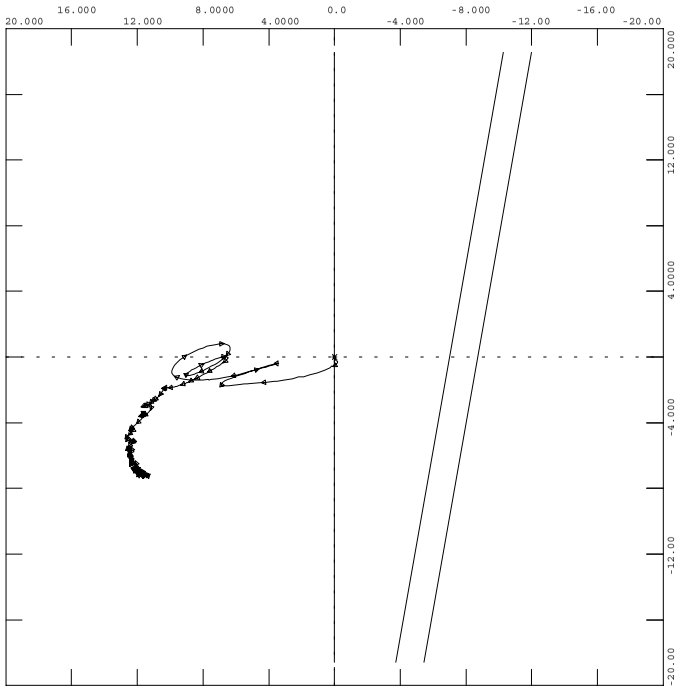


WED, MAY 01 2002 16:41
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

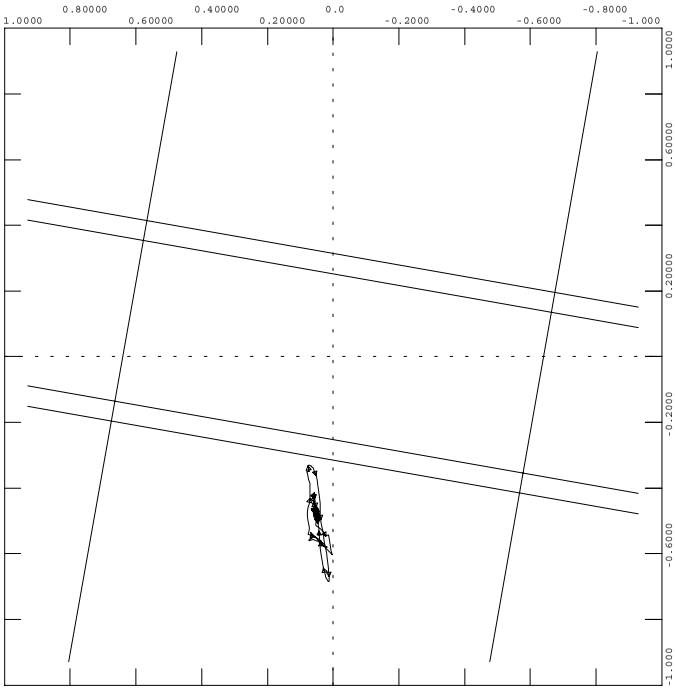


WED, MAY 01 2002 16:41
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

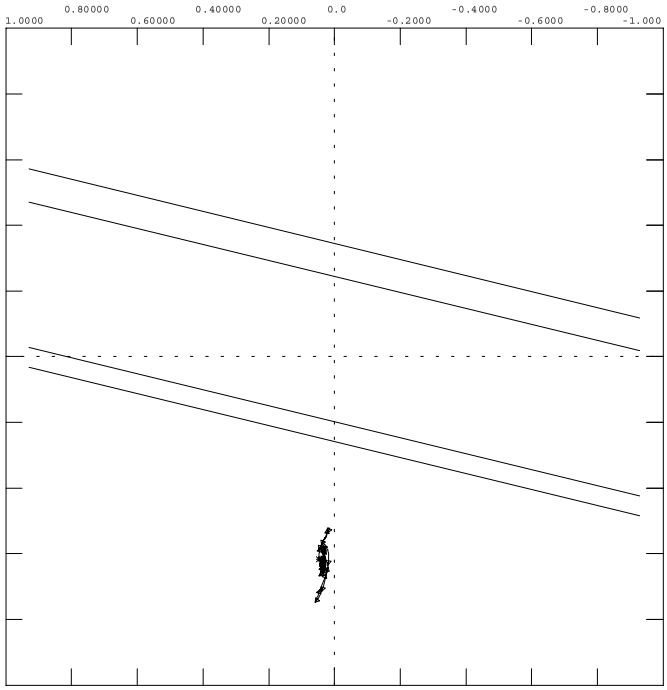


WED, MAY 01 2002 16:41
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

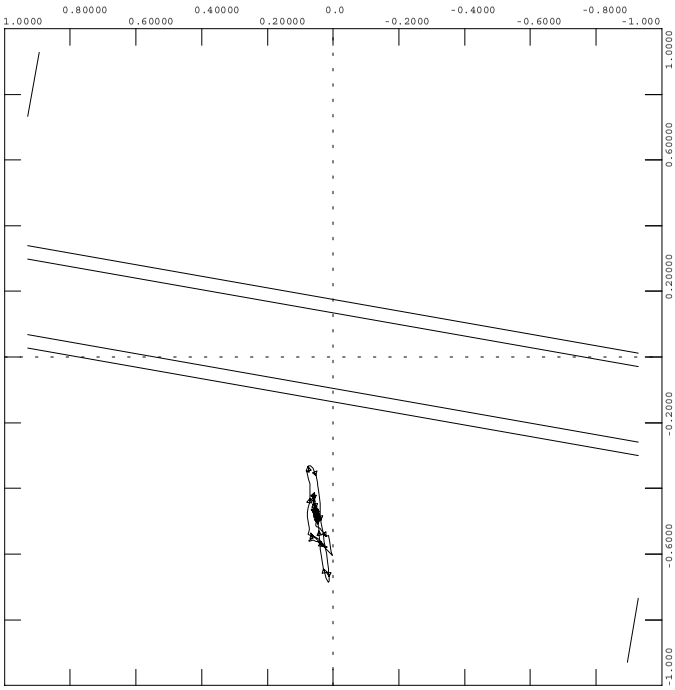


WED, MAY 01 2002 16:41
R50M AT MORANVILLE (520)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

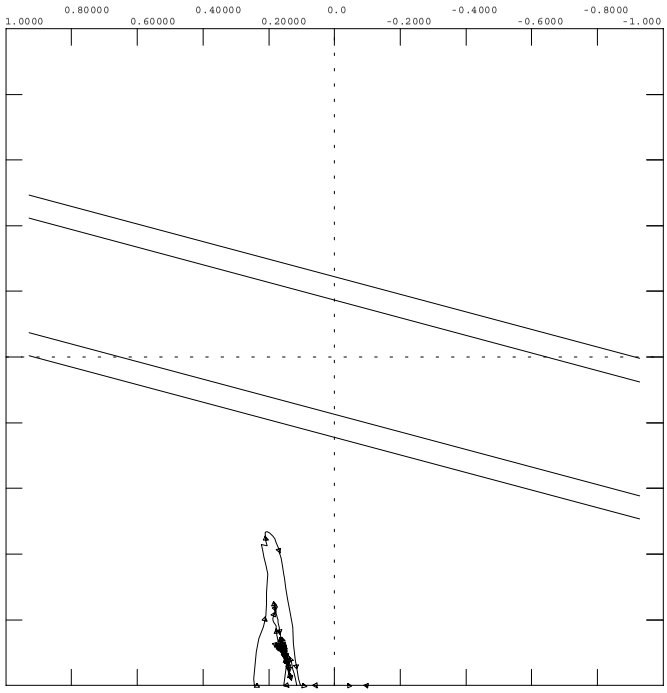


WED, MAY 01 2002 16:41
L20D AT DRAYTON (506)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

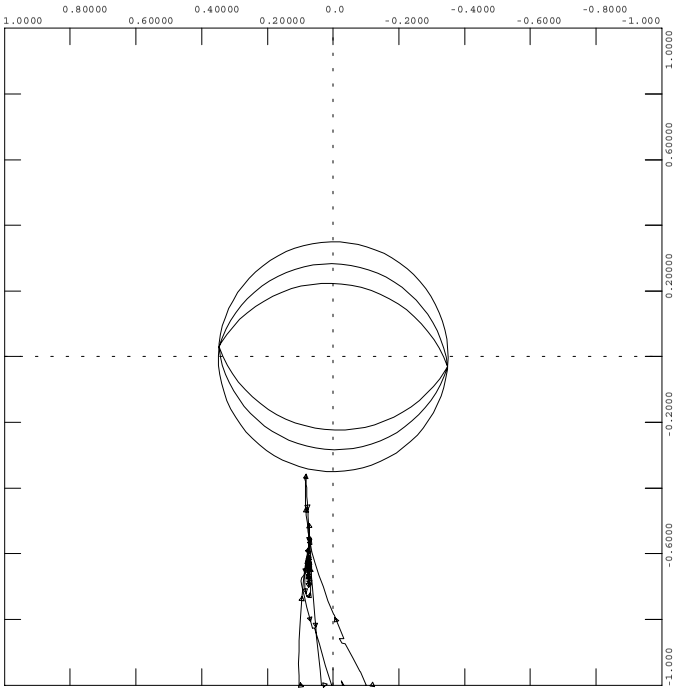


WED, MAY 01 2002 16:41
L20D-PRAIRIE (510)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

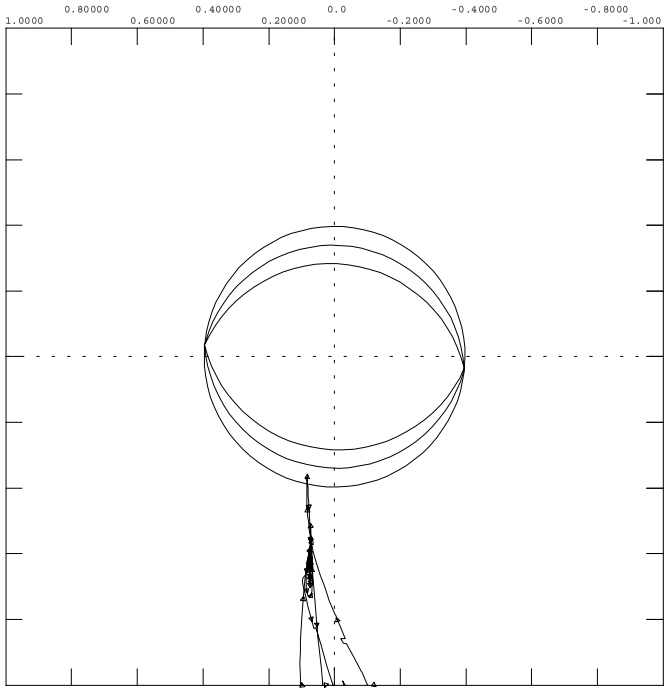
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

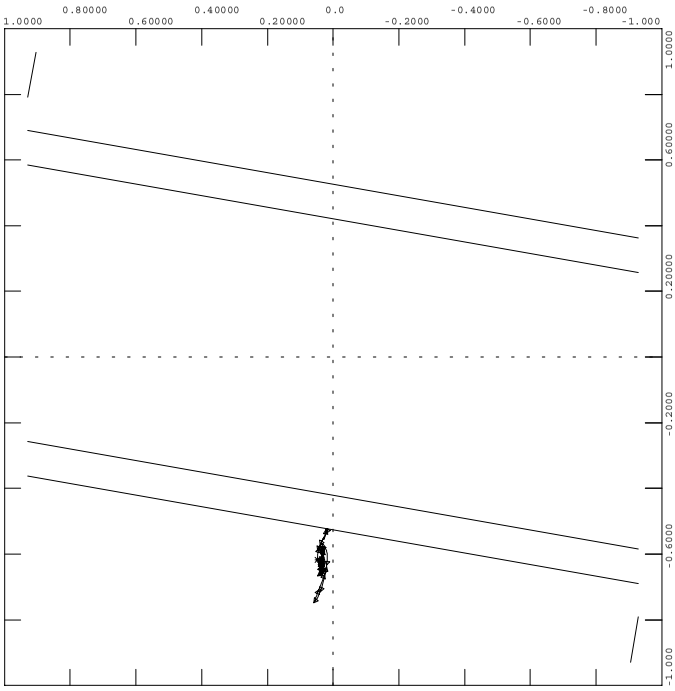
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

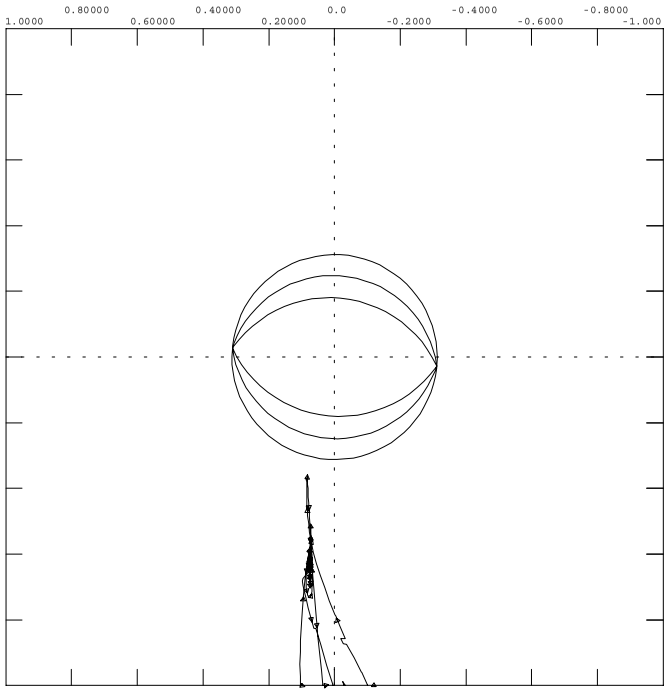
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



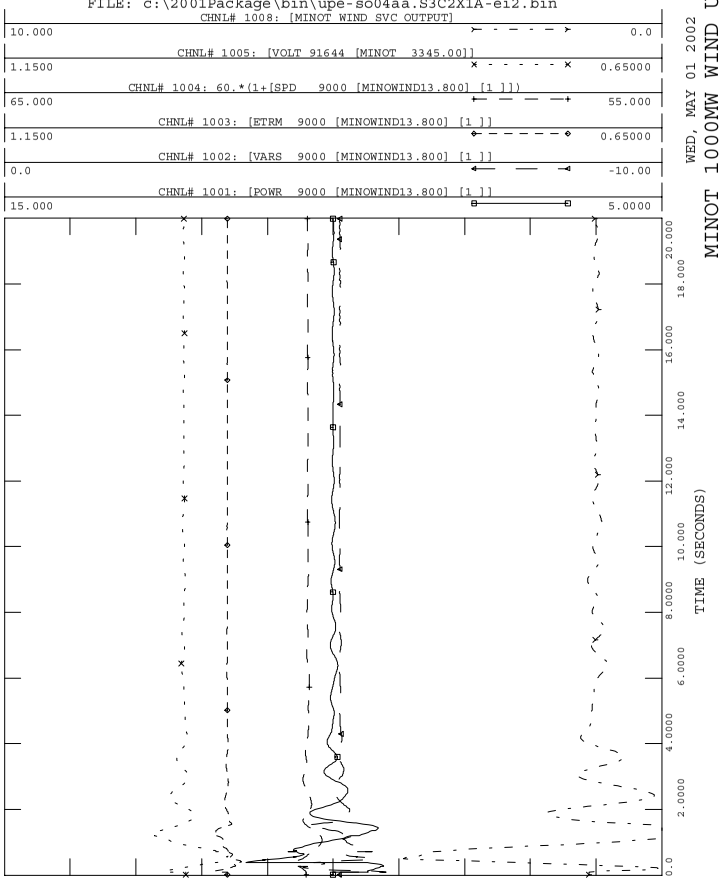
UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

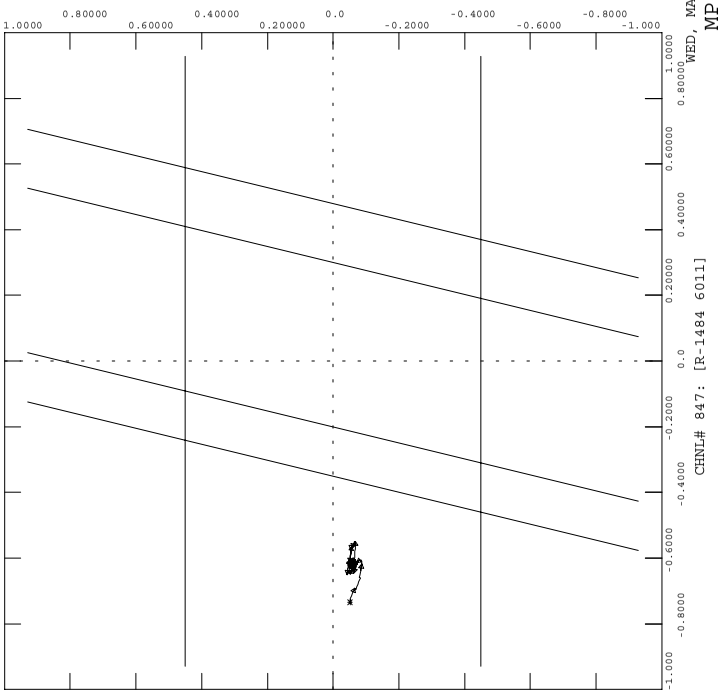


WED, MAY 01 2002 16:41
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

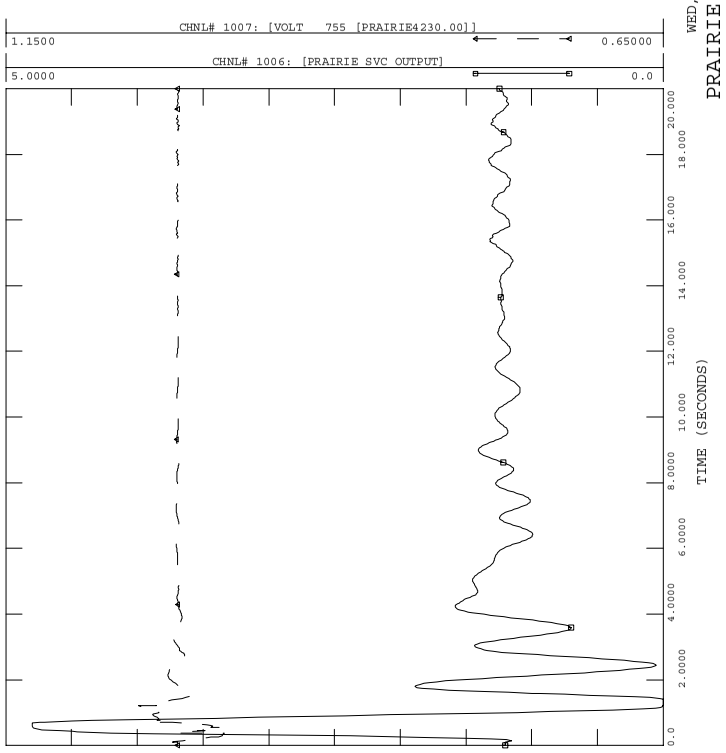
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



WED, MAY 01 2002 16:41
MP-OH I.FALLS (779)

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C2X1A-ei2.bin



WED, MAY 01 2002 16:41
PRAIRIE SVC RESPONSE

APPENDIX 22

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 3 (MINOT)

ALTERNATIVES WITH PRAIRIE-DULUTH 345 KV LINE

CASES S3C3X2A, S3CSX3A, AND S3C3X4A

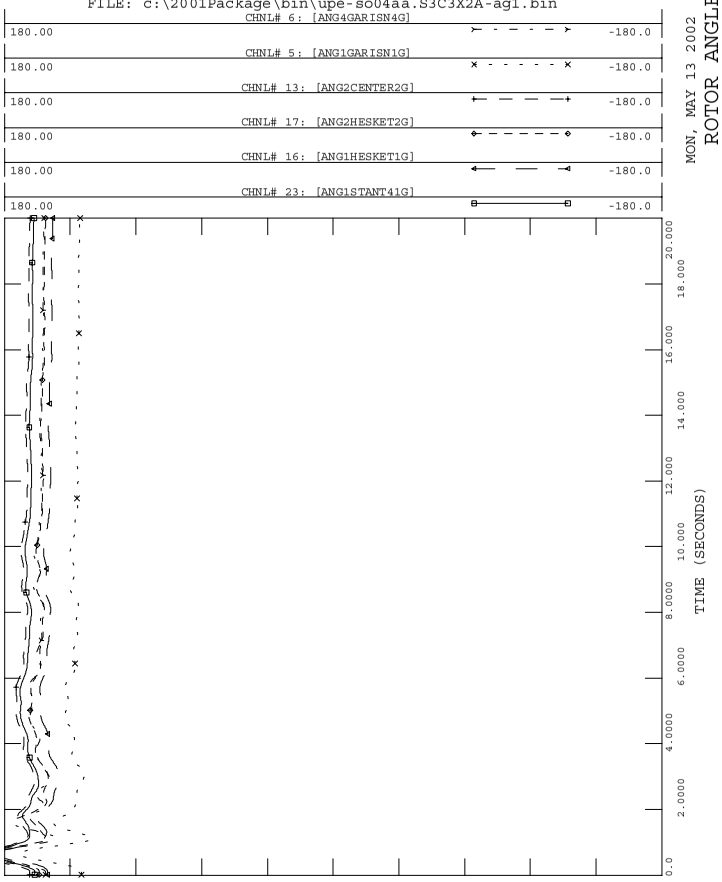
CASE S3C3X2A

CONTINGENCY AG1

Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

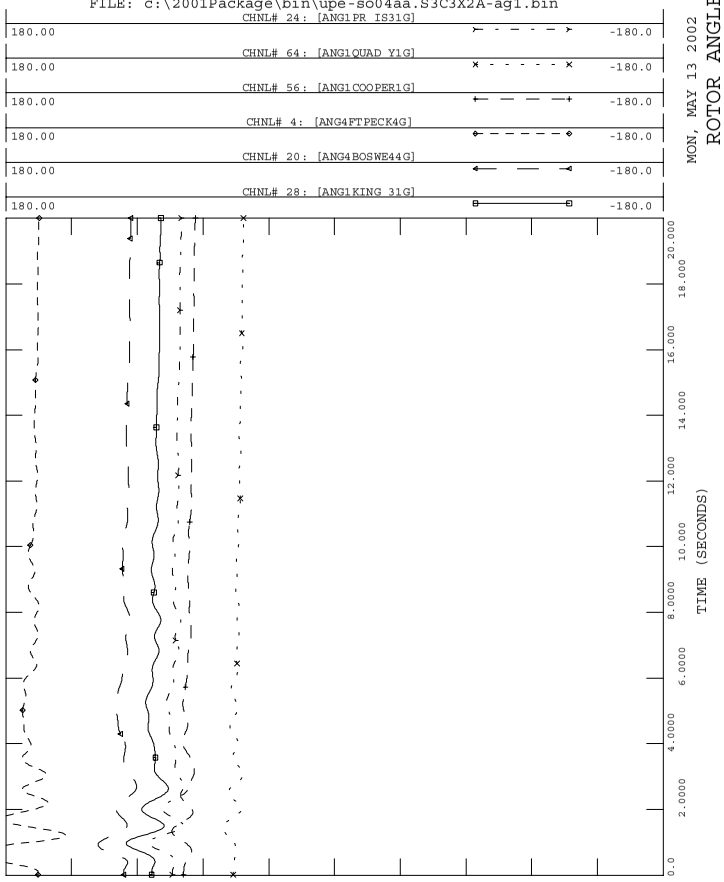
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
ROTOR ANGLES 2



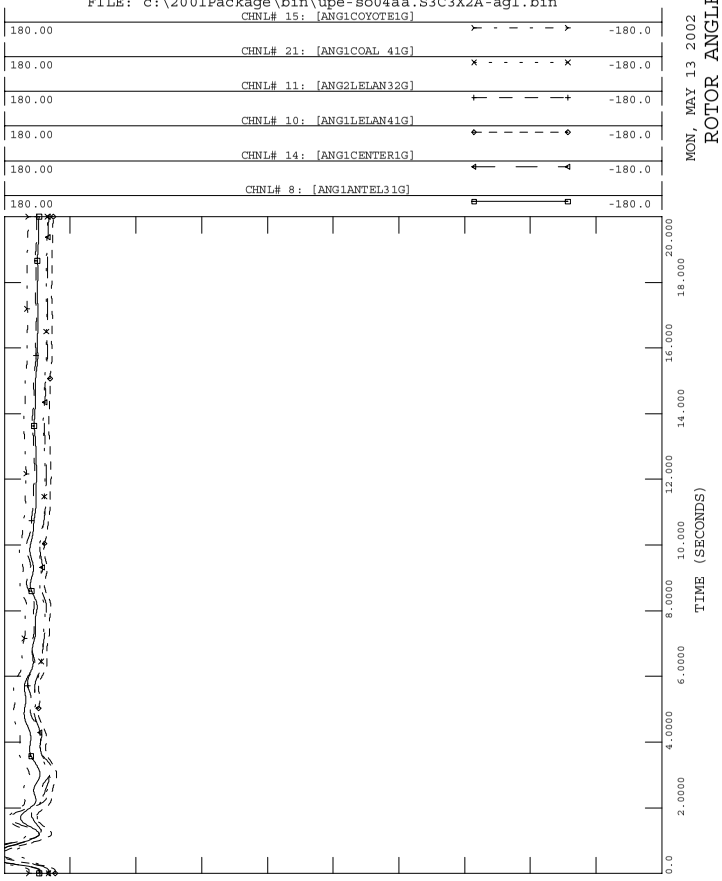
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
ROTOR ANGLES 4



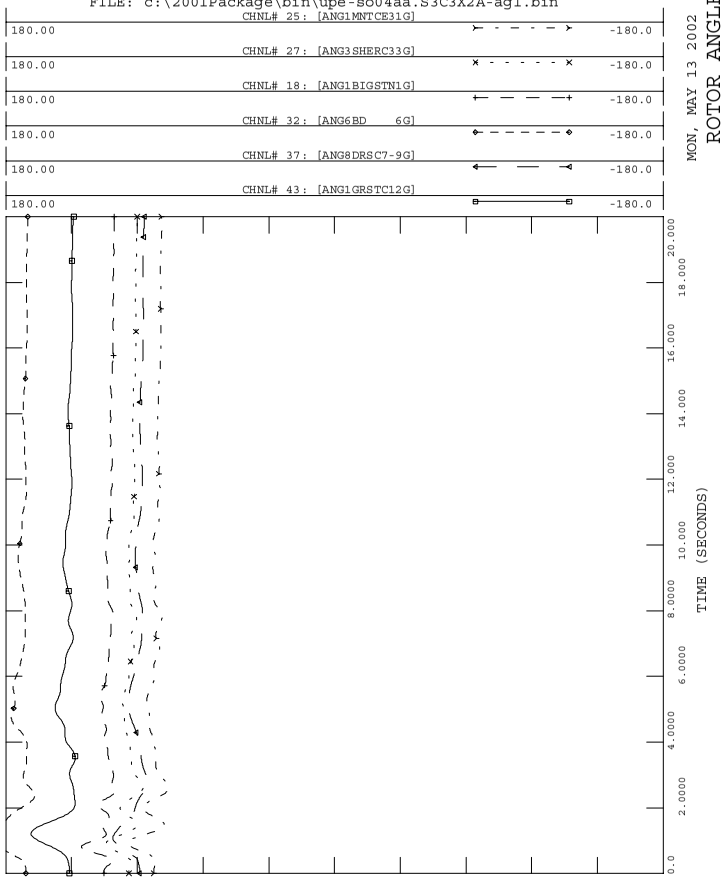
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
ROTOR ANGLES 1

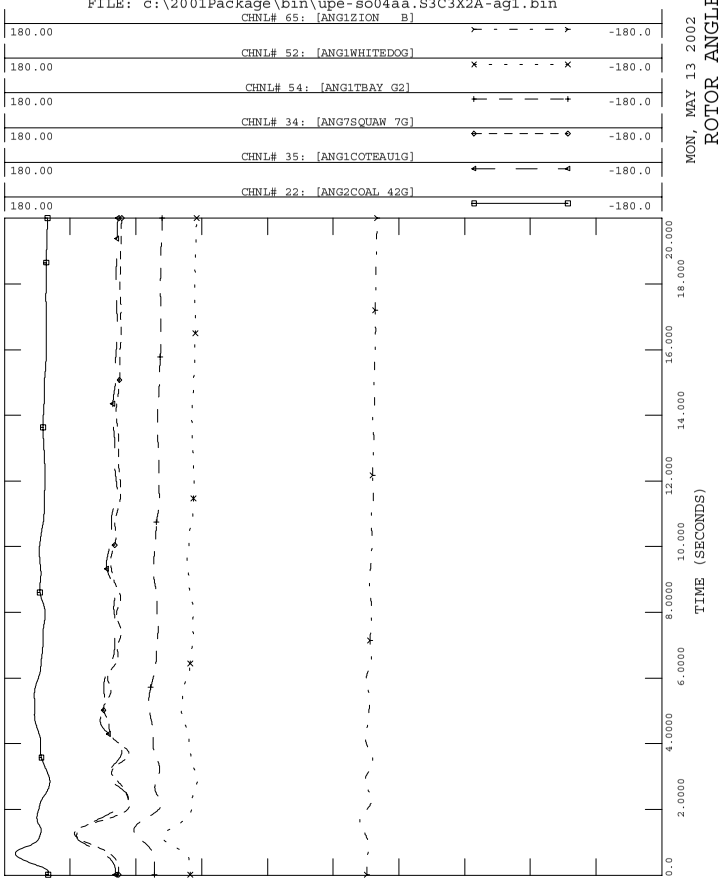


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
ROTOR ANGLES 3

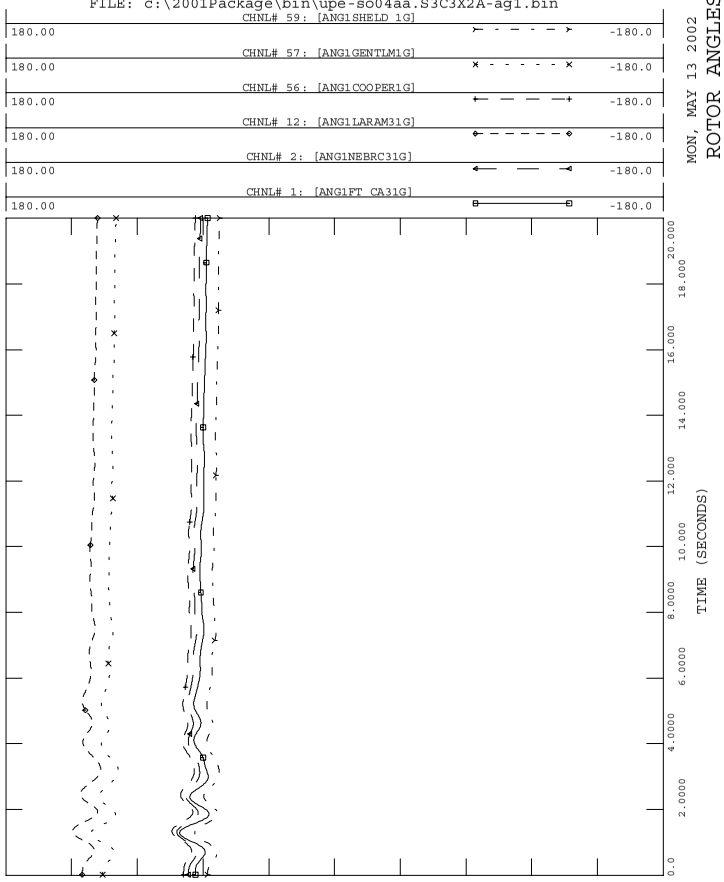


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin



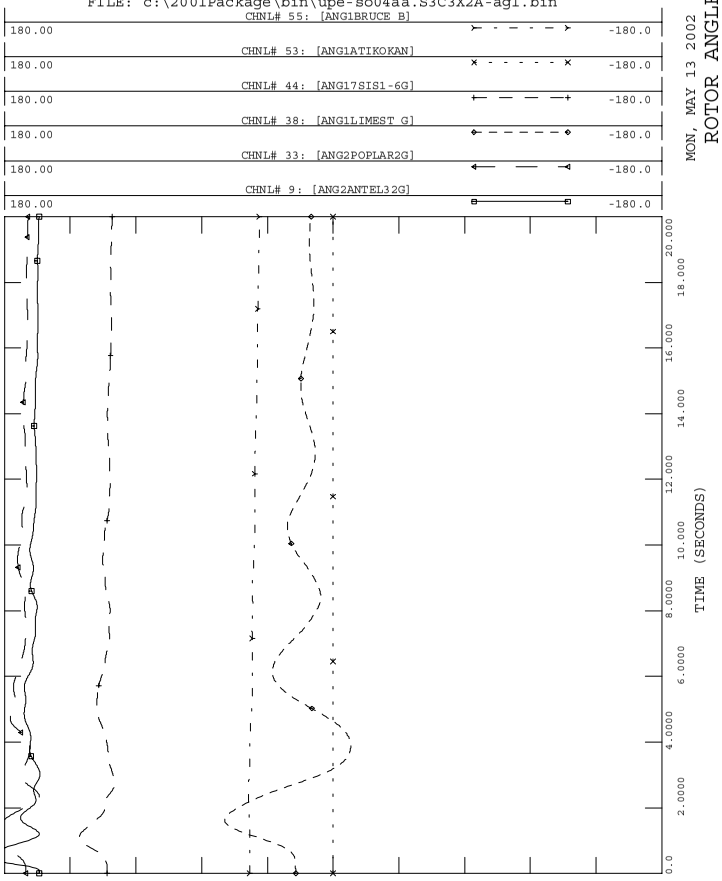
MON, MAY 13 2002 17:50
ROTOR ANGLES 6

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin



MON, MAY 13 2002 17:50
ROTOR ANGLES NB

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin



MON, MAY 13 2002 17:50
ROTOR ANGLES 5

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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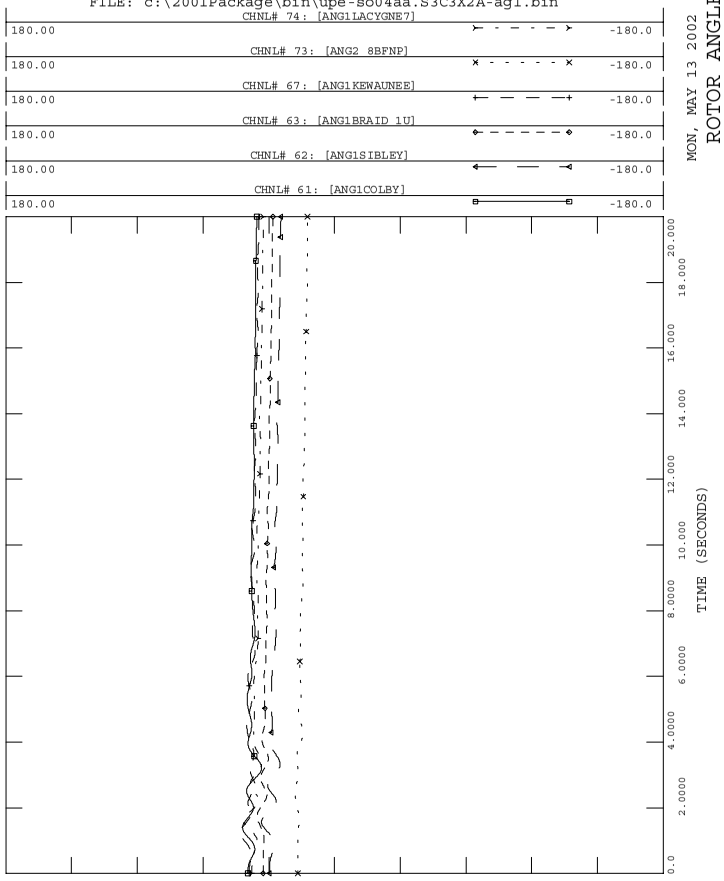
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin



MON, MAY 13 2002 17:50
ROTOR ANGLES 7

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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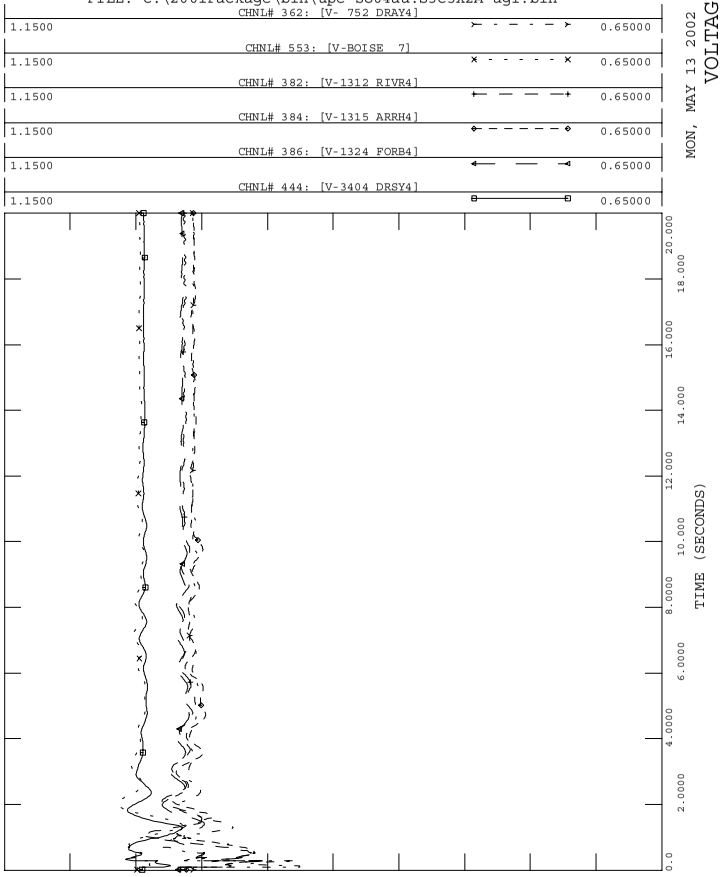
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
VOLTAGES 1



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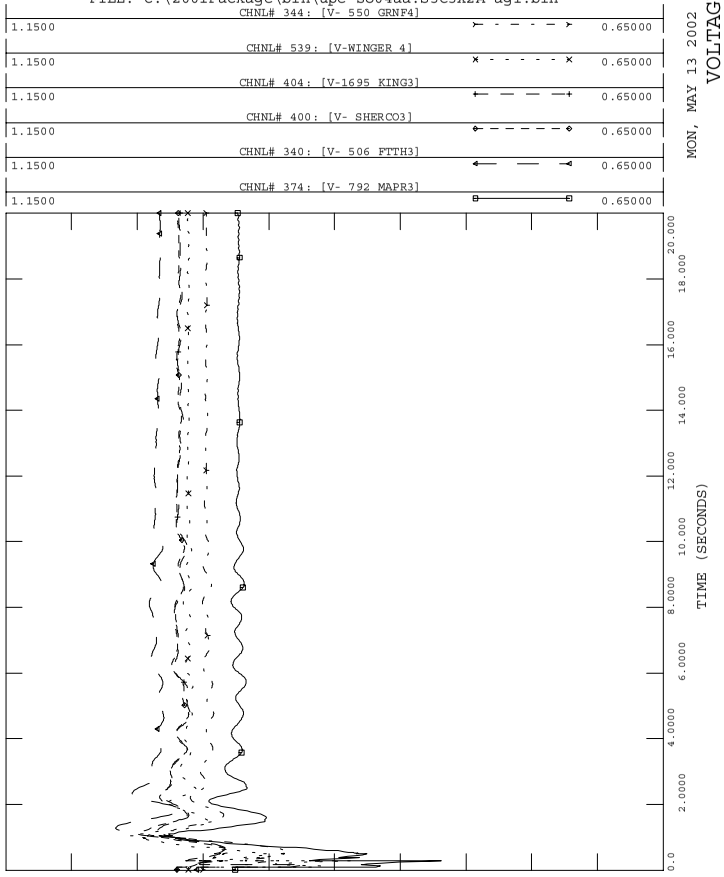
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
VOLTAGES 3



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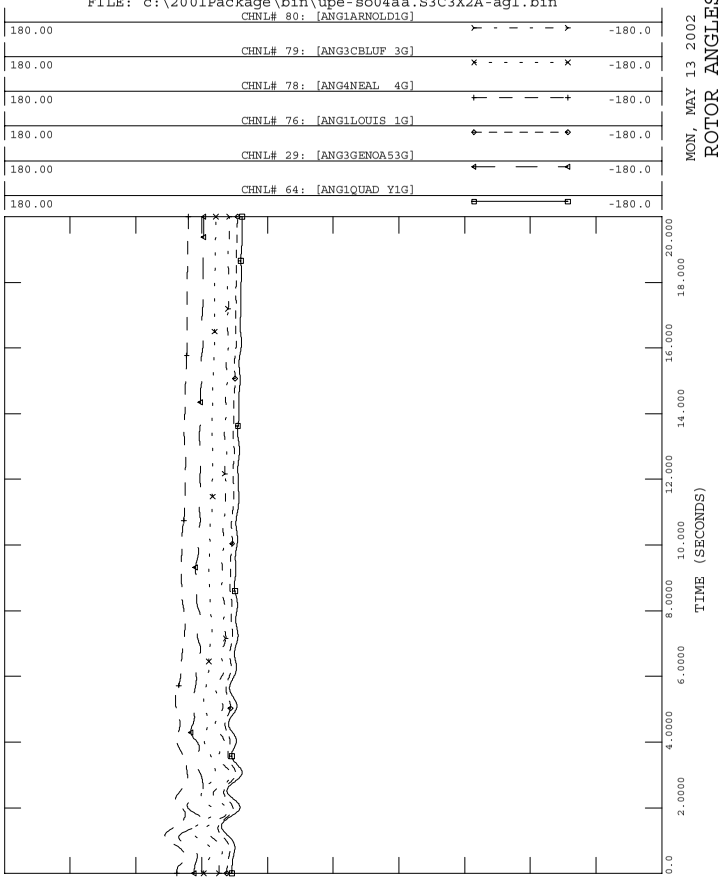
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
ROTOR ANGLES IA



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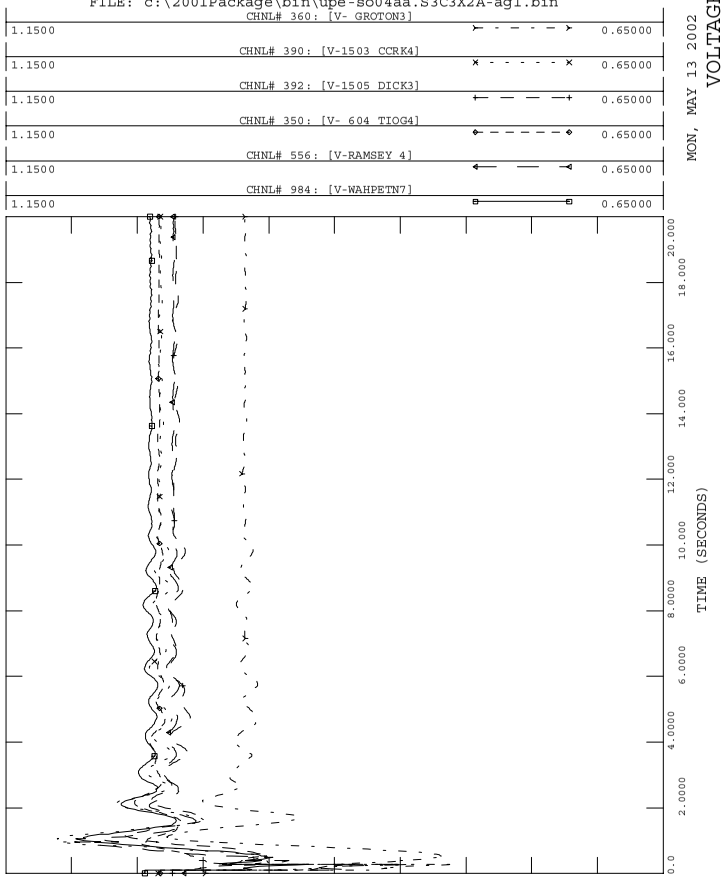
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
VOLTAGES 2



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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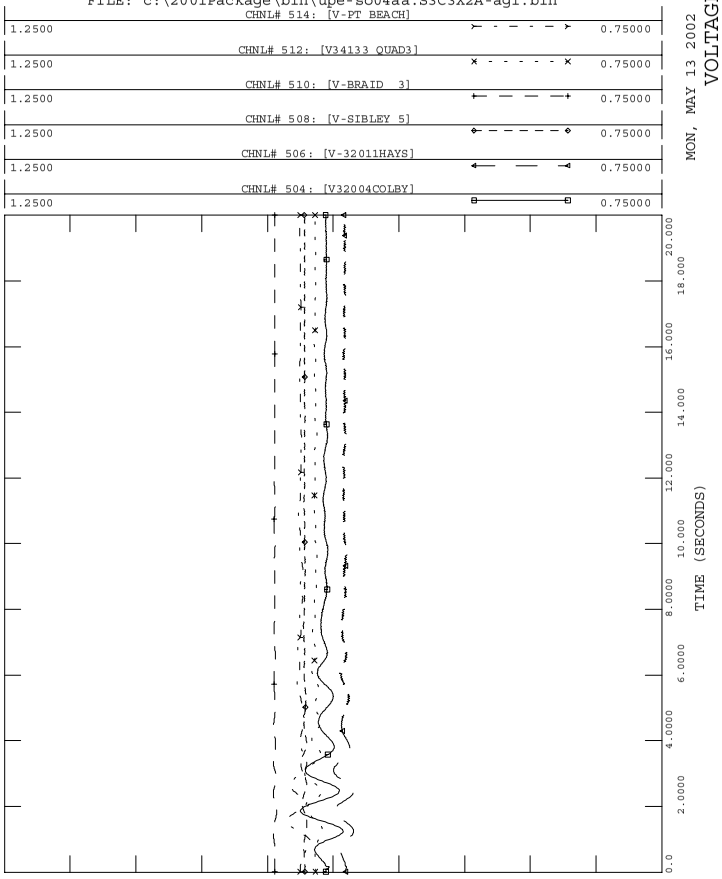

MON, MAY 13 2002 17:50
VOLTAGES 5

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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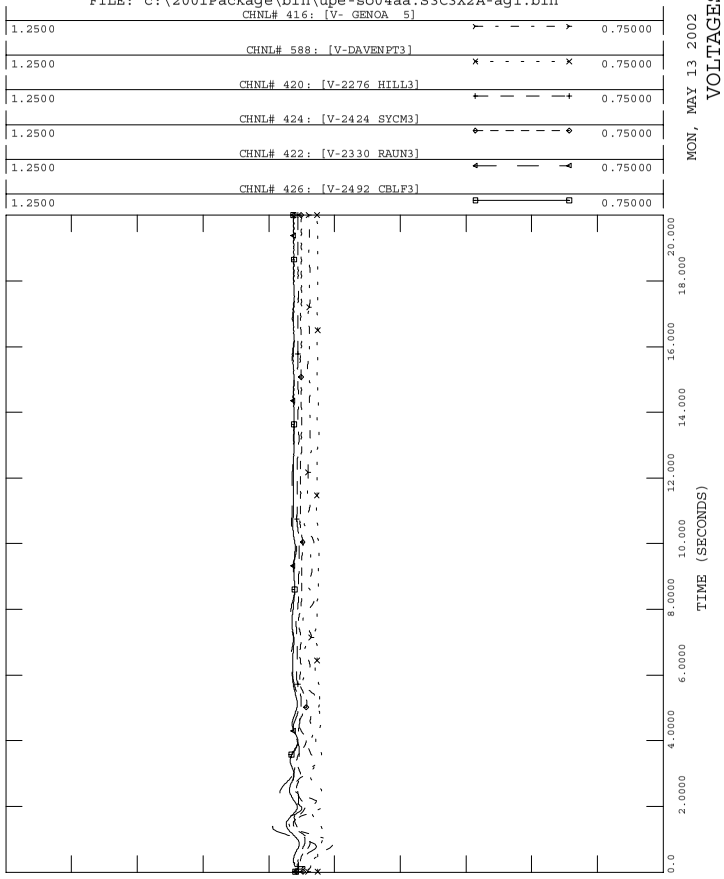
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin



MON, MAY 13 2002 17:50
VOLTAGES IA

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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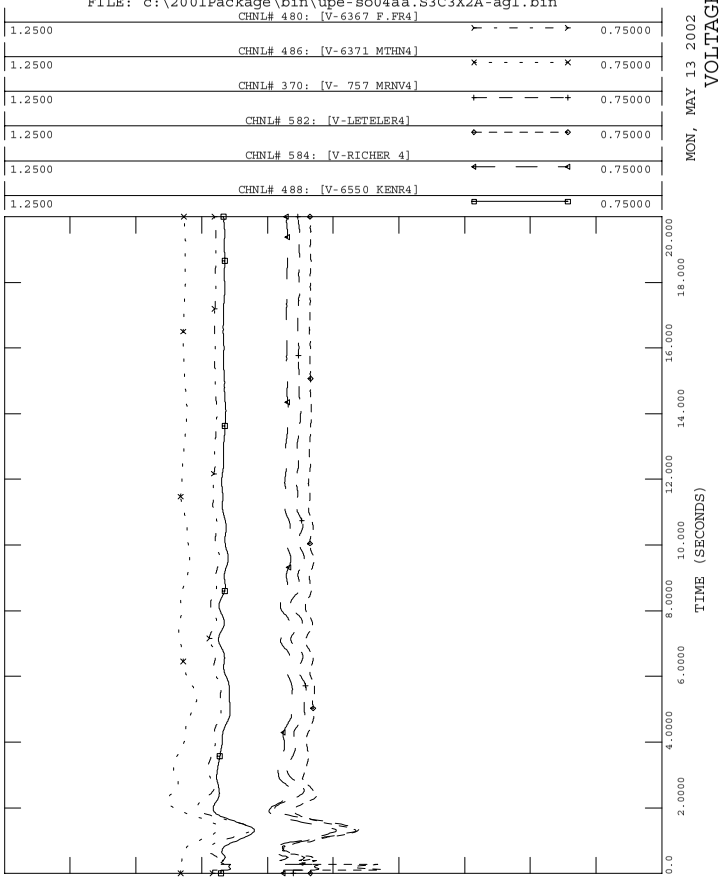
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin



MON, MAY 13 2002 17:50
VOLTAGES 4

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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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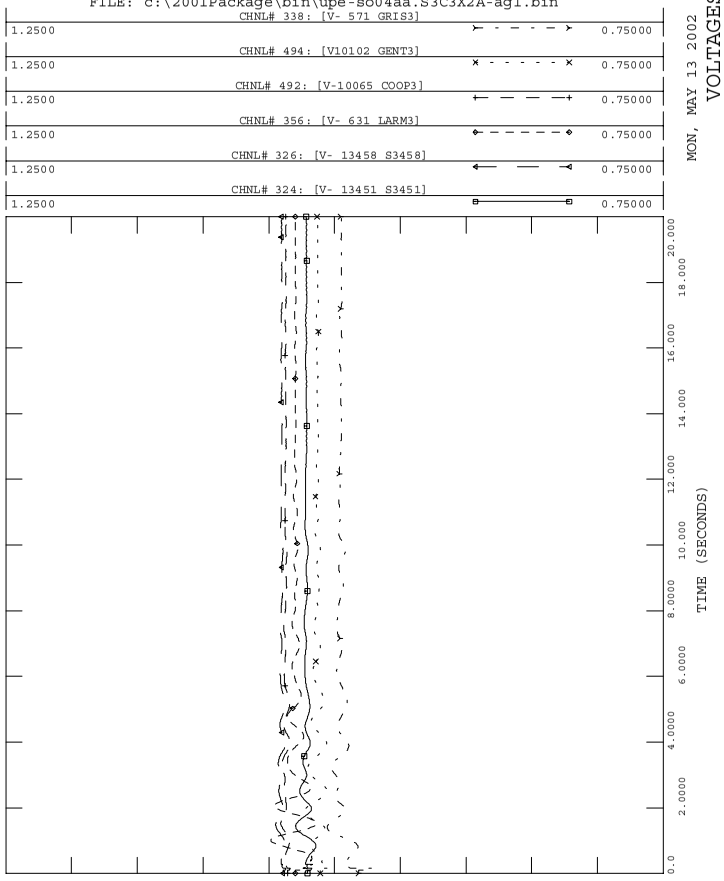
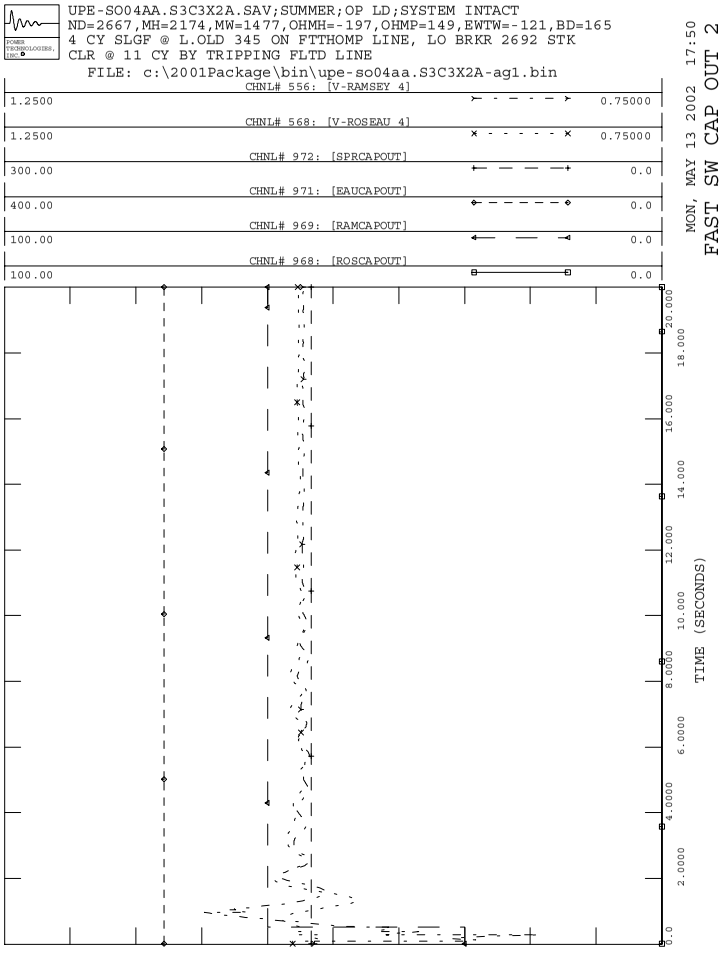


MON, MAY 13 2002 17:50
VOLTAGES NB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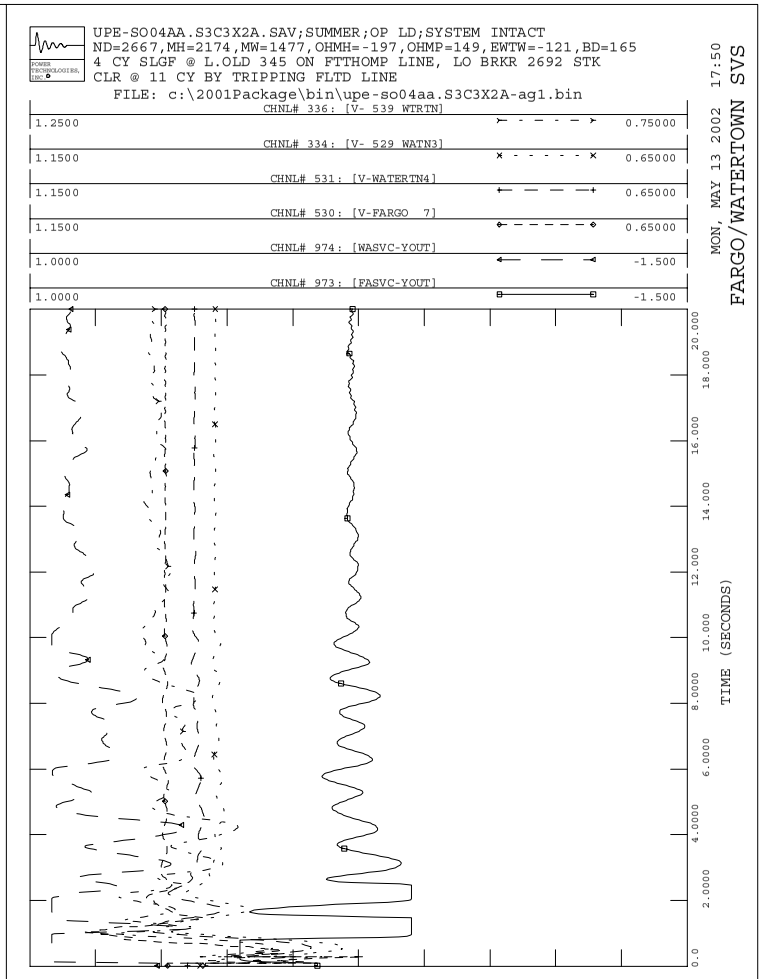
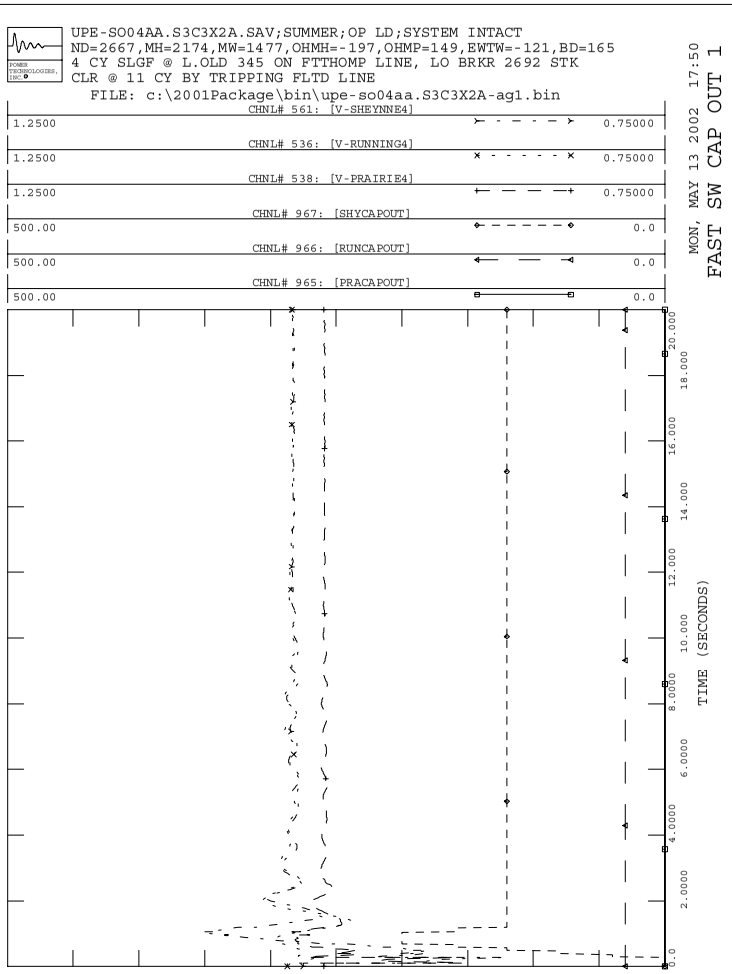
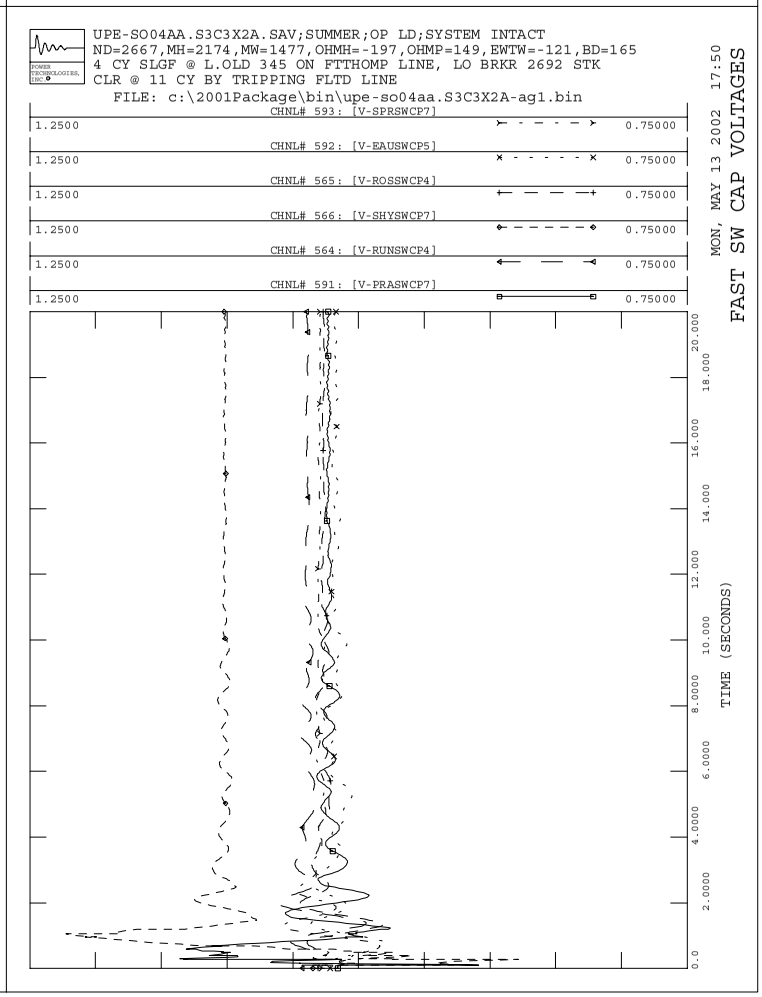
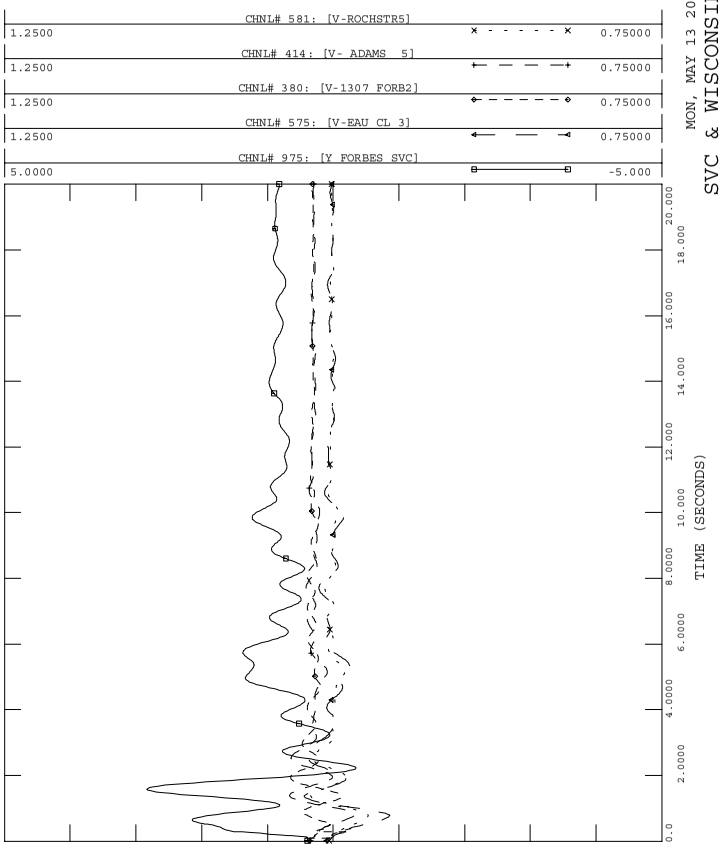
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
MON, MAY 13 2002 17:50
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
MON, MAY 13 2002 17:50
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
MON, MAY 13 2002 17:50
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
MON, MAY 13 2002 17:50
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin



MON, MAY 13 2002 17:50
SVC & WISCONSIN VOLT

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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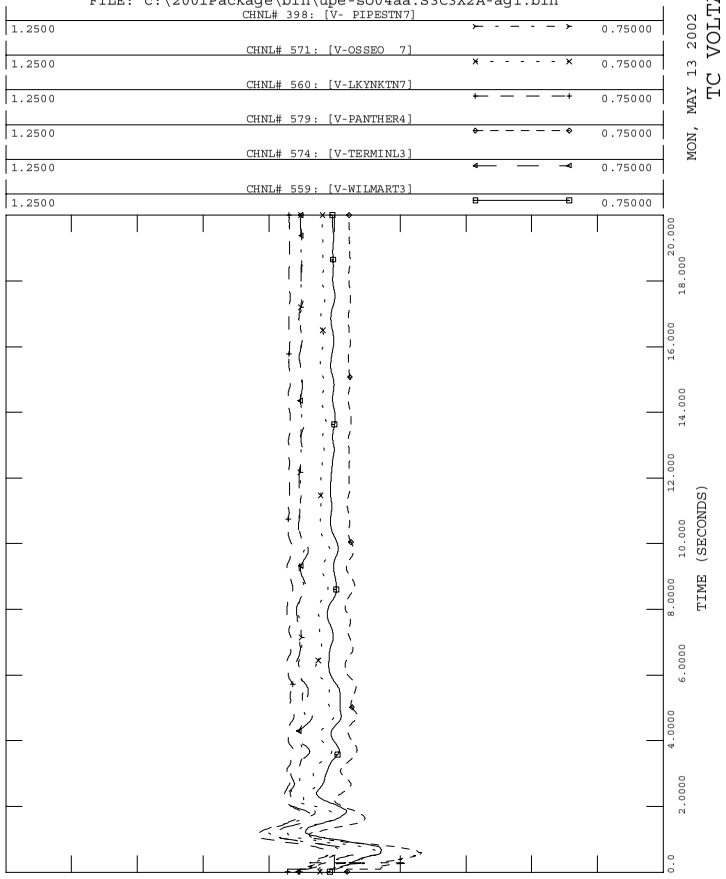
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin



MON, MAY 13 2002 17:50
TC VOLTAGES

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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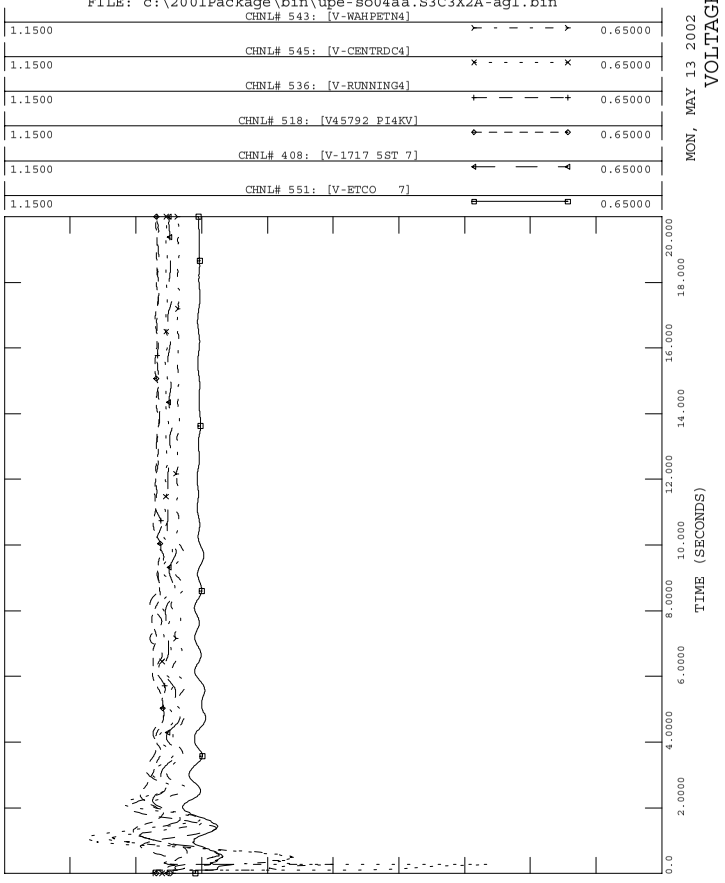
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin



MON, MAY 13 2002 17:50
VOLTAGES 6

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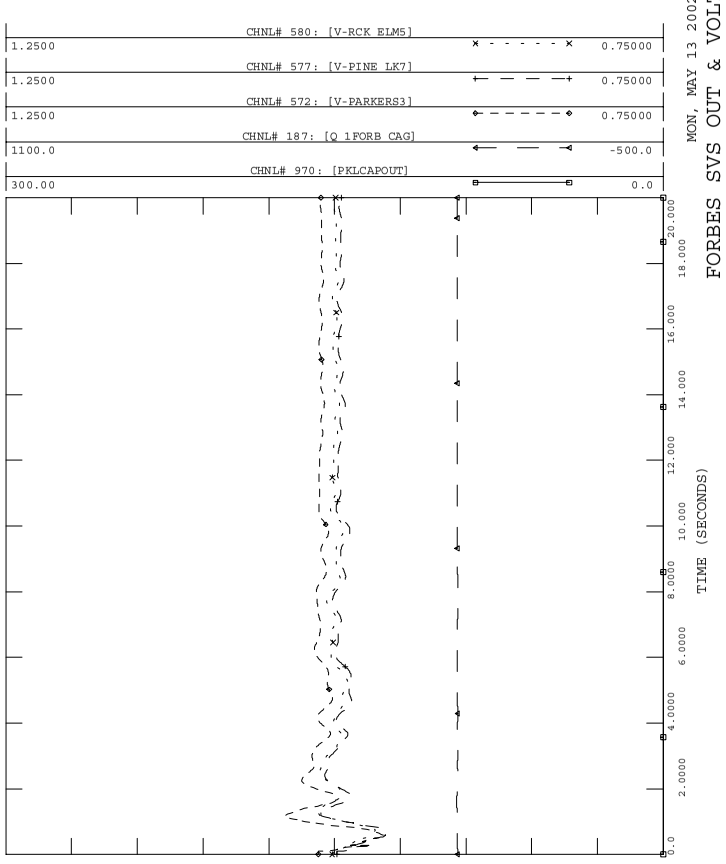
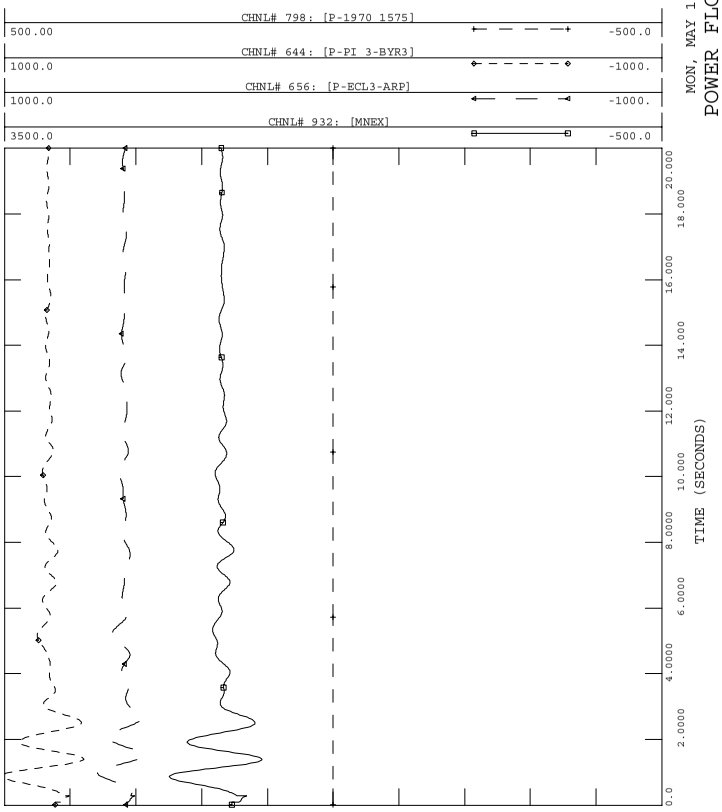
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin



MON, MAY 13 2002 17:50
FORBES SVS OUT & VOLTAGES

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
POWER FLOW SUMS 2



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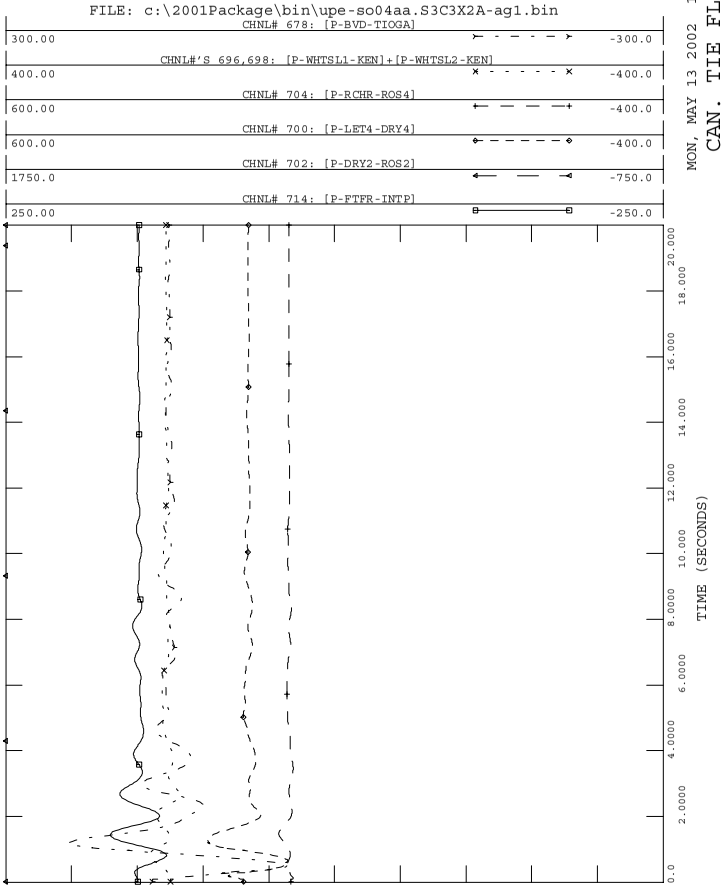
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
CAN. TIE FLOWS



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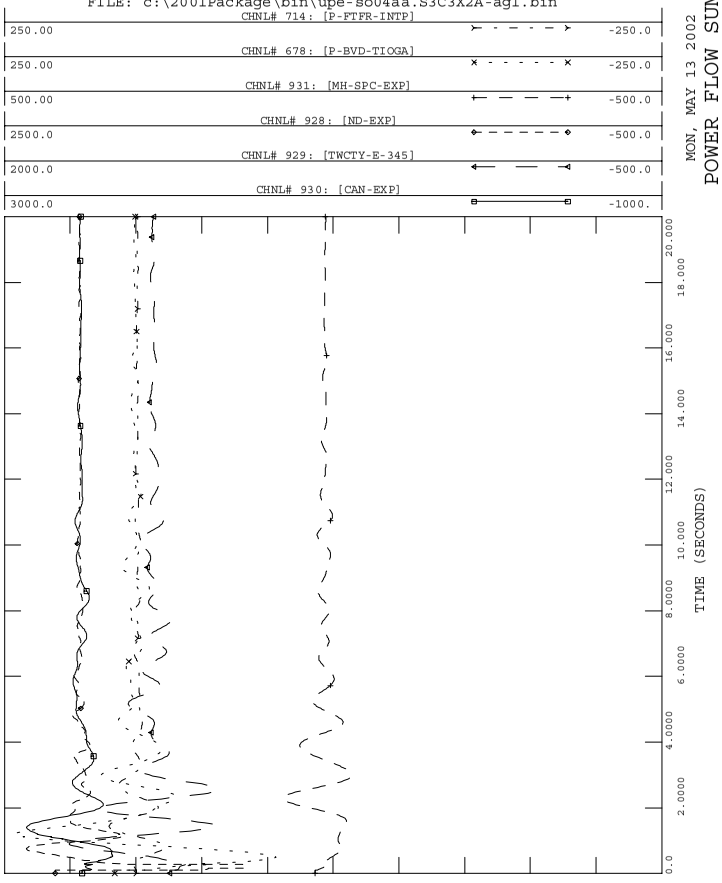
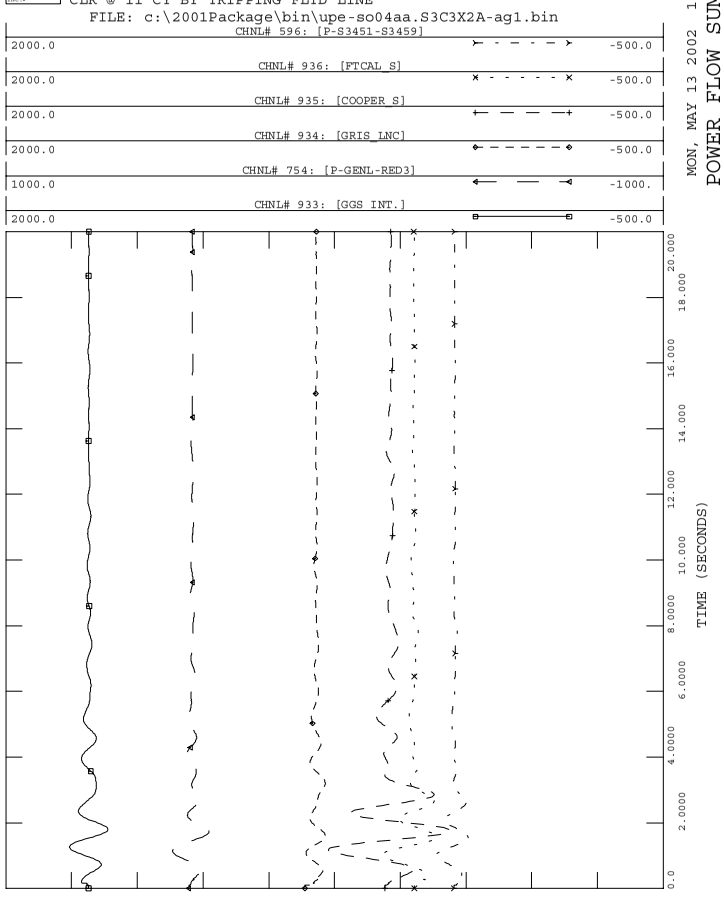
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
POWER FLOW SUMS 1



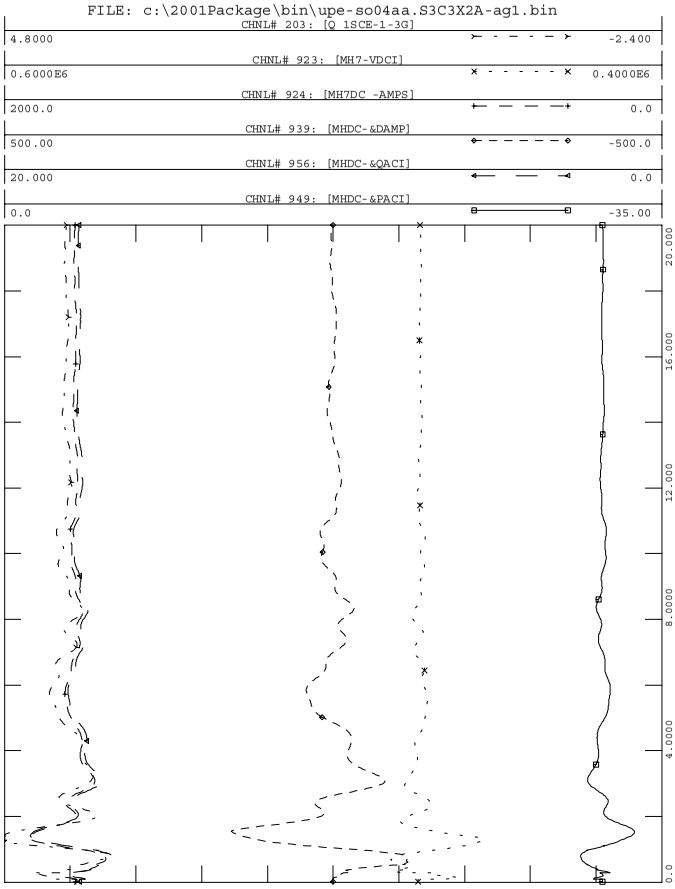
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
POWER FLOW SUM 3



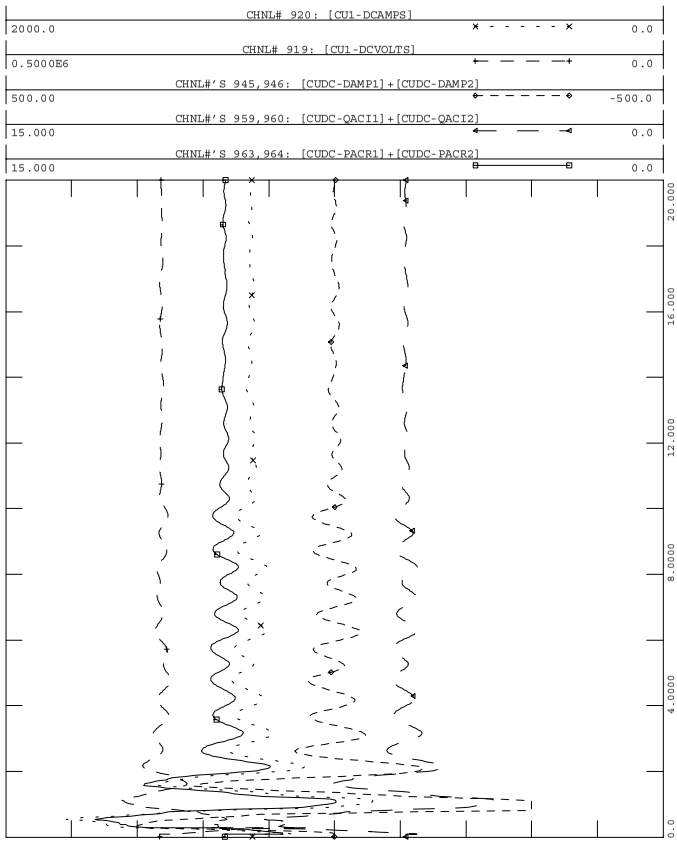
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
MH DC PARAMETERS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
CU DC #1



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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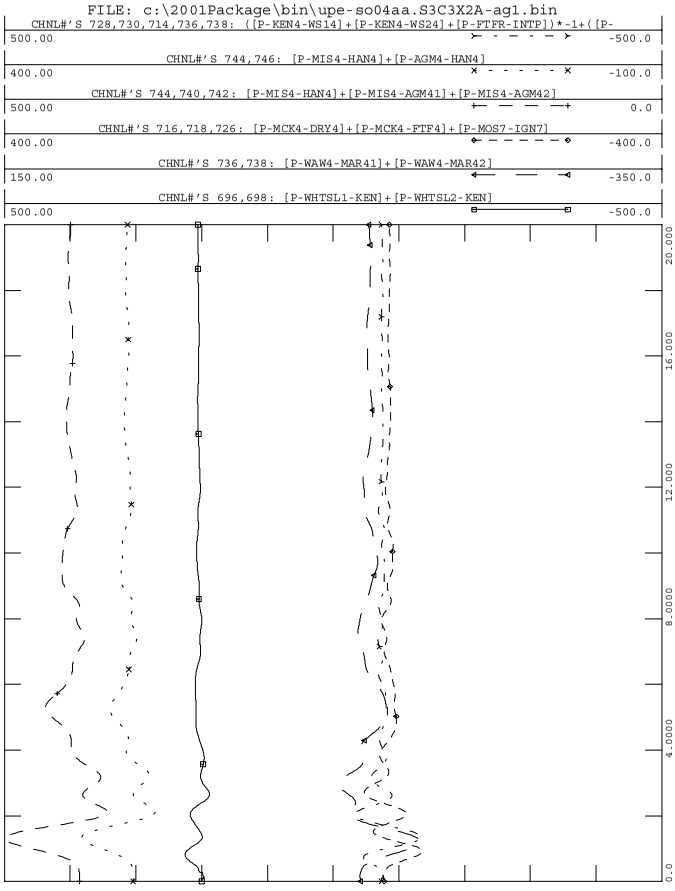
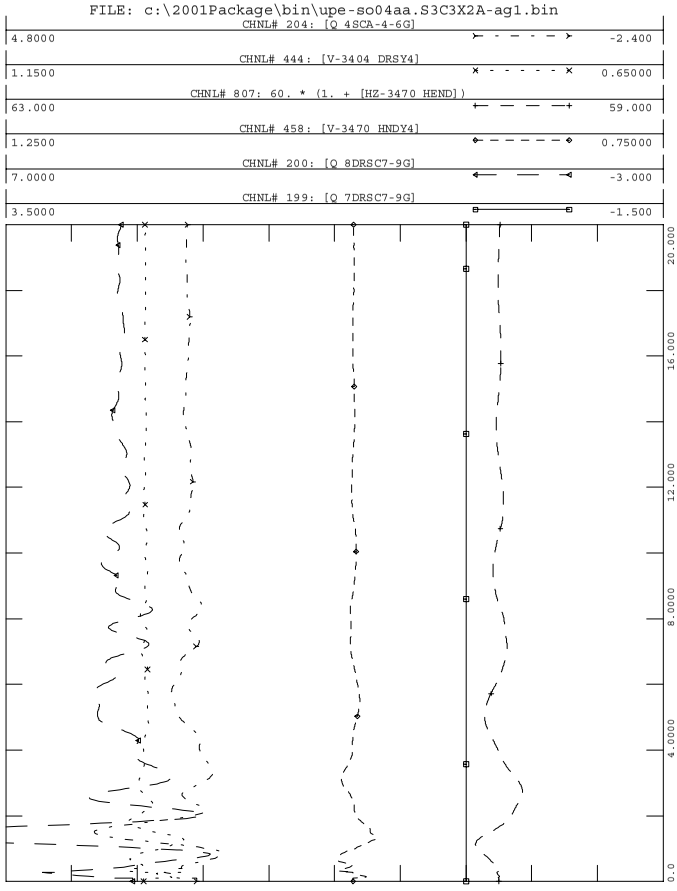
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50
OH TIE FLOWS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

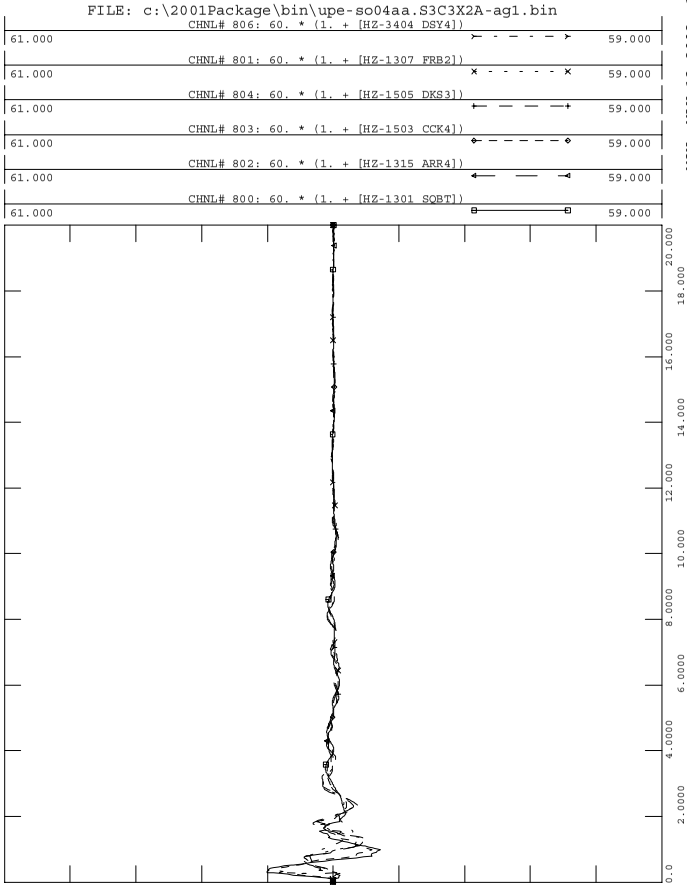
MON, MAY 13 2002 17:50
MH DC PARAMETERS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50

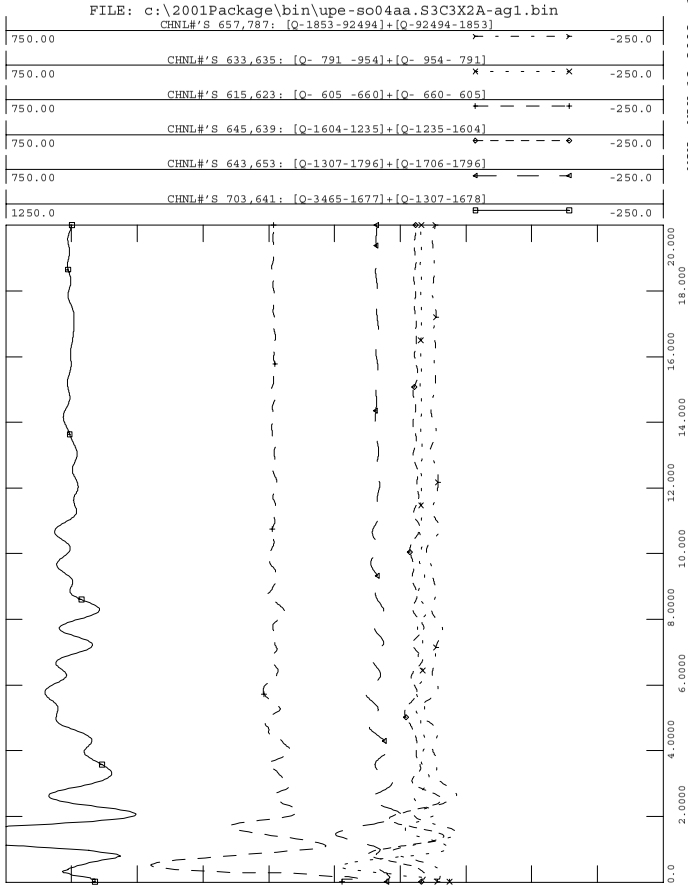
FREQ AT DC TERMINALS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50

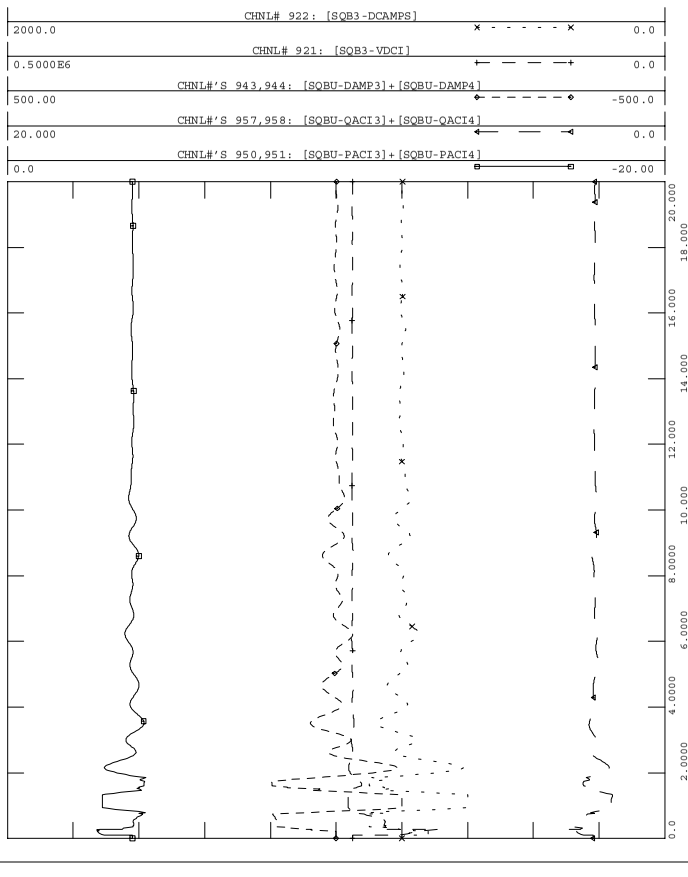
VAR LOSSES



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50

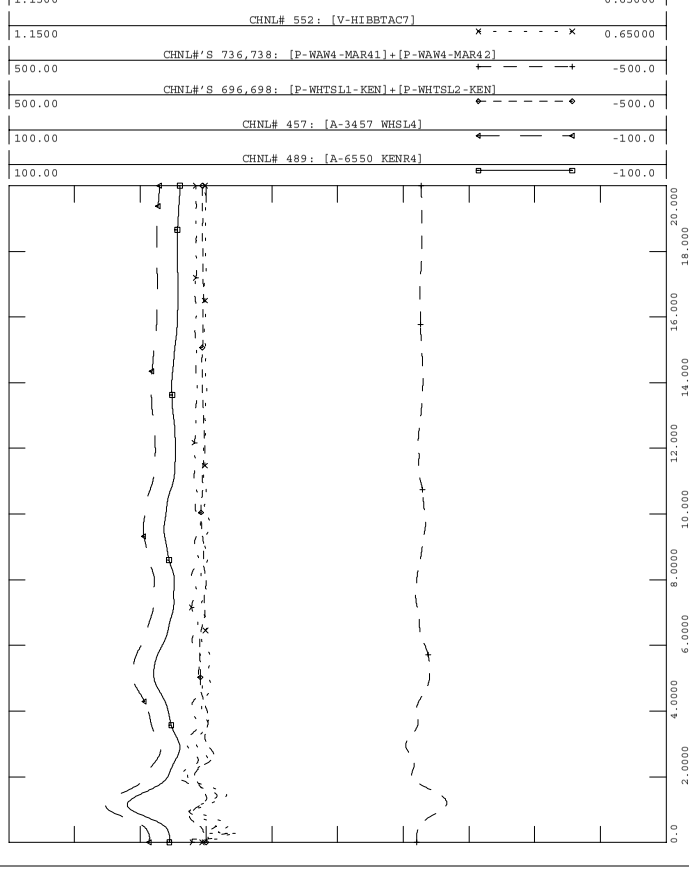
SQB DC #3



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

MON, MAY 13 2002 17:50

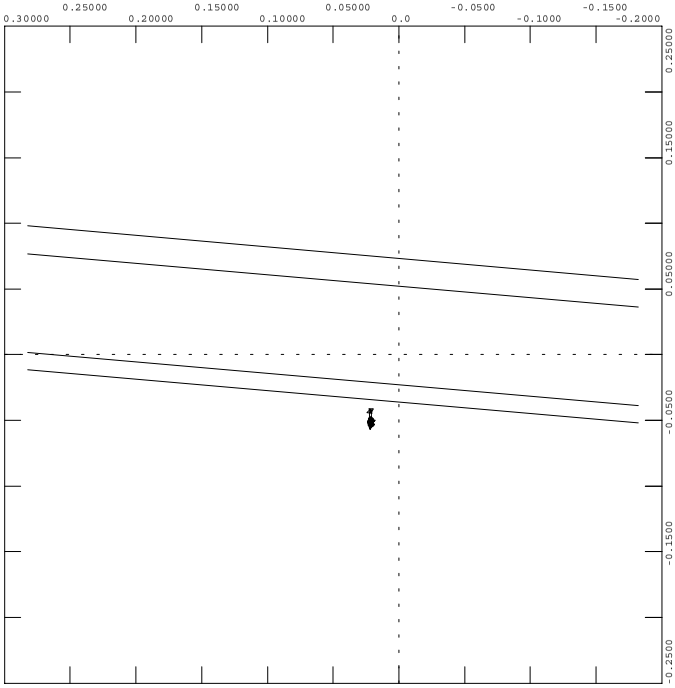
VOLTAGES, ANGLES



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

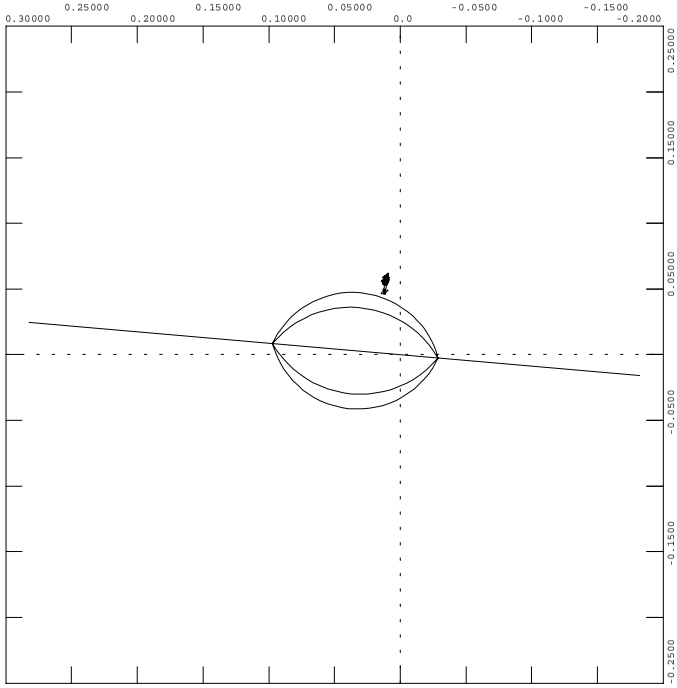


MON, MAY 13 2002 17:50
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

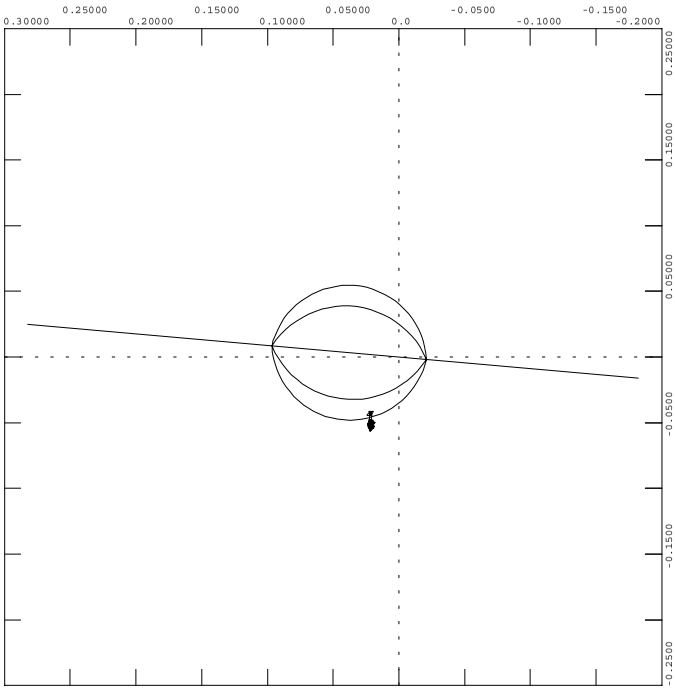


MON, MAY 13 2002 17:50
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

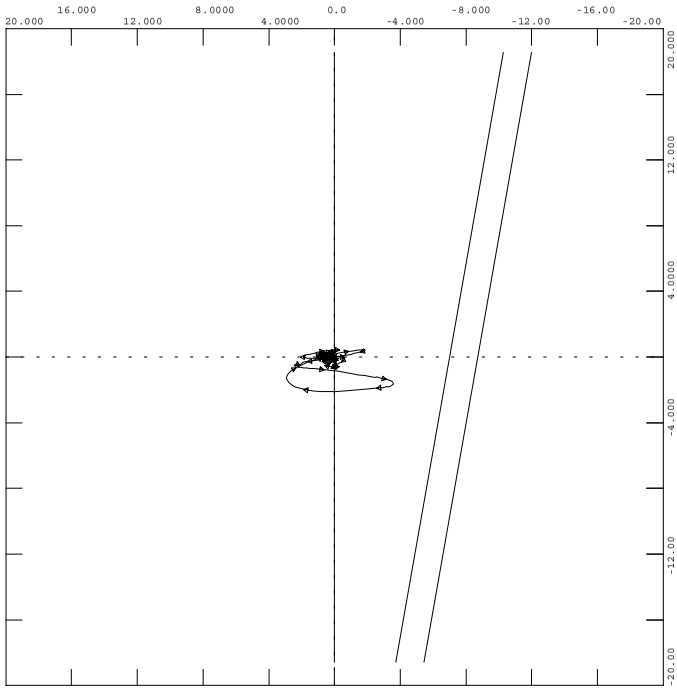


MON, MAY 13 2002 17:50
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

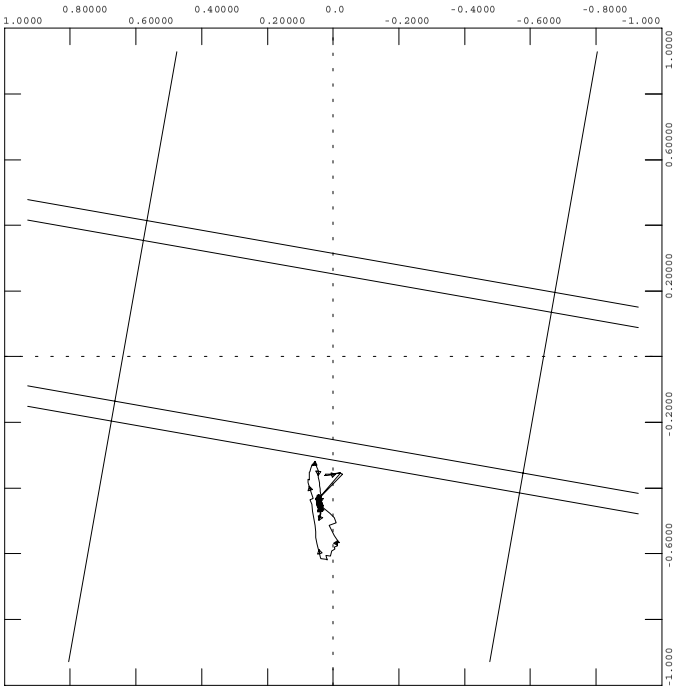


MON, MAY 13 2002 17:50
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

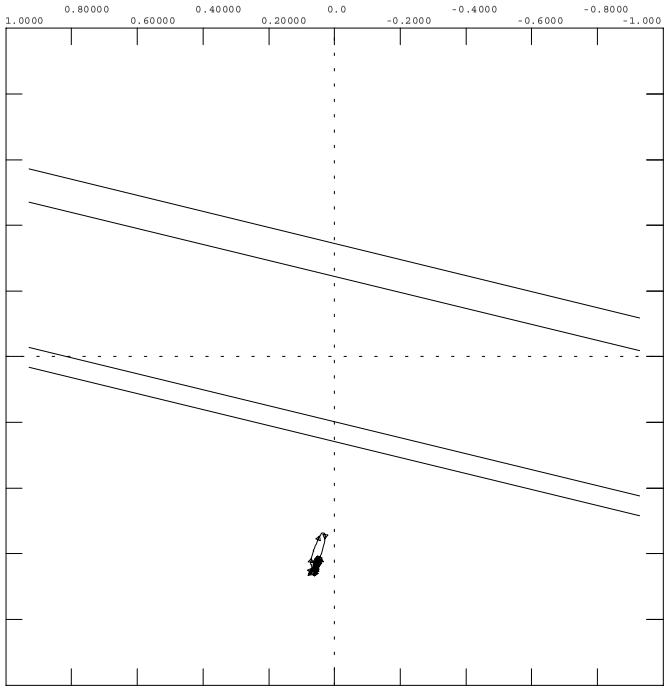
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

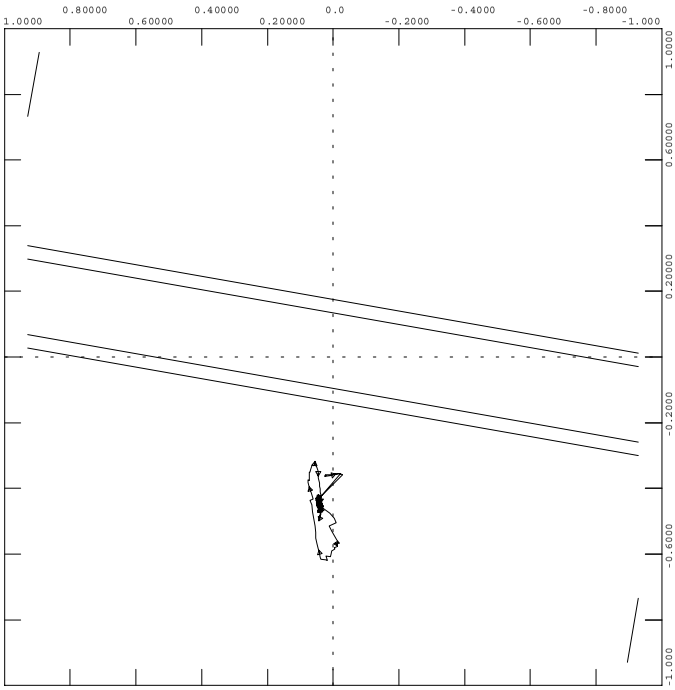
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

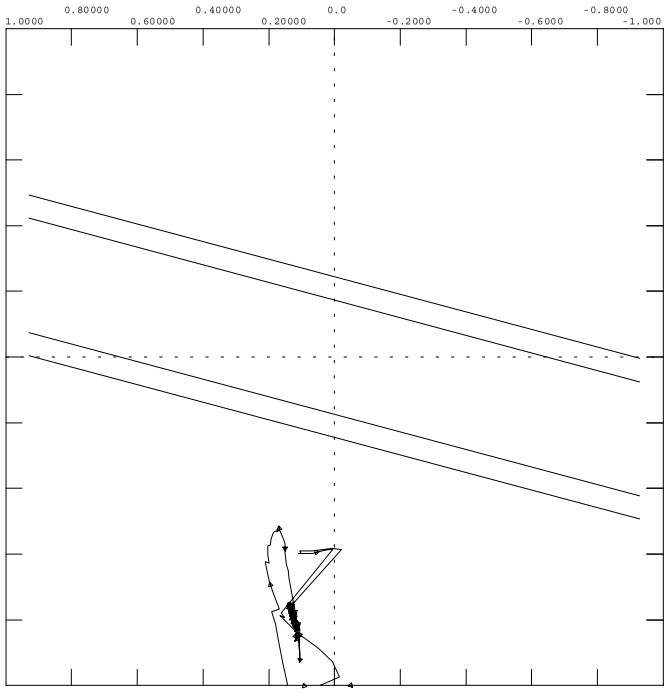
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

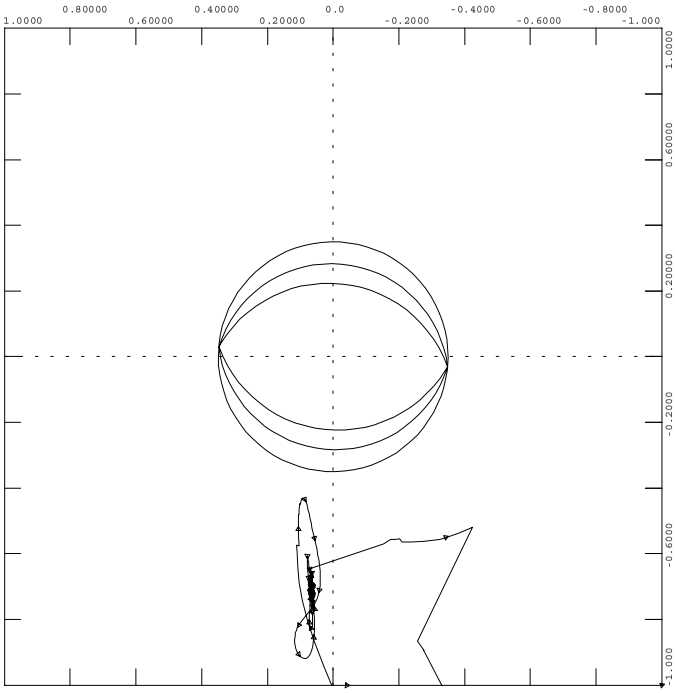
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

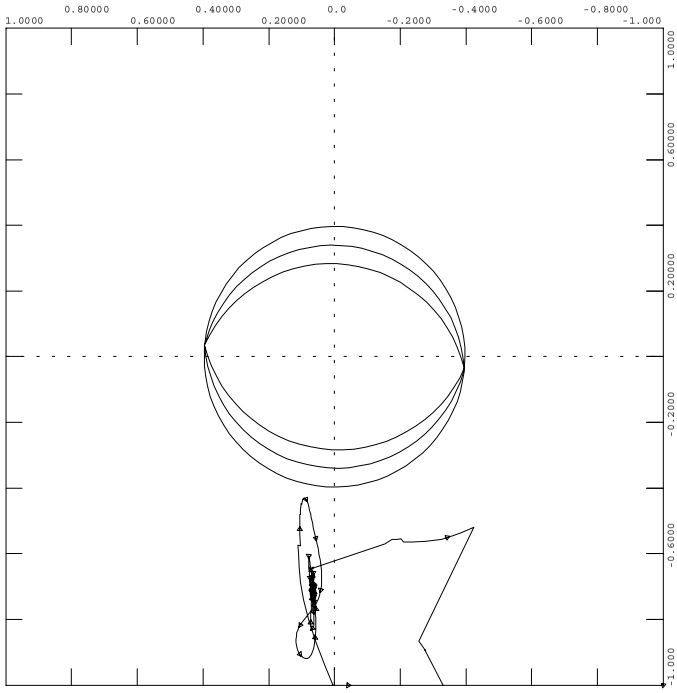


MON, MAY 13 2002 17:50
TIOGA-B.DAM-SOUTH (266)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

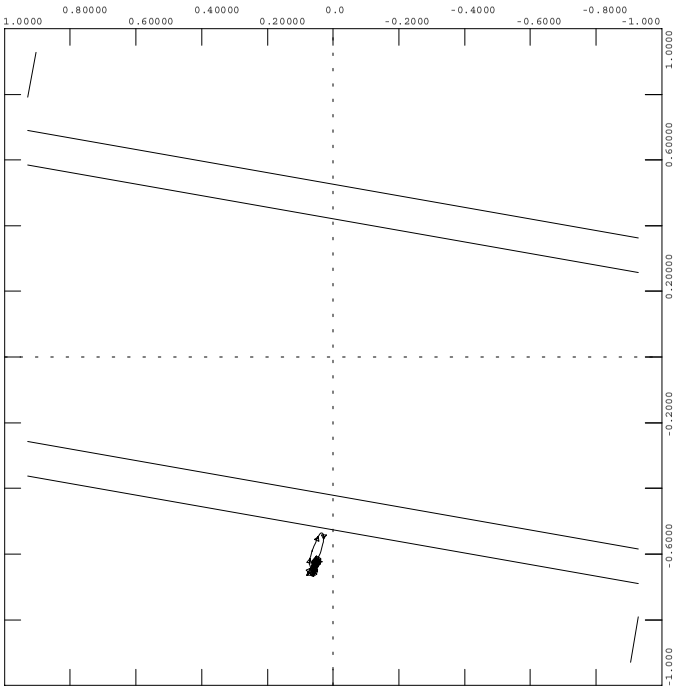


MON, MAY 13 2002 17:50
TIOGA-B.DAM-EMRG (267)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

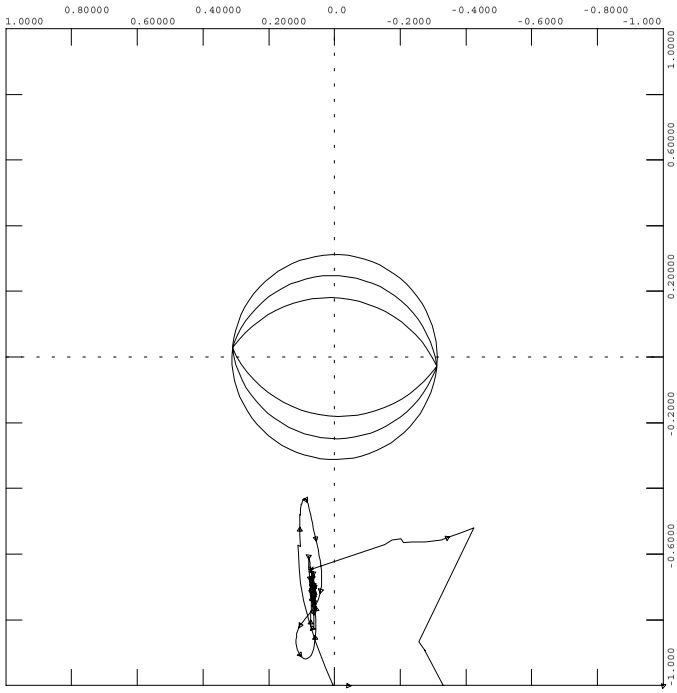


MON, MAY 13 2002 17:50
R50M-MORANVILLE-EMRG (777

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

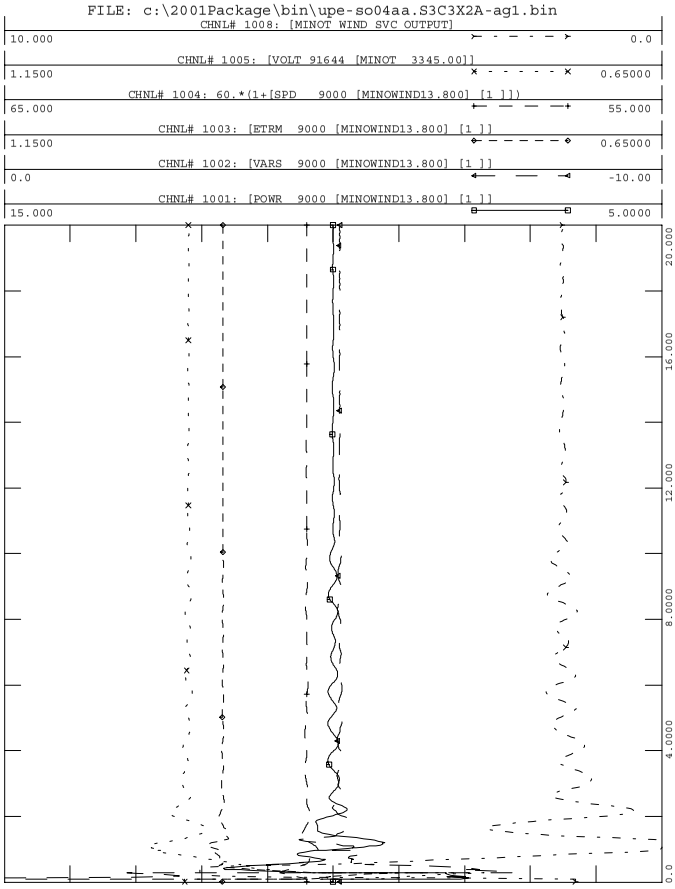
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



MON, MAY 13 2002 17:50
TIOGA-B.DAM-NORTH (268)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

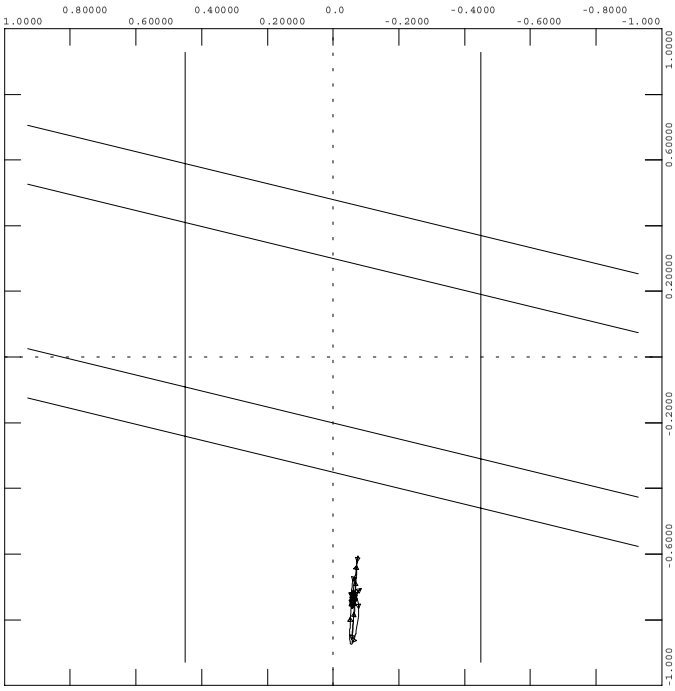


MON, MAY 13 2002 17:50
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

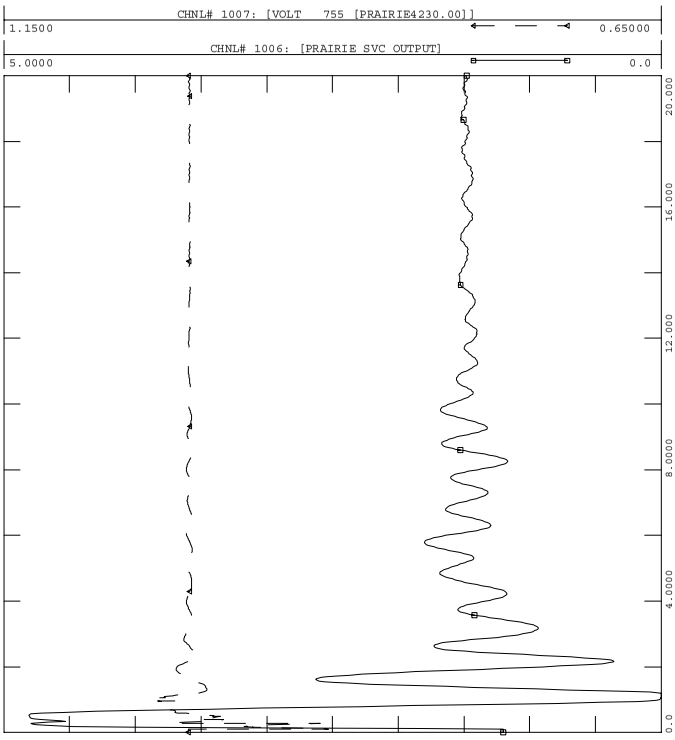
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, MAY 13 2002 17:50
MP-OH I.FALLS (779)

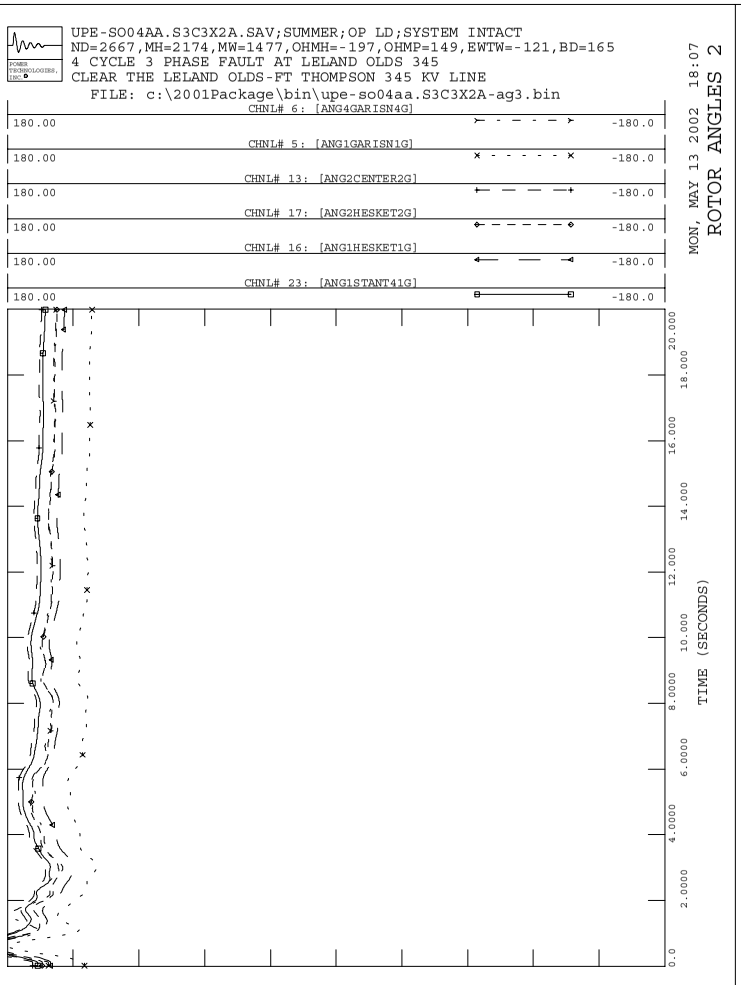
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag1.bin

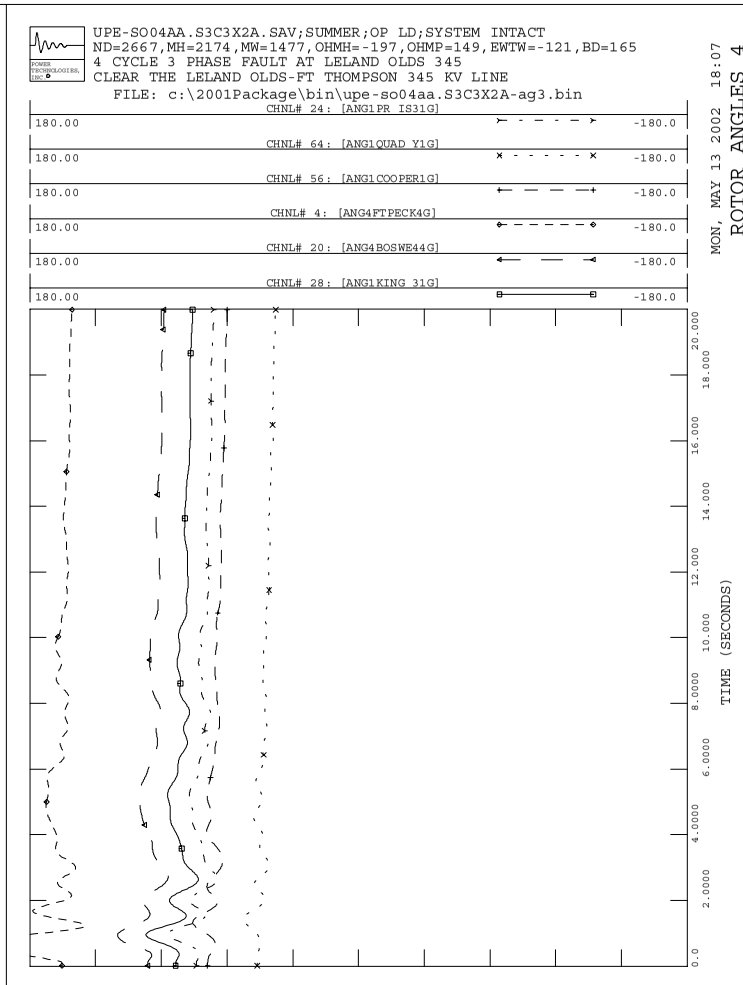


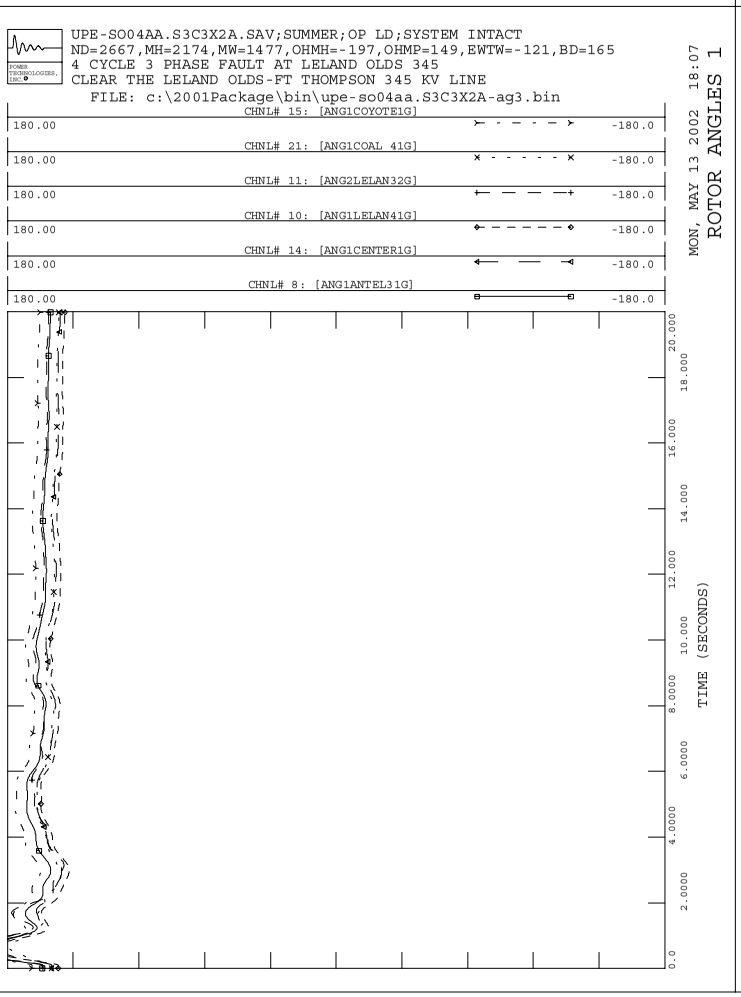
MON, MAY 13 2002 17:50
PRAIRIE SVC RESPONSE

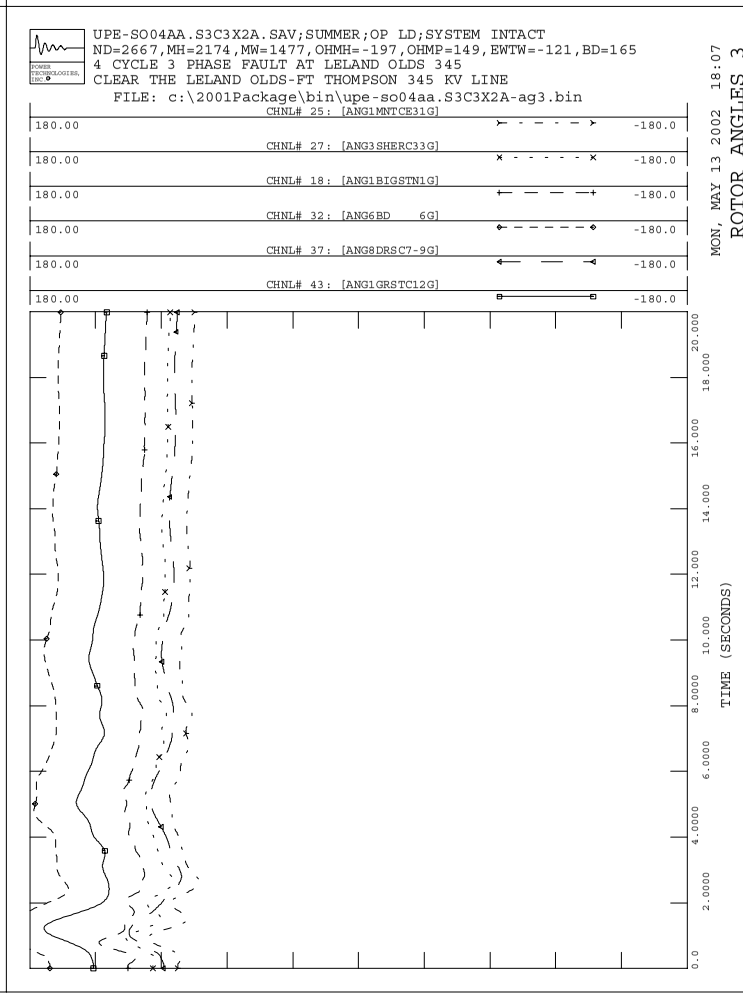
CONTINGENCY AG3

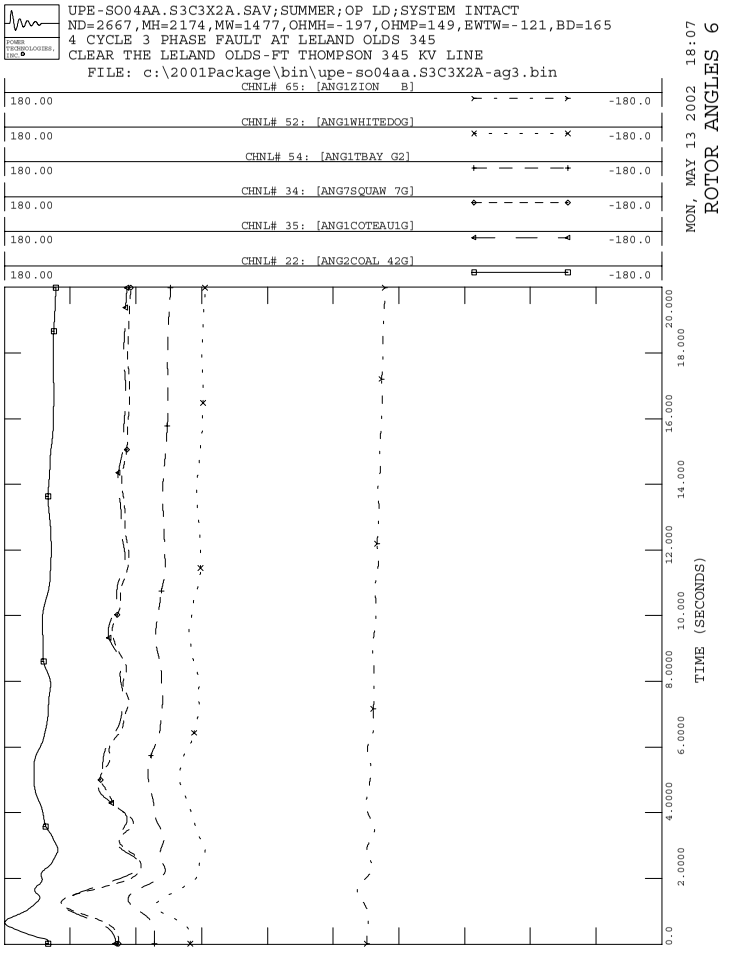
Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

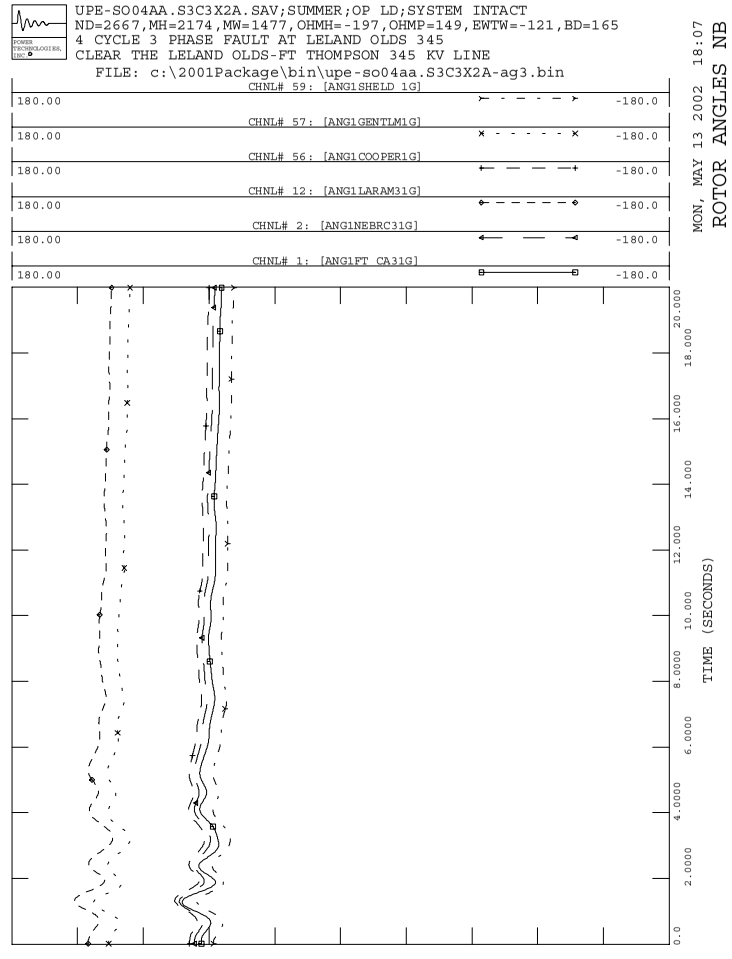

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:07
ROTOR ANGLES 2


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:07
ROTOR ANGLES 4


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:07
ROTOR ANGLES 1


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:07
ROTOR ANGLES 3


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:07
ROTOR ANGLES 6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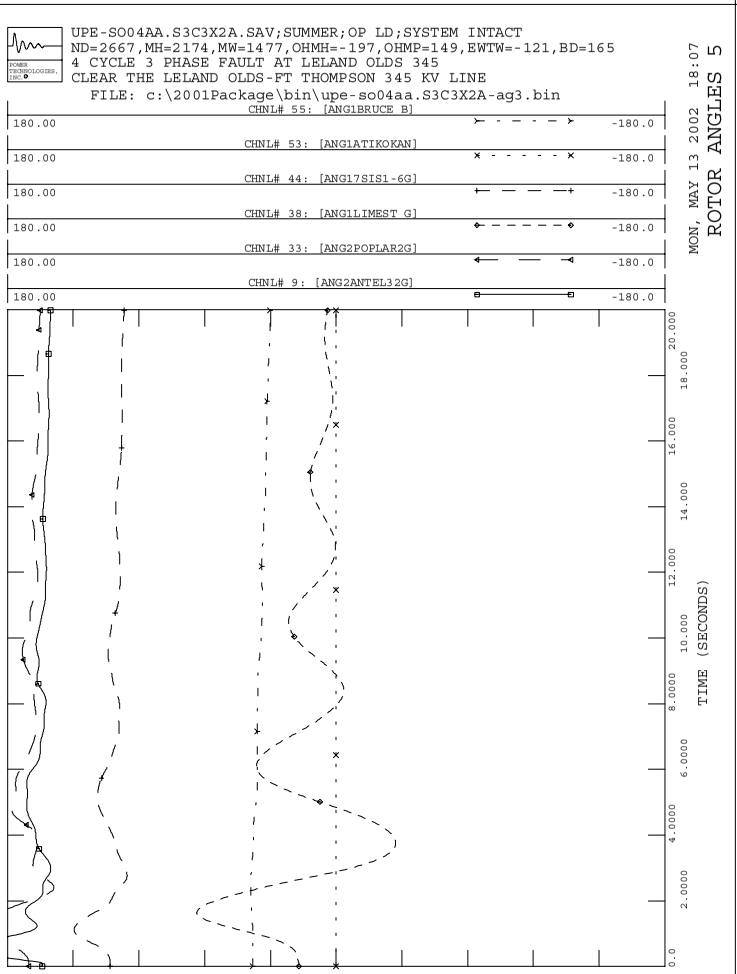
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:07
ROTOR ANGLES NB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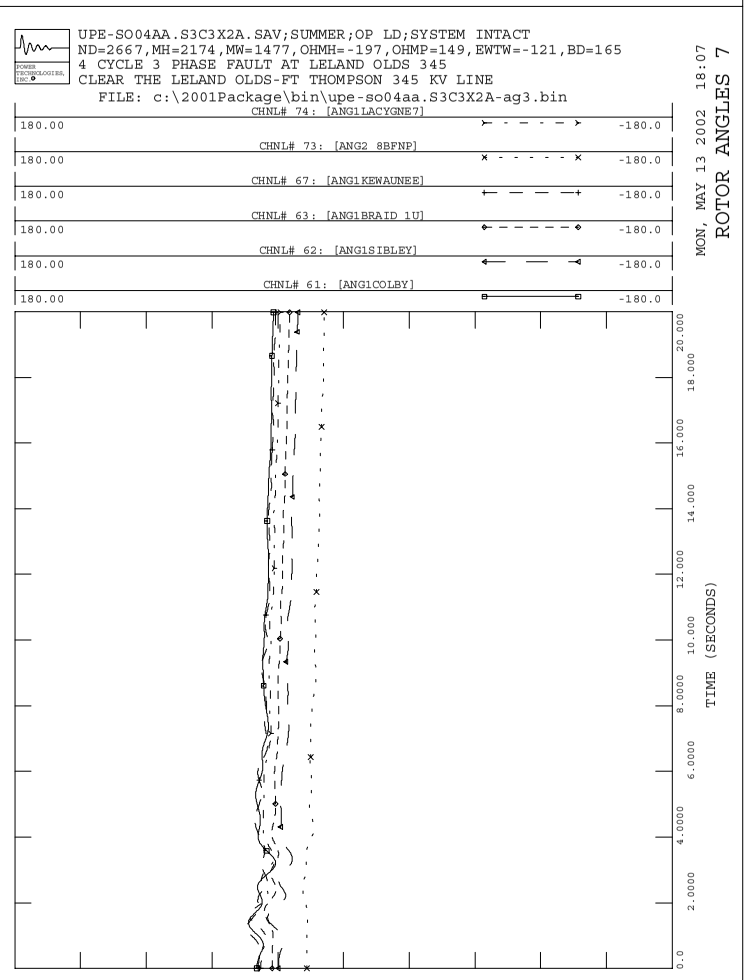
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:07
ROTOR ANGLES 5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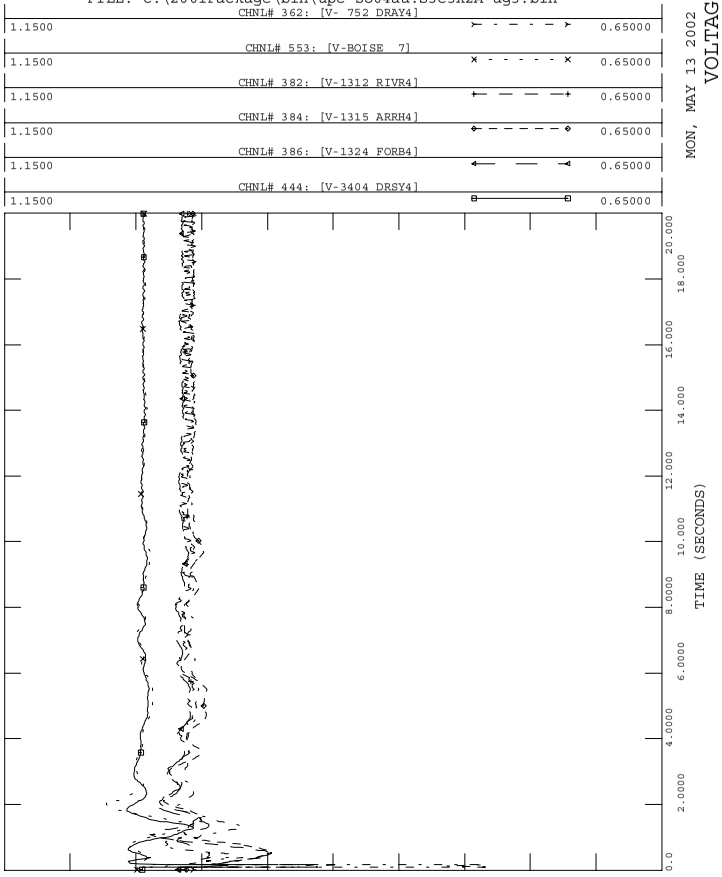
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:07
ROTOR ANGLES 7

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
VOLTAGES 1



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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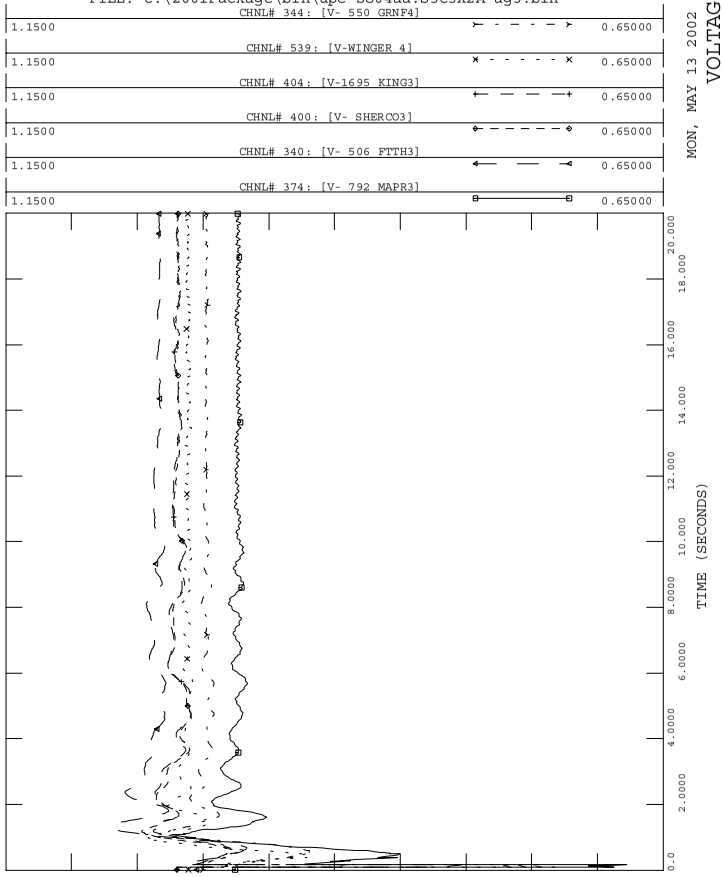
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
VOLTAGES 3



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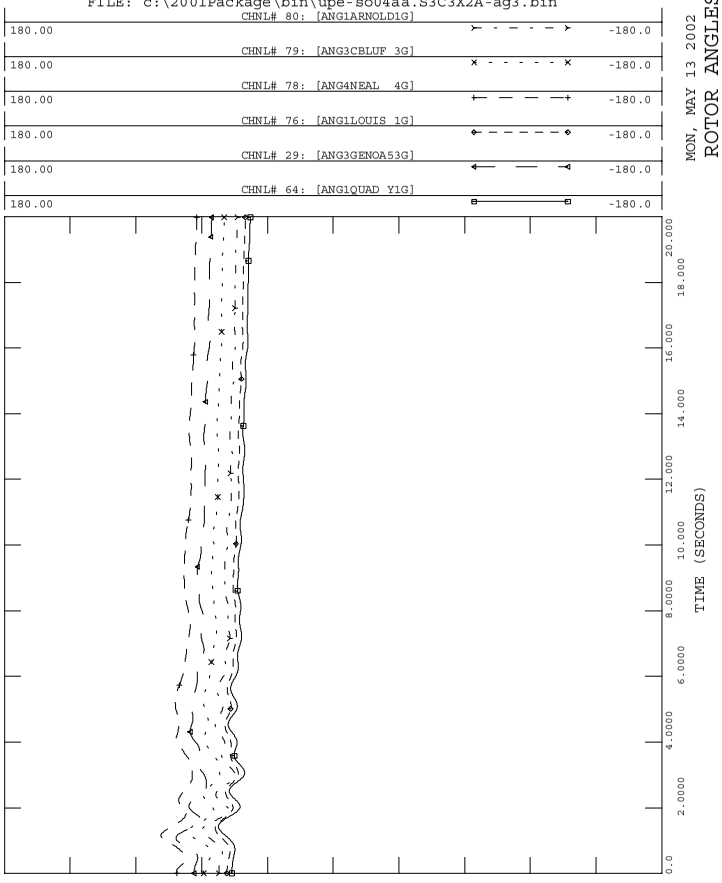
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
ROTOR ANGLES IA



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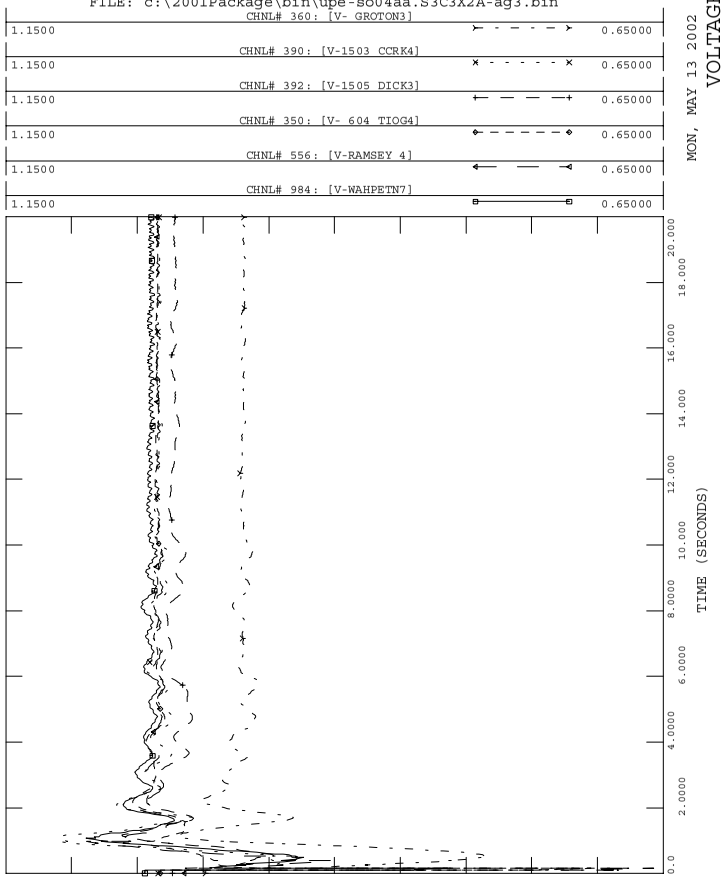
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
VOLTAGES 2



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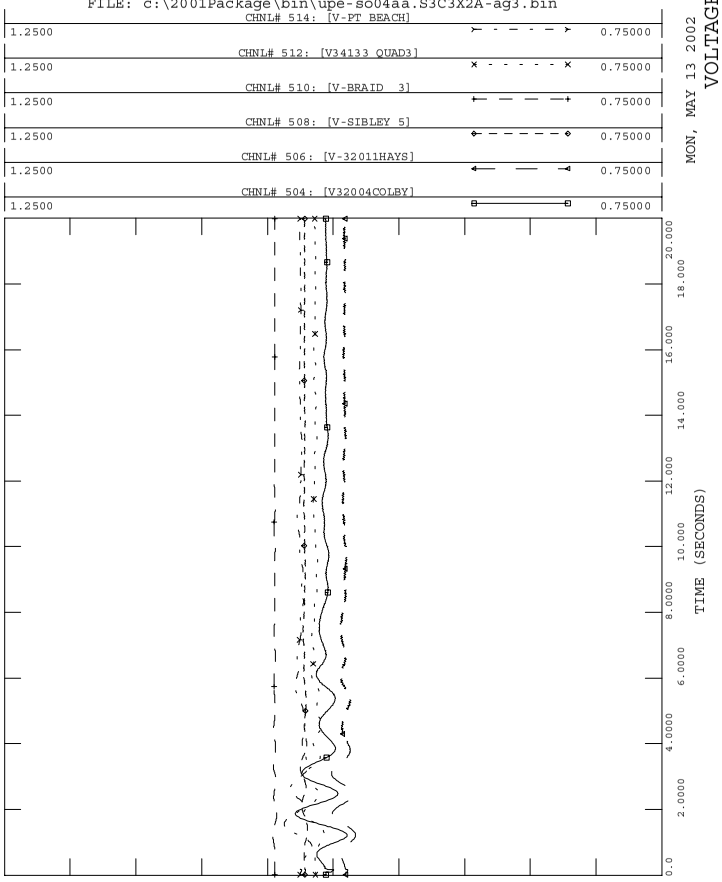
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
VOLTAGES 5



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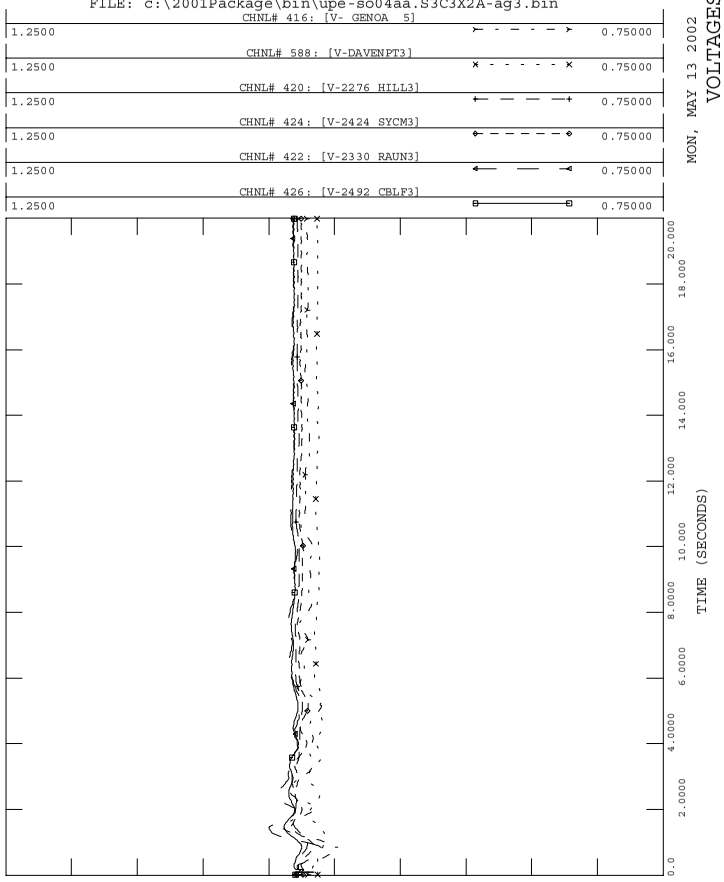
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
VOLTAGES IA



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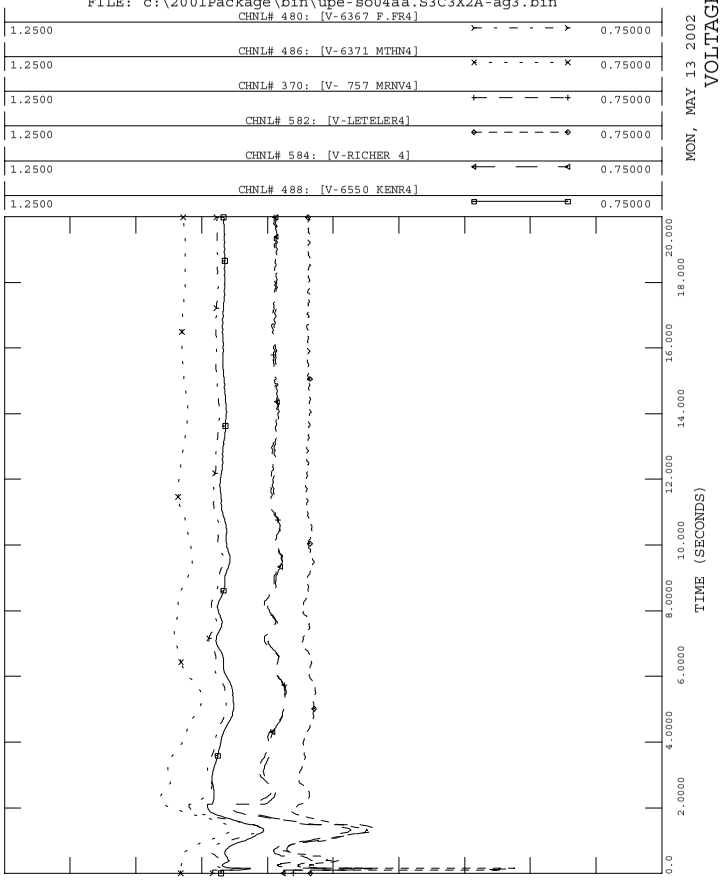
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
VOLTAGES 4



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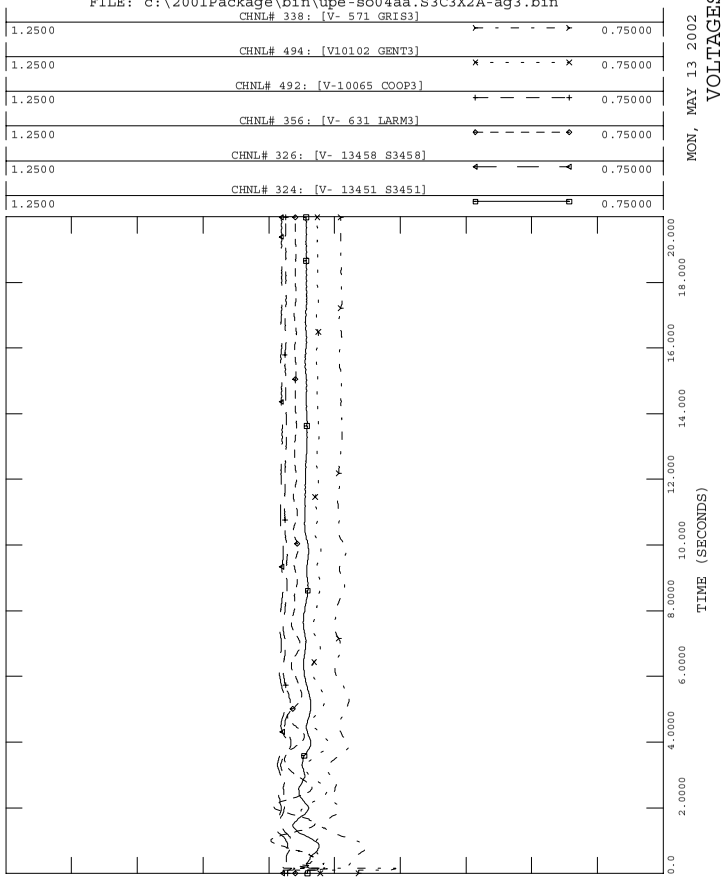
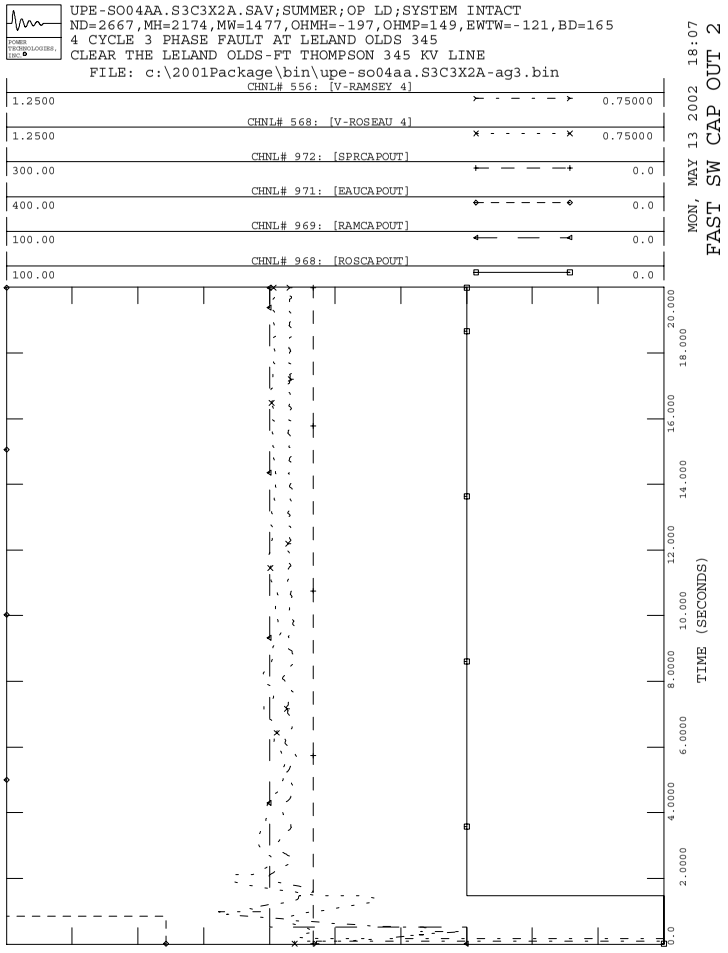
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
VOLTAGES NB

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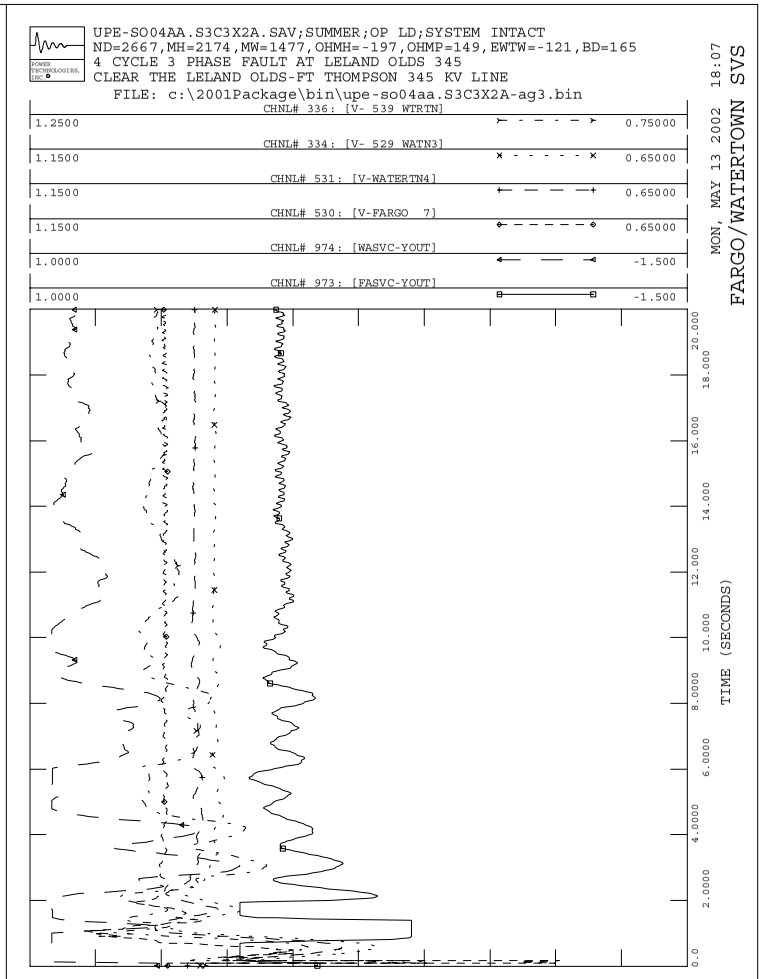
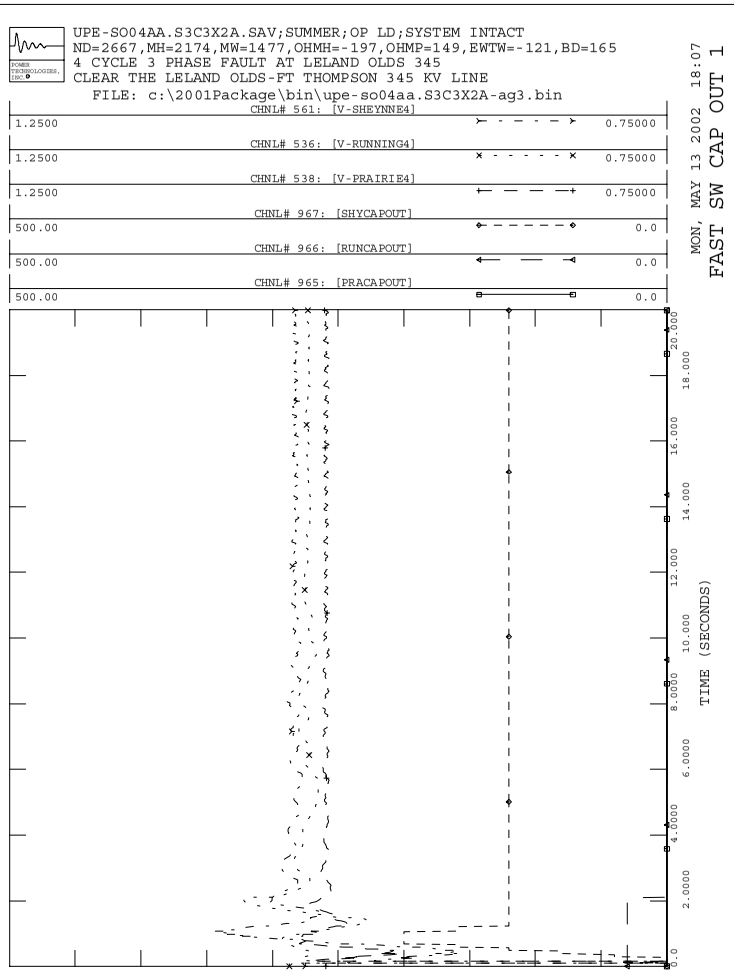
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
MON, MAY 13 2002 18:07
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
MON, MAY 13 2002 18:07
FARGO/WATERTOWN SVS
TIME (SECONDS)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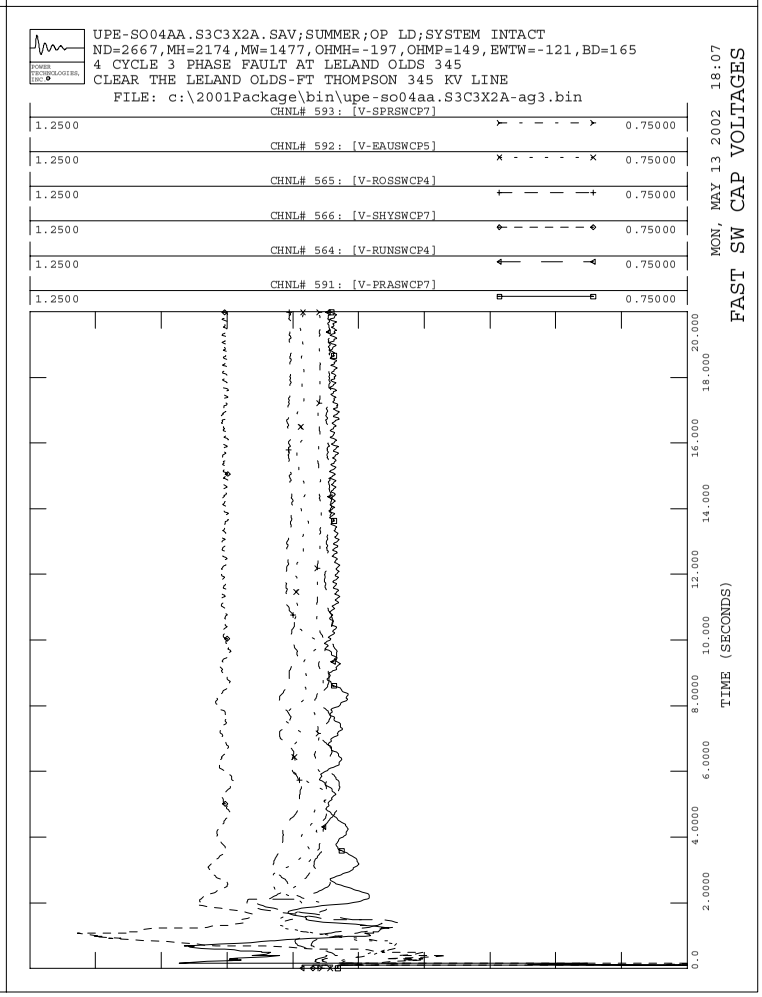
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
MON, MAY 13 2002 18:07
FAST SW CAP OUT 1
TIME (SECONDS)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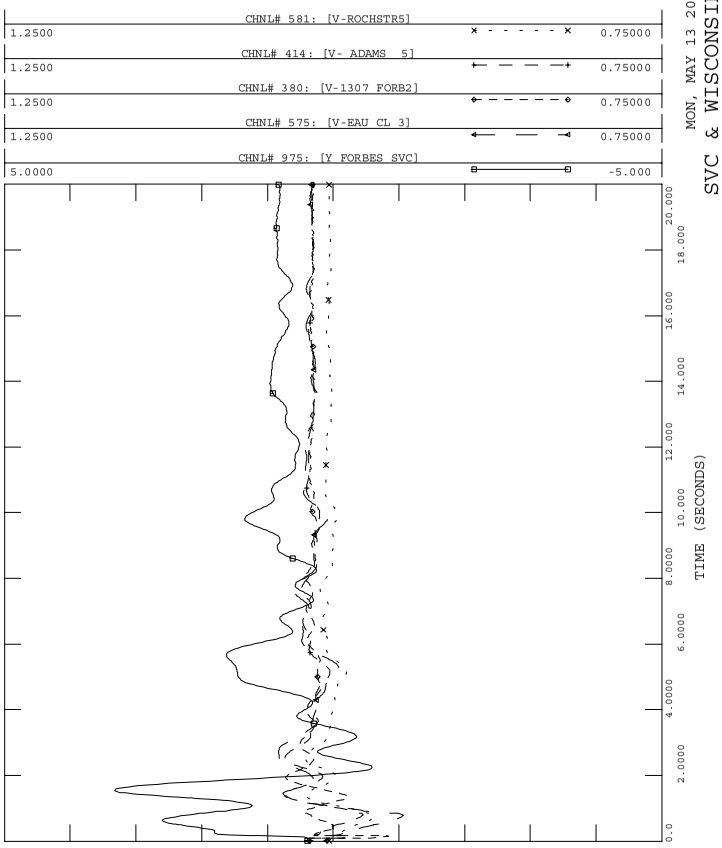
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
MON, MAY 13 2002 18:07
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07

SVC & WISCONSIN VOLT



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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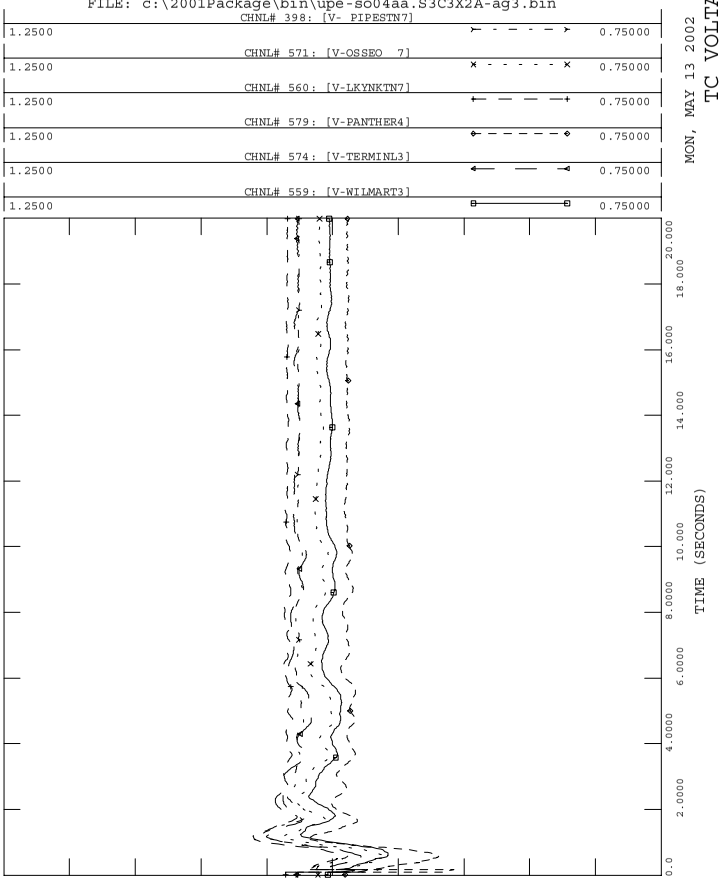
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07

TC VOLTAGES



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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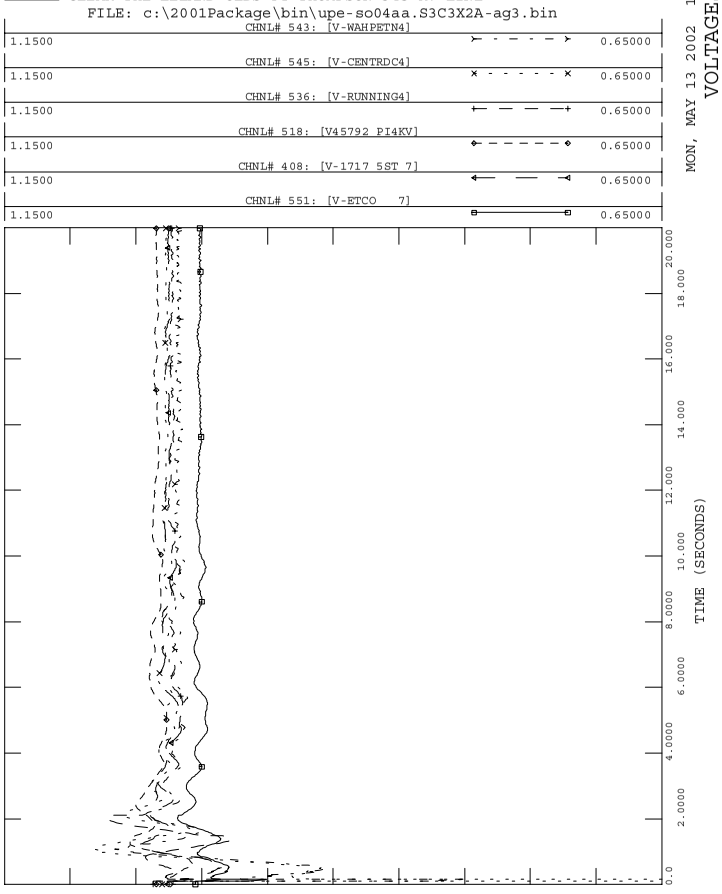
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07

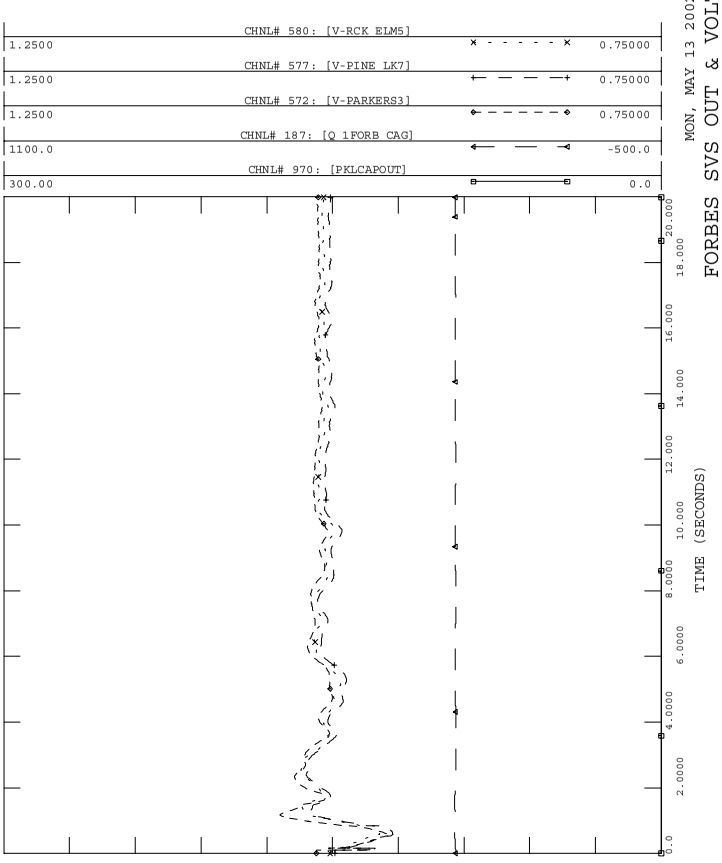
VOLTAGES 6



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07

FORBES SVS OUT & VOLTAGES



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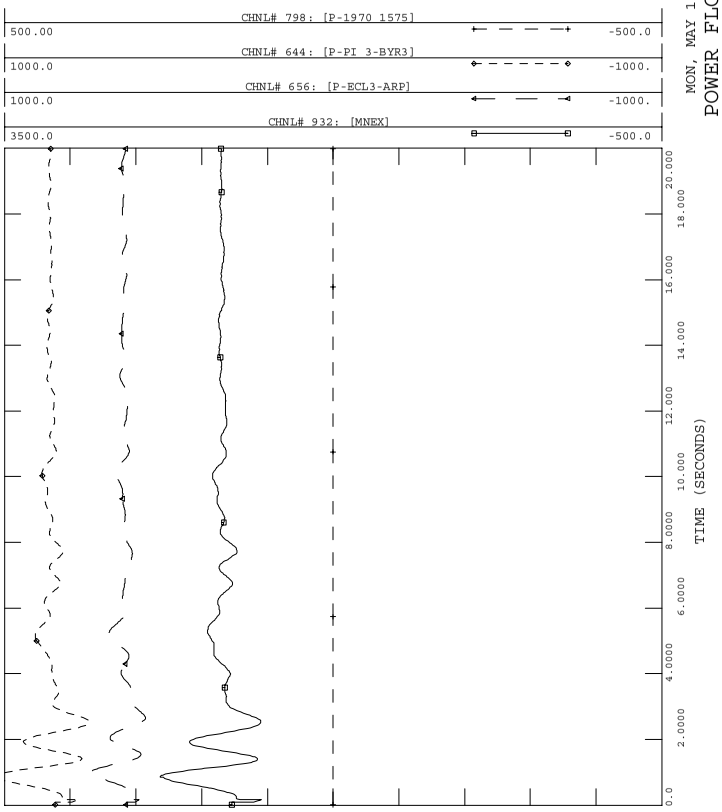
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
POWER FLOW SUMS 2



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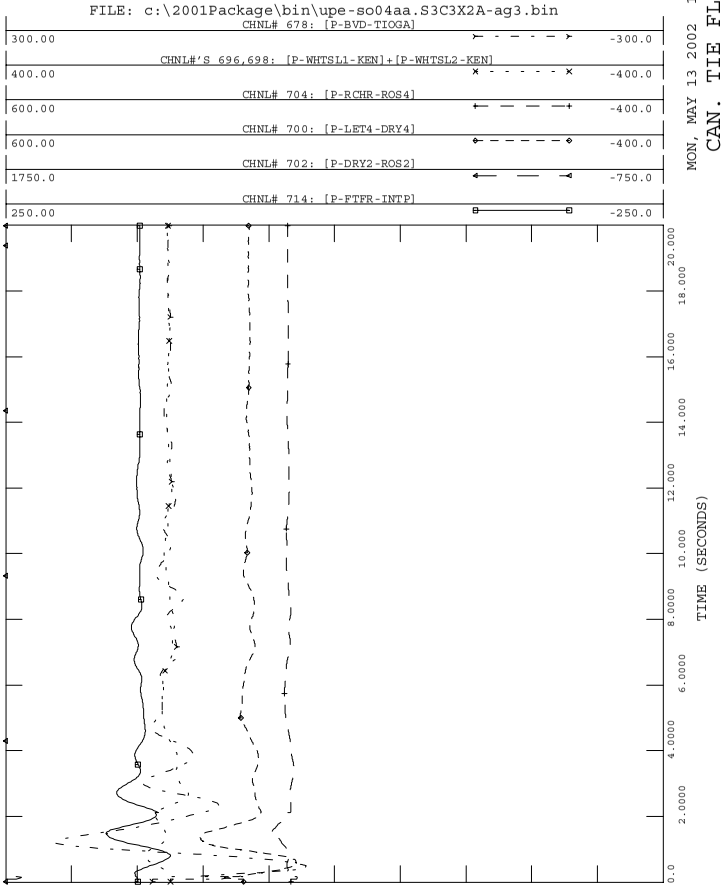
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
CAN. TIE FLOWS



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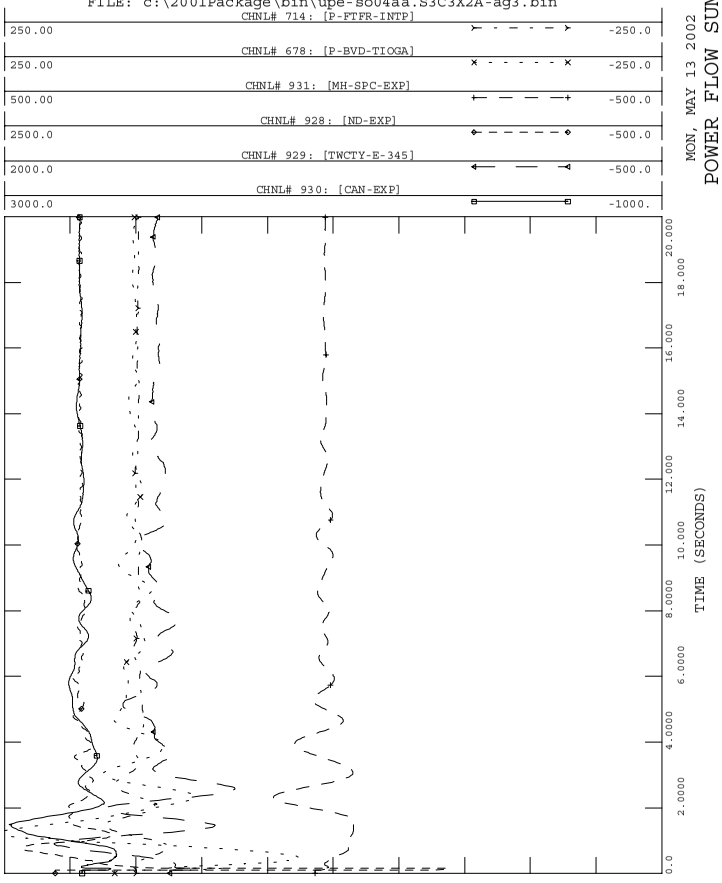
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
POWER FLOW SUMS 1



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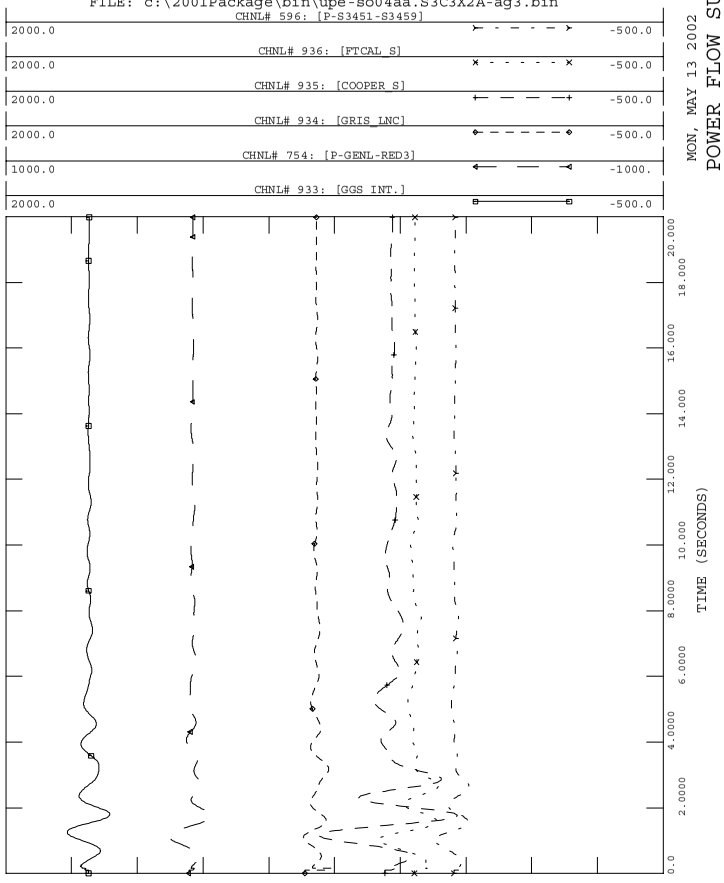
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
POWER FLOW SUM 3



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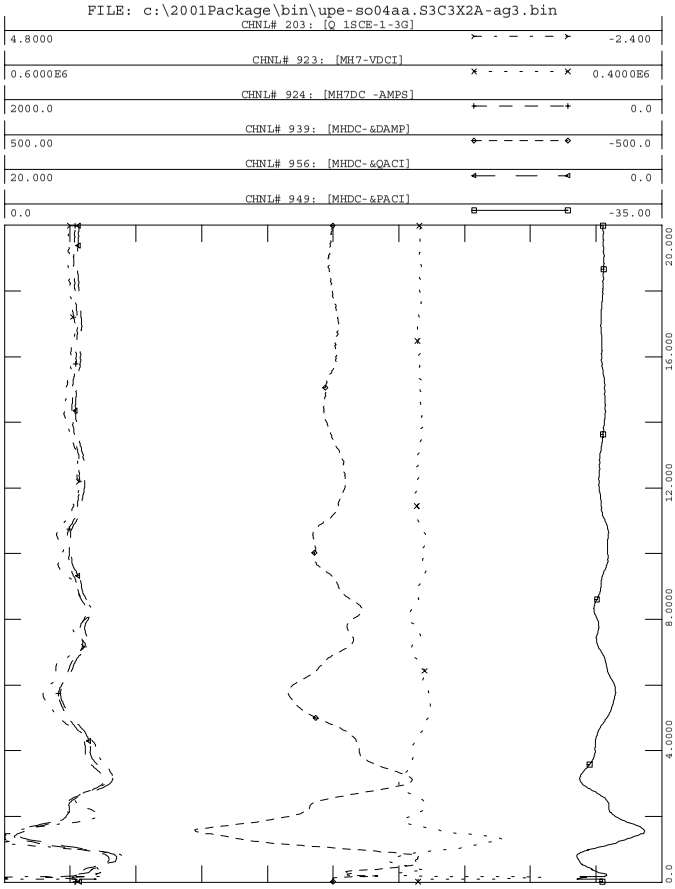
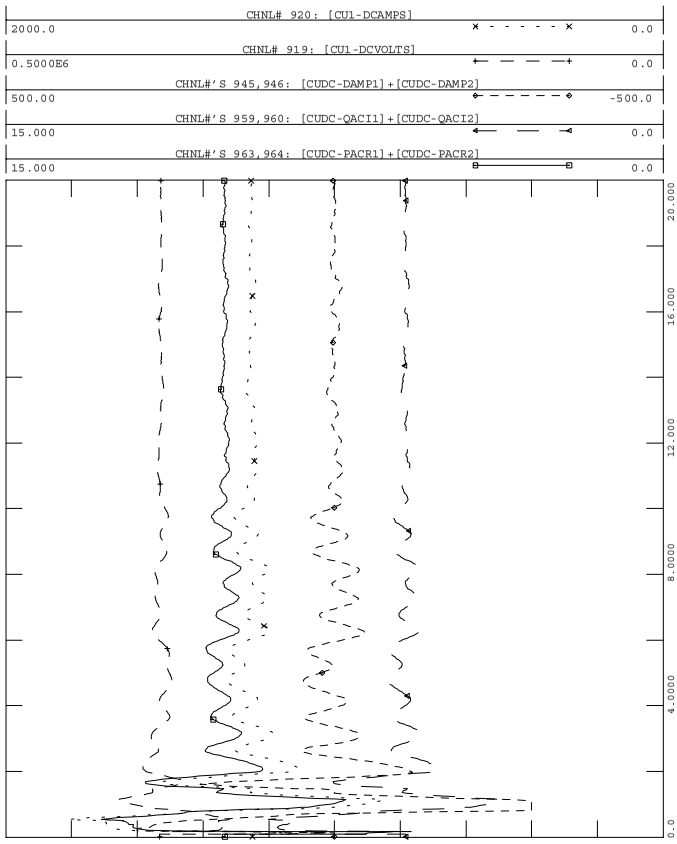
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
MH DC PARAMETERS



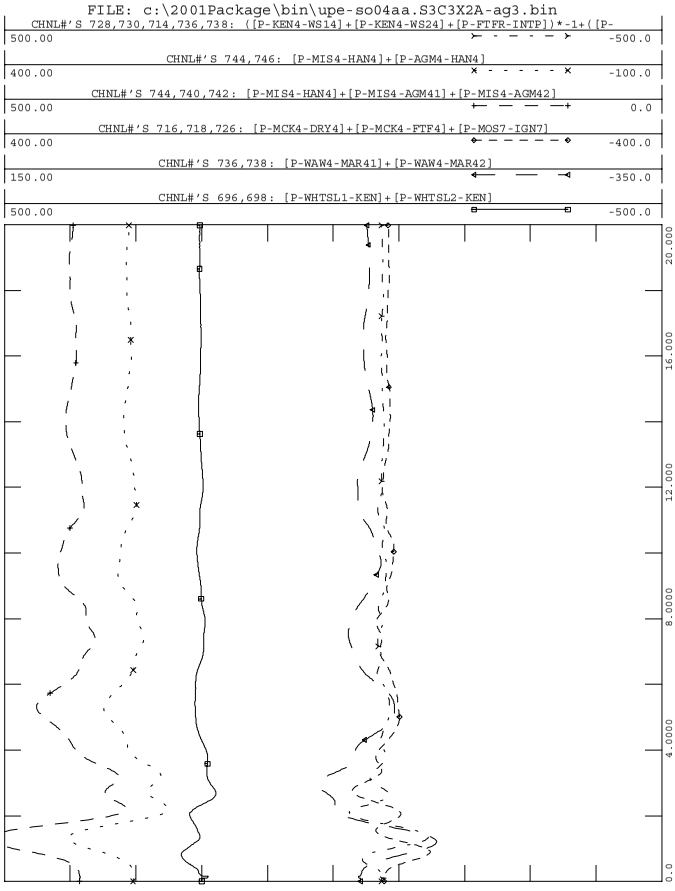
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

MON, MAY 13 2002 18:07
CU DC #1



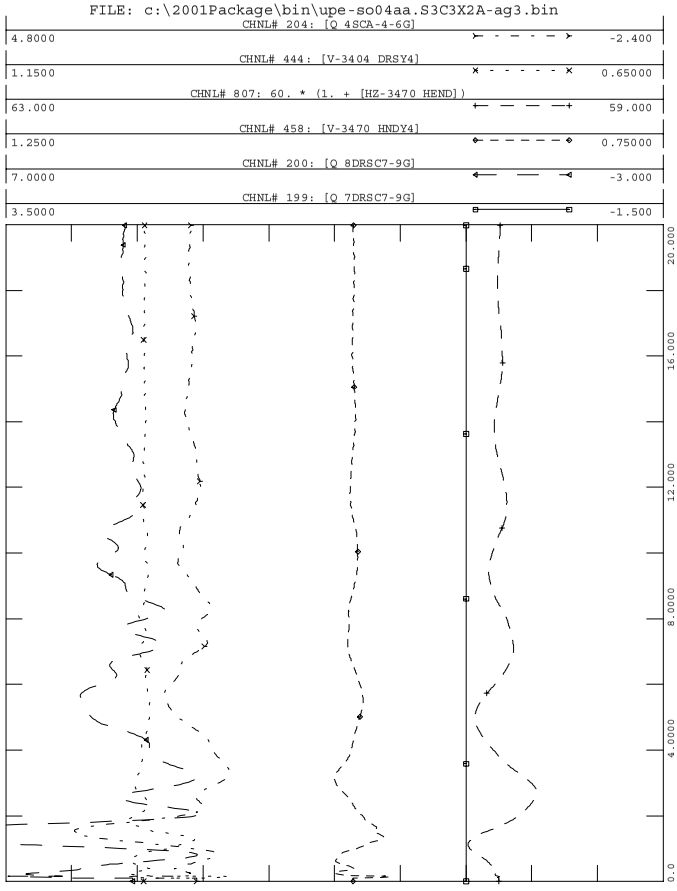
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

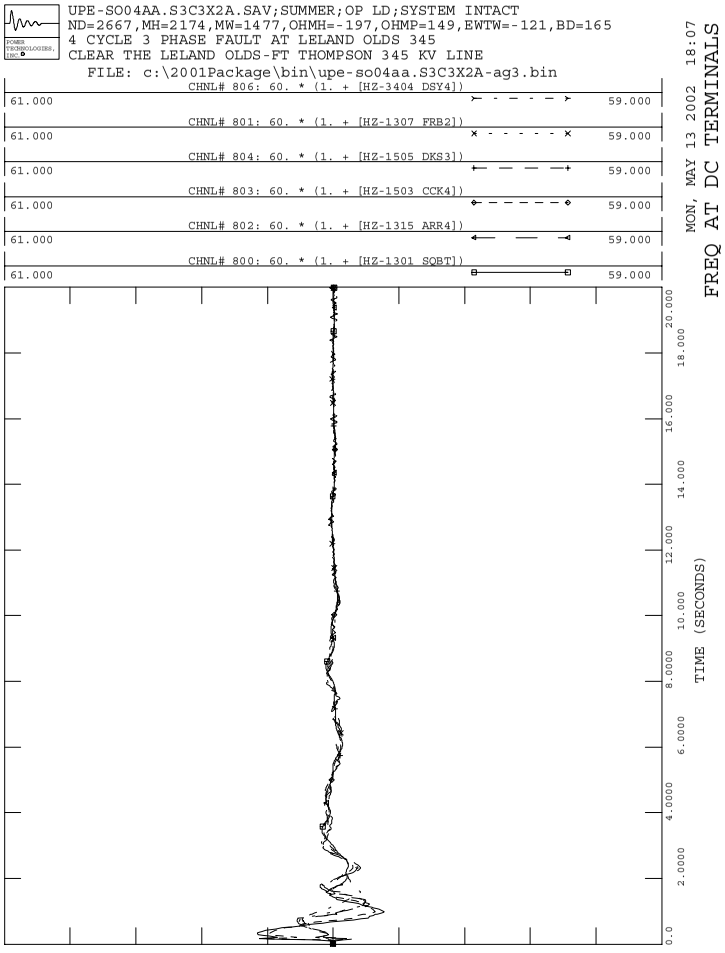
MON, MAY 13 2002 18:07
OH TIE FLOWS

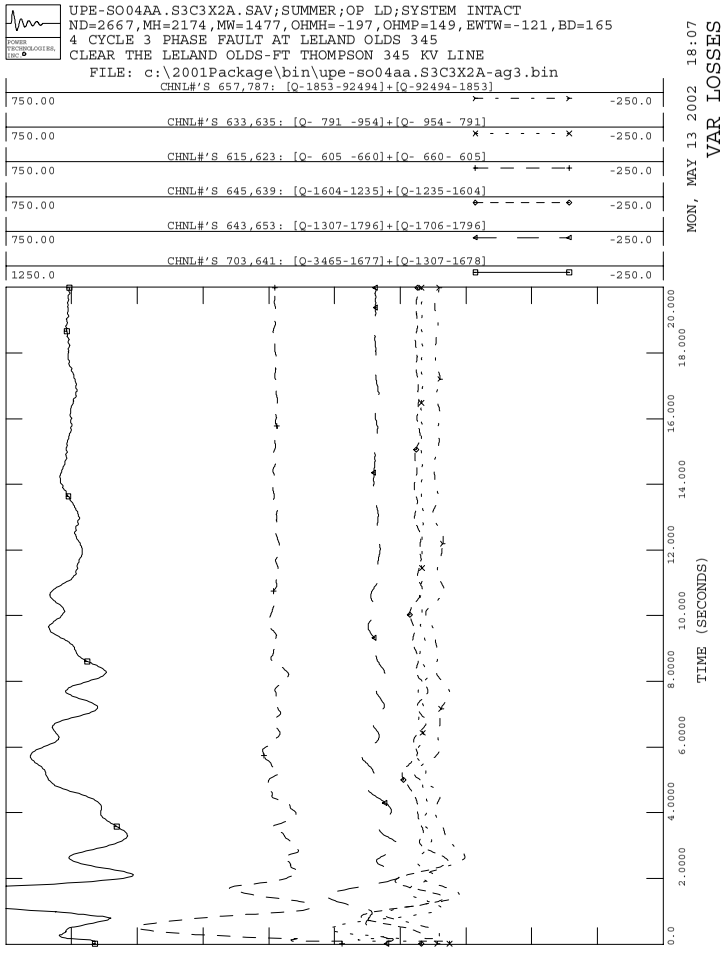


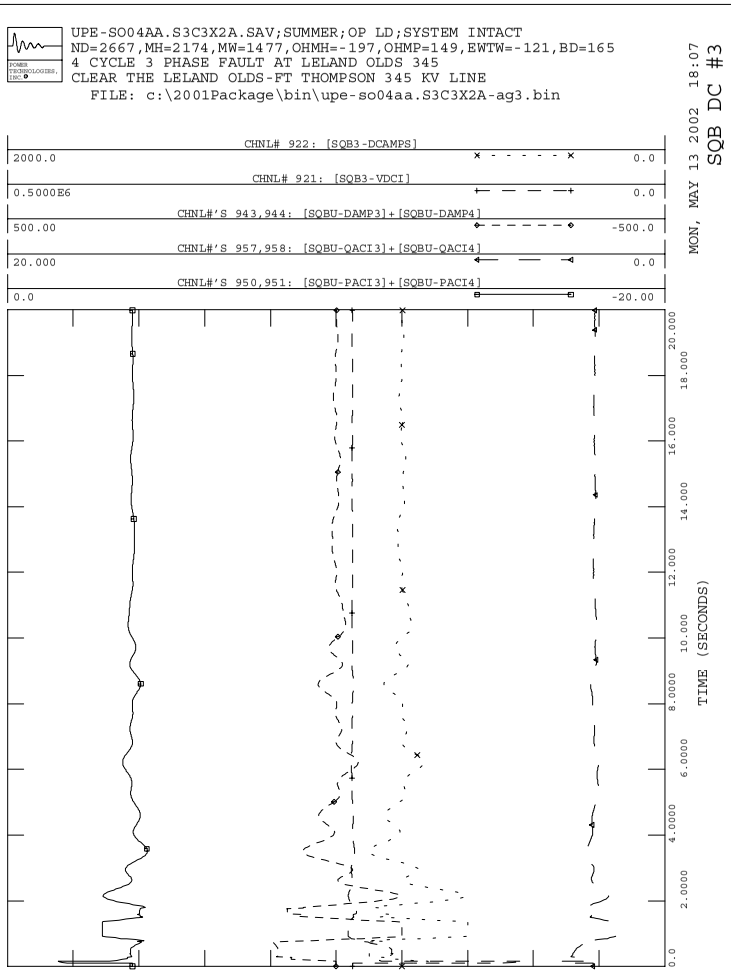
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

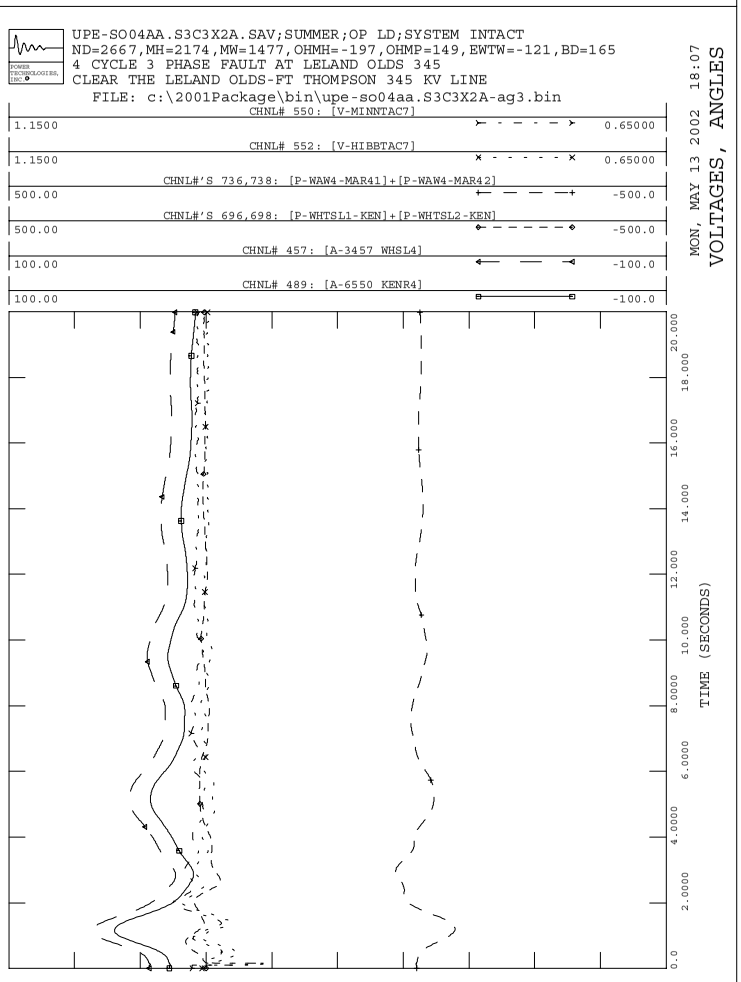
MON, MAY 13 2002 18:07
MH DC PARAMETERS




UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
MON, MAY 13 2002 18:07
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
MON, MAY 13 2002 18:07
VAR LOSSES
TIME (SECONDS)

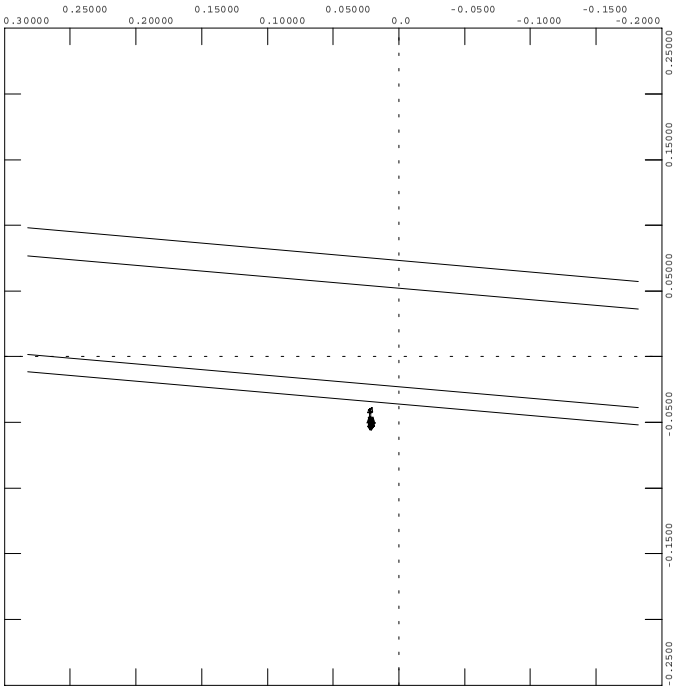

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
MON, MAY 13 2002 18:07
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
MON, MAY 13 2002 18:07
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

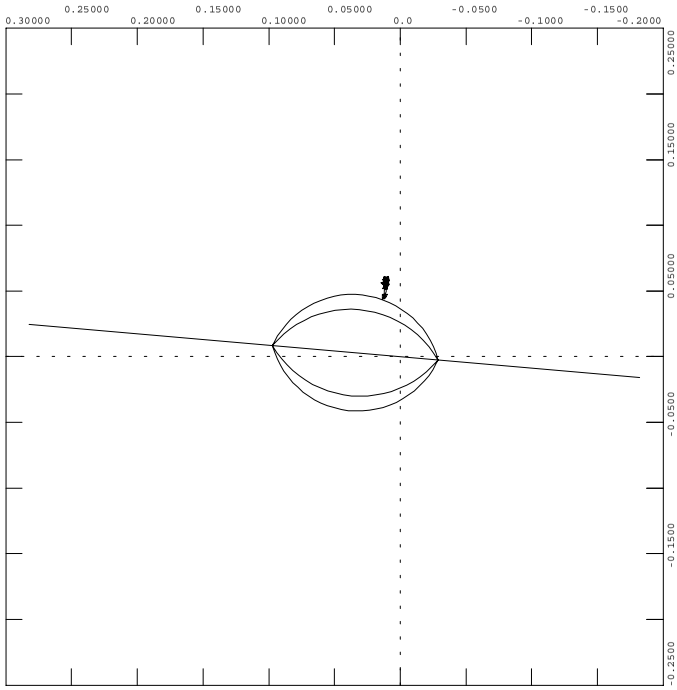


MON, MAY 13 2002 18:07
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

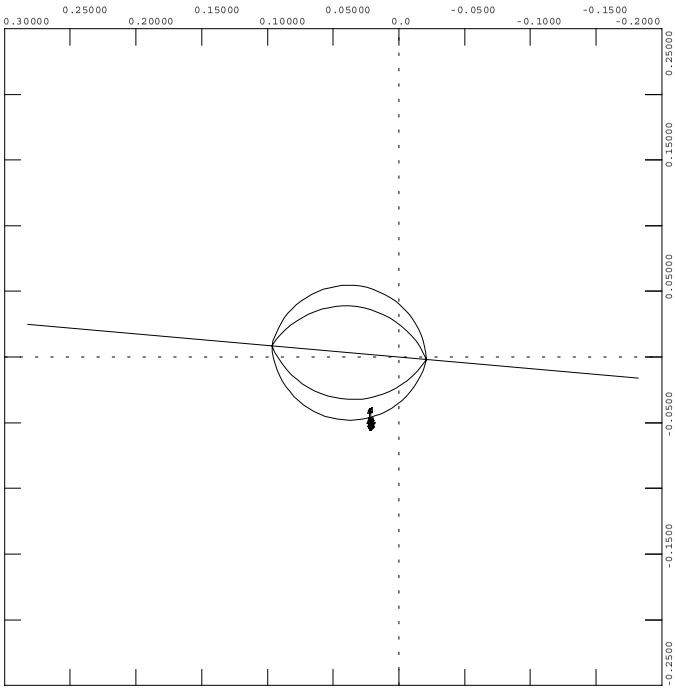


MON, MAY 13 2002 18:07
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

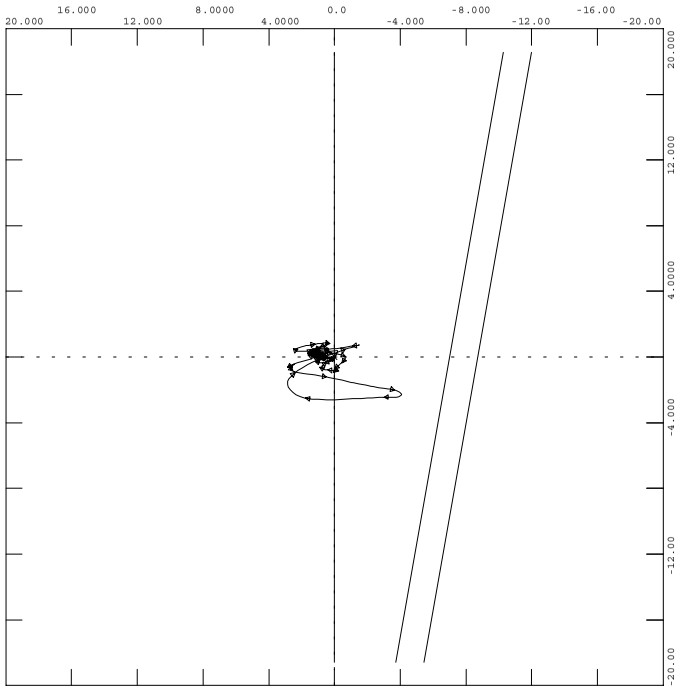


MON, MAY 13 2002 18:07
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

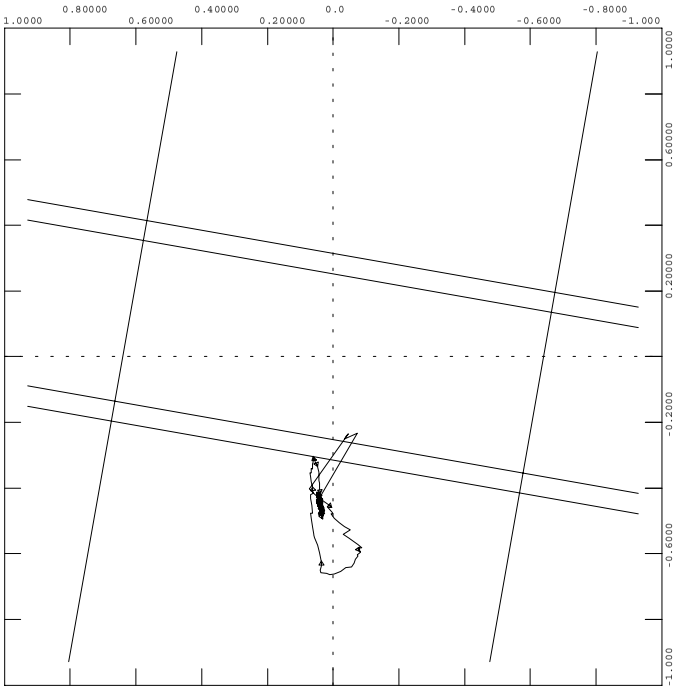


MON, MAY 13 2002 18:07
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

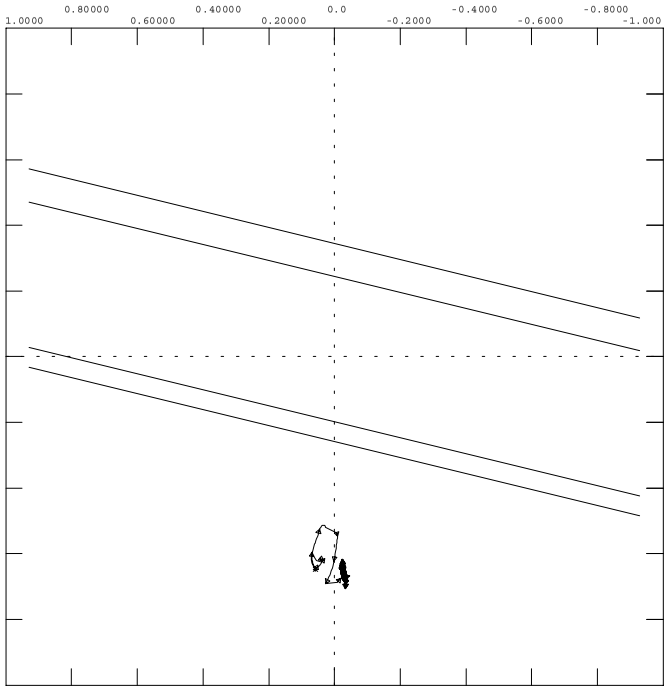
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

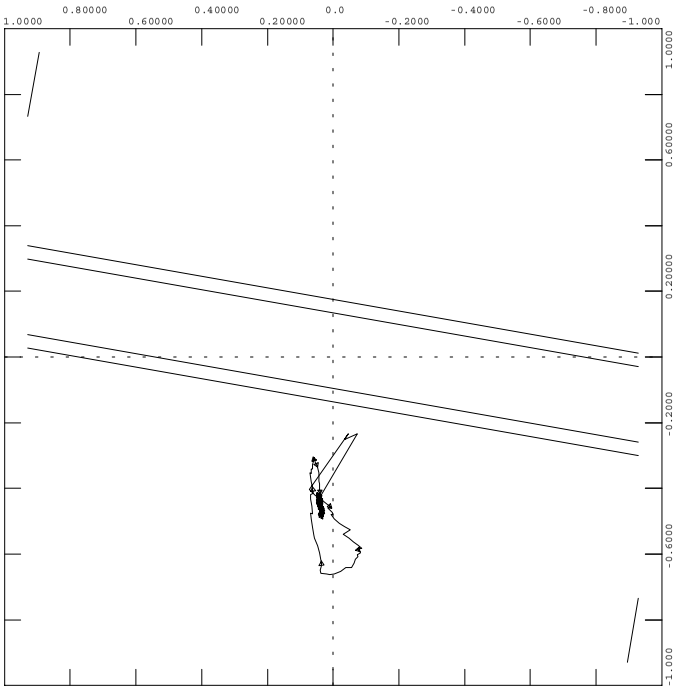
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

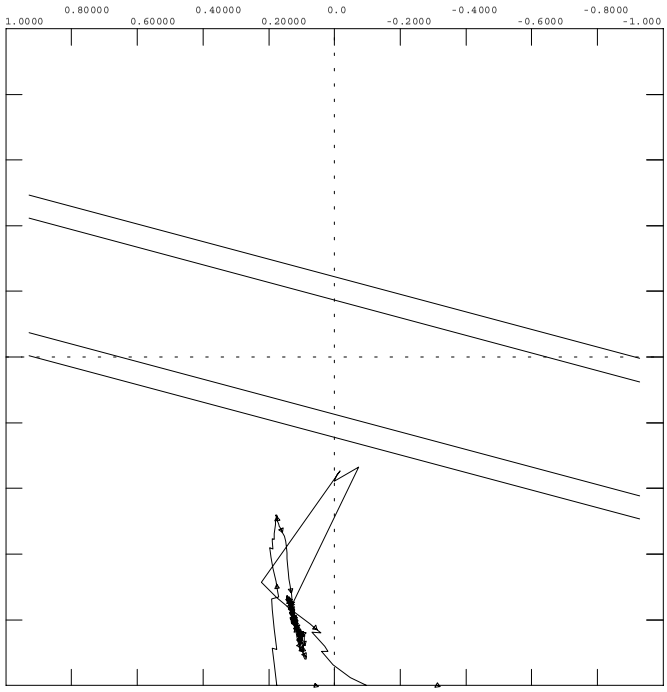
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

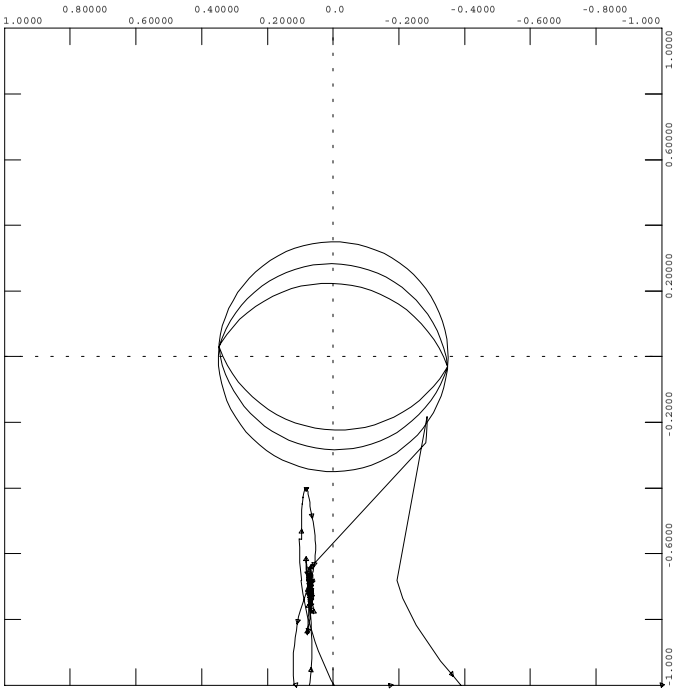
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

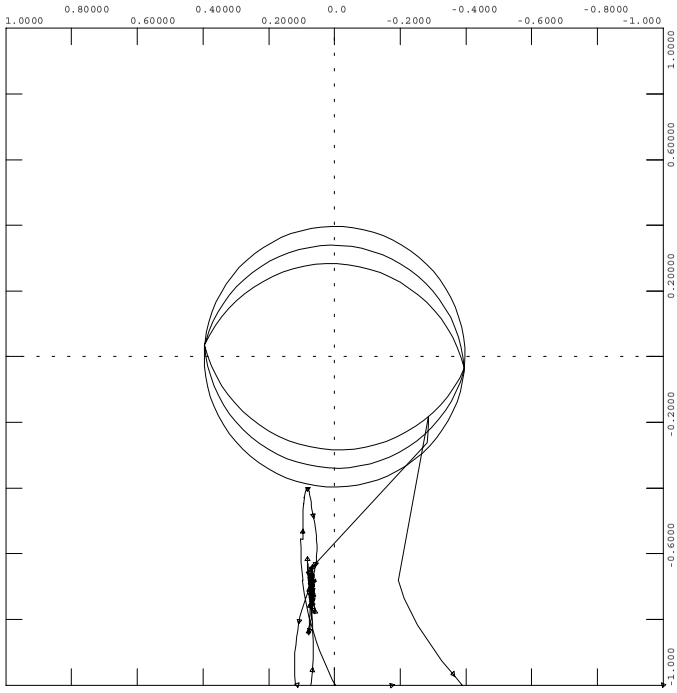
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

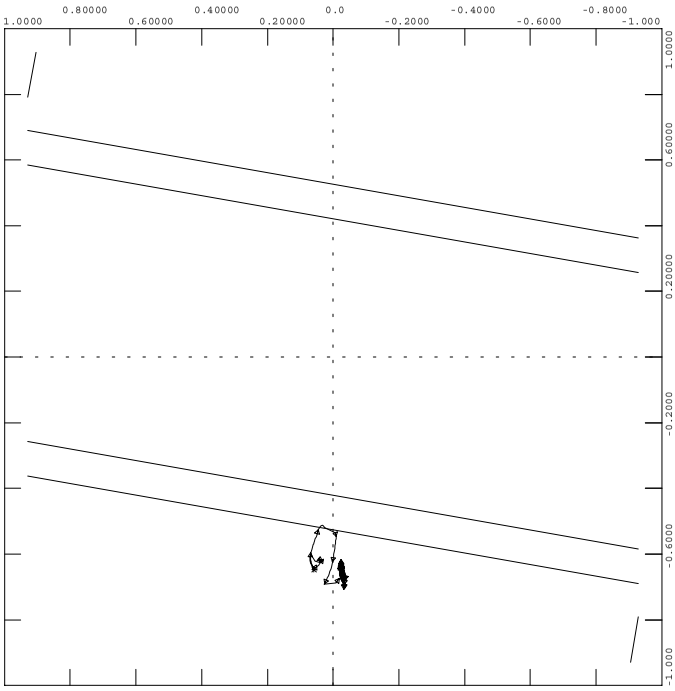
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

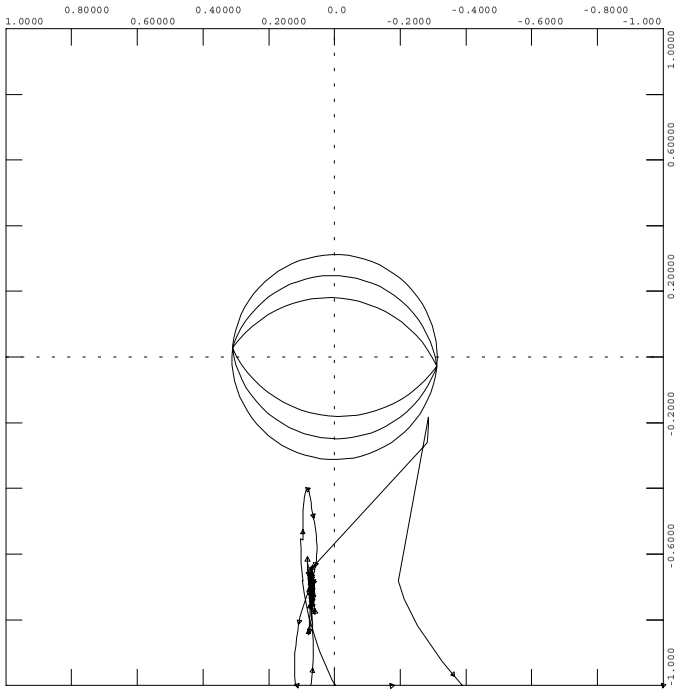
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



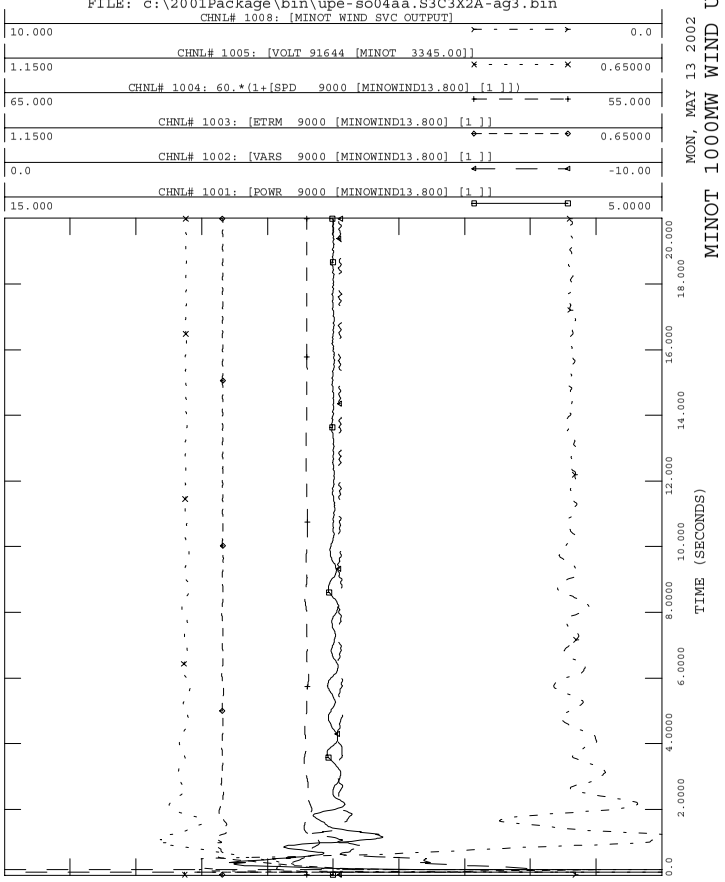
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

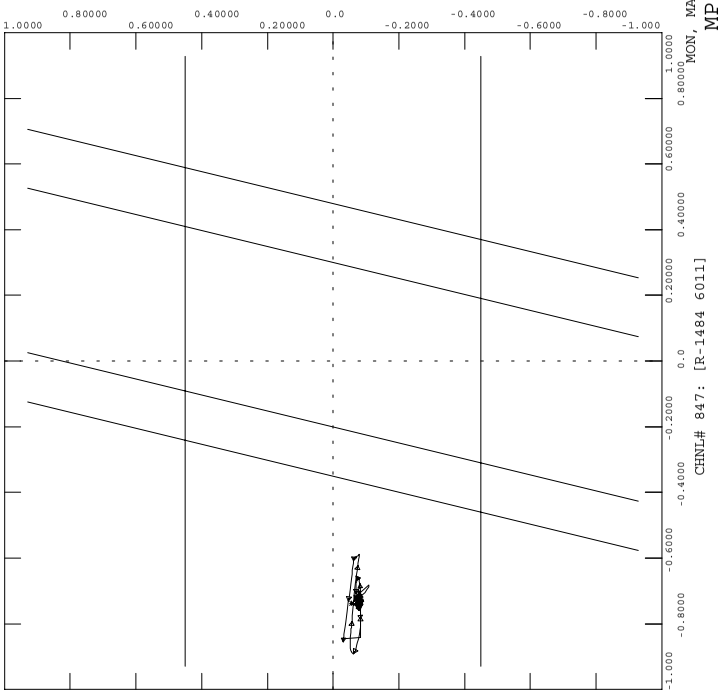


MON, MAY 13 2002 18:07
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

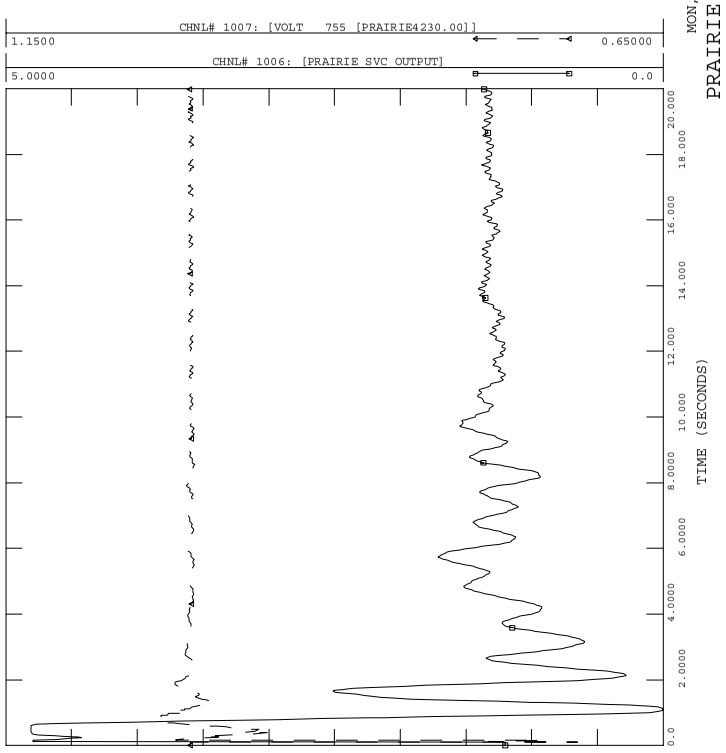
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, MAY 13 2002 18:07
MP-OH I.FALLS (779)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ag3.bin



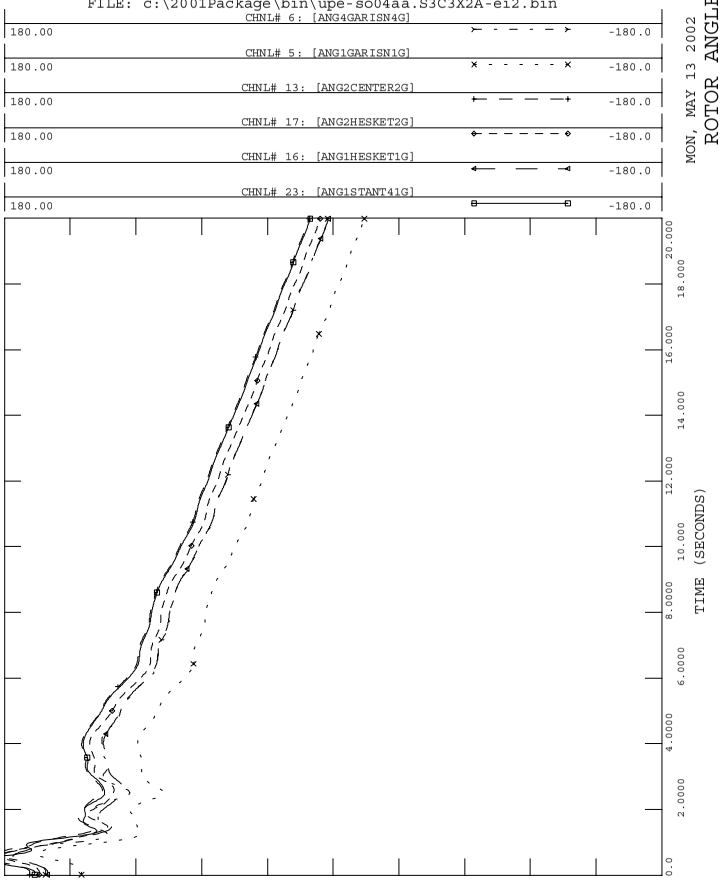
MON, MAY 13 2002 18:07
PRAIRIE SVC RESPONSE

CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

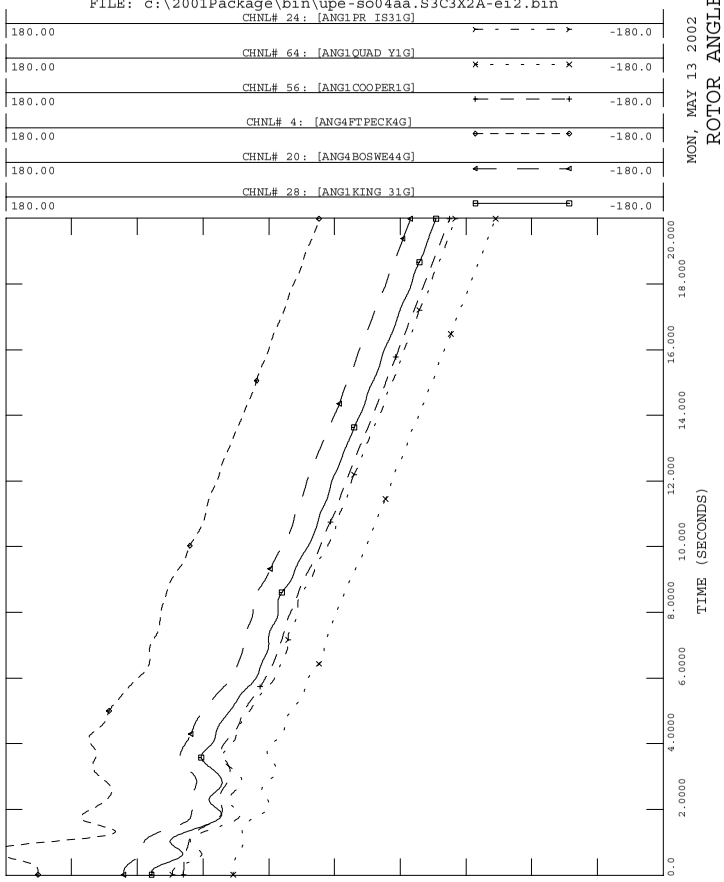
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

MON, MAY 13 2002 18:23
ROTOR ANGLES 2



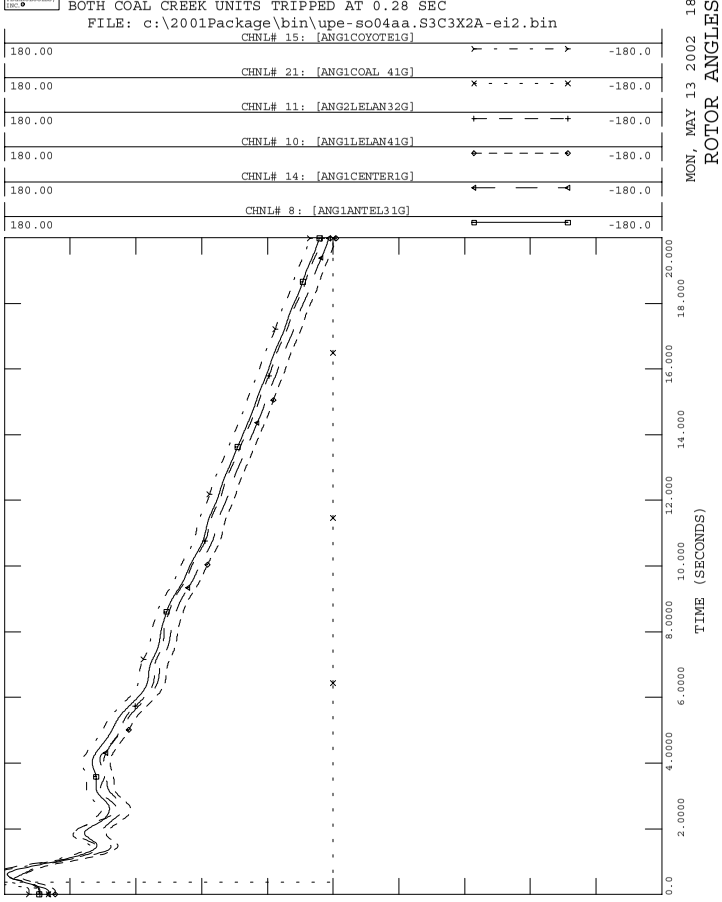
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

MON, MAY 13 2002 18:23
ROTOR ANGLES 4



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

MON, MAY 13 2002 18:23
ROTOR ANGLES 1



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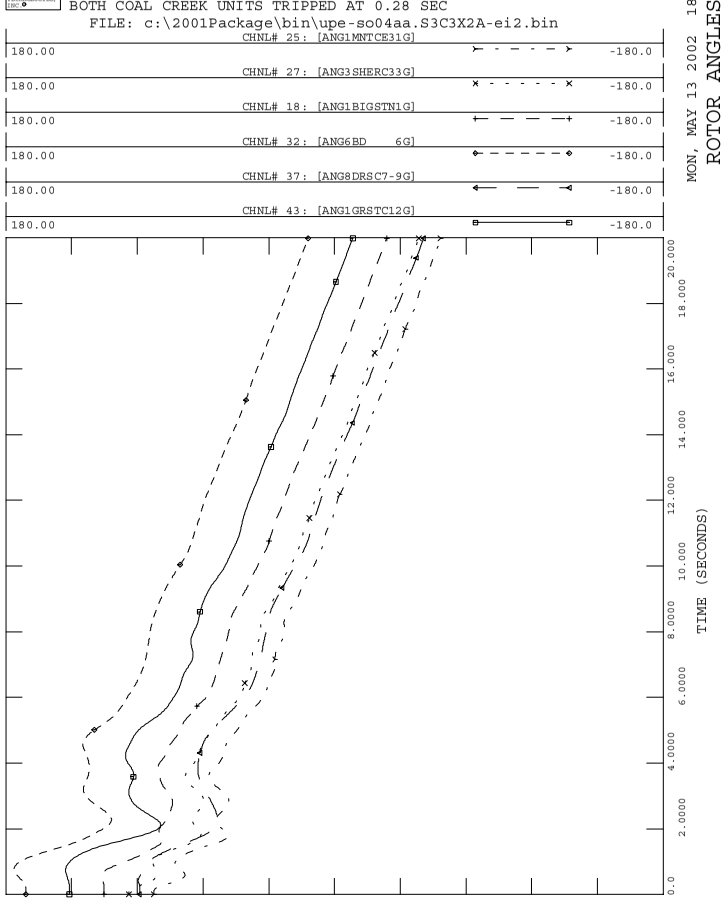
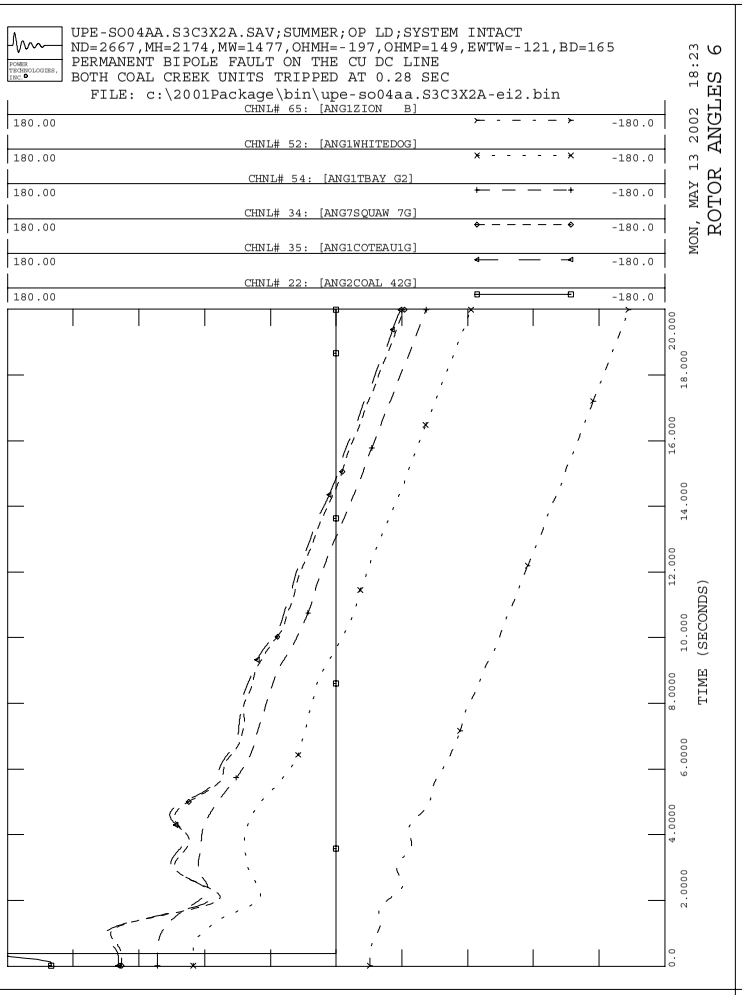
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

MON, MAY 13 2002 18:23
ROTOR ANGLES 3

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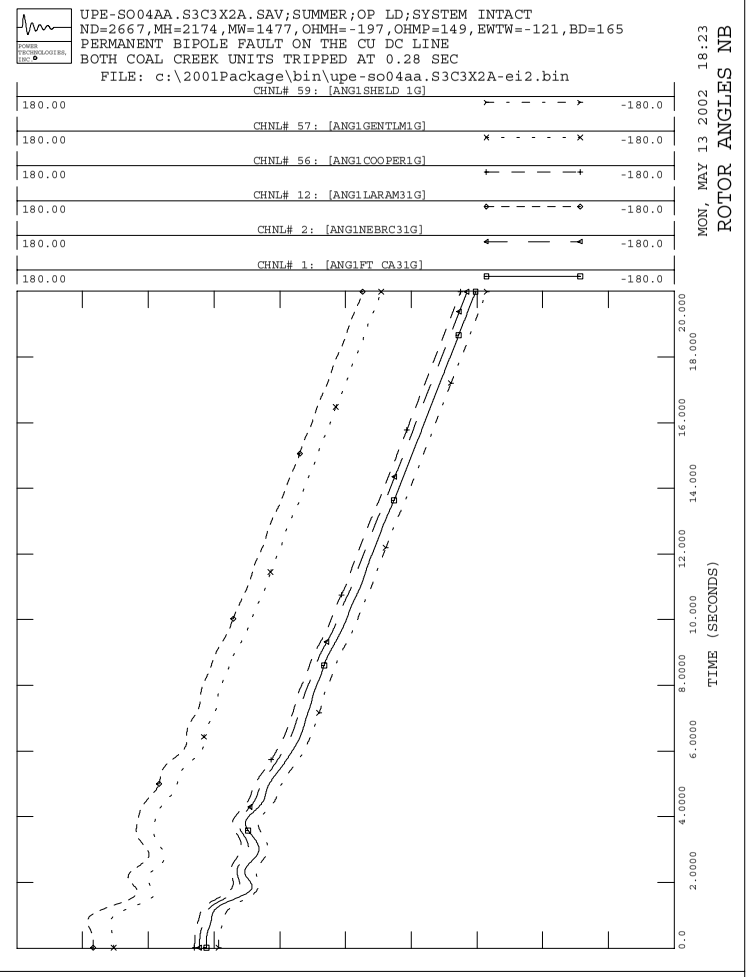
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:23
ROTOR ANGLES 6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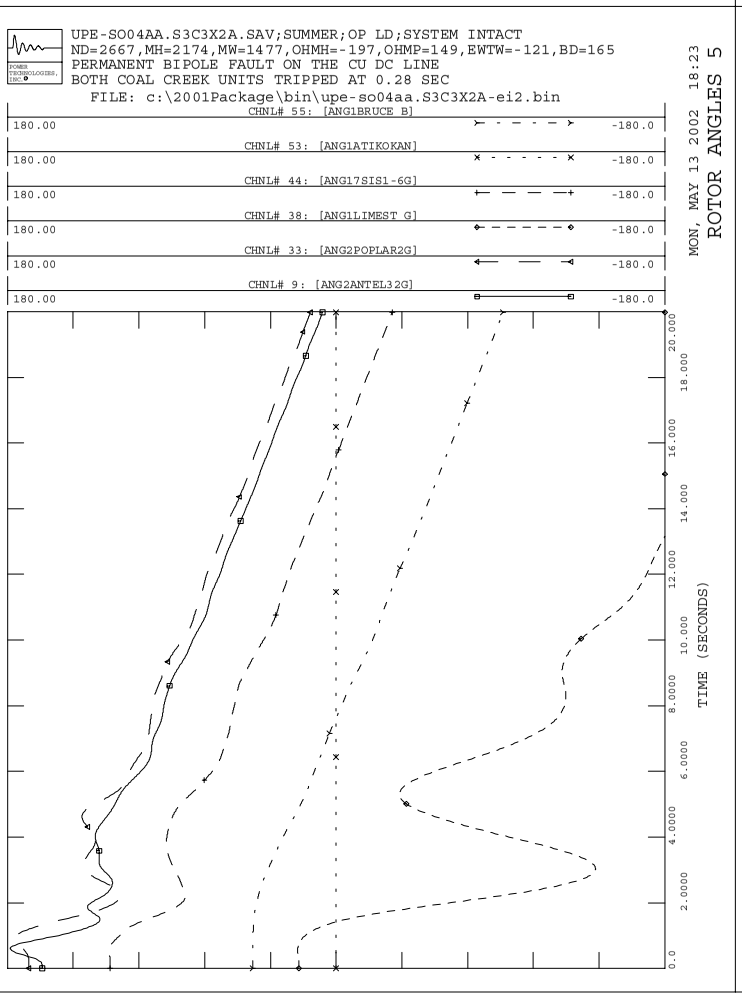
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:23
ROTOR ANGLES NB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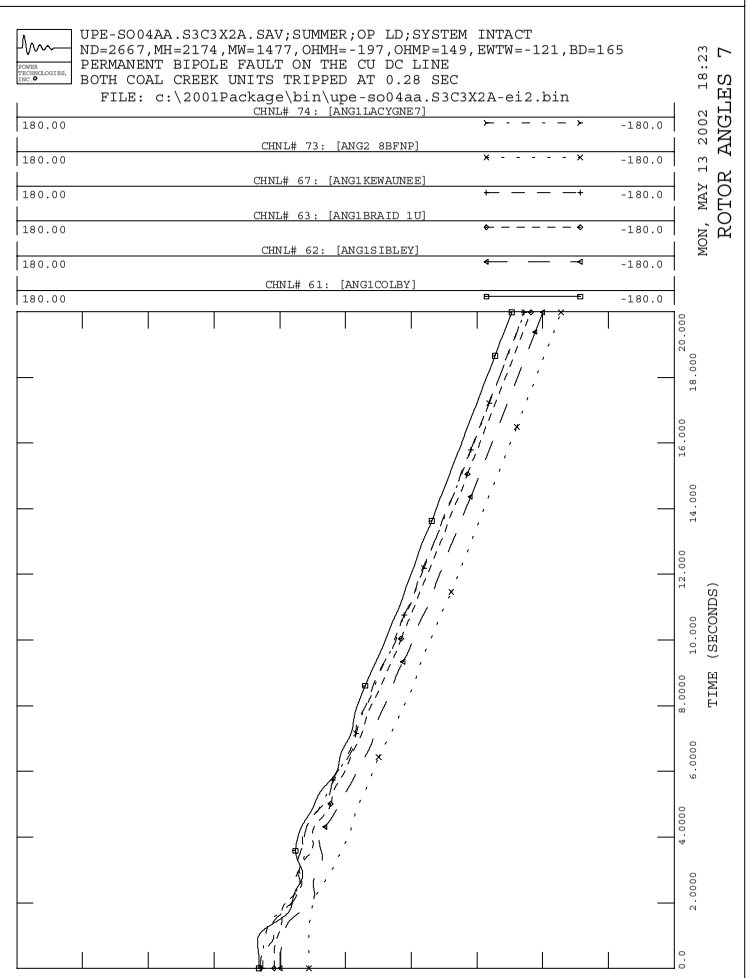
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:23
ROTOR ANGLES 5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PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
MON, MAY 13 2002 18:23
ROTOR ANGLES 7

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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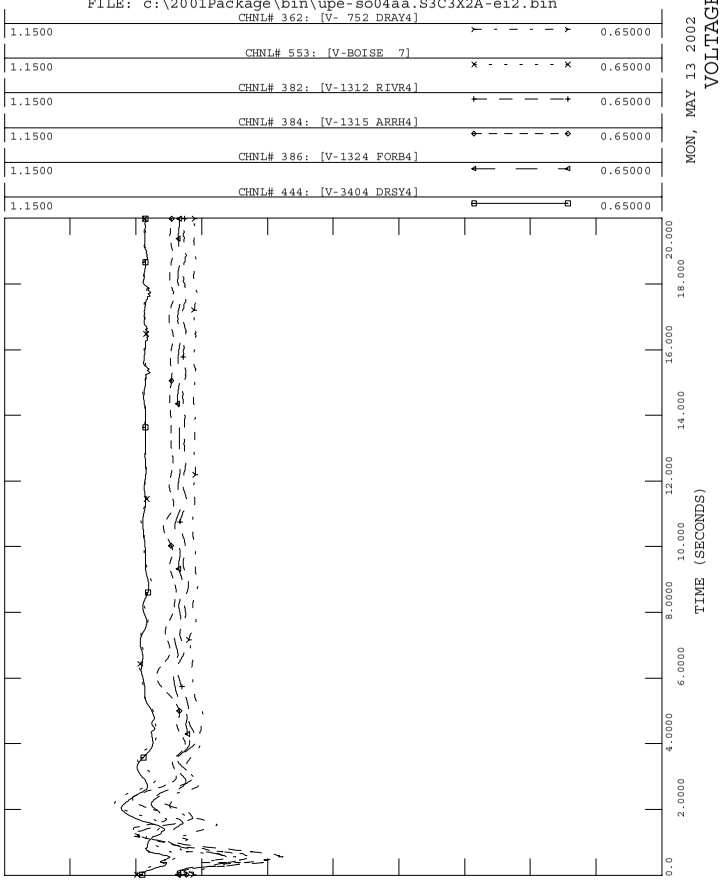
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

MON, MAY 13 2002 18:23
VOLTAGES 1



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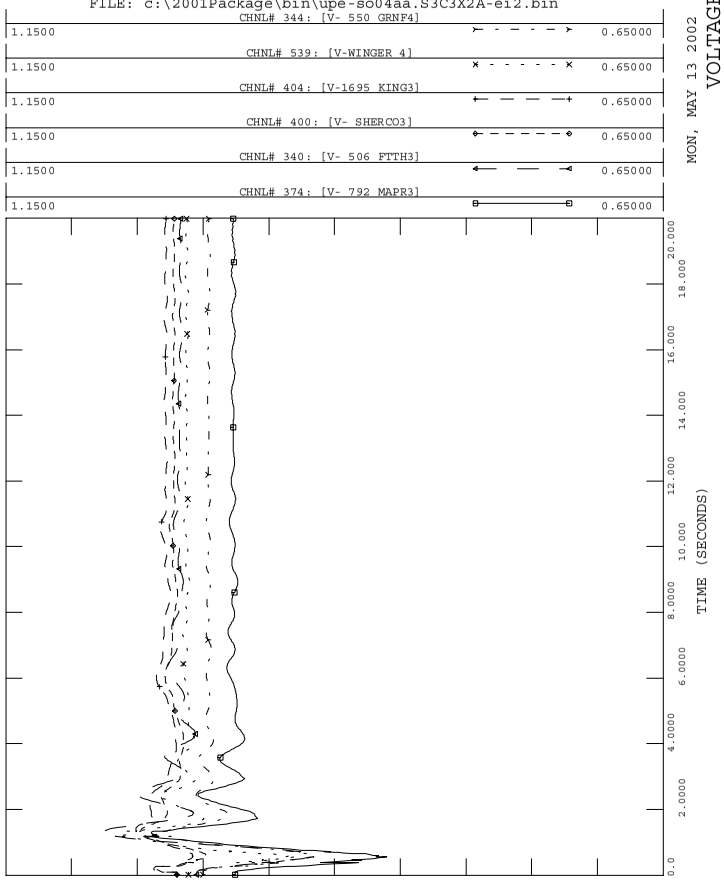
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

MON, MAY 13 2002 18:23
VOLTAGES 3



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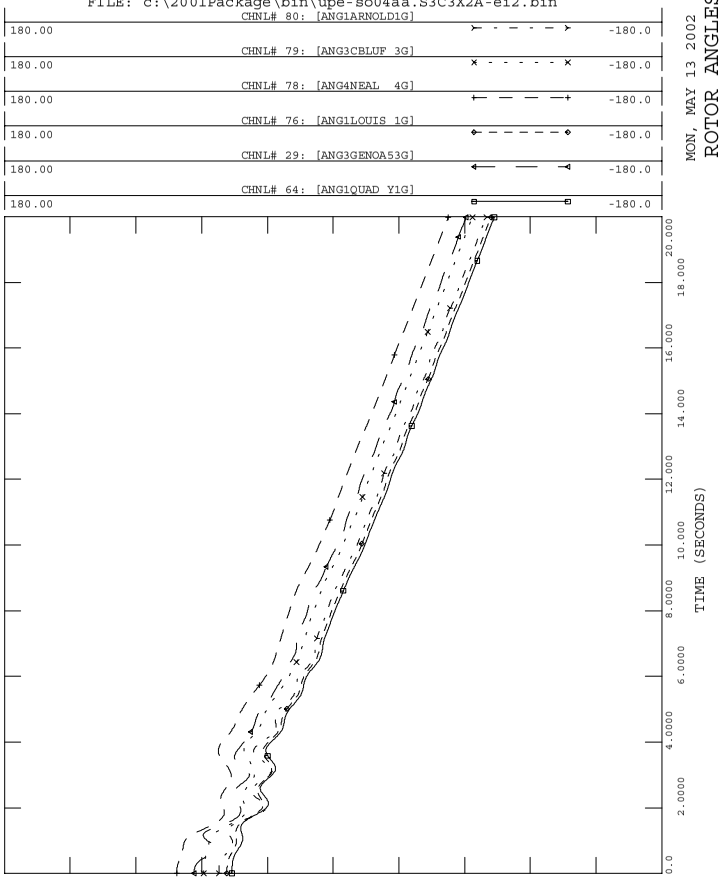
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

MON, MAY 13 2002 18:23
ROTOR ANGLES IA



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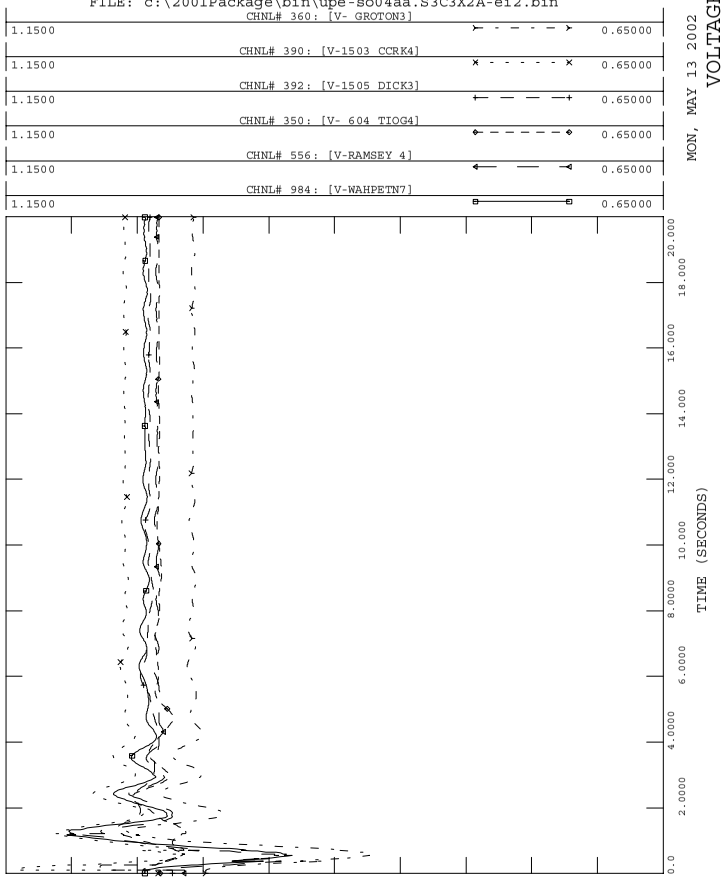
MON, MAY 13 2002 18:23
VOLTAGES 2



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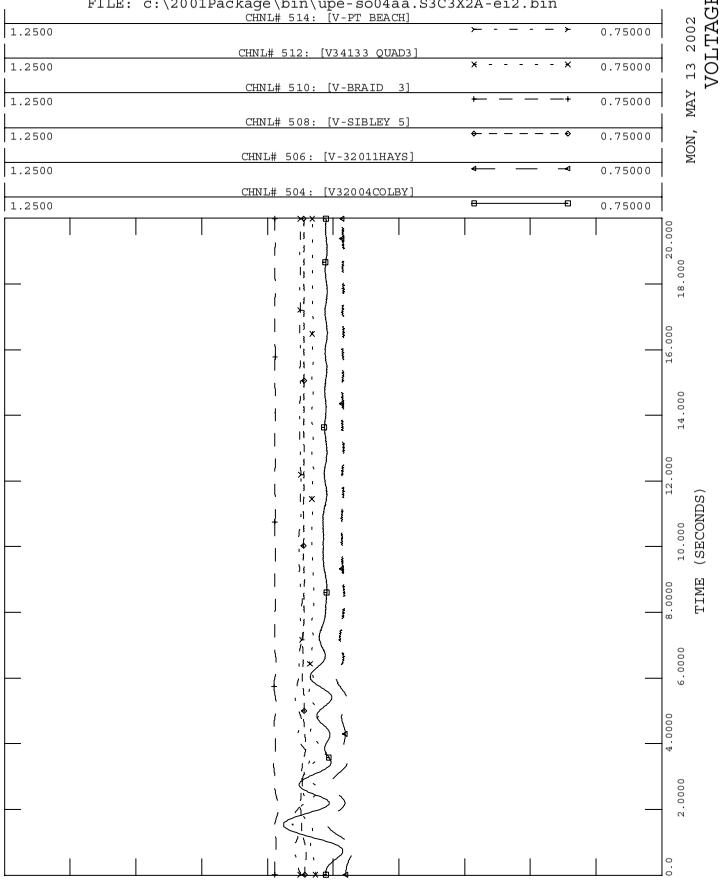
VOLTAGES 5



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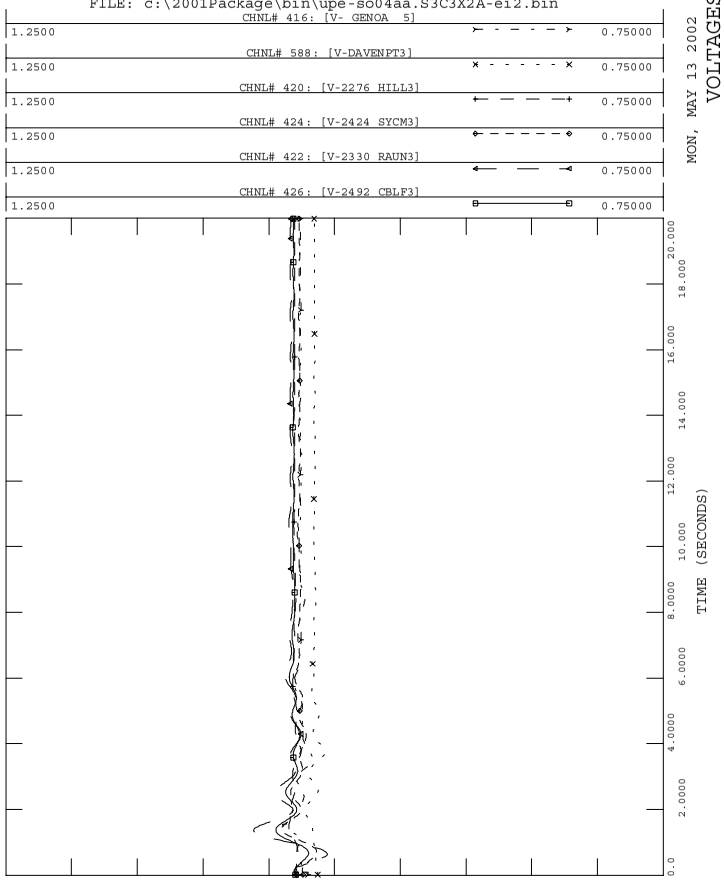
VOLTAGES IA



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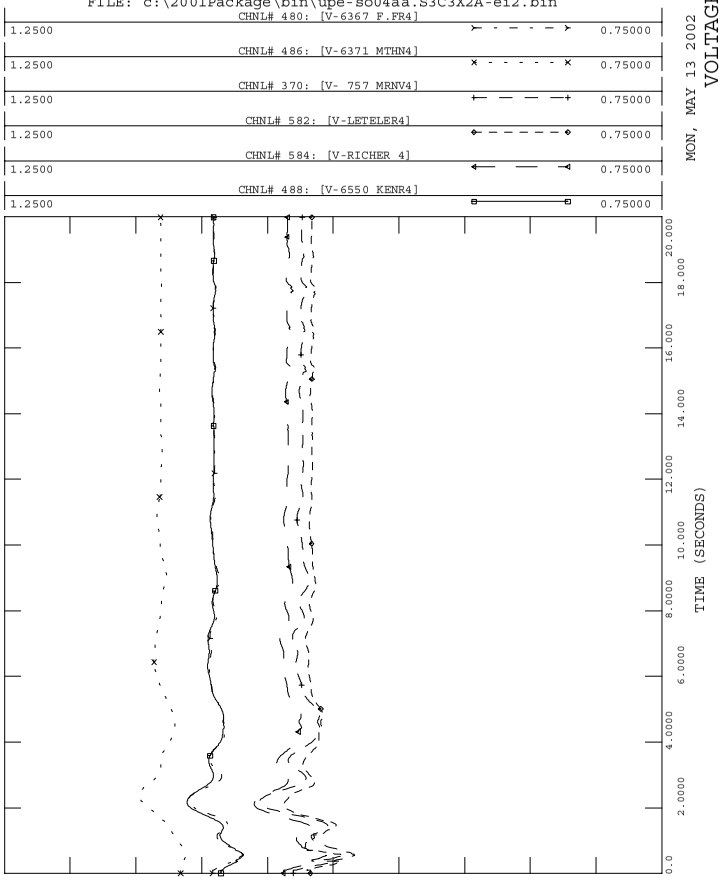
VOLTAGES 4



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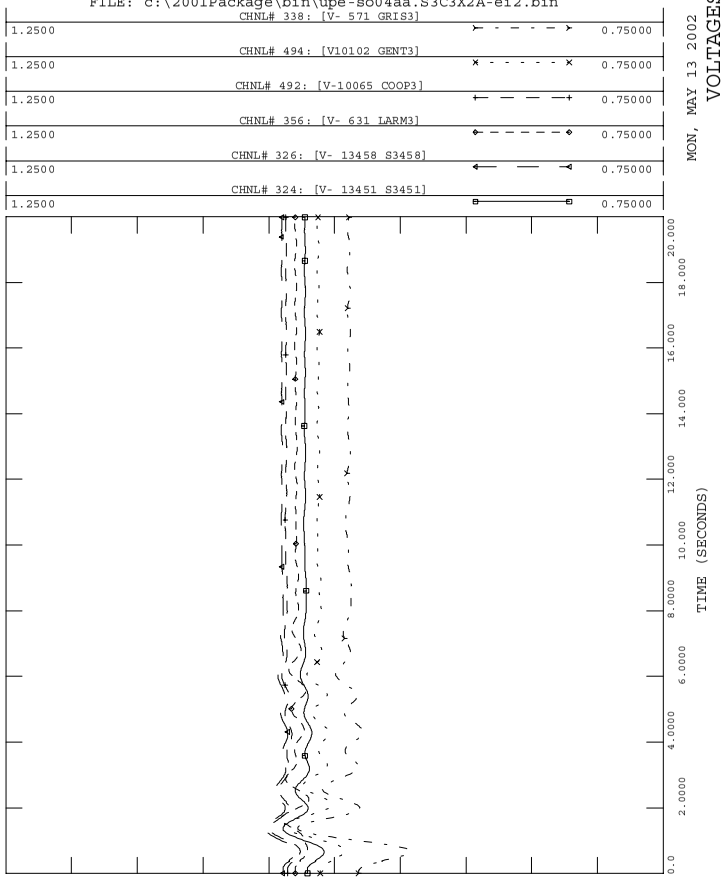
VOLTAGES NB



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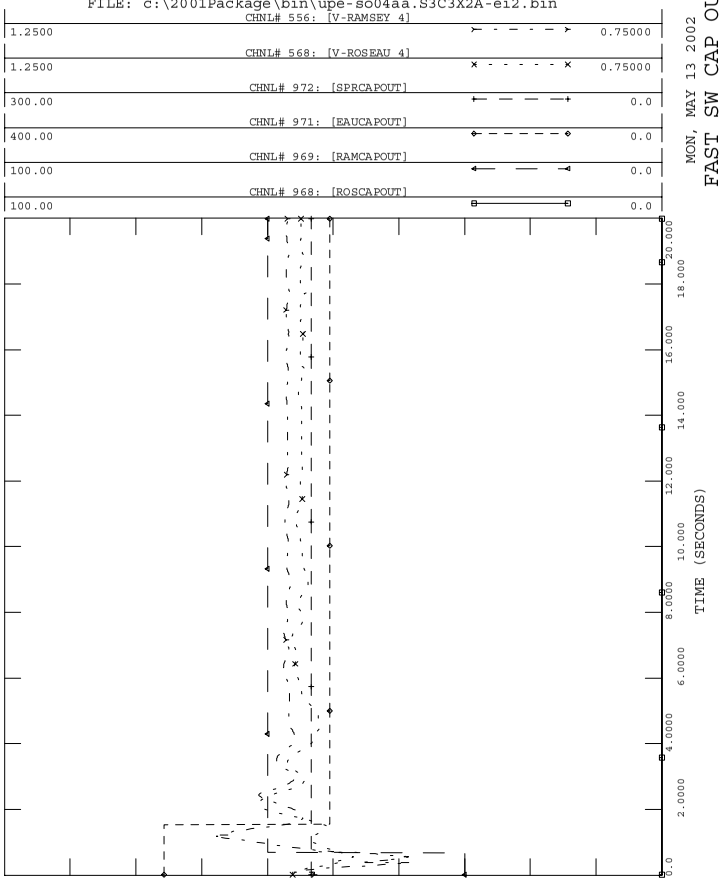
MON, MAY 13 2002 18:23

FAST SW CAP OUT 2



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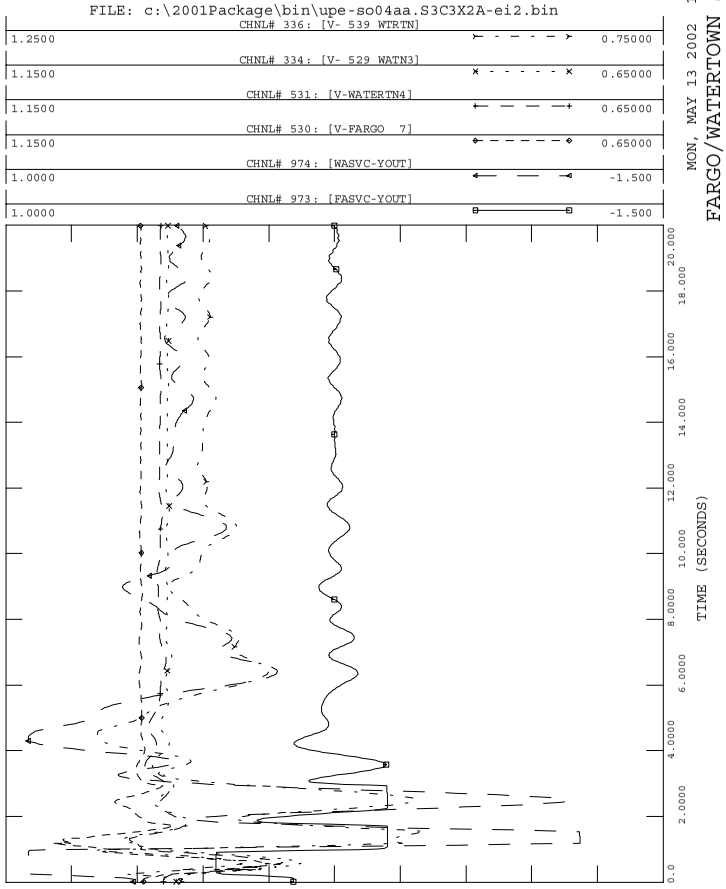
MON, MAY 13 2002 18:23

FARGO/WATERTOWN SVS



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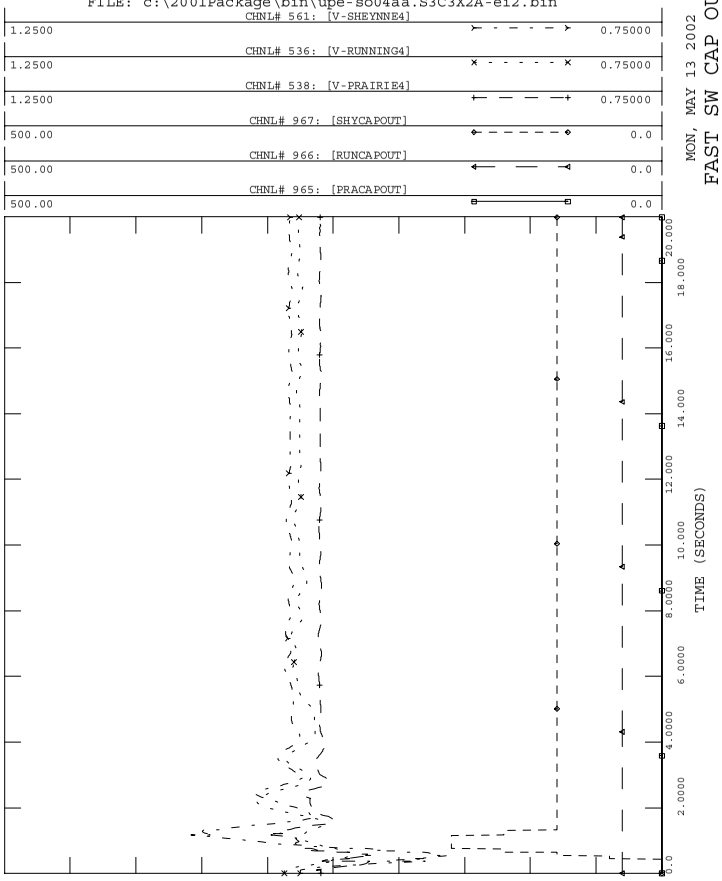
FAST SW CAP OUT 1



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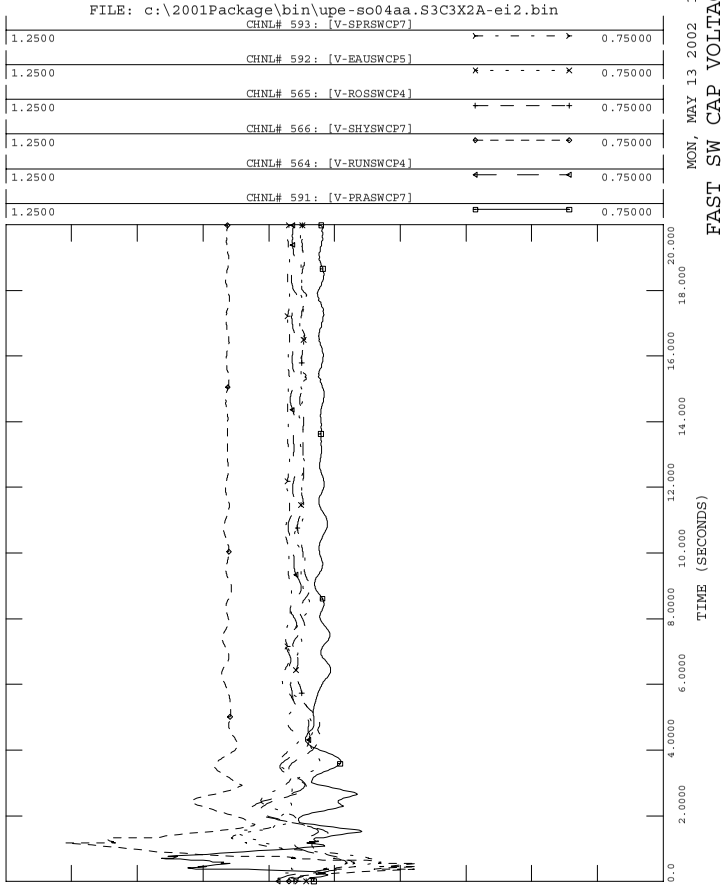
MON, MAY 13 2002 18:23

FAST SW CAP VOLTAGES



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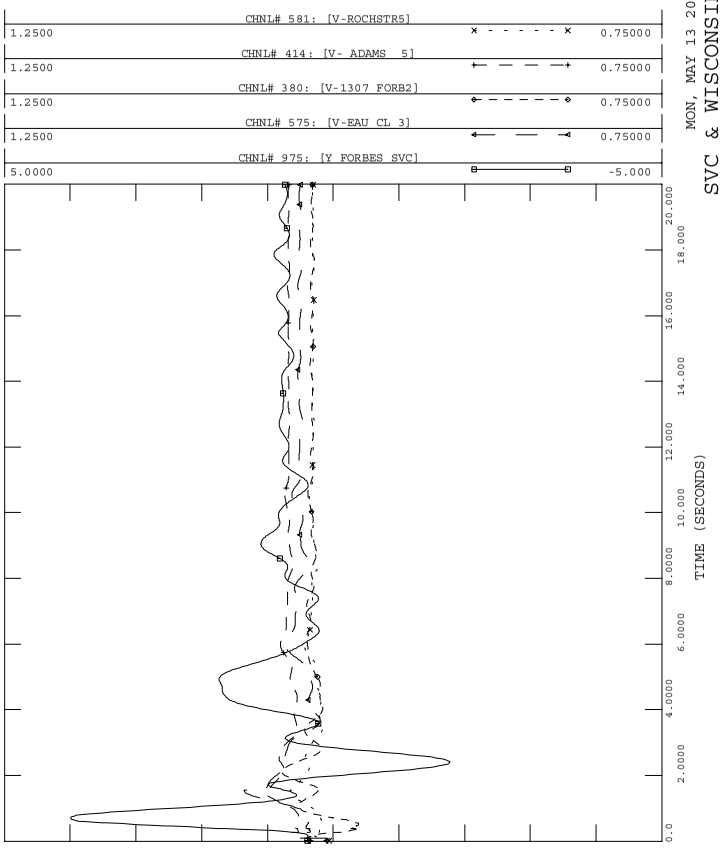
SVC & WISCONSIN VOLT



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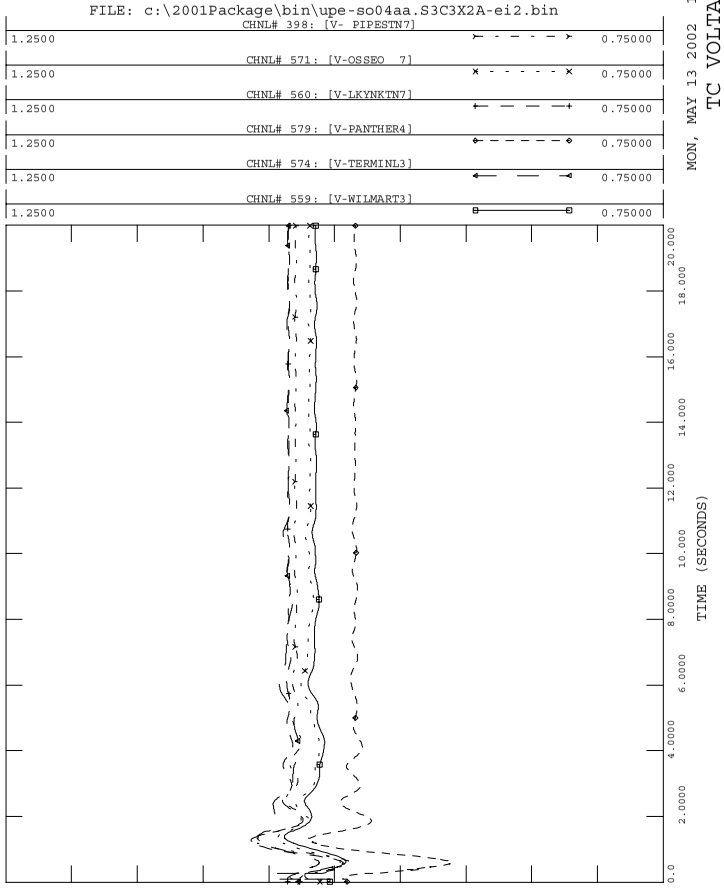
TC VOLTAGES



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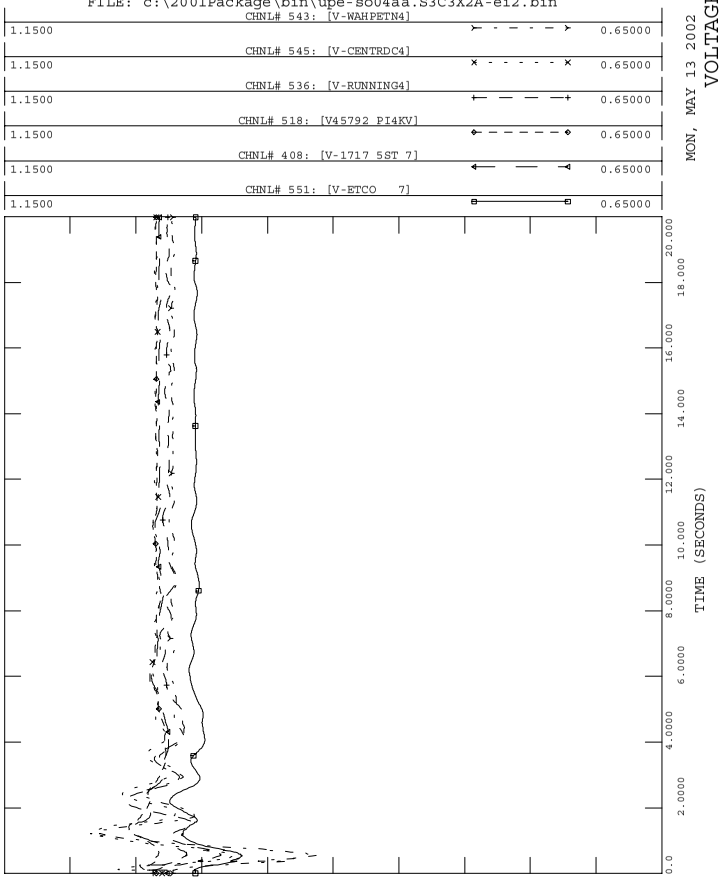
VOLTAGES 6



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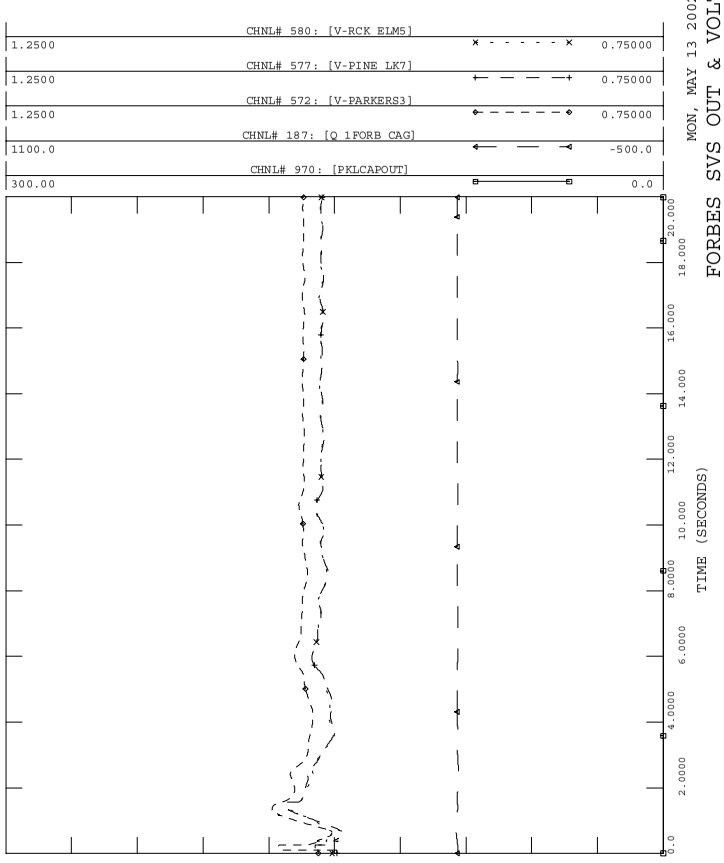
FORBES SVS OUT & VOLTAGES



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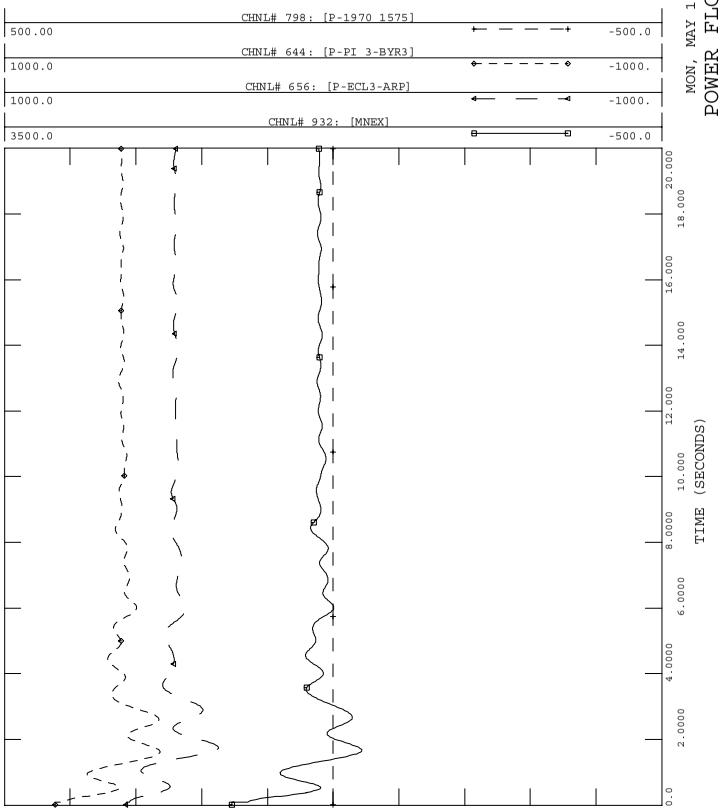
POWER FLOW SUMS 2



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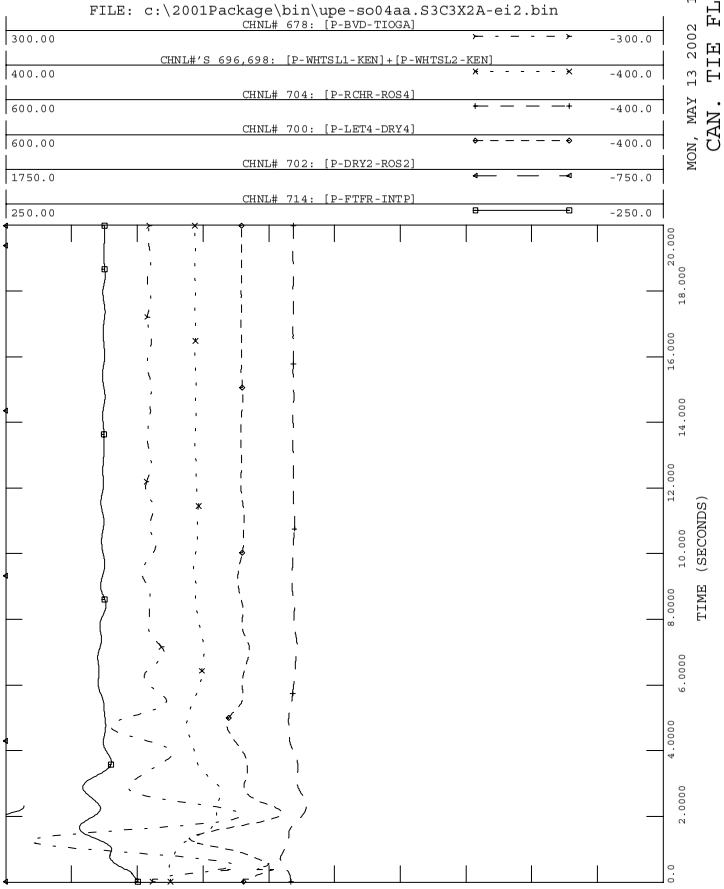
MON, MAY 13 2002 18:23
CAN. TIE FLOWS



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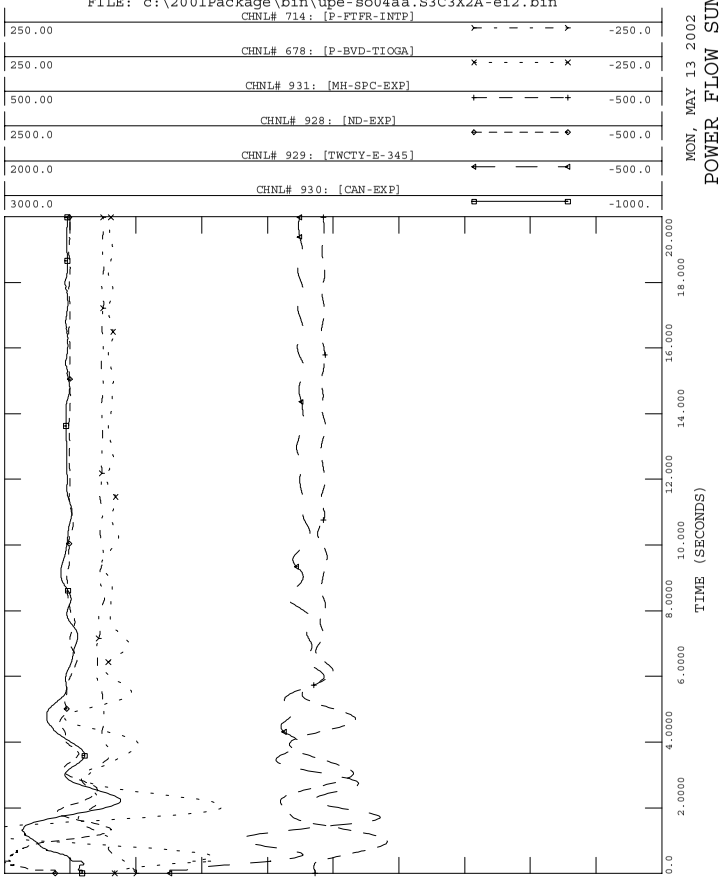
POWER FLOW SUMS 1



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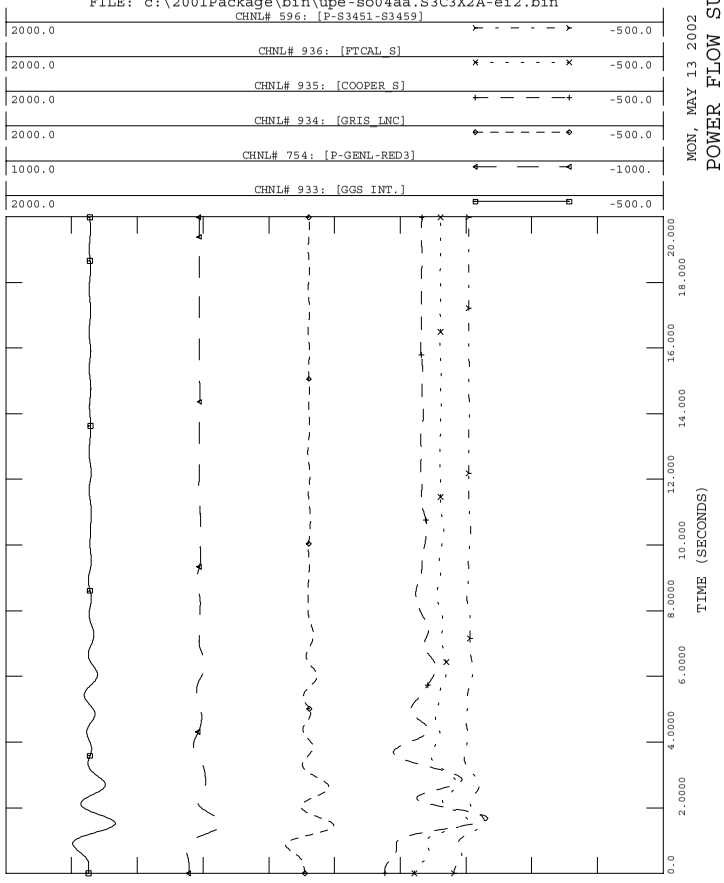
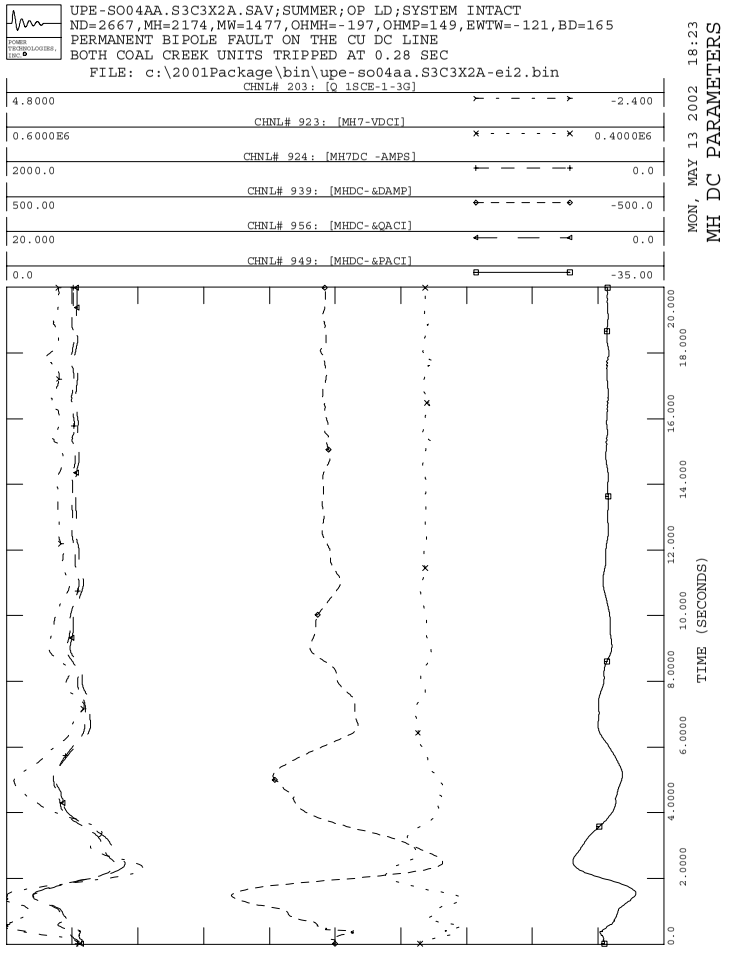
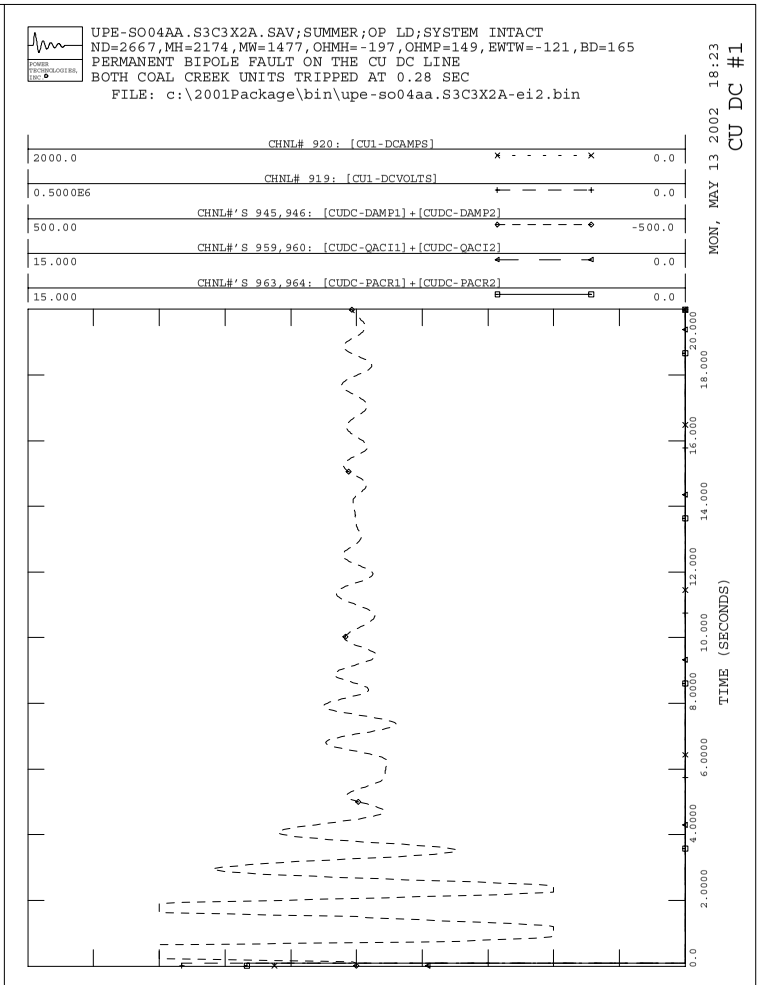
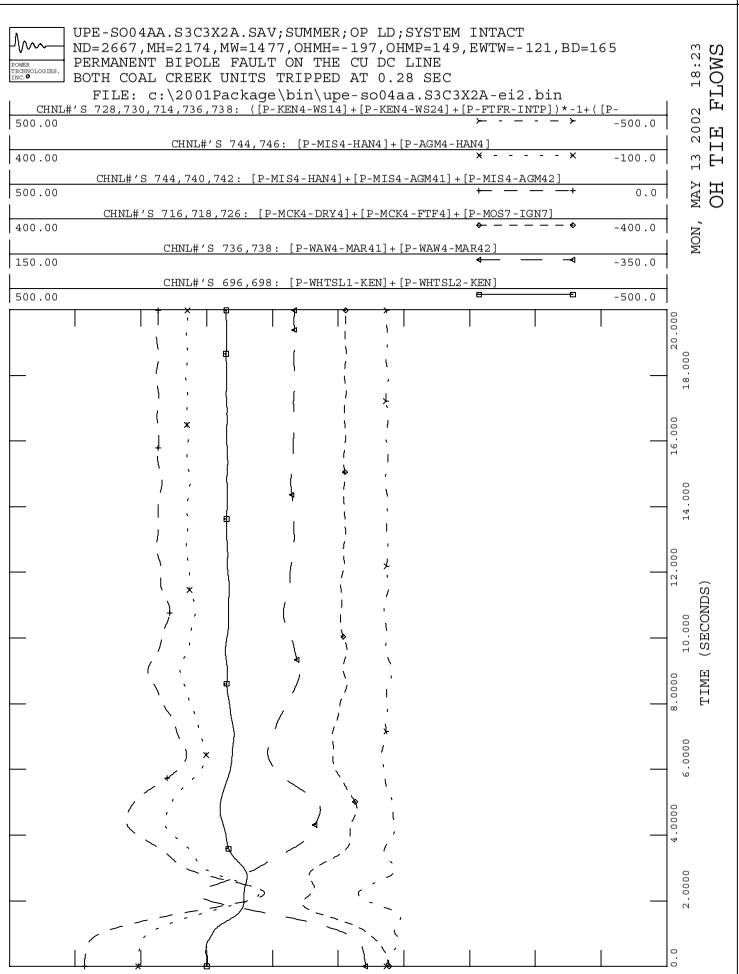
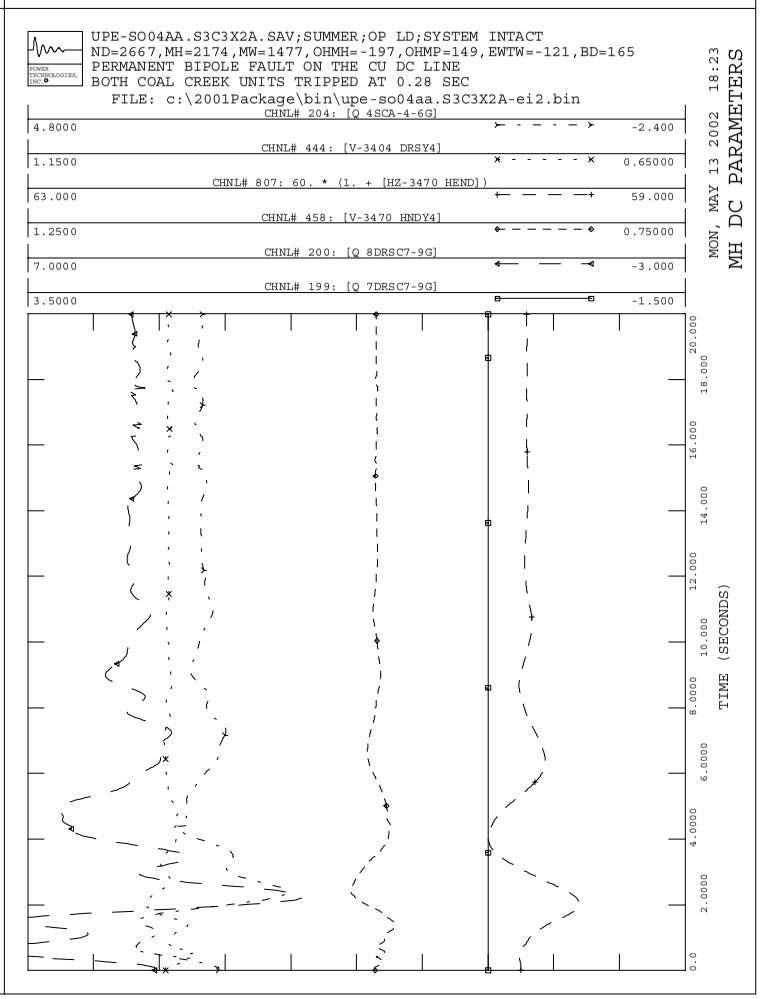
POWER FLOW SUM 3

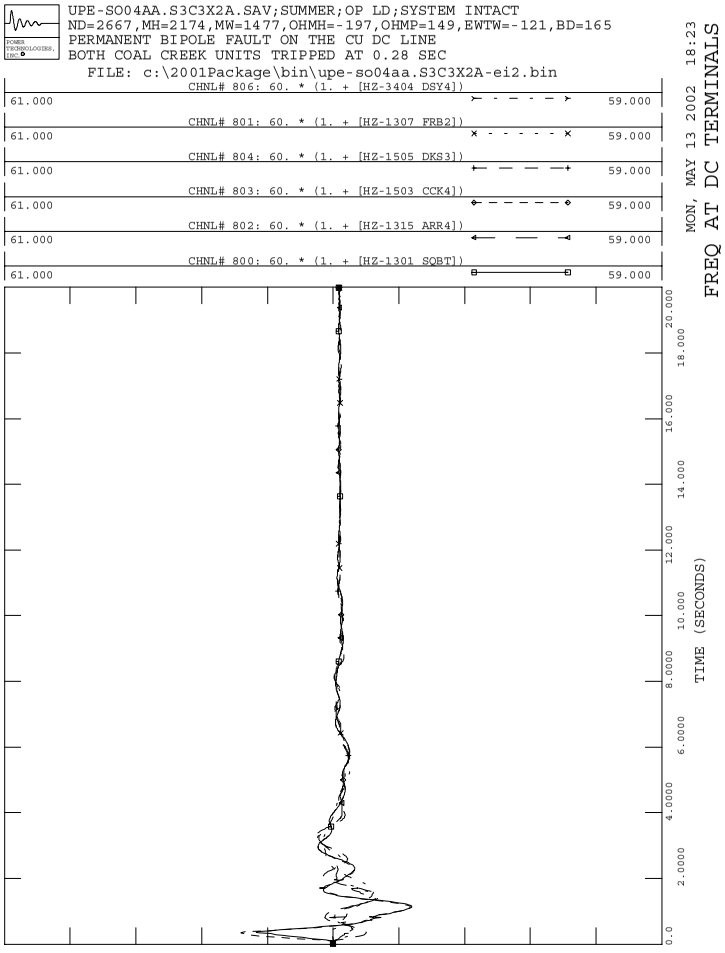


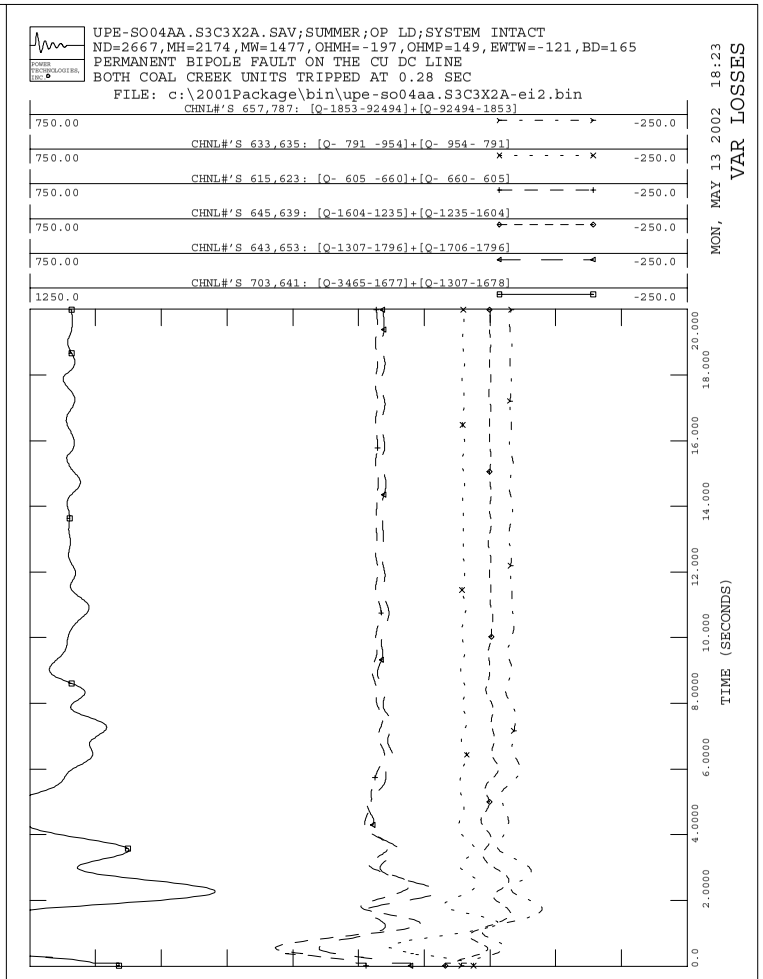

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000 -2.400
CHNL# 923: [MH7-VDCI]
0.6000E6 0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0 0.0
CHNL# 939: [MHDC-&DAMP]
500.00 -500.0
CHNL# 956: [MHDC-&QACI]
20.000 0.0
CHNL# 949: [MHDC-&PACI]
0.0 -35.00
MON, MAY 13 2002 18:23
MH DC PARAMETERS
TIME (SECONDS)

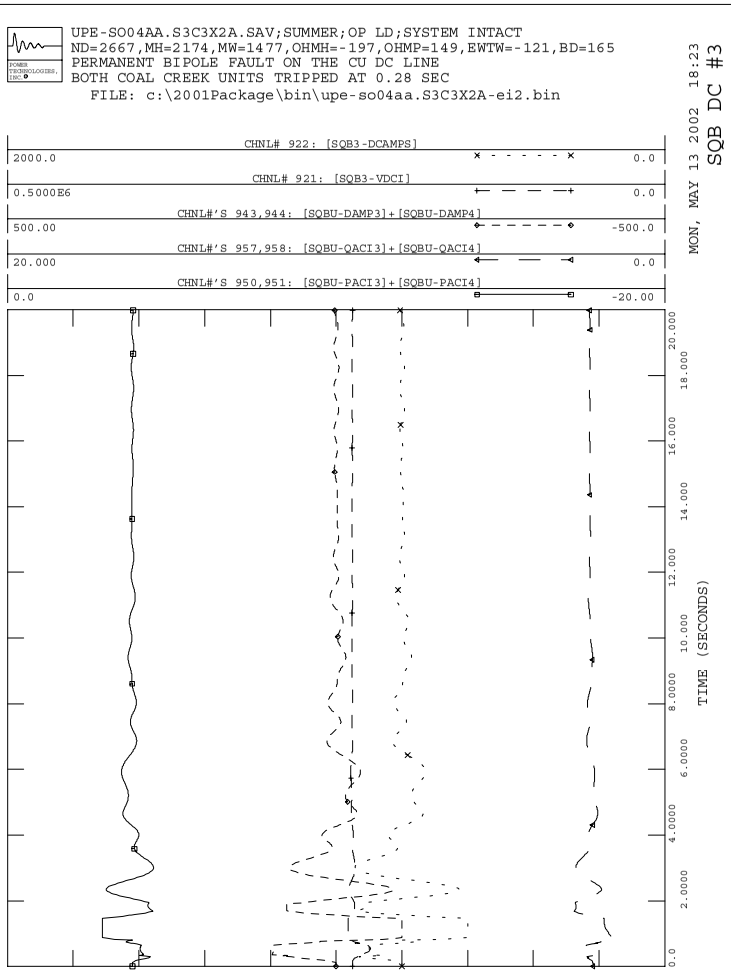

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL# 920: [CU1-DCAMPS]
2000.0 0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6 0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00 -500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000 0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000 0.0
MON, MAY 13 2002 18:23
CU DC #1
TIME (SECONDS)

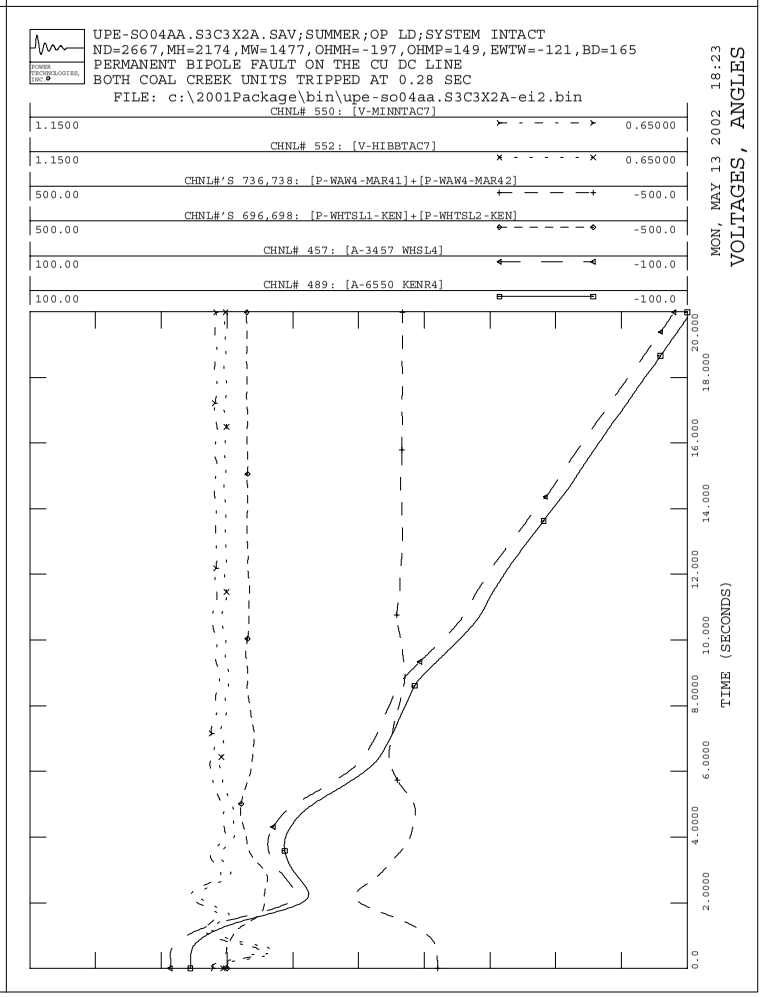

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00 -500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00 -100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00 0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00 -400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00 -350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00 -500.0
MON, MAY 13 2002 18:23
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000 -2.400
CHNL# 444: [V-3404 DRSY4]
1.1500 0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000 59.000
CHNL# 458: [V-3470 HNDY4]
1.2500 0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000 -3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000 -1.500
MON, MAY 13 2002 18:23
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
MON, MAY 13 2002 18:23
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
MON, MAY 13 2002 18:23
VAR LOSSES
TIME (SECONDS)

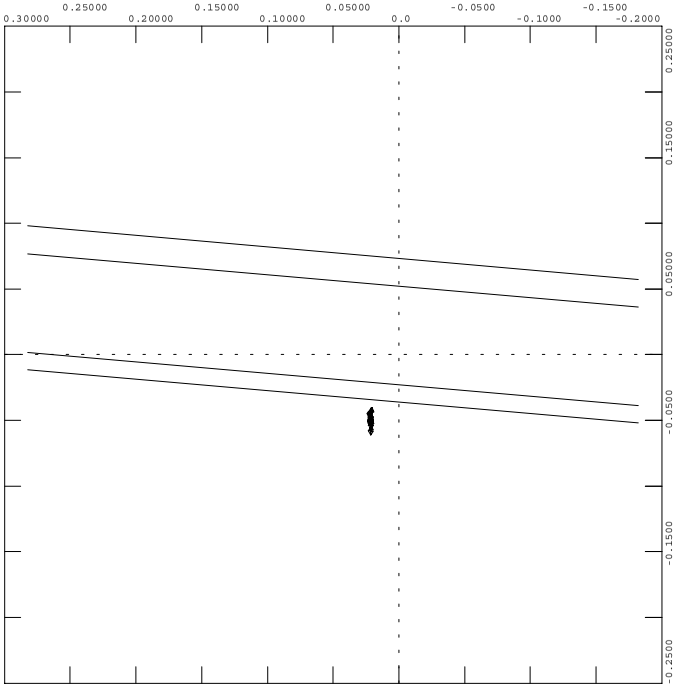

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
MON, MAY 13 2002 18:23
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
MON, MAY 13 2002 18:23
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

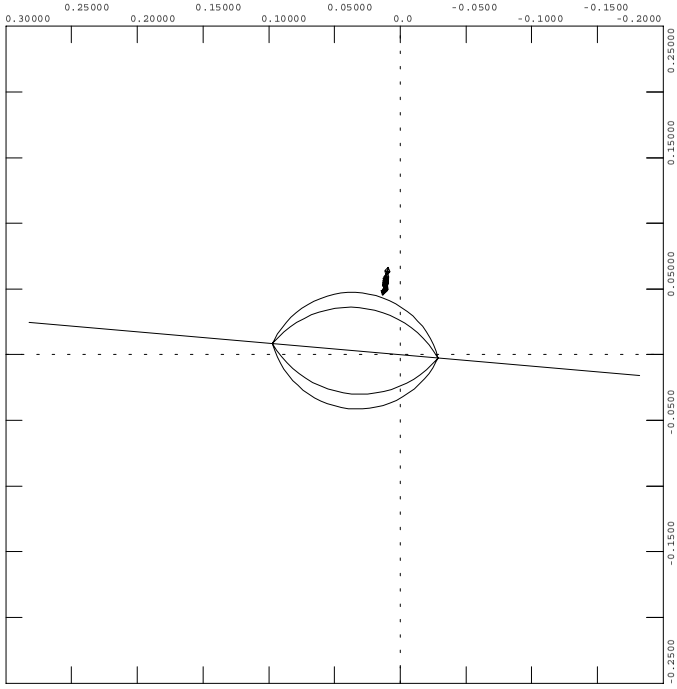


MON, MAY 13 2002 18:23
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

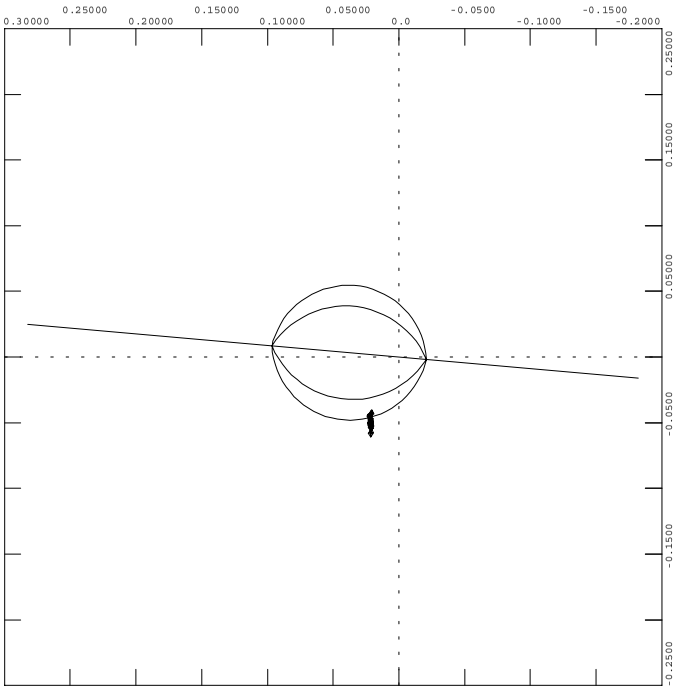


MON, MAY 13 2002 18:23
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

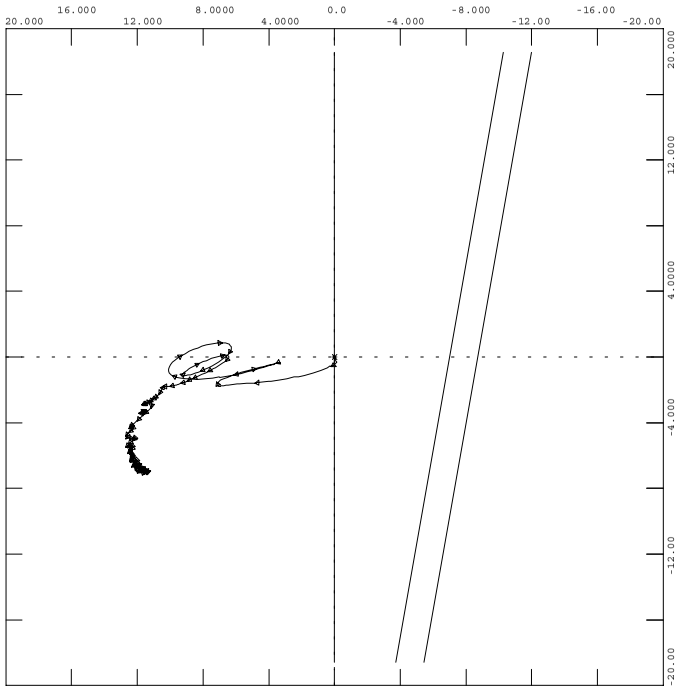


MON, MAY 13 2002 18:23
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

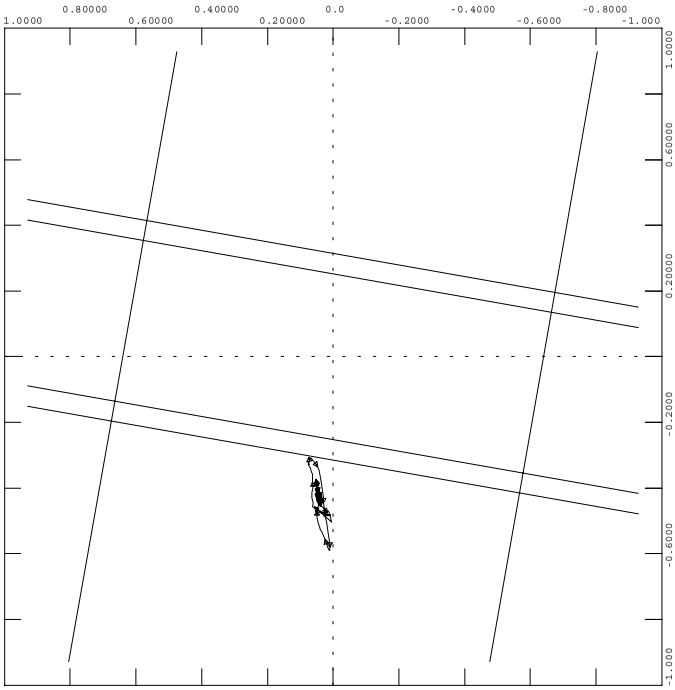


MON, MAY 13 2002 18:23
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

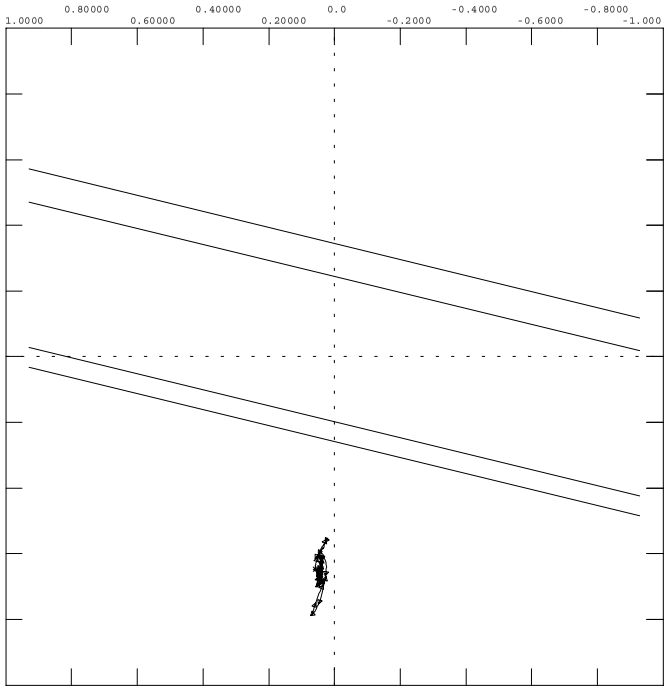
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

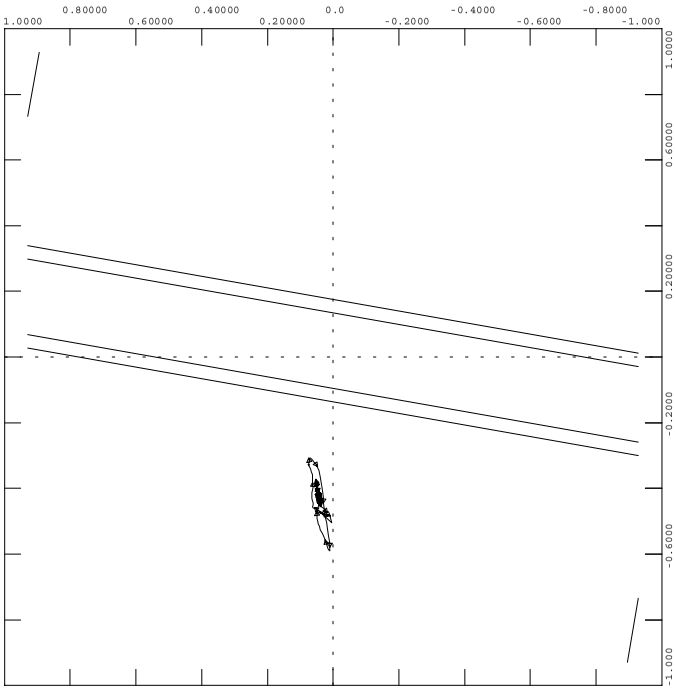
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

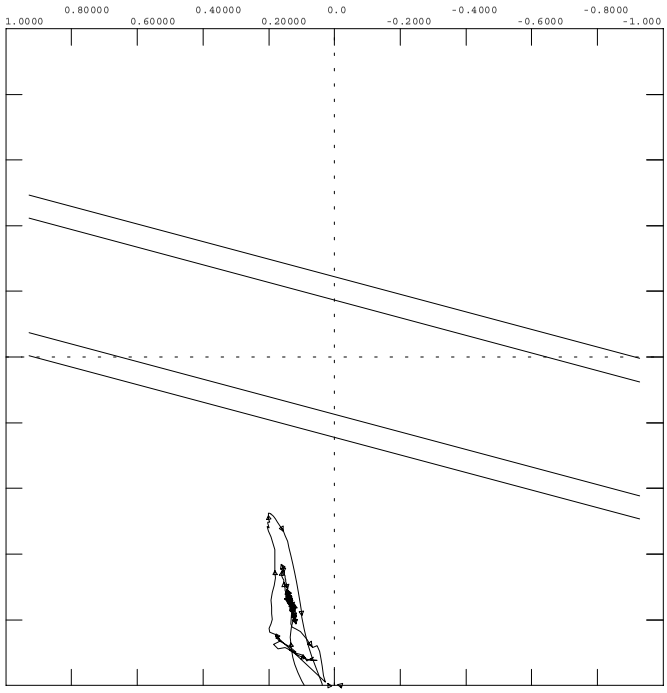
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

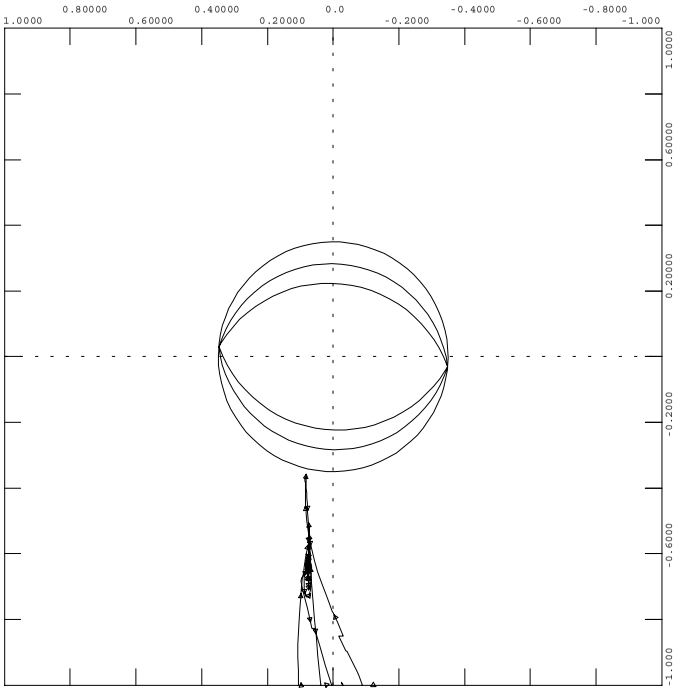
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

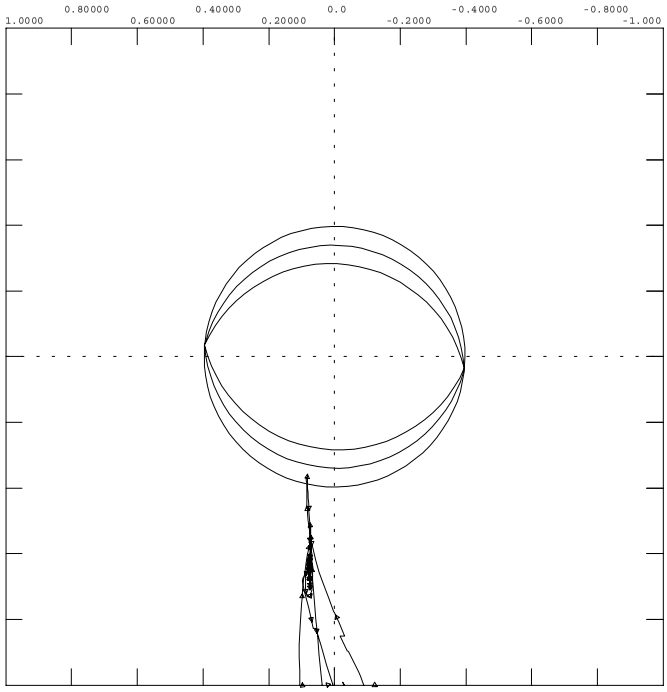
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

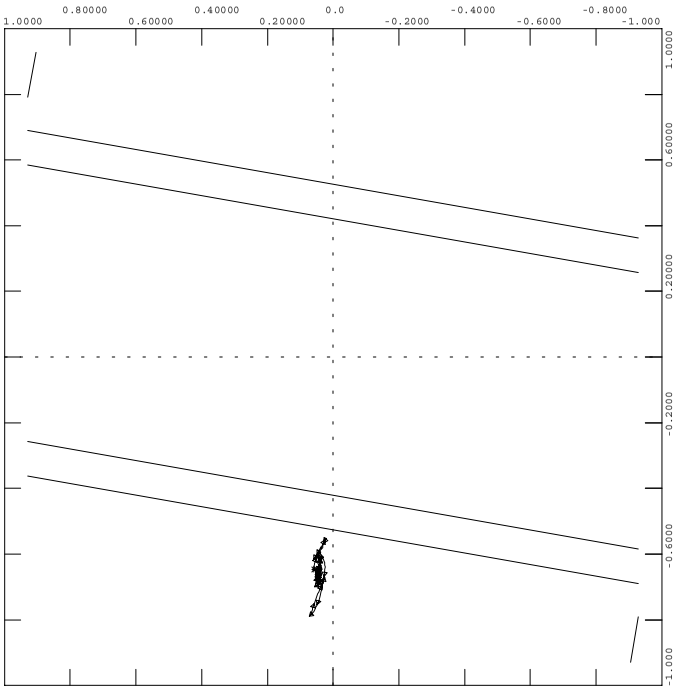
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

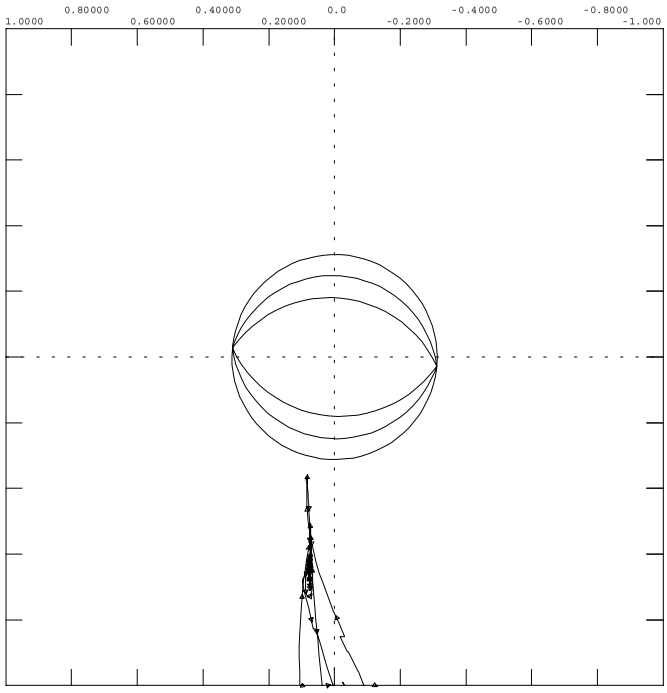
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



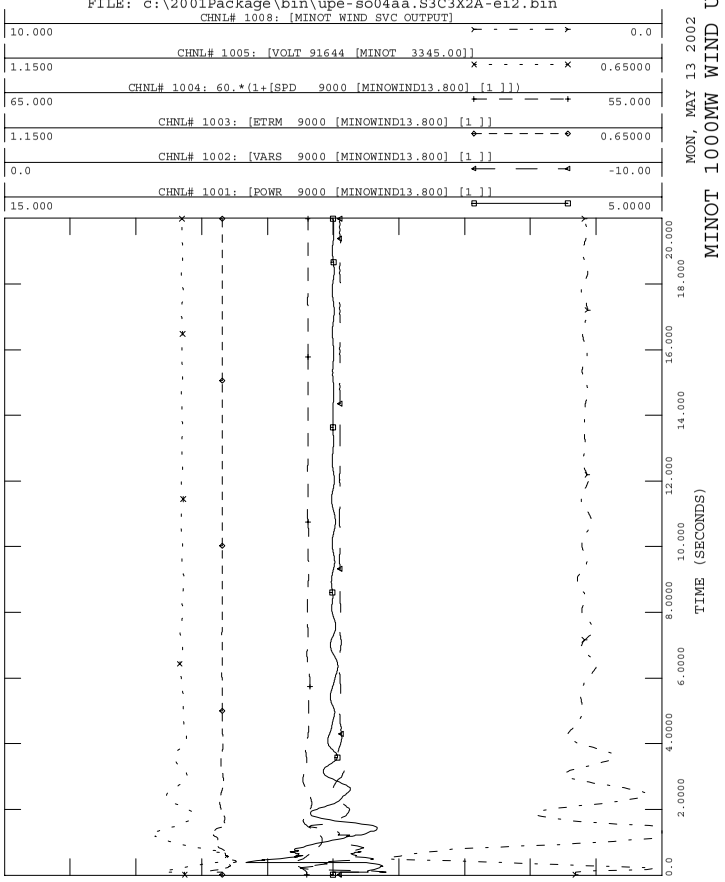
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

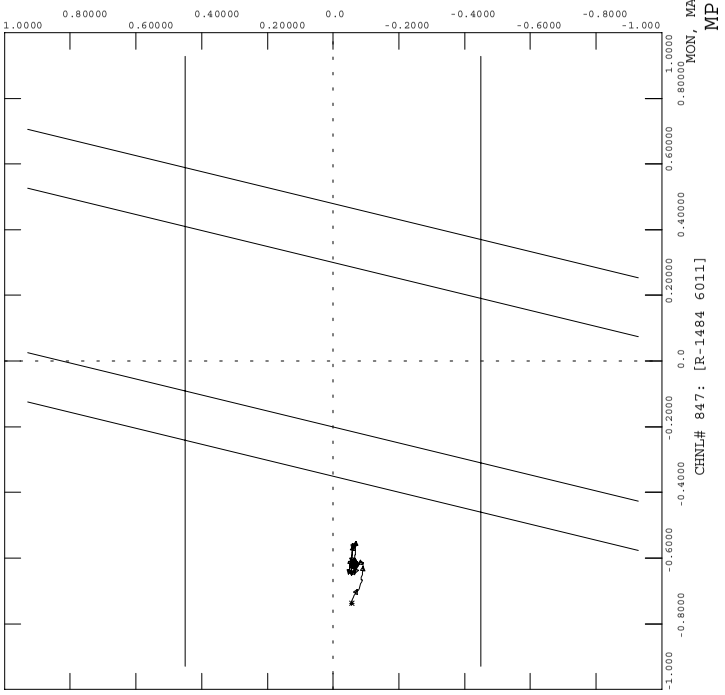


MON, MAY 13 2002 18:23
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

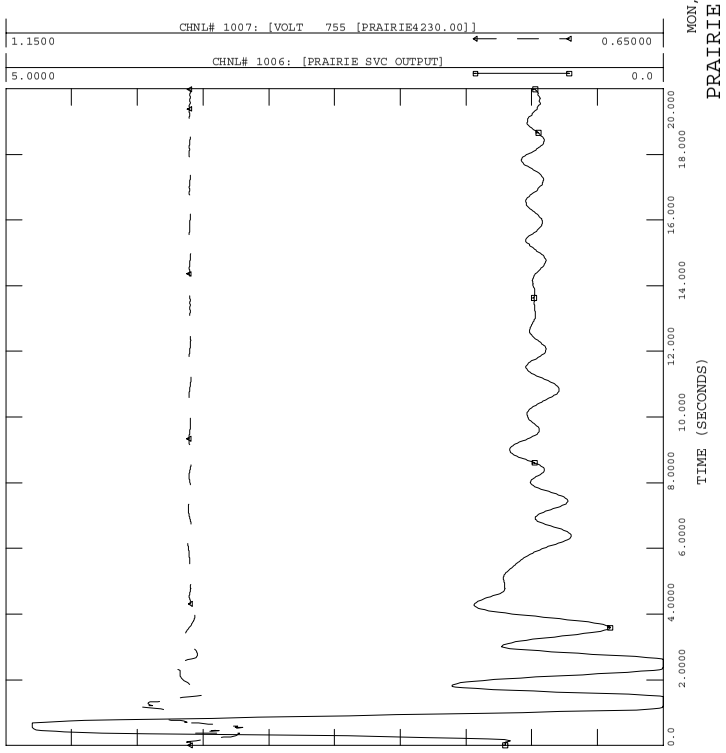
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, MAY 13 2002 18:23
MP-OH I.FALLS (779)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ei2.bin



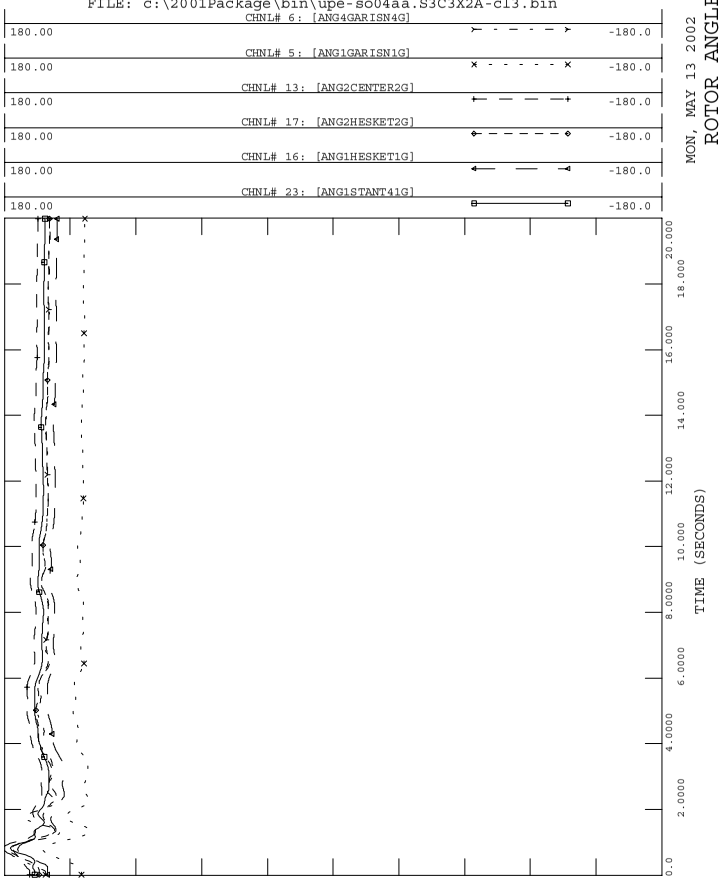
MON, MAY 13 2002 18:23
PRAIRIE SVC RESPONSE

CONTINGENCY CL3

4 cycle 3 phase fault at Minot 345kV. Clear Minot – Harvey 345 kV line

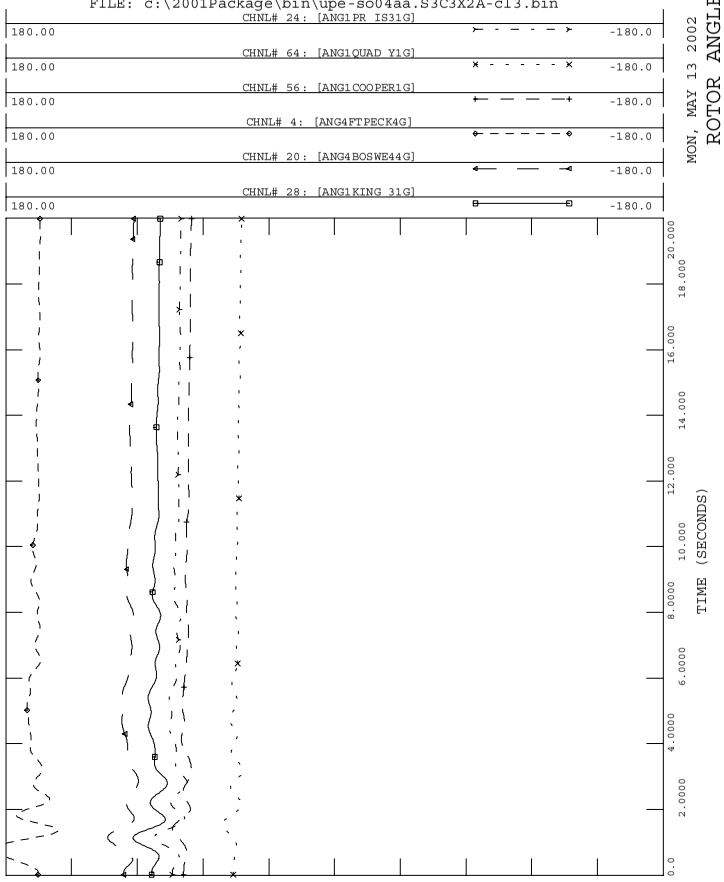
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
ROTOR ANGLES 2



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
ROTOR ANGLES 4



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
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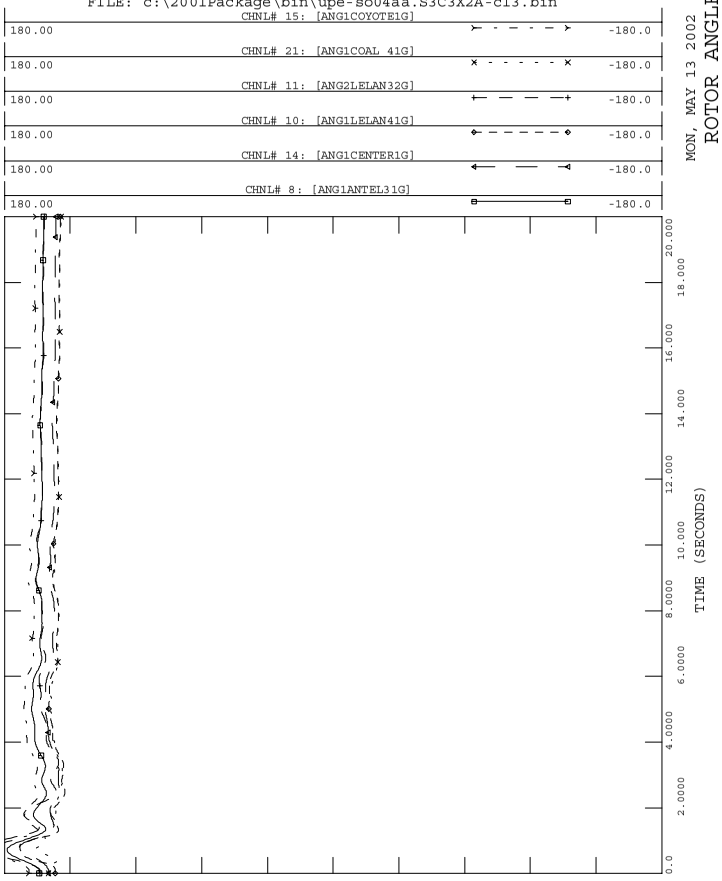
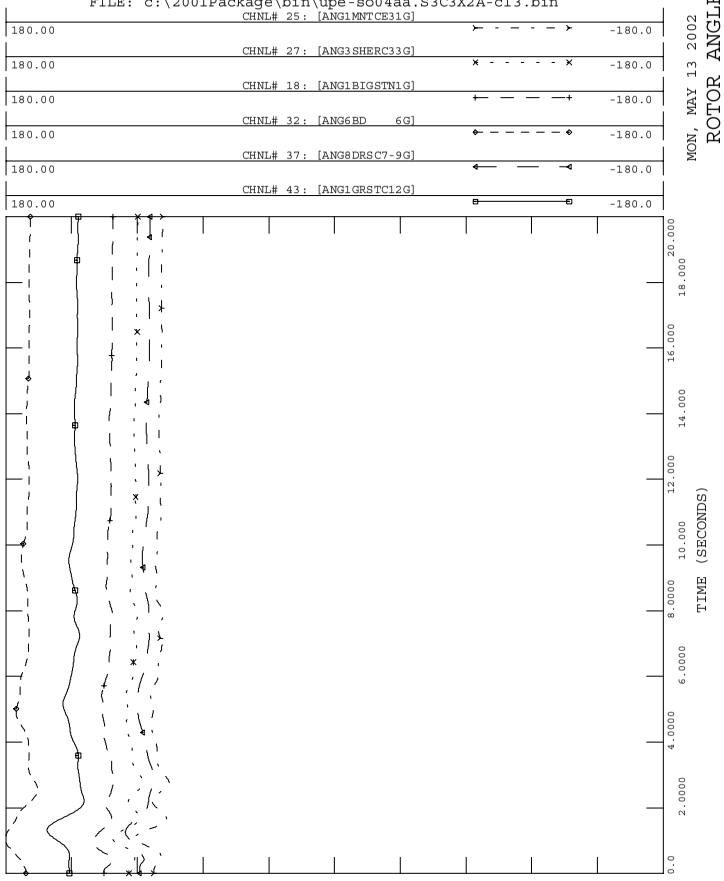


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
ROTOR ANGLES 3



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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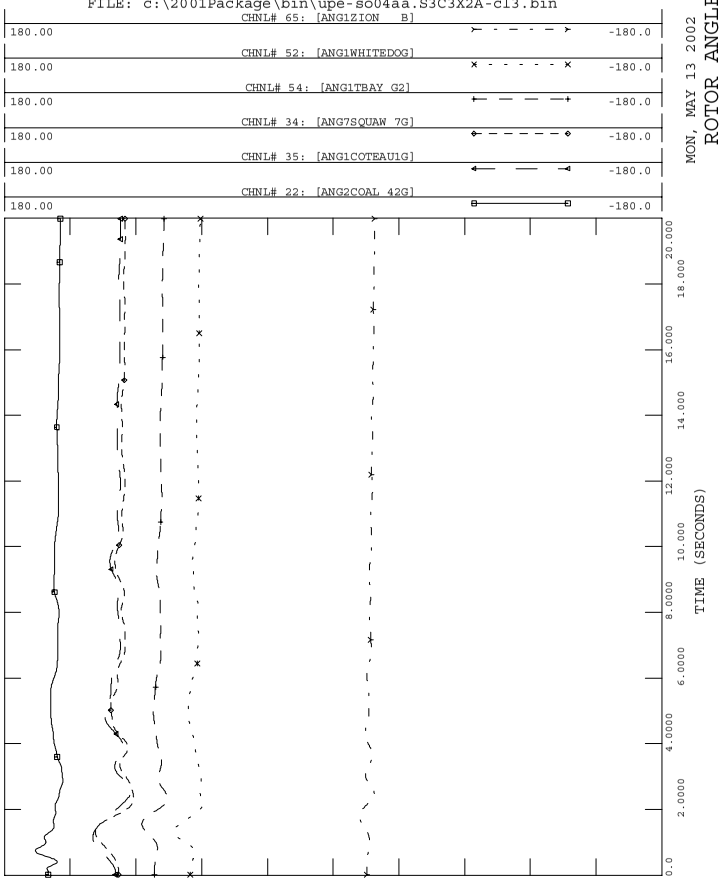
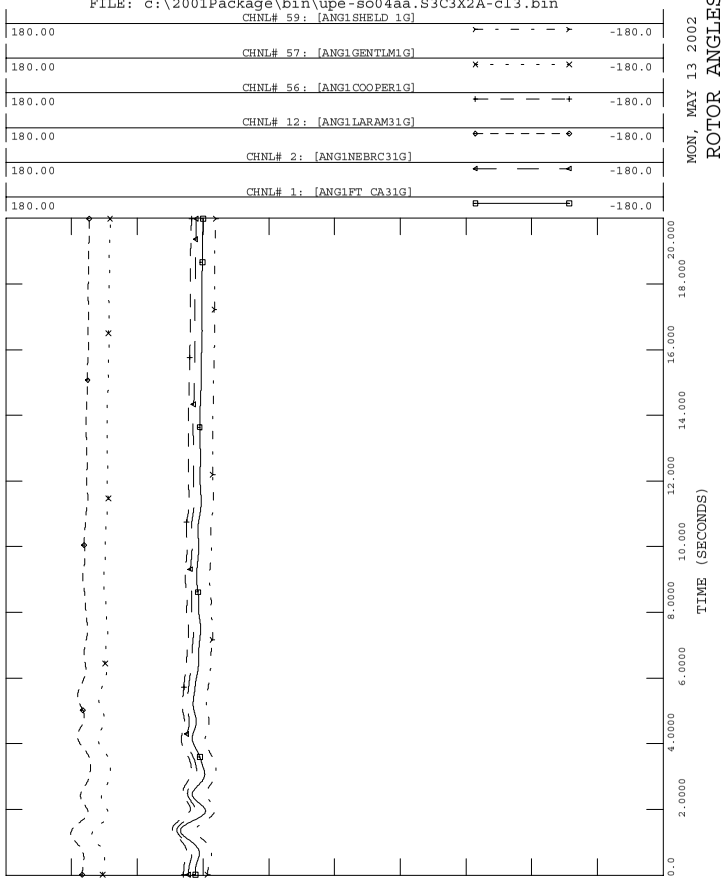
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin



MON, MAY 13 2002 19:54
ROTOR ANGLES 6

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin



MON, MAY 13 2002 19:54
ROTOR ANGLES NB

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
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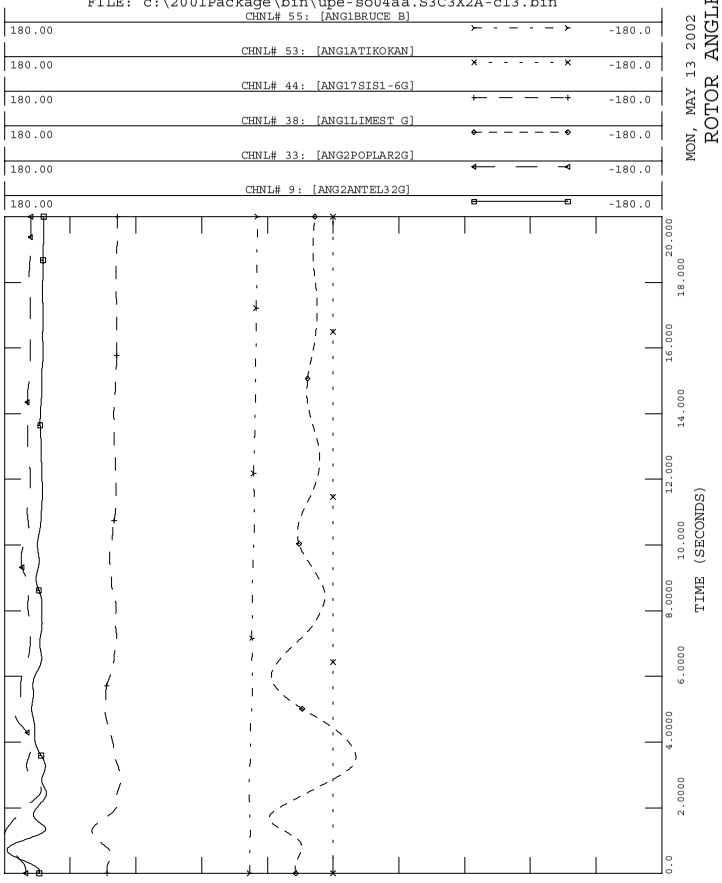

MON, MAY 13 2002 19:54
ROTOR ANGLES 5

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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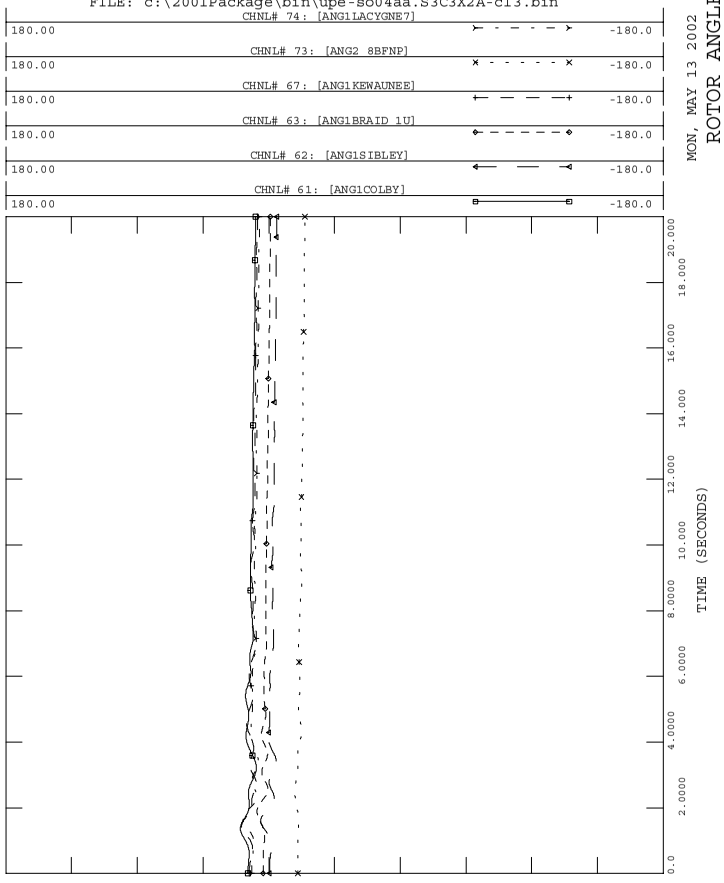
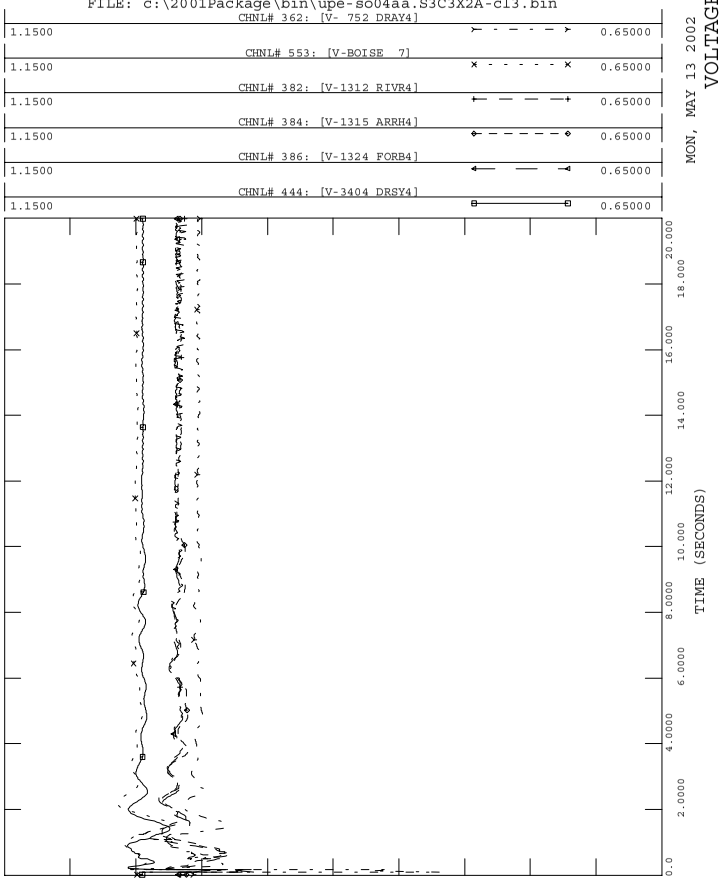
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin



MON, MAY 13 2002 19:54
ROTOR ANGLES 7

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
VOLTAGES 1



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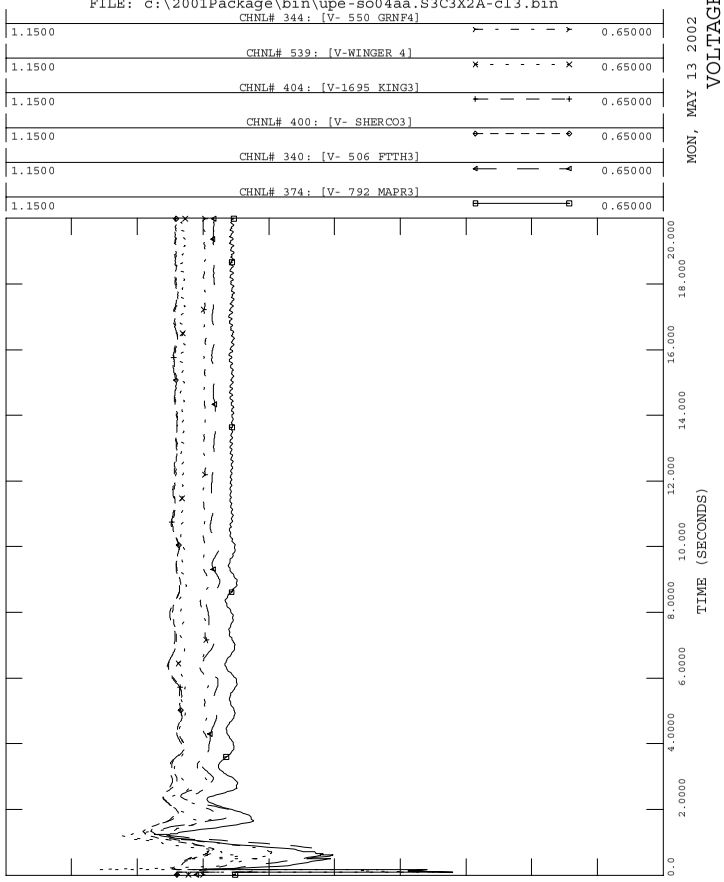
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
VOLTAGES 3



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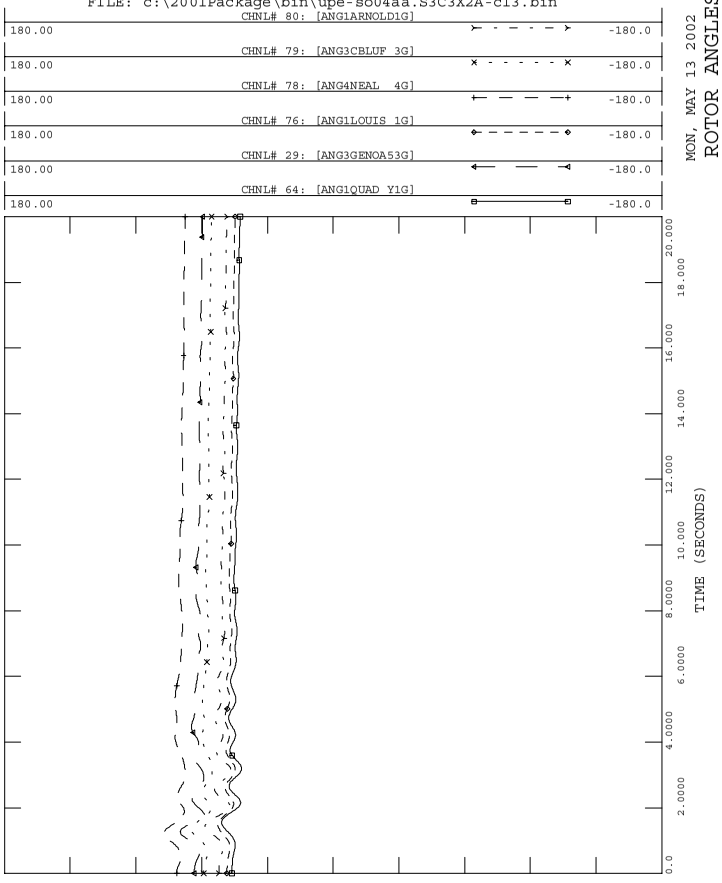
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
ROTOR ANGLES IA



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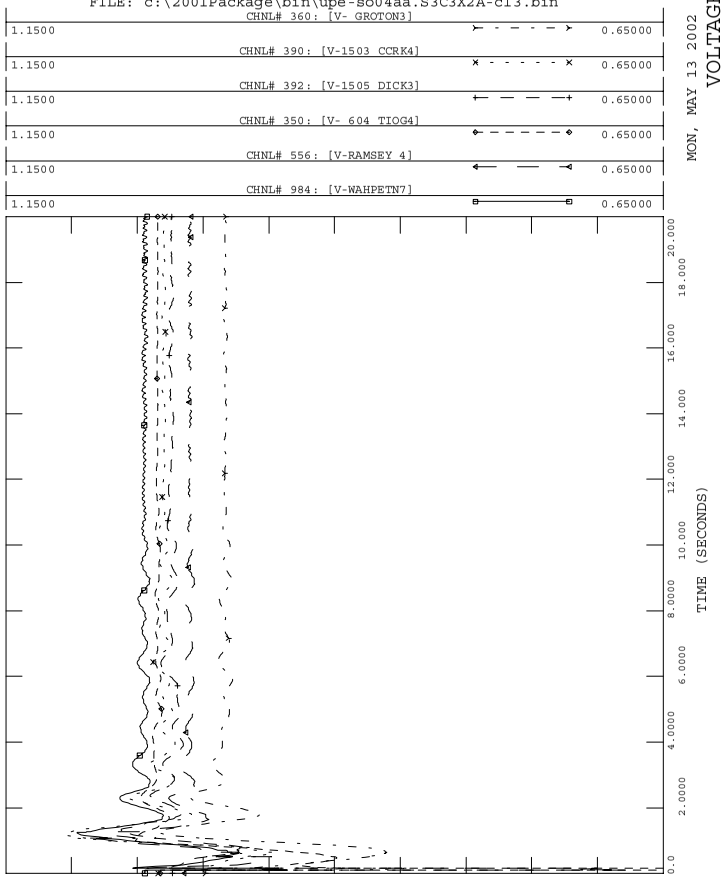
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
VOLTAGES 2



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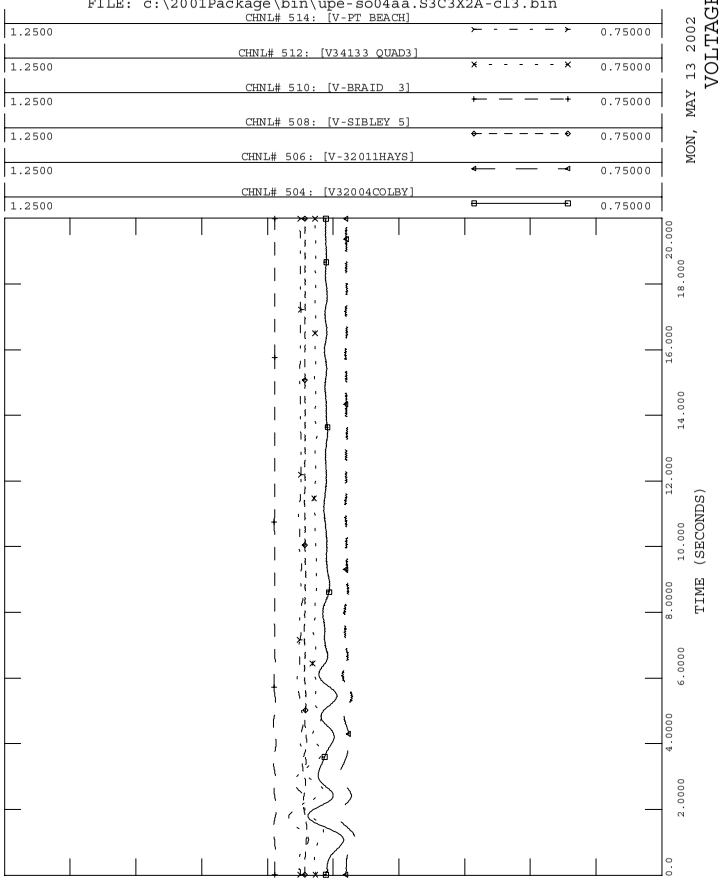
MON, MAY 13 2002 19:54
VOLTAGES 5



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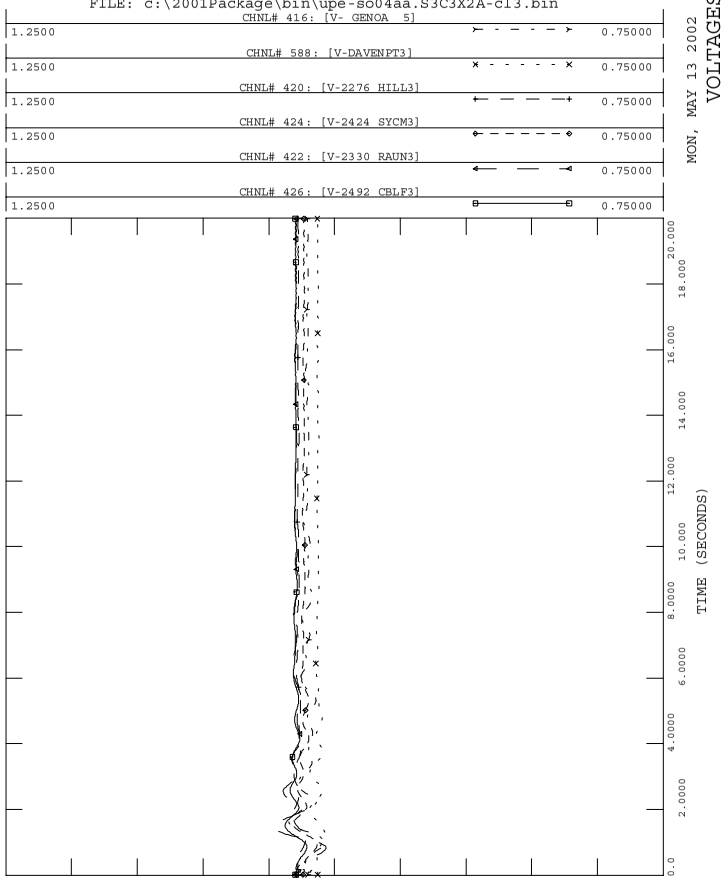
MON, MAY 13 2002 19:54
VOLTAGES IA



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CLEAR MINOT - HARVEY 345 KV LINE
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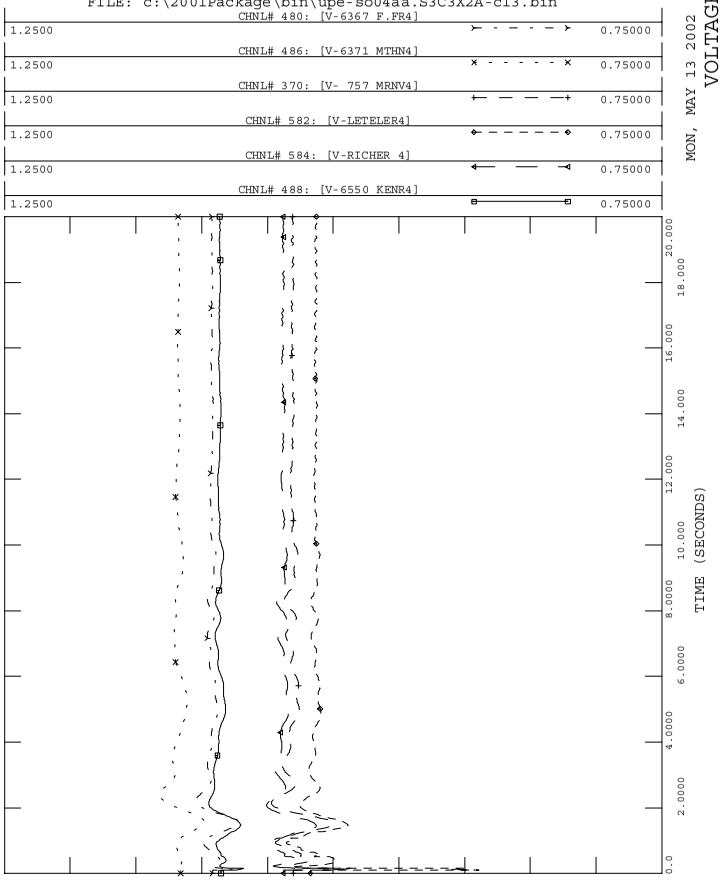
MON, MAY 13 2002 19:54
VOLTAGES 4



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CLEAR MINOT - HARVEY 345 KV LINE
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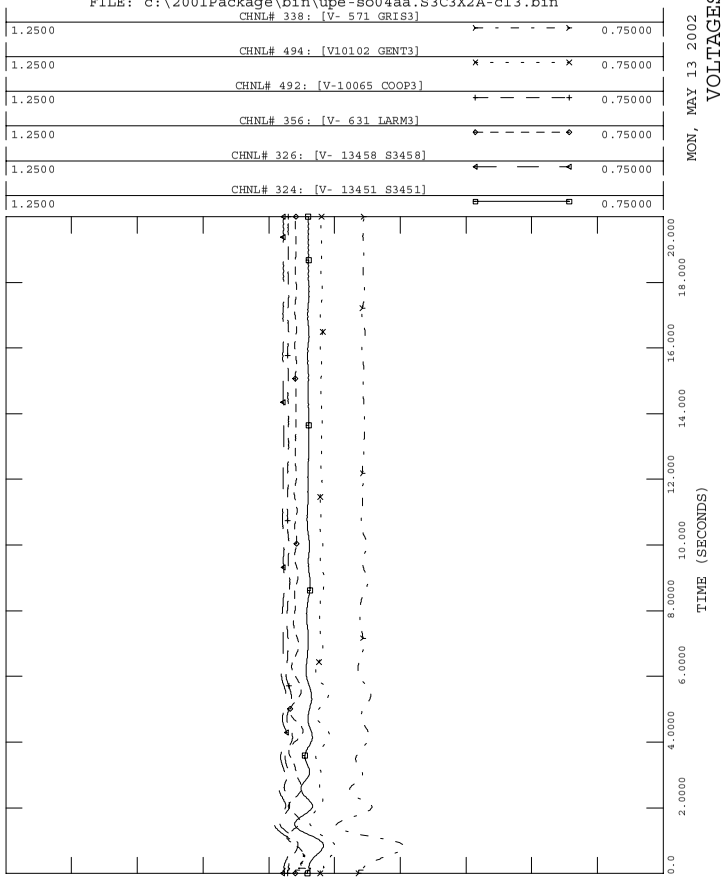
MON, MAY 13 2002 19:54
VOLTAGES NB



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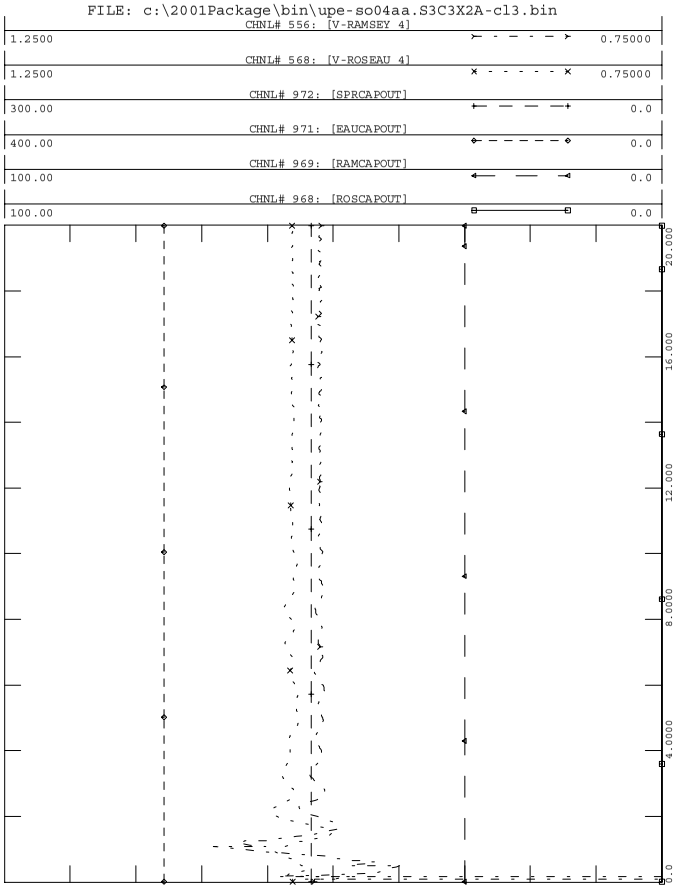

MON, MAY 13 2002 19:54
FAST SW CAP OUT 2

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
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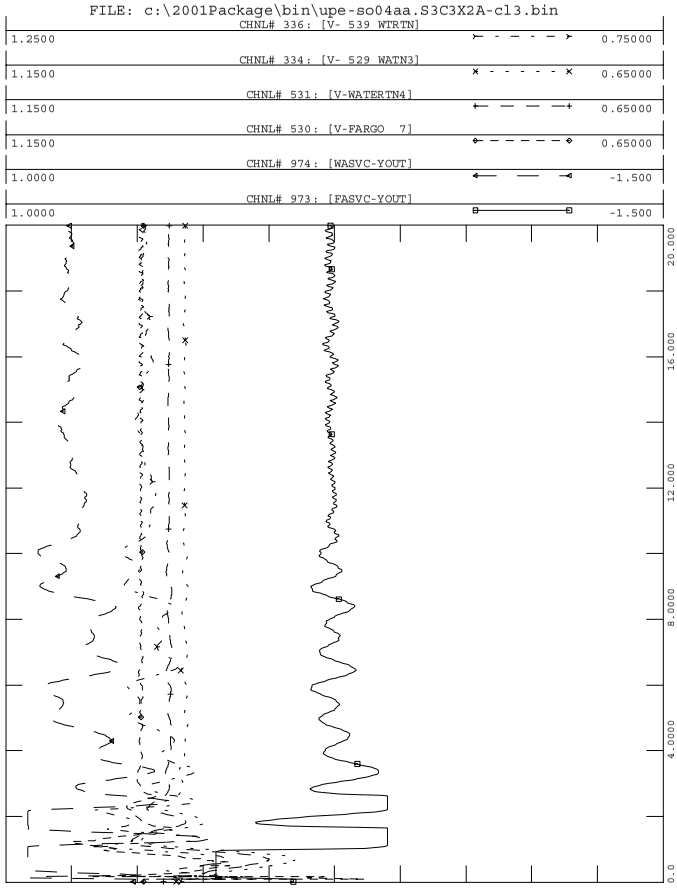

MON, MAY 13 2002 19:54
FARGO/WATERTOWN SVS

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
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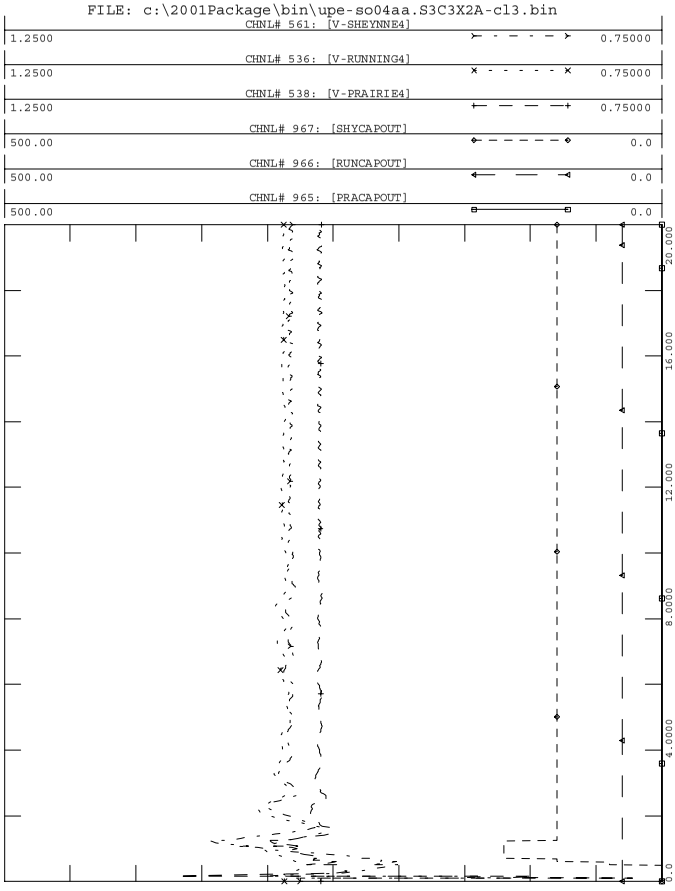

MON, MAY 13 2002 19:54
FAST SW CAP OUT 1

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
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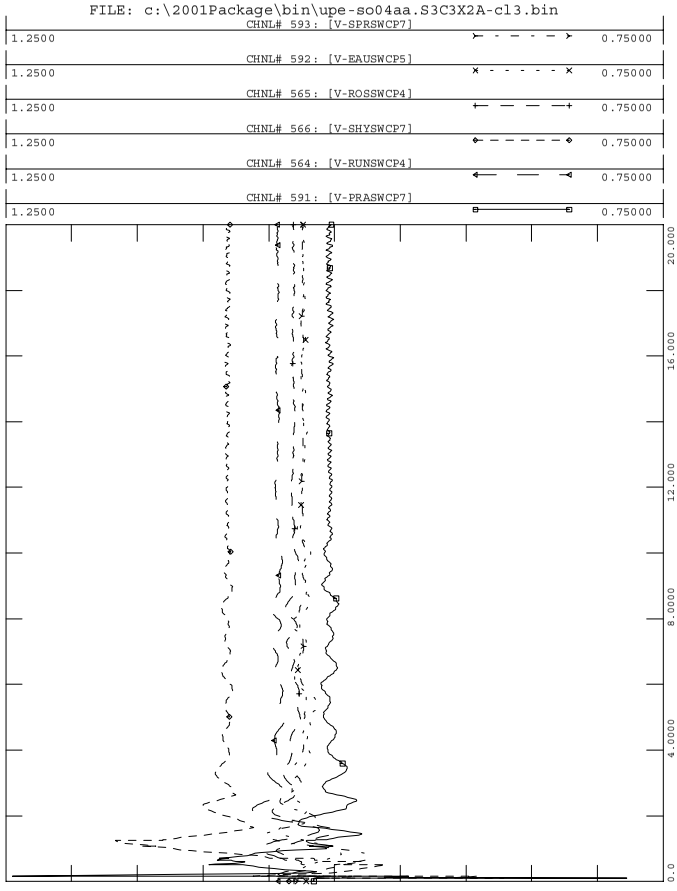

MON, MAY 13 2002 19:54
FAST SW CAP VOLTAGES

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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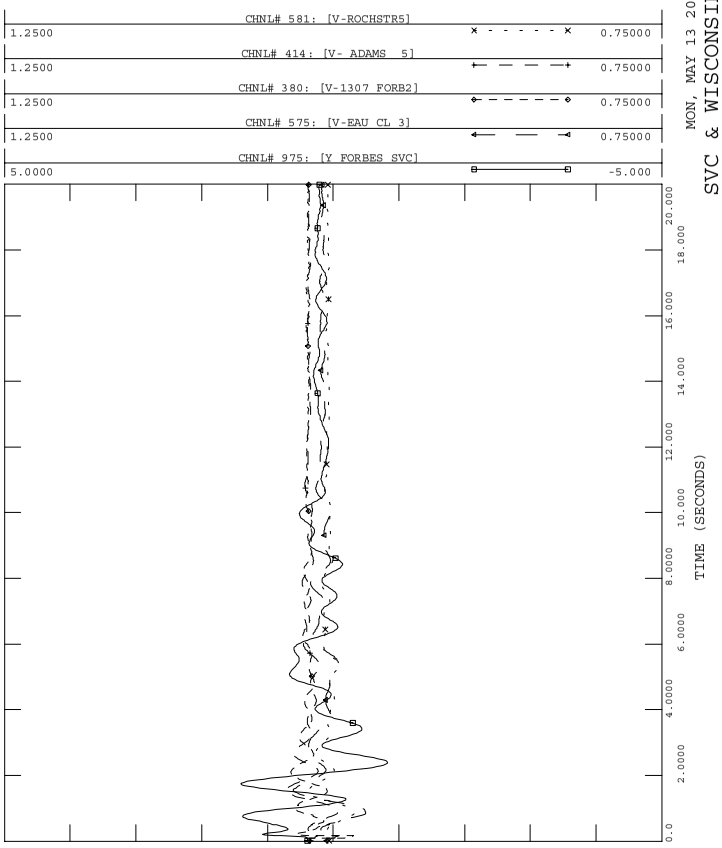
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54

SVC & WISCONSIN VOLT



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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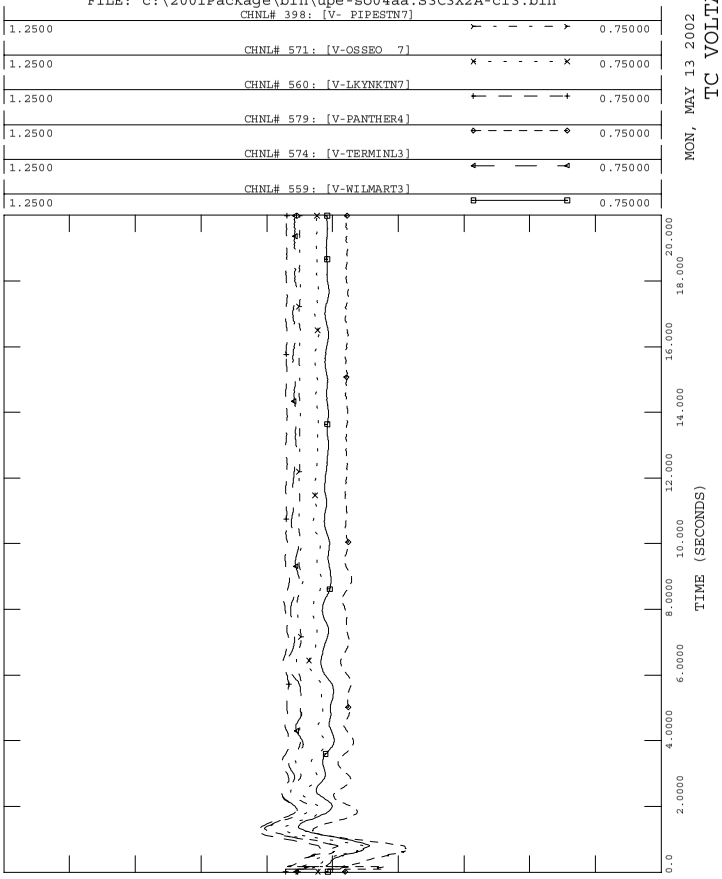
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54

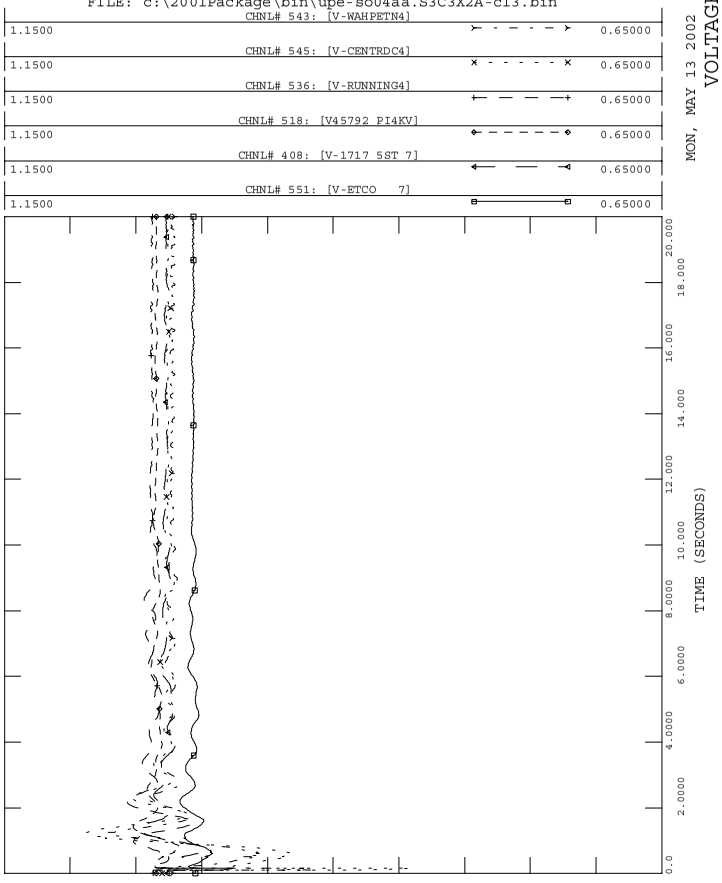
TC VOLTAGES



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54

VOLTAGES 6



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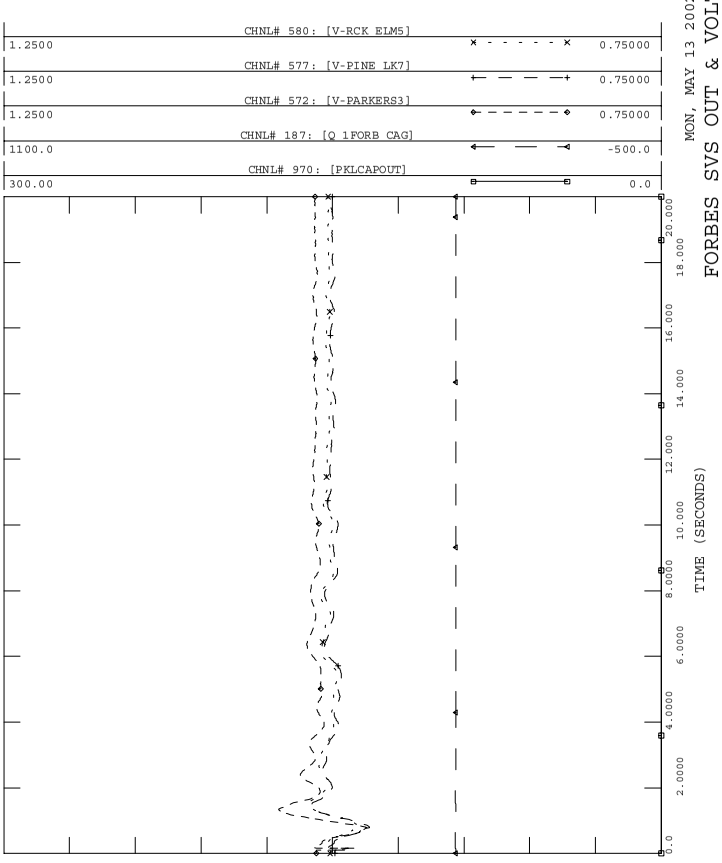
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54

FORBES SVS OUT & VOLTAGES



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
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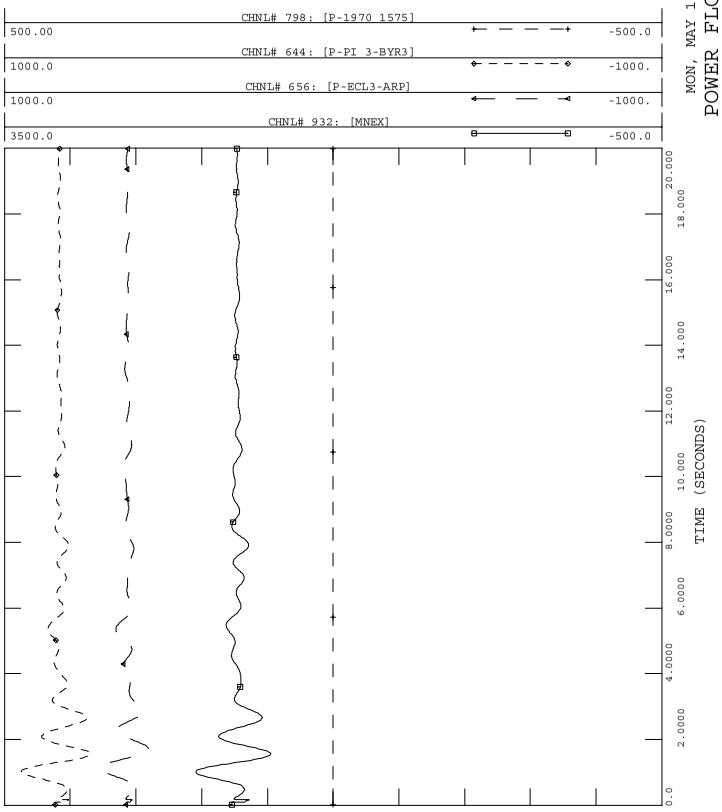
MON, MAY 13 2002 19:54
POWER FLOW SUMS 2



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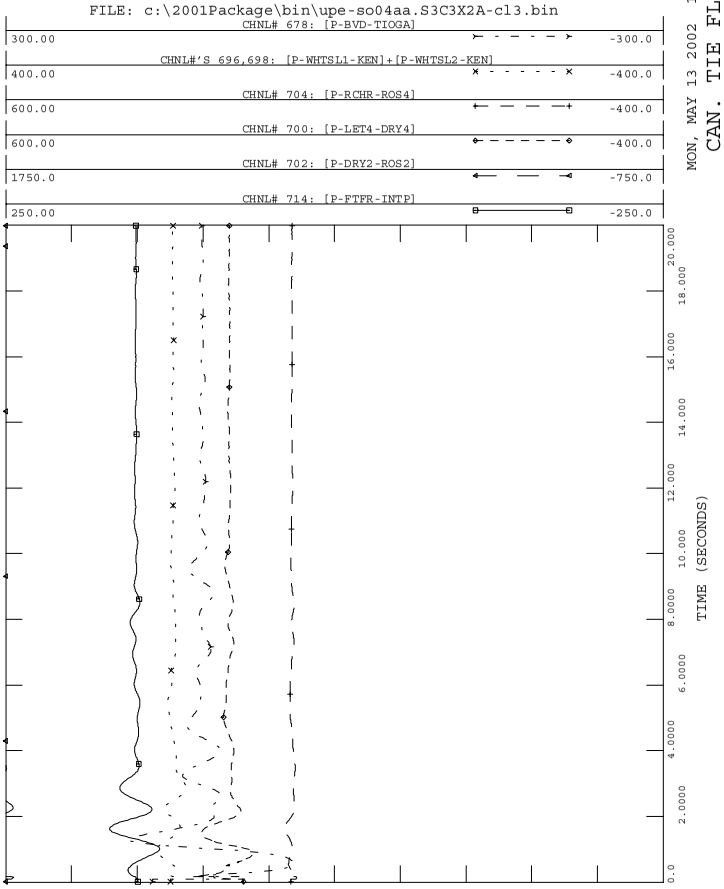
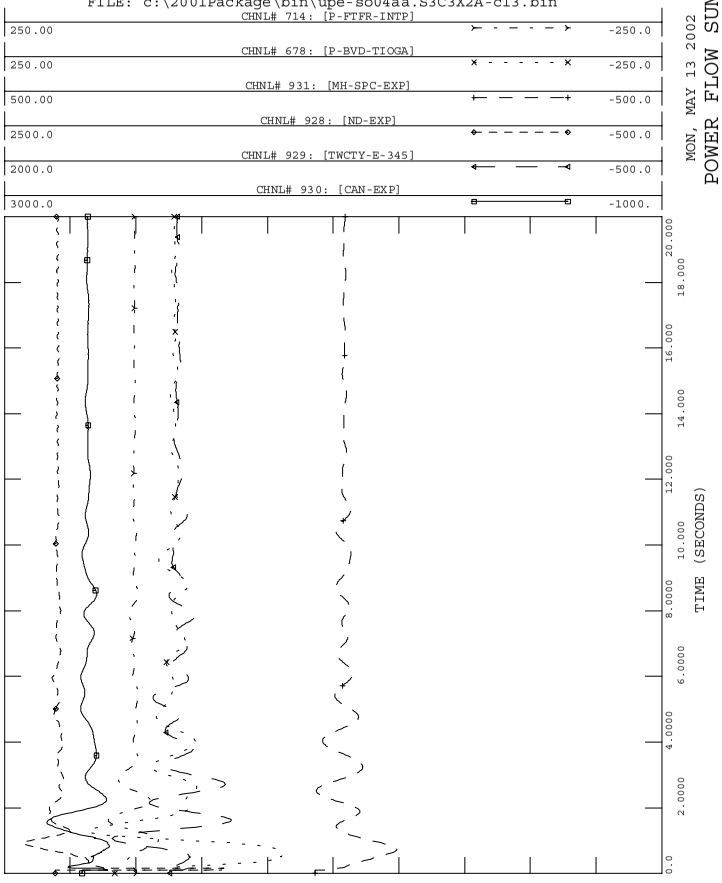
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
CAN. TIE FLOWS



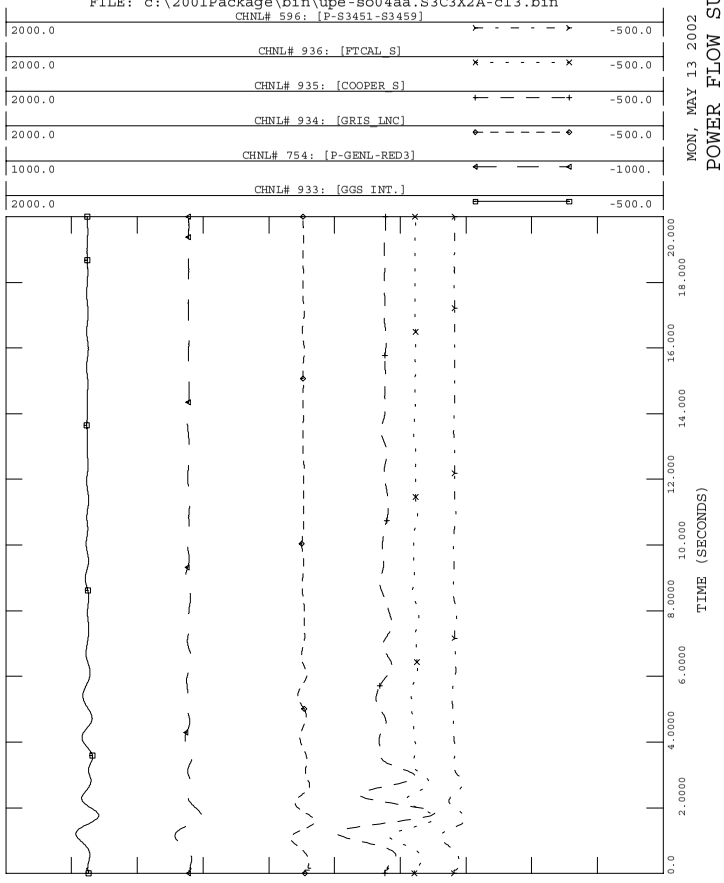
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
POWER FLOW SUMS 1



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
POWER FLOW SUM 3



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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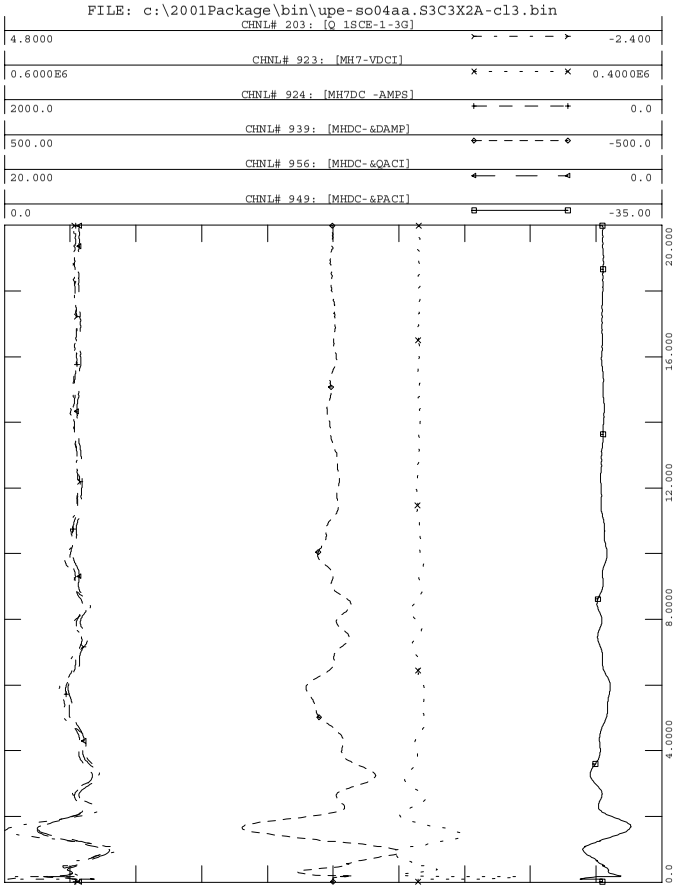
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
MH DC PARAMETERS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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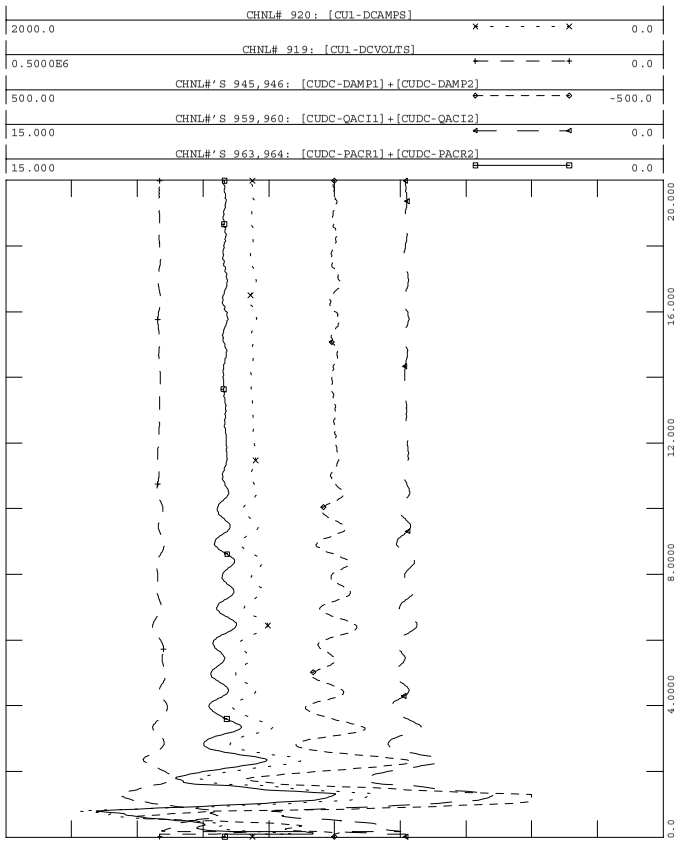
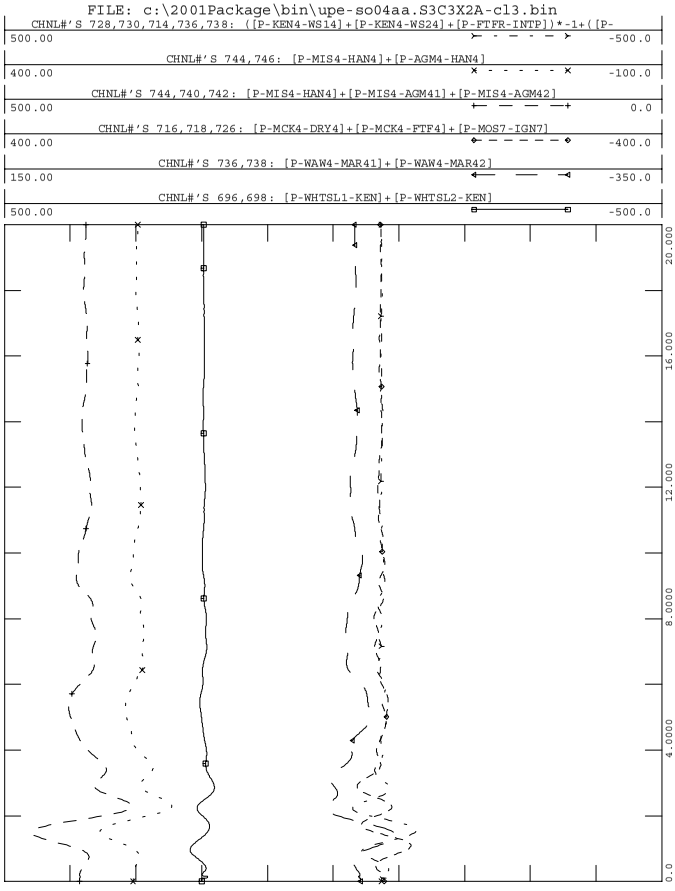
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
CU DC #1



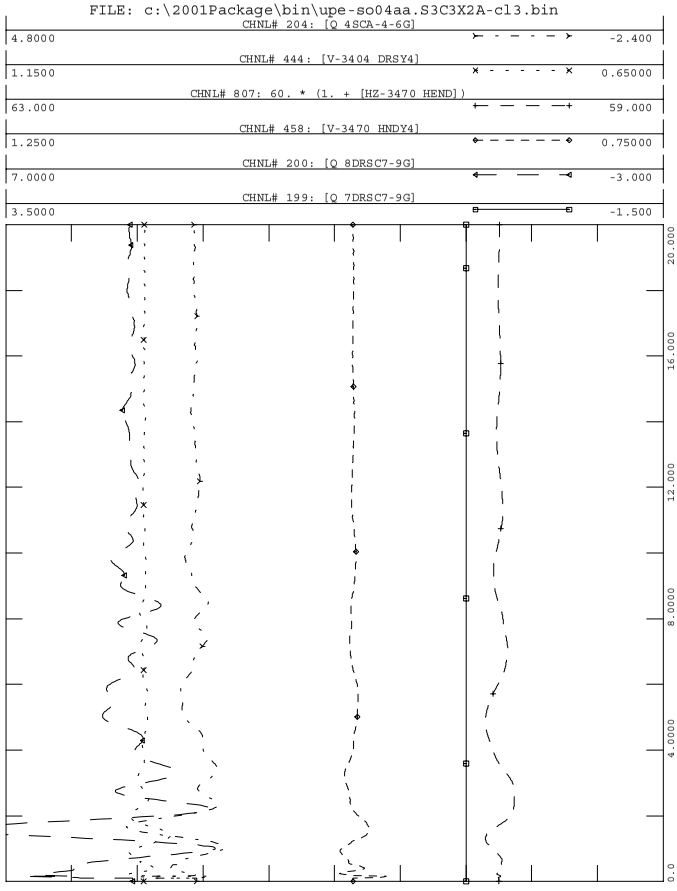
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
OH TIE FLOWS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

MON, MAY 13 2002 19:54
MH DC PARAMETERS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

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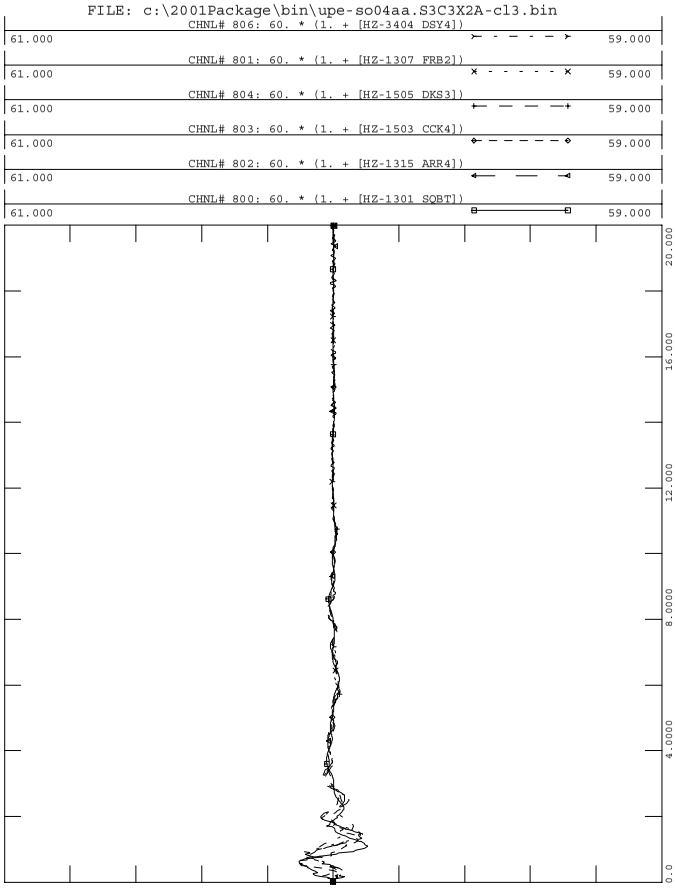
FREQ AT DC TERMINALS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

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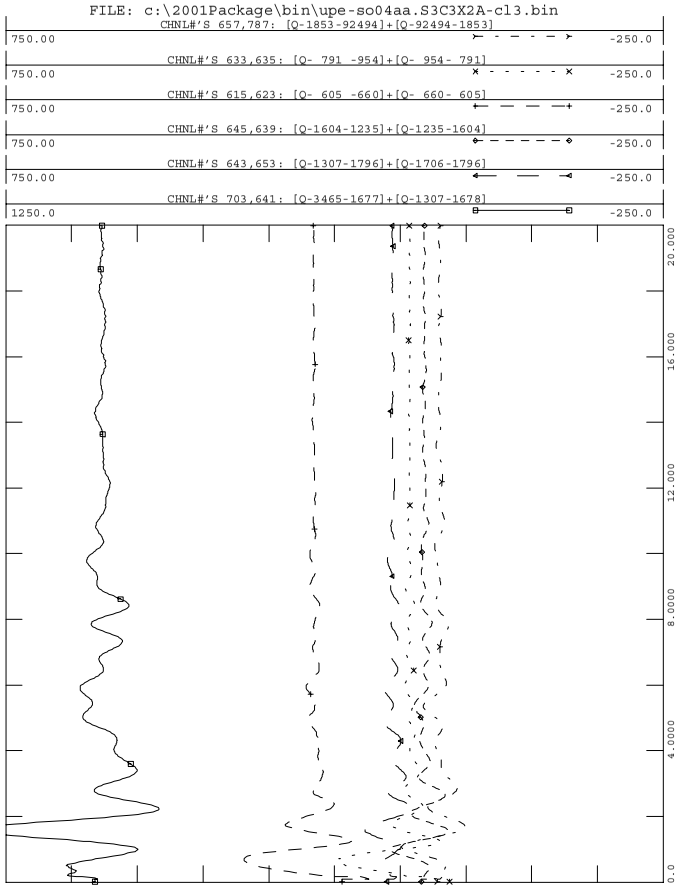
VAR LOSSES



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

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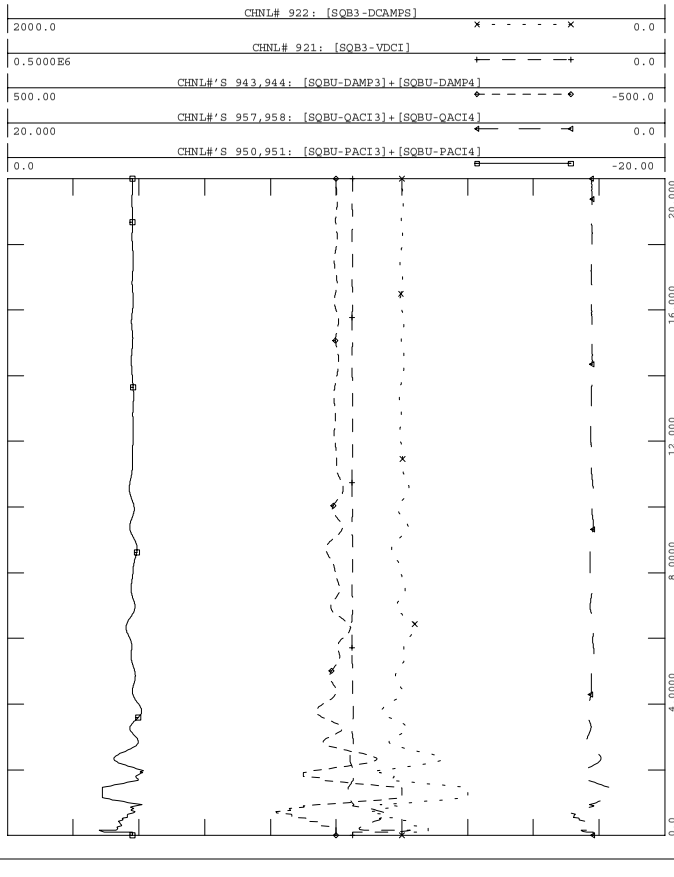
SQB DC #3



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

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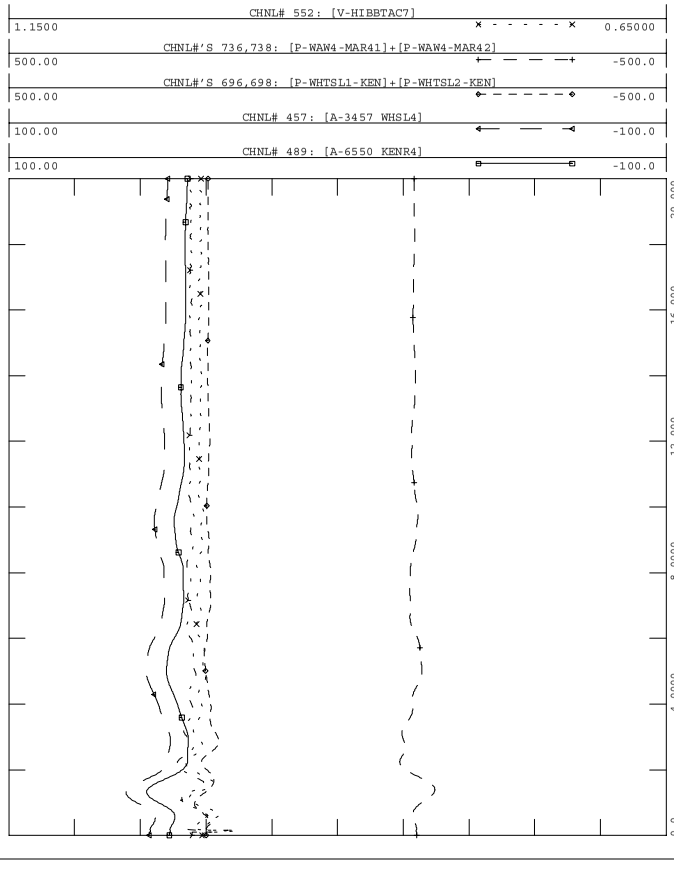
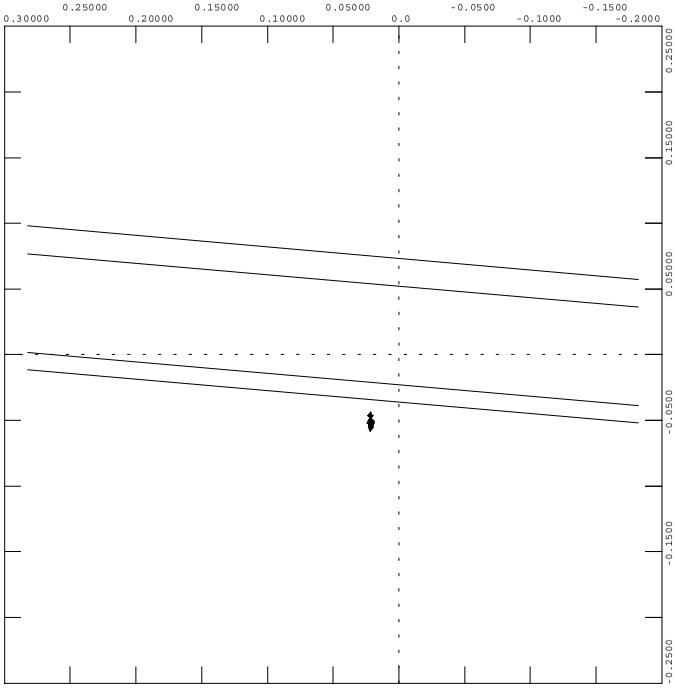
VOLTAGES, ANGLES



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



MON, MAY 13 2002 19:54
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

RELAY: RELAYG
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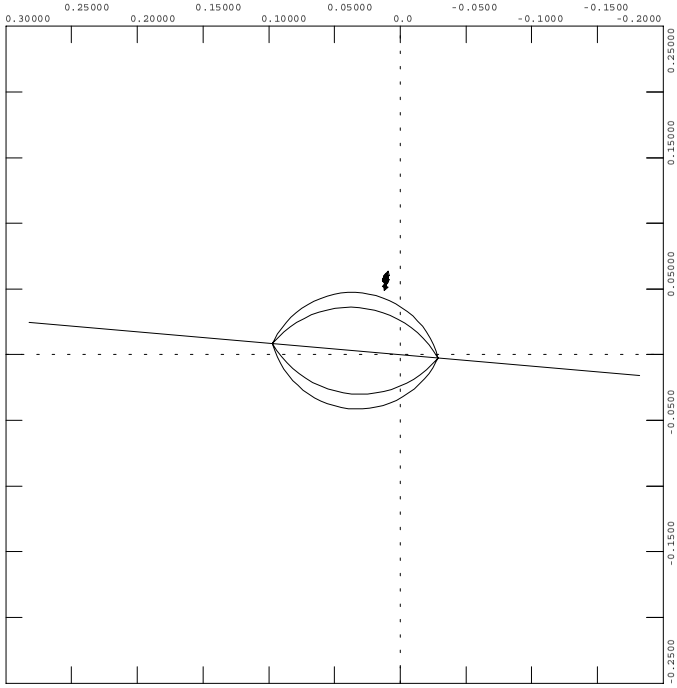
CHNL# 856: [X-DSY2-ROS2]

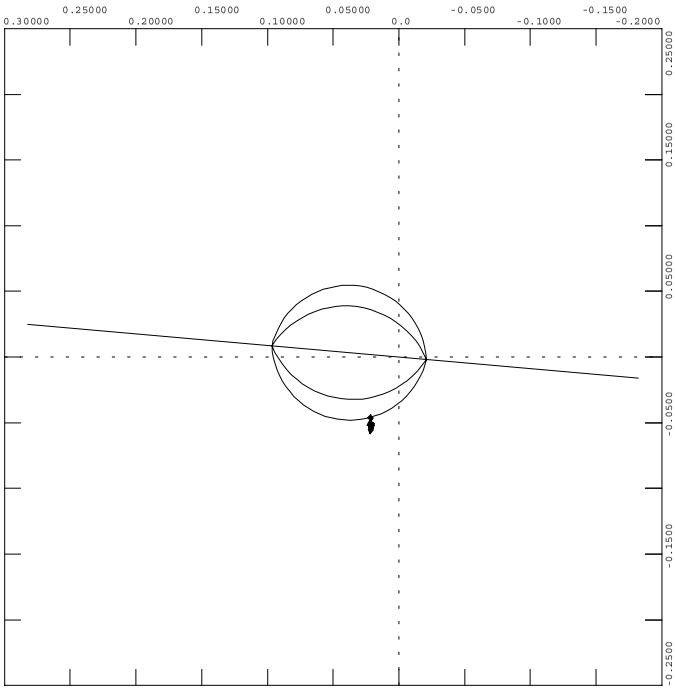


MON, MAY 13 2002 19:54
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

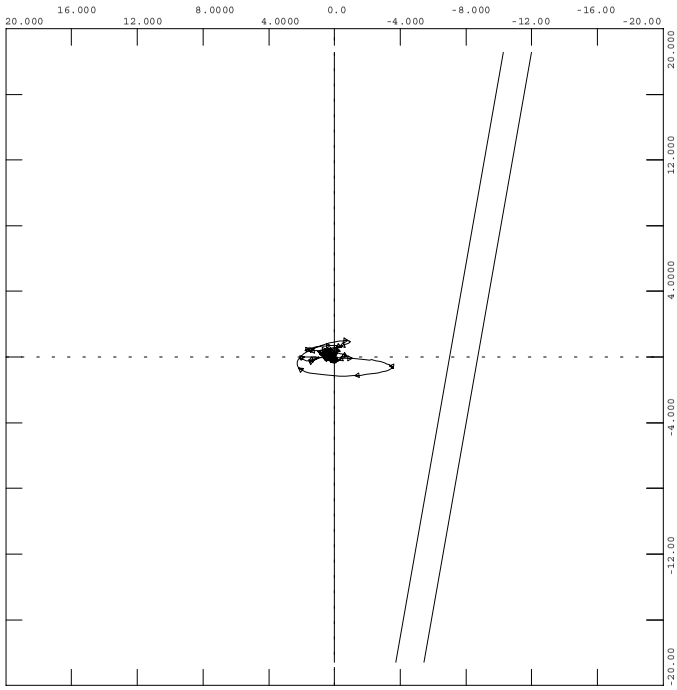


MON, MAY 13 2002 19:54
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

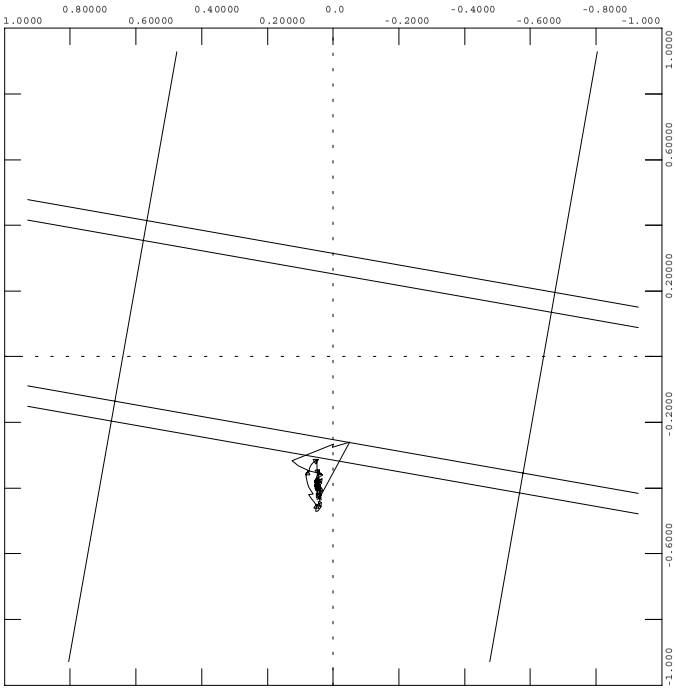


MON, MAY 13 2002 19:54
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

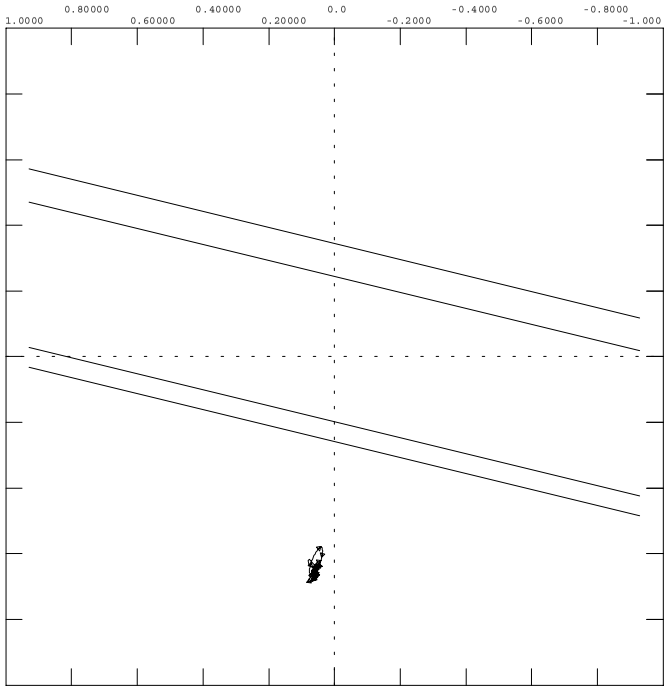
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

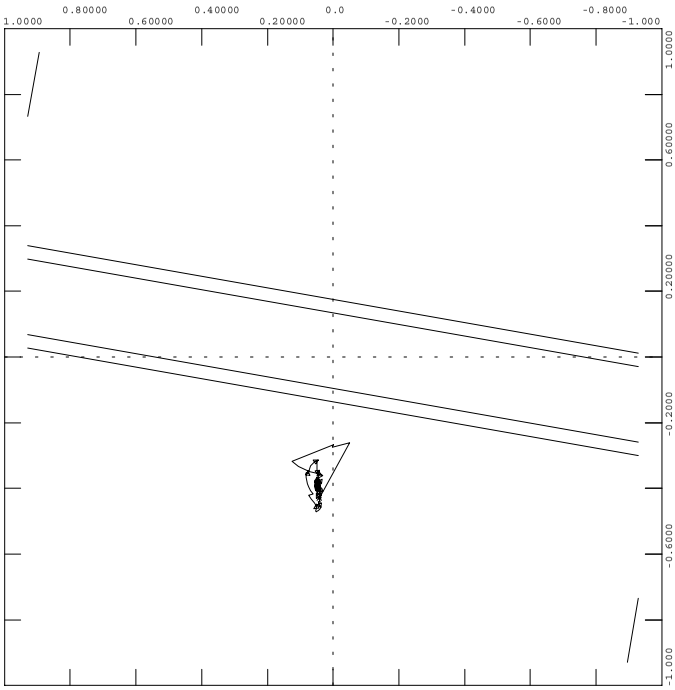
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

RELAY: SLINOS
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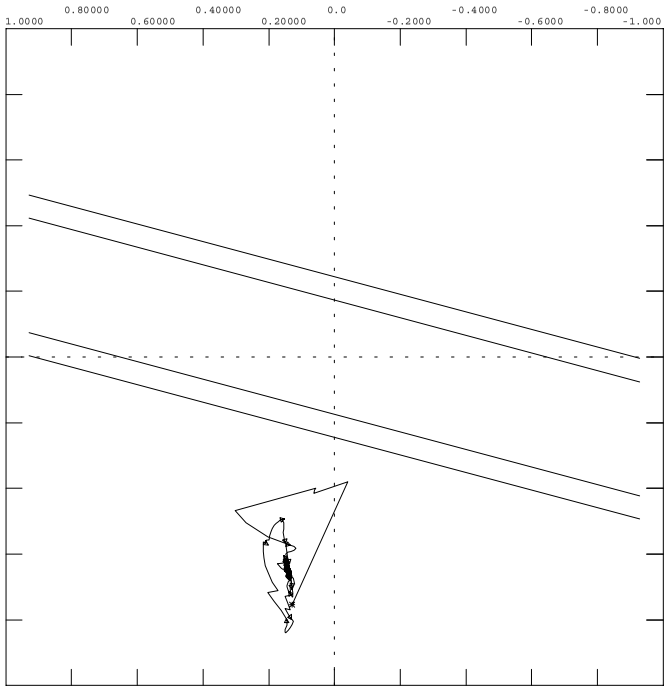

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

RELAY: SLLP
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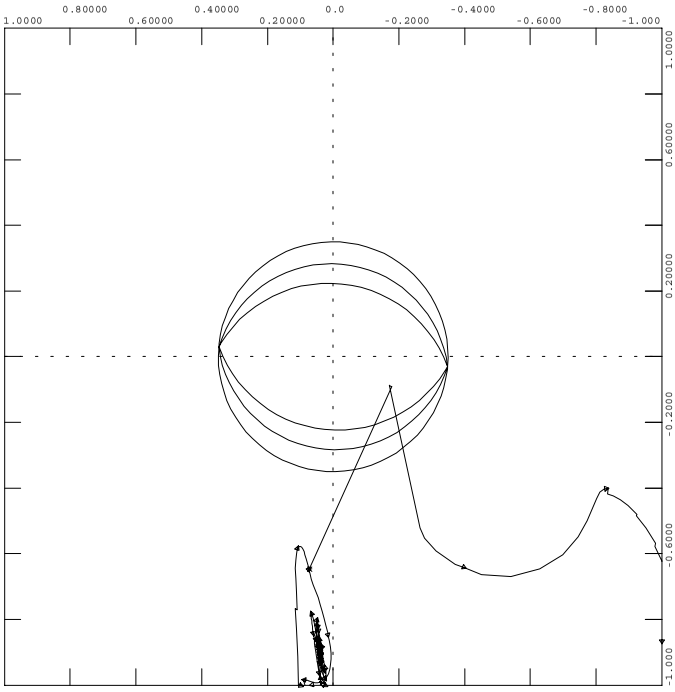
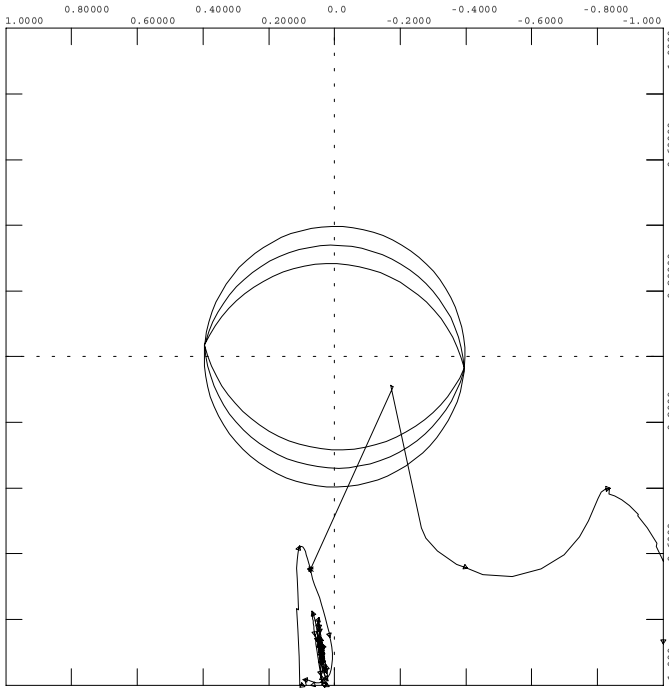
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

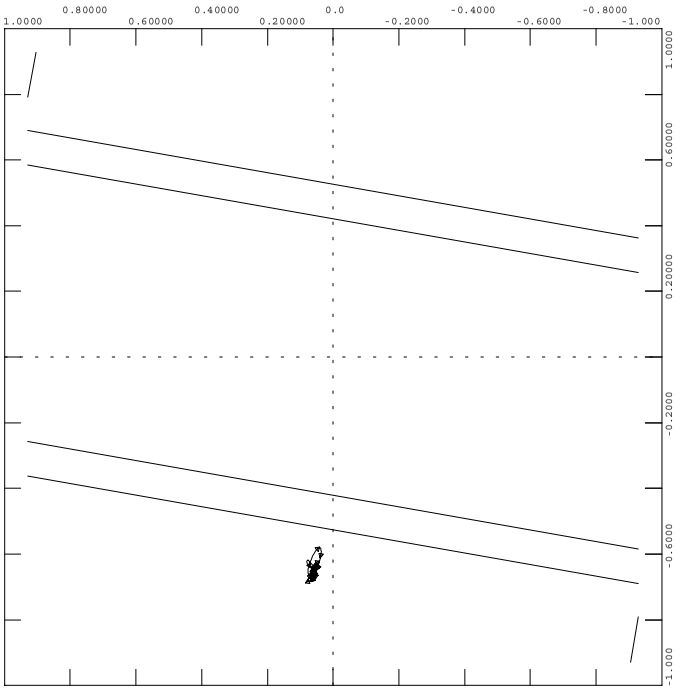
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

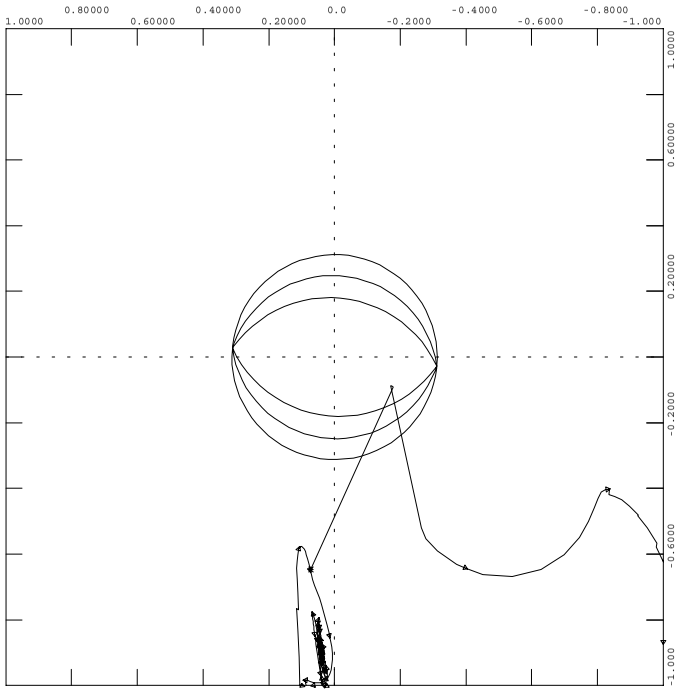
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



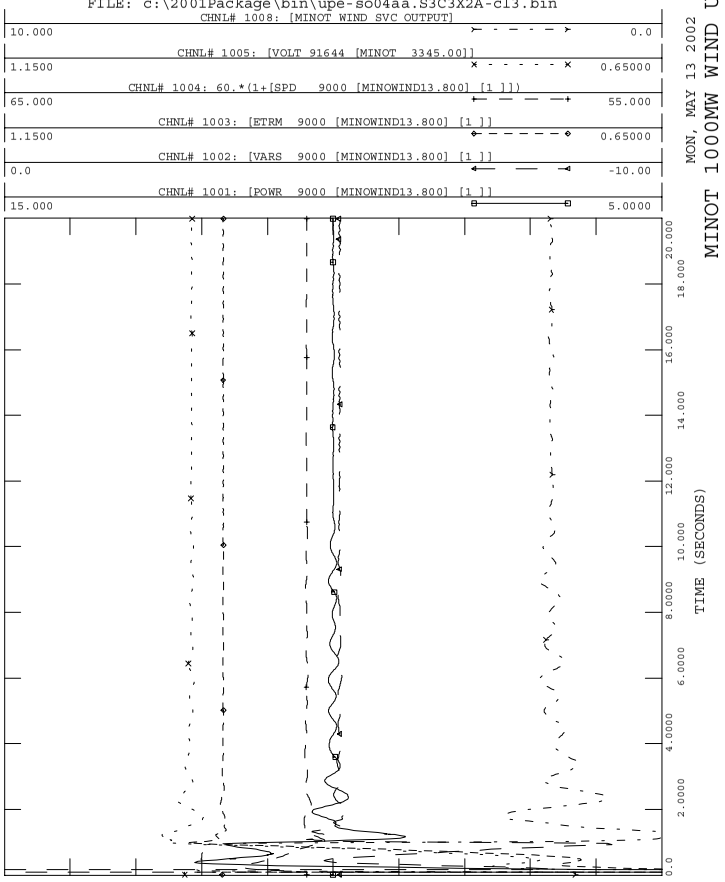
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

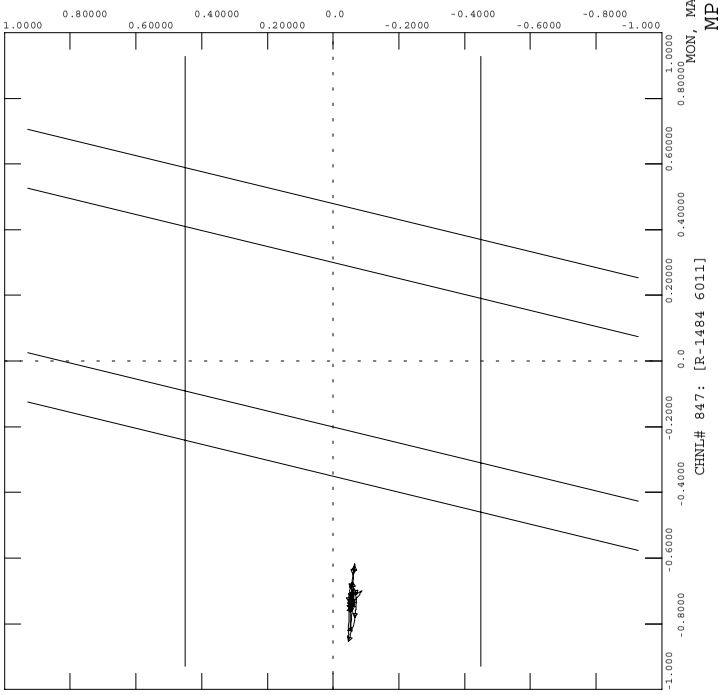


MON, MAY 13 2002 19:54
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE

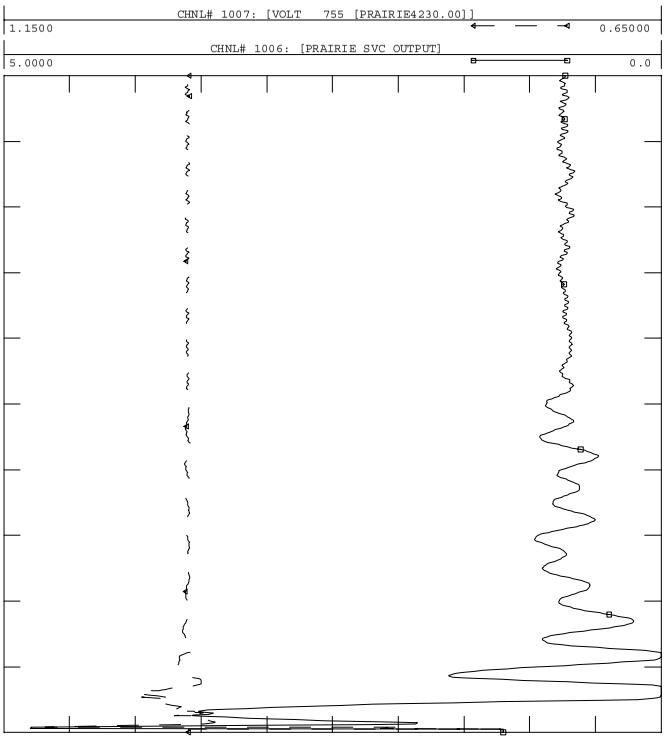
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, MAY 13 2002 19:54
MP-OH I.FALLS (779)

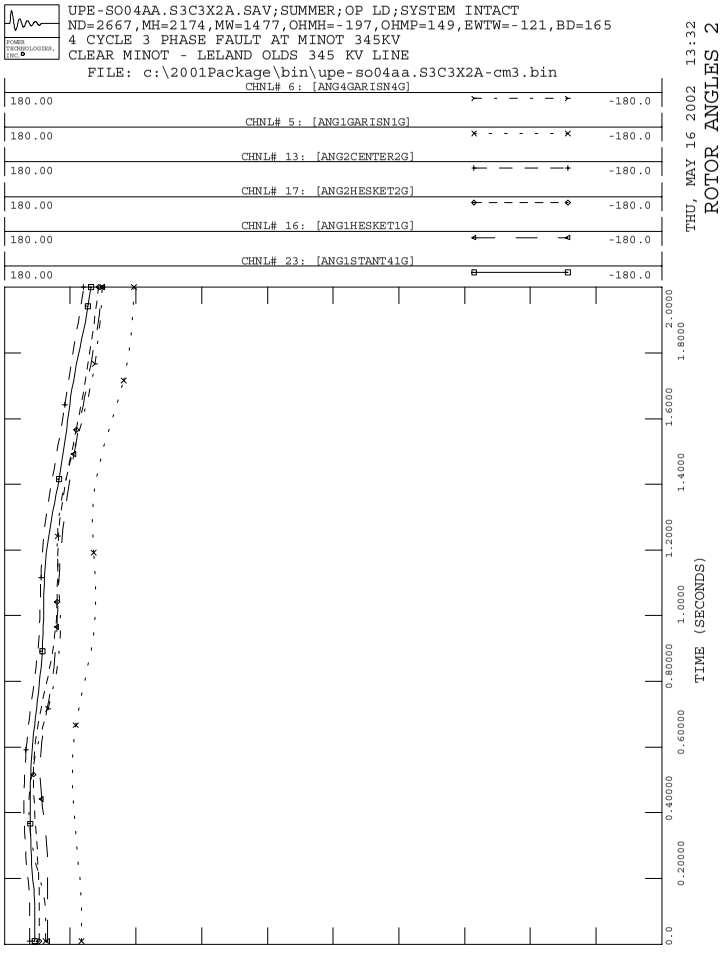
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - HARVEY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cl3.bin

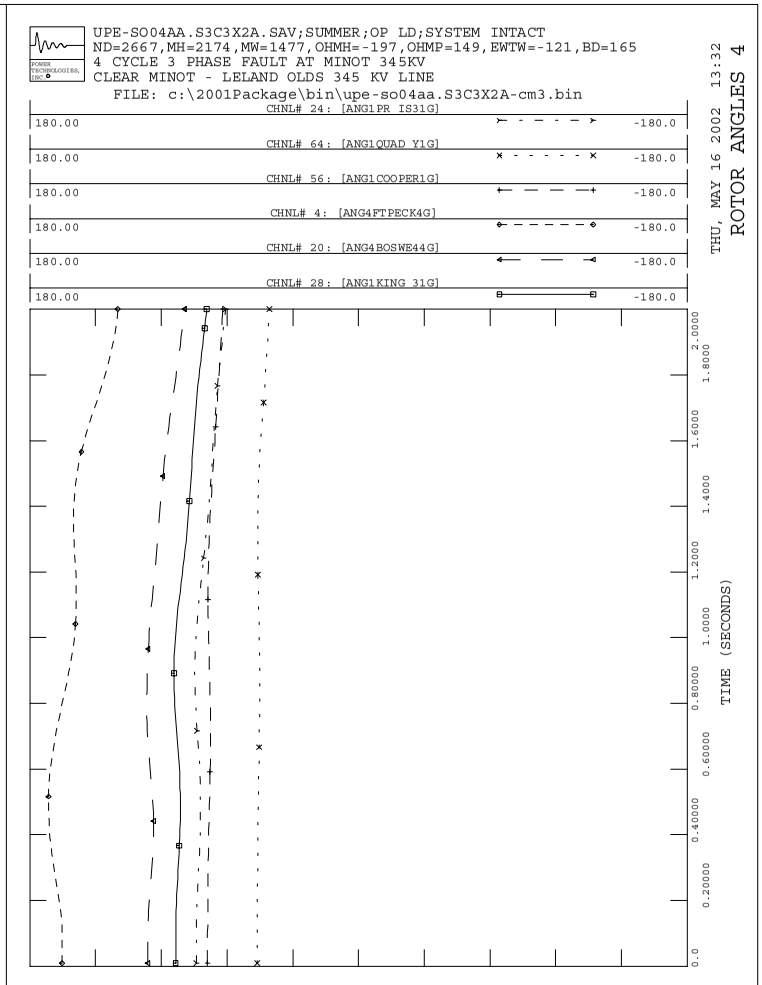


MON, MAY 13 2002 19:54
PRAIRIE SVC RESPONSE

CONTINGENCY CM3

4 cycle 3 phase fault at Minot 345kV. Clear Minot – Leland Olds 345 kV line


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
0.0
0.20000
0.40000
0.60000
0.80000
1.0000
1.2000
1.4000
1.6000
1.8000
2.0000
TIME (SECONDS)
THU, MAY 16 2002 13:32
ROTOR ANGLES 2


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
0.0
0.20000
0.40000
0.60000
0.80000
1.0000
1.2000
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1.6000
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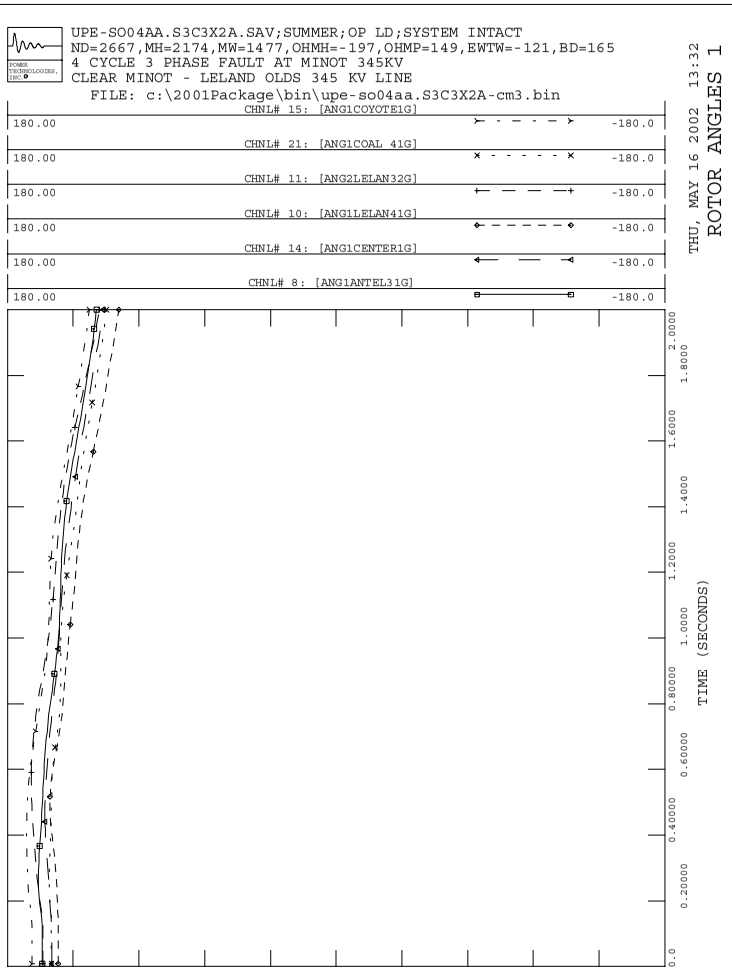
TIME (SECONDS)
THU, MAY 16 2002 13:32
ROTOR ANGLES 4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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
0.0
0.20000
0.40000
0.60000
0.80000
1.0000
1.2000
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1.6000
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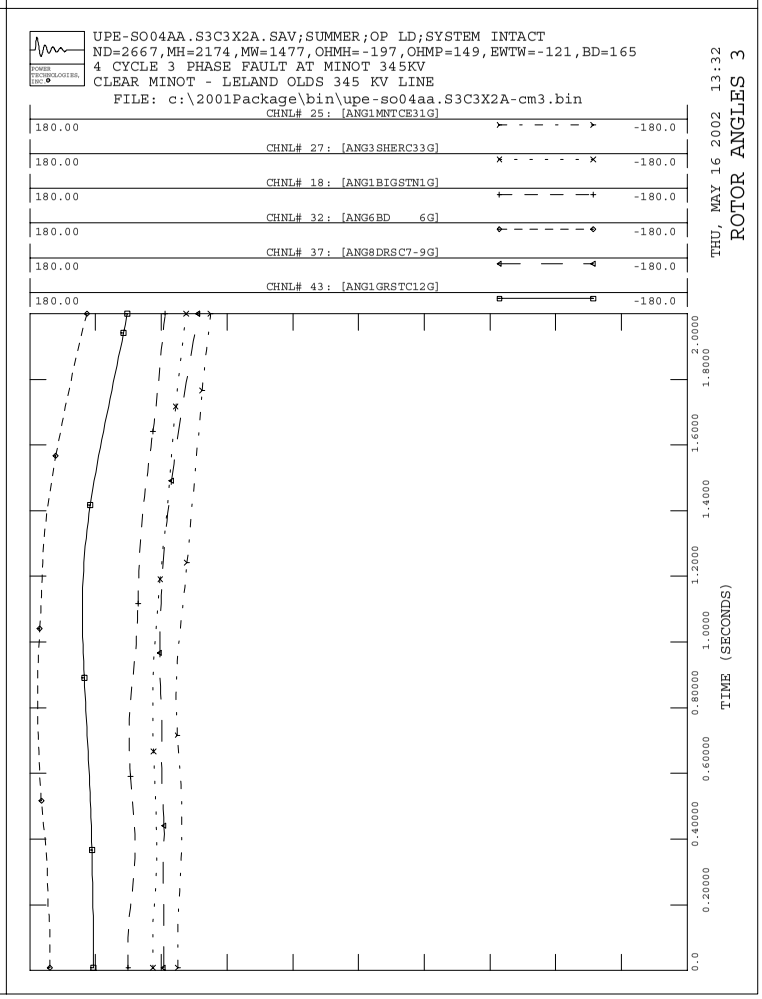
TIME (SECONDS)
THU, MAY 16 2002 13:32
ROTOR ANGLES 1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ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
0.0
0.20000
0.40000
0.60000
0.80000
1.0000
1.2000
1.4000
1.6000
1.8000
2.0000
TIME (SECONDS)
THU, MAY 16 2002 13:32
ROTOR ANGLES 3

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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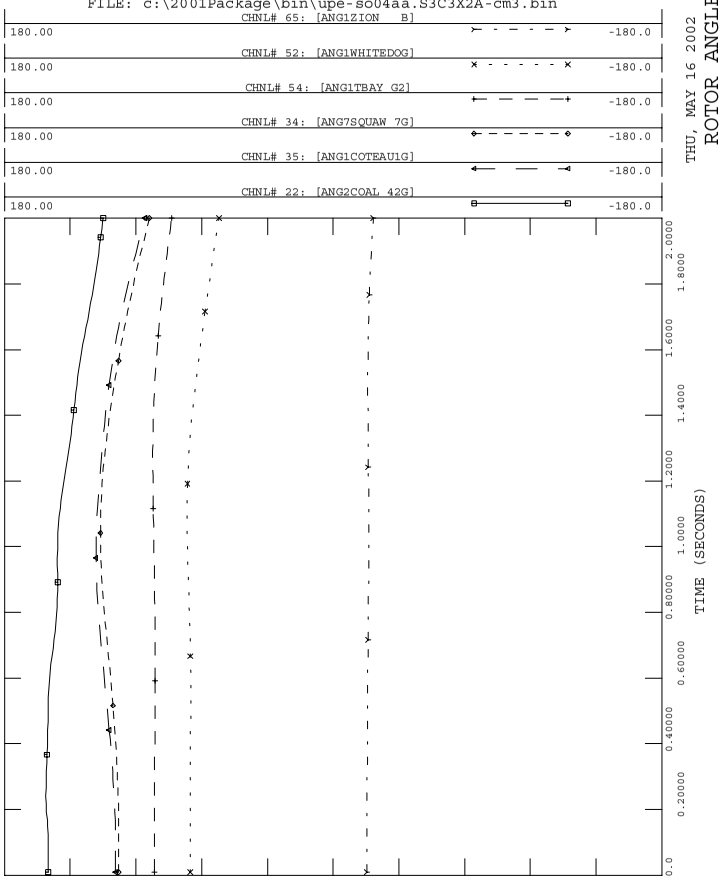
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
ROTOR ANGLES 6



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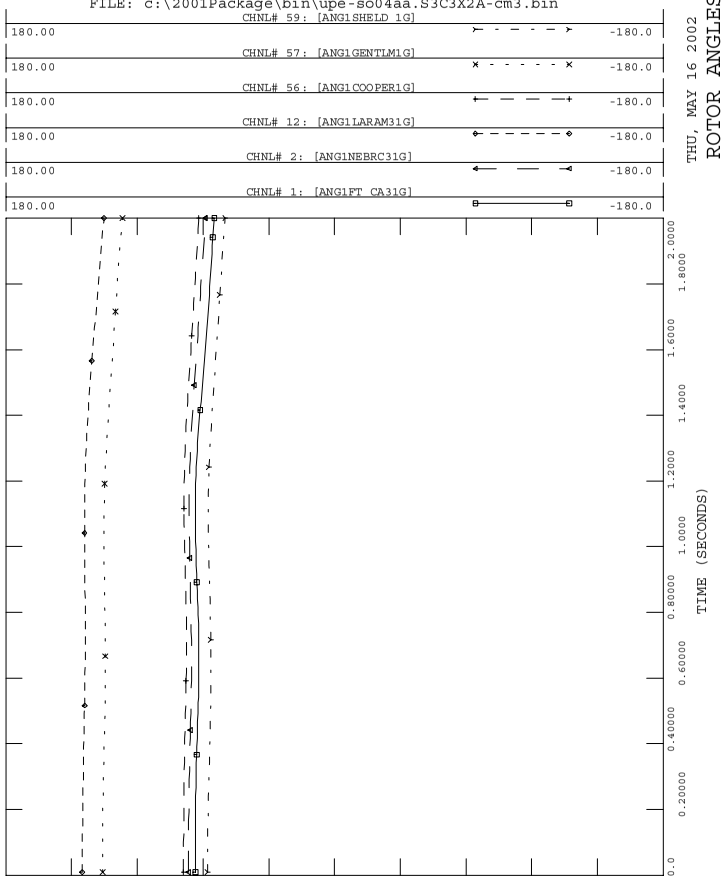
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
ROTOR ANGLES NB



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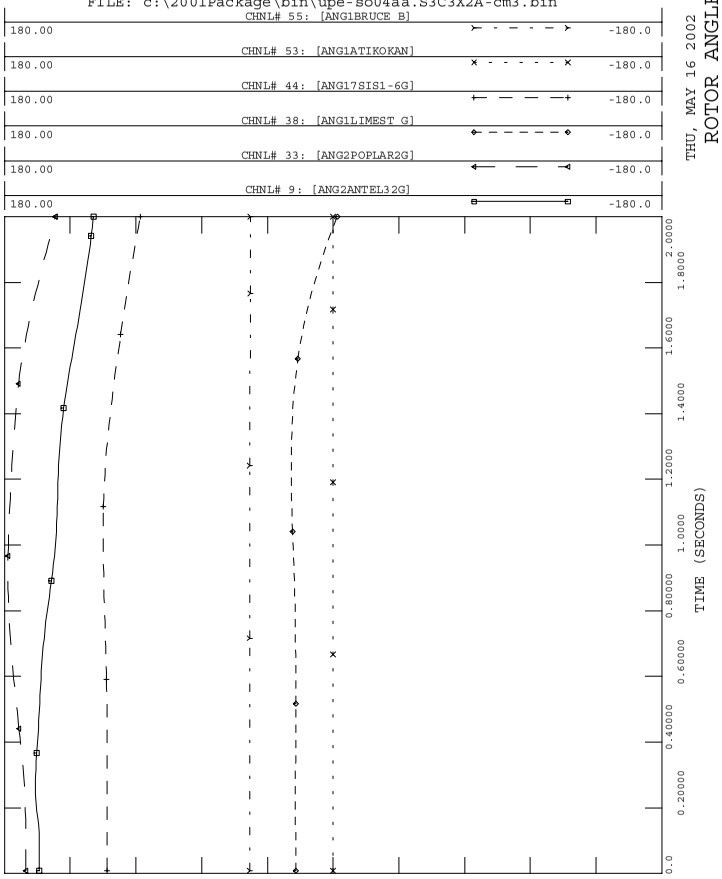
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
ROTOR ANGLES 5



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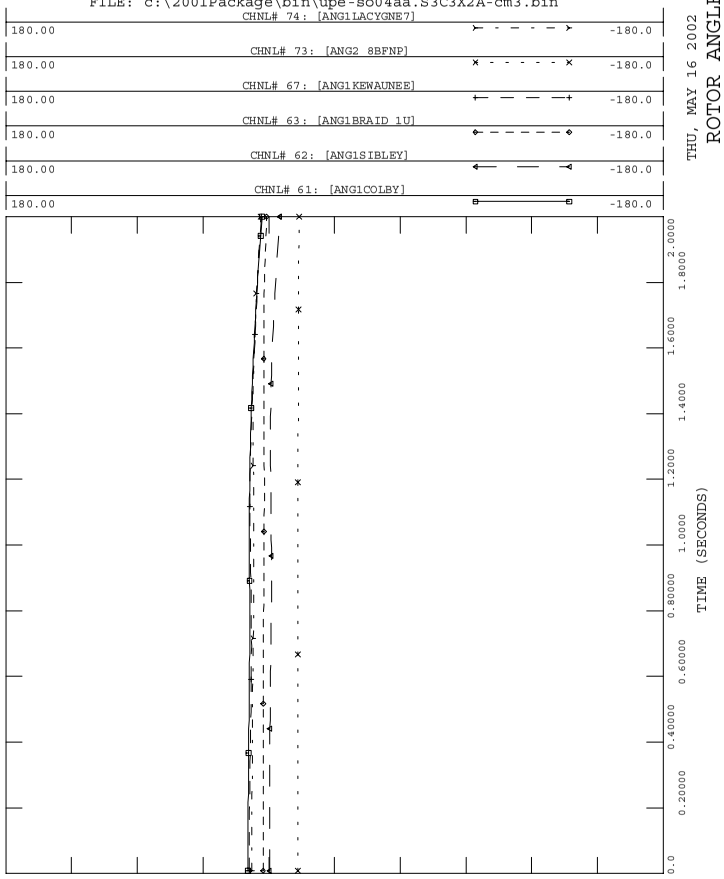
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
ROTOR ANGLES 7



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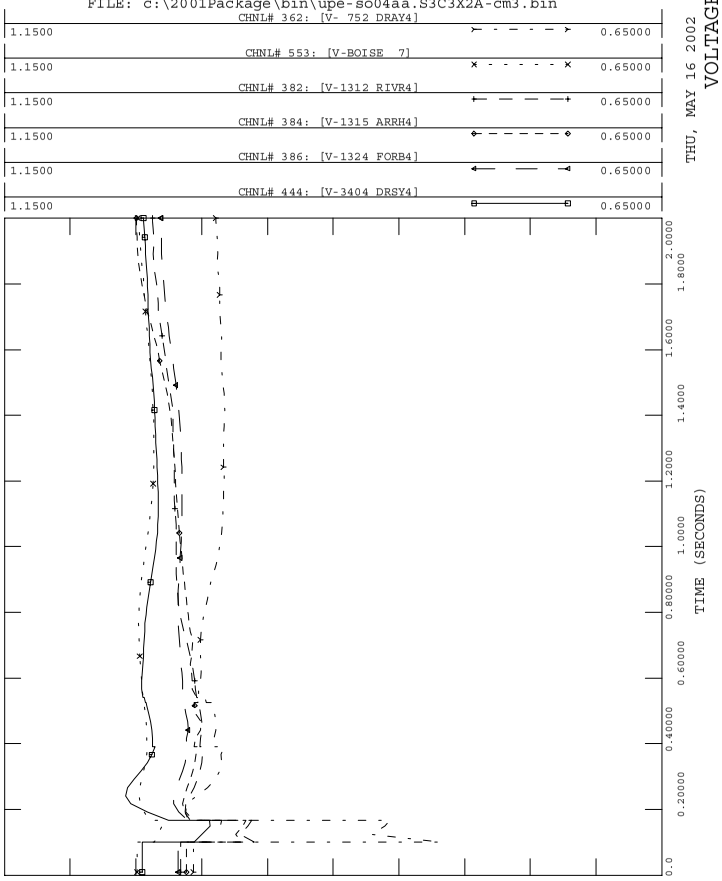
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
VOLTAGES 1



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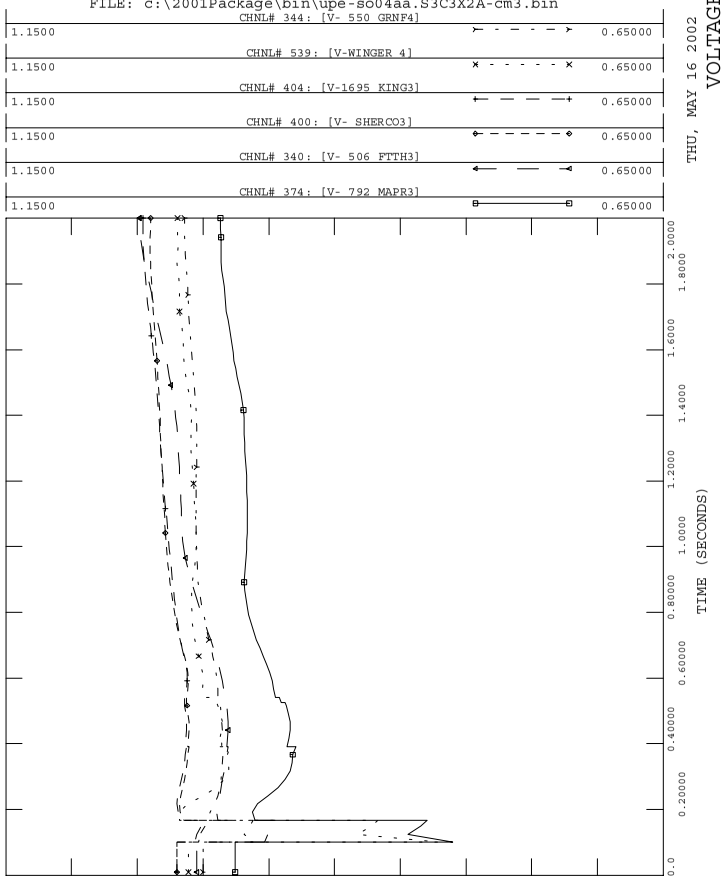
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
VOLTAGES 3



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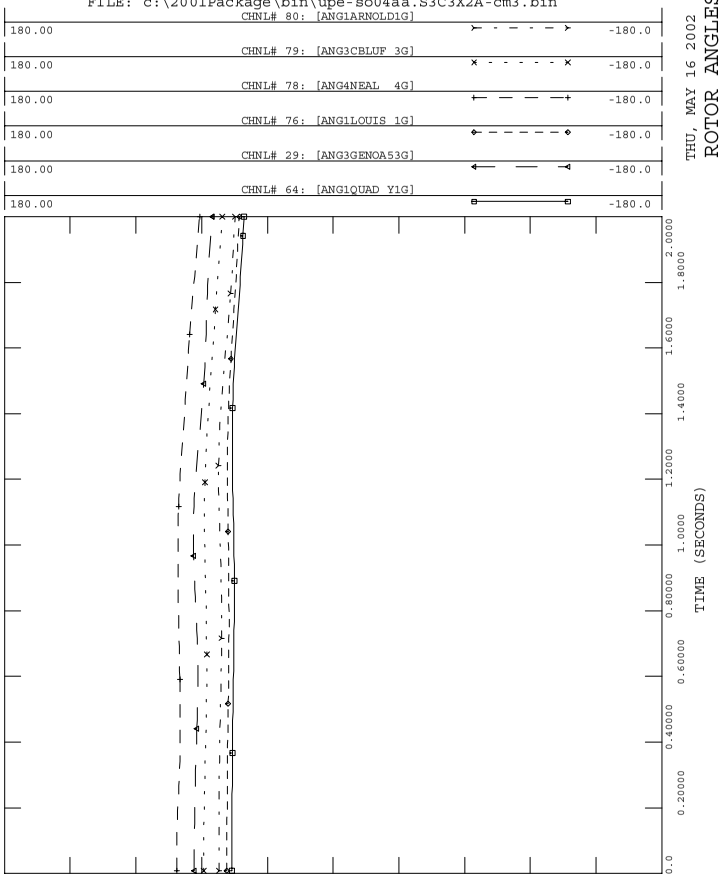
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
ROTOR ANGLES IA



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
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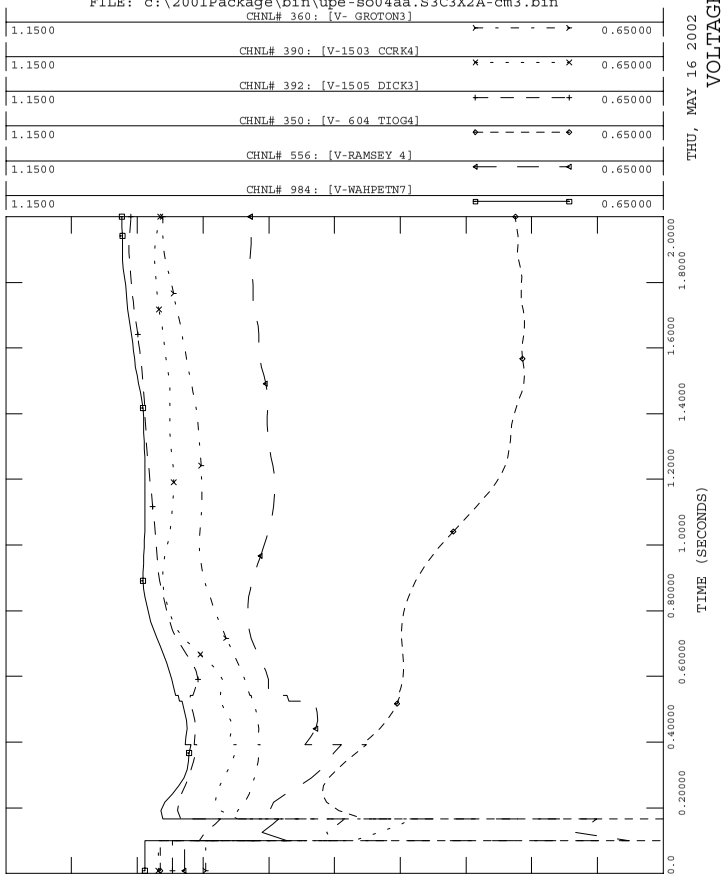
THU, MAY 16 2002 13:32
VOLTAGES 2



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
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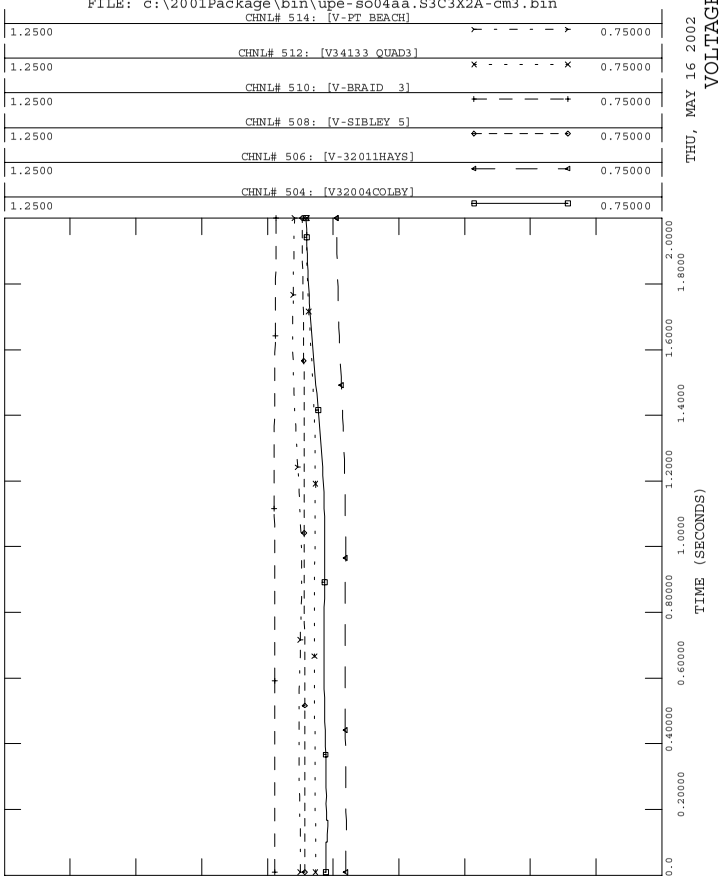
THU, MAY 16 2002 13:32
VOLTAGES 5



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
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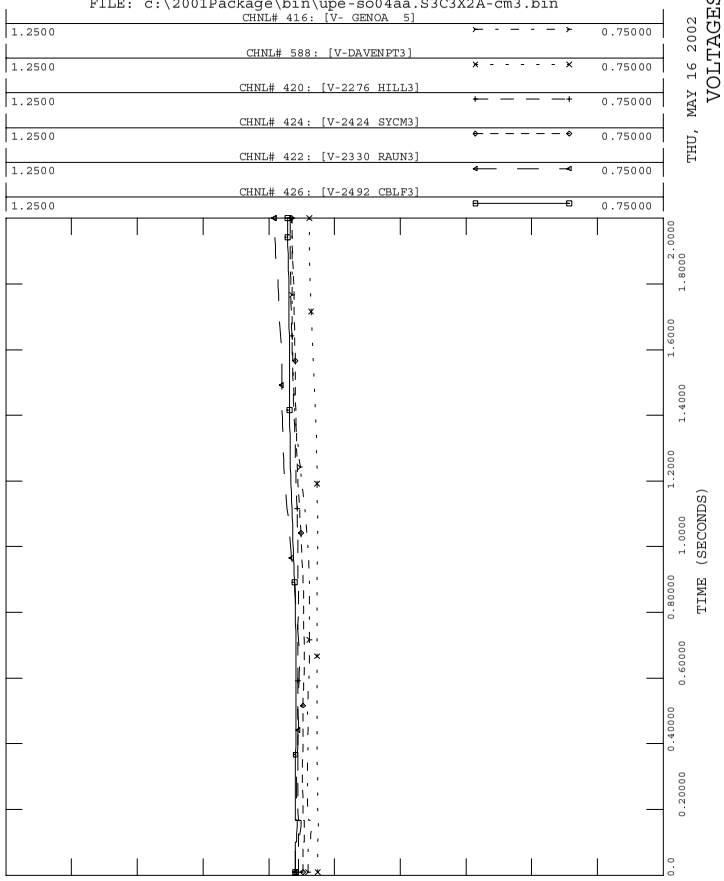
VOLTAGES IA



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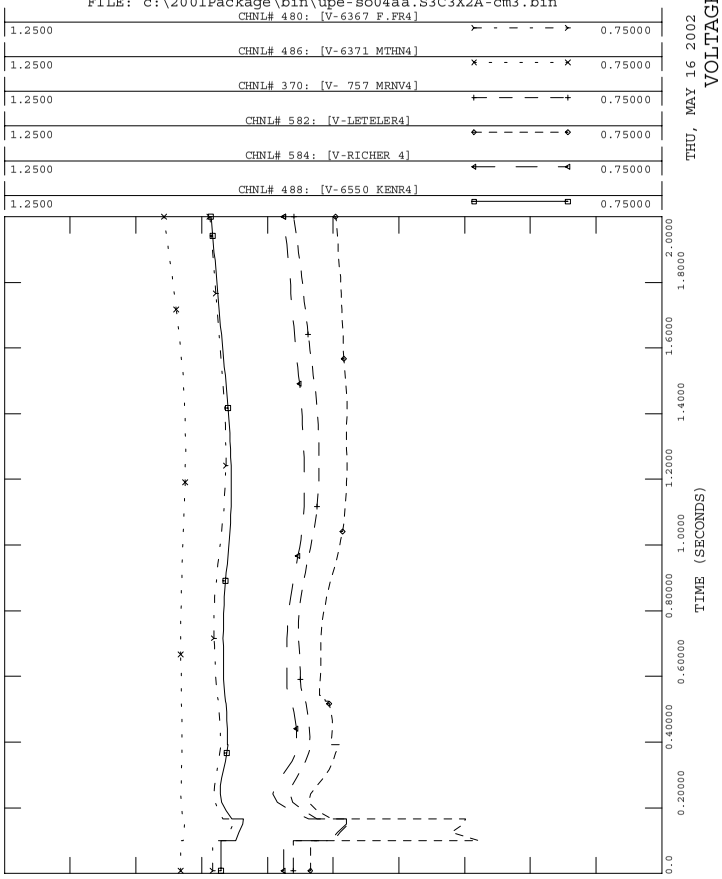
VOLTAGES 4



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CLEAR MINOT - LELAND OLDS 345 KV LINE
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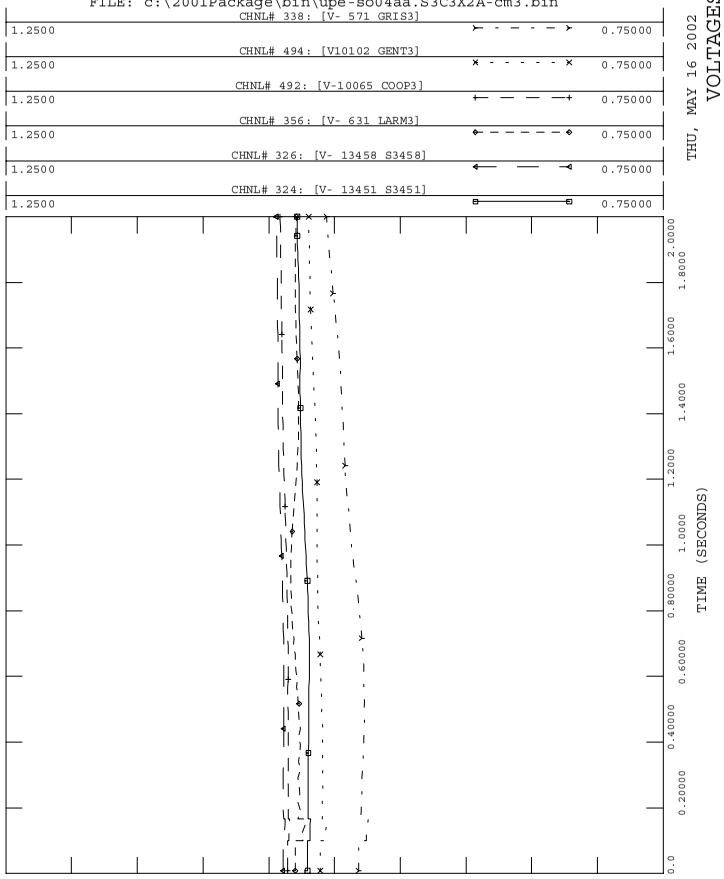
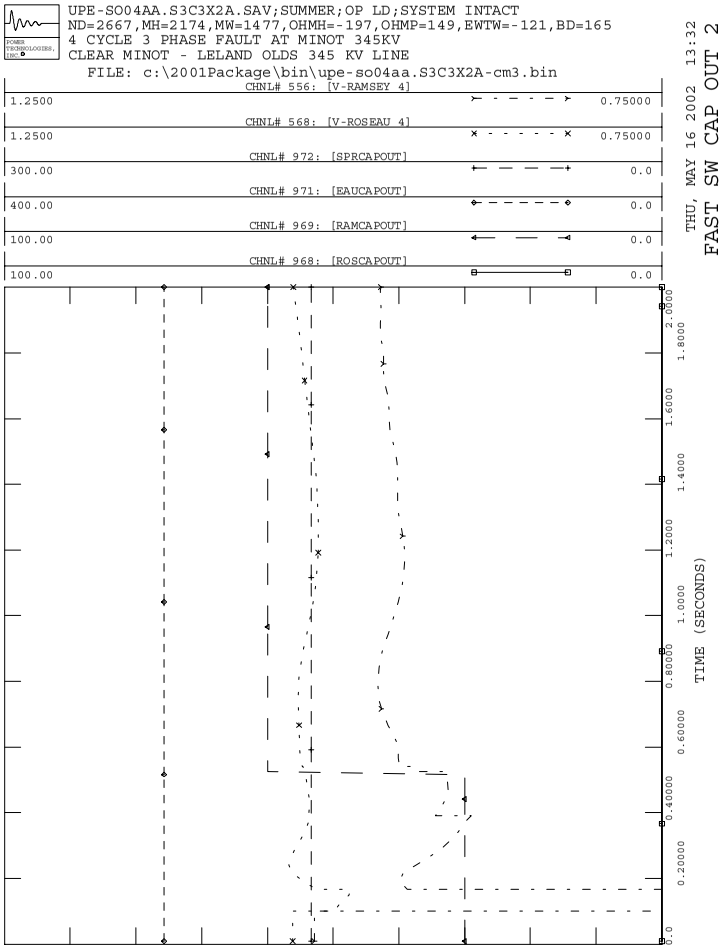
THU, MAY 16 2002 13:32
VOLTAGES NB

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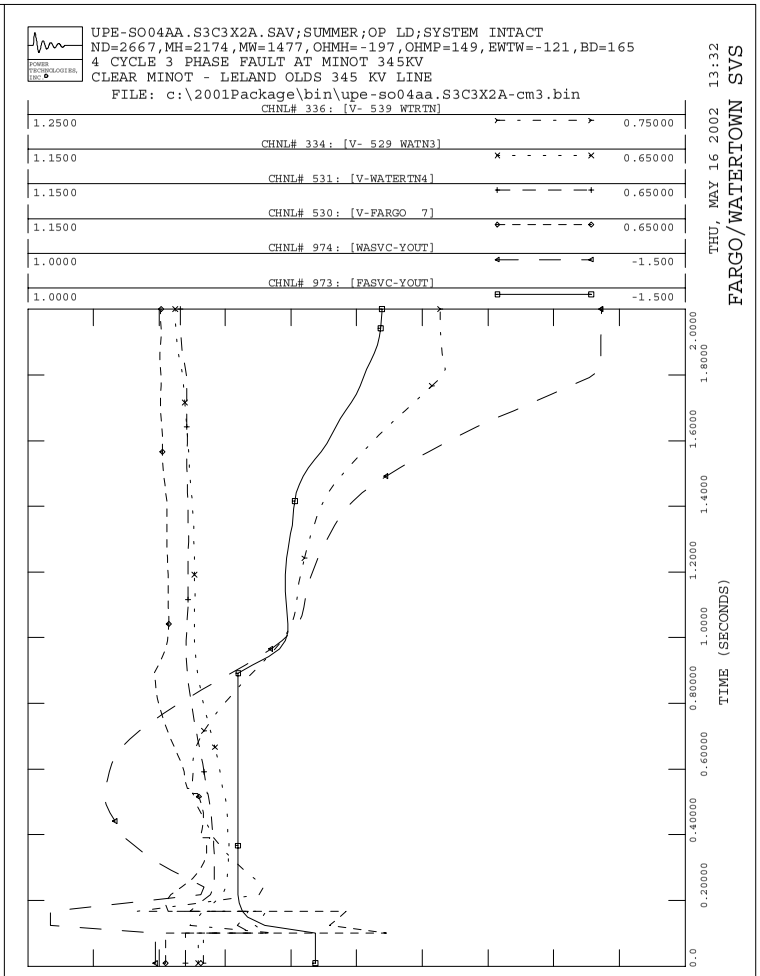
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
THU, MAY 16 2002 13:32
FAST SW CAP OUT 2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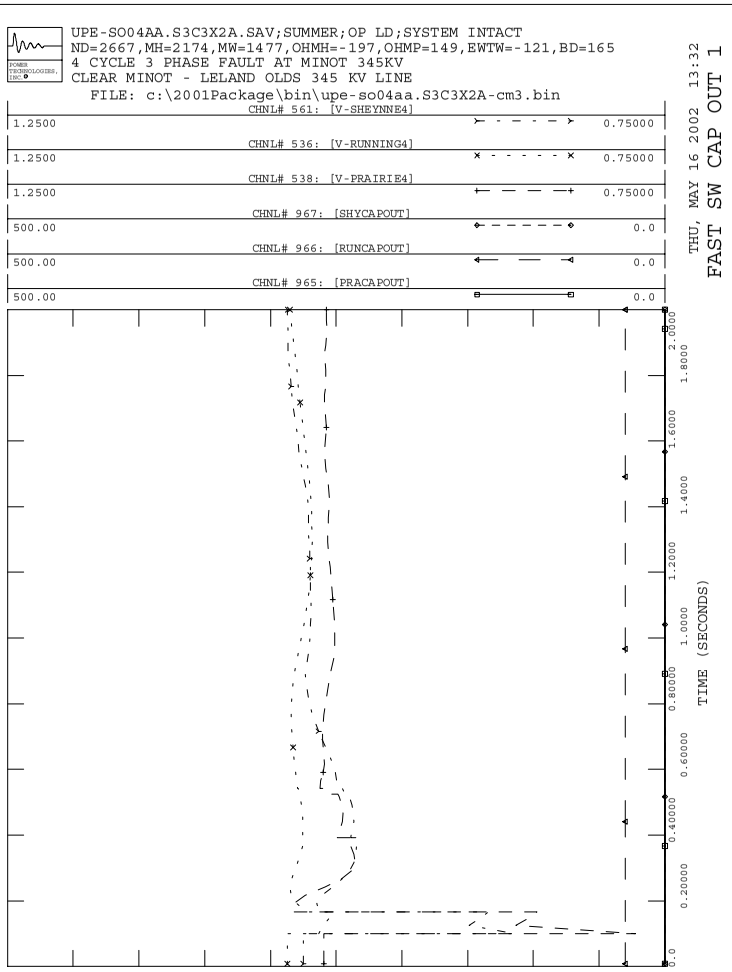
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
THU, MAY 16 2002 13:32
FARGO/WATERTOWN SVS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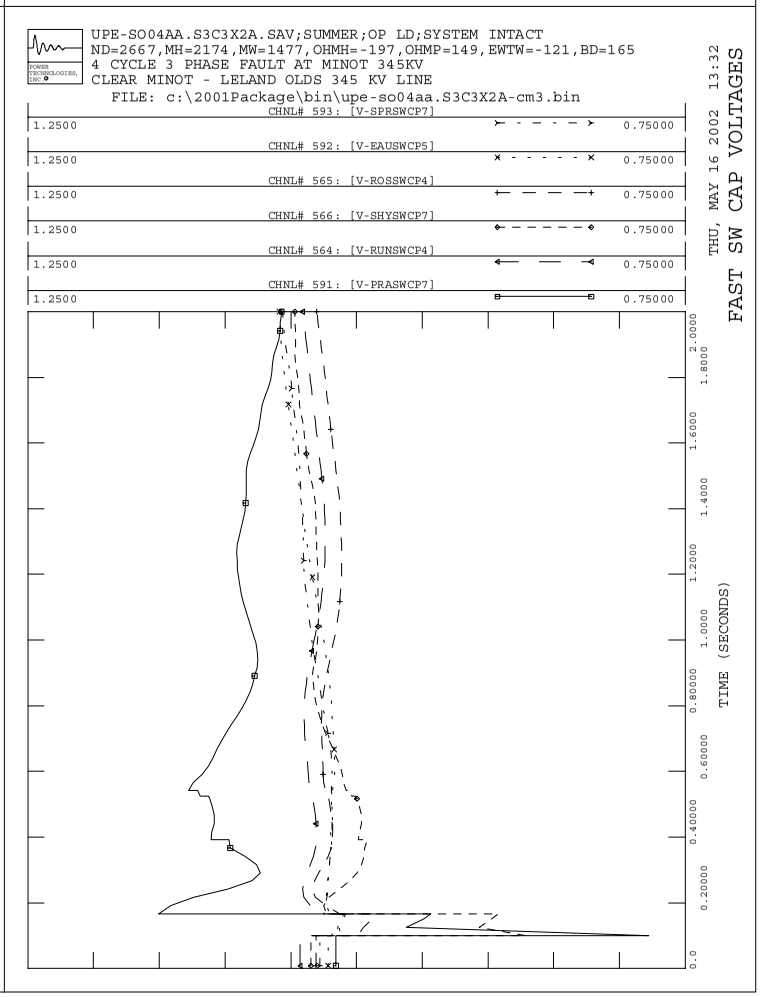
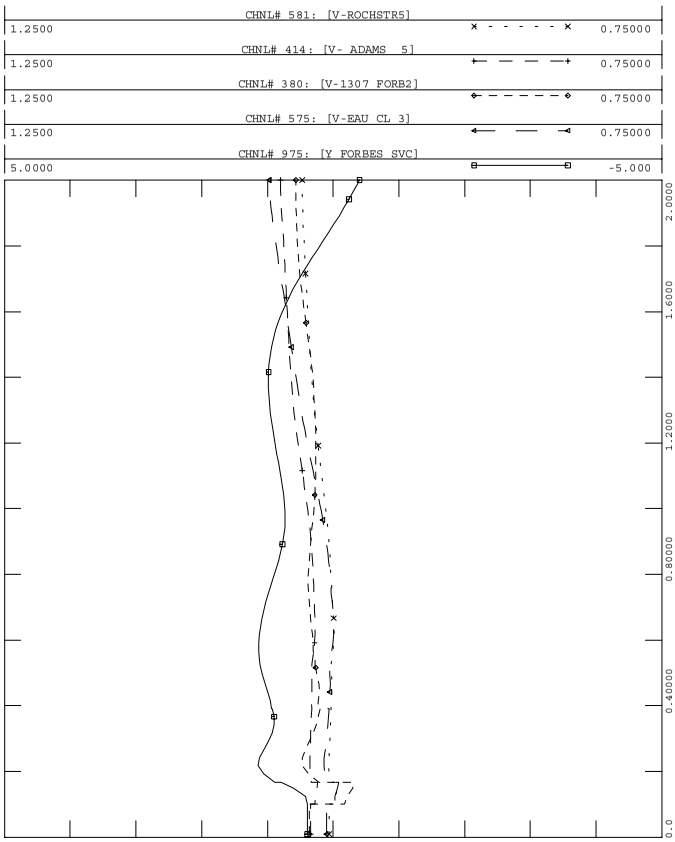
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
THU, MAY 16 2002 13:32
FAST SW CAP OUT 1


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
THU, MAY 16 2002 13:32
FAST SW CAP VOLTAGES

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32

SVC & WISCONSIN VOLT



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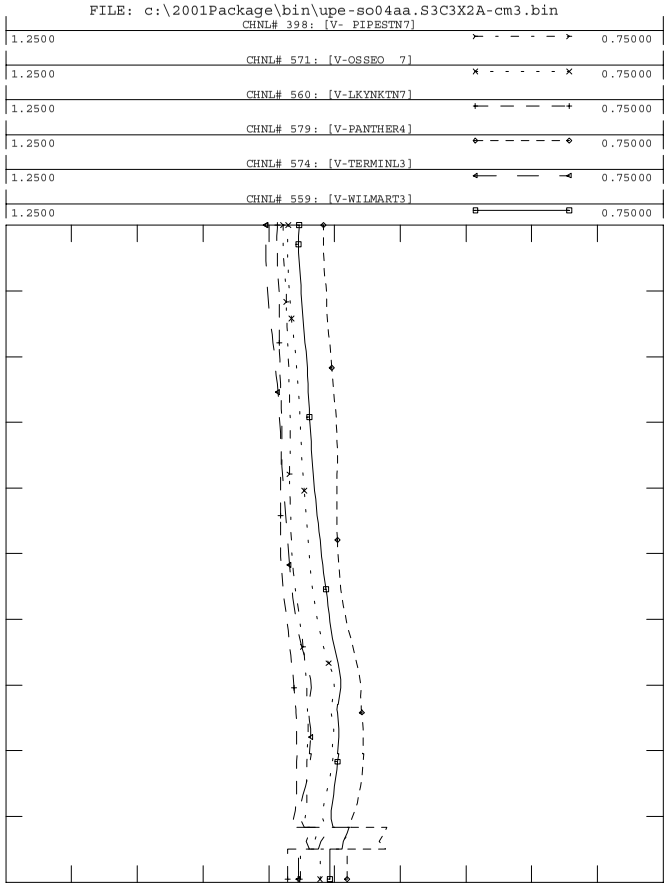
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32

TC VOLTAGES



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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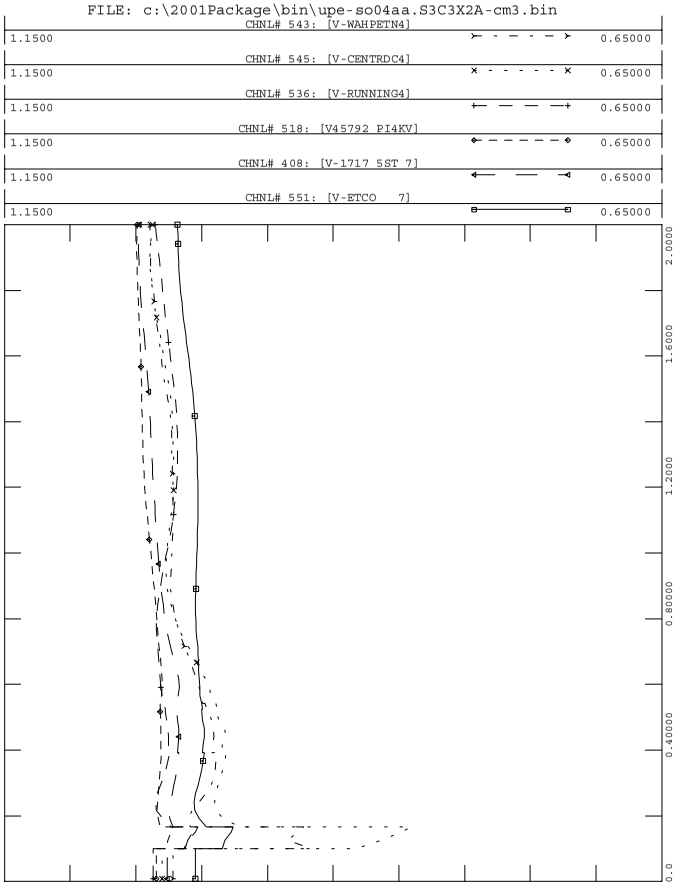
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32

VOLTAGES 6



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
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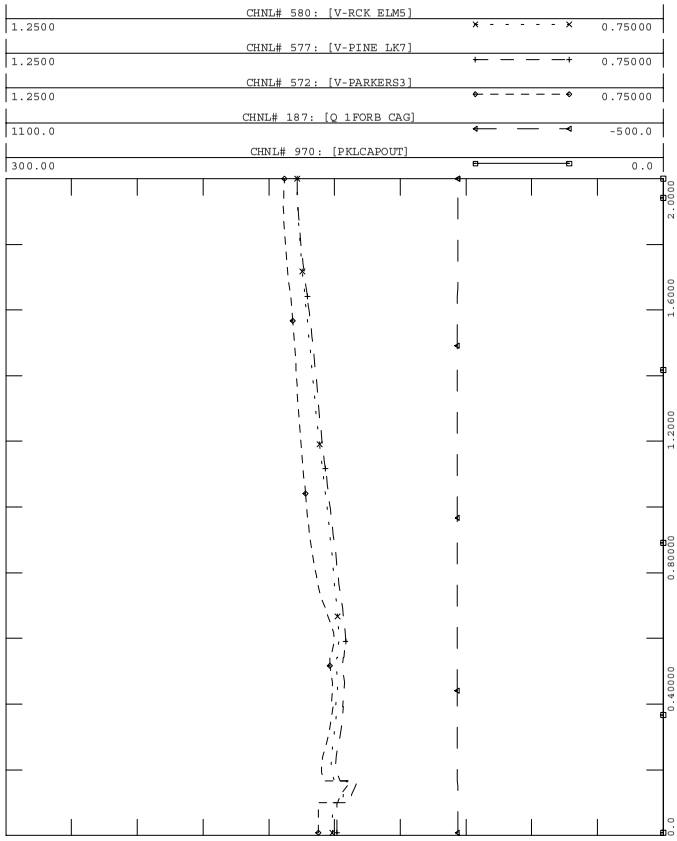
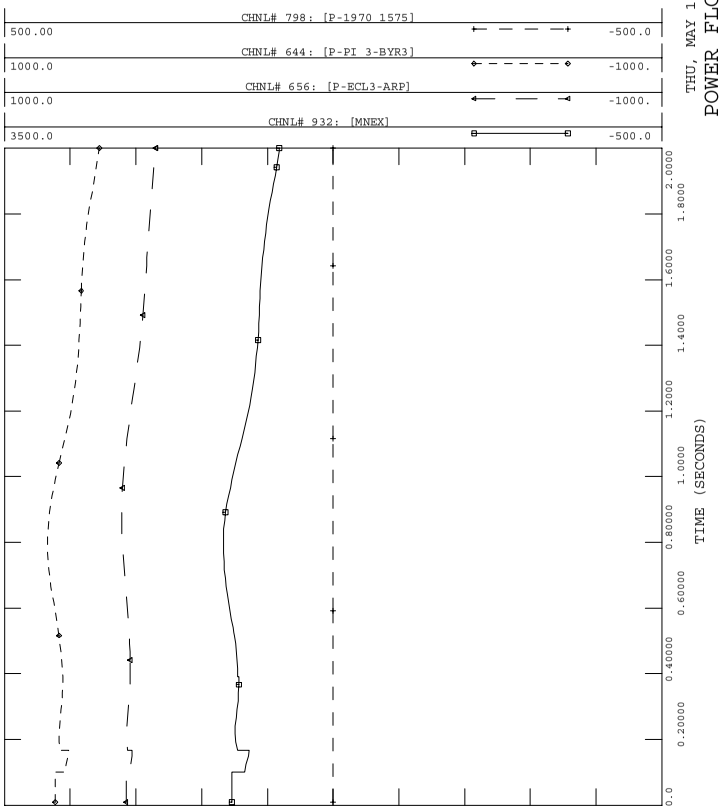
THU, MAY 16 2002 13:32

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
POWER FLOW SUMS 2



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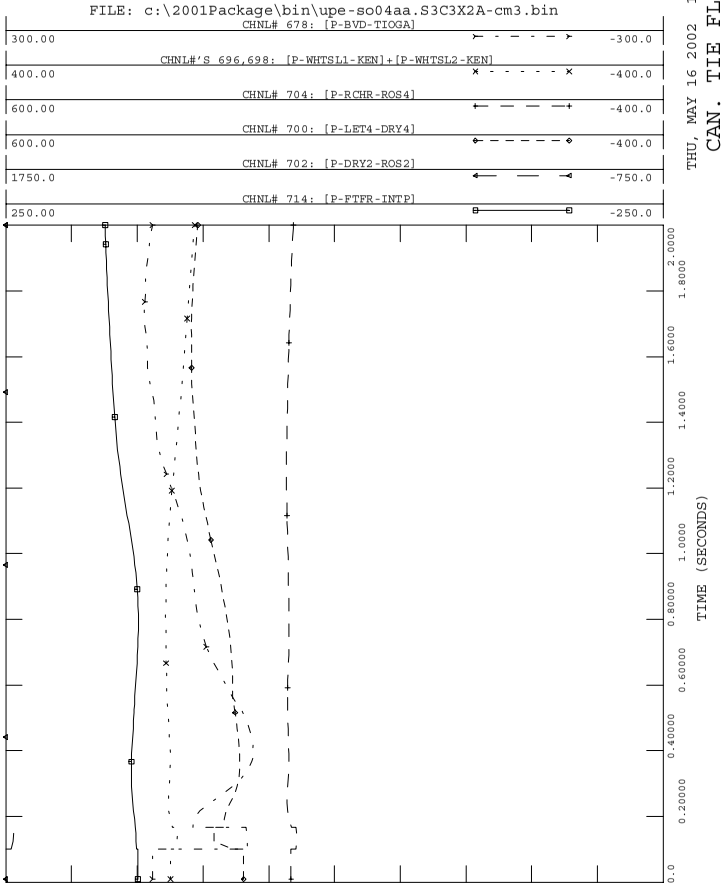
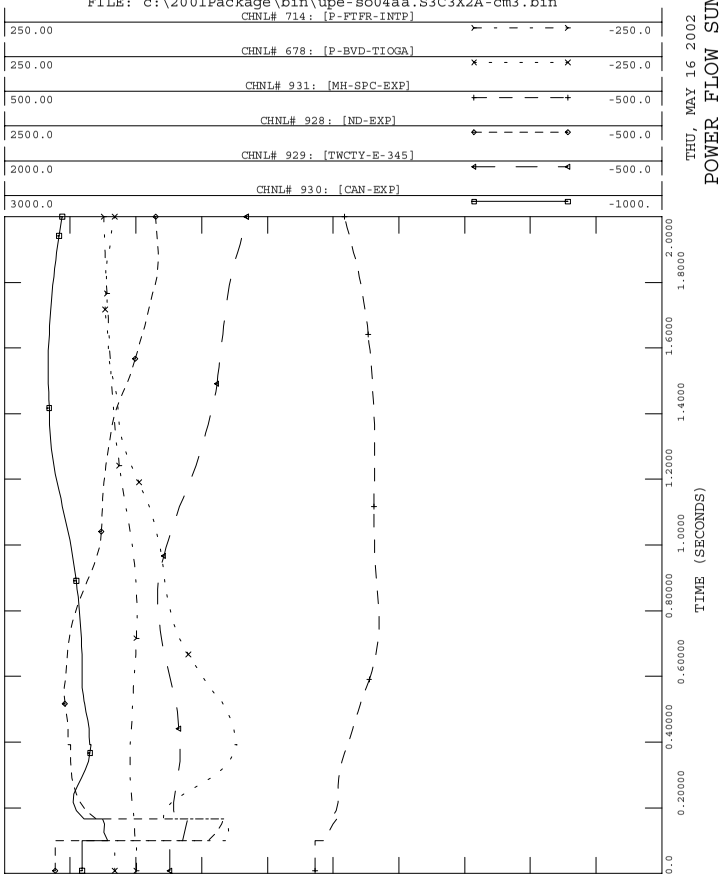
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
CAN. TIE FLOWS



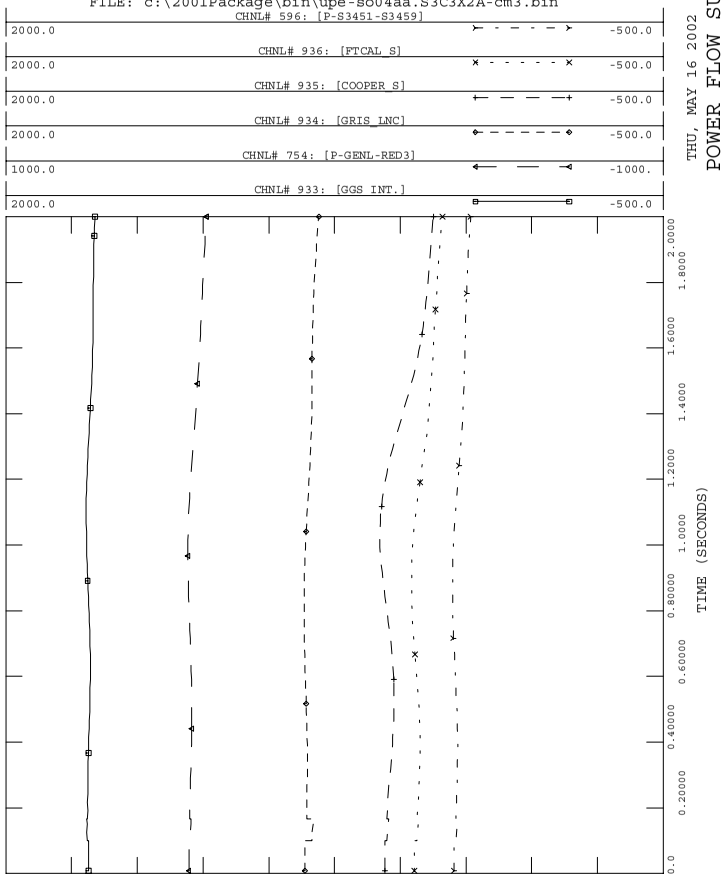
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
POWER FLOW SUMS 1



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
POWER FLOW SUM 3



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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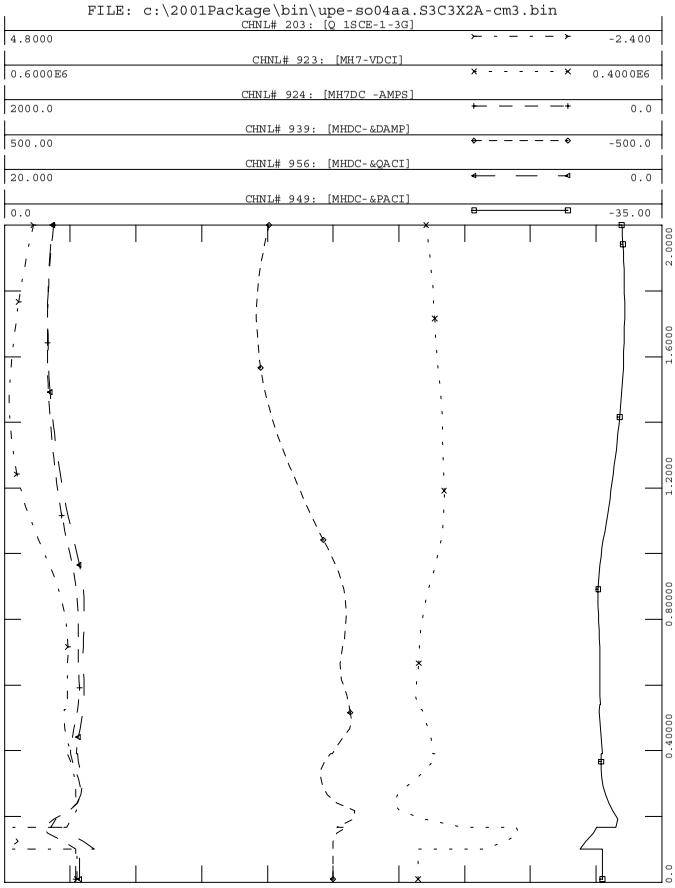
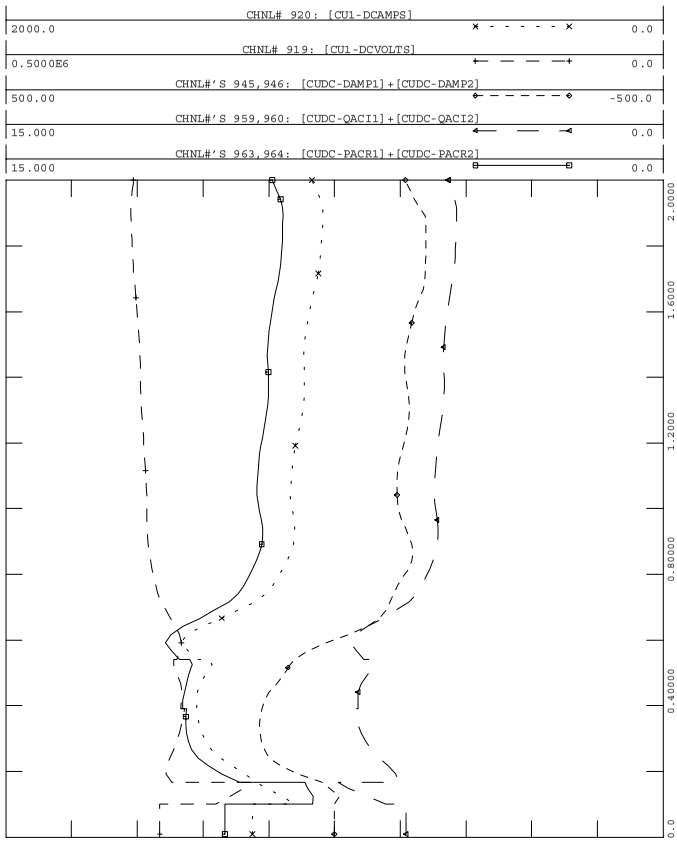
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
MH DC PARAMETERS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
CU DC #1



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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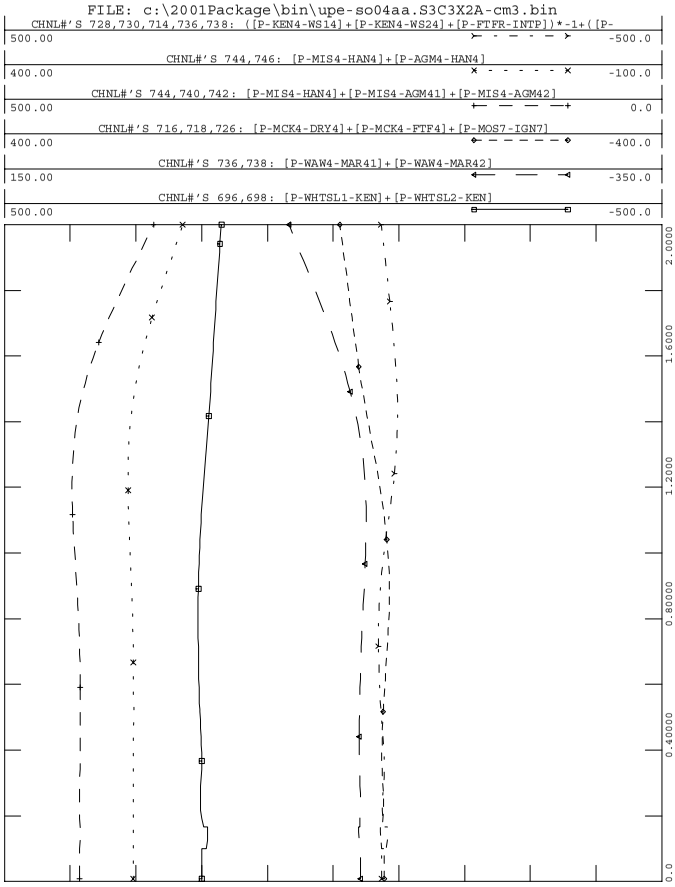
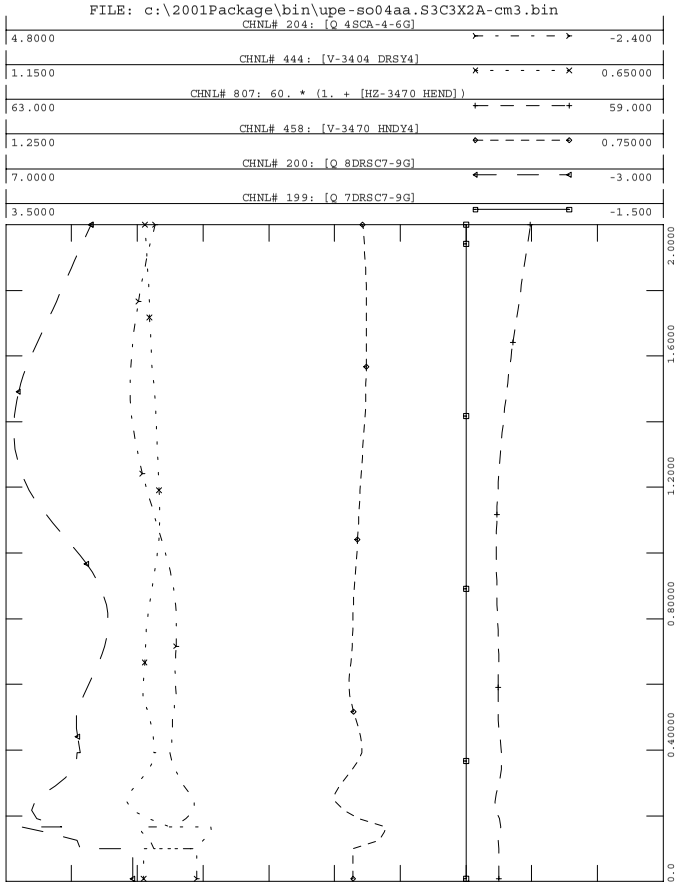
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32
OH TIE FLOWS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

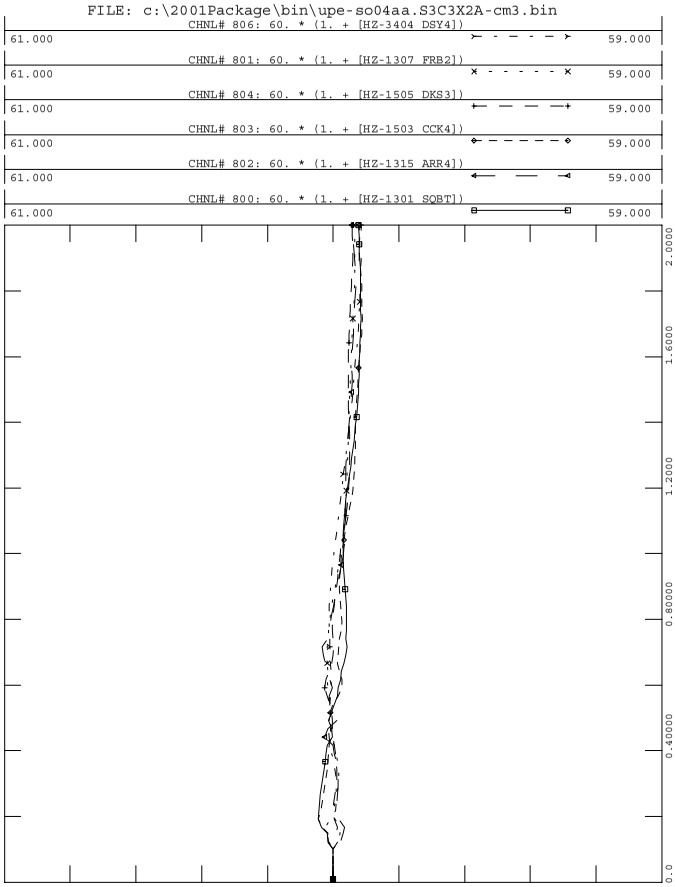
THU, MAY 16 2002 13:32
MH DC PARAMETERS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32

FREQ AT DC TERMINALS



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

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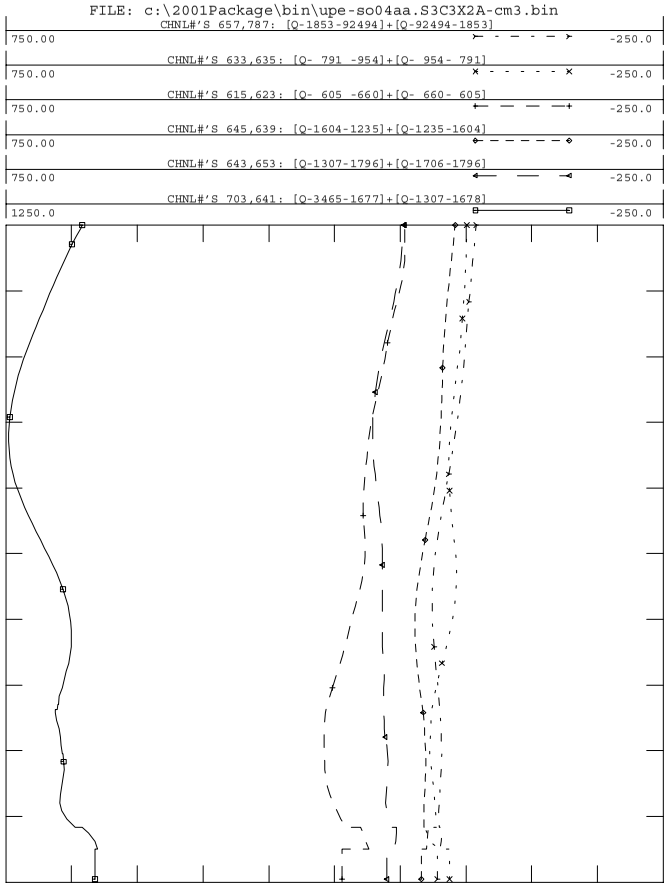
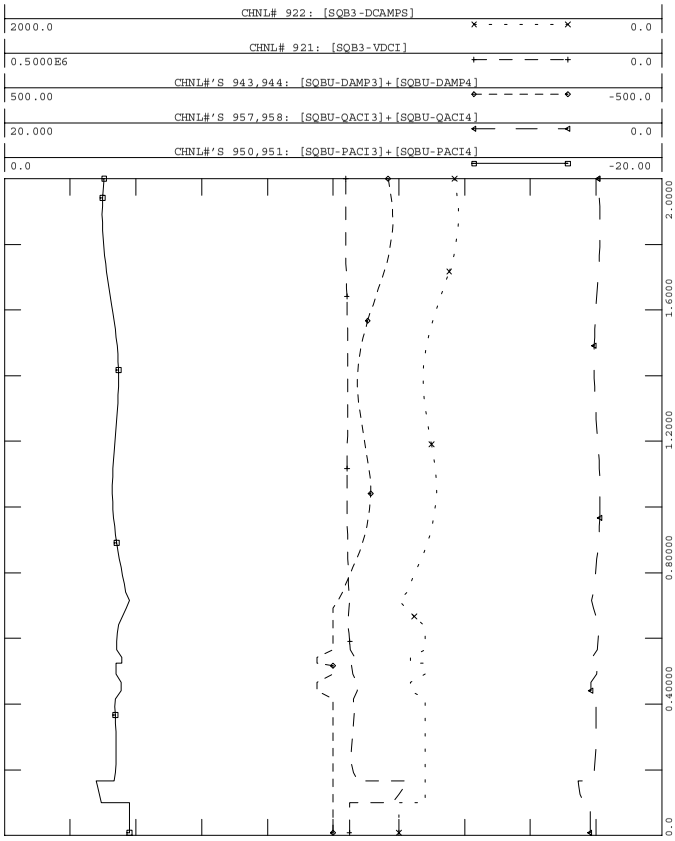
VAR LOSSES



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32

SQB DC #3



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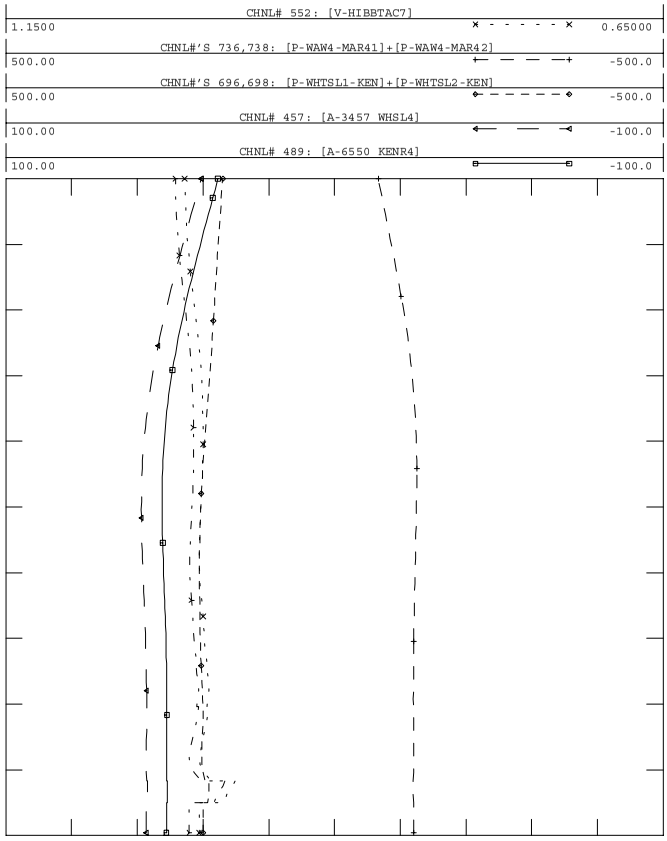
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

THU, MAY 16 2002 13:32

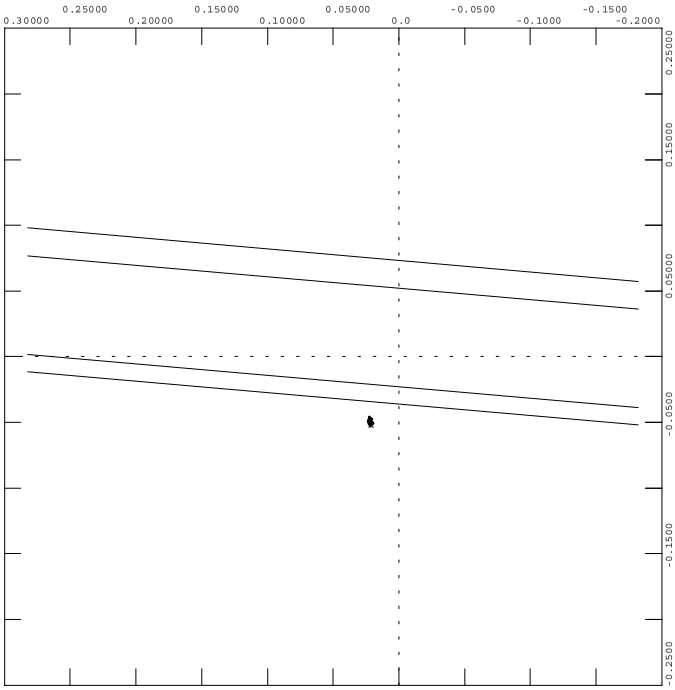
VOLTAGES, ANGLES



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, MAY 16 2002 13:32
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

RELAY: RELAYG
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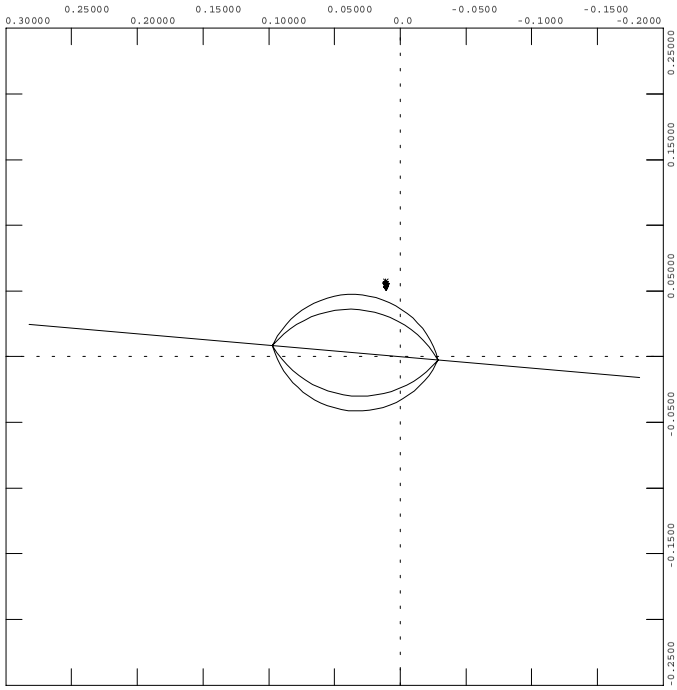
CHNL# 856: [X-DSY2-ROS2]



THU, MAY 16 2002 13:32
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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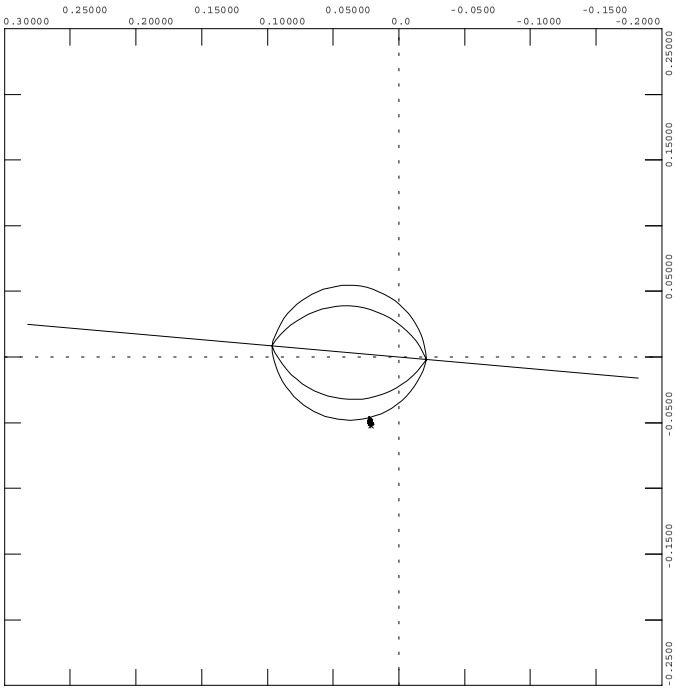
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

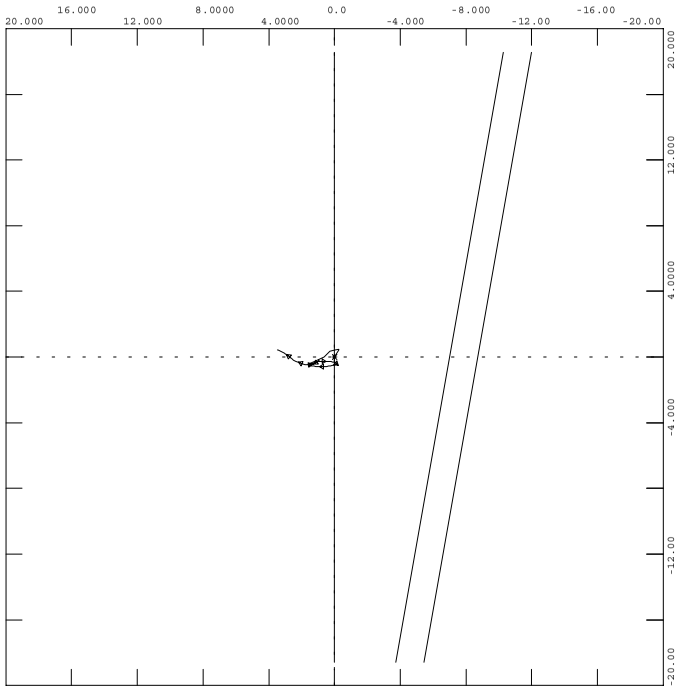


THU, MAY 16 2002 13:32
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

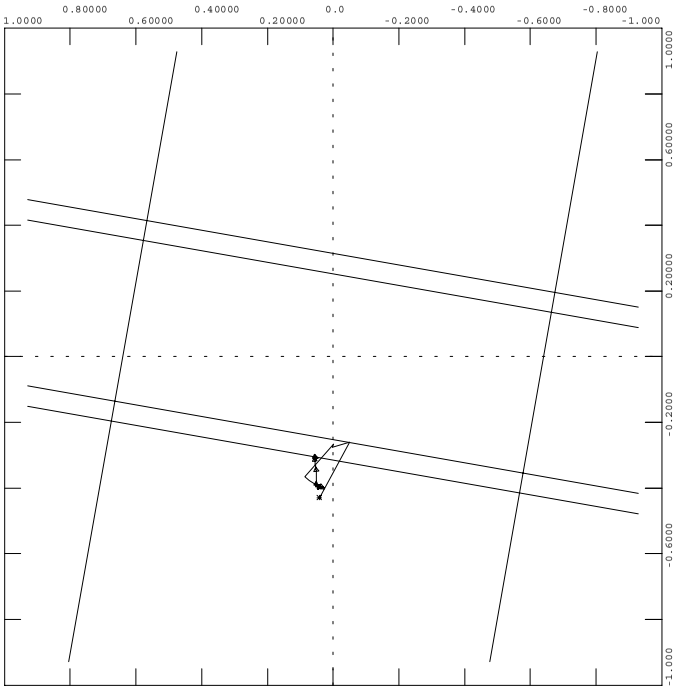


THU, MAY 16 2002 13:32
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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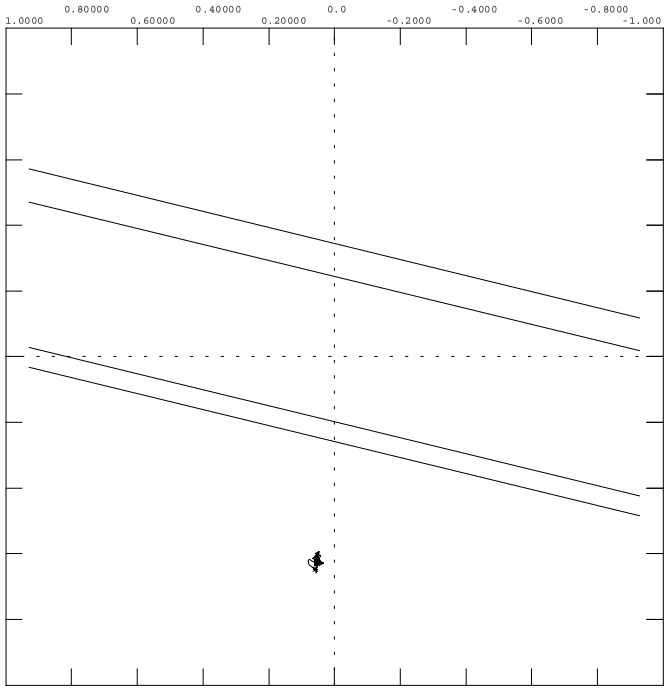
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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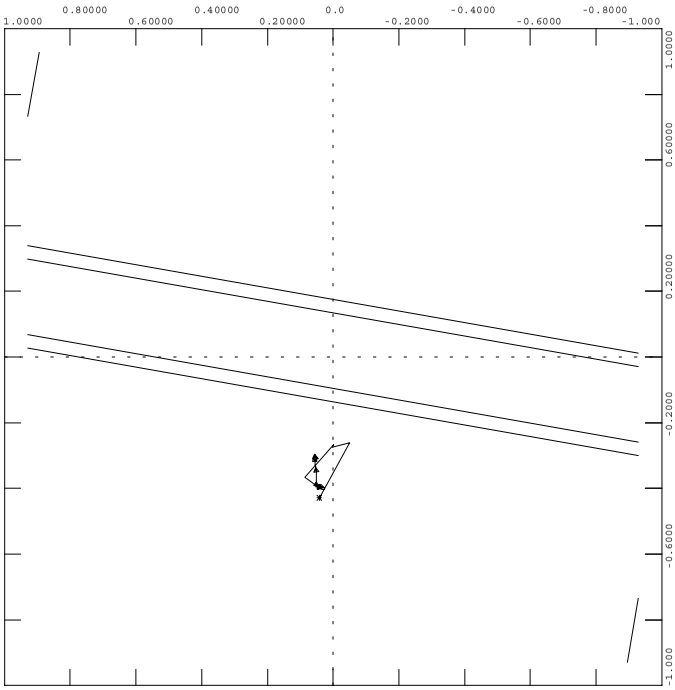
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

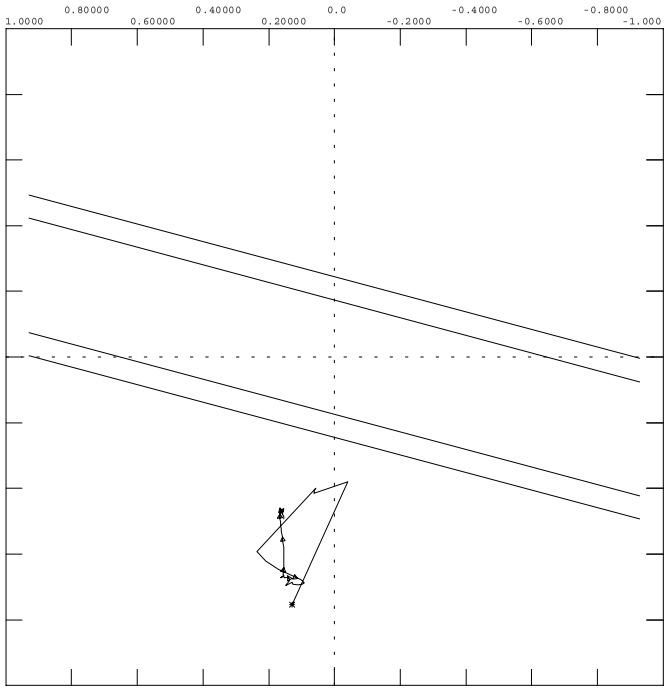
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

RELAY: SLLP
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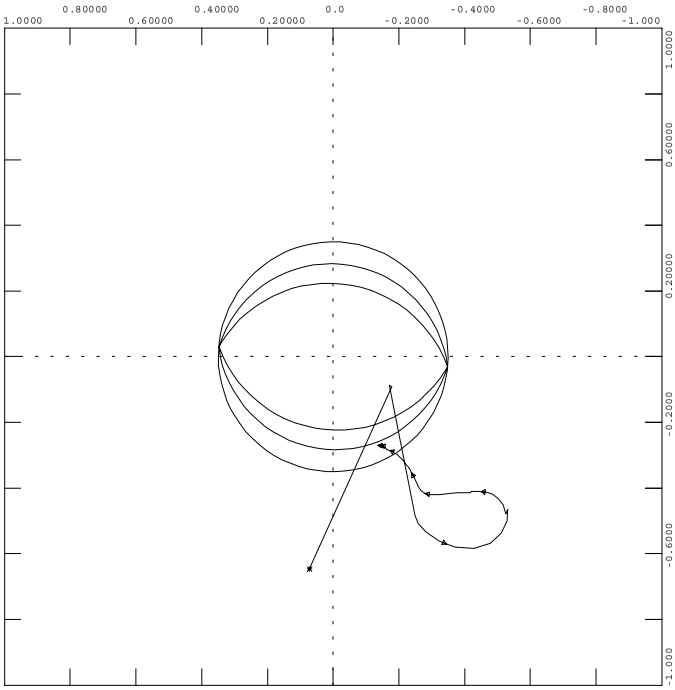
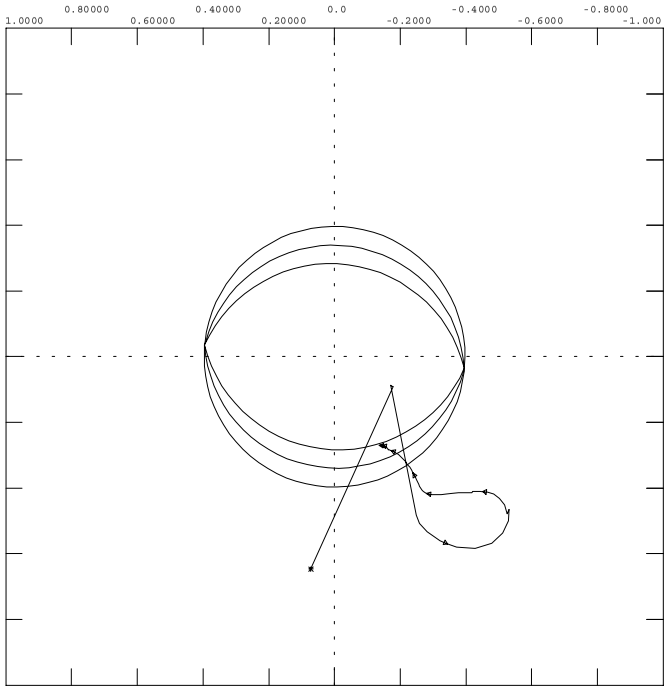
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

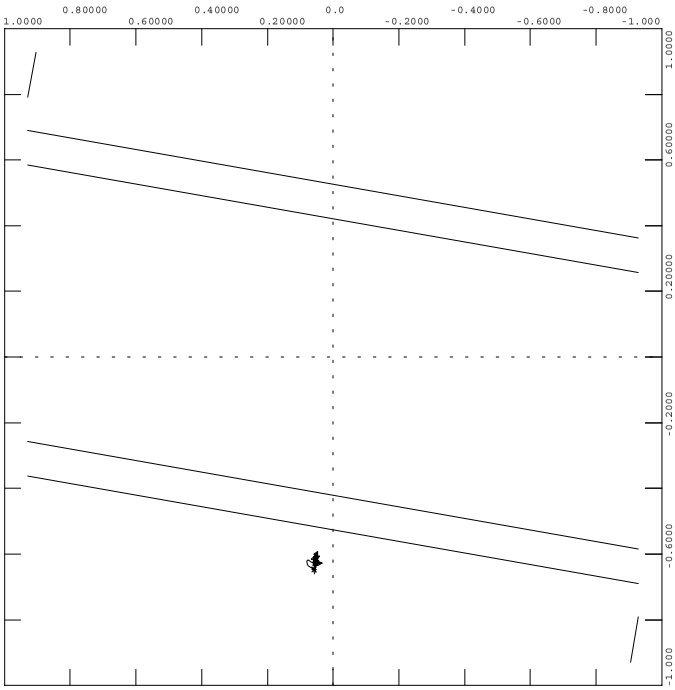
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

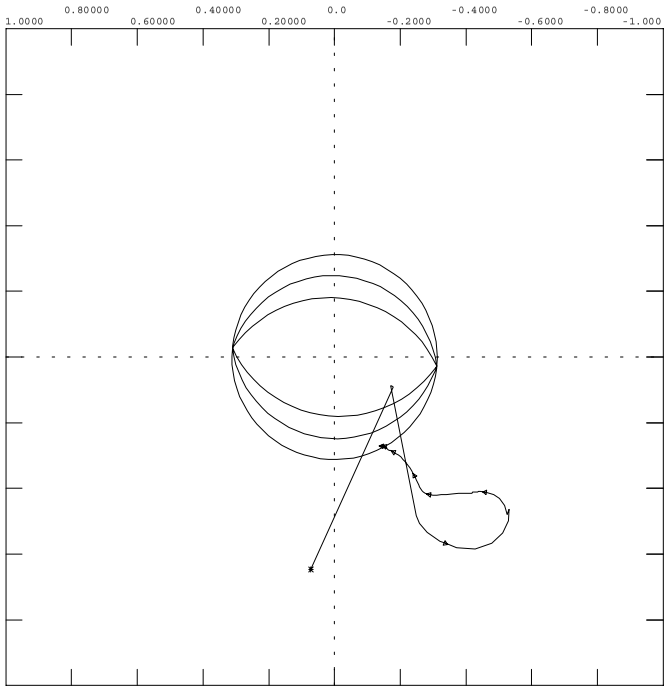
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



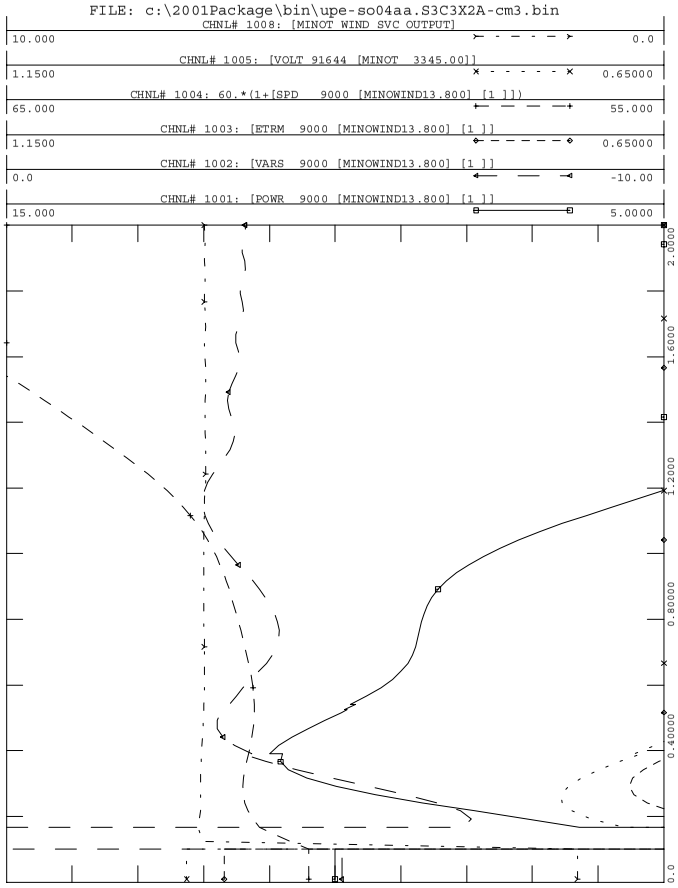
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

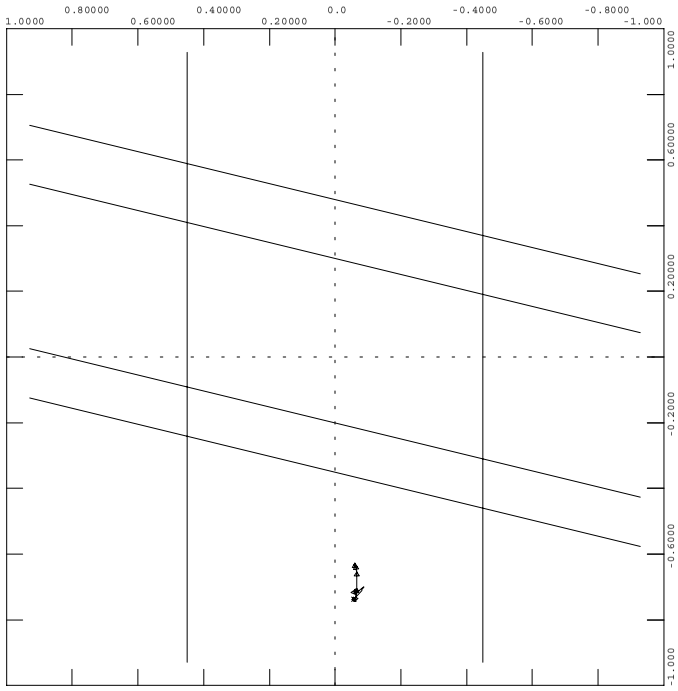


THU, MAY 16 2002 13:32
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

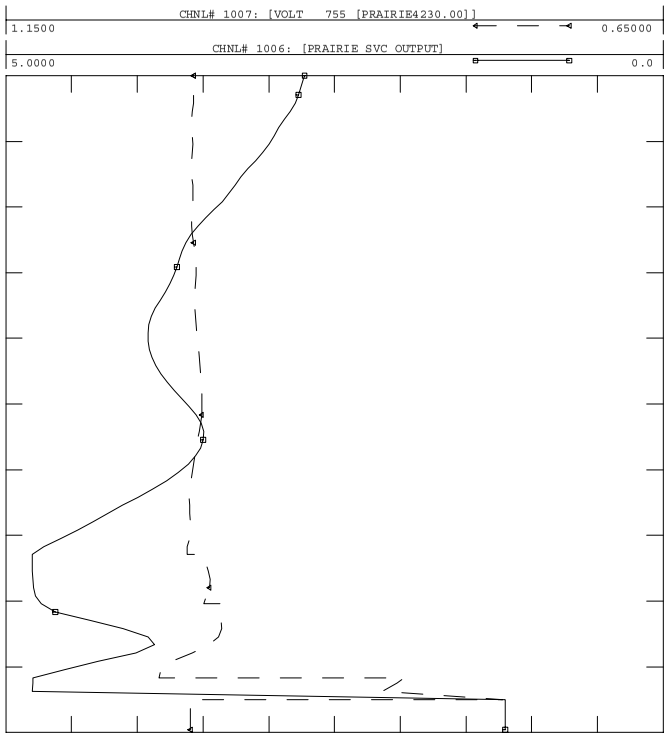
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



THU, MAY 16 2002 13:32
MP-OH I.FALLS (779)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-cm3.bin



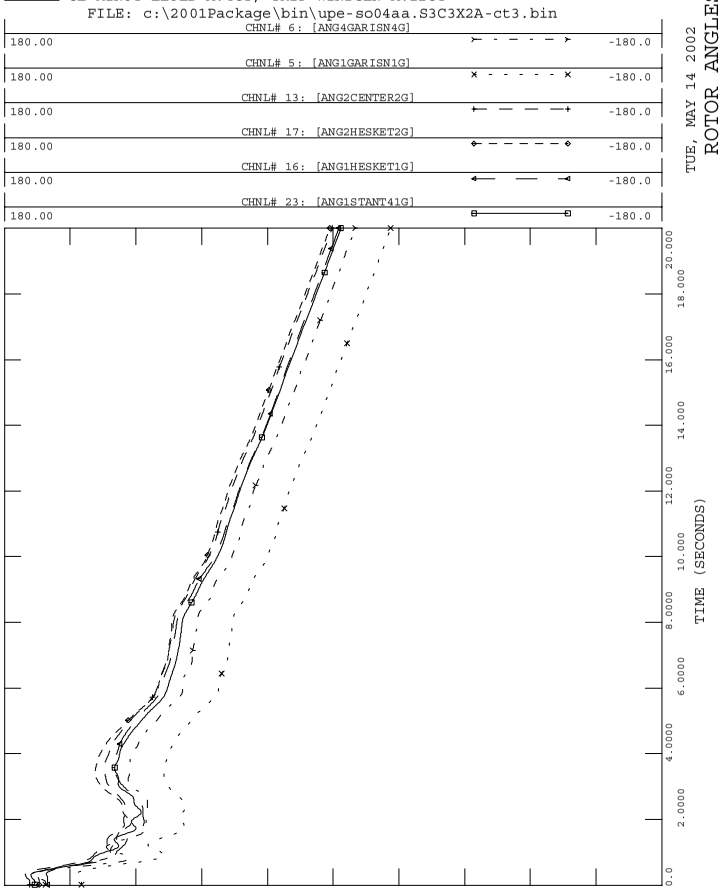
THU, MAY 16 2002 13:32
PRAIRIE SVC RESPONSE

CONTINGENCY CT3

4 cycle 3 phase fault at Minot on Minot – Leland Olds 345 kV.
Clear fault after 4 cycles. Trip wind unit after 12 cycles

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

TUE, MAY 14 2002 9:22
ROTOR ANGLES 2



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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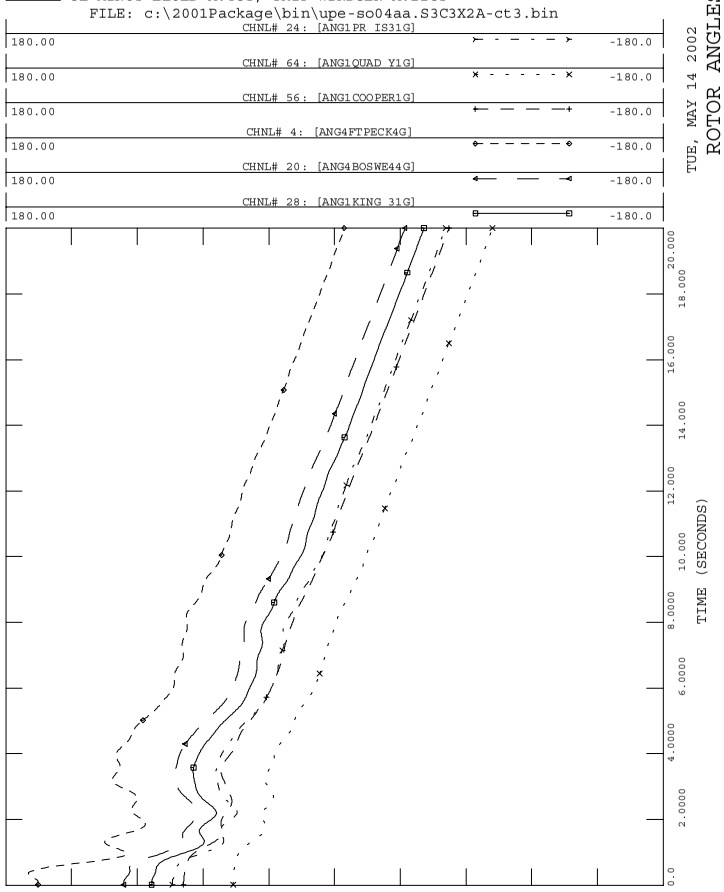
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

TUE, MAY 14 2002 9:22
ROTOR ANGLES 4



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

TUE, MAY 14 2002 9:22
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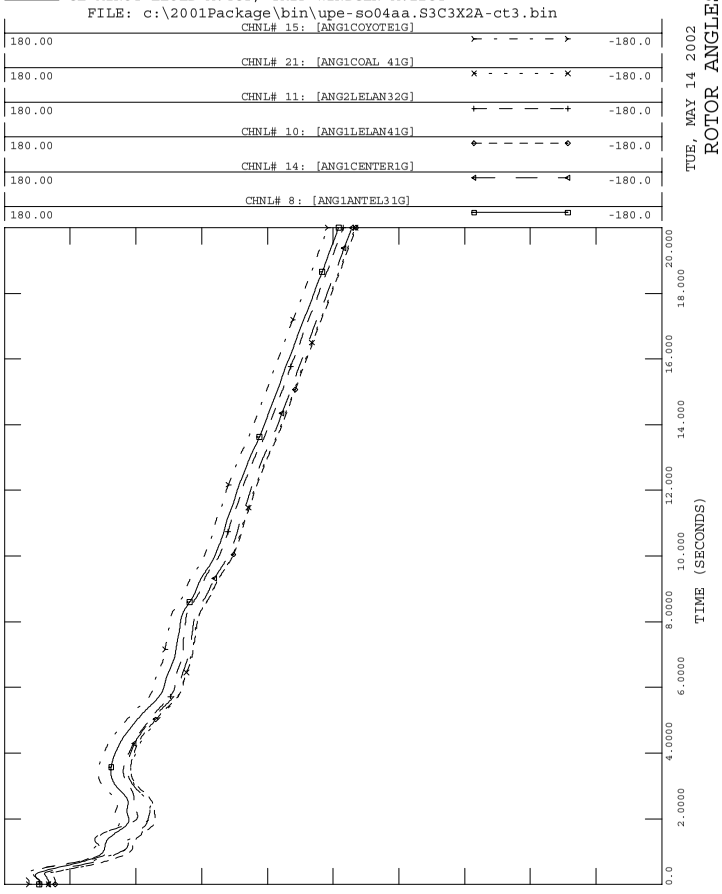

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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
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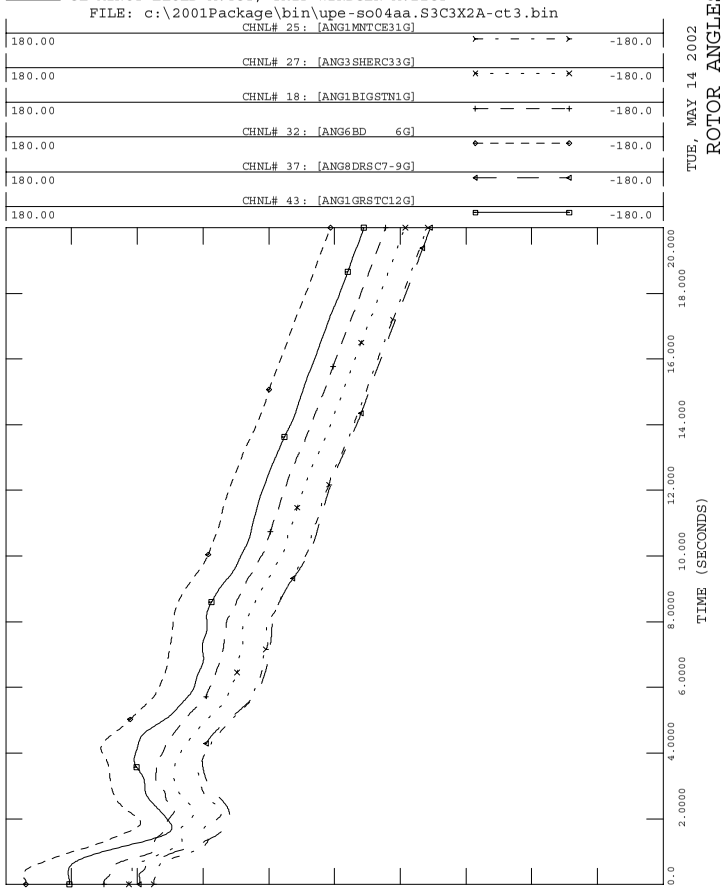
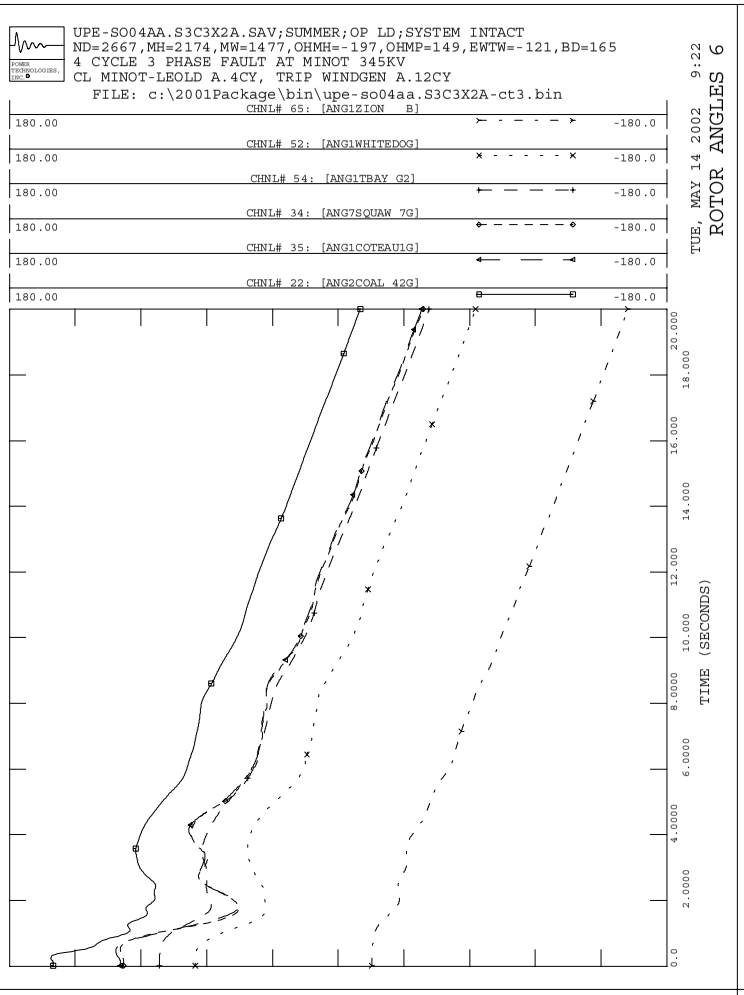
TUE, MAY 14 2002 9:22
ROTOR ANGLES 3

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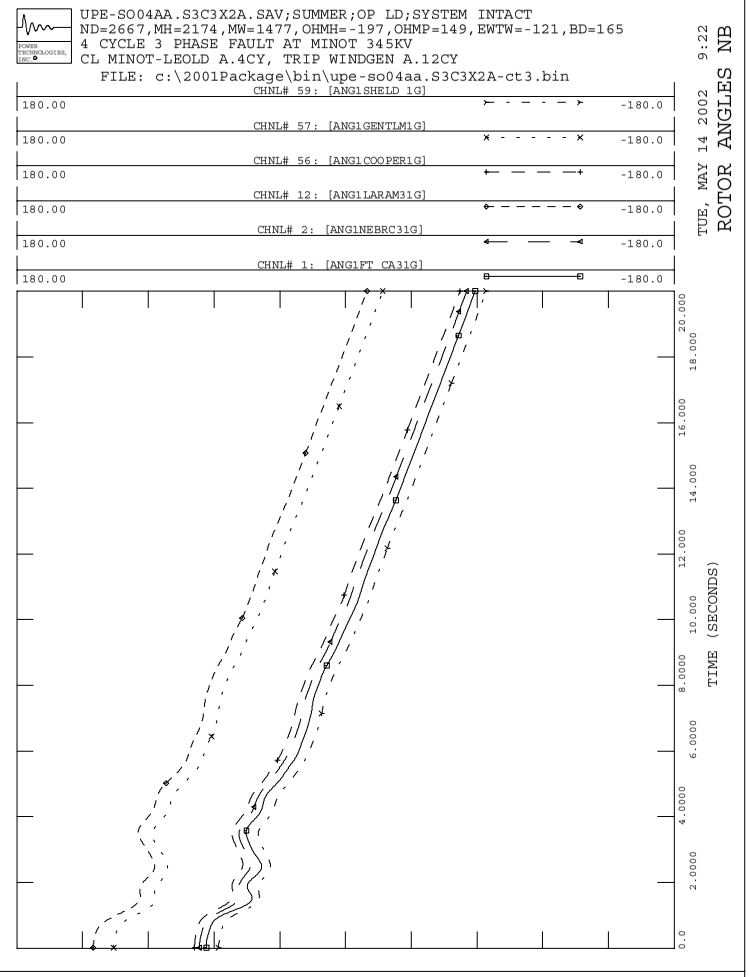
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
TUE, MAY 14 2002 9:22
ROTOR ANGLES 6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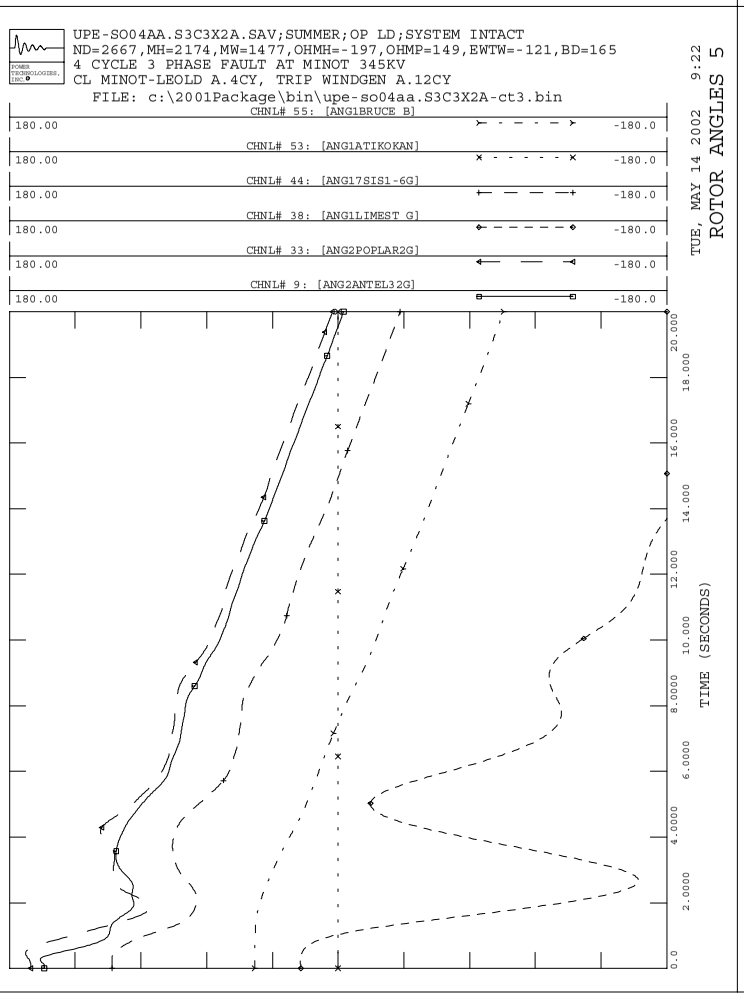
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
TUE, MAY 14 2002 9:22
ROTOR ANGLES NB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CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
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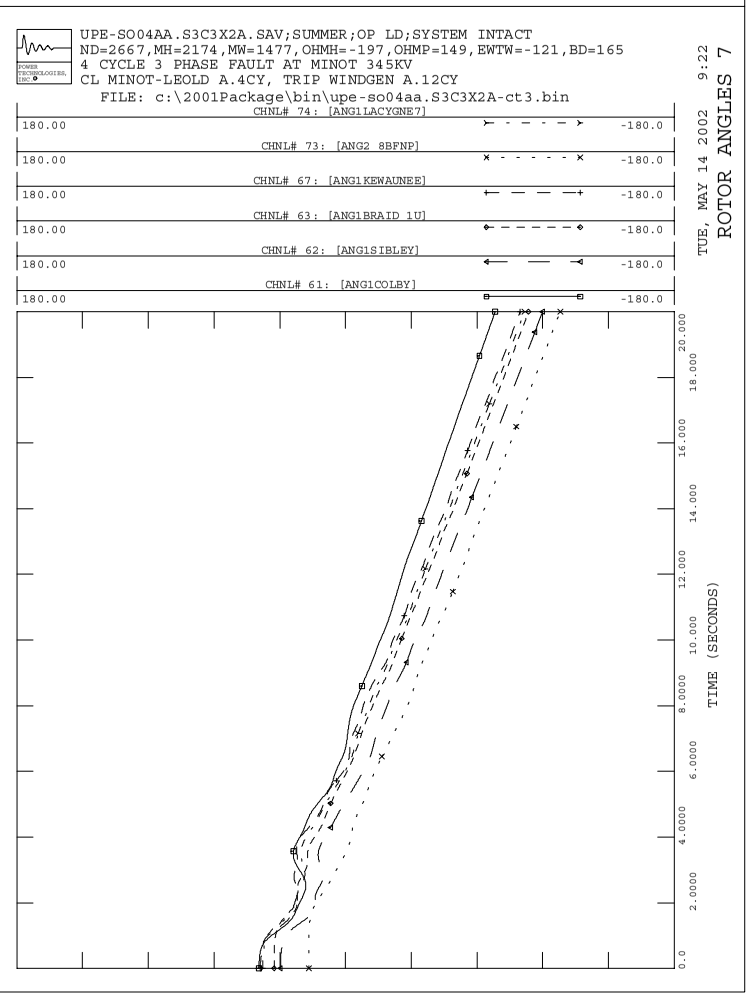
TIME (SECONDS)
TUE, MAY 14 2002 9:22
ROTOR ANGLES 5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CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
TUE, MAY 14 2002 9:22
ROTOR ANGLES 7

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
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TUE, MAY 14 2002 9:22
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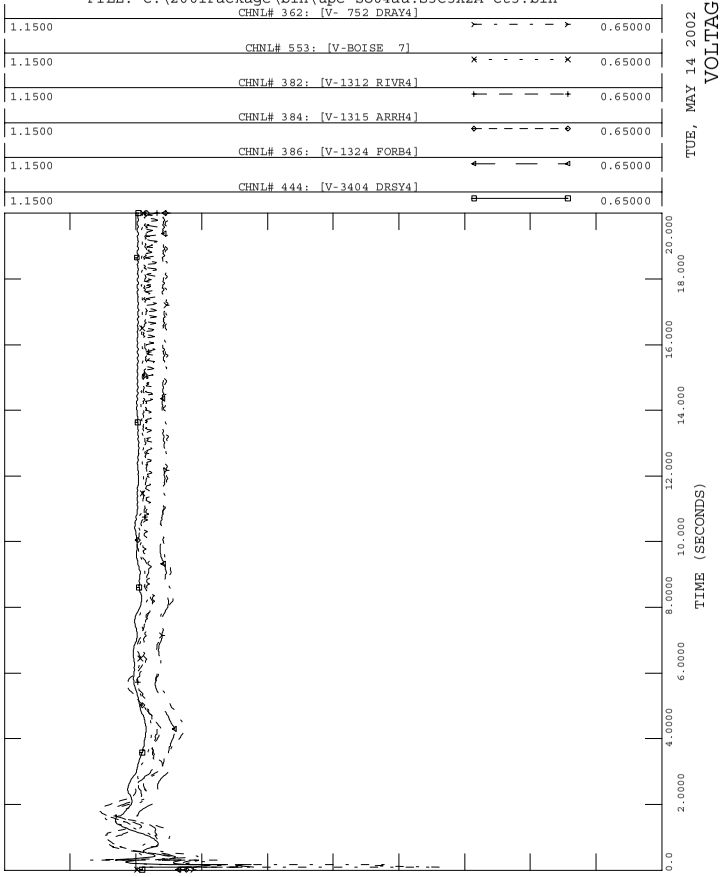

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CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
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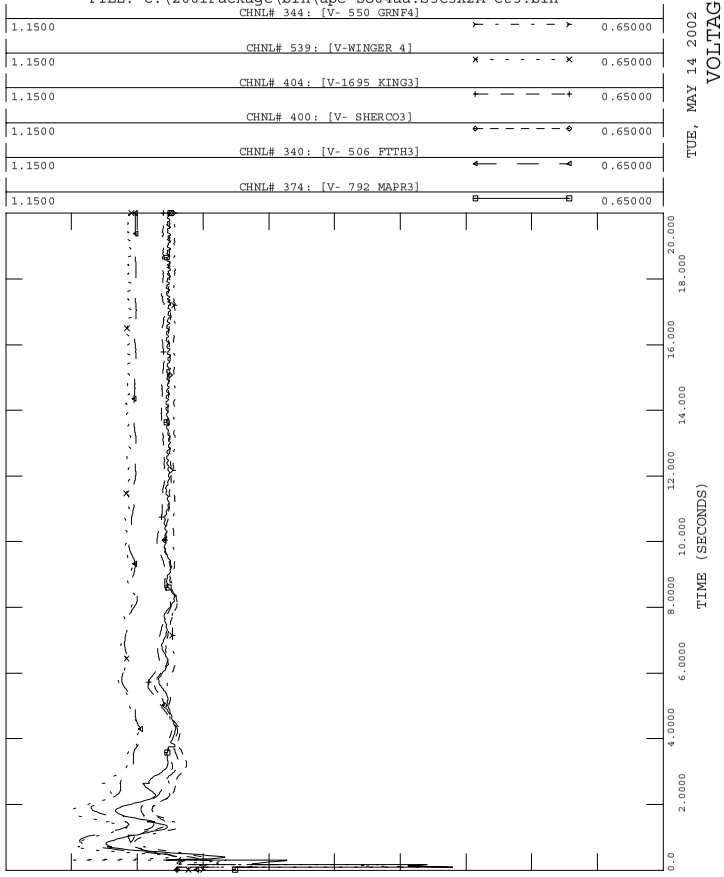
TUE, MAY 14 2002 9:22
VOLTAGES 3



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CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
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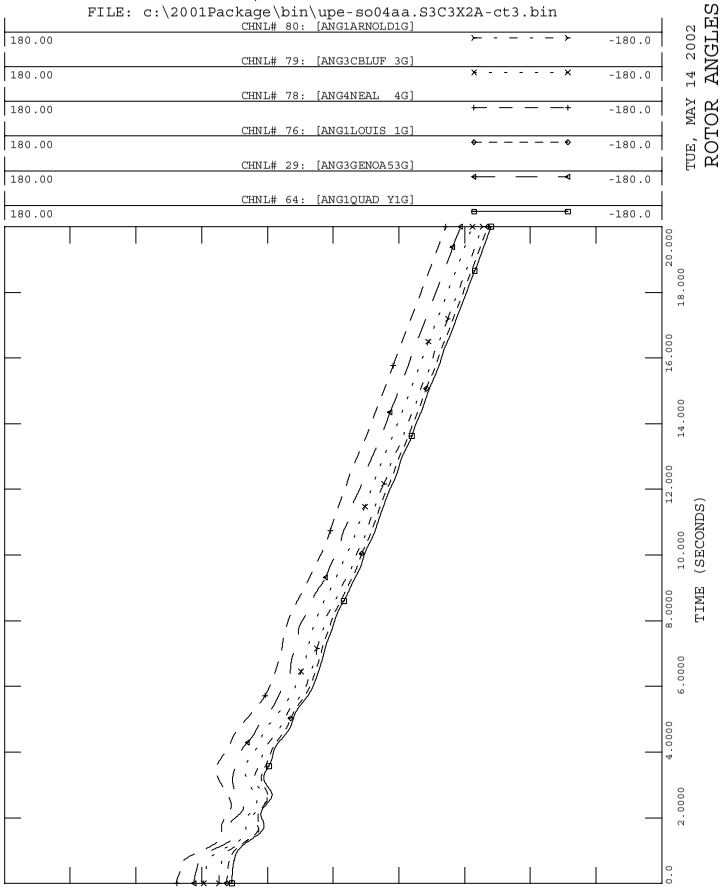
TUE, MAY 14 2002 9:22
ROTOR ANGLES IA



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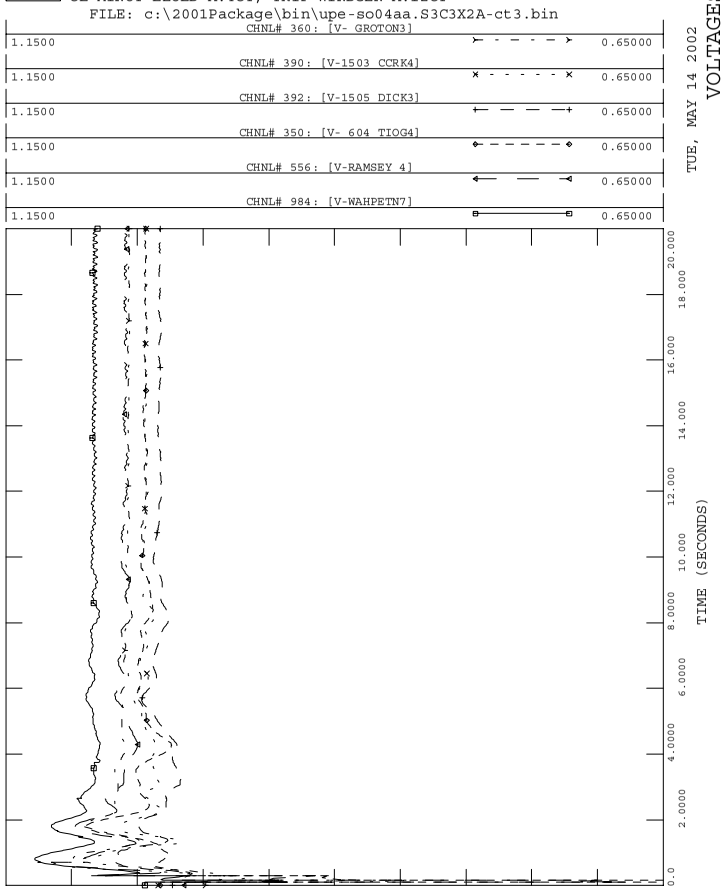
TUE, MAY 14 2002 9:22
VOLTAGES 2



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CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
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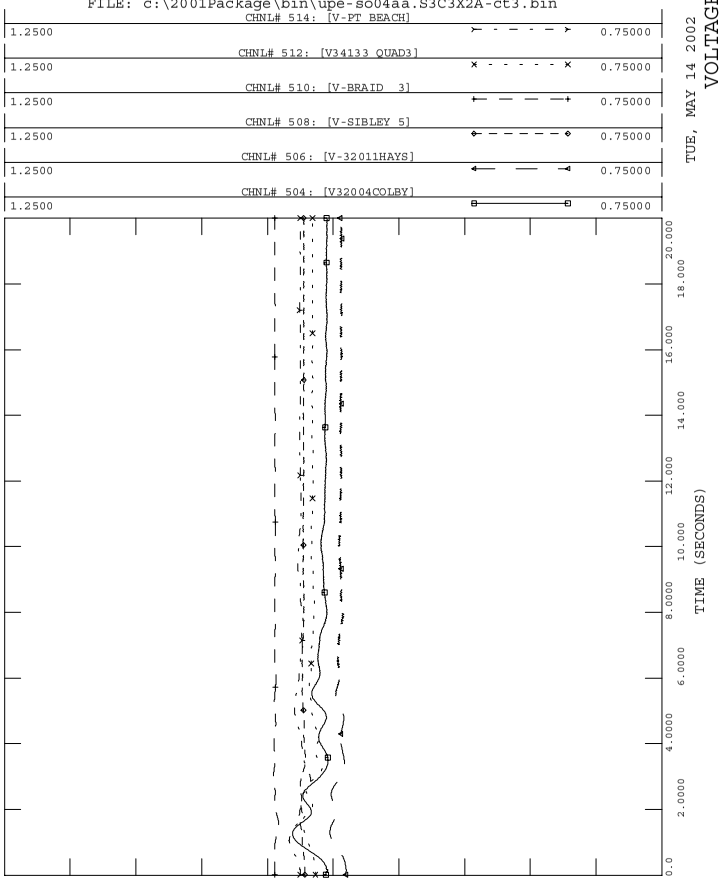
TUE, MAY 14 2002 9:22
VOLTAGES 5



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CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
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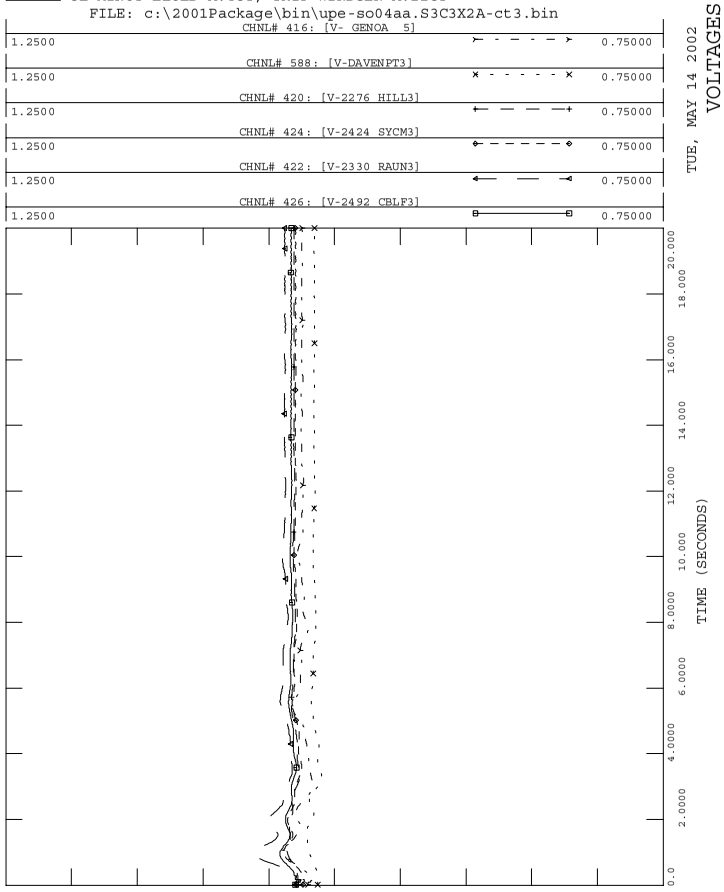
TUE, MAY 14 2002 9:22
VOLTAGES IA



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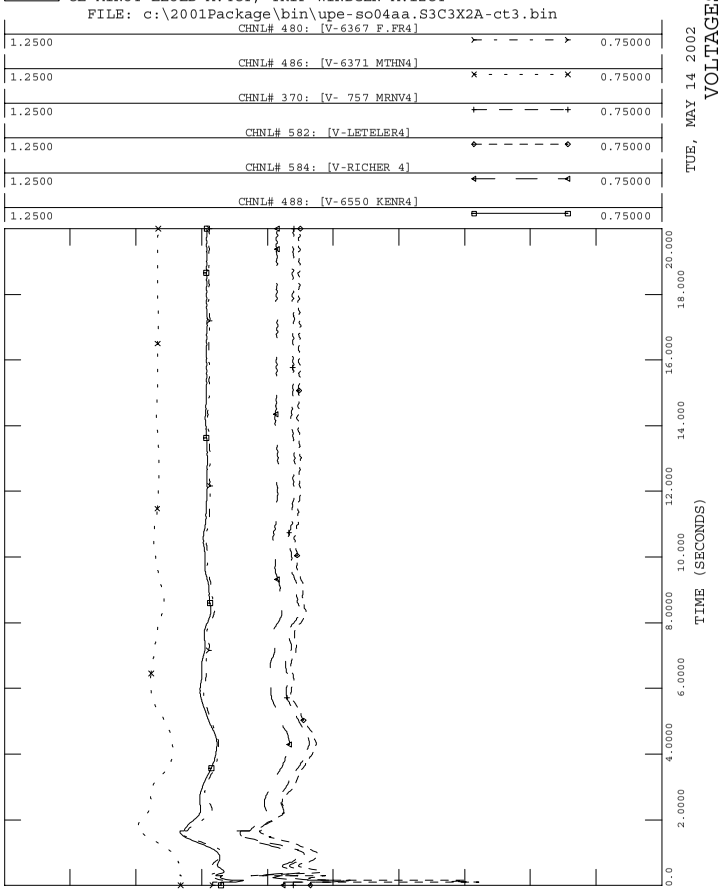
TUE, MAY 14 2002 9:22
VOLTAGES 4



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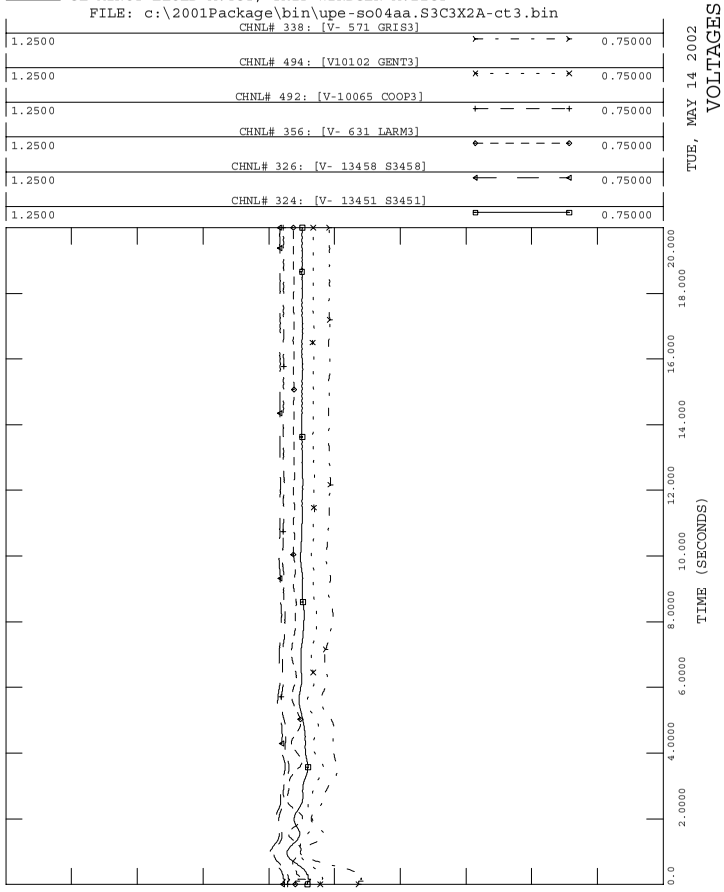
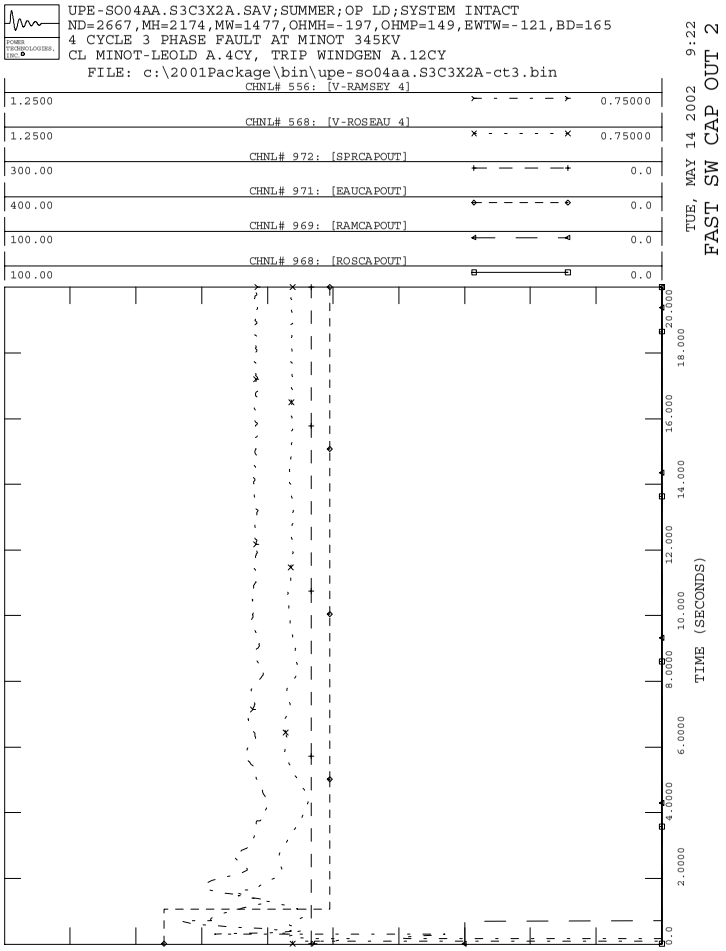
TUE, MAY 14 2002 9:22
VOLTAGES NB

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CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
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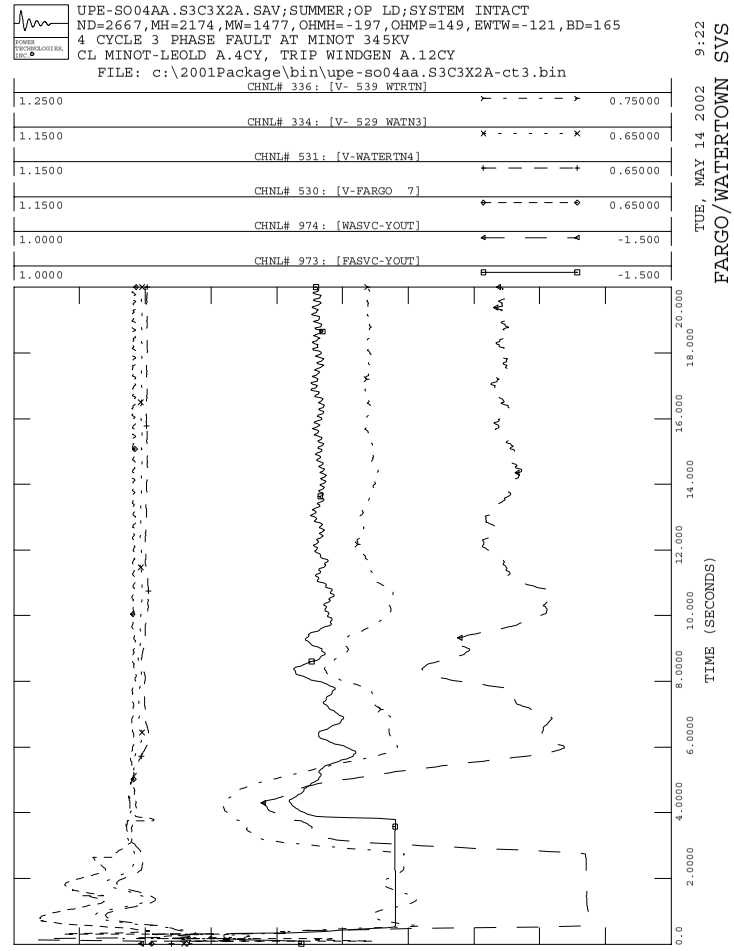
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
TUE, MAY 14 2002 9:22
FAST SW CAP OUT 2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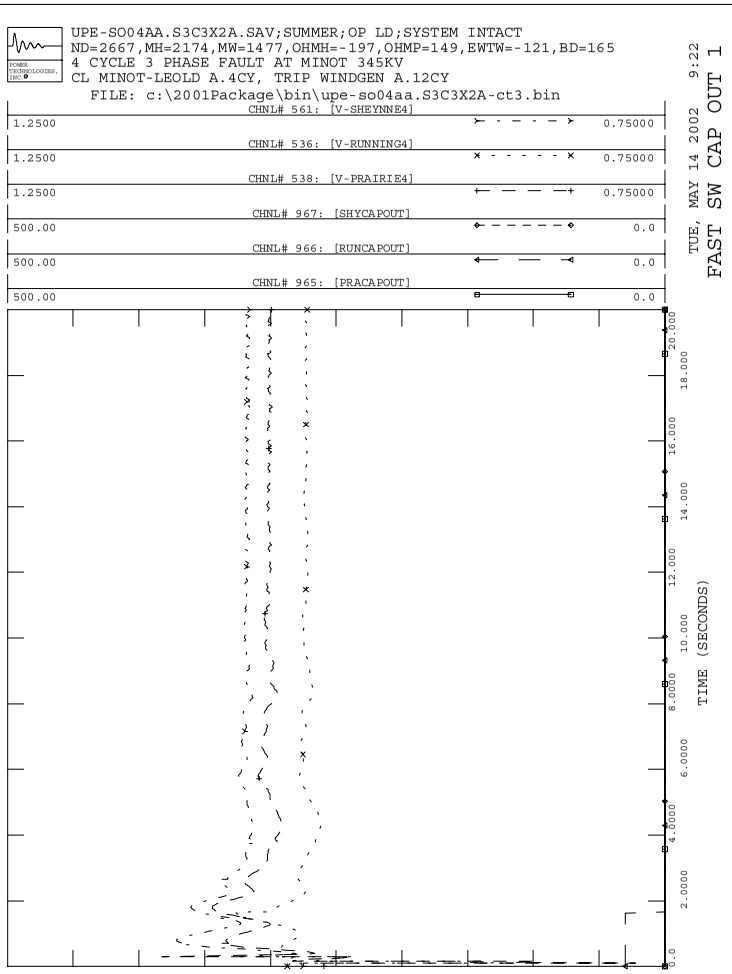
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
TUE, MAY 14 2002 9:22
FARGO/WATERTOWN SVS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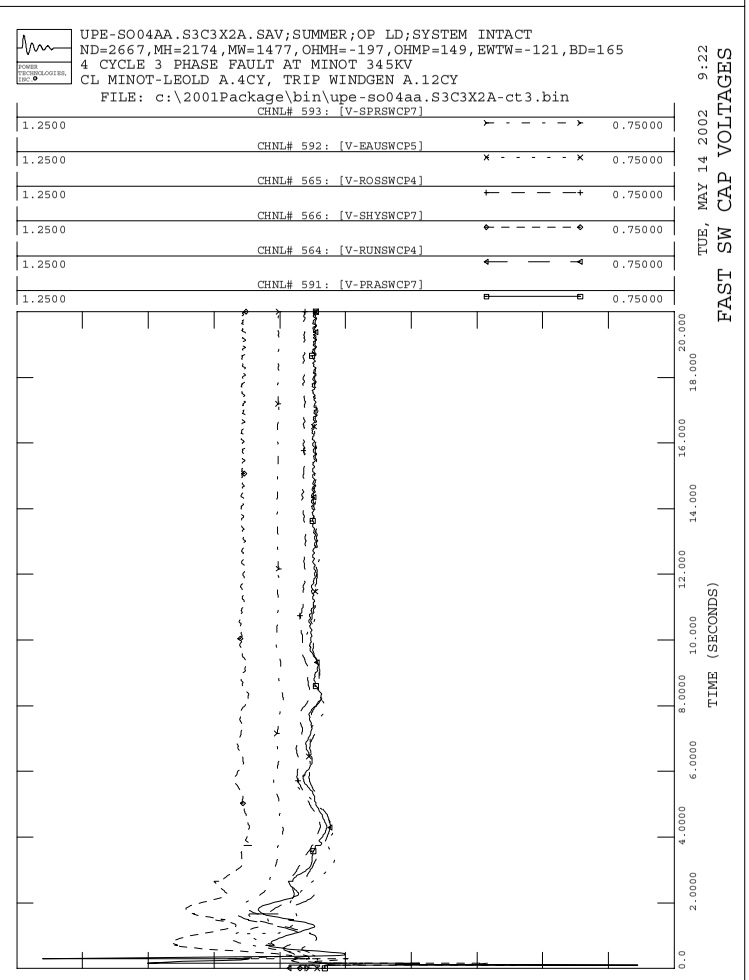
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
TUE, MAY 14 2002 9:22
FAST SW CAP OUT 1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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
TUE, MAY 14 2002 9:22
FAST SW CAP VOLTAGES

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
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CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
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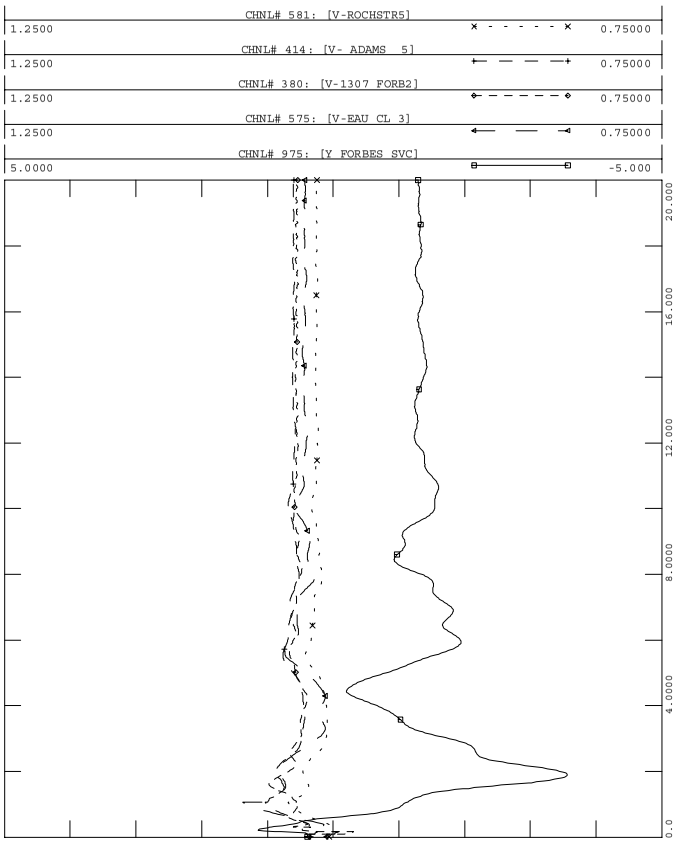
TUE, MAY 14 2002 9:22

SVC & WISCONSIN VOLT



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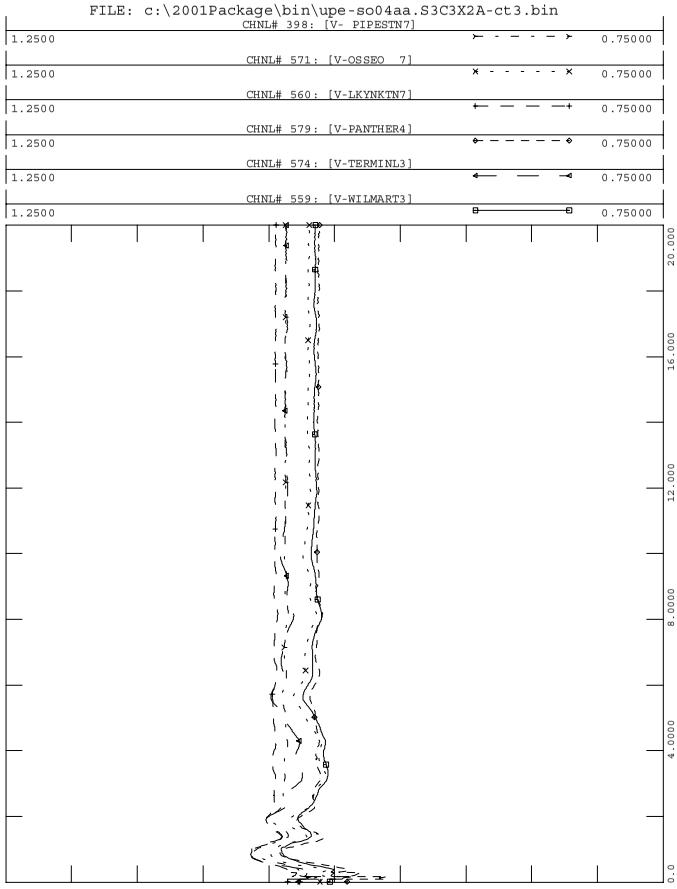
TUE, MAY 14 2002 9:22

TC VOLTAGES



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CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
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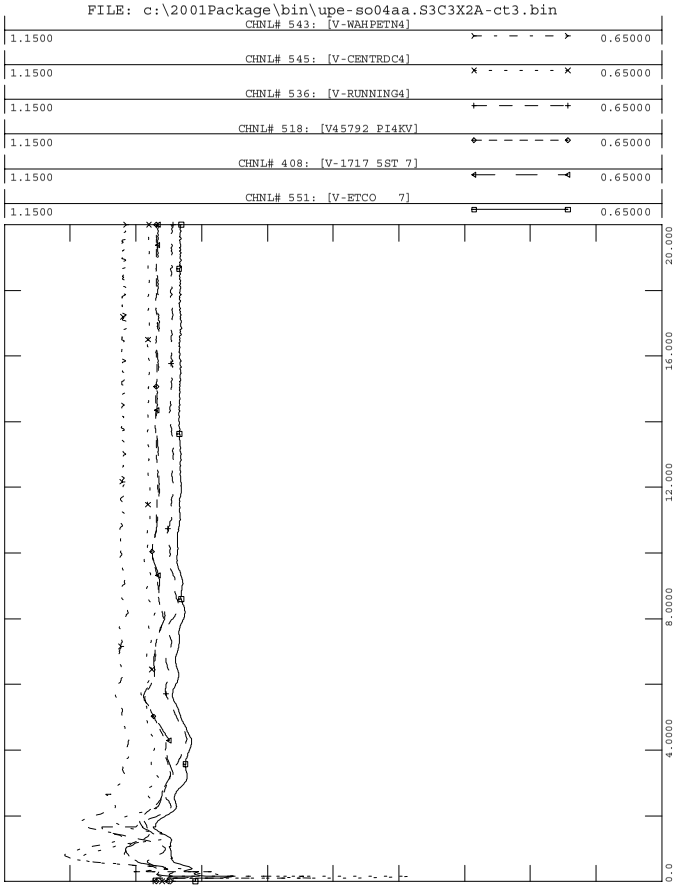
TUE, MAY 14 2002 9:22

VOLTAGES 6



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CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
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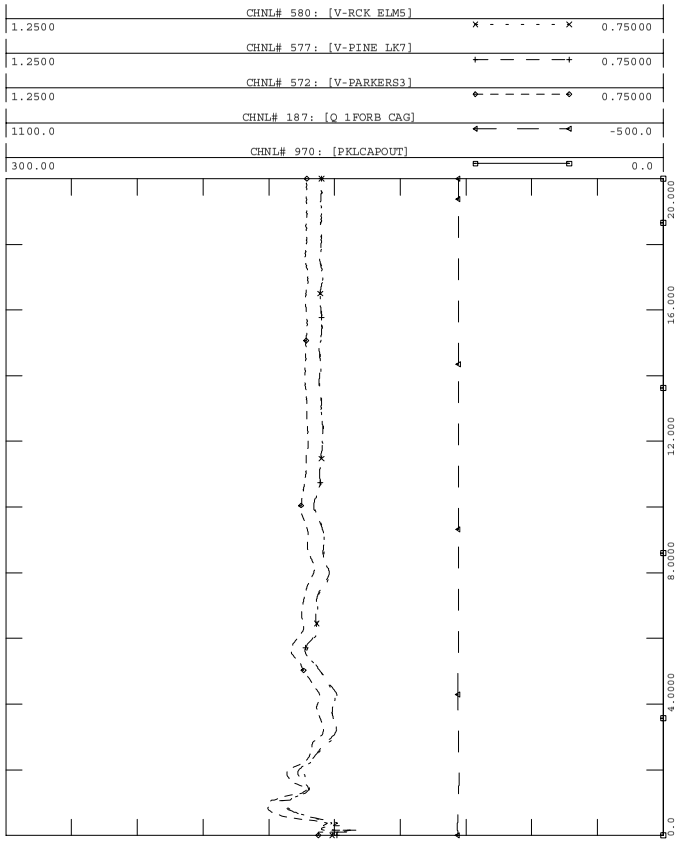
TUE, MAY 14 2002 9:22

FORBES SVS OUT & VOLTAGES



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CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
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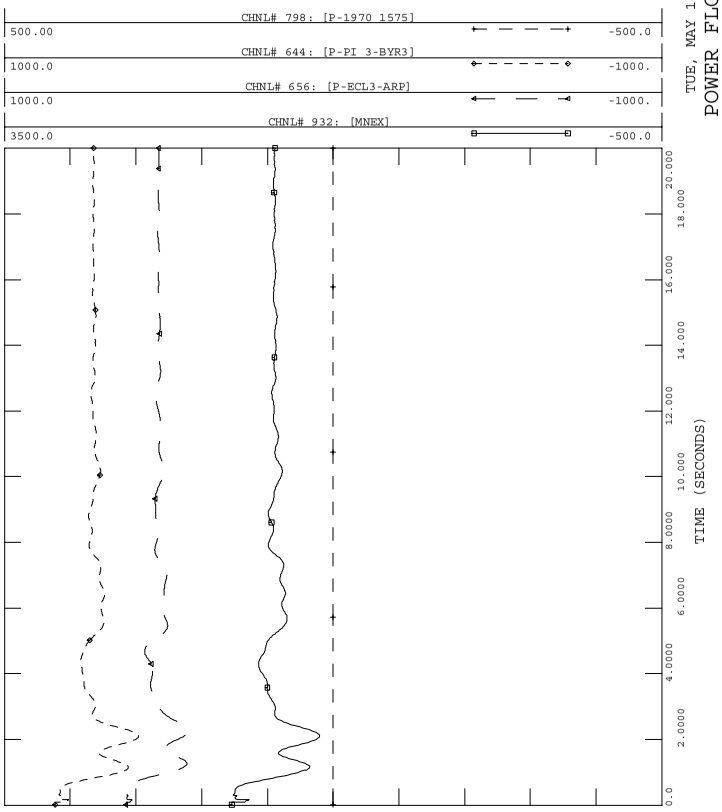
TUE, MAY 14 2002 9:22
POWER FLOW SUMS 2



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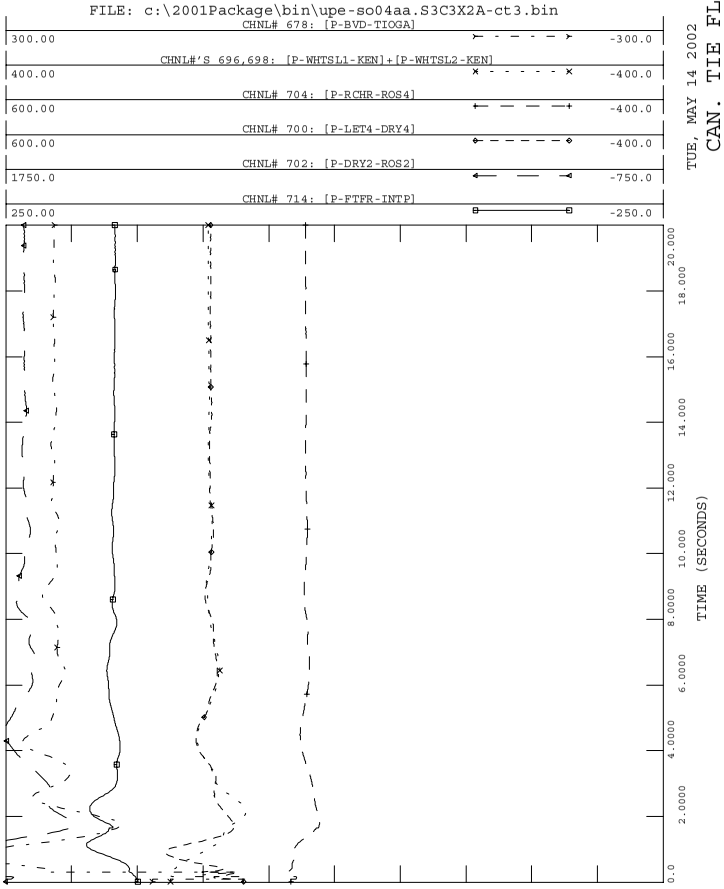
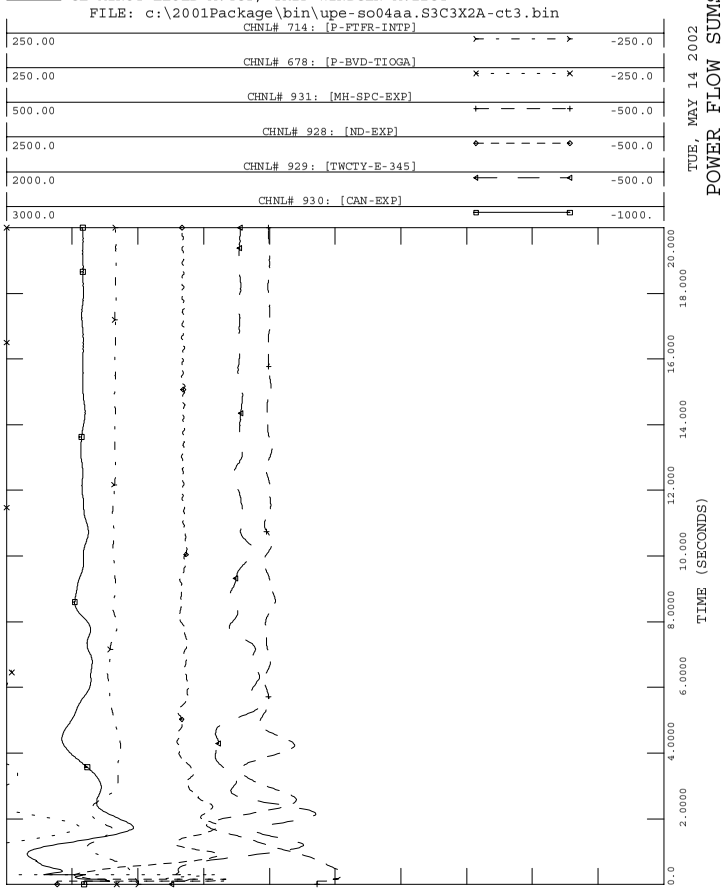
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

TUE, MAY 14 2002 9:22
CAN. TIE FLOWS



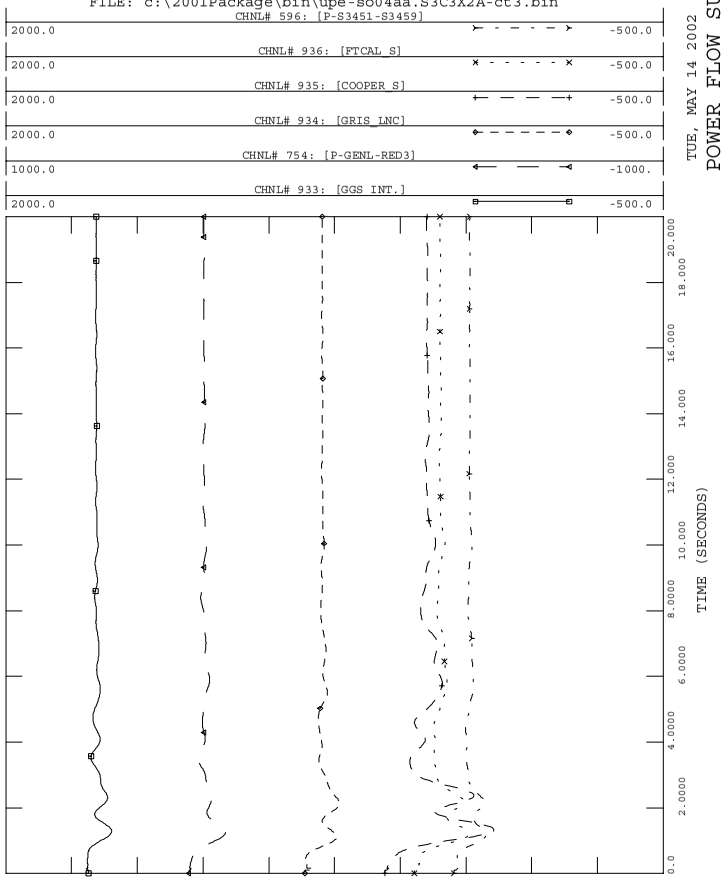
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

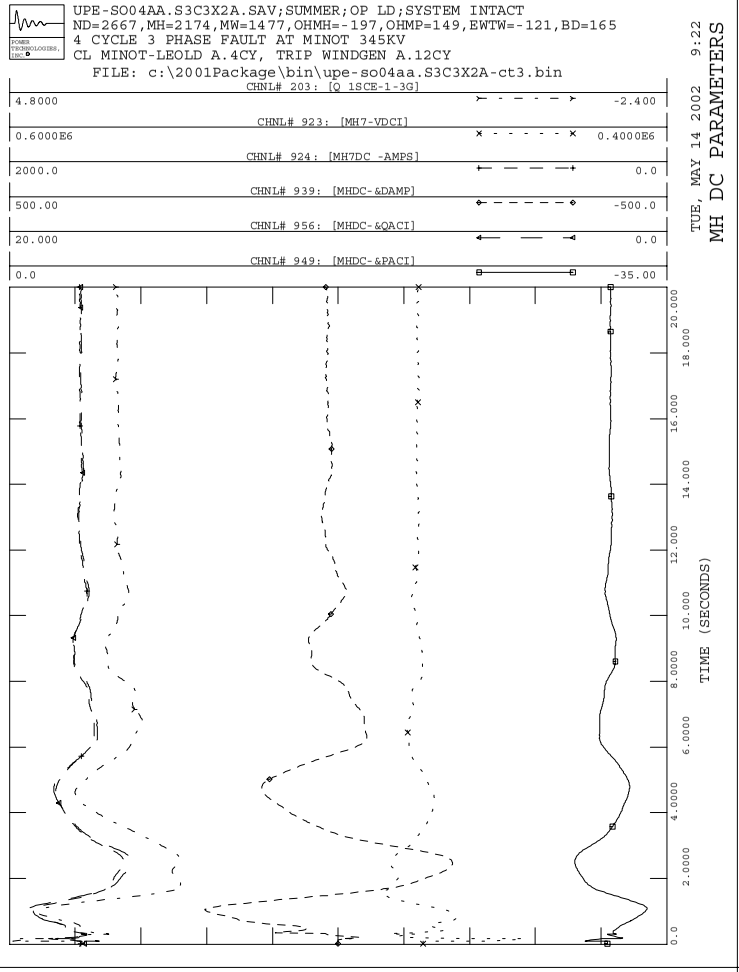
TUE, MAY 14 2002 9:22
POWER FLOW SUMS 1

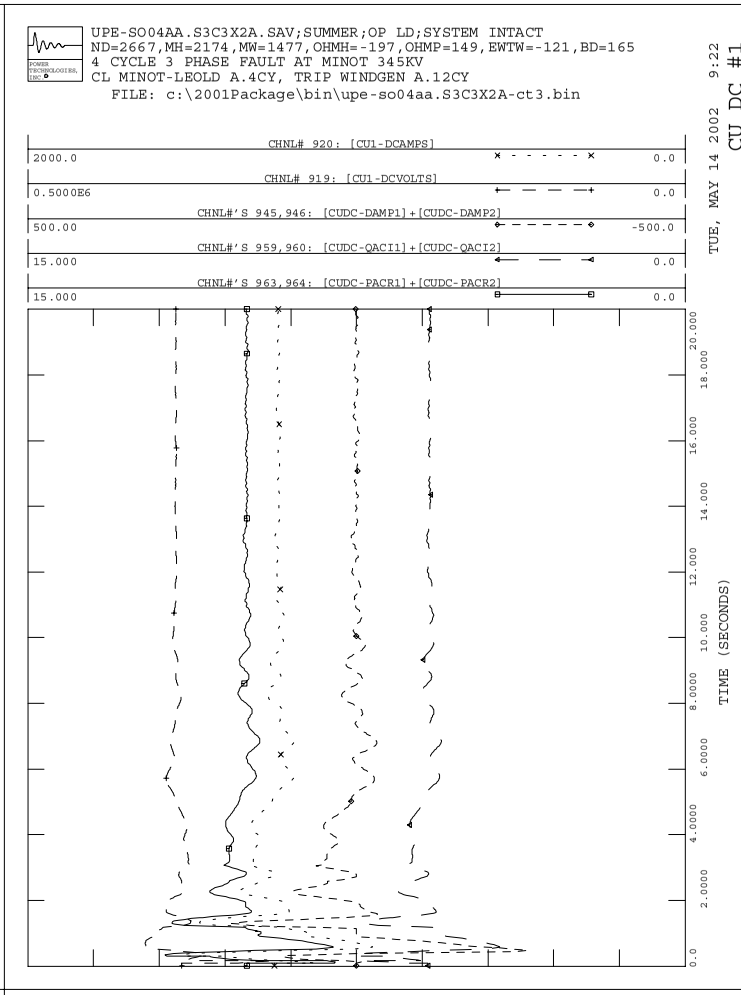


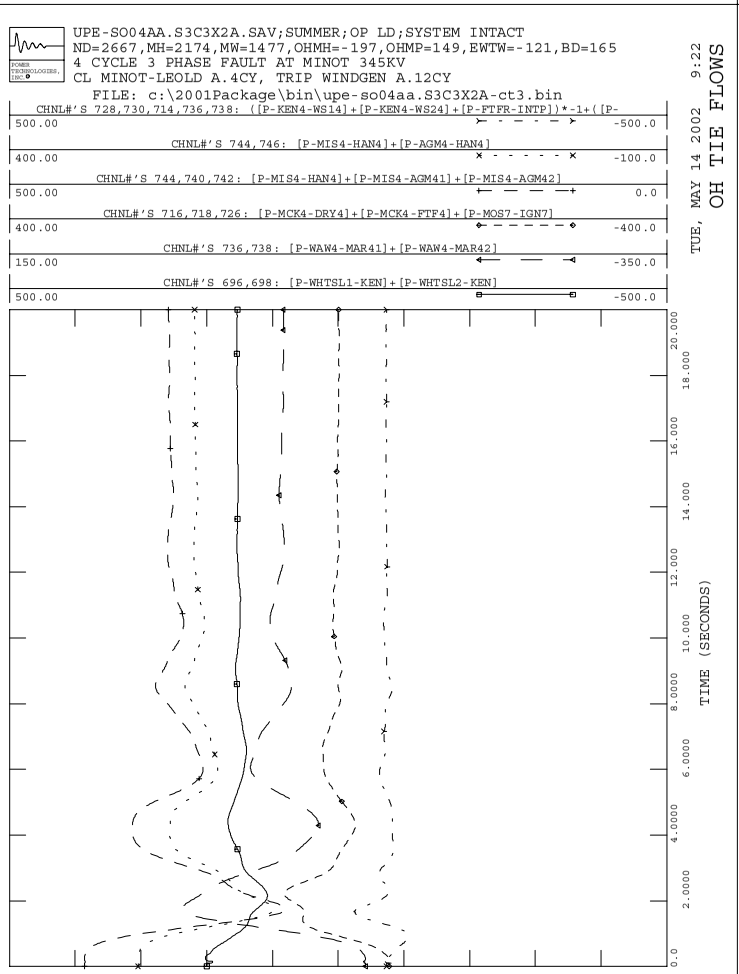
UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

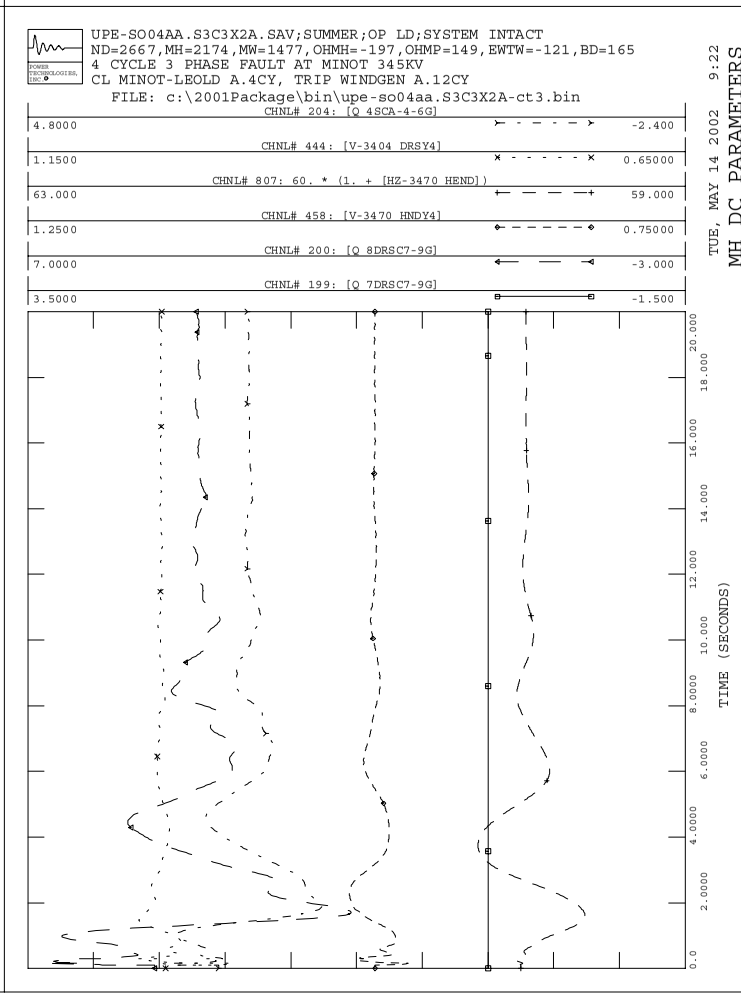
TUE, MAY 14 2002 9:22
POWER FLOW SUM 3

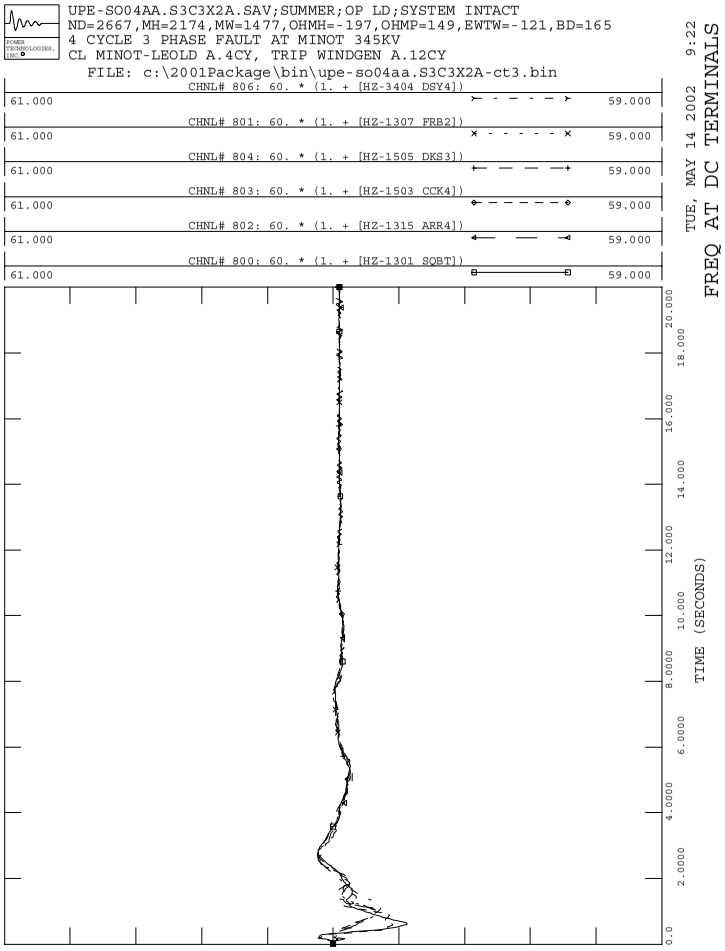


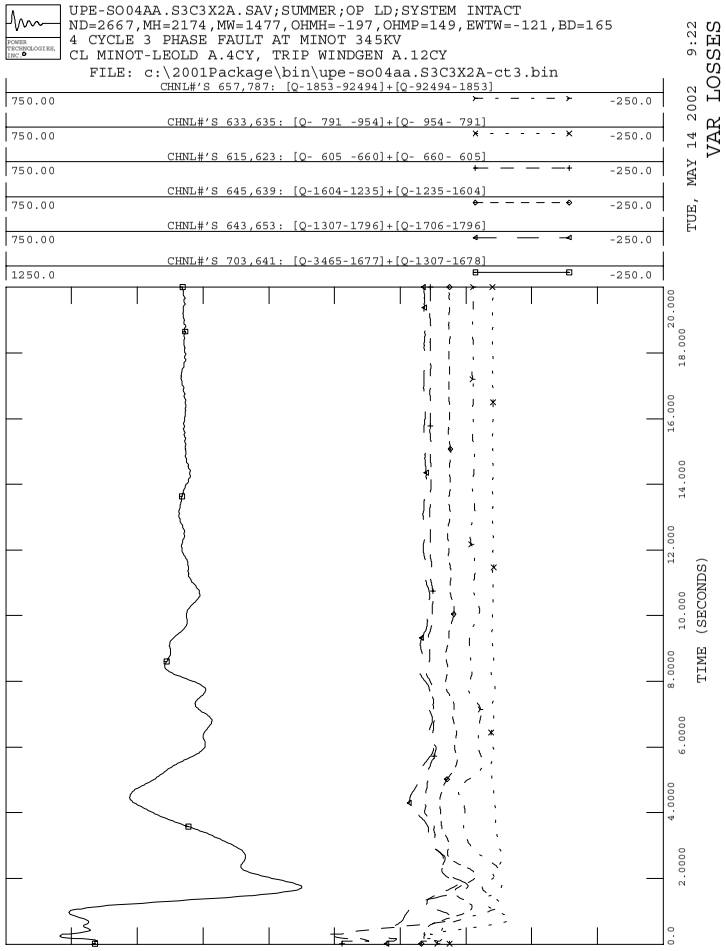

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TIME (SECONDS)
TUE, MAY 14 2002 9:22
MH DC PARAMETERS

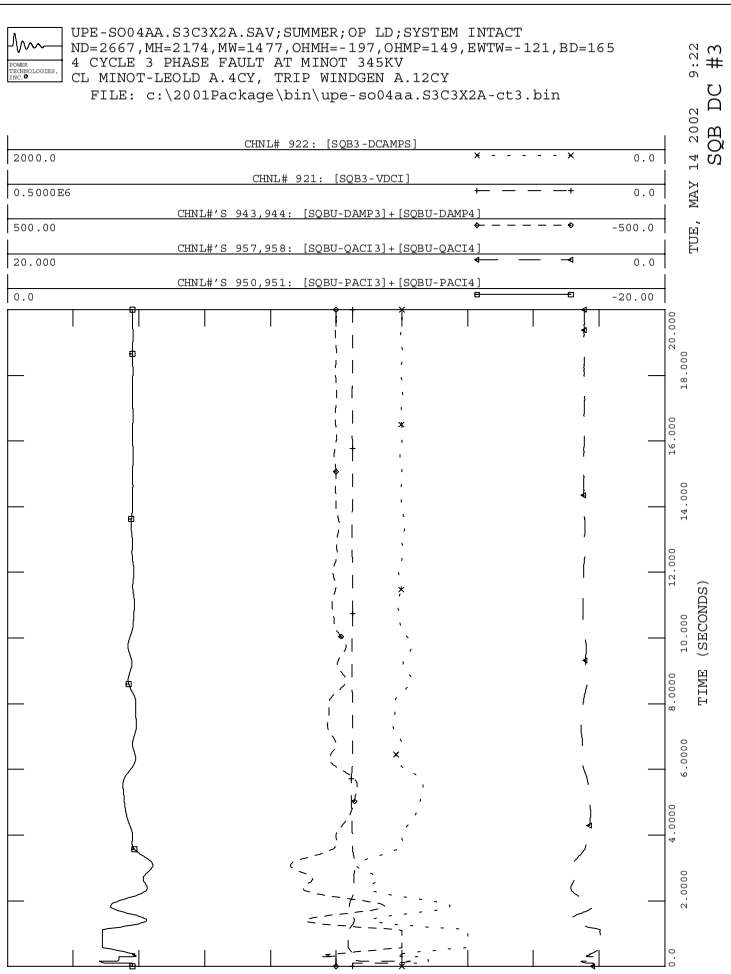

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TIME (SECONDS)
TUE, MAY 14 2002 9:22
CU DC #1

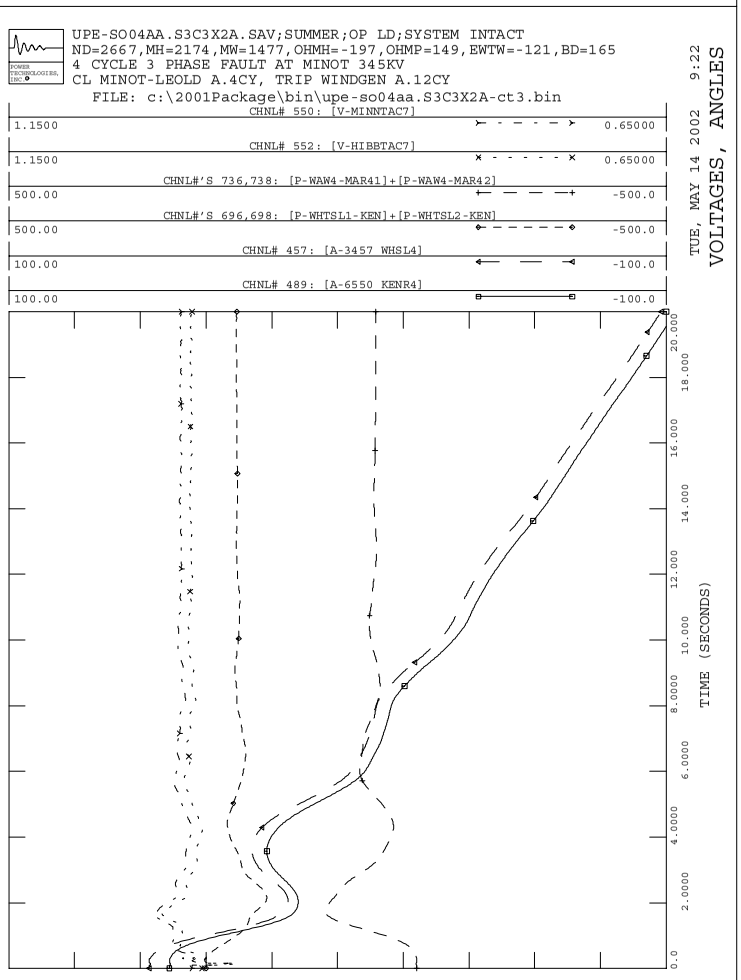

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TIME (SECONDS)
TUE, MAY 14 2002 9:22
OH TIE FLOWS


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TIME (SECONDS)
TUE, MAY 14 2002 9:22
MH DC PARAMETERS


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
TUE, MAY 14 2002 9:22
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
TUE, MAY 14 2002 9:22
VAR LOSSES
TIME (SECONDS)

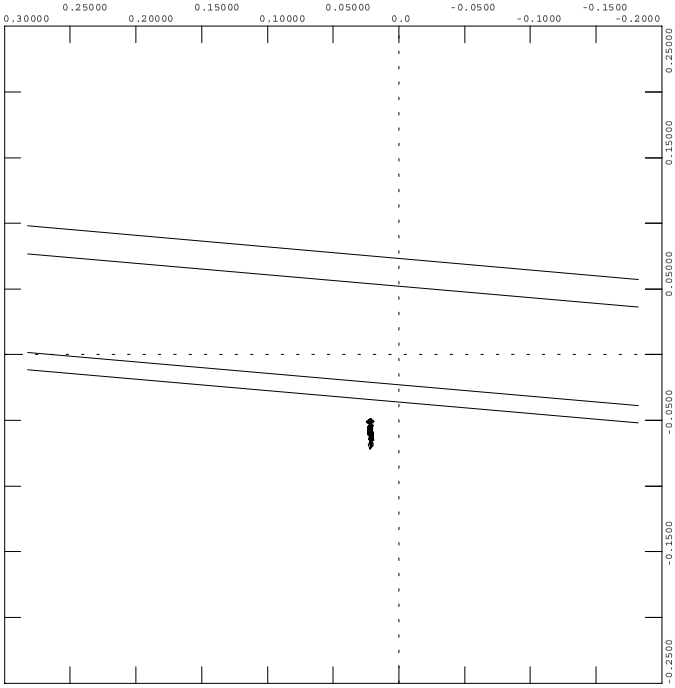

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
TUE, MAY 14 2002 9:22
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
TUE, MAY 14 2002 9:22
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

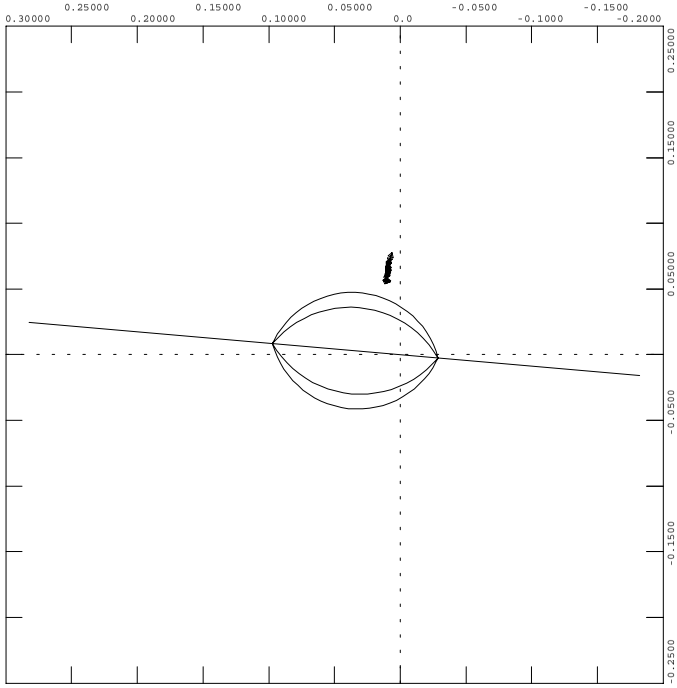


TUE, MAY 14 2002 9:22
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

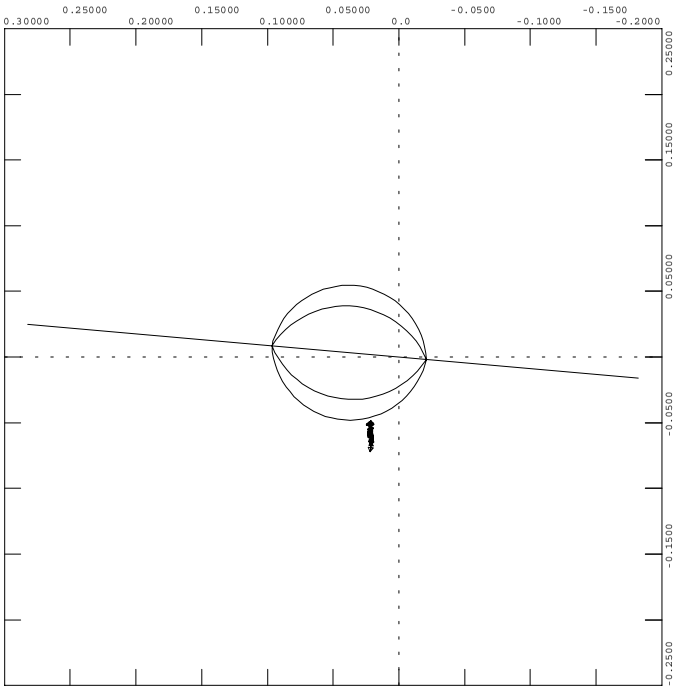


TUE, MAY 14 2002 9:22
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

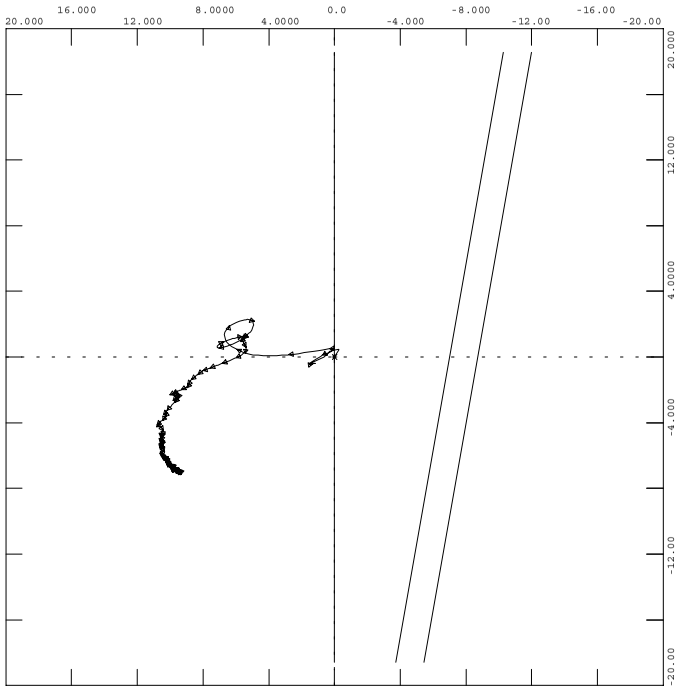


TUE, MAY 14 2002 9:22
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

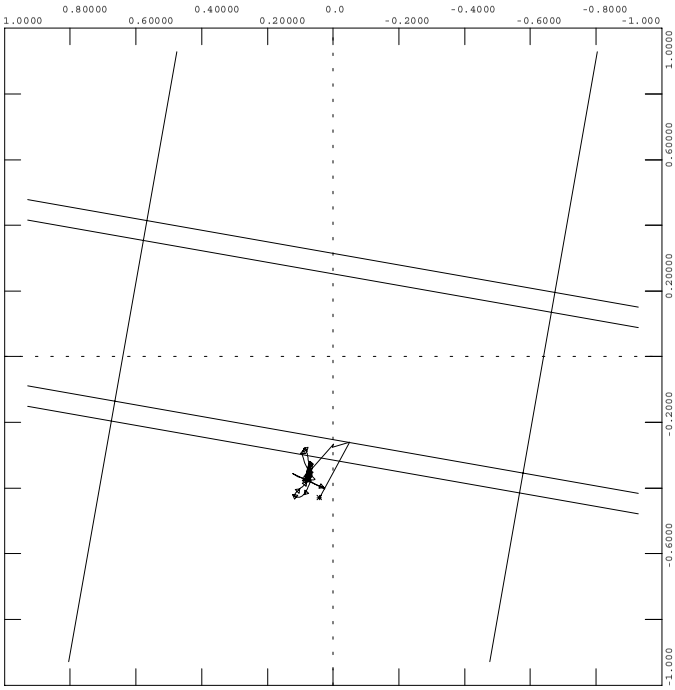


TUE, MAY 14 2002 9:22
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

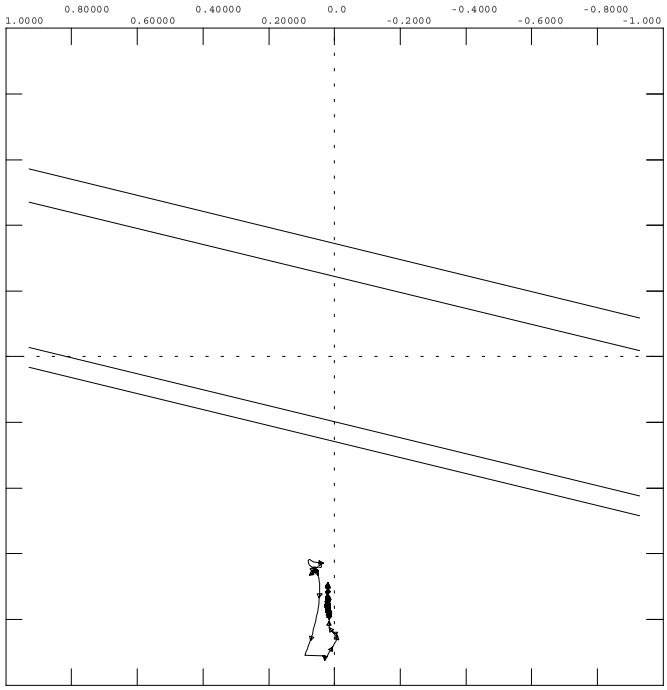
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

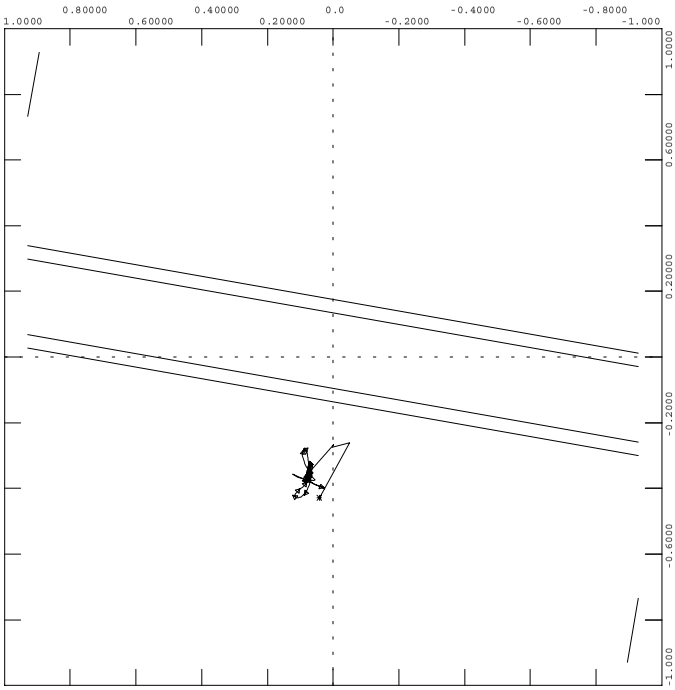
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

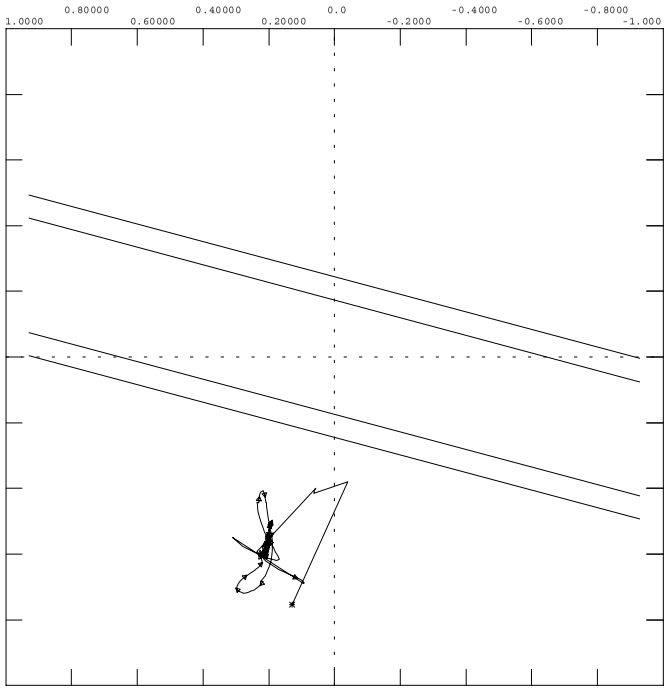
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

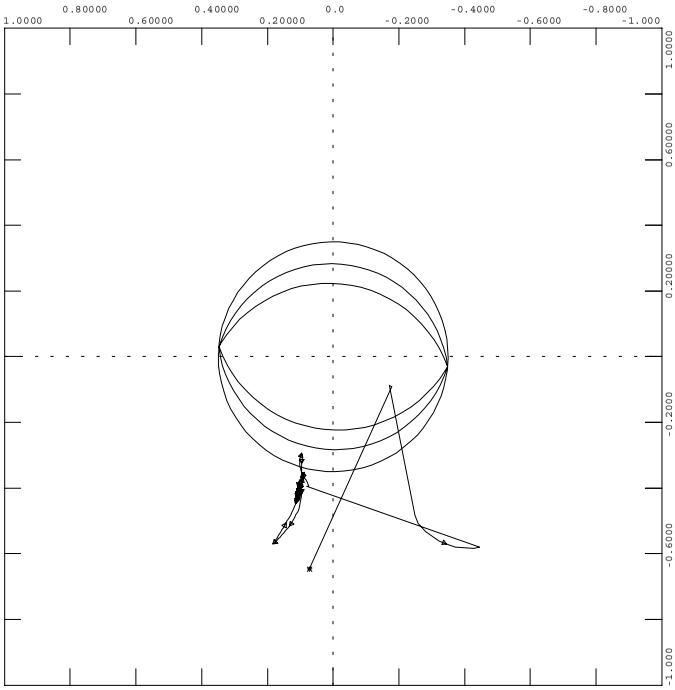
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

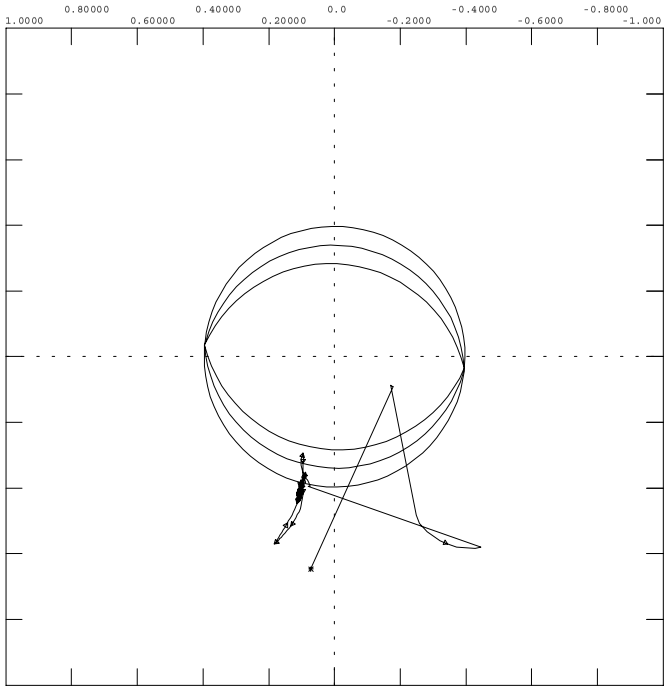
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

RELAY: SLINOS
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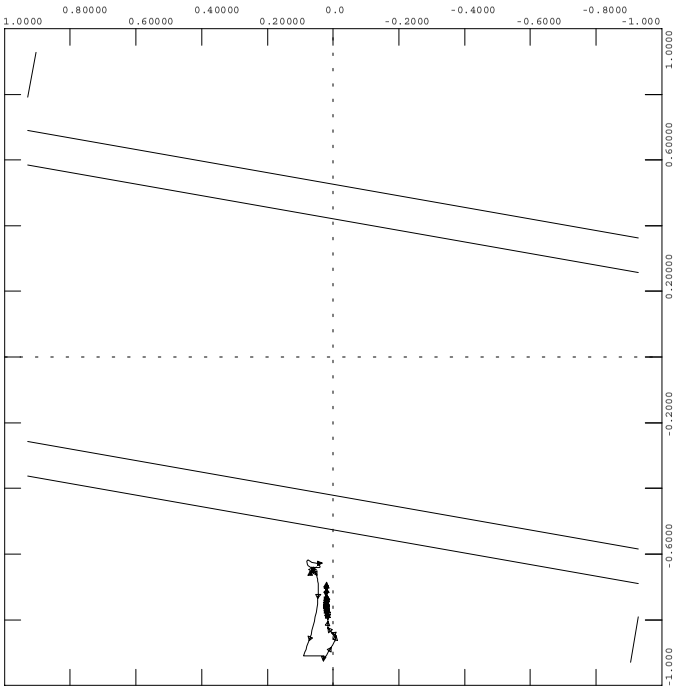

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

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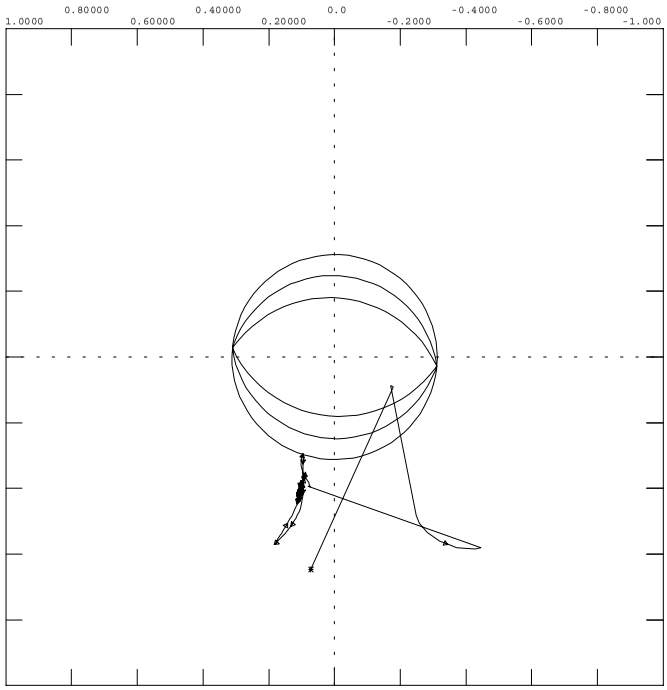
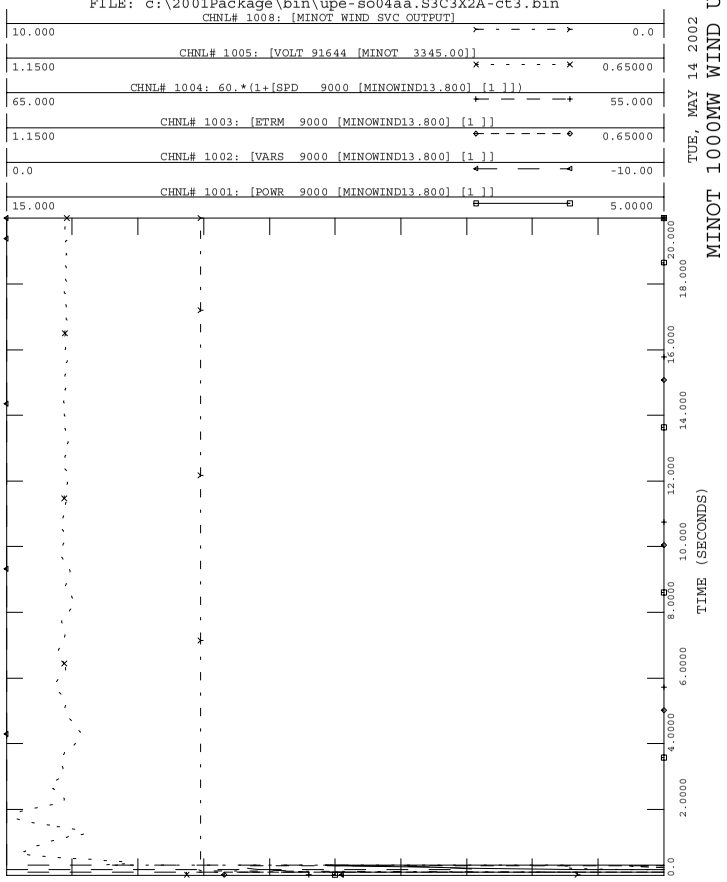


UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

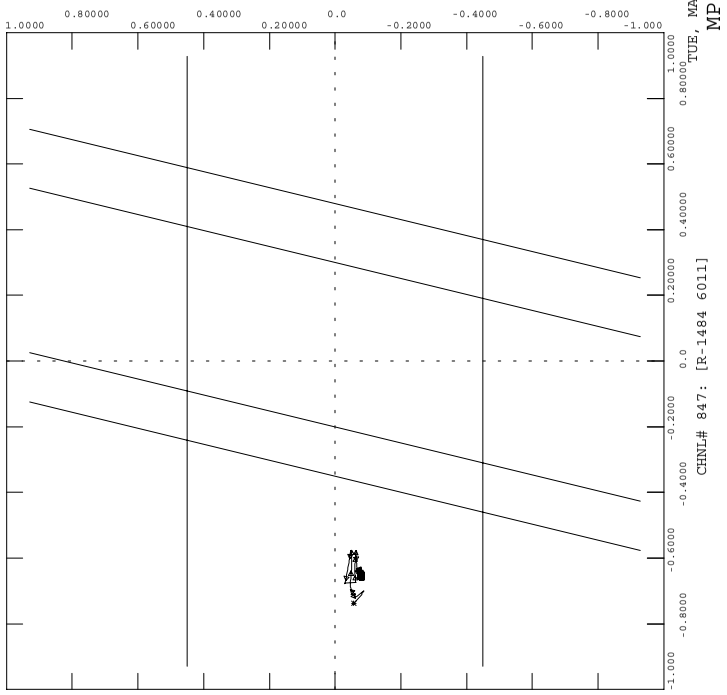


TUE, MAY 14 2002 9:22
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY

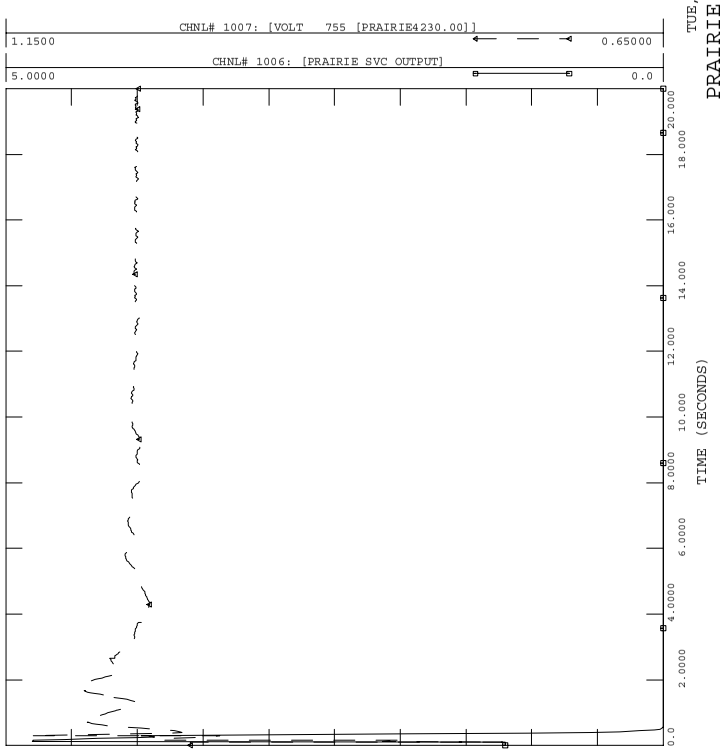
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



TUE, MAY 14 2002 9:22
MP-OH I.FALLS (779)

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CL MINOT-LEOLD A.4CY, TRIP WINDGEN A.12CY
FILE: c:\2001Package\bin\upe-so04aa.S3C3X2A-ct3.bin



TUE, MAY 14 2002 9:22
PRAIRIE SVC RESPONSE

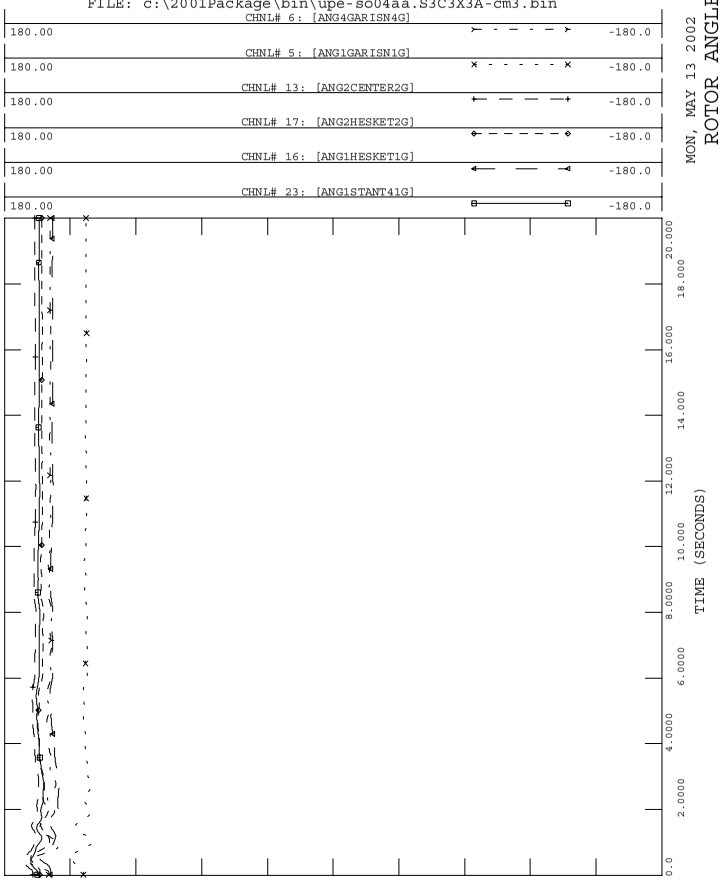
CASE S3C3X3A

CONTINGENCY CM3

4 cycle 3 phase fault at Minot 345kV. Clear Minot – Leland Olds 345 kV line

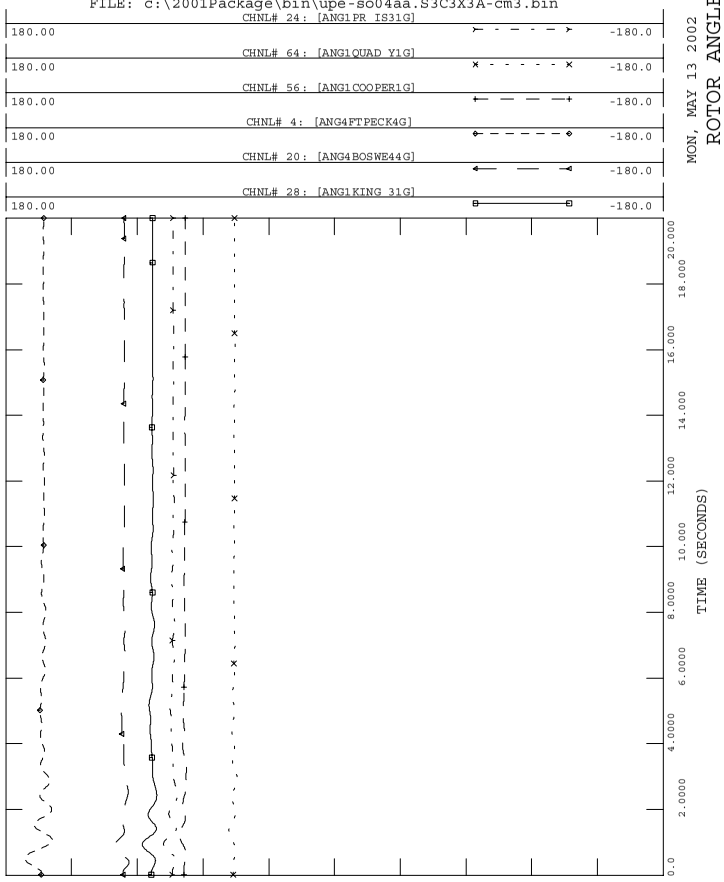
UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
ROTOR ANGLES 2



UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
ROTOR ANGLES 4



UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
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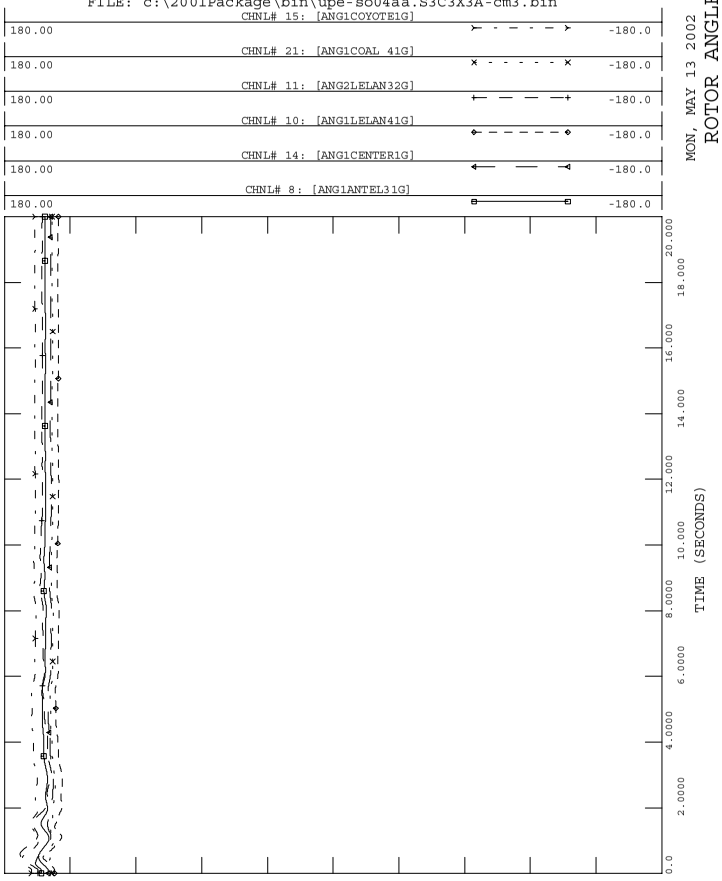

UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
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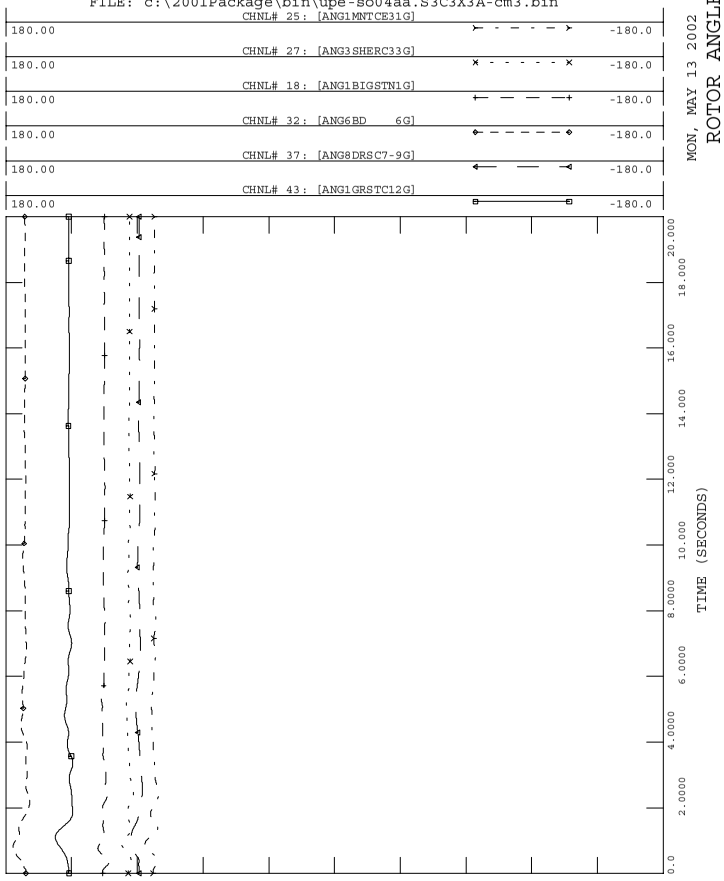
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
ROTOR ANGLES 3



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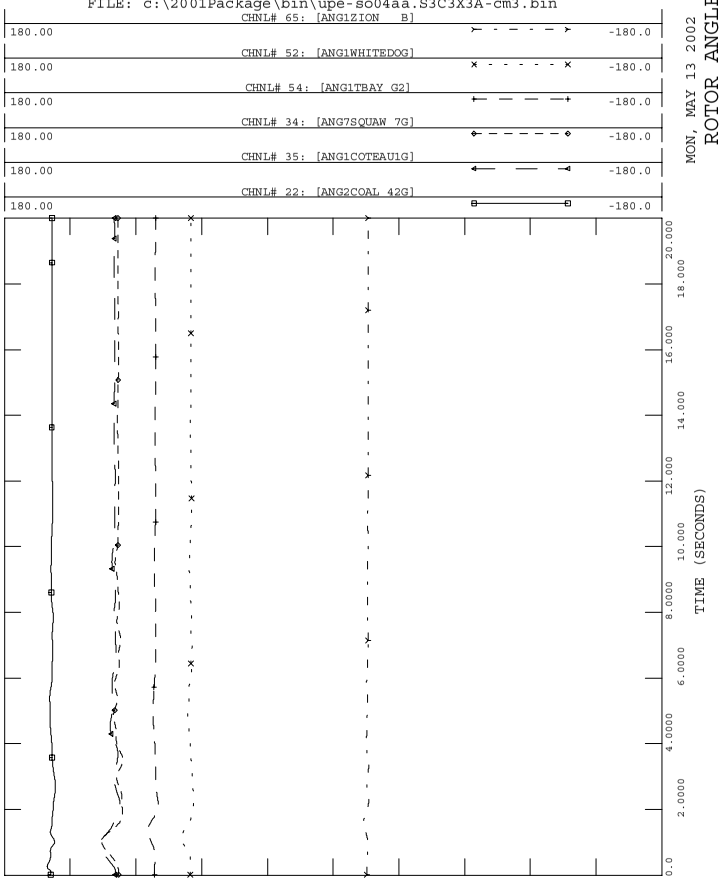
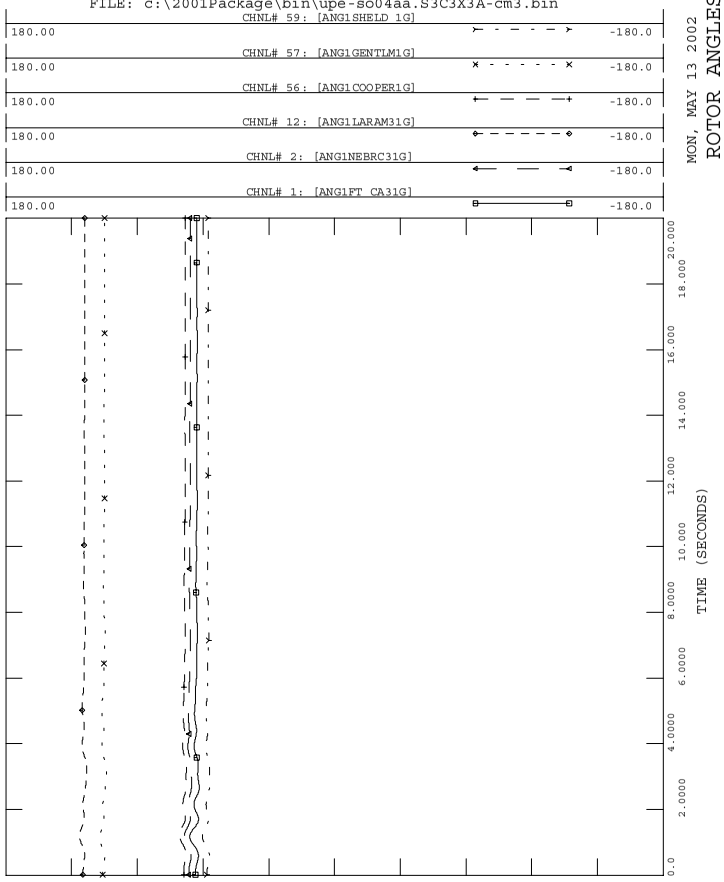
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
ROTOR ANGLES 6



UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
ROTOR ANGLES NB



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ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
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MON, MAY 13 2002 20:07
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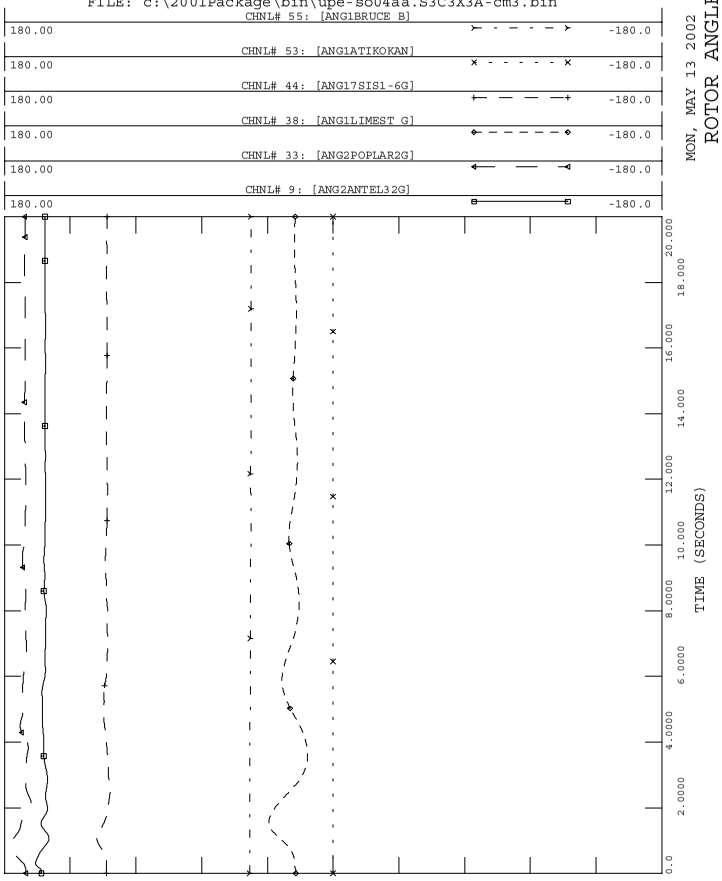

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ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
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CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
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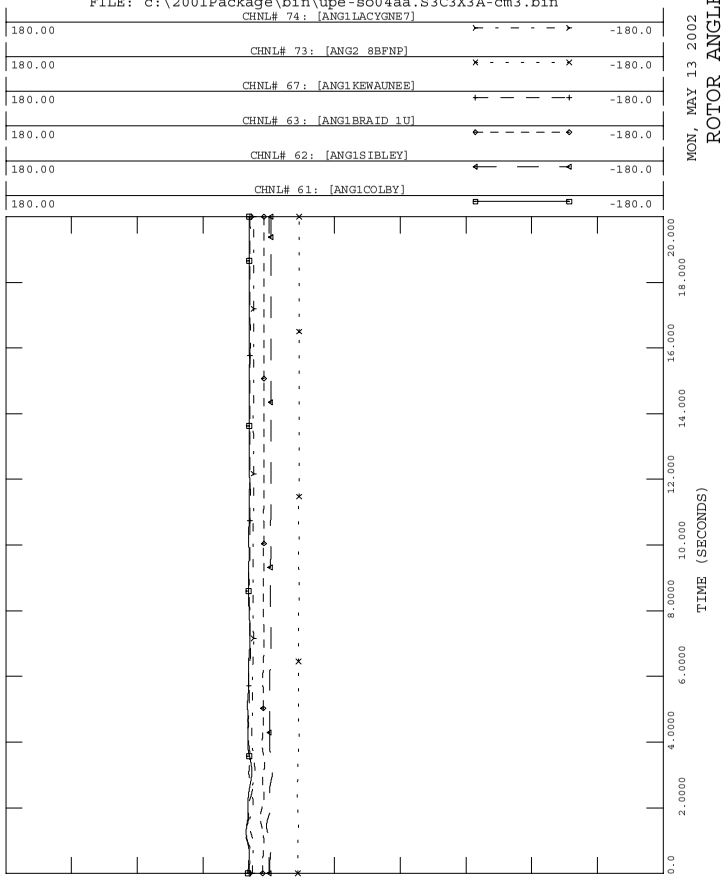

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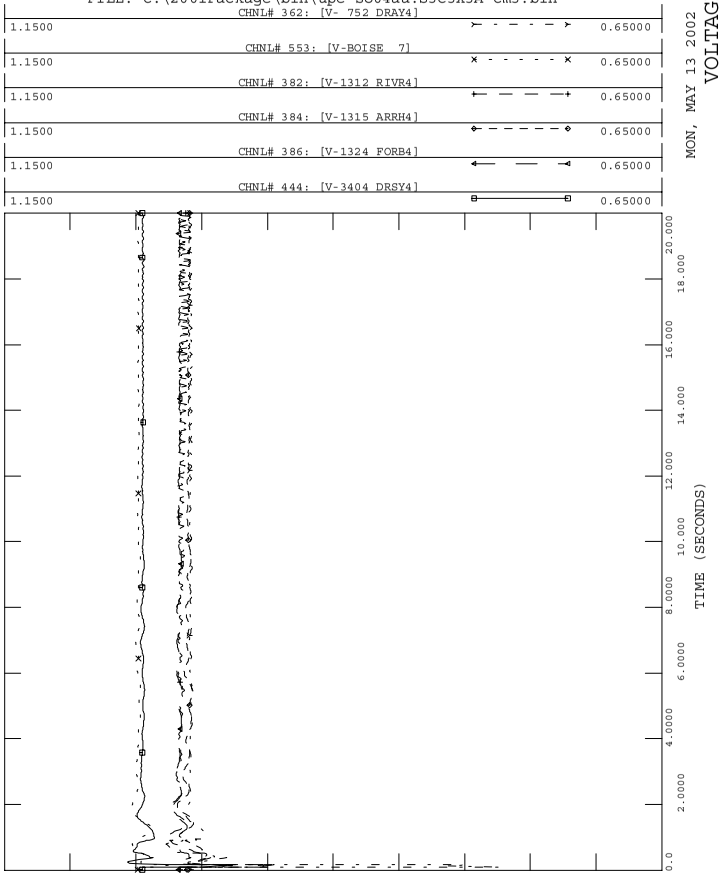
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
VOLTAGES 1



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ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
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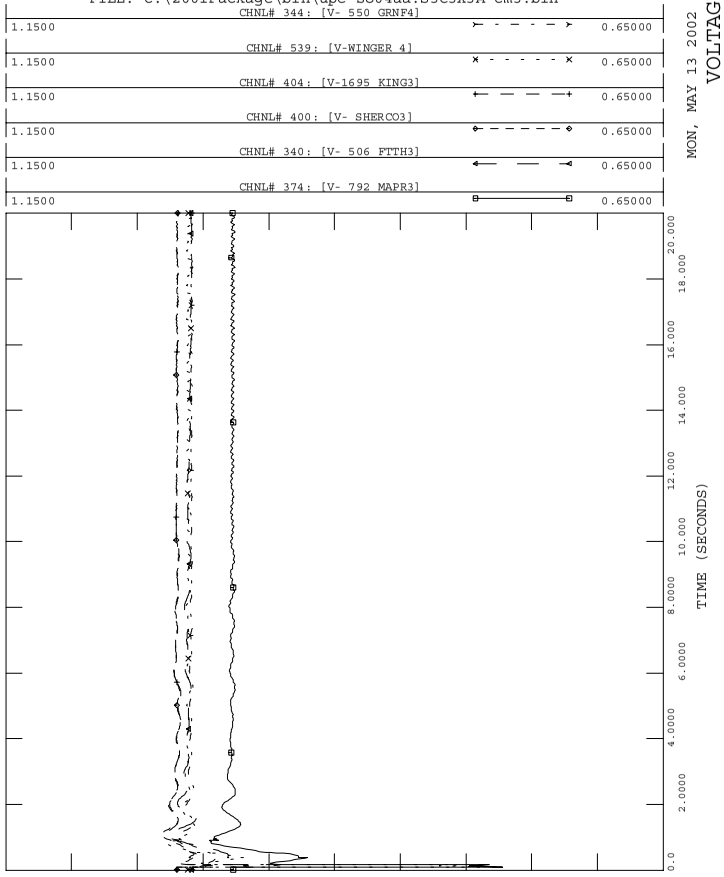
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
VOLTAGES 3



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ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
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CLEAR MINOT - LELAND OLDS 345 KV LINE
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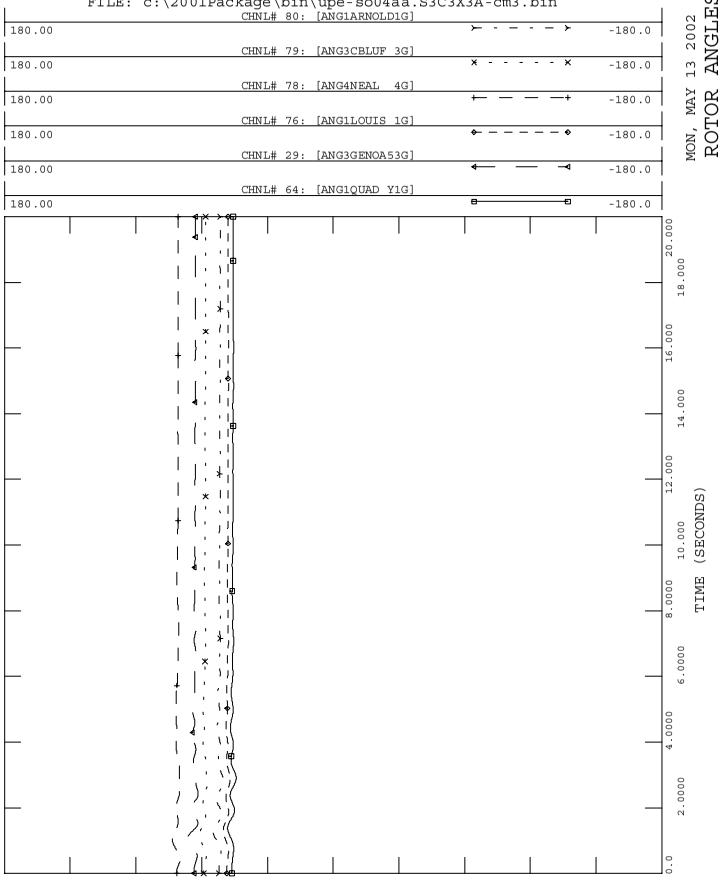
MON, MAY 13 2002 20:07
ROTOR ANGLES IA



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CLEAR MINOT - LELAND OLDS 345 KV LINE
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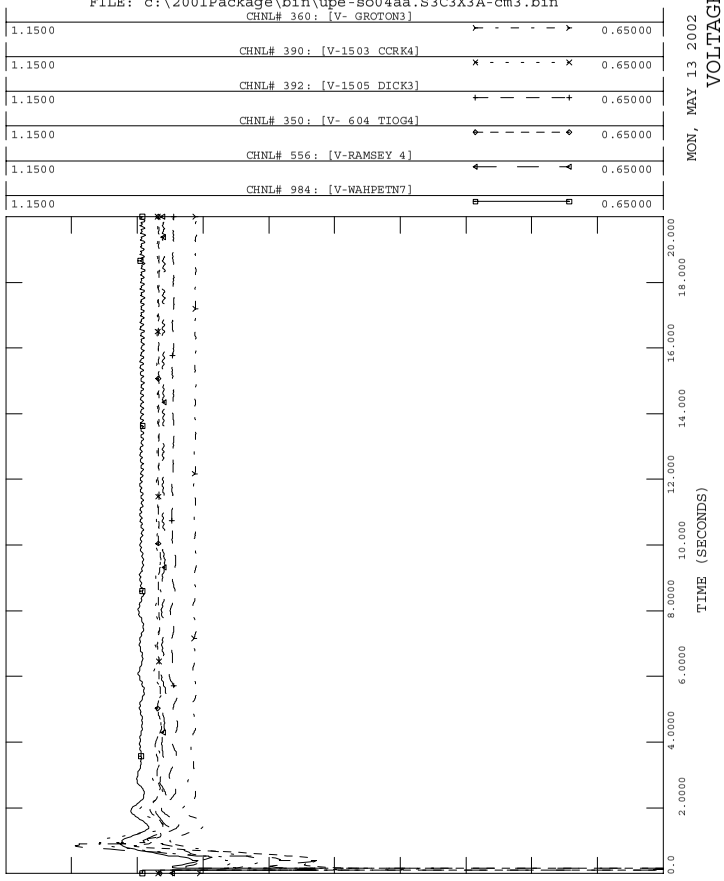
MON, MAY 13 2002 20:07
VOLTAGES 2



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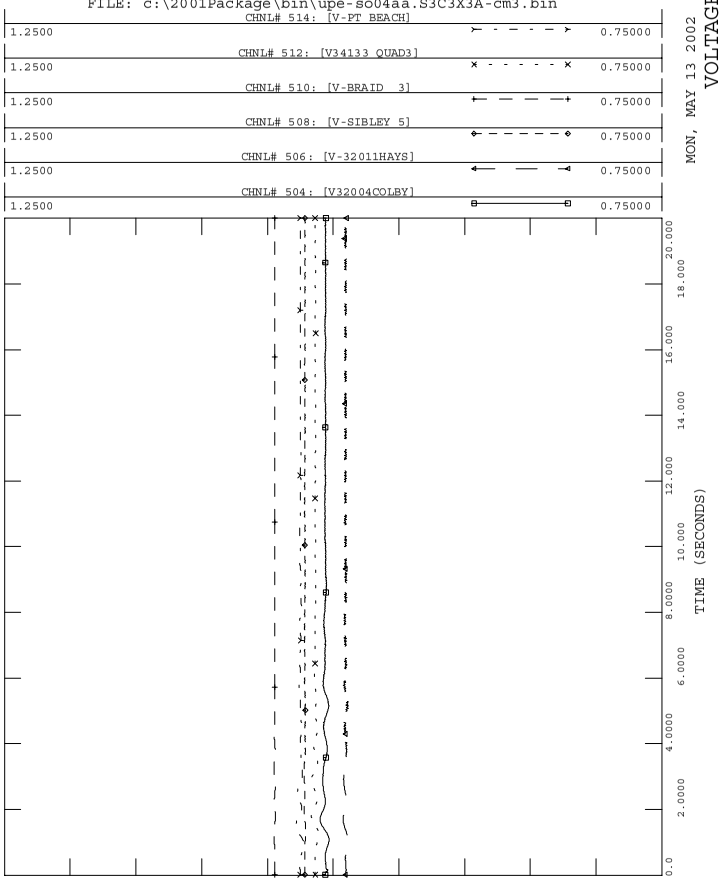
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
VOLTAGES 5



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
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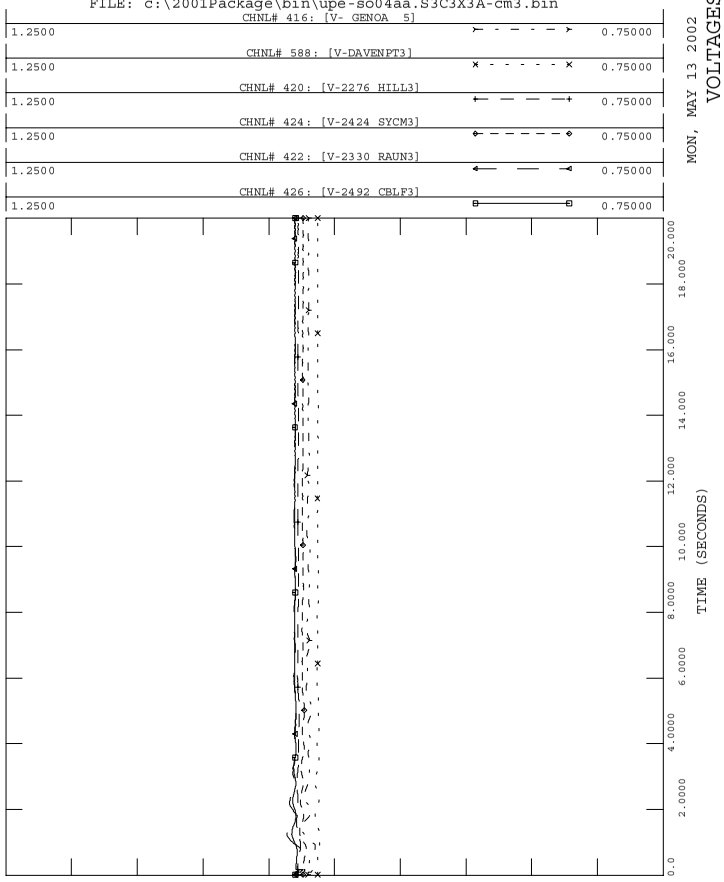
MON, MAY 13 2002 20:07
VOLTAGES IA



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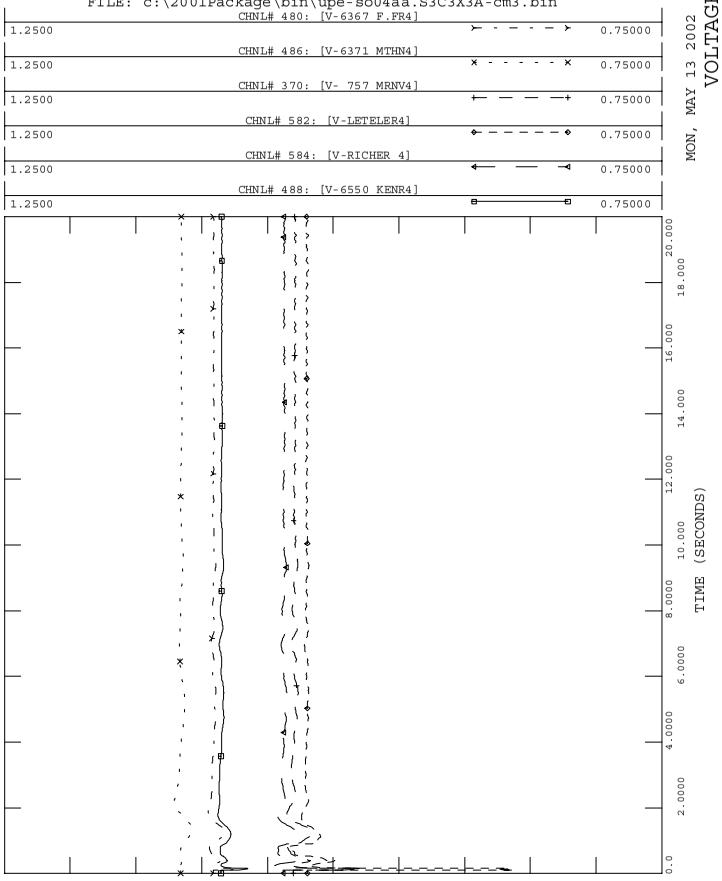
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
VOLTAGES 4



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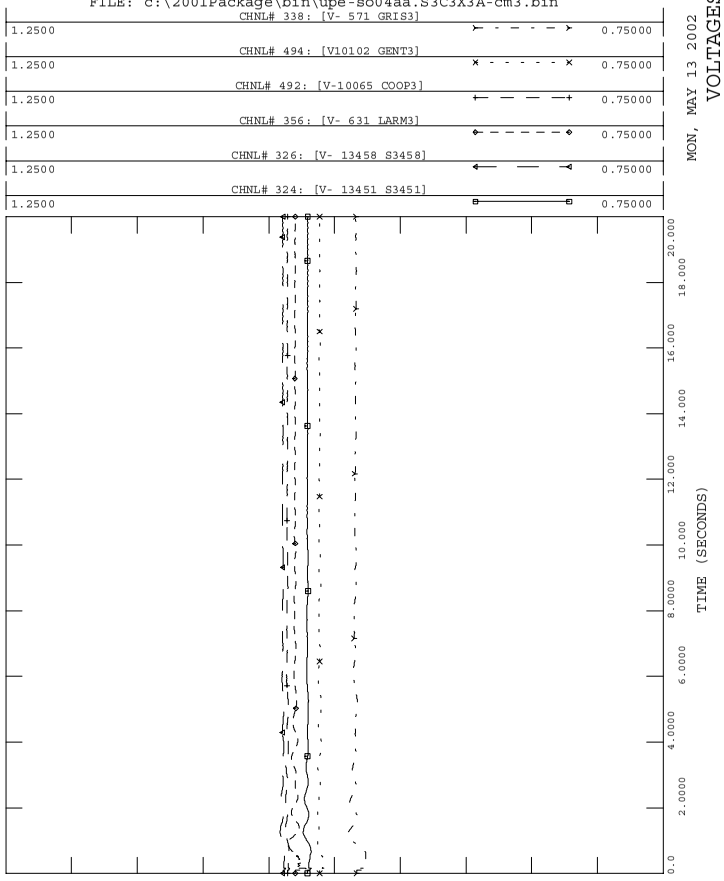
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
VOLTAGES NB



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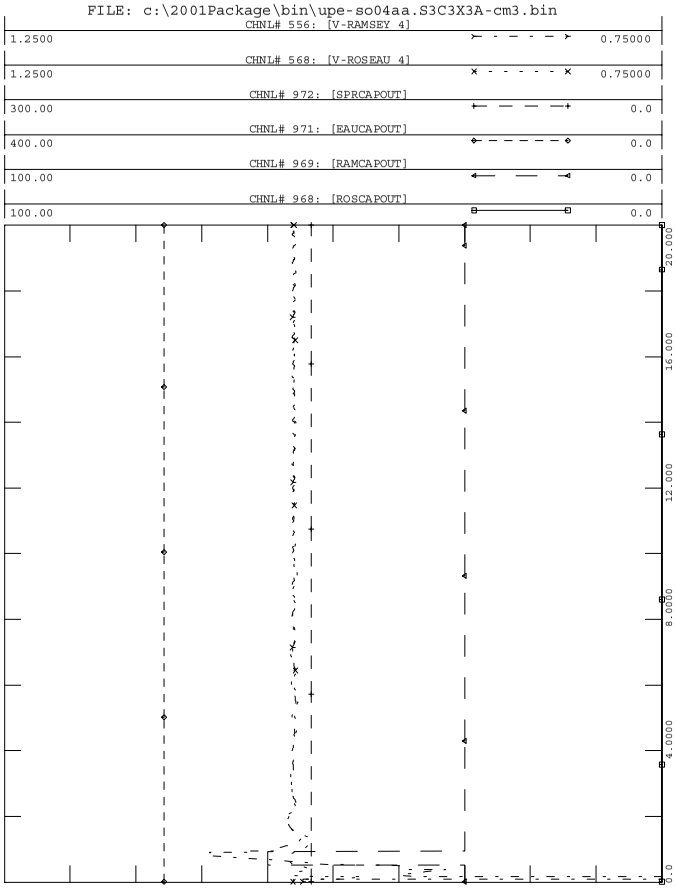
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
FAST SW CAP OUT 2



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ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
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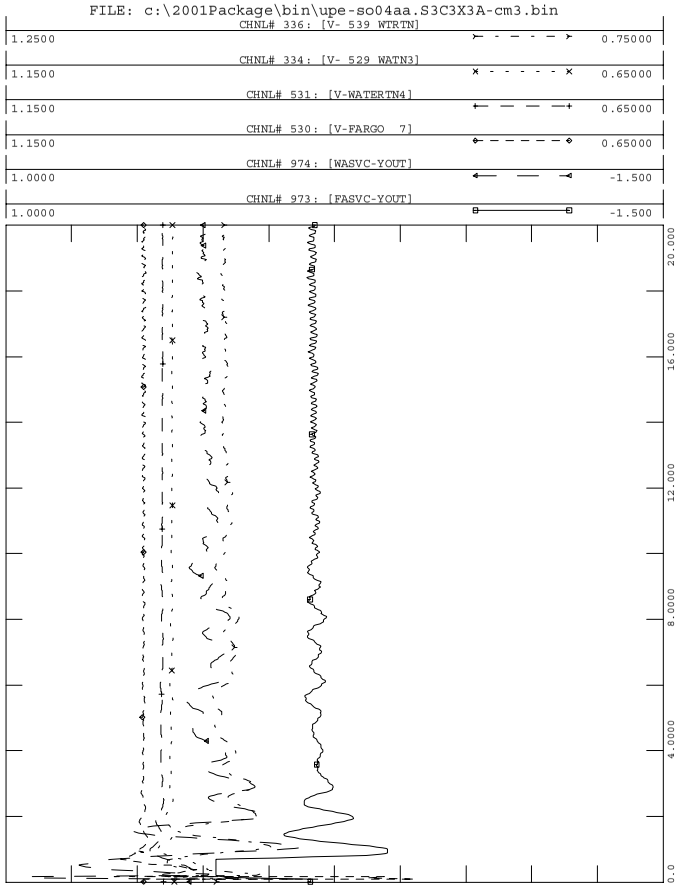
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
FARGO/WATERTOWN SVS



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ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
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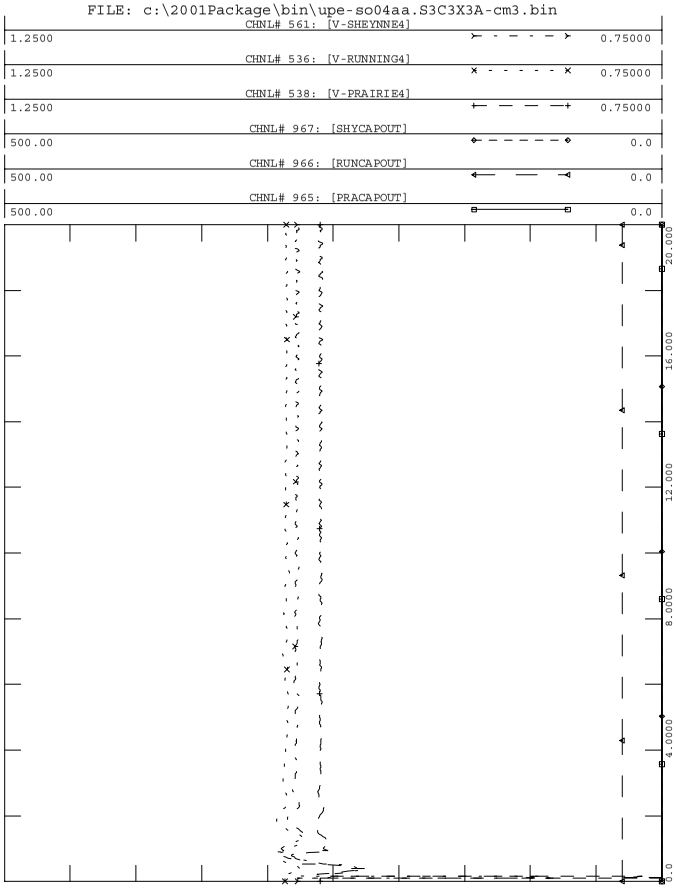
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
FAST SW CAP OUT 1



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ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
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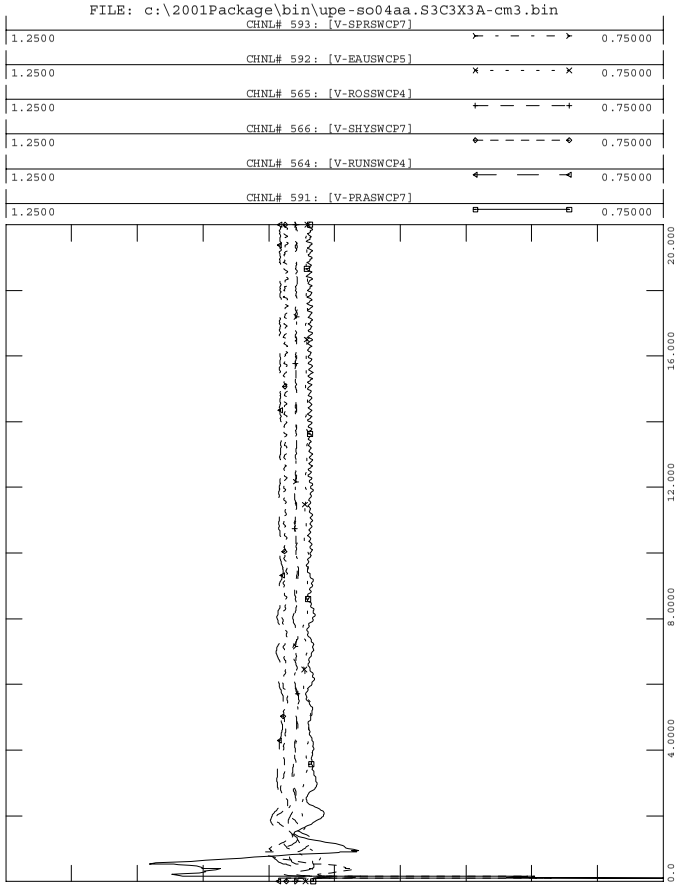
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
FAST SW CAP VOLTAGES



UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
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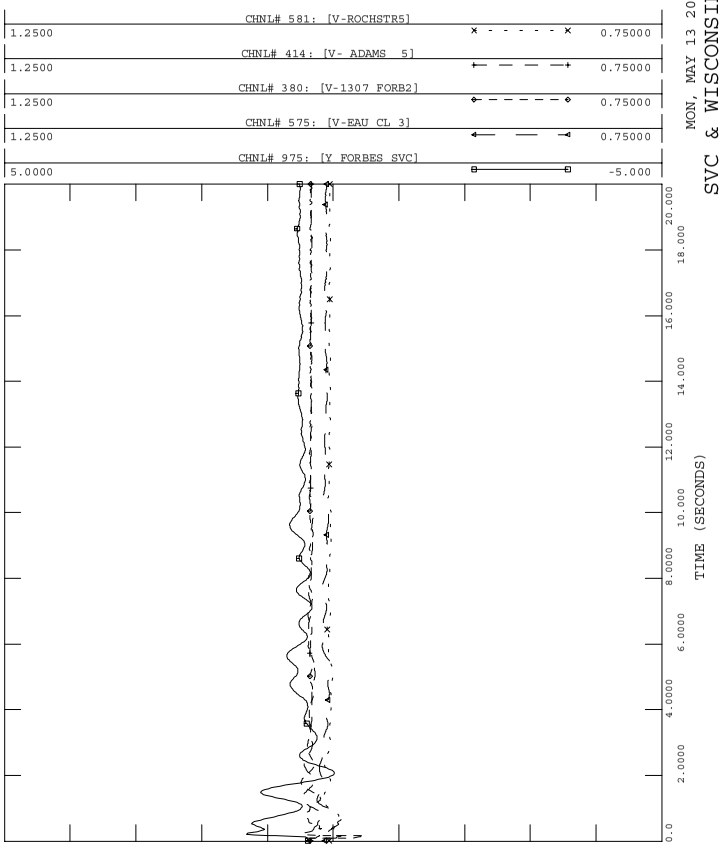
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07

SVC & WISCONSIN VOLT



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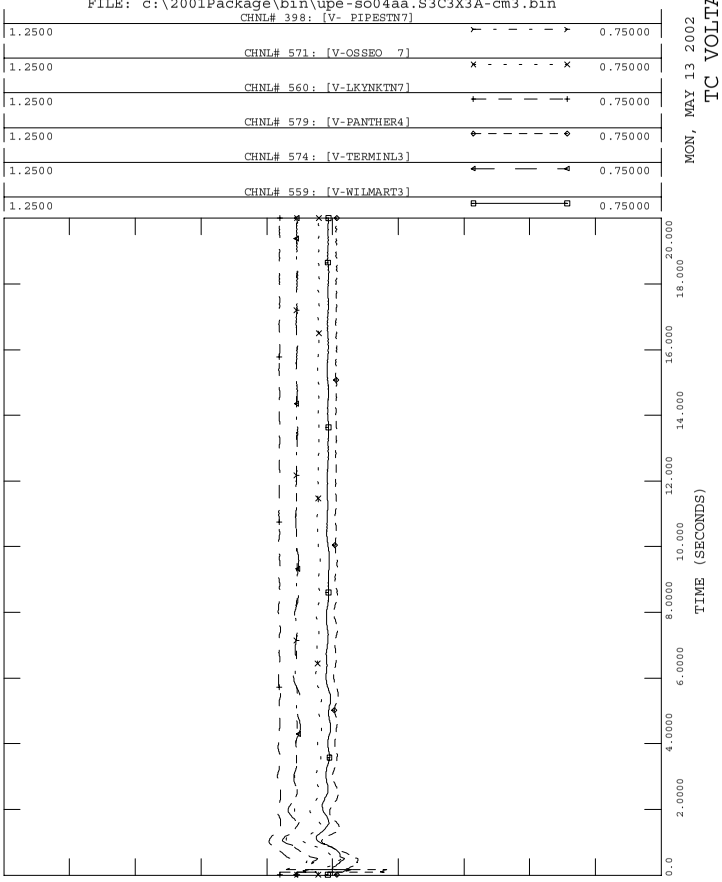
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07

TC VOLTAGES



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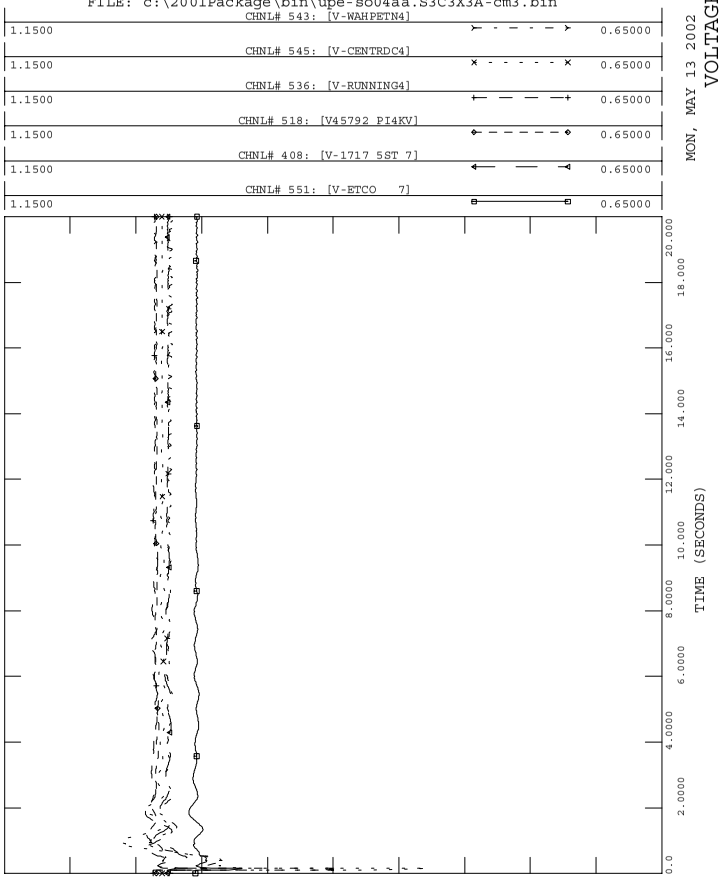
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07

VOLTAGES 6



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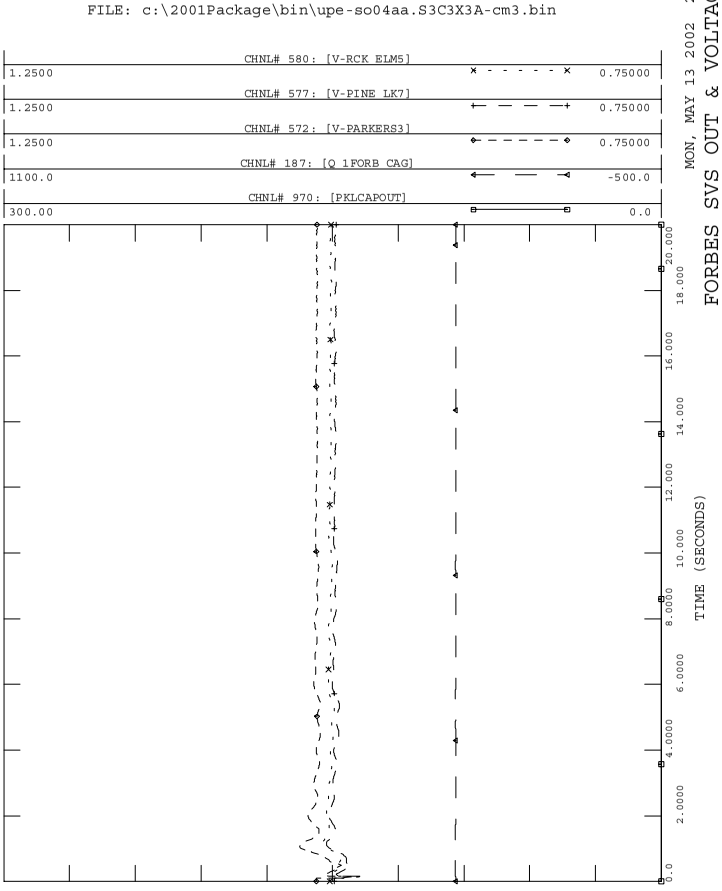
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07

FORBES SVS OUT & VOLTAGES



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
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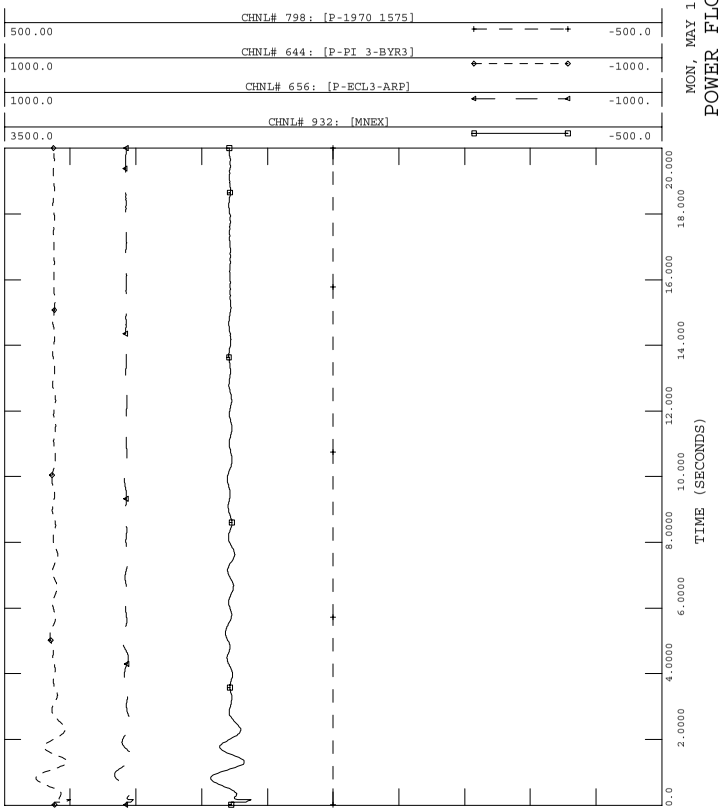
MON, MAY 13 2002 20:07
POWER FLOW SUMS 2



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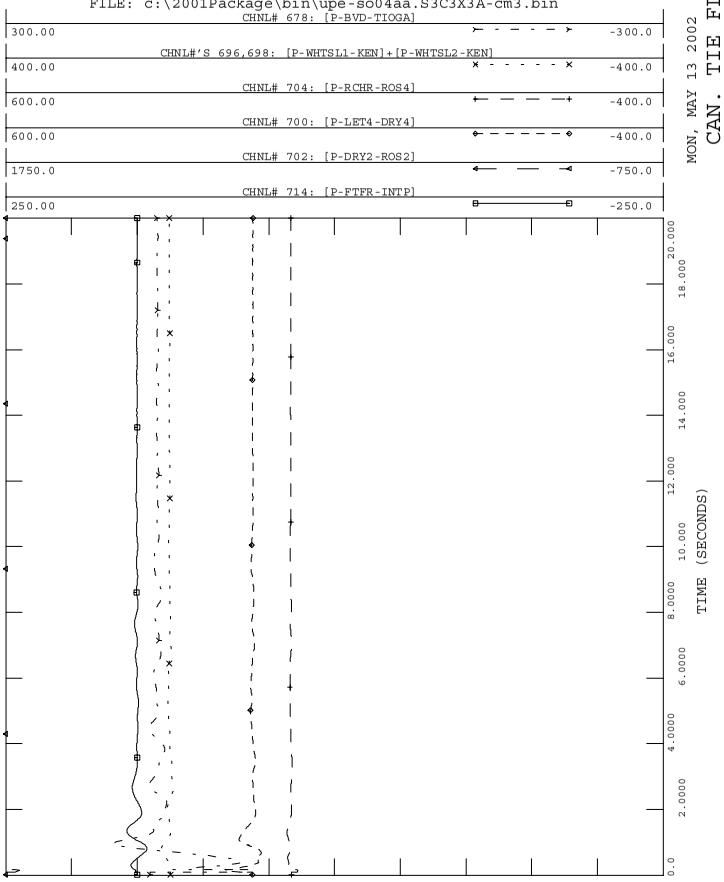
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
CAN. TIE FLOWS



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ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
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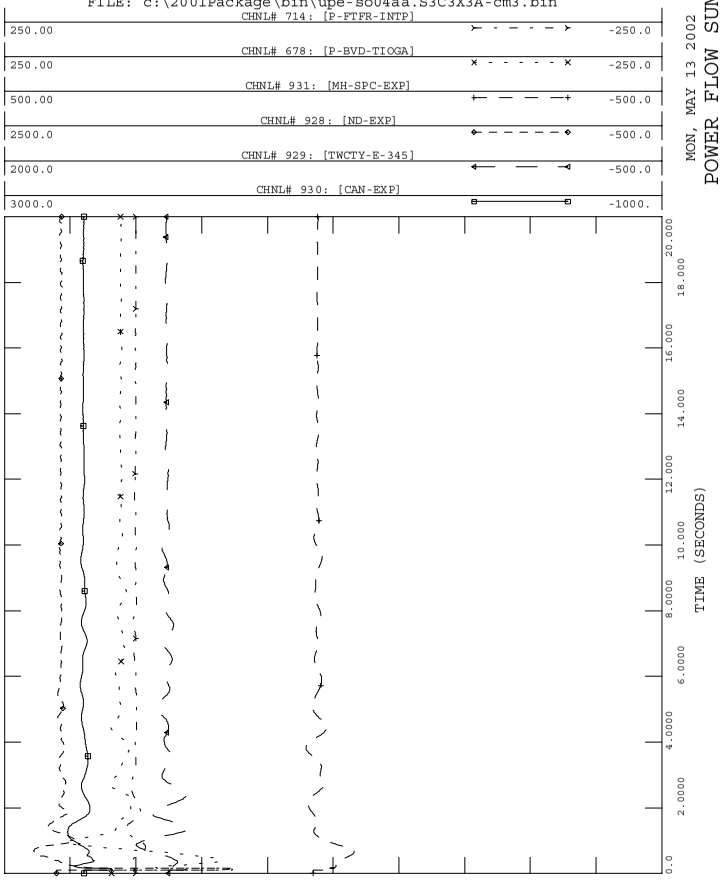
MON, MAY 13 2002 20:07
POWER FLOW SUMS 1



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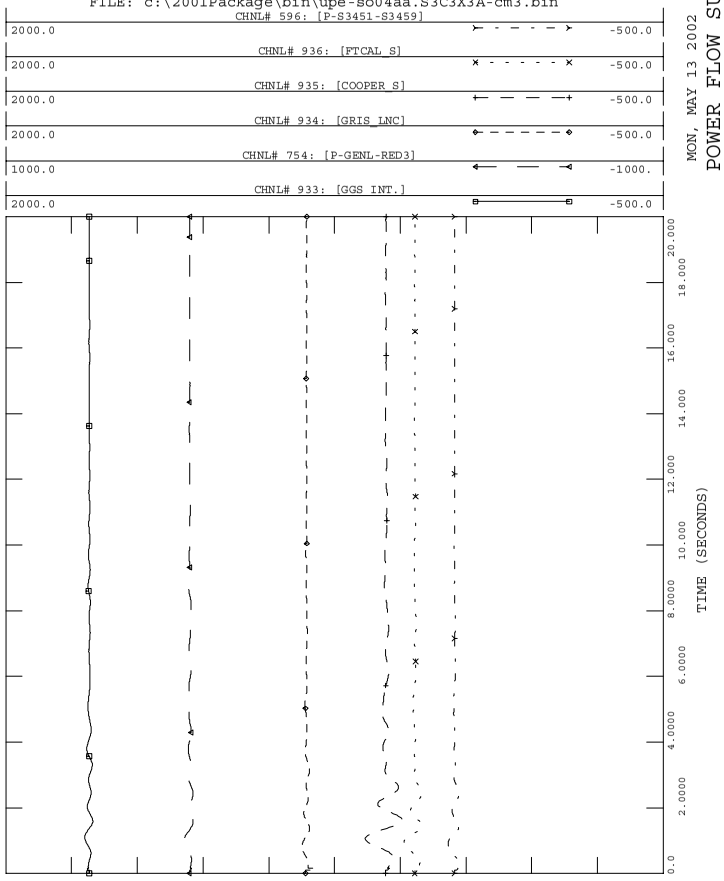
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
POWER FLOW SUM 3



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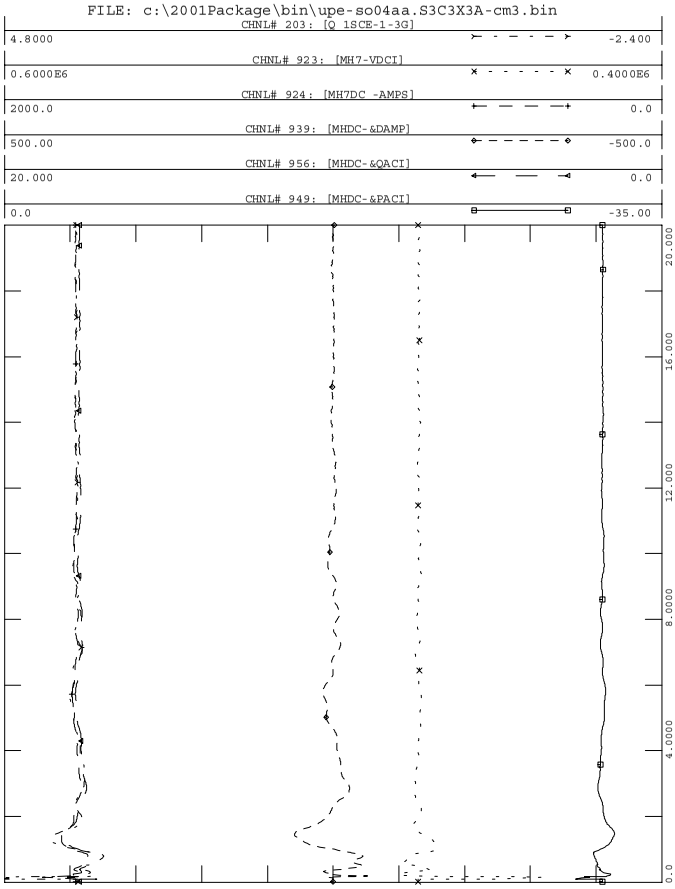
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
MH DC PARAMETERS



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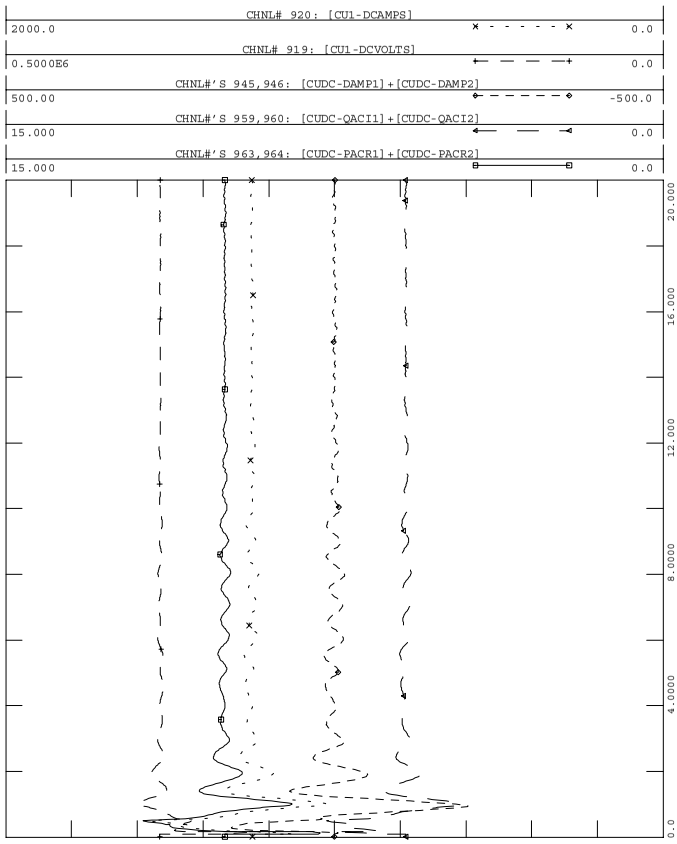
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
CU DC #1



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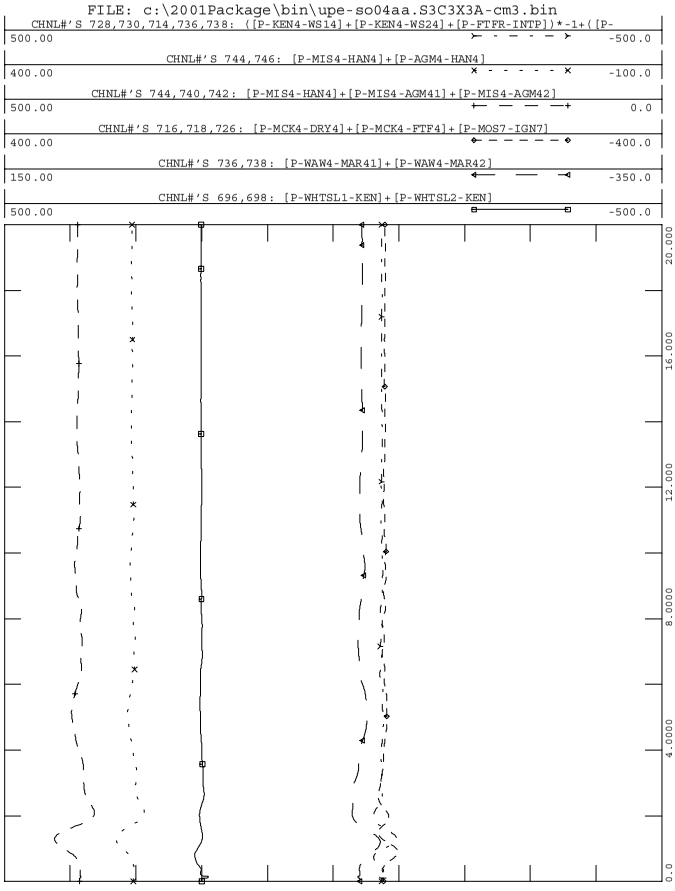
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
OH TIE FLOWS



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07
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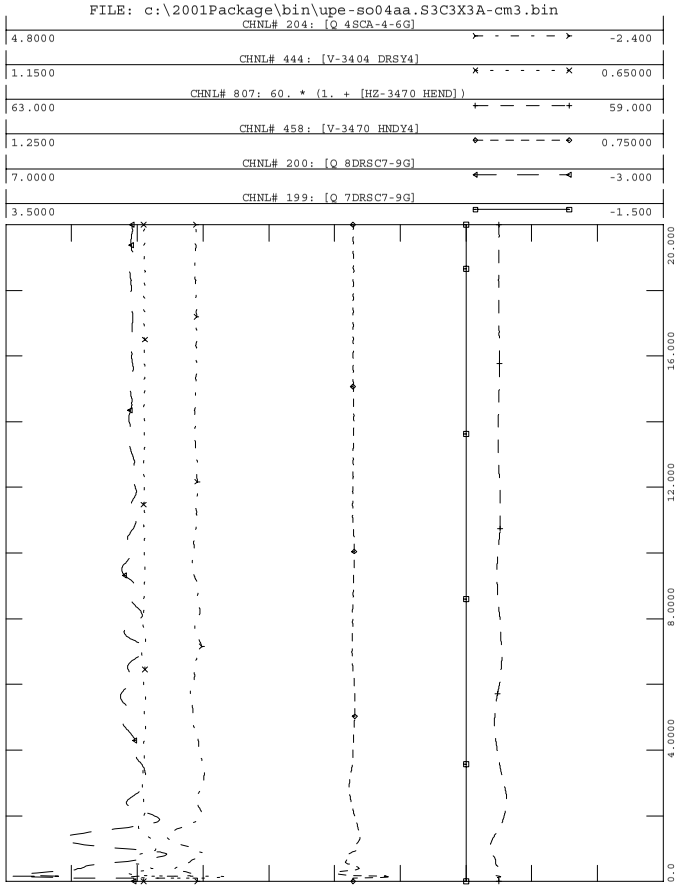

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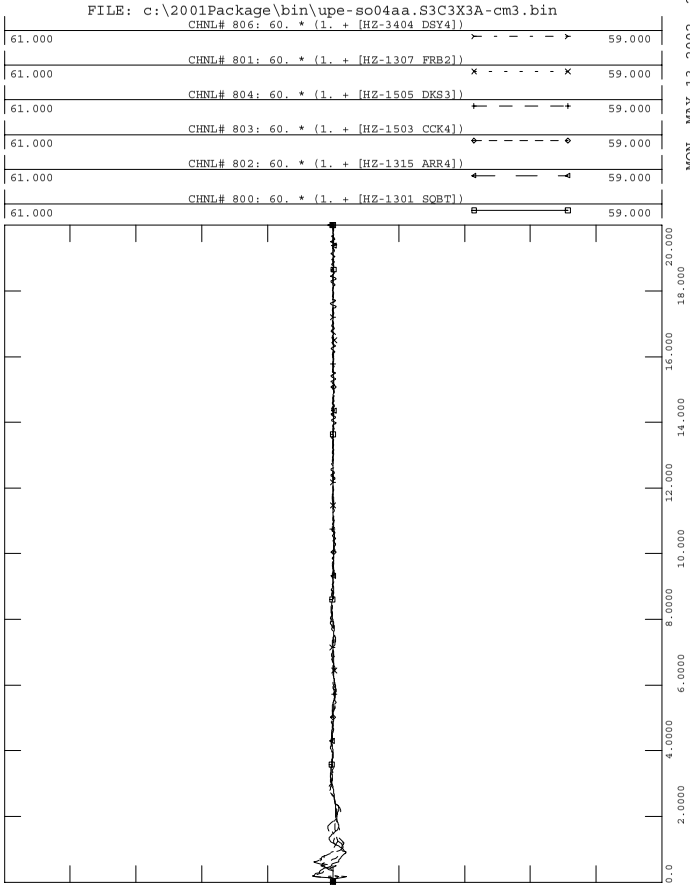
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07

FREQ AT DC TERMINALS



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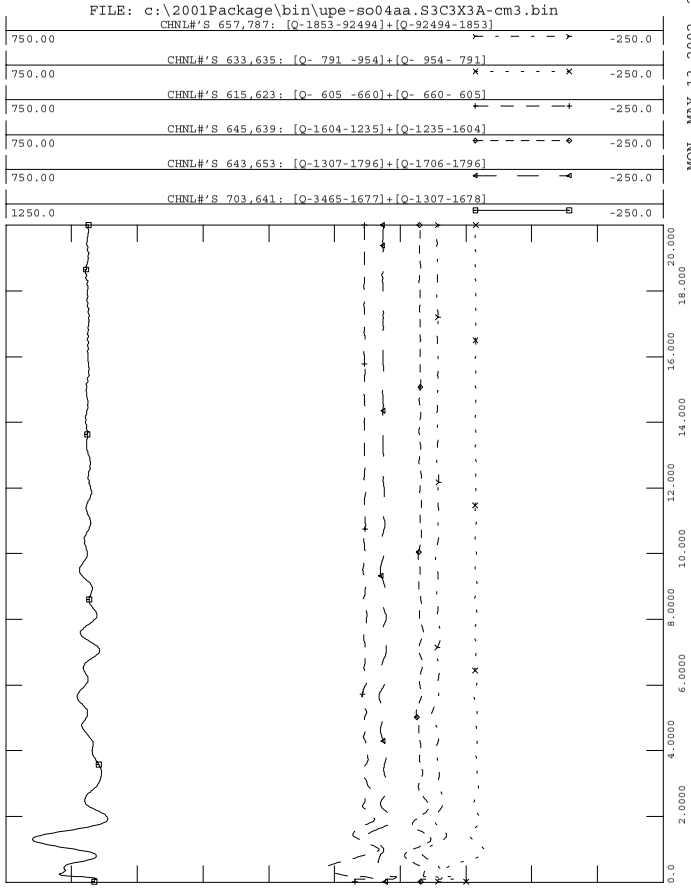
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07

VAR LOSSES



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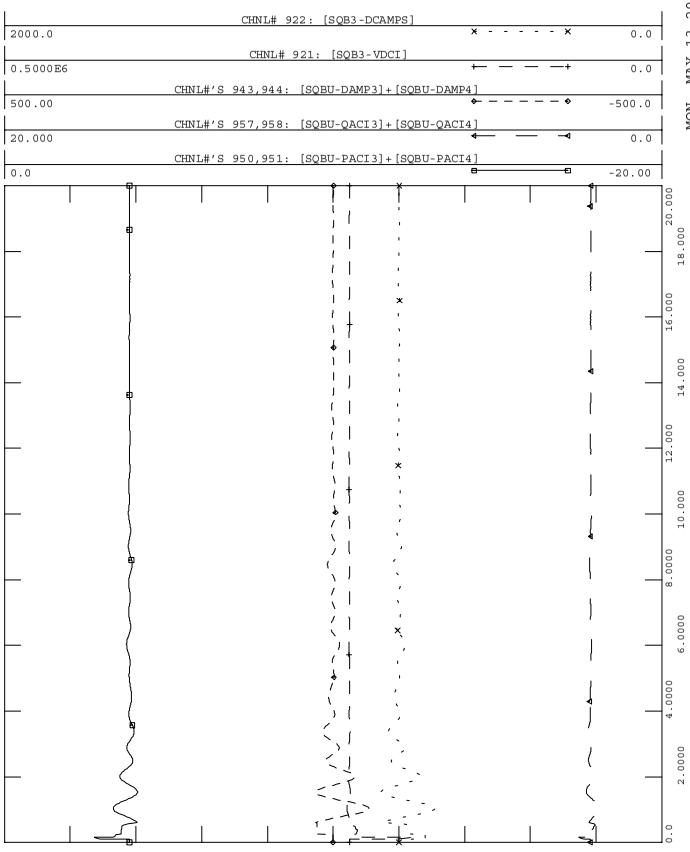
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07

SQB DC #3



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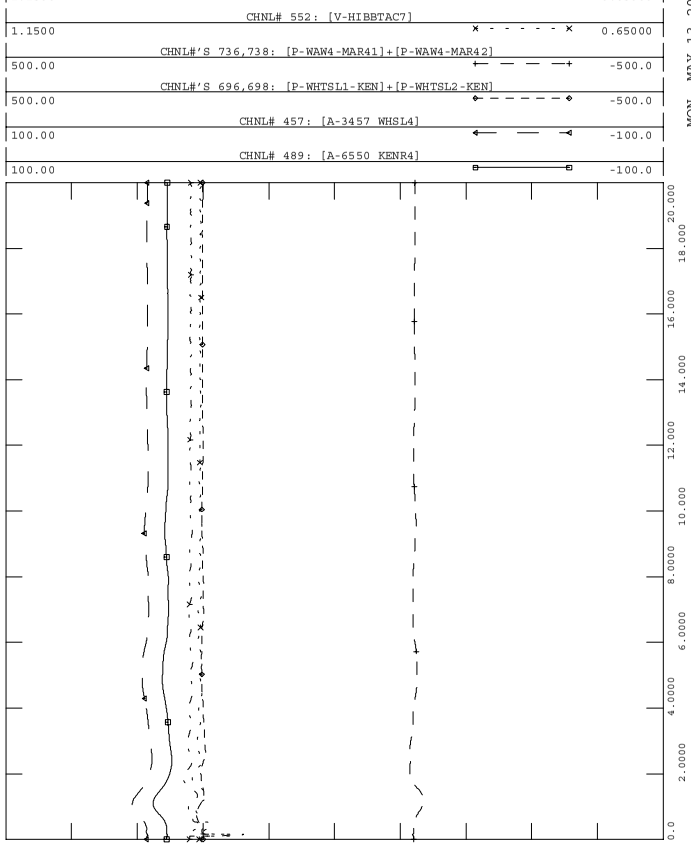
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

MON, MAY 13 2002 20:07

VOLTAGES, ANGLES



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

RELAY: SLINOS
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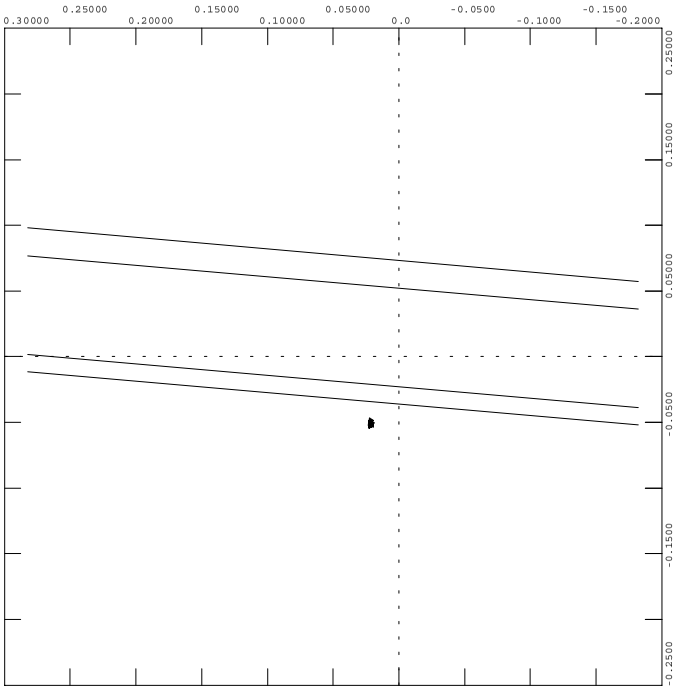
CHNL# 824: [X-FRB2-ROS2]



MON, MAY 13 2002 20:07
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

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ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

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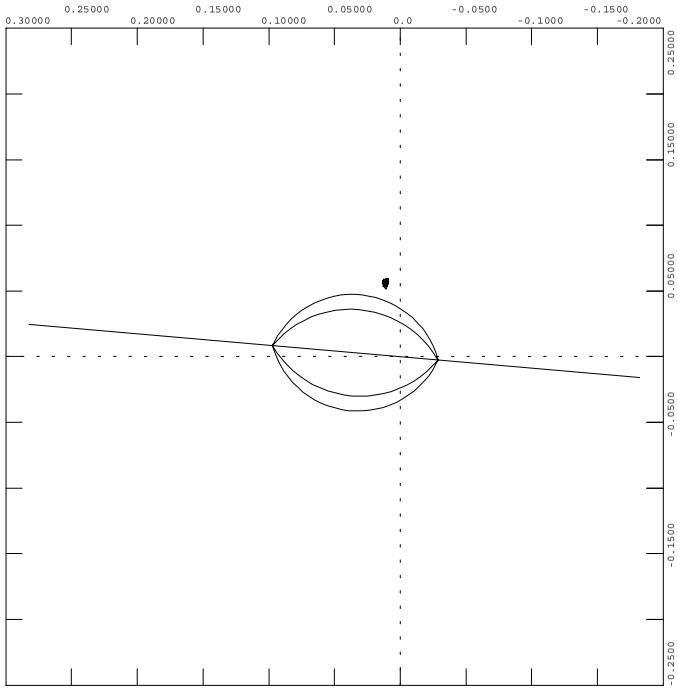

MON, MAY 13 2002 20:07
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

RELAY: RELAYG
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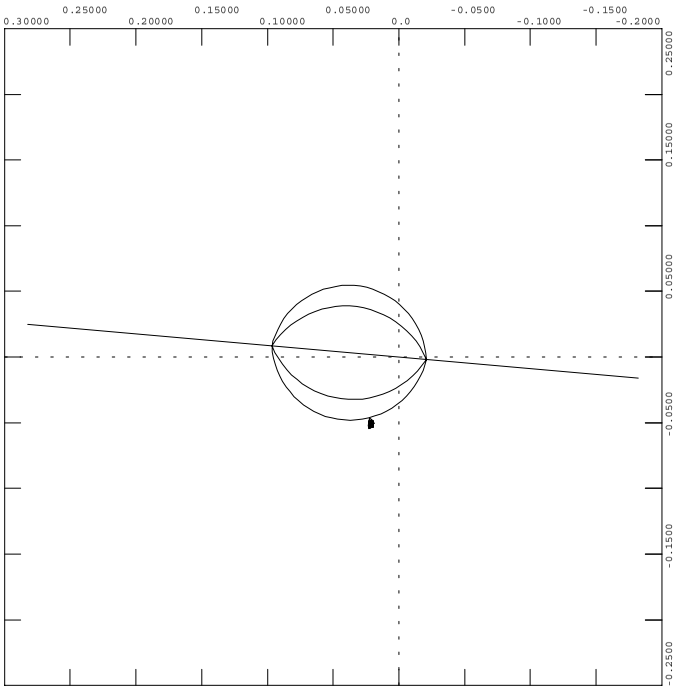

MON, MAY 13 2002 20:07
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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

RELAY: SLINOS
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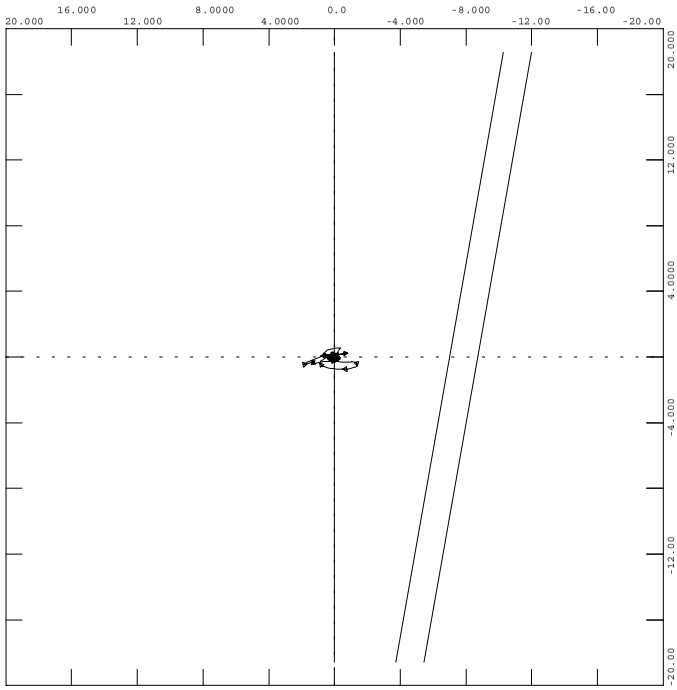
CHNL# 977: [DCAR-B]



MON, MAY 13 2002 20:07
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

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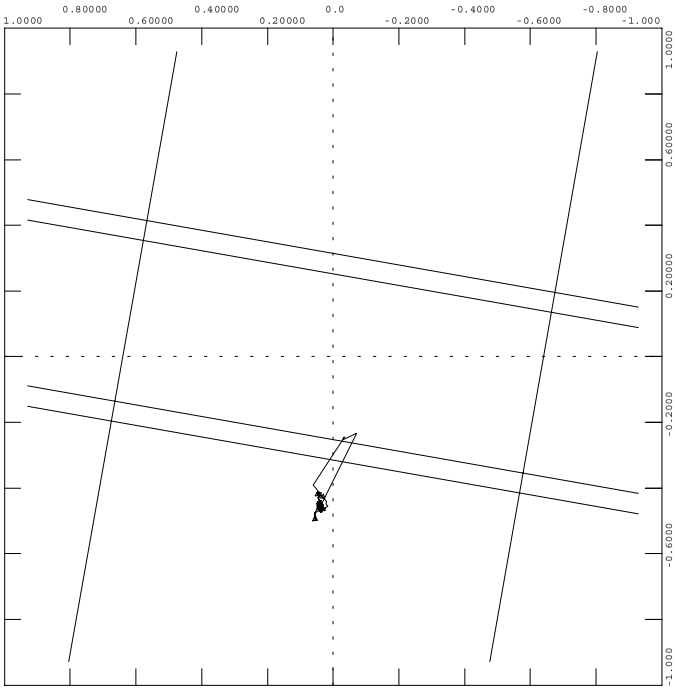
CHNL# 816: [X-DRY4-LET4]



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

RELAY: SLINOS
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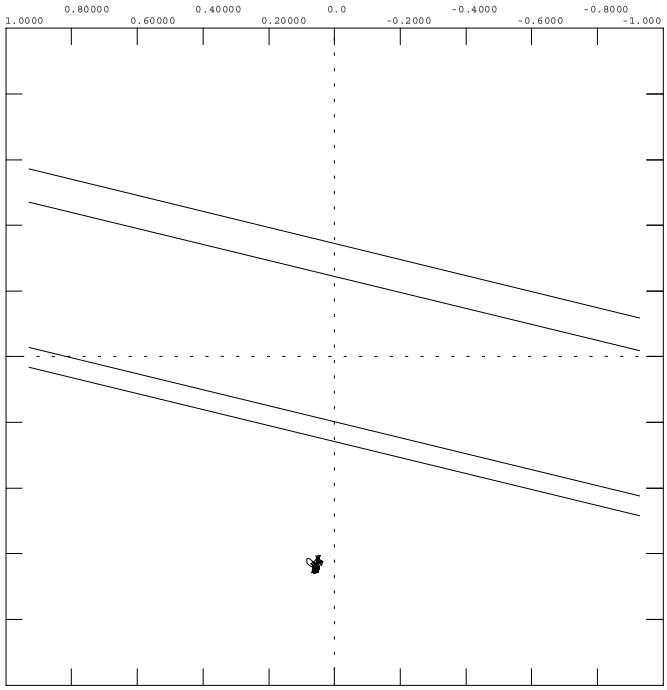

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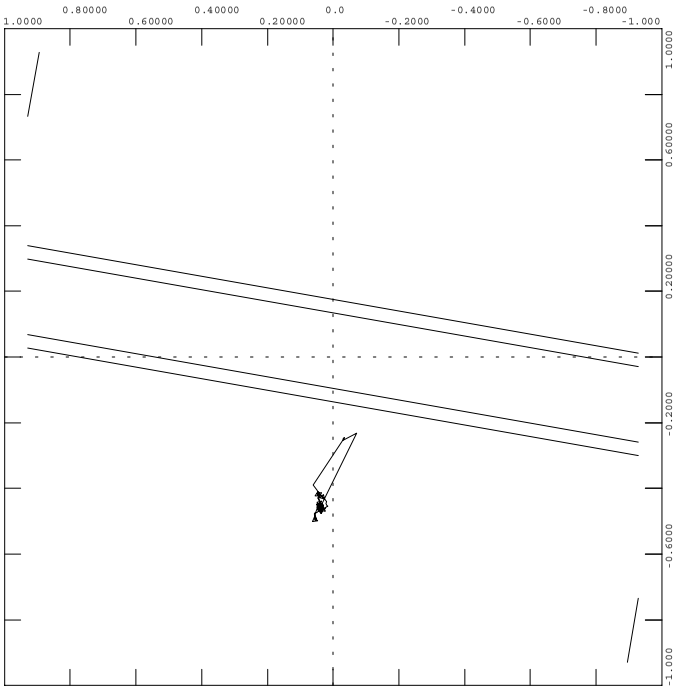
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



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ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

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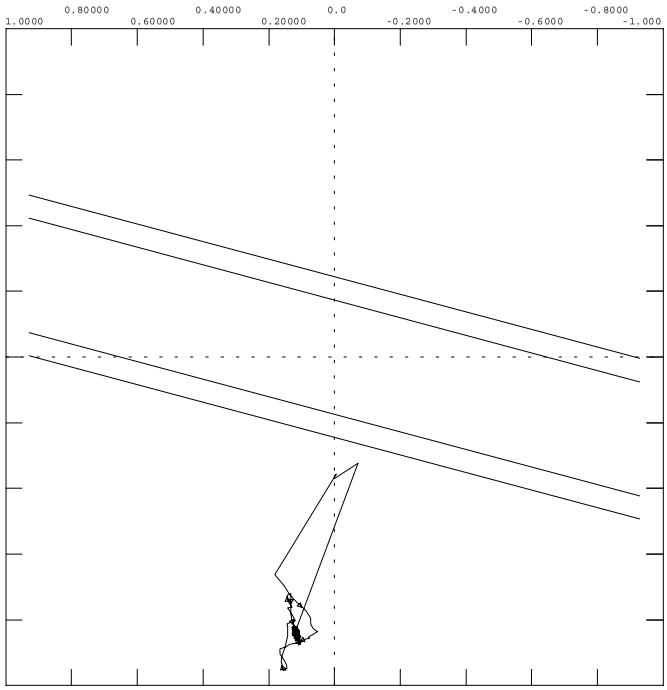
CHNL# 820: [X-PRA4-DRY4]



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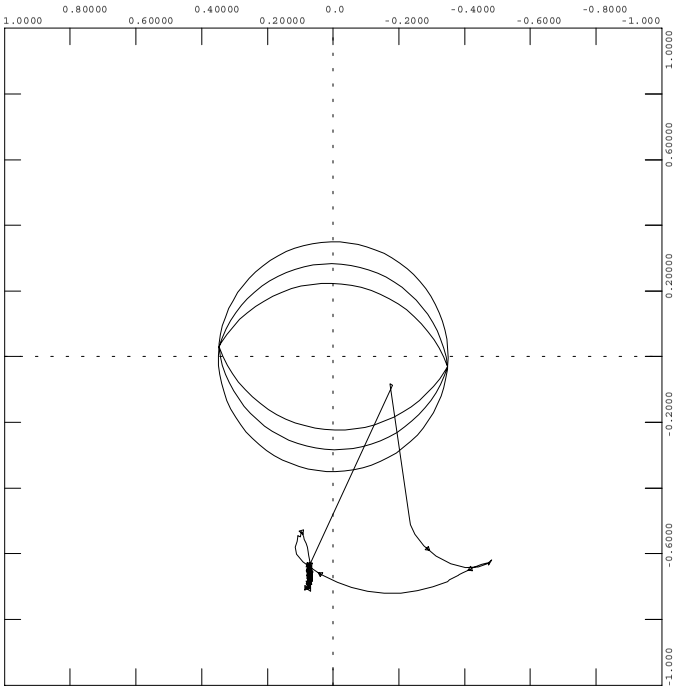
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



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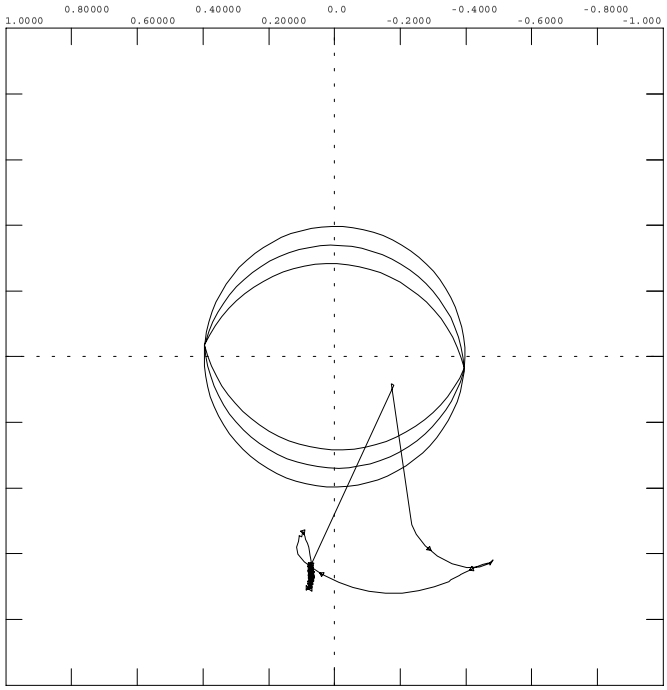
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

RELAY: SLINOS
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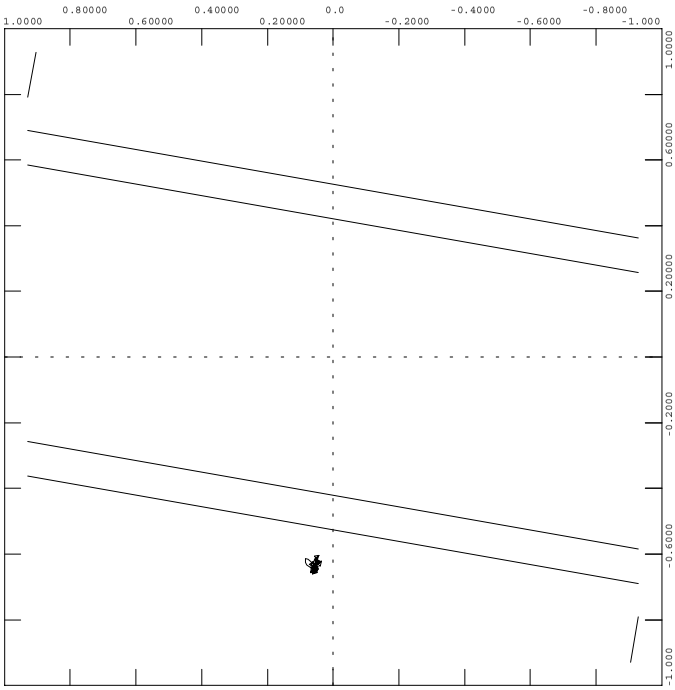
CHNL# 822: [X-MRV4-RCH4]



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
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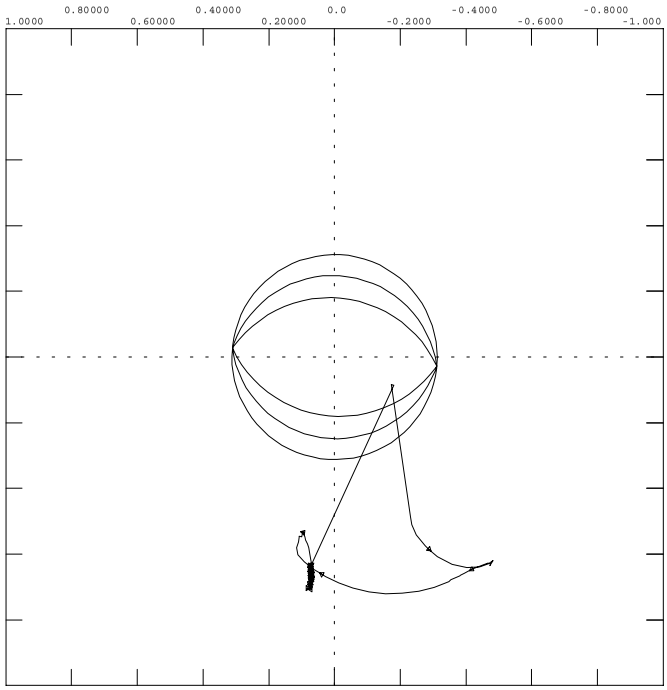
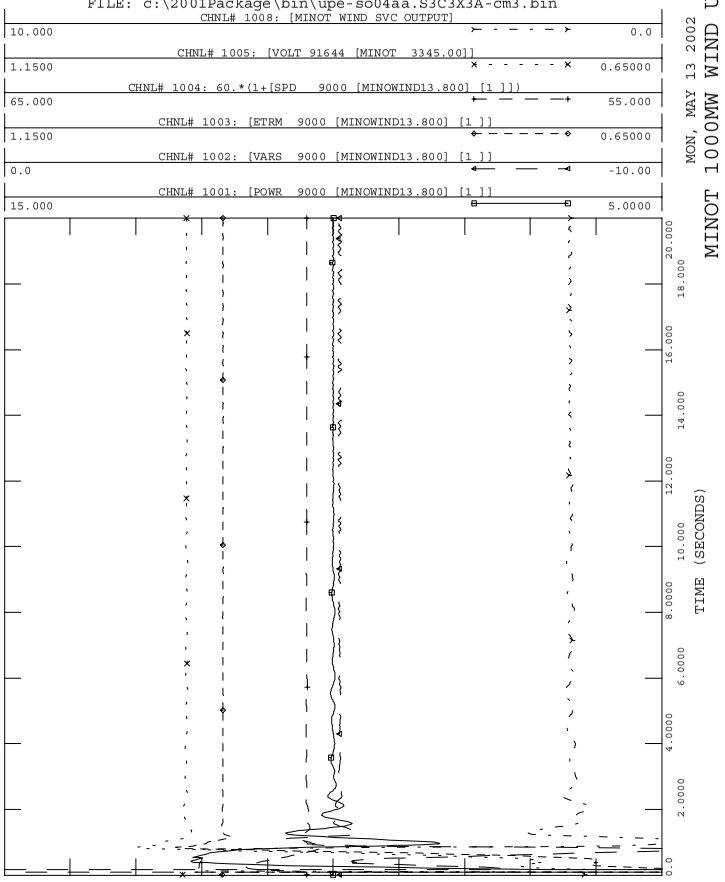
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

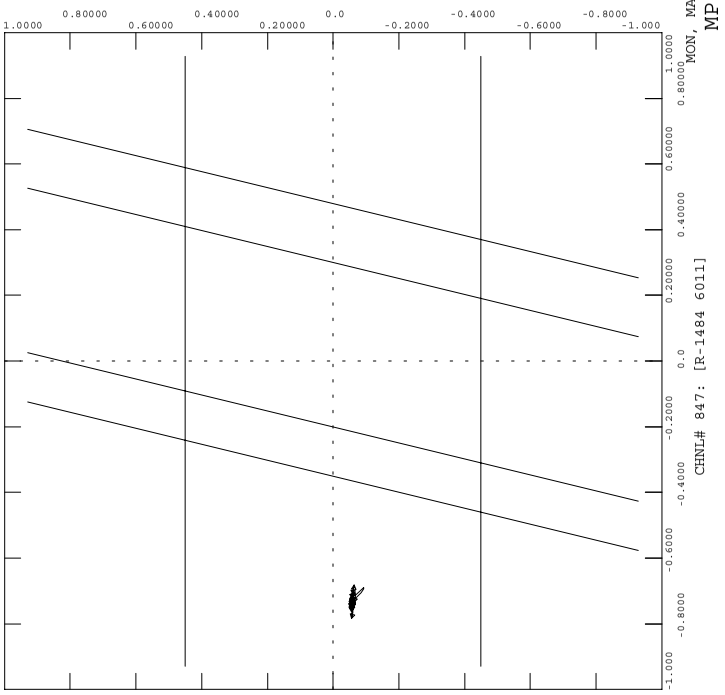


MON, MAY 13 2002 20:07
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

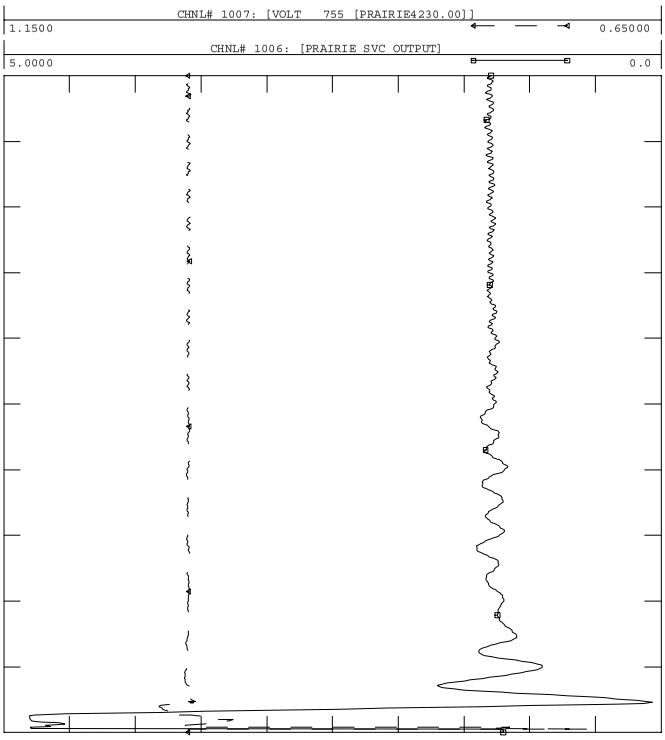
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, MAY 13 2002 20:07
MP-OH I.FALLS (779)

UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X3A-cm3.bin



MON, MAY 13 2002 20:07
PRAIRIE SVC RESPONSE

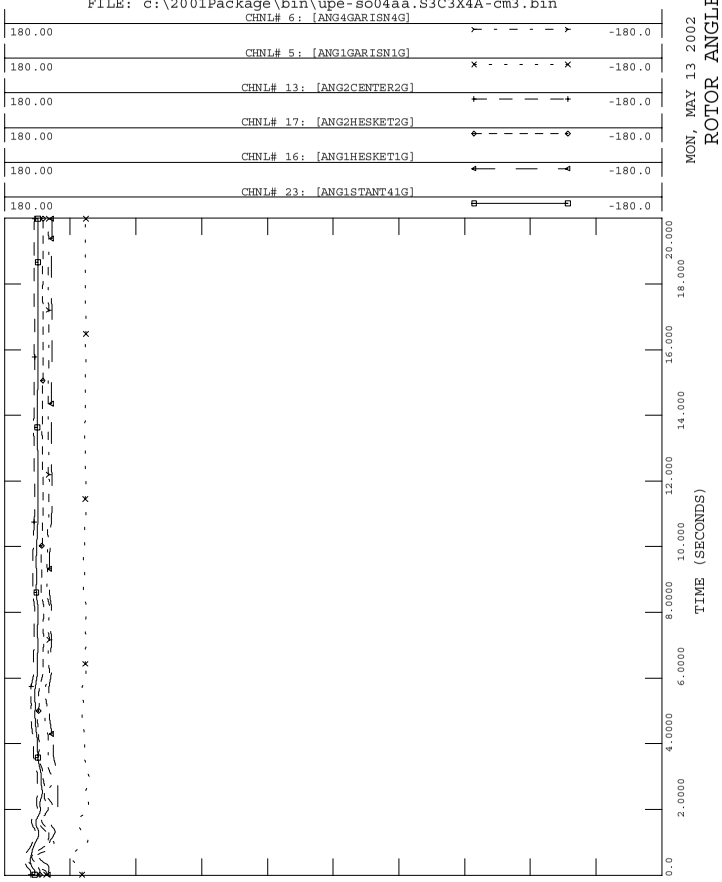
CASE S3C3X4A

CONTINGENCY CM3

4 cycle 3 phase fault at Minot 345kV. Clear Minot – Leland Olds 345 kV line

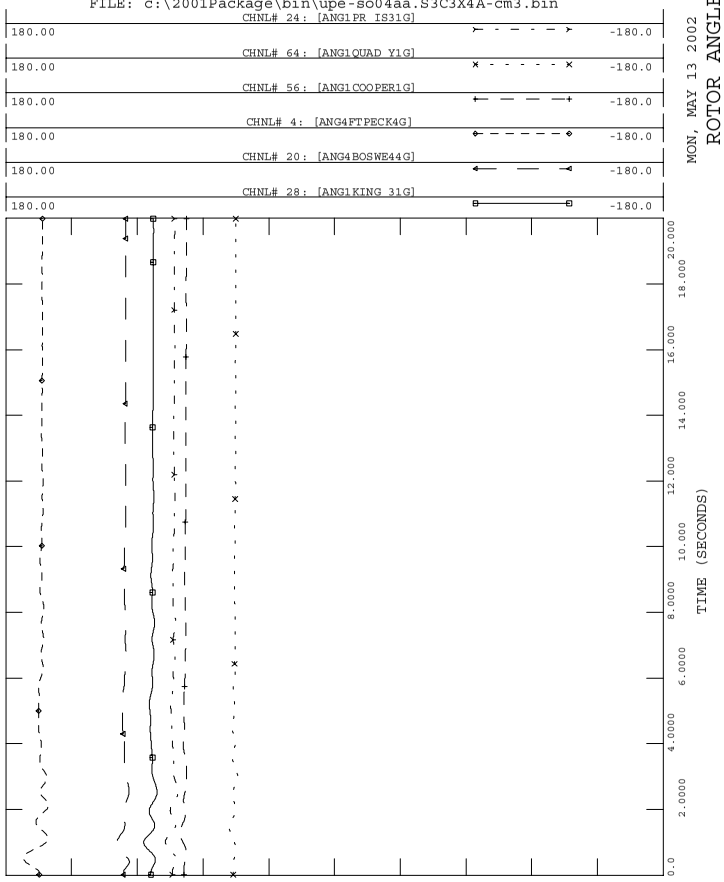
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
ROTOR ANGLES 2



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
ROTOR ANGLES 4



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
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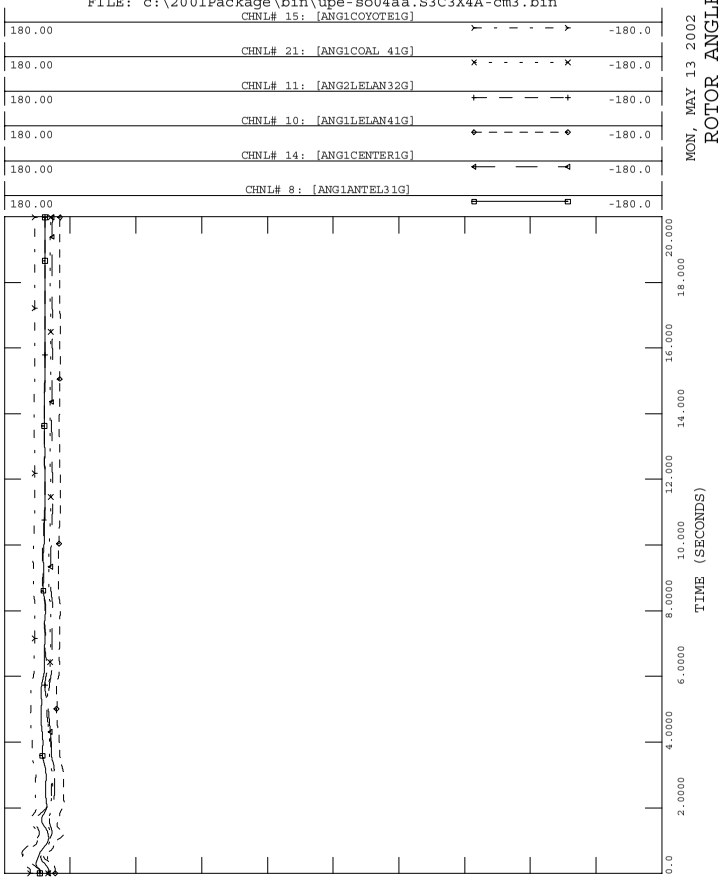
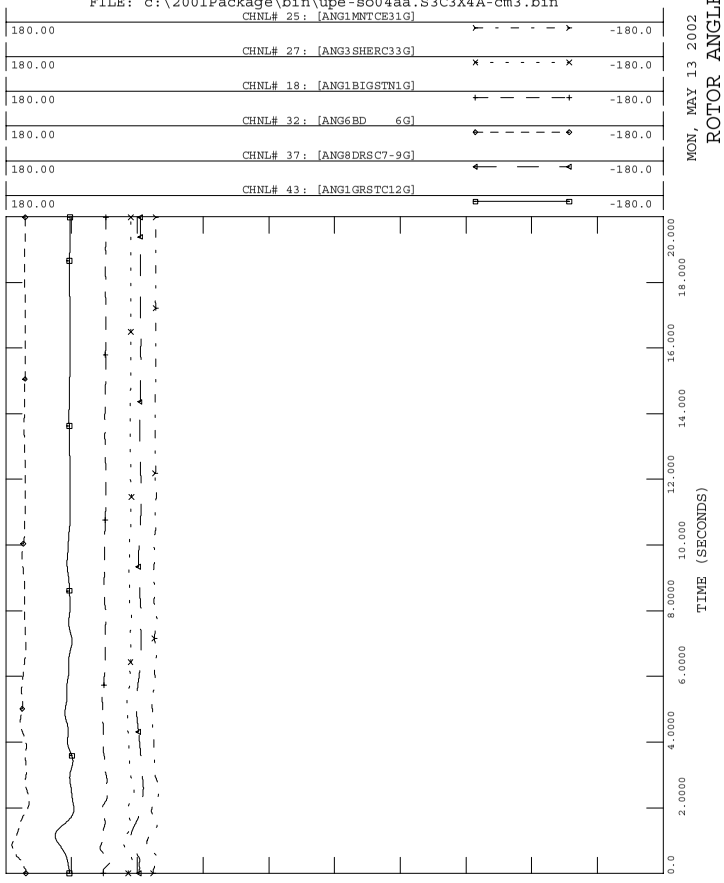


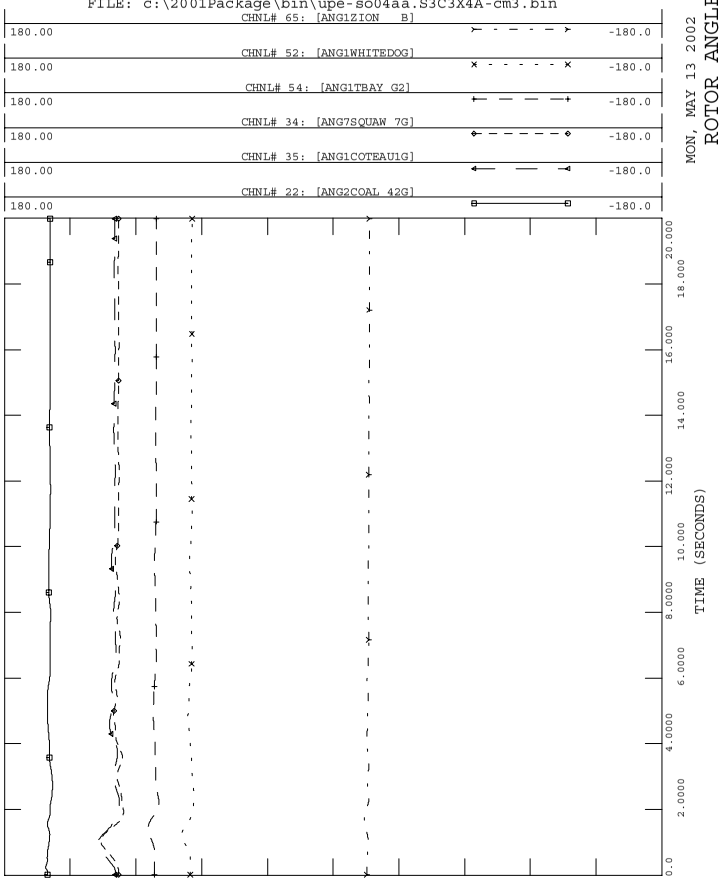
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
ROTOR ANGLES 3



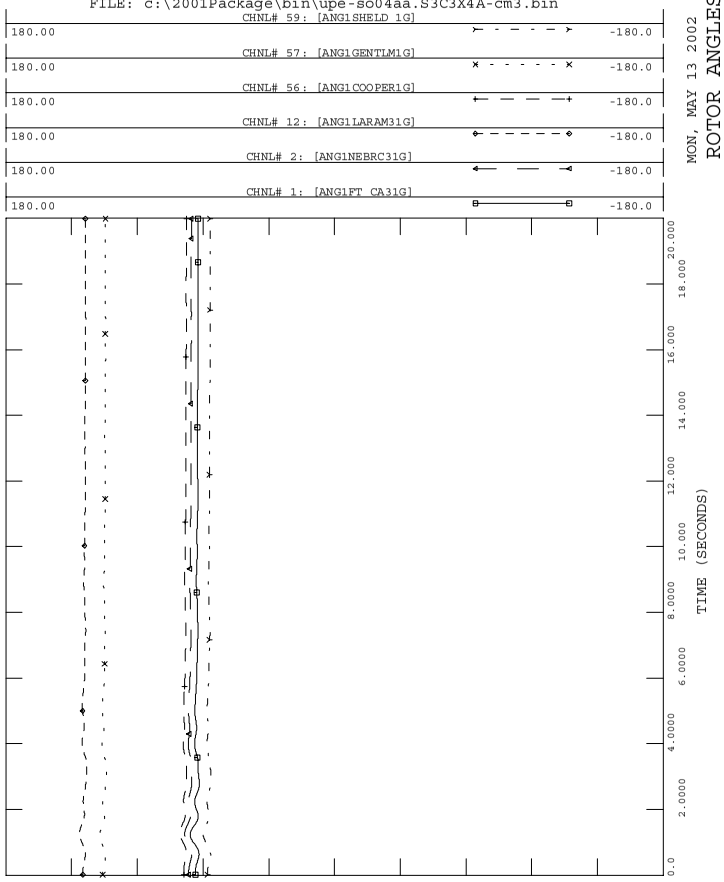
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
ROTOR ANGLES 6



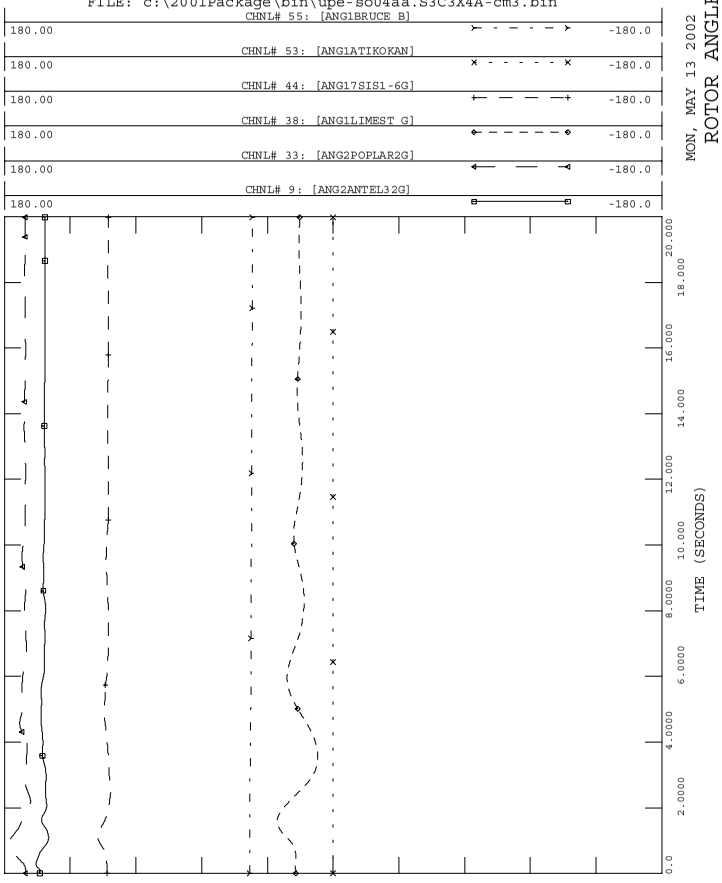
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2666,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
ROTOR ANGLES NB



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
ROTOR ANGLES 5



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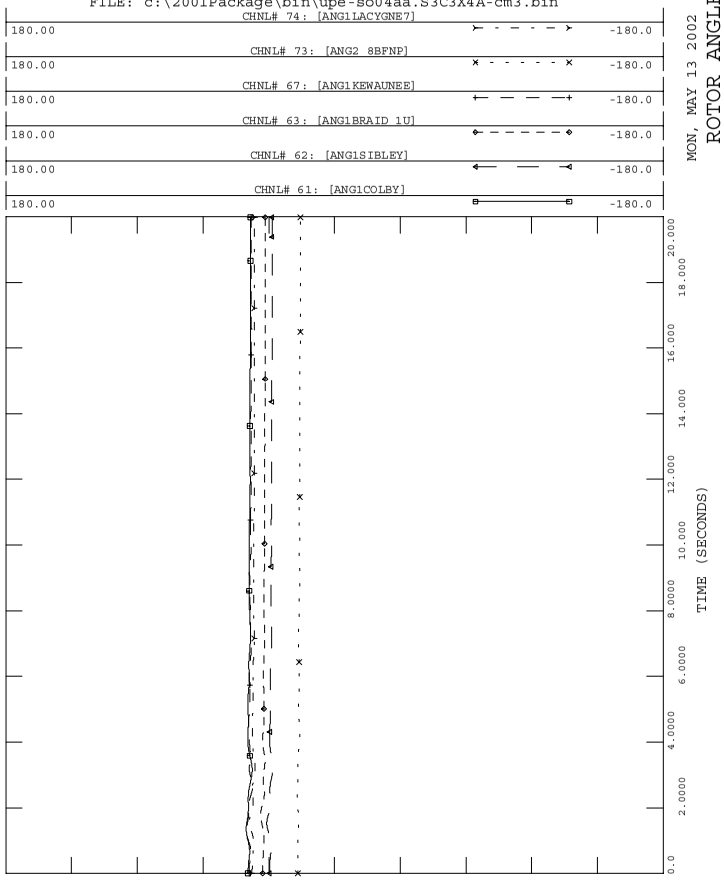
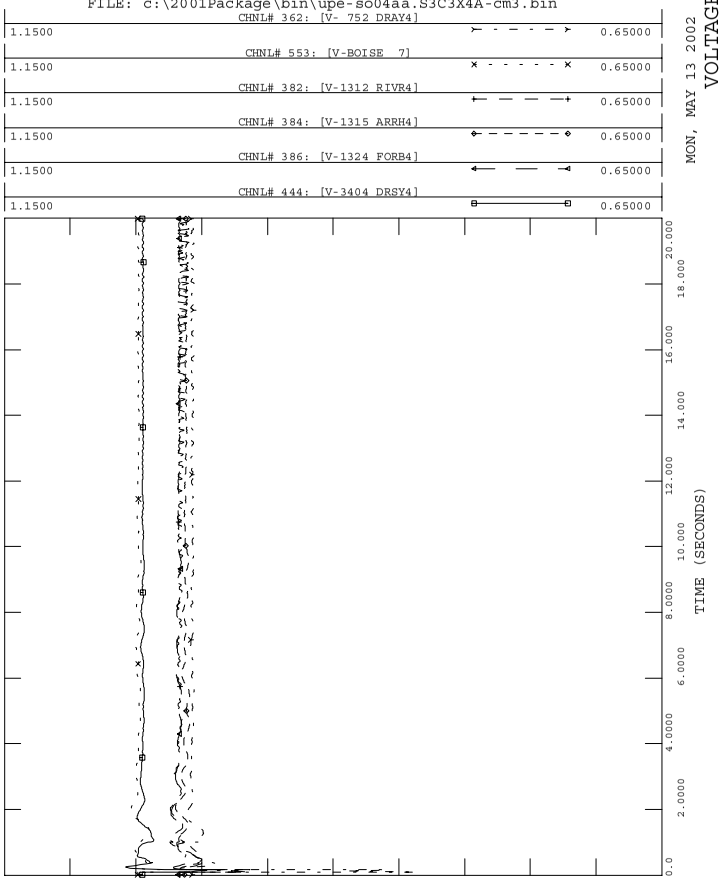
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
ROTOR ANGLES 7



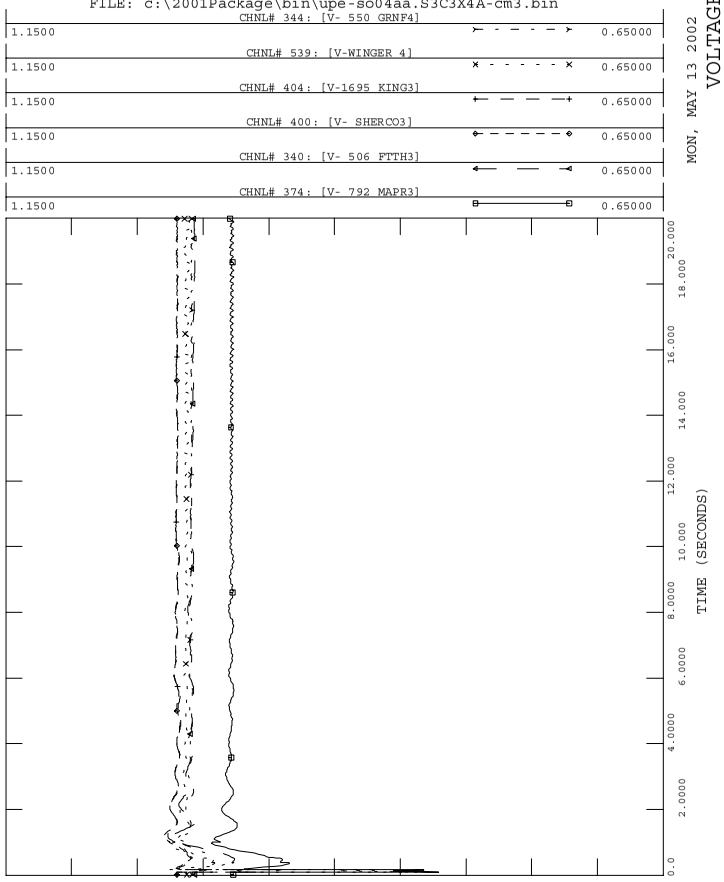
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
VOLTAGES 1



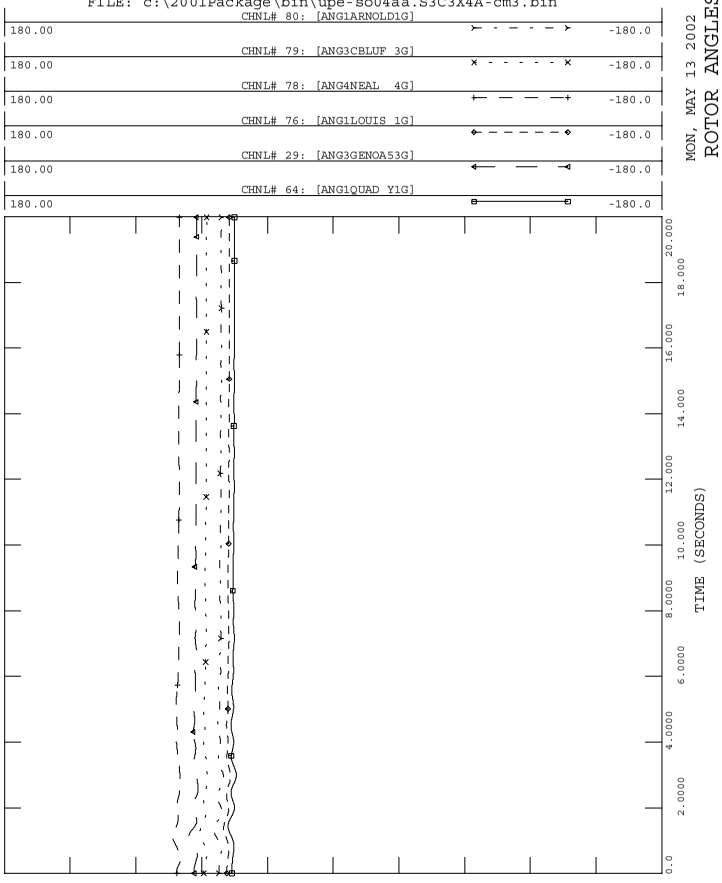
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
VOLTAGES 3



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
ROTOR ANGLES IA



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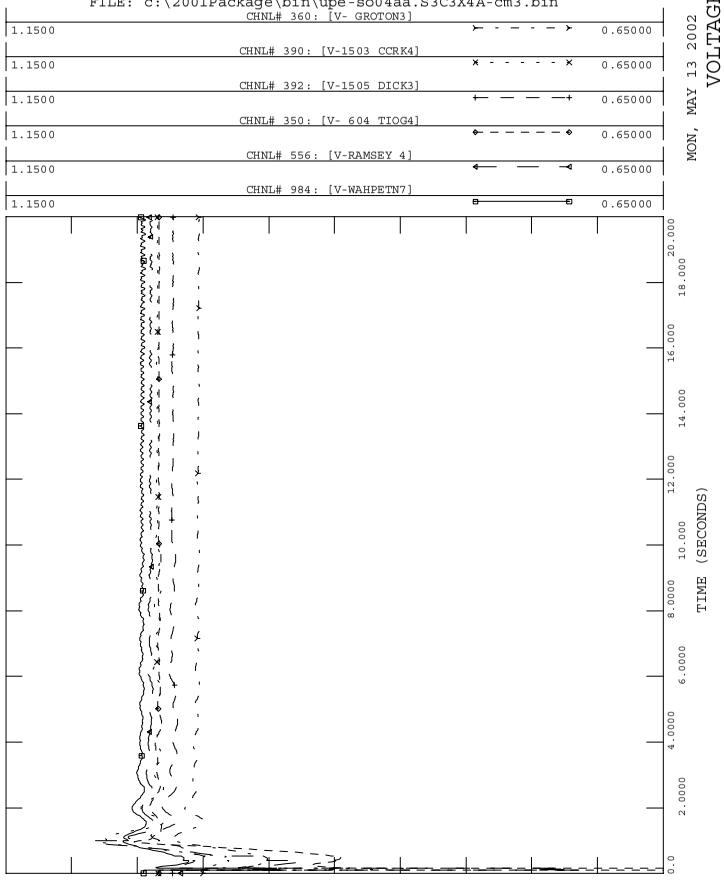
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
VOLTAGES 2



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
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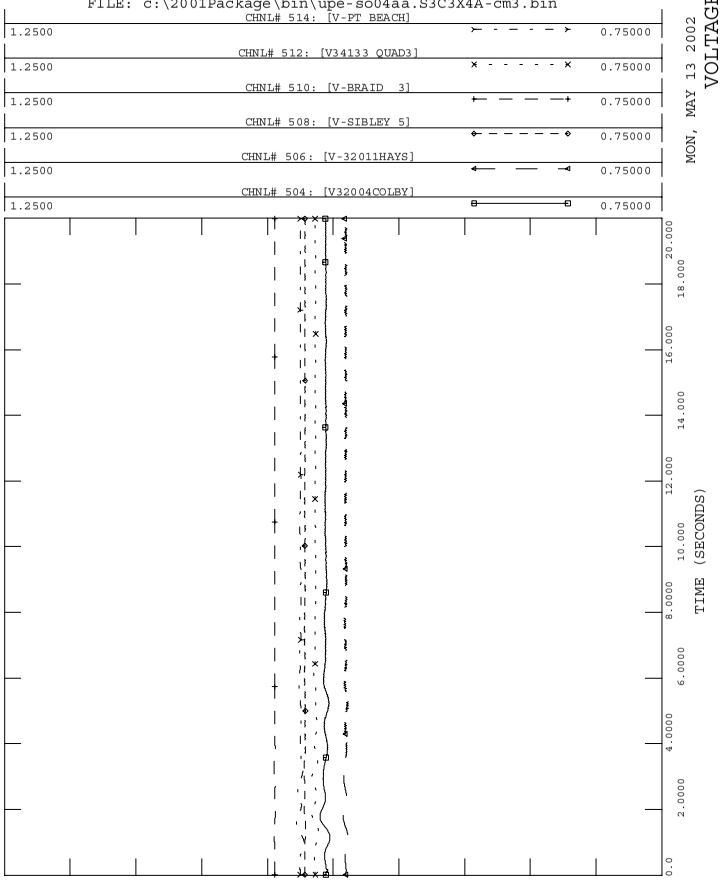
MON, MAY 13 2002 20:21
VOLTAGES 5



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4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
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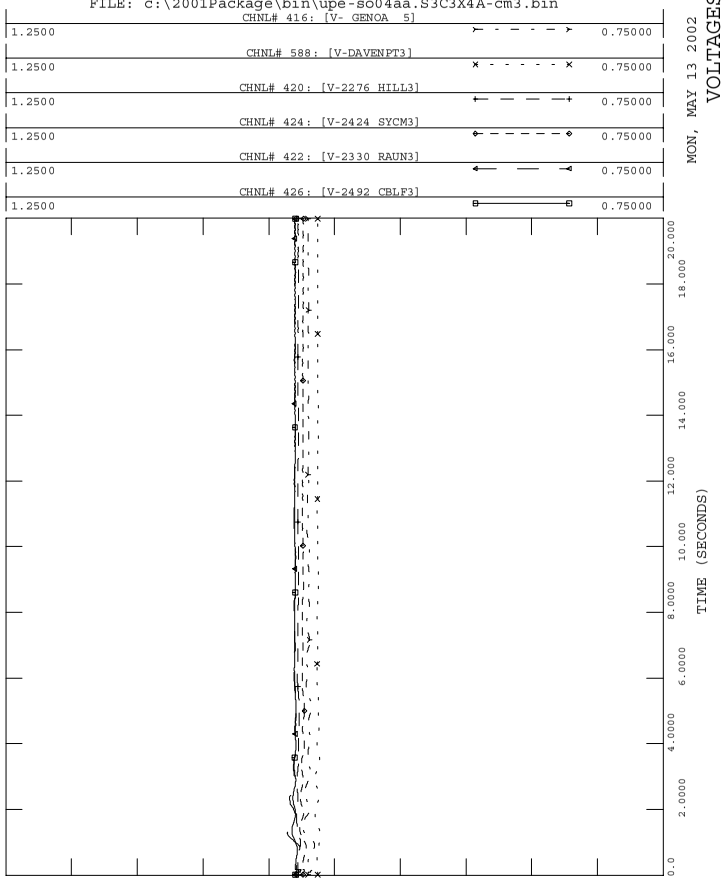
MON, MAY 13 2002 20:21
VOLTAGES IA



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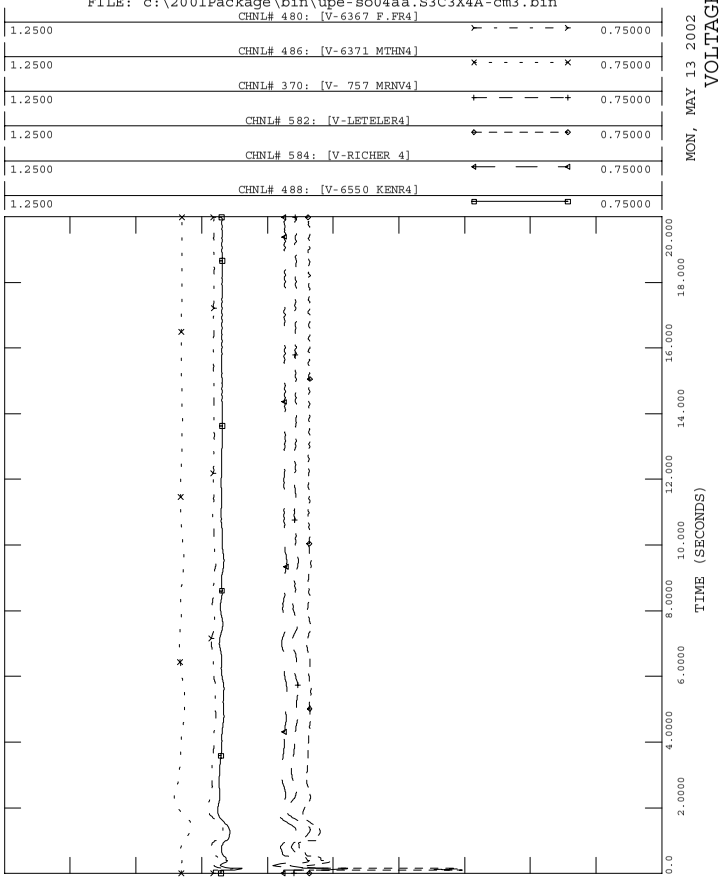
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
VOLTAGES 4



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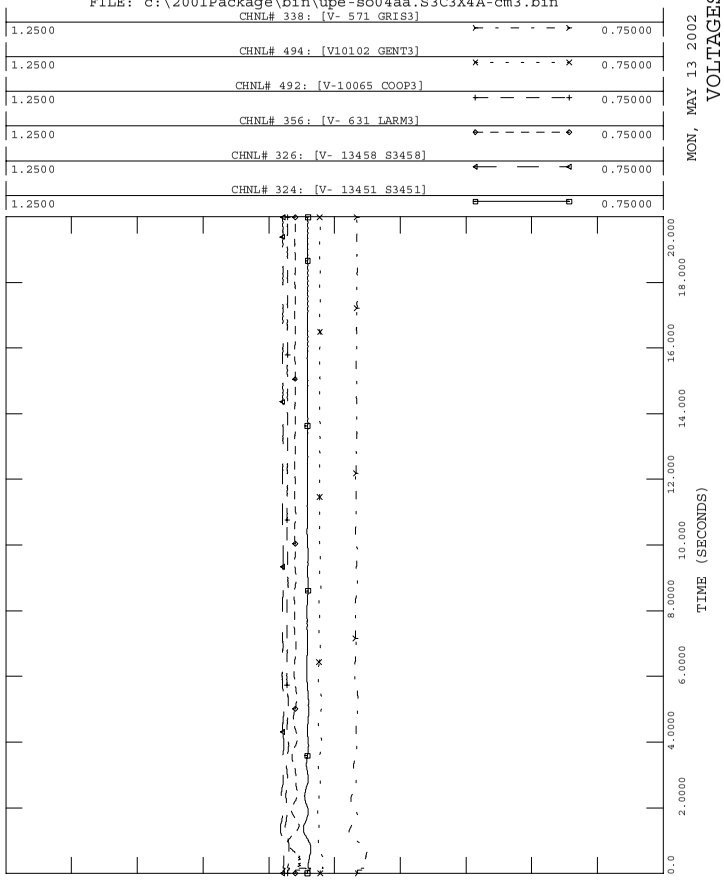
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
VOLTAGES NB



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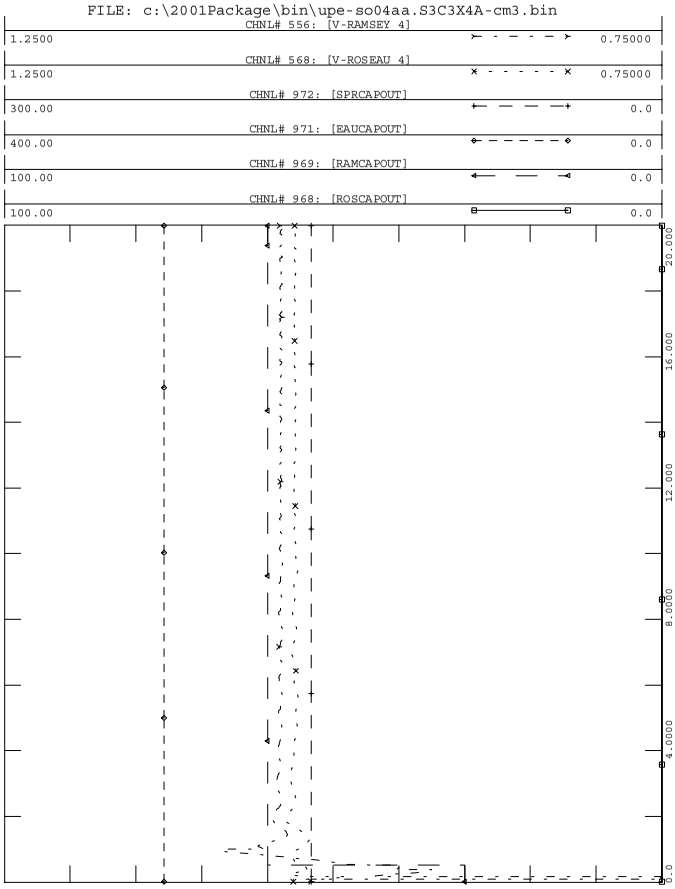
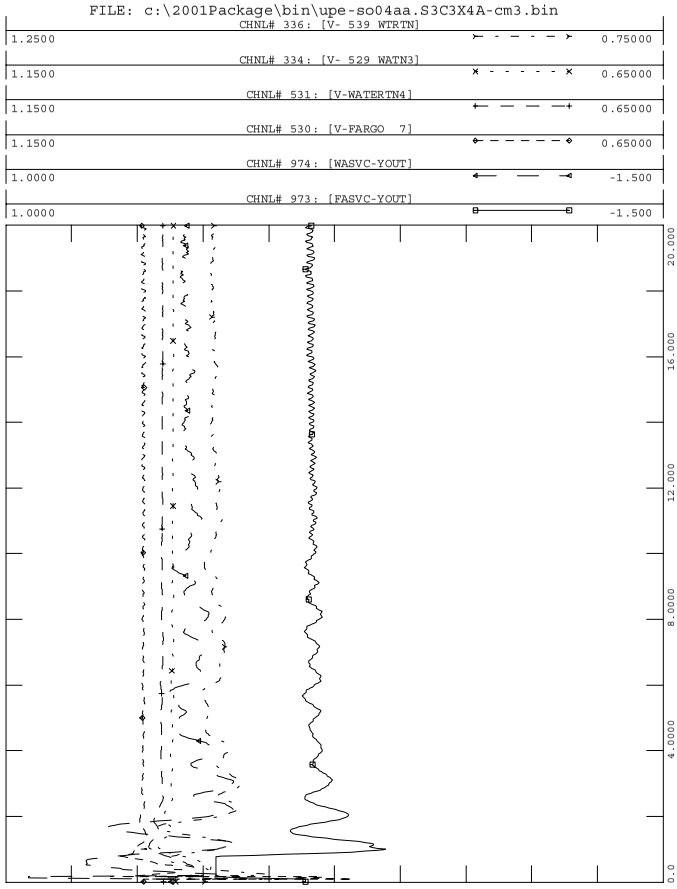
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin



MON, MAY 13 2002 20:21
FAST SW CAP OUT 2

UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin



MON, MAY 13 2002 20:21
FARGO/WATERTOWN SVS

UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
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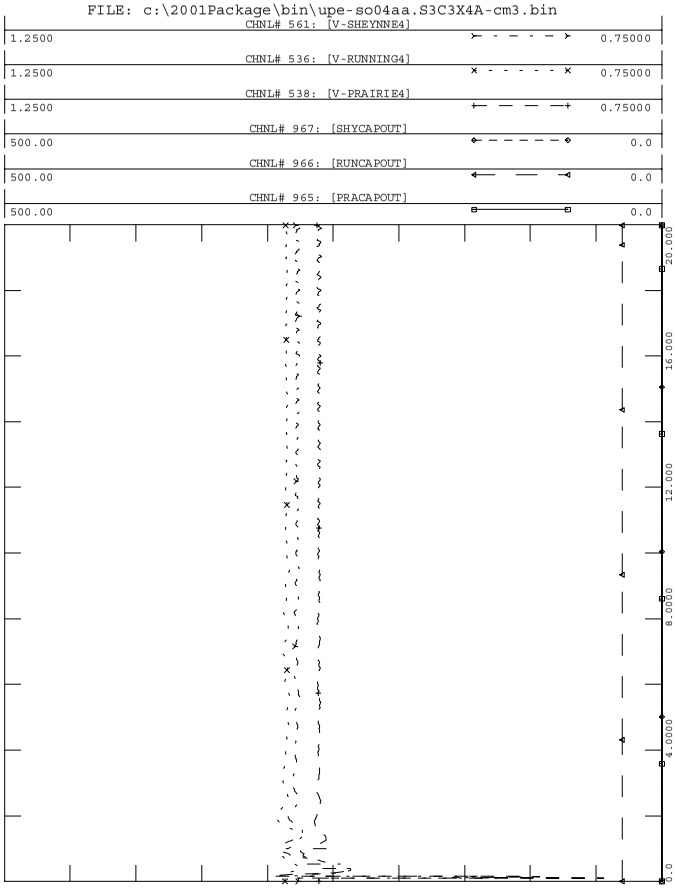
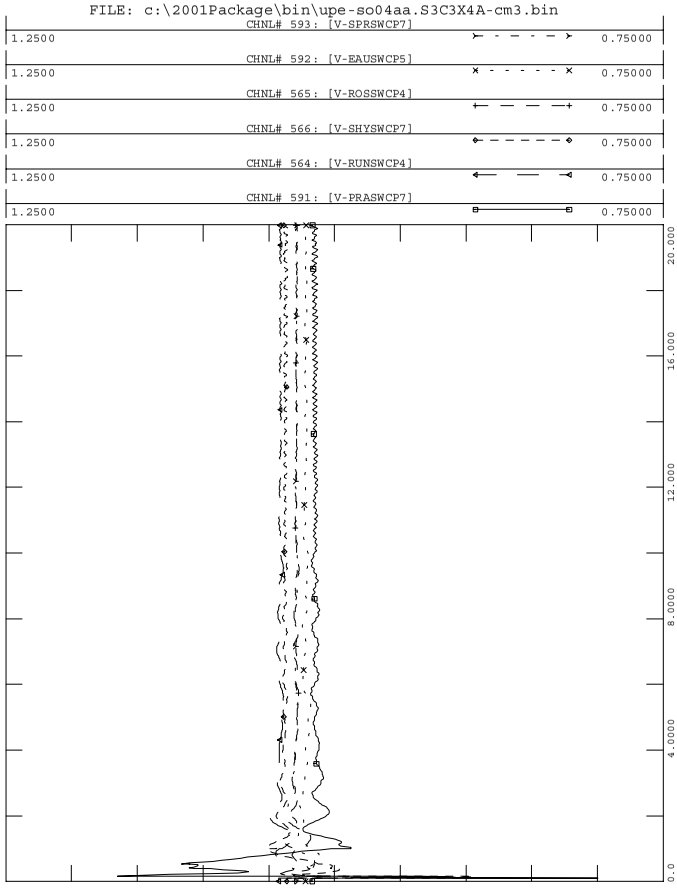
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin



MON, MAY 13 2002 20:21
FAST SW CAP OUT 1

UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

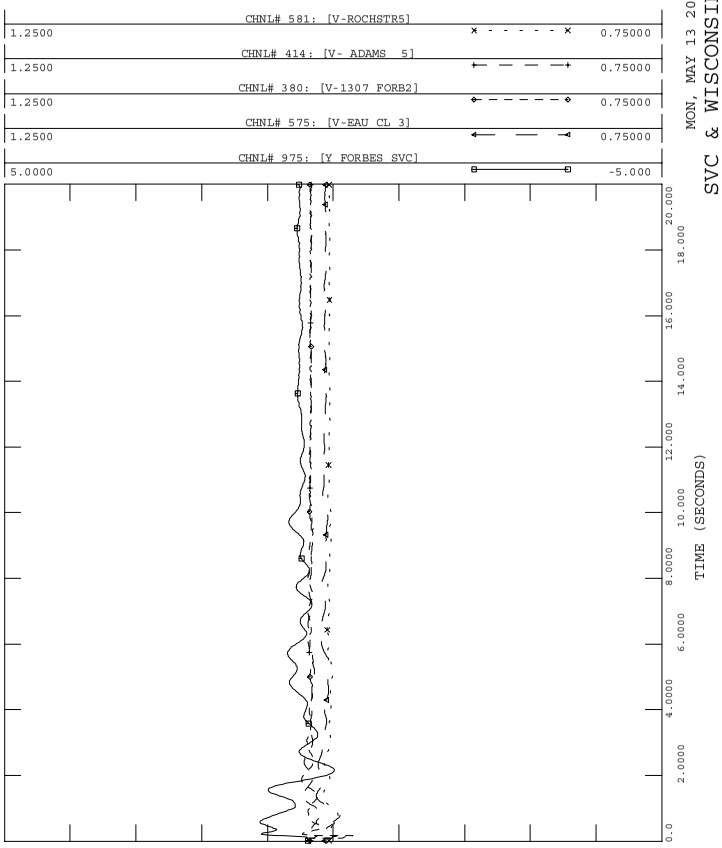


MON, MAY 13 2002 20:21
FAST SW CAP VOLTAGES

UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21

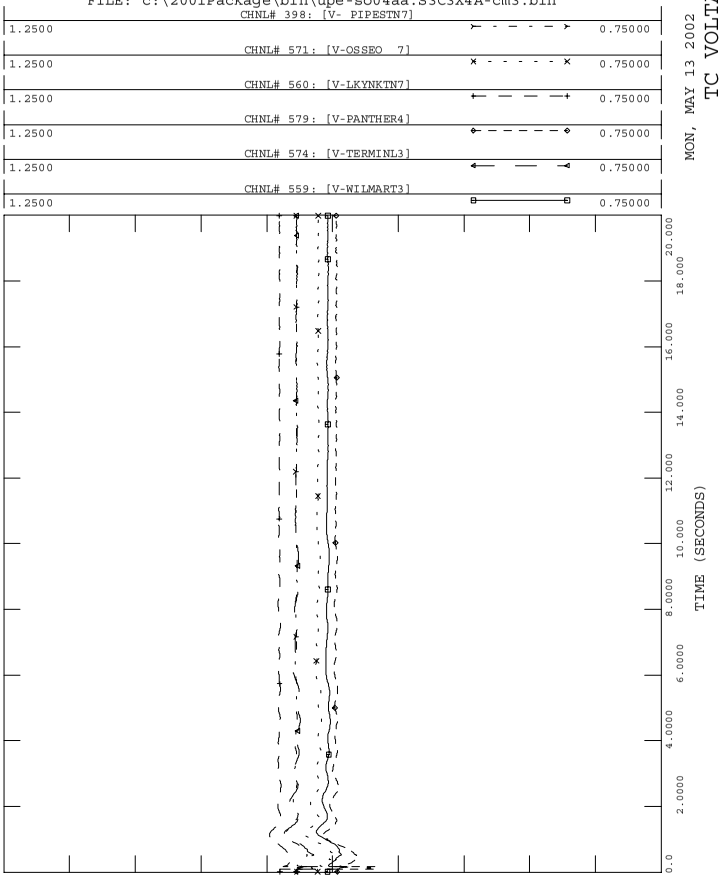
SVC & WISCONSIN VOLT



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21

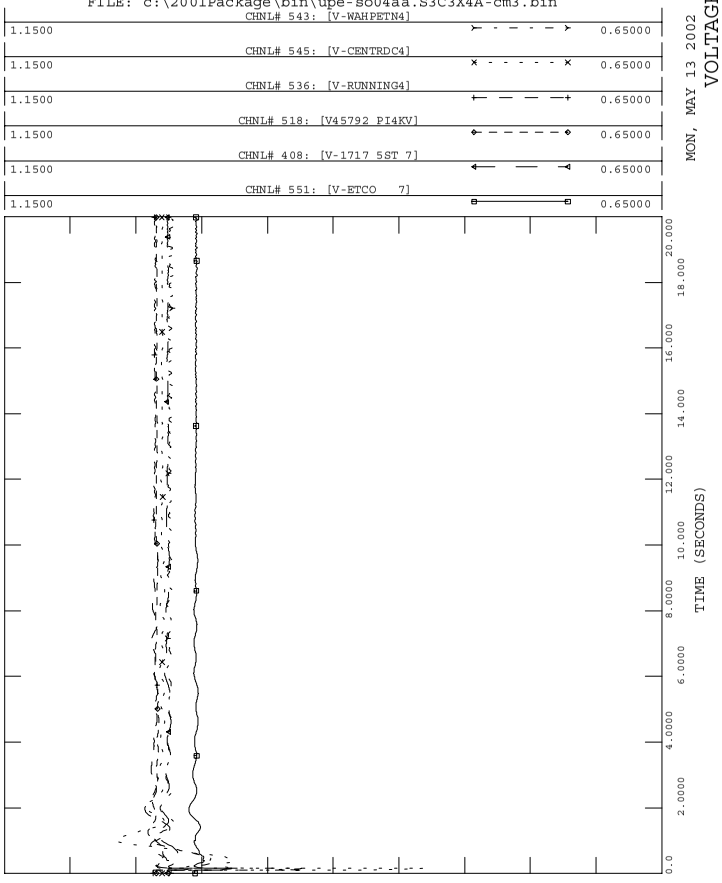
TC VOLTAGES



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21

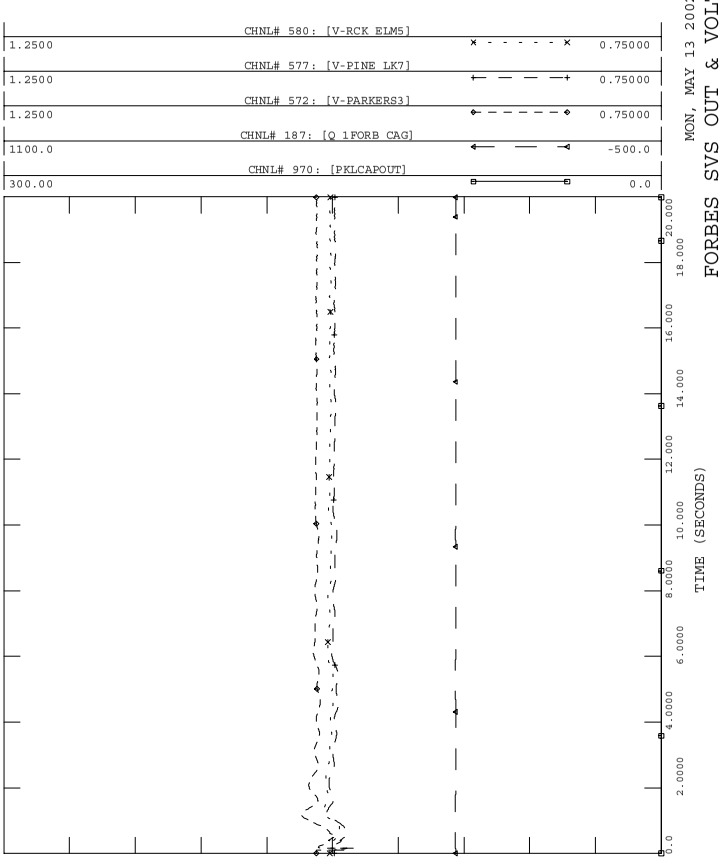
VOLTAGES 6



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

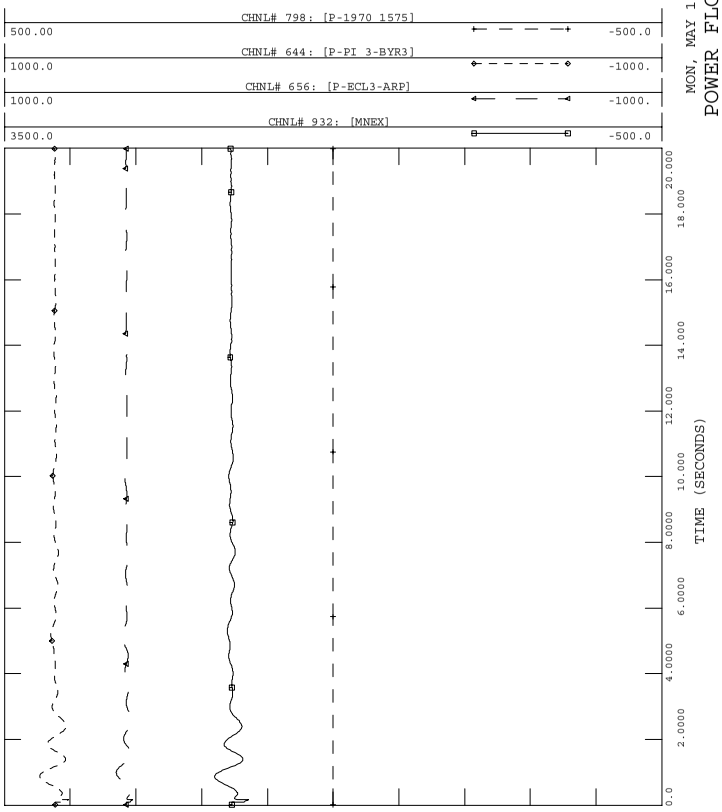
MON, MAY 13 2002 20:21

FORBES SVS OUT & VOLTAGES



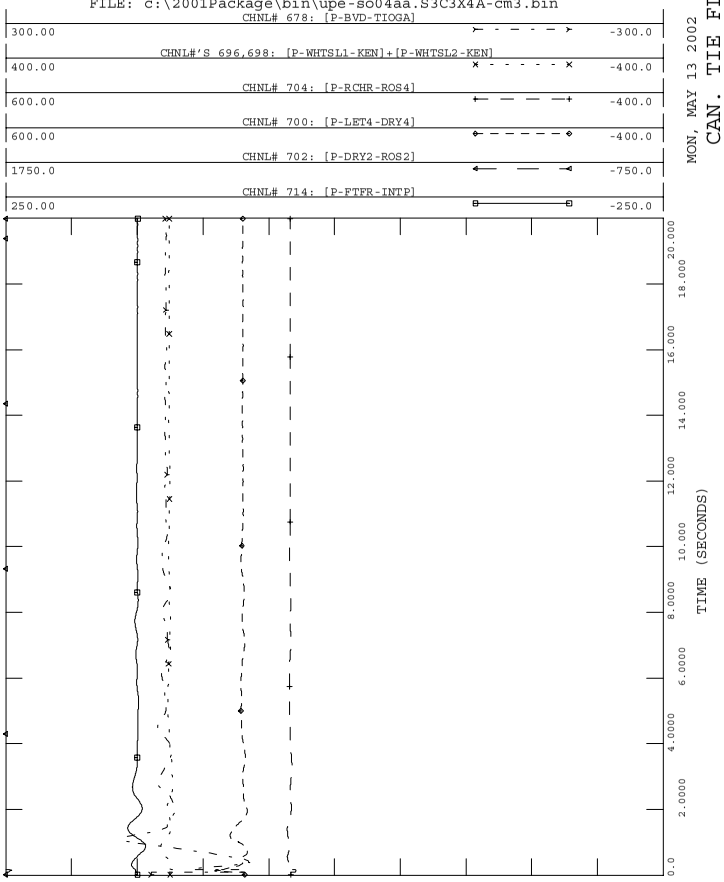
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
POWER FLOW SUMS 2



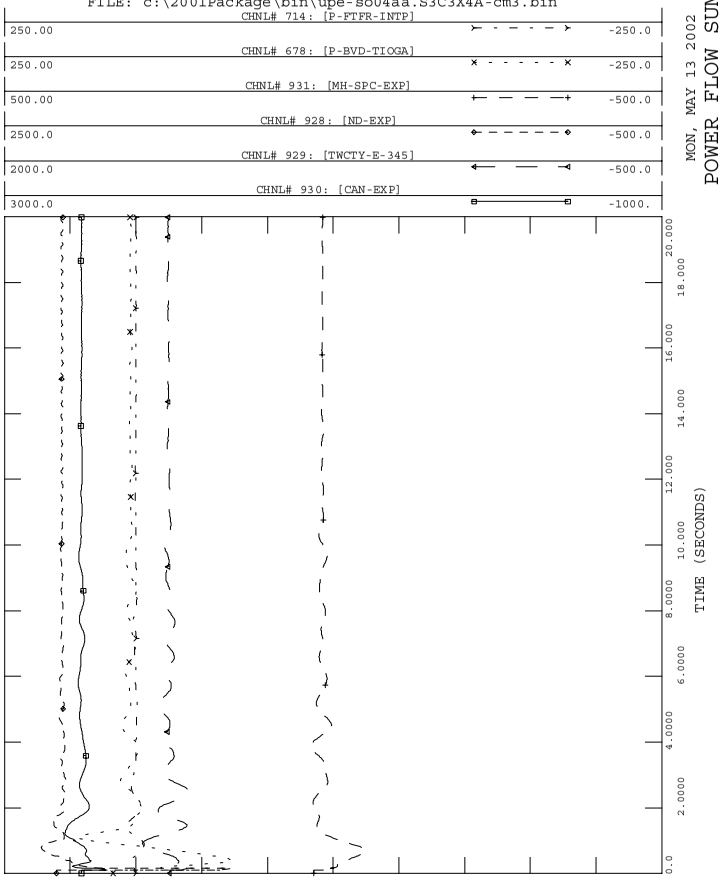
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
CAN. TIE FLOWS



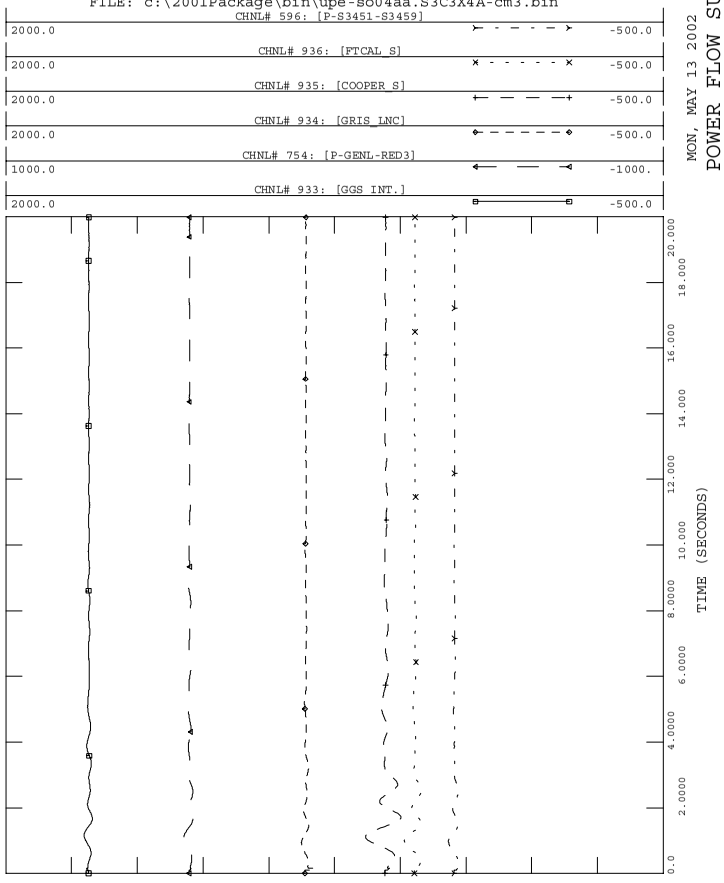
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
POWER FLOW SUMS 1



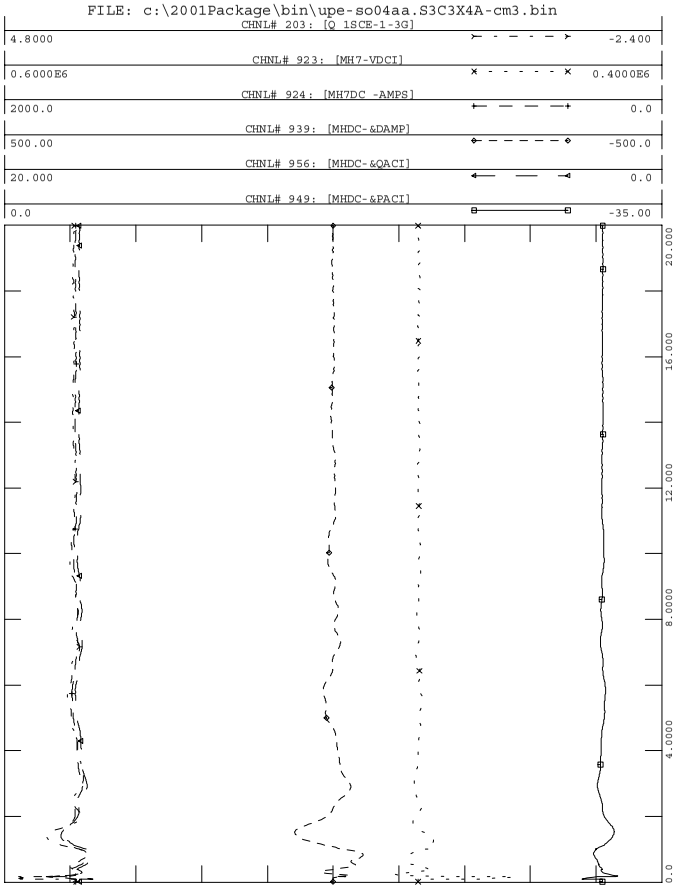
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
POWER FLOW SUM 3



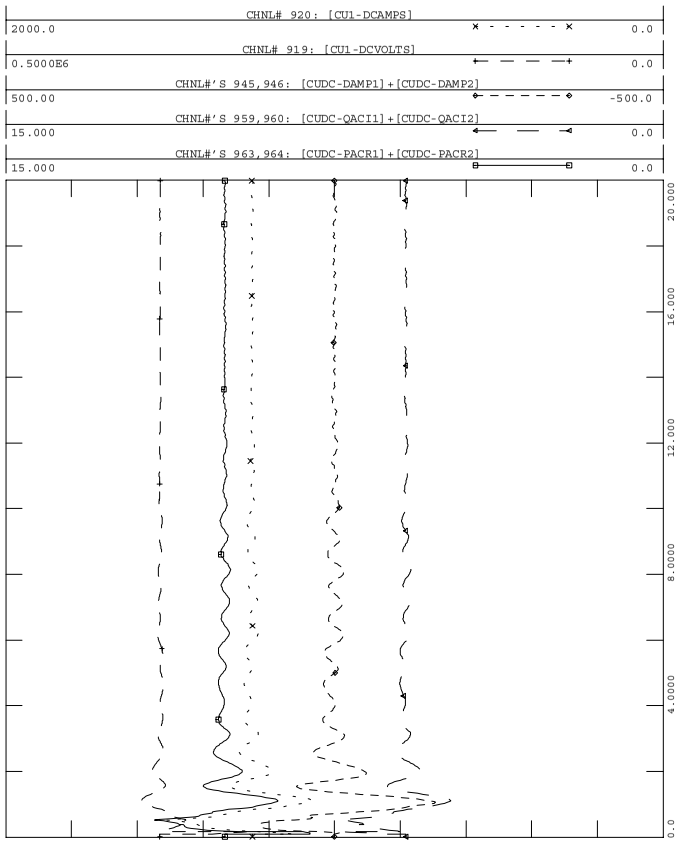
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
MH DC PARAMETERS



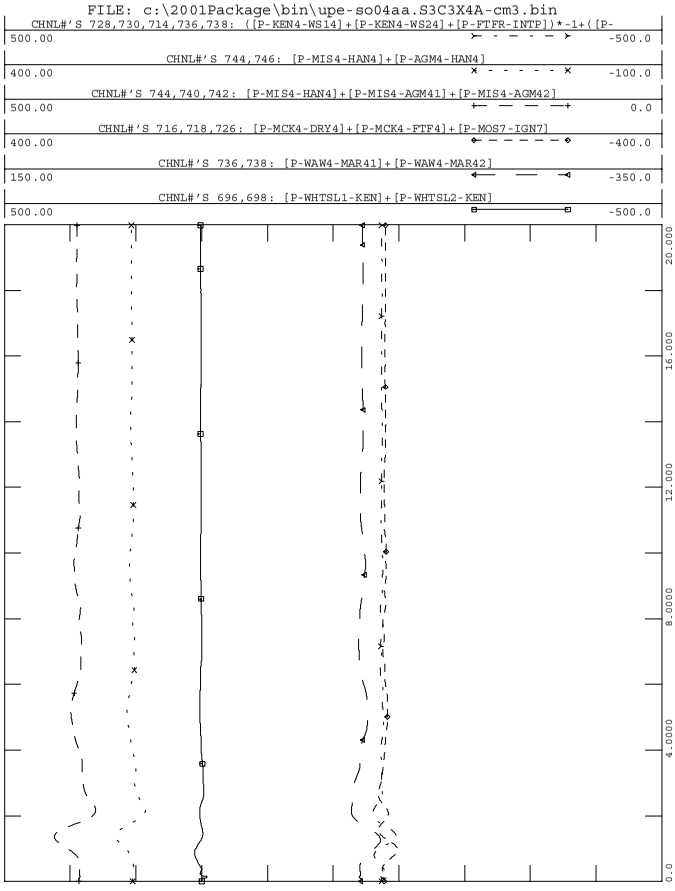
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
CU DC #1



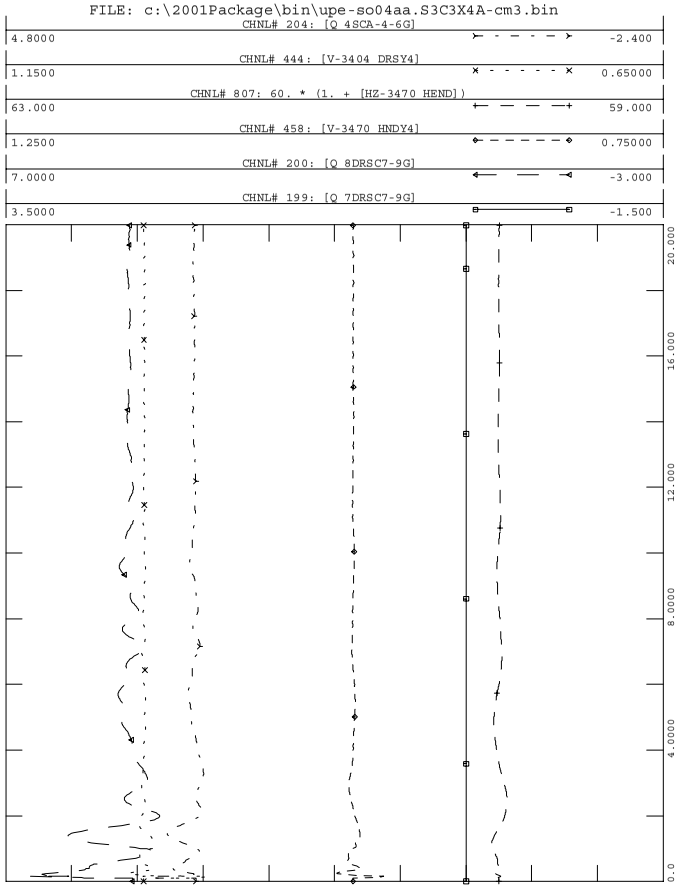
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
OH TIE FLOWS



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21
MH DC PARAMETERS



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

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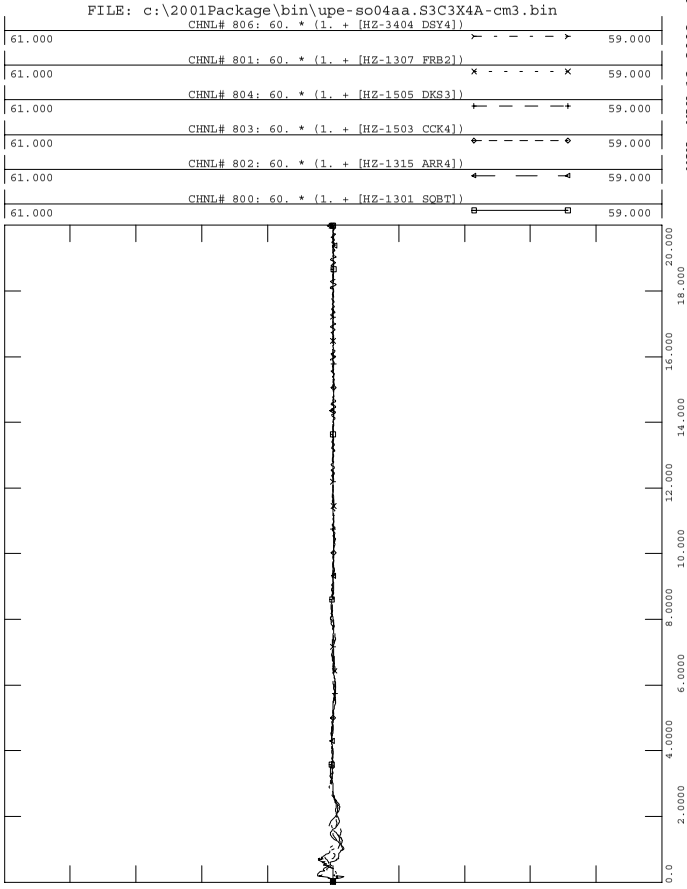
FREQ AT DC TERMINALS



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

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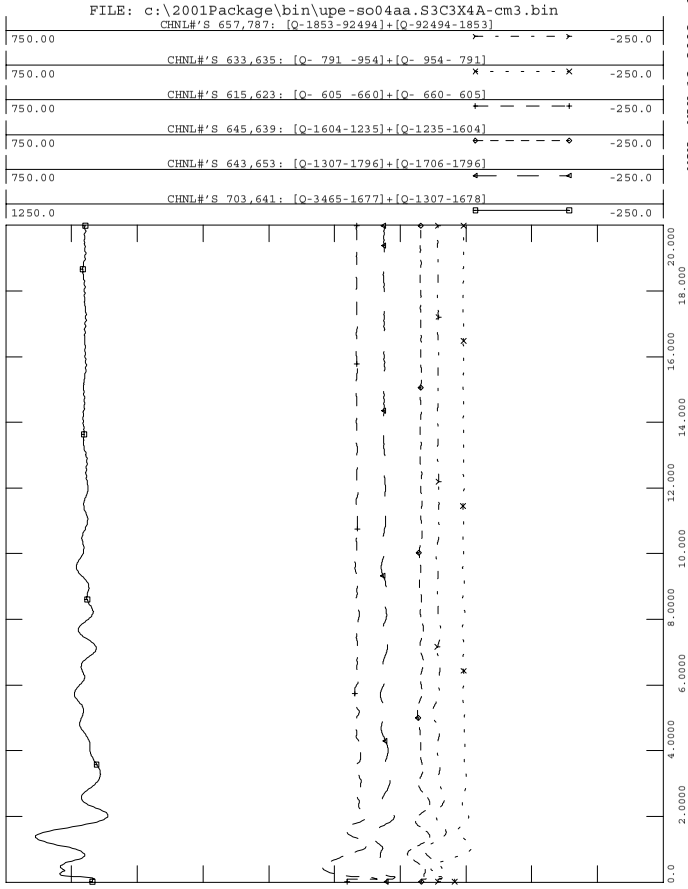
VAR LOSSES



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

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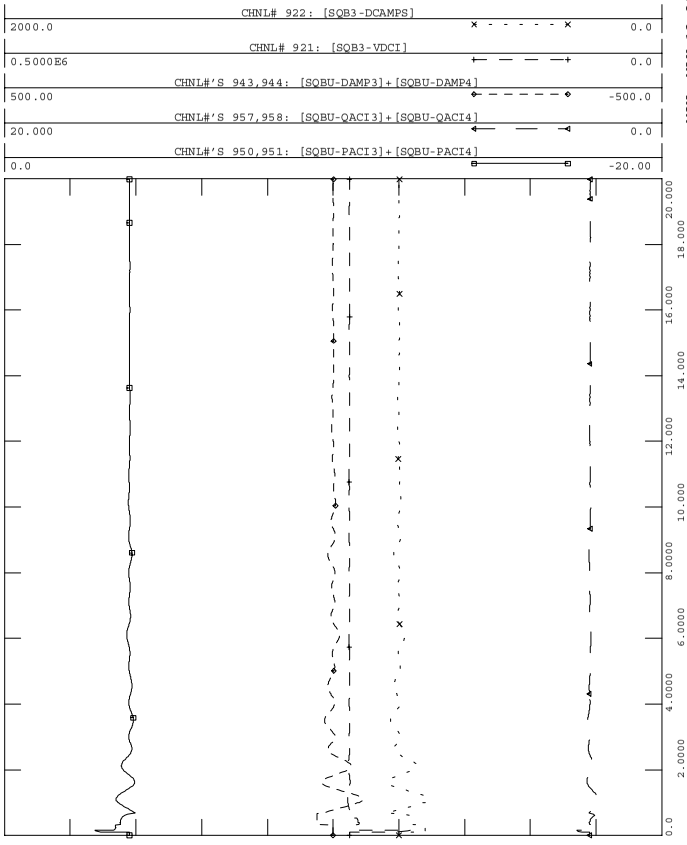
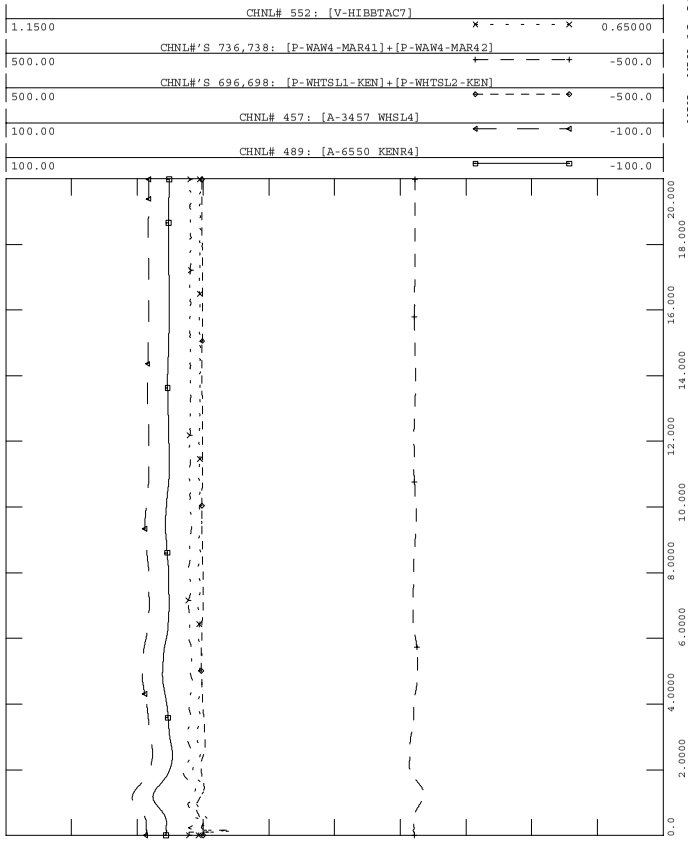
SQB DC #3



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

MON, MAY 13 2002 20:21

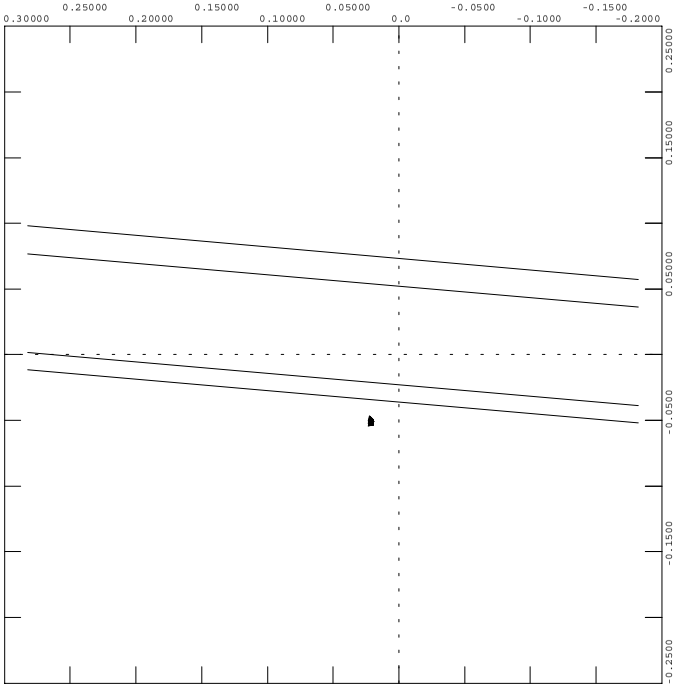
VOLTAGES, ANGLES



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



MON, MAY 13 2002 20:21
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

RELAY: RELAYG
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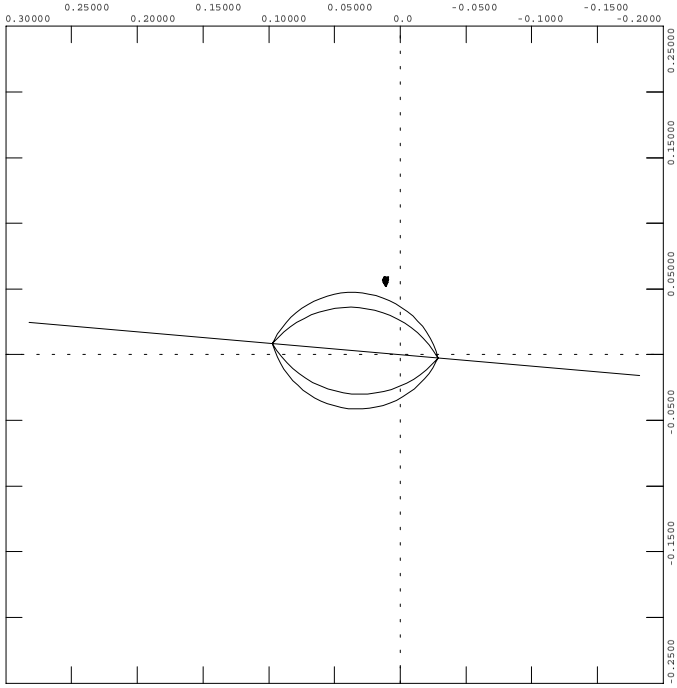
CHNL# 856: [X-DSY2-ROS2]

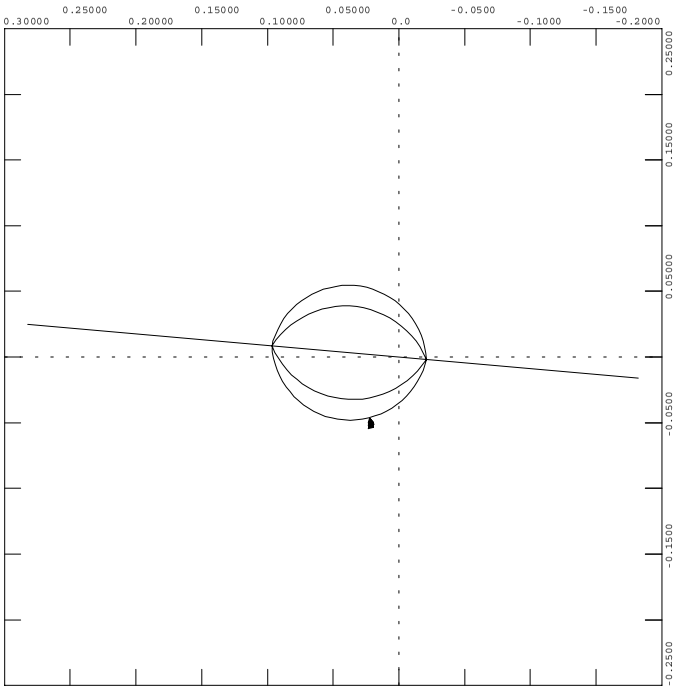


MON, MAY 13 2002 20:21
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

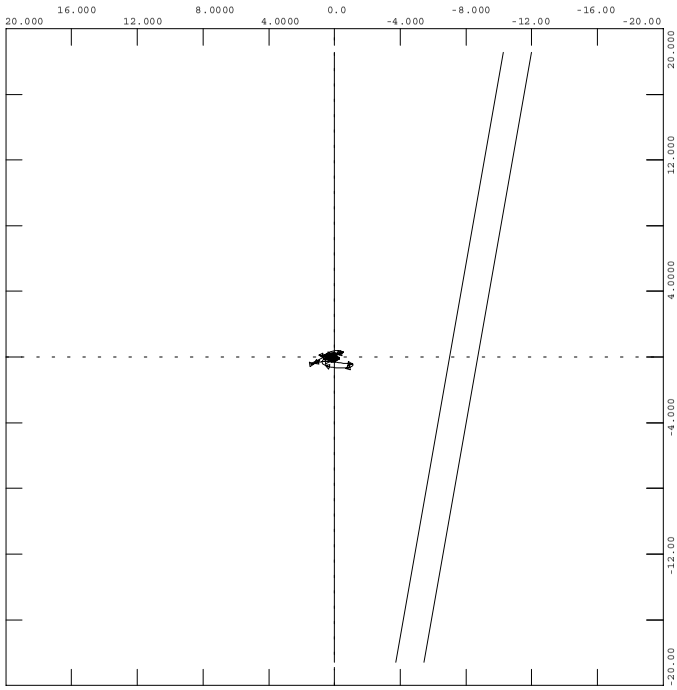


MON, MAY 13 2002 20:21
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

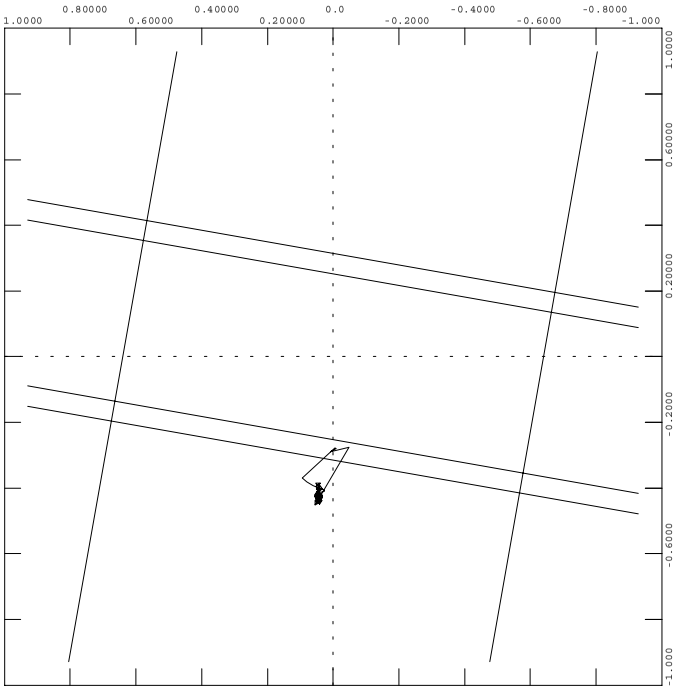


MON, MAY 13 2002 20:21
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

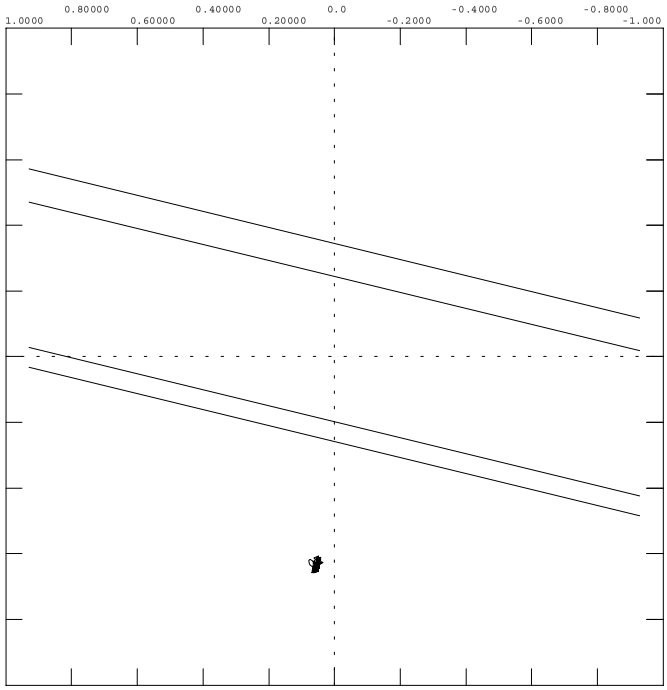
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

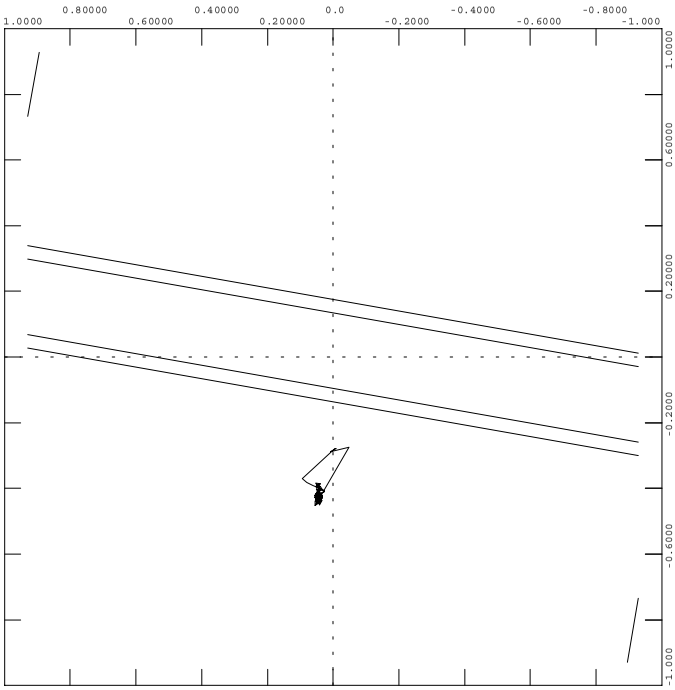
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

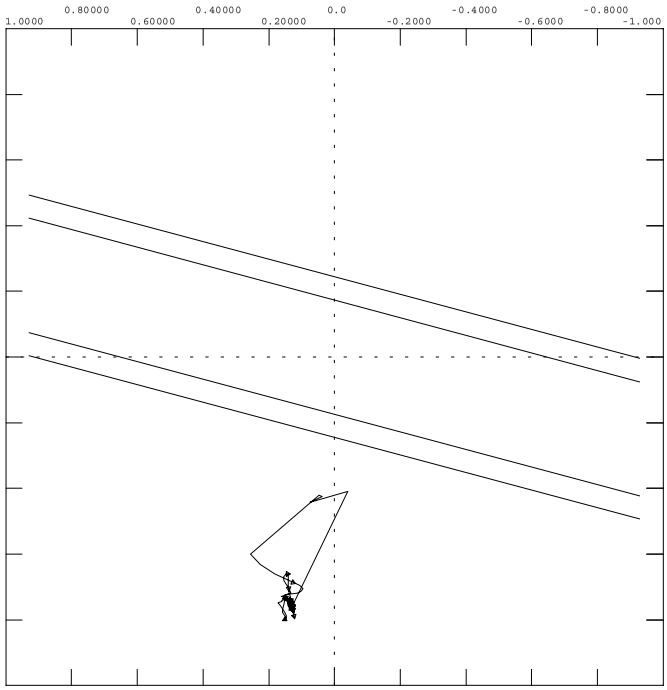
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

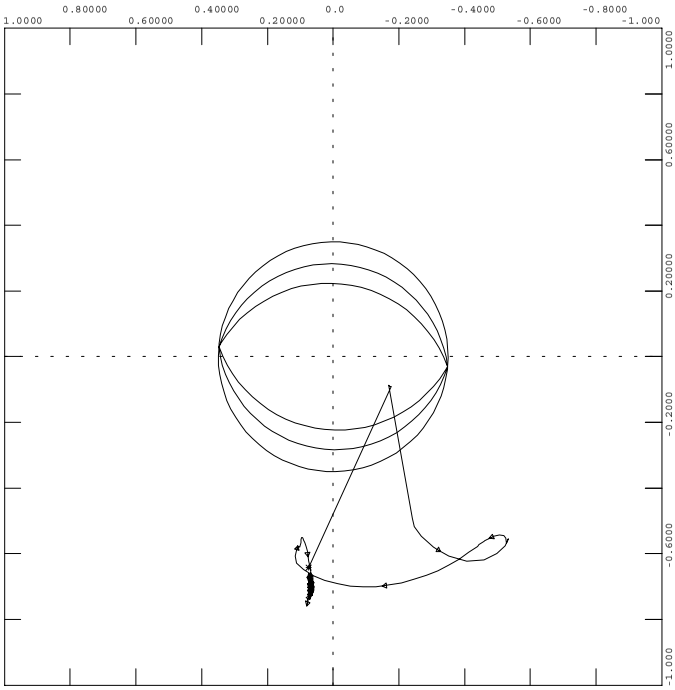
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

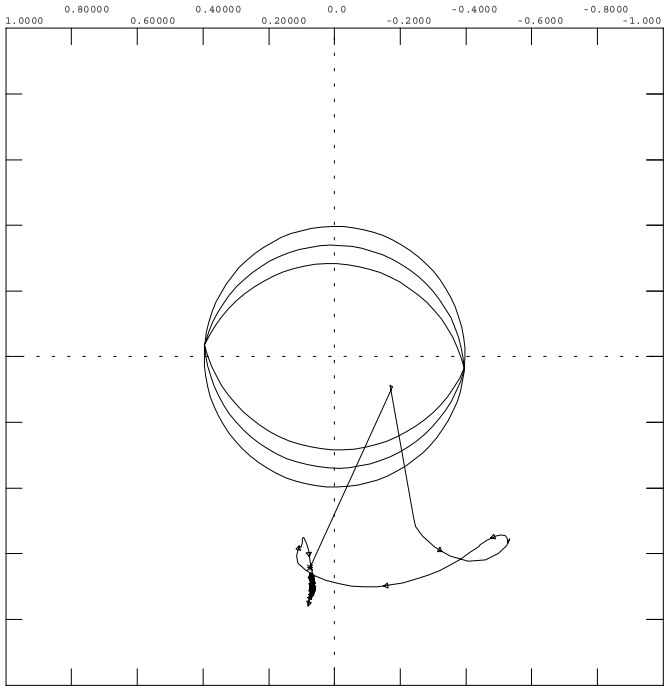
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

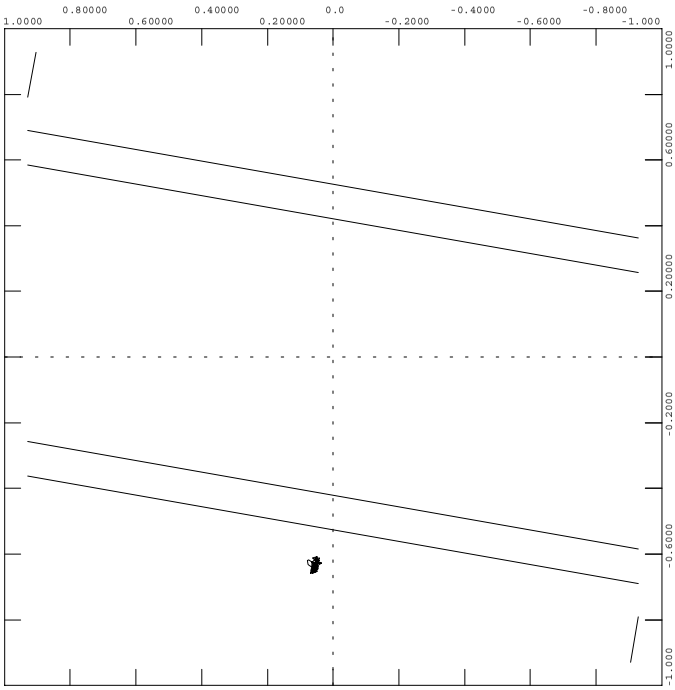
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

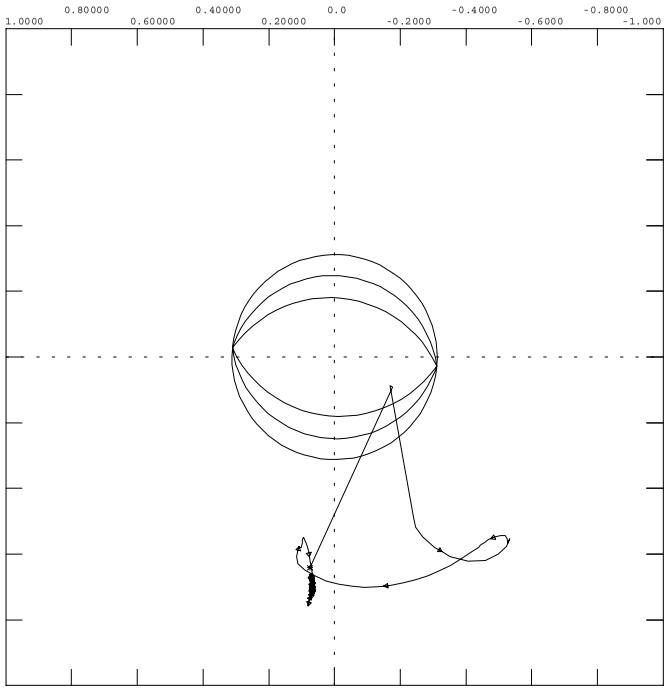
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



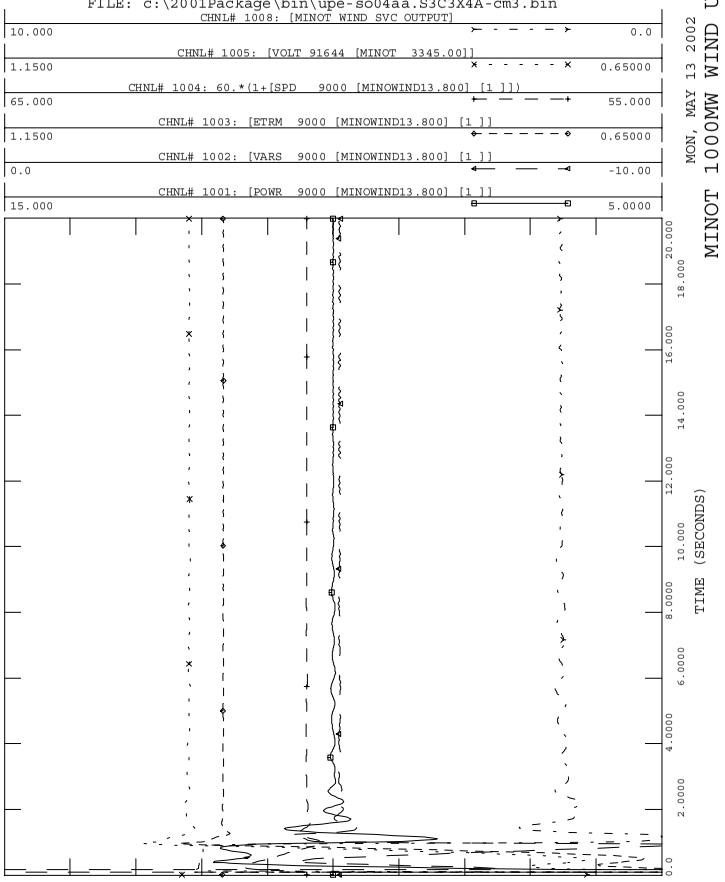
UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

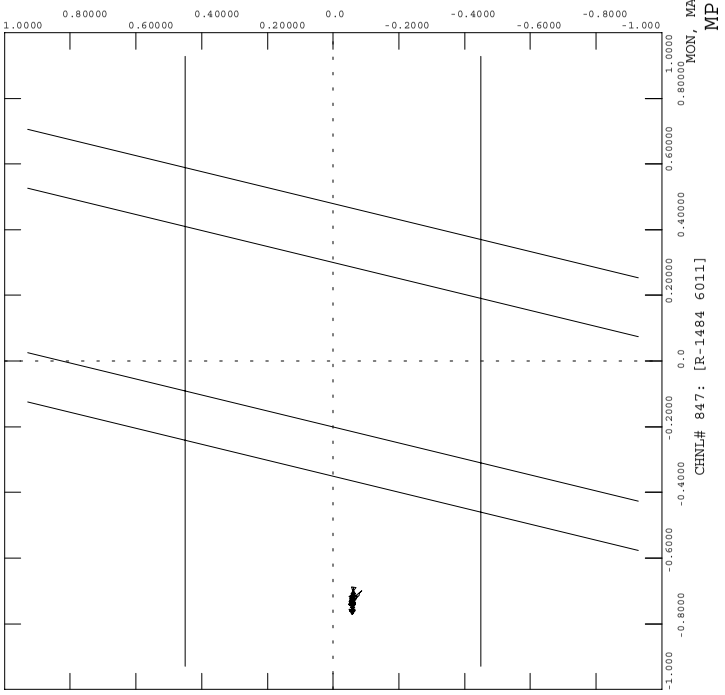


MON, MAY 13 2002 20:21
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE

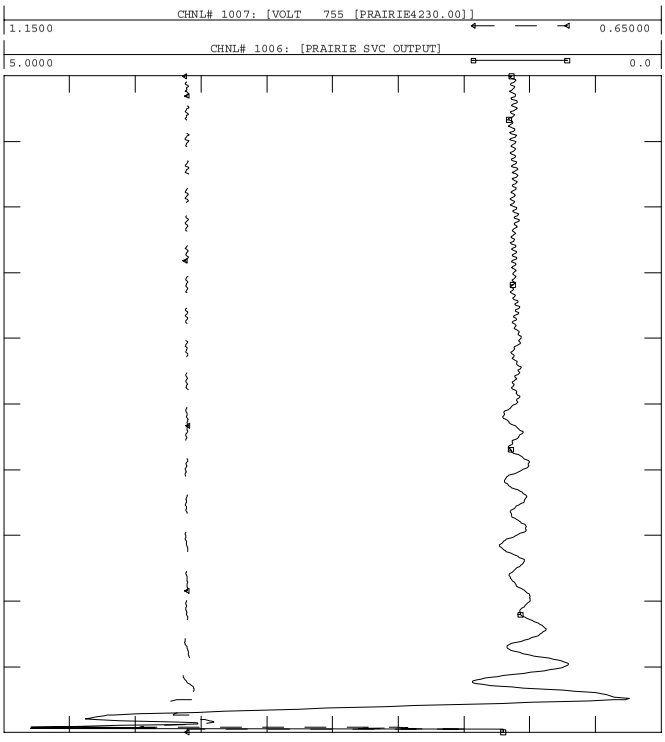
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



MON, MAY 13 2002 20:21
MP-OH I.FALLS (779)

UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT MINOT 345KV
CLEAR MINOT - LELAND OLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C3X4A-cm3.bin



MON, MAY 13 2002 20:21
PRAIRIE SVC RESPONSE

APPENDIX 23

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 3 (MINOT)

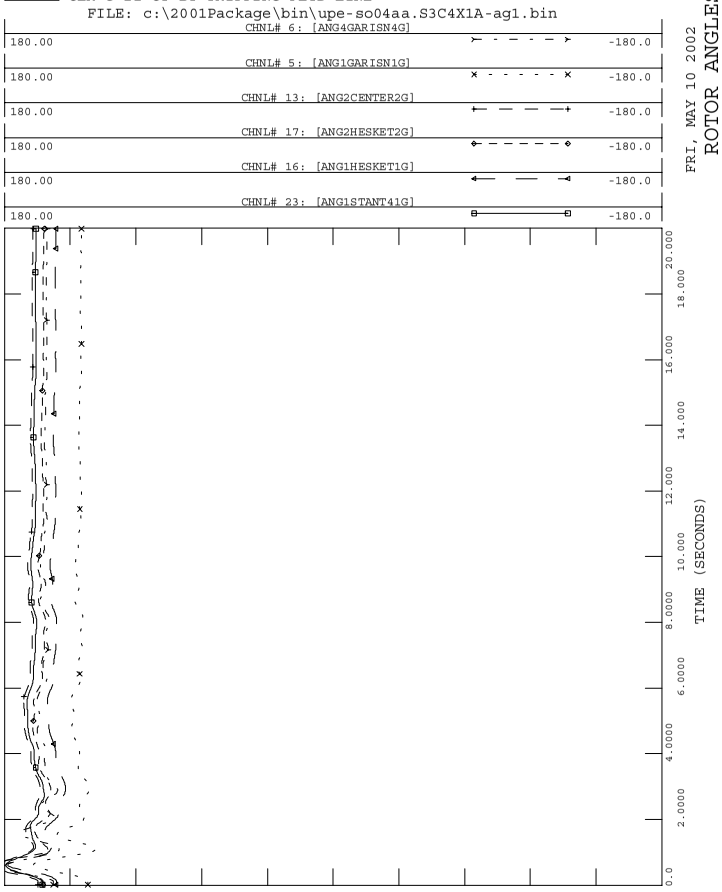
CASE S3C4X1A

CONTINGENCY AG1

Single line to ground fault with breaker fail at Leland Olds on the Ft. Thompson 345 kV line

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

FRI, MAY 10 2002 4:34
ROTOR ANGLES 2



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ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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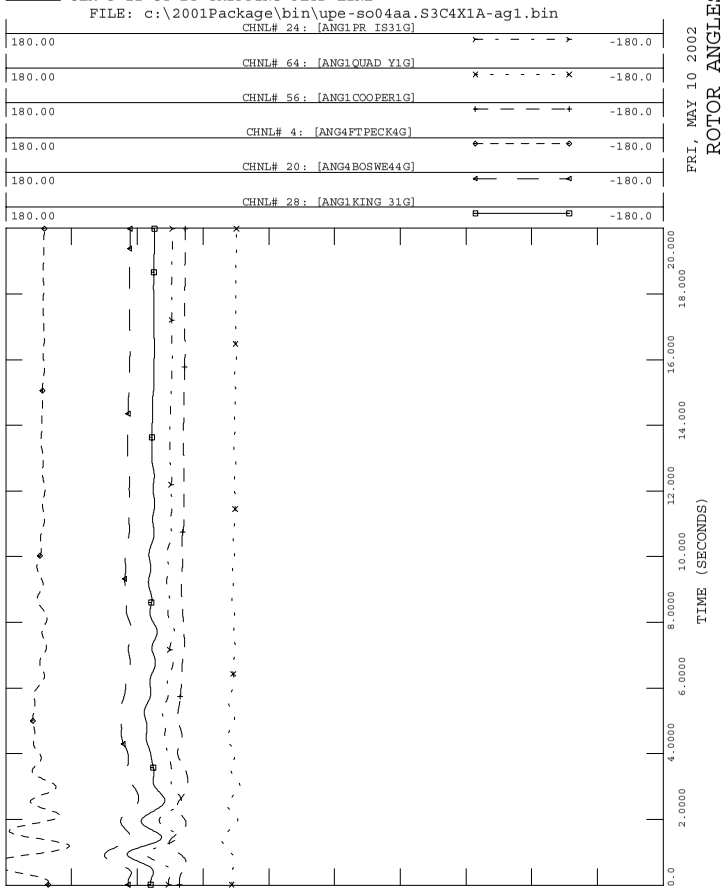
ROTOR ANGLES 4



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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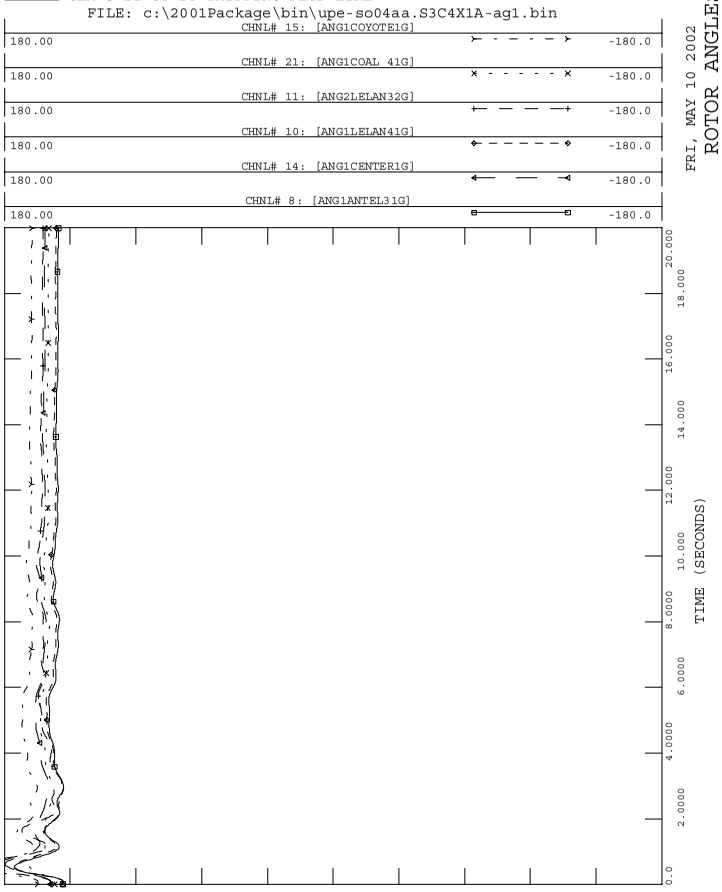

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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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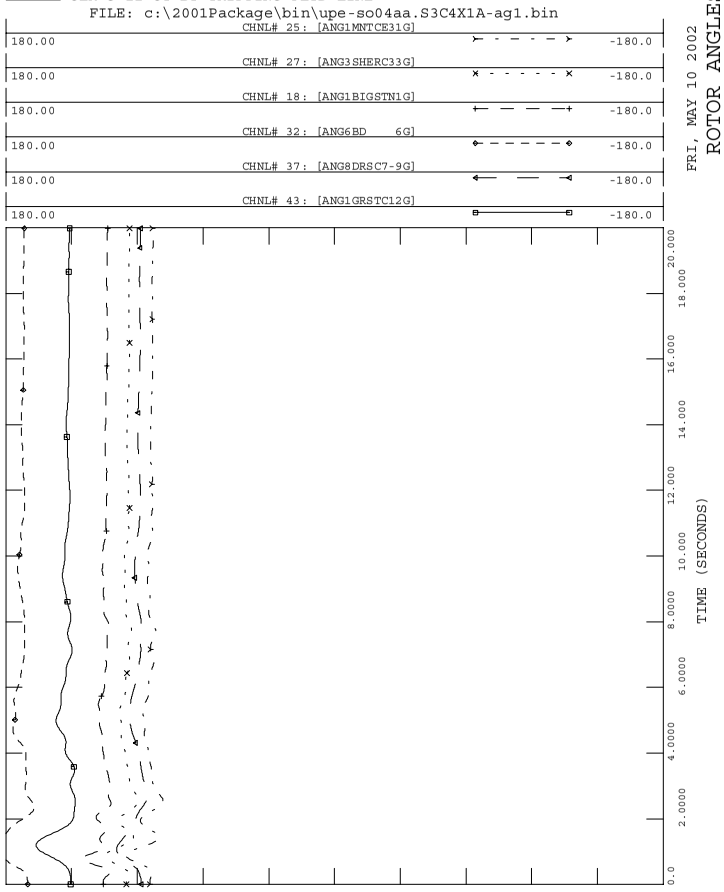
ROTOR ANGLES 3



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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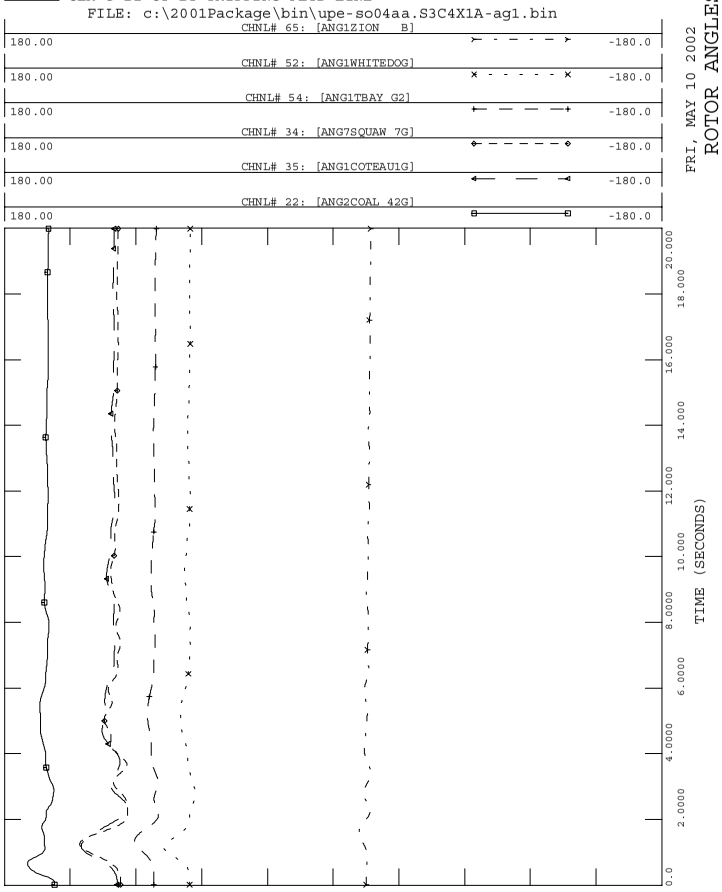
ROTOR ANGLES 6



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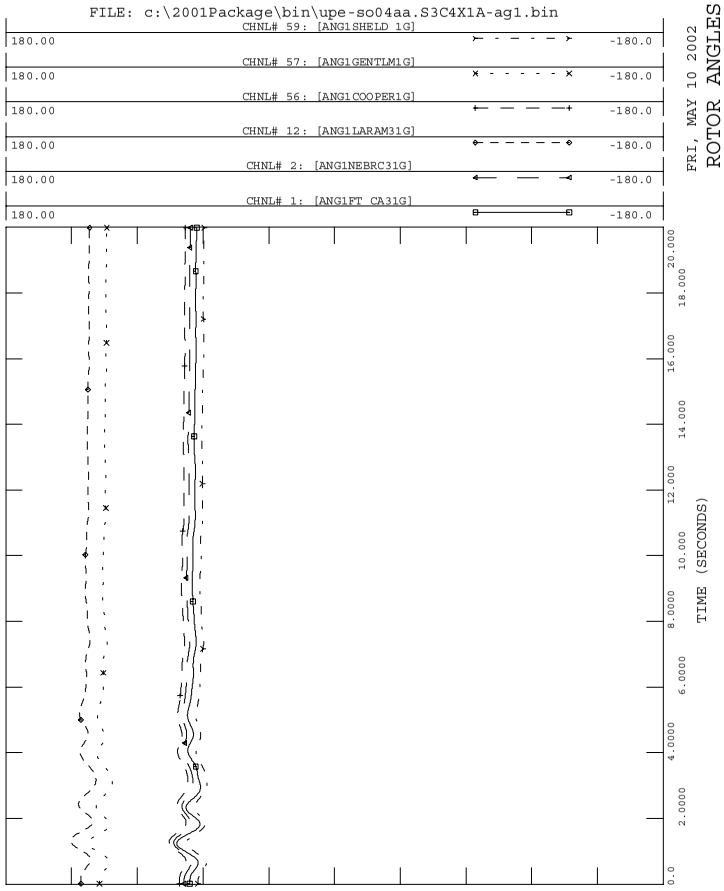
FRI, MAY 10 2002 4:34
ROTOR ANGLES NB



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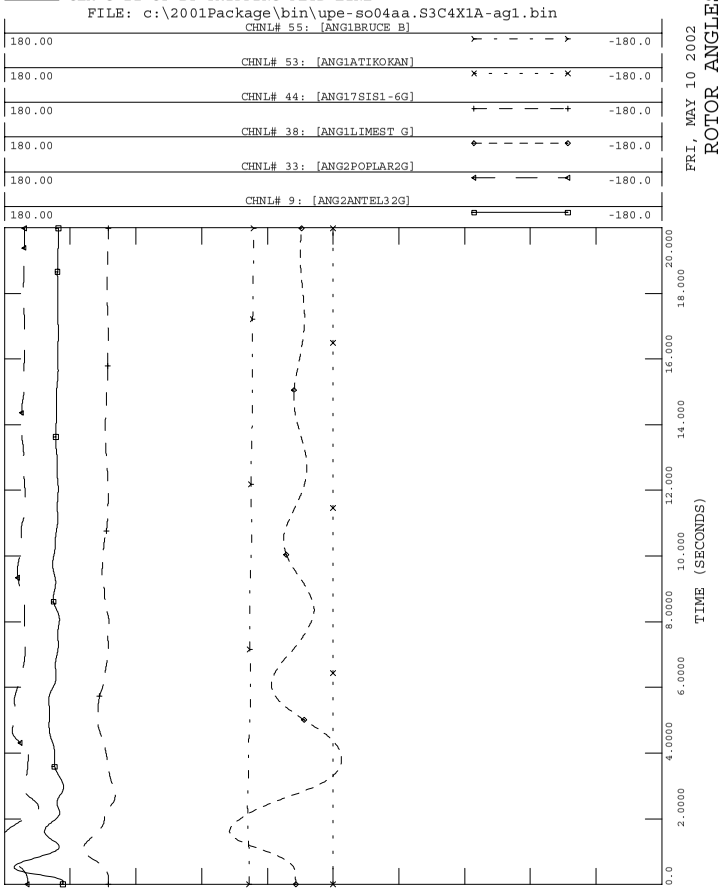
ROTOR ANGLES 5



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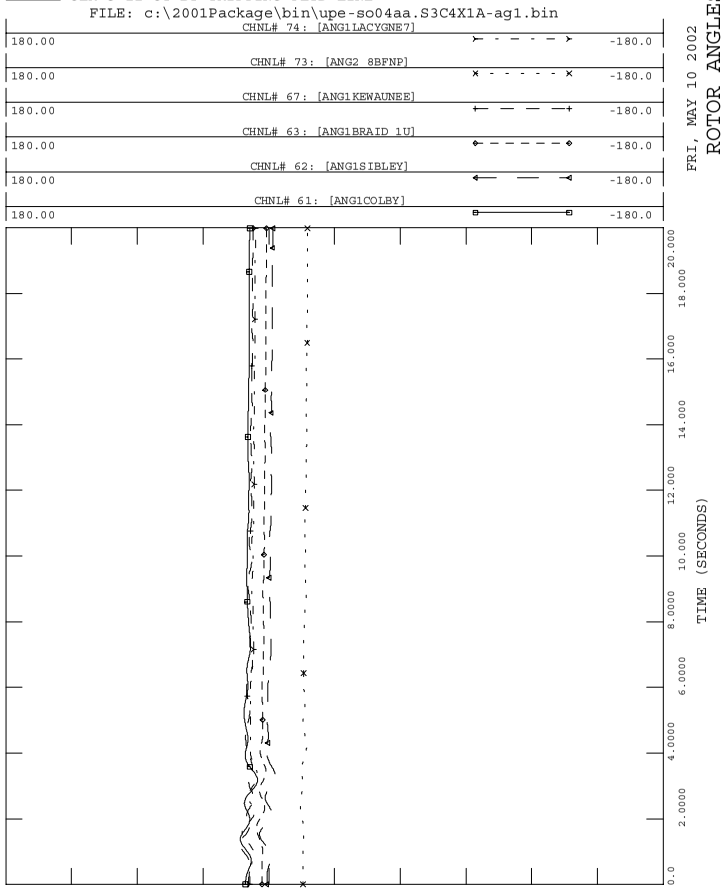
ROTOR ANGLES 7



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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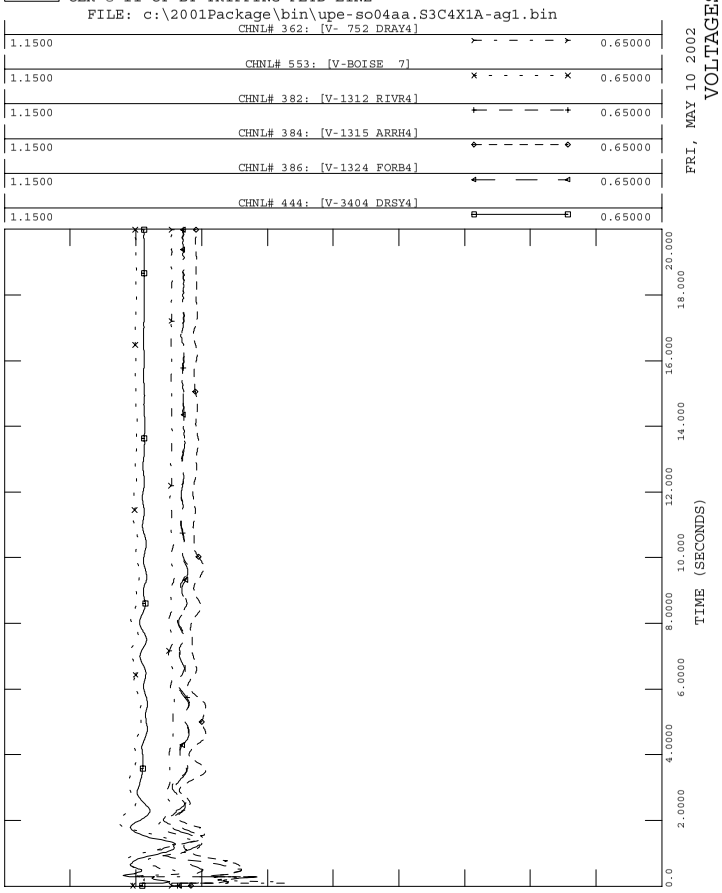

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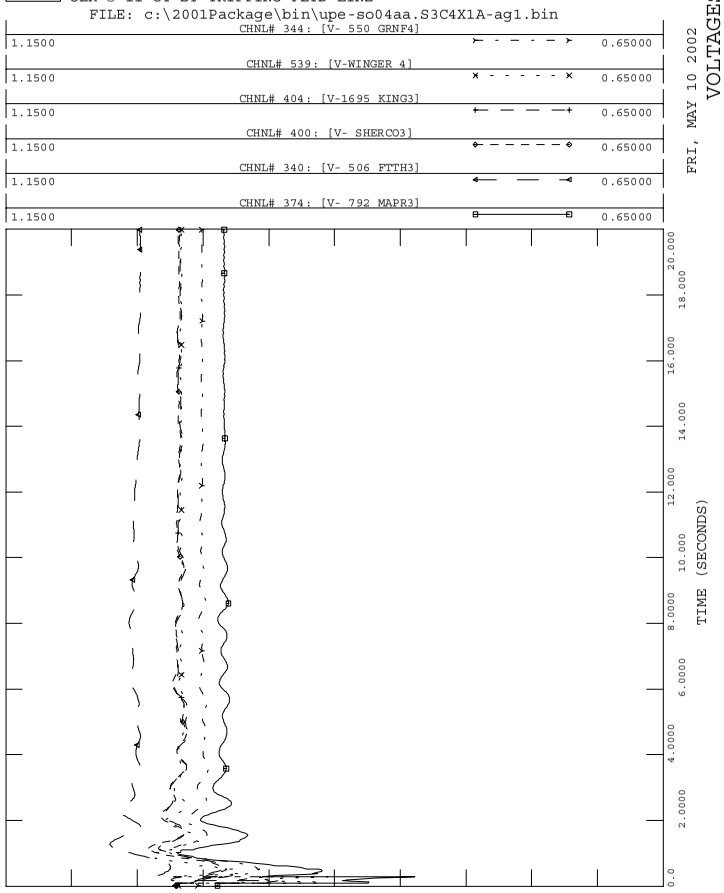
VOLTAGES 3



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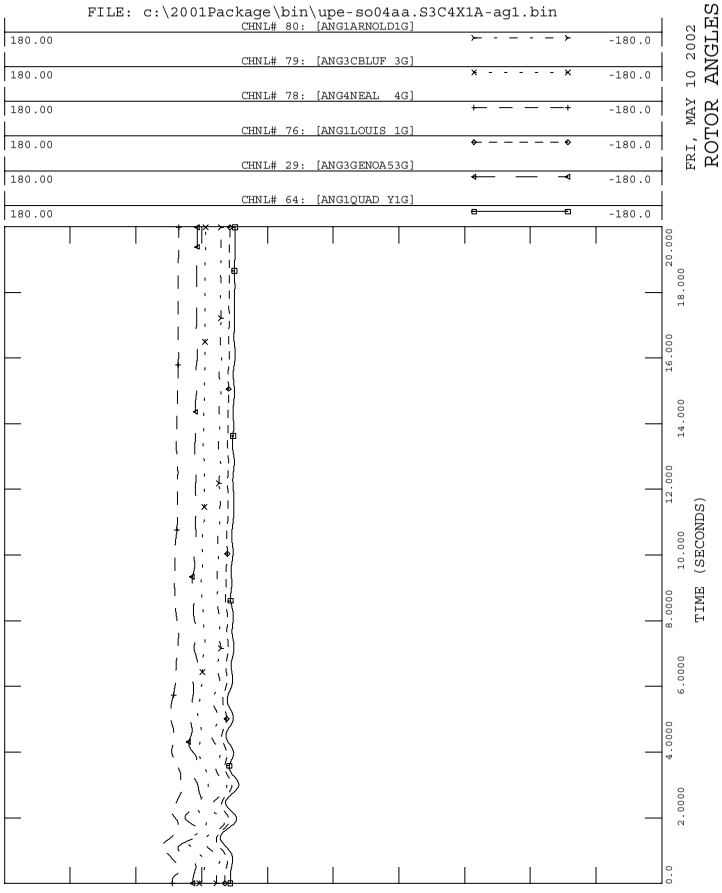
ROTOR ANGLES IA



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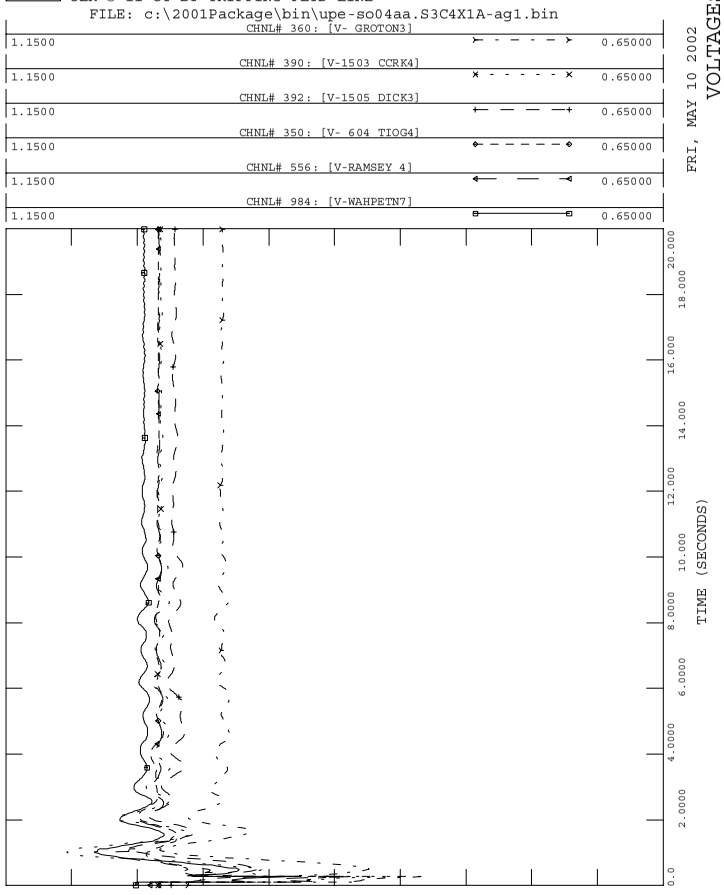
VOLTAGES 2



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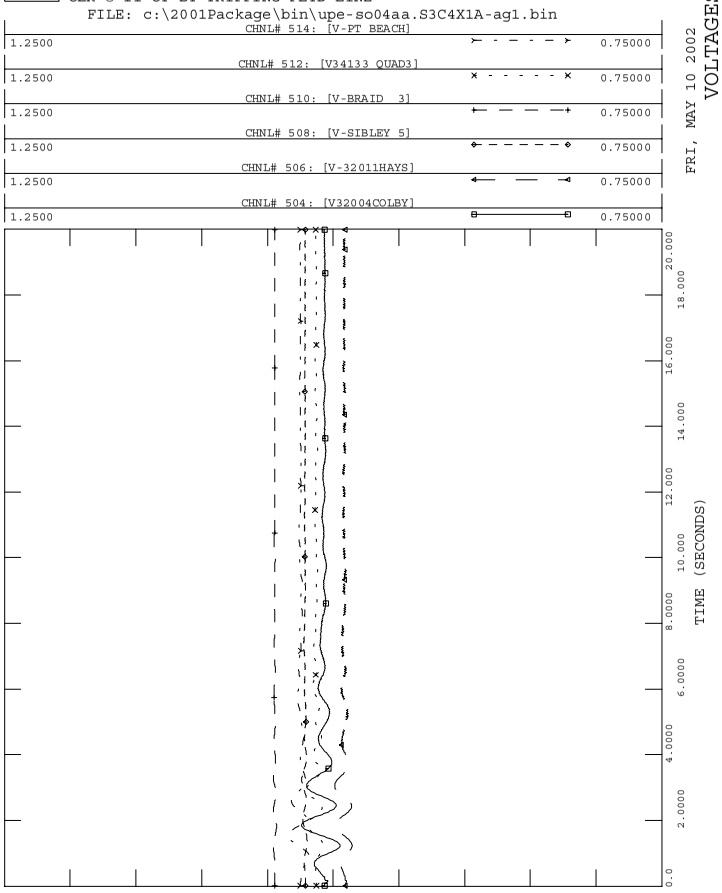

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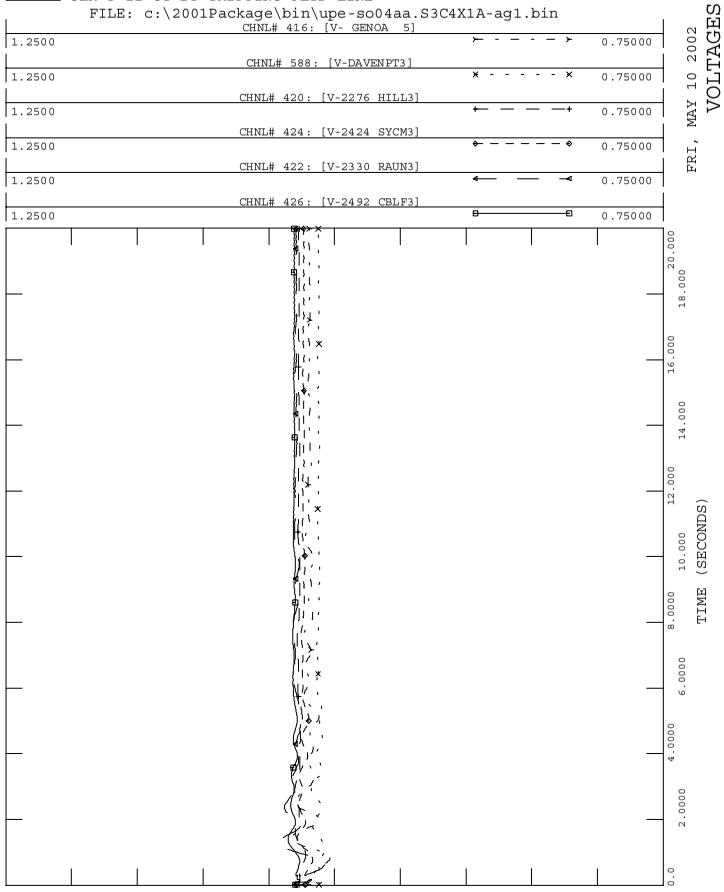

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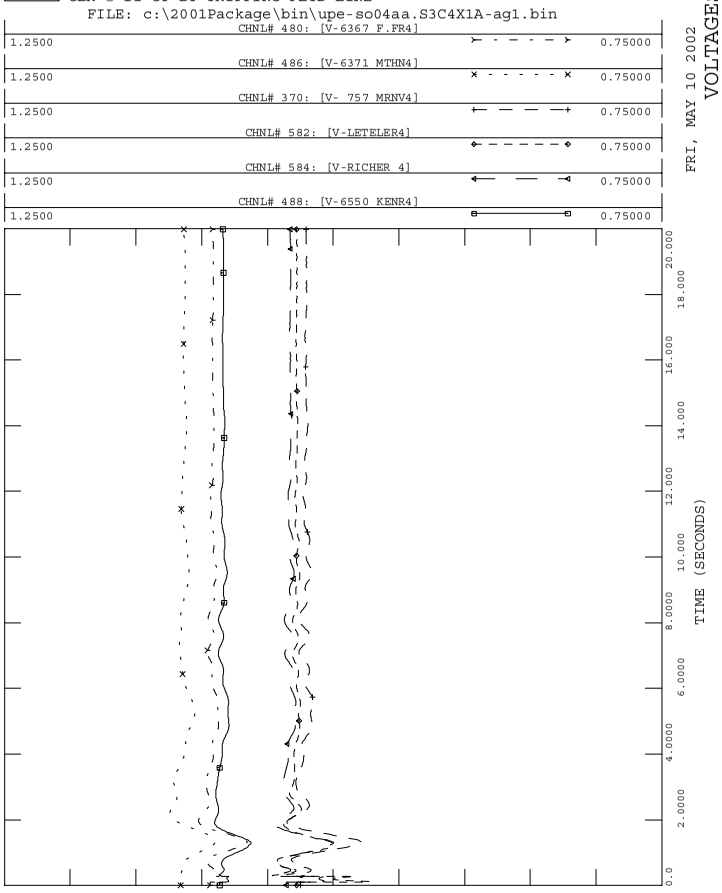

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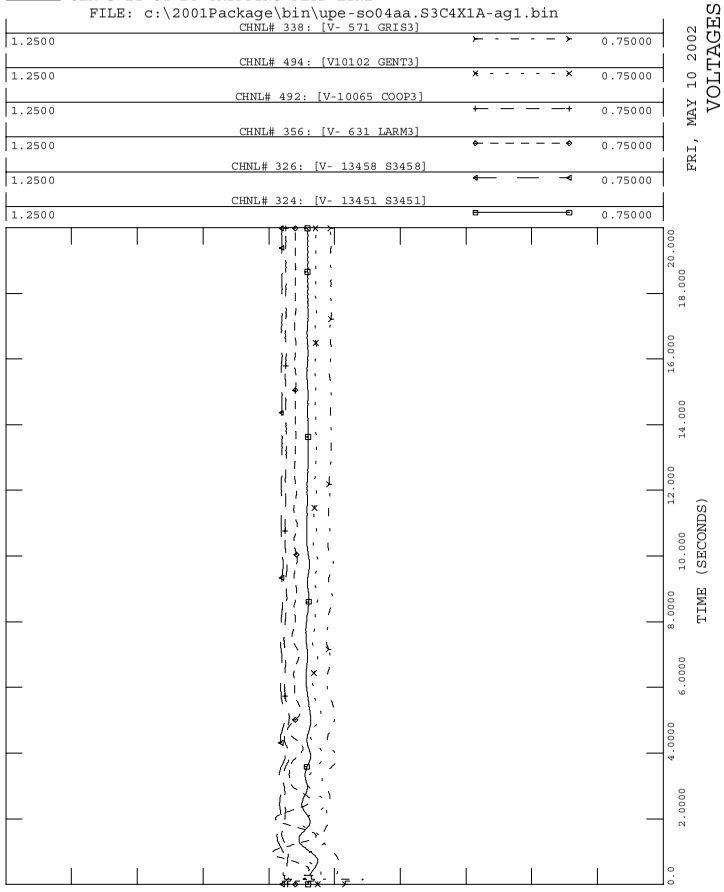

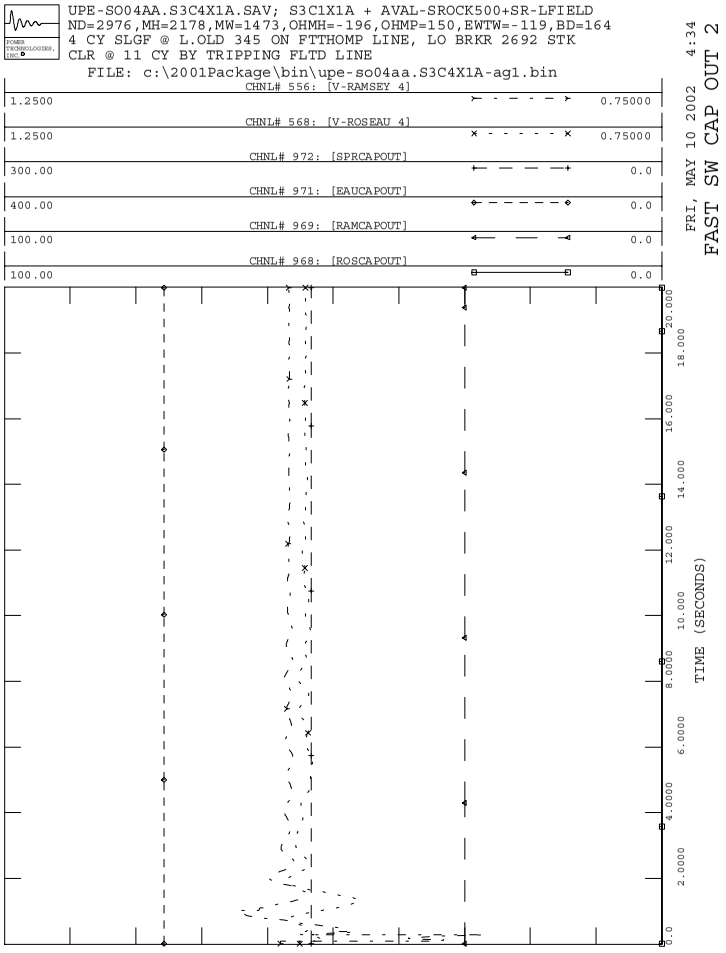
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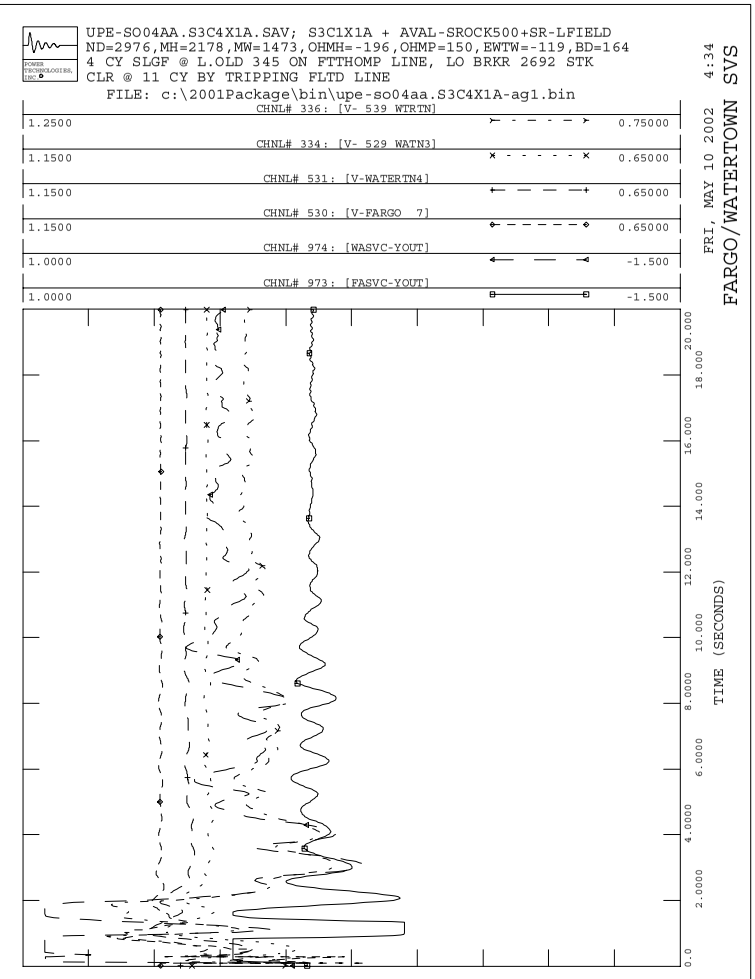
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
FRI, MAY 10 2002 4:34
FAST SW CAP OUT 2
TIME (SECONDS)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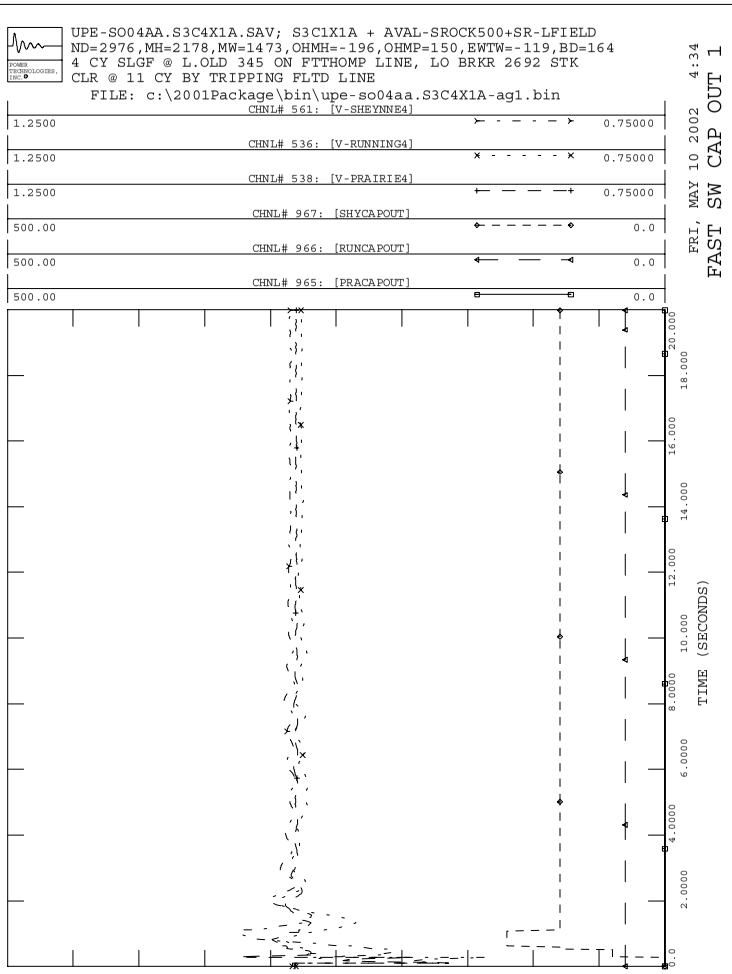
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
FRI, MAY 10 2002 4:34
FARGO/WATERTOWN SVS
TIME (SECONDS)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CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
FRI, MAY 10 2002 4:34
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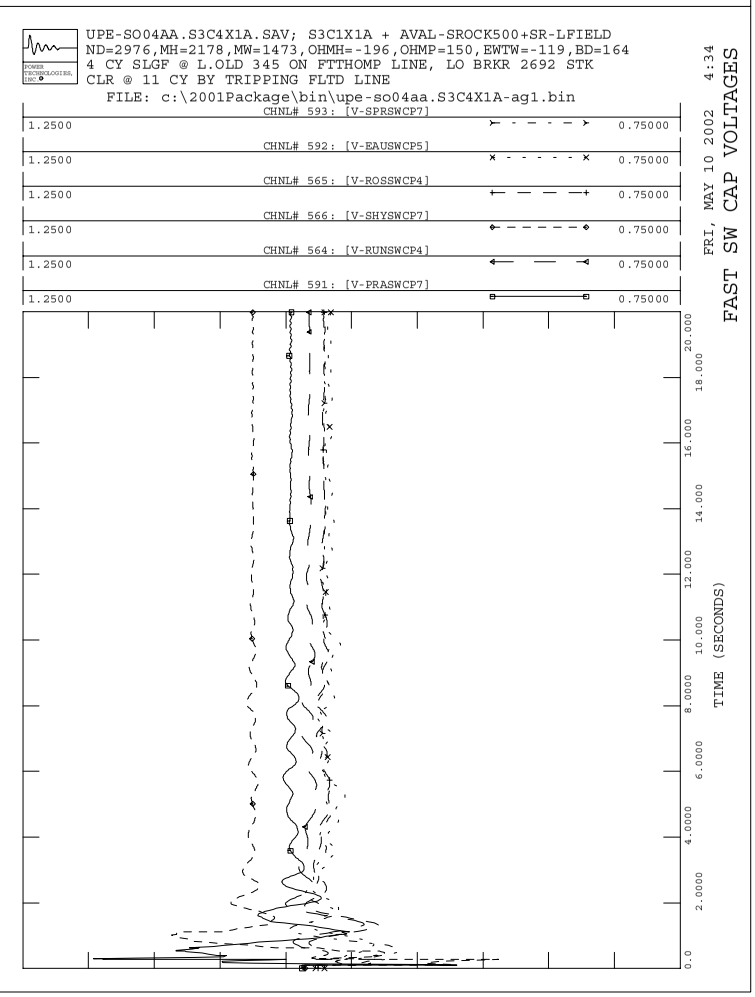
TIME (SECONDS)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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
FRI, MAY 10 2002 4:34
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
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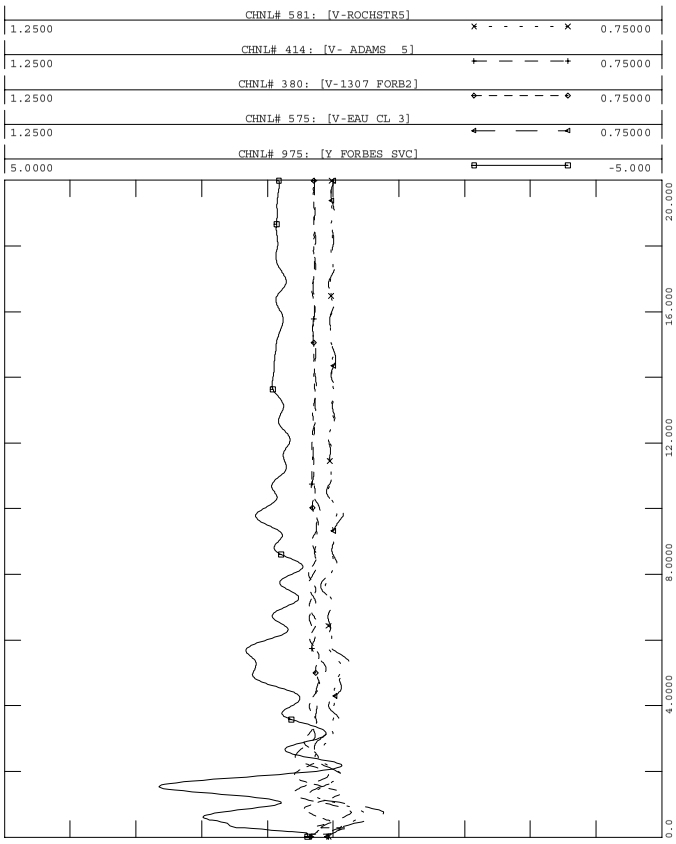
FRI, MAY 10 2002 4:34

SVC & WISCONSIN VOLT



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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
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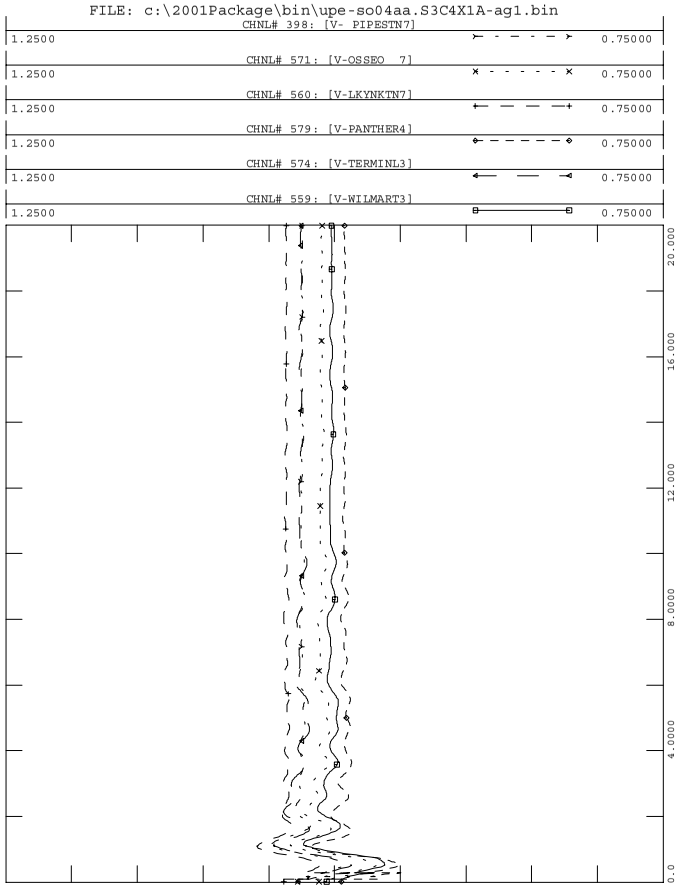
FRI, MAY 10 2002 4:34

TC VOLTAGES



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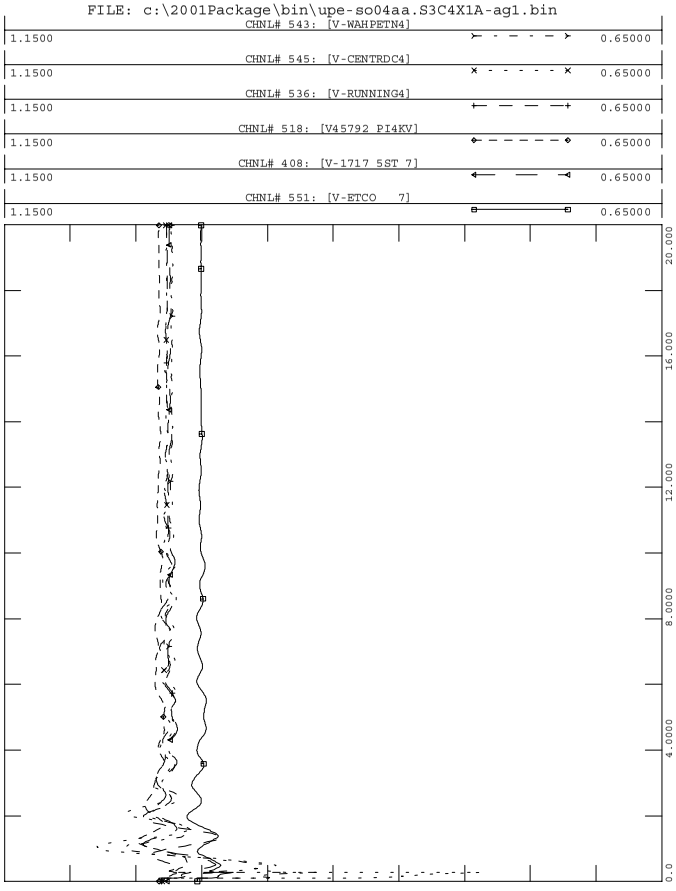
FRI, MAY 10 2002 4:34

VOLTAGES 6



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CLR @ 11 CY BY TRIPPING FLTD LINE
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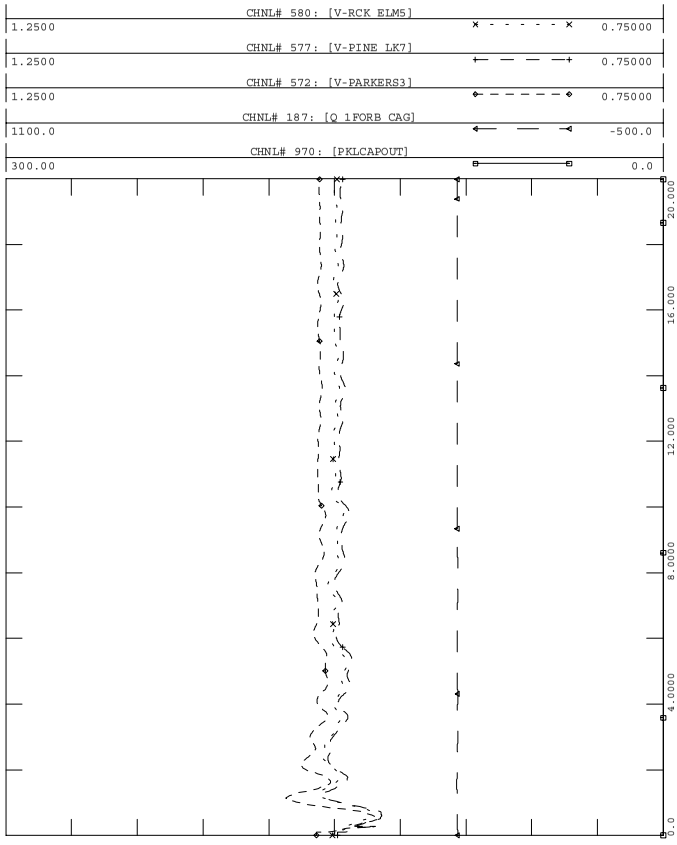
FRI, MAY 10 2002 4:34

FORBES SVS OUT & VOLTAGES



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CLR @ 11 CY BY TRIPPING FLTD LINE
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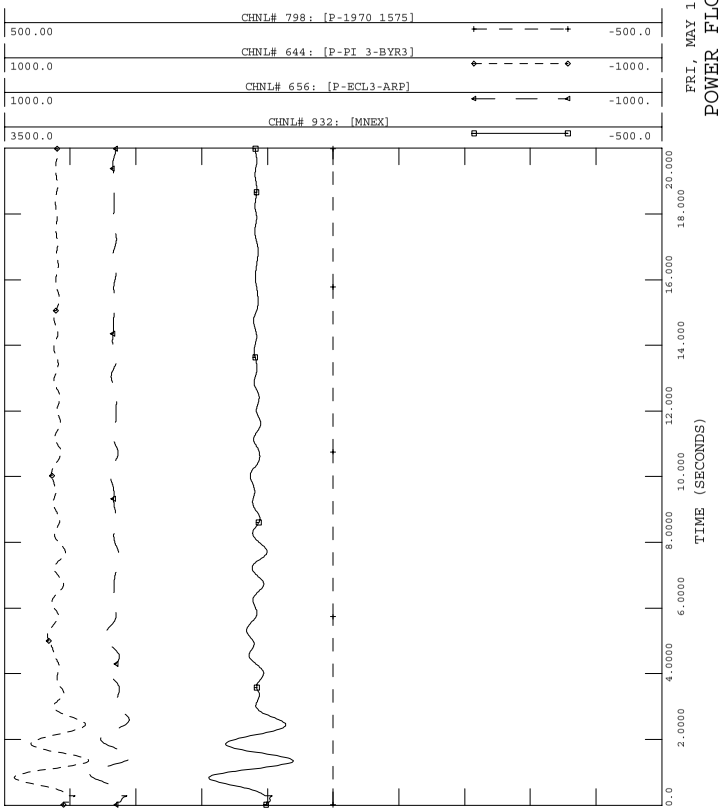
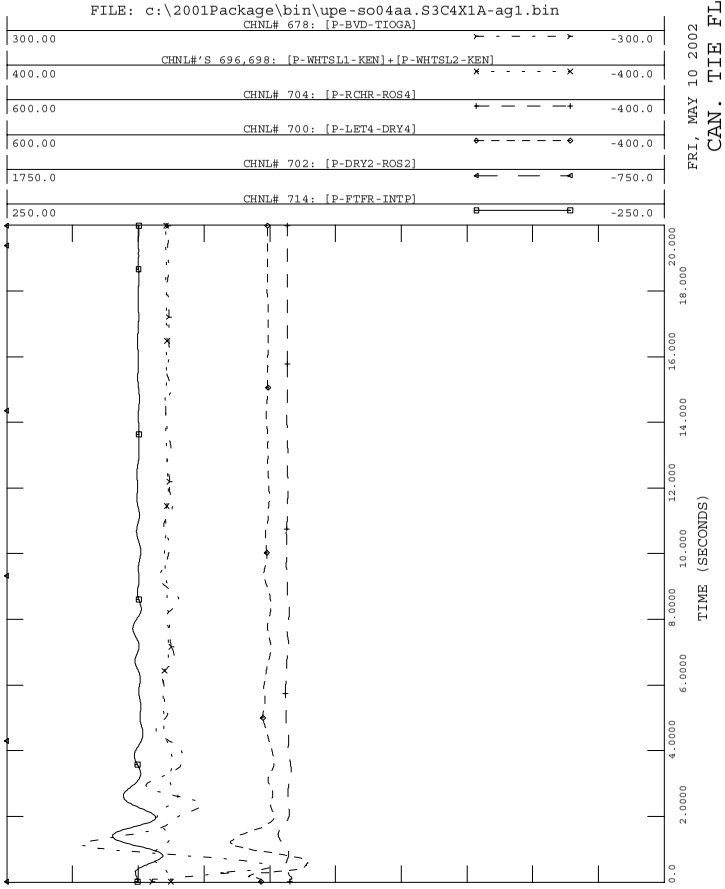
FRI, MAY 10 2002 4:34
POWER FLOW SUMS 2



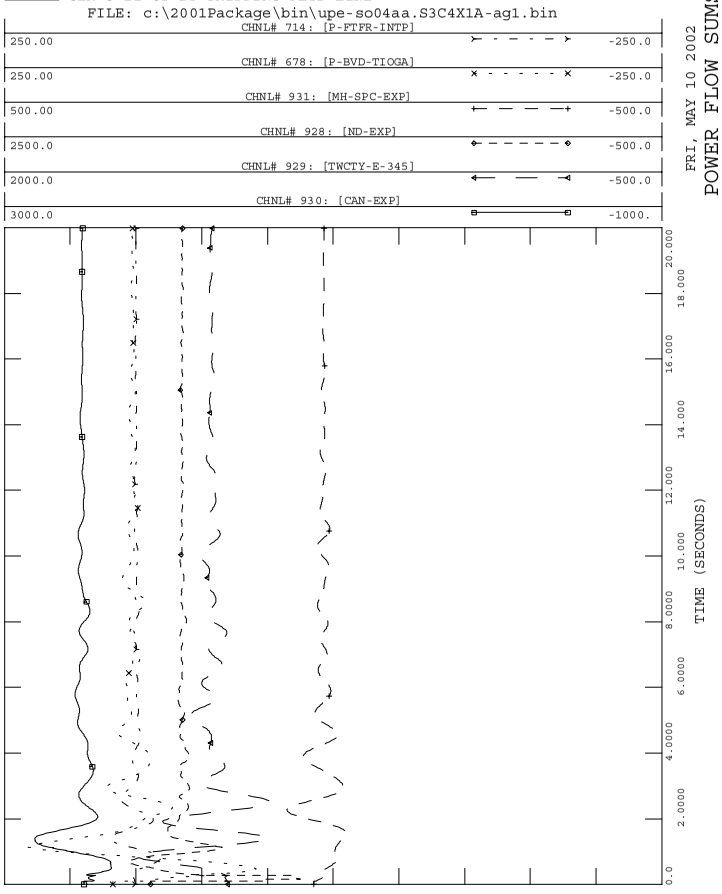
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

FRI, MAY 10 2002 4:34
CAN. TIE FLOWS



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

FRI, MAY 10 2002 4:34
POWER FLOW SUMS 1



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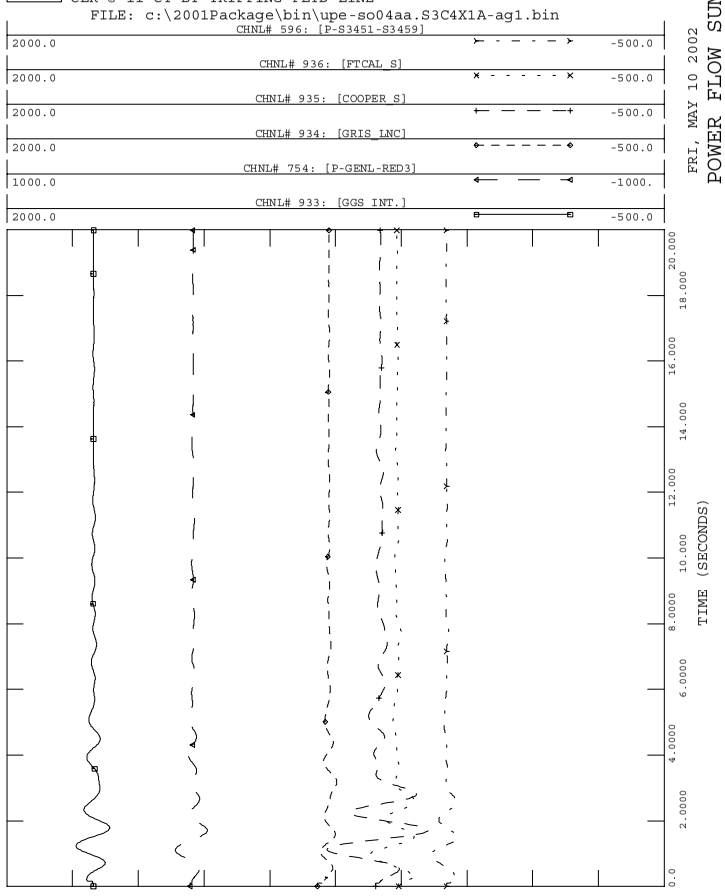
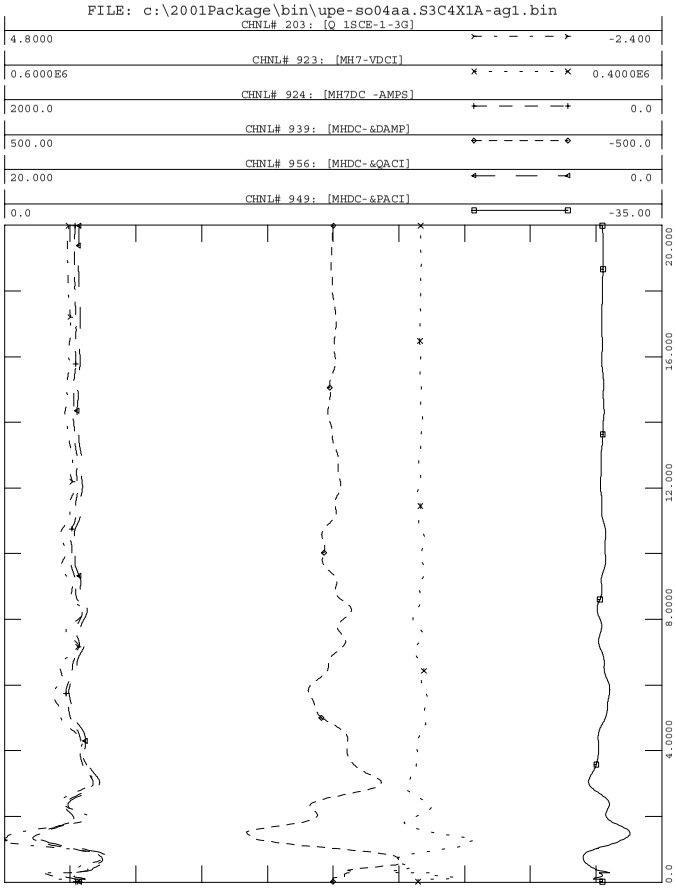
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

FRI, MAY 10 2002 4:34
POWER FLOW SUM 3



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

FRI, MAY 10 2002 4:34
MH DC PARAMETERS



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
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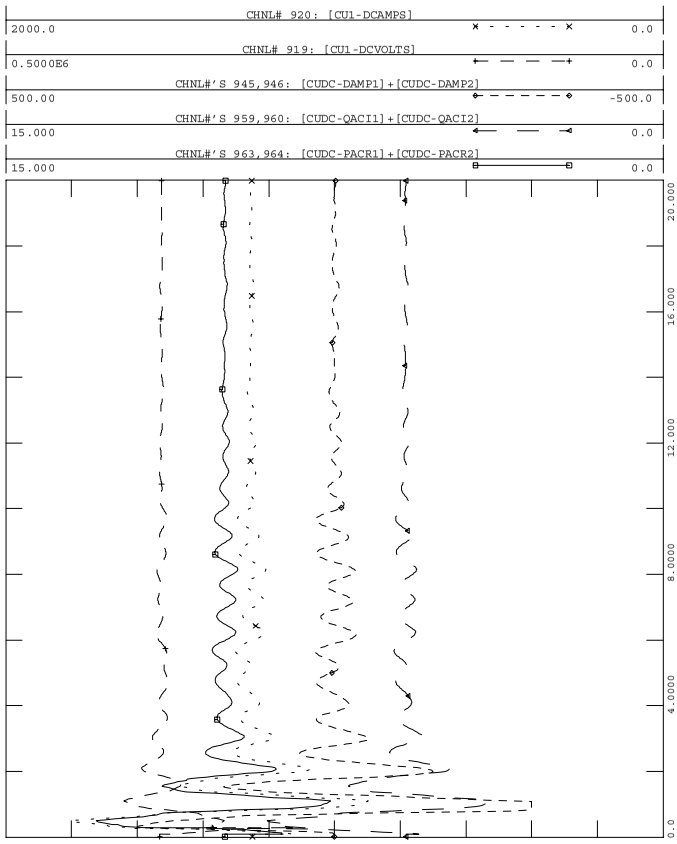
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

FRI, MAY 10 2002 4:34
CU DC #1



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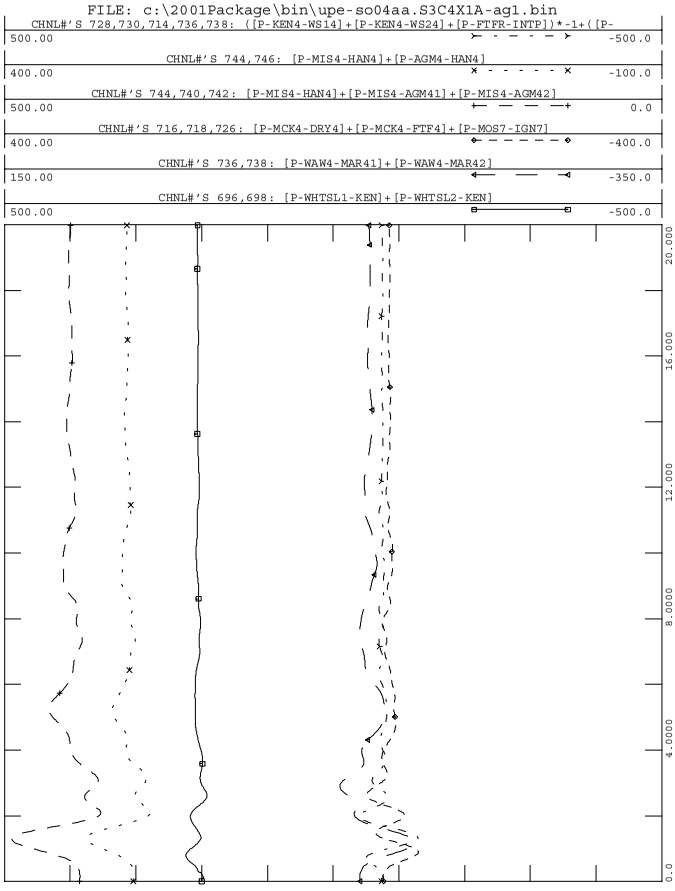
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

FRI, MAY 10 2002 4:34
OH TIE FLOWS



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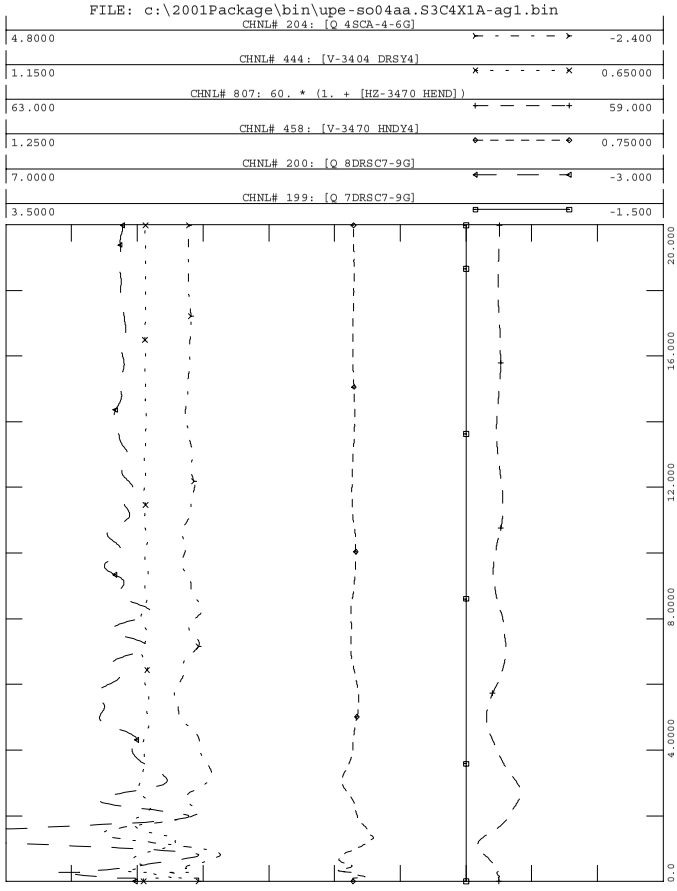
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

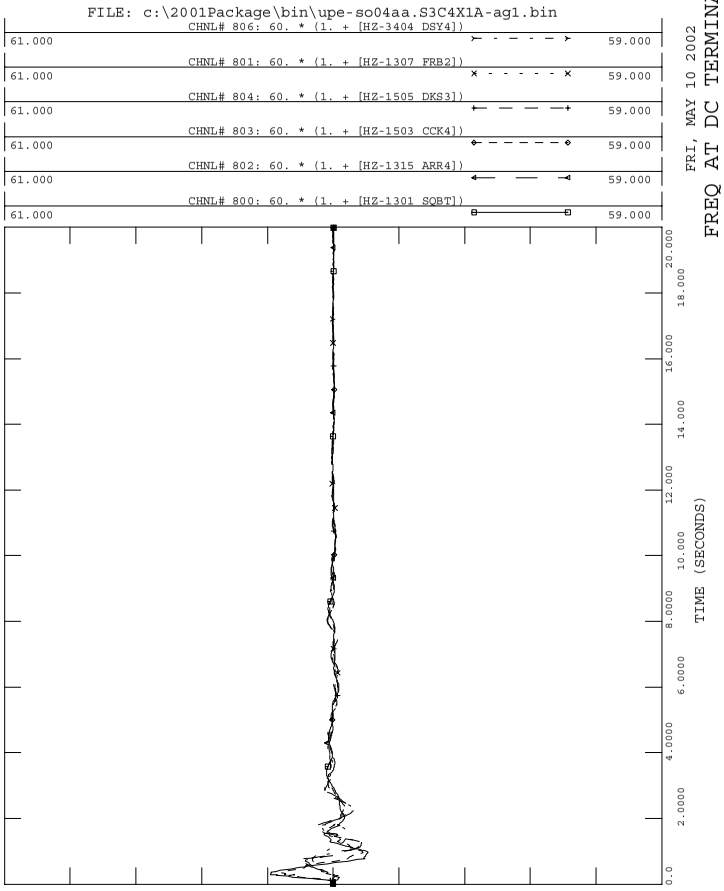
FRI, MAY 10 2002 4:34
MH DC PARAMETERS



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

FRI, MAY 10 2002 4:34

FREQ AT DC TERMINALS



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ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

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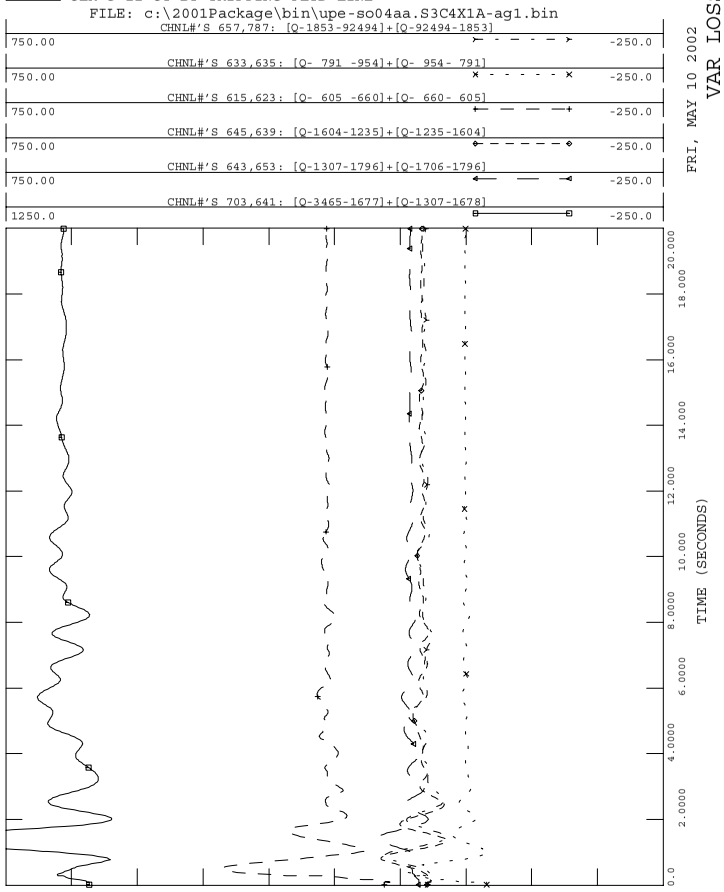
VAR LOSSES



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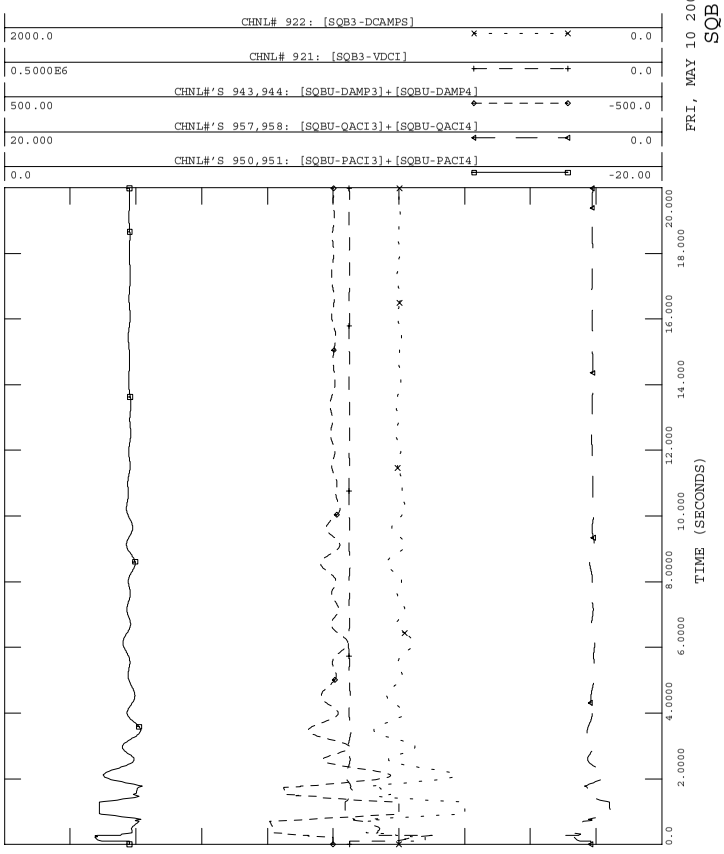
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

FRI, MAY 10 2002 4:34

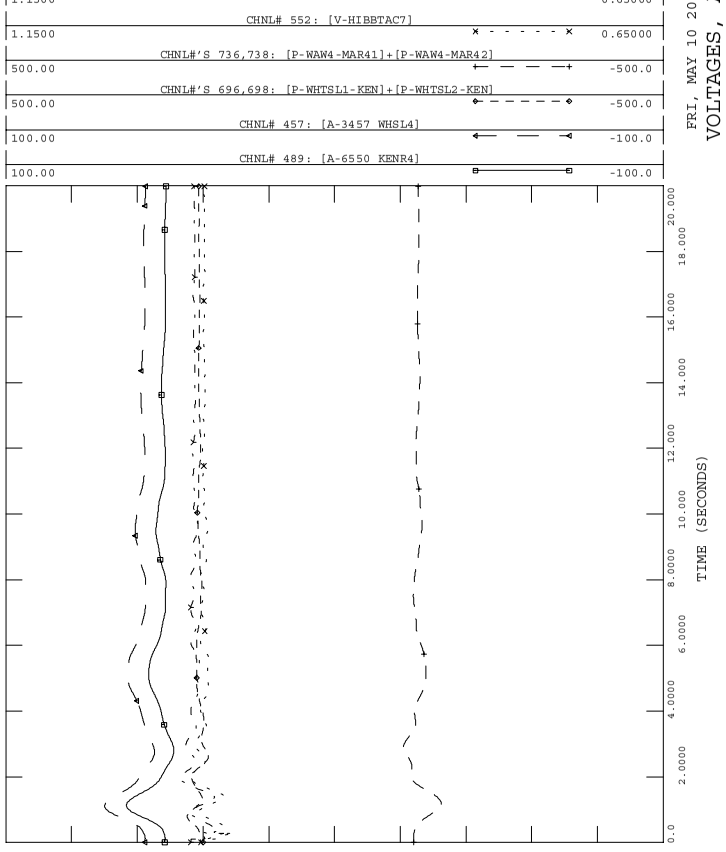
SQB DC #3



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

FRI, MAY 10 2002 4:34

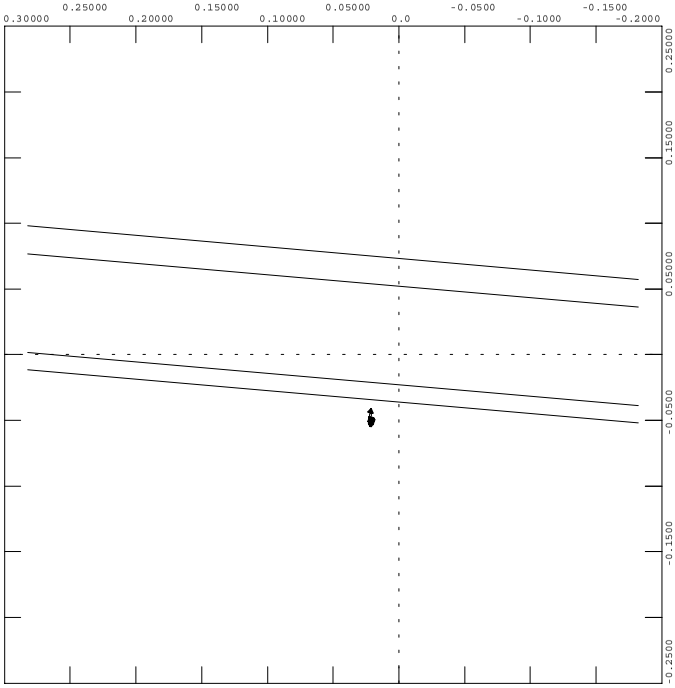
VOLTAGES, ANGLES



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



FRI, MAY 10 2002 4:34
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

RELAY: RELAYG
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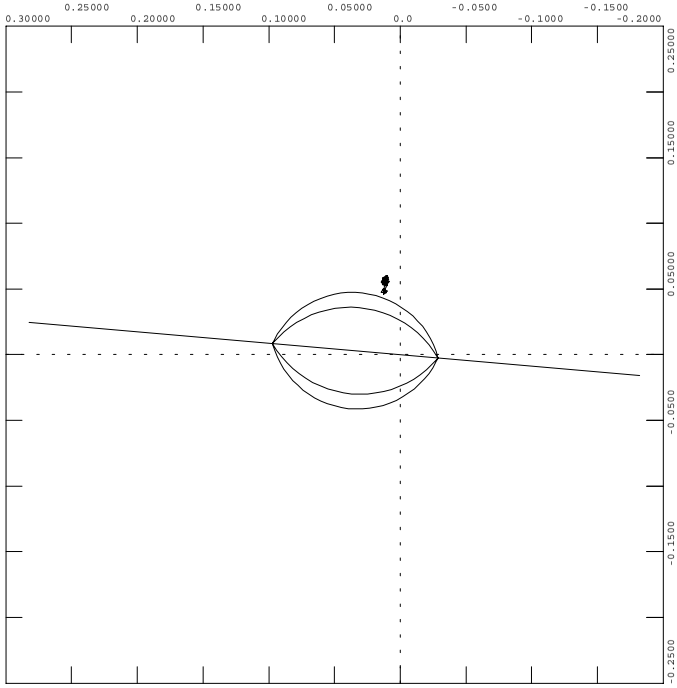
CHNL# 856: [X-DSY2-ROS2]



FRI, MAY 10 2002 4:34
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
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4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

RELAY: RELAYG
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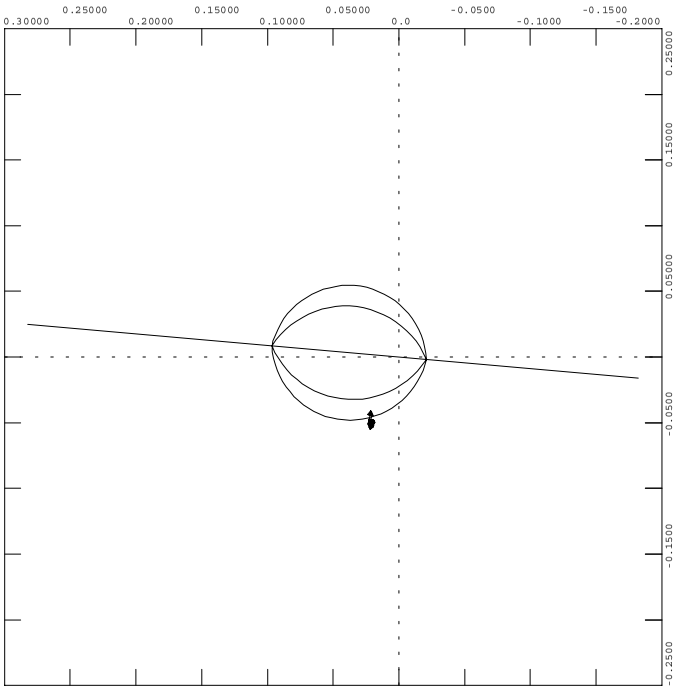
CHNL# 824: [X-FRB2-ROS2]



FRI, MAY 10 2002 4:34
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

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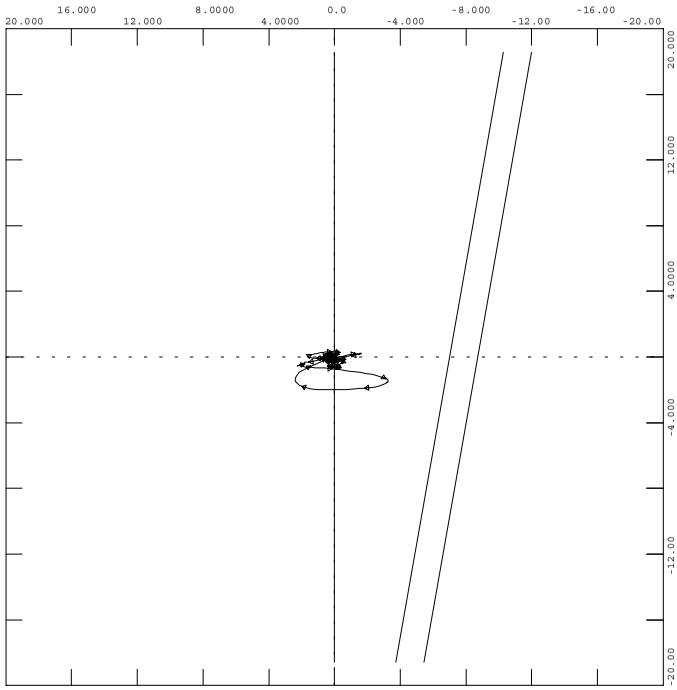
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]



FRI, MAY 10 2002 4:34
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
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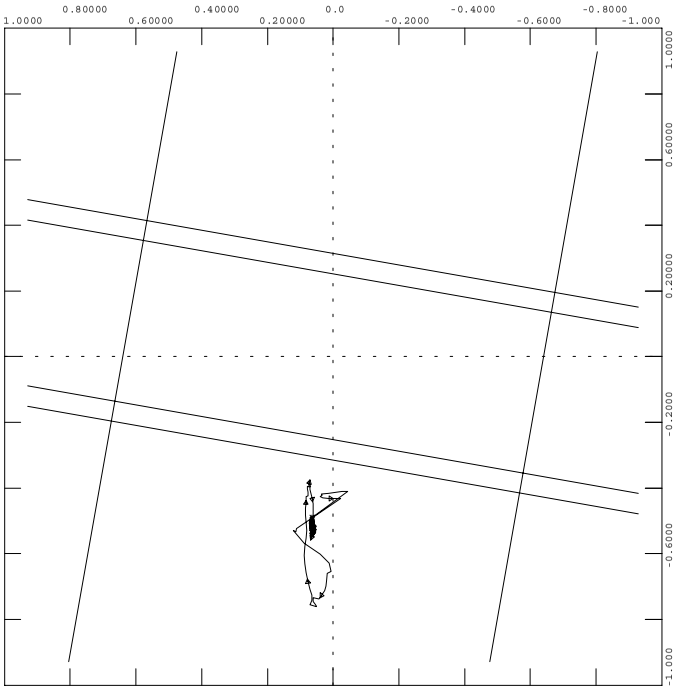
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

RELAY: SLINOS
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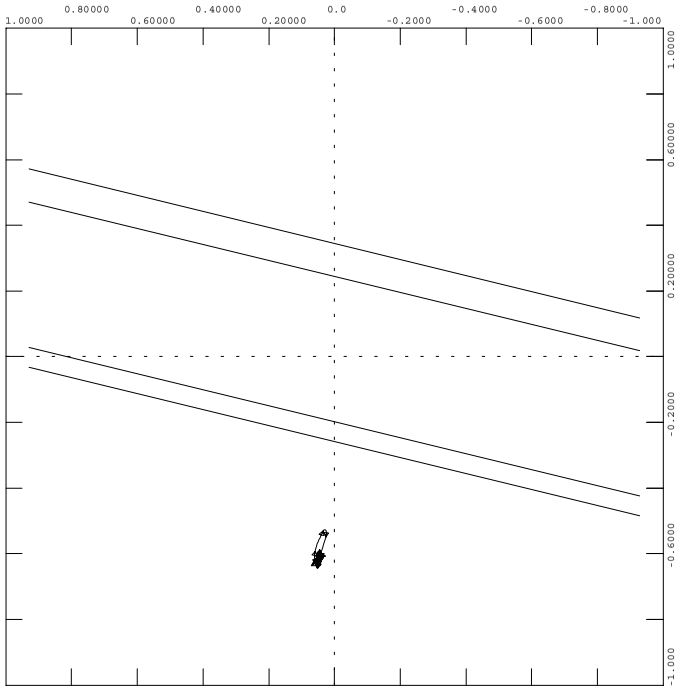
CHNL# 822: [X-MRV4-RCH4]



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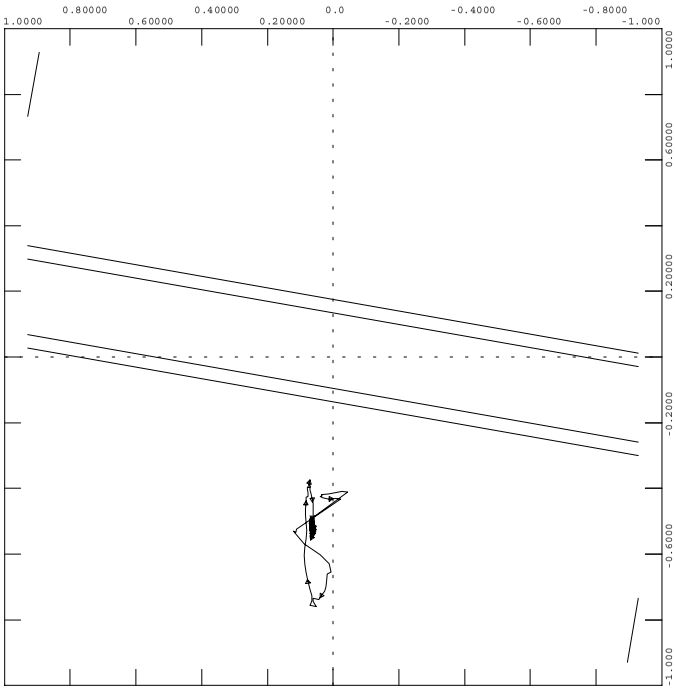
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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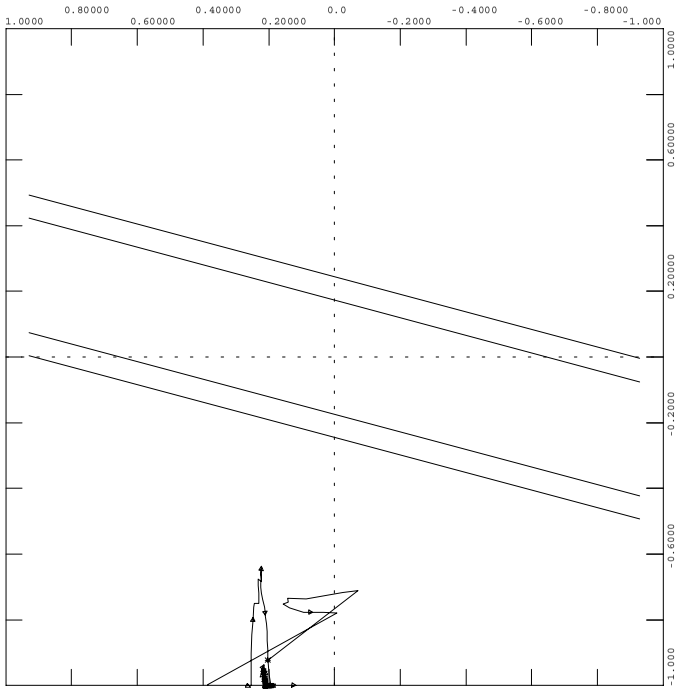
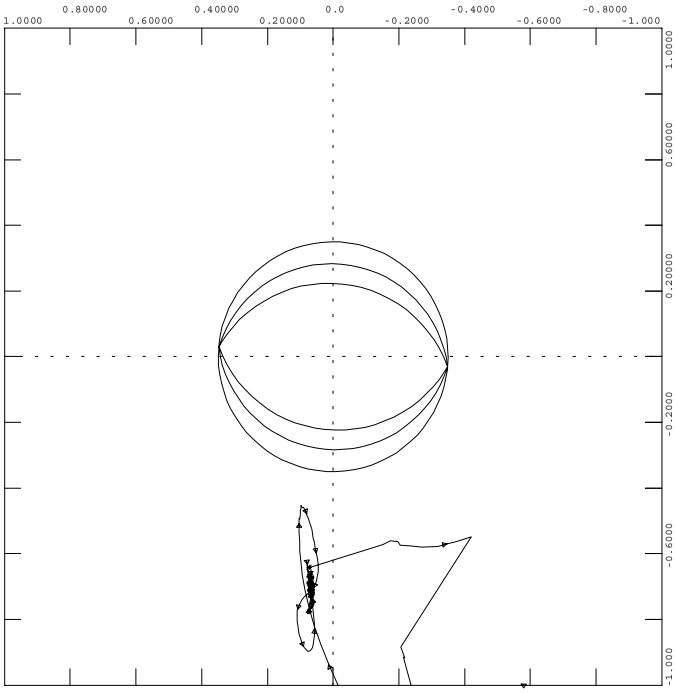


UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

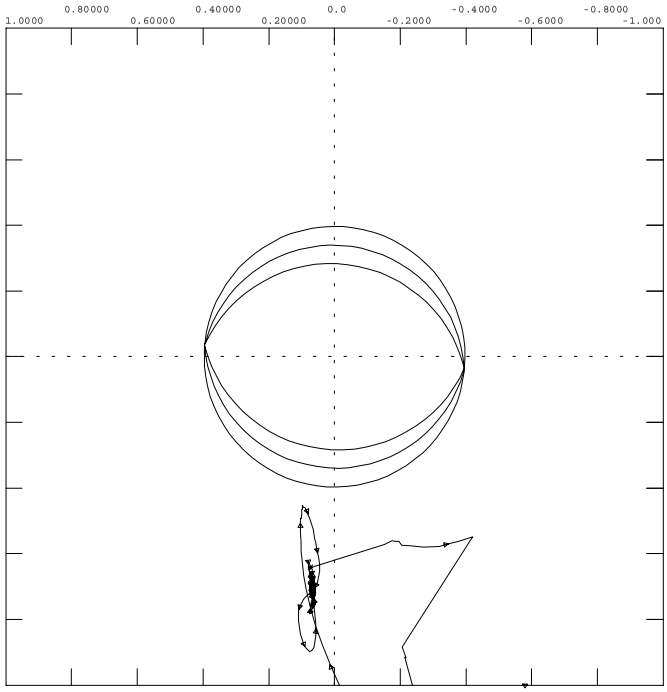
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



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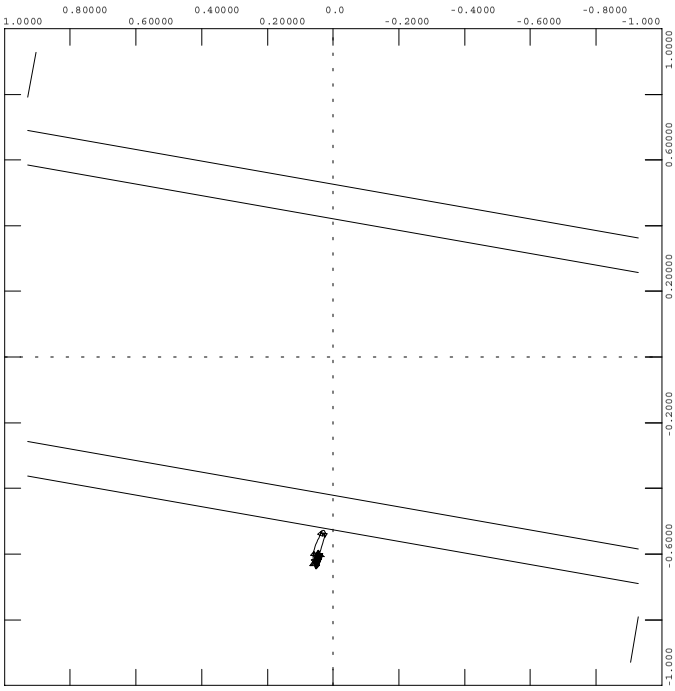
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

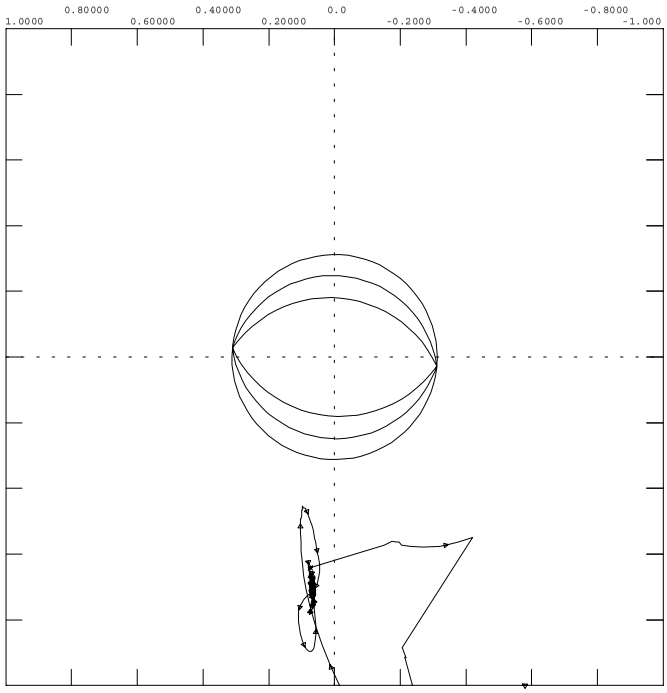
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



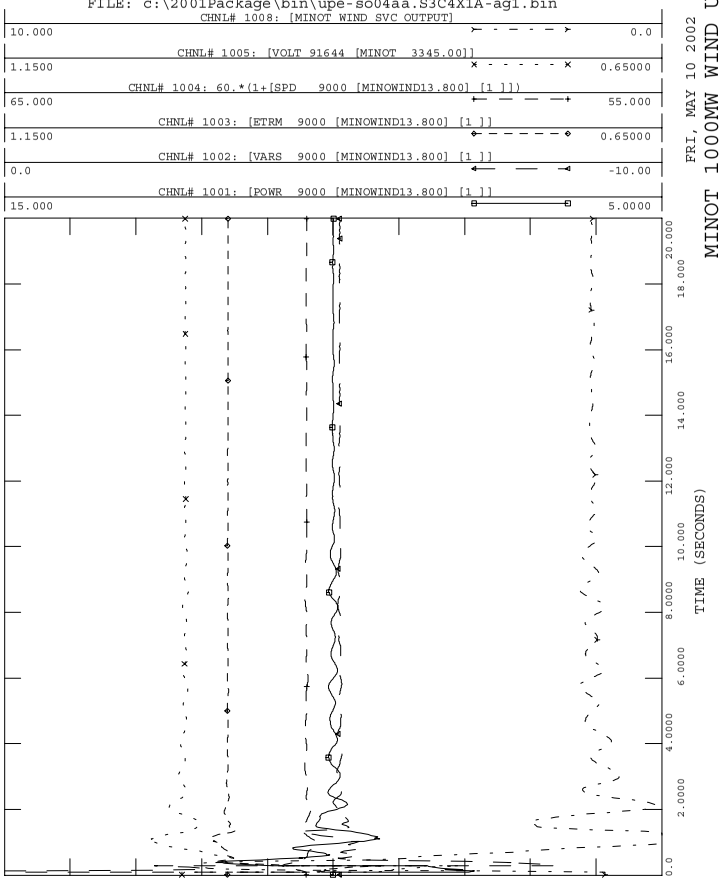
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

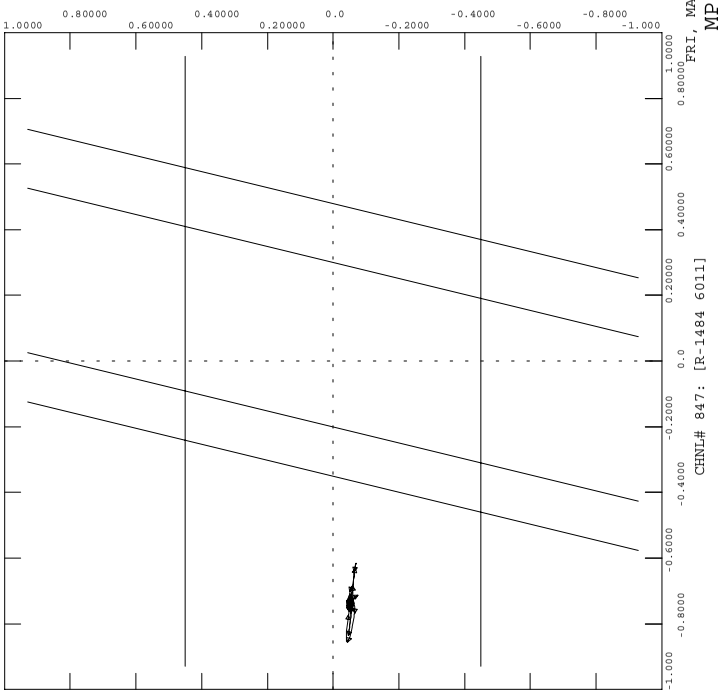


FRI, MAY 10 2002 4:34
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE

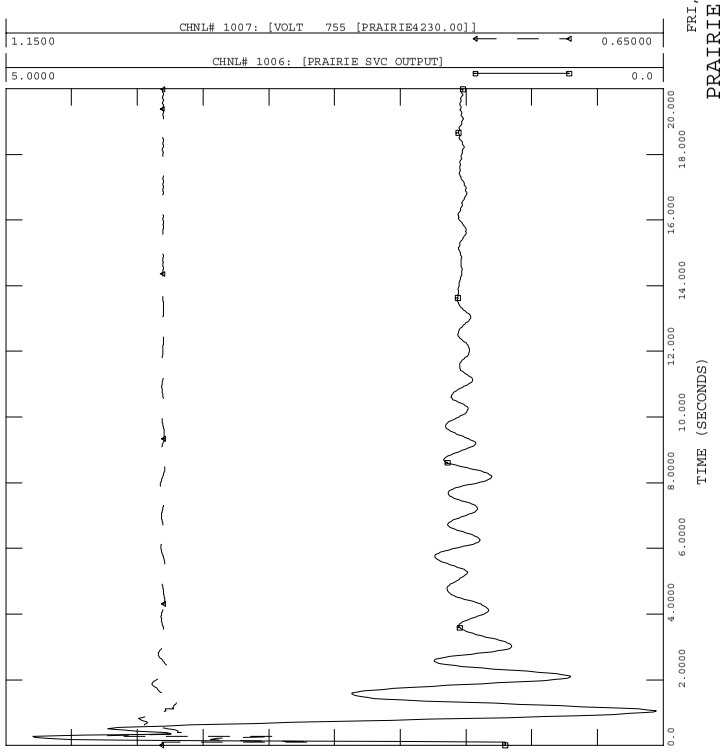
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



FRI, MAY 10 2002 4:34
MP-OH I.FALLS (779)

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CY SLGF @ L.OLD 345 ON FTTHOMP LINE, LO BRKR 2692 STK
CLR @ 11 CY BY TRIPPING FLTD LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag1.bin



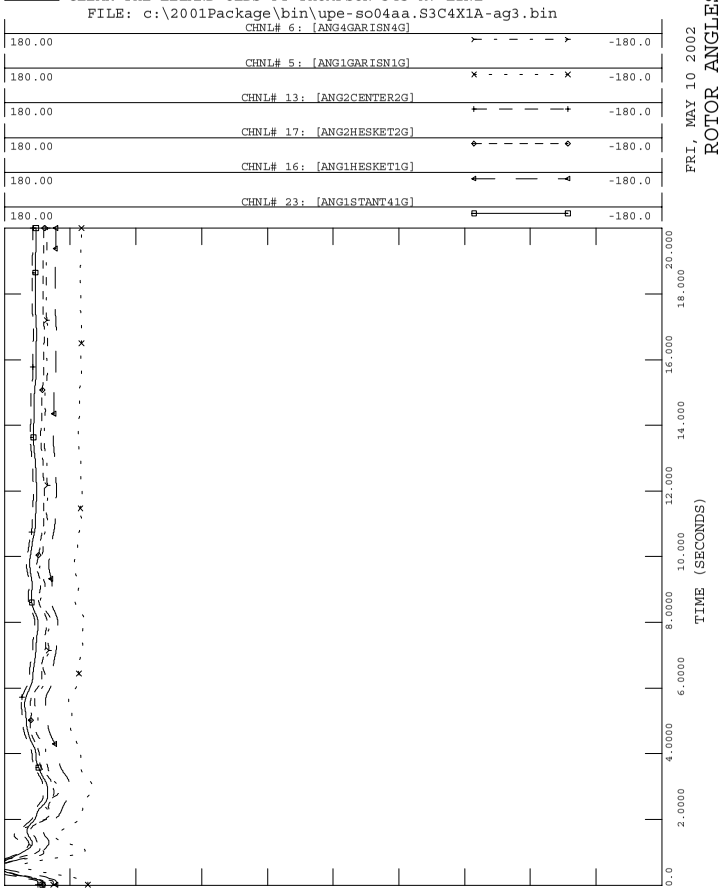
FRI, MAY 10 2002 4:34
PRAIRIE SVC RESPONSE

CONTINGENCY AG3

Three phase fault at Leland Olds on the Ft. Thompson 345 kV line

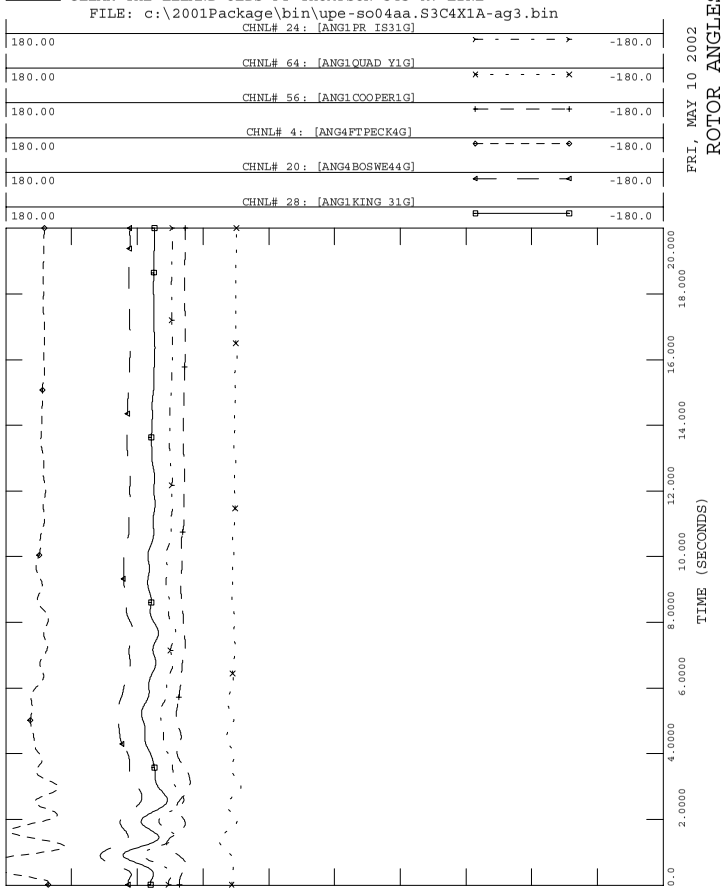
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
ROTOR ANGLES 2



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
ROTOR ANGLES 4



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
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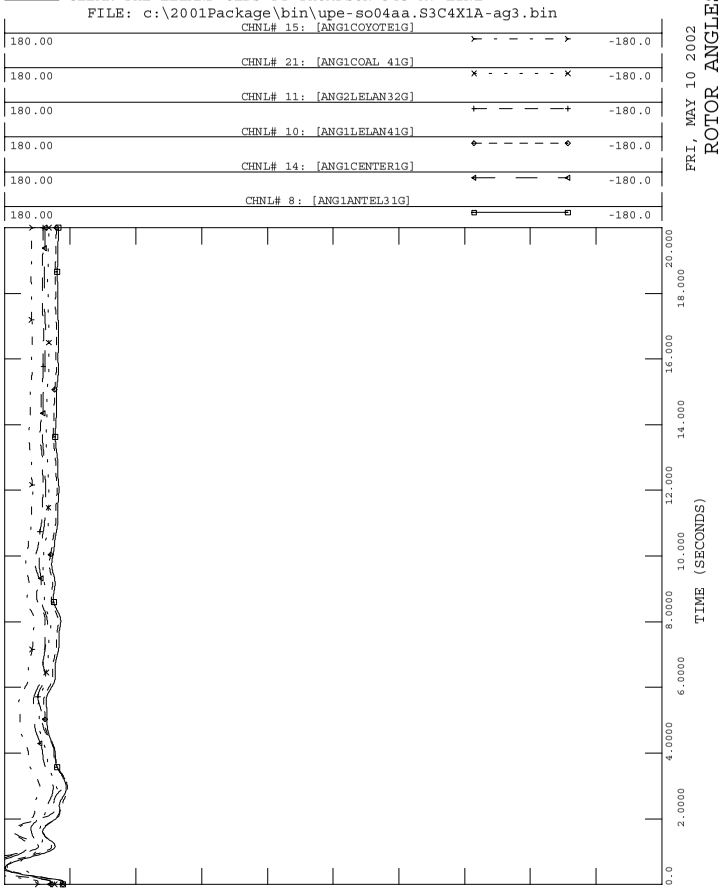
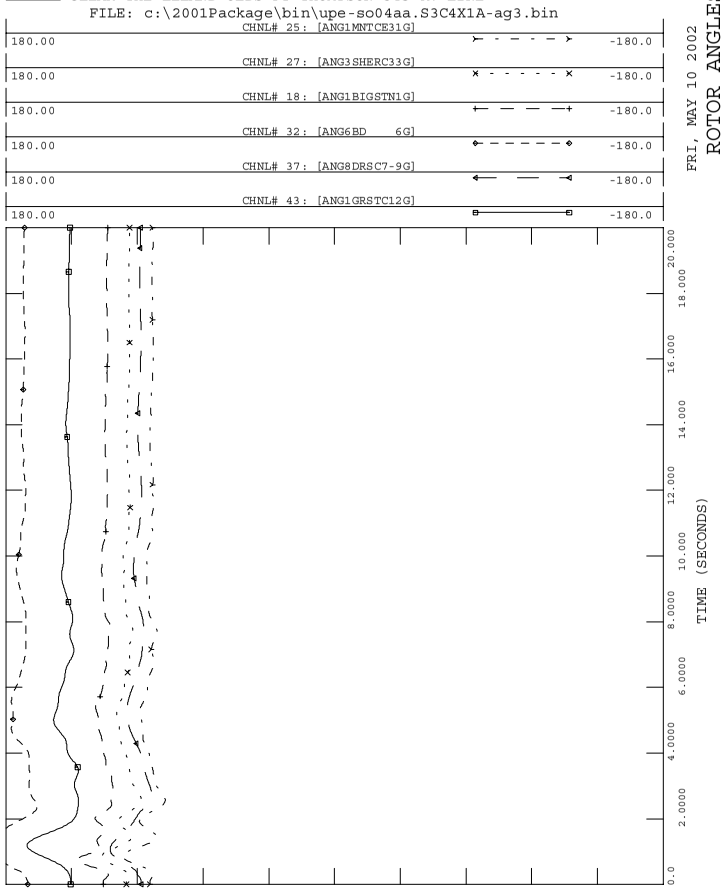


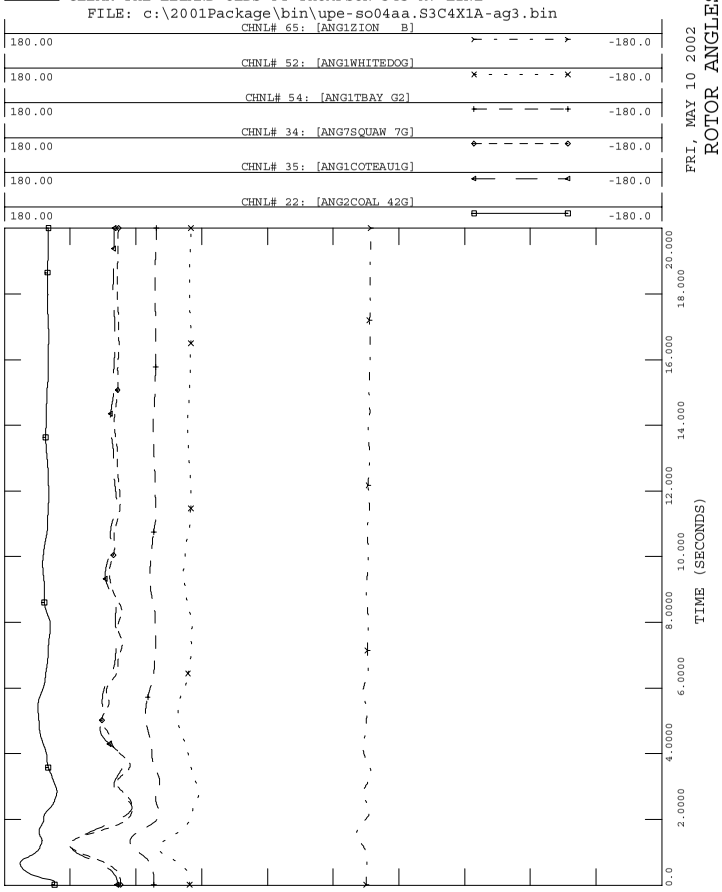
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
ROTOR ANGLES 3



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
ROTOR ANGLES 6



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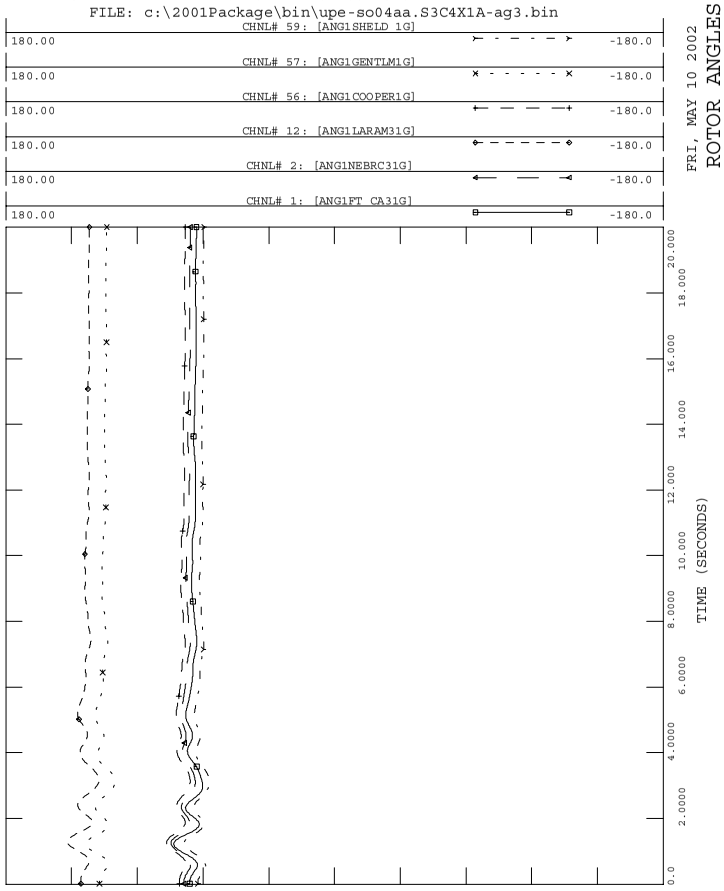
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
ROTOR ANGLES NB



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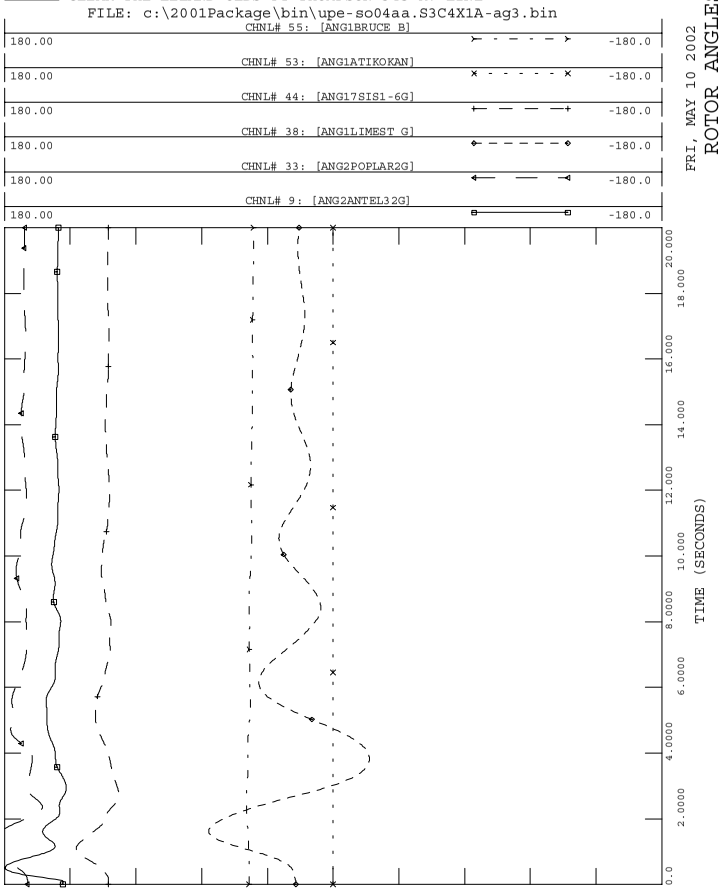
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
ROTOR ANGLES 5



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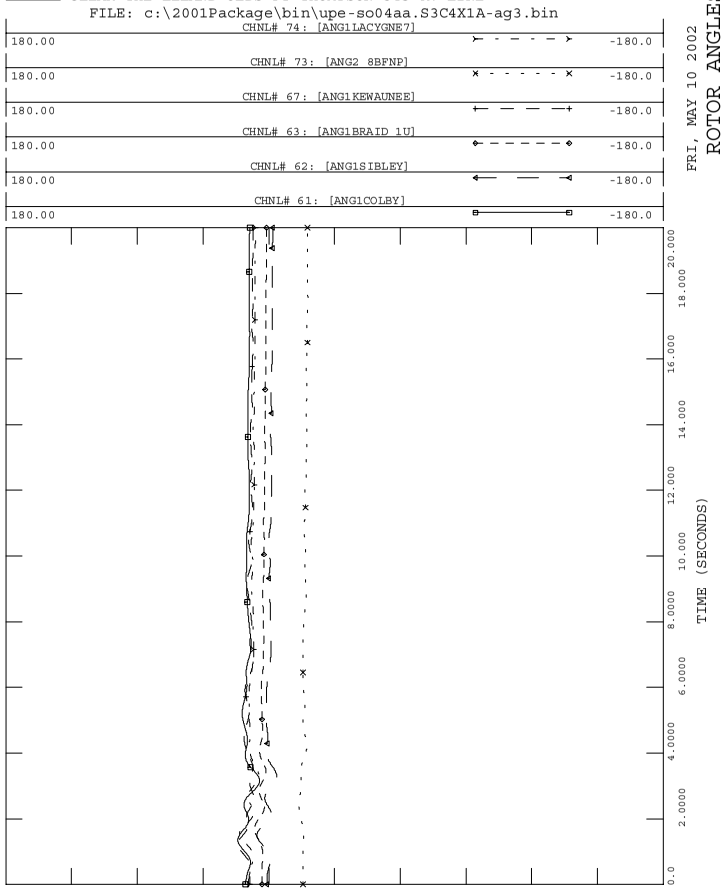
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
ROTOR ANGLES 7



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
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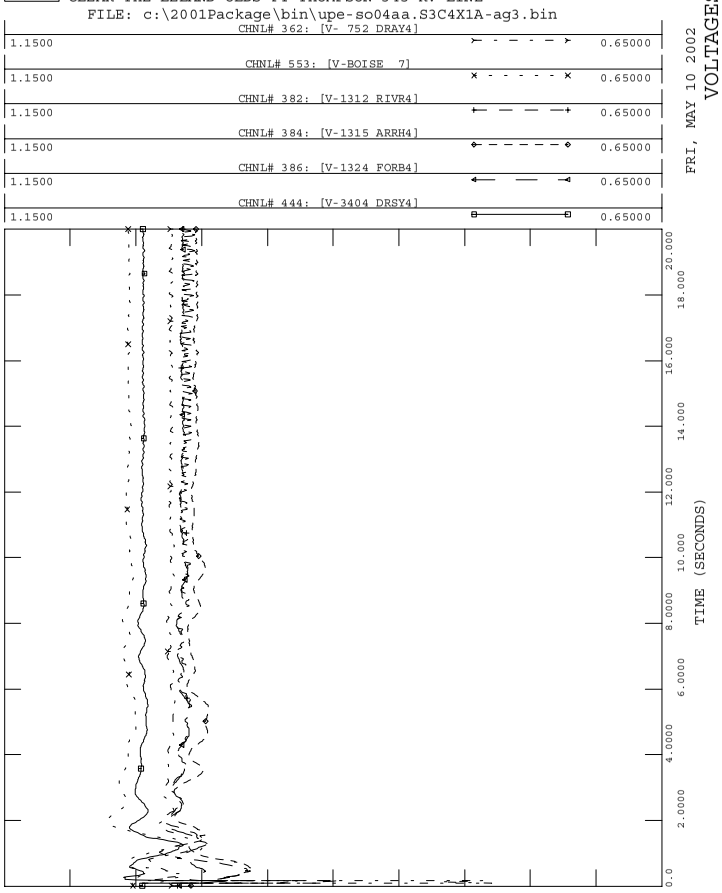
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
VOLTAGES 1



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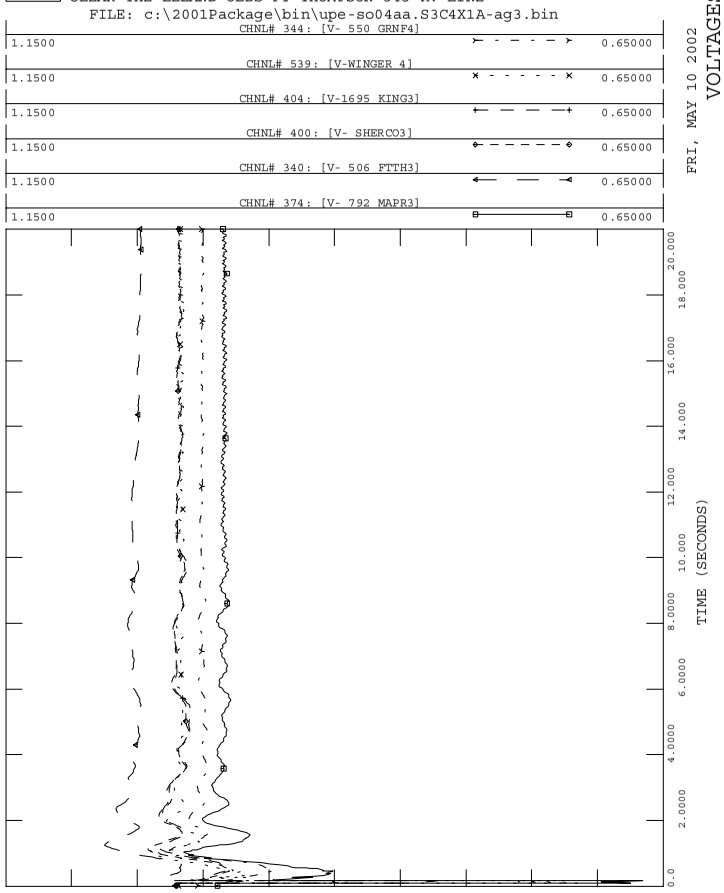
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
VOLTAGES 3



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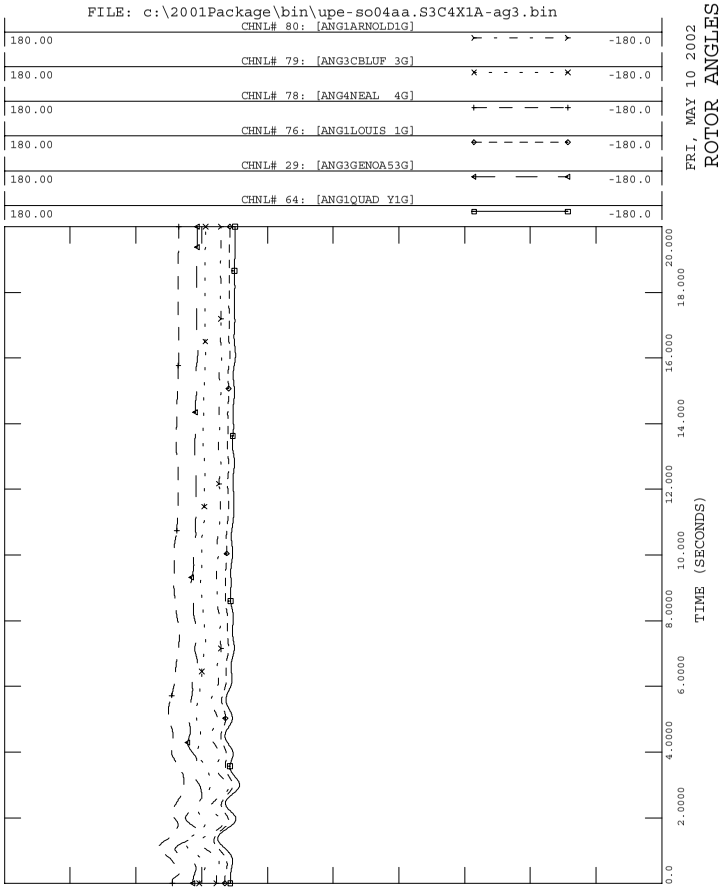
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
ROTOR ANGLES IA



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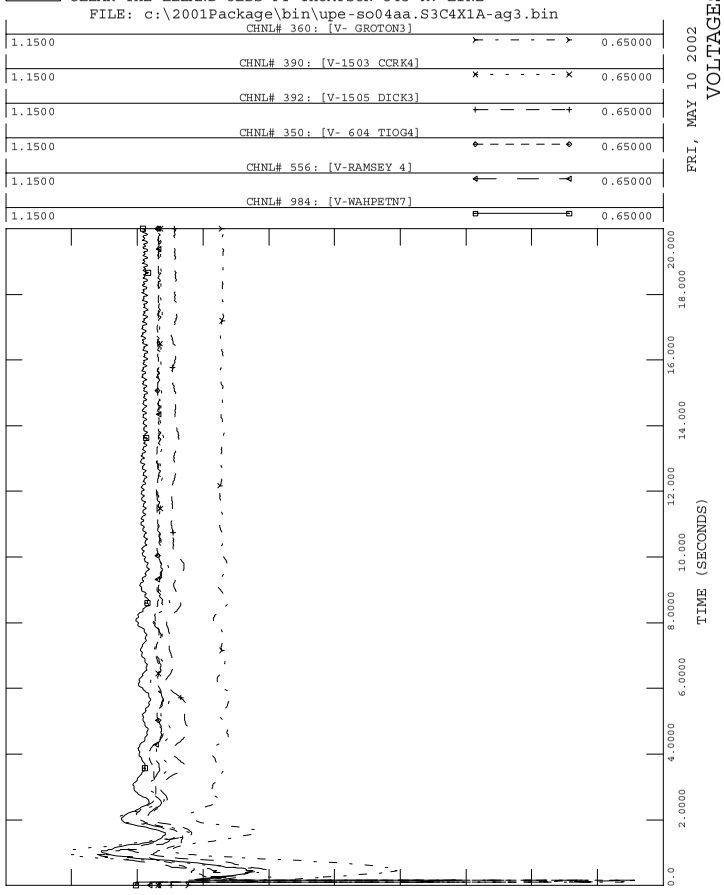
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
VOLTAGES 2



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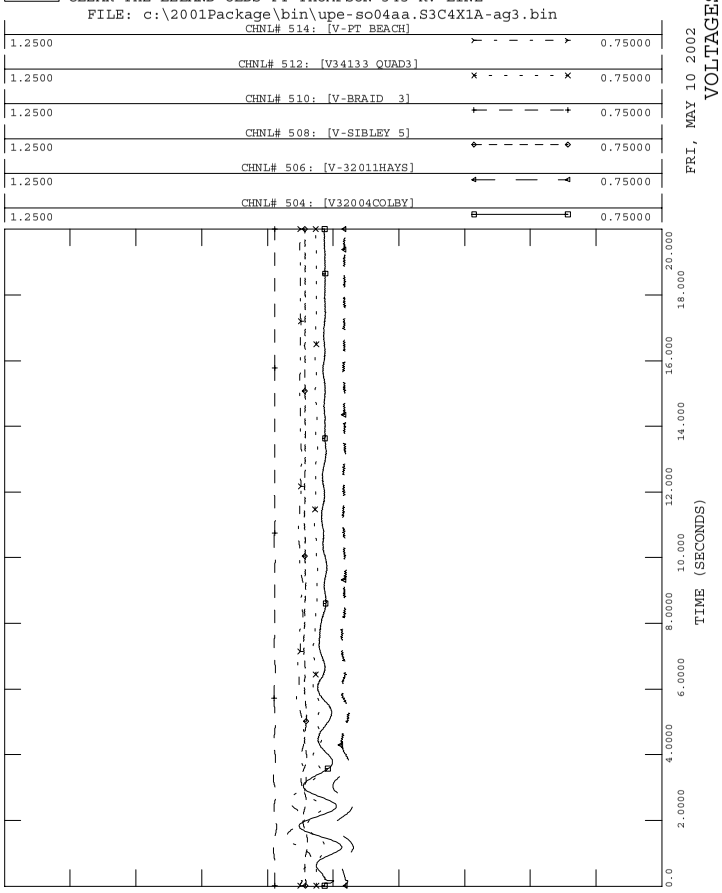
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50 VOLTAGES 5



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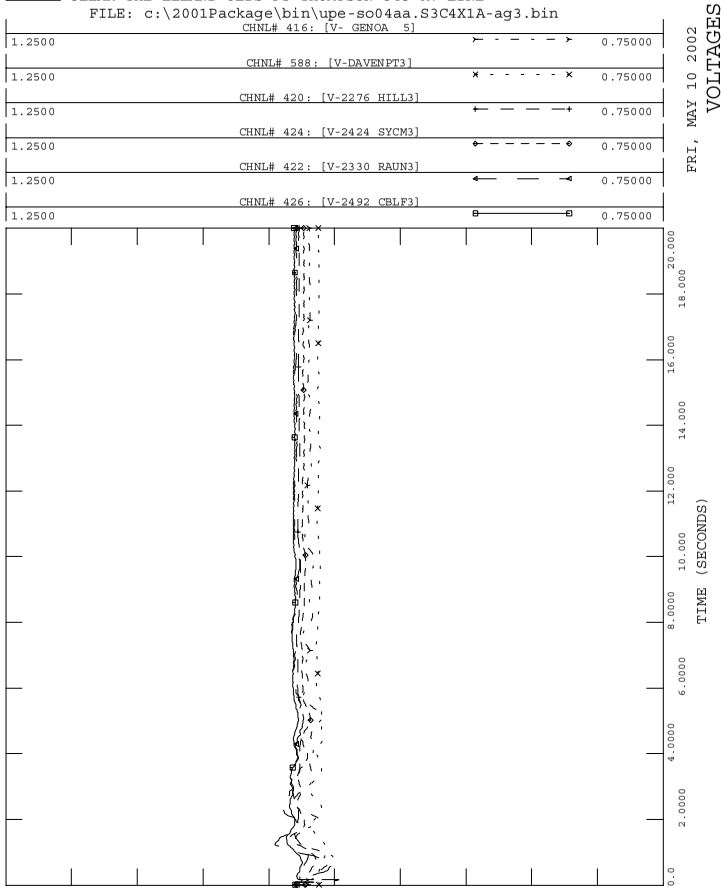
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50 VOLTAGES IA



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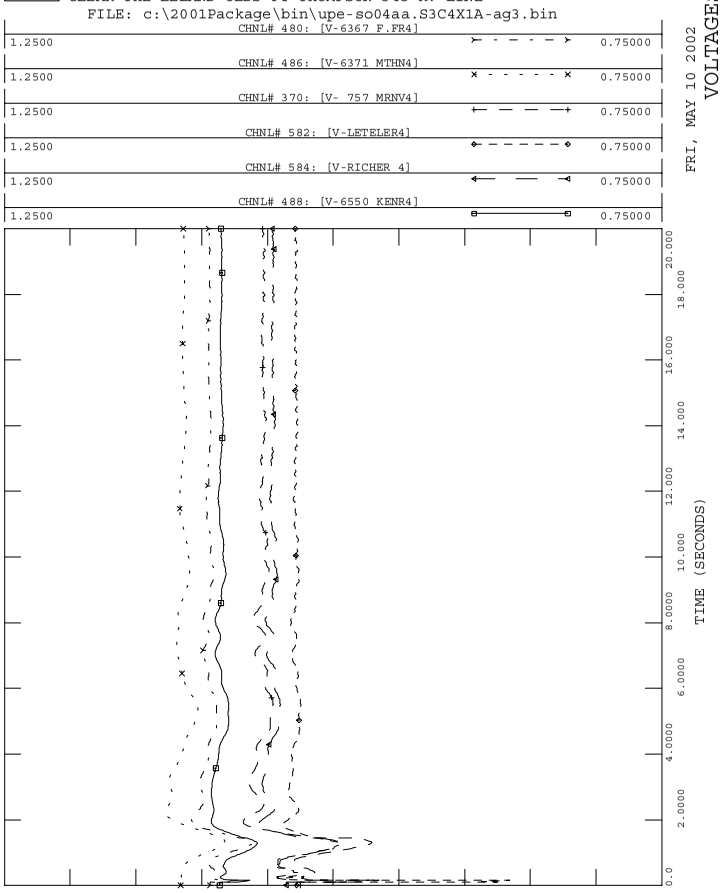
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50 VOLTAGES 4



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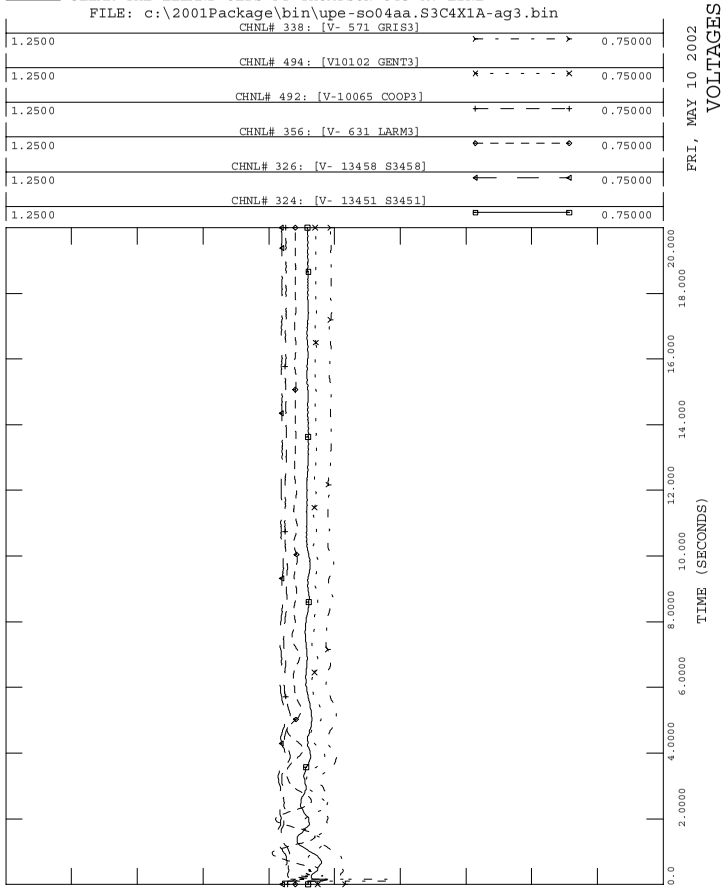
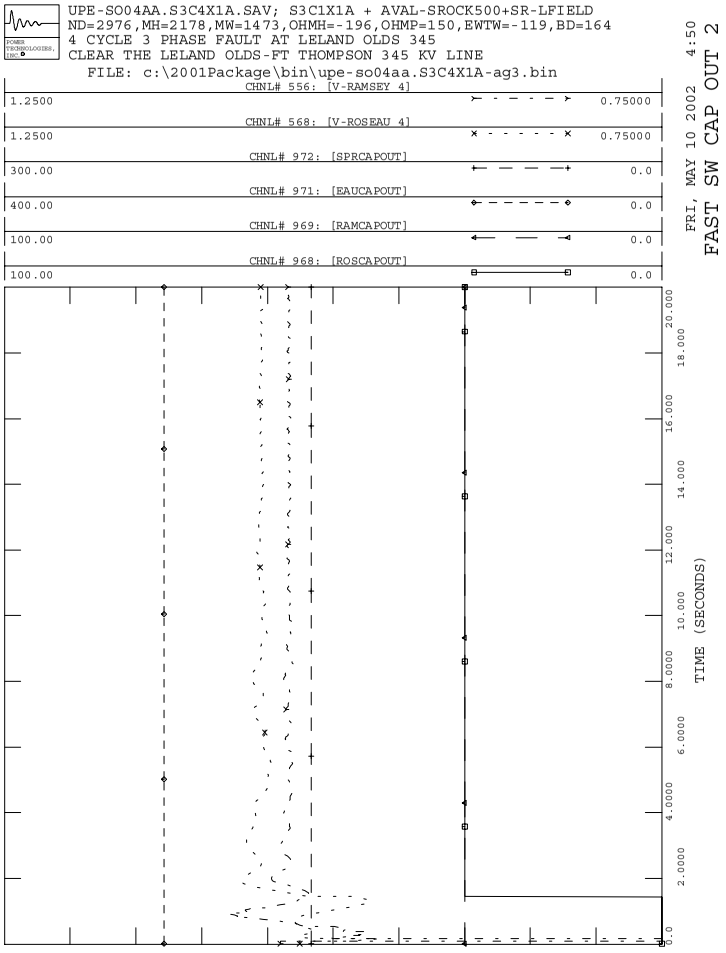
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50 VOLTAGES NB

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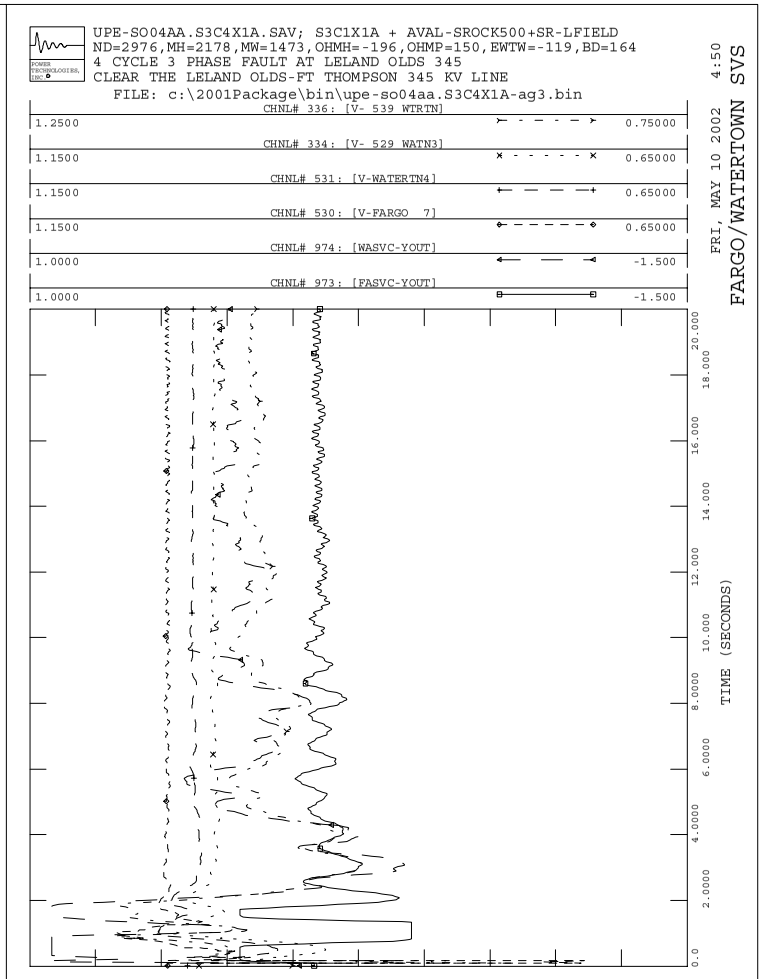
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
FRI, MAY 10 2002 4:50
FAST SW CAP OUT 2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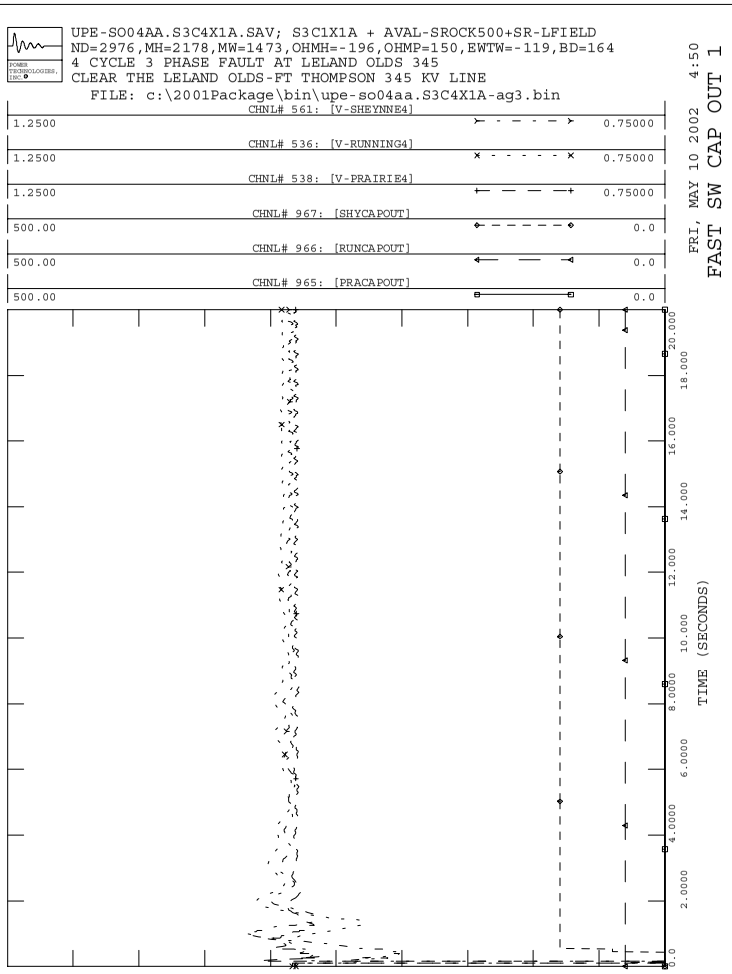
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
FRI, MAY 10 2002 4:50
FARGO/WATERTOWN SVS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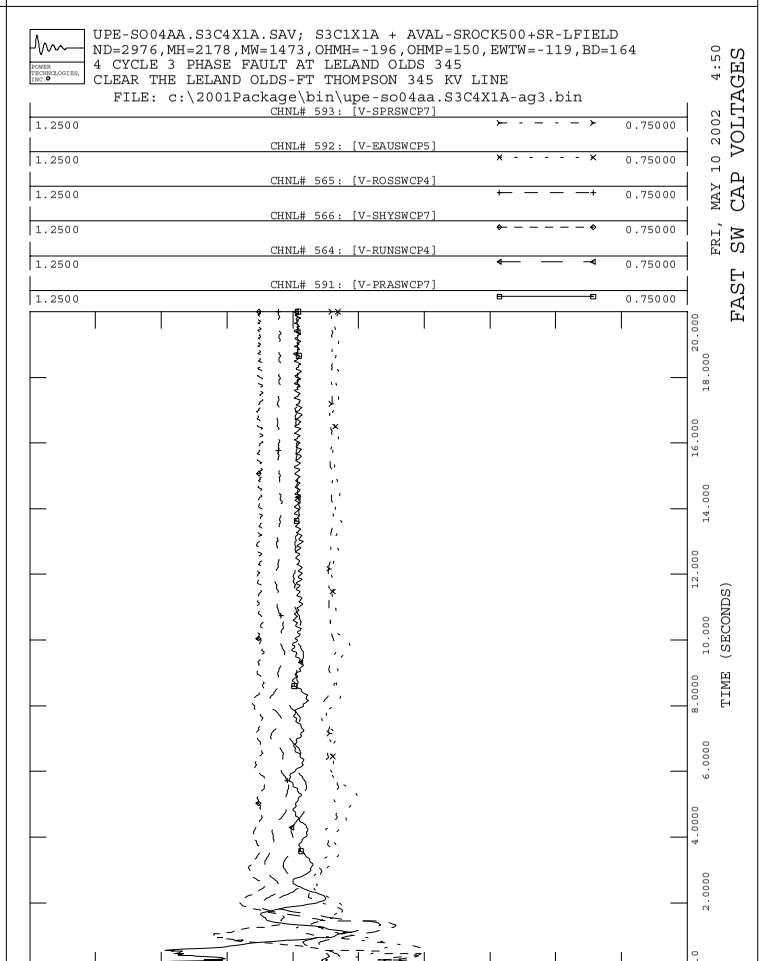
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
FRI, MAY 10 2002 4:50
FAST SW CAP OUT 1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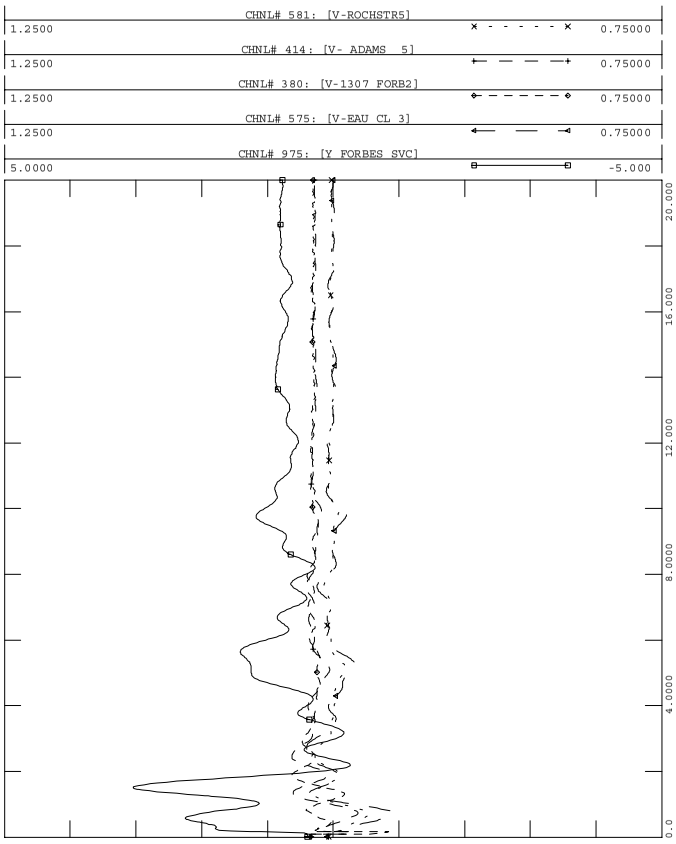
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
FRI, MAY 10 2002 4:50
FAST SW CAP VOLTAGES

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50

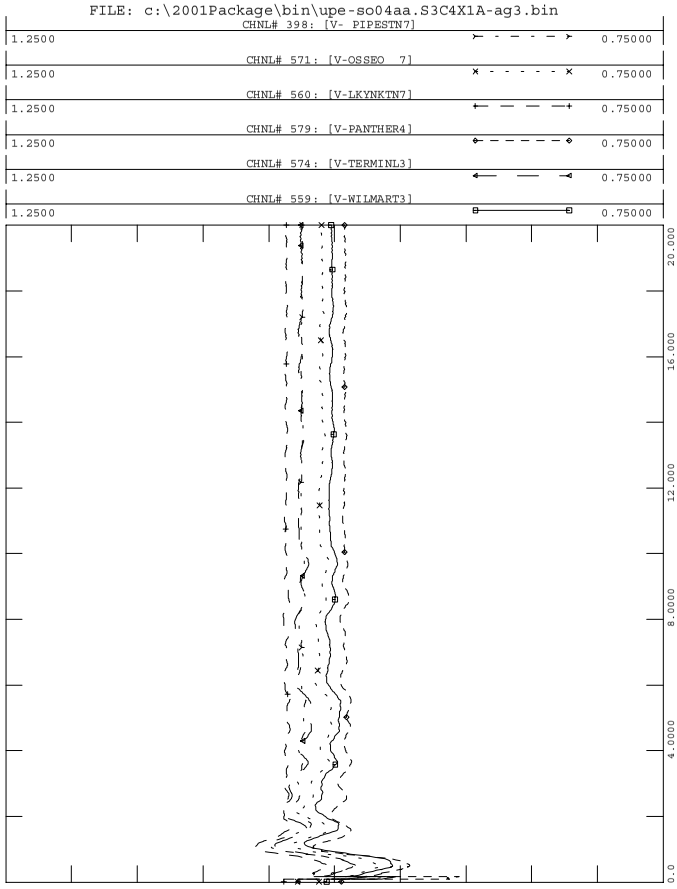
SVC & WISCONSIN VOLT



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50

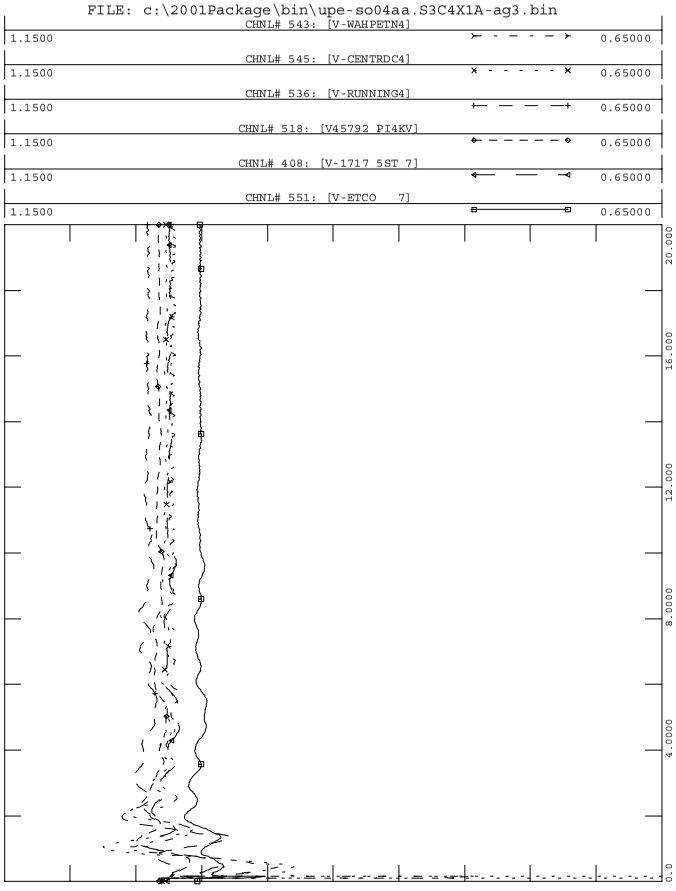
TC VOLTAGES



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50

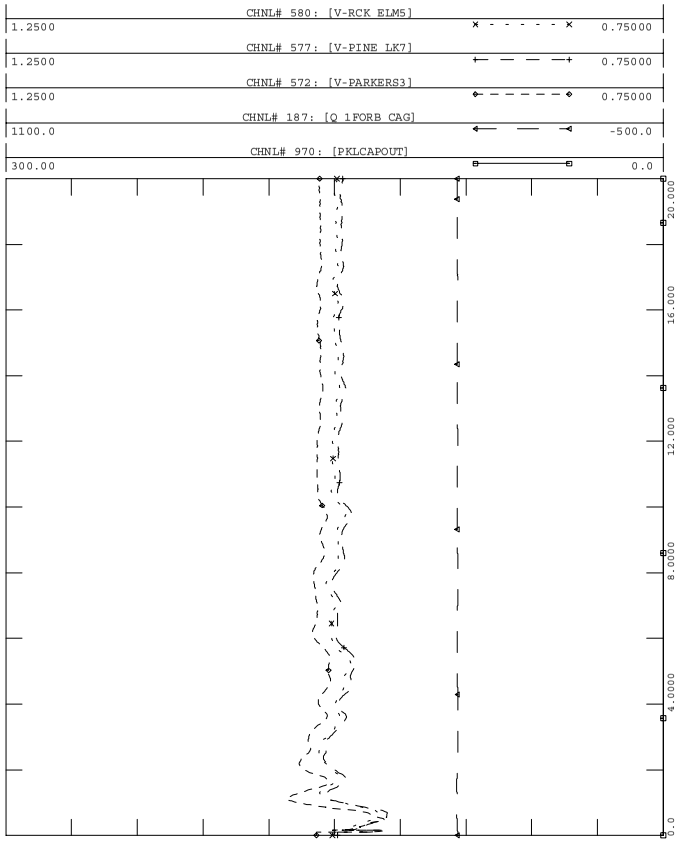
VOLTAGES 6



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

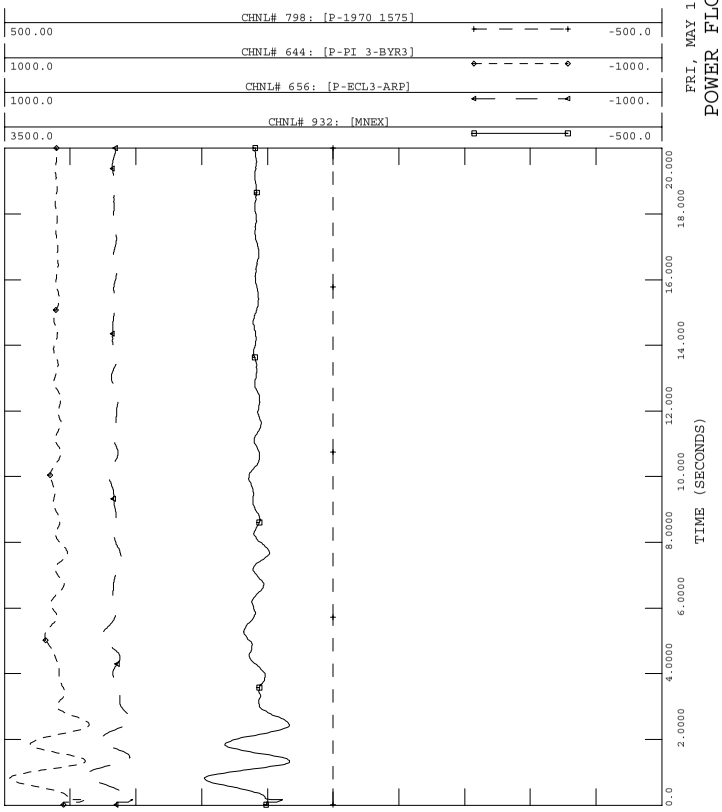
FRI, MAY 10 2002 4:50

FORBES SVS OUT & VOLTAGES



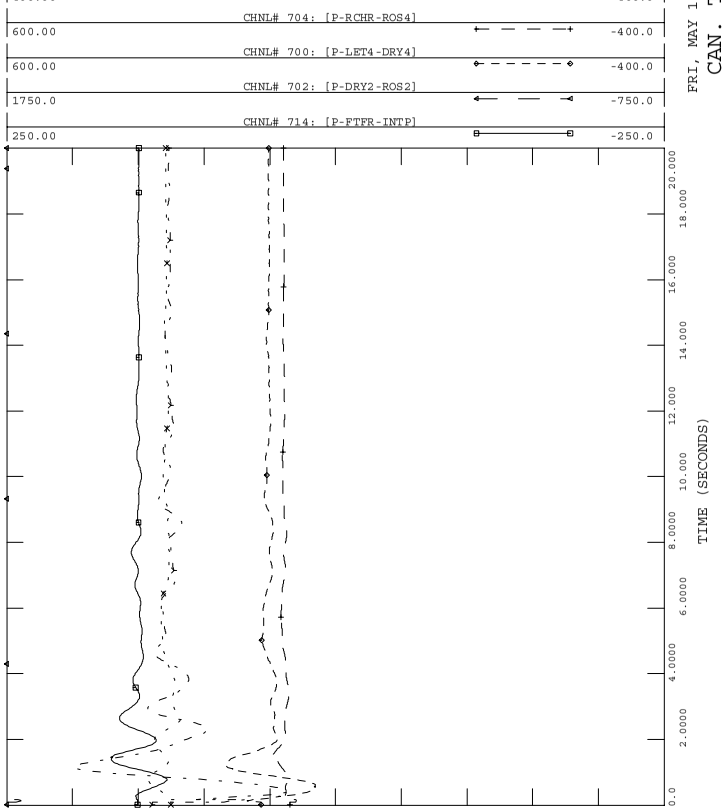
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
POWER FLOW SUMS 2



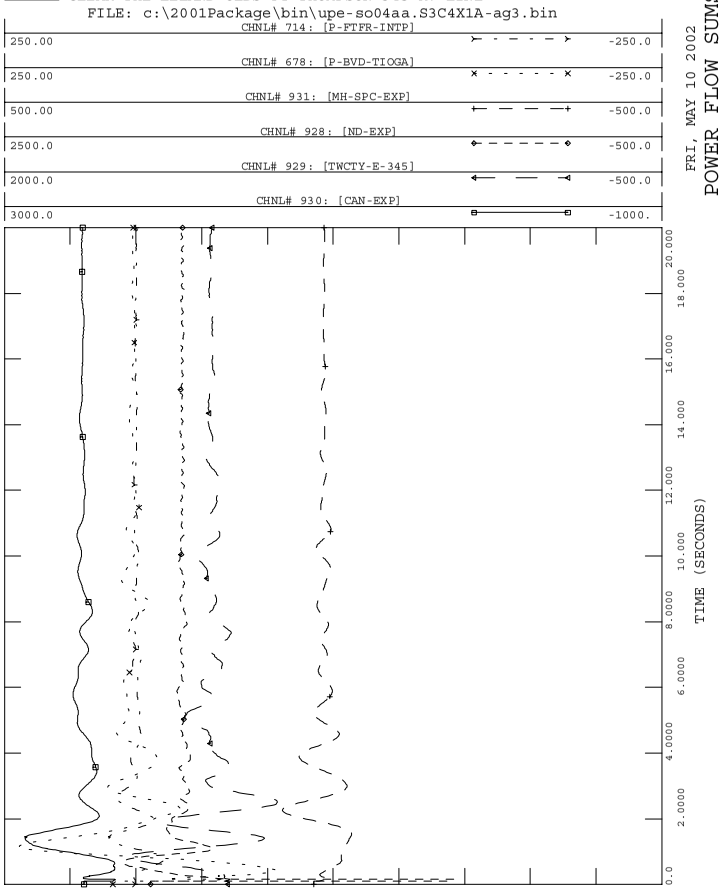
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
CAN. TIE FLOWS



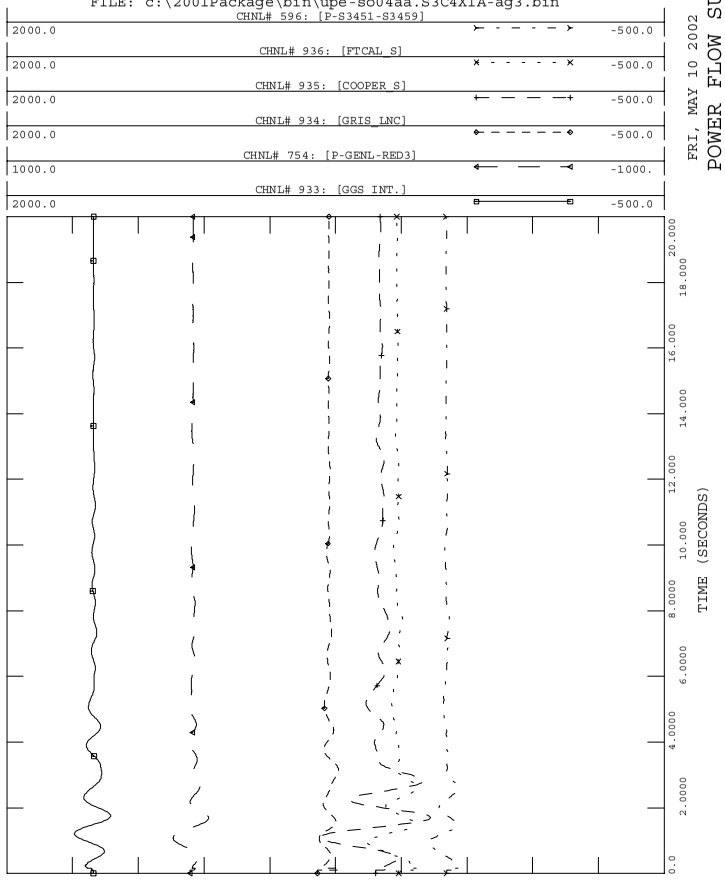
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
POWER FLOW SUMS 1



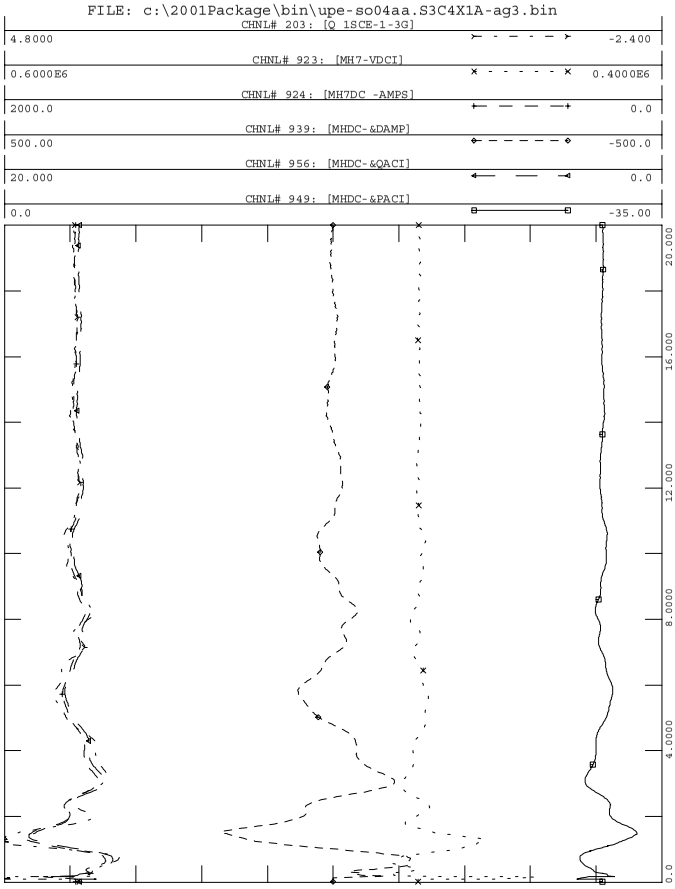
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
POWER FLOW SUM 3



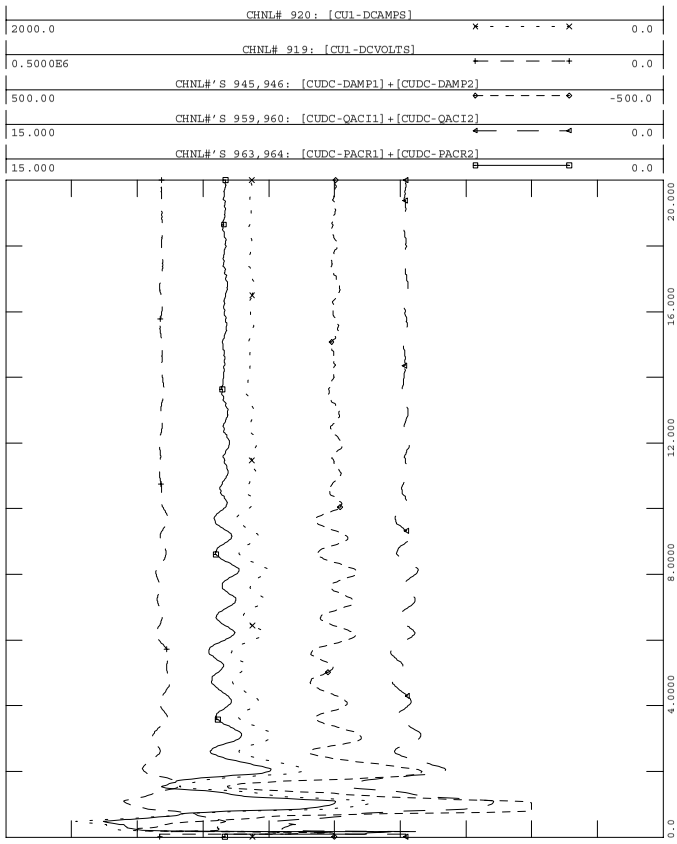
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
MH DC PARAMETERS



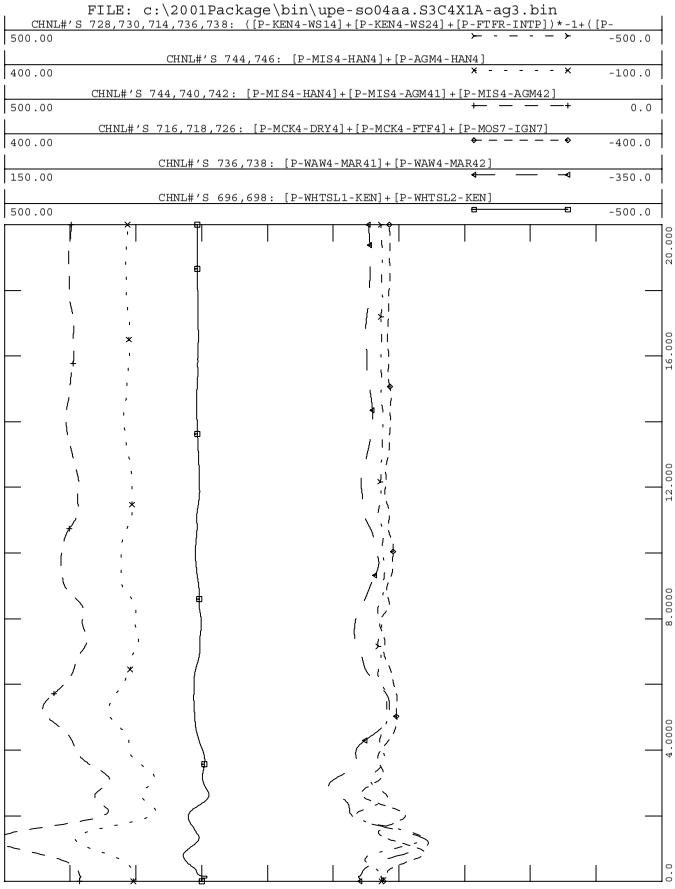
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

FRI, MAY 10 2002 4:50
CU DC #1



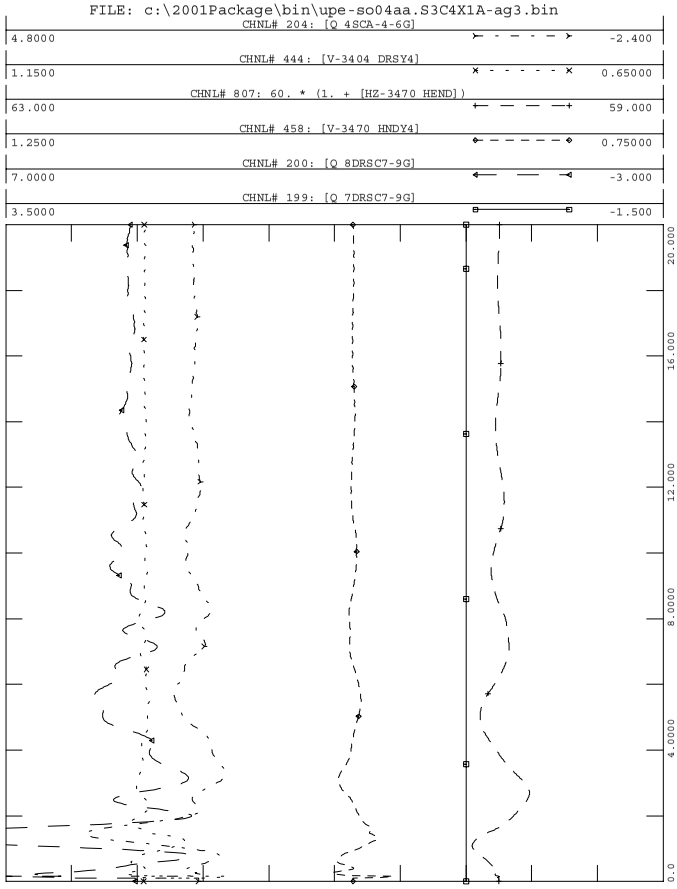
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

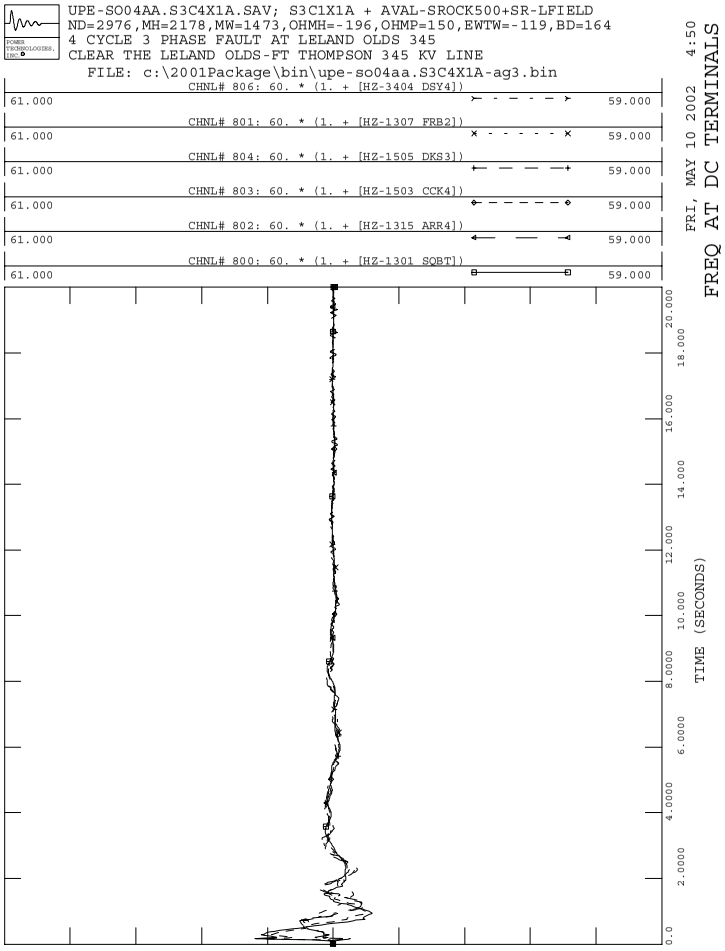
FRI, MAY 10 2002 4:50
OH TIE FLOWS

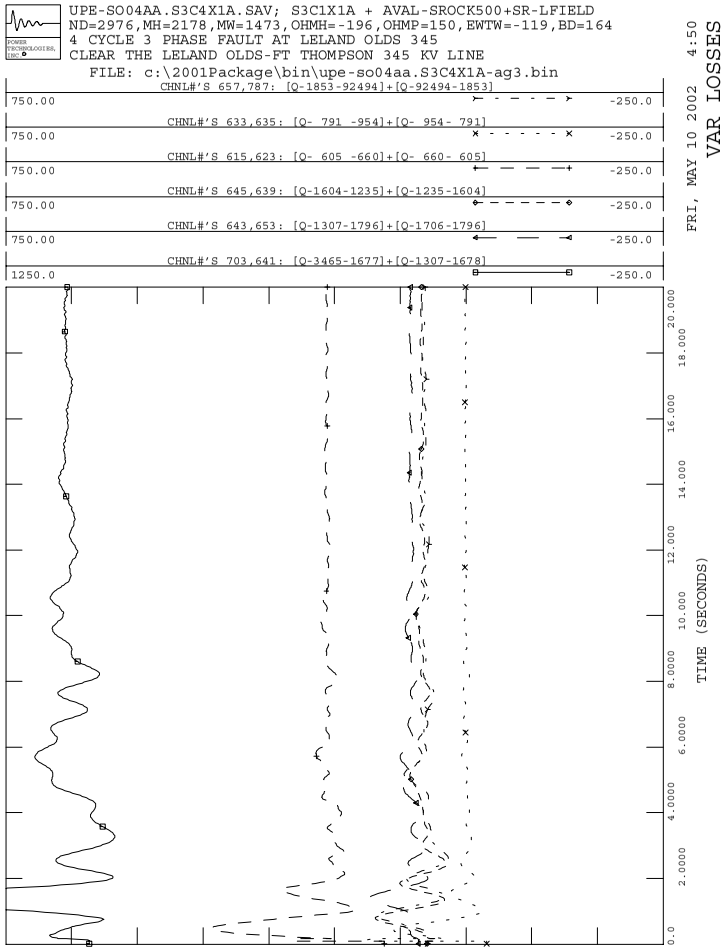


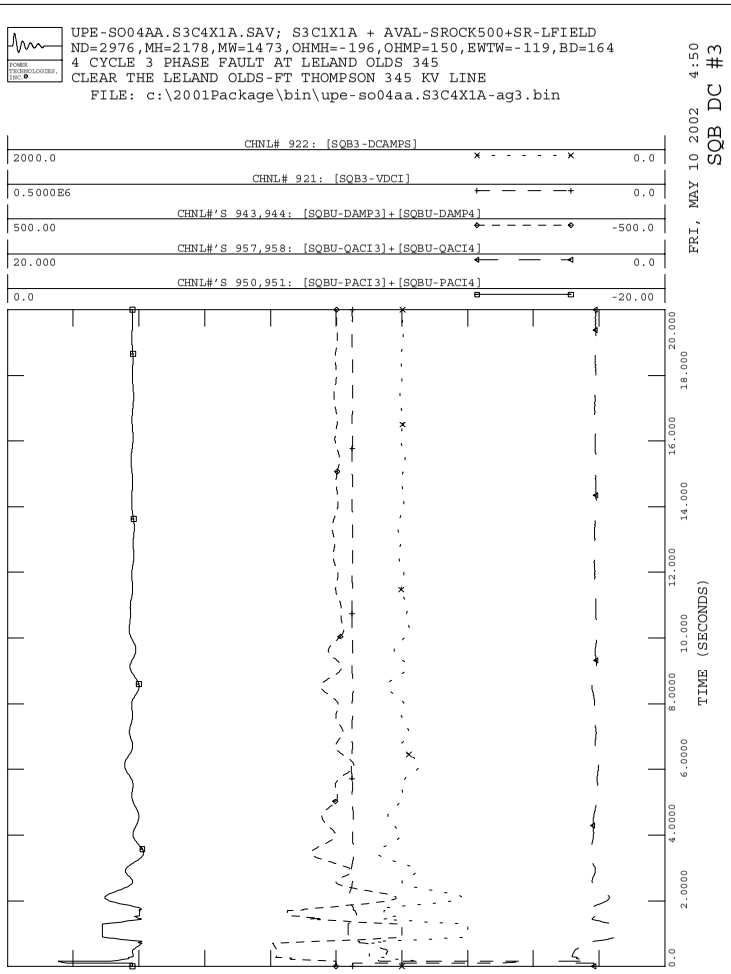
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

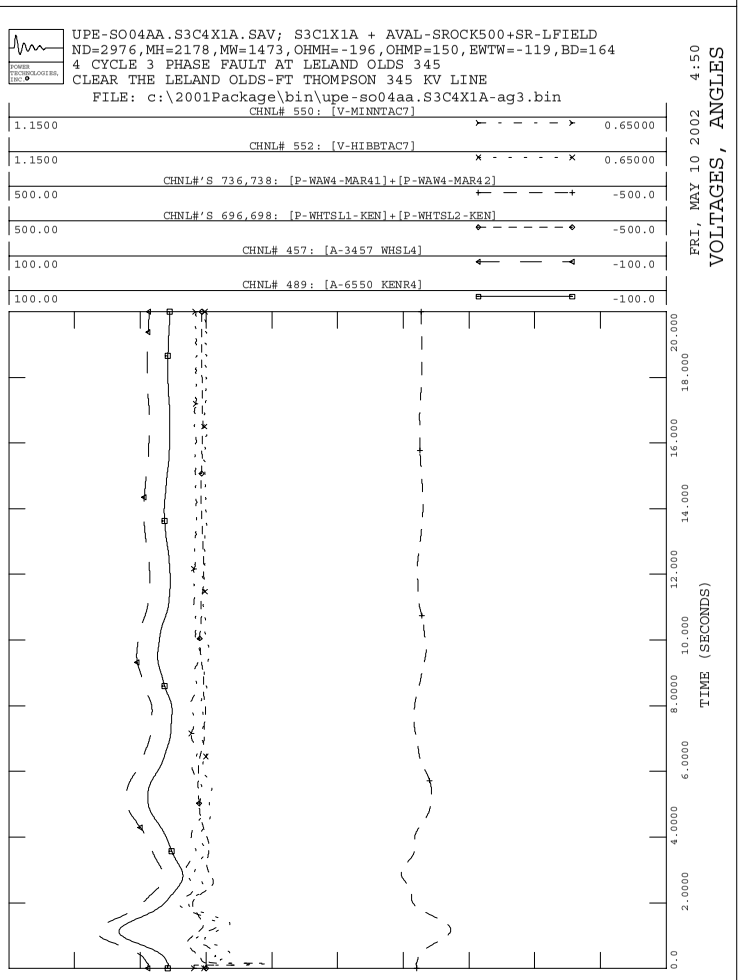
FRI, MAY 10 2002 4:50
MH DC PARAMETERS




UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
FRI, MAY 10 2002 4:50
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
FRI, MAY 10 2002 4:50
VAR LOSSES
TIME (SECONDS)

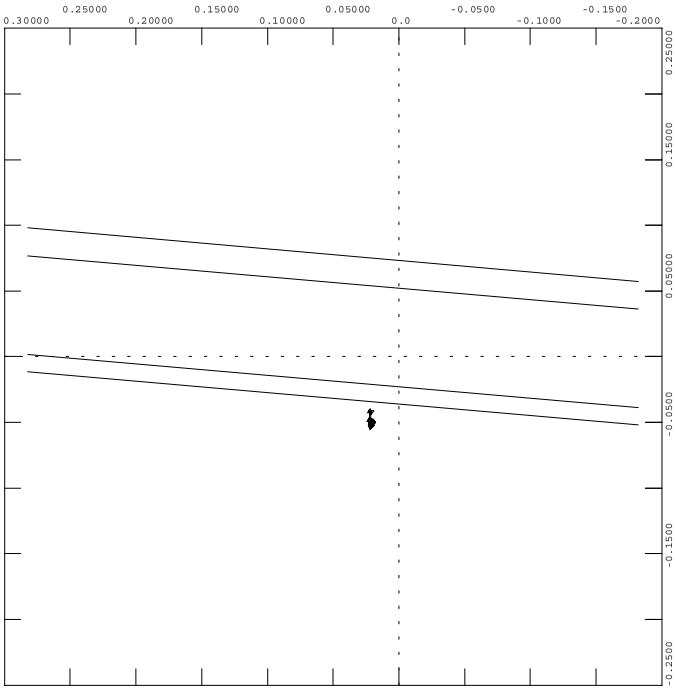

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
FRI, MAY 10 2002 4:50
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
FRI, MAY 10 2002 4:50
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

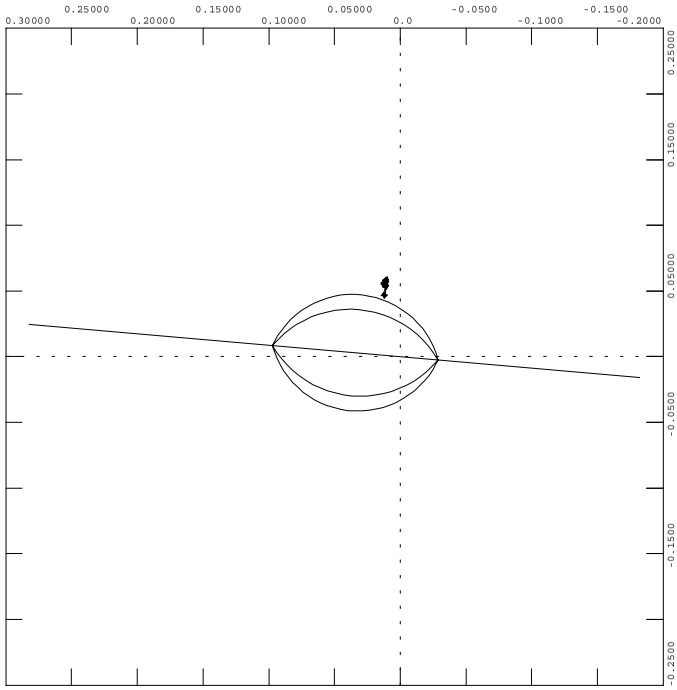


FRI, MAY 10 2002 4:50
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

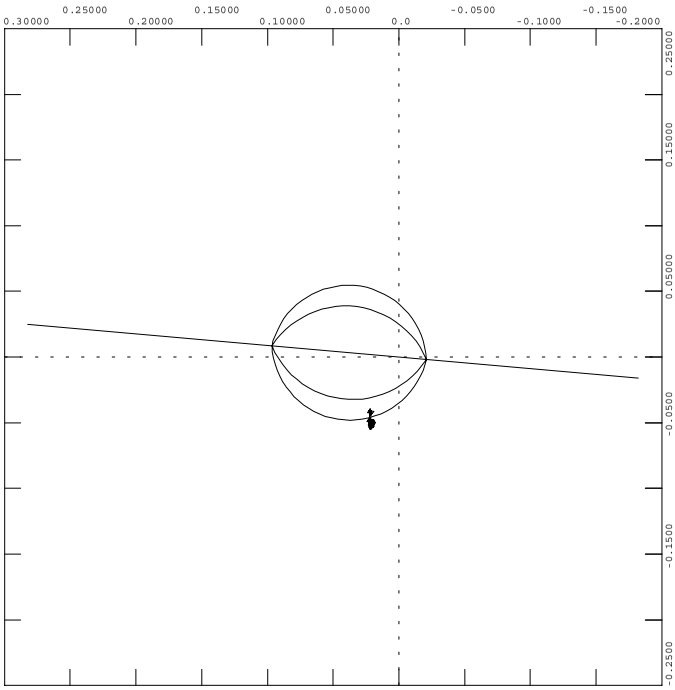


FRI, MAY 10 2002 4:50
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

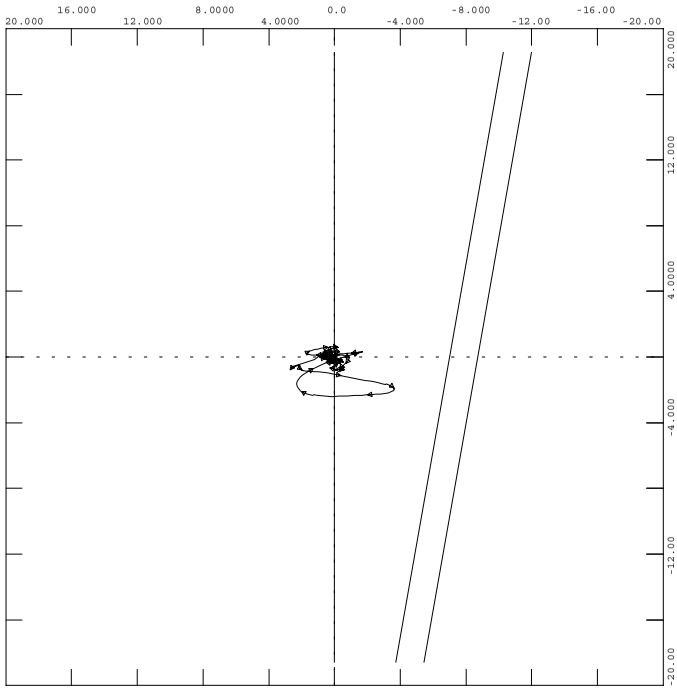


FRI, MAY 10 2002 4:50
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

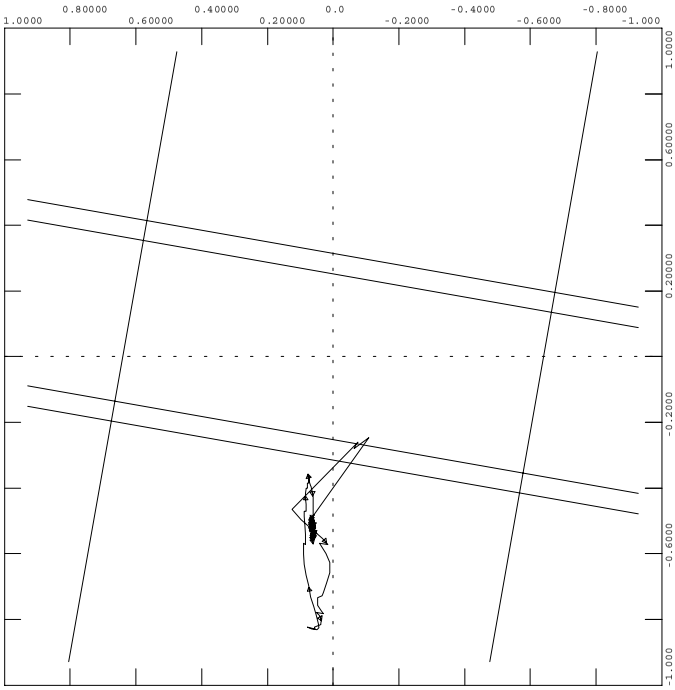


FRI, MAY 10 2002 4:50
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

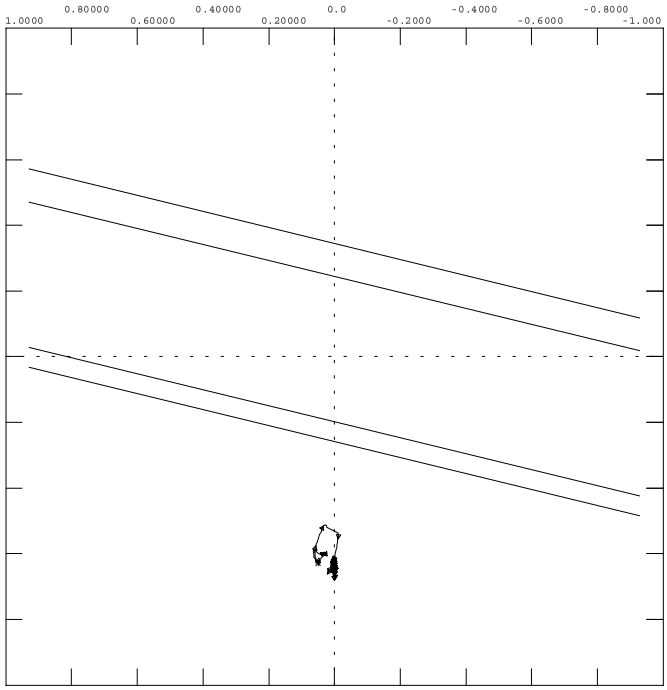
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

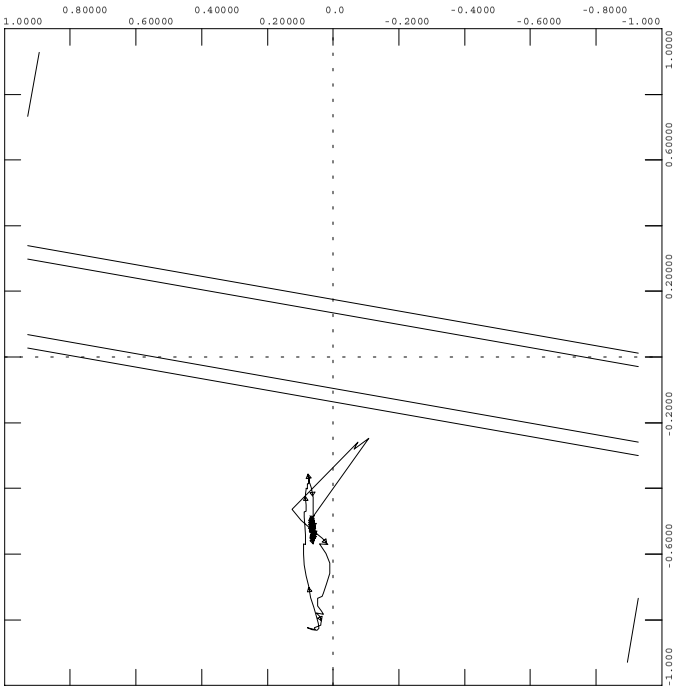
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

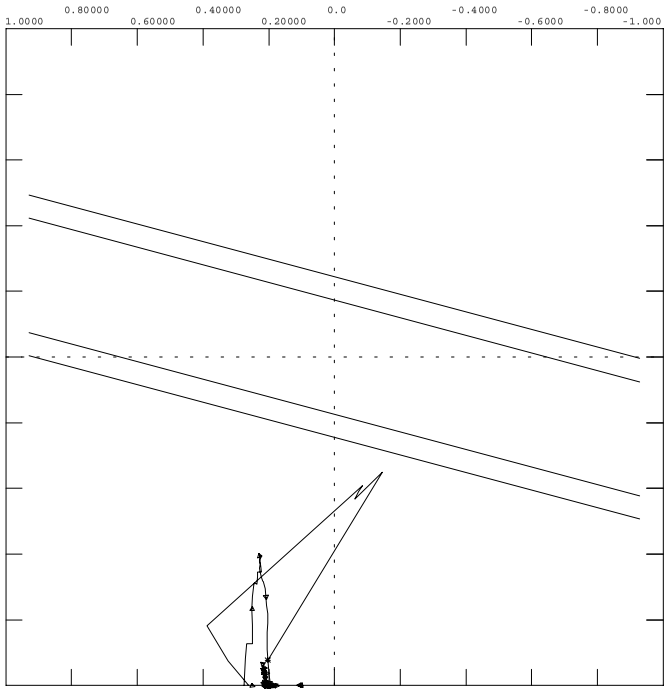
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

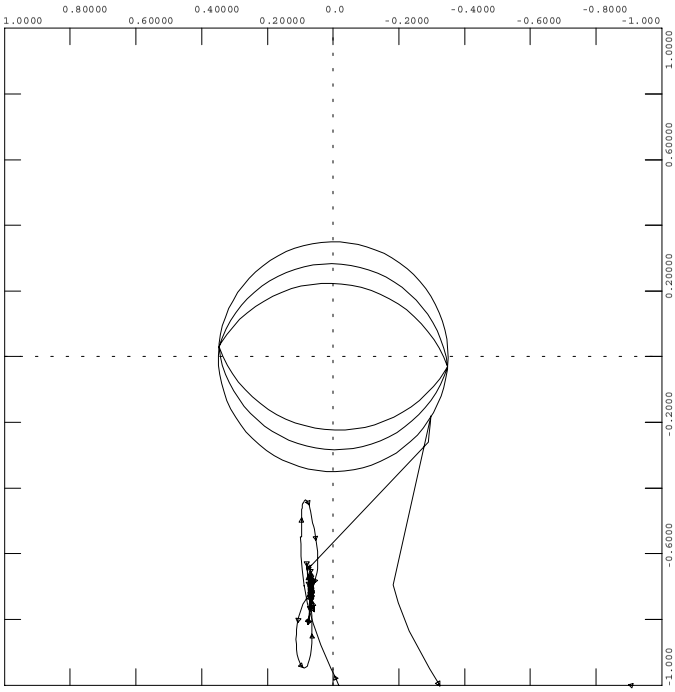
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

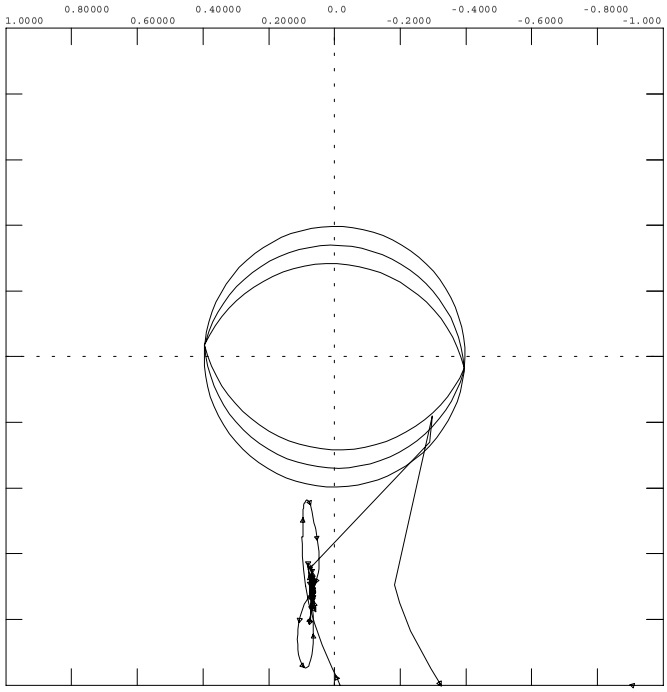
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

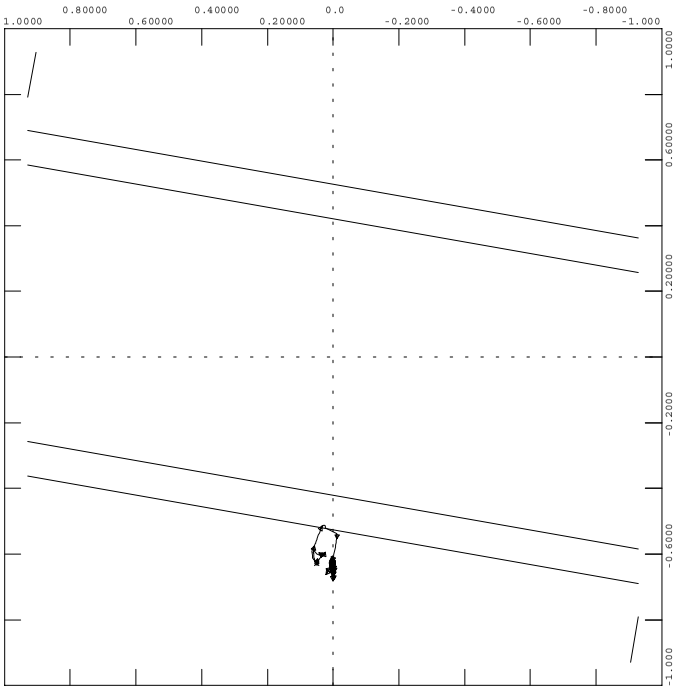
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

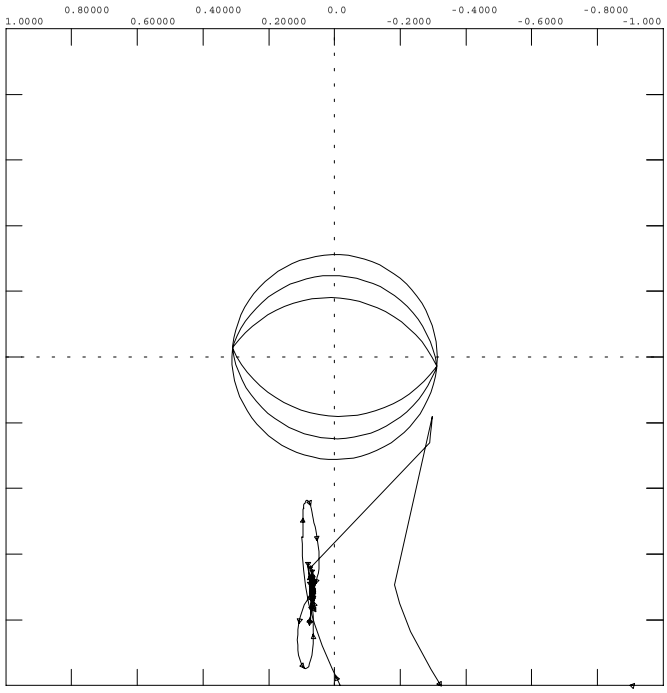
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



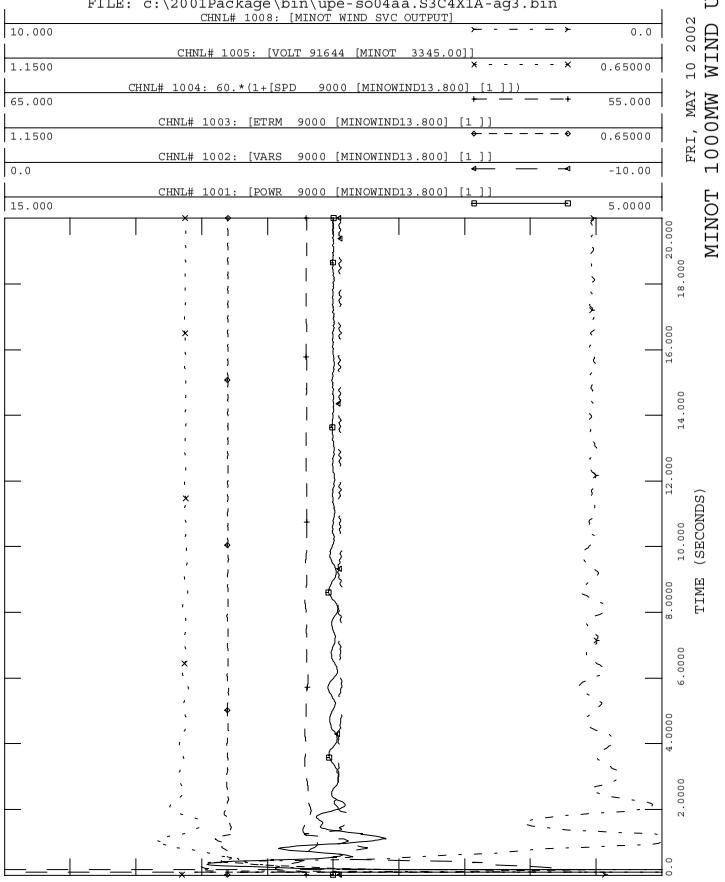
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

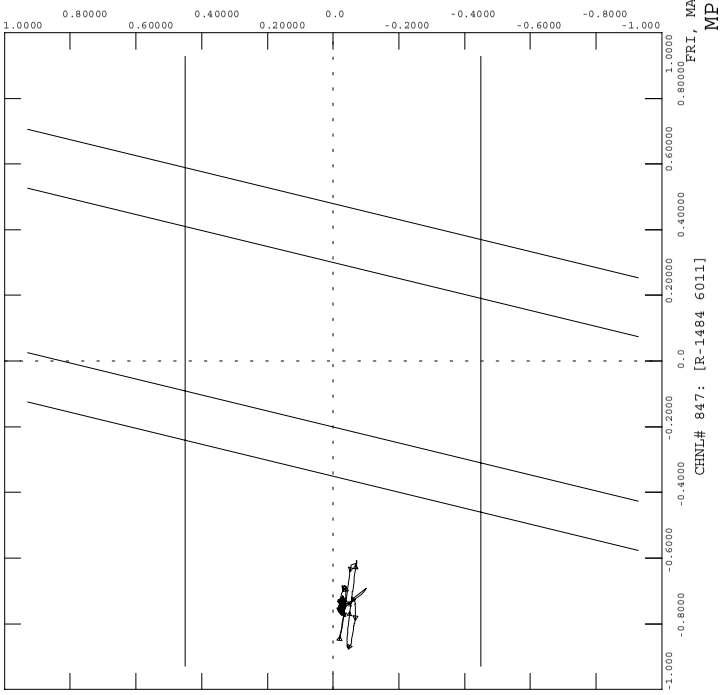


FRI, MAY 10 2002 4:50
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE

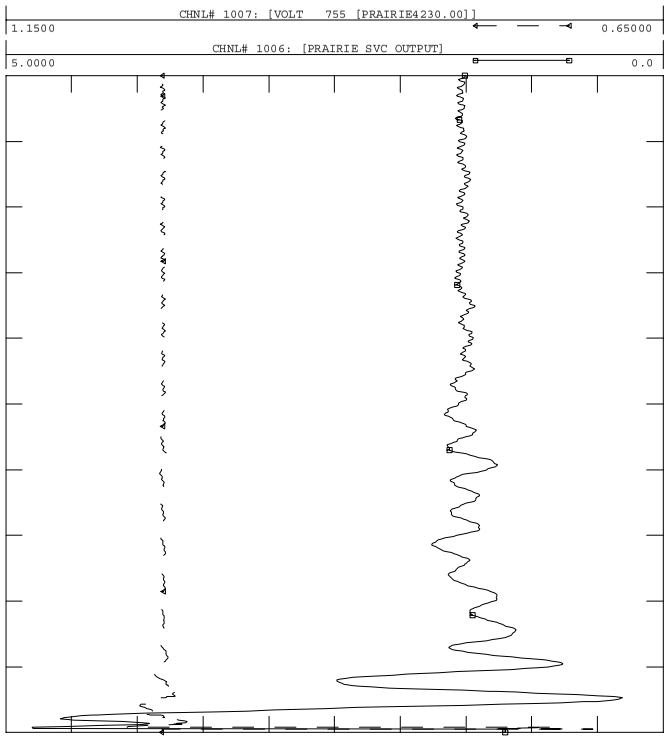
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



FRI, MAY 10 2002 4:50
MP-OH I.FALLS (779)

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
4 CYCLE 3 PHASE FAULT AT LELAND OLDS 345
CLEAR THE LELAND OLDS-FT THOMPSON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ag3.bin



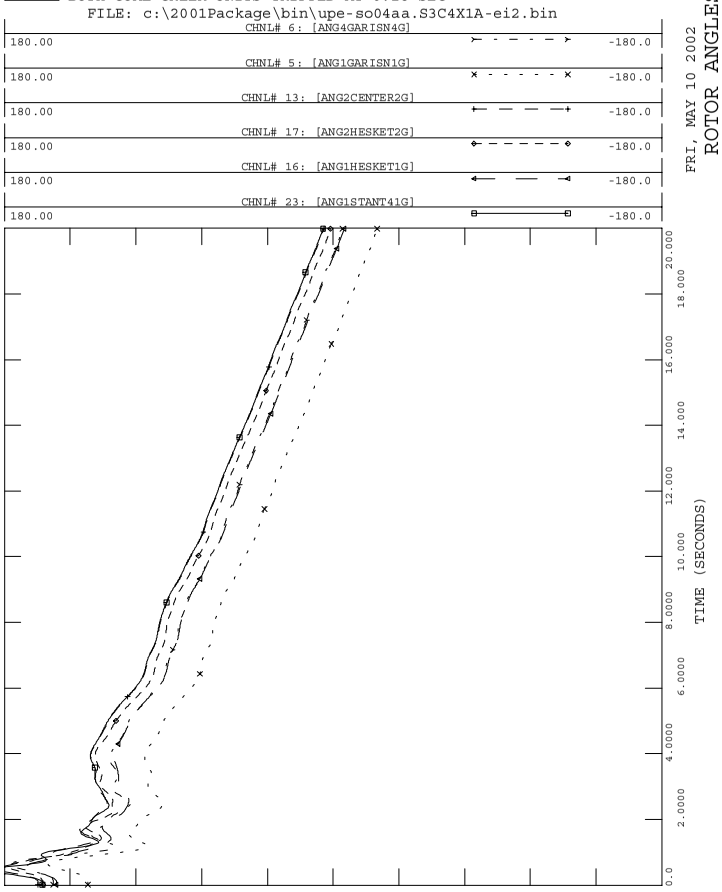
FRI, MAY 10 2002 4:50
PRAIRIE SVC RESPONSE

CONTINGENCY EI2

CU DC Permanent Bipole Fault with tripping of both Coal Creek units

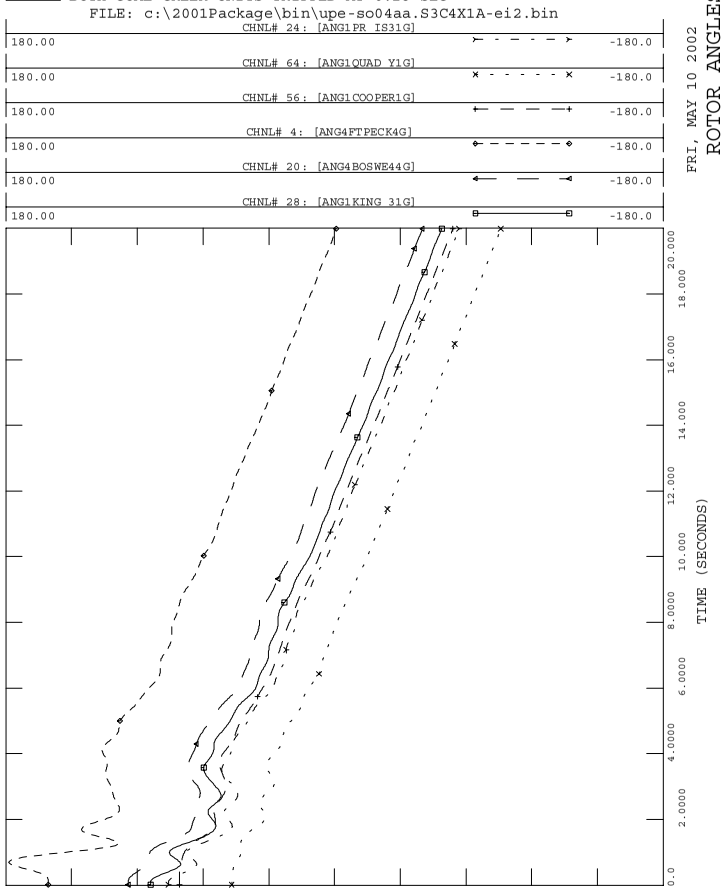
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05
ROTOR ANGLES 2



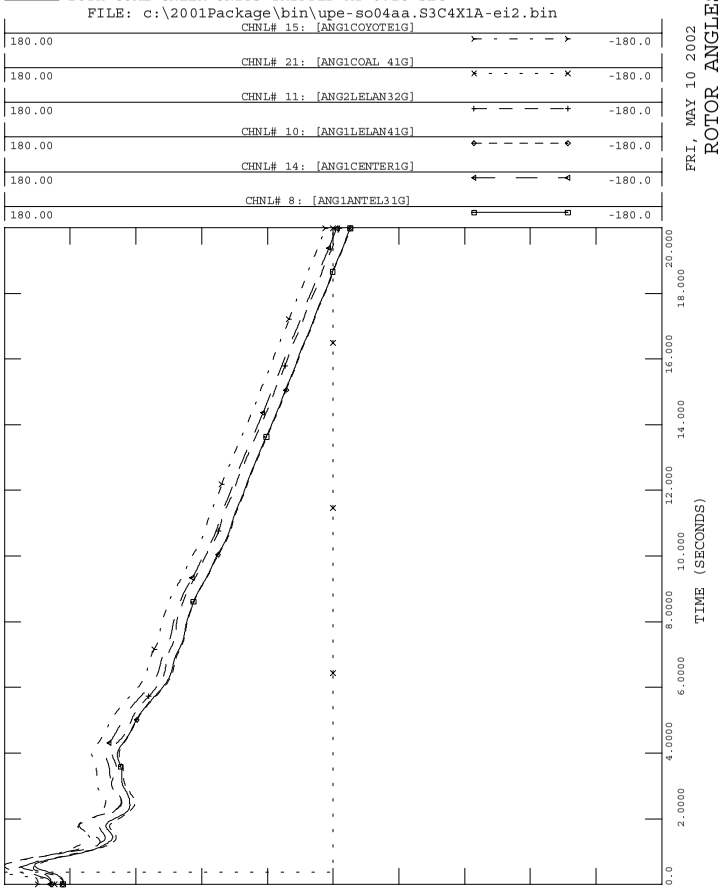
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05
ROTOR ANGLES 4



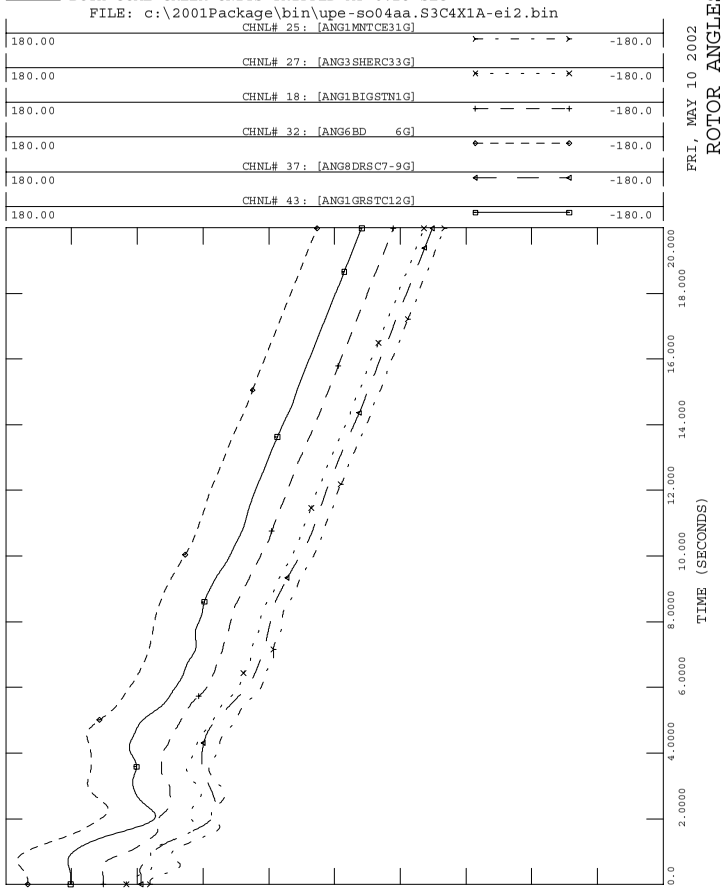
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

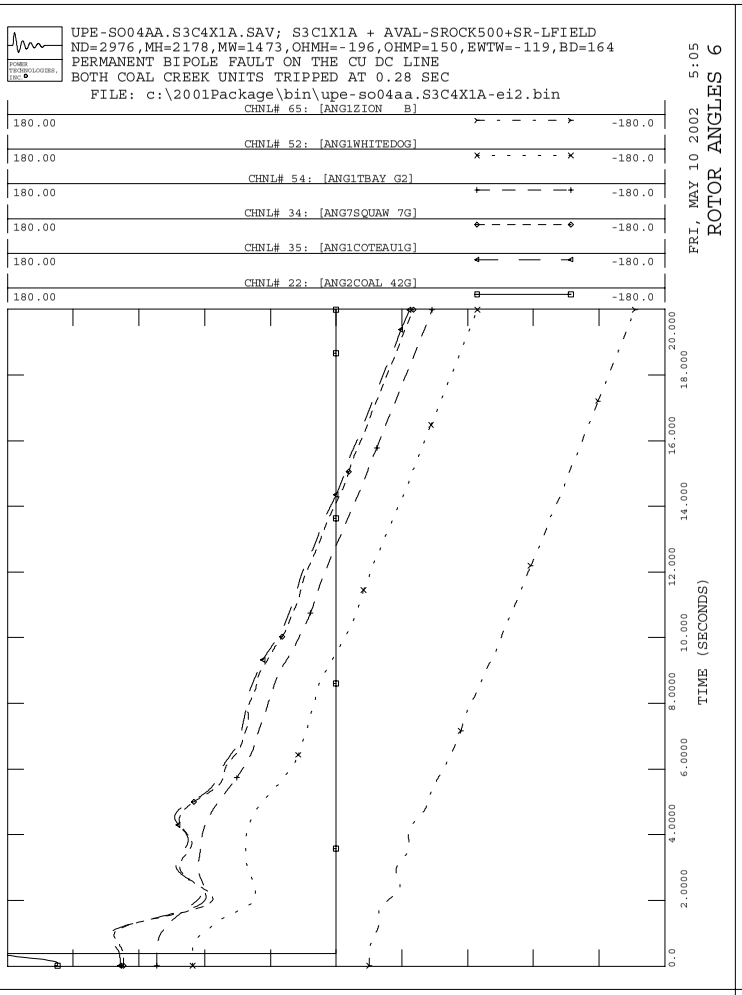
FRI, MAY 10 2002 5:05
ROTOR ANGLES 1

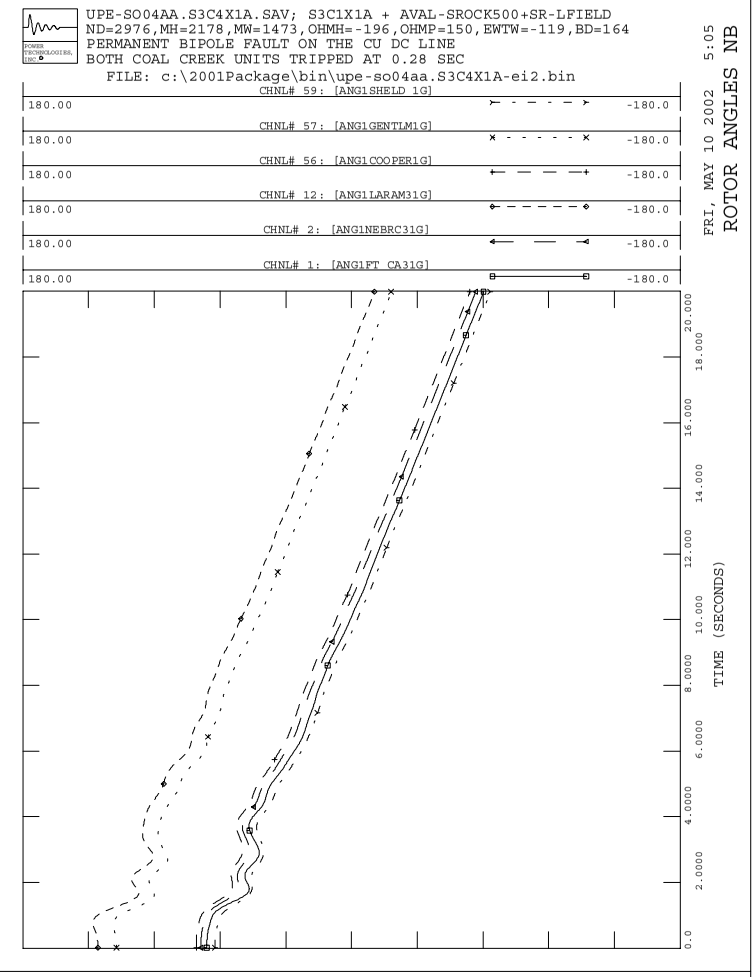


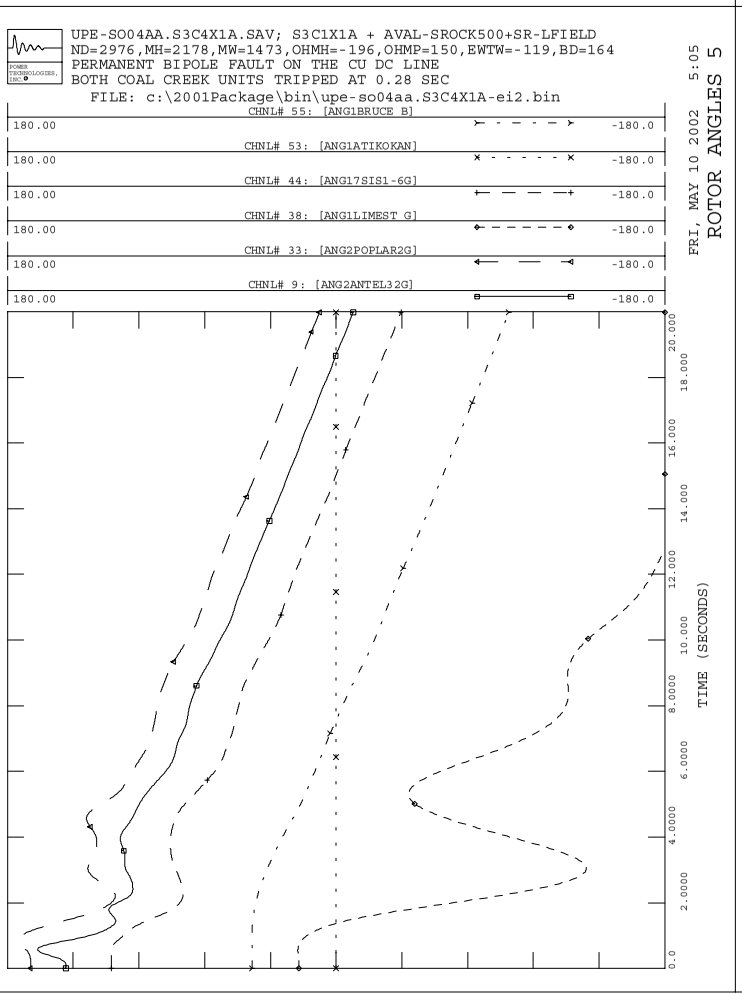
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

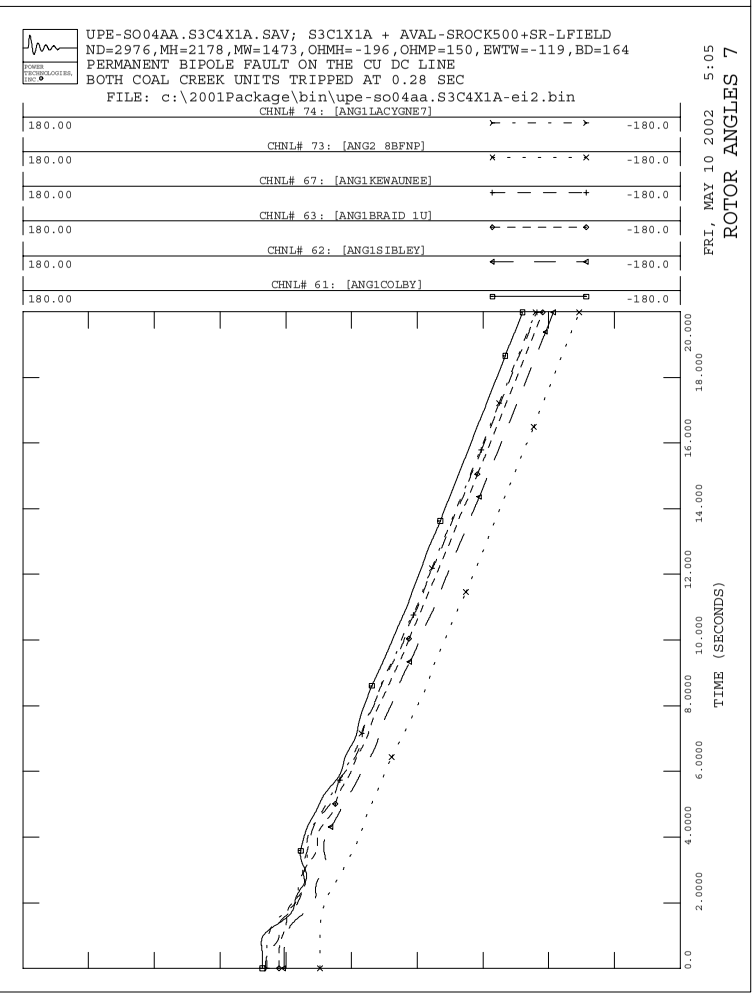
FRI, MAY 10 2002 5:05
ROTOR ANGLES 3




UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 5:05
ROTOR ANGLES 6

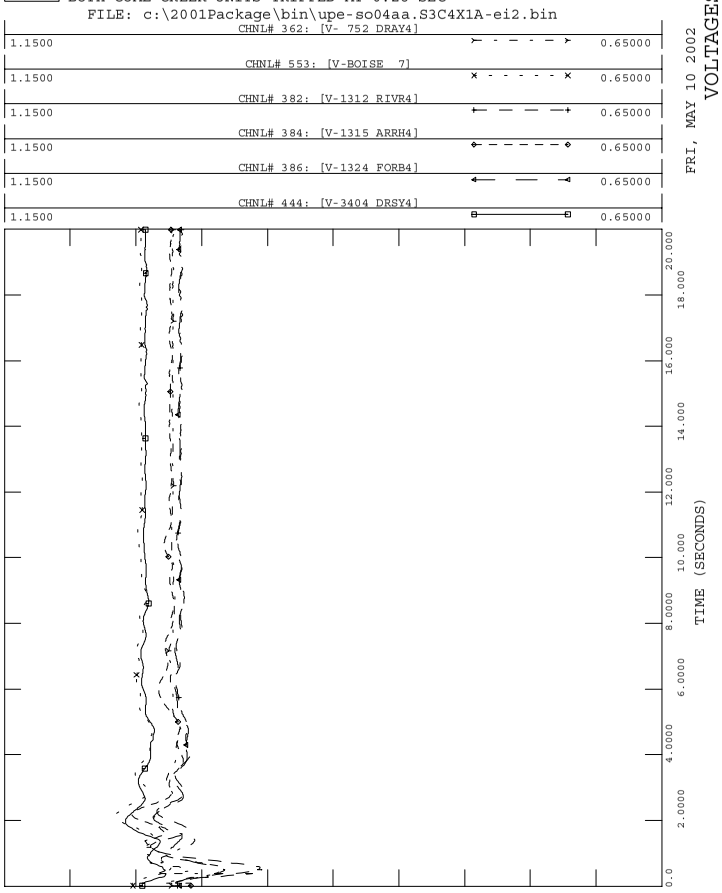

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 5:05
ROTOR ANGLES NB


UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 5:05
ROTOR ANGLES 5


UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 5:05
ROTOR ANGLES 7

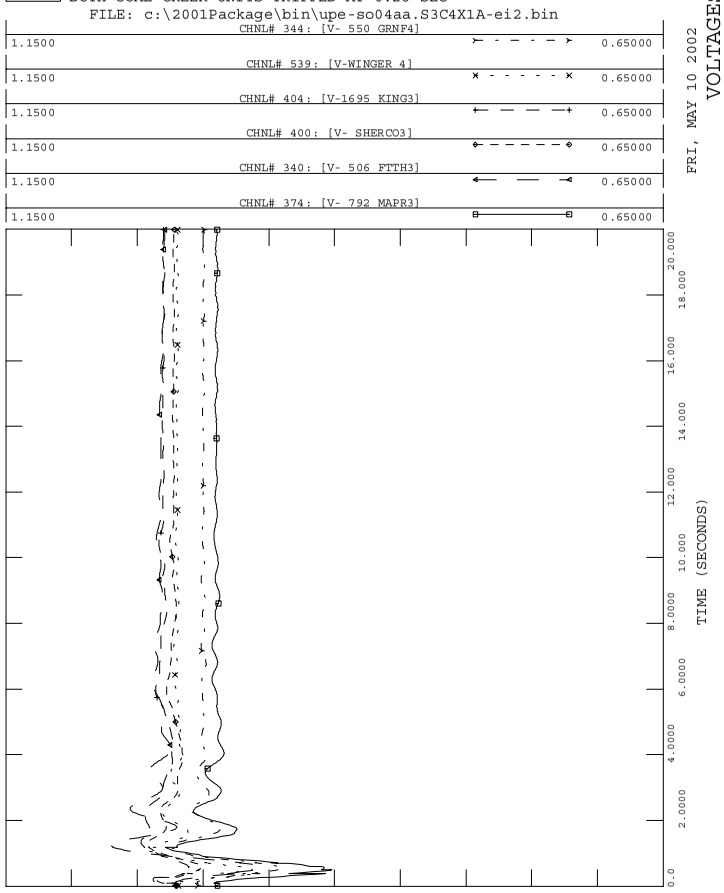
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05
VOLTAGES 1



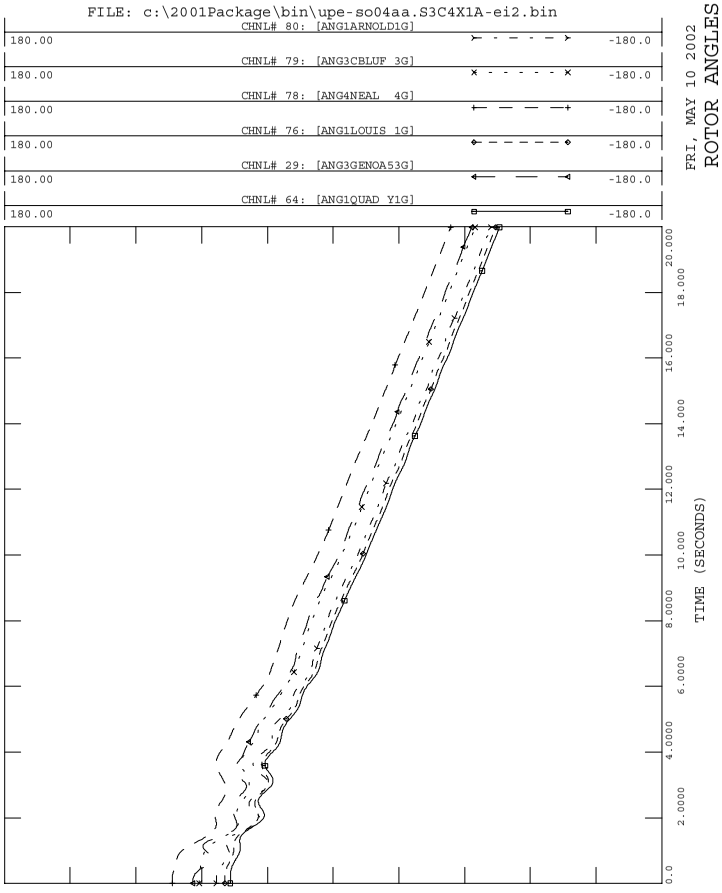
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05
VOLTAGES 3



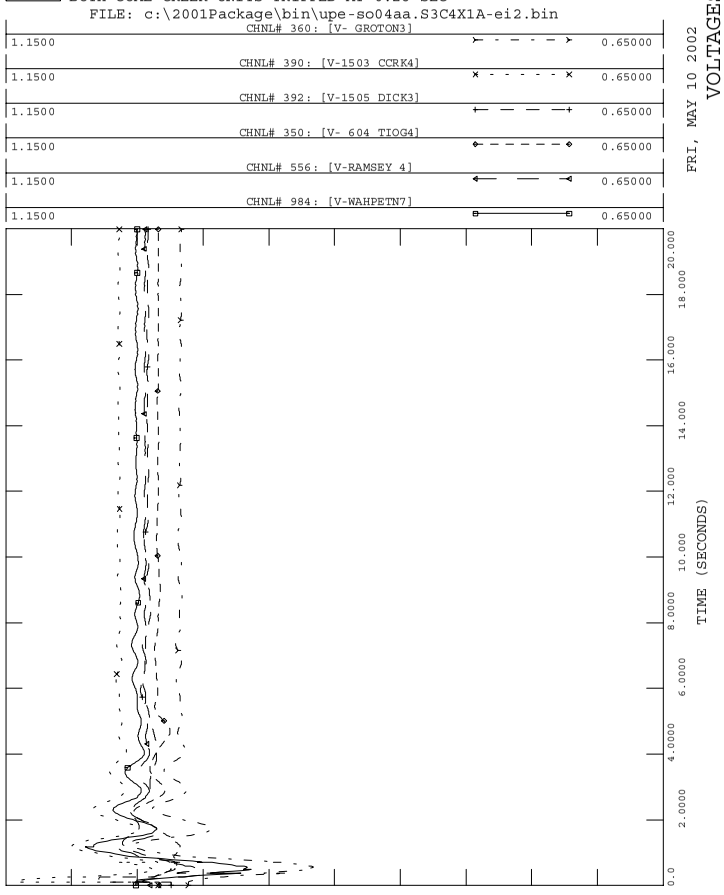
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05
ROTOR ANGLES IA



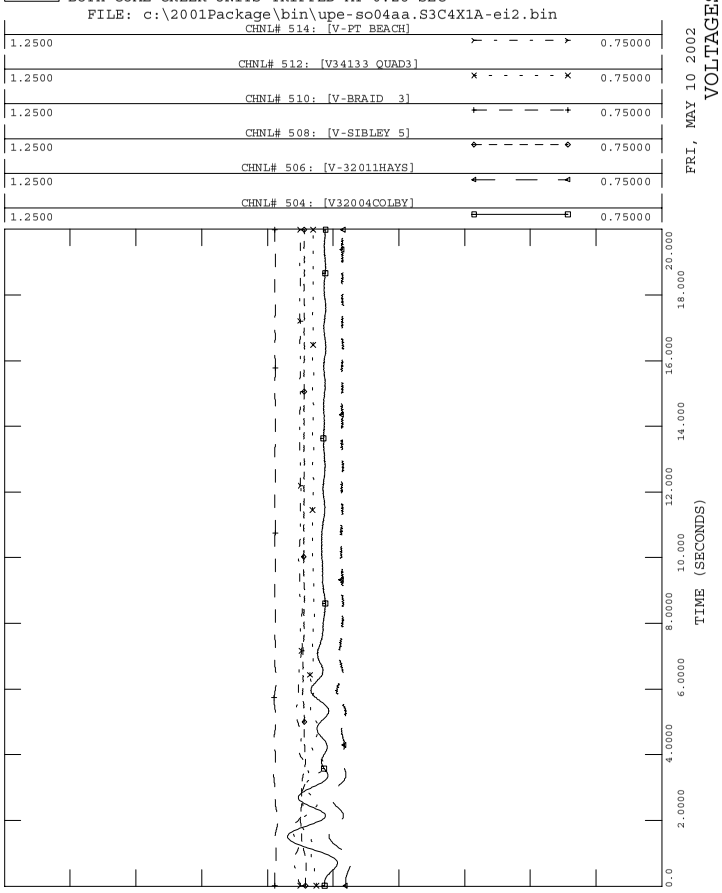
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05
VOLTAGES 2



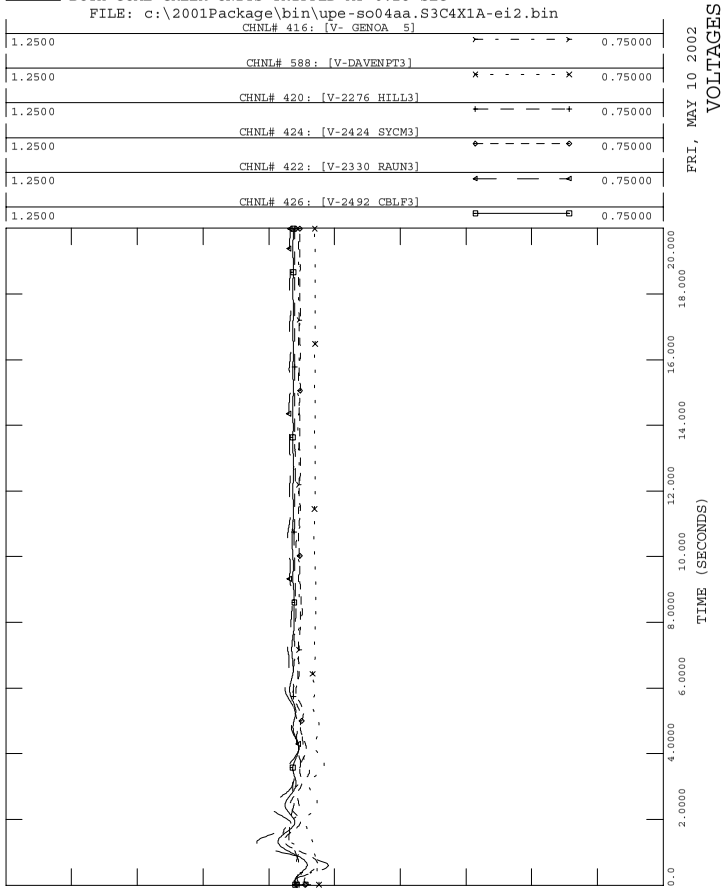
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05
VOLTAGES 5



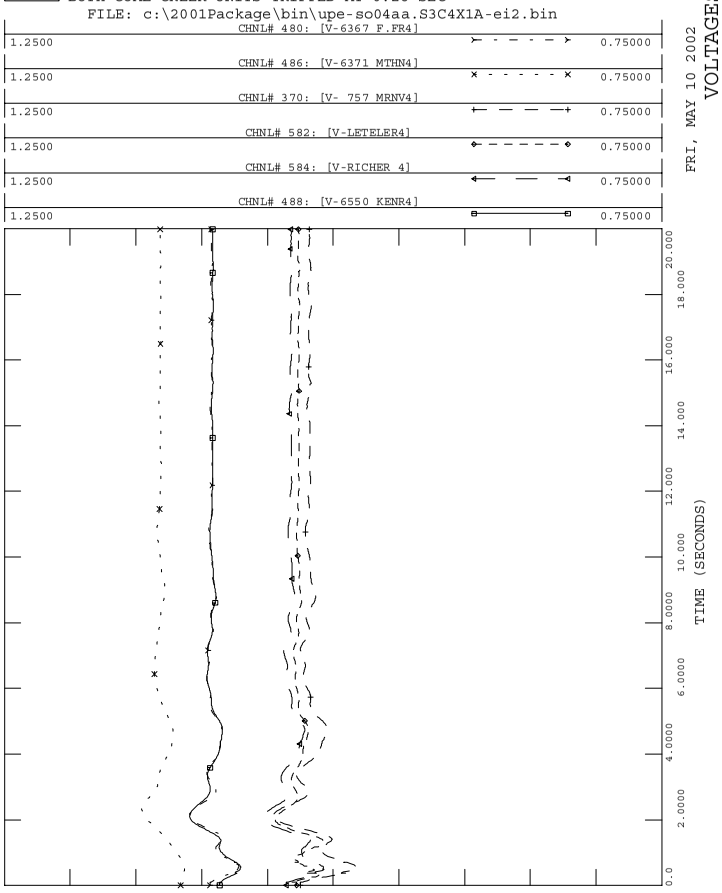
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05
VOLTAGES IA



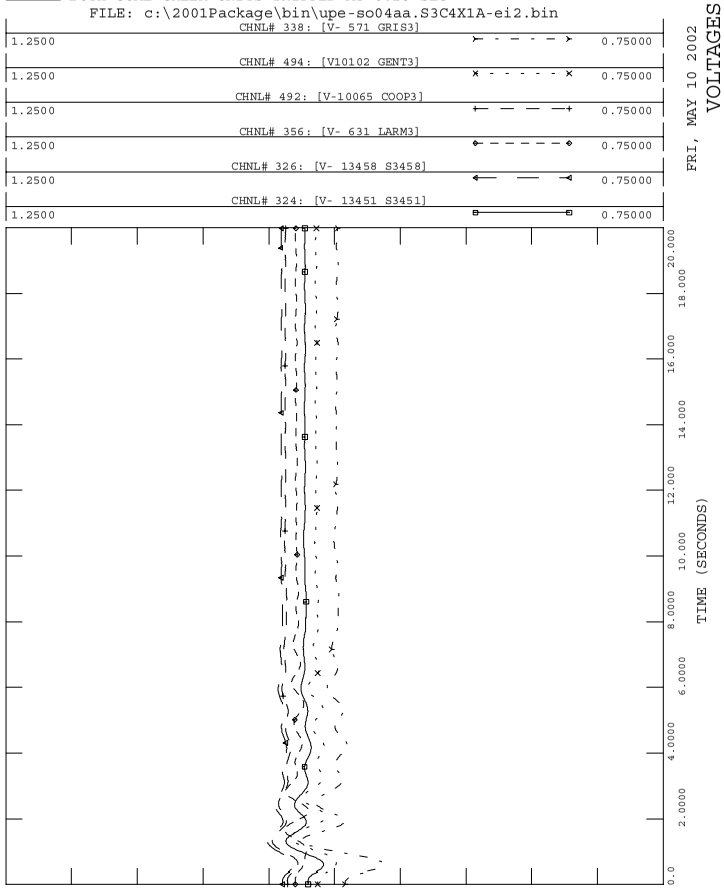
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

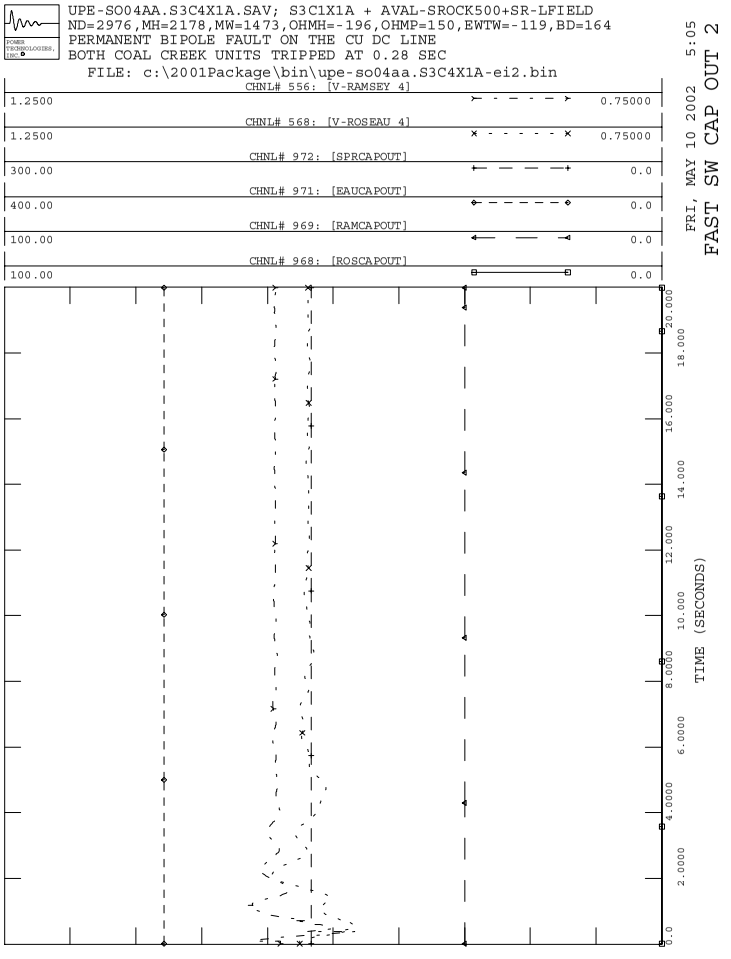
FRI, MAY 10 2002 5:05
VOLTAGES 4

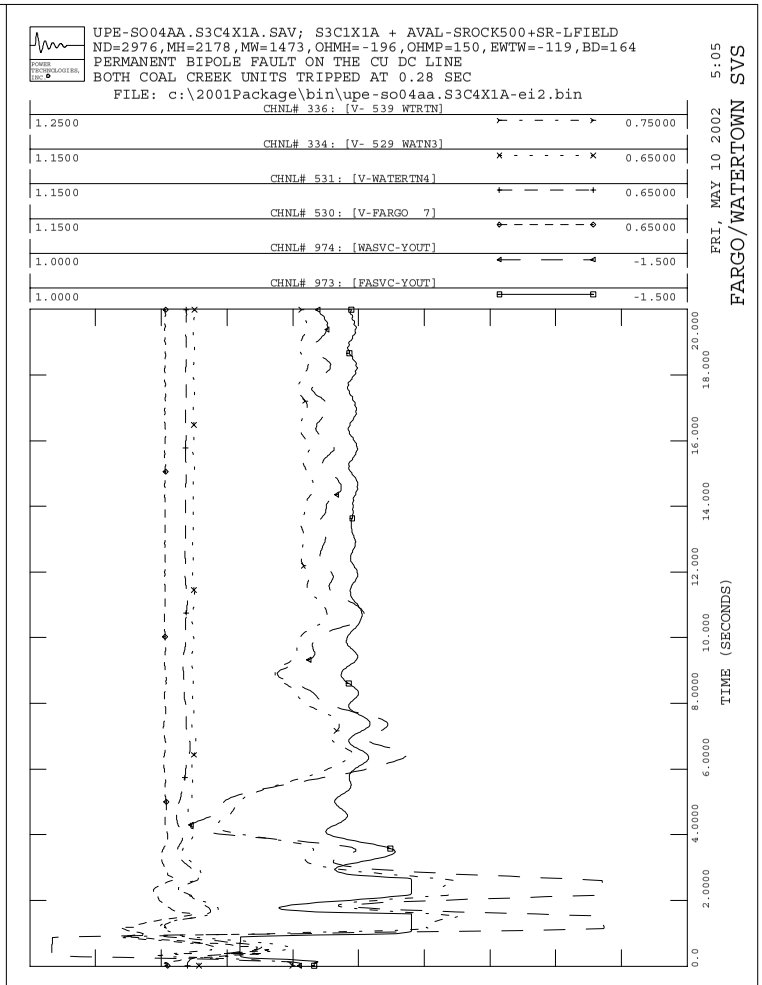


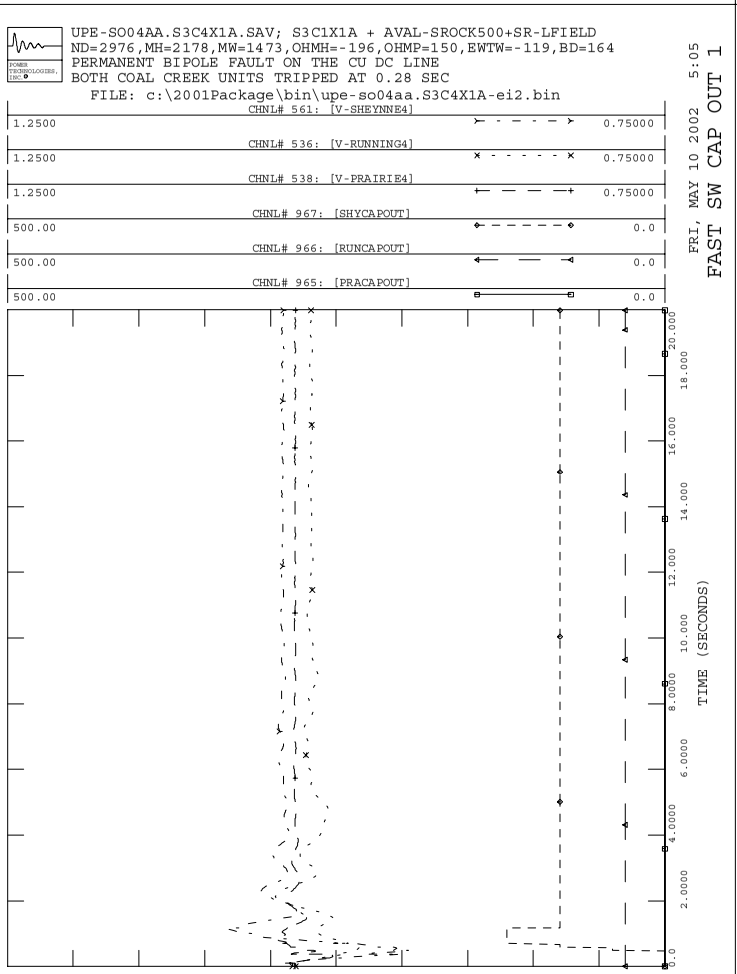
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

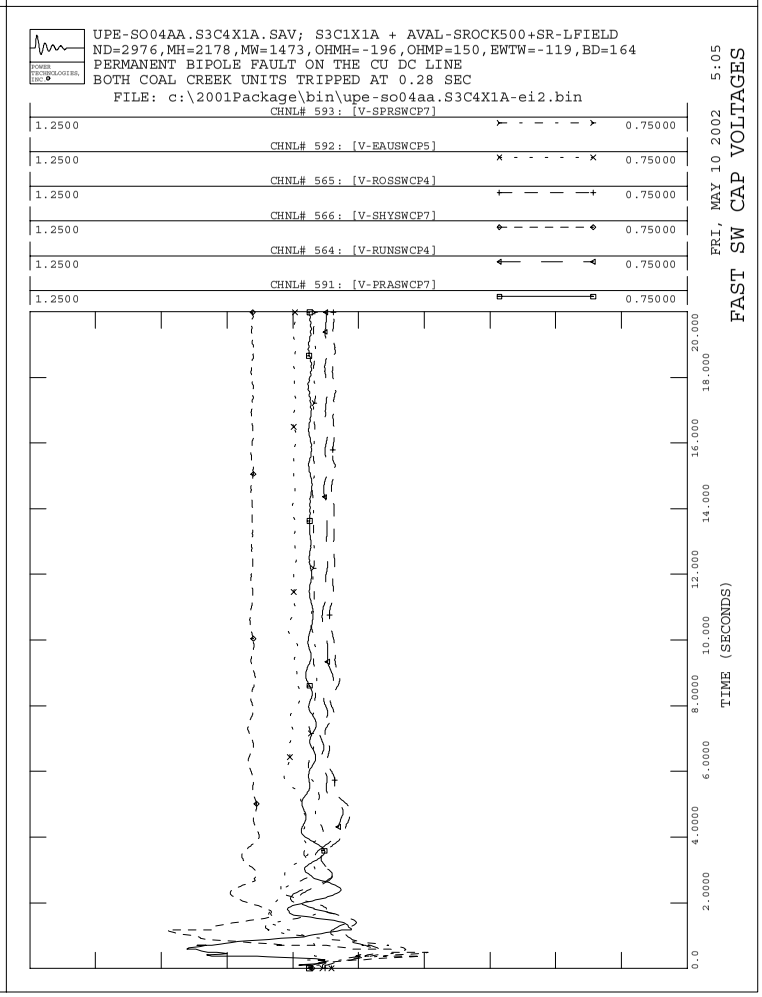
FRI, MAY 10 2002 5:05
VOLTAGES NB




UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
FRI, MAY 10 2002 5:05
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
FRI, MAY 10 2002 5:05
FARGO/WATERTOWN SVS
TIME (SECONDS)

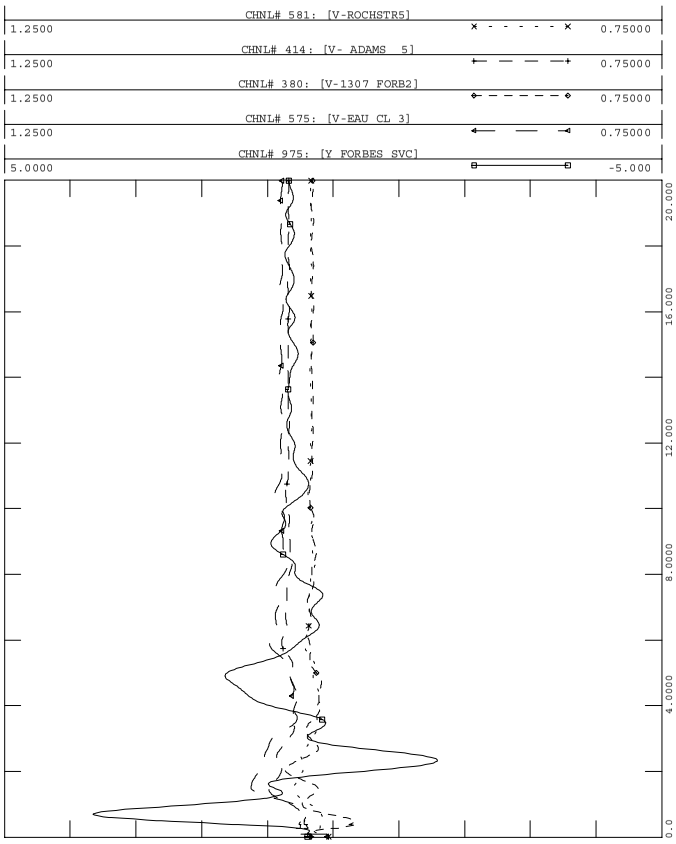

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
FRI, MAY 10 2002 5:05
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
FRI, MAY 10 2002 5:05
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05

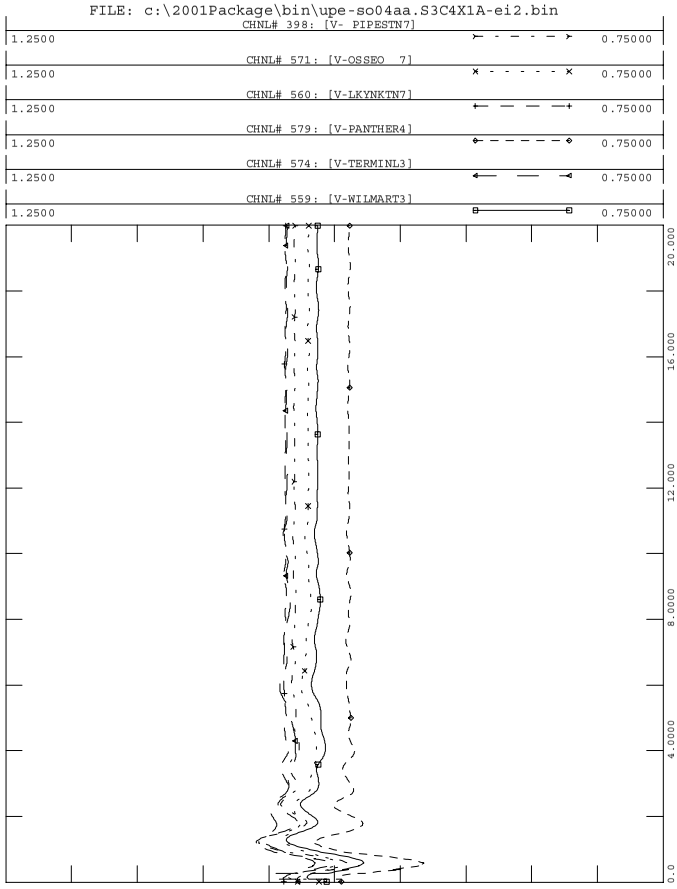
SVC & WISCONSIN VOLT



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05

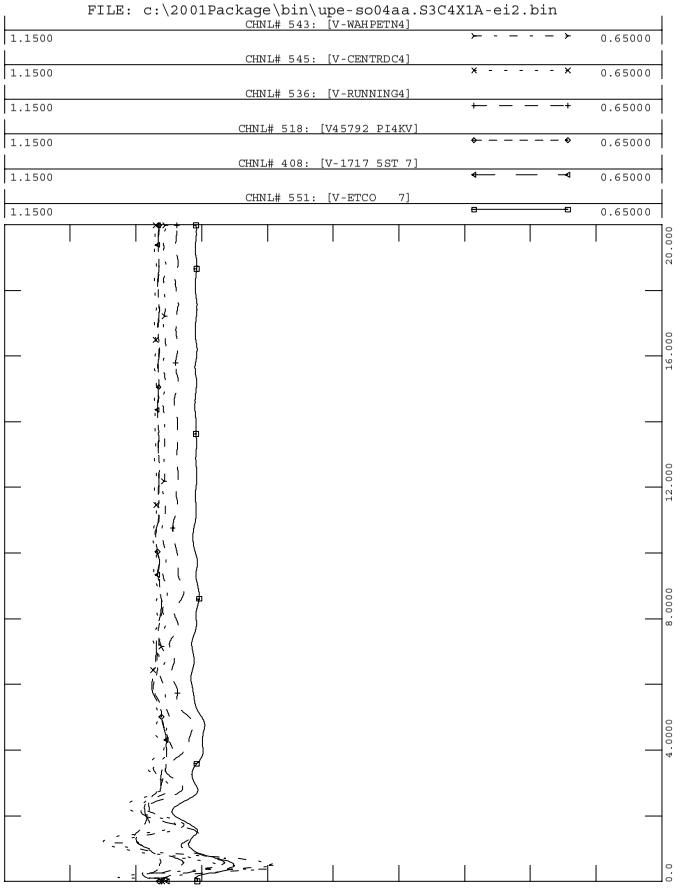
TC VOLTAGES



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05

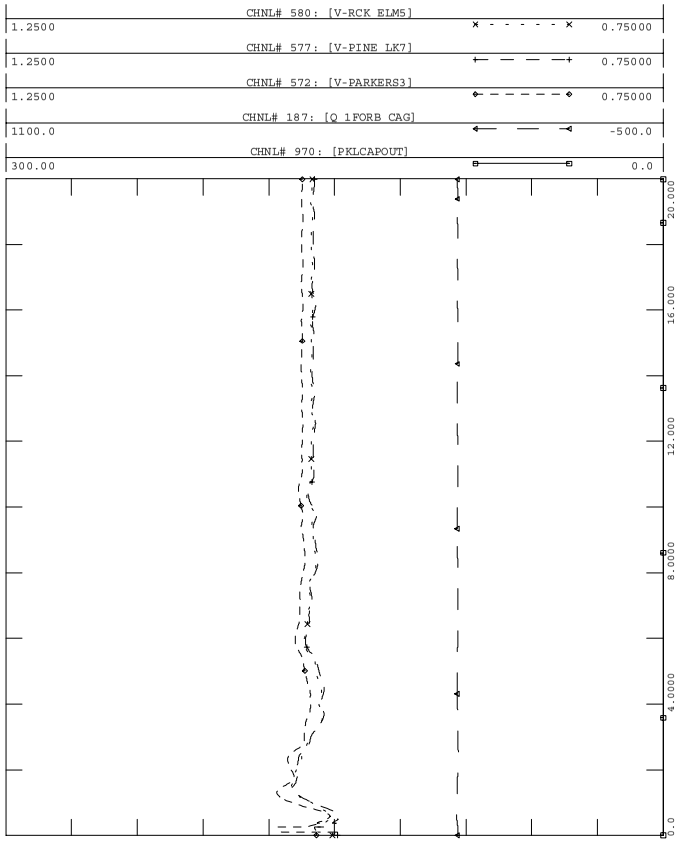
VOLTAGES 6



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

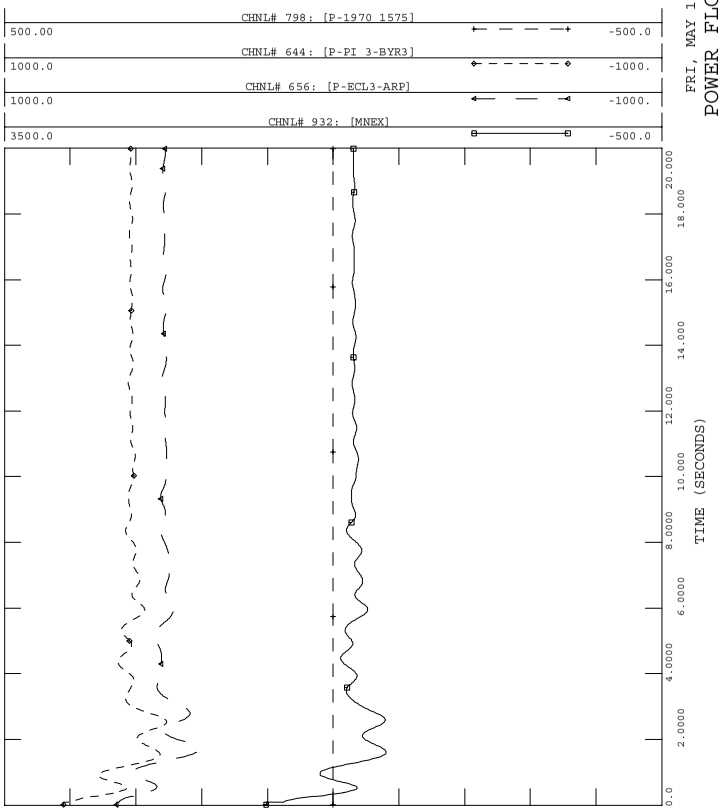
FRI, MAY 10 2002 5:05

FORBES SVS OUT & VOLTAGES



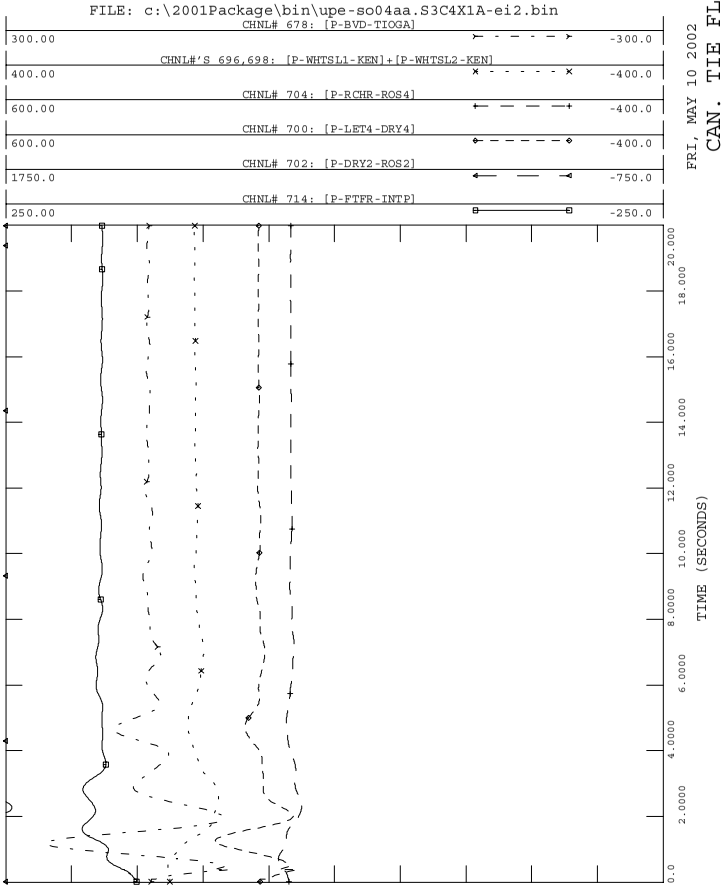
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05
POWER FLOW SUMS 2



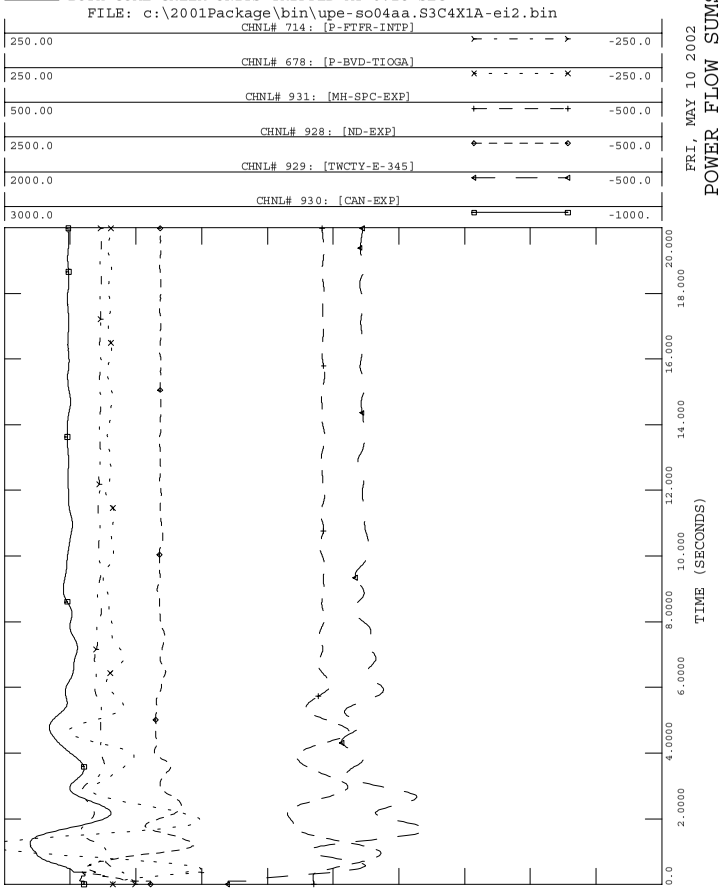
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

FRI, MAY 10 2002 5:05
CAN. TIE FLOWS



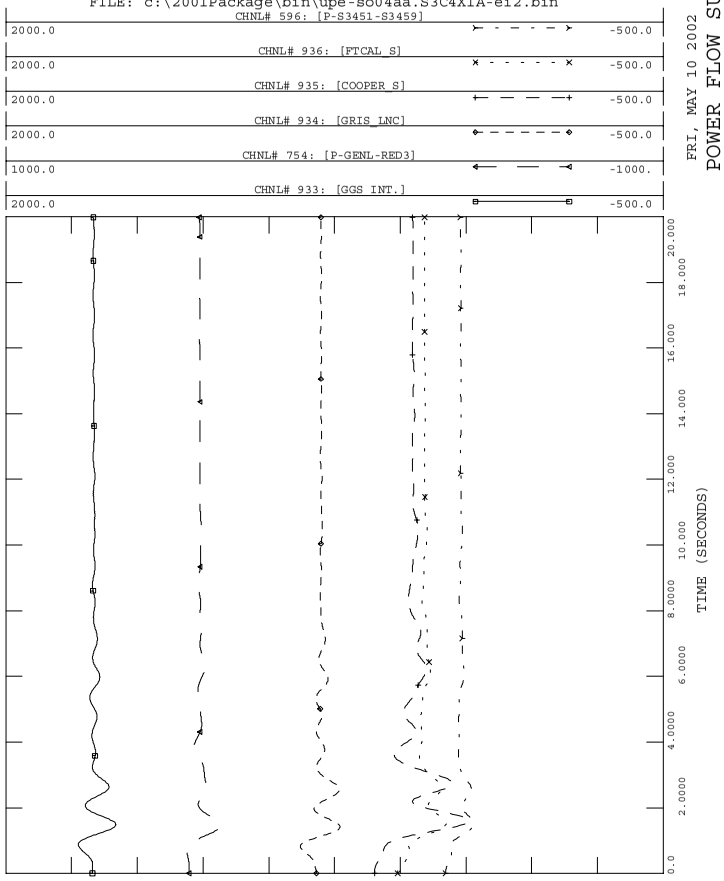
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

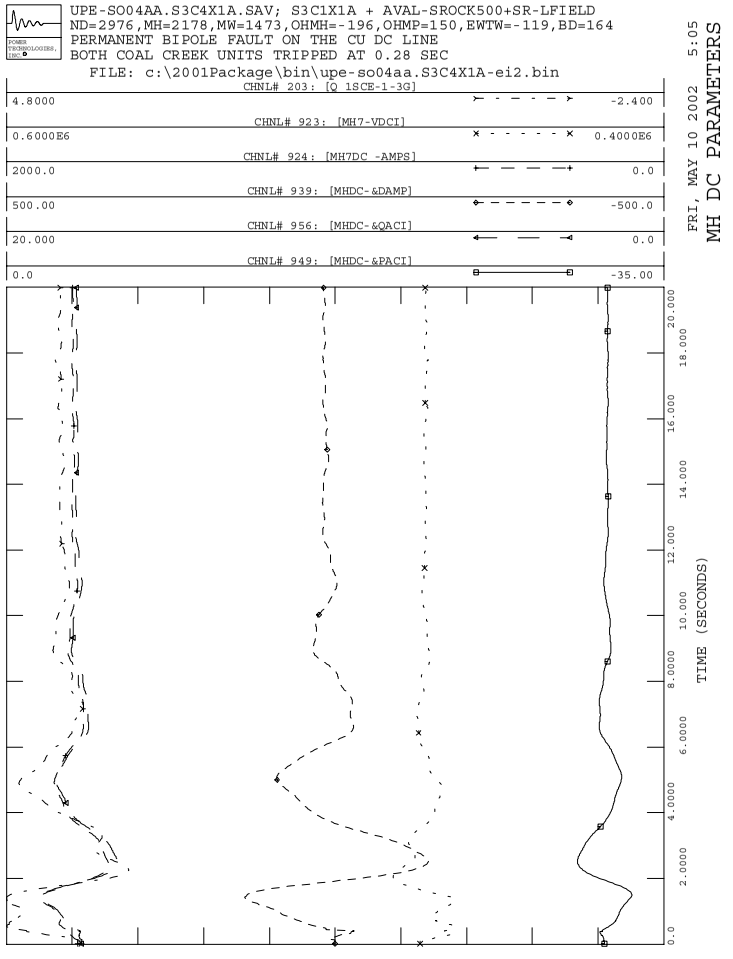
FRI, MAY 10 2002 5:05
POWER FLOW SUMS 1

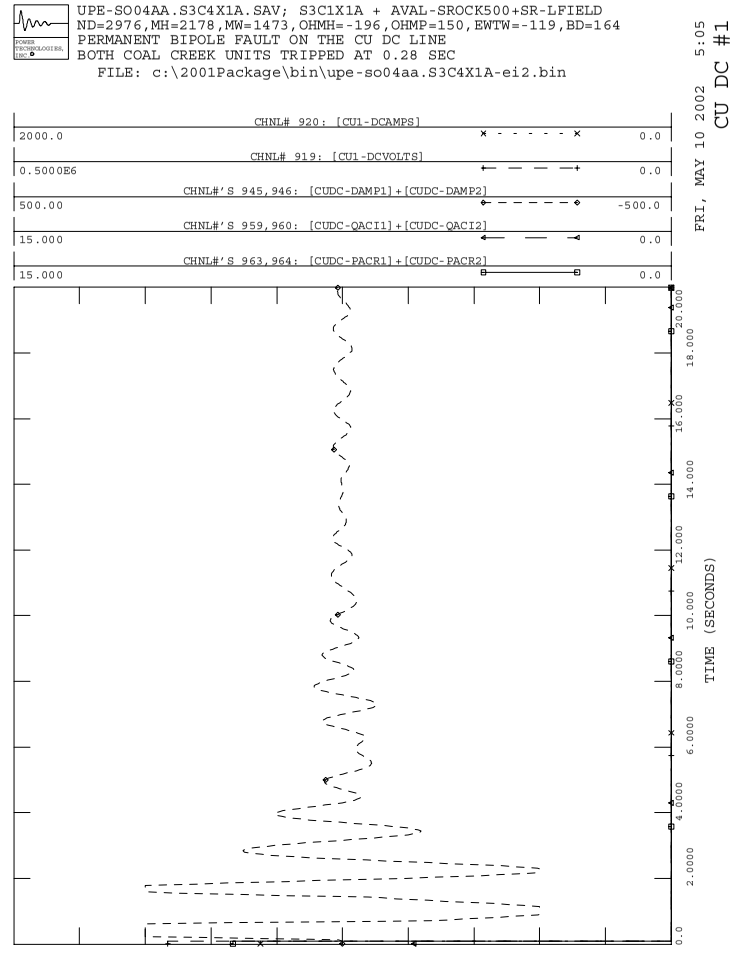


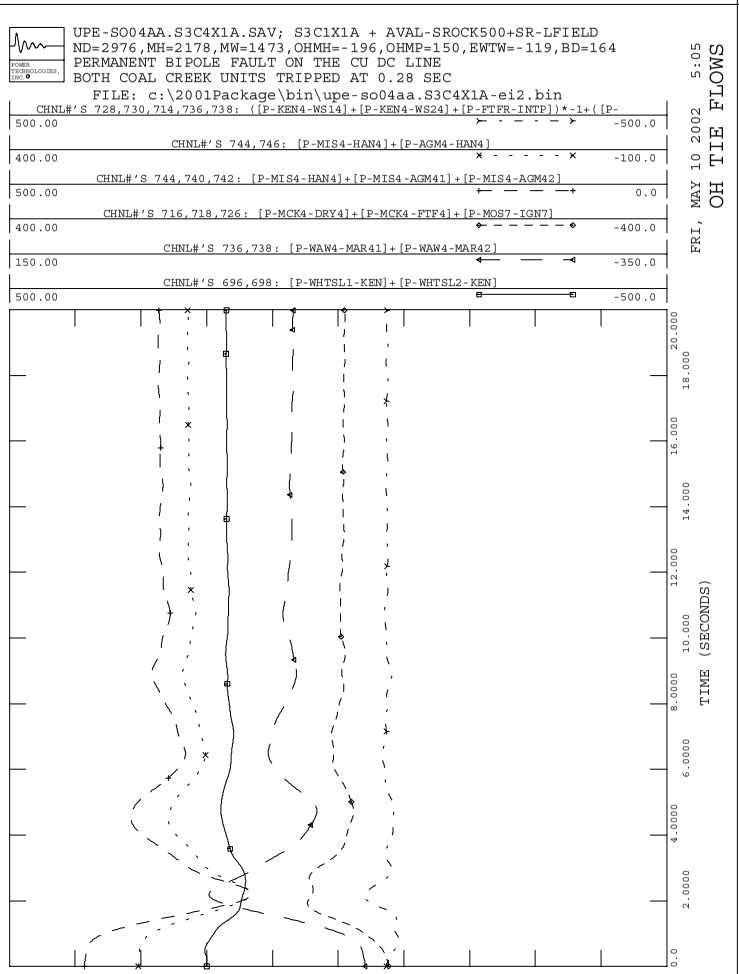
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

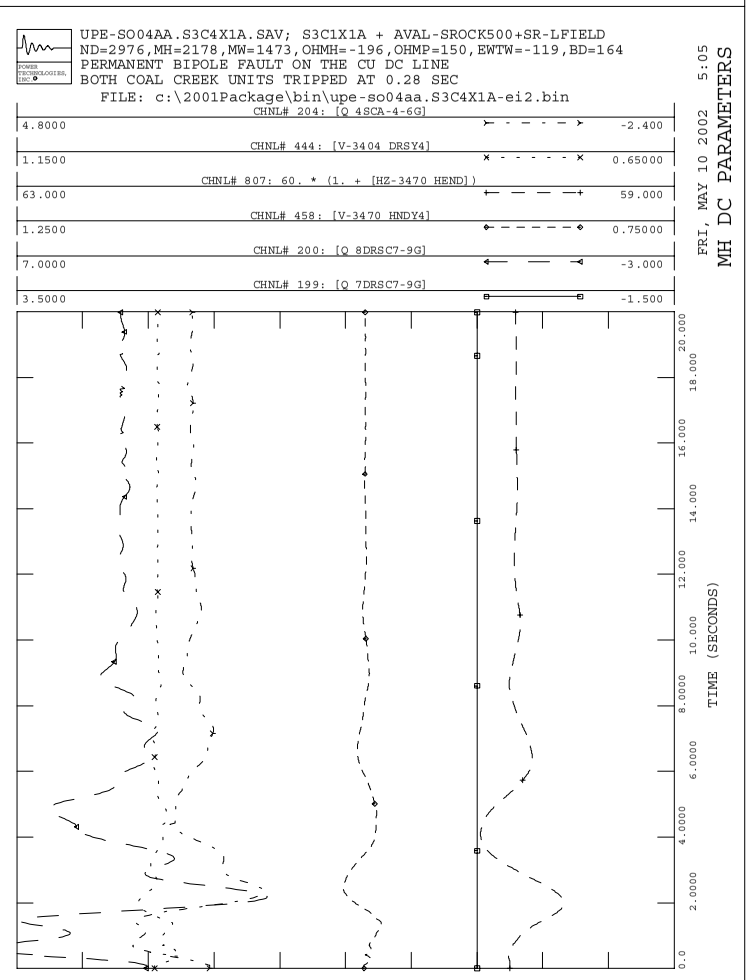
FRI, MAY 10 2002 5:05
POWER FLOW SUM 3

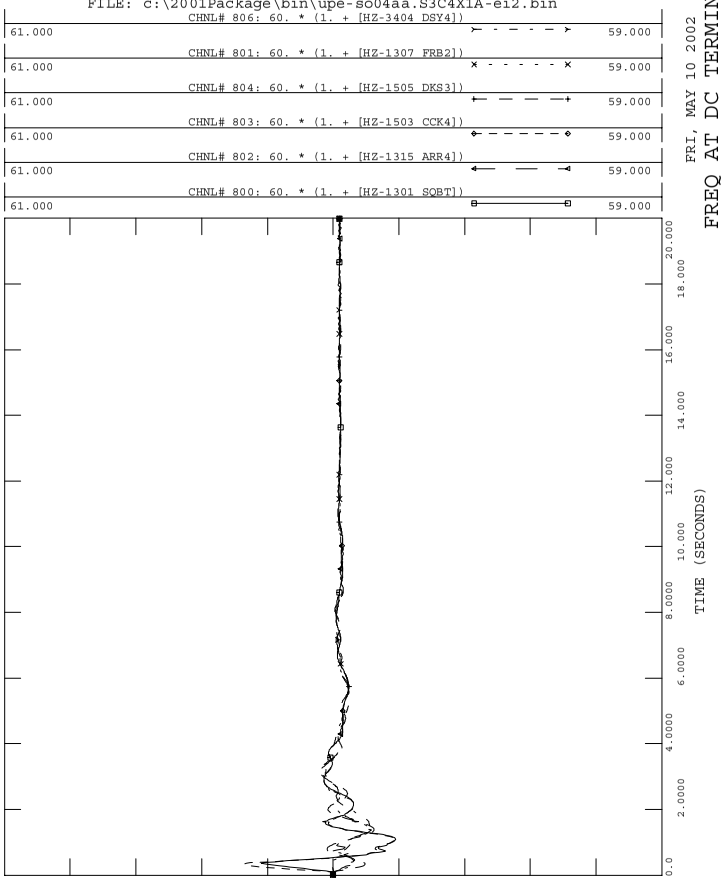


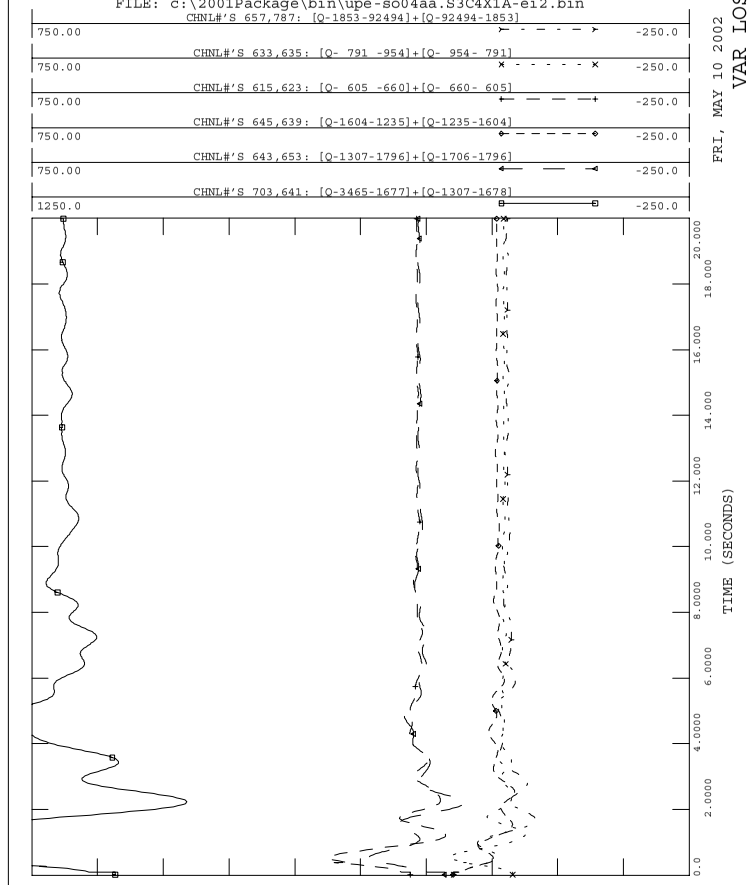

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TIME (SECONDS)
FRI, MAY 10 2002 5:05
MH DC PARAMETERS

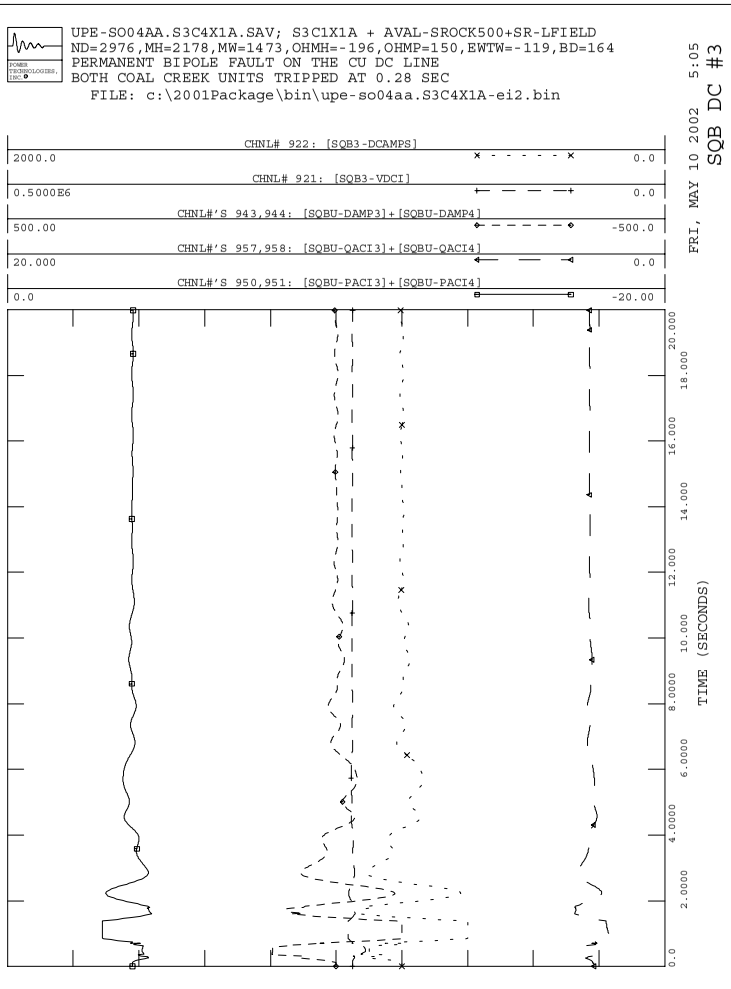

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TIME (SECONDS)
FRI, MAY 10 2002 5:05
CU DC #1

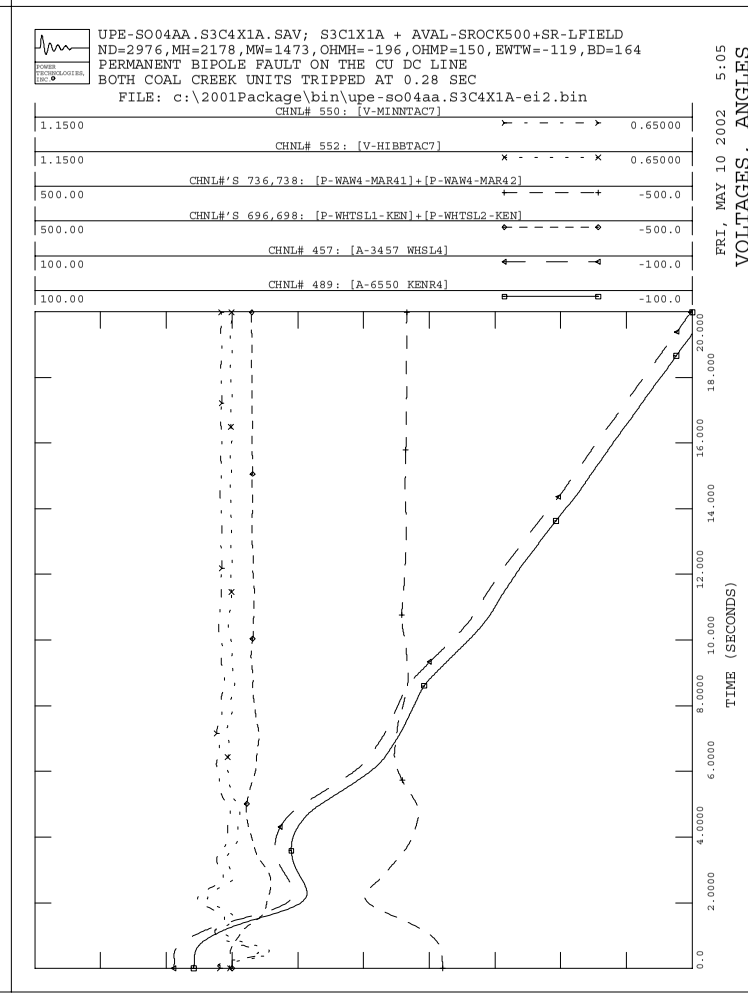

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TIME (SECONDS)
FRI, MAY 10 2002 5:05
OH TIE FLOWS


UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TIME (SECONDS)
FRI, MAY 10 2002 5:05
MH DC PARAMETERS


UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
FRI, MAY 10 2002 5:05
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
FRI, MAY 10 2002 5:05
VAR LOSSES
TIME (SECONDS)

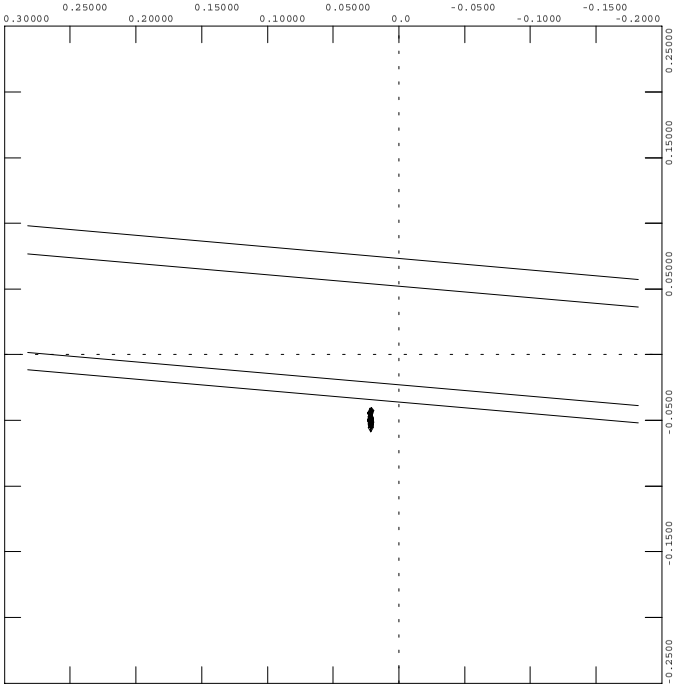

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
FRI, MAY 10 2002 5:05
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
FRI, MAY 10 2002 5:05
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

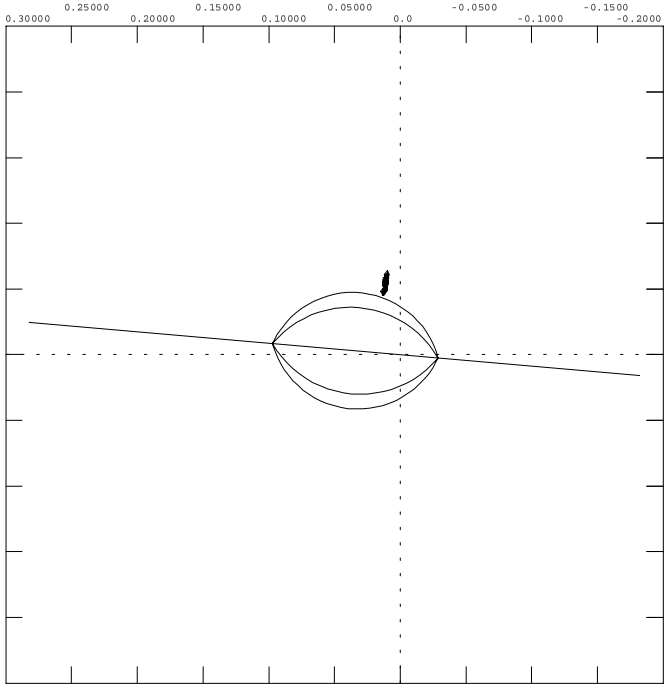


FRI, MAY 10 2002 5:05
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

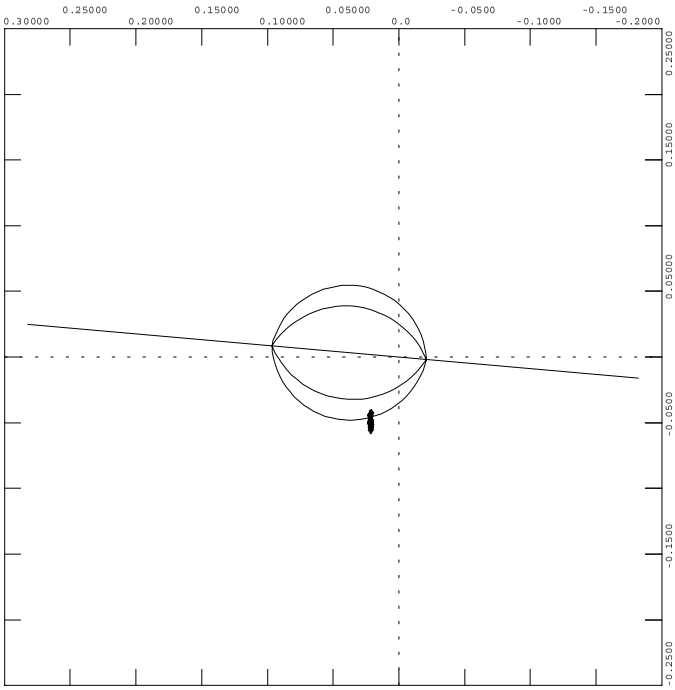


FRI, MAY 10 2002 5:05
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

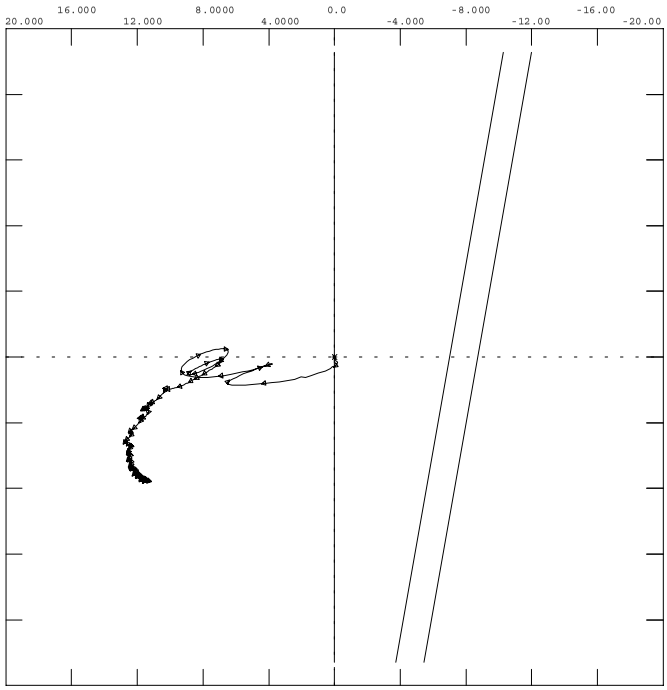


FRI, MAY 10 2002 5:05
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

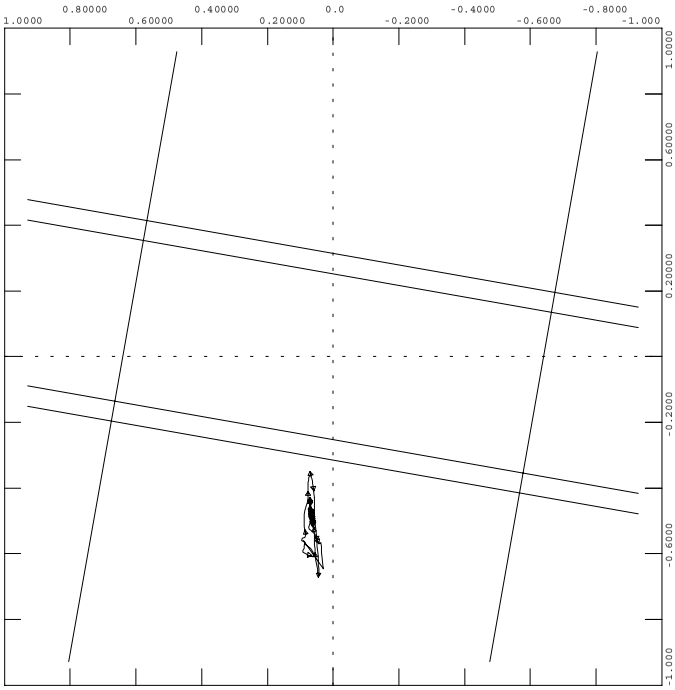


FRI, MAY 10 2002 5:05
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

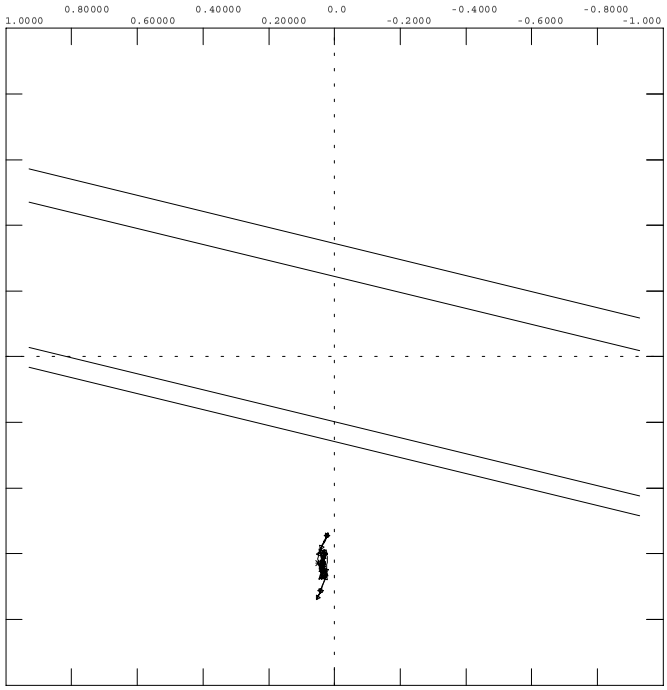
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

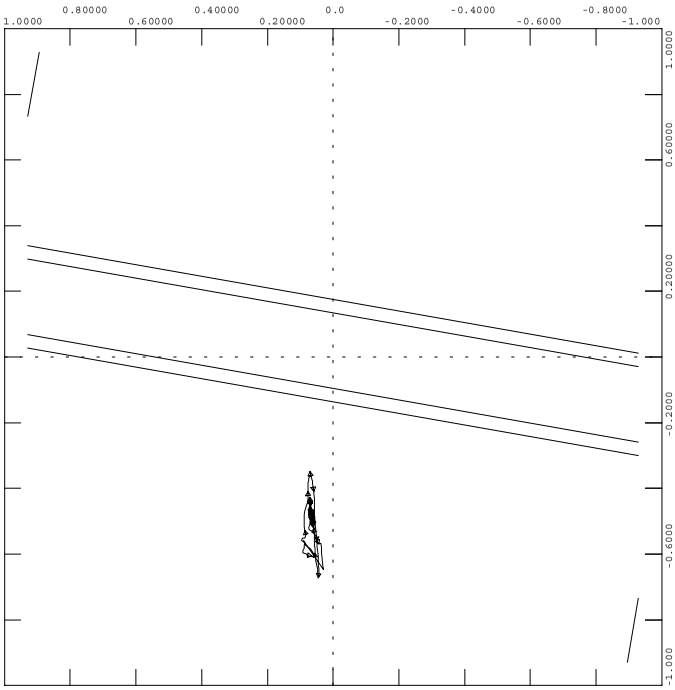
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

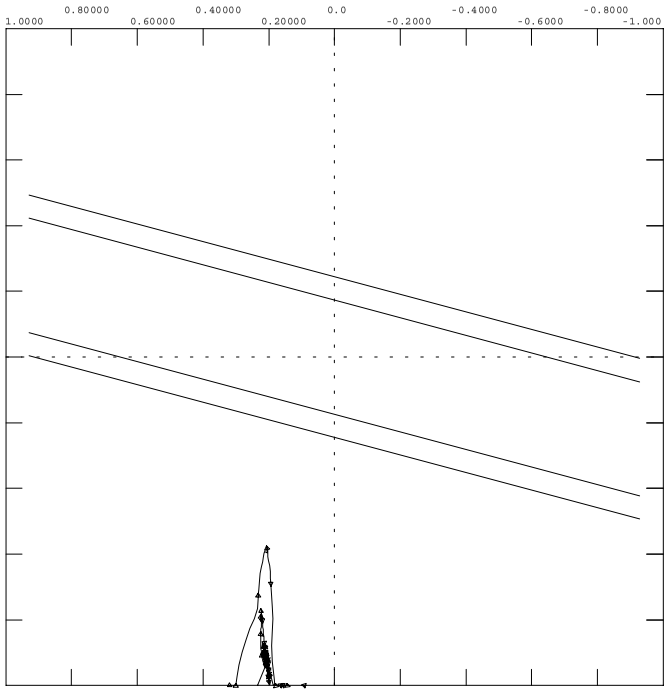
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

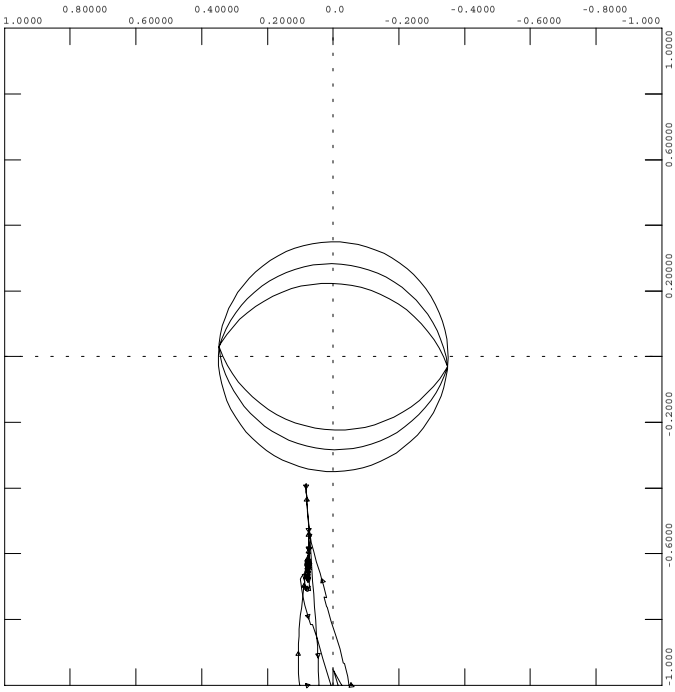
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

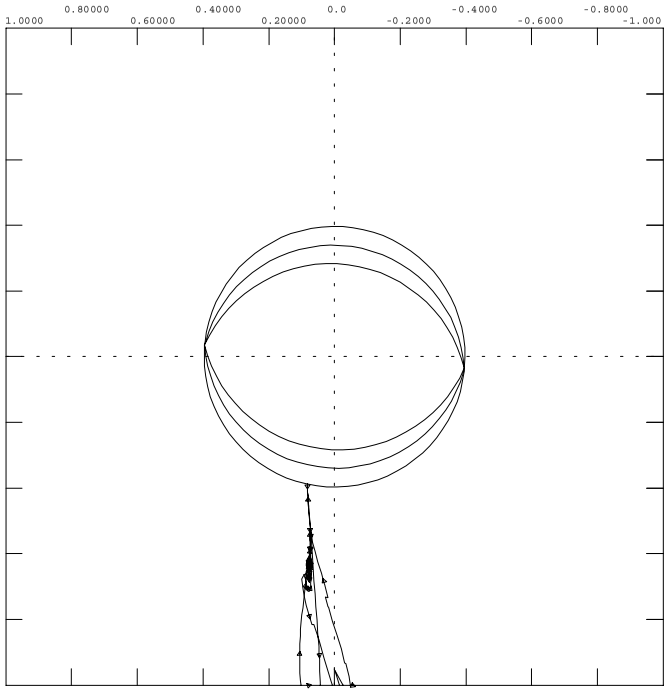
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

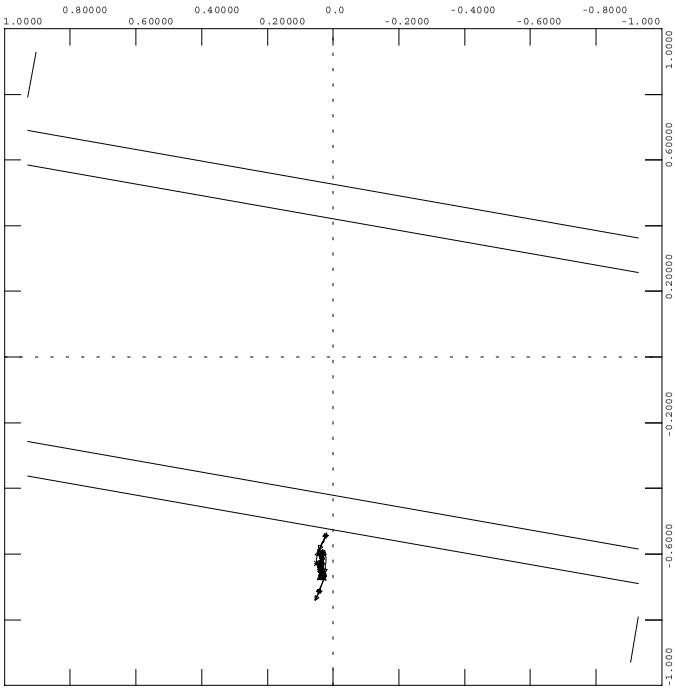
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

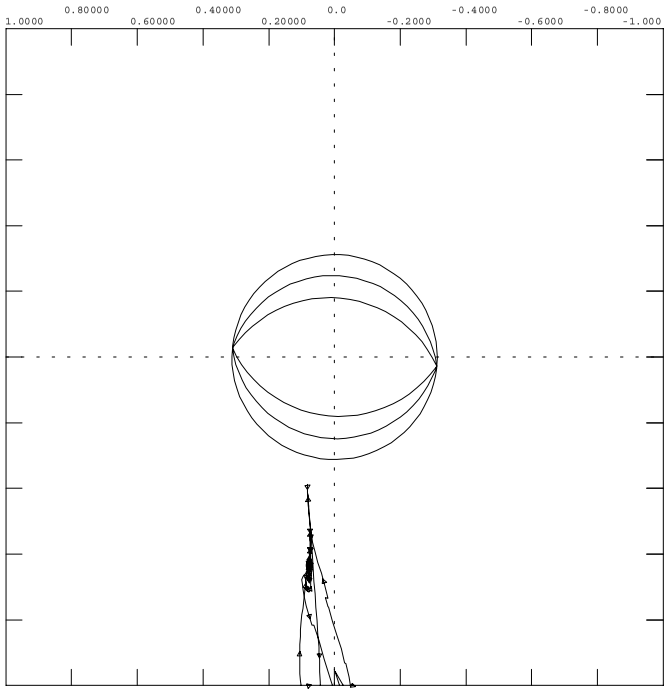
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



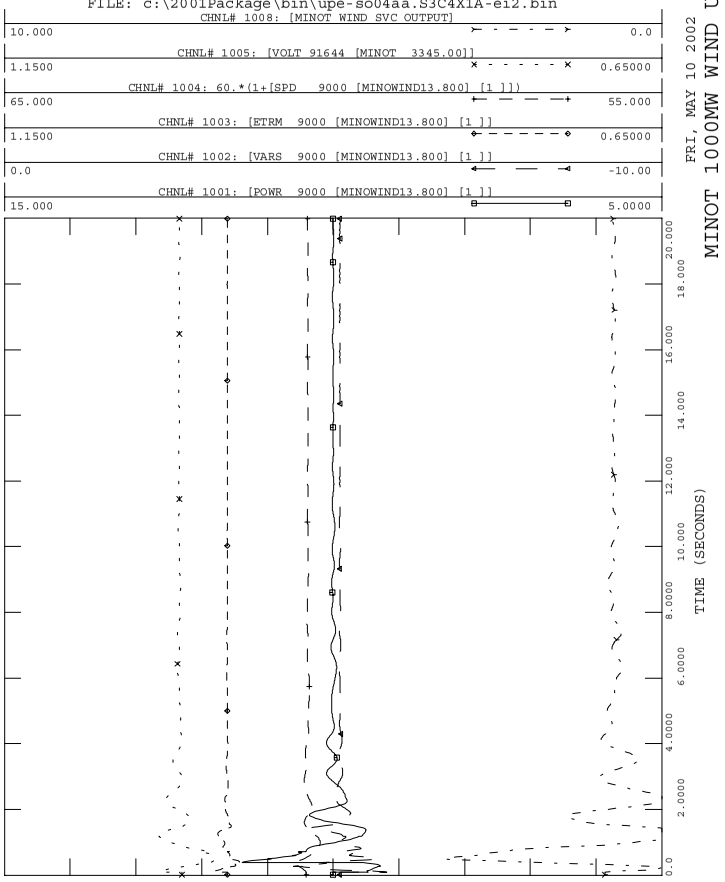
UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

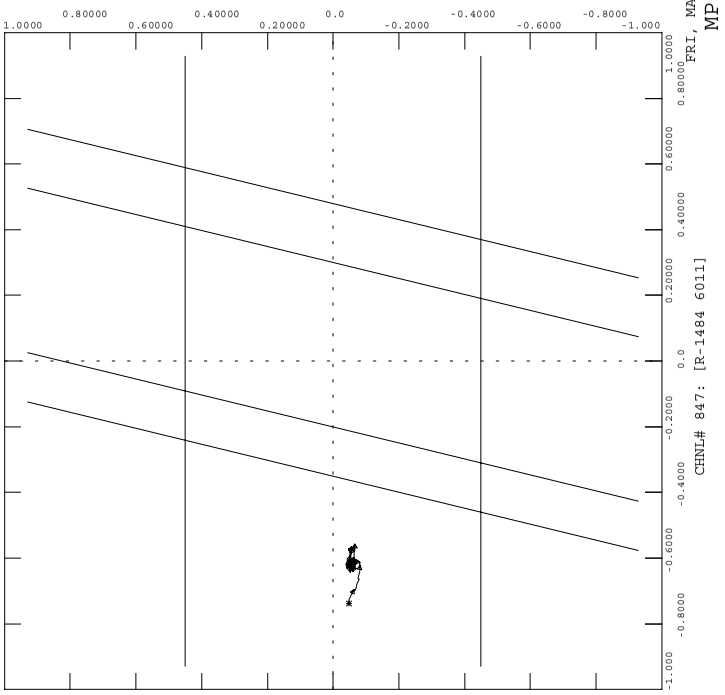


FRI, MAY 10 2002 5:05
MINOT 1000MW WIND UNIT

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC

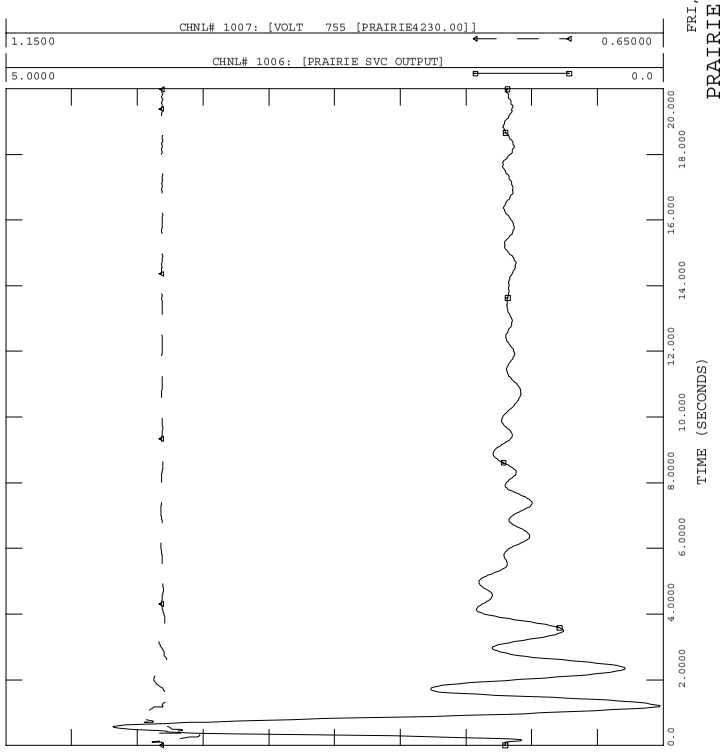
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



FRI, MAY 10 2002 5:05
MP-OH I.FALLS (779)

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164
PERMANENT BIPOLE FAULT ON THE CU DC LINE
BOTH COAL CREEK UNITS TRIPPED AT 0.28 SEC
FILE: c:\2001Package\bin\upe-so04aa.S3C4X1A-ei2.bin



FRI, MAY 10 2002 5:05
PRAIRIE SVC RESPONSE

APPENDIX 24

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 4 (FT. THOMPSON)

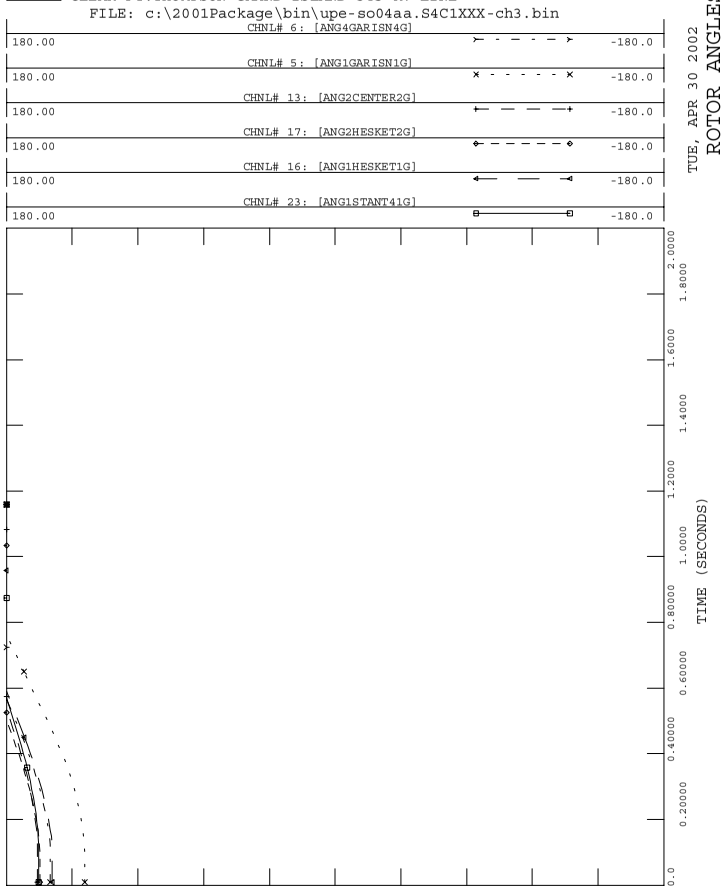
CASE S4C1XXX

CONTINGENCY CH3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Grand Island 345 kV line

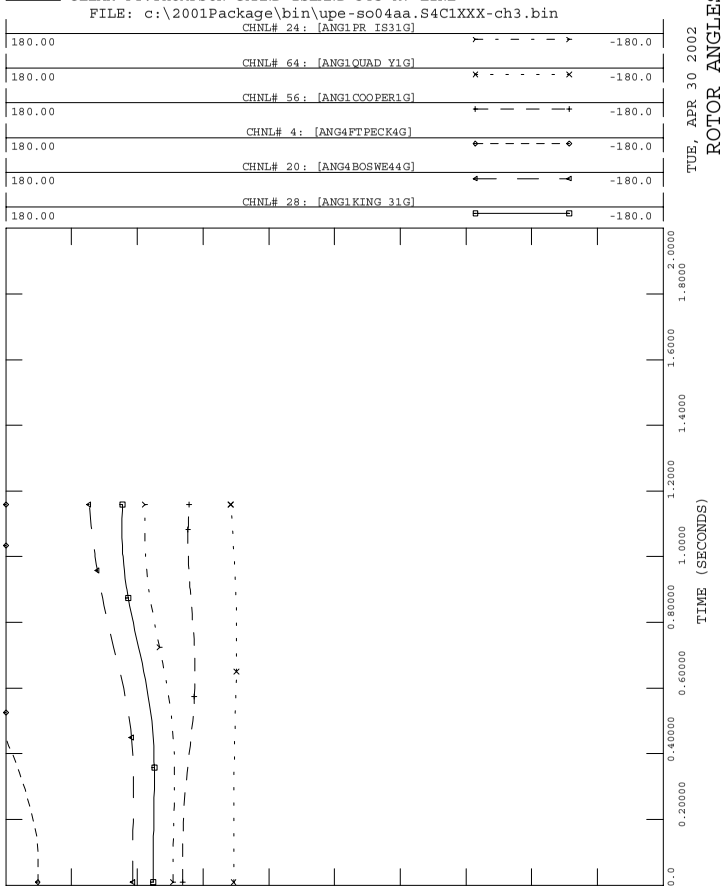
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
ROTOR ANGLES 2



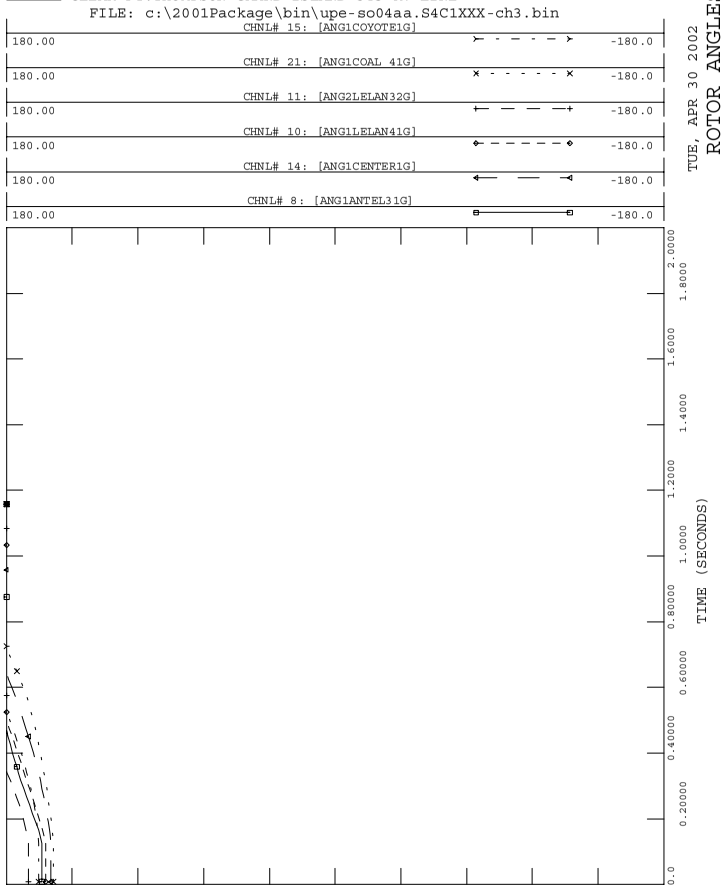
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
ROTOR ANGLES 4



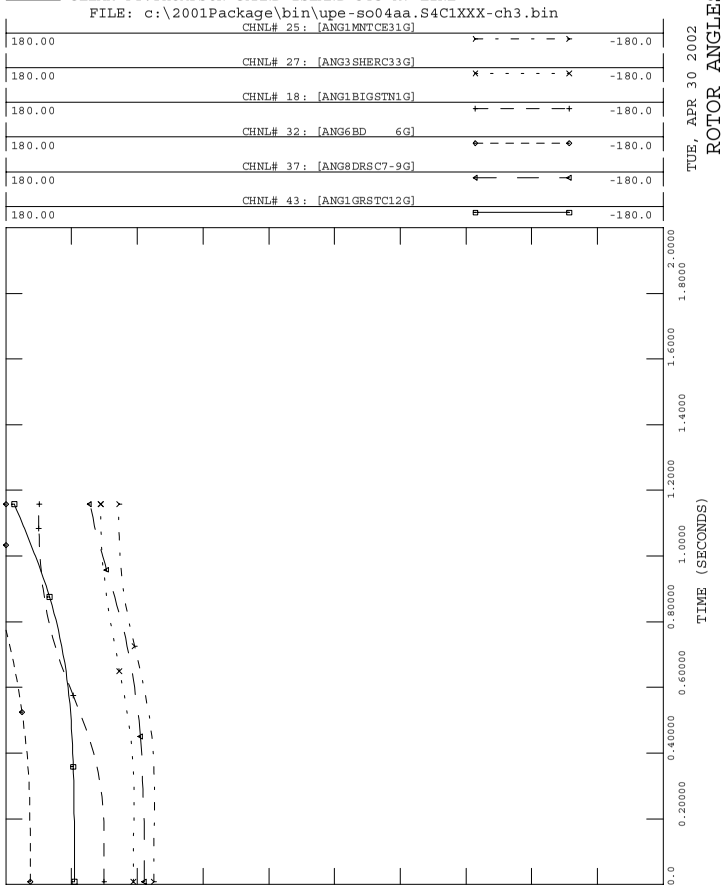
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
ROTOR ANGLES 1



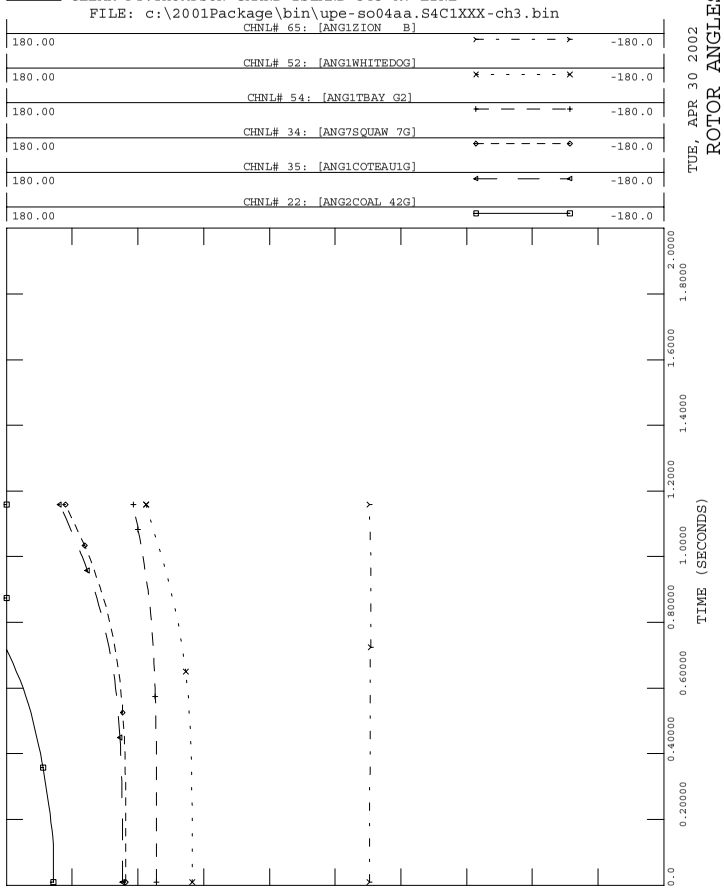
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
ROTOR ANGLES 3



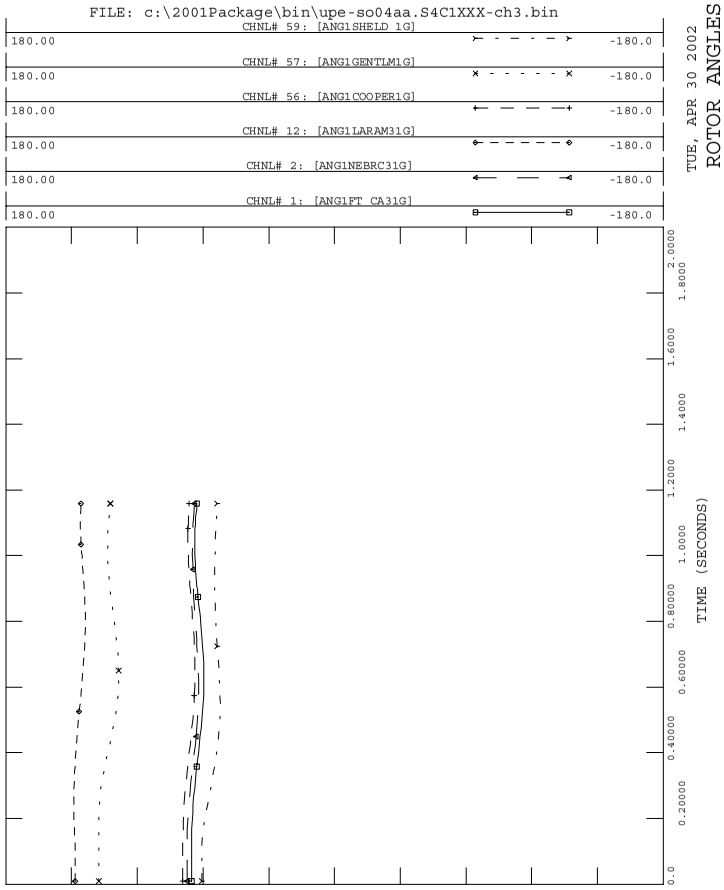
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
ROTOR ANGLES 6



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
ROTOR ANGLES NB



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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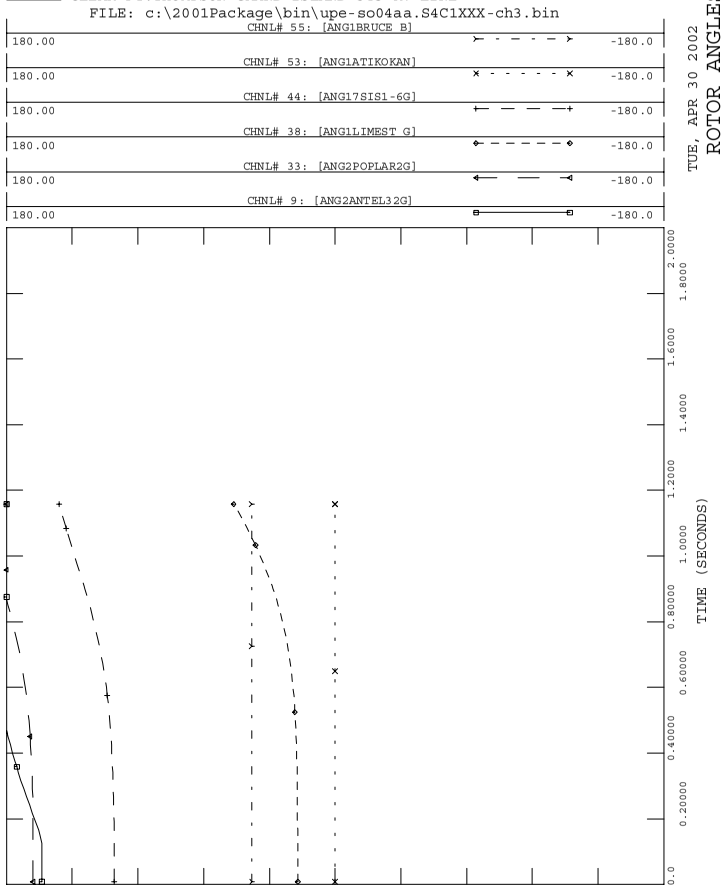
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
ROTOR ANGLES 5



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
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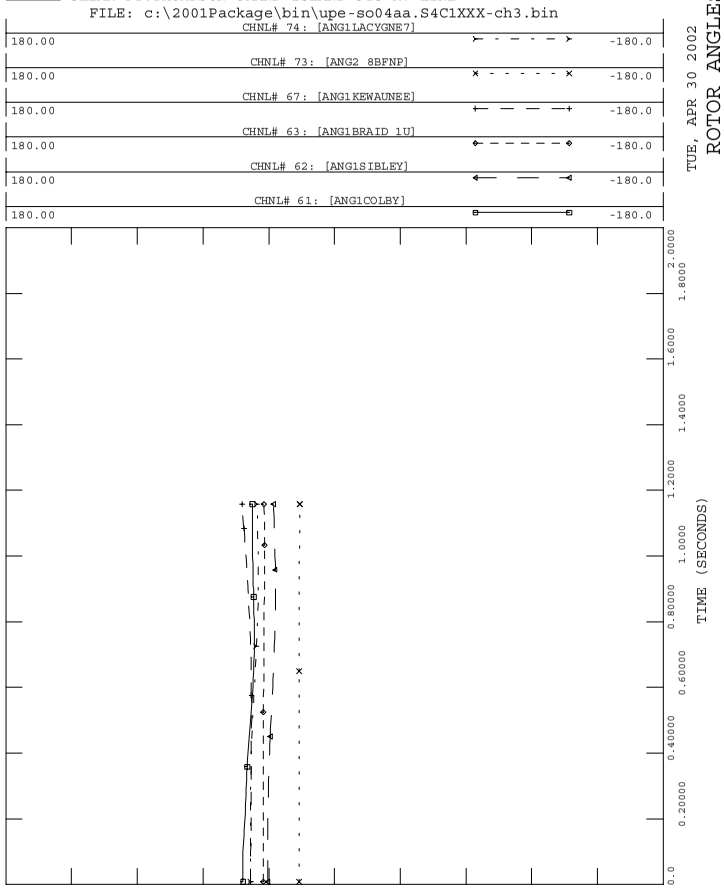

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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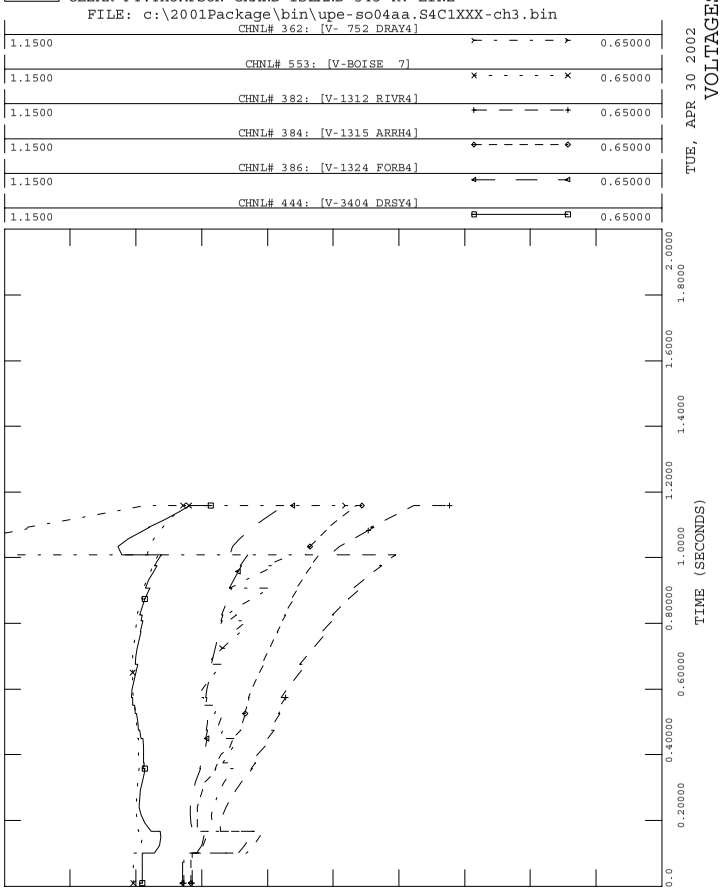
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
VOLTAGES 1



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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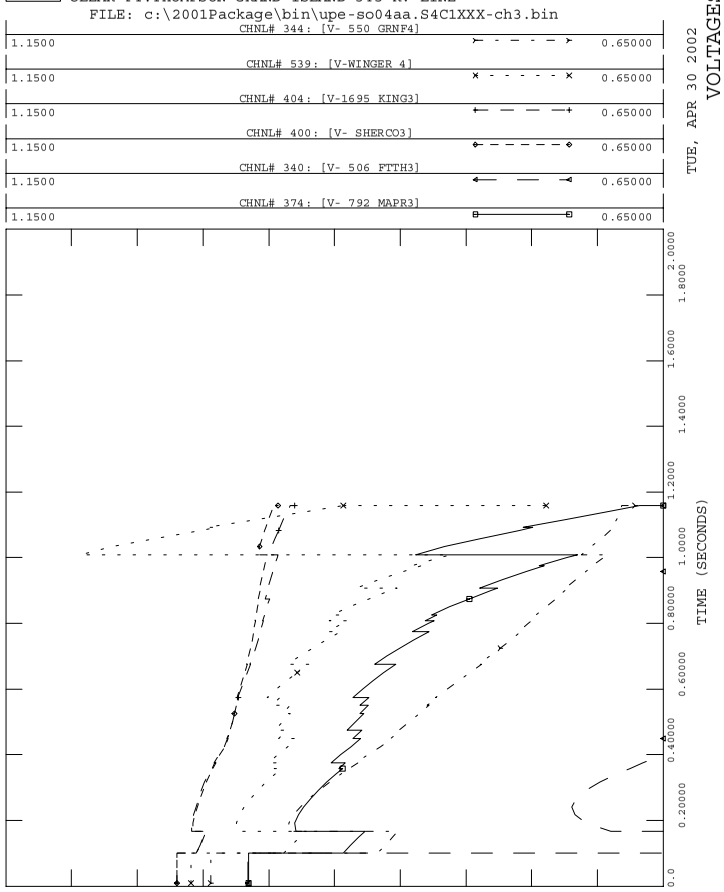
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
VOLTAGES 3



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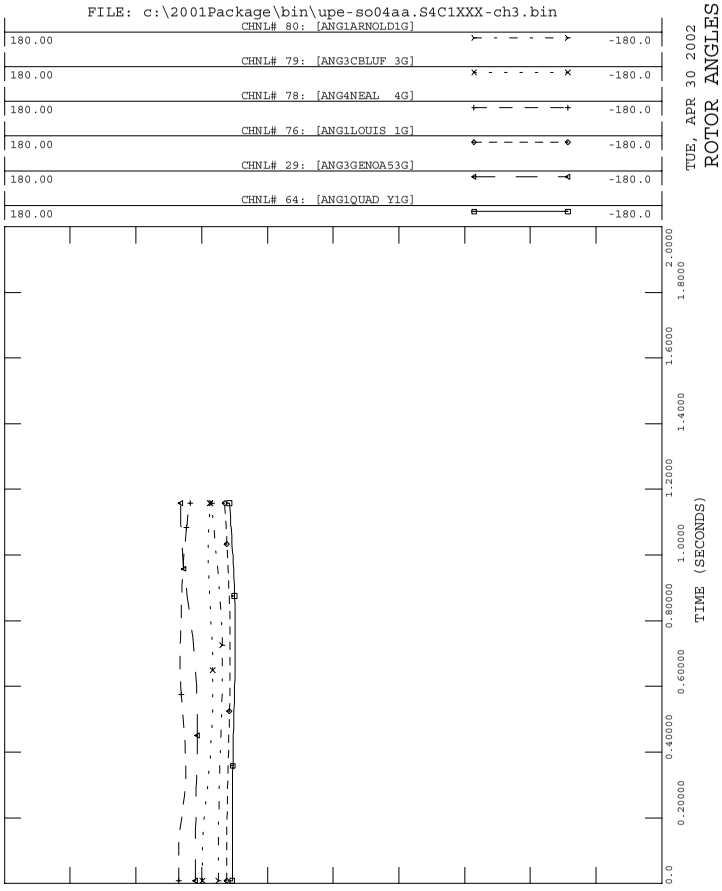
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
ROTOR ANGLES IA



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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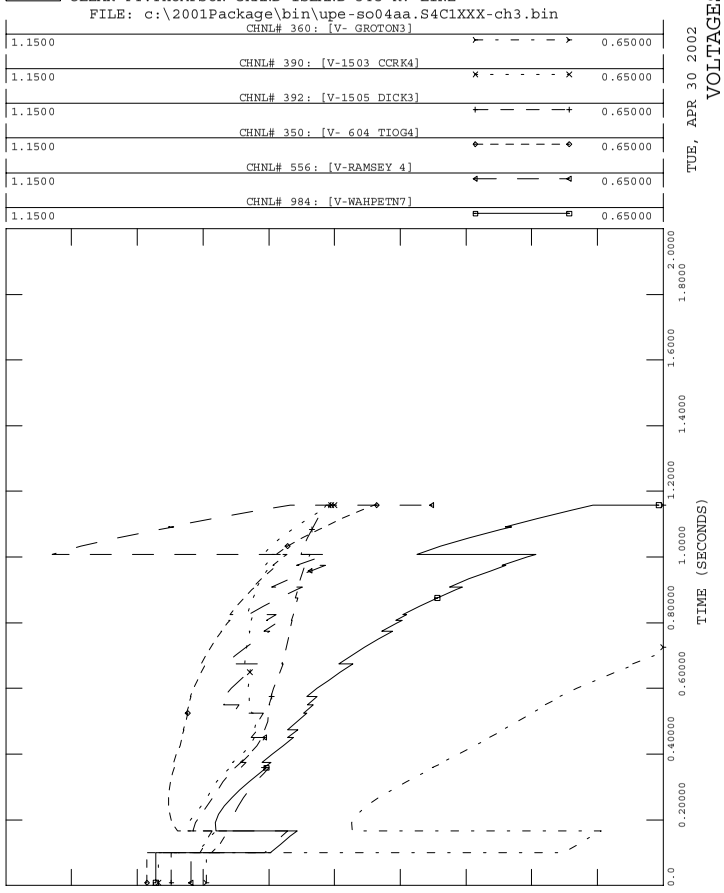
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
VOLTAGES 2



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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TUE, APR 30 2002 9:41
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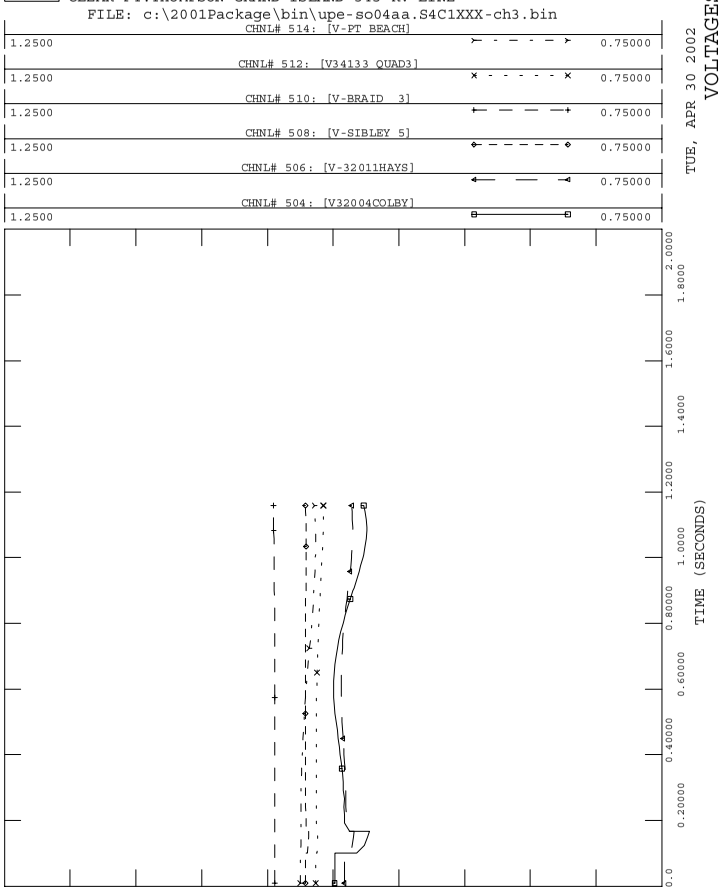

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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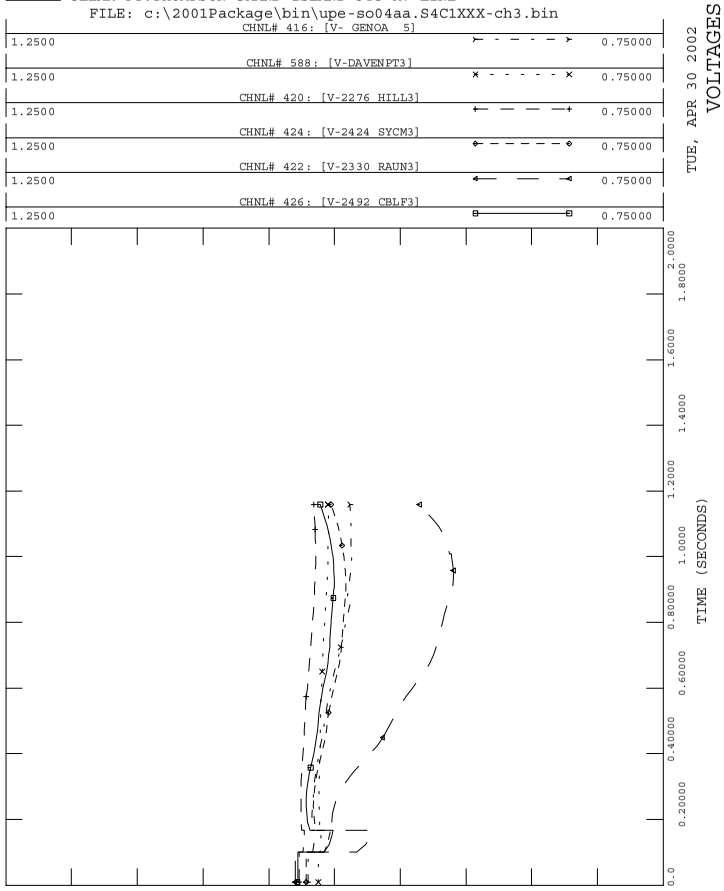
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
VOLTAGES IA



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
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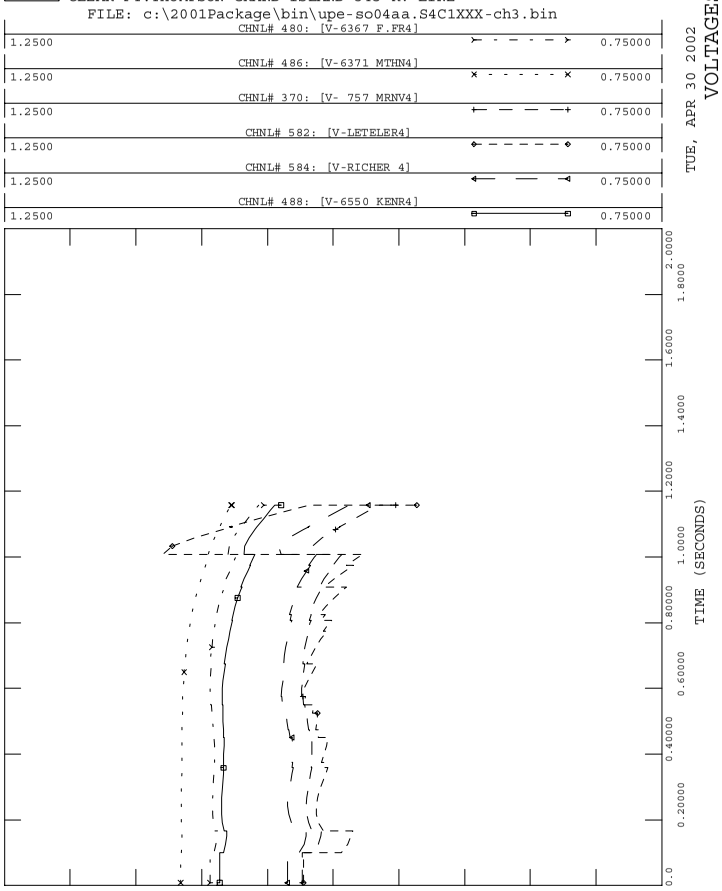

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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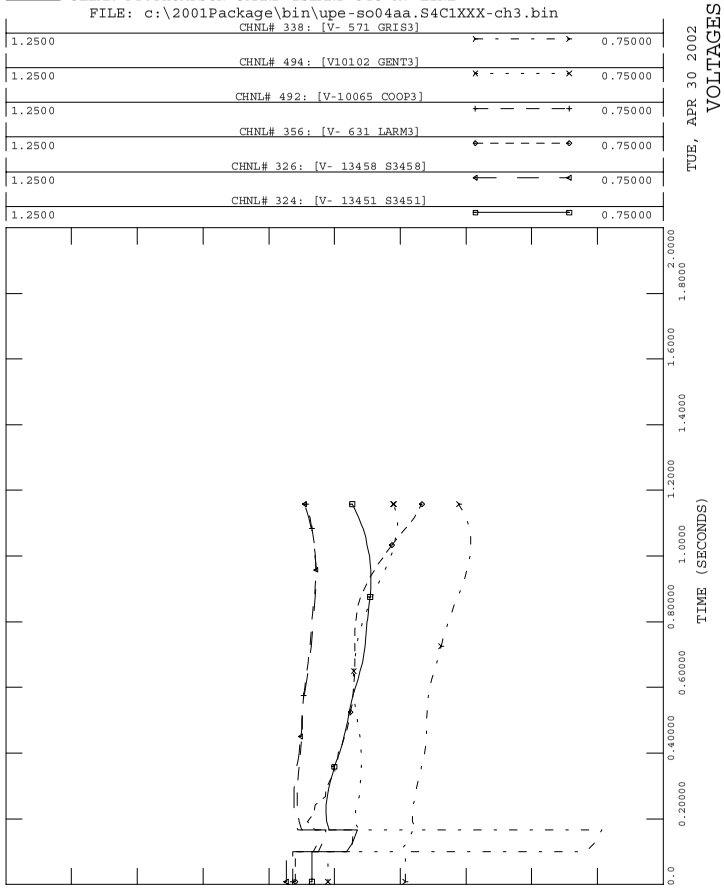
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
VOLTAGES NB



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

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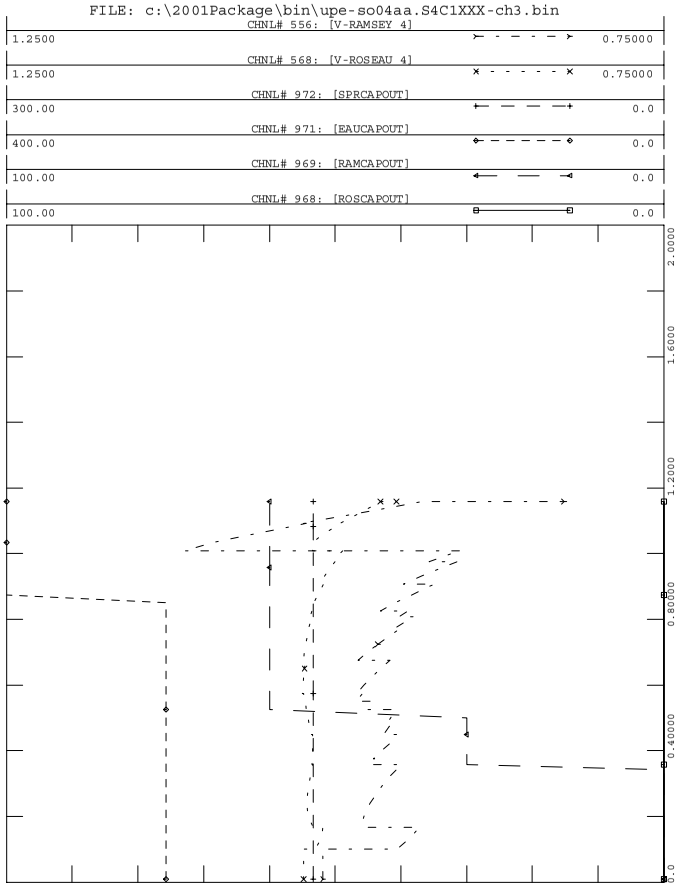
FAST SW CAP OUT 2



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

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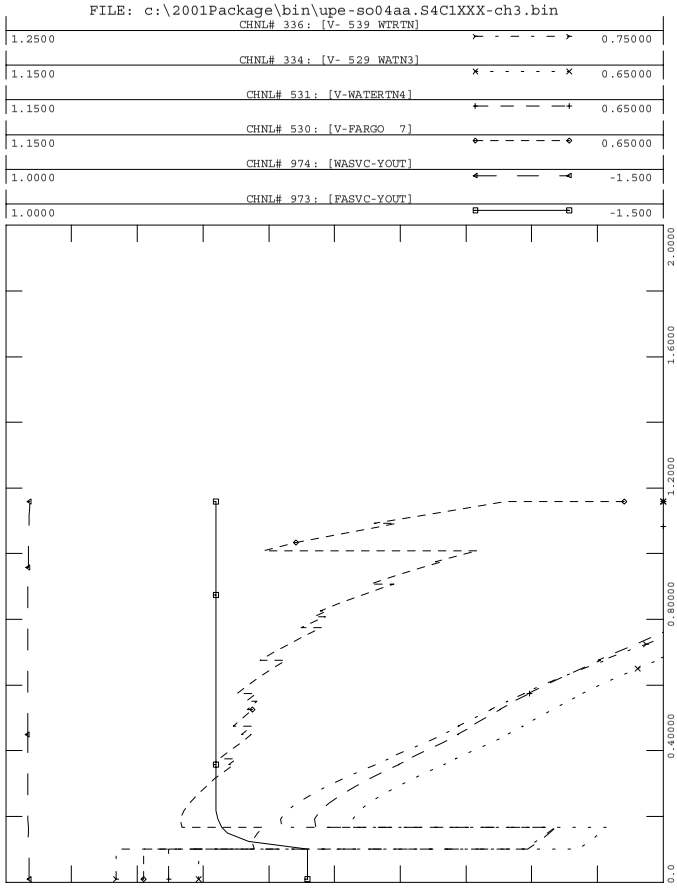
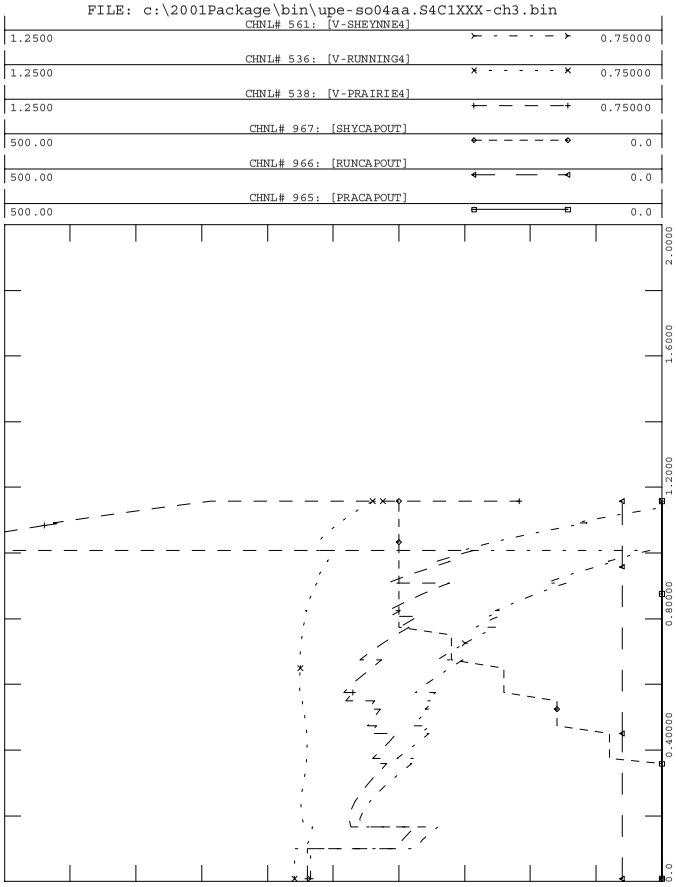
FARGO/WATERTOWN SVS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41

FAST SW CAP OUT 1



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

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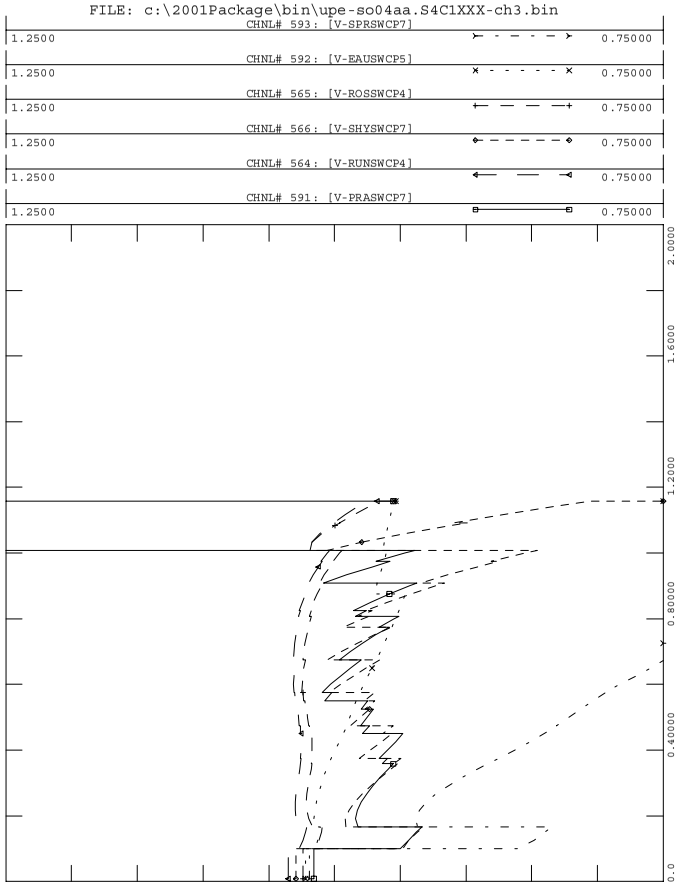
FAST SW CAP VOLTAGES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

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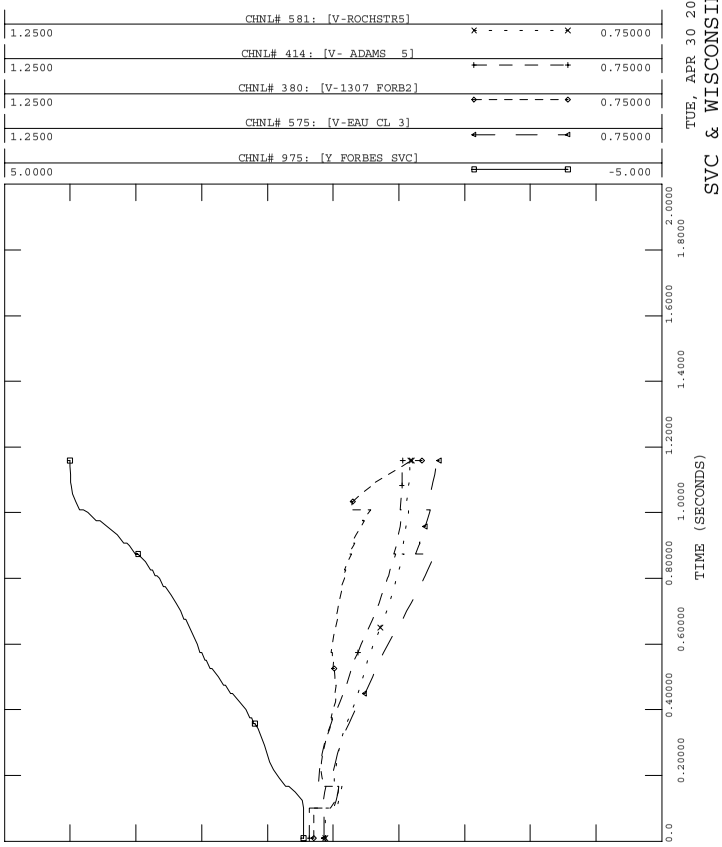
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

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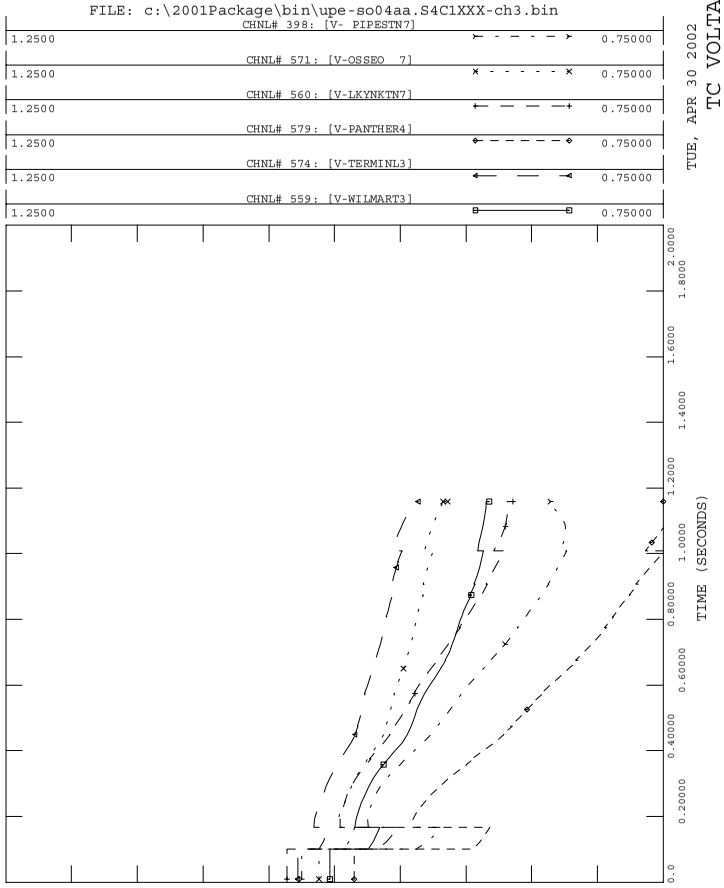
TC VOLTAGES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

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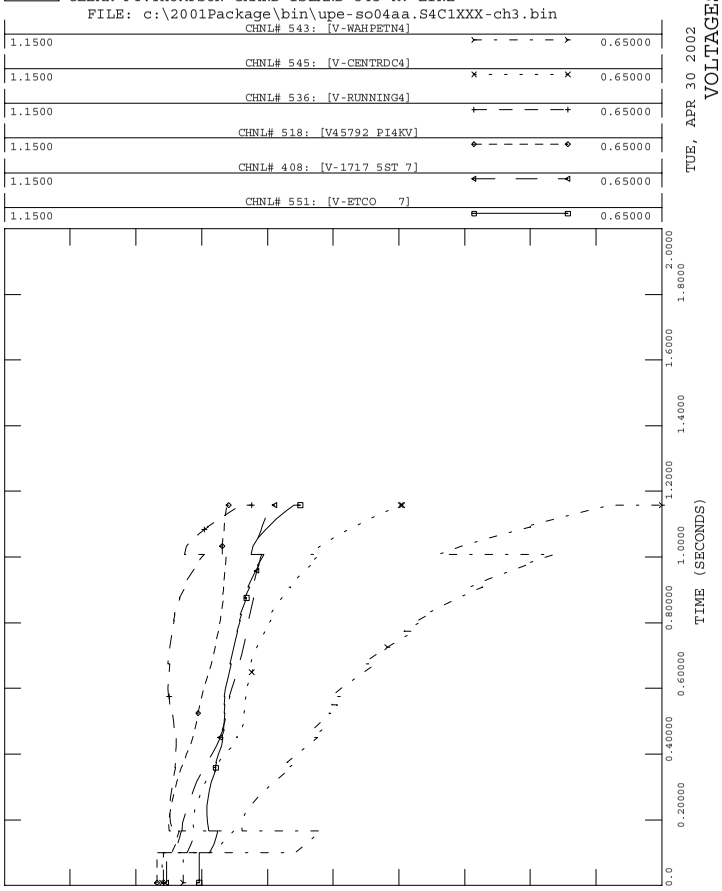
VOLTAGES 6



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

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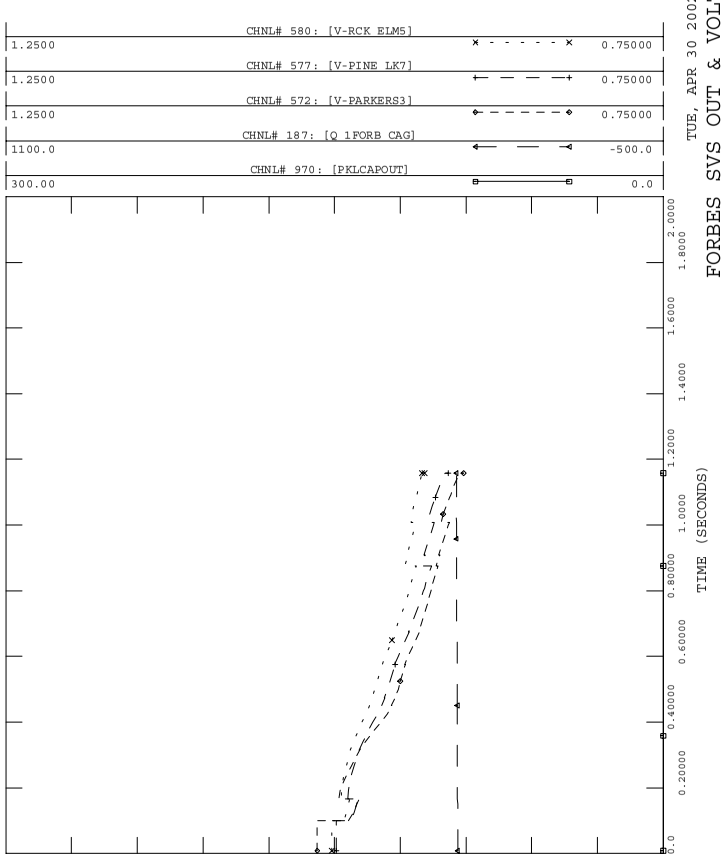
FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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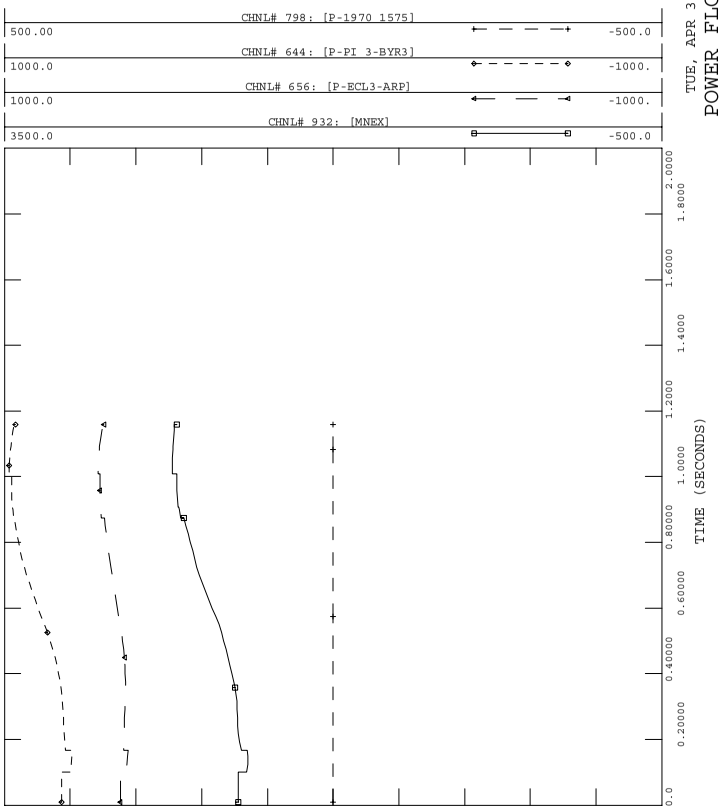
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
POWER FLOW SUMS 2



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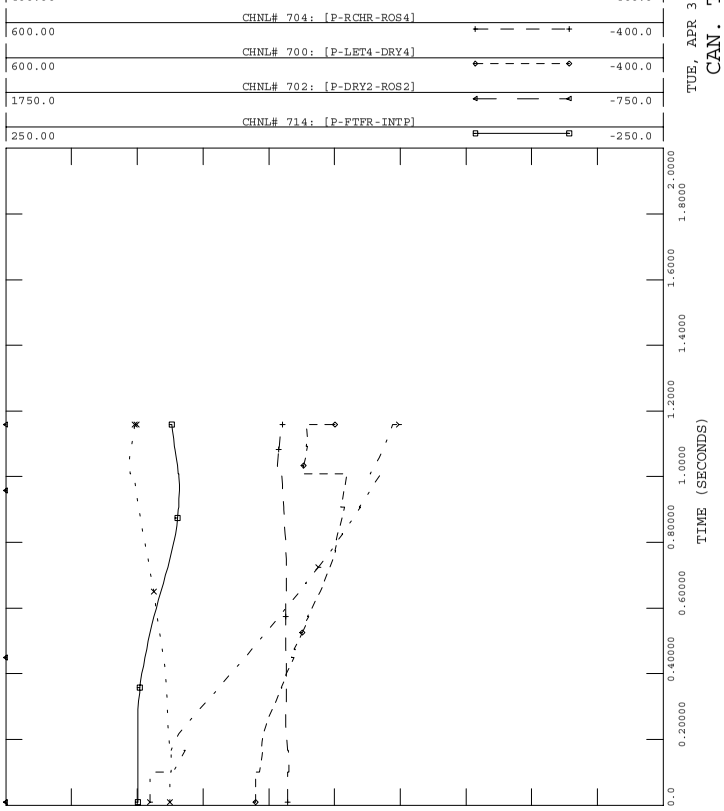
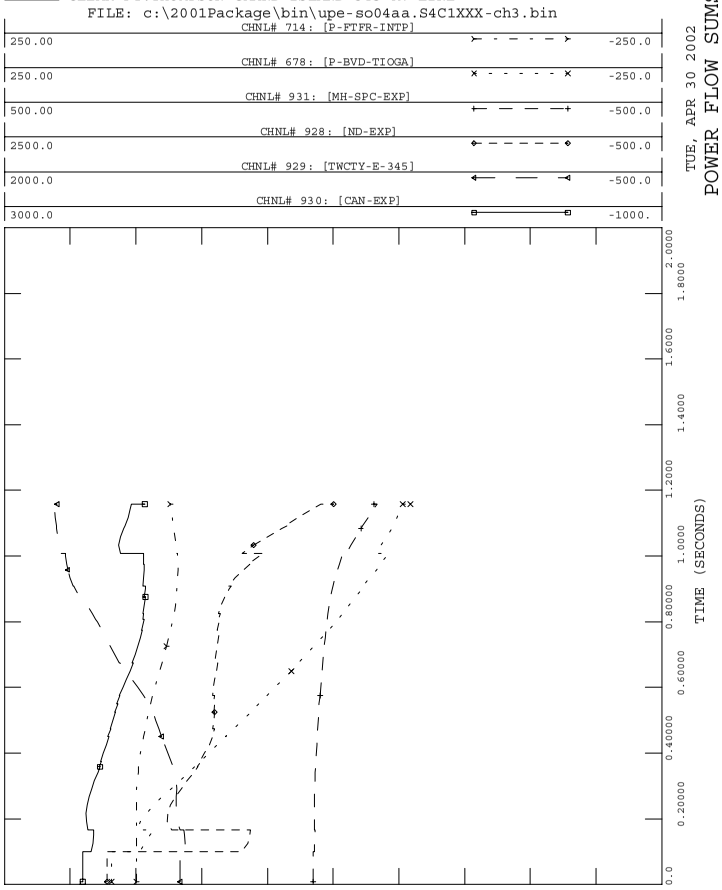
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
CAN. TIE FLOWS



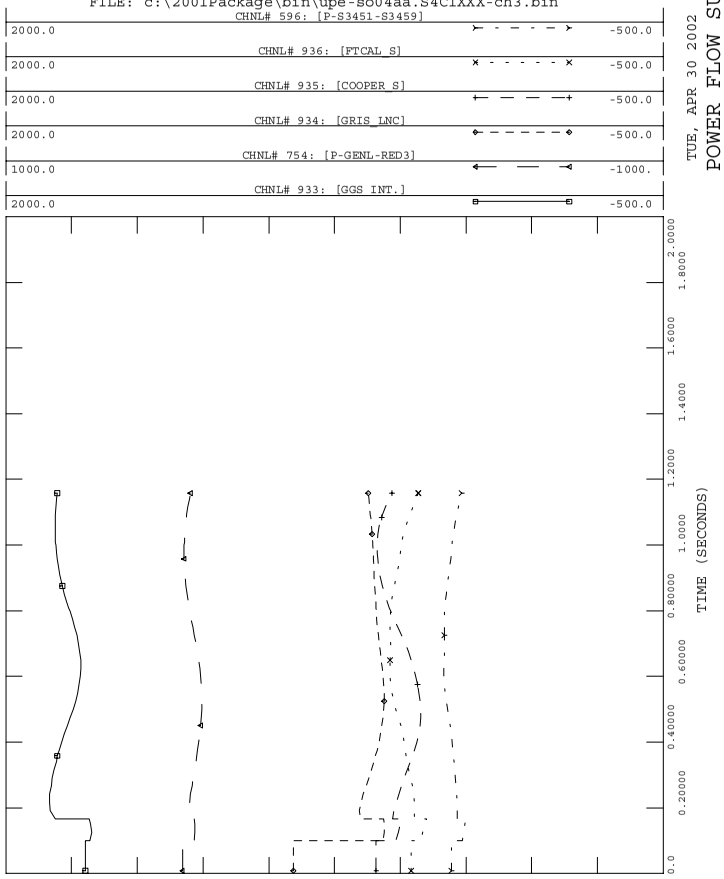
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
POWER FLOW SUMS 1



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
POWER FLOW SUM 3



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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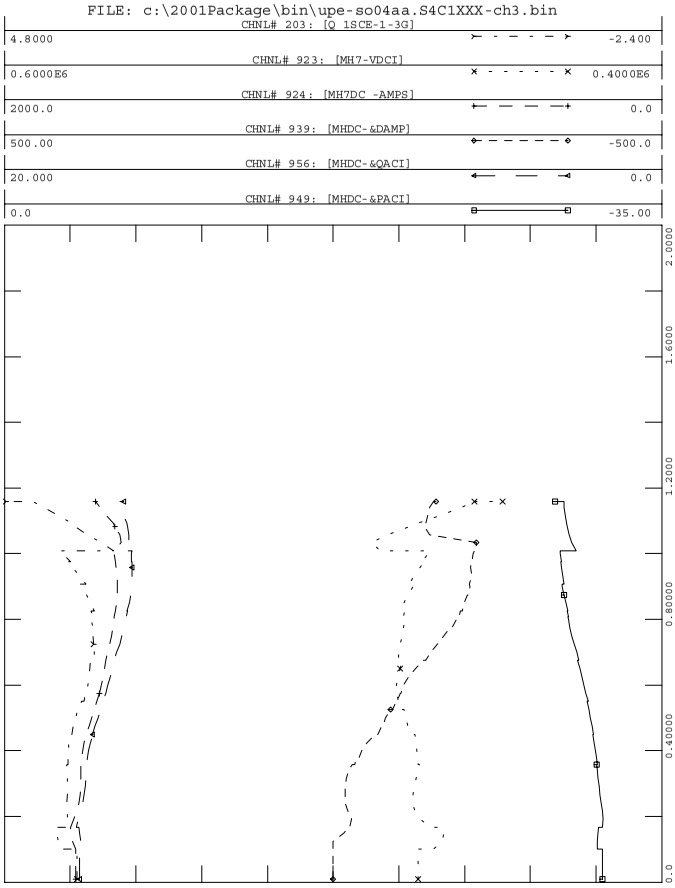
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
MH DC PARAMETERS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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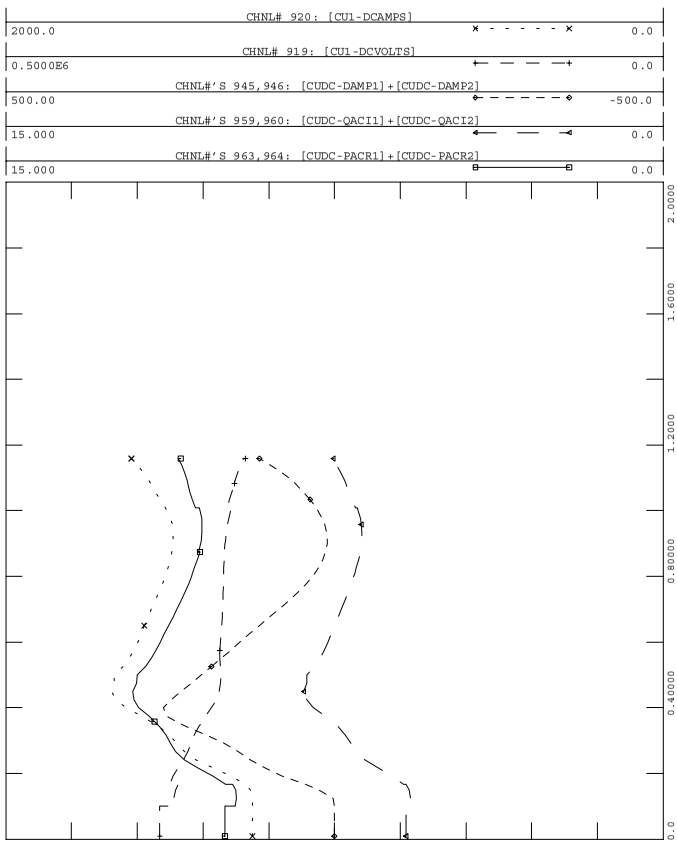
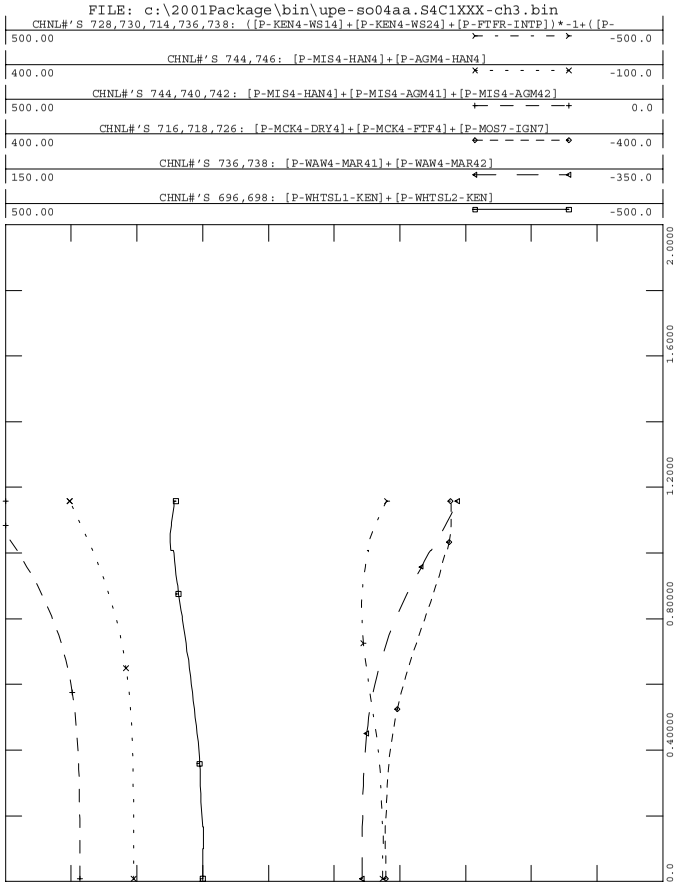
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
CU DC #1



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
OH TIE FLOWS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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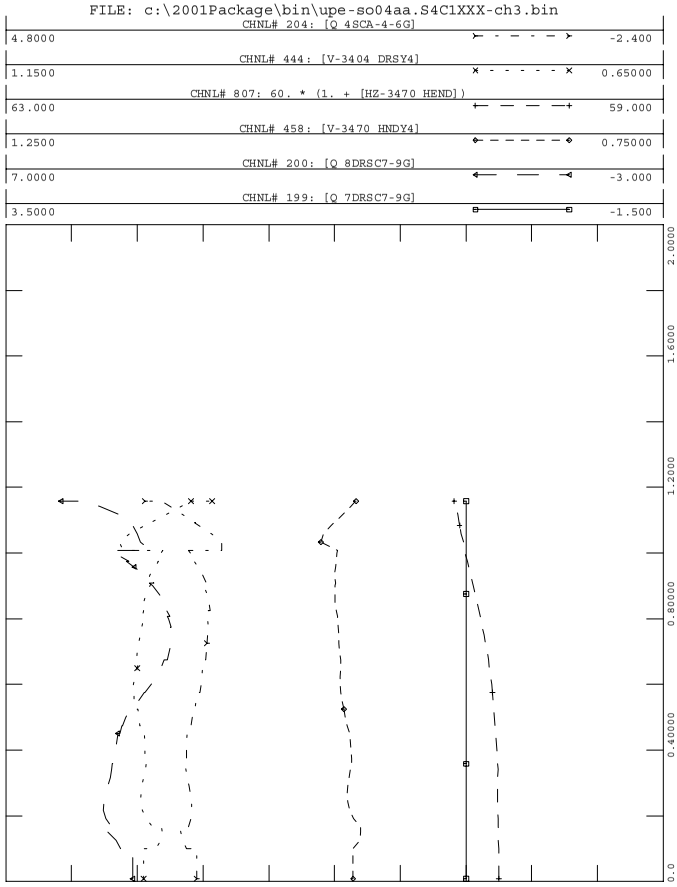
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41
MH DC PARAMETERS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

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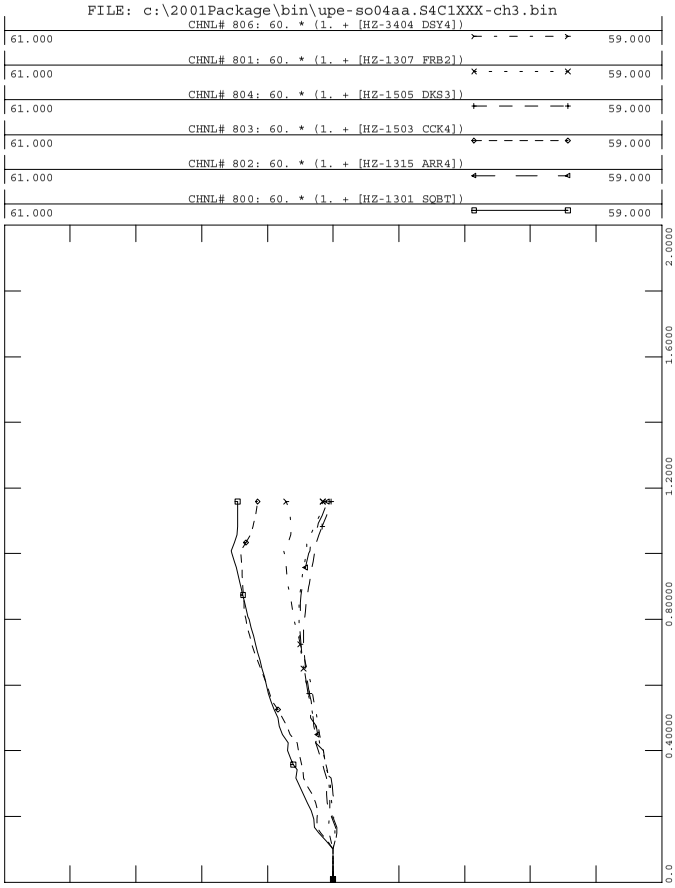
FREQ AT DC TERMINALS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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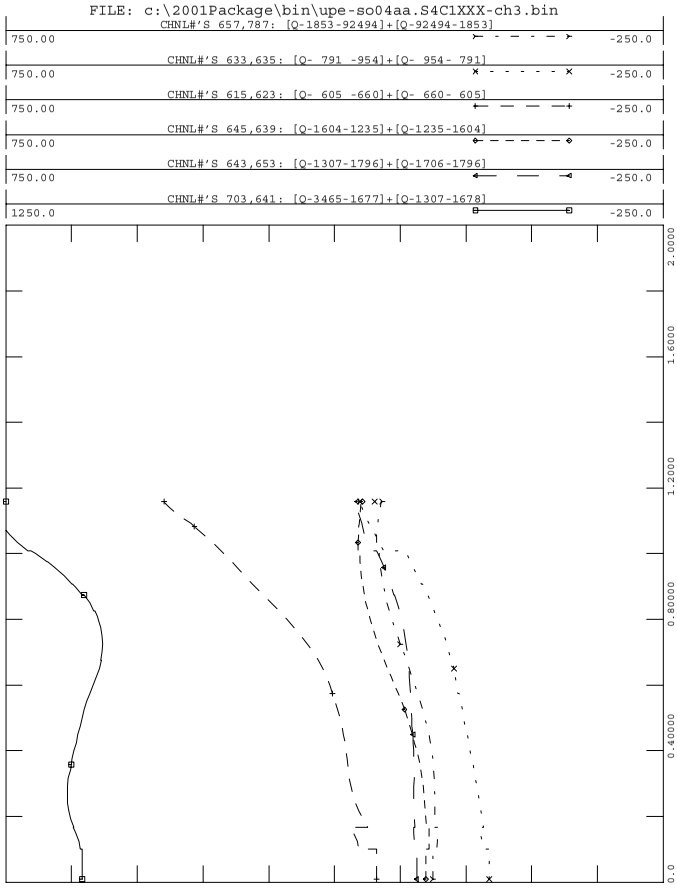
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41

VAR LOSSES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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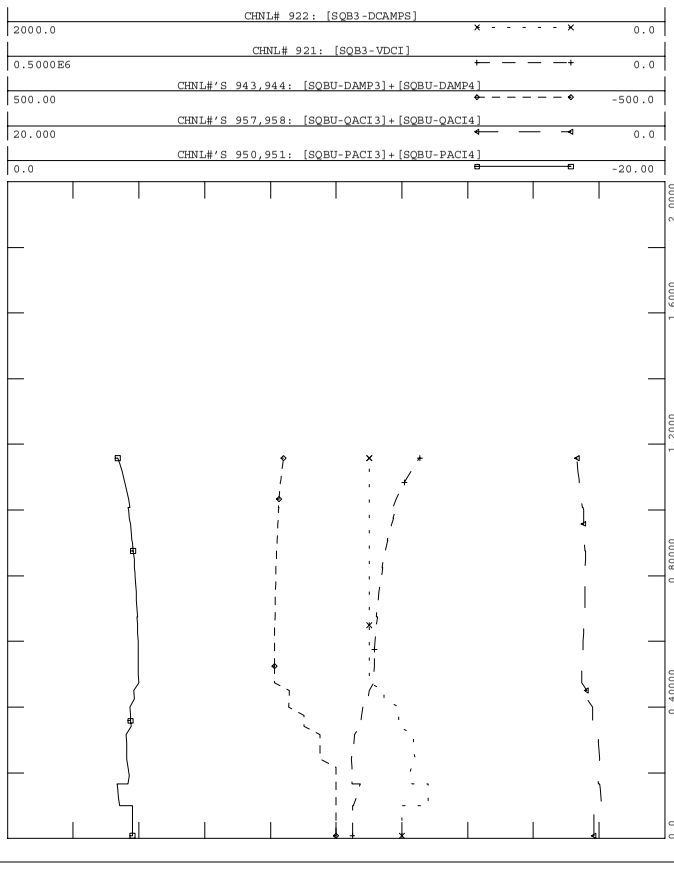
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41

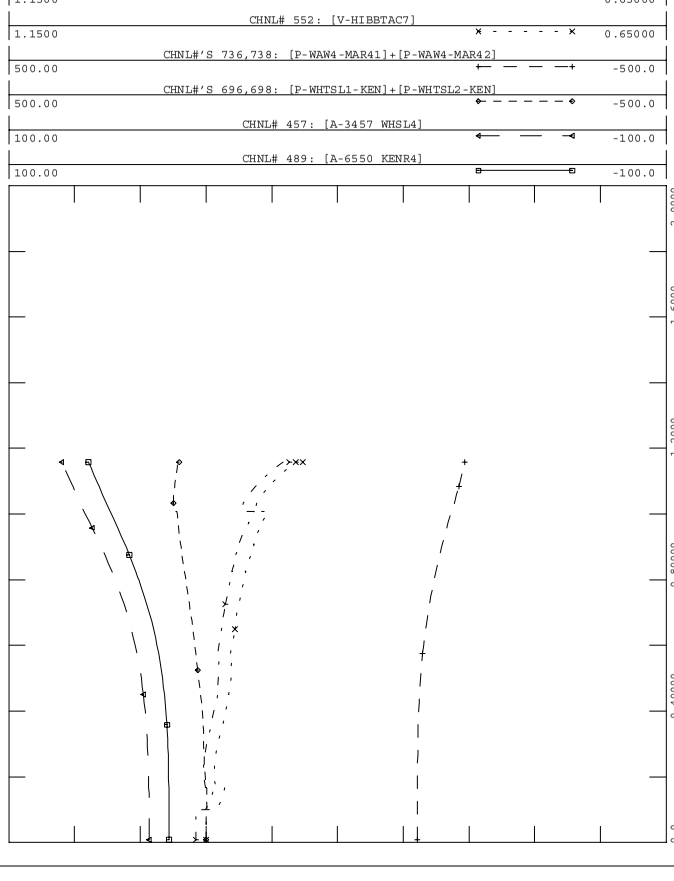
SQB DC #3



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

TUE, APR 30 2002 9:41

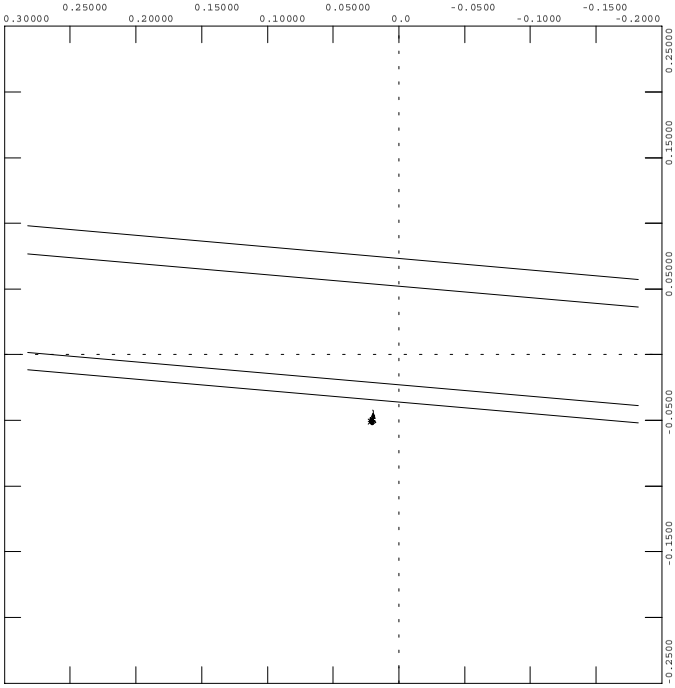
VOLTAGES, ANGLES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

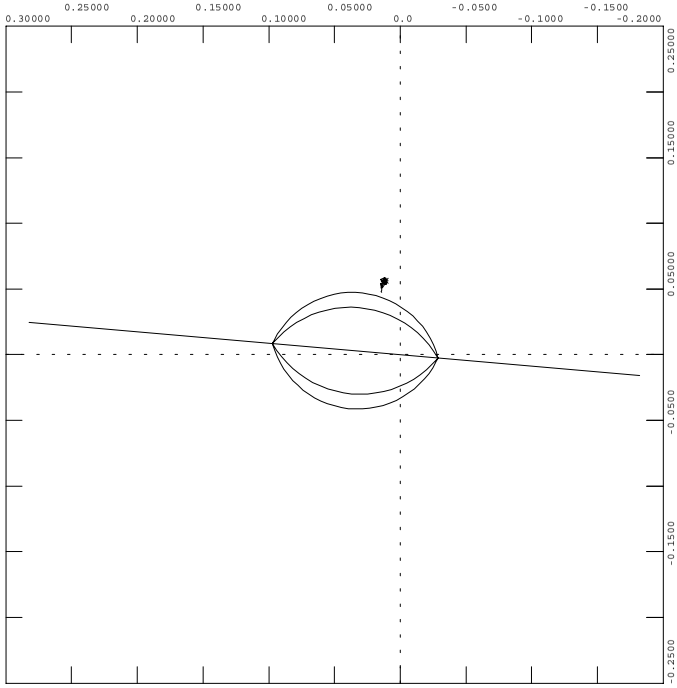


TUE, APR 30 2002 9:41
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

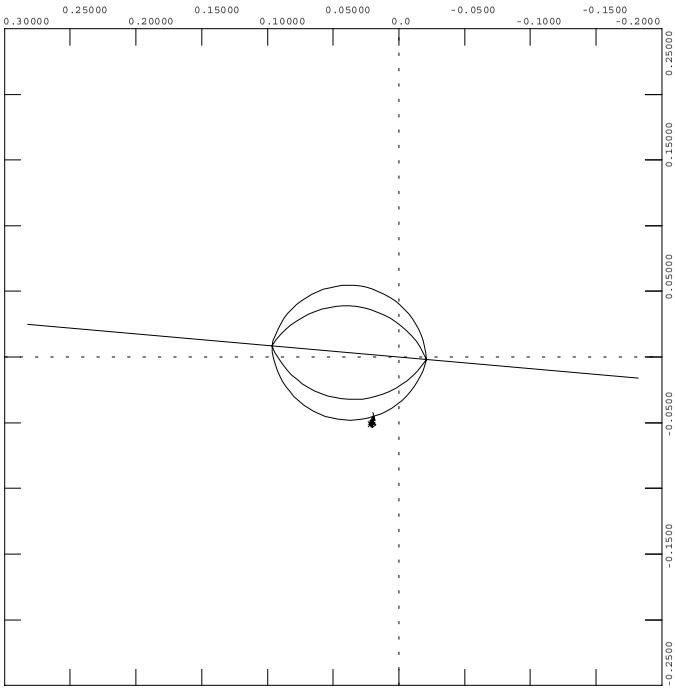


TUE, APR 30 2002 9:41
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

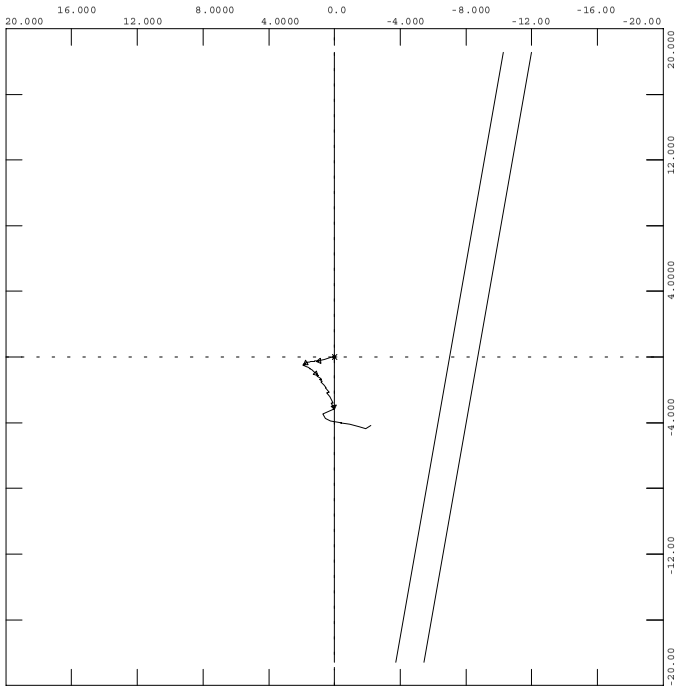


TUE, APR 30 2002 9:41
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

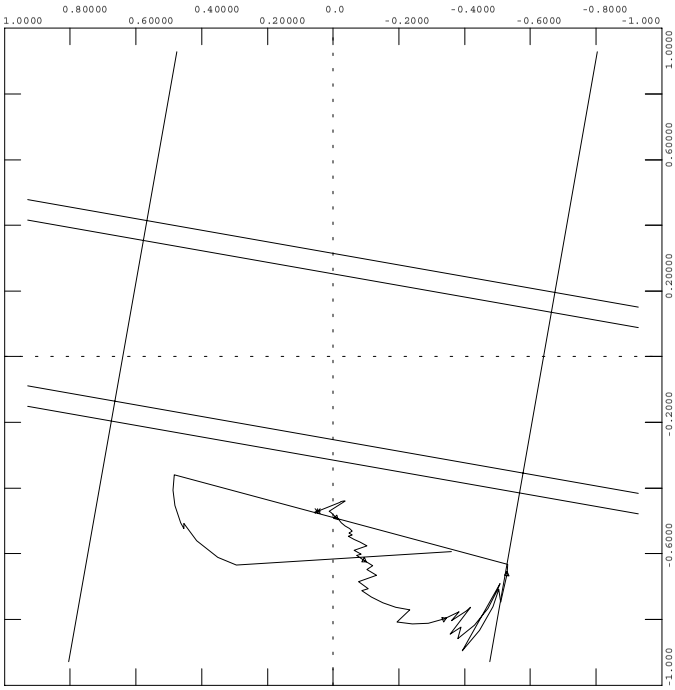


TUE, APR 30 2002 9:41
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

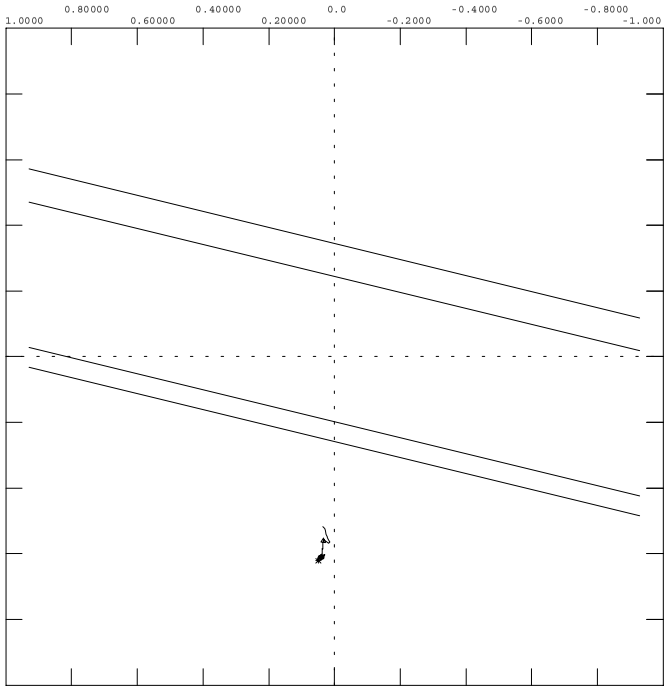
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

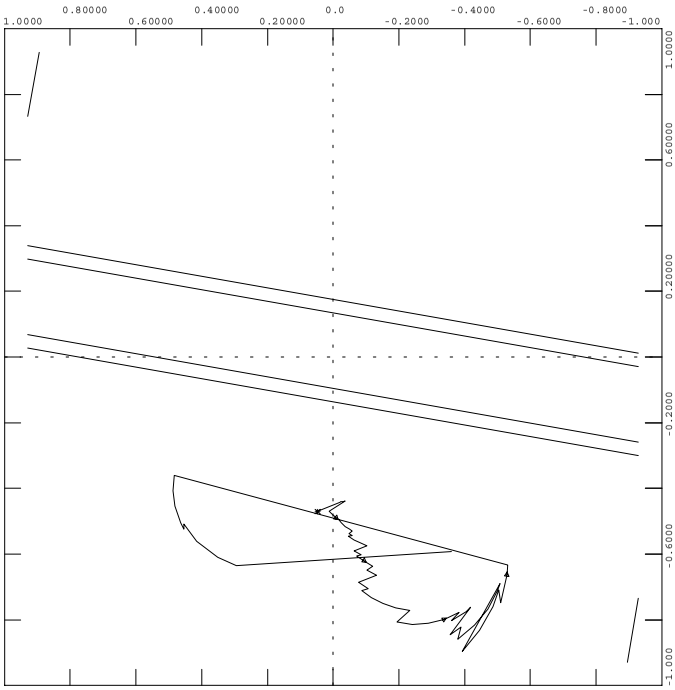
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

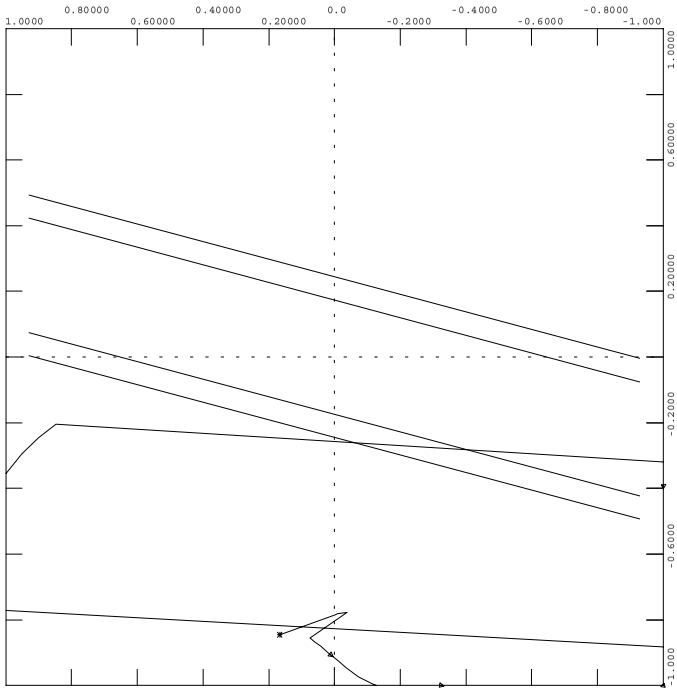
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

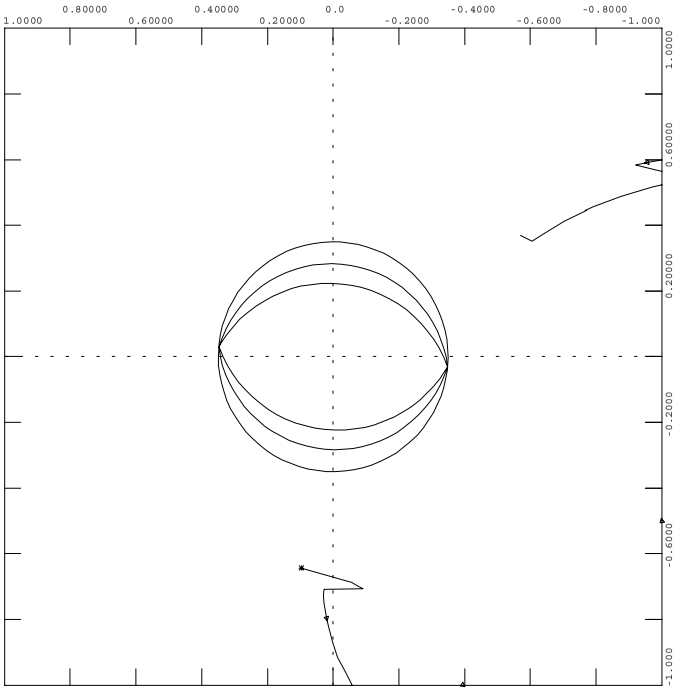
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

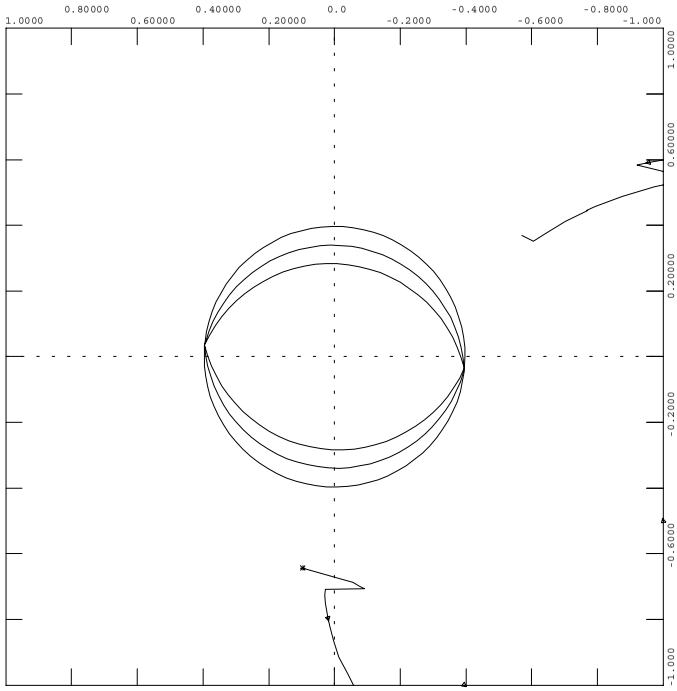


TUE, APR 30 2002 9:41
TIOGA-B.DAM-SOUTH (266)

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

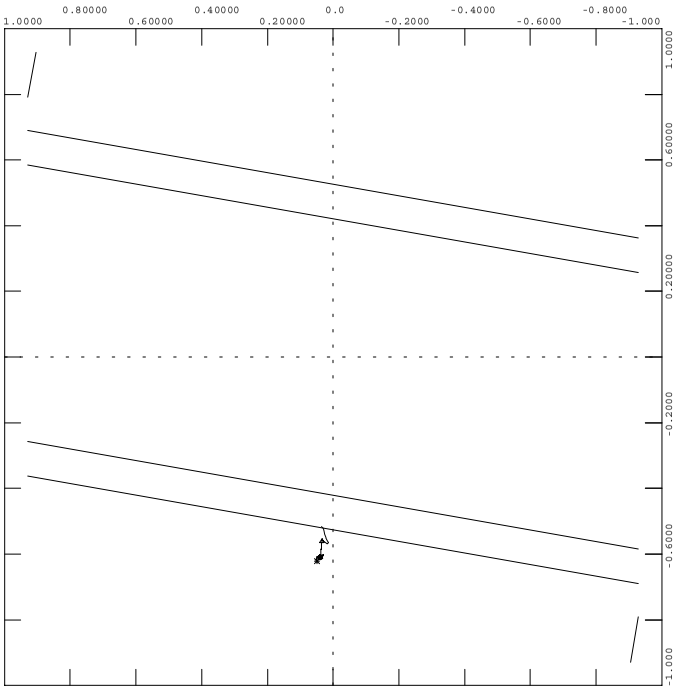


TUE, APR 30 2002 9:41
TIOGA-B.DAM-EMRG (267)

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

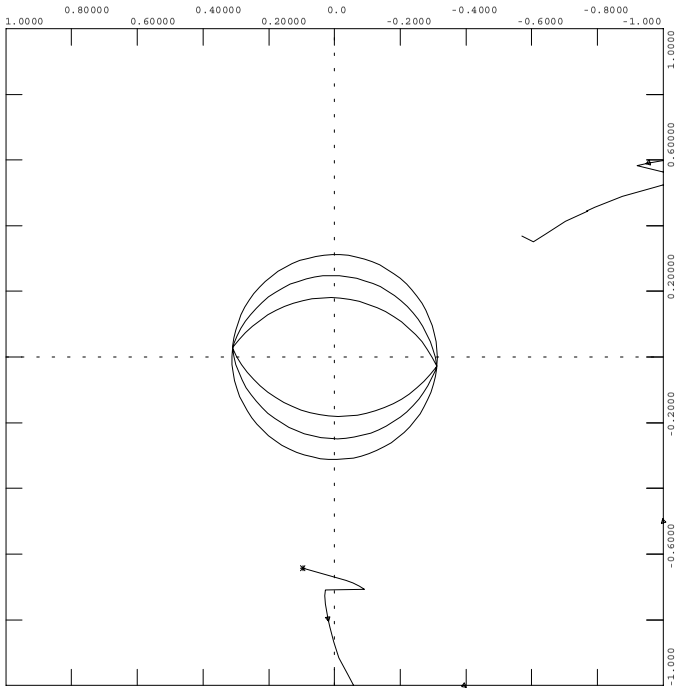


TUE, APR 30 2002 9:41
R50M-MORANVILLE-EMRG (777

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

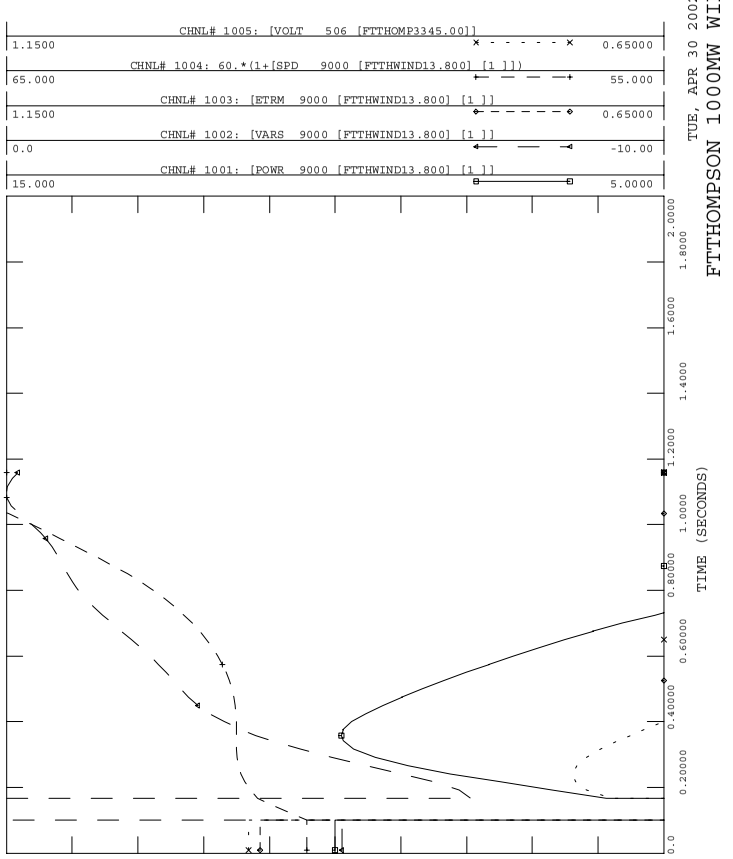
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



TUE, APR 30 2002 9:41
TIOGA-B.DAM-NORTH (268)

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

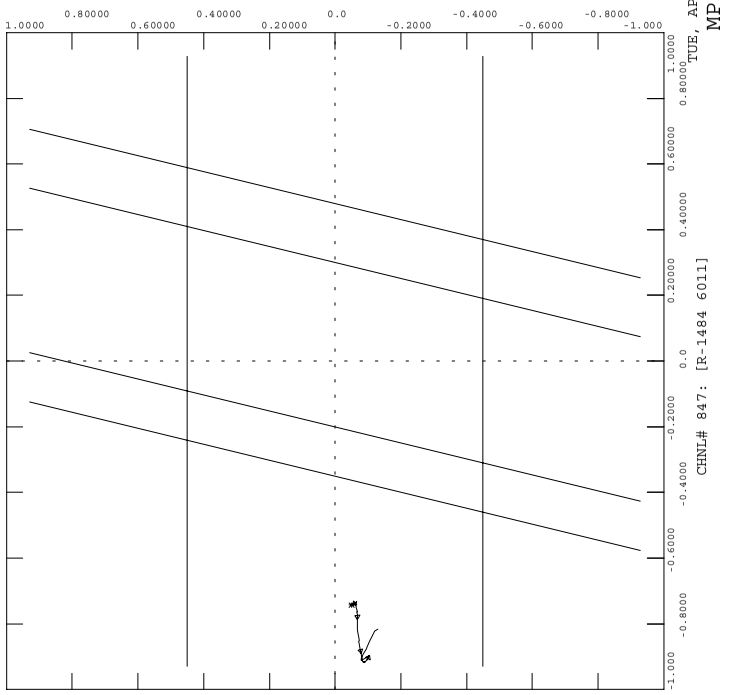


TUE, APR 30 2002 9:41
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



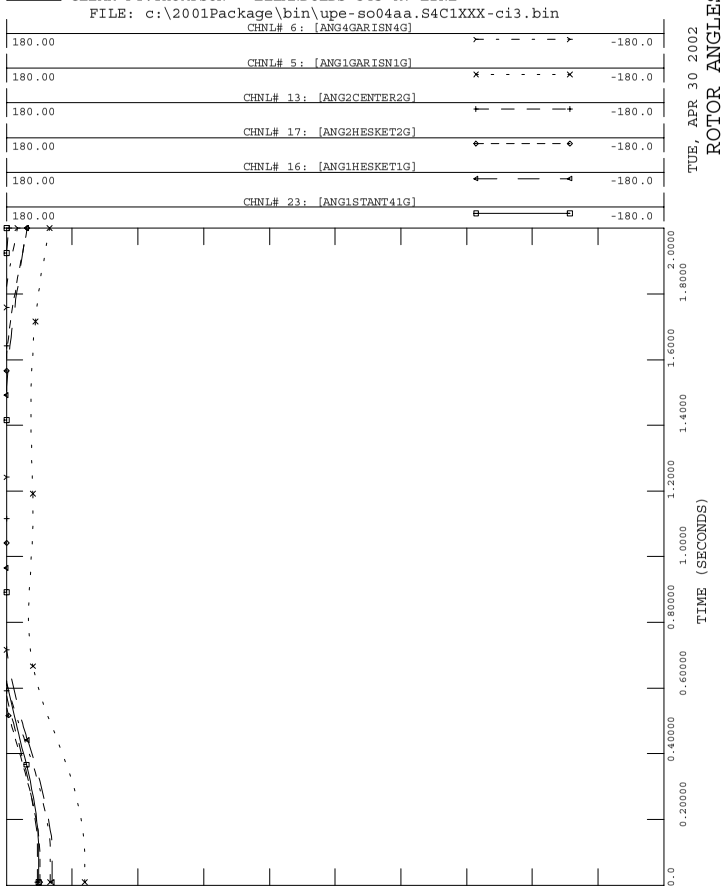
TUE, APR 30 2002 9:41
MP-OH I.FALLS (779)

CONTINGENCY CI3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Leland Olds 345 kV line

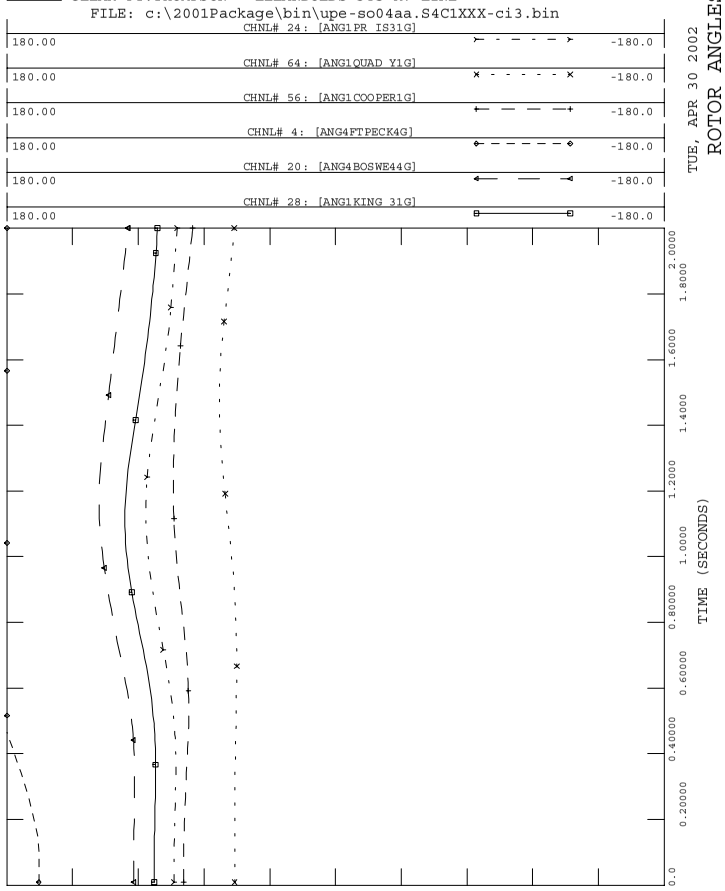
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
ROTOR ANGLES 2



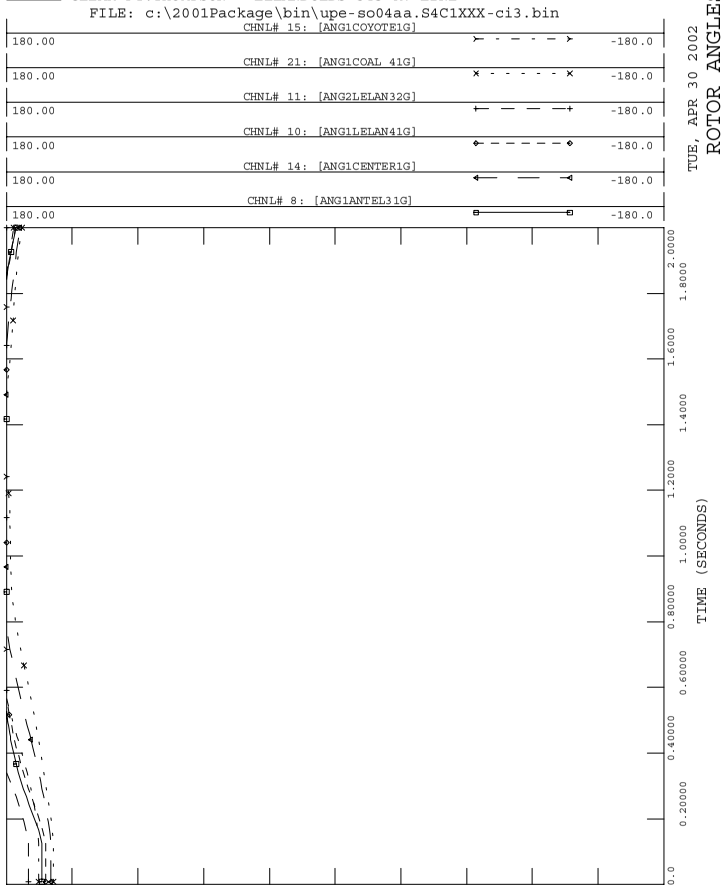
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
ROTOR ANGLES 4



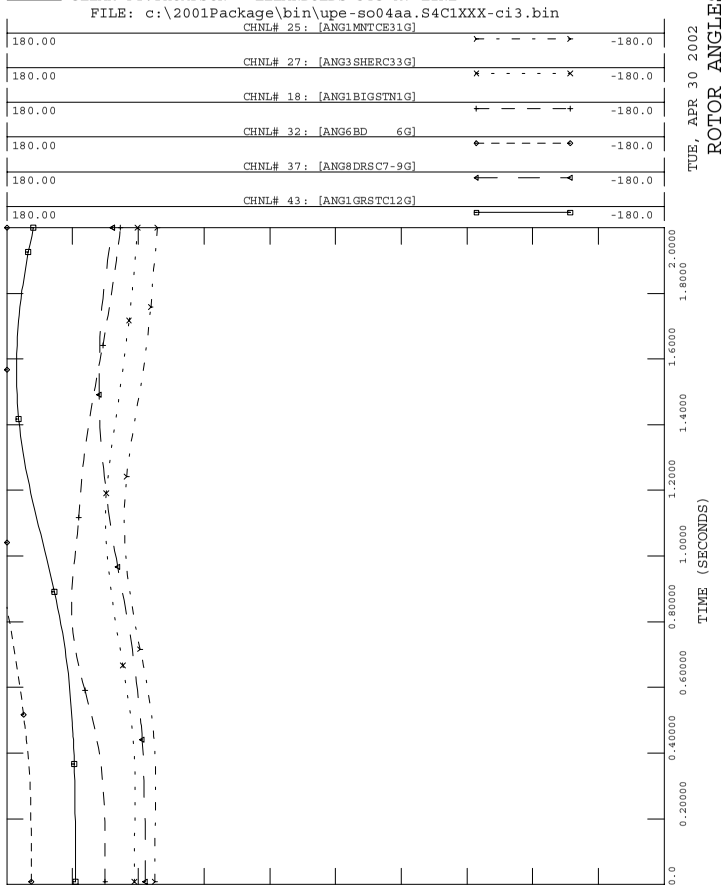
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
ROTOR ANGLES 1



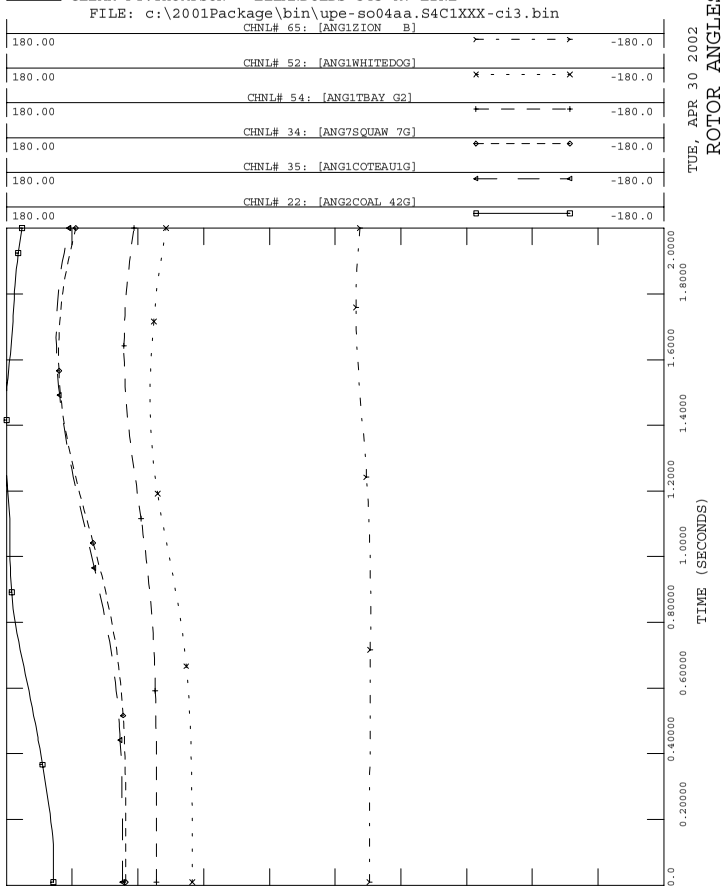
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
ROTOR ANGLES 3



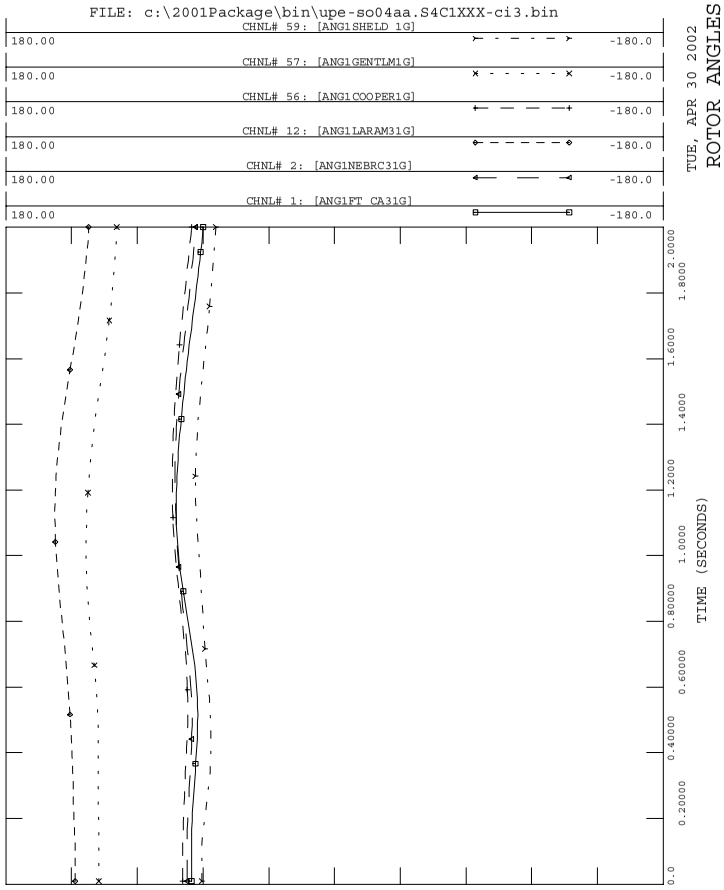
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
ROTOR ANGLES 6



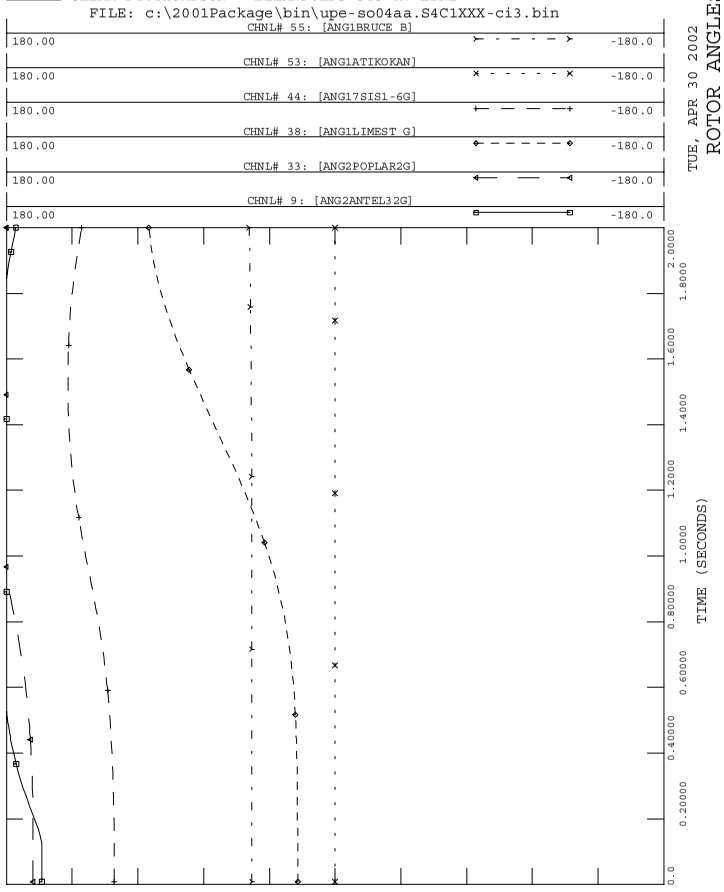
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
ROTOR ANGLES NB



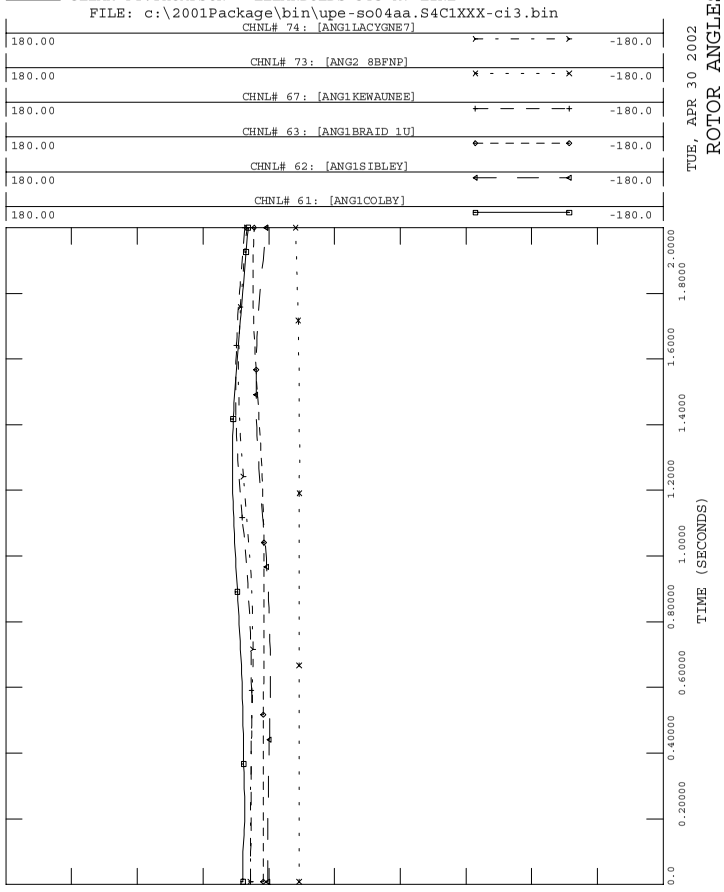
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
ROTOR ANGLES 5



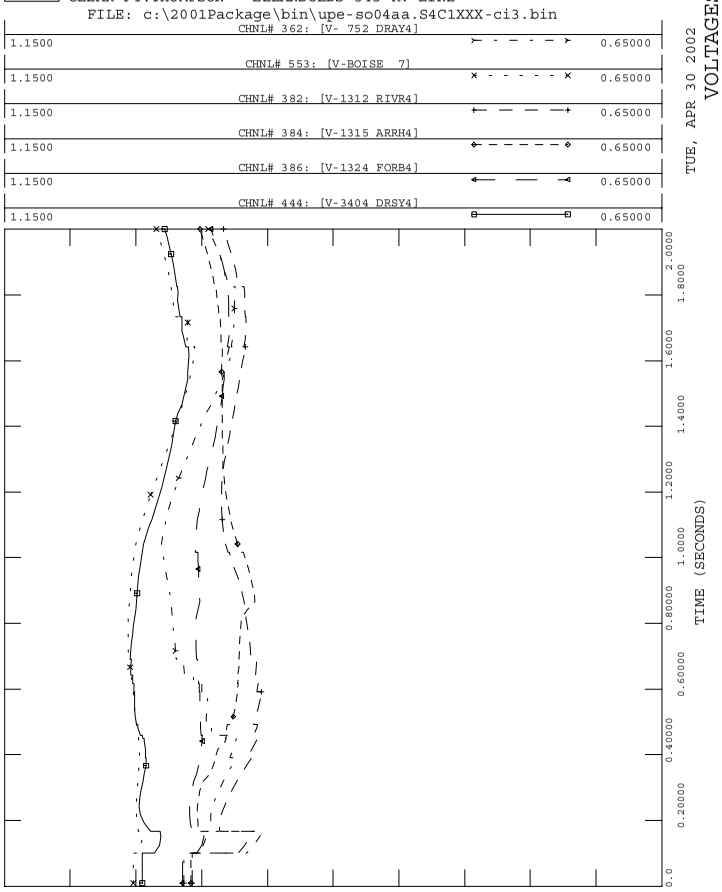
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
ROTOR ANGLES 7



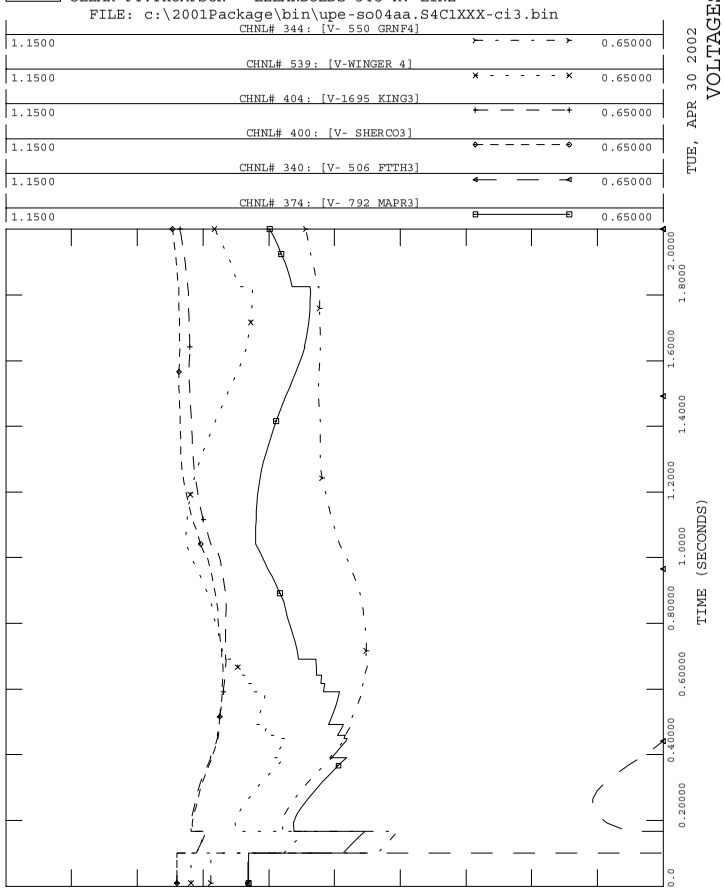
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
VOLTAGES 1



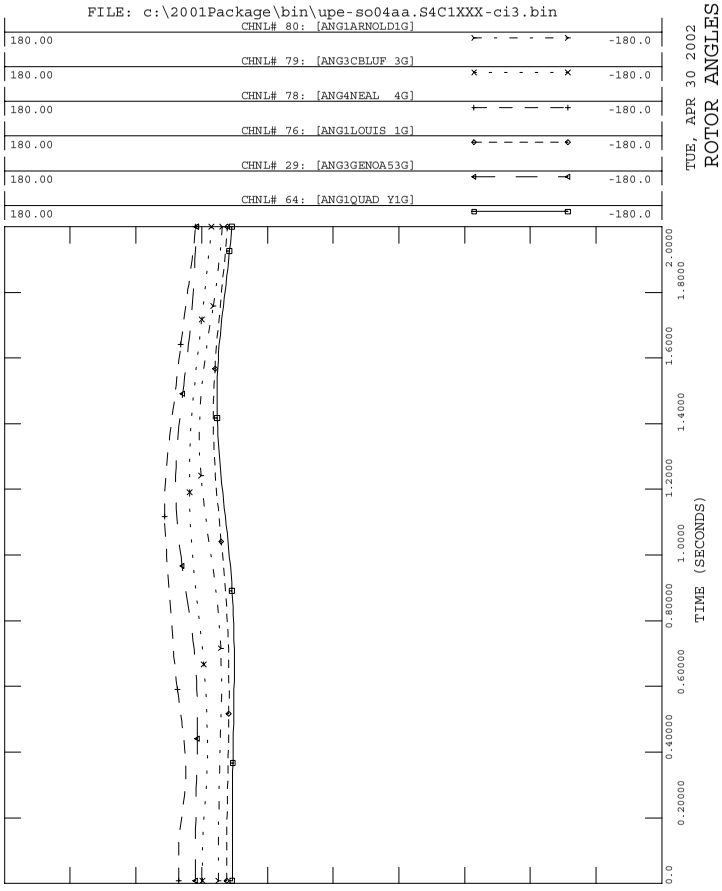
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
VOLTAGES 3



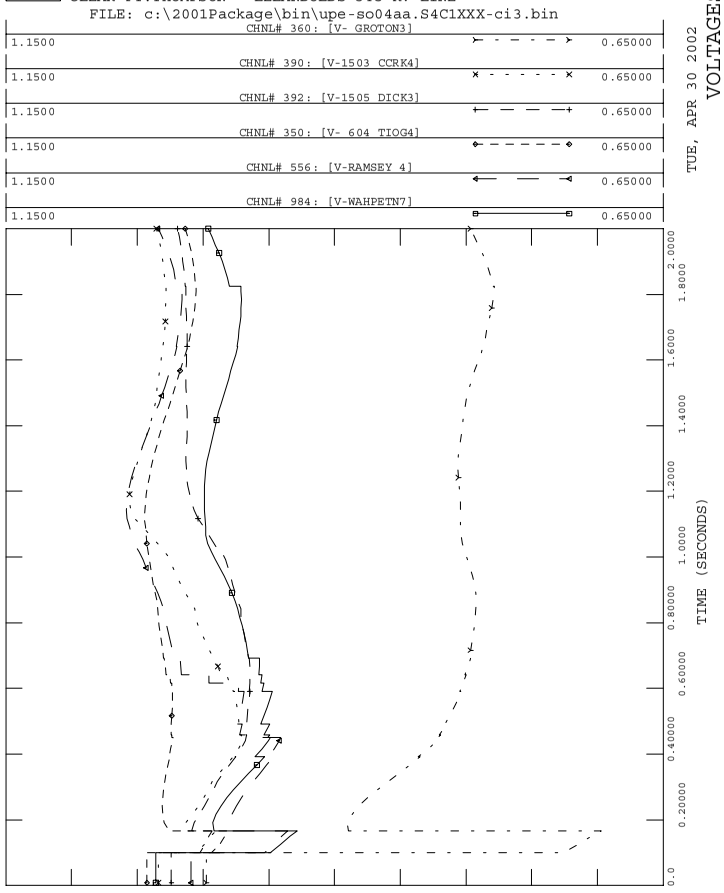
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
ROTOR ANGLES IA



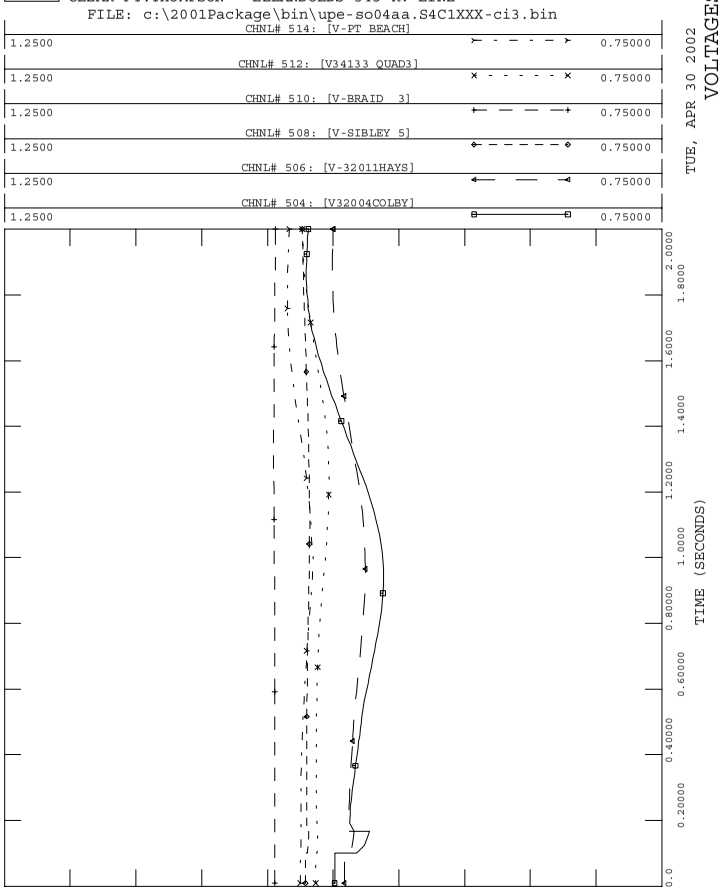
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
VOLTAGES 2



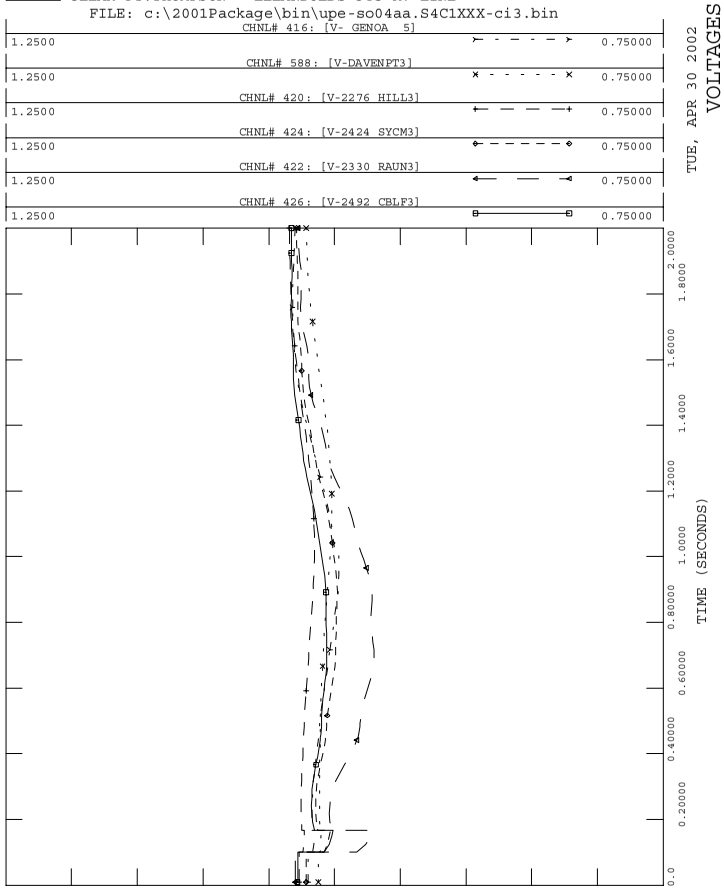
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44 VOLTAGES 5



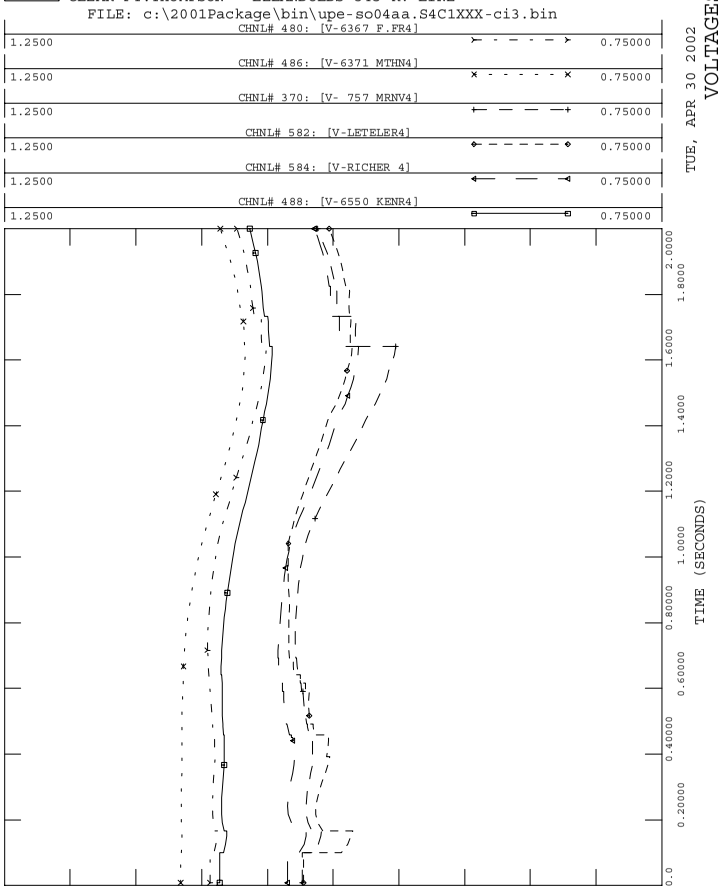
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44 VOLTAGES IA



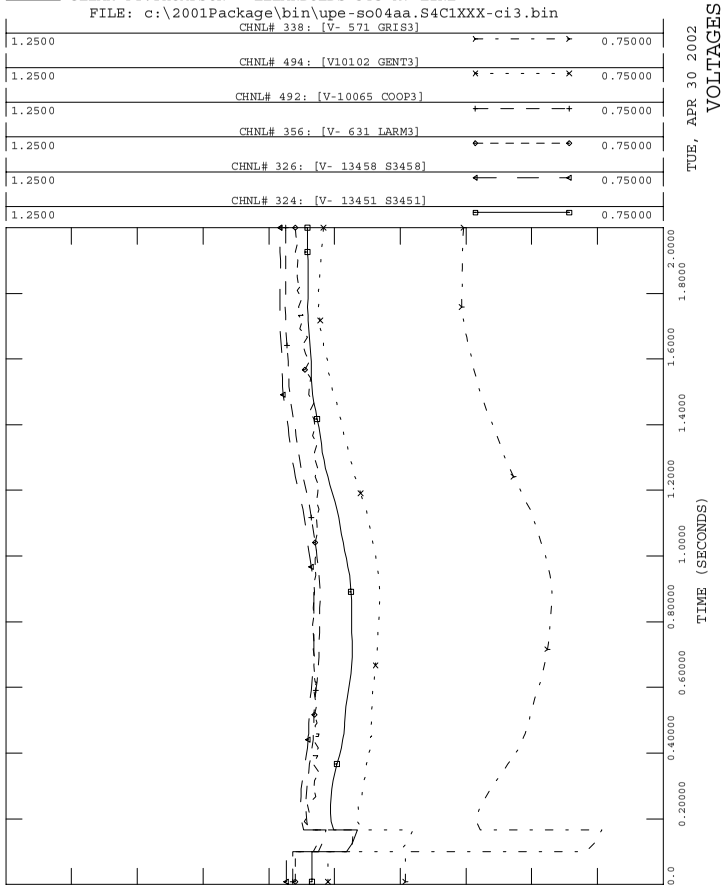
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44 VOLTAGES 4



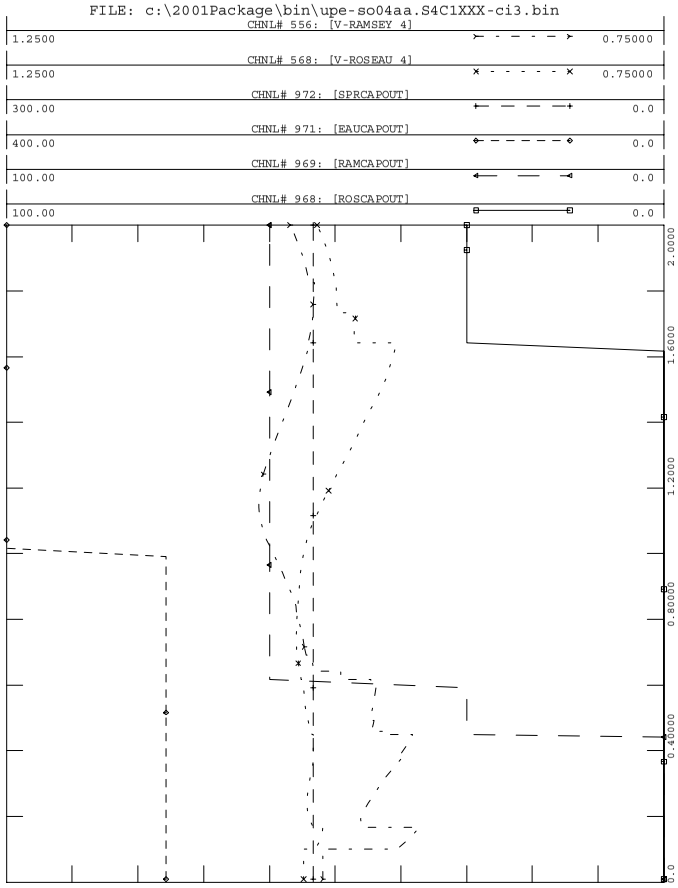
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44 VOLTAGES NB



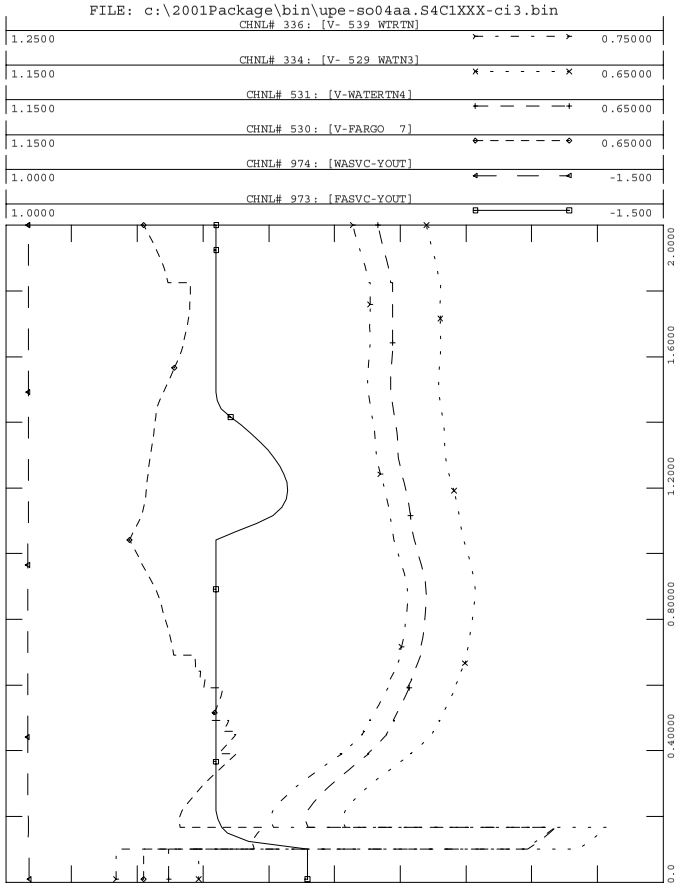
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
FAST SW CAP OUT 2



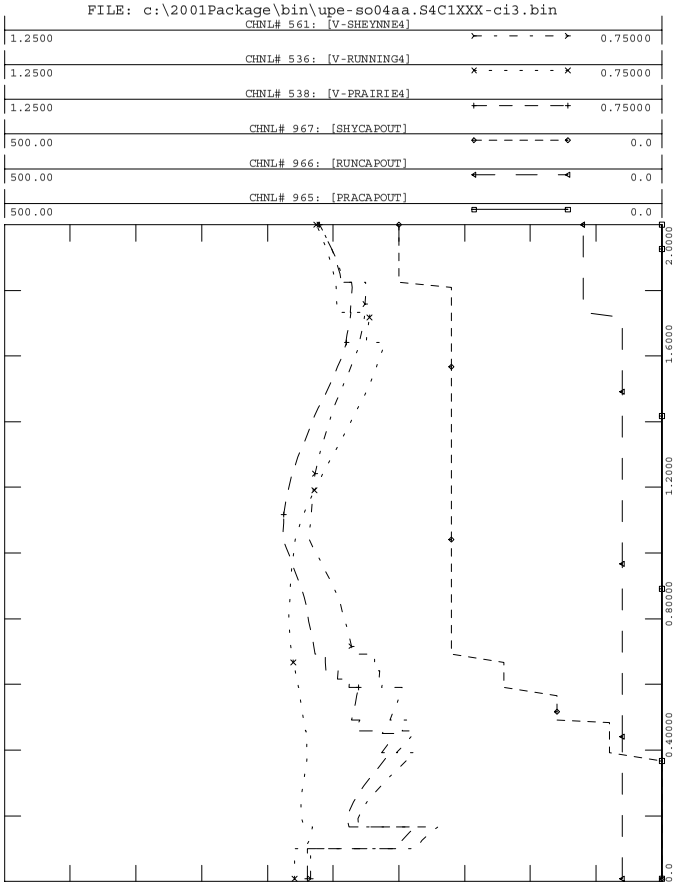
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
FARGO/WATERTOWN SVS



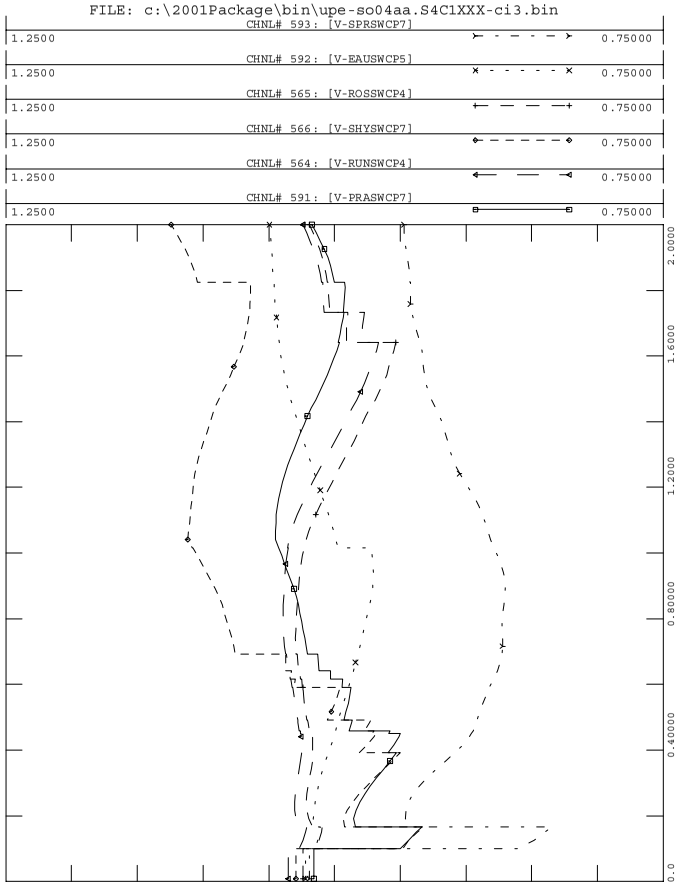
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
FAST SW CAP OUT 1



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

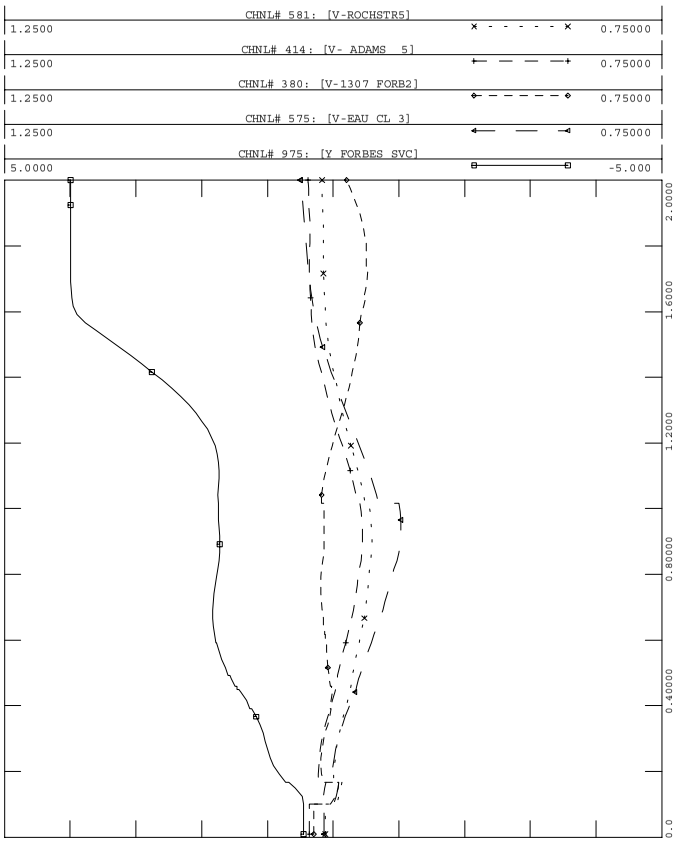
TUE, APR 30 2002 9:44
FAST SW CAP VOLTAGES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44

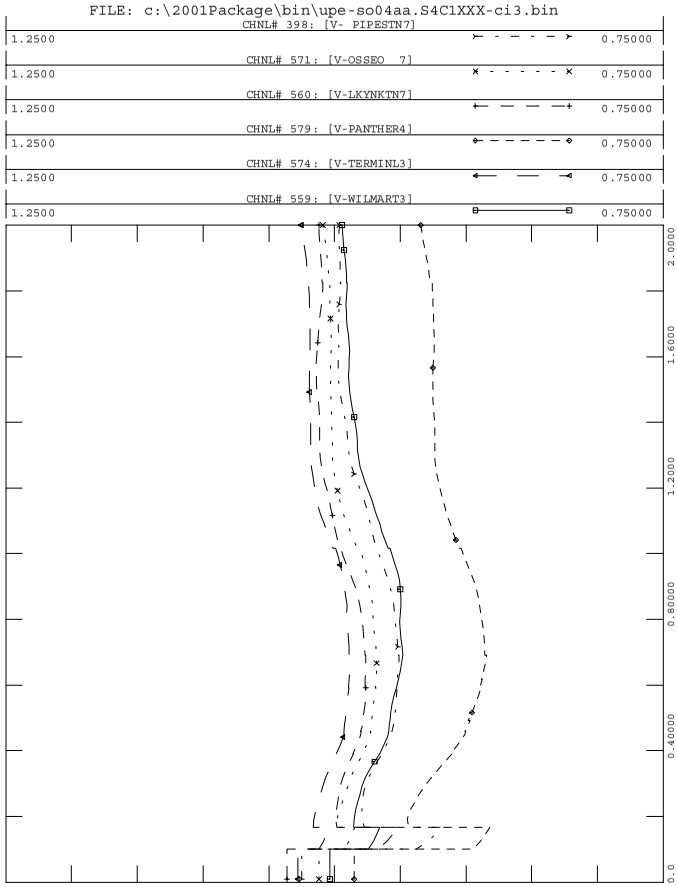
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44

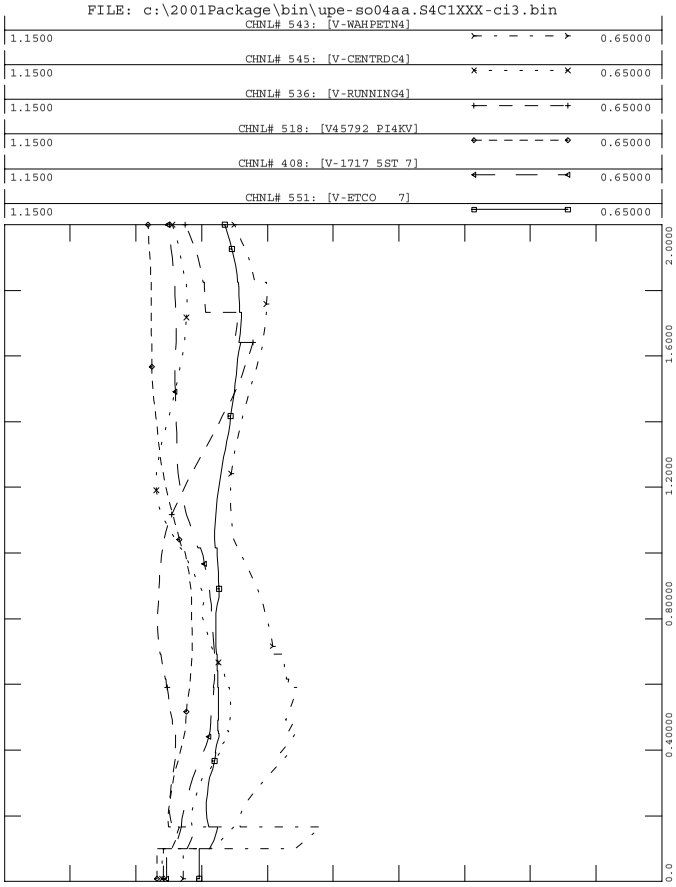
TC VOLTAGES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44

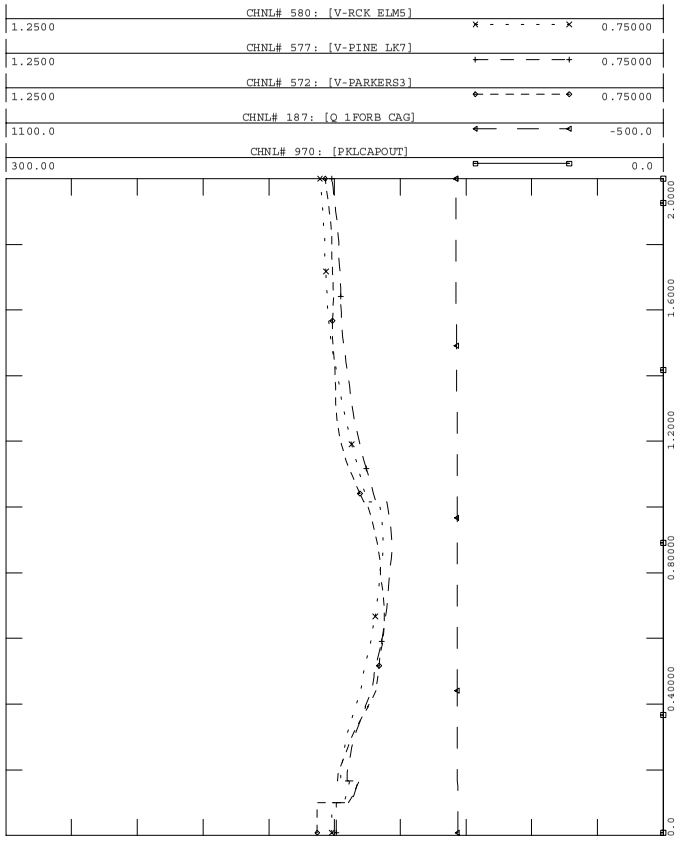
VOLTAGES 6



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

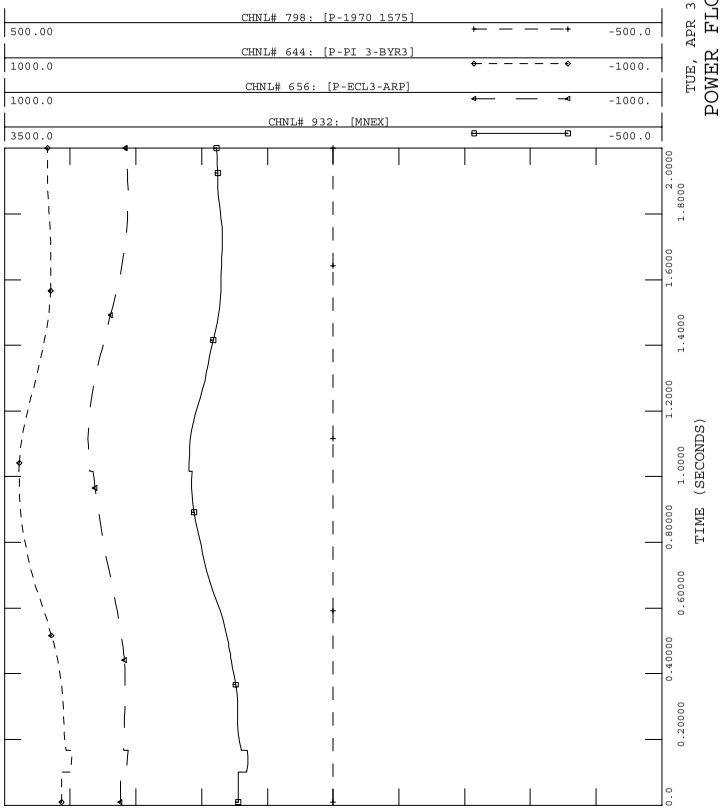
TUE, APR 30 2002 9:44

FORBES SVS OUT & VOLTAGES



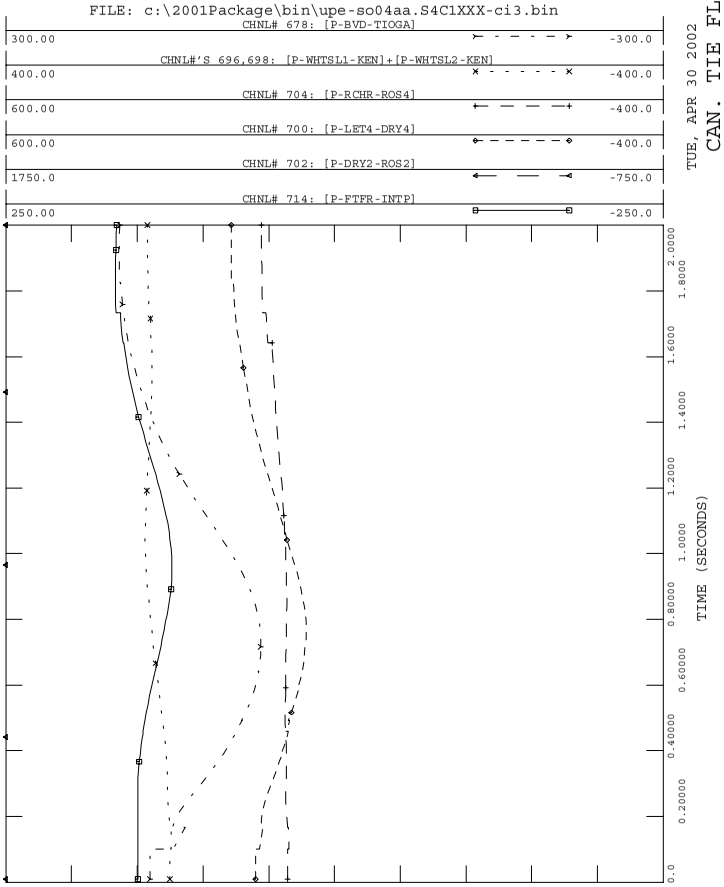
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
POWER FLOW SUMS 2



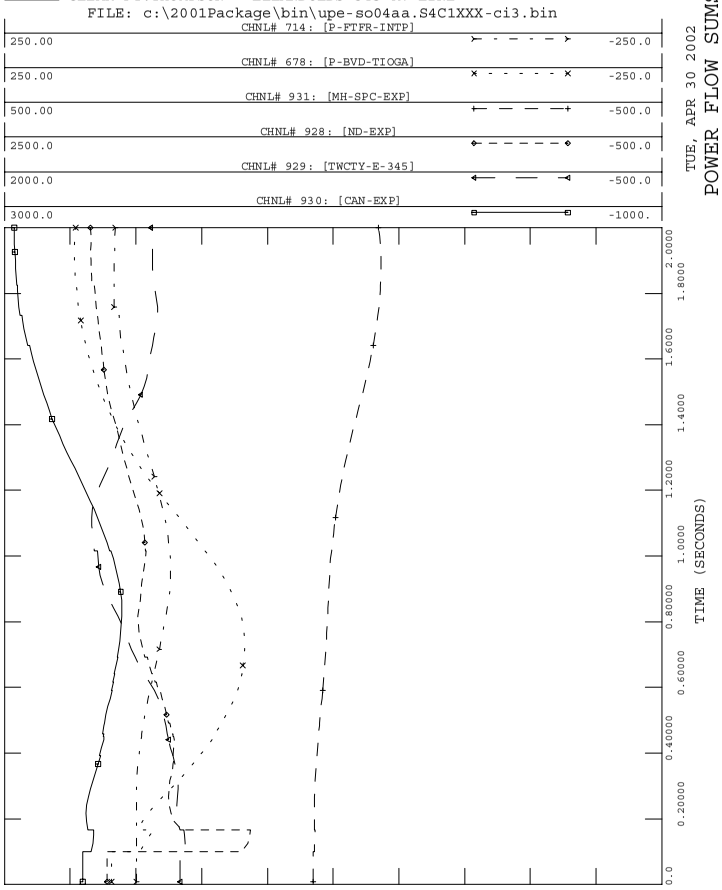
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44
CAN. TIE FLOWS



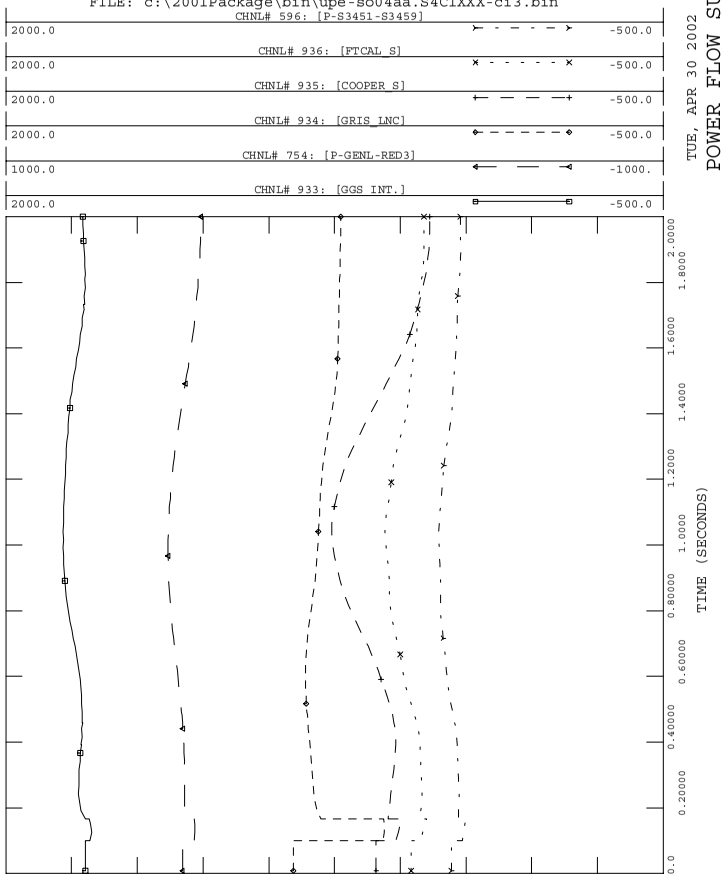
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

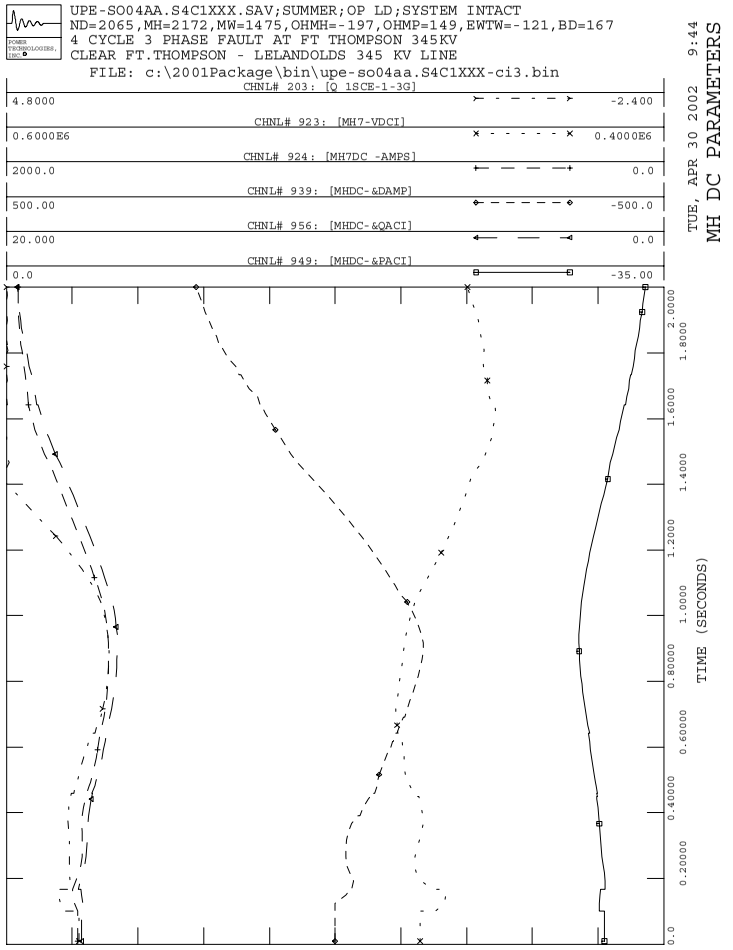
TUE, APR 30 2002 9:44
POWER FLOW SUMS 1

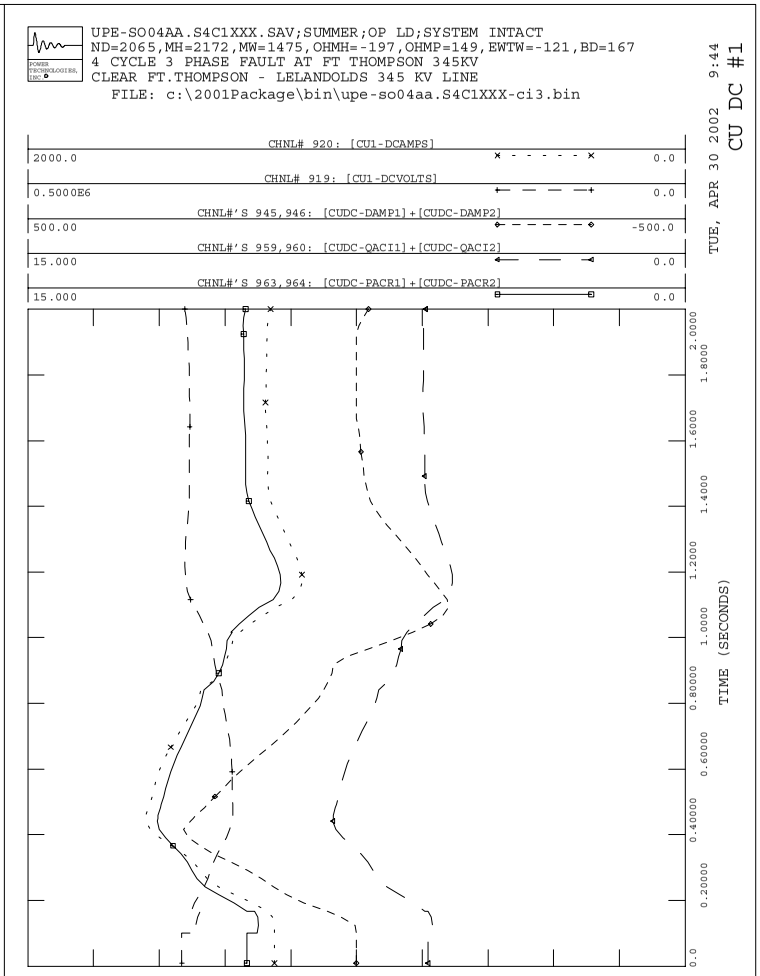


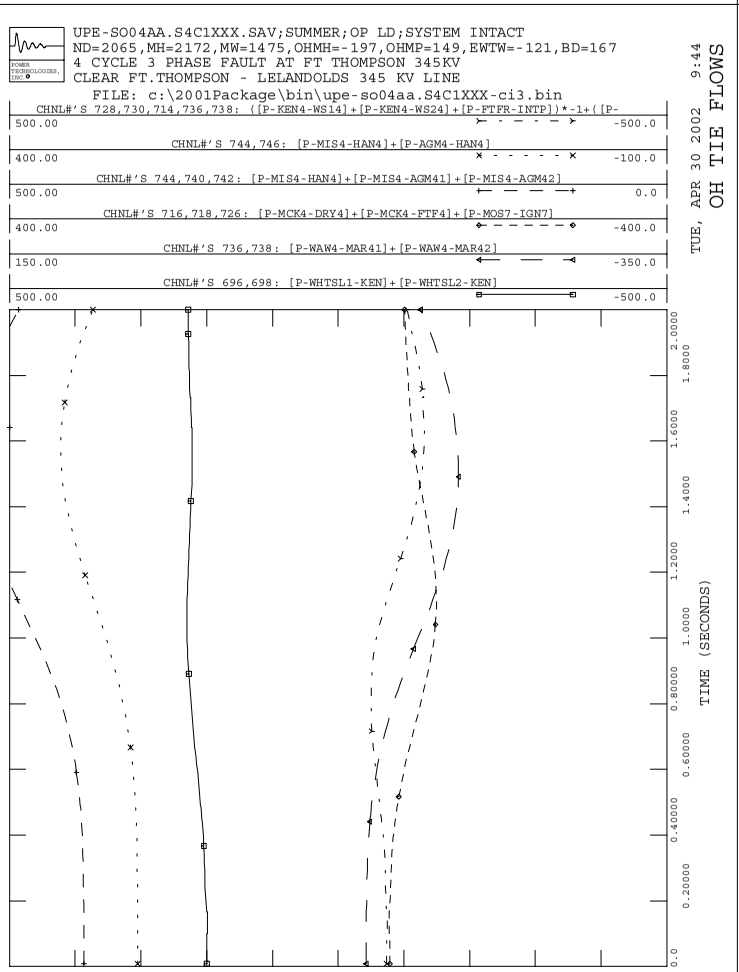
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

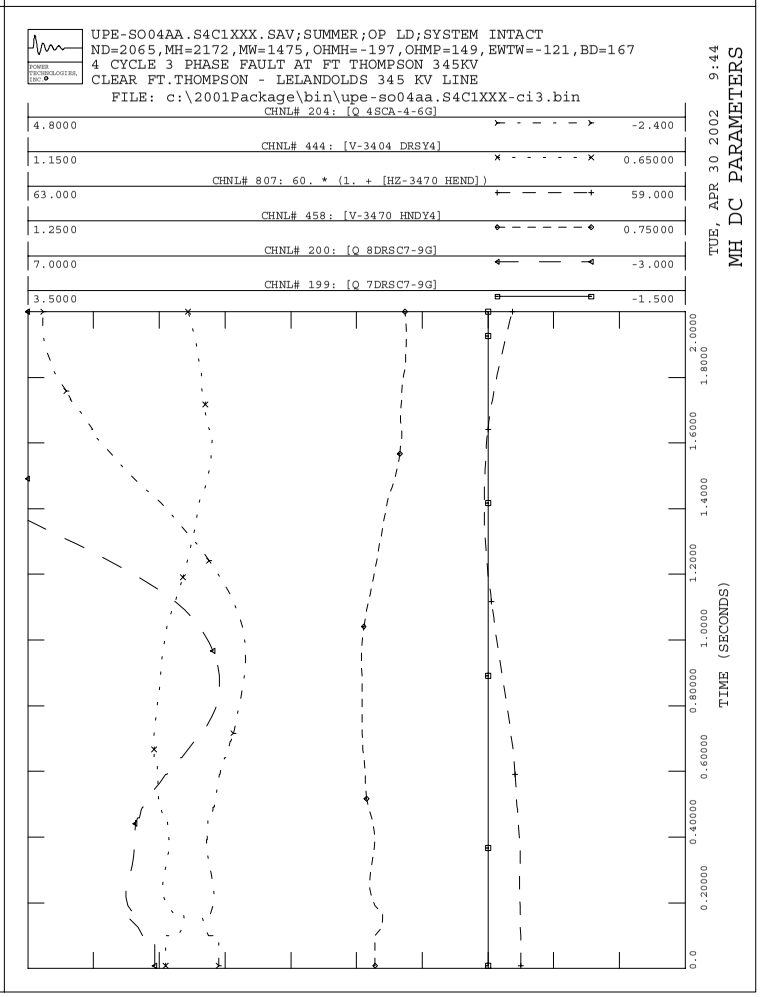
TUE, APR 30 2002 9:44
POWER FLOW SUM 3




UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TUE, APR 30 2002 9:44
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TUE, APR 30 2002 9:44
CU DC #1
TIME (SECONDS)

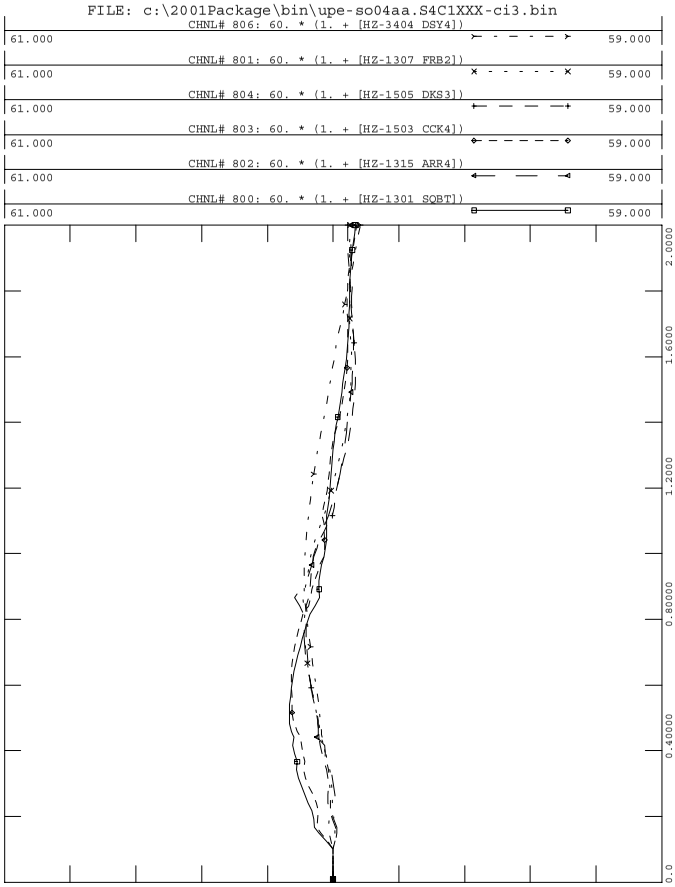

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TUE, APR 30 2002 9:44
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TUE, APR 30 2002 9:44
MH DC PARAMETERS
TIME (SECONDS)

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44

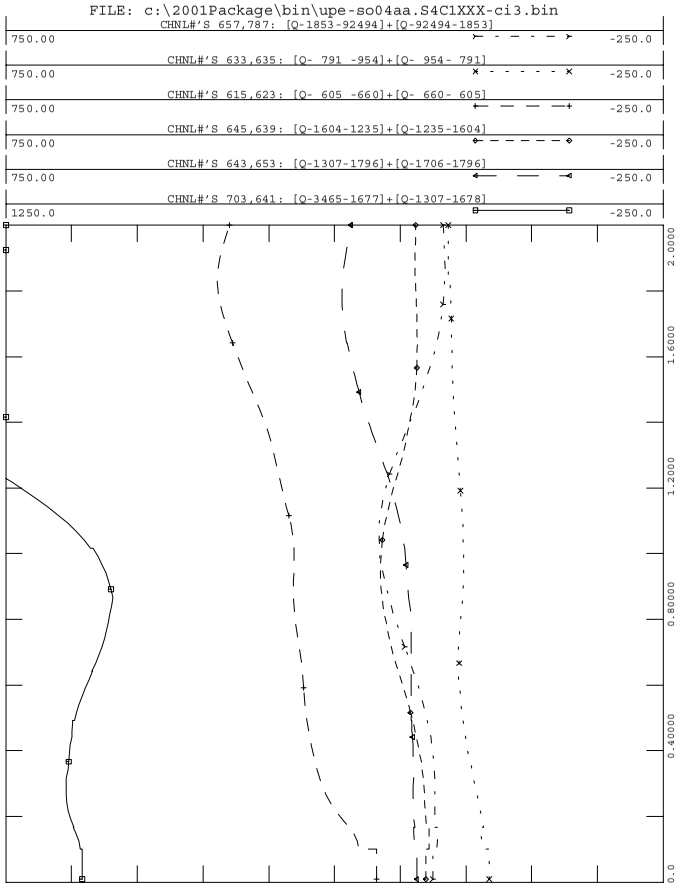
FREQ AT DC TERMINALS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44

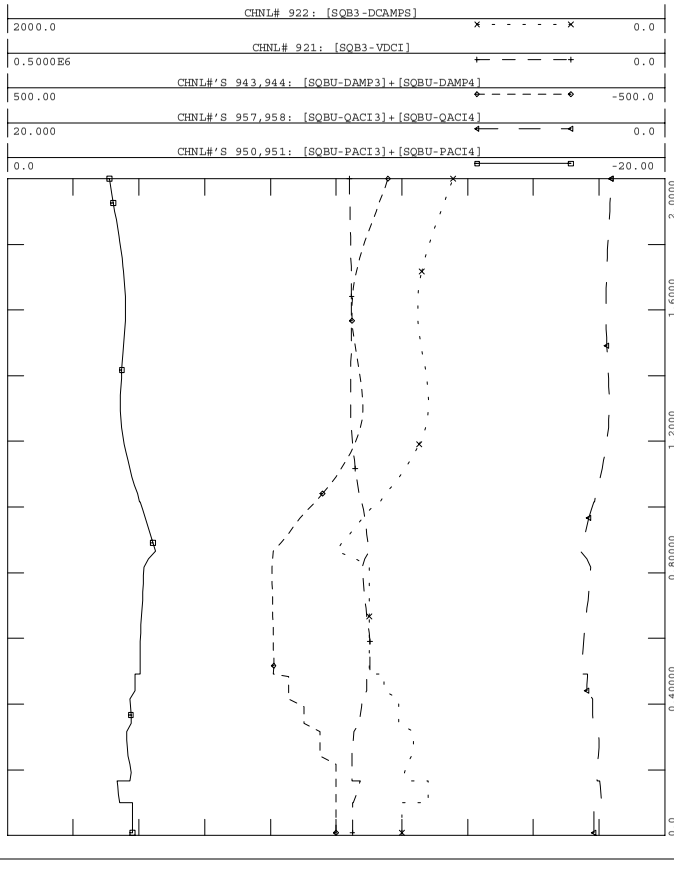
VAR LOSSES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44

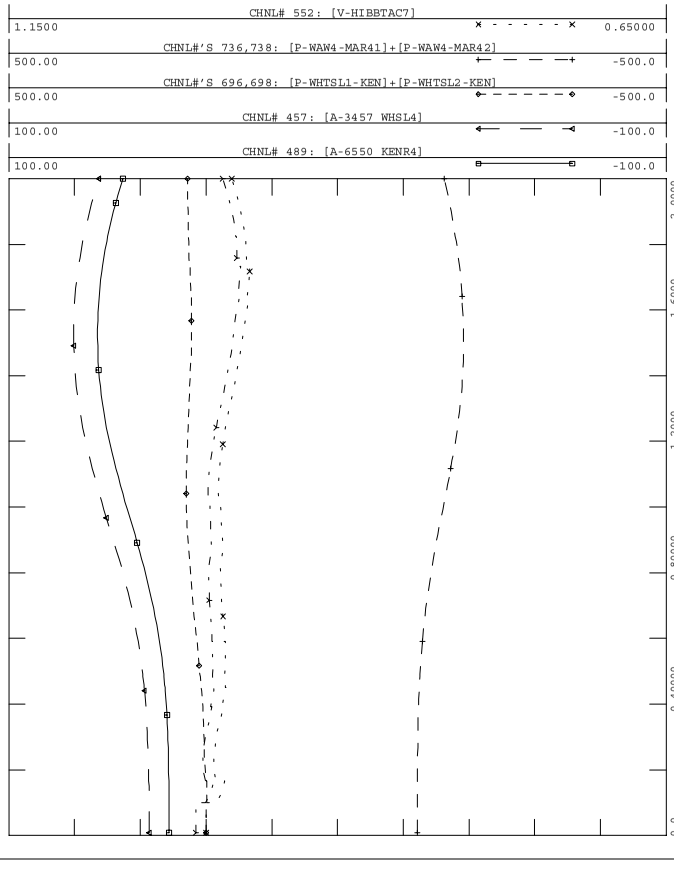
SQB DC #3



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

TUE, APR 30 2002 9:44

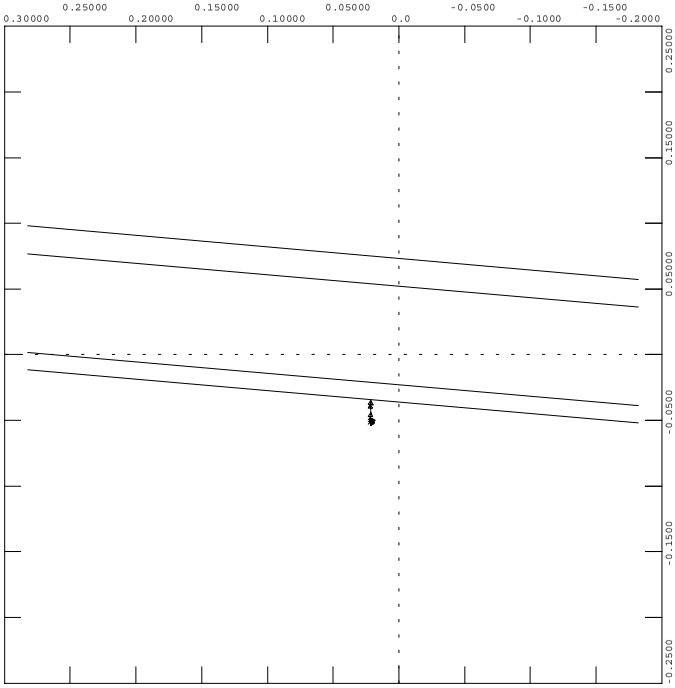
VOLTAGES, ANGLES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

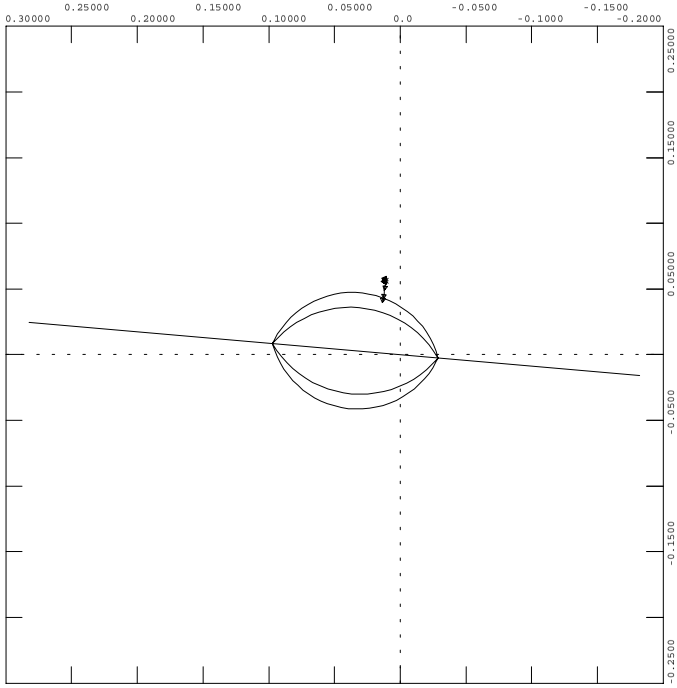


TUE, APR 30 2002 9:44
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

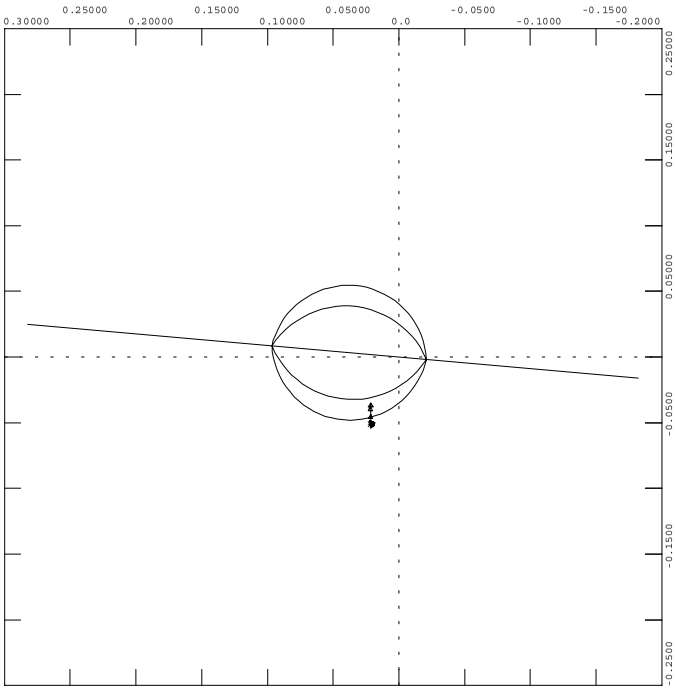


TUE, APR 30 2002 9:44
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

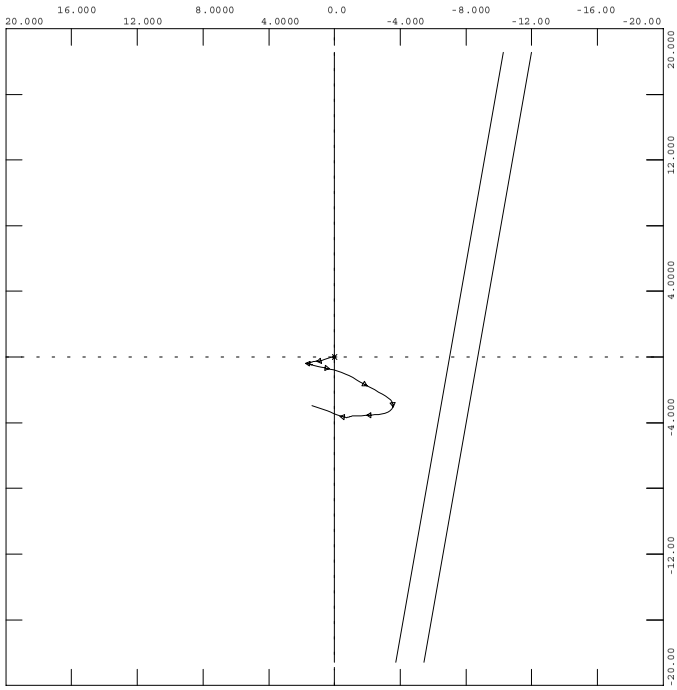


TUE, APR 30 2002 9:44
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

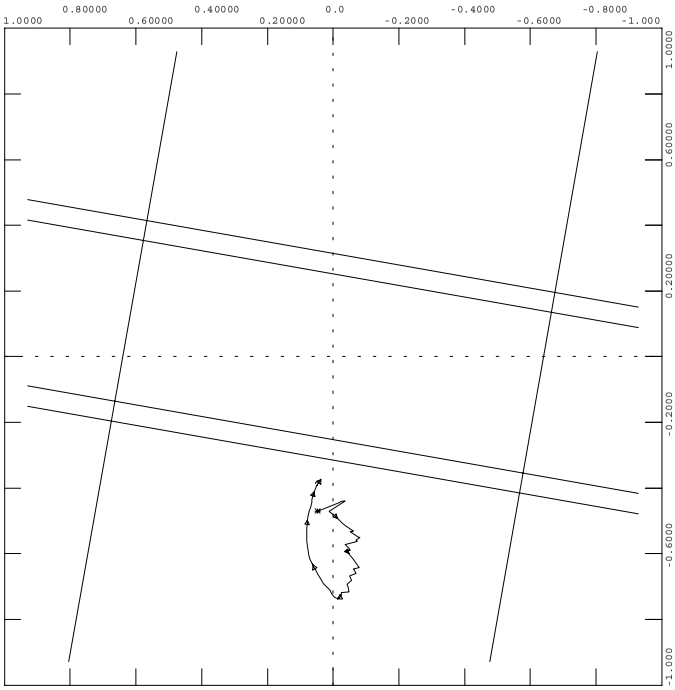


TUE, APR 30 2002 9:44
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

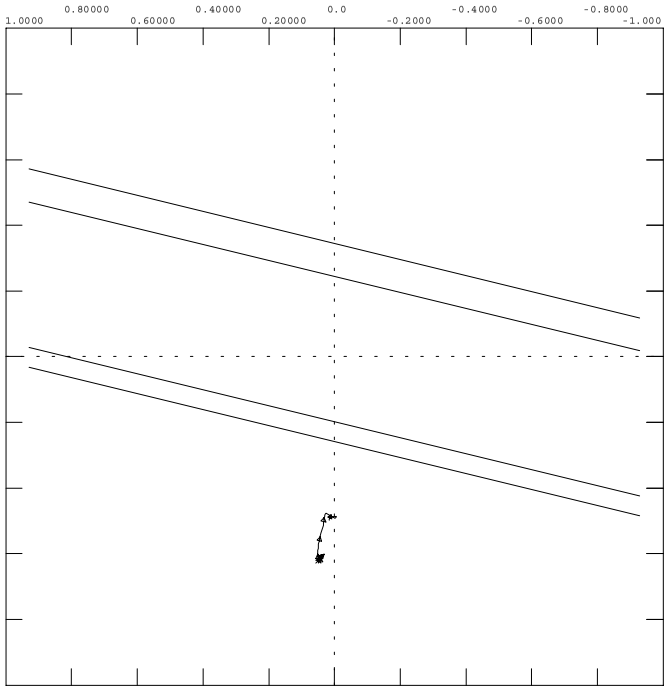


TUE, APR 30 2002 9:44
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

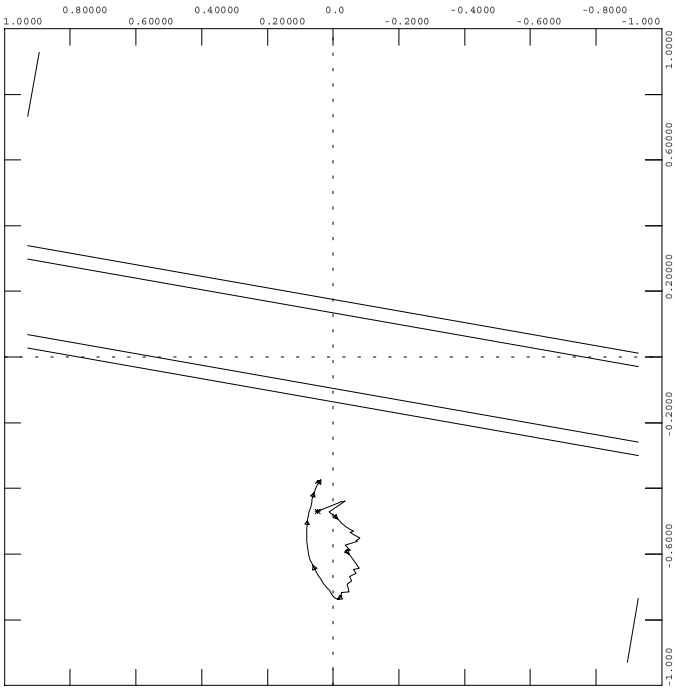


TUE, APR 30 2002 9:44
R50M AT MORANVILLE (520)

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

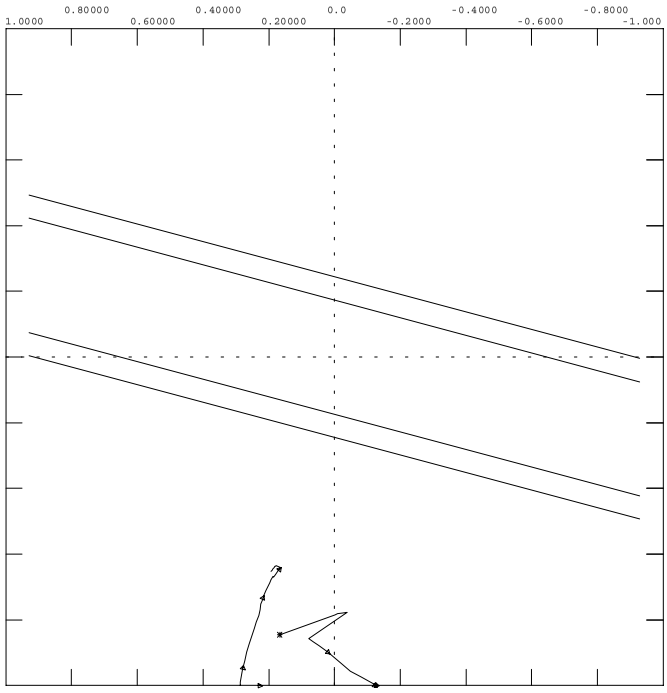


TUE, APR 30 2002 9:44
L20D AT DRAYTON (506)

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

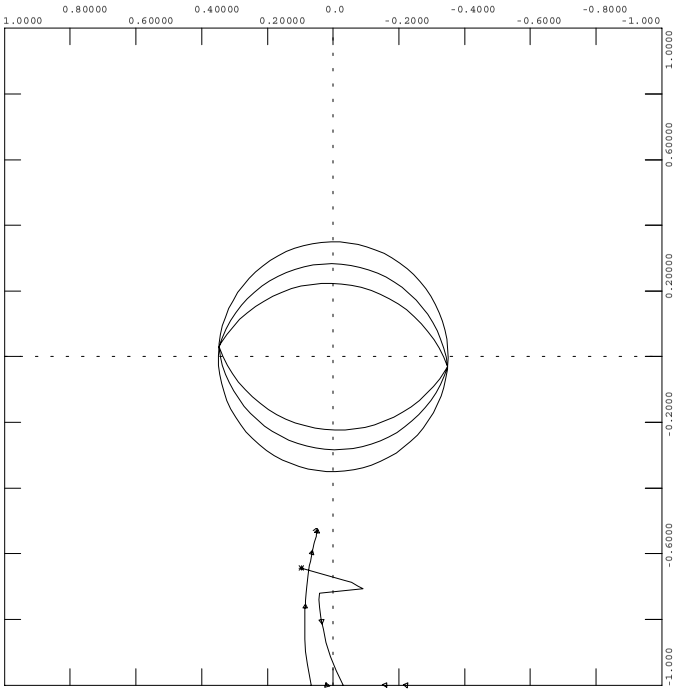


TUE, APR 30 2002 9:44
L20D-PRAIRIE (510)

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

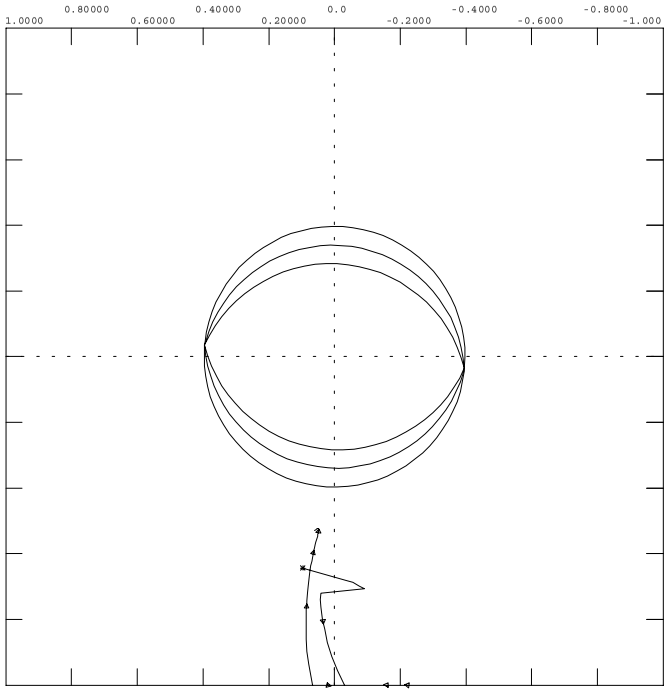
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

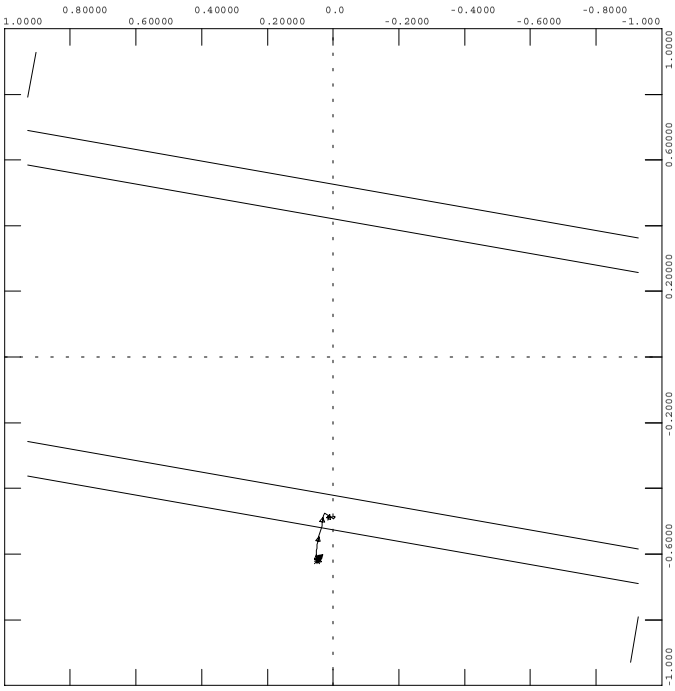
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

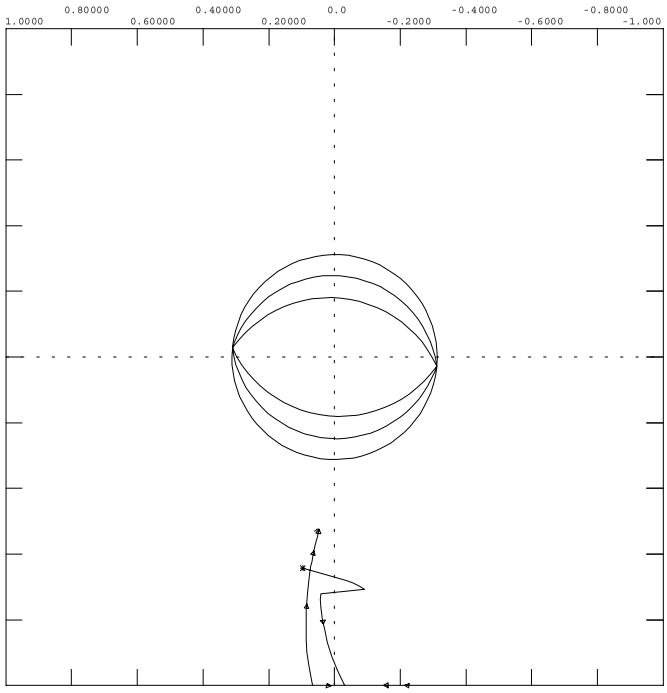
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



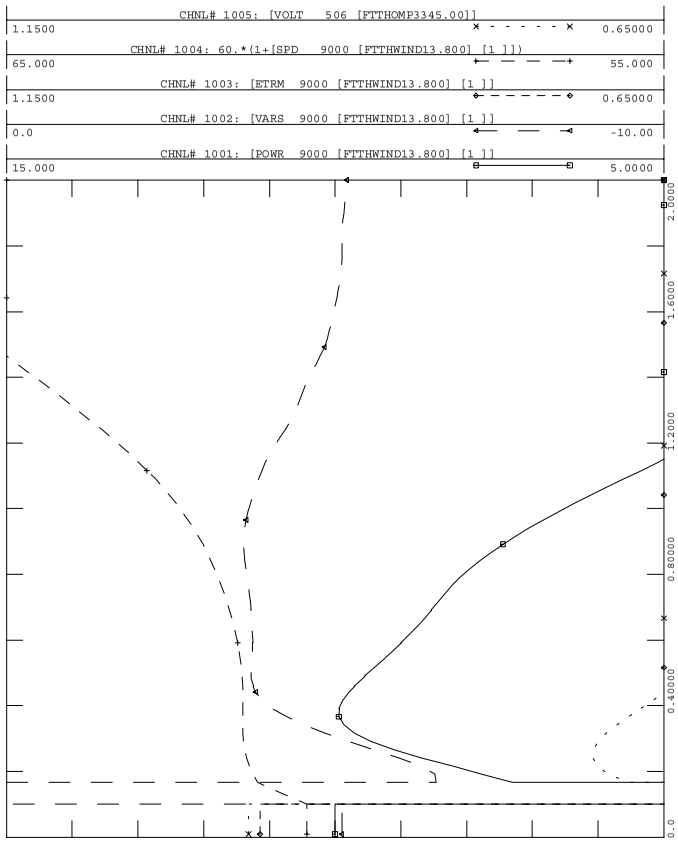
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

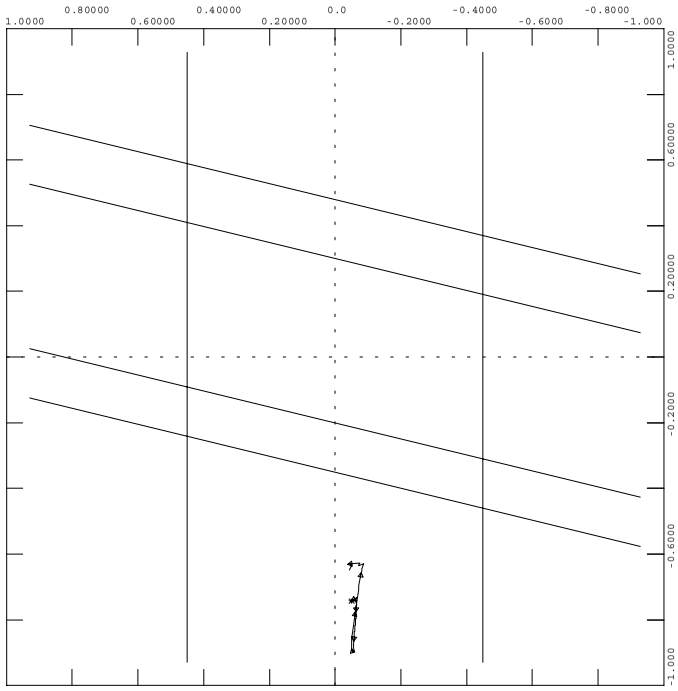


TUE, APR 30 2002 9:44
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



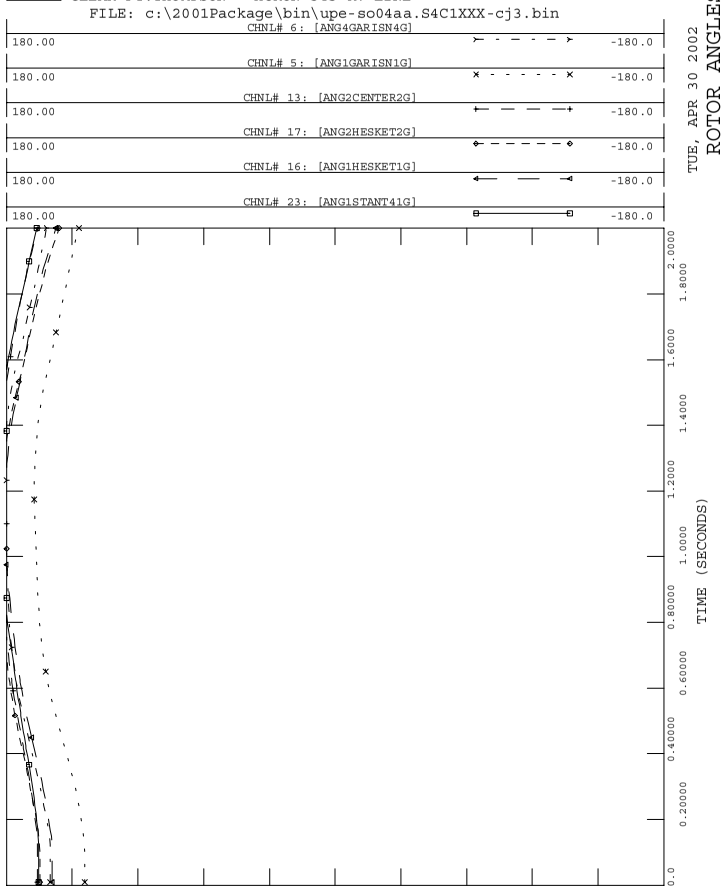
TUE, APR 30 2002 9:44
MP-OH I.FALLS (779)

CONTINGENCY CJ3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Huron 345 kV line

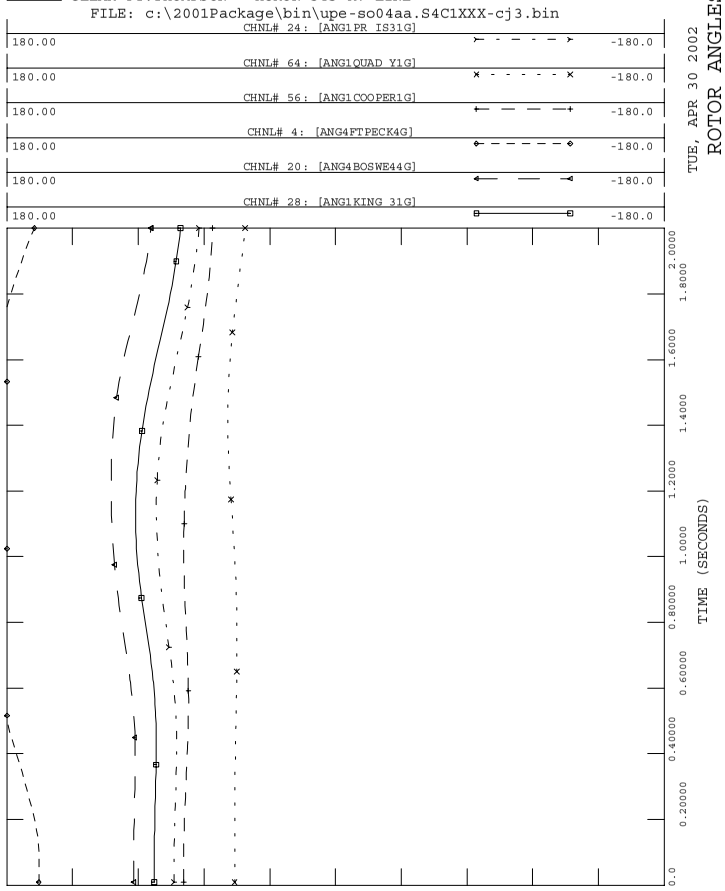
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
ROTOR ANGLES 2



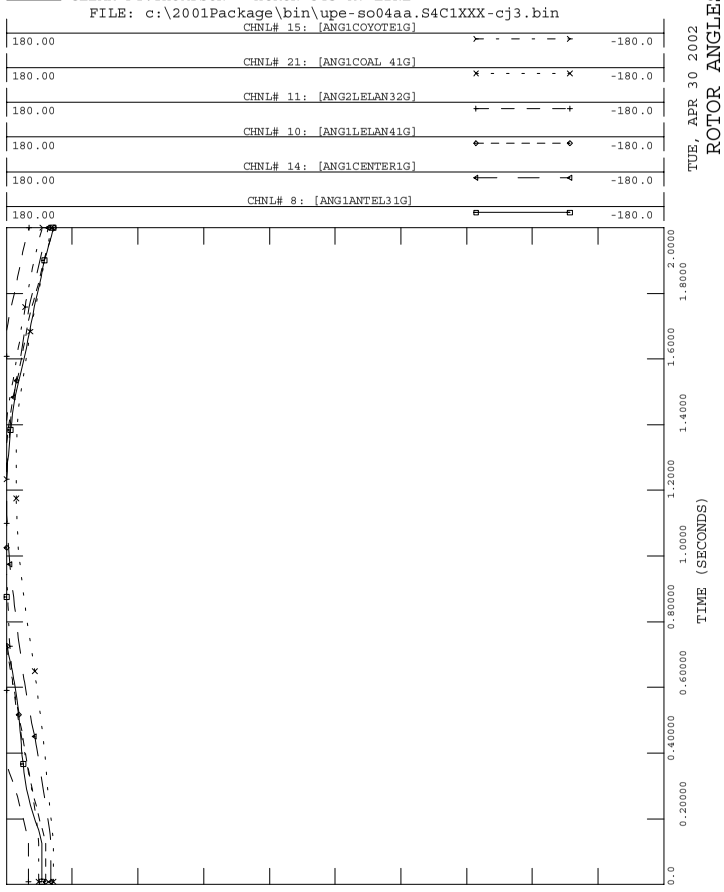
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
ROTOR ANGLES 4



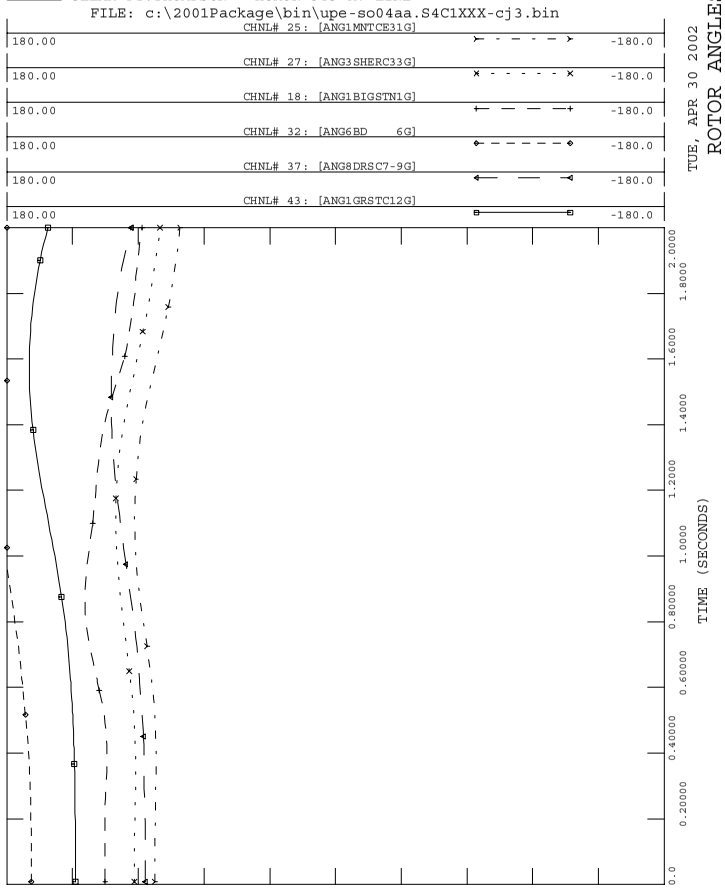
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
ROTOR ANGLES 1



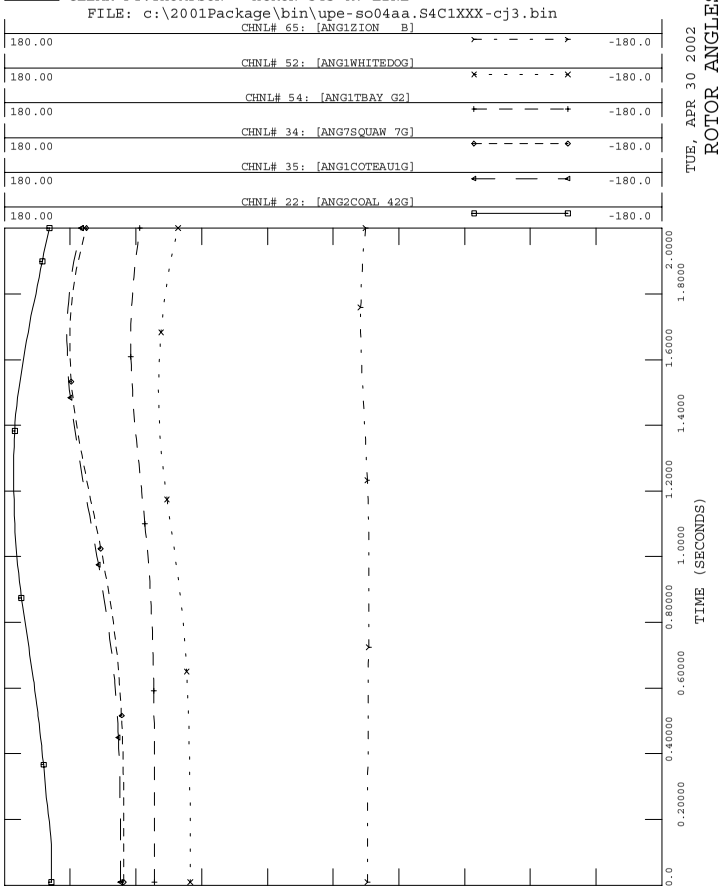
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
ROTOR ANGLES 3



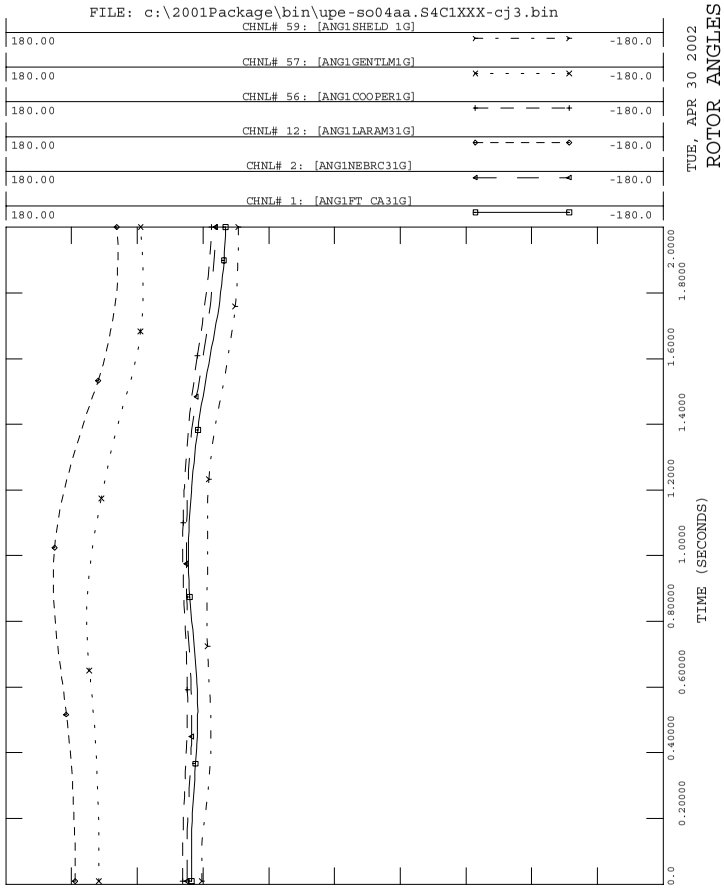
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
ROTOR ANGLES 6



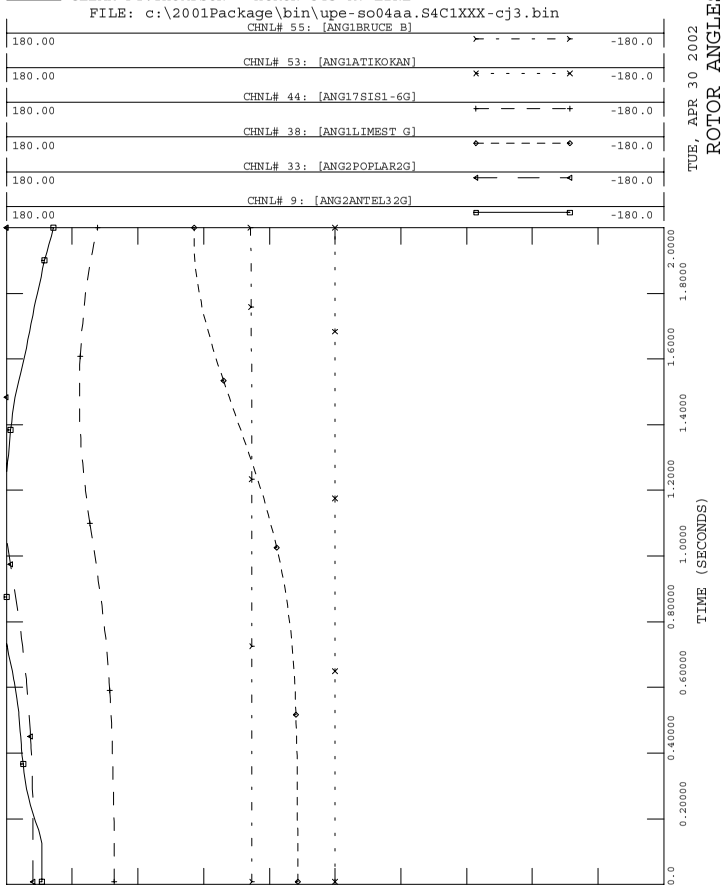
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
ROTOR ANGLES NB



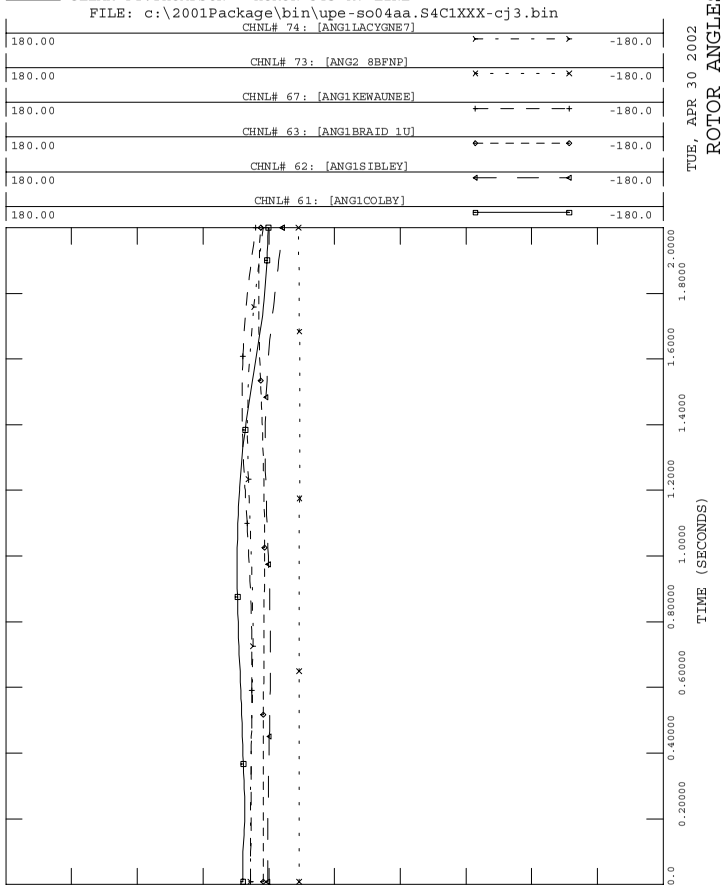
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
ROTOR ANGLES 5



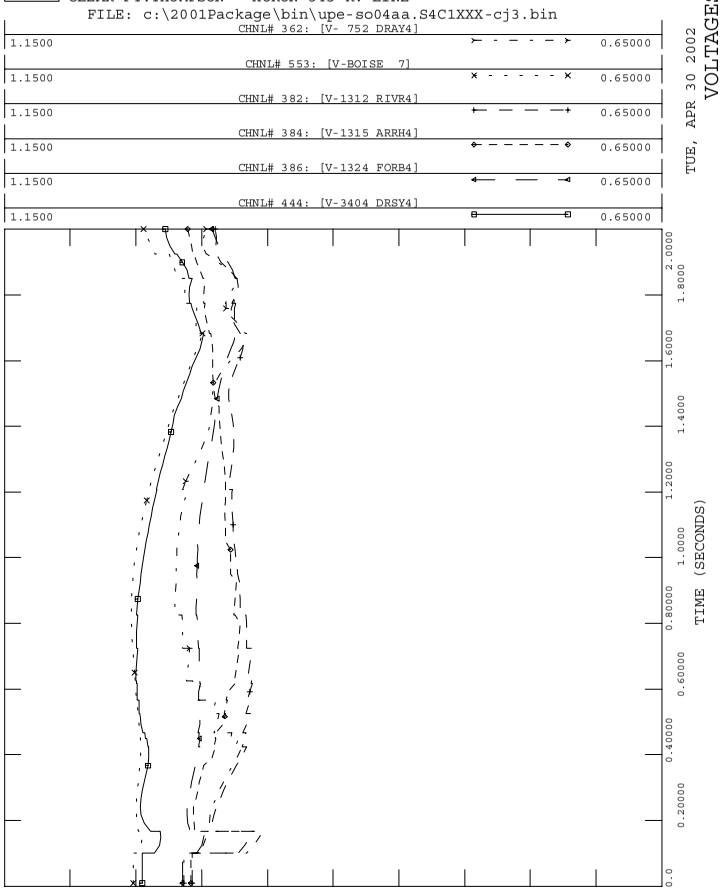
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
ROTOR ANGLES 7



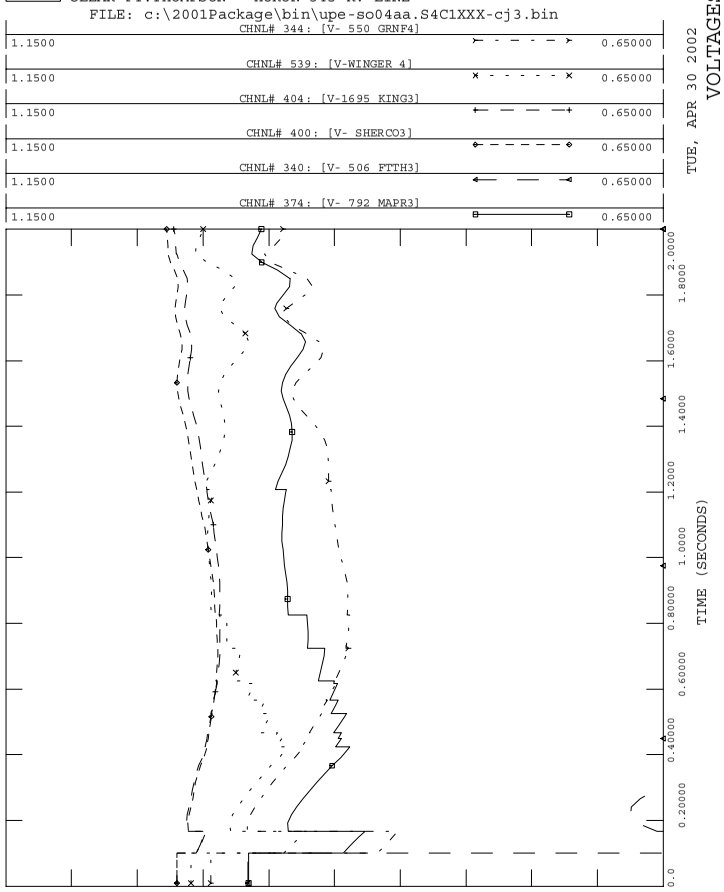
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
VOLTAGES 1



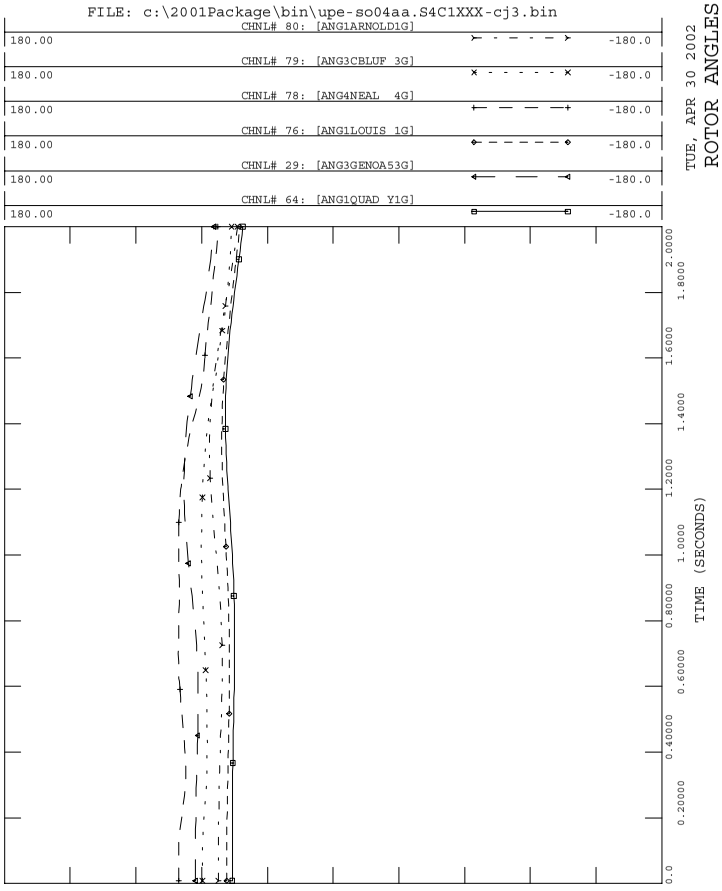
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
VOLTAGES 3



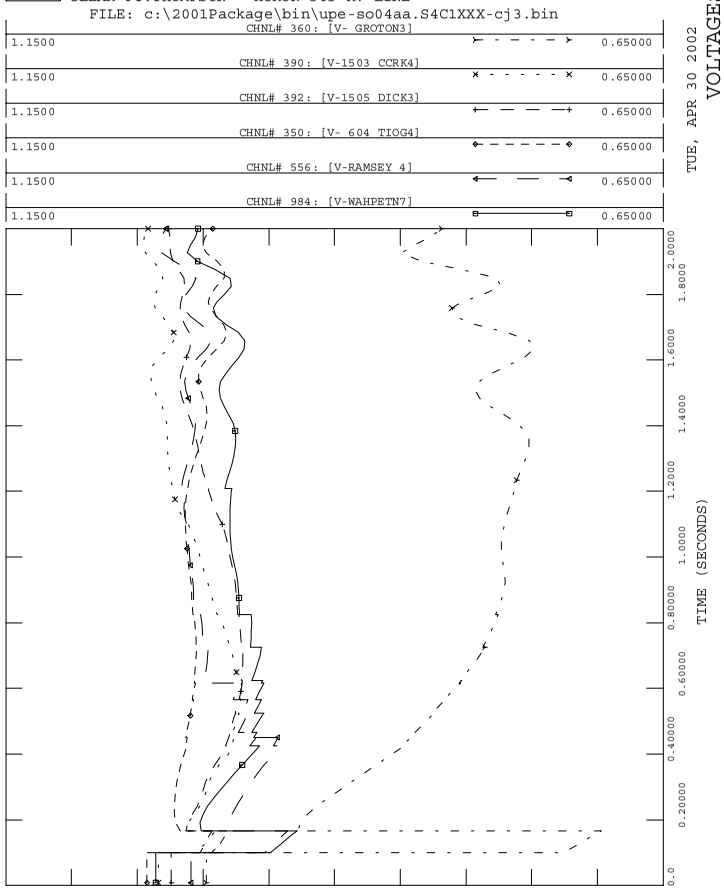
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
ROTOR ANGLES IA



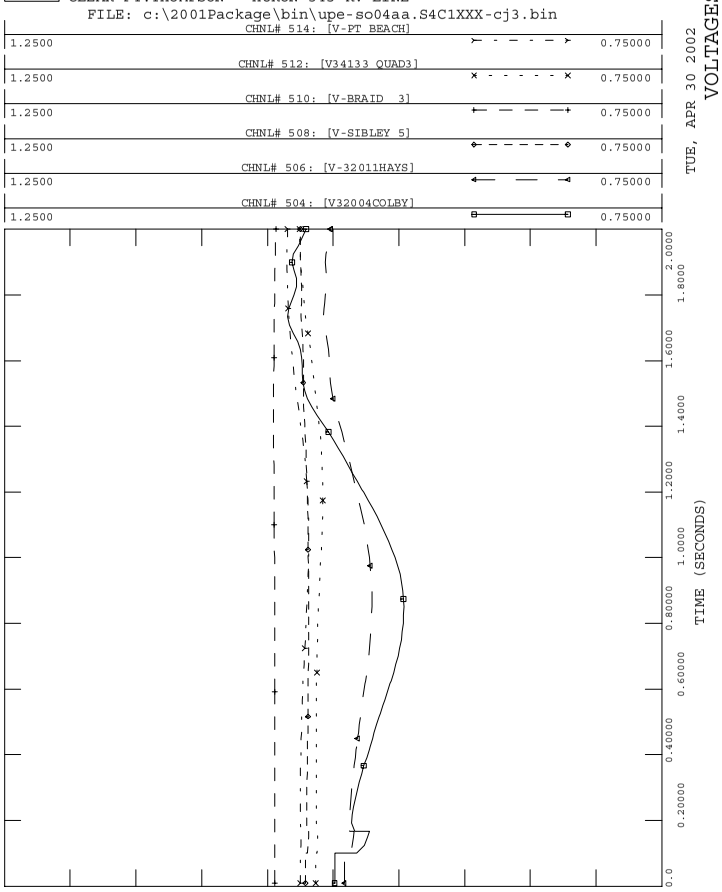
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
VOLTAGES 2



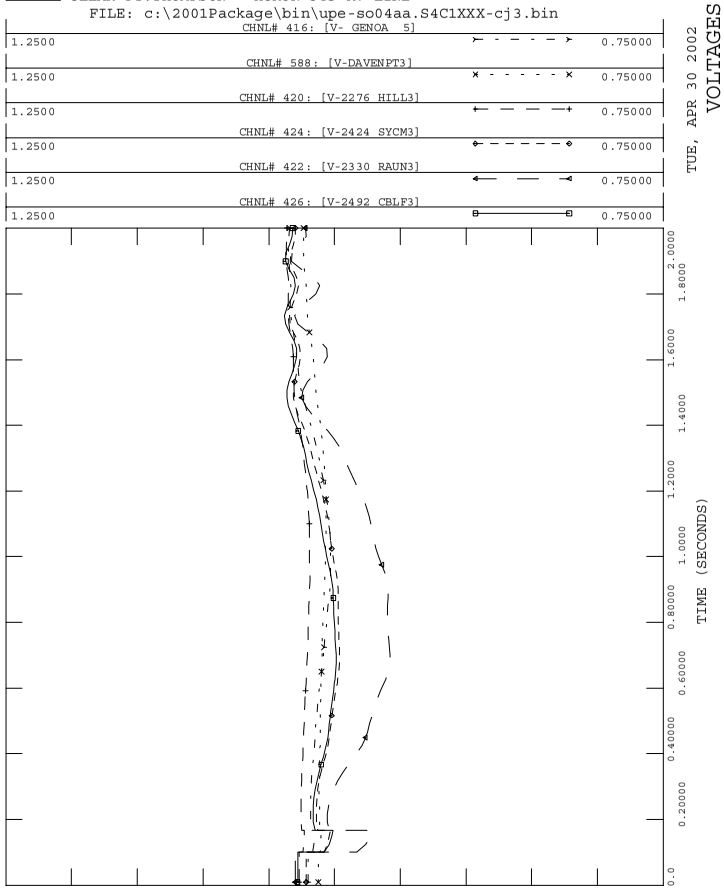
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
VOLTAGES 5



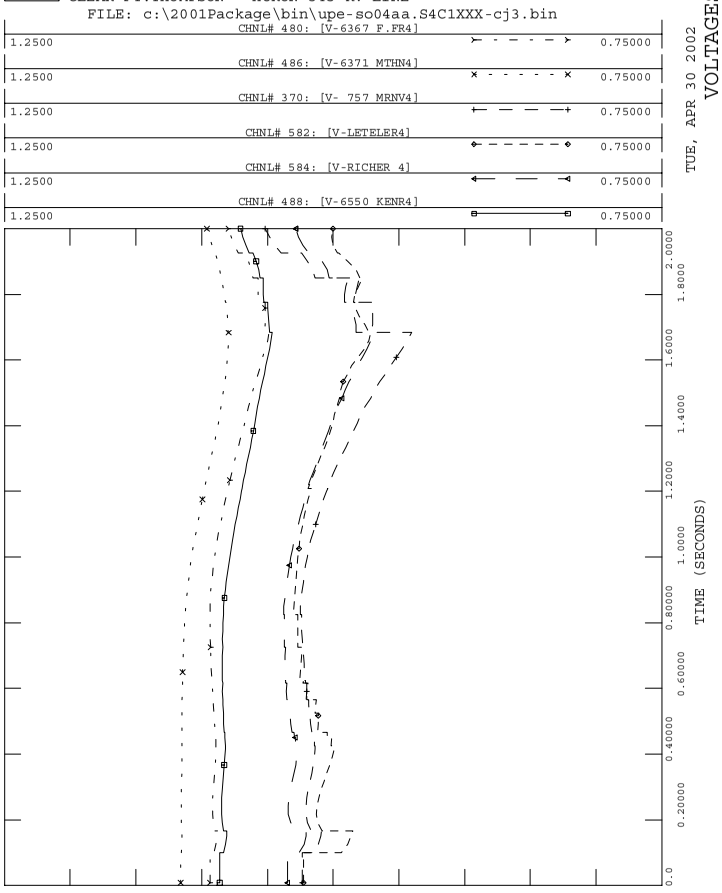
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
VOLTAGES IA



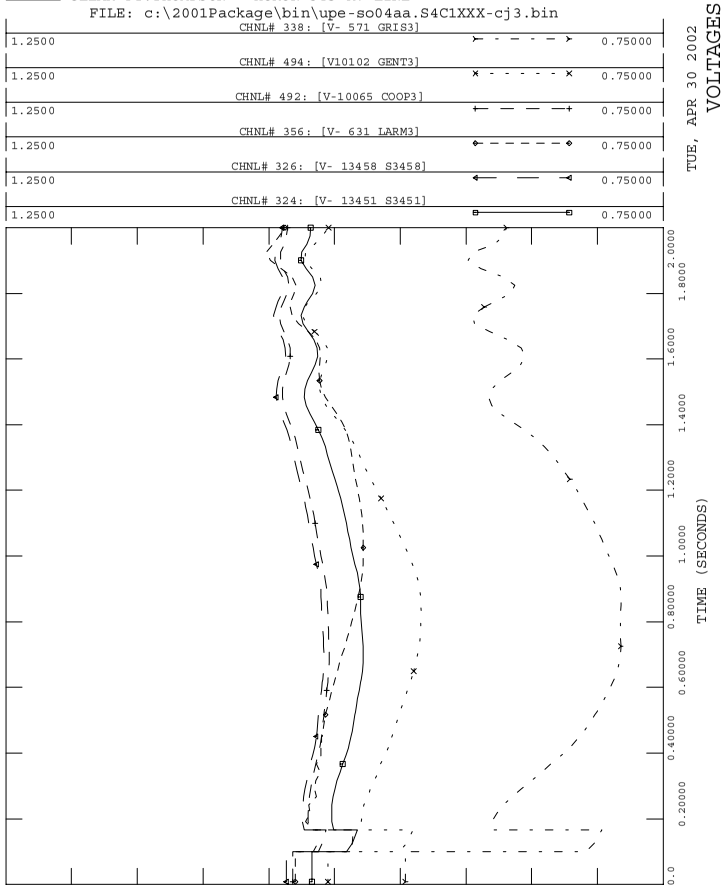
UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
VOLTAGES 4



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

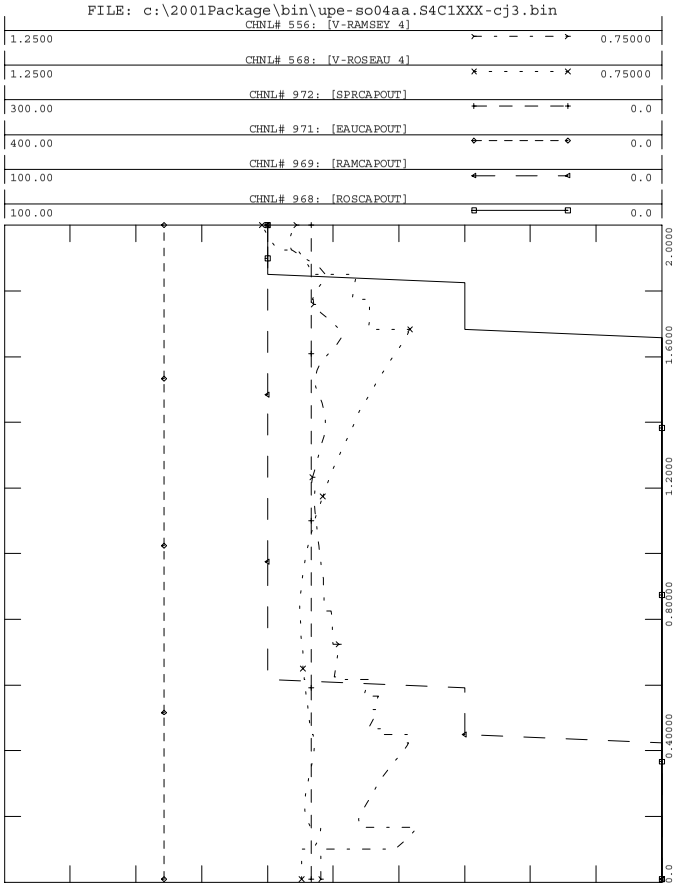
TUE, APR 30 2002 9:47
VOLTAGES NB



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47

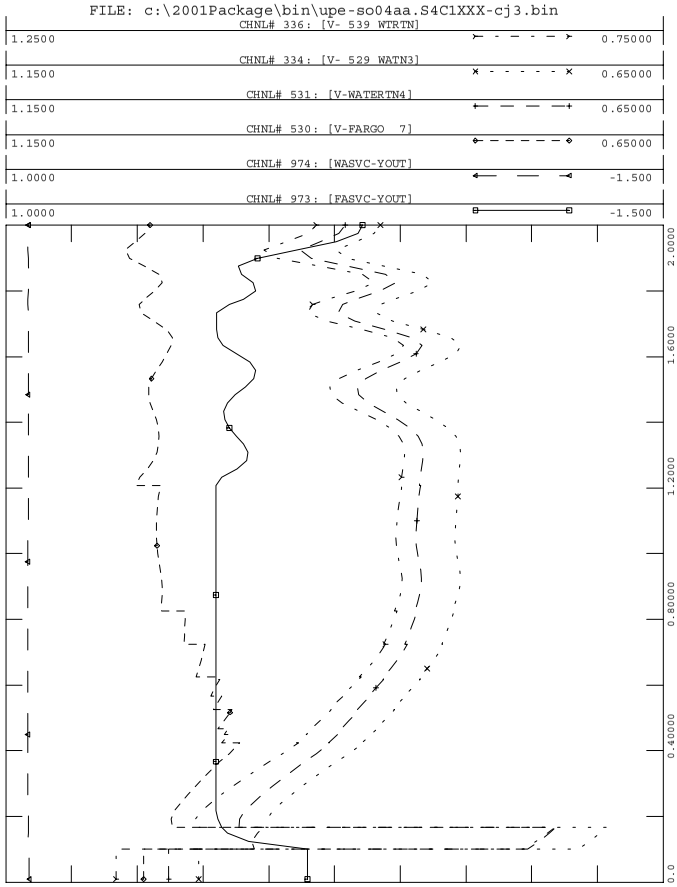
FAST SW CAP OUT 2



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47

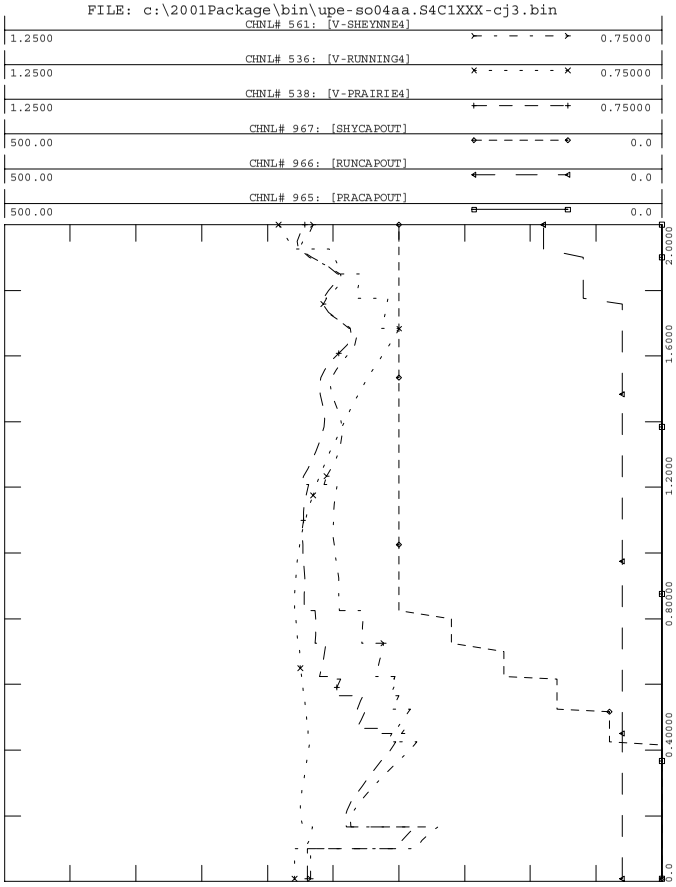
FARGO/WATERTOWN SVS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47

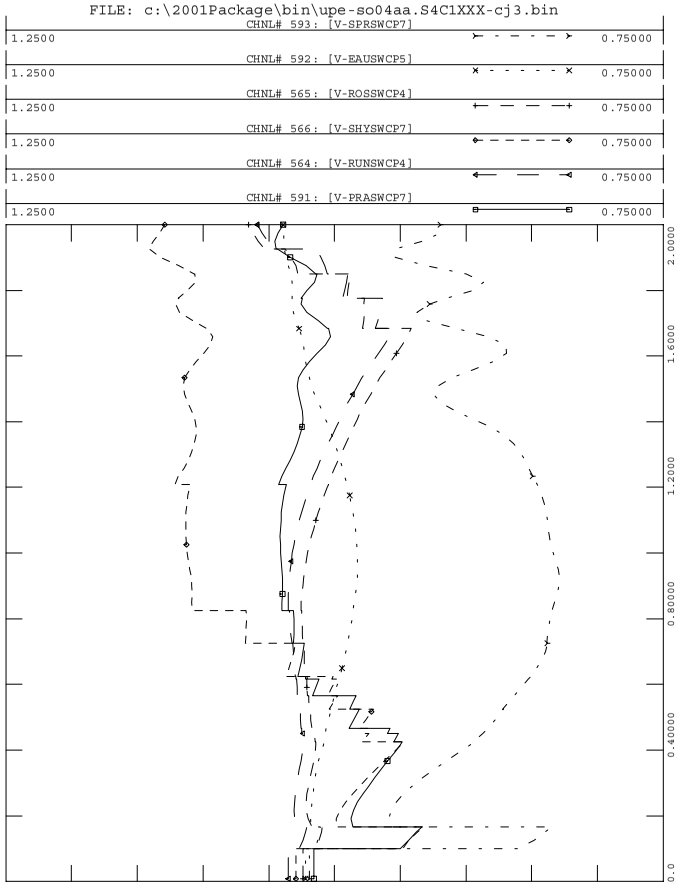
FAST SW CAP OUT 1



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47

FAST SW CAP VOLTAGES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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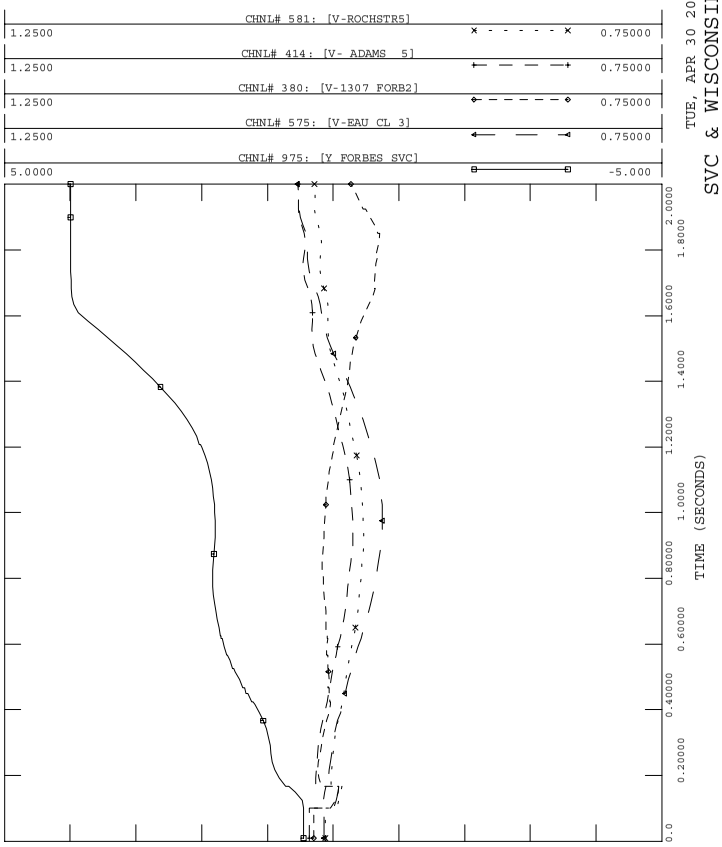
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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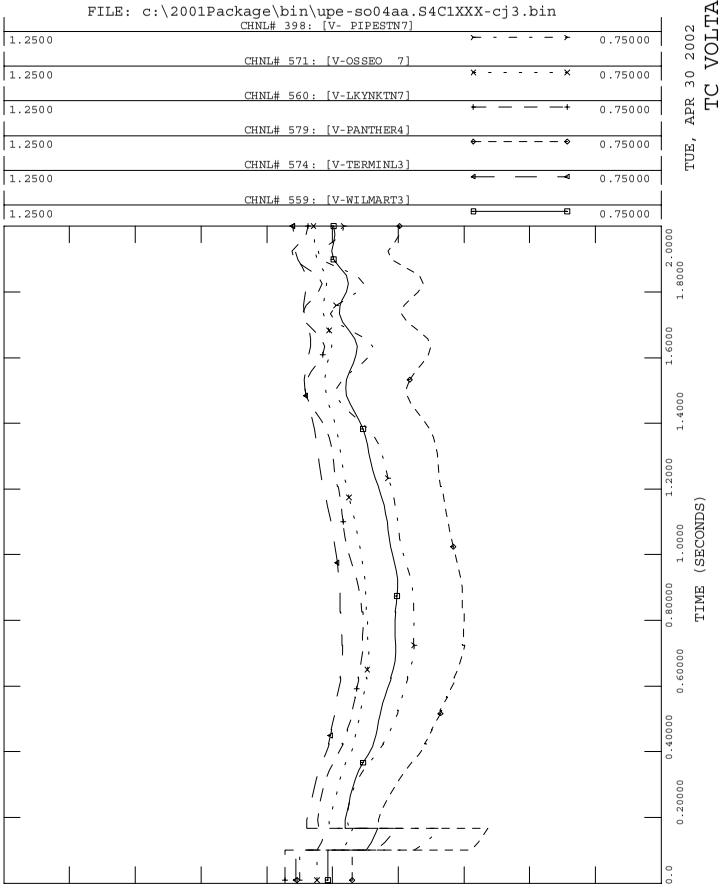
TC VOLTAGES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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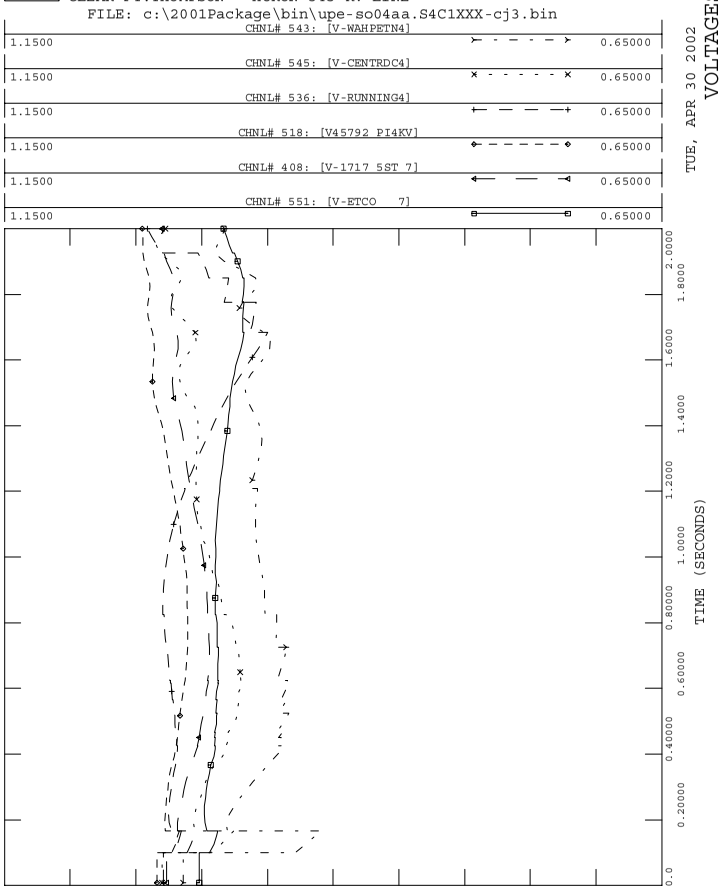
VOLTAGES 6



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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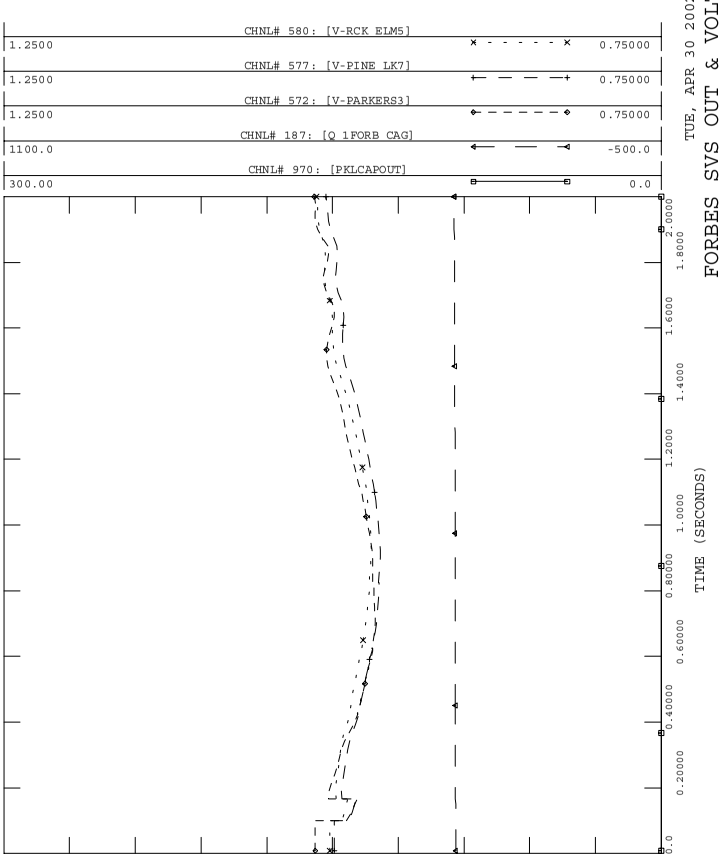
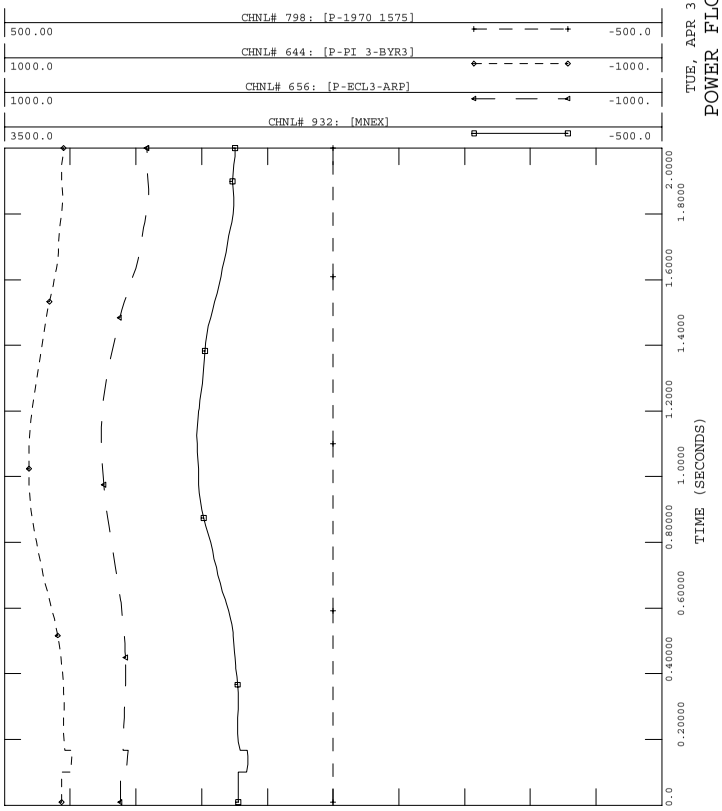
FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
POWER FLOW SUMS 2



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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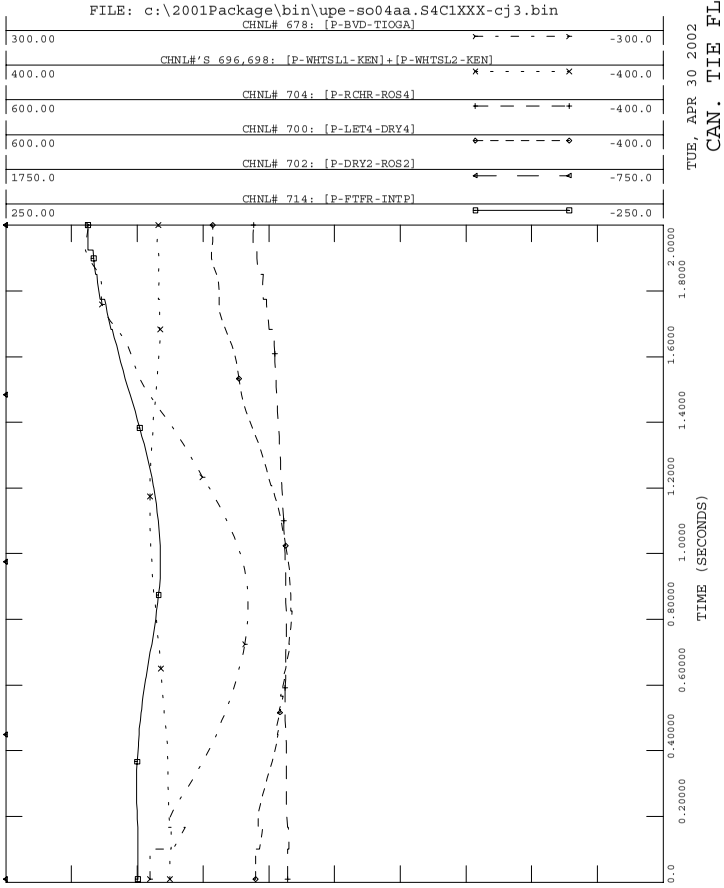
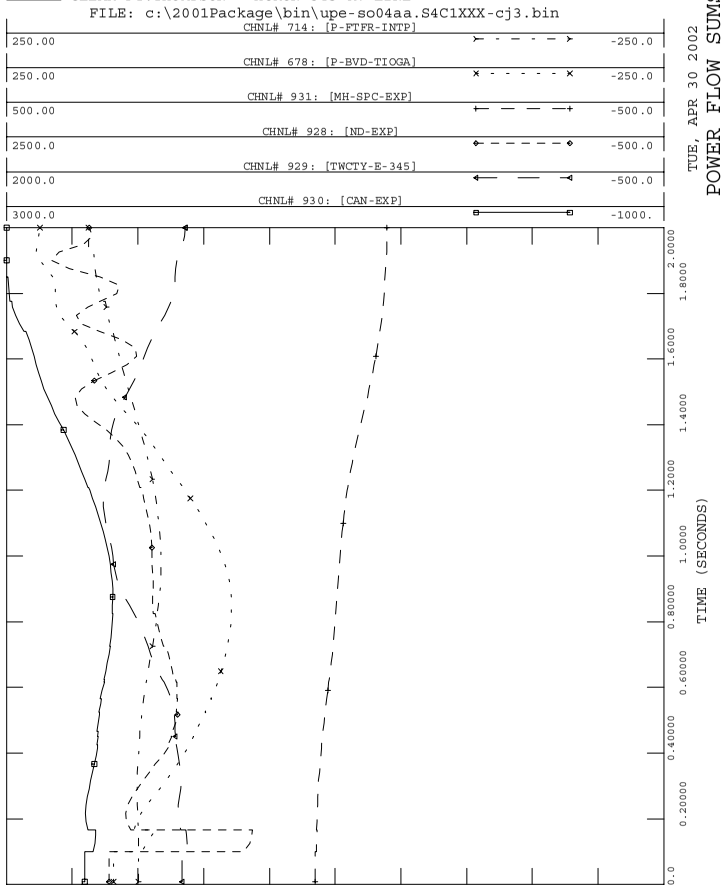
CAN. TIE FLOWS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

TUE, APR 30 2002 9:47
POWER FLOW SUMS 1



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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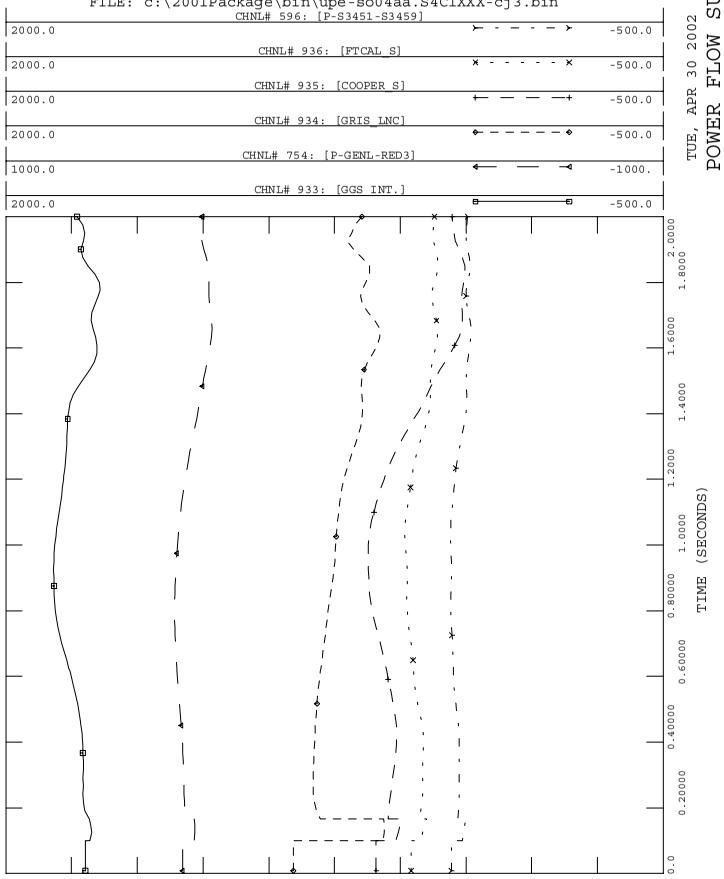
POWER FLOW SUM 3



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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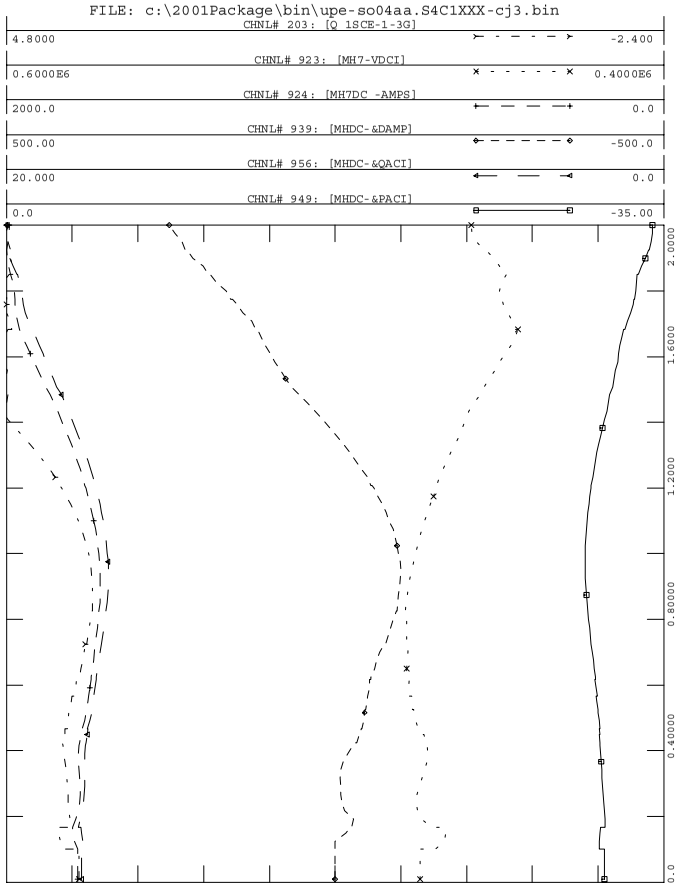
MH DC PARAMETERS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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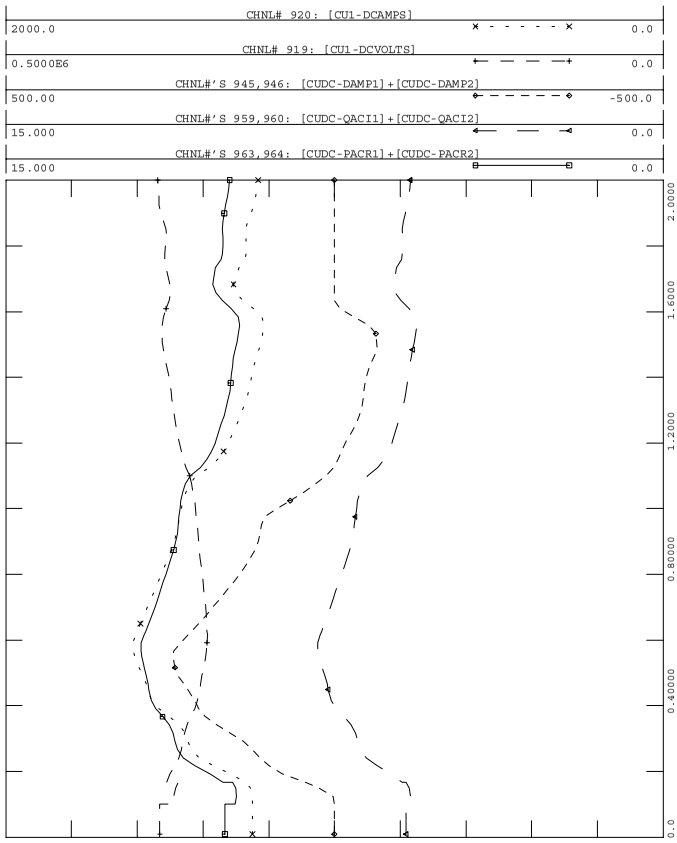
CU DC #1



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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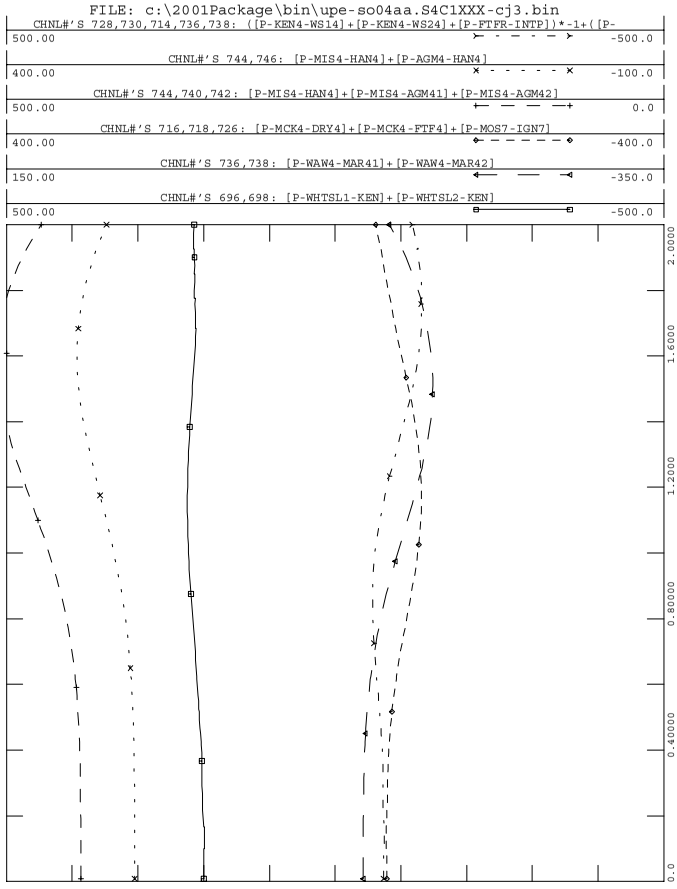
OH TIE FLOWS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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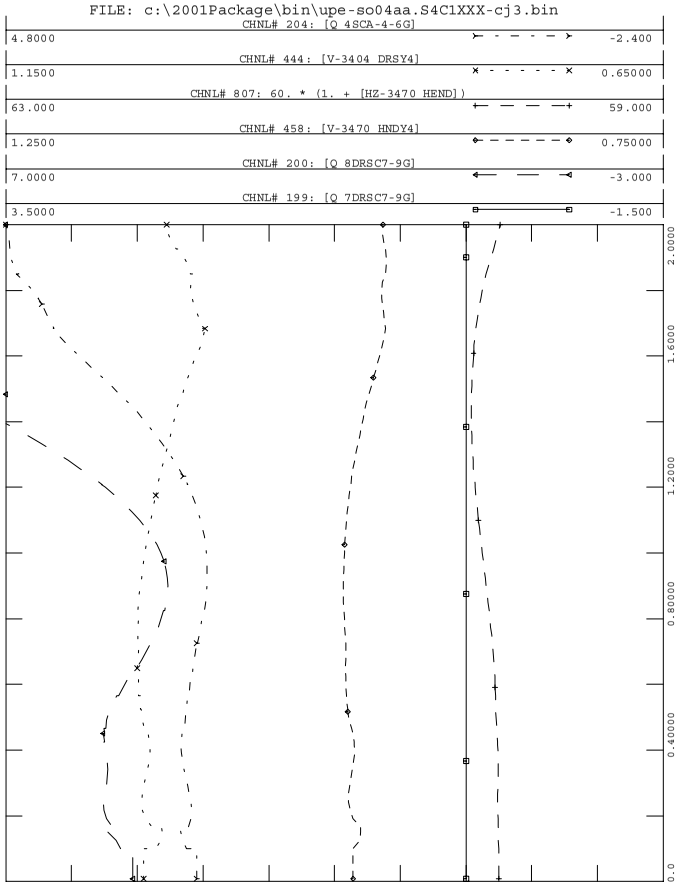
MH DC PARAMETERS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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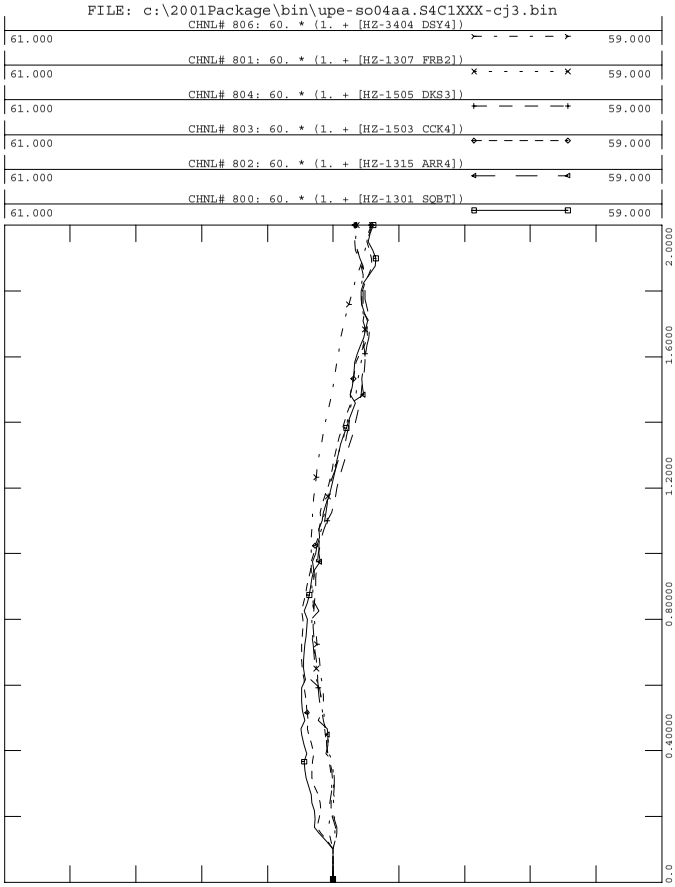
FREQ AT DC TERMINALS



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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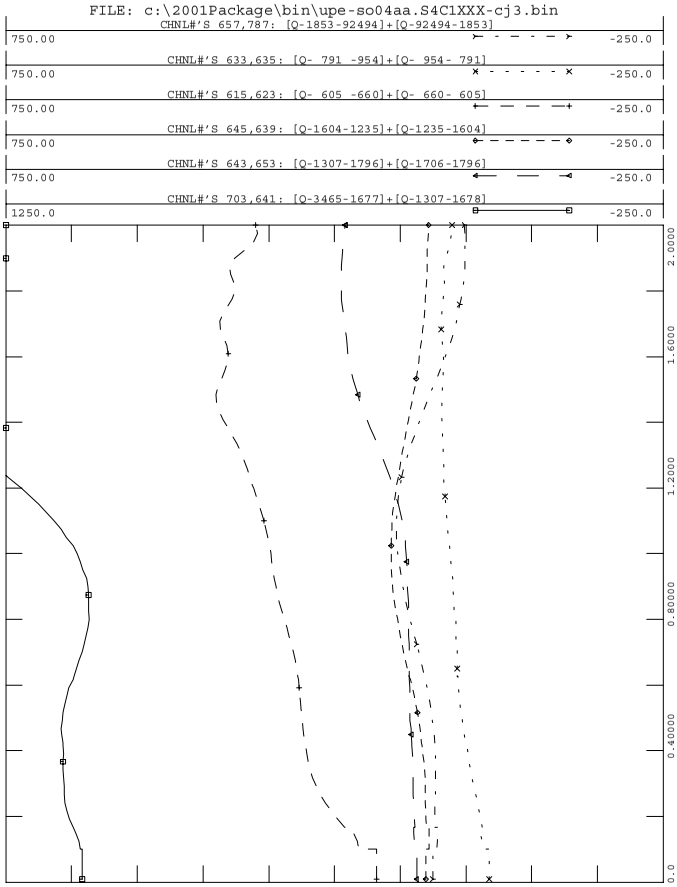
VAR LOSSES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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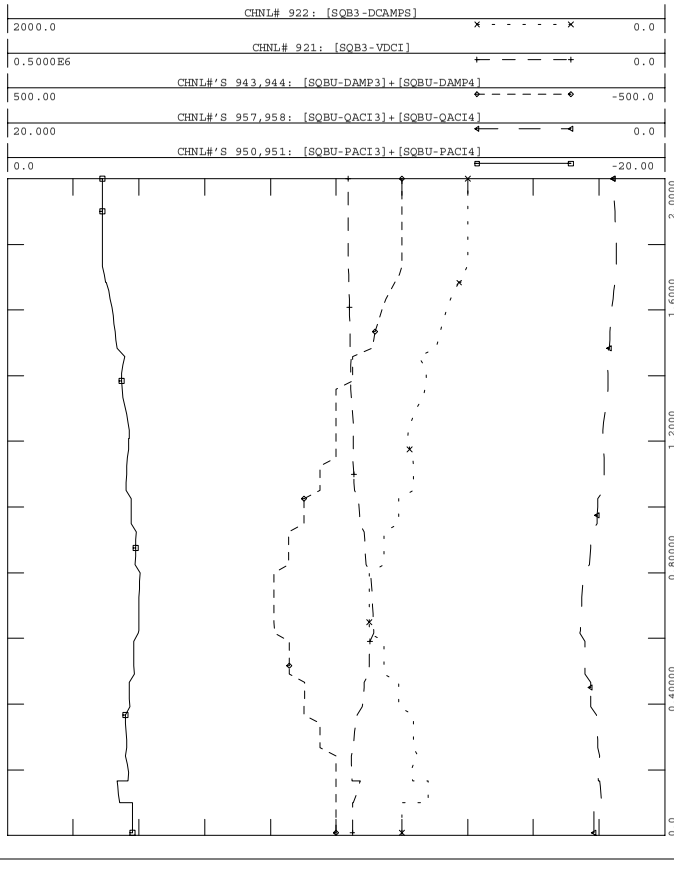
SQB DC #3



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

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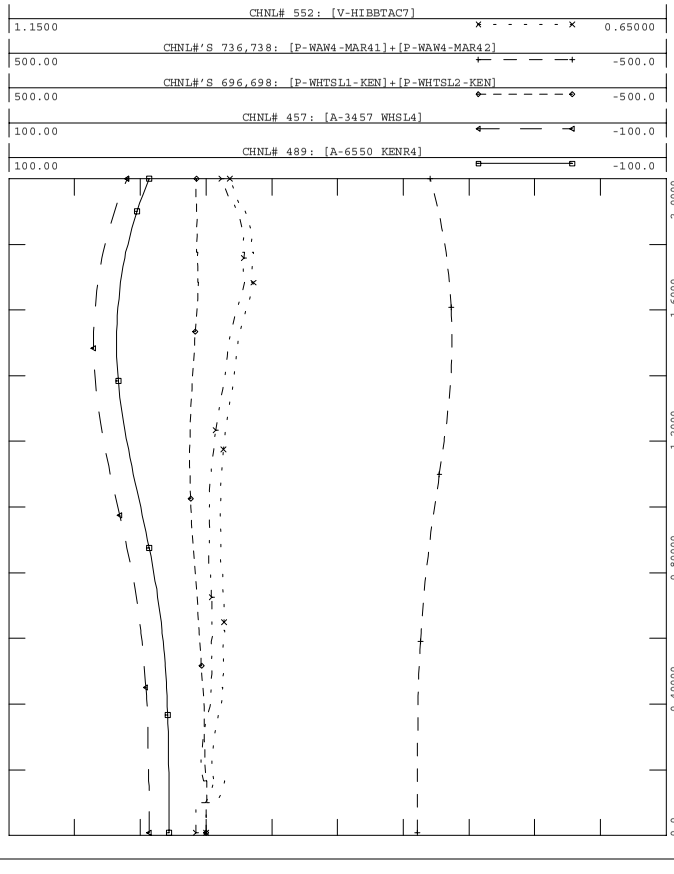
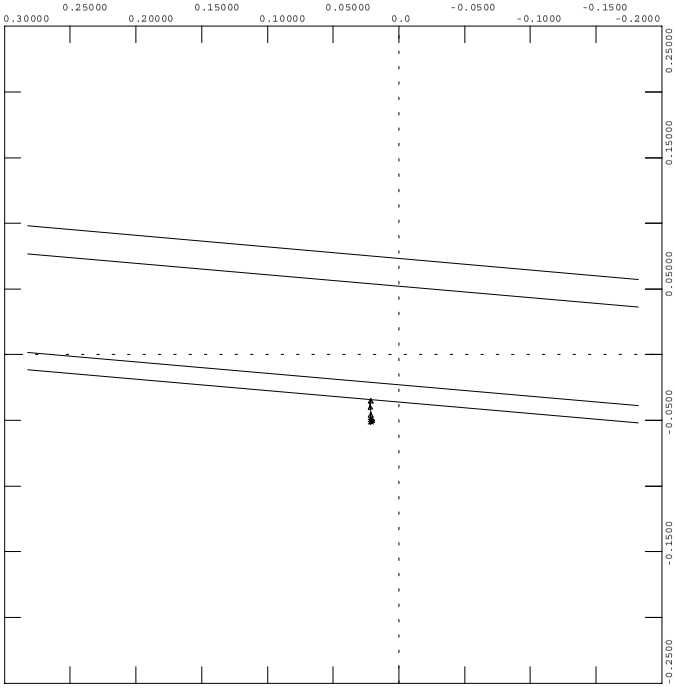
VOLTAGES, ANGLES



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

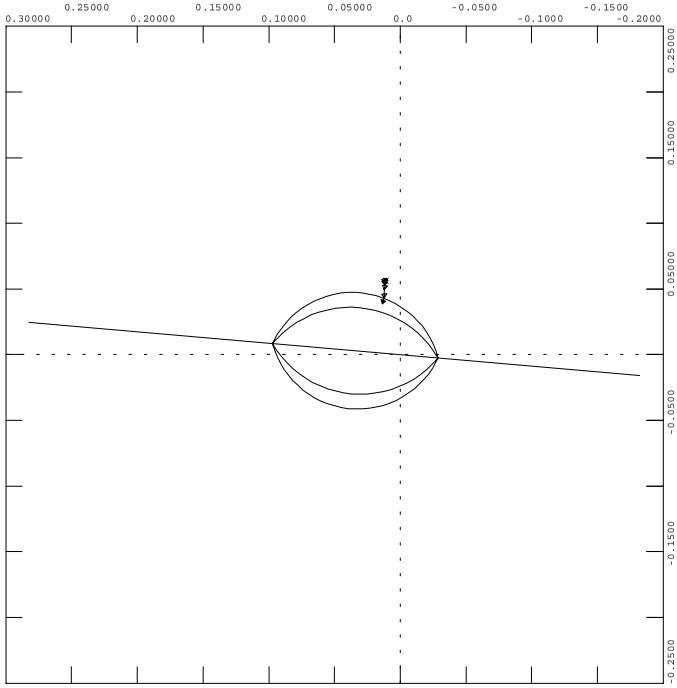


TUE, APR 30 2002 9:47
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

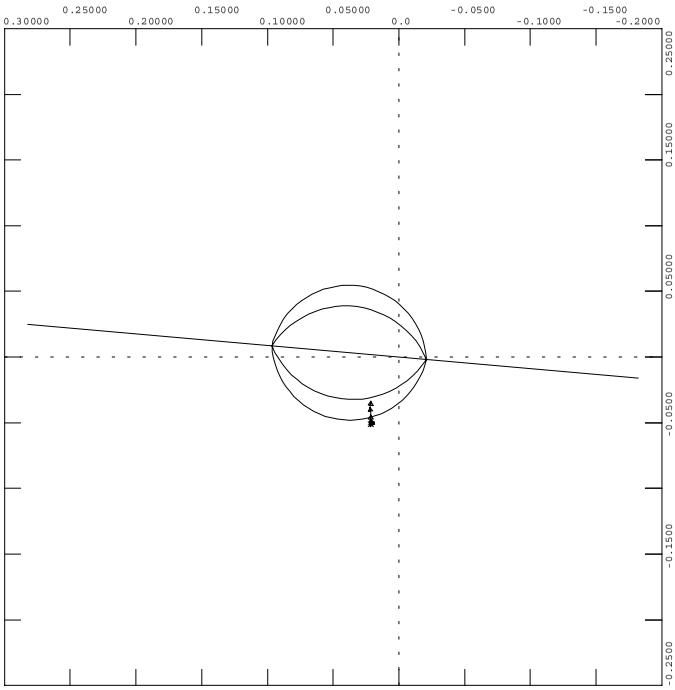


TUE, APR 30 2002 9:47
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

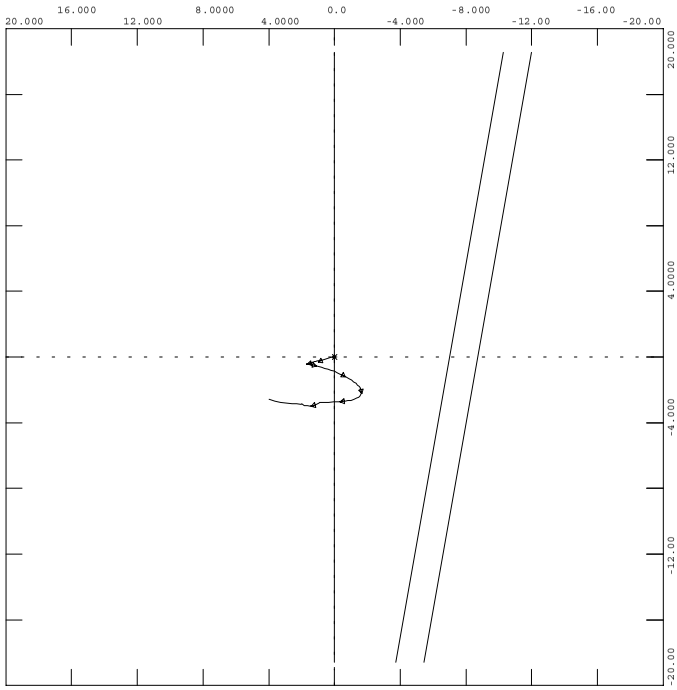


TUE, APR 30 2002 9:47
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

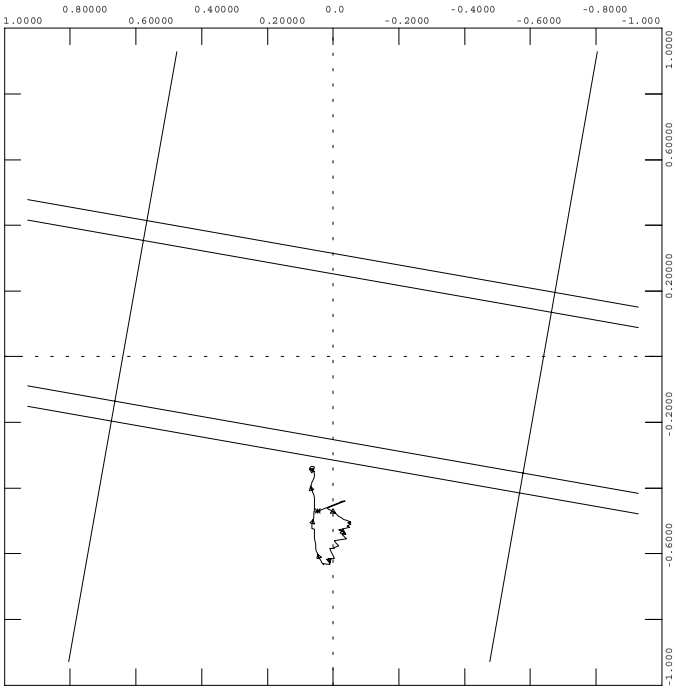


TUE, APR 30 2002 9:47
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

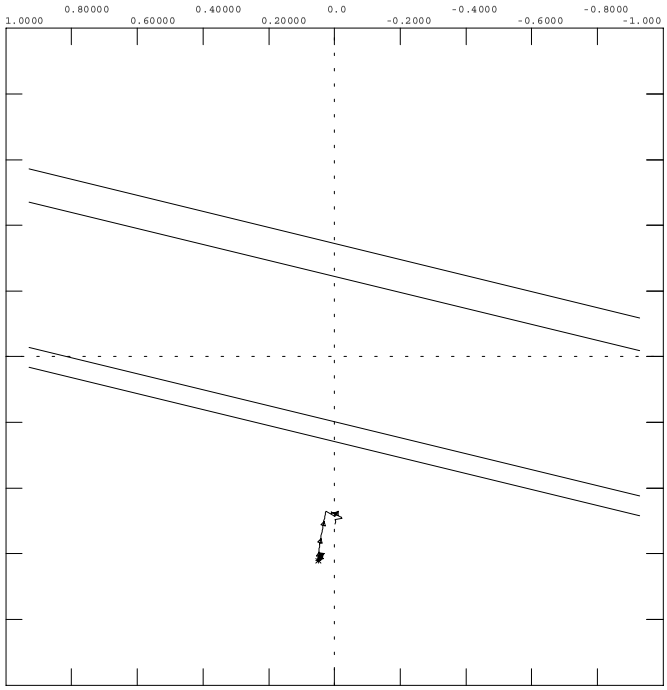
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

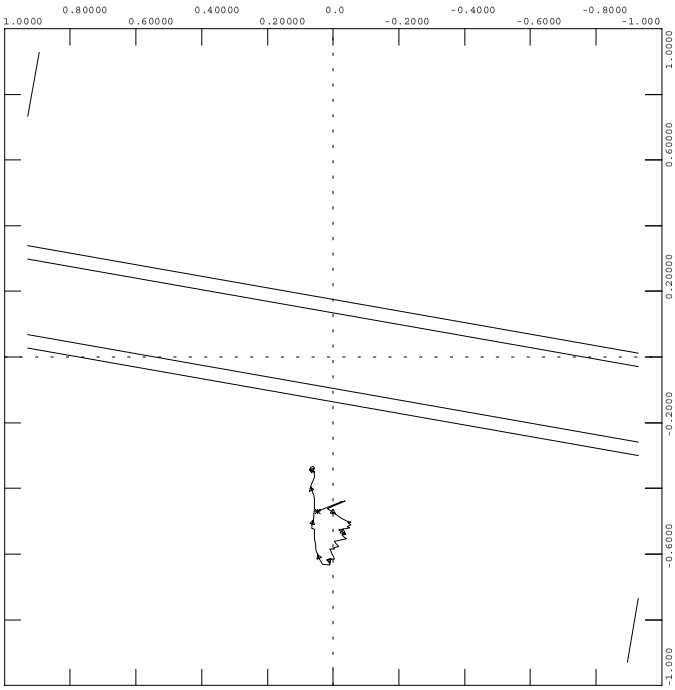
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

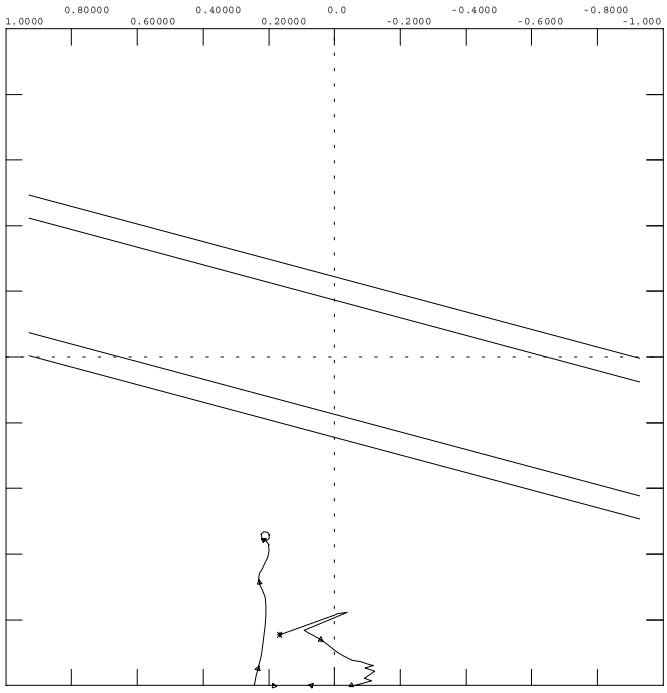
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

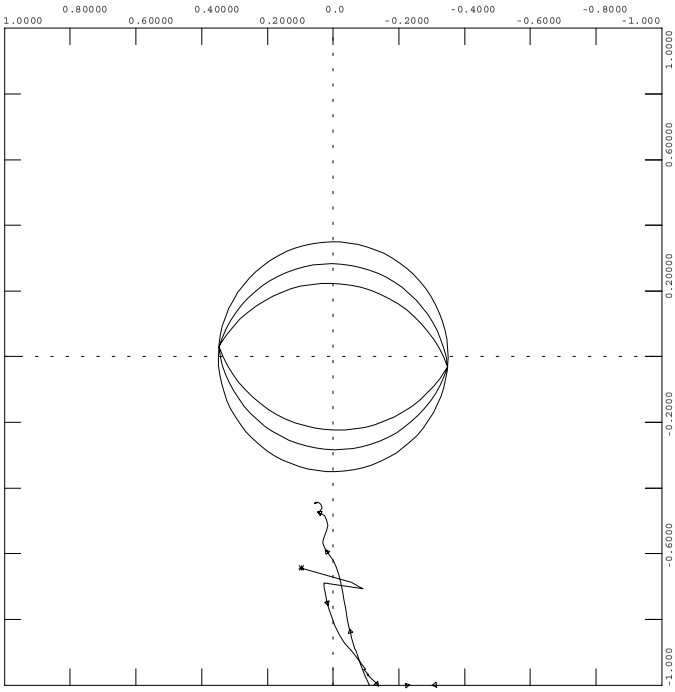
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

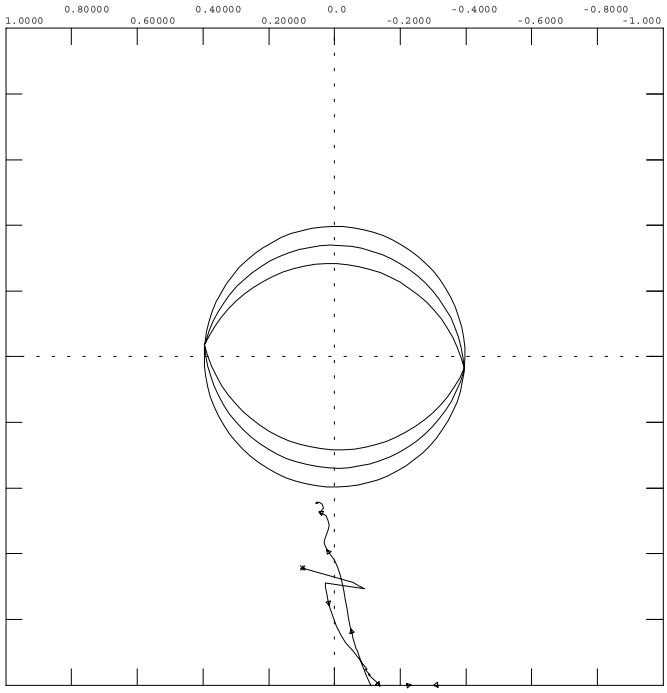


TUE, APR 30 2002 9:47
TIOGA-B.DAM-SOUTH (266)
CHNL# 813: [R-604 3203 1]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

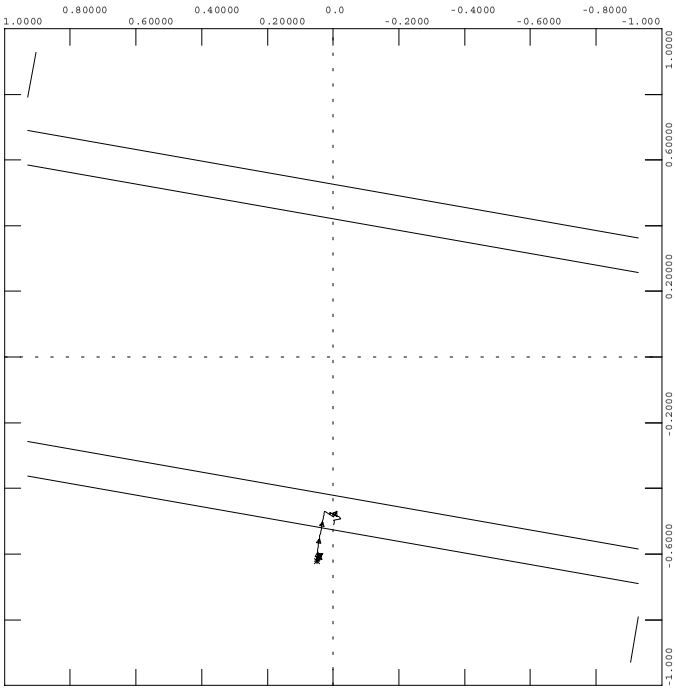


TUE, APR 30 2002 9:47
TIOGA-B.DAM-EMRG (267)
CHNL# 813: [R-604 3203 1]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

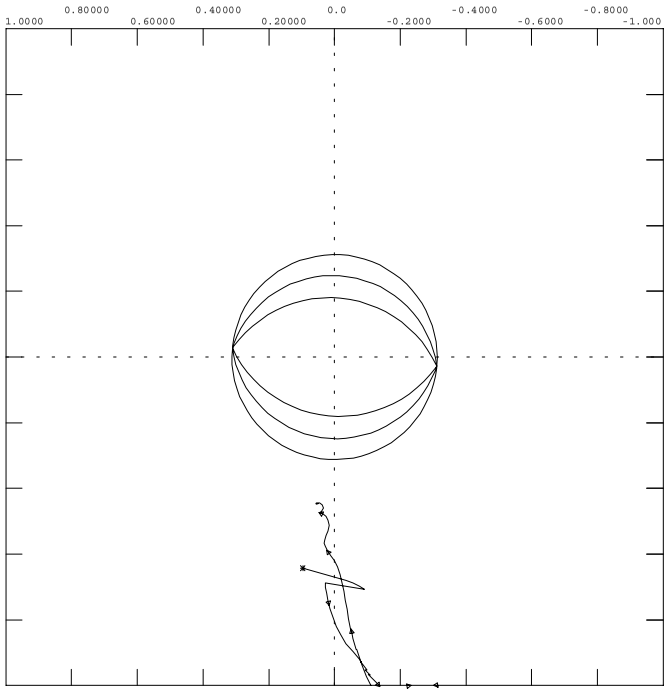


TUE, APR 30 2002 9:47
R50M-MORANVILLE-EMRG (777
CHNL# 821: [R-757 1679 1]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

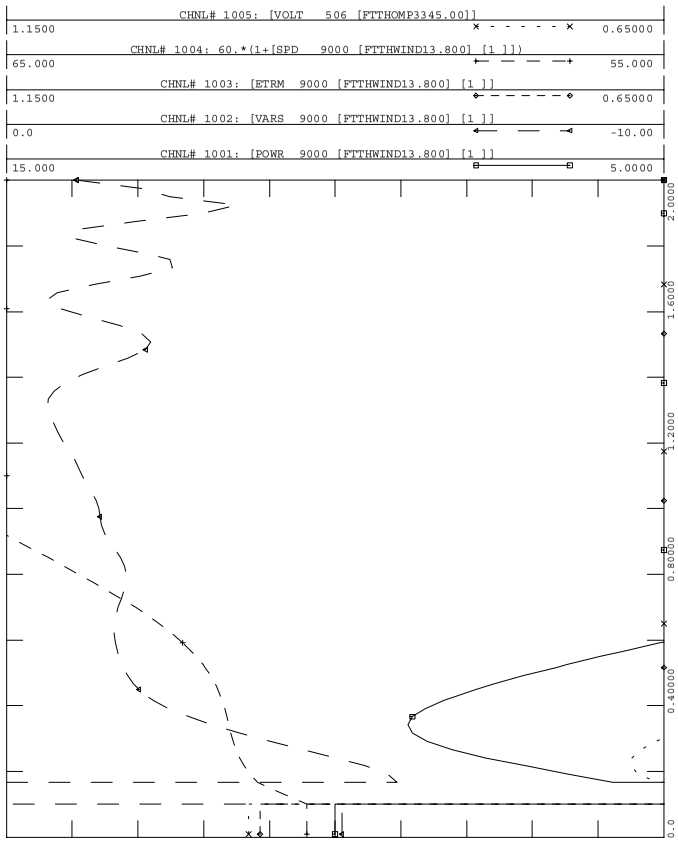
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



TUE, APR 30 2002 9:47
TIOGA-B.DAM-NORTH (268)
CHNL# 813: [R-604 3203 1]

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

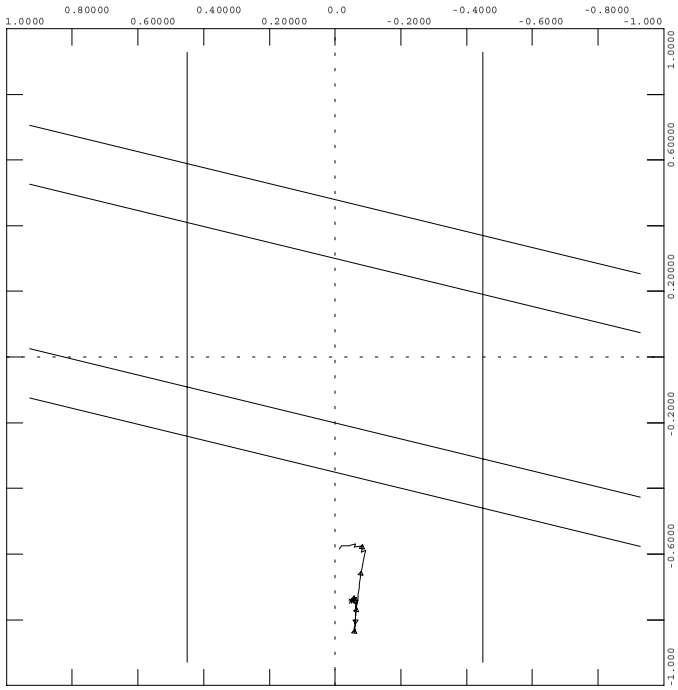


TUE, APR 30 2002 9:47
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXX-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



TUE, APR 30 2002 9:47
MP-OH I.FALLS (779)

APPENDIX 25

SCREENING OF MAPP CONTINGENCIES

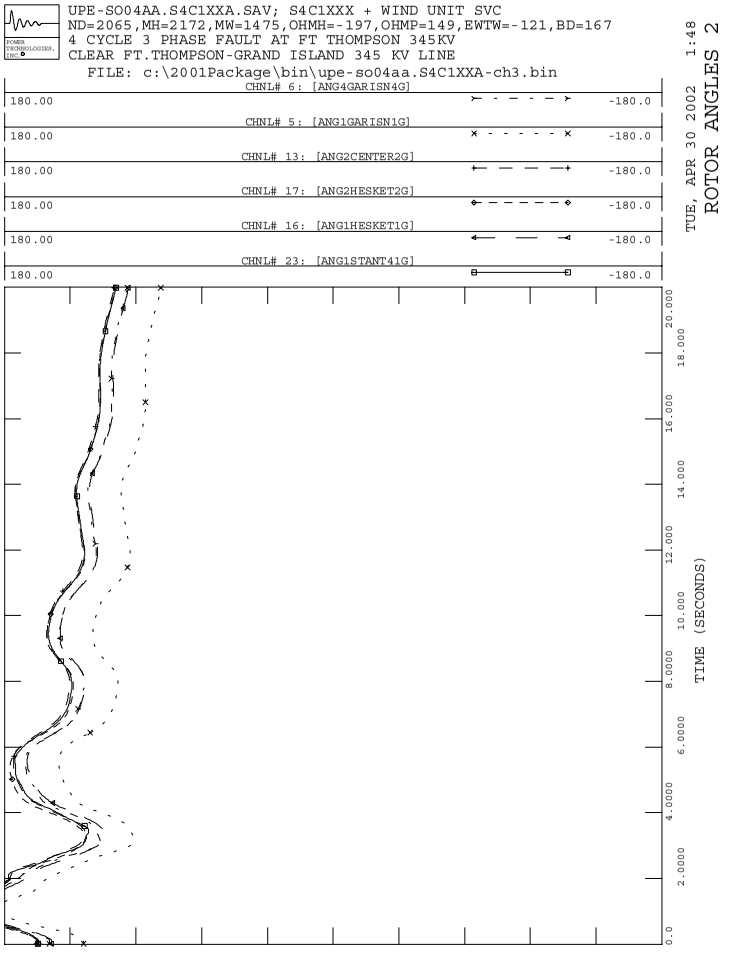
WITH DYNAMIC SIMULATION

SITE 4 (FT. THOMPSON)

CASE S4C1XXA

CONTINGENCY CH3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Grand Island 345 kV line


UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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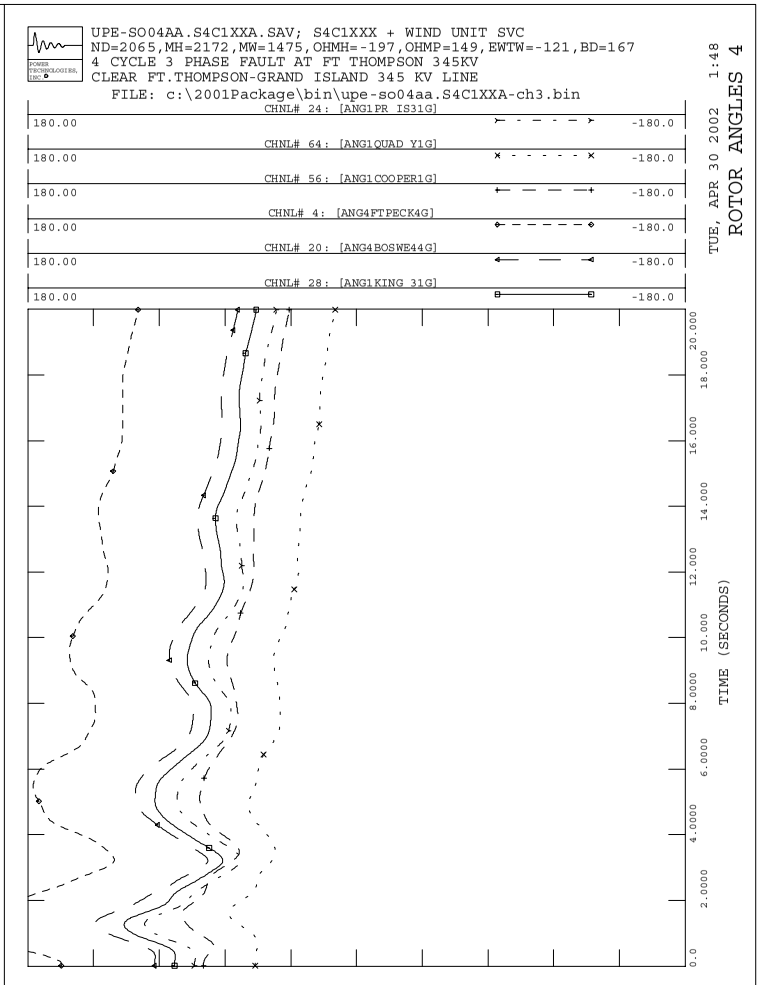
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 1:48
ROTOR ANGLES 2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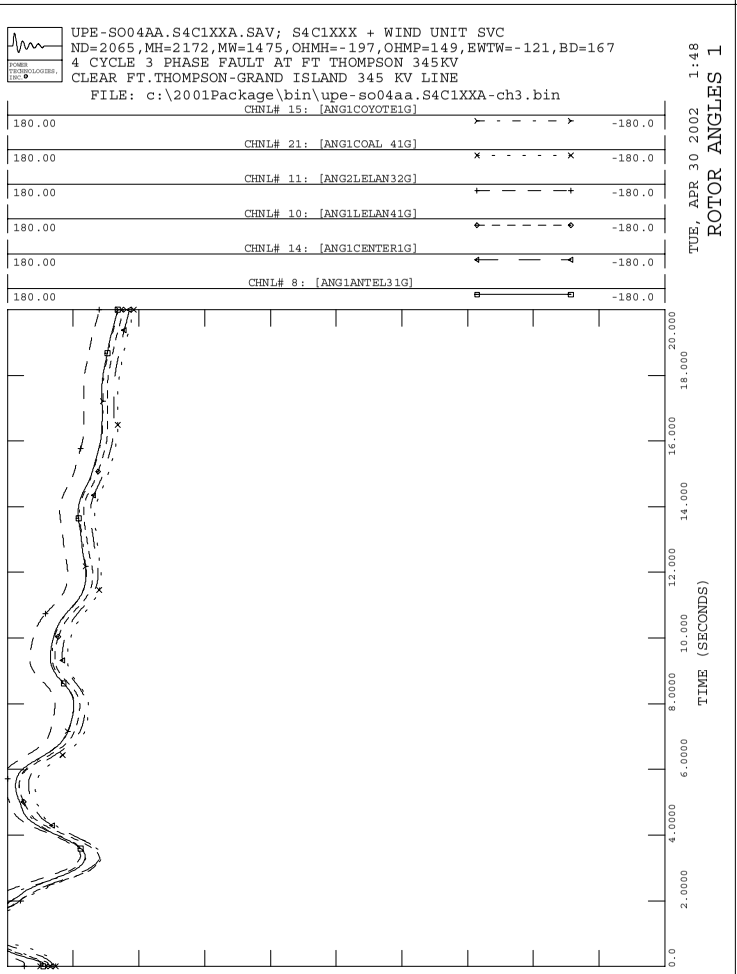
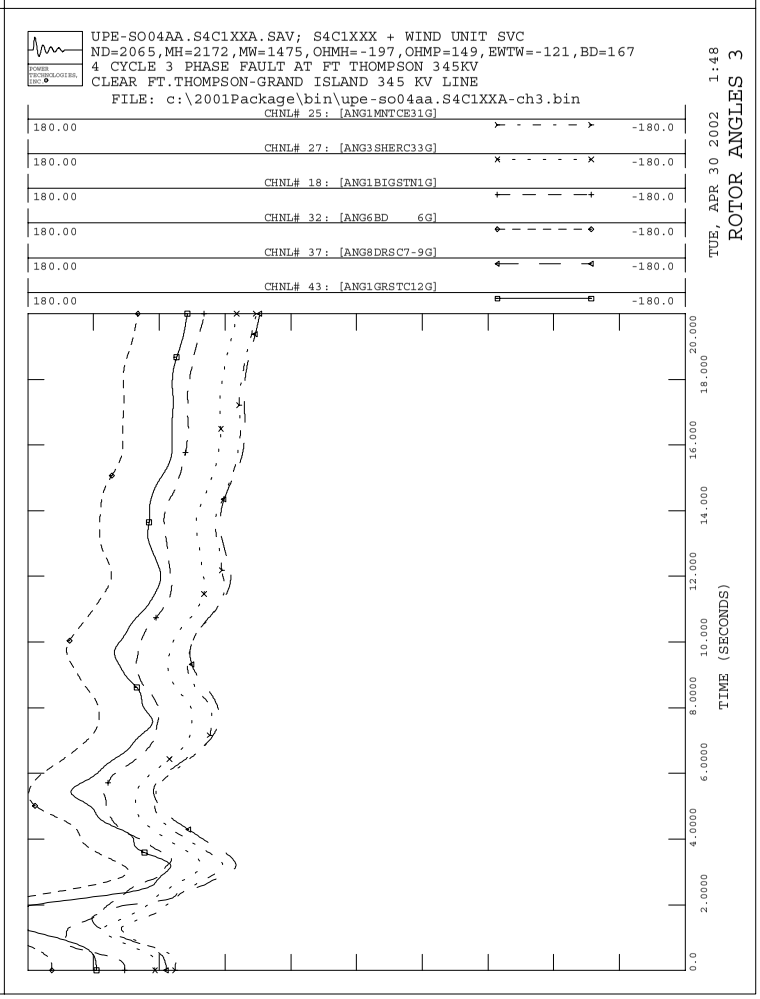
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 1:48
ROTOR ANGLES 4


UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 1:48
ROTOR ANGLES 1


UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 1:48
ROTOR ANGLES 3

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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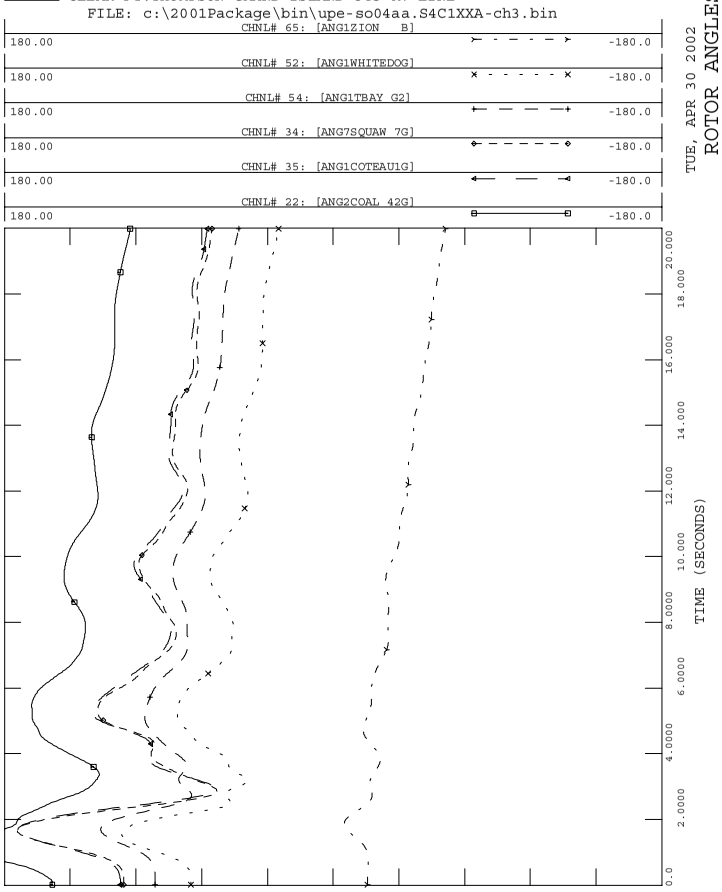
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48
ROTOR ANGLES 6



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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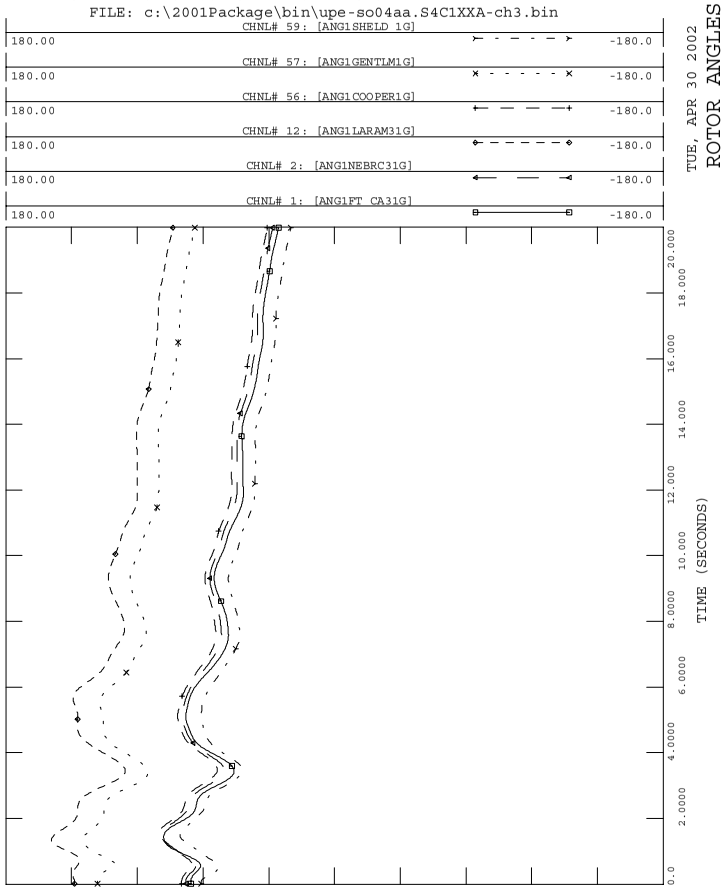
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48
ROTOR ANGLES NB



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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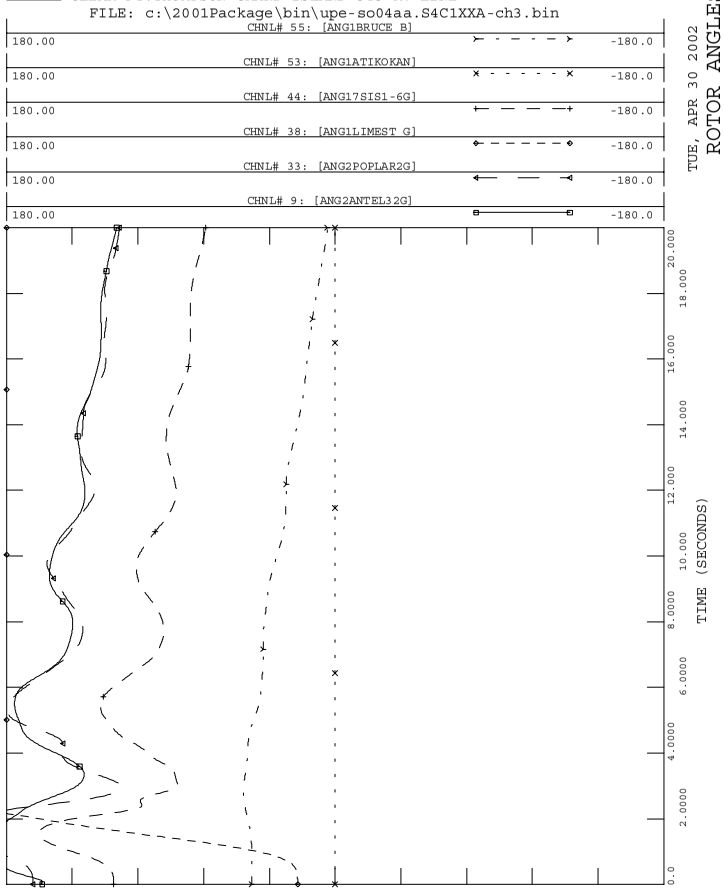
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48
ROTOR ANGLES 5



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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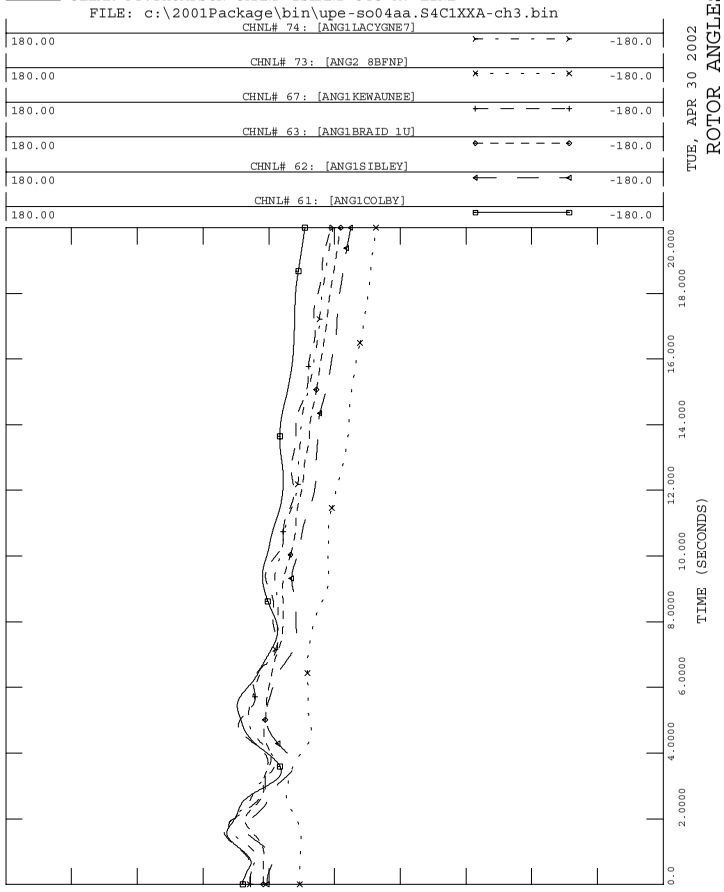
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48
ROTOR ANGLES 7



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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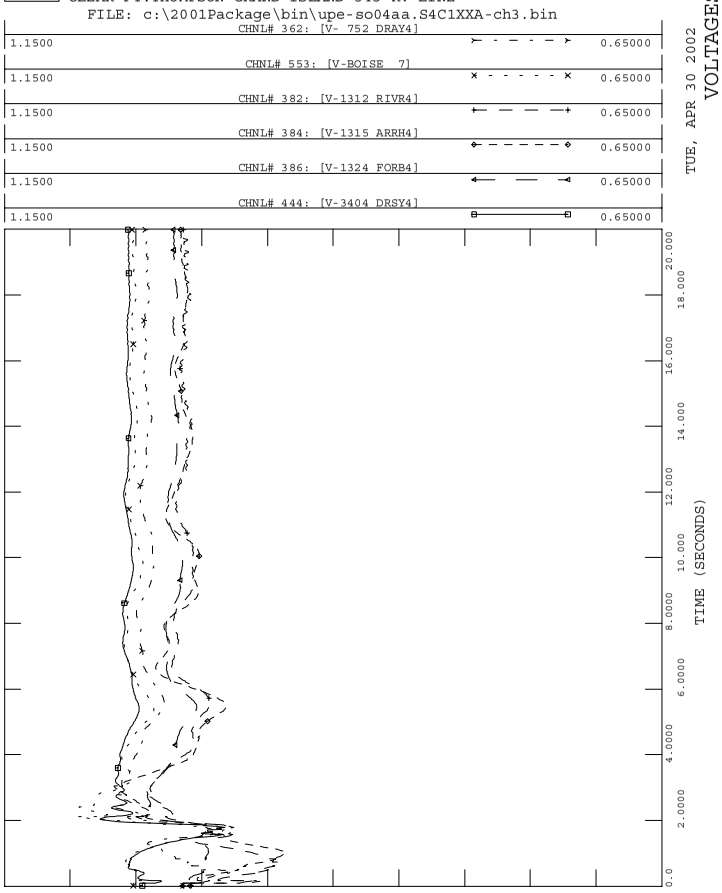
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48
VOLTAGES 1



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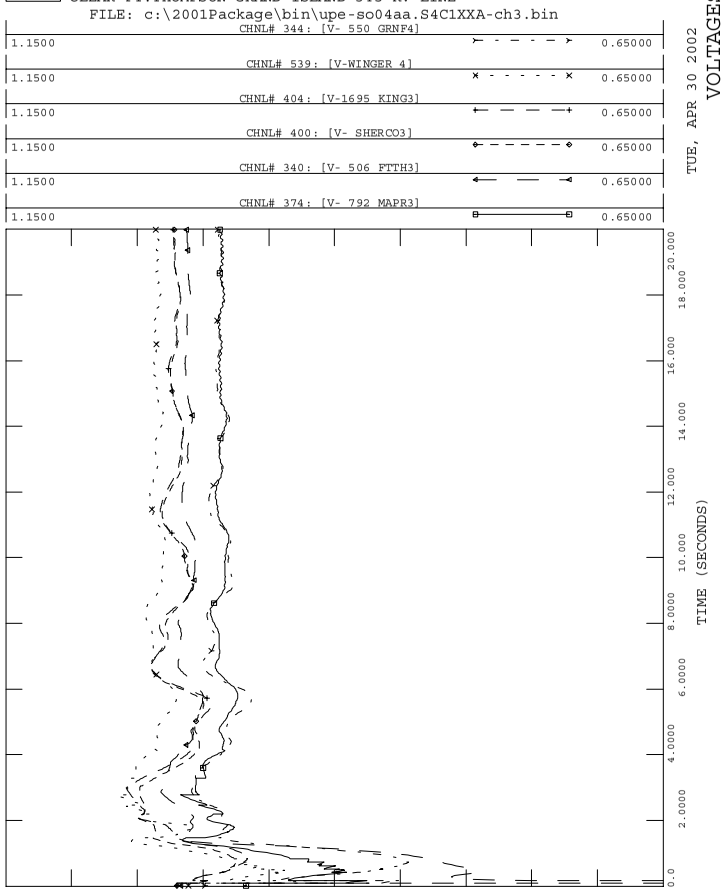
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48
VOLTAGES 3



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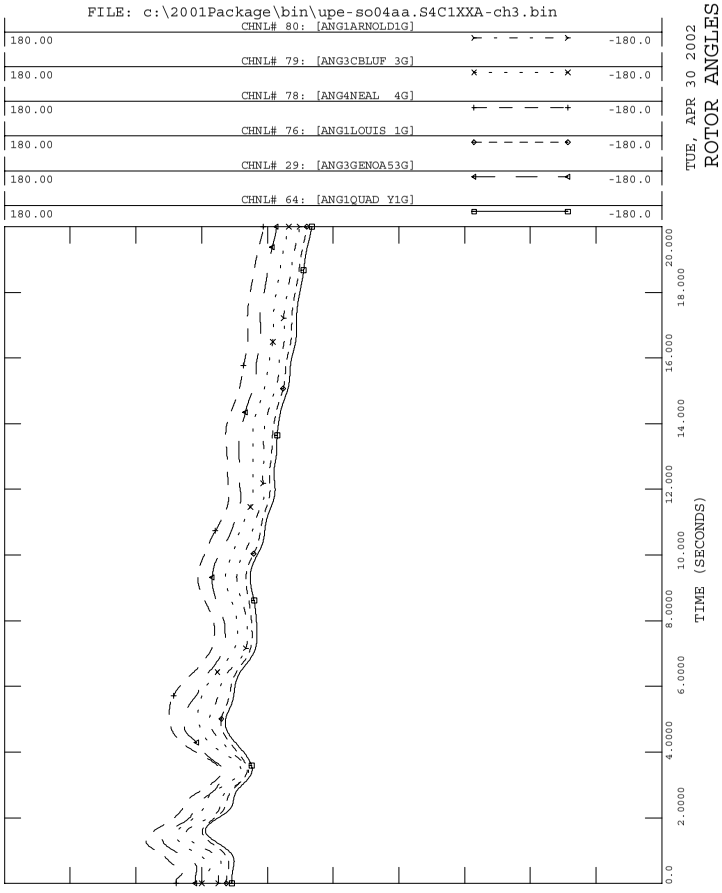
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48
ROTOR ANGLES IA



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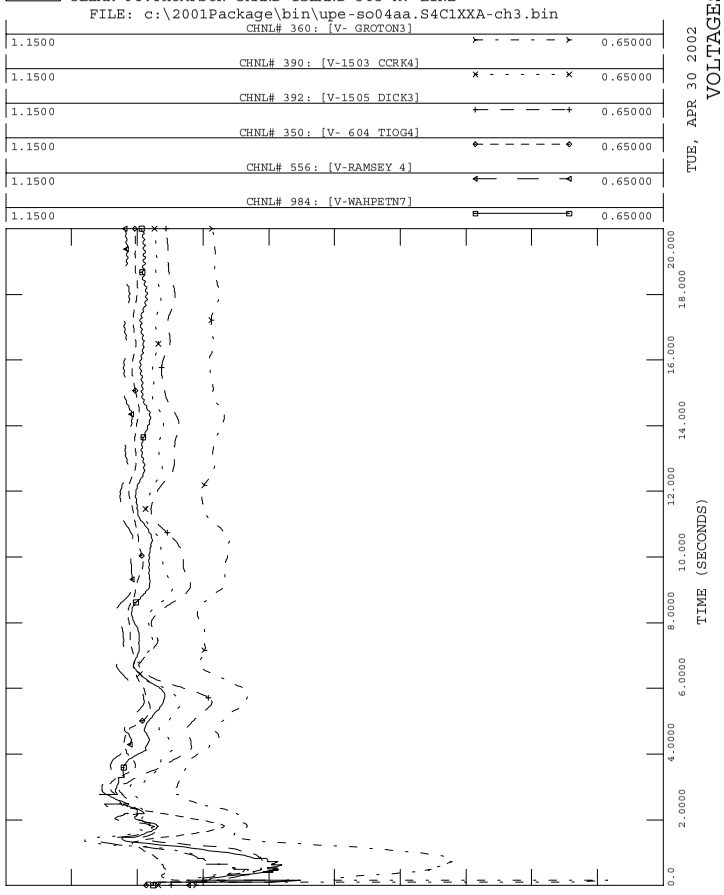
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48
VOLTAGES 2



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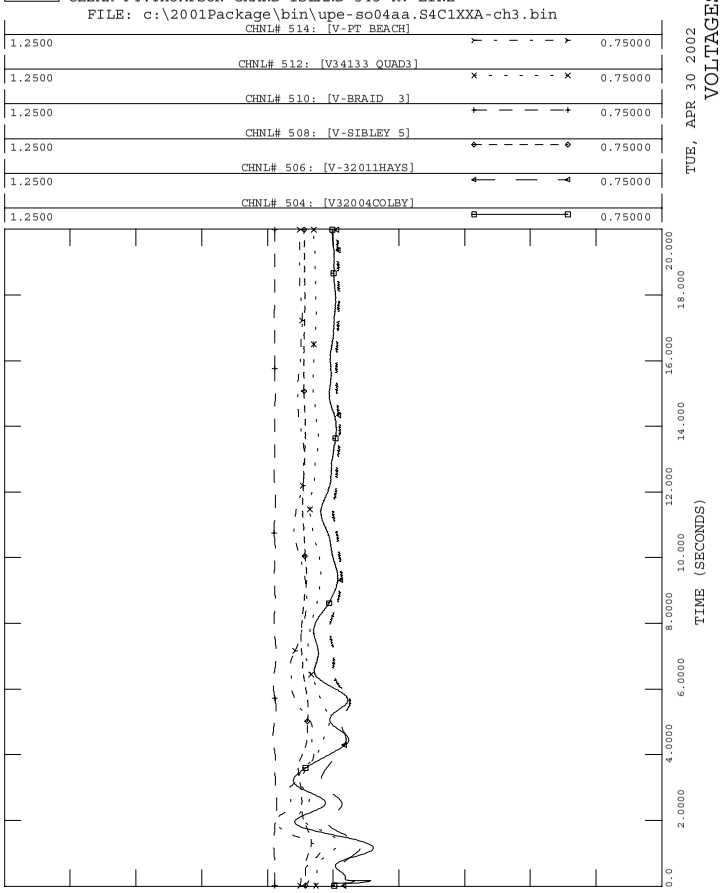
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48 VOLTAGES 5



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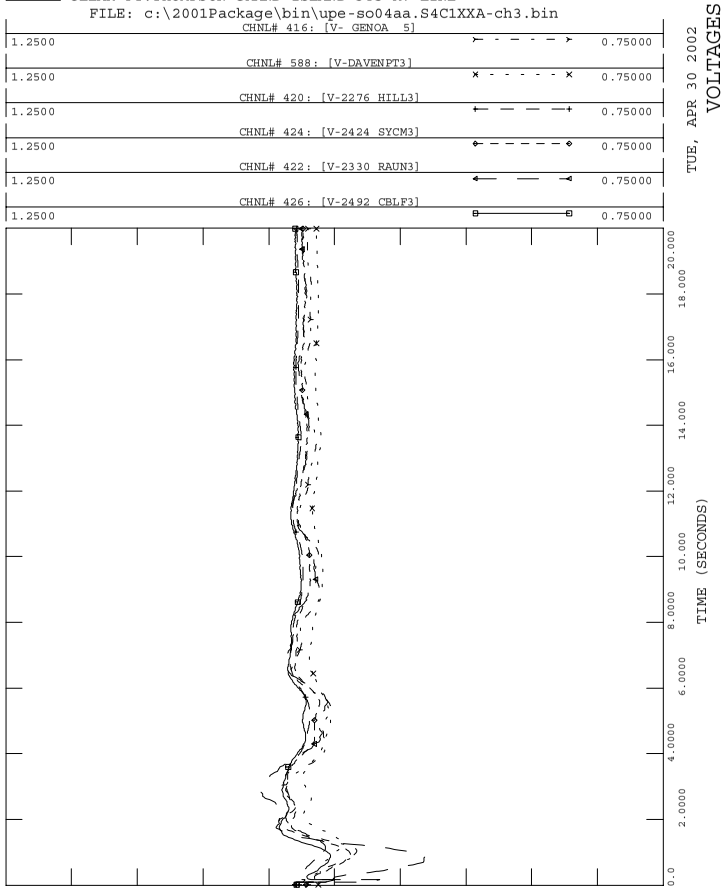
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48 VOLTAGES IA



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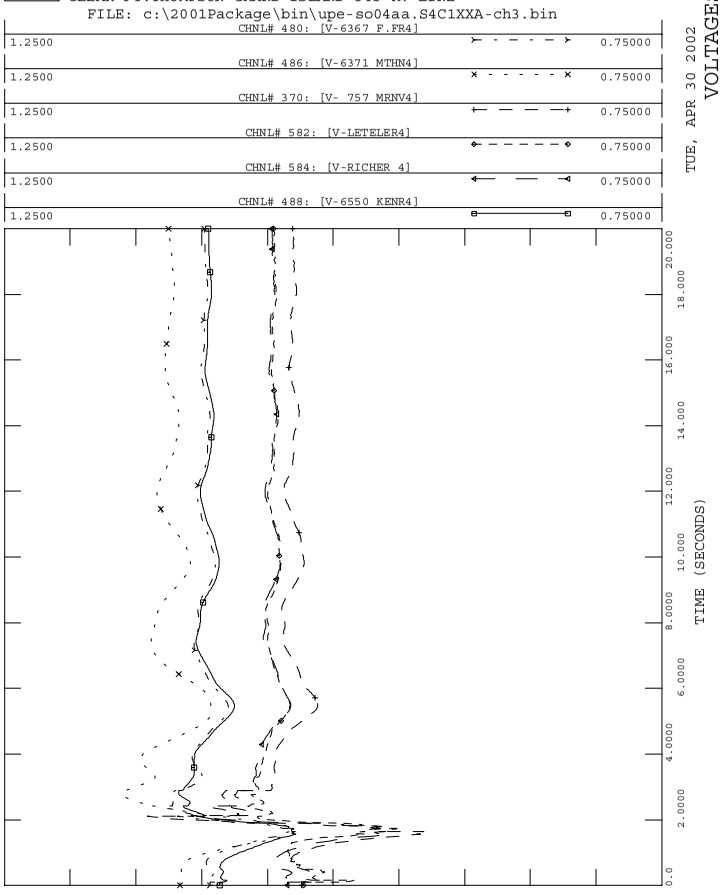
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48 VOLTAGES 4



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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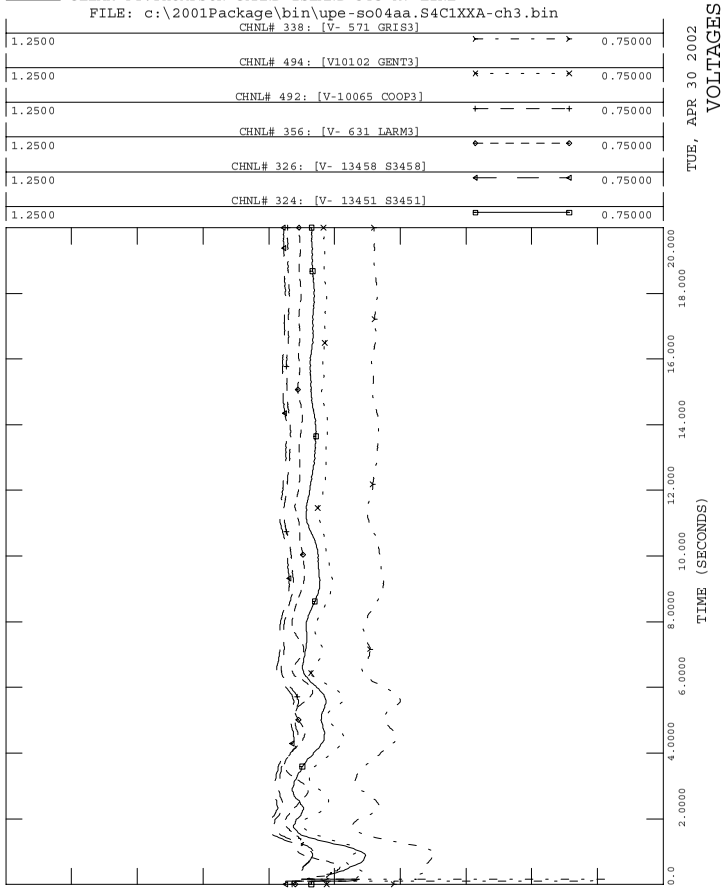
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48 VOLTAGES NB



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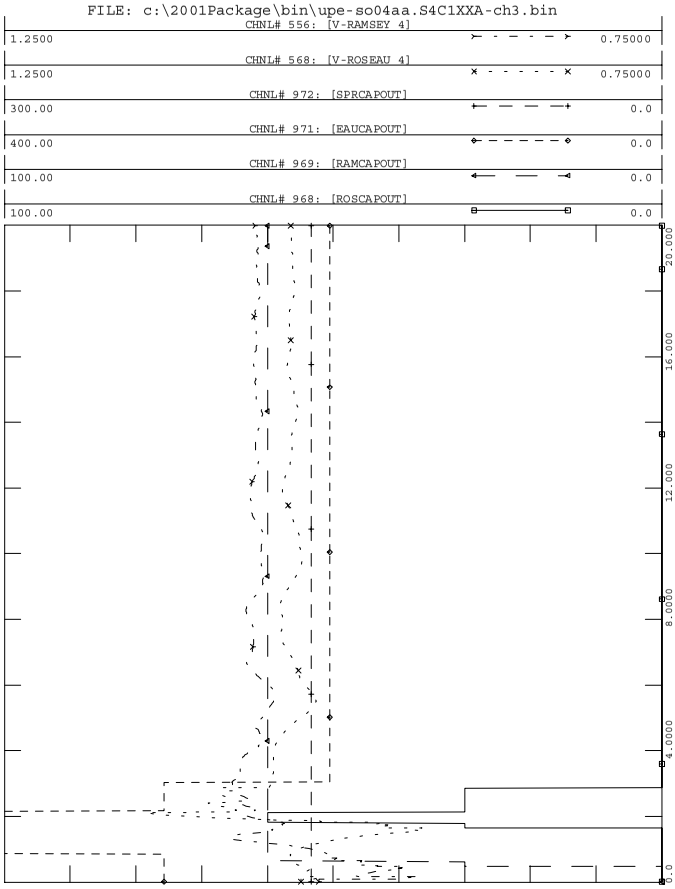
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48

FAST SW CAP OUT 2



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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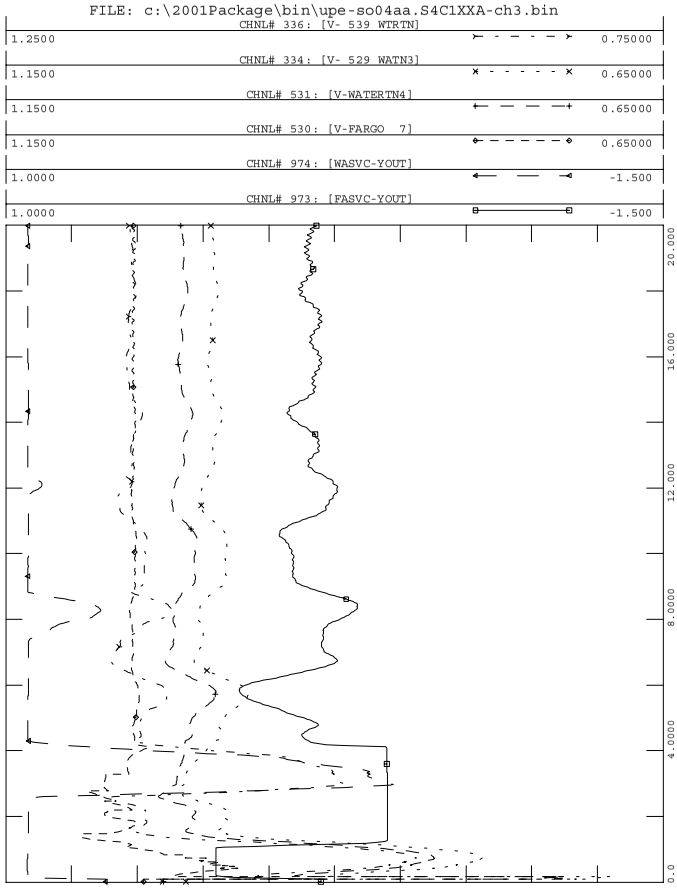
TUE, APR 30 2002 1:48

FARGO/WATERTOWN SVS



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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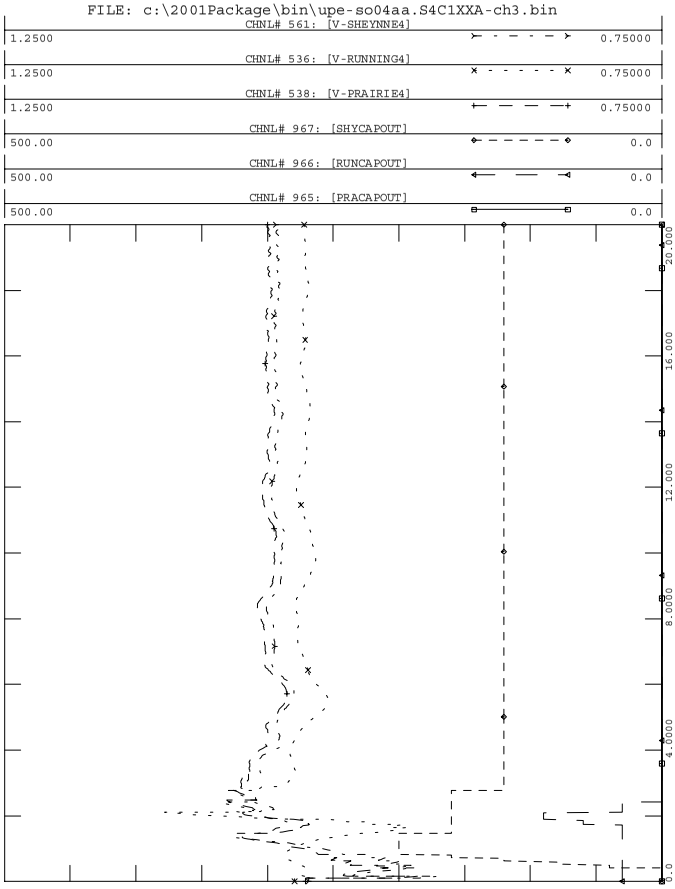
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48

FAST SW CAP OUT 1



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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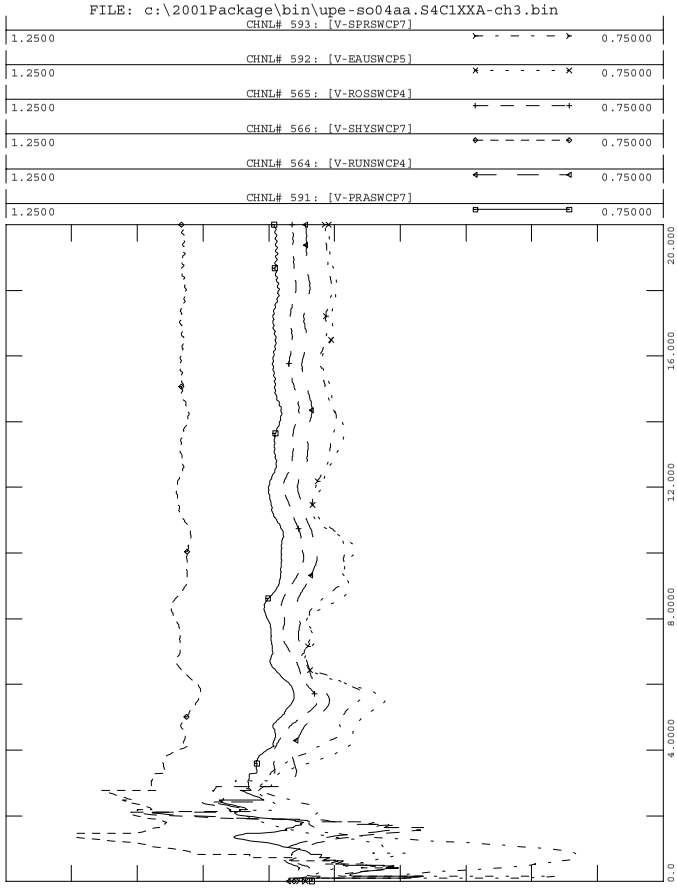
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48

FAST SW CAP VOLTAGES



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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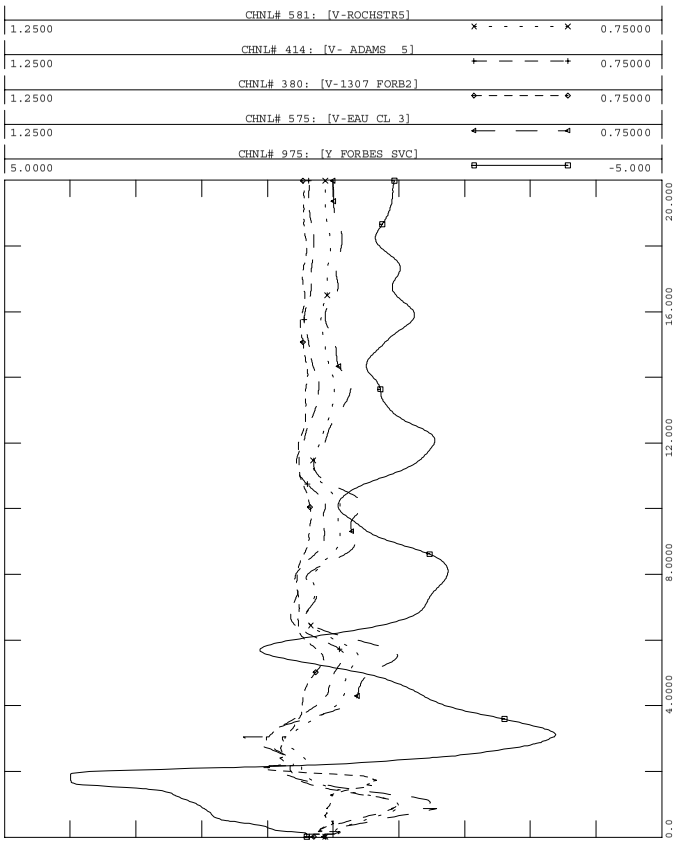
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48

SVC & WISCONSIN VOLT



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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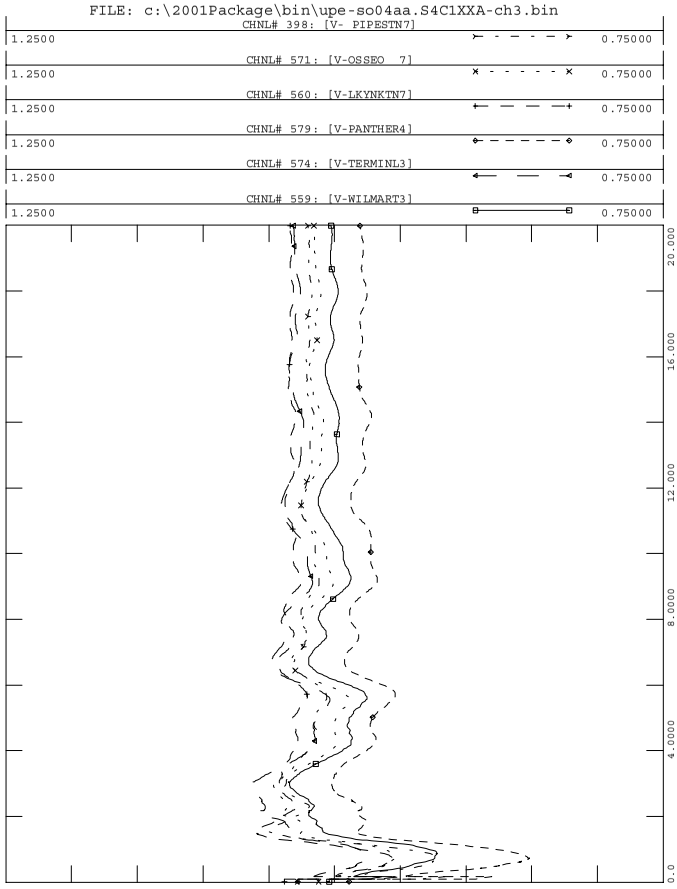
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48

TC VOLTAGES



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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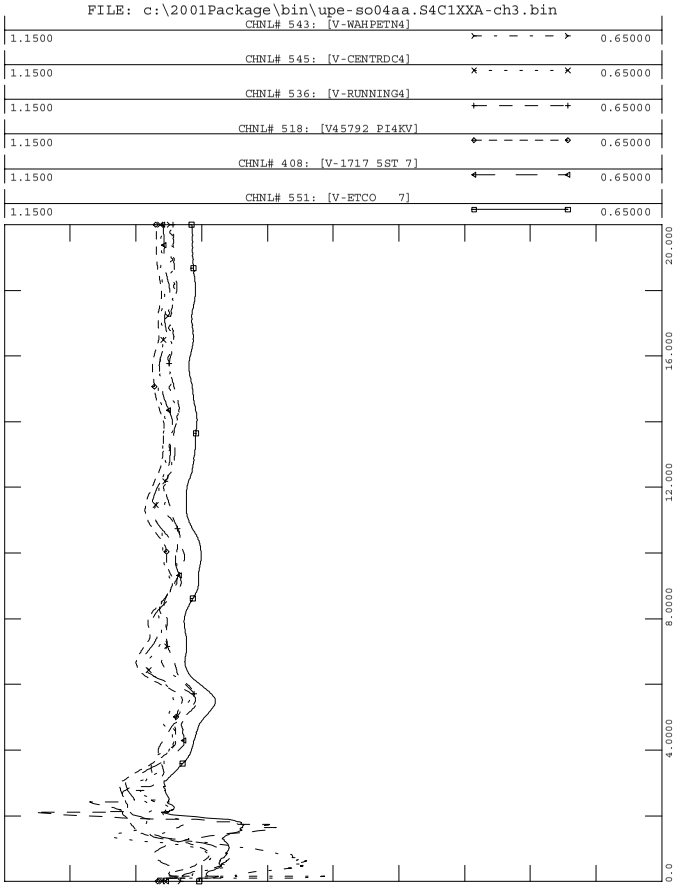
VOLTAGES 6



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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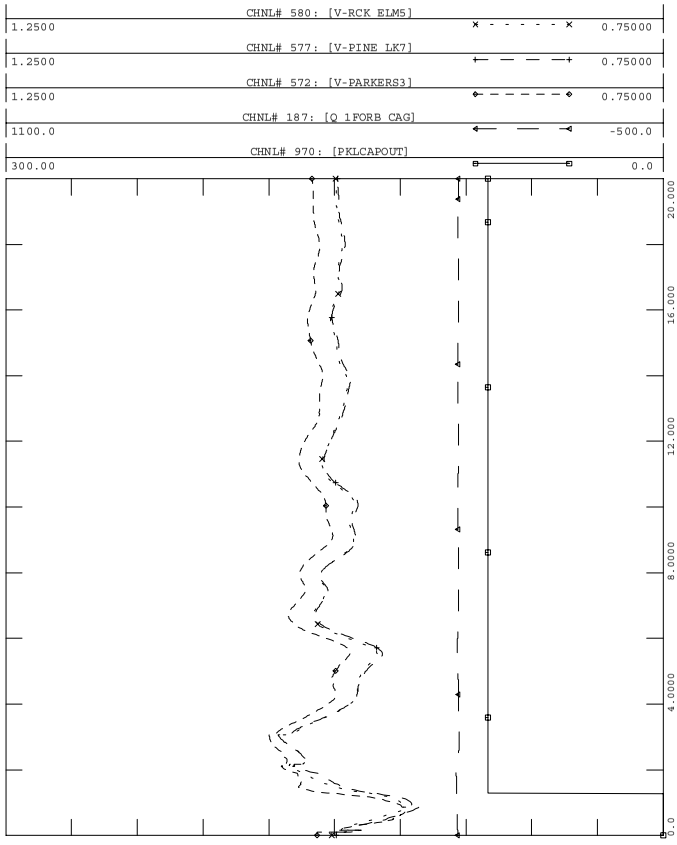
FORBES SVS OUT & VOLTAGES



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CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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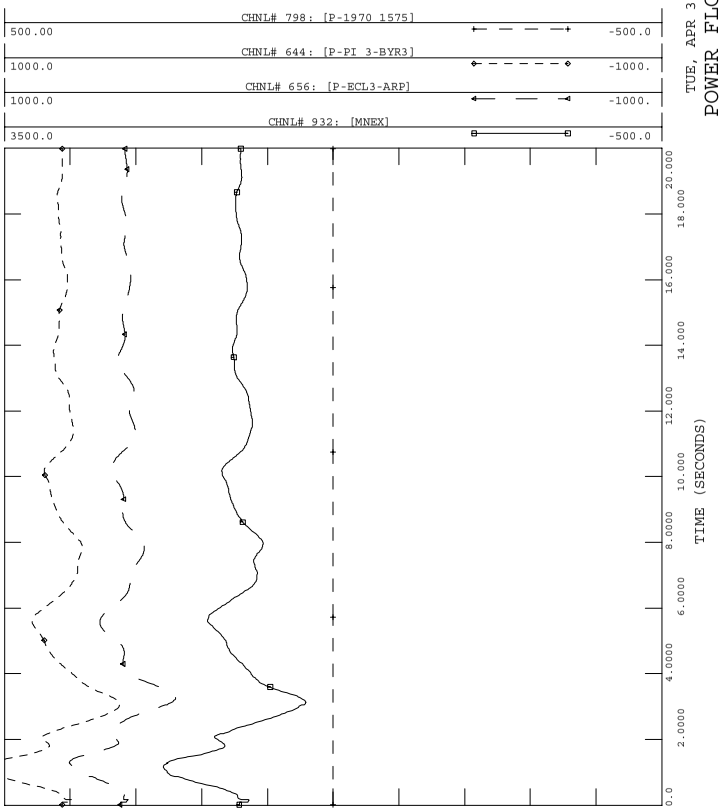
POWER FLOW SUMS 2



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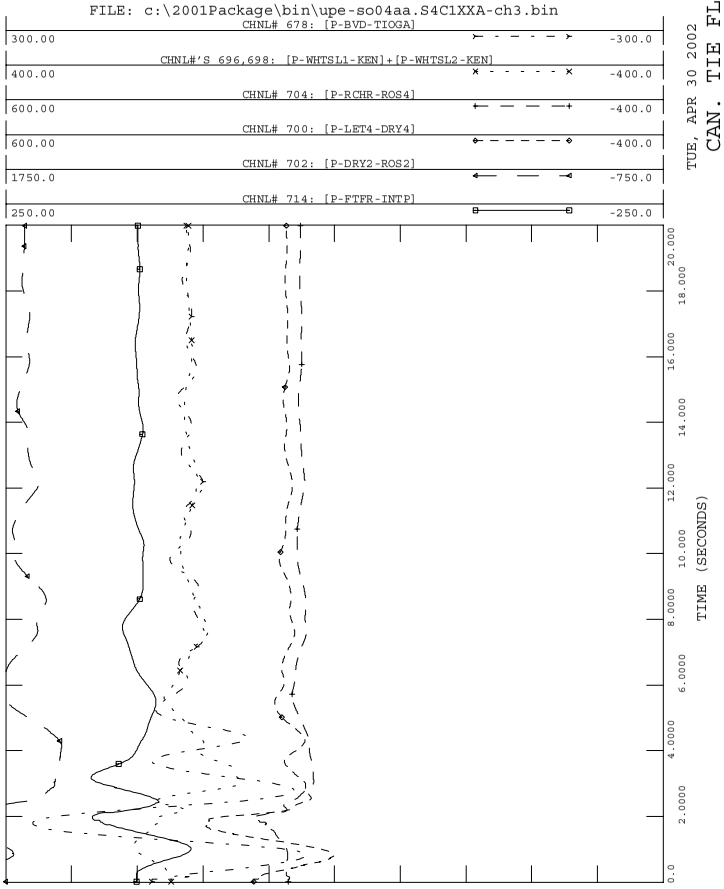
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48
CAN. TIE FLOWS



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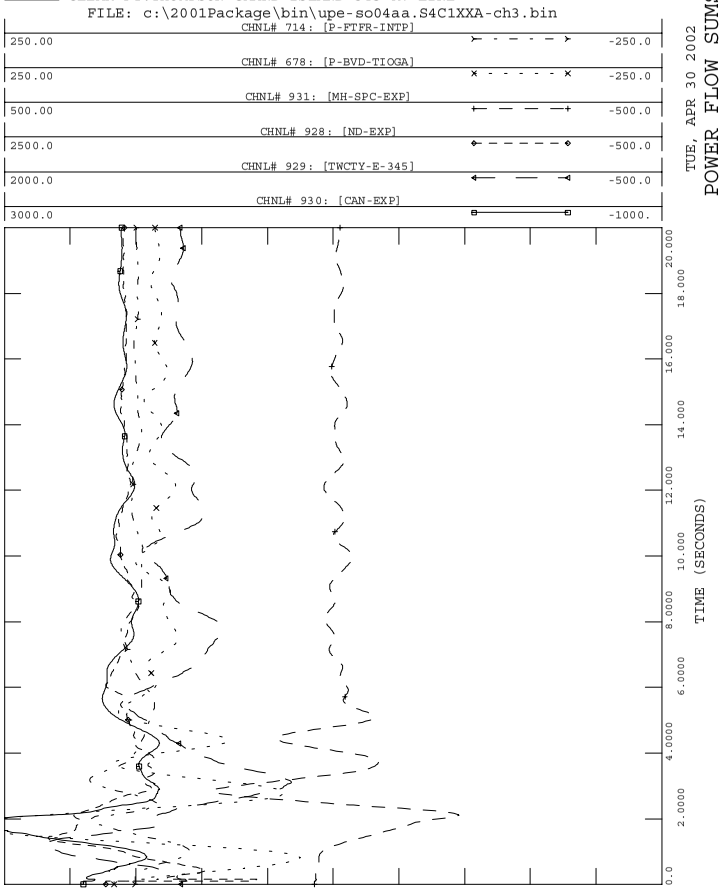
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48
POWER FLOW SUMS 1



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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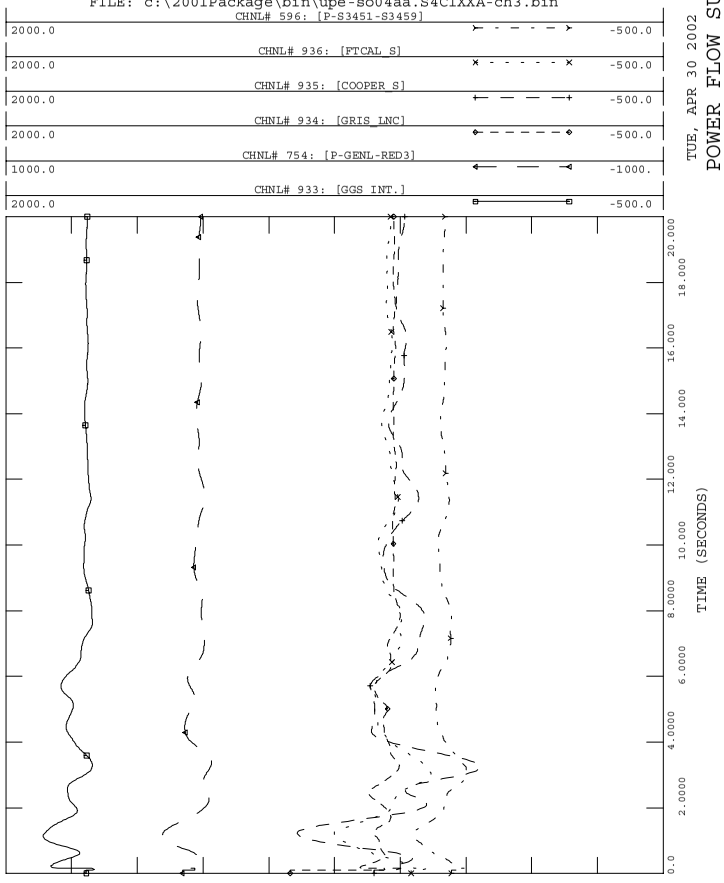
POWER FLOW SUM 3



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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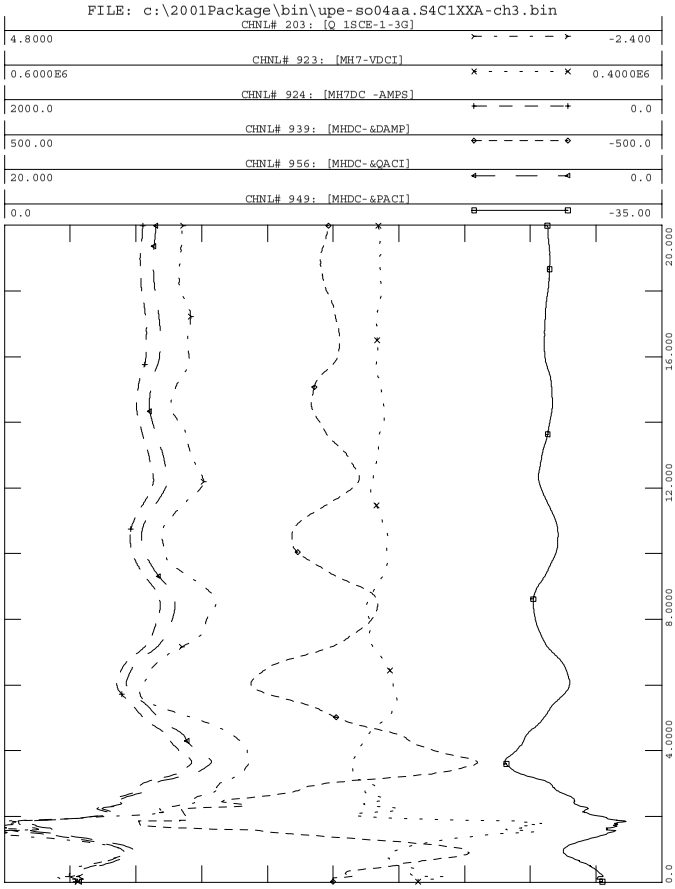
TUE, APR 30 2002 1:48
MH DC PARAMETERS



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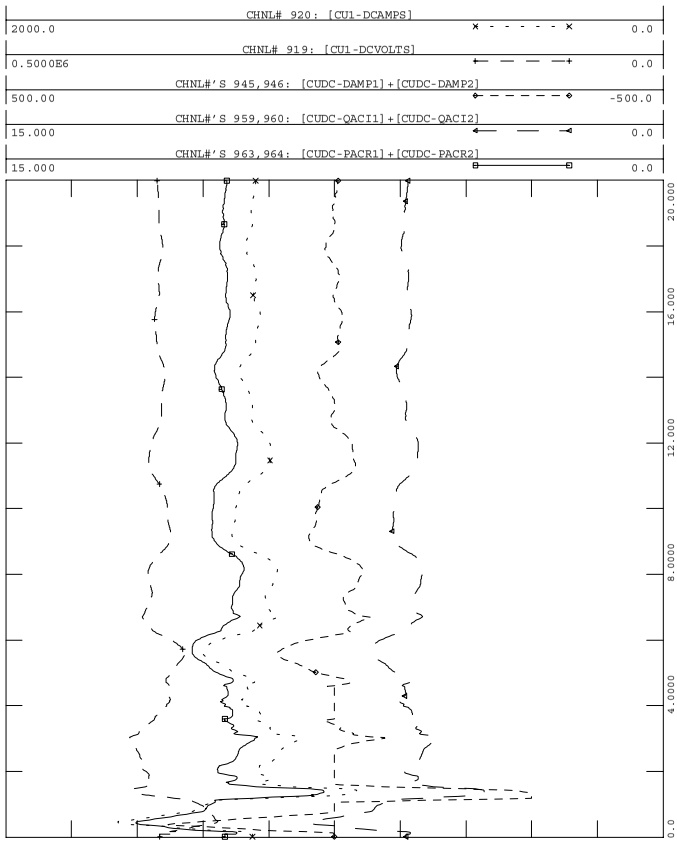
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

TUE, APR 30 2002 1:48
CU DC #1



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CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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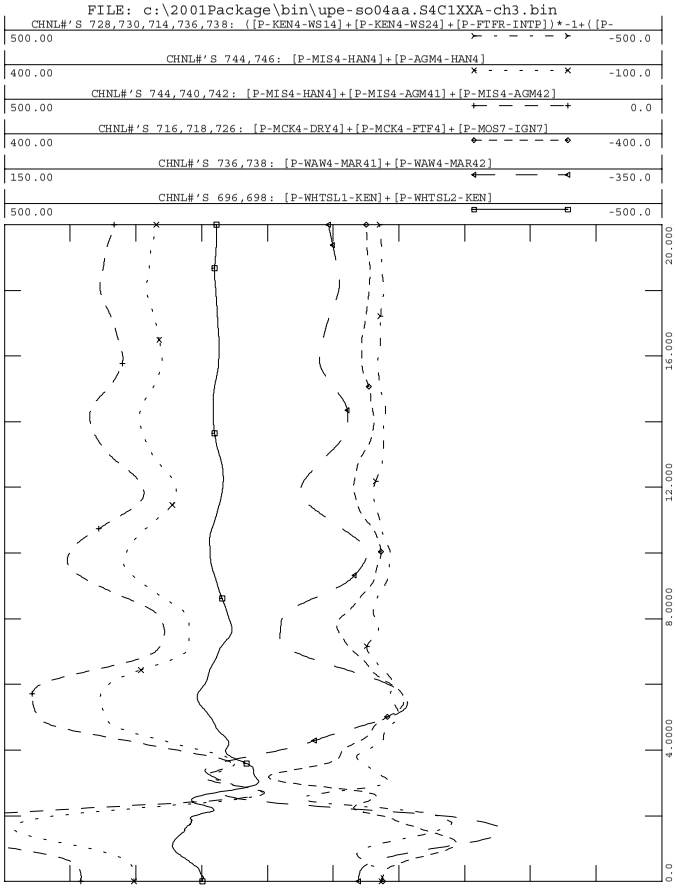
OH TIE FLOWS



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CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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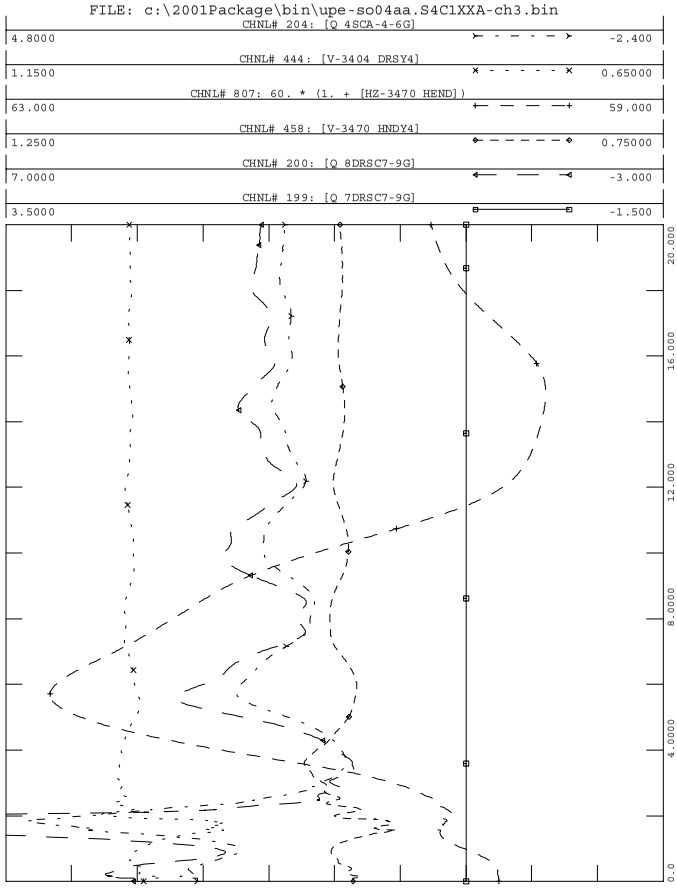
MH DC PARAMETERS



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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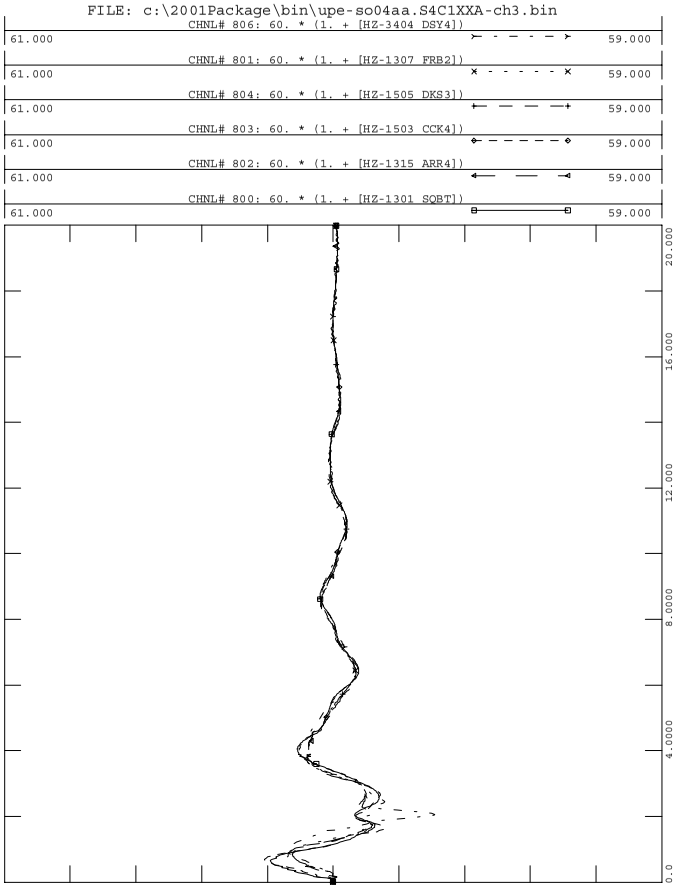
FREQ AT DC TERMINALS



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CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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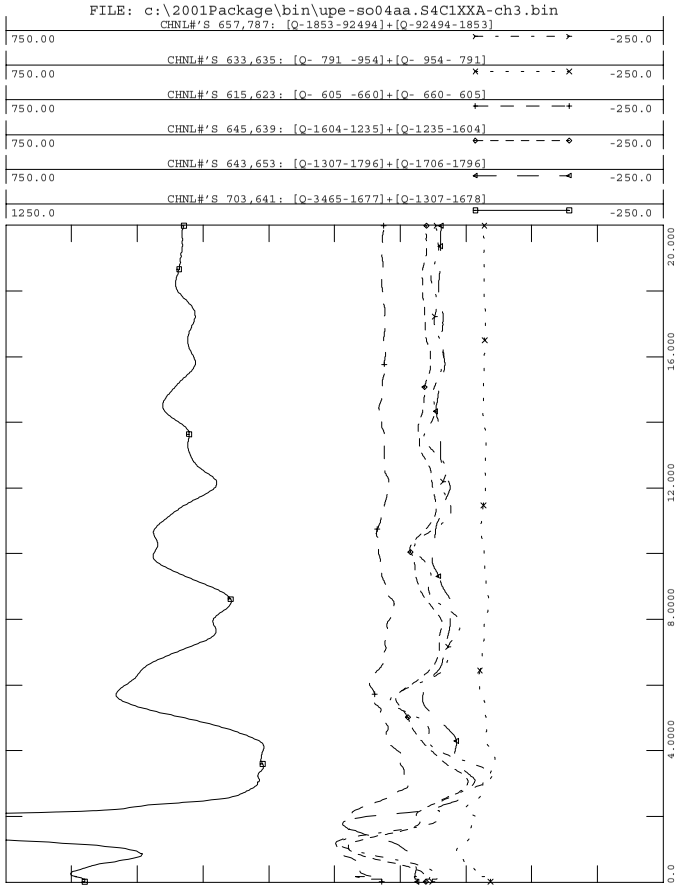
VAR LOSSES



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CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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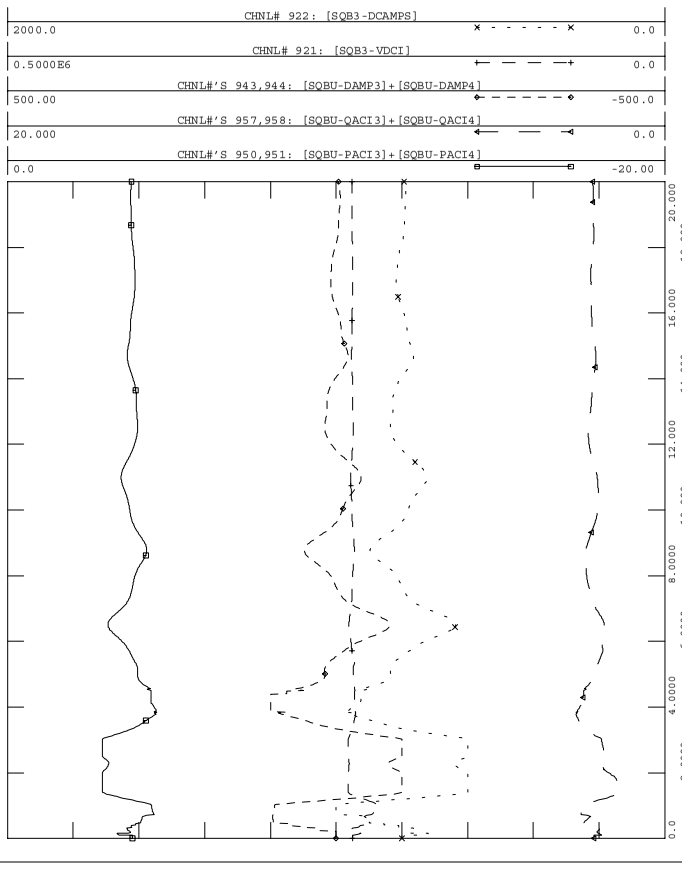
SQB DC #3



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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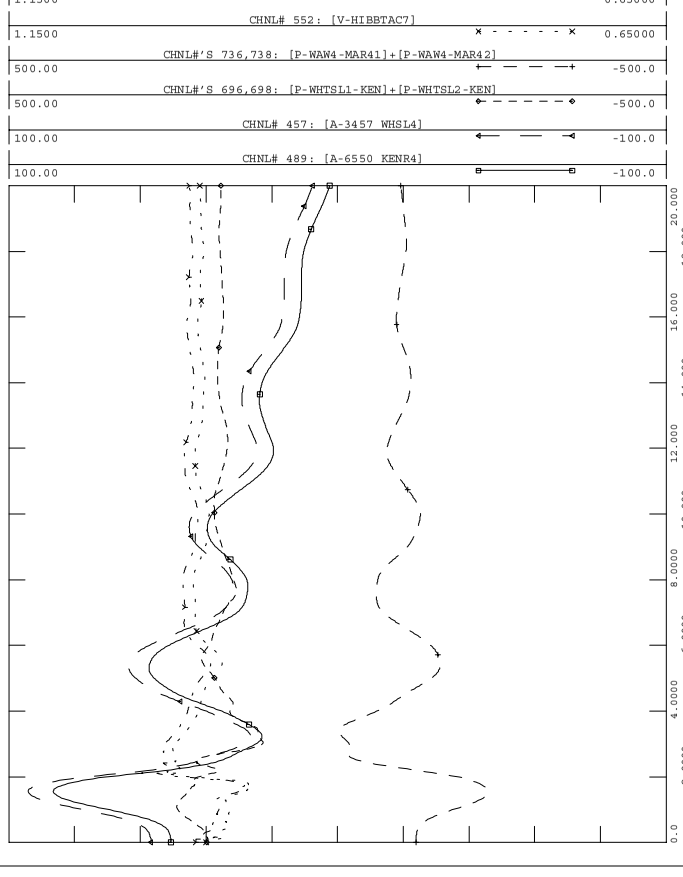
VOLTAGES, ANGLES



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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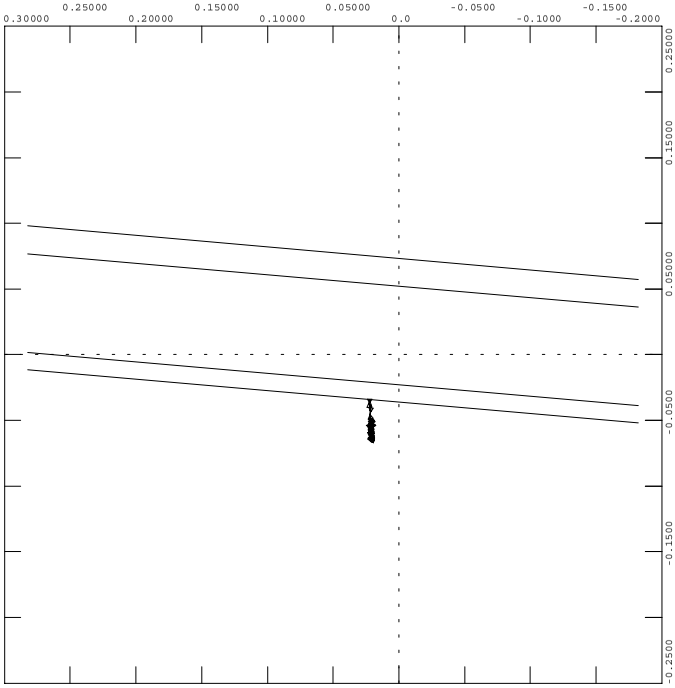
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 30 2002 1:48
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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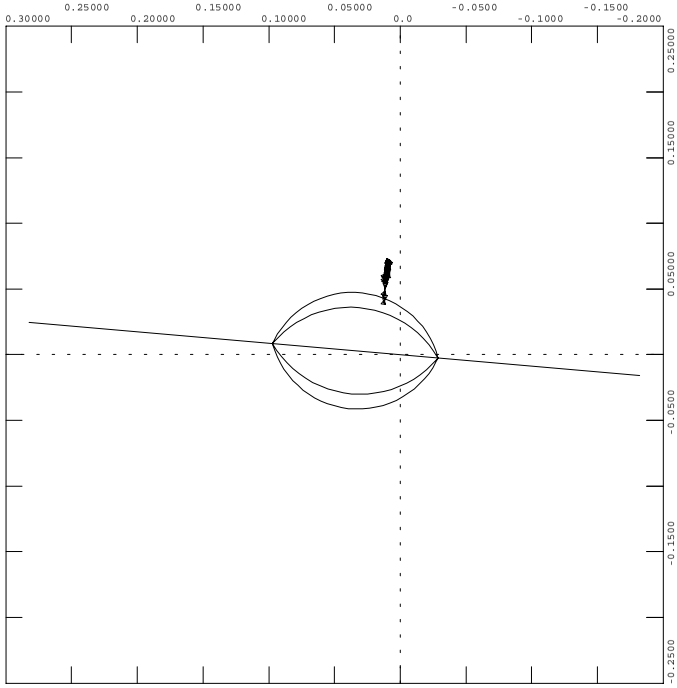

TUE, APR 30 2002 1:48
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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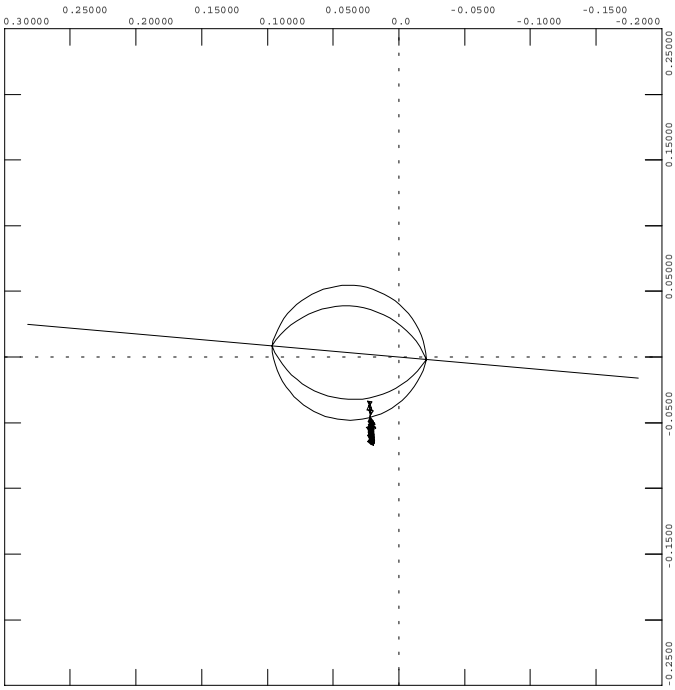
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 30 2002 1:48
D602F-FORBES (612)
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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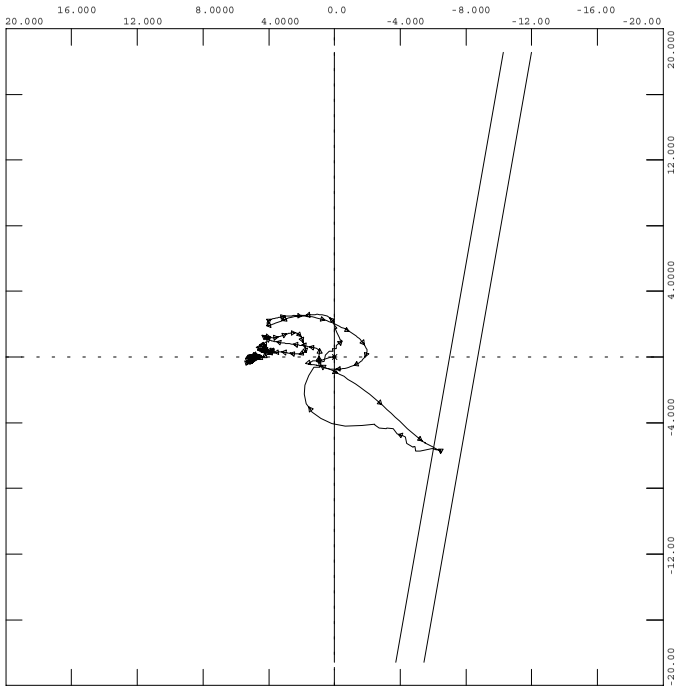
CHNL# 977: [DCAR-B]



TUE, APR 30 2002 1:48
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

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CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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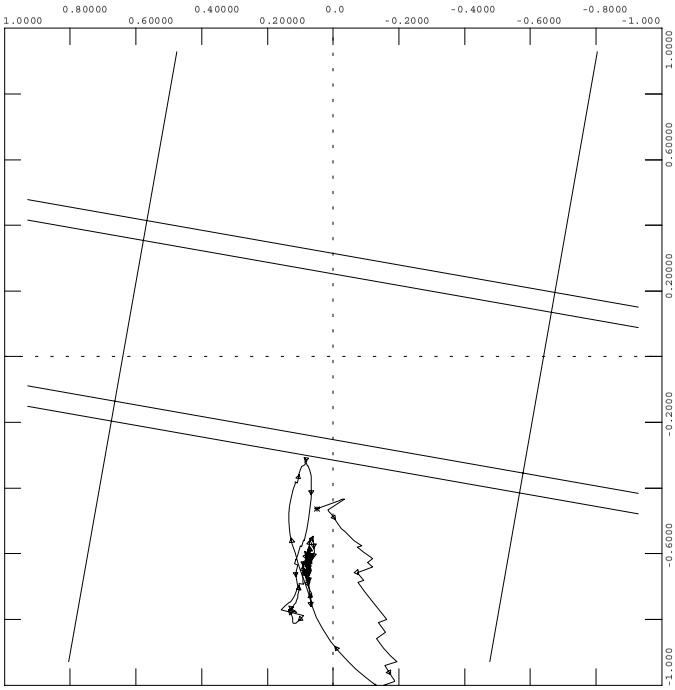

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

RELAY: SLINOS
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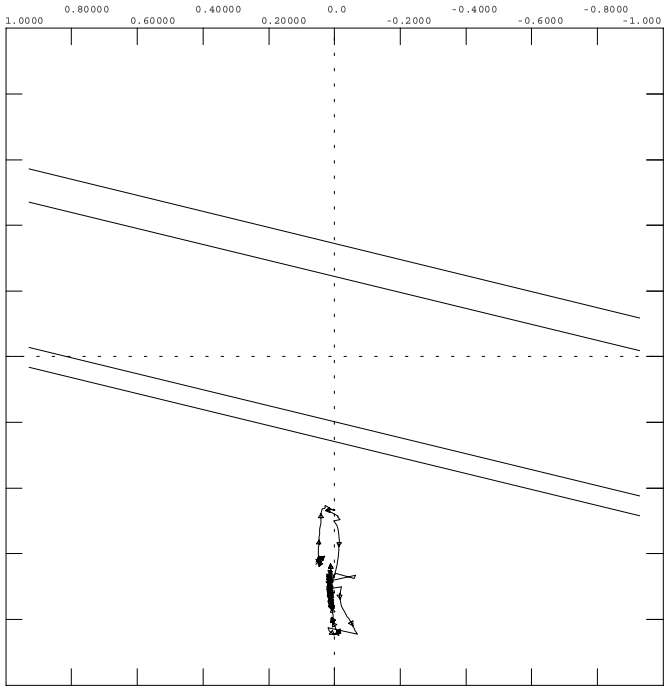

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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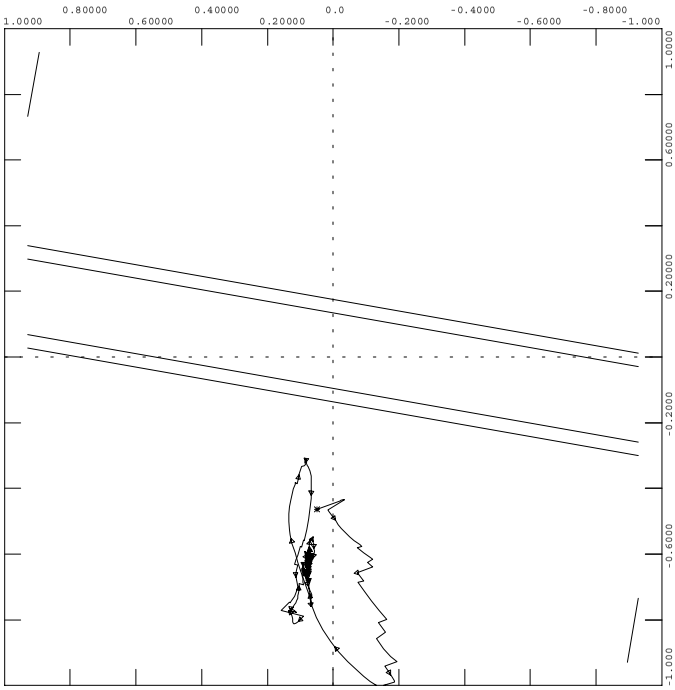

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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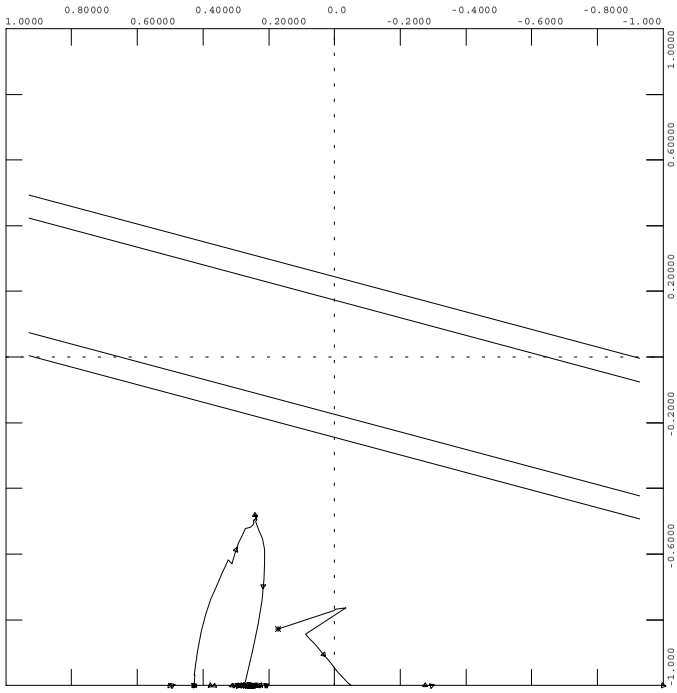

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

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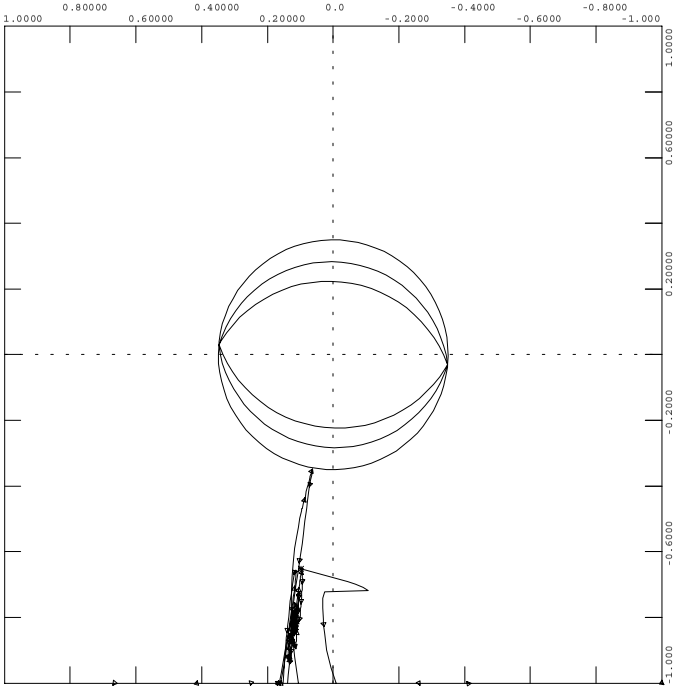
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

RELAY: SLLP
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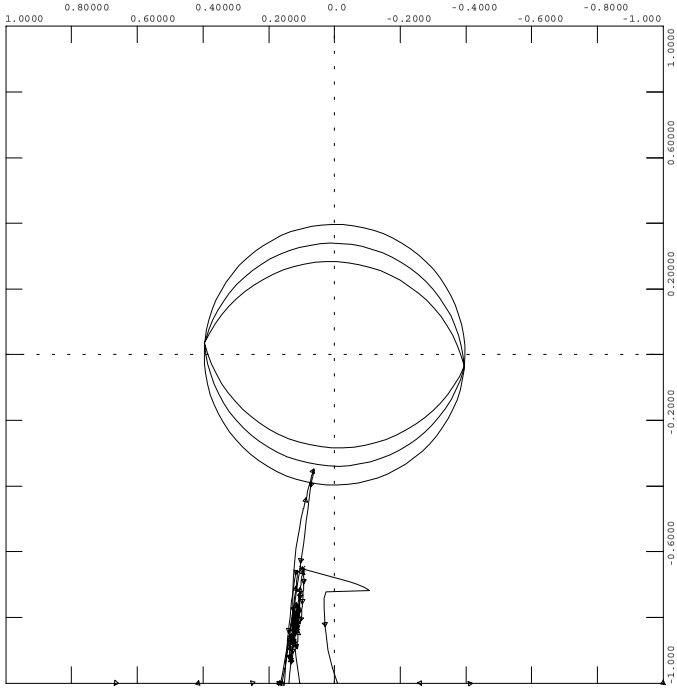
CHNL# 814: [X-TGA4-BD 4]



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

RELAY: SLINOS
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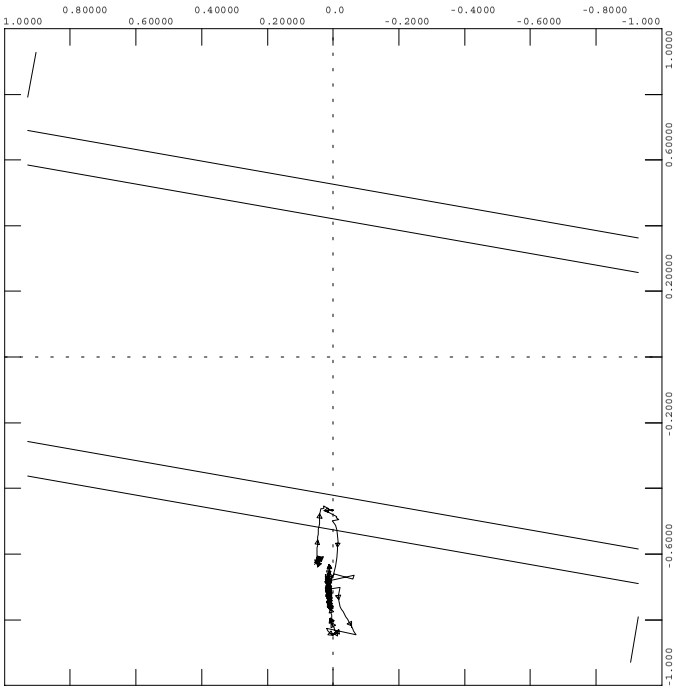

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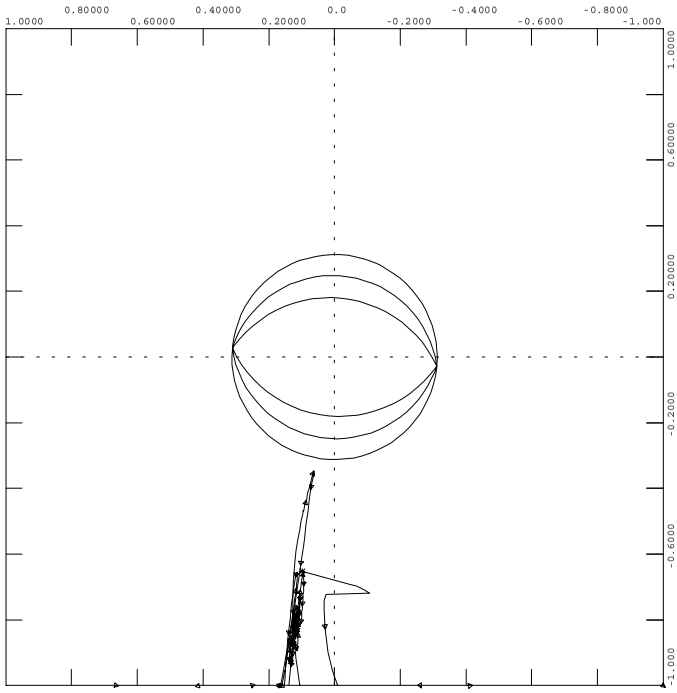
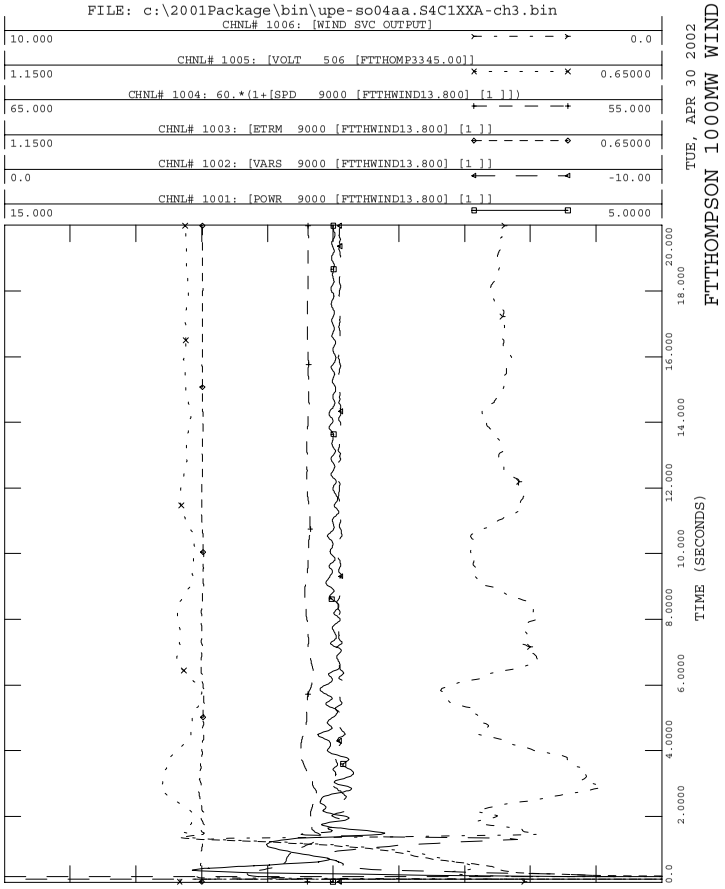
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

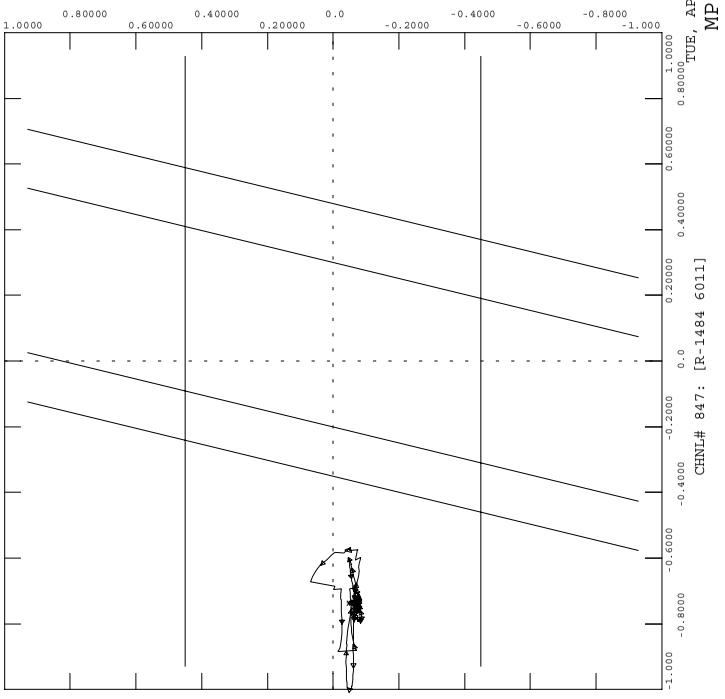


TUE, APR 30 2002 1:48
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



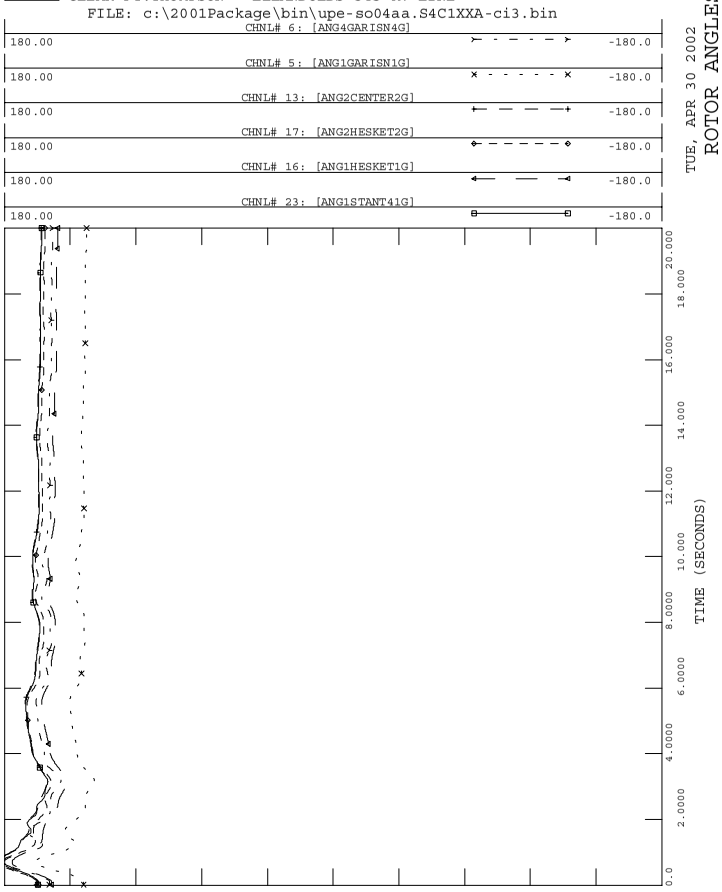
TUE, APR 30 2002 1:48
MP-OH I.FALLS (779)

CONTINGENCY CI3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Leland Olds 345 kV line

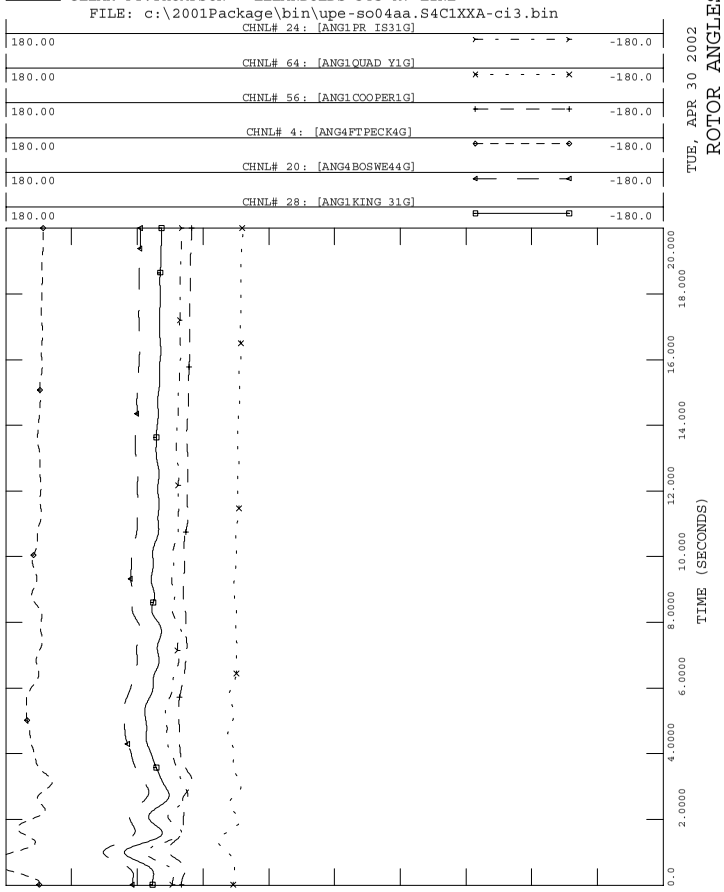
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
ROTOR ANGLES 2



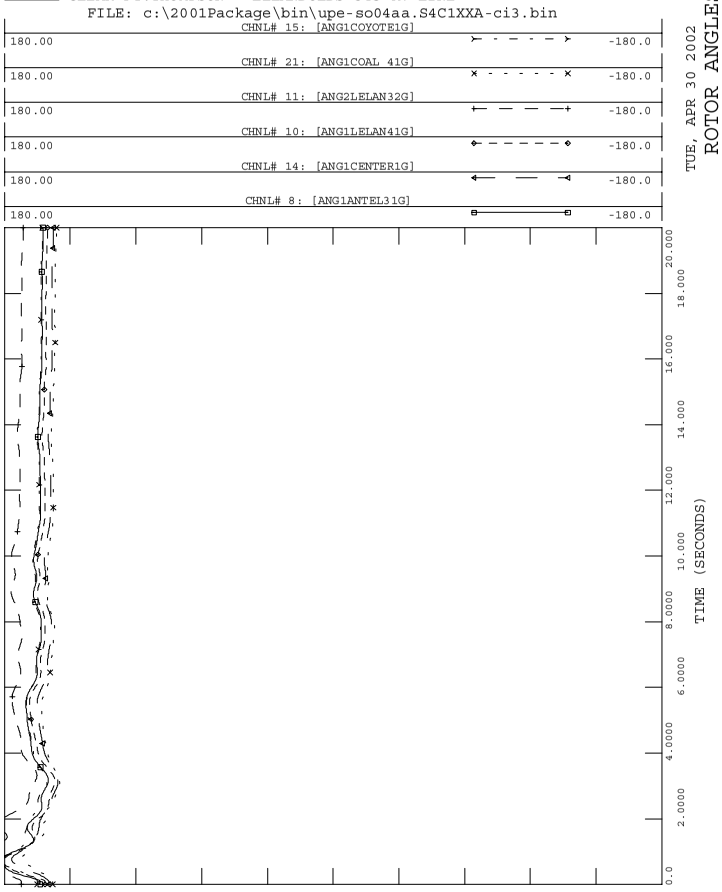
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
ROTOR ANGLES 4



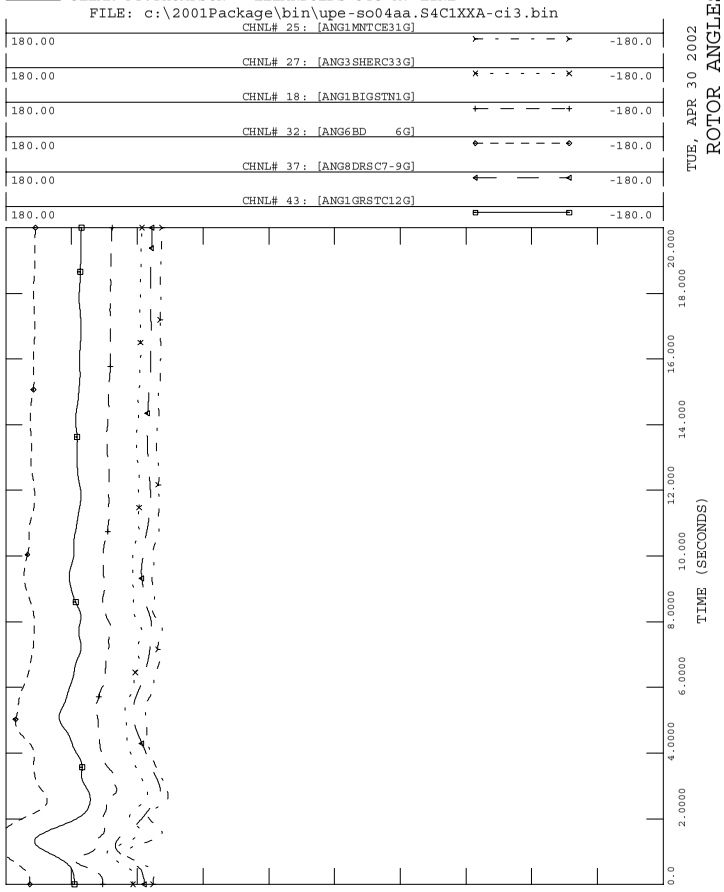
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
ROTOR ANGLES 1



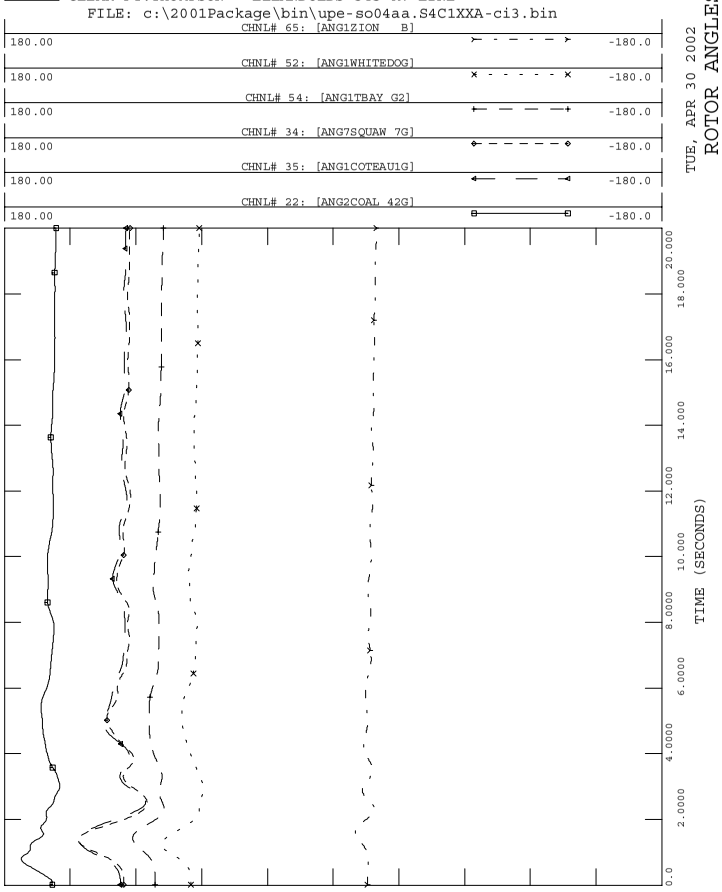
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
ROTOR ANGLES 3



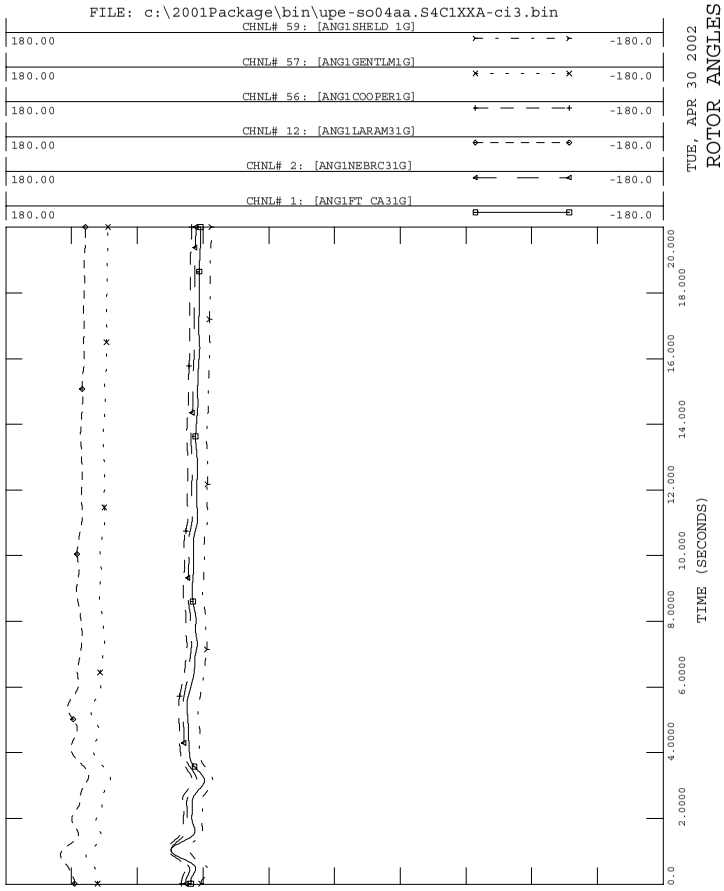
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
ROTOR ANGLES 6



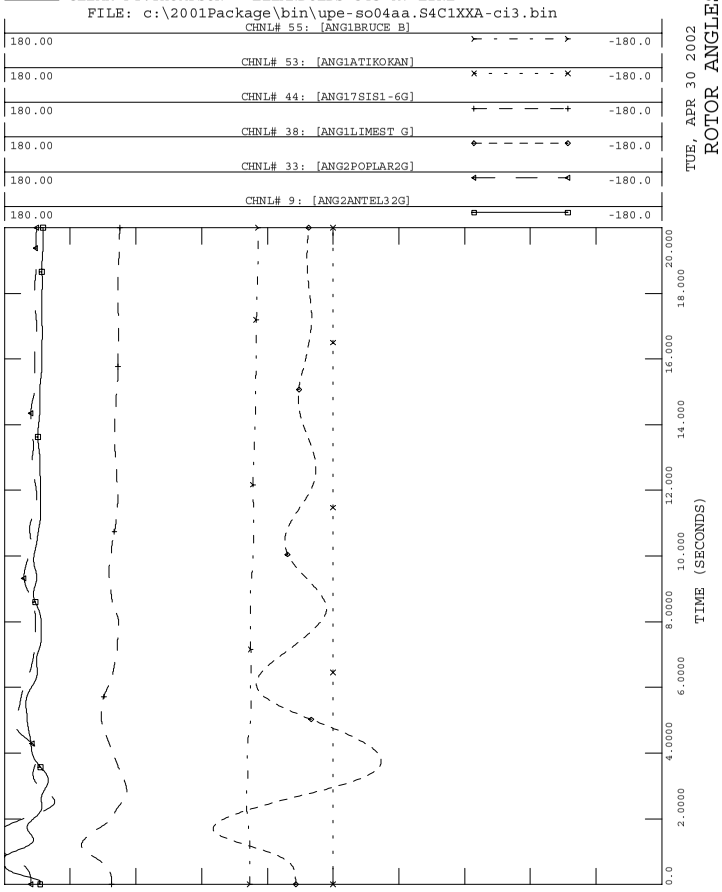
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
ROTOR ANGLES NB



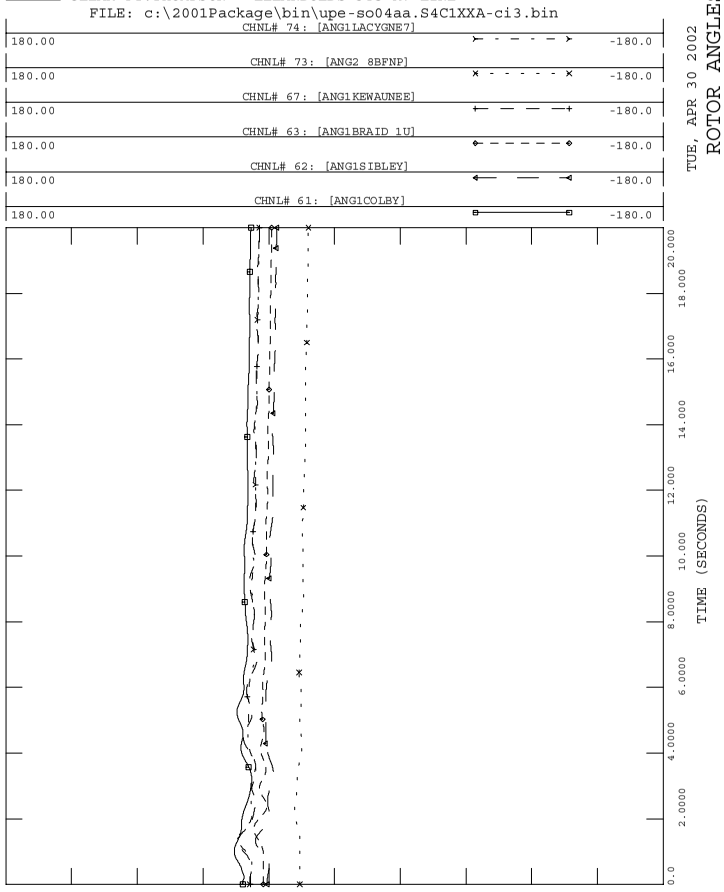
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
ROTOR ANGLES 5



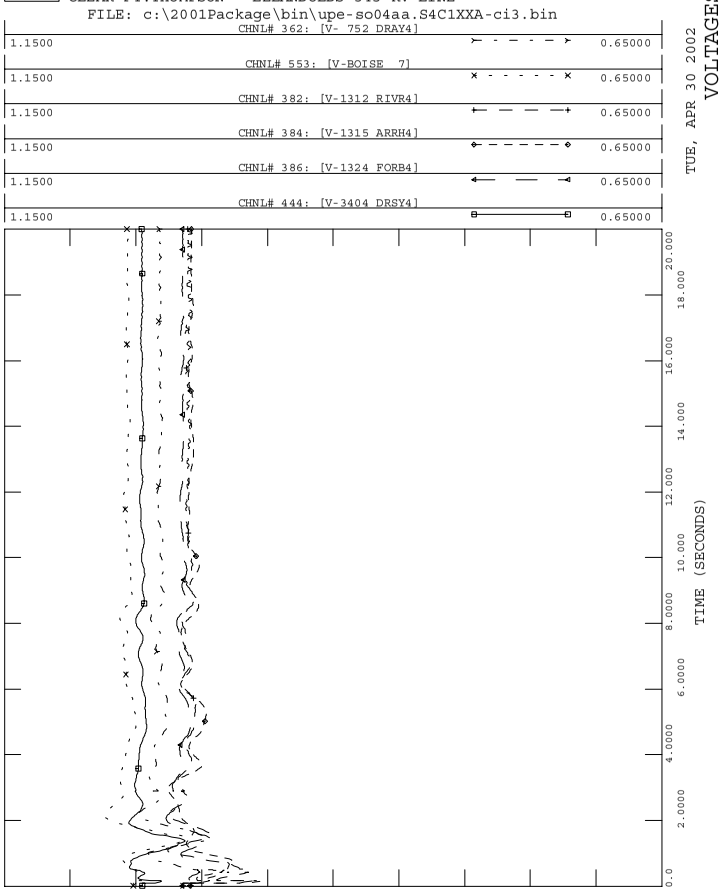
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
ROTOR ANGLES 7



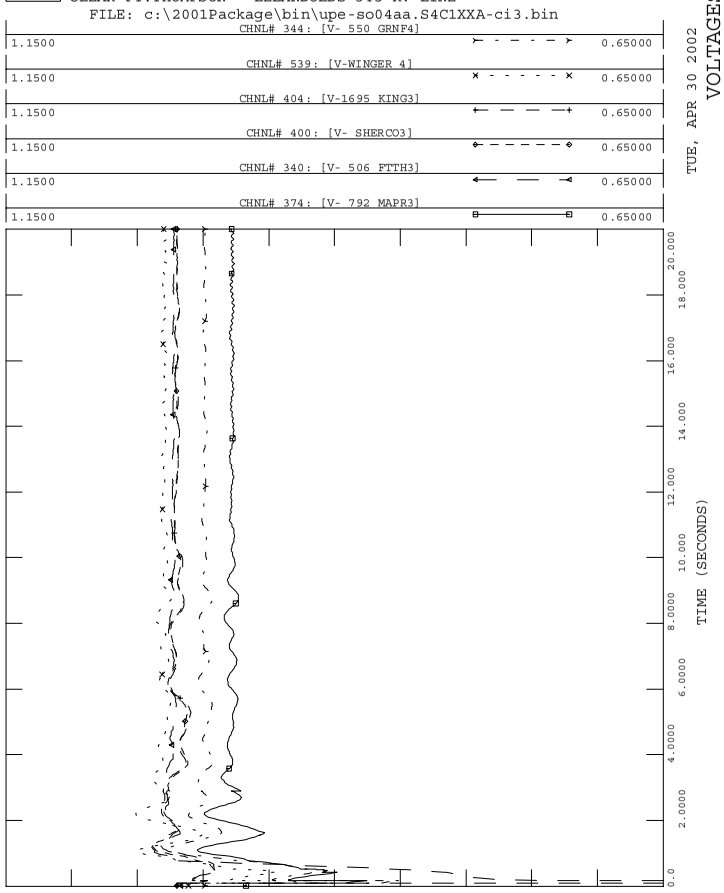
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
VOLTAGES 1



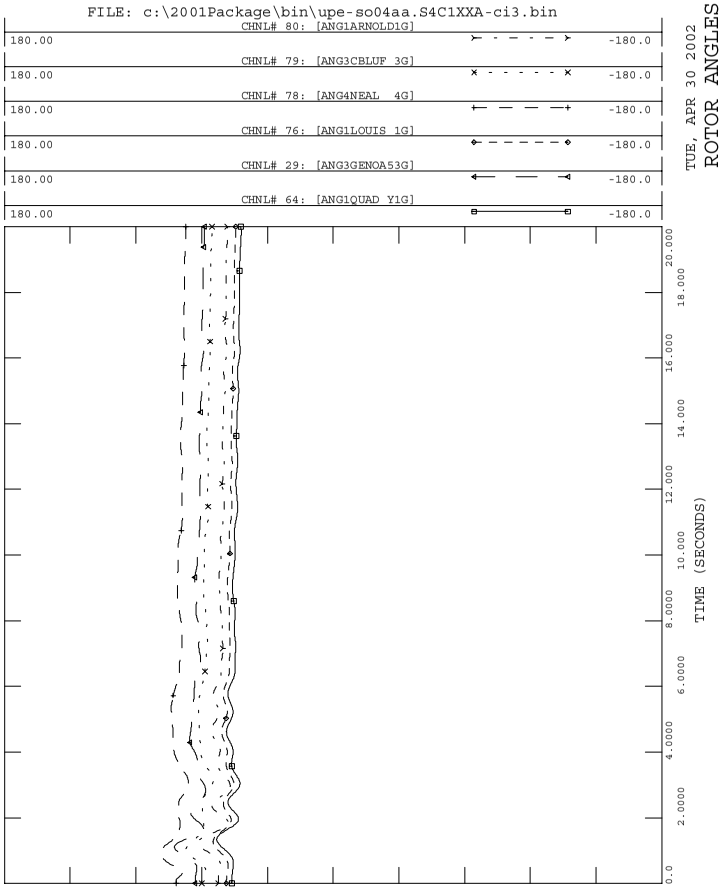
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
VOLTAGES 3



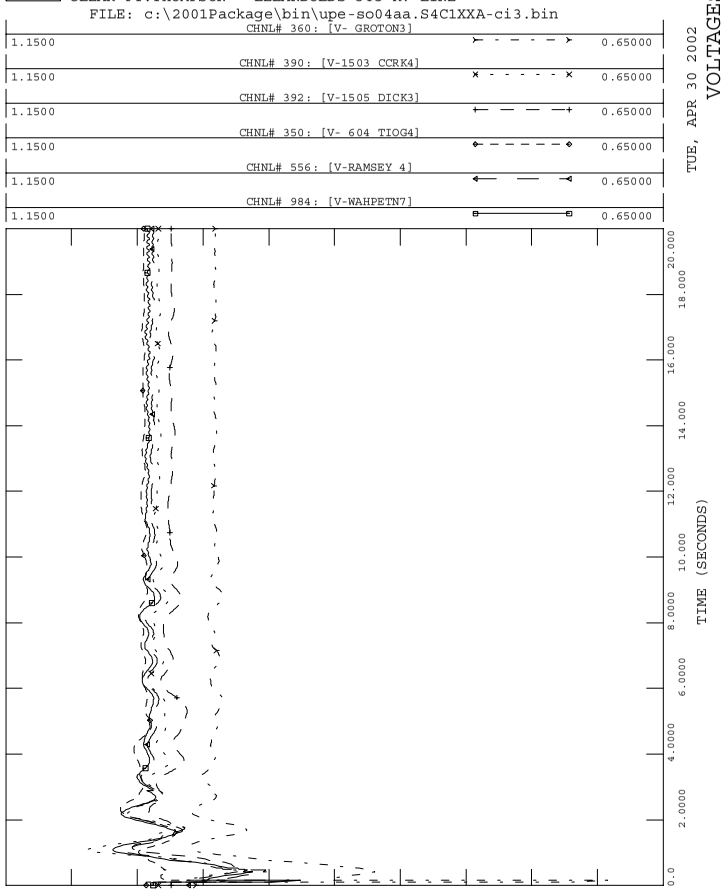
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
ROTOR ANGLES IA



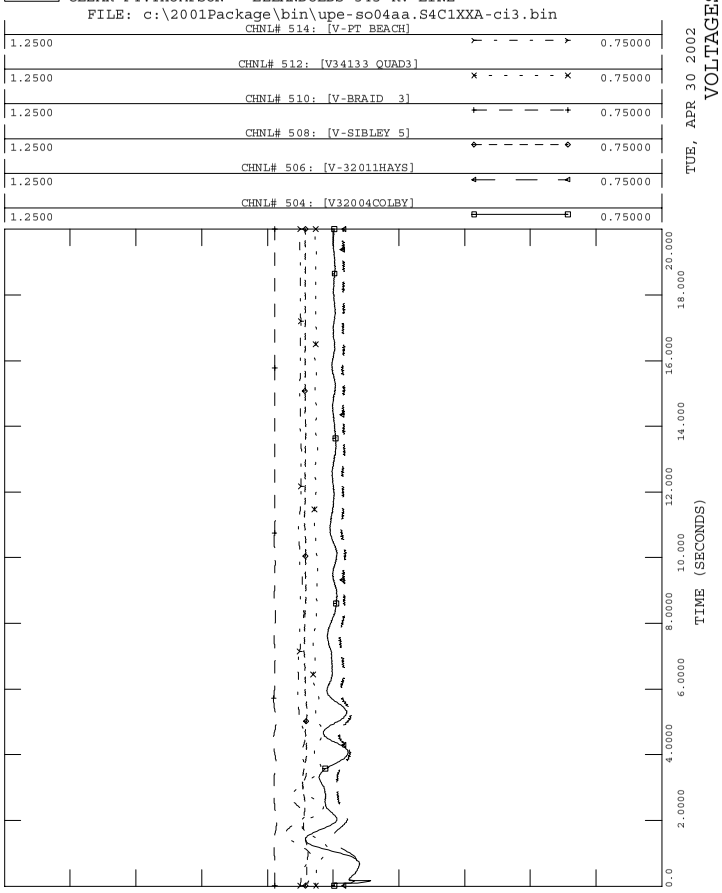
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
VOLTAGES 2



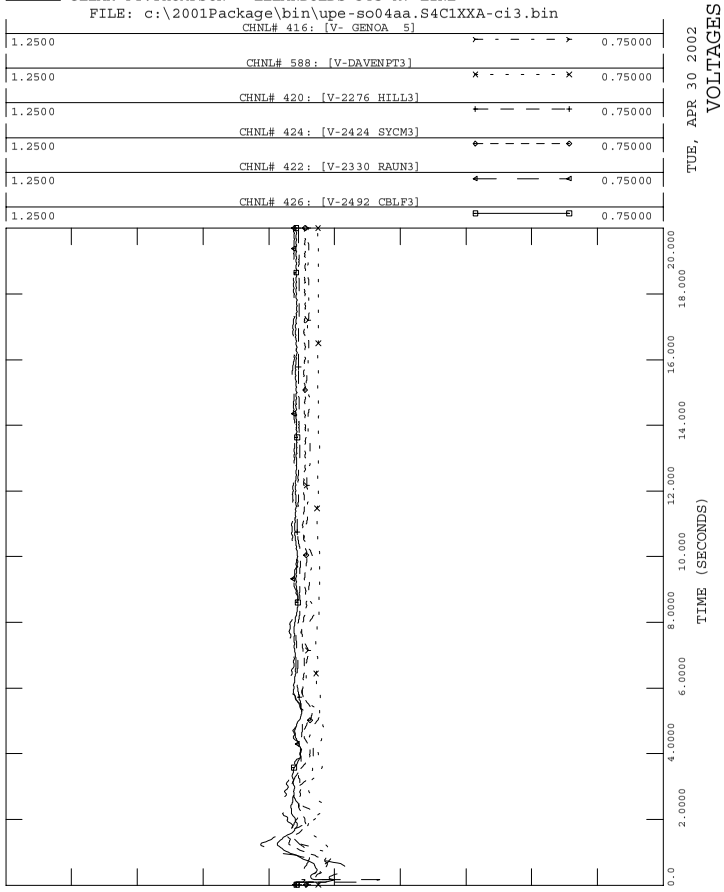
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02 VOLTAGES 5



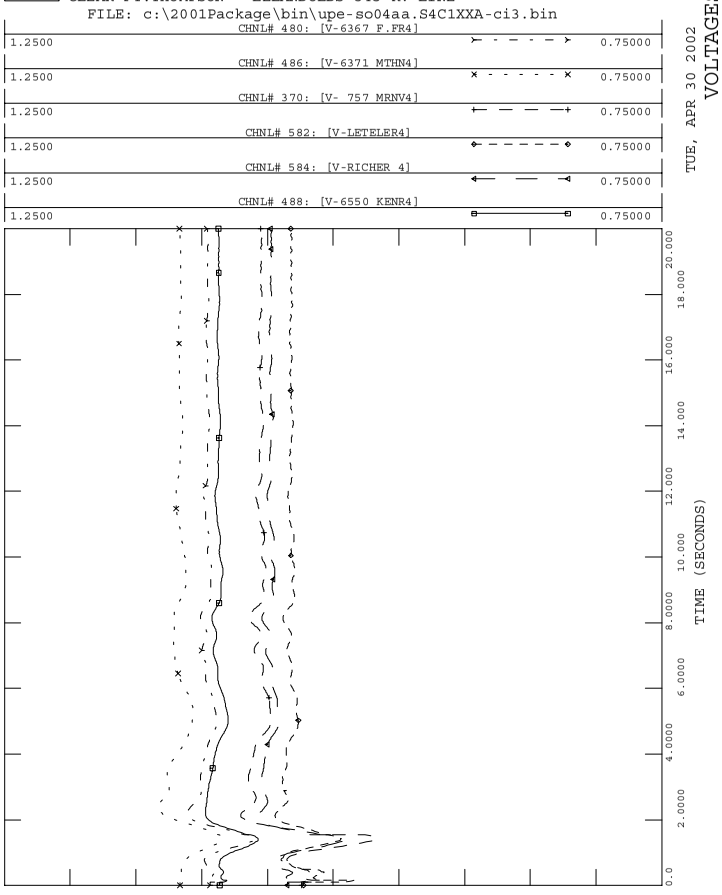
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02 VOLTAGES IA



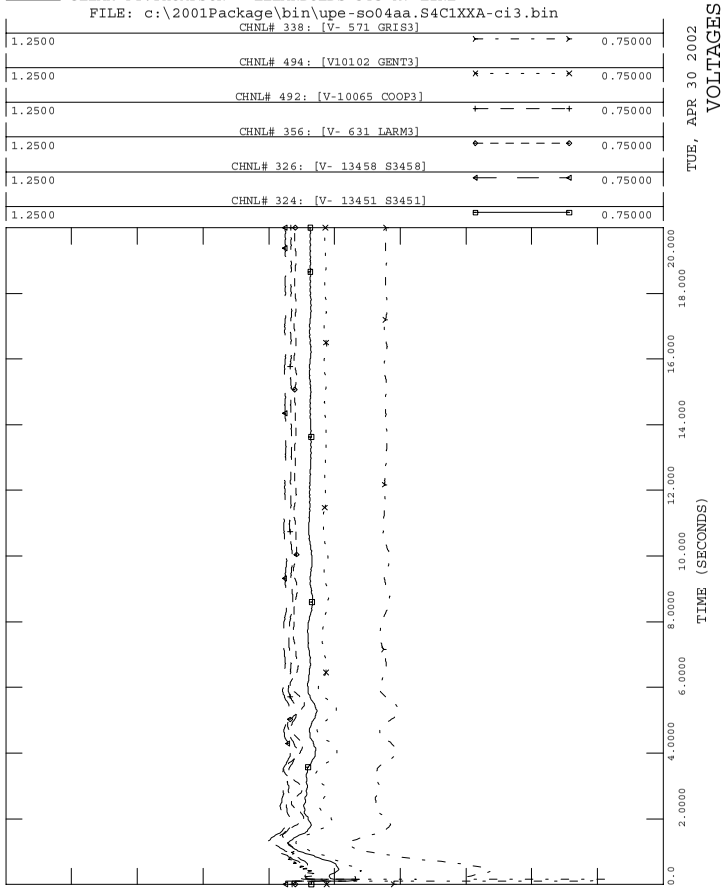
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02 VOLTAGES 4



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

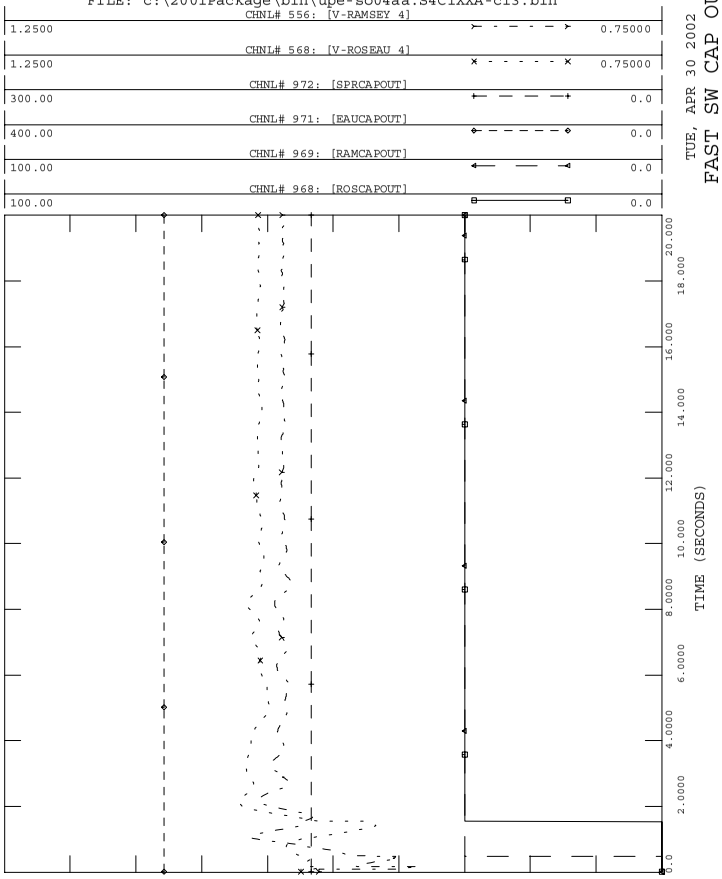
TUE, APR 30 2002 2:02 VOLTAGES NB



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02

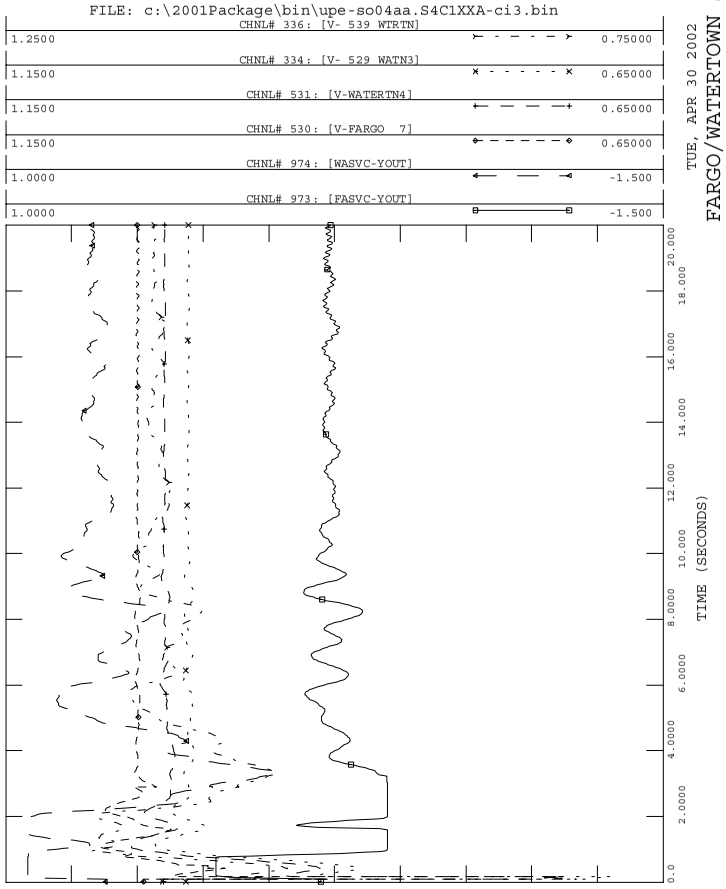
FAST SW CAP OUT 2



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02

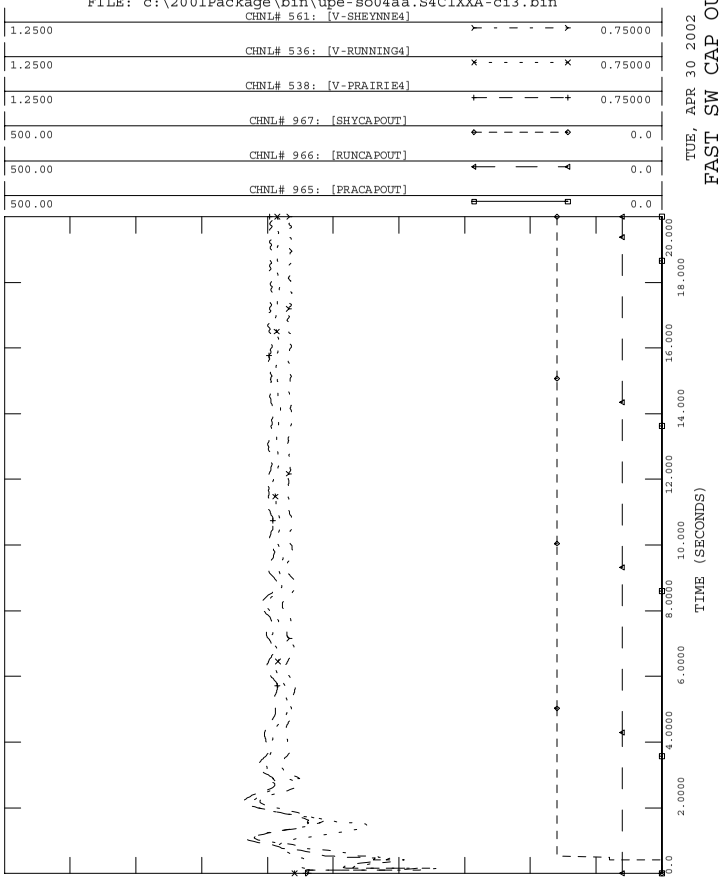
FARGO/WATERTOWN SVS



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02

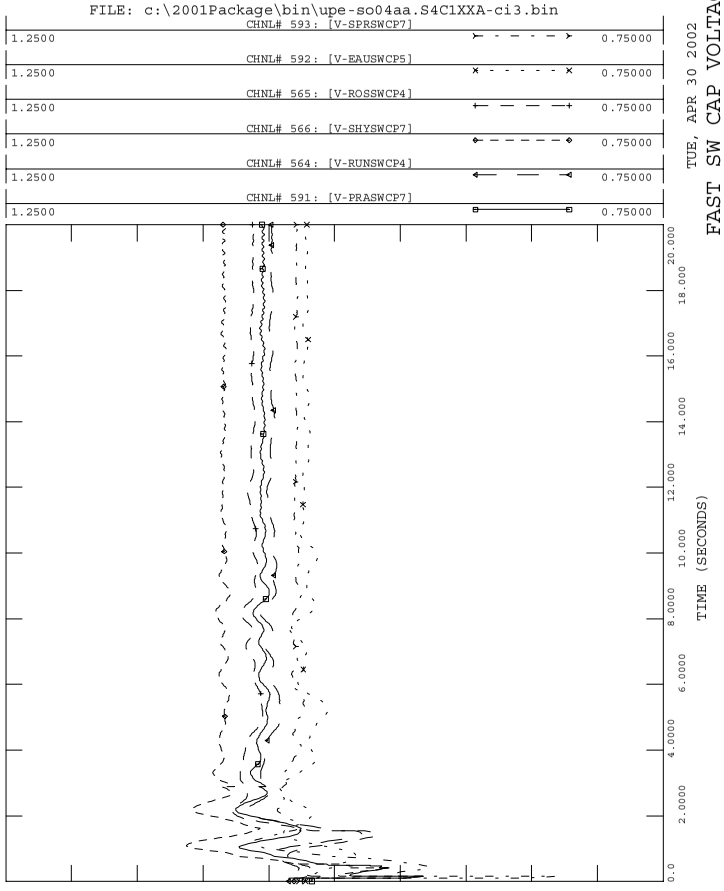
FAST SW CAP OUT 1



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02

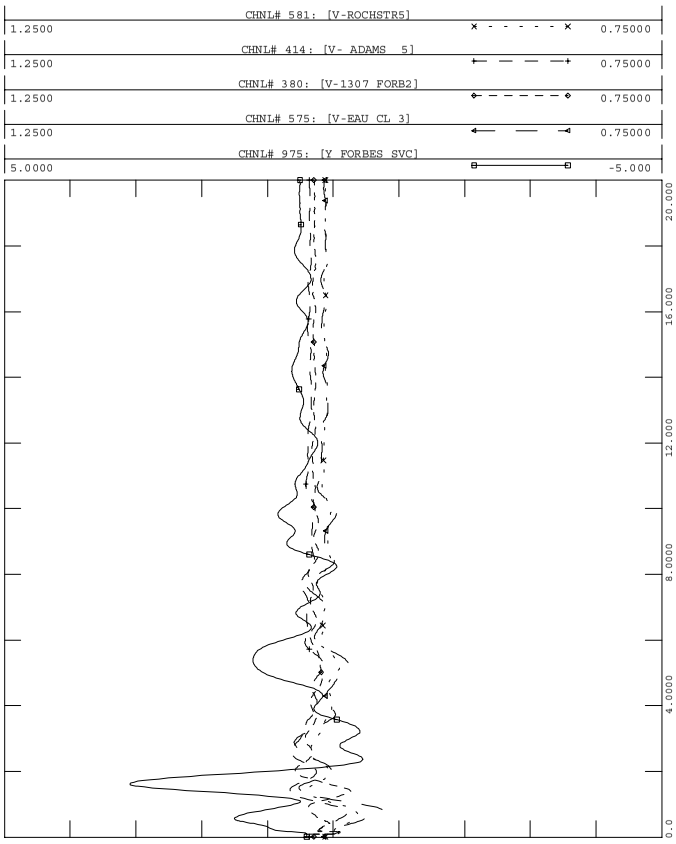
FAST SW CAP VOLTAGES



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02

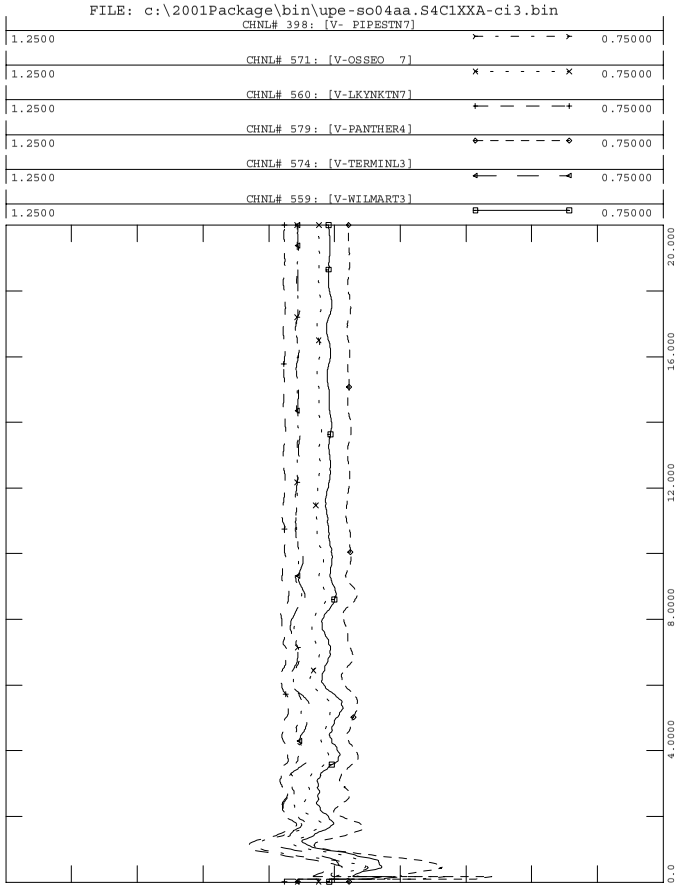
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02

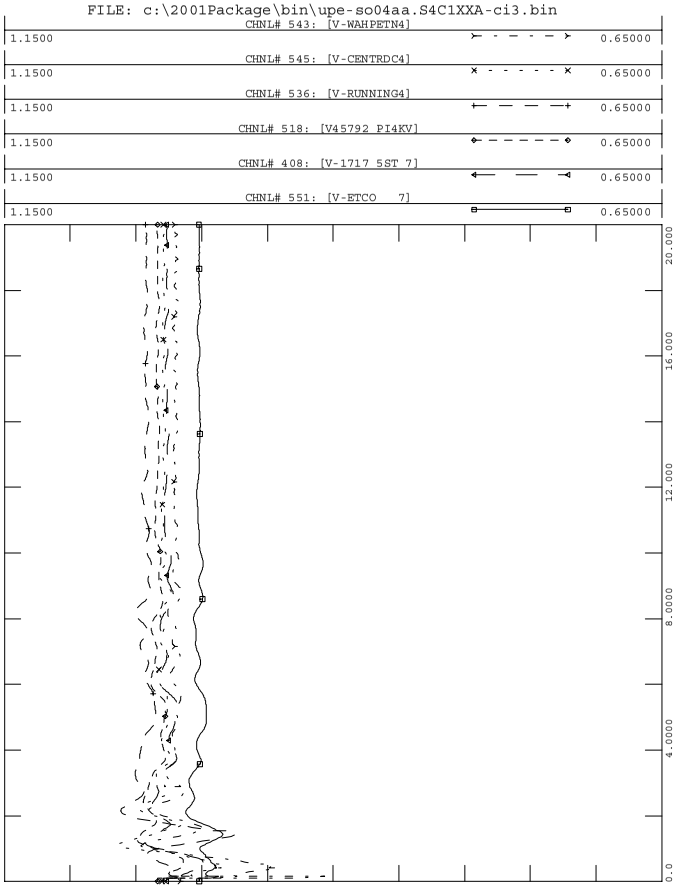
TC VOLTAGES



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02

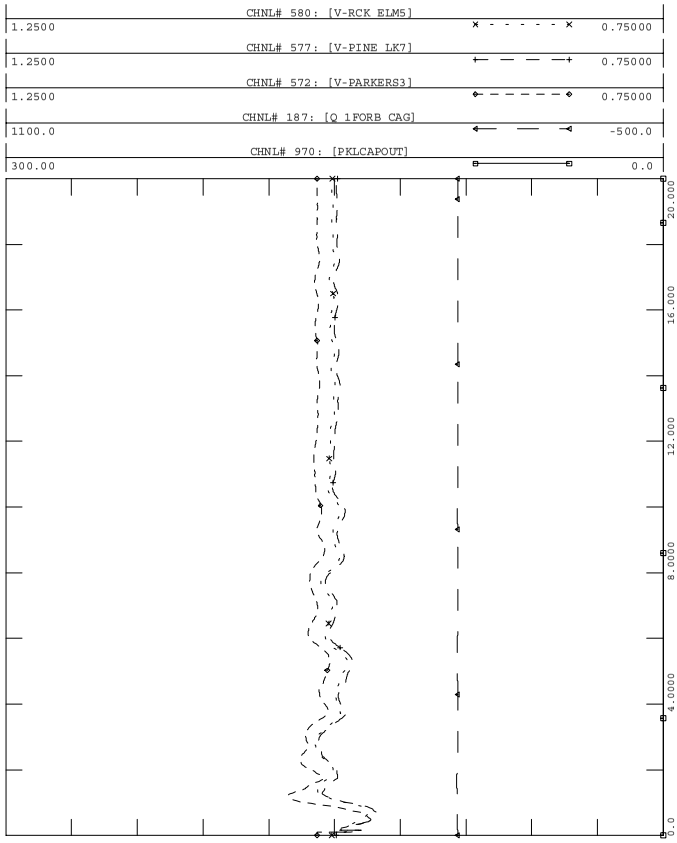
VOLTAGES 6



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

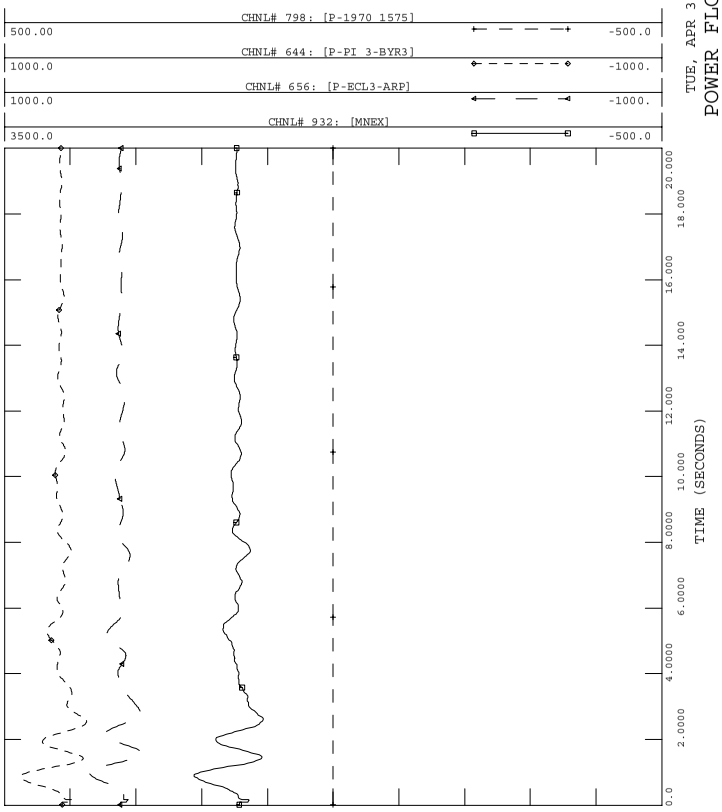
TUE, APR 30 2002 2:02

FORBES SVS OUT & VOLTAGES



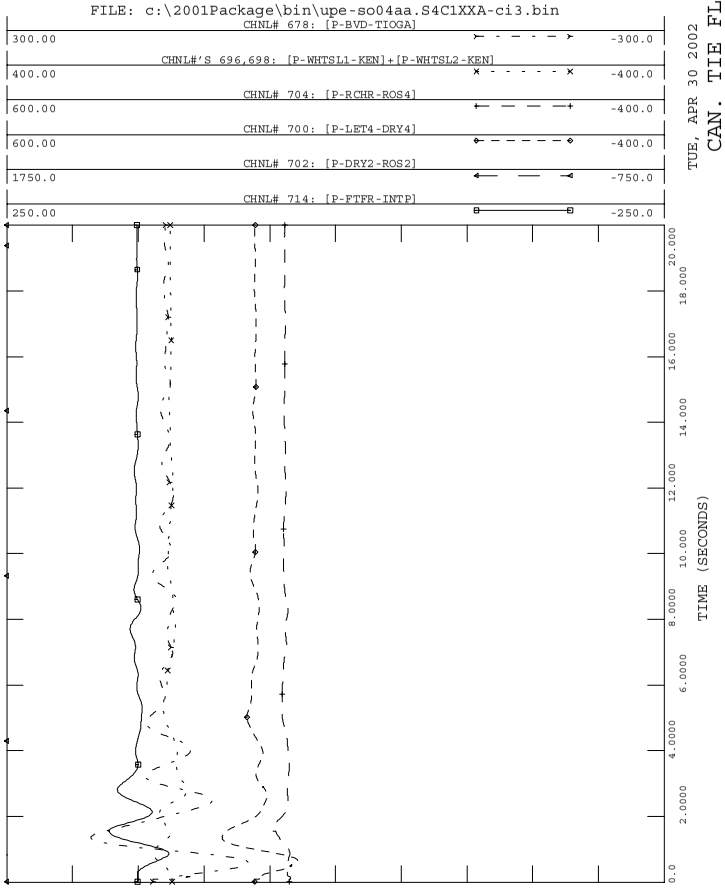
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
POWER FLOW SUMS 2



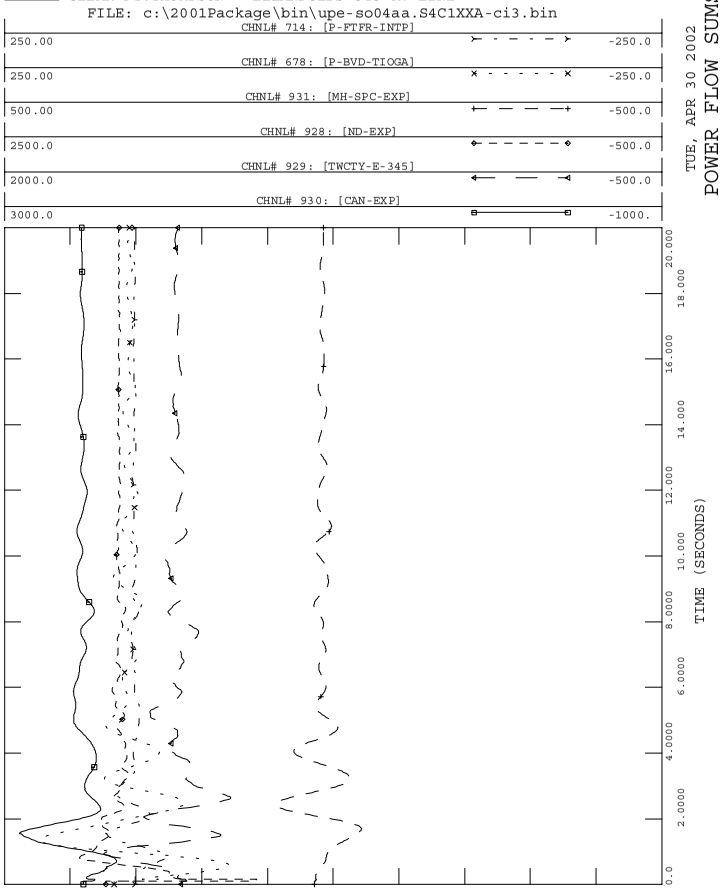
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
CAN. TIE FLOWS



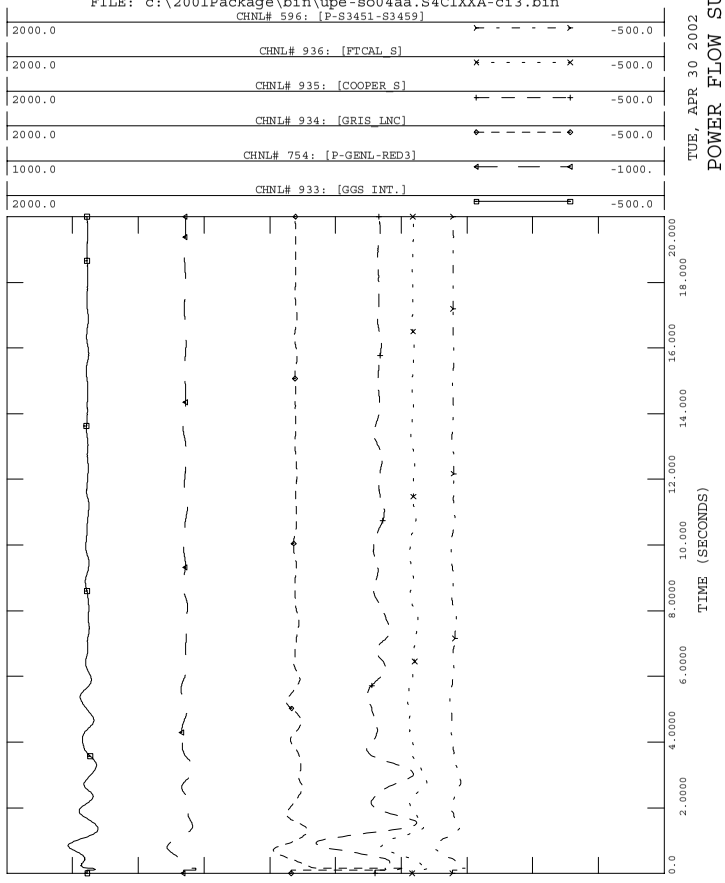
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
POWER FLOW SUMS 1



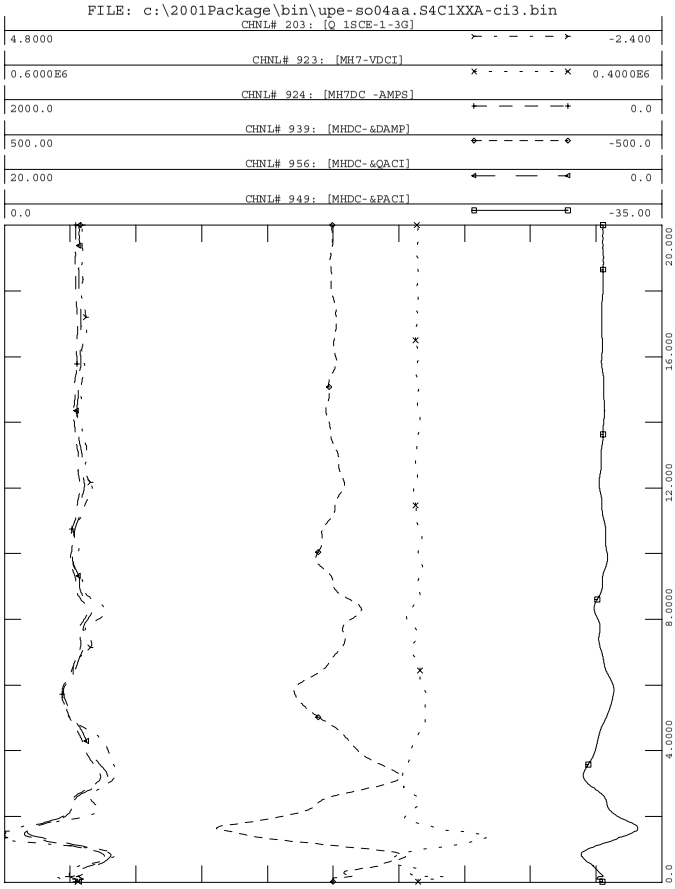
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
POWER FLOW SUM 3



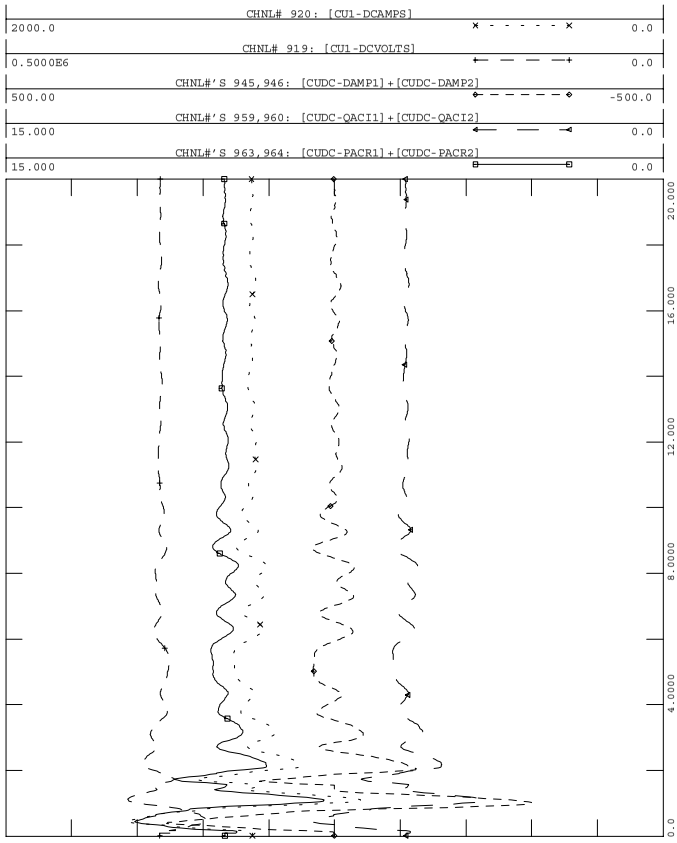
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
MH DC PARAMETERS



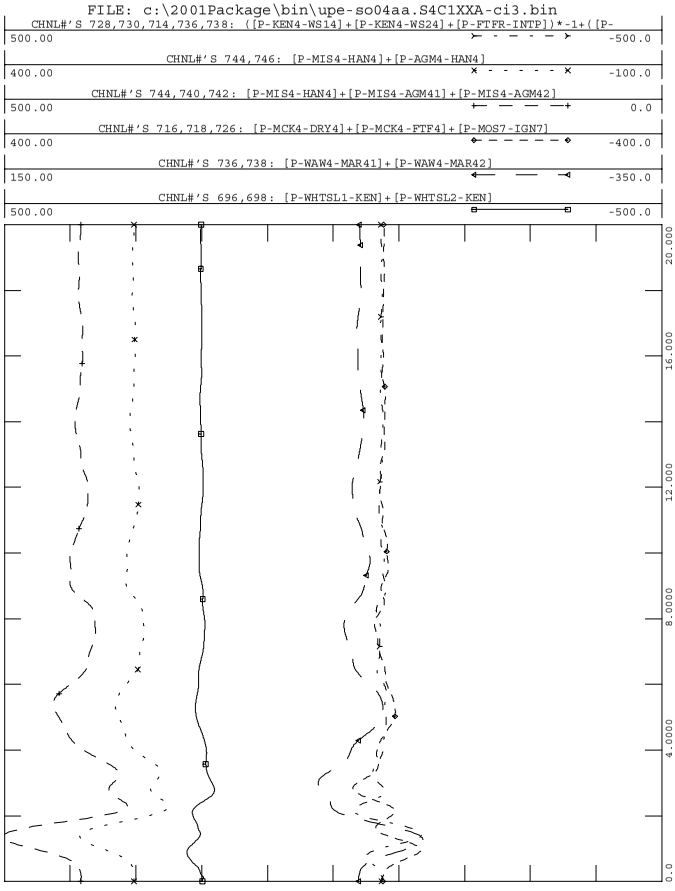
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
CU DC #1



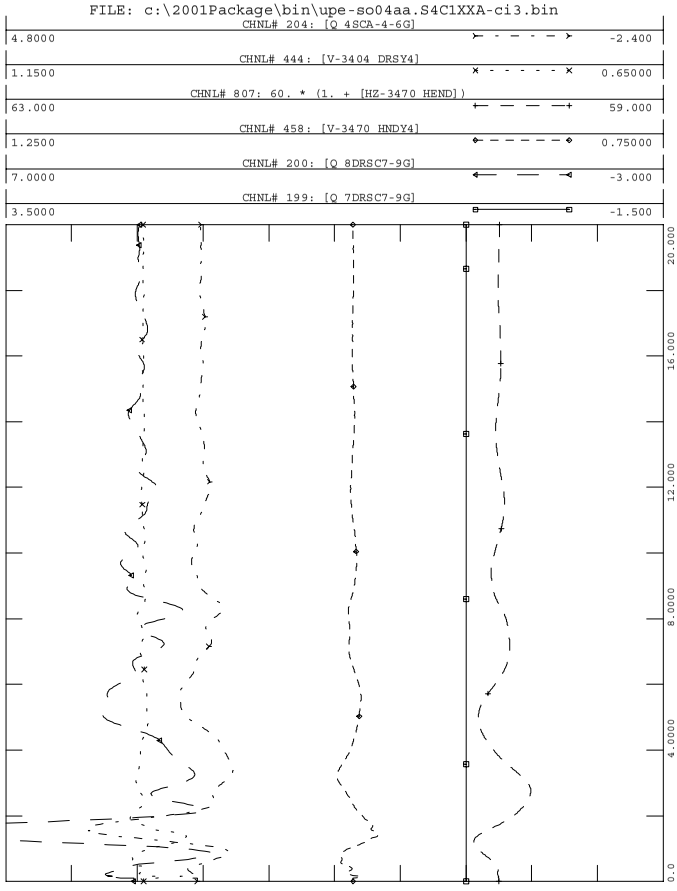
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02
OH TIE FLOWS



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

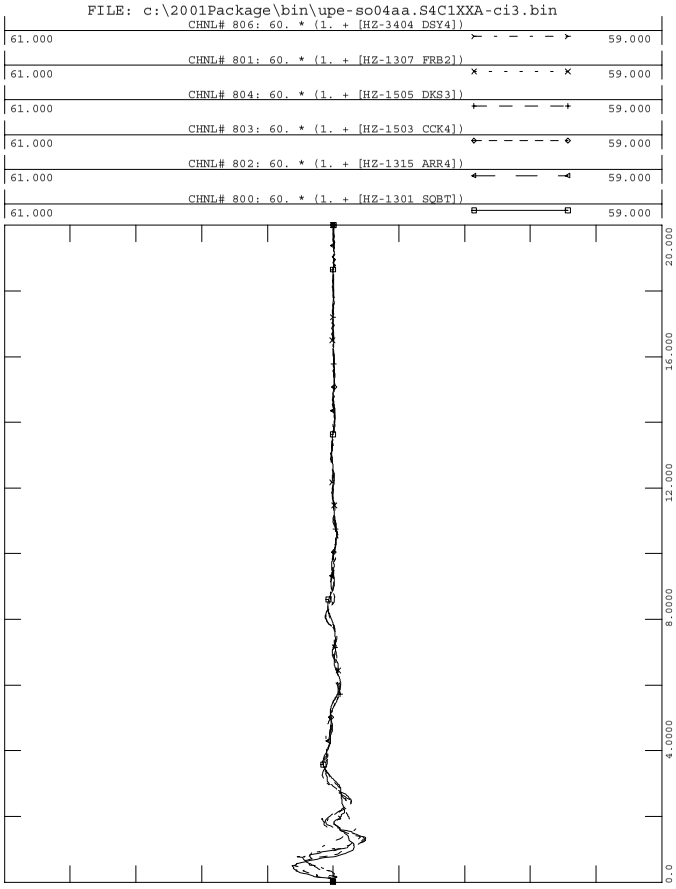
TUE, APR 30 2002 2:02
MH DC PARAMETERS



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02

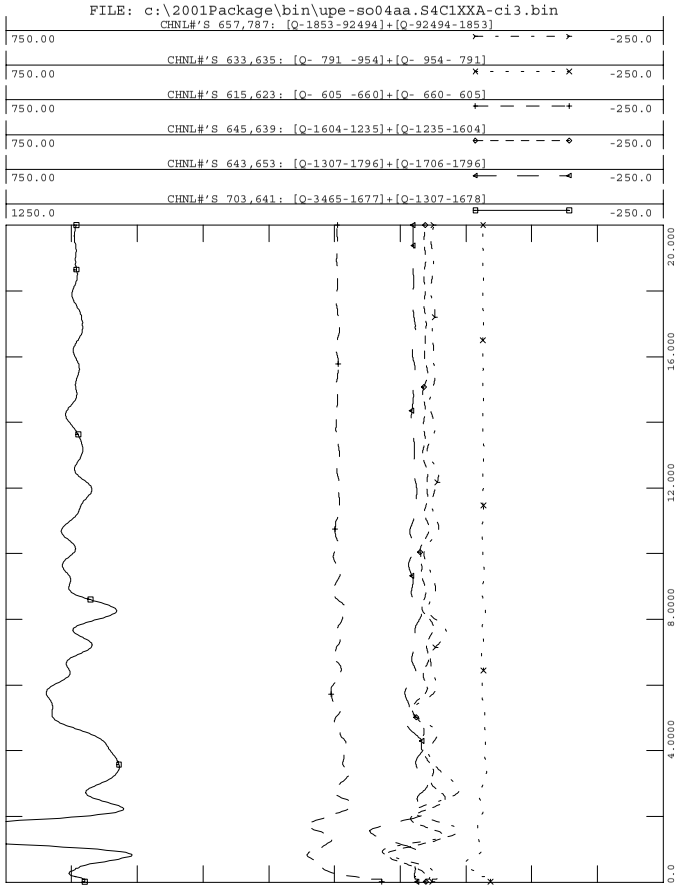
FREQ AT DC TERMINALS



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02

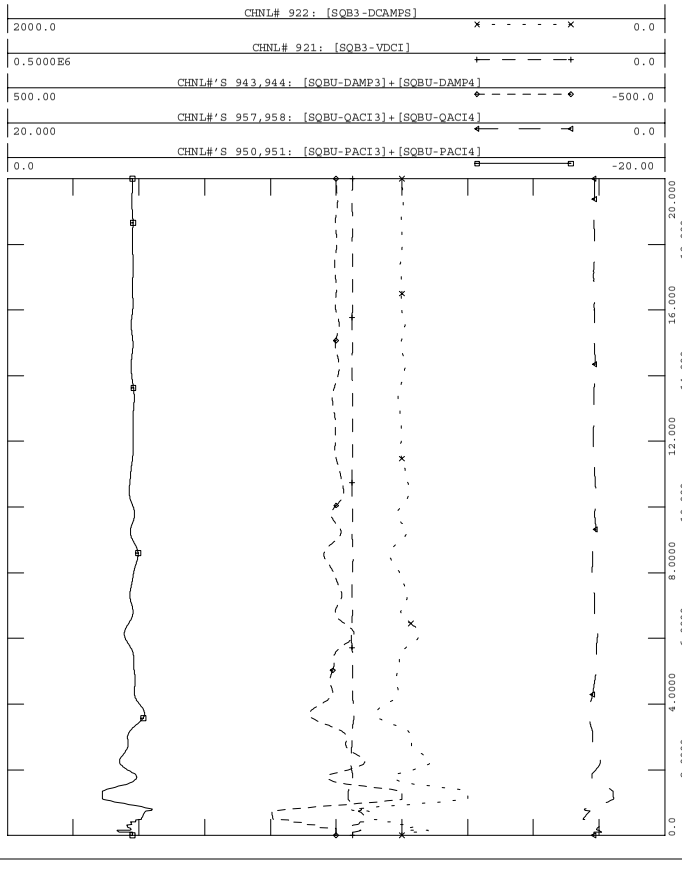
VAR LOSSES



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02

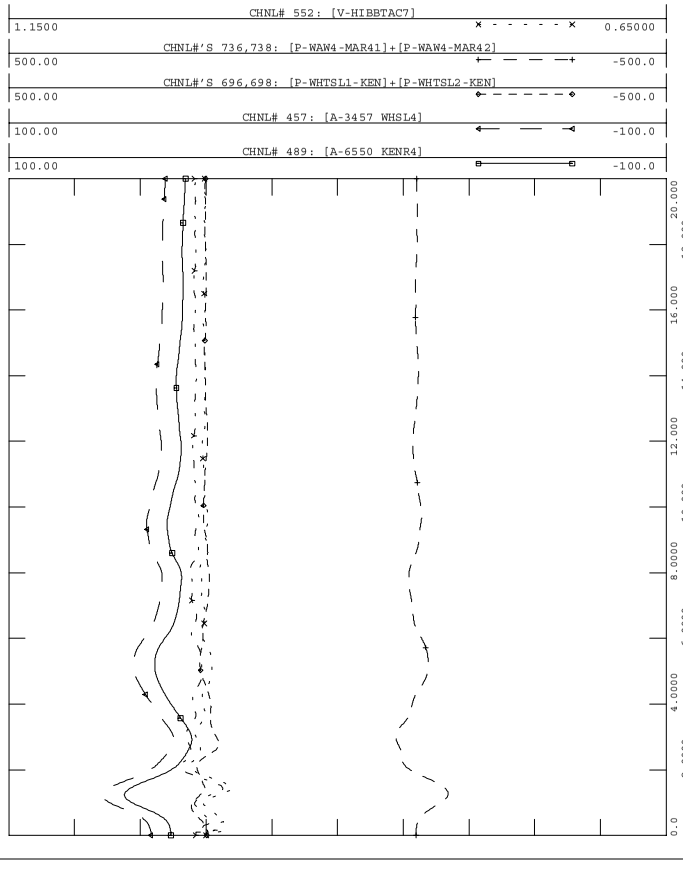
SQB DC #3



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

TUE, APR 30 2002 2:02

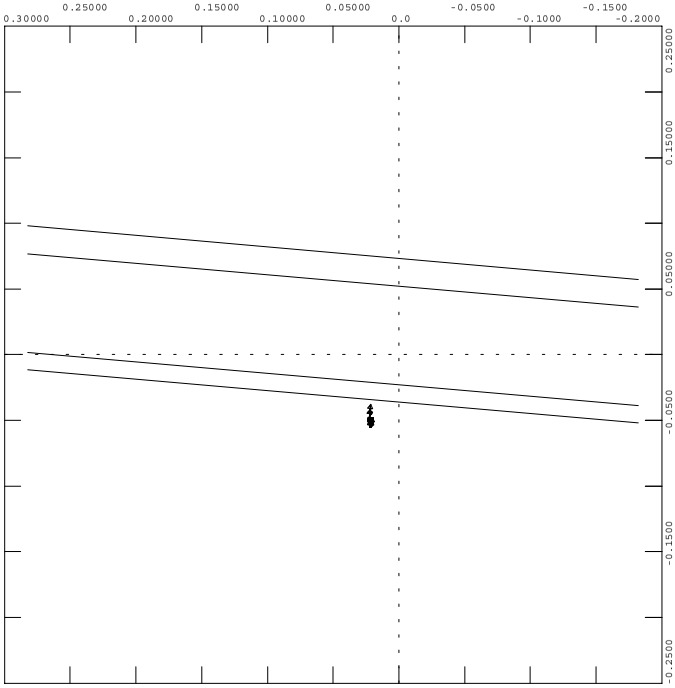
VOLTAGES, ANGLES



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

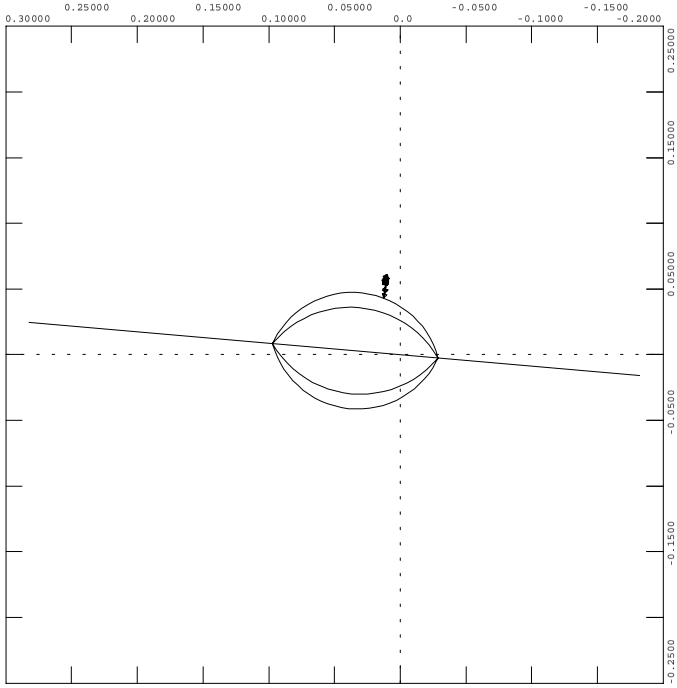


TUE, APR 30 2002 2:02
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

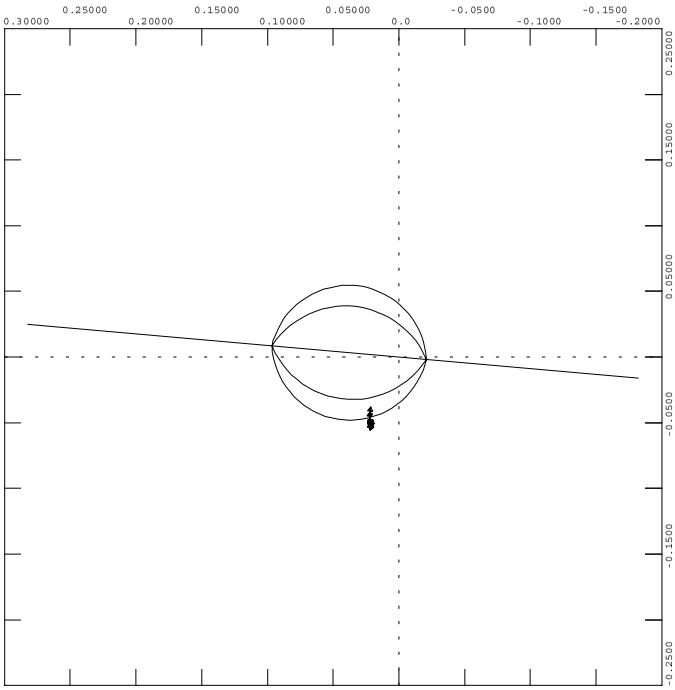


TUE, APR 30 2002 2:02
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

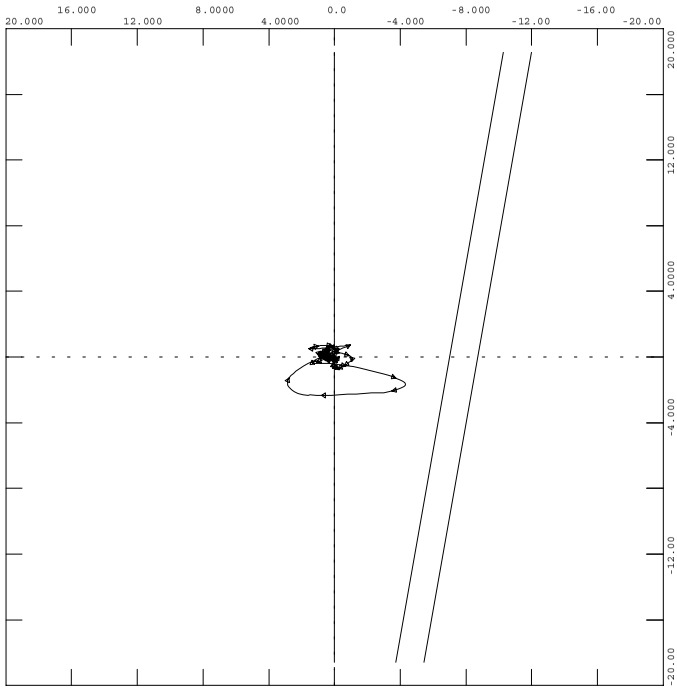


TUE, APR 30 2002 2:02
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

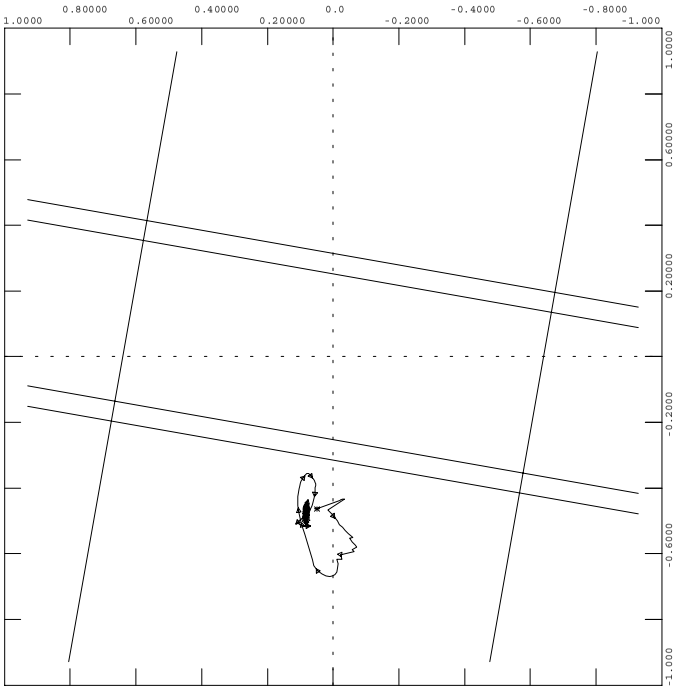


TUE, APR 30 2002 2:02
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

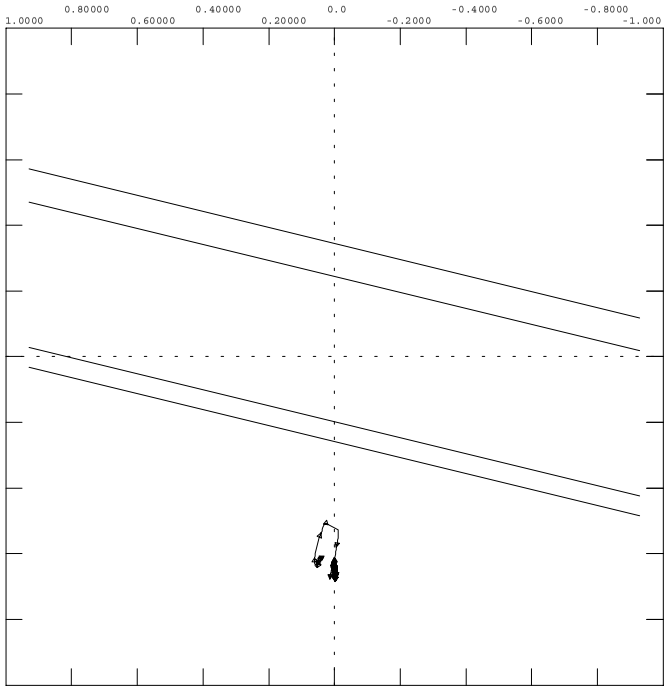
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

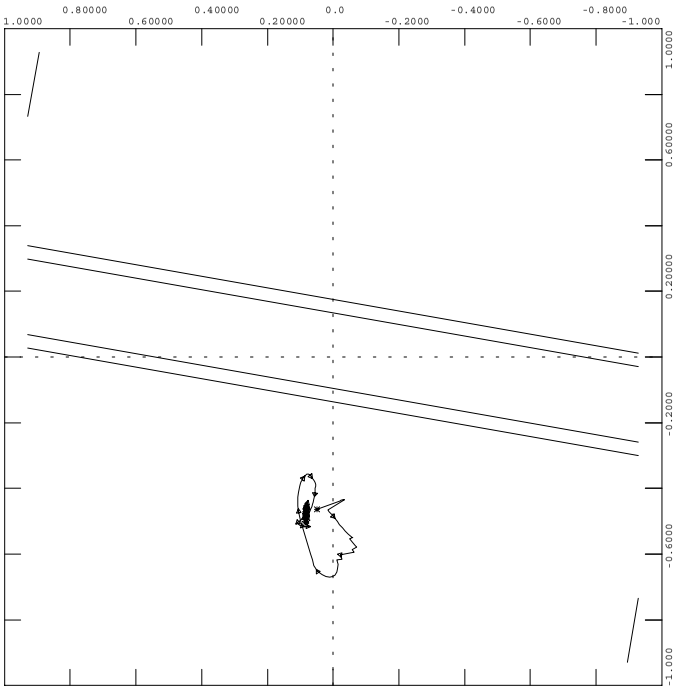
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

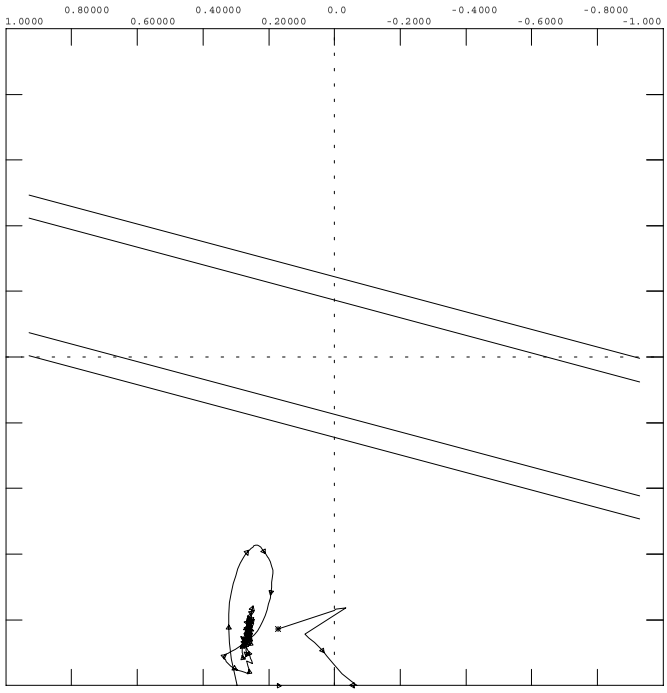
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

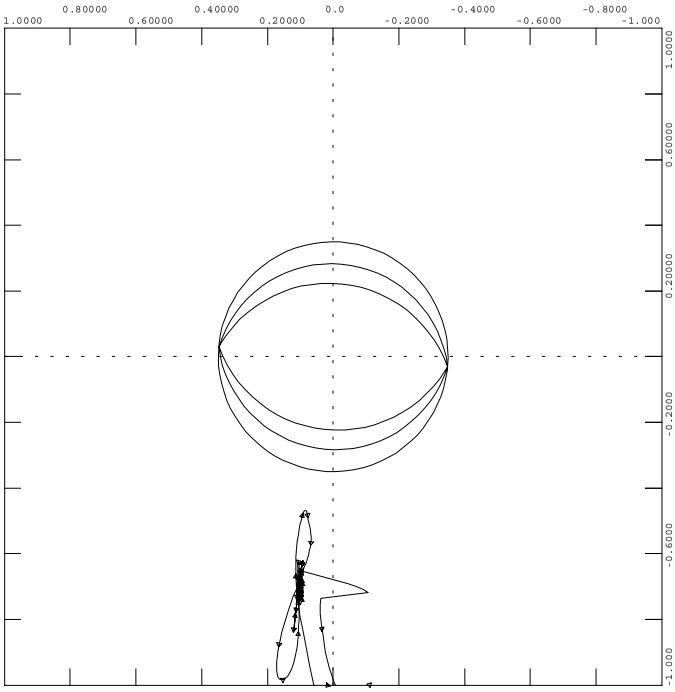
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

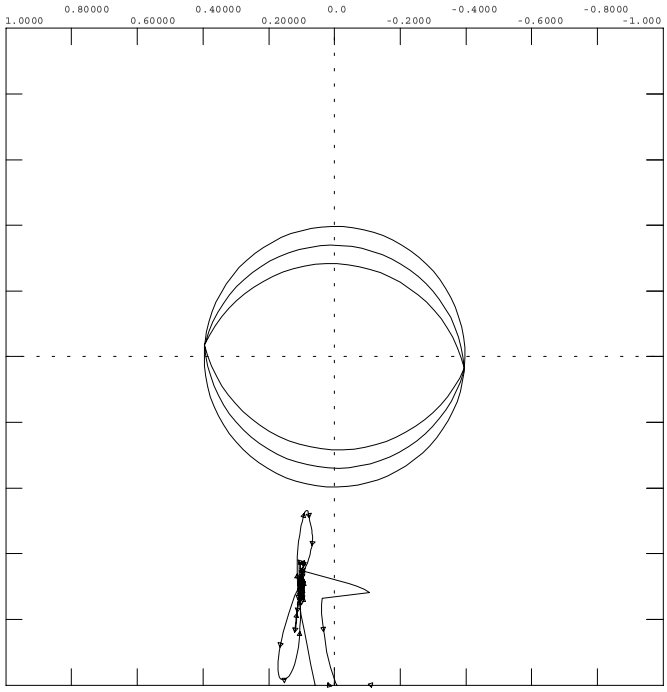
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

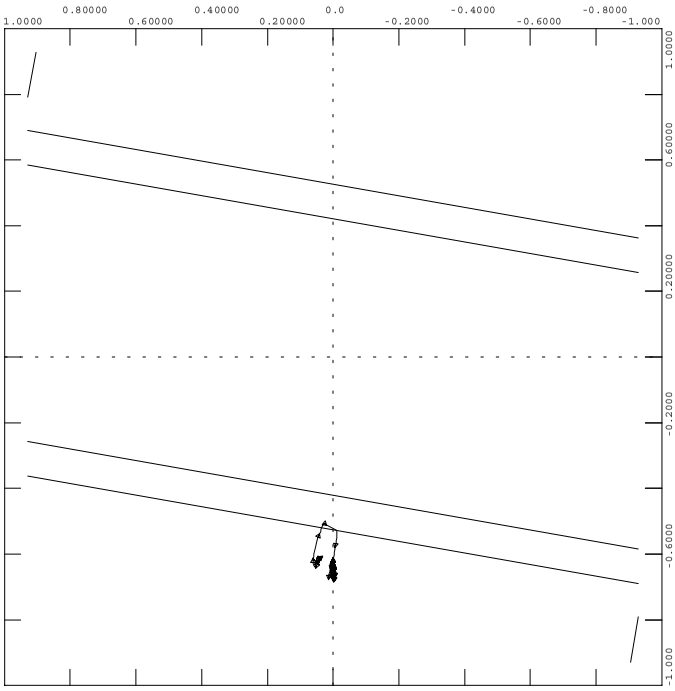
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

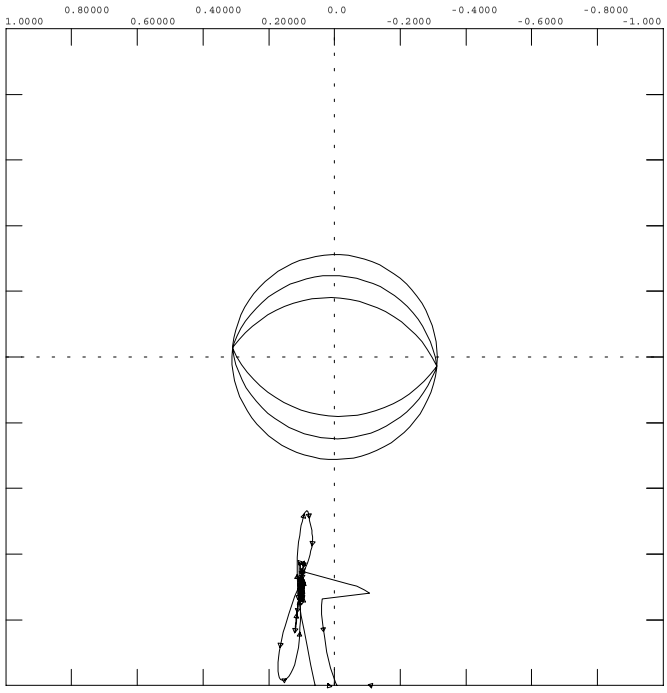
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



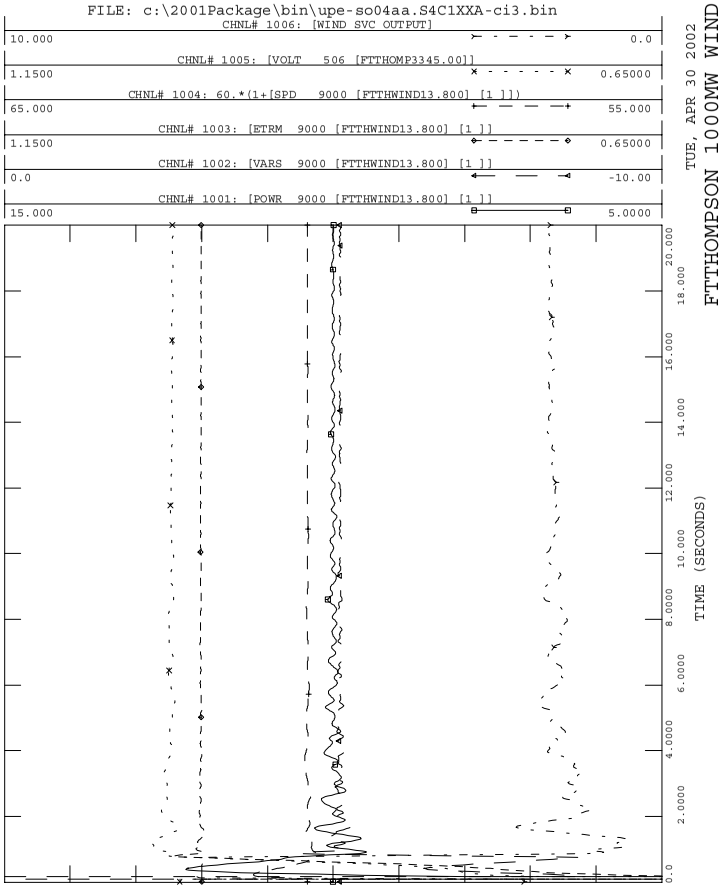
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

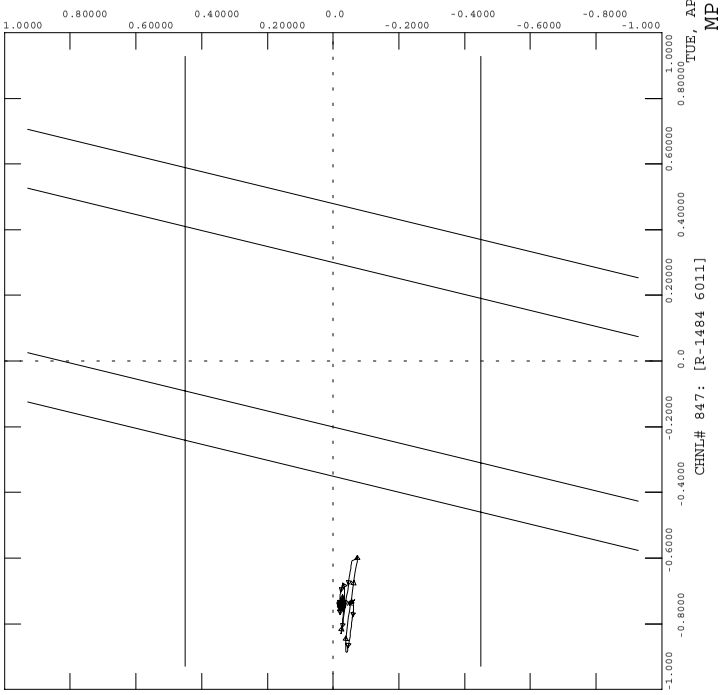


TUE, APR 30 2002 2:02
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

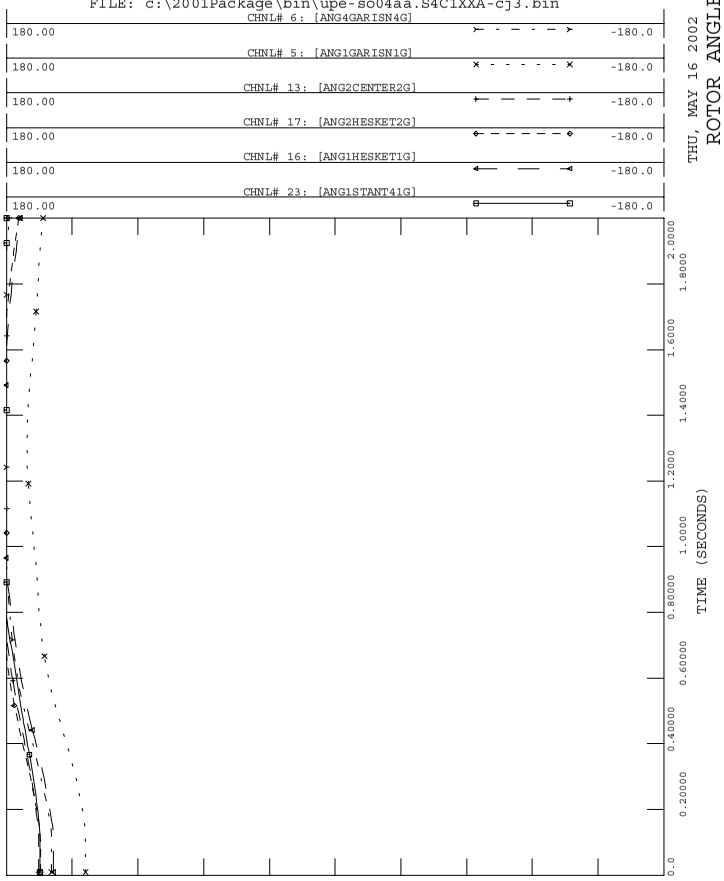


TUE, APR 30 2002 2:02
MP-OH I.FALLS (779)

CONTINGENCY CJ3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Huron 345 kV line

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin



THU, MAY 16 2002 14:14
ROTOR ANGLES 2

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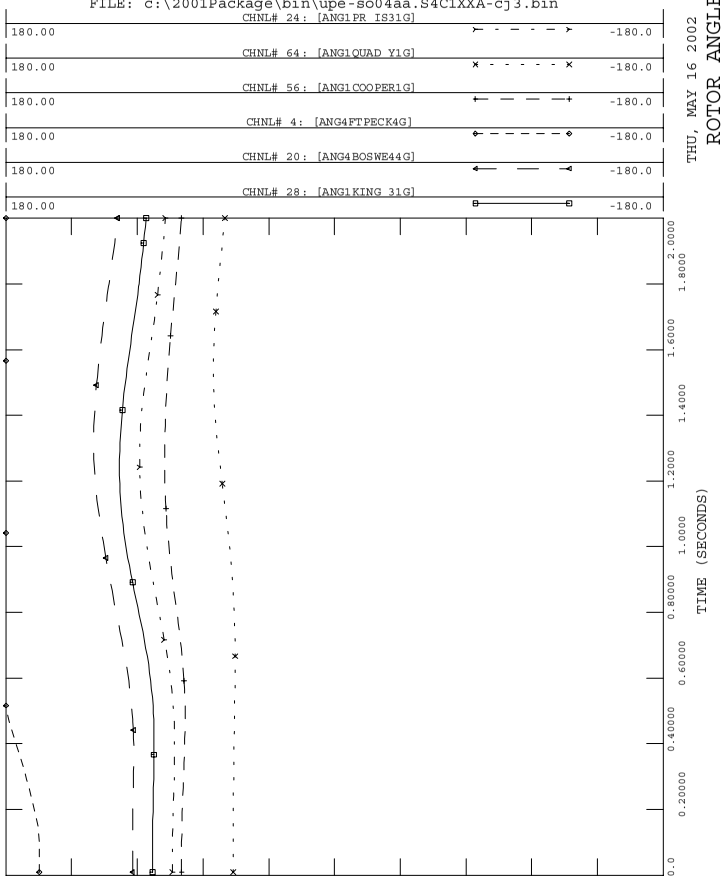
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin



THU, MAY 16 2002 14:14
ROTOR ANGLES 4

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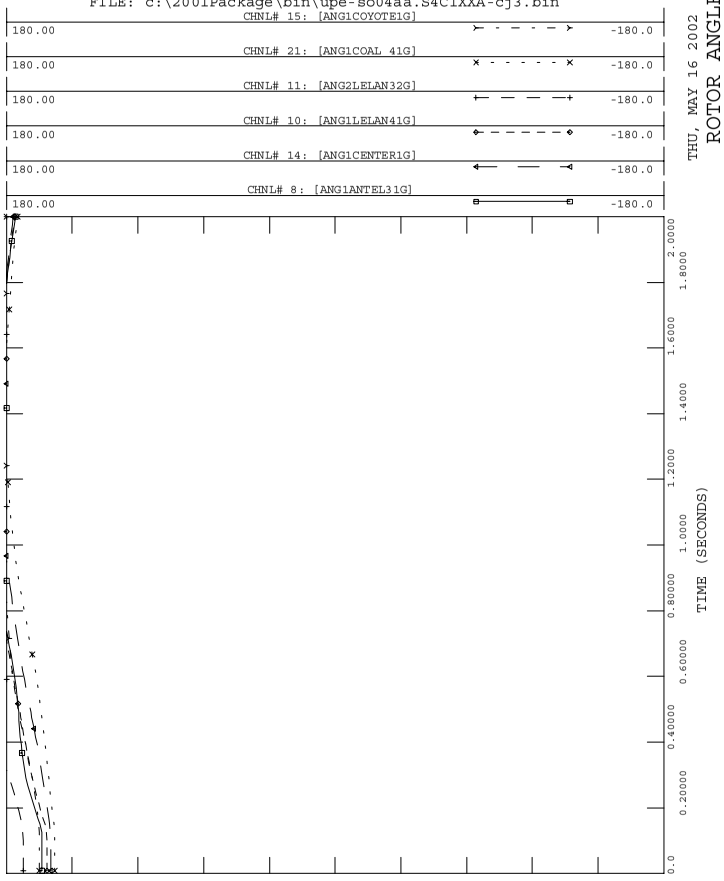
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin



THU, MAY 16 2002 14:14
ROTOR ANGLES 1

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
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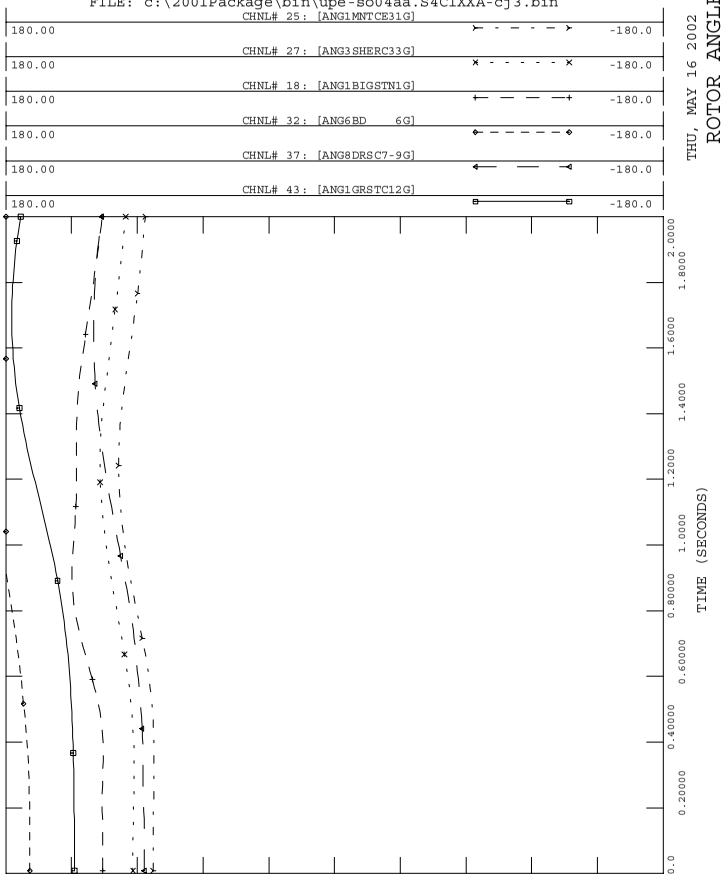

THU, MAY 16 2002 14:14
ROTOR ANGLES 3

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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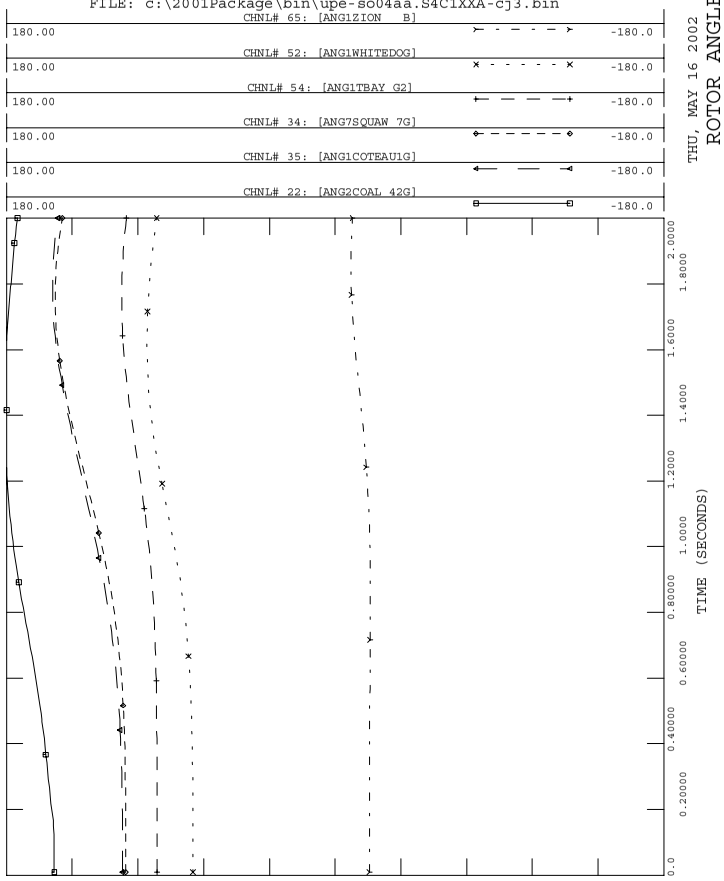
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

THU, MAY 16 2002 14:14
ROTOR ANGLES 6



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CLEAR FT.THOMPSON - HURON 345 KV LINE
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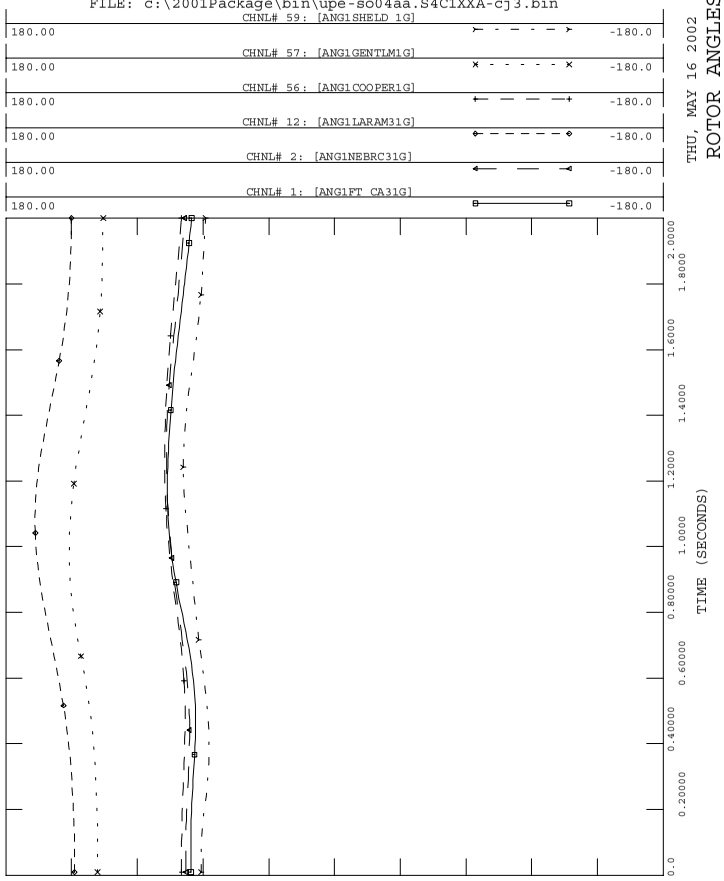
THU, MAY 16 2002 14:14
ROTOR ANGLES NB



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CLEAR FT.THOMPSON - HURON 345 KV LINE
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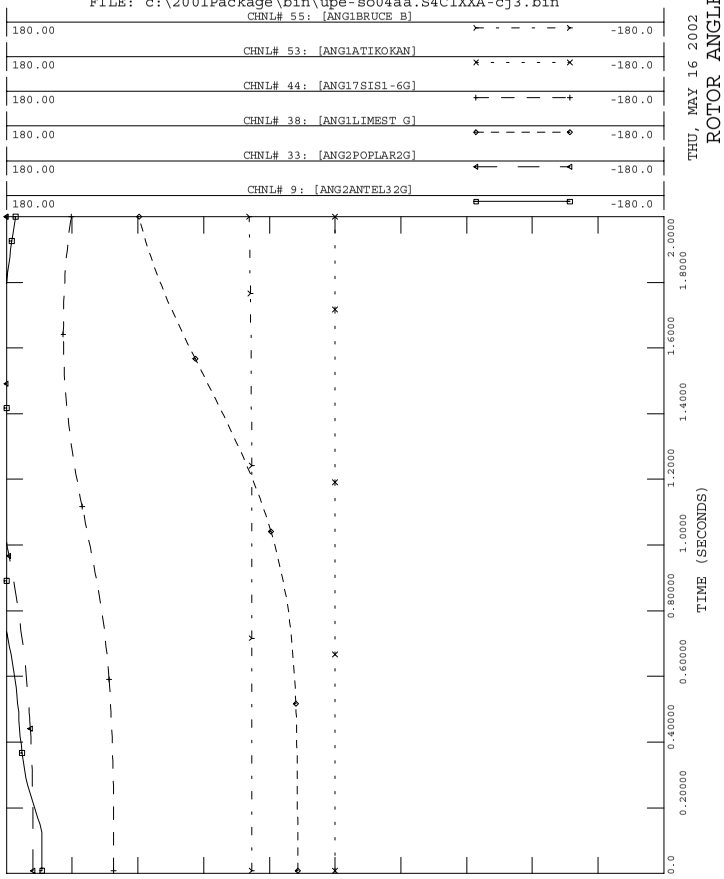
THU, MAY 16 2002 14:14
ROTOR ANGLES 5



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CLEAR FT.THOMPSON - HURON 345 KV LINE
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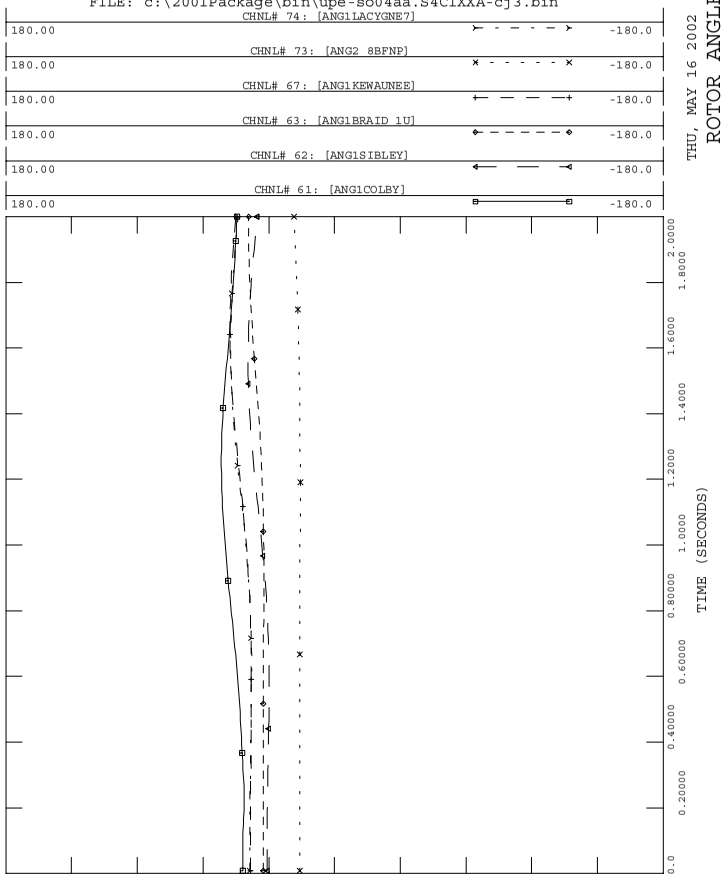
THU, MAY 16 2002 14:14
ROTOR ANGLES 7



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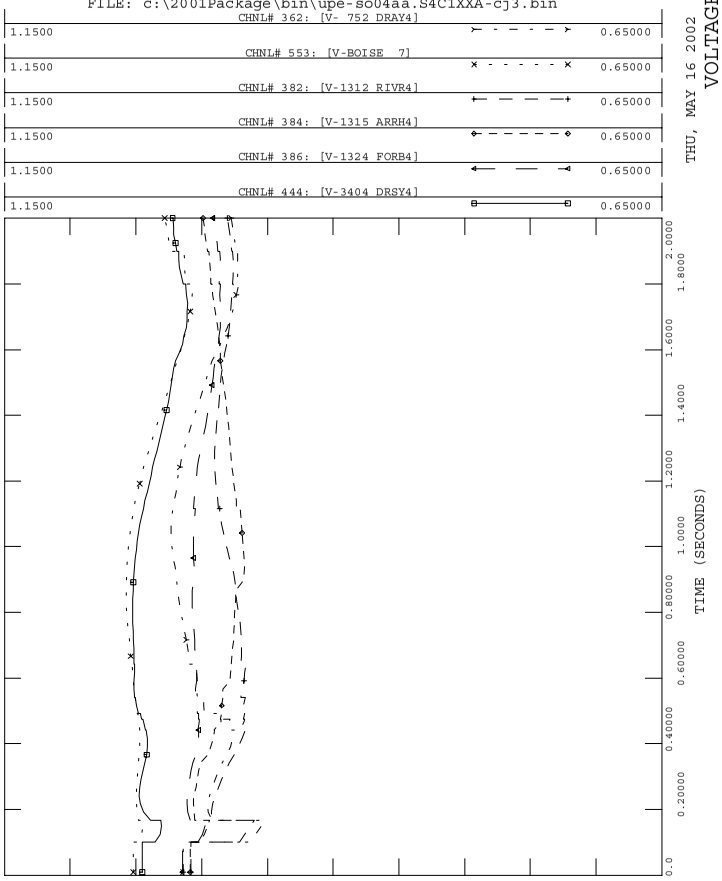
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

THU, MAY 16 2002 14:14
VOLTAGES 1



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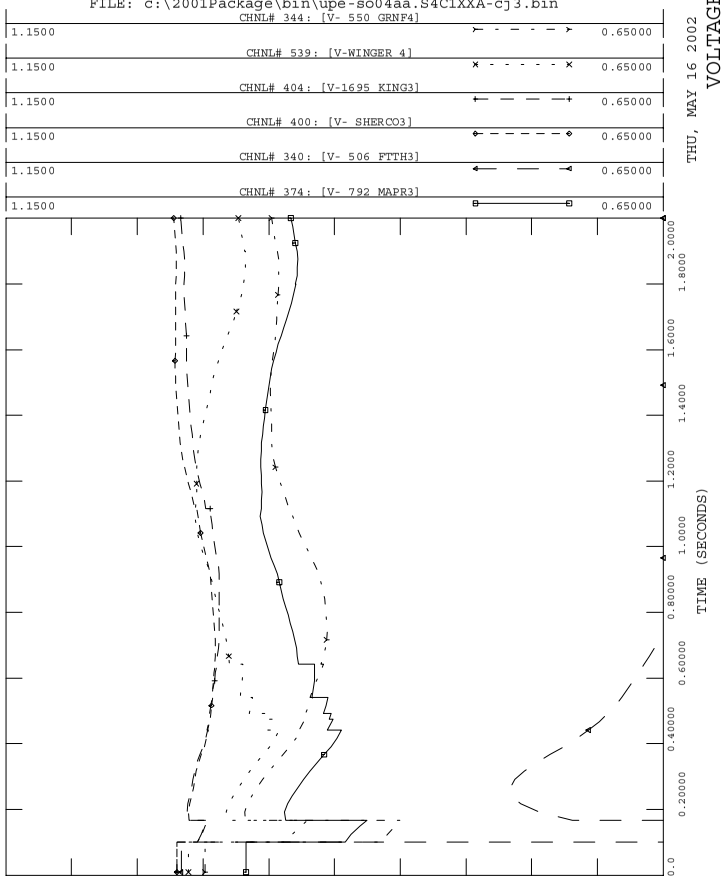
THU, MAY 16 2002 14:14
VOLTAGES 3



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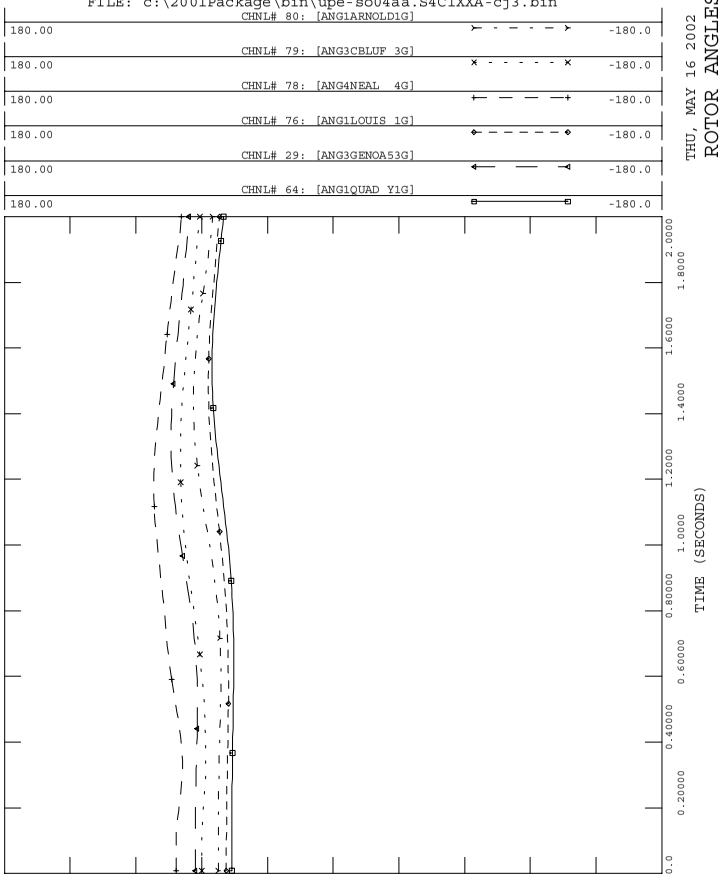
THU, MAY 16 2002 14:14
ROTOR ANGLES IA



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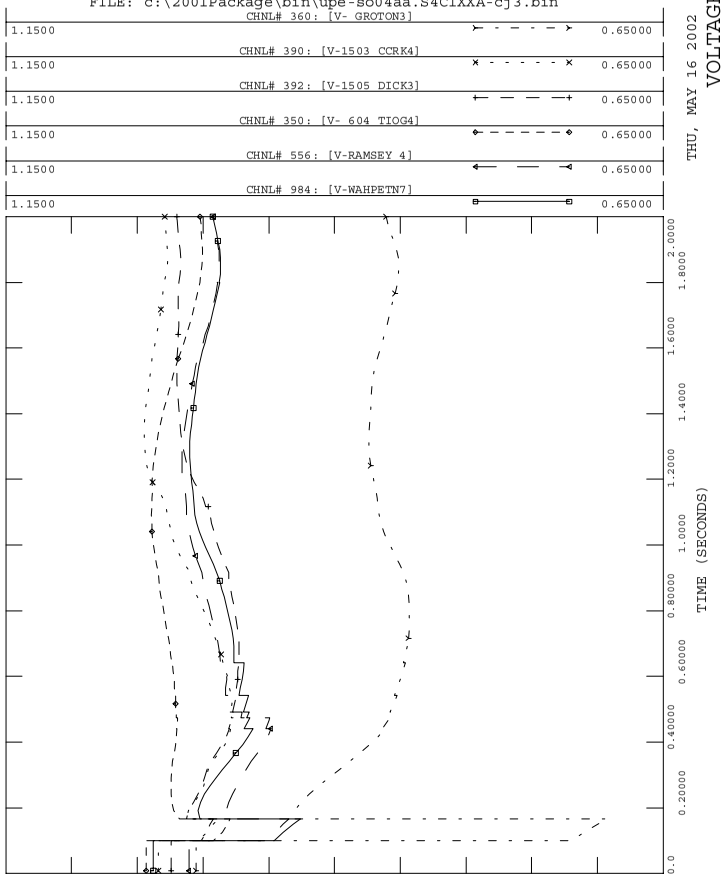
THU, MAY 16 2002 14:14
VOLTAGES 2



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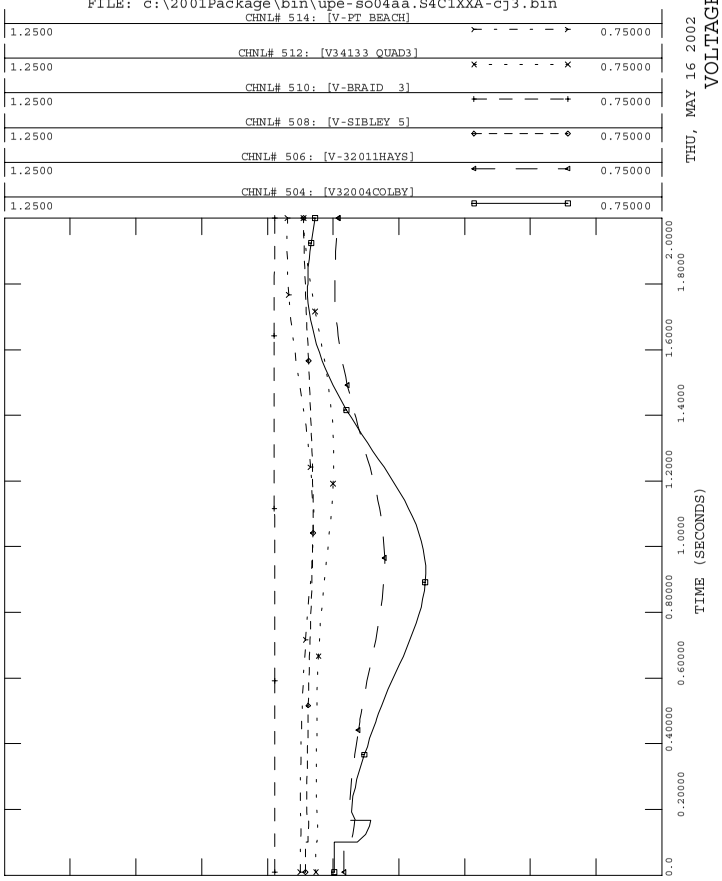
THU, MAY 16 2002 14:14
VOLTAGES 5



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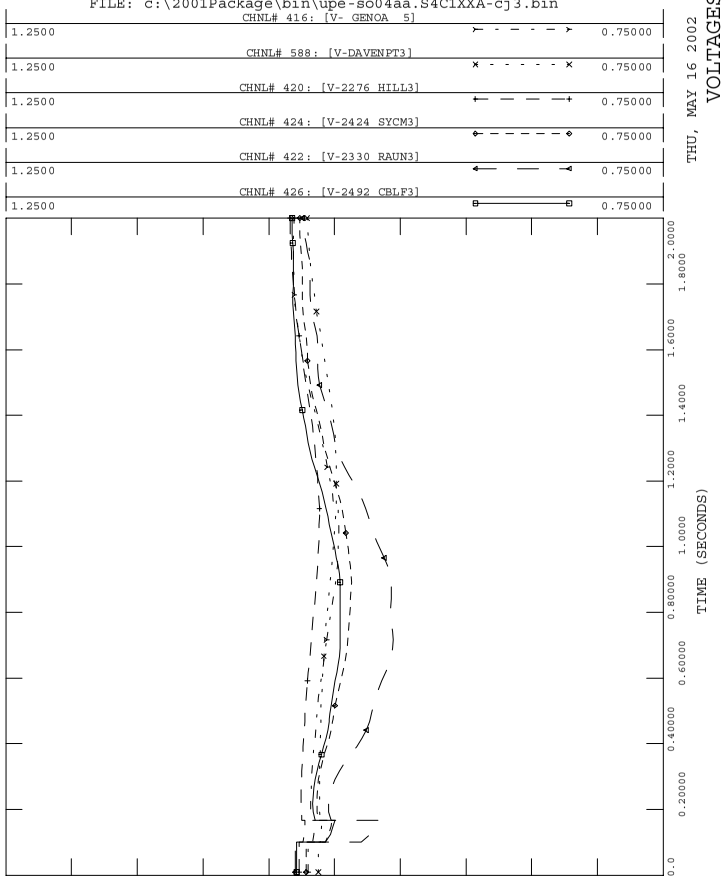
VOLTAGES IA



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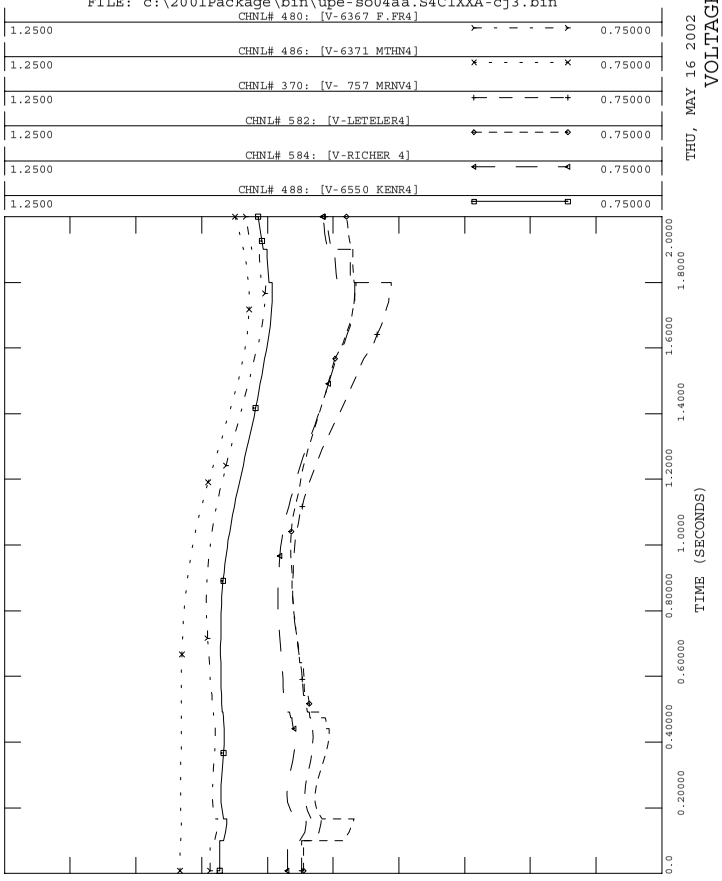
VOLTAGES 4



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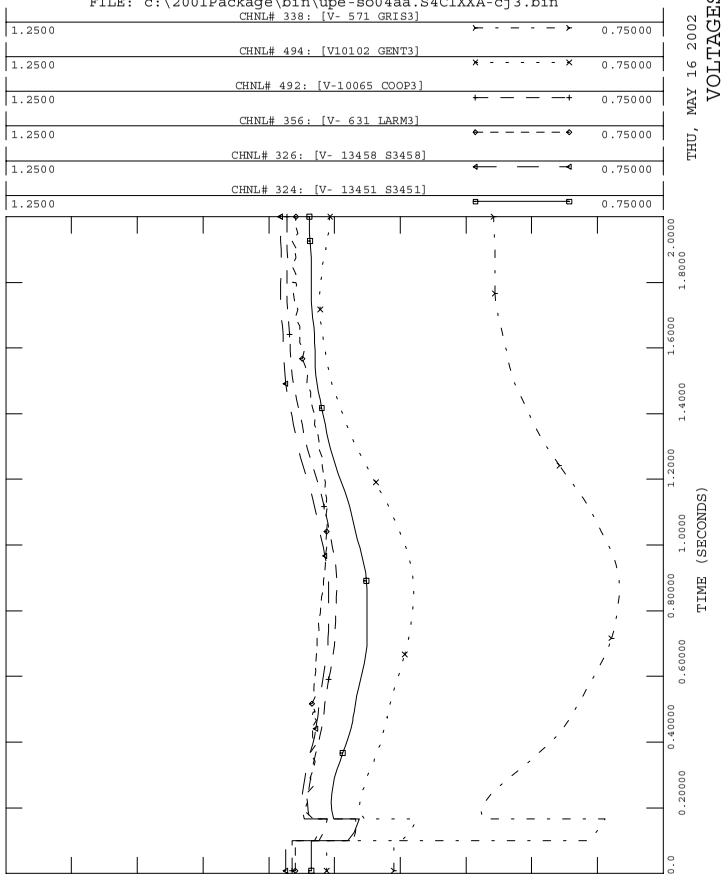
THU, MAY 16 2002 14:14
VOLTAGES NB



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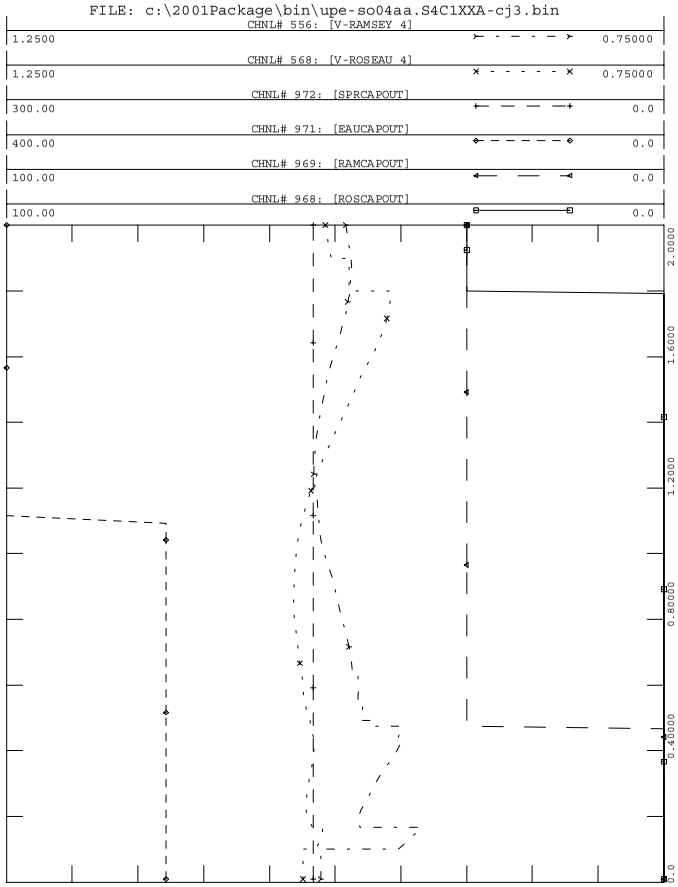
THU, MAY 16 2002 14:14
FAST SW CAP OUT 2



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CLEAR FT.THOMPSON - HURON 345 KV LINE
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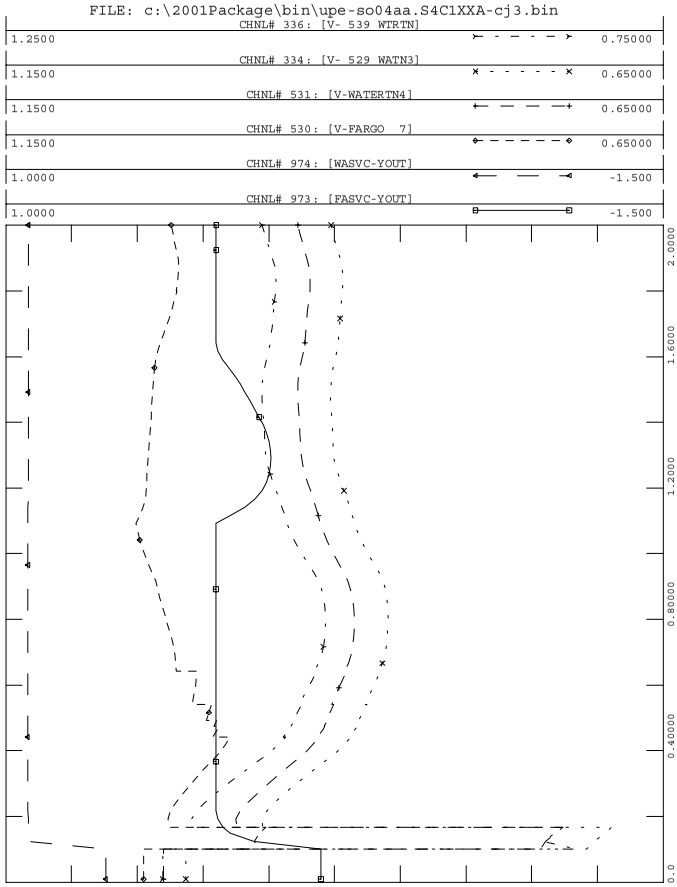
THU, MAY 16 2002 14:14
FARGO/WATERTOWN SVS



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CLEAR FT.THOMPSON - HURON 345 KV LINE
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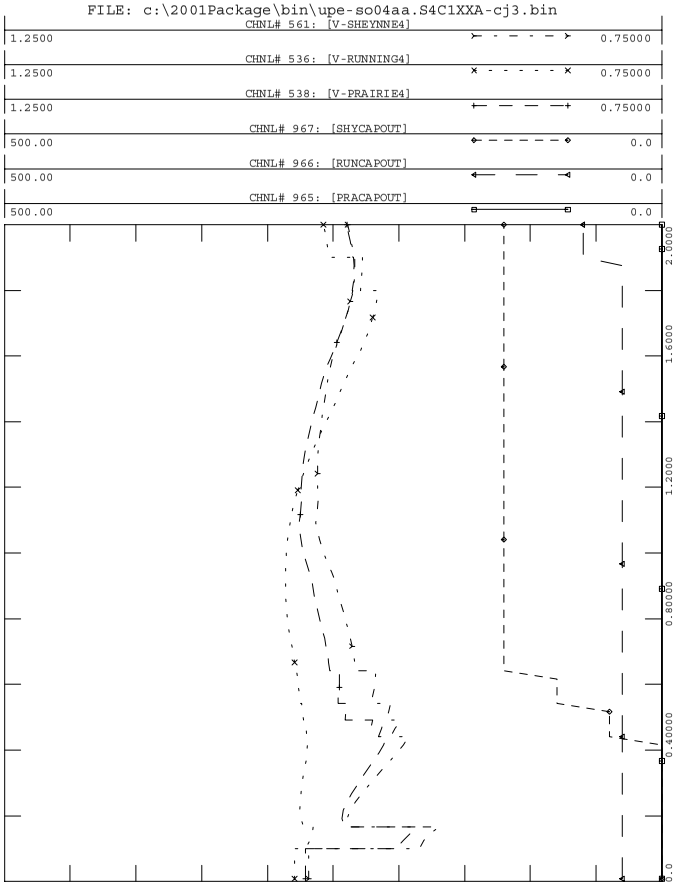
THU, MAY 16 2002 14:14
FAST SW CAP OUT 1



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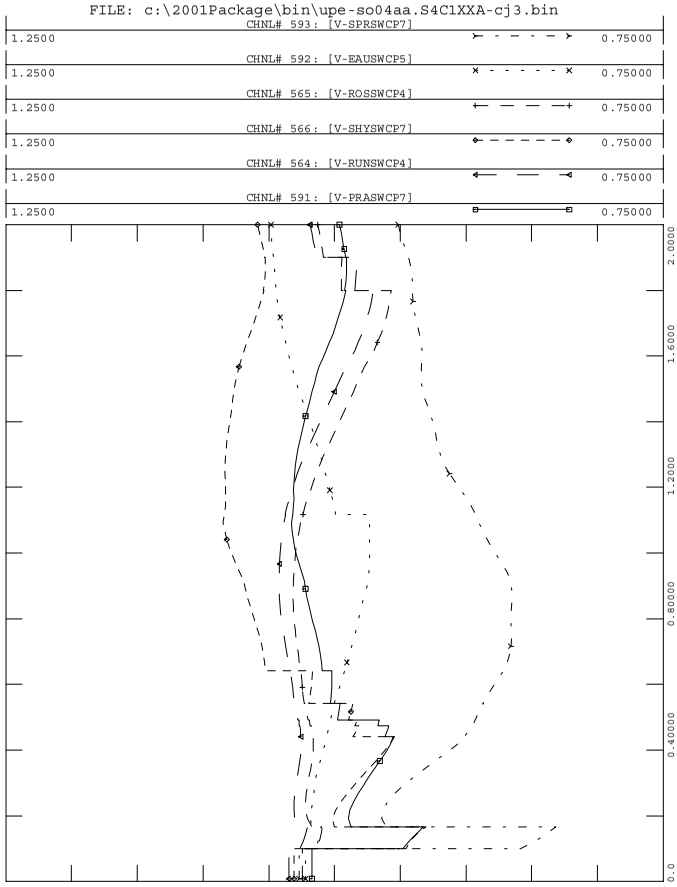
THU, MAY 16 2002 14:14
FAST SW CAP VOLTAGES



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CLEAR FT.THOMPSON - HURON 345 KV LINE
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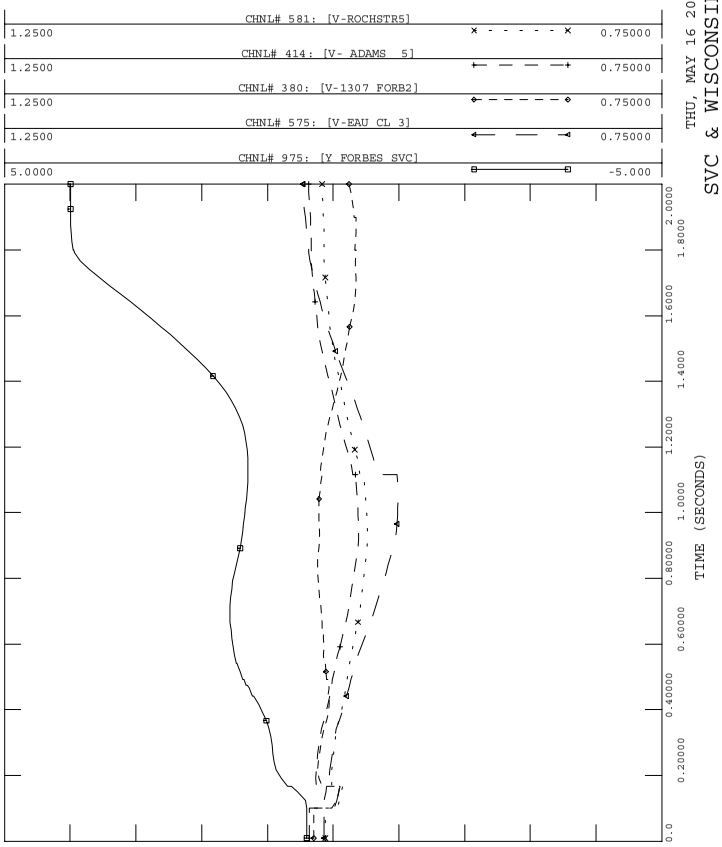
THU, MAY 16 2002 14:14

SVC & WISCONSIN VOLT



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CLEAR FT.THOMPSON - HURON 345 KV LINE
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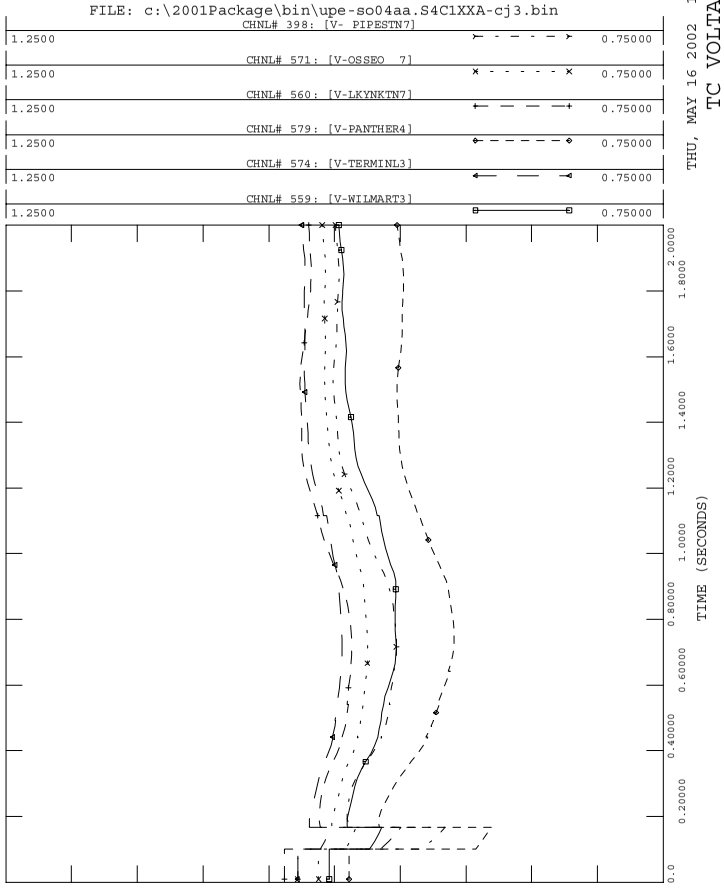
THU, MAY 16 2002 14:14

TC VOLTAGES



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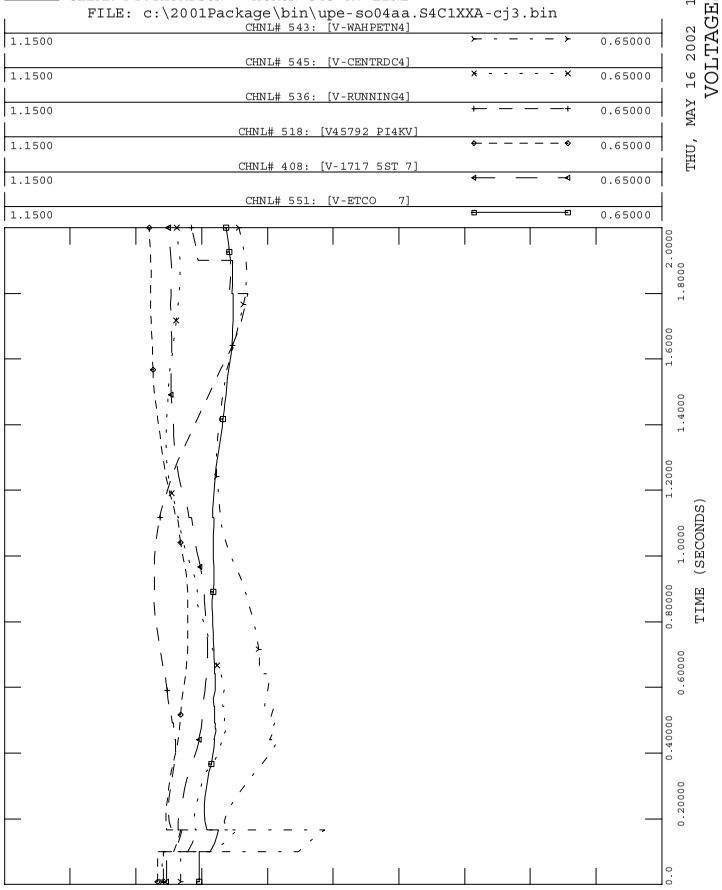
THU, MAY 16 2002 14:14

VOLTAGES 6



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CLEAR FT.THOMPSON - HURON 345 KV LINE
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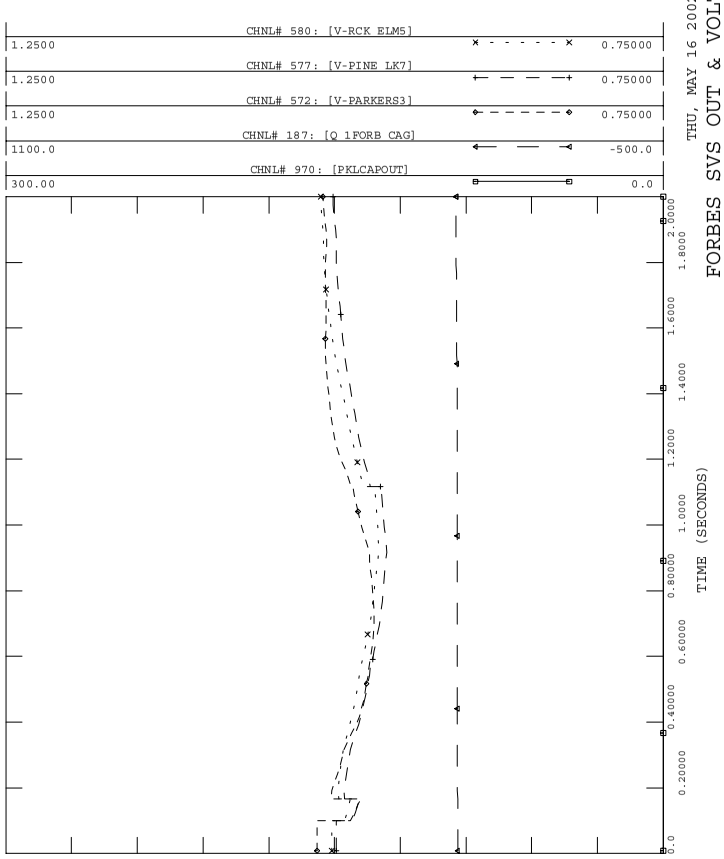
FORBES SVS OUT & VOLTAGES



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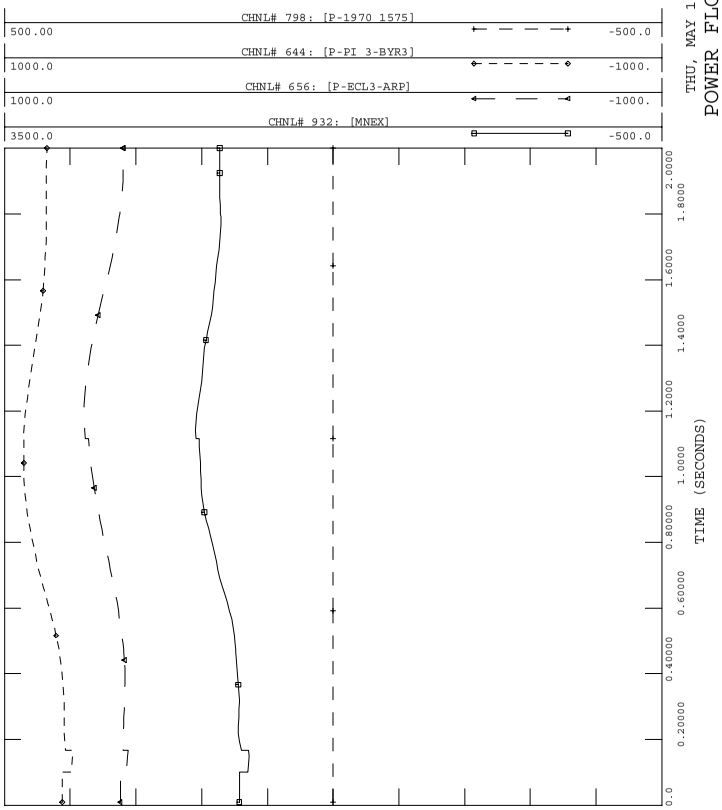
POWER FLOW SUMS 2



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CLEAR FT.THOMPSON - HURON 345 KV LINE
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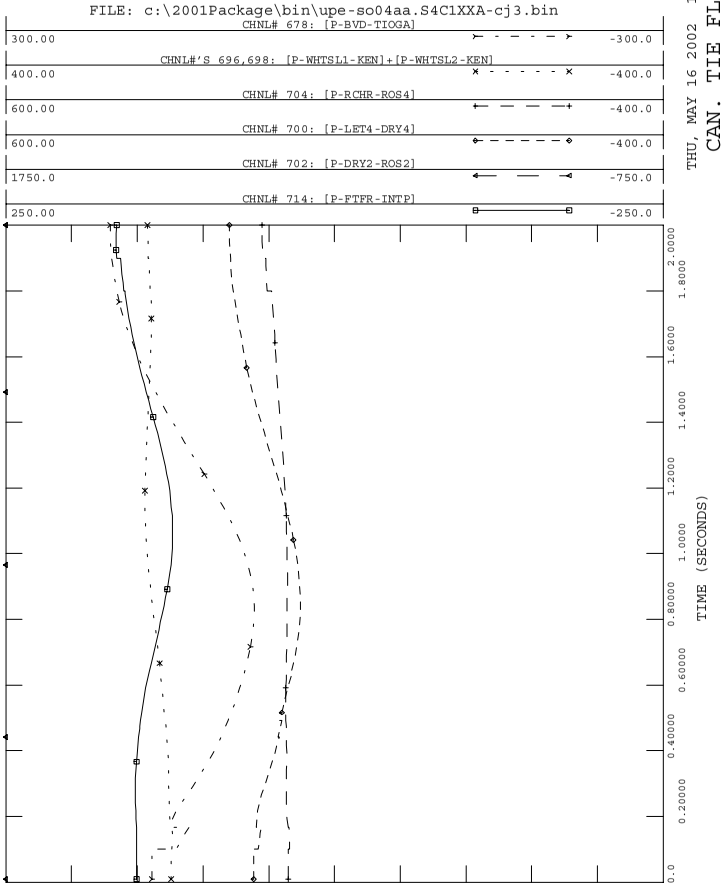
CAN. TIE FLOWS



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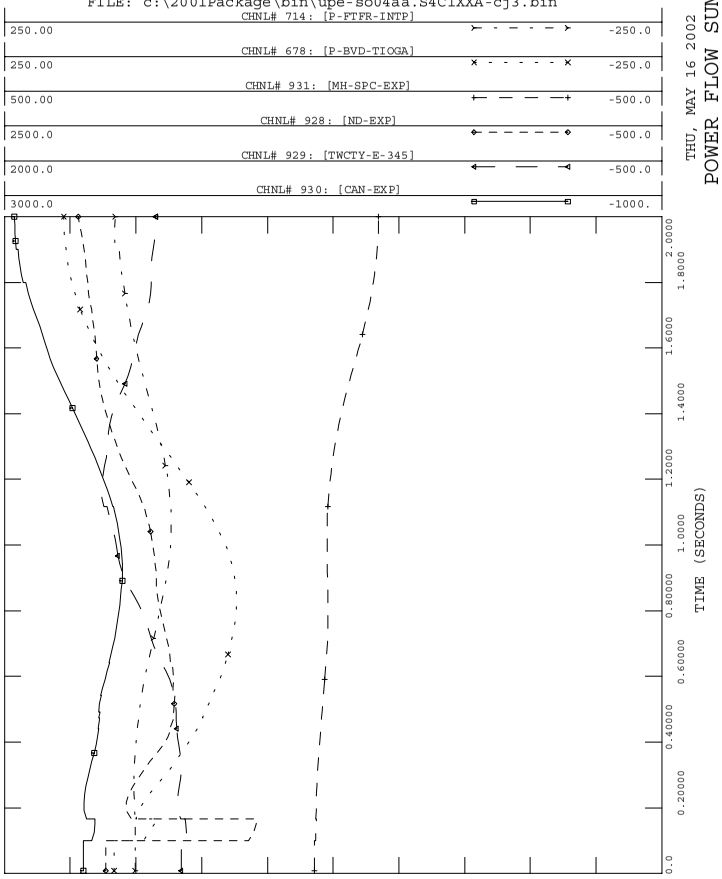
POWER FLOW SUMS 1



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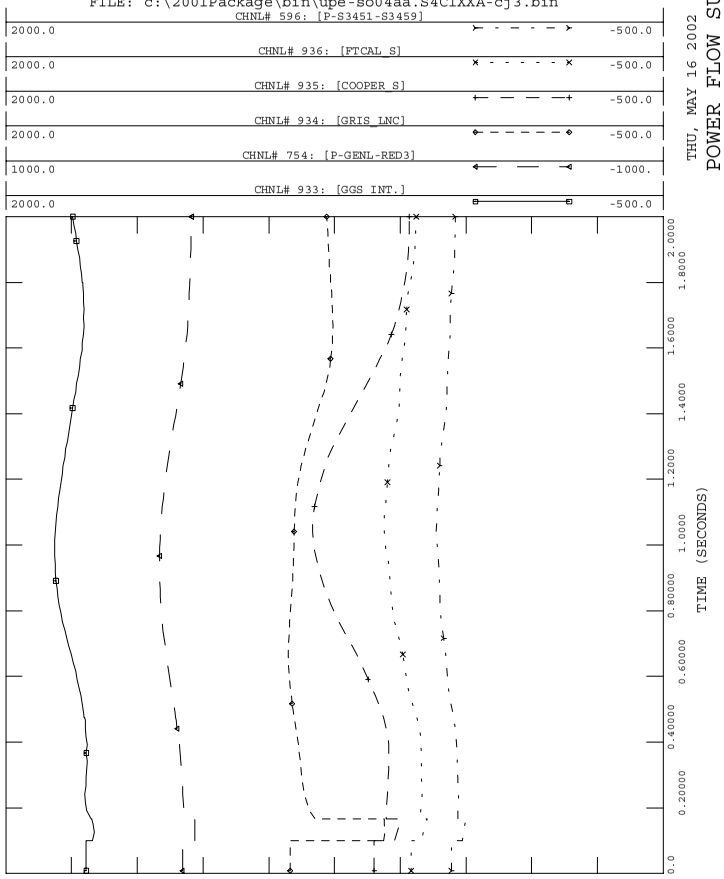
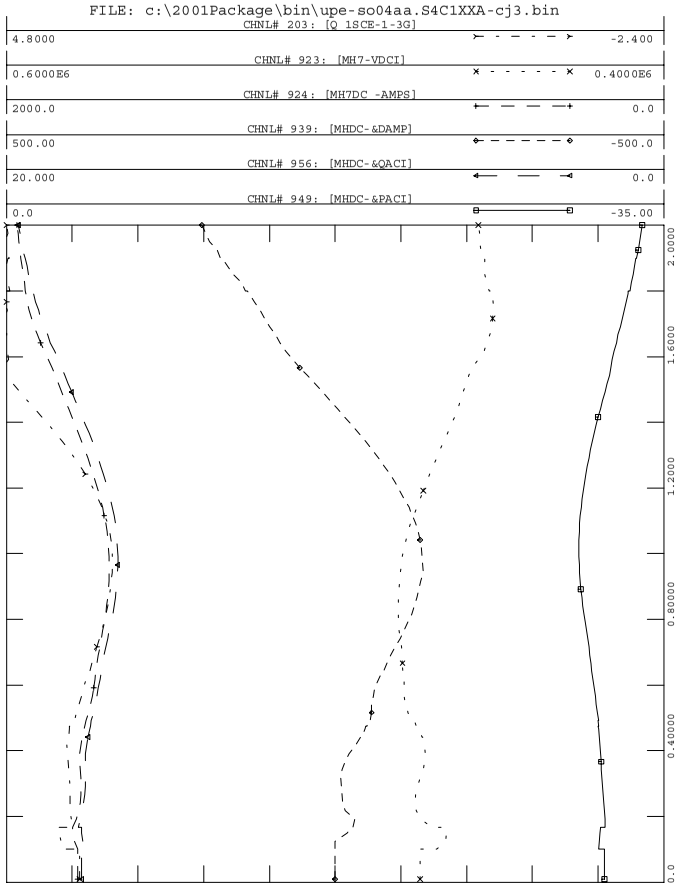
THU, MAY 16 2002 14:14
POWER FLOW SUM 3



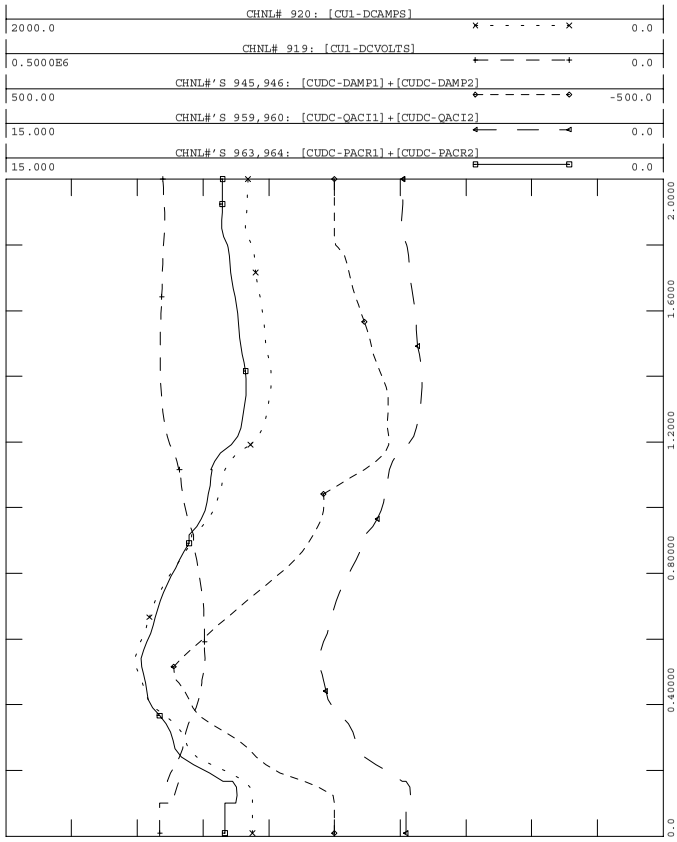
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

THU, MAY 16 2002 14:14
MH DC PARAMETERS



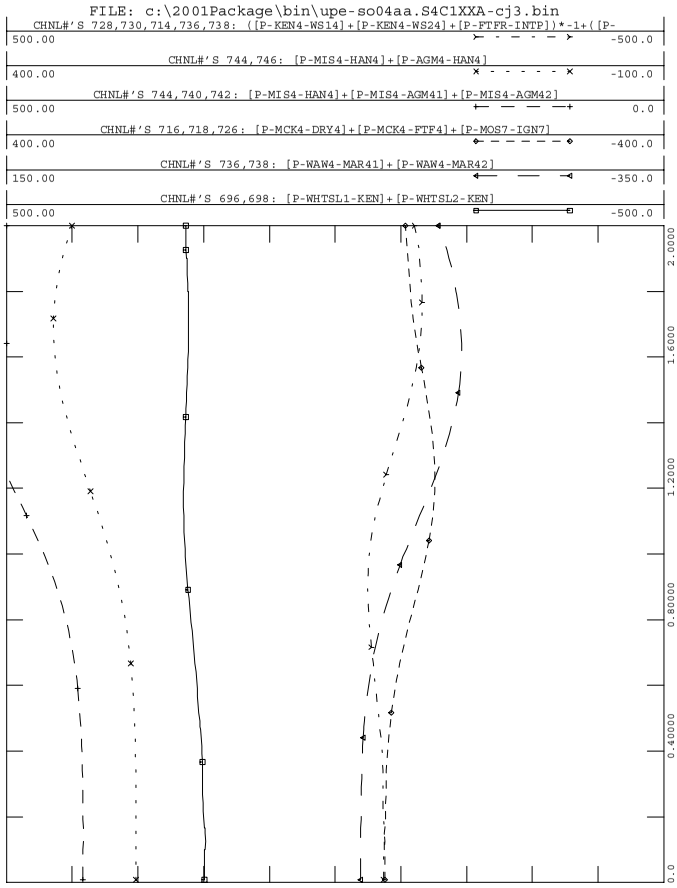
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

THU, MAY 16 2002 14:14
CU DC #1



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

THU, MAY 16 2002 14:14
OH TIE FLOWS



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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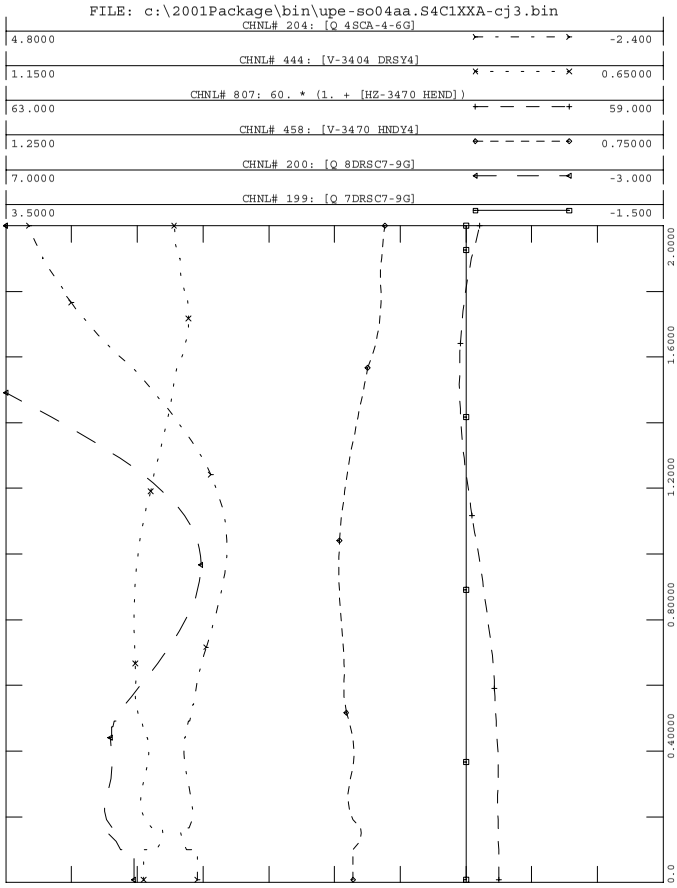
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

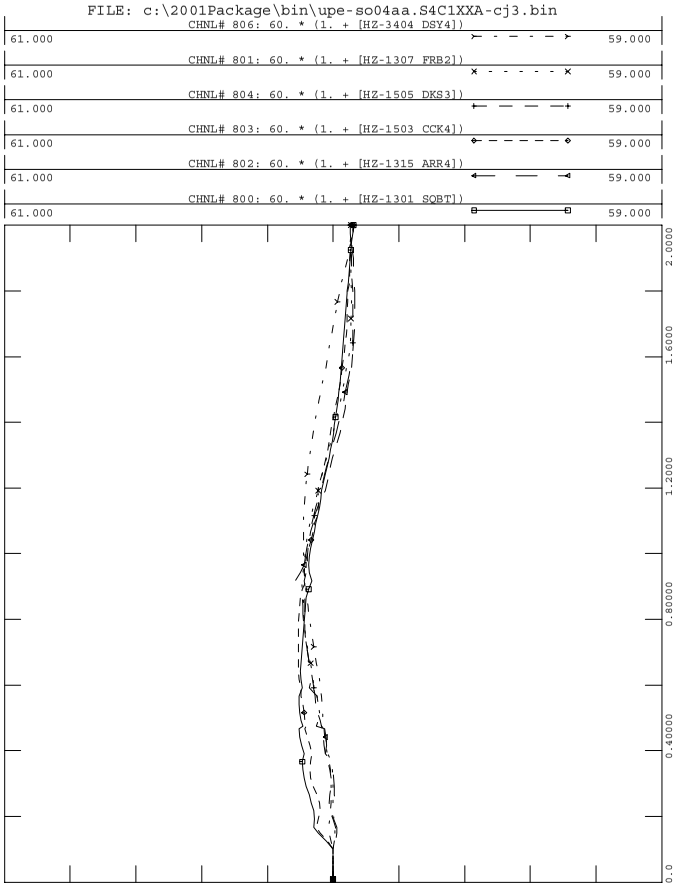
THU, MAY 16 2002 14:14
MH DC PARAMETERS



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

THU, MAY 16 2002 14:14

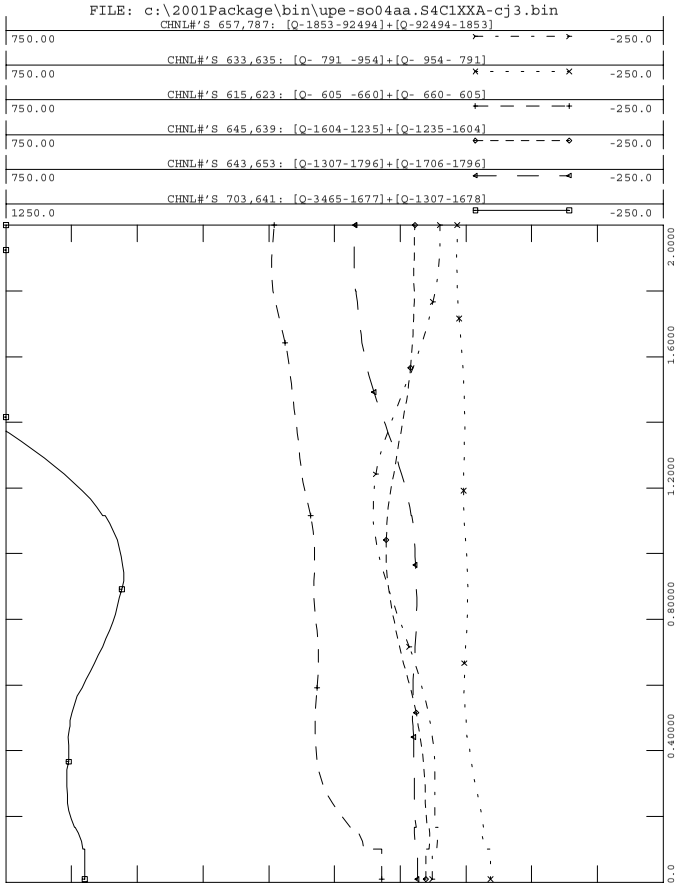
FREQ AT DC TERMINALS



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

THU, MAY 16 2002 14:14

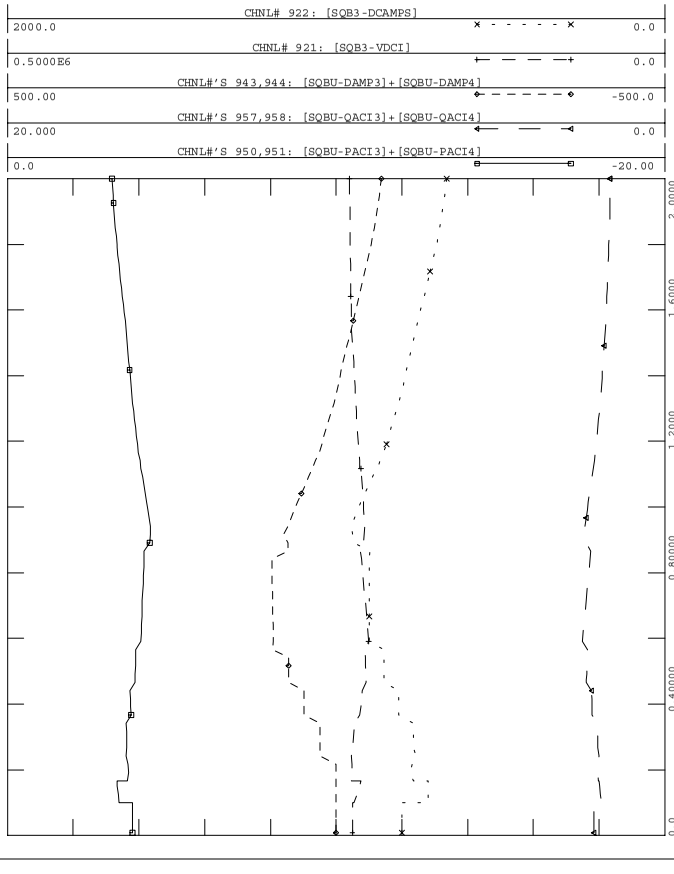
VAR LOSSES



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

THU, MAY 16 2002 14:14

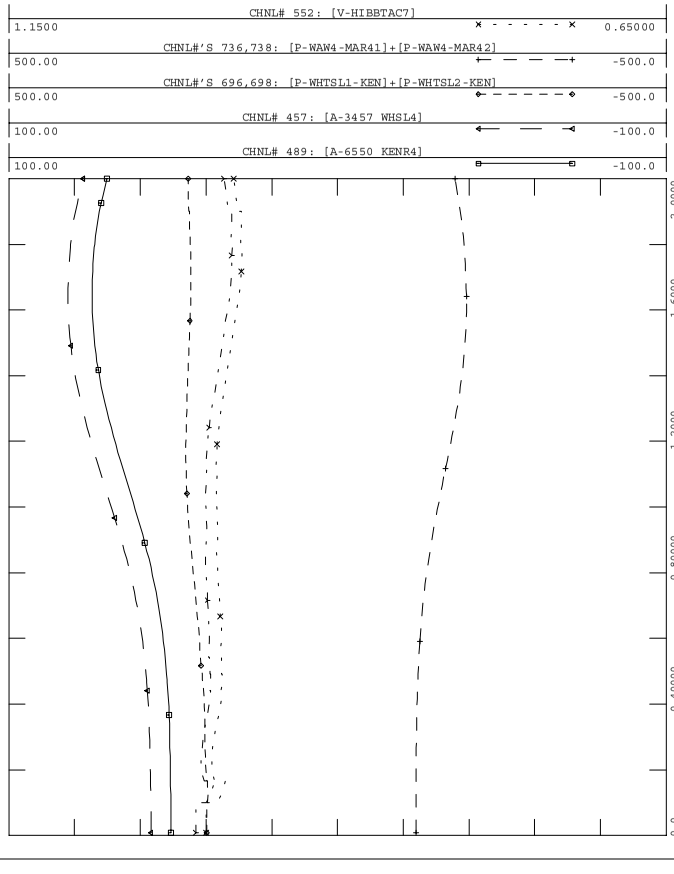
SQB DC #3



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

THU, MAY 16 2002 14:14

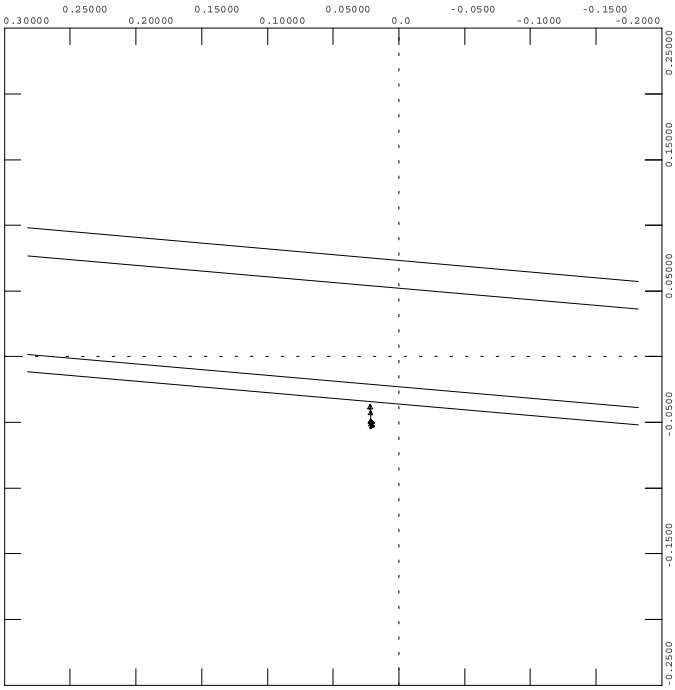
VOLTAGES, ANGLES



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

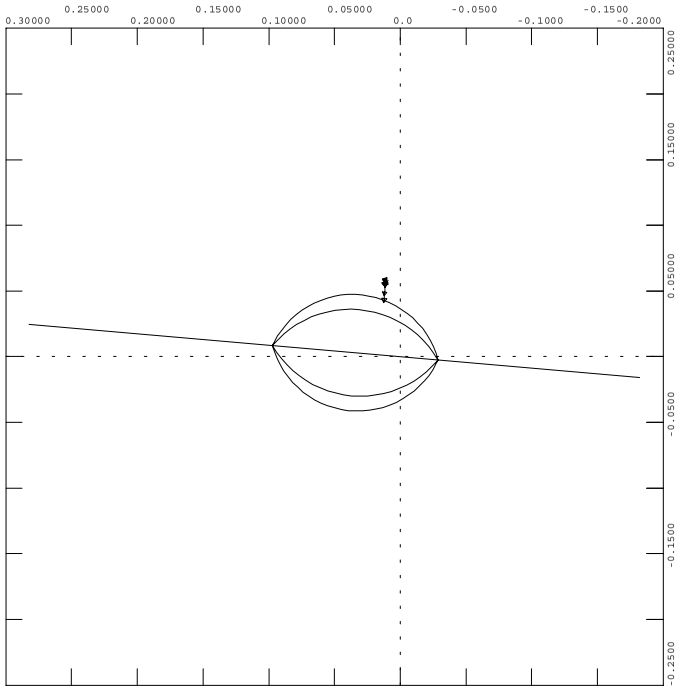


THU, MAY 16 2002 14:14
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

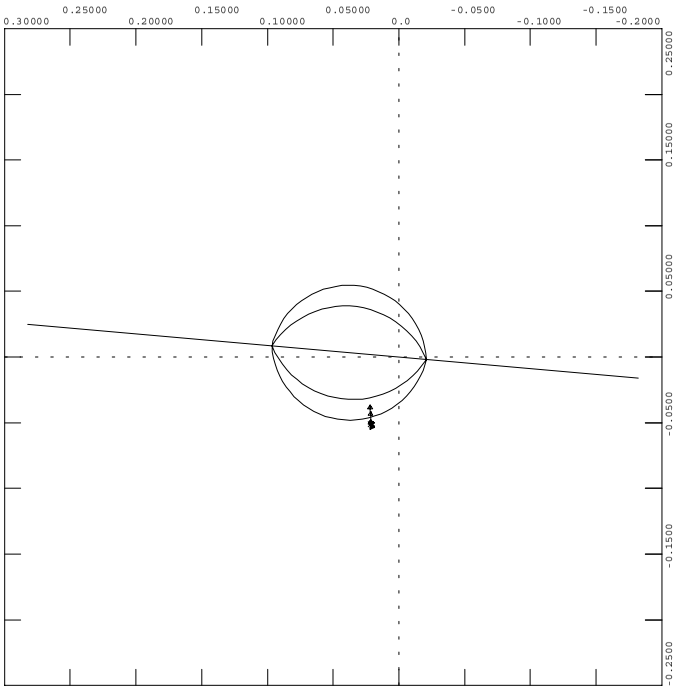


THU, MAY 16 2002 14:14
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

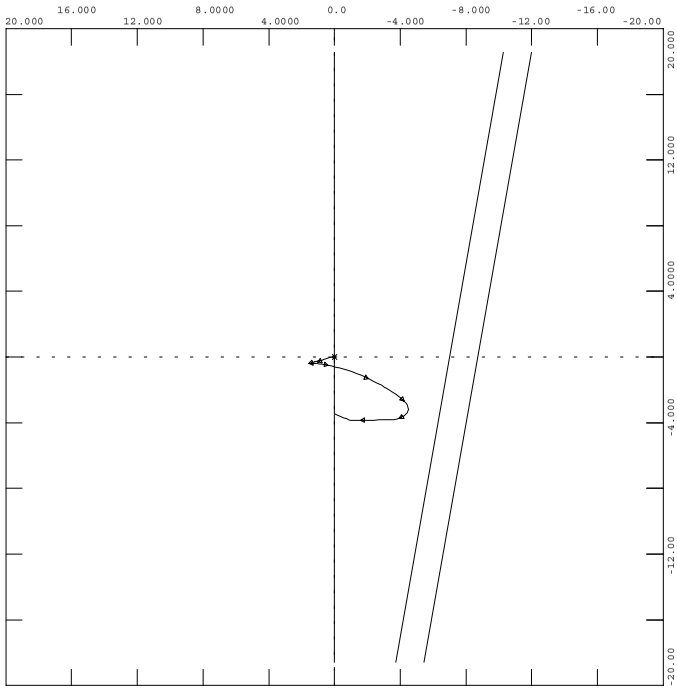


THU, MAY 16 2002 14:14
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

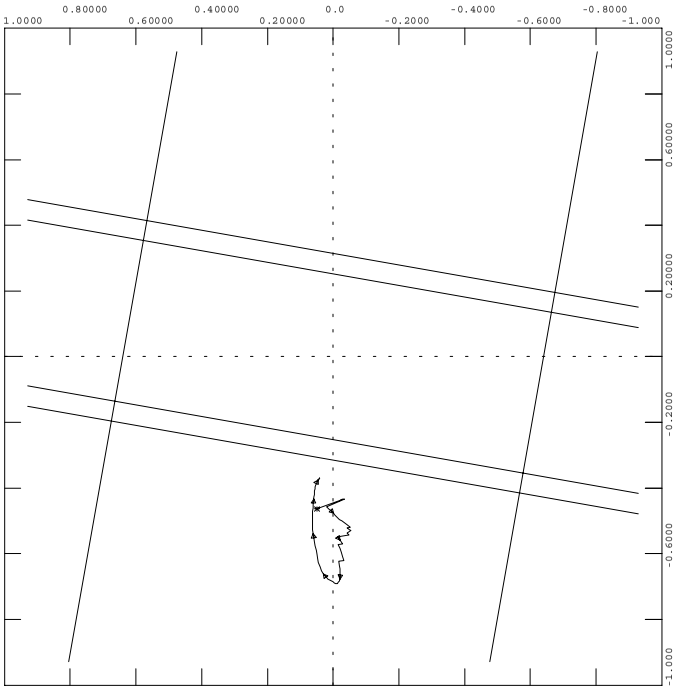


THU, MAY 16 2002 14:14
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

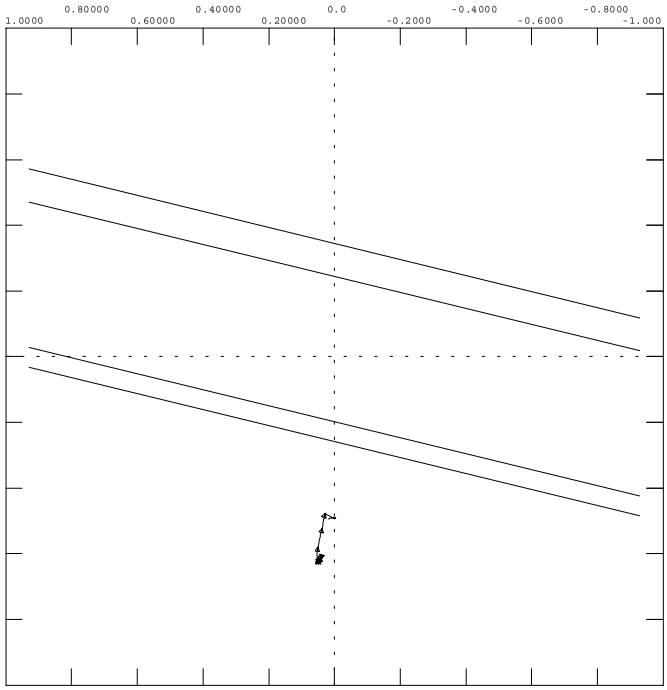
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

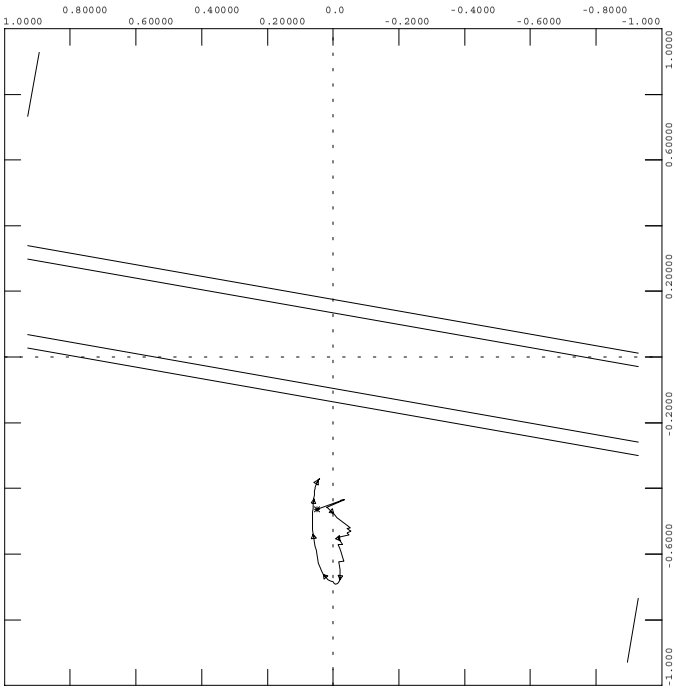
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

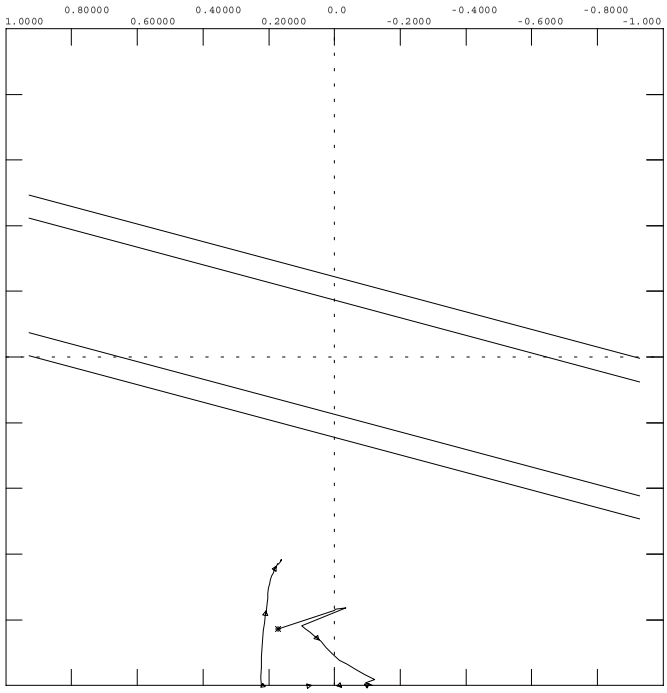
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

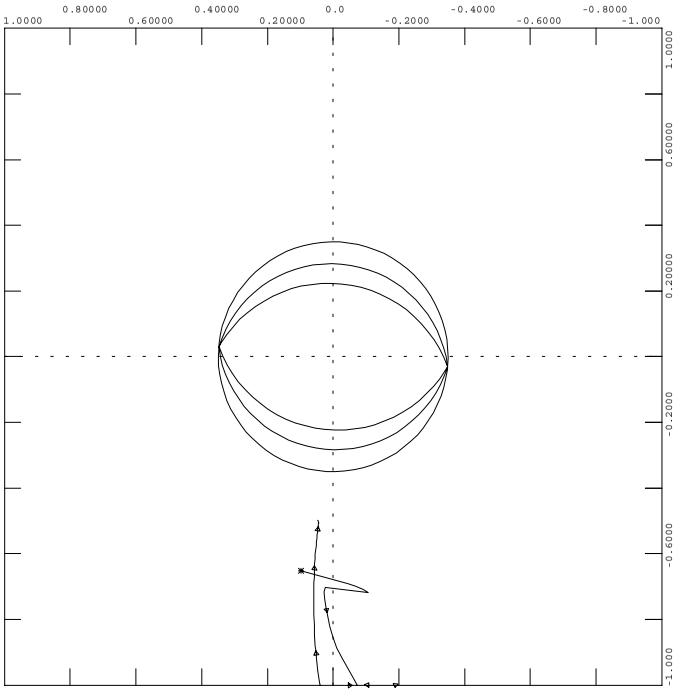
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

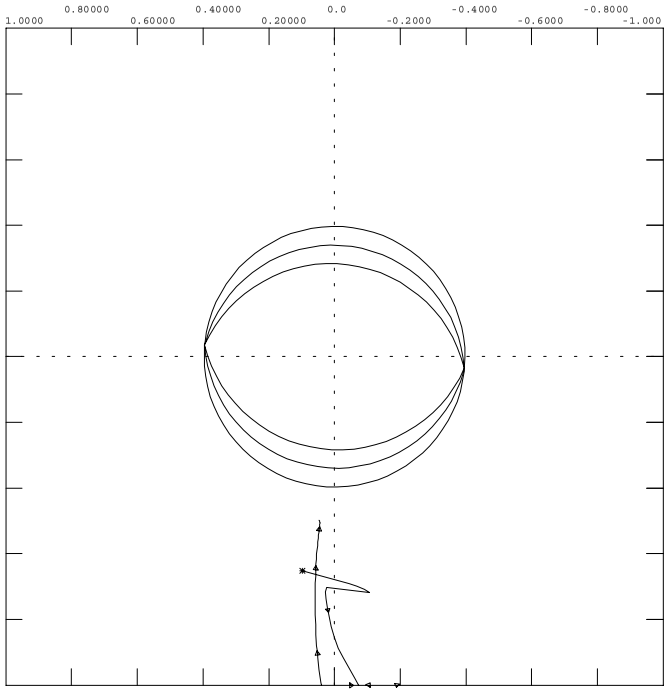
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

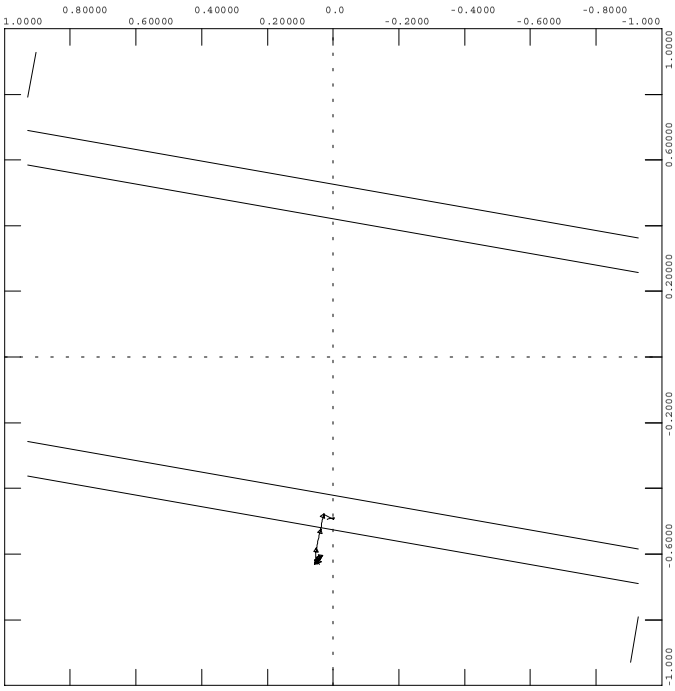
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

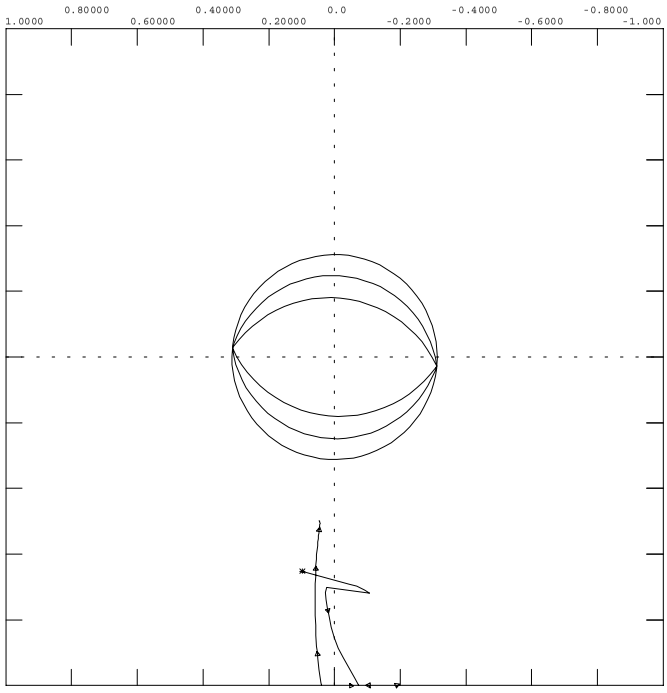
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

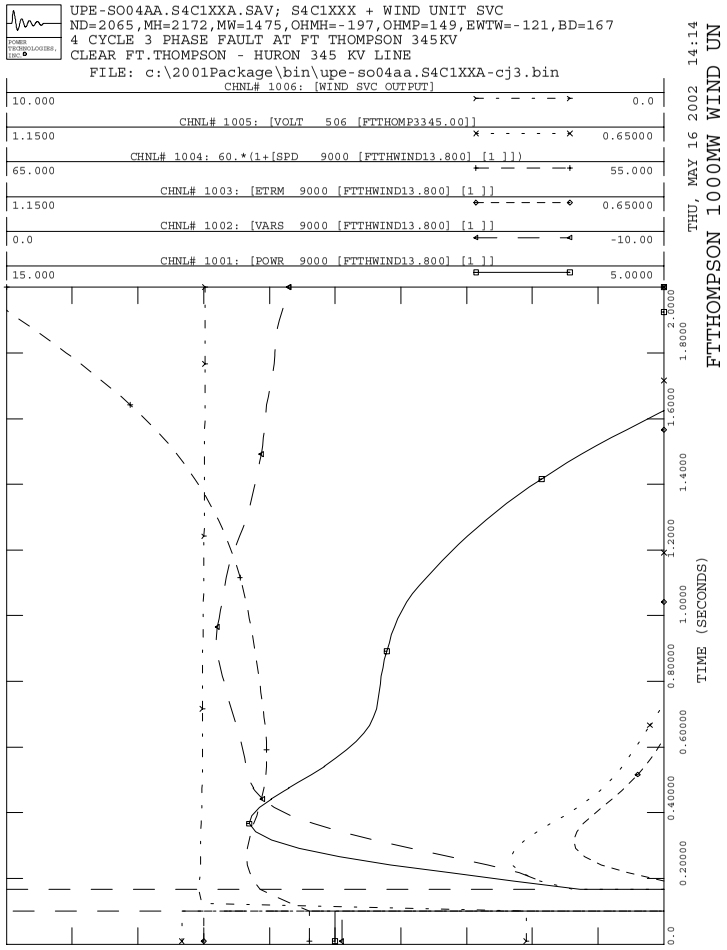


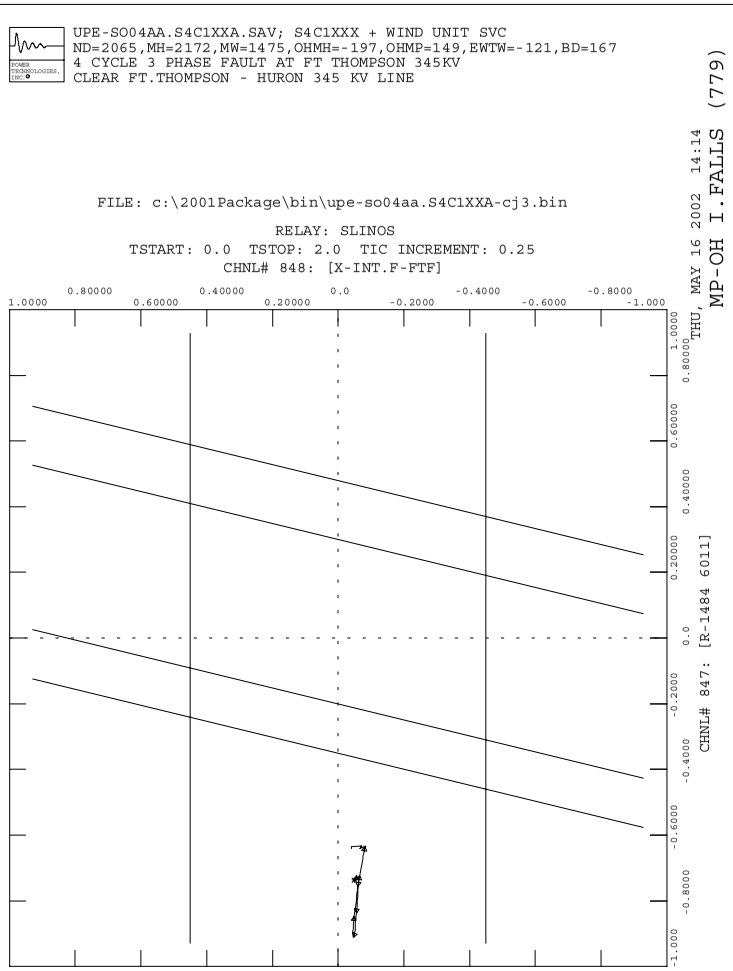
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

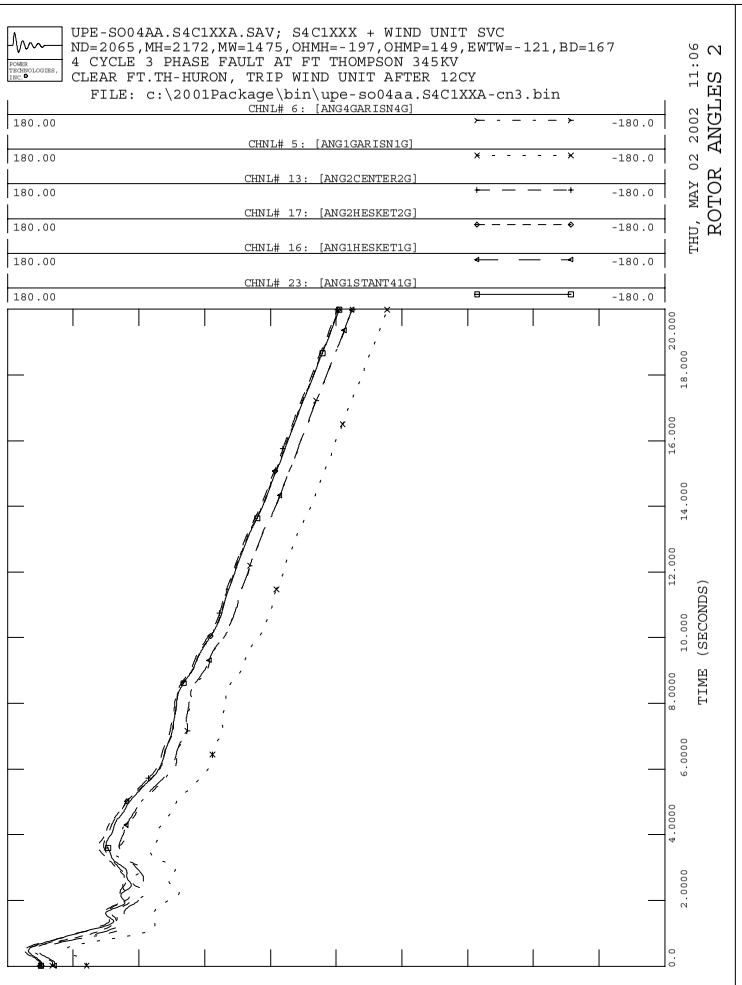


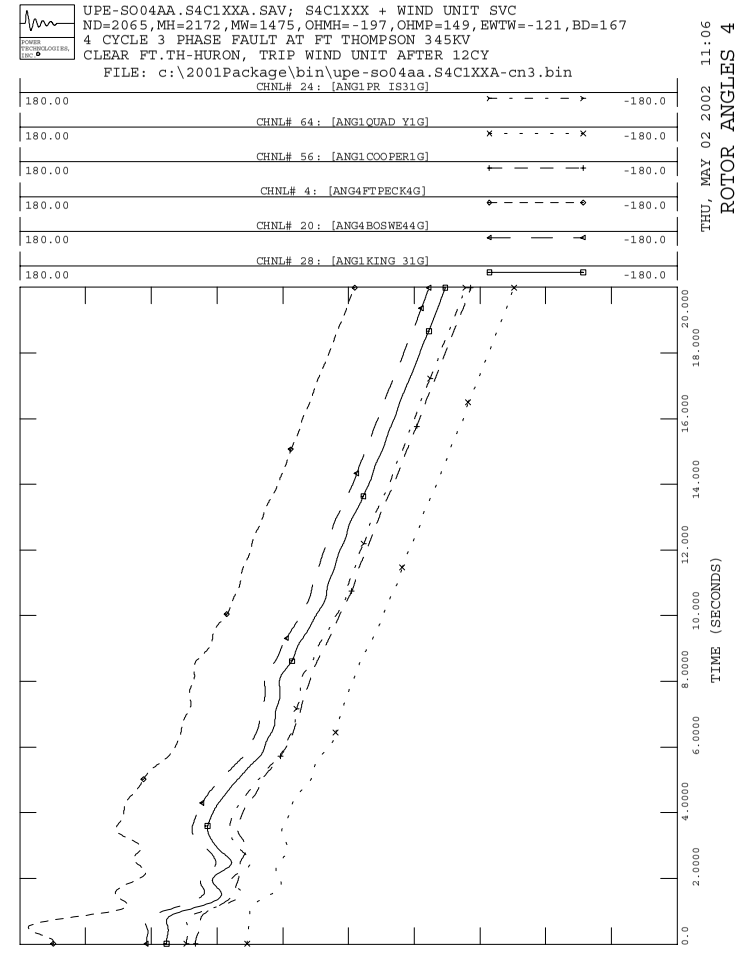

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin
CHNL# 1006: [WIND SVC OUTPUT]
10.000
0.0
CHNL# 1005: [VOLT 506 [FTTHOMP3345.00]]
1.1500
0.65000
CHNL# 1004: 60.*(1+[SPD 9000 [FTTHWIND13.800] [1]])
65.000
55.000
CHNL# 1003: [ETRM 9000 [FTTHWIND13.800] [1]]
1.1500
0.65000
CHNL# 1002: [VARS 9000 [FTTHWIND13.800] [1]]
0.0
-10.00
CHNL# 1001: [POWR 9000 [FTTHWIND13.800] [1]]
15.000
5.0000
0.0
0.20000
0.40000
0.60000
0.80000
1.0000
1.2000
1.4000
1.6000
1.8000
2.0000
TIME (SECONDS)
THU, MAY 16 2002 14:14
FTTHOMPSON 1000MW WIND UN


UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cj3.bin
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]
1.0000
0.80000
0.60000
0.40000
0.20000
0.0
-0.2000
-0.4000
-0.6000
-0.8000
-1.000
CHNL# 847: [R-1484 6011]
THU, MAY 16 2002 14:14
MP-OH I.FALLS (779)

CONTINGENCY CN3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear Ft.Thompson-Huron. Trip wind unit after 12 cycles


UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 02 2002 11:06
ROTOR ANGLES 2


UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
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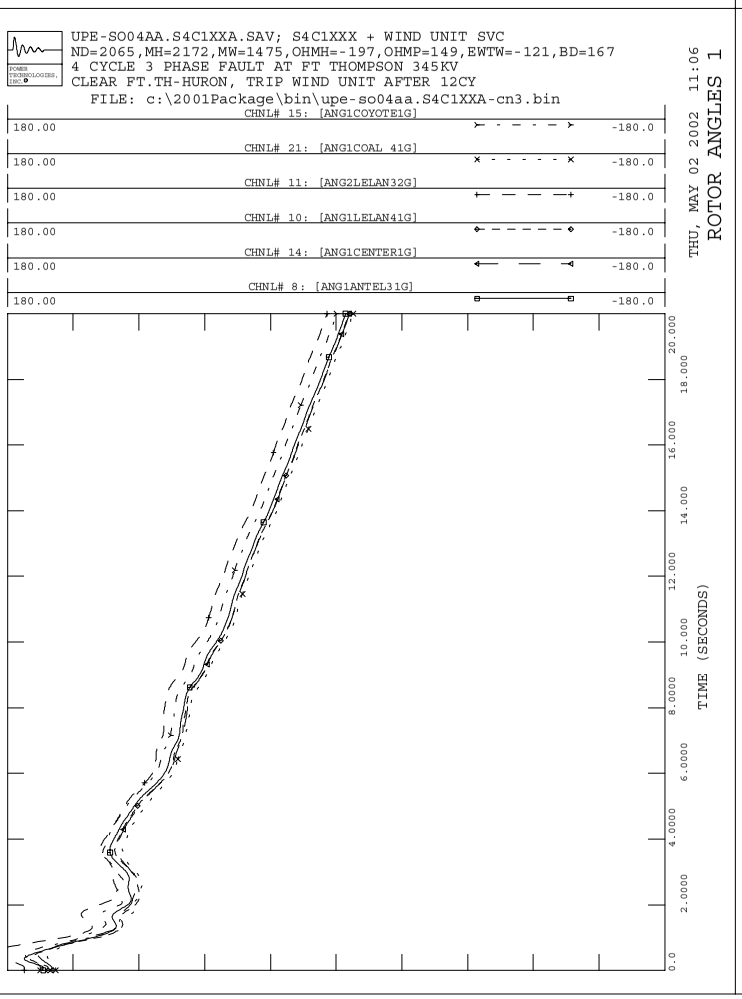
TIME (SECONDS)
THU, MAY 02 2002 11:06
ROTOR ANGLES 4


UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
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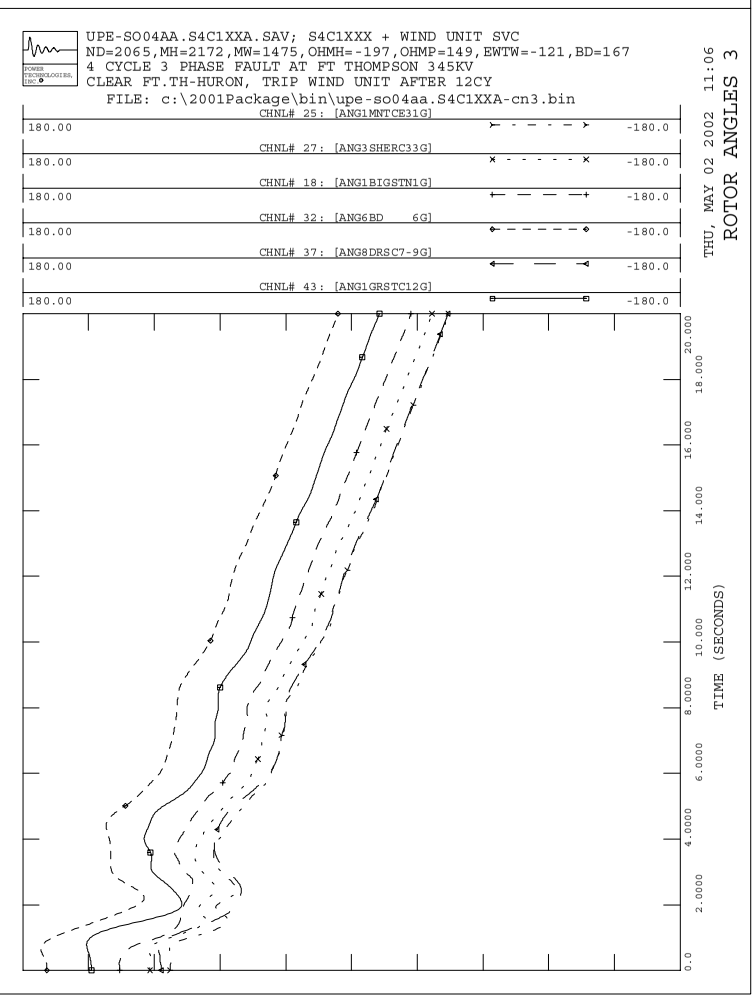
TIME (SECONDS)
THU, MAY 02 2002 11:06
ROTOR ANGLES 1


UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
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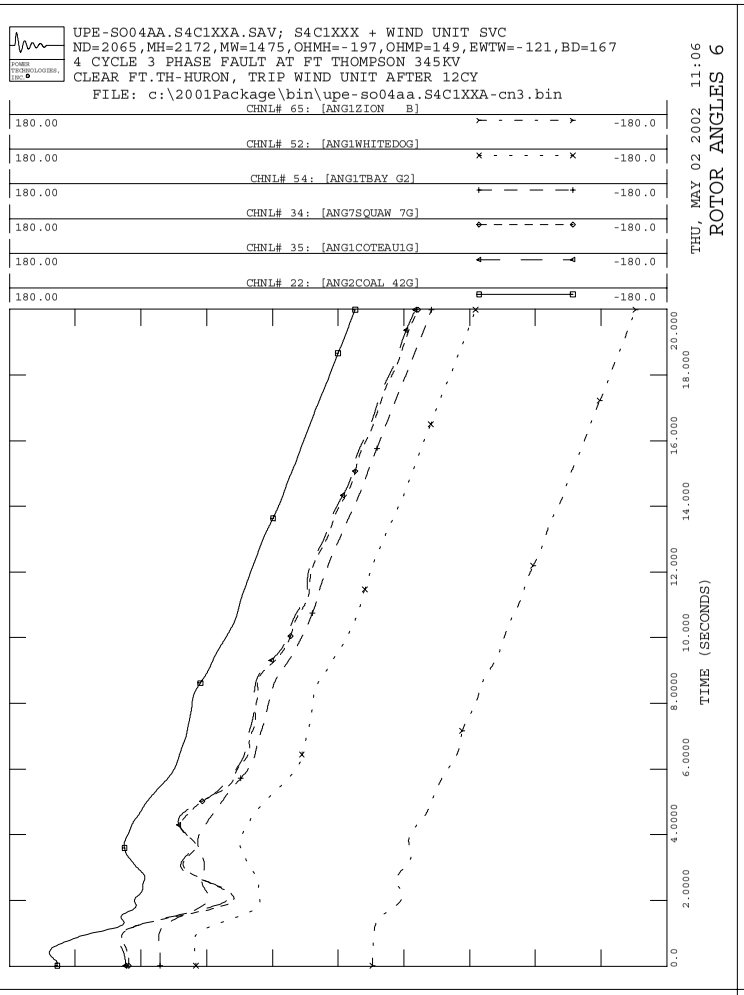
TIME (SECONDS)
THU, MAY 02 2002 11:06
ROTOR ANGLES 3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CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
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TIME (SECONDS)
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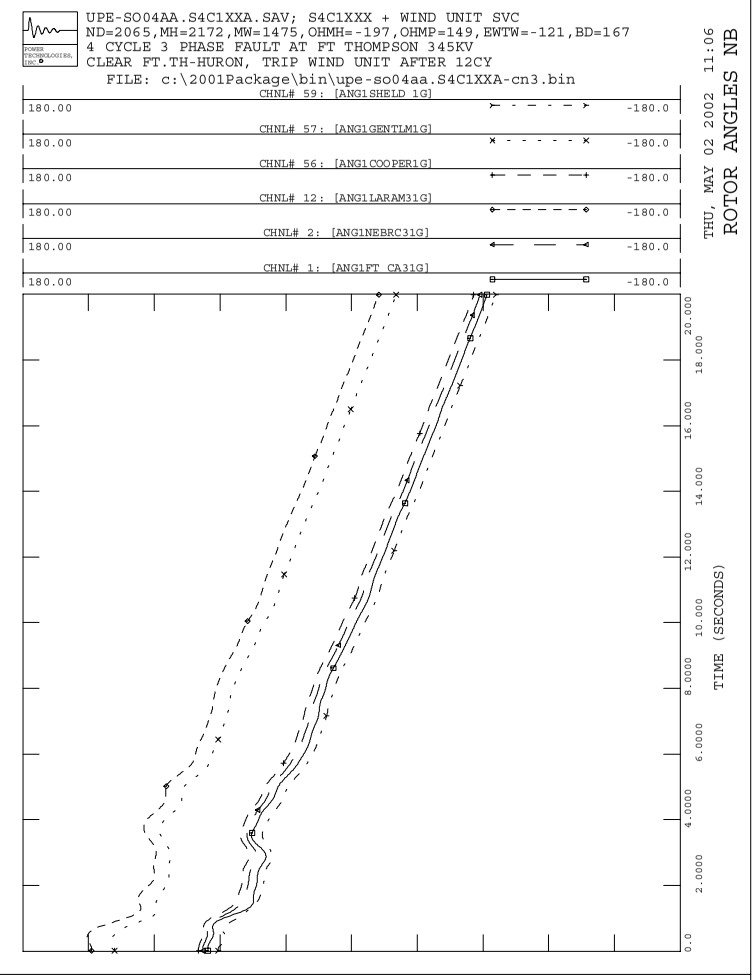
ROTOR ANGLES 6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CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
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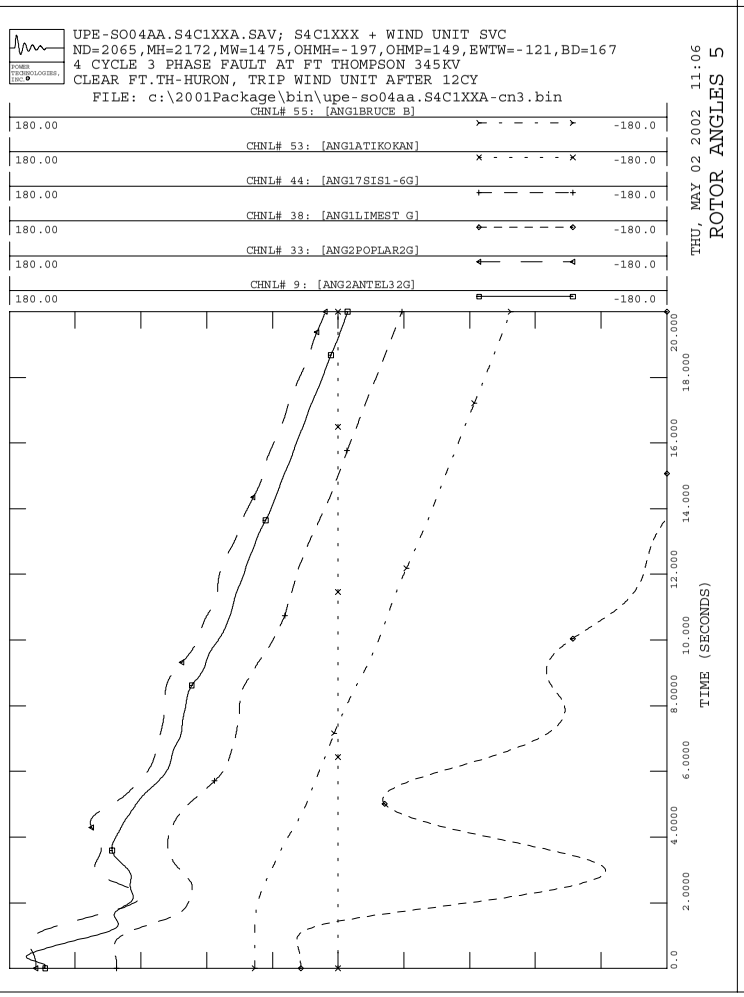
TIME (SECONDS)
THU, MAY 02 2002 11:06
ROTOR ANGLES NB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CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
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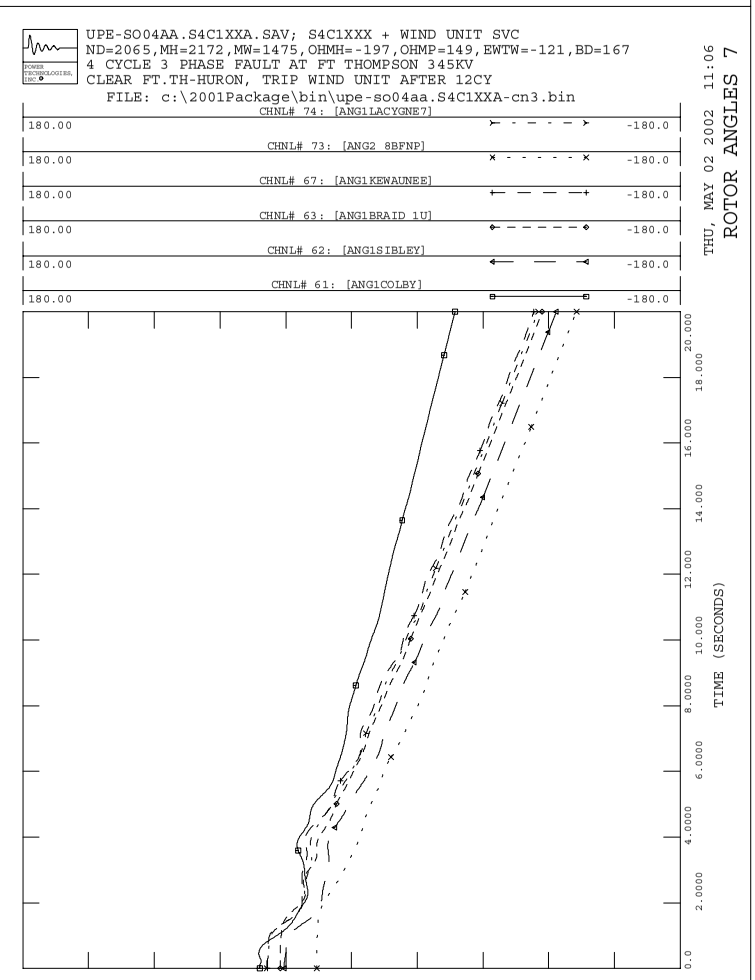
TIME (SECONDS)
THU, MAY 02 2002 11:06
ROTOR ANGLES 5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CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
THU, MAY 02 2002 11:06
ROTOR ANGLES 7

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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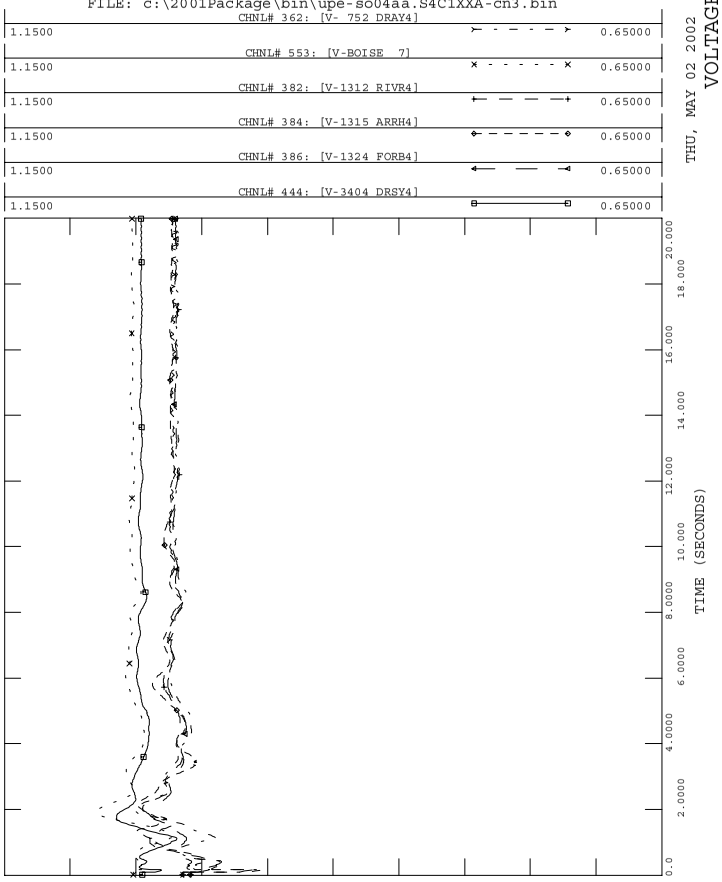
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

THU, MAY 02 2002 11:06
VOLTAGES 1



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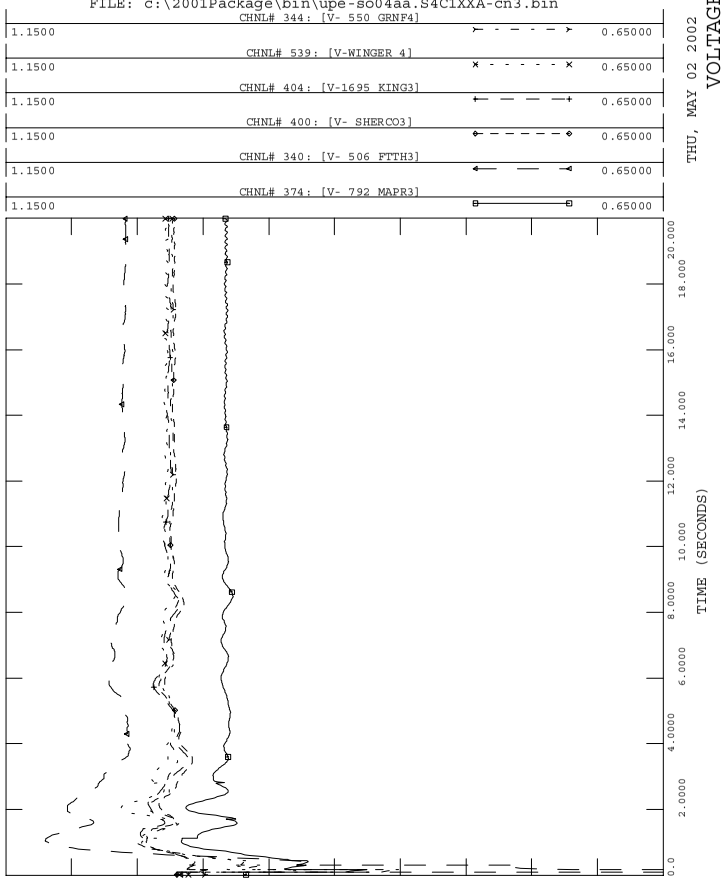
THU, MAY 02 2002 11:06
VOLTAGES 3



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CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
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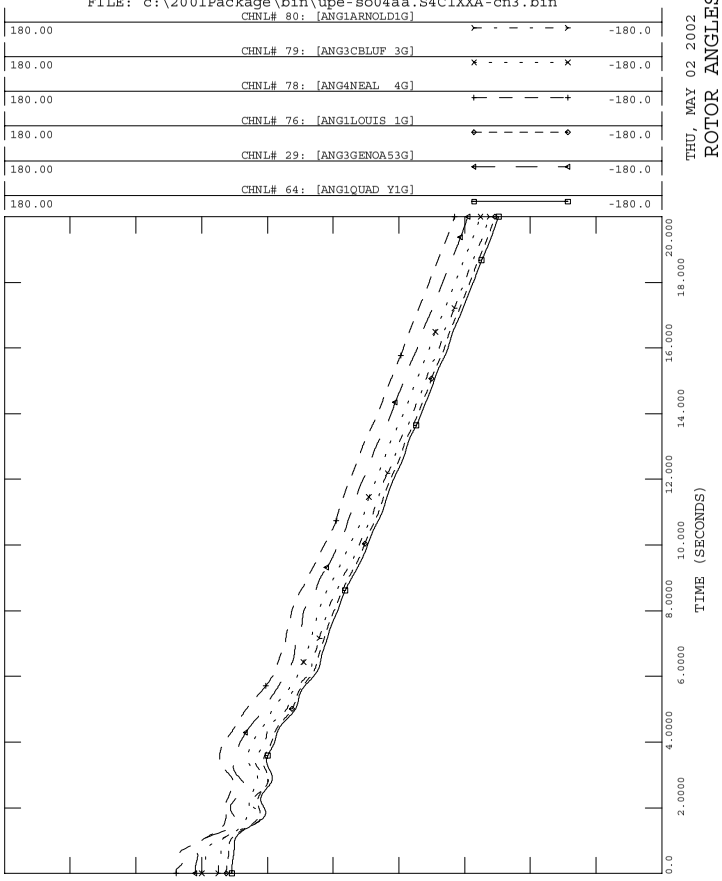
ROTOR ANGLES IA



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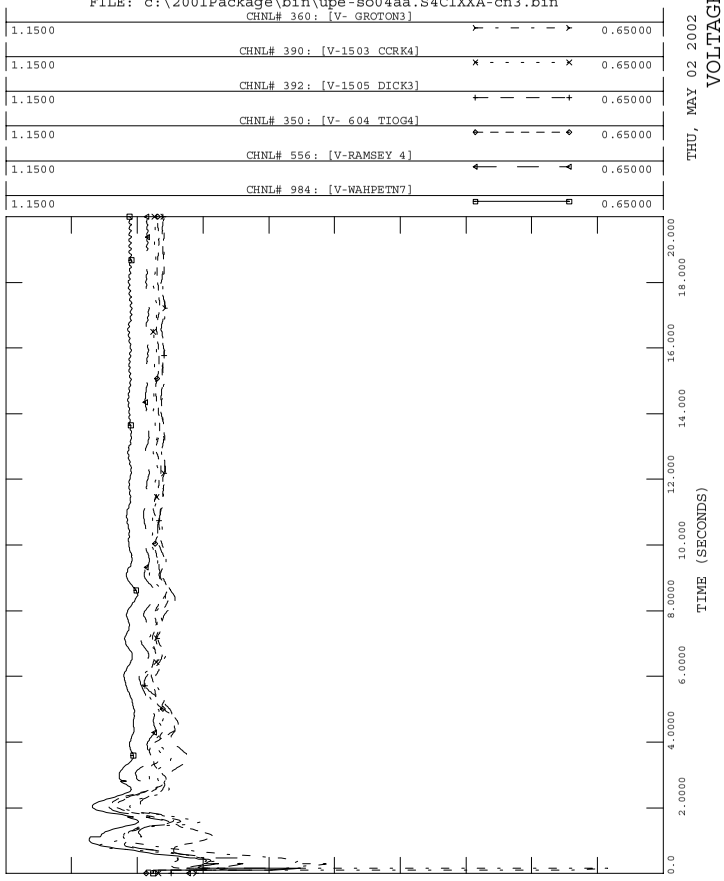
VOLTAGES 2



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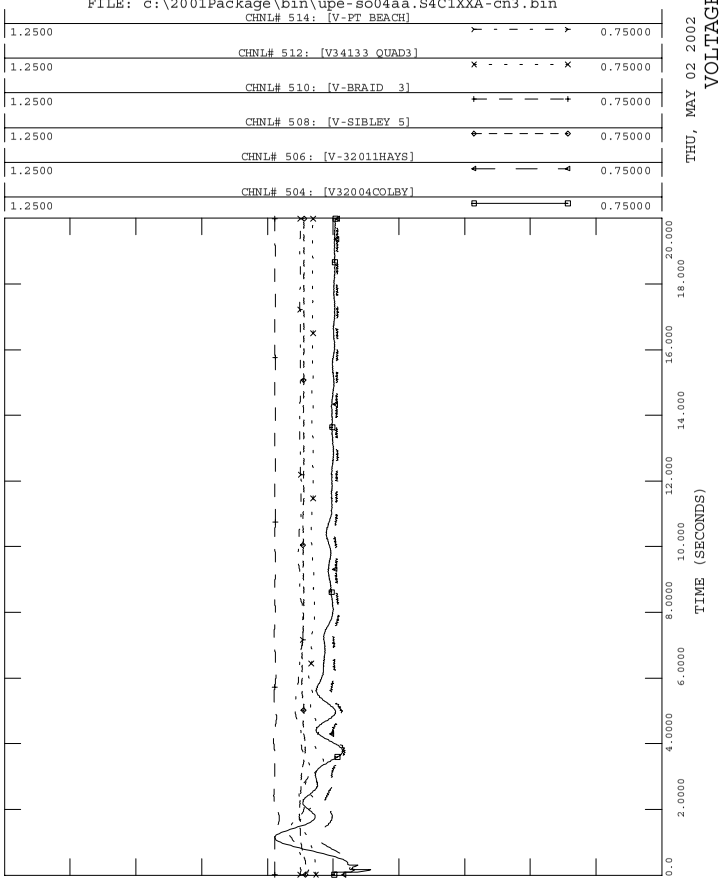
VOLTAGES 5



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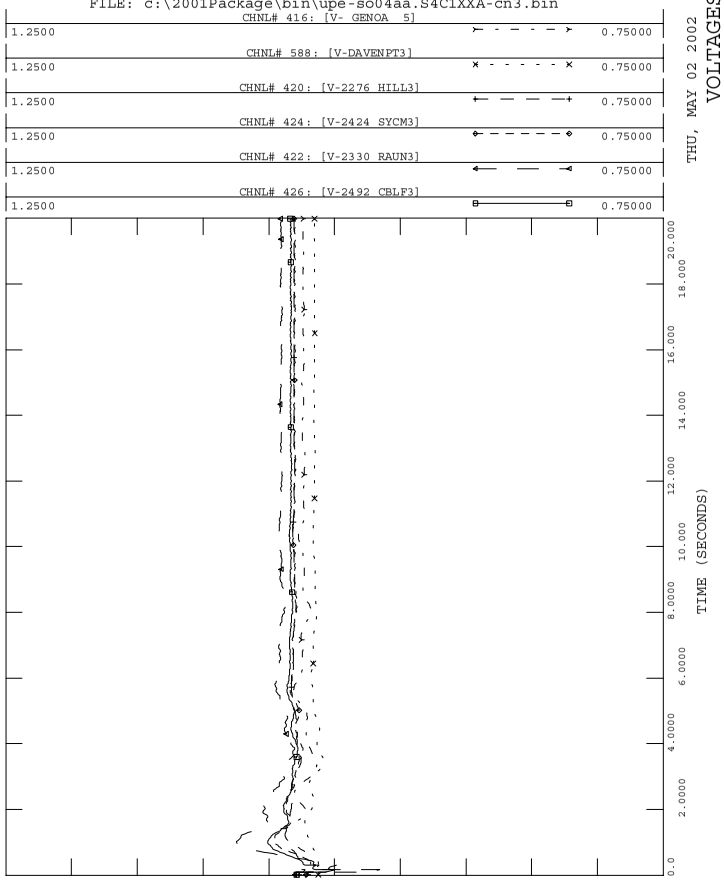
VOLTAGES IA



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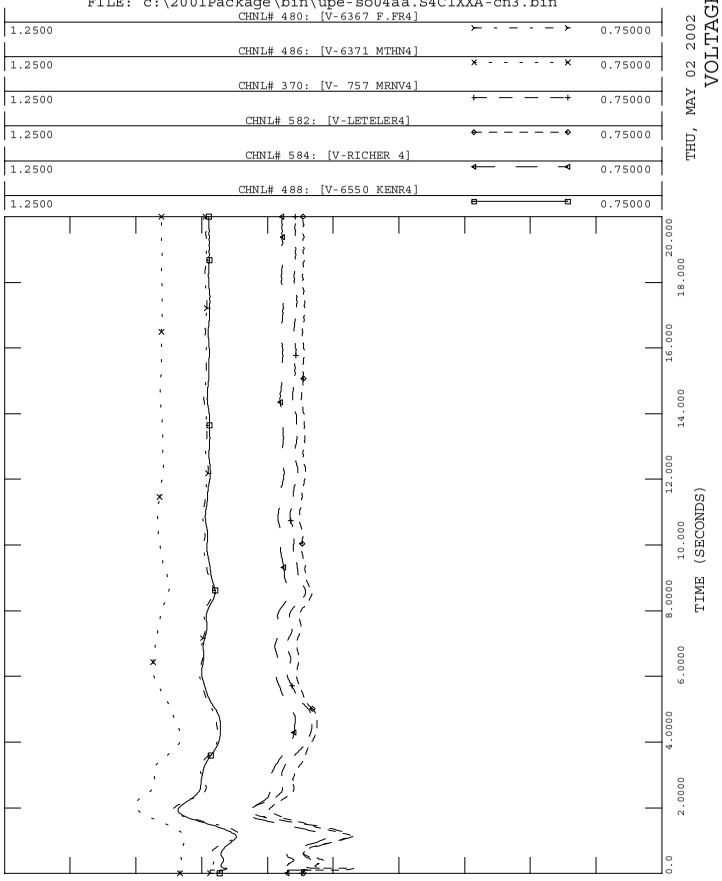
VOLTAGES 4



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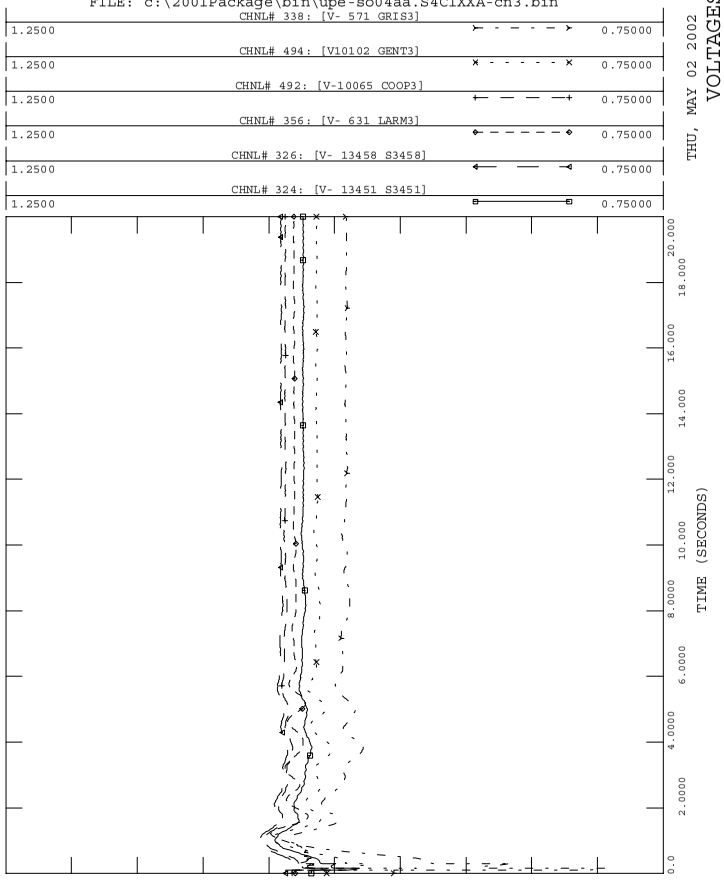
VOLTAGES NB



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CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
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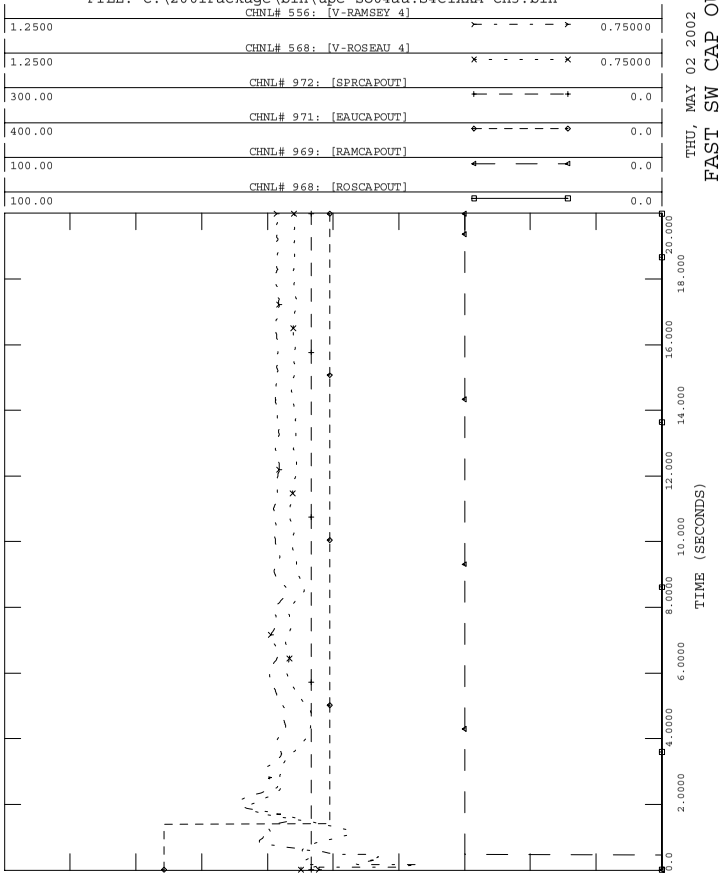
THU, MAY 02 2002 11:06

FAST SW CAP OUT 2



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CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
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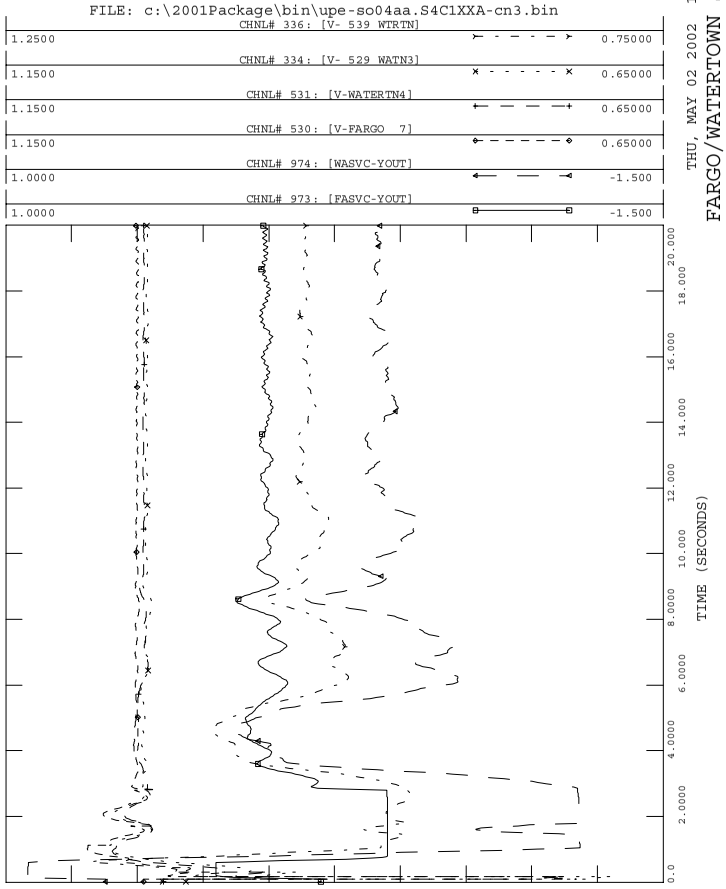
THU, MAY 02 2002 11:06

FARGO/WATERTOWN SVS



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CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
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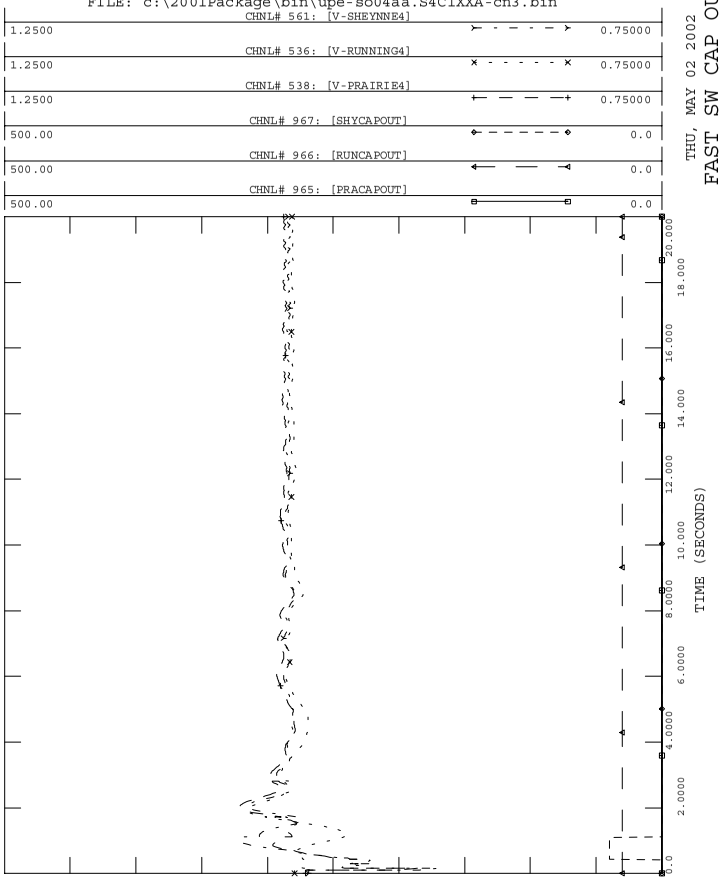

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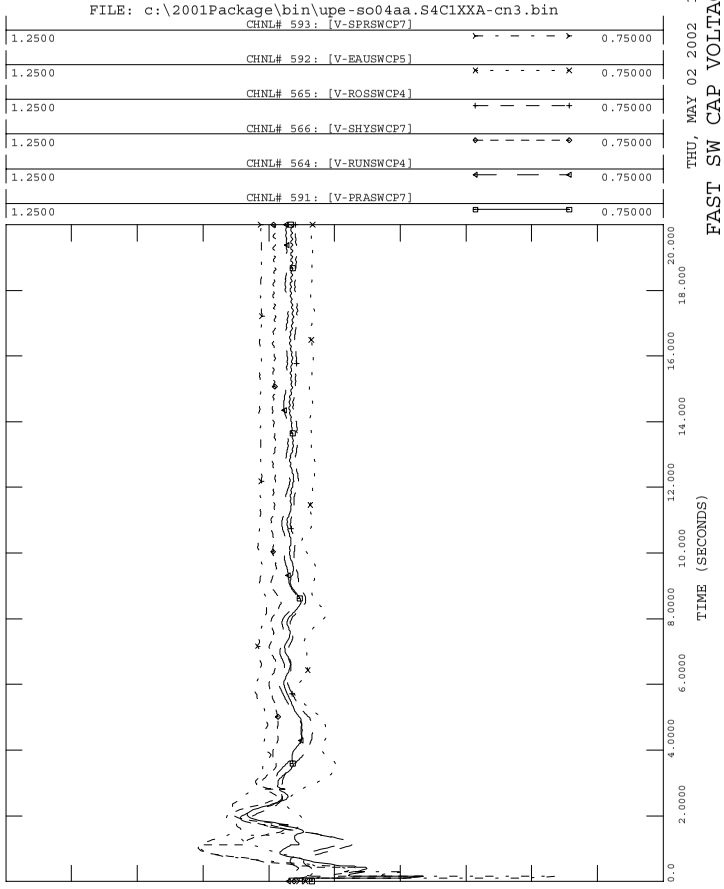
FAST SW CAP VOLTAGES



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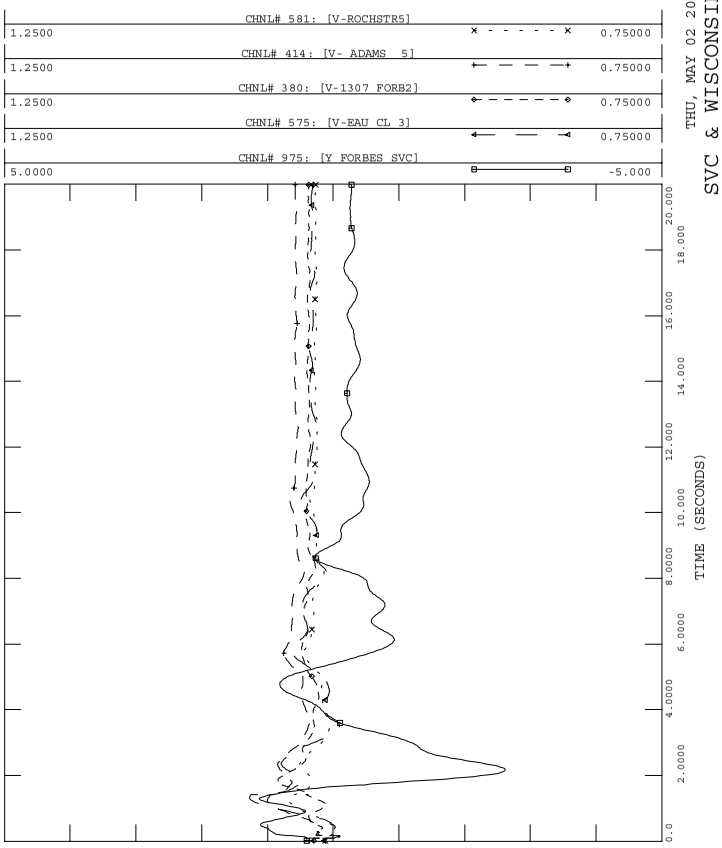
THU, MAY 02 2002 11:06

SVC & WISCONSIN VOLT



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CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
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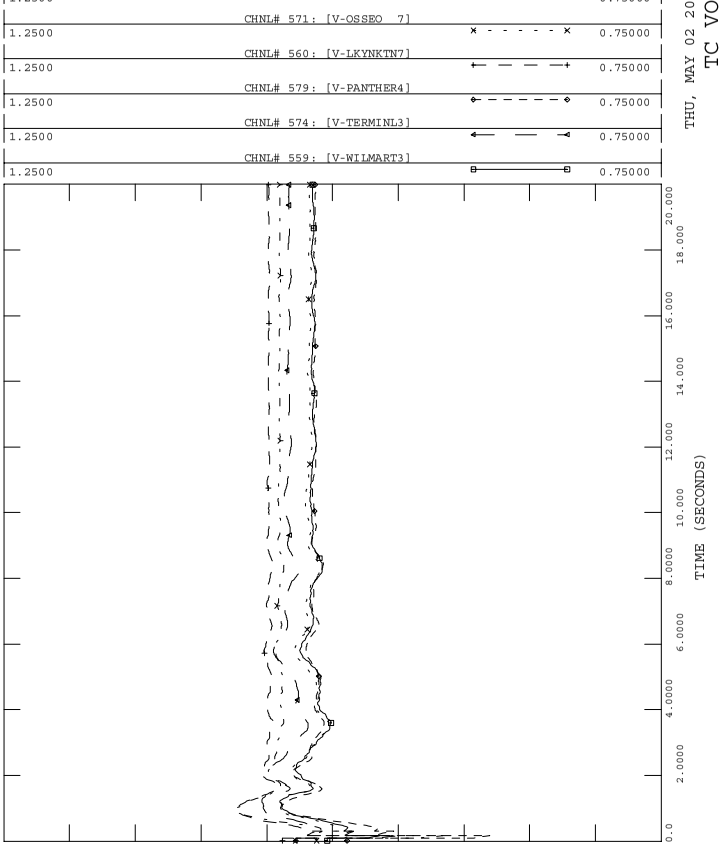
THU, MAY 02 2002 11:06

TC VOLTAGES



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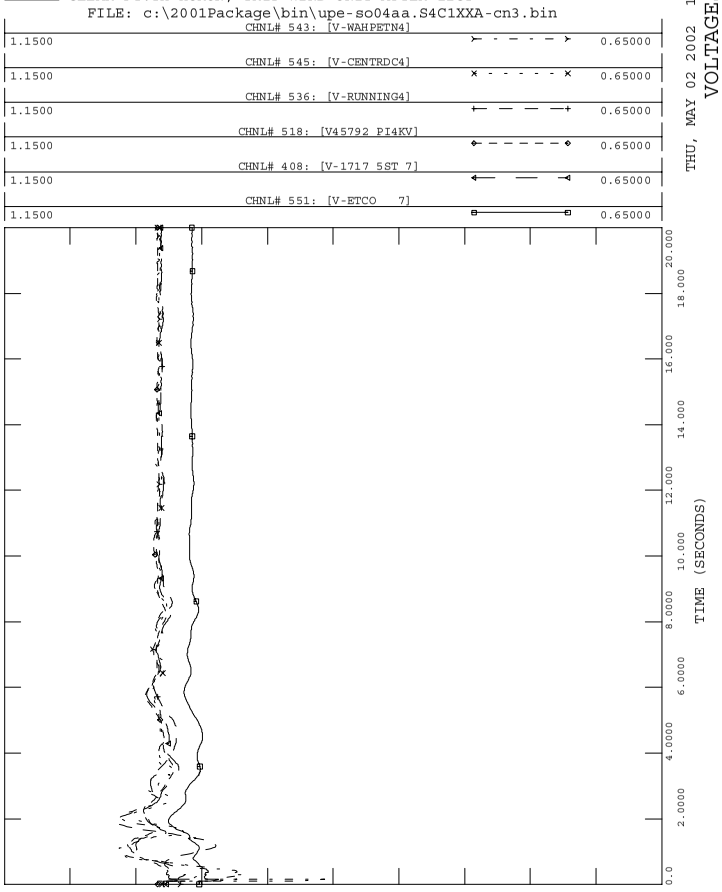
THU, MAY 02 2002 11:06

VOLTAGES 6



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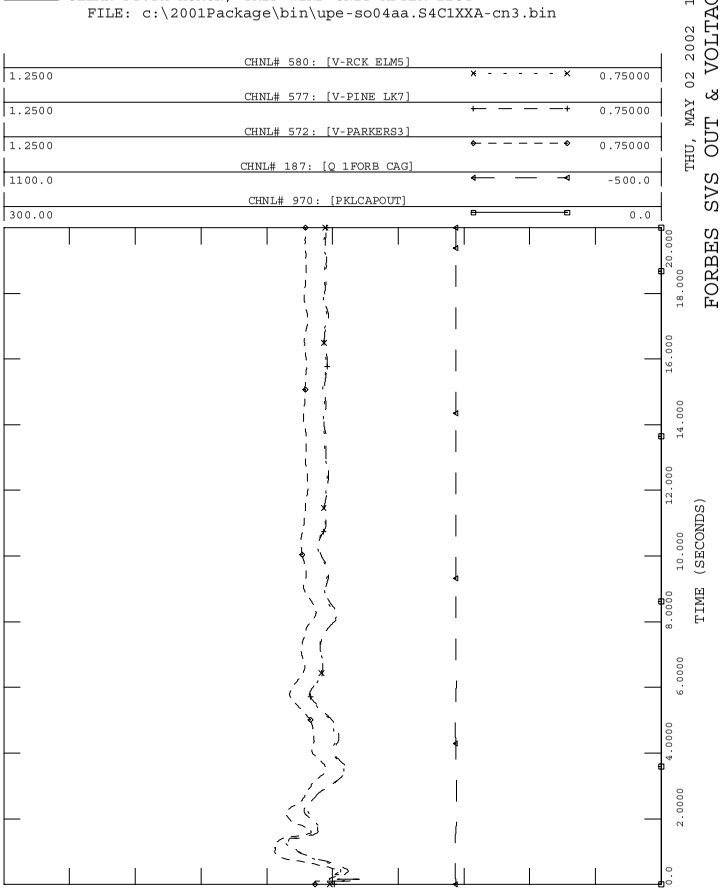
THU, MAY 02 2002 11:06

FORBES SVS OUT & VOLTAGES



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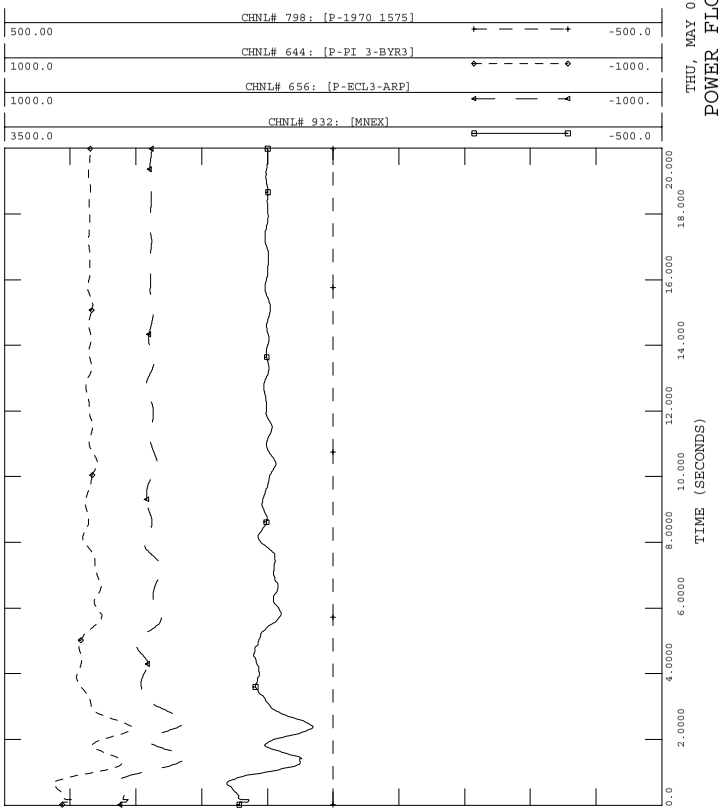
THU, MAY 02 2002 11:06
POWER FLOW SUMS 2



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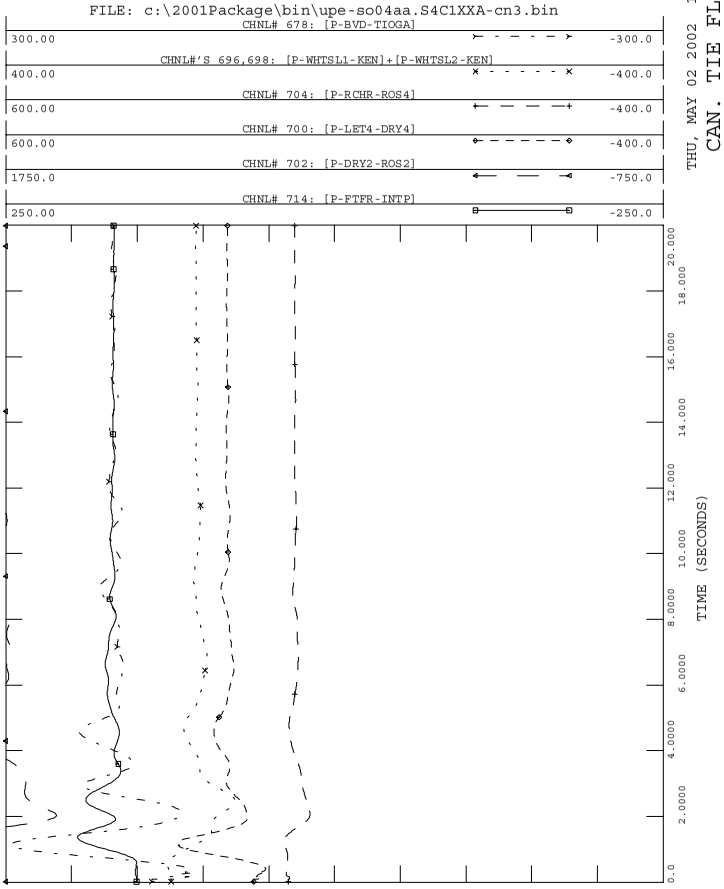
THU, MAY 02 2002 11:06
CAN. TIE FLOWS



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CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
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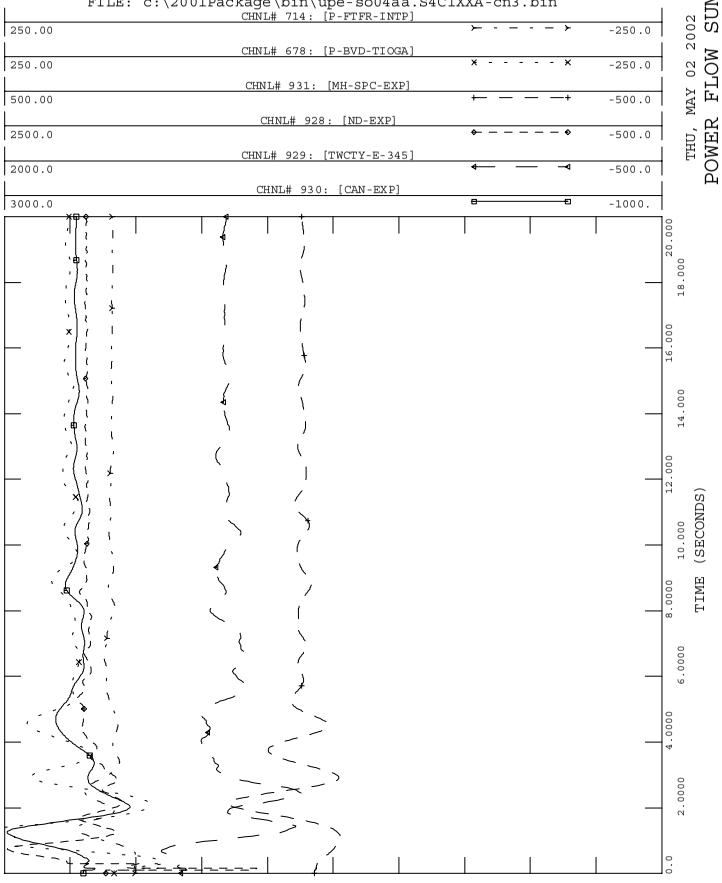
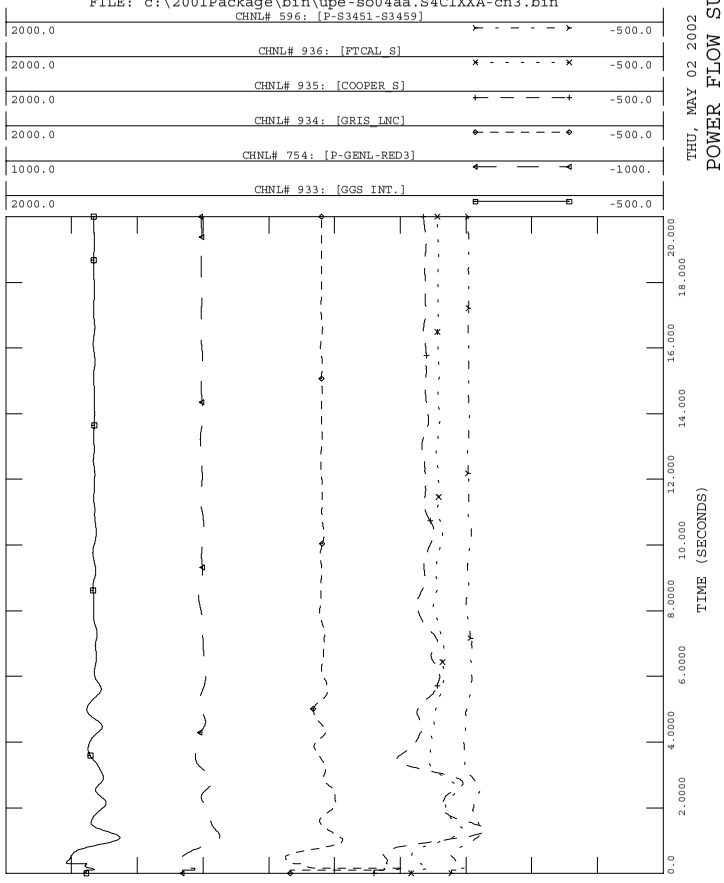
THU, MAY 02 2002 11:06
POWER FLOW SUMS 1



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

THU, MAY 02 2002 11:06
POWER FLOW SUM 3



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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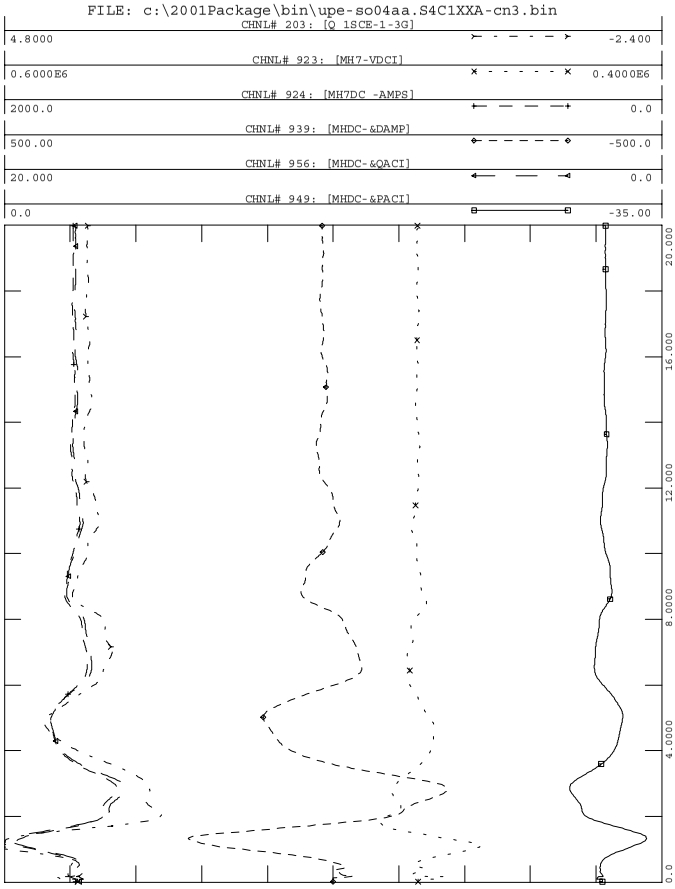
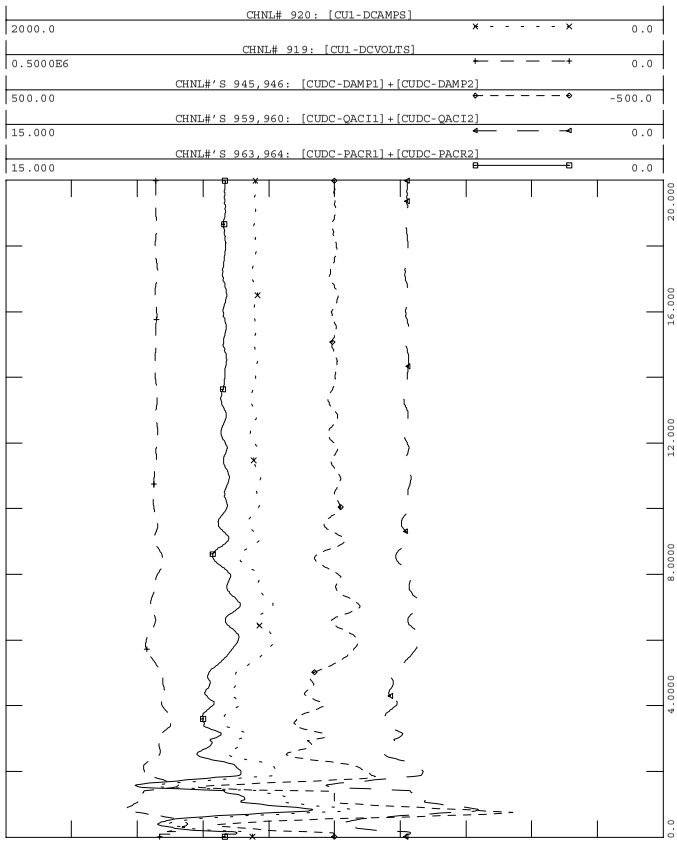
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

THU, MAY 02 2002 11:06
MH DC PARAMETERS



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

THU, MAY 02 2002 11:06
CU DC #1



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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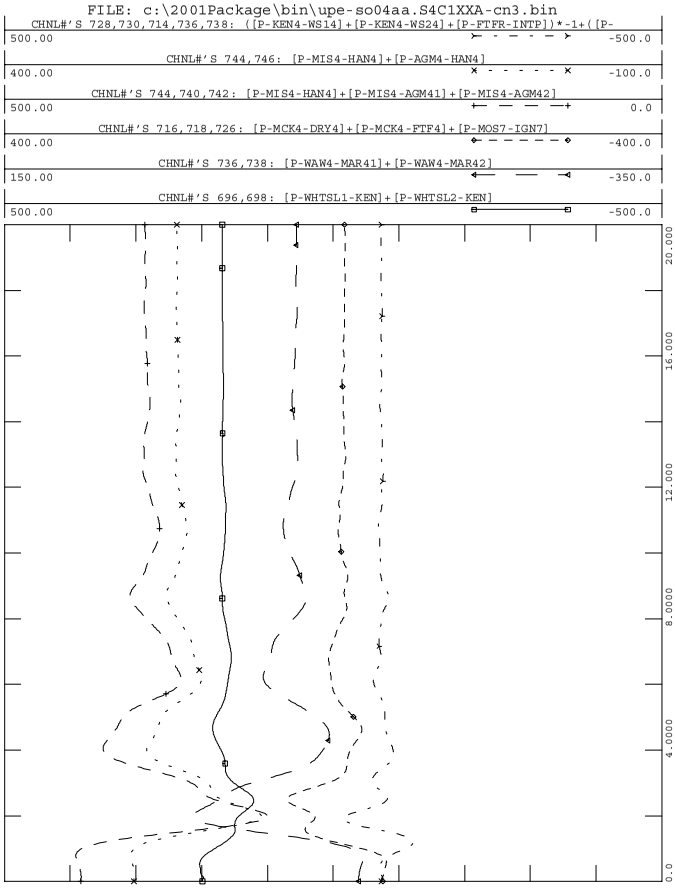
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

THU, MAY 02 2002 11:06
OH TIE FLOWS



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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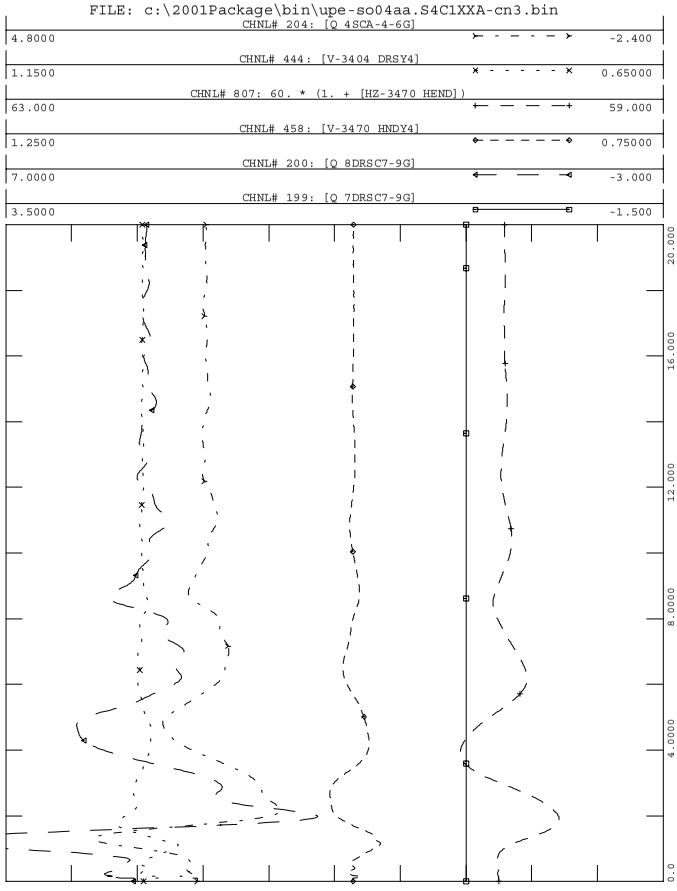
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

THU, MAY 02 2002 11:06
MH DC PARAMETERS



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
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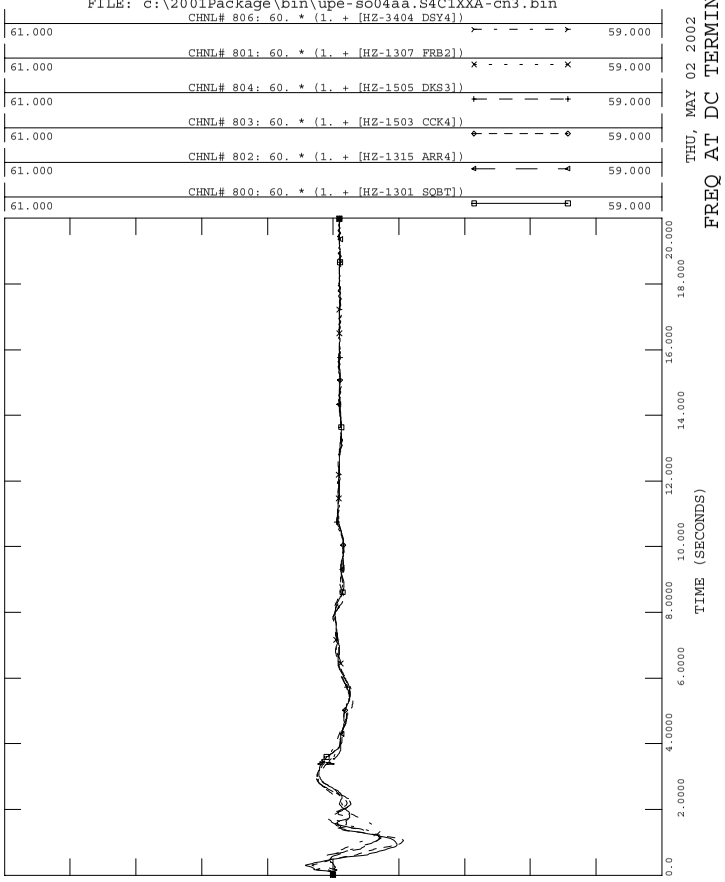
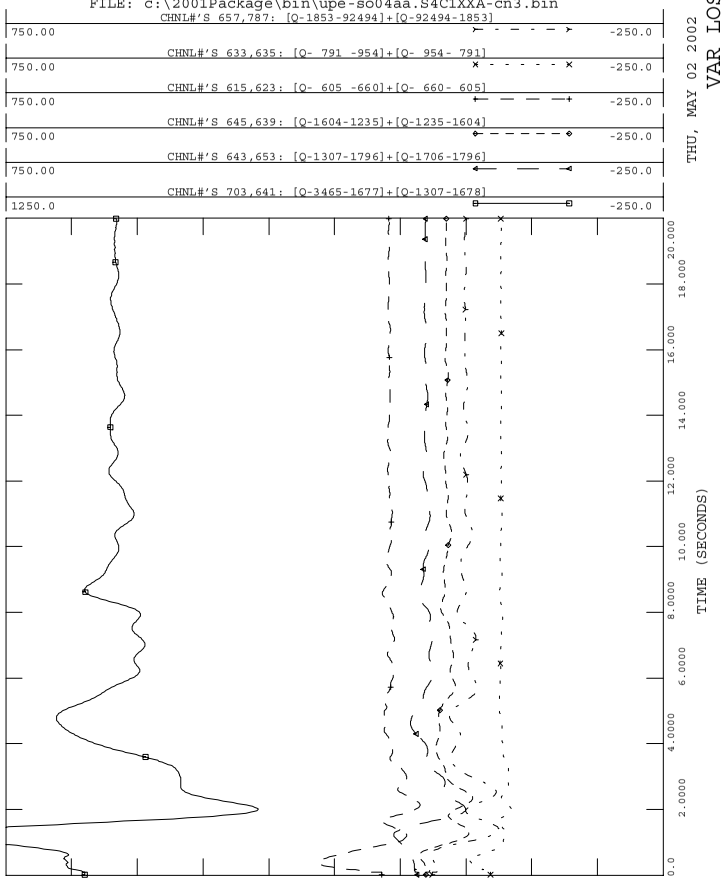
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin



THU, MAY 02 2002 11:06
FREQ AT DC TERMINALS

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin



THU, MAY 02 2002 11:06
VAR LOSSES

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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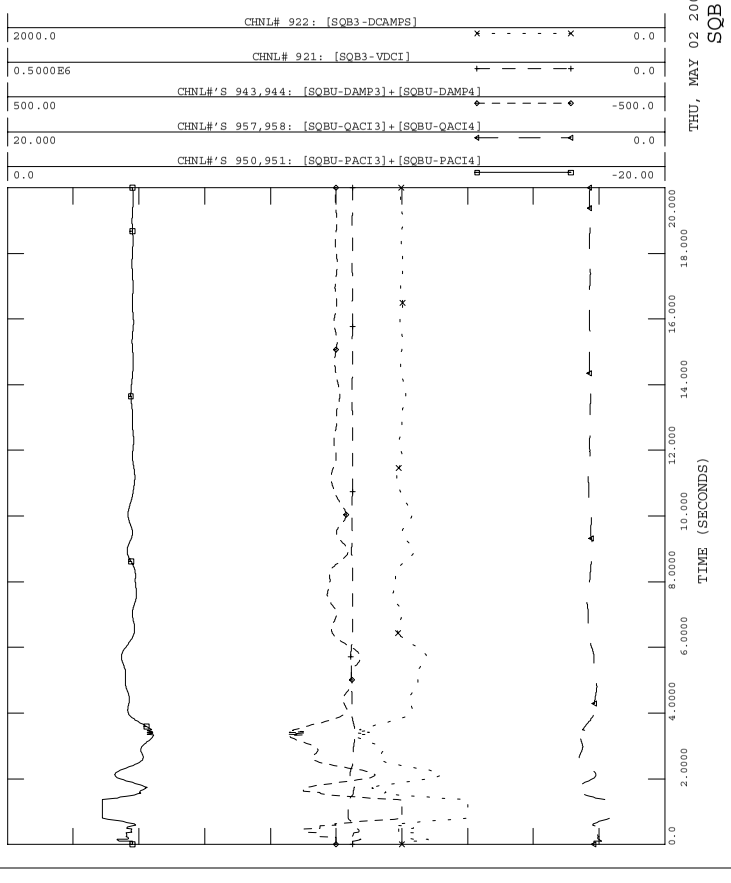
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin



THU, MAY 02 2002 11:06
SQB DC #3

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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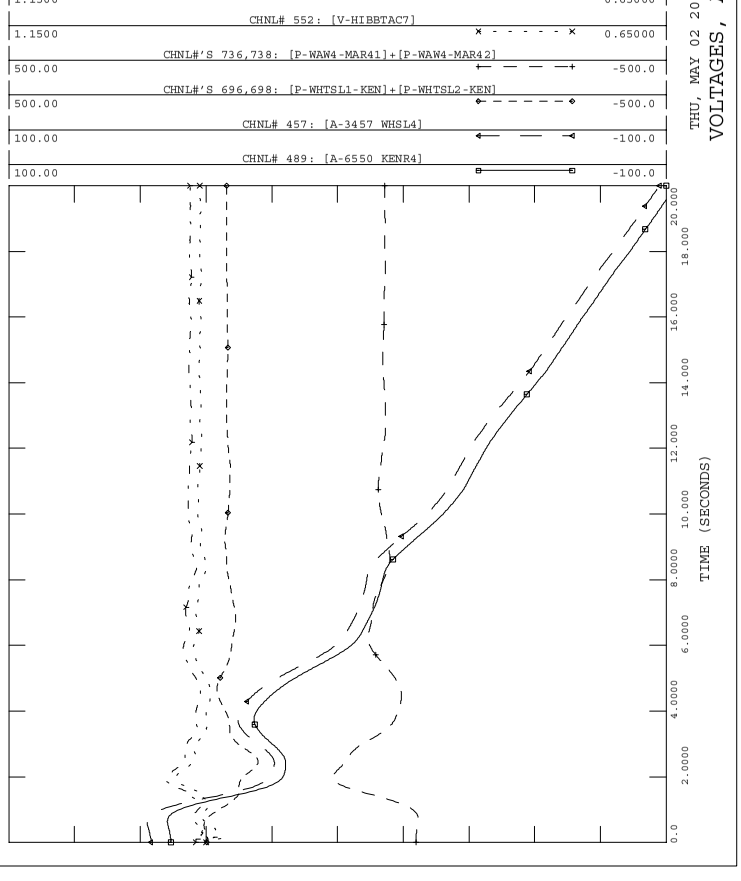
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

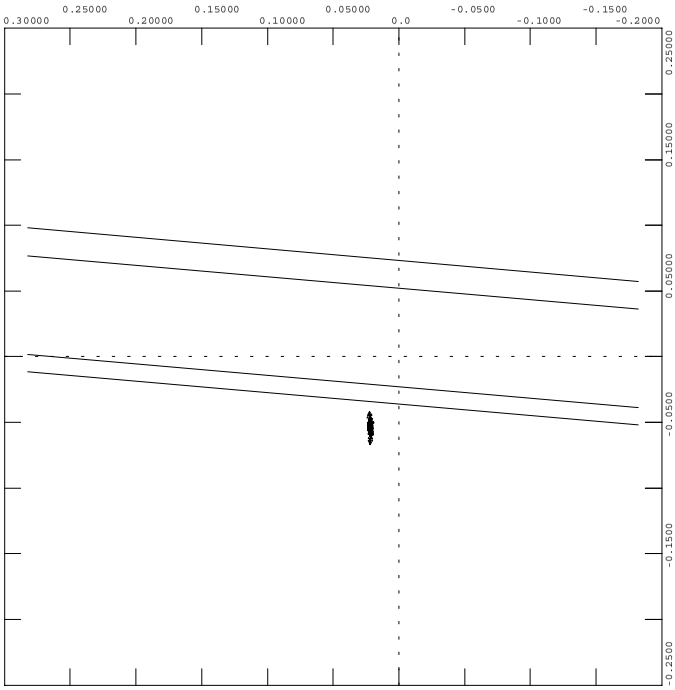


THU, MAY 02 2002 11:06
VOLTAGES, ANGLES

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, MAY 02 2002 11:06
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

RELAY: RELAYG
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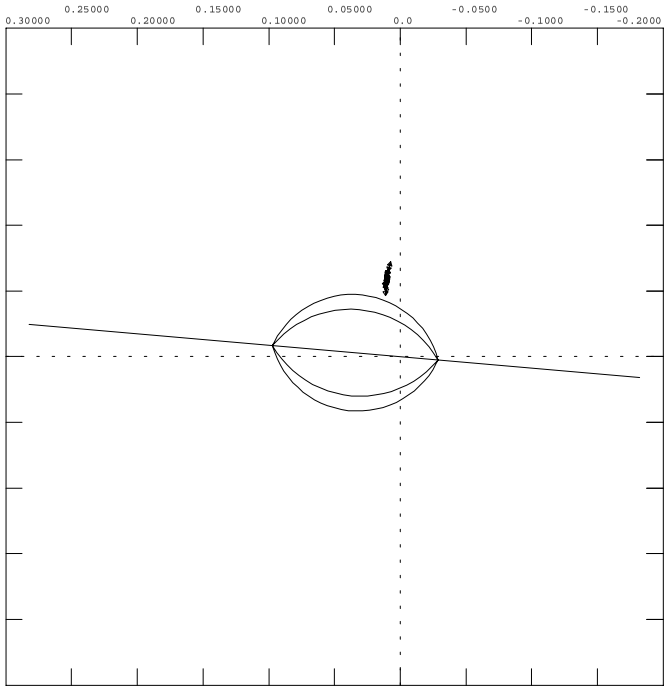

THU, MAY 02 2002 11:06
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

RELAY: RELAYG
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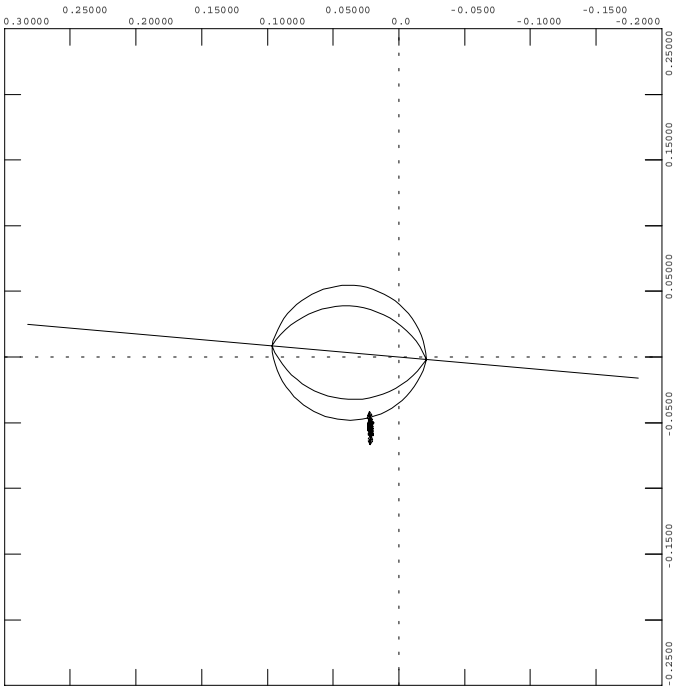
CHNL# 824: [X-FRB2-ROS2]



THU, MAY 02 2002 11:06
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

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ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

RELAY: SLINOS
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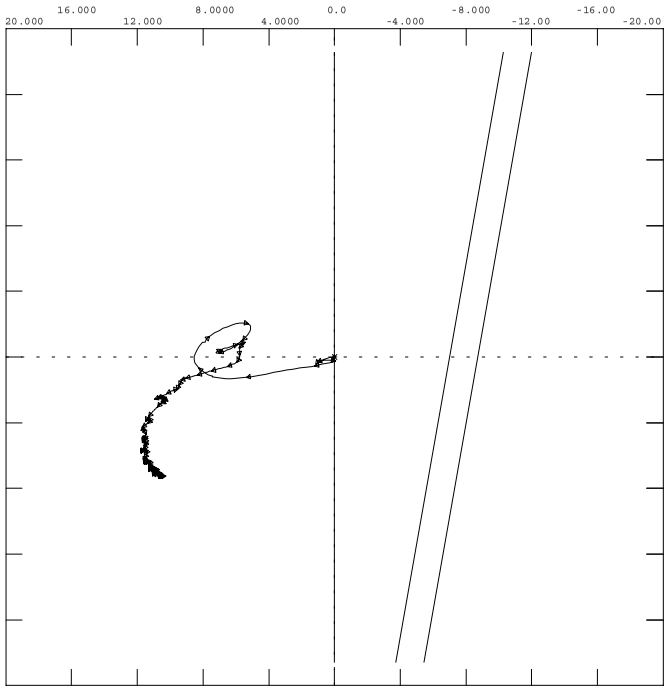
CHNL# 977: [DCAR-B]



THU, MAY 02 2002 11:06
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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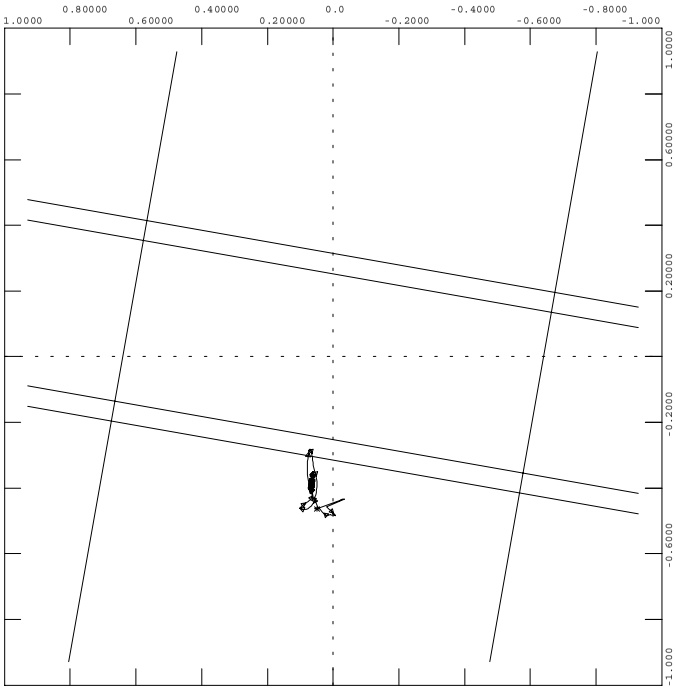
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

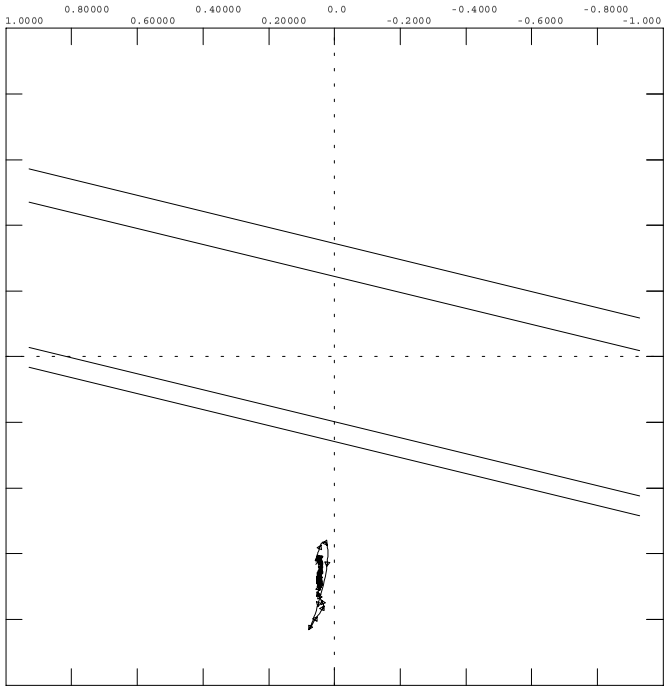
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

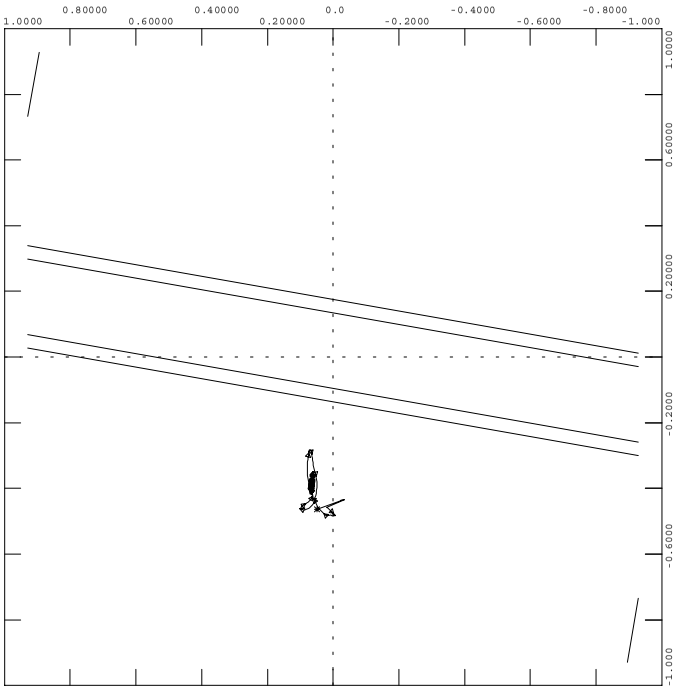
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

RELAY: SLINOS
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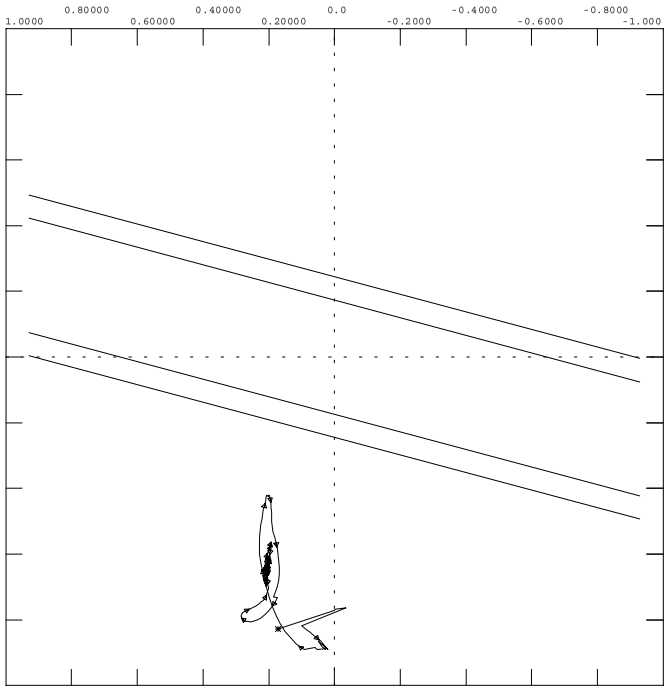

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ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

RELAY: SLLP
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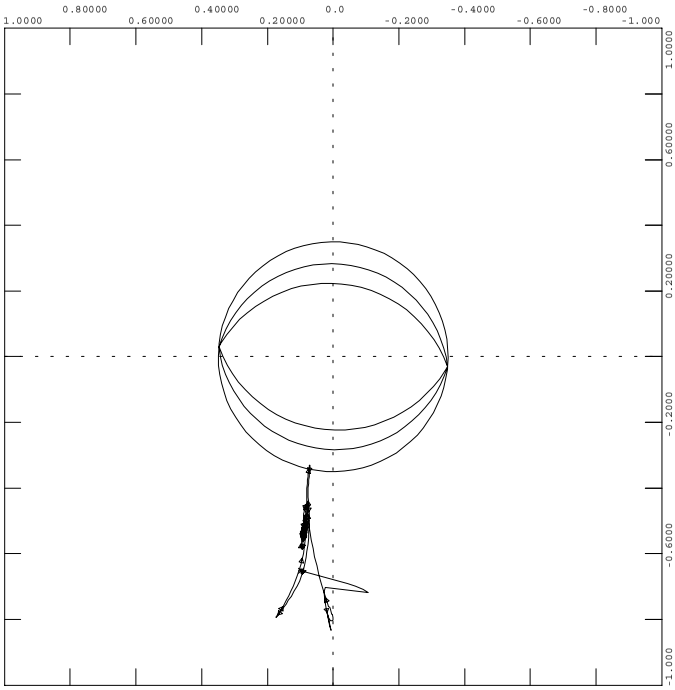

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

RELAY: SLLP
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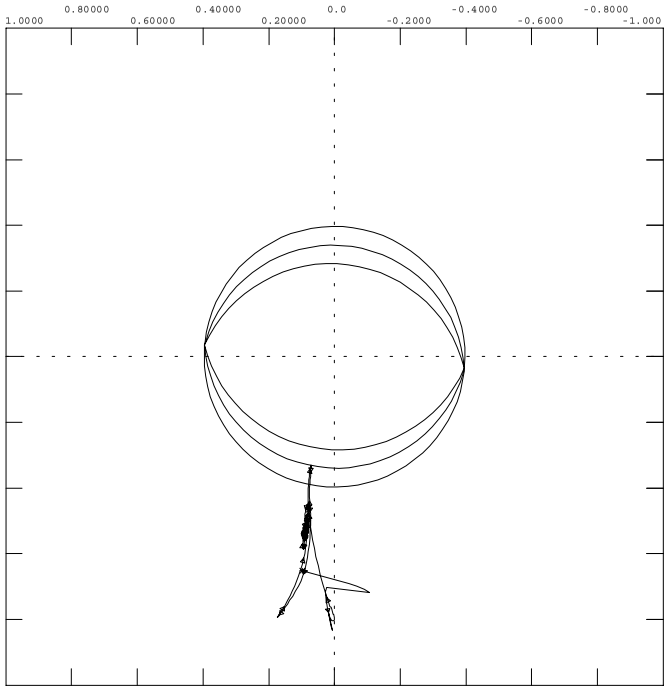
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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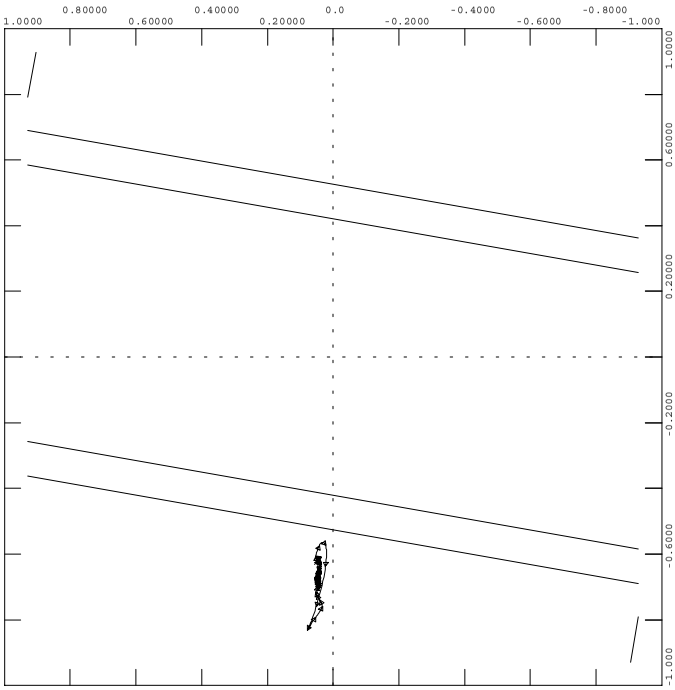
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

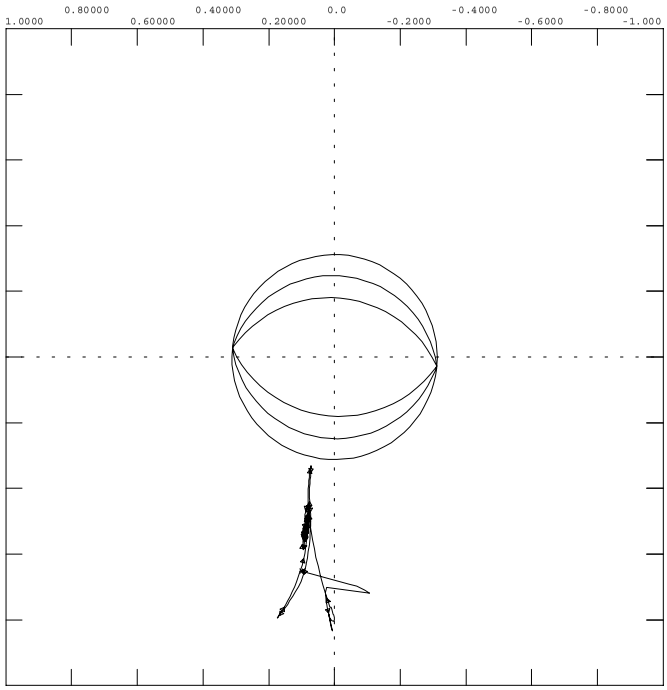
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
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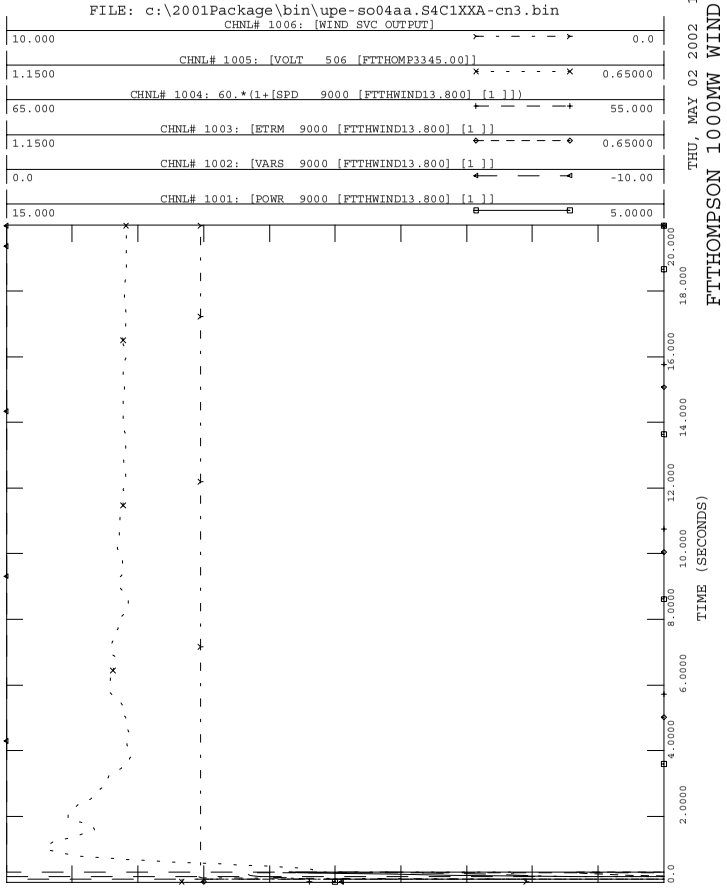
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin



THU, MAY 02 2002 11:06
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.TH-HURON, TRIP WIND UNIT AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-cn3.bin

RELAY: SLINOS
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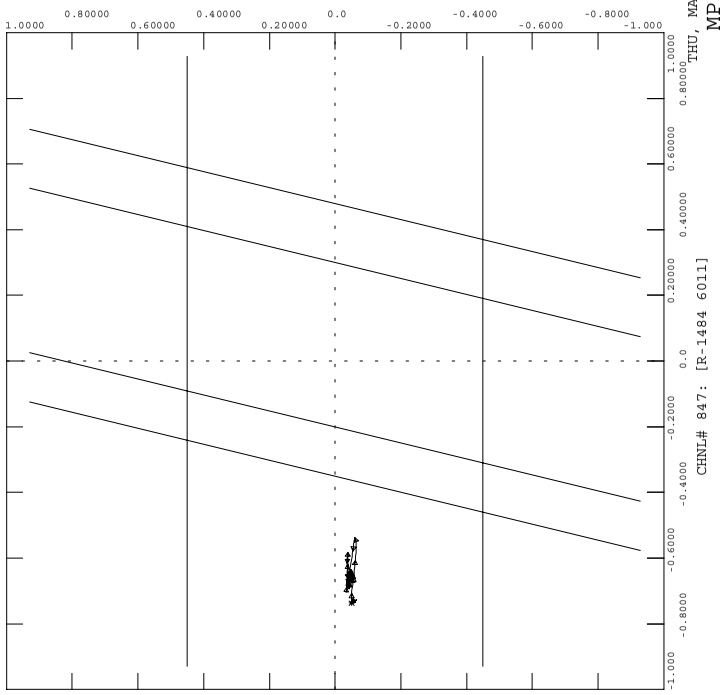
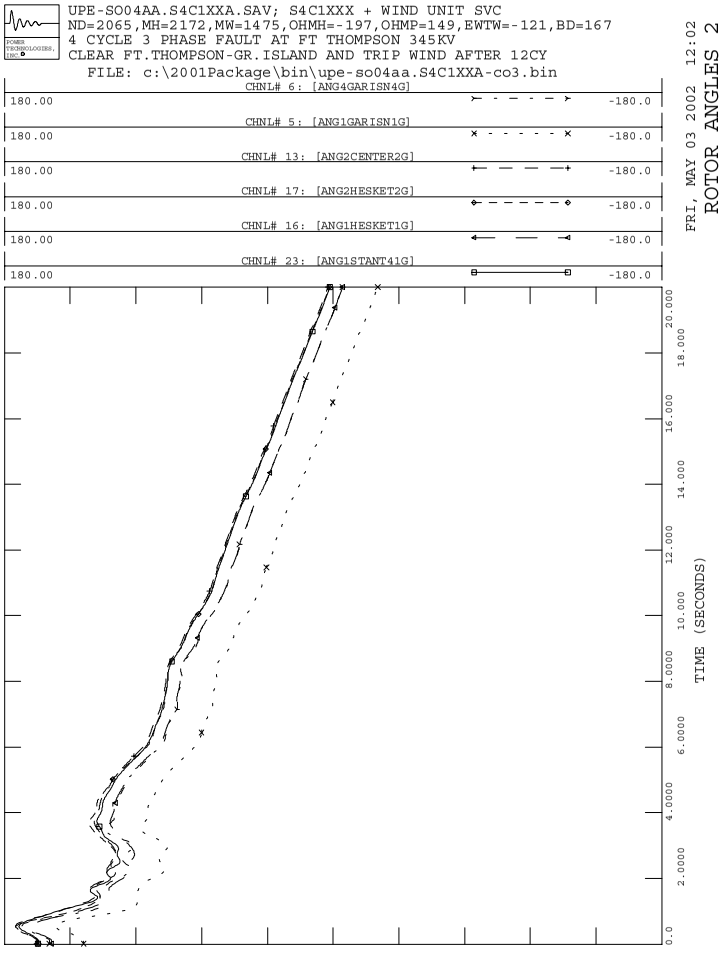
CHNL# 848: [X-INT.F-FTF]



THU, MAY 02 2002 11:06
MP-OH I.FALLS (779)

CONTINGENCY CO3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear Ft.Thompson-Gr.Island and trip wind unit after 12 cycles


UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
FRI, MAY 03 2002 12:02
ROTOR ANGLES 2
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
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18.000
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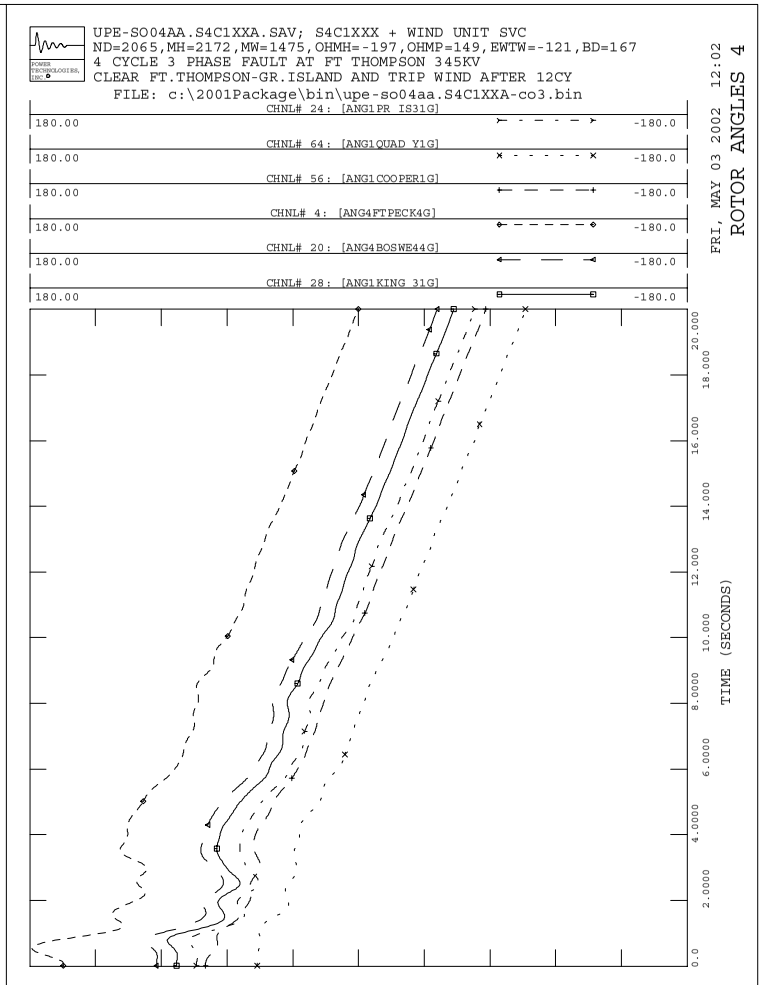
UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
FRI, MAY 03 2002 12:02
ROTOR ANGLES 4
TIME (SECONDS)
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12.000
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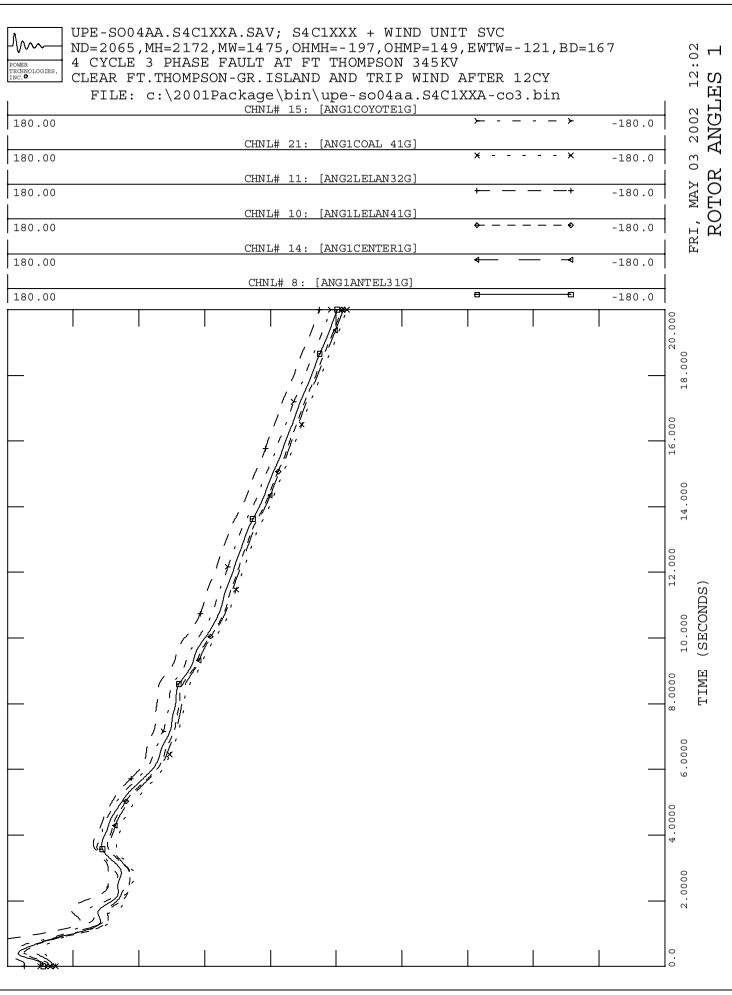
18.000
20.000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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
FRI, MAY 03 2002 12:02
ROTOR ANGLES 1
TIME (SECONDS)
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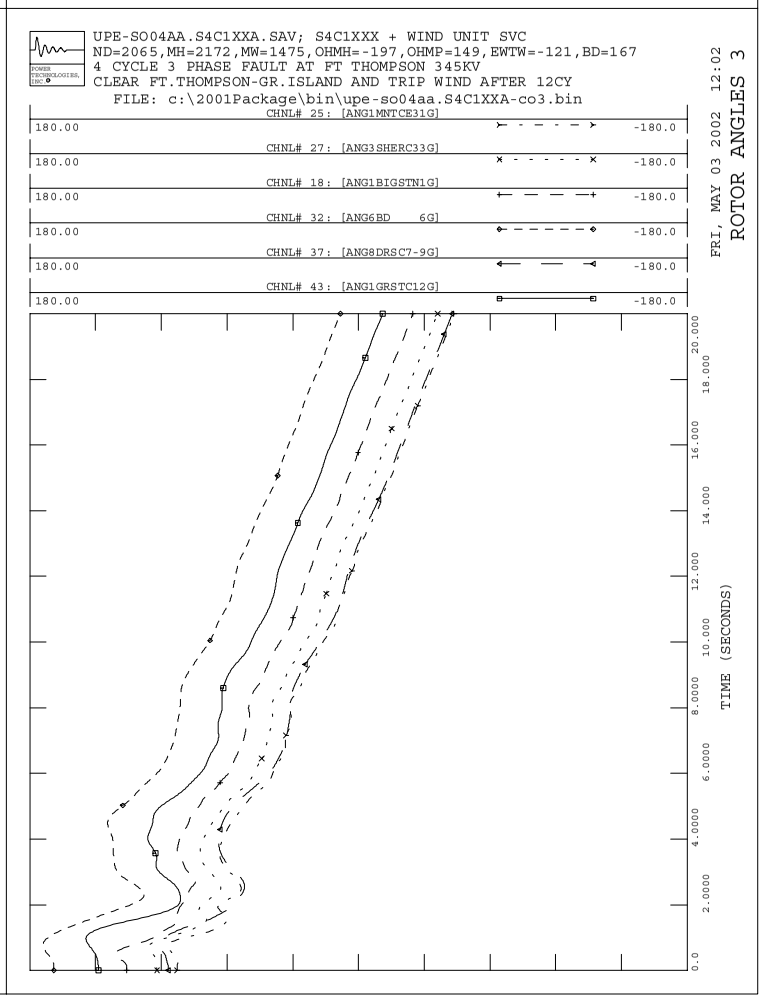
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
FRI, MAY 03 2002 12:02
ROTOR ANGLES 3
TIME (SECONDS)
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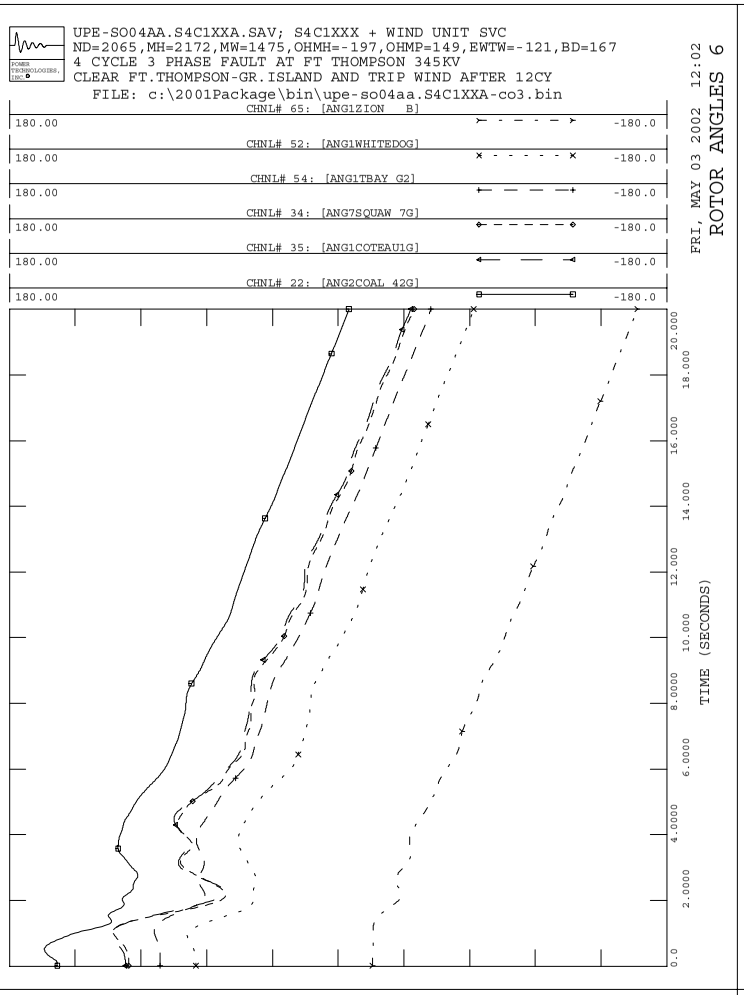
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000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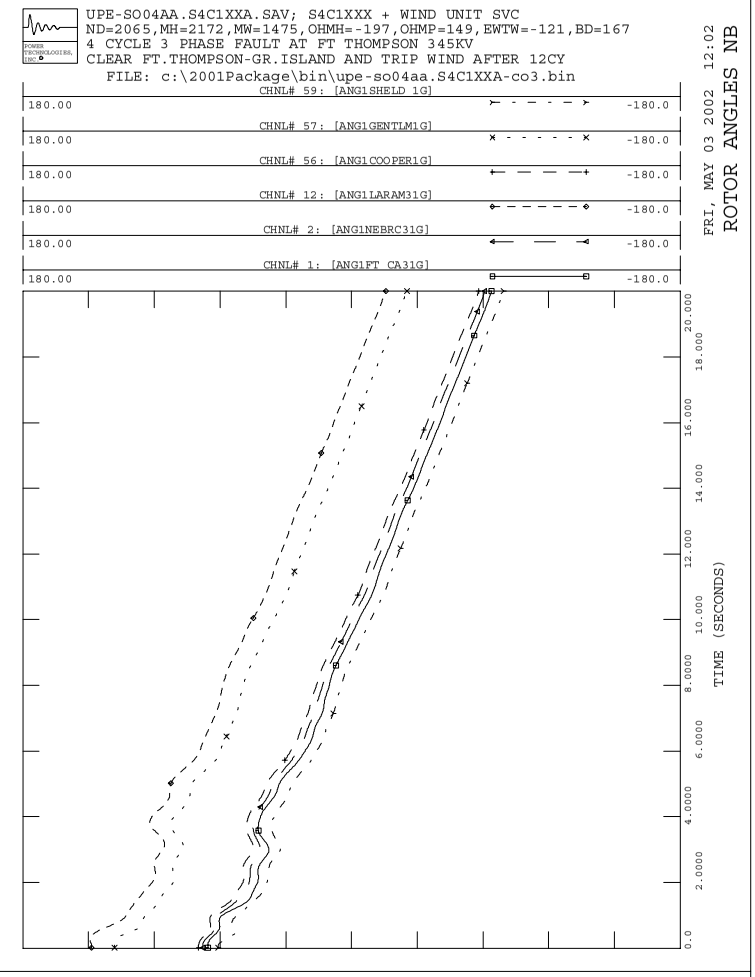
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 12:02
ROTOR ANGLES 6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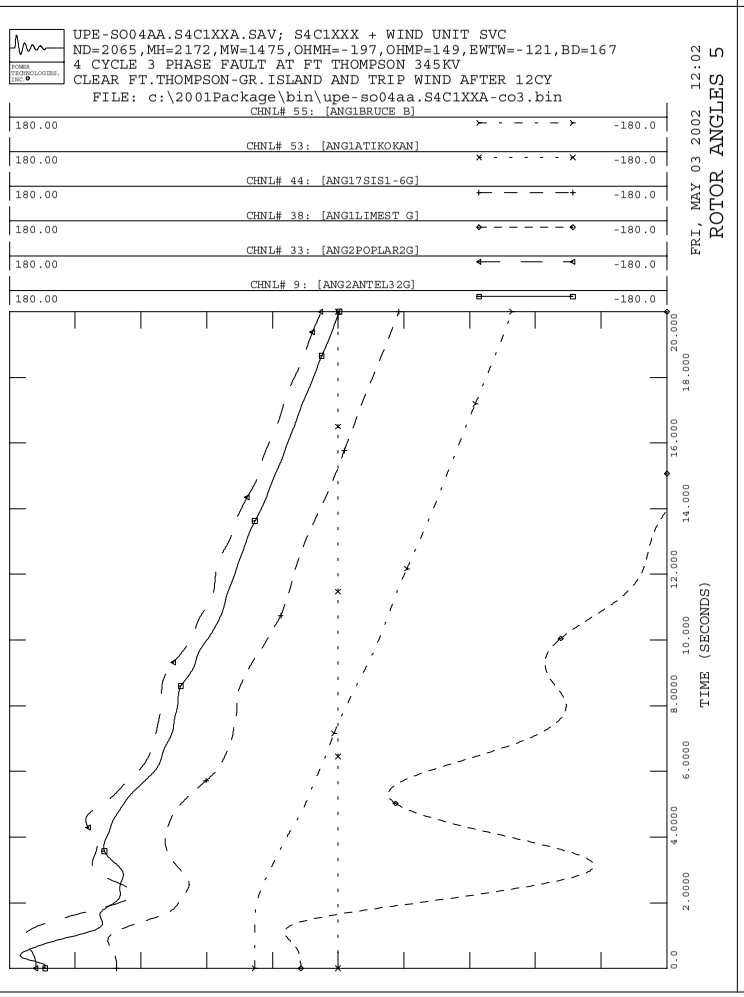
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 12:02
ROTOR ANGLES NB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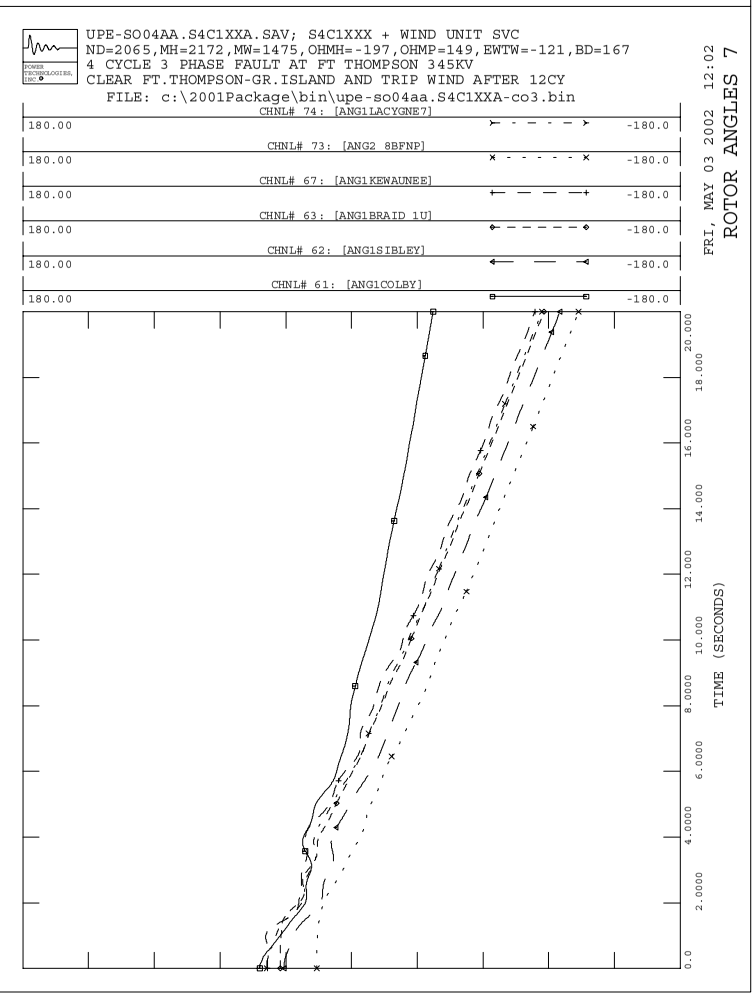
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 12:02
ROTOR ANGLES 5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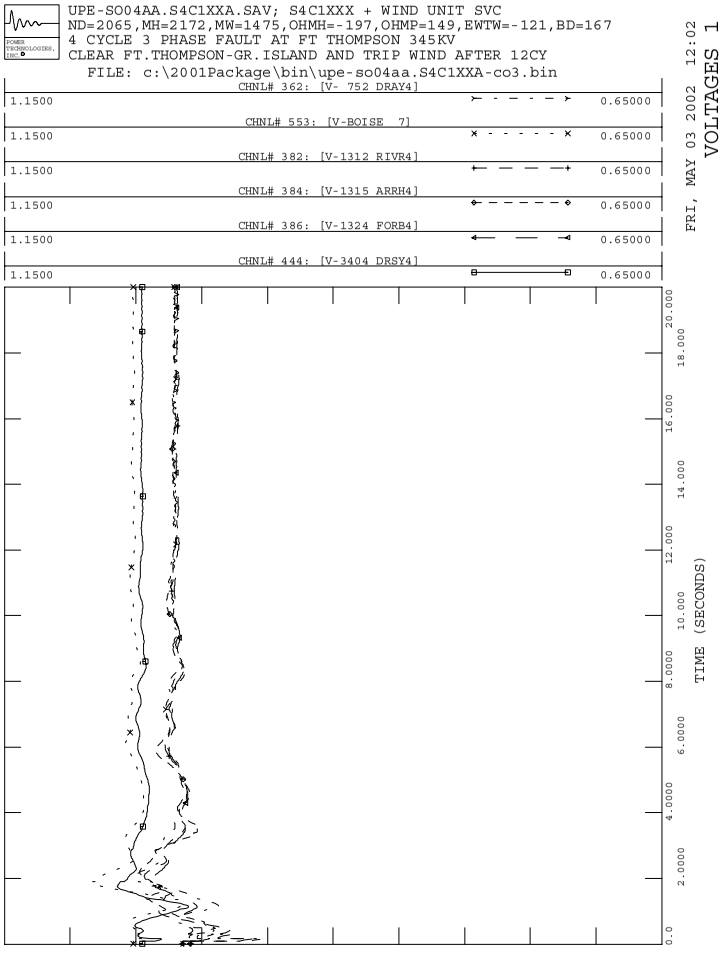
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 12:02
ROTOR ANGLES 7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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 362: [V- 752 DRAY4]
CHNL# 553: [V-BOISE 7]
CHNL# 382: [V-1312 RIVR4]
CHNL# 384: [V-1315 ARRH4]
CHNL# 386: [V-1324 FORB4]
CHNL# 444: [V-3404 DRSY4]
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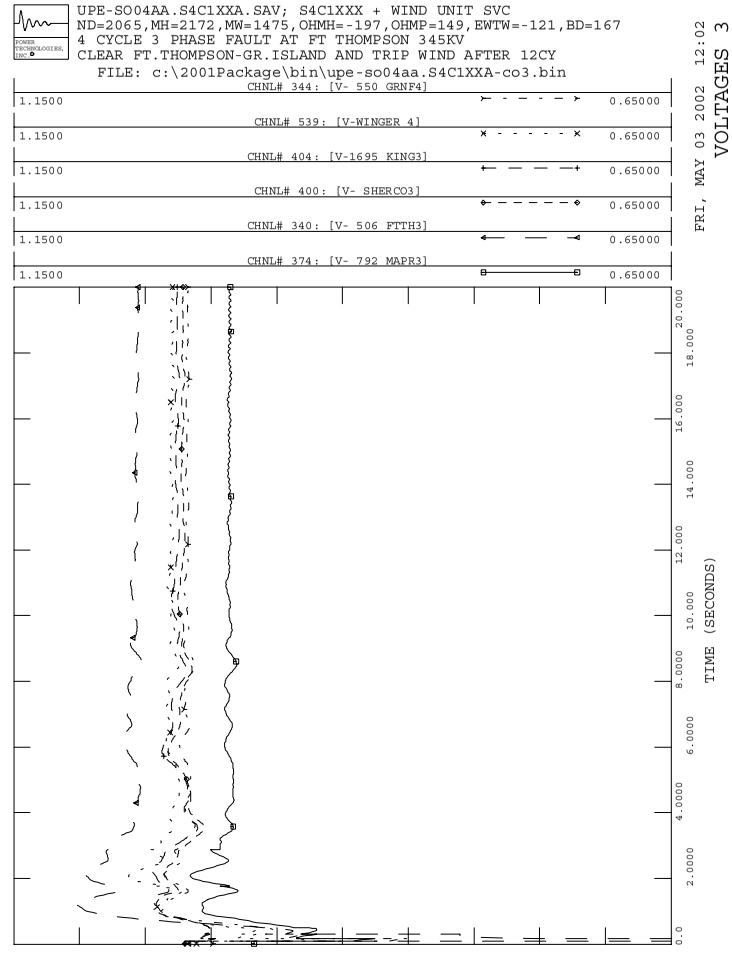
0.65000
TIME (SECONDS)
FRI, MAY 03 2002 12:02
VOLTAGES 1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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 344: [V- 550 GRNF4]
CHNL# 539: [V-WINGER 4]
CHNL# 404: [V-1695 KING3]
CHNL# 400: [V- SHERCO3]
CHNL# 340: [V- 506 FTTH3]
CHNL# 374: [V- 792 MAPR3]
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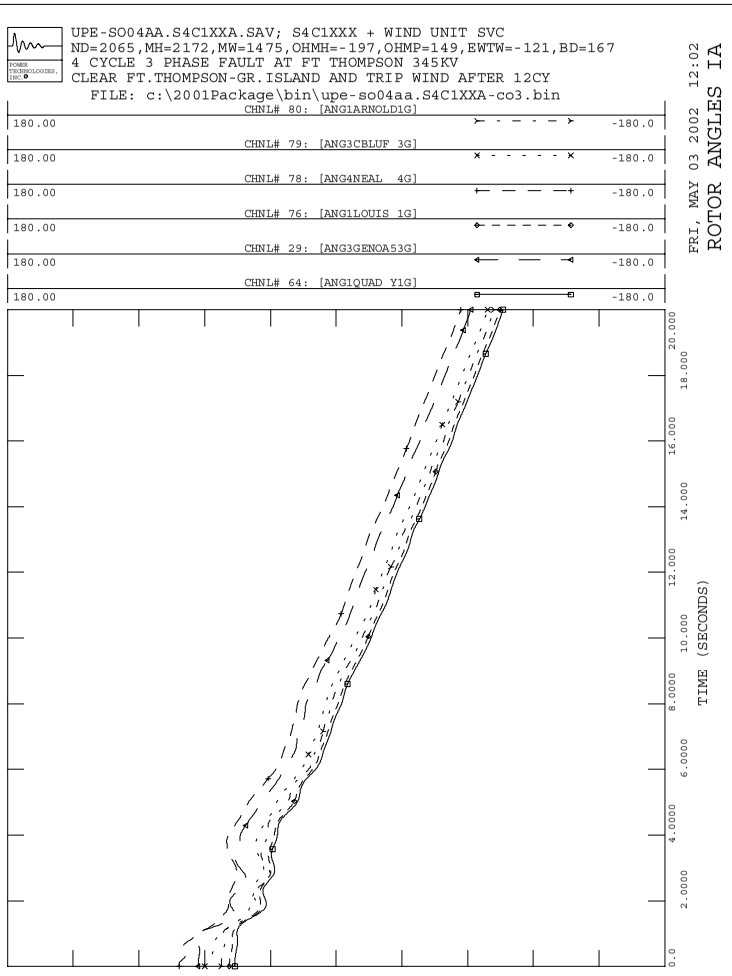
TIME (SECONDS)
FRI, MAY 03 2002 12:02
VOLTAGES 3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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 80: [ANG1ARNOLD1G]
CHNL# 79: [ANG3CBLUF 3G]
CHNL# 78: [ANG4NEAL 4G]
CHNL# 76: [ANG1LOUIS 1G]
CHNL# 29: [ANG3GENOA53G]
CHNL# 64: [ANG1QUAD Y1G]
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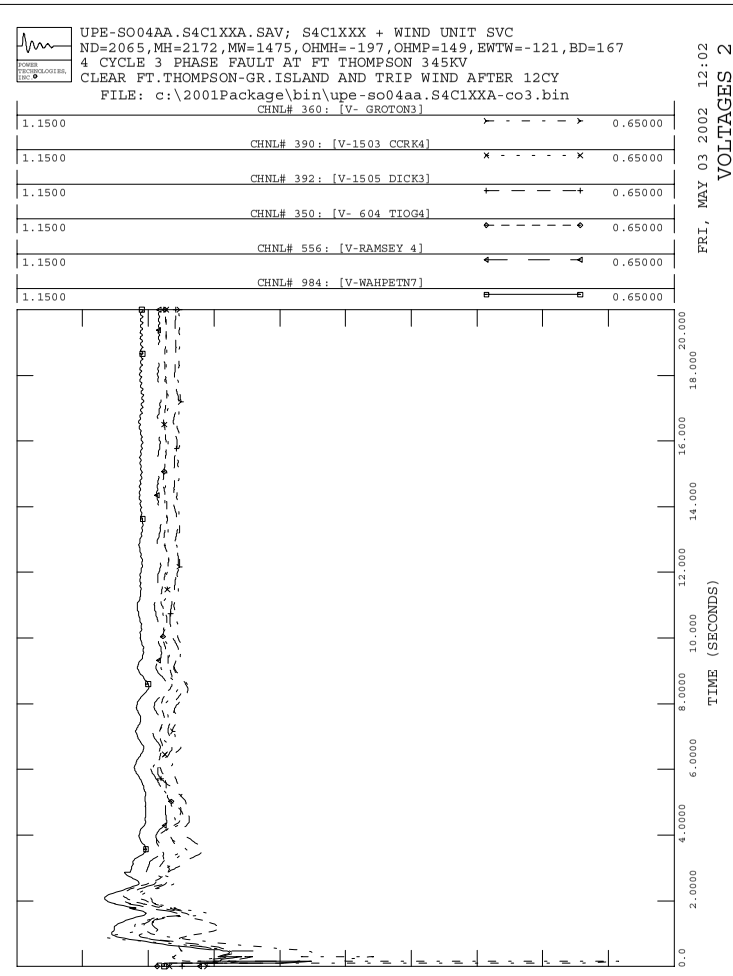
TIME (SECONDS)
FRI, MAY 03 2002 12:02
ROTOR ANGLES IA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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 360: [V- GROTON3]
CHNL# 390: [V-1503 CCRK4]
CHNL# 392: [V-1505 DICK3]
CHNL# 350: [V- 604 TIOG4]
CHNL# 556: [V-RAMSEY 4]
CHNL# 984: [V-WAHPETN7]
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TIME (SECONDS)
FRI, MAY 03 2002 12:02
VOLTAGES 2

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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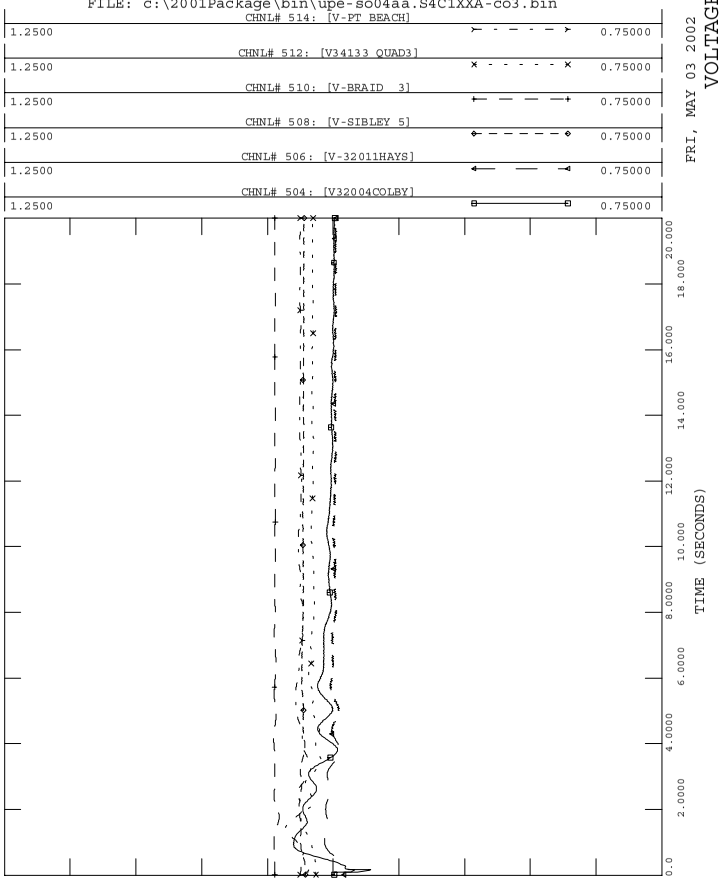
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02
VOLTAGES 5



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

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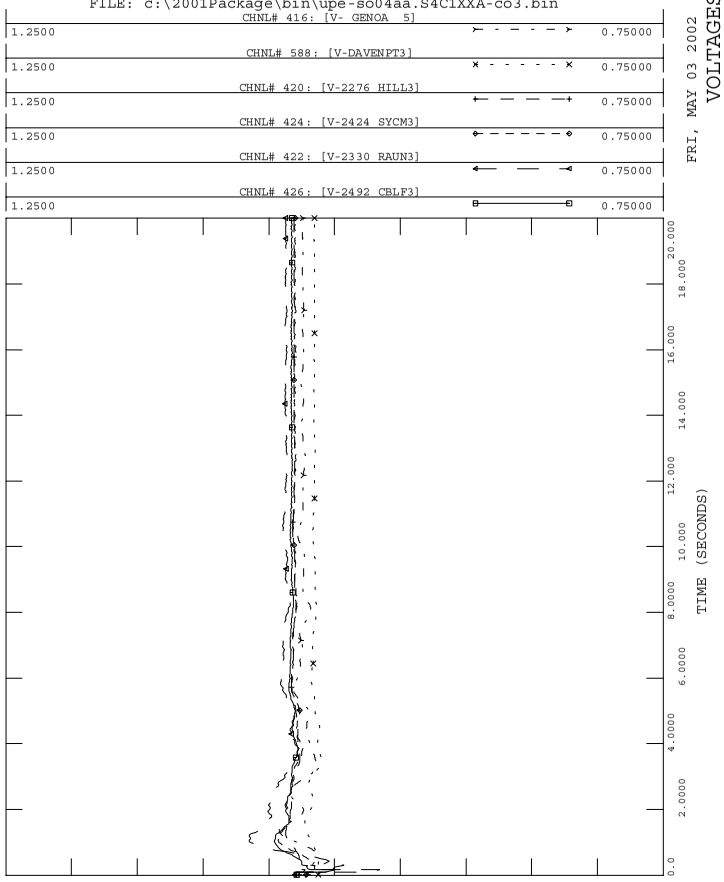
VOLTAGES IA



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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
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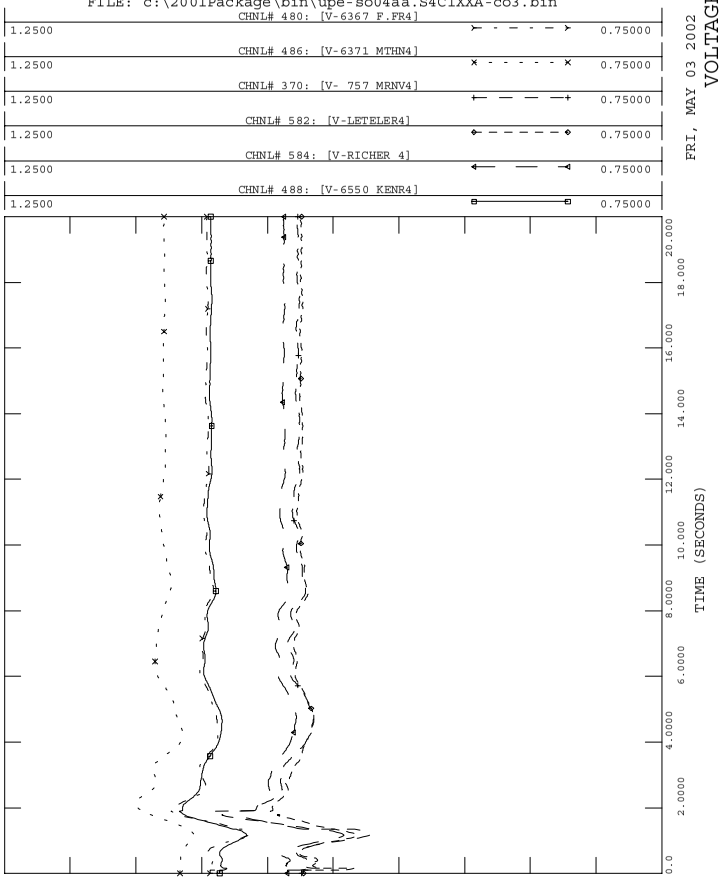
VOLTAGES 4



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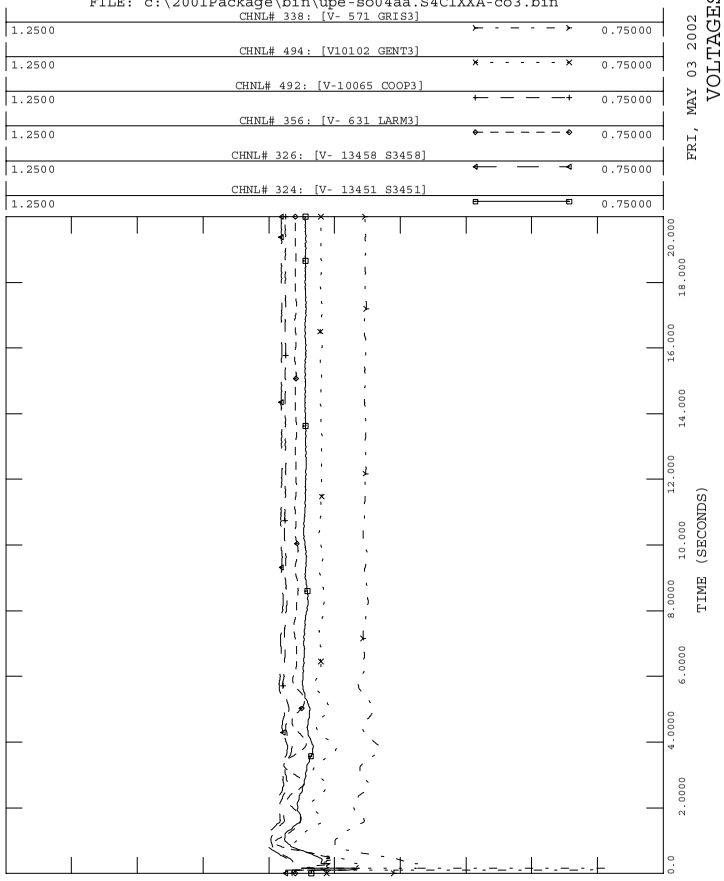
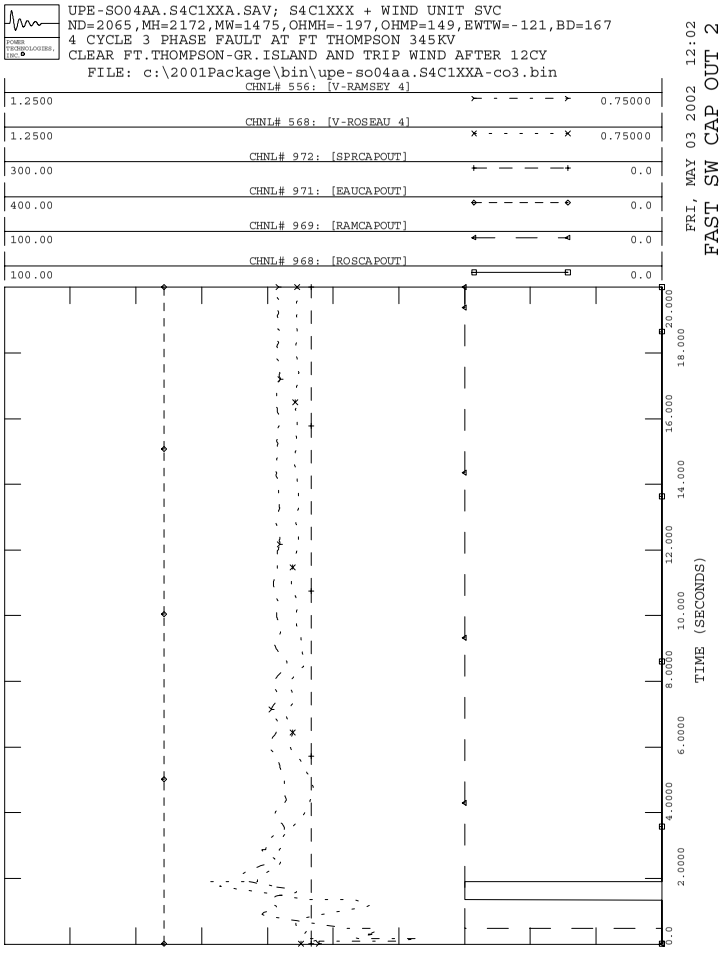
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02
VOLTAGES NB

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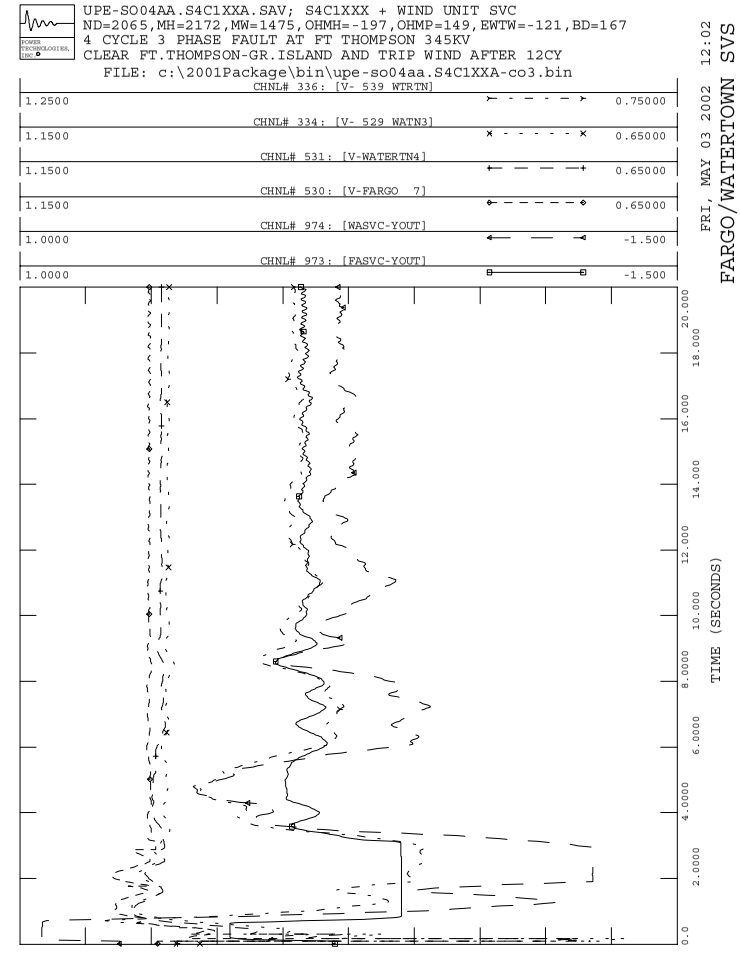
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
FRI, MAY 03 2002 12:02
FAST SW CAP OUT 2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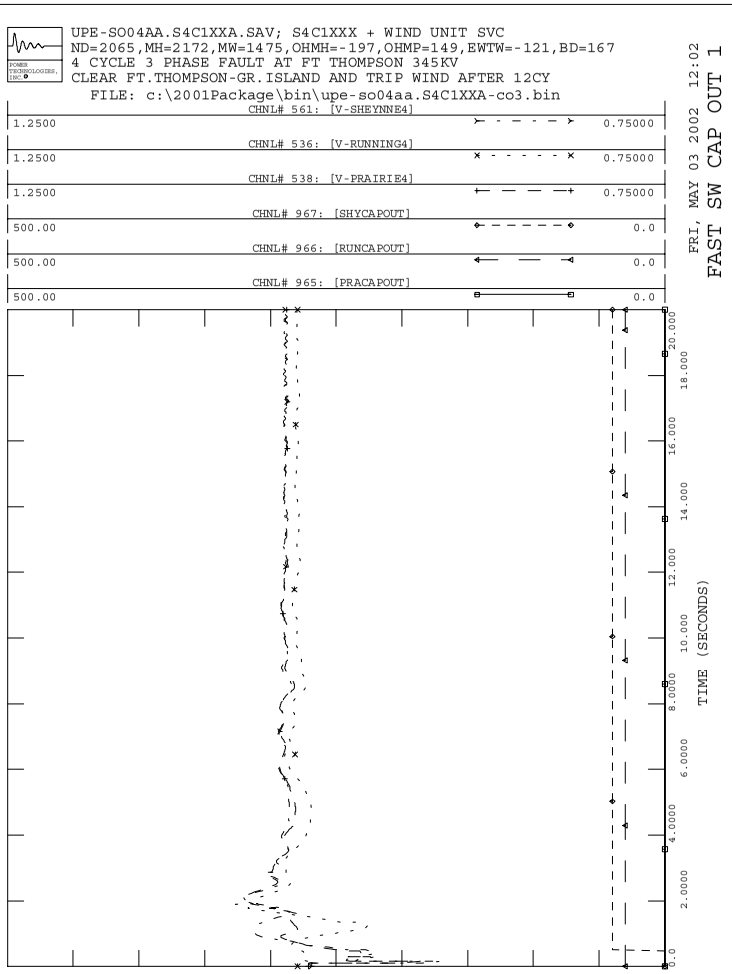
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
FRI, MAY 03 2002 12:02
FARGO/WATERTOWN SVS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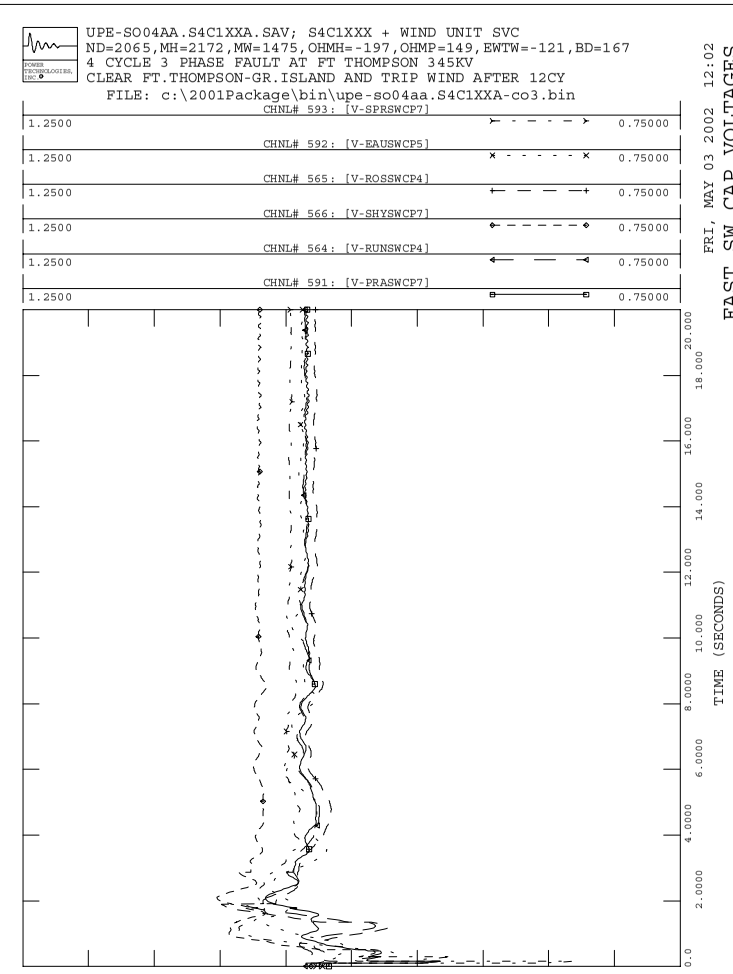
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
FRI, MAY 03 2002 12:02
FAST SW CAP OUT 1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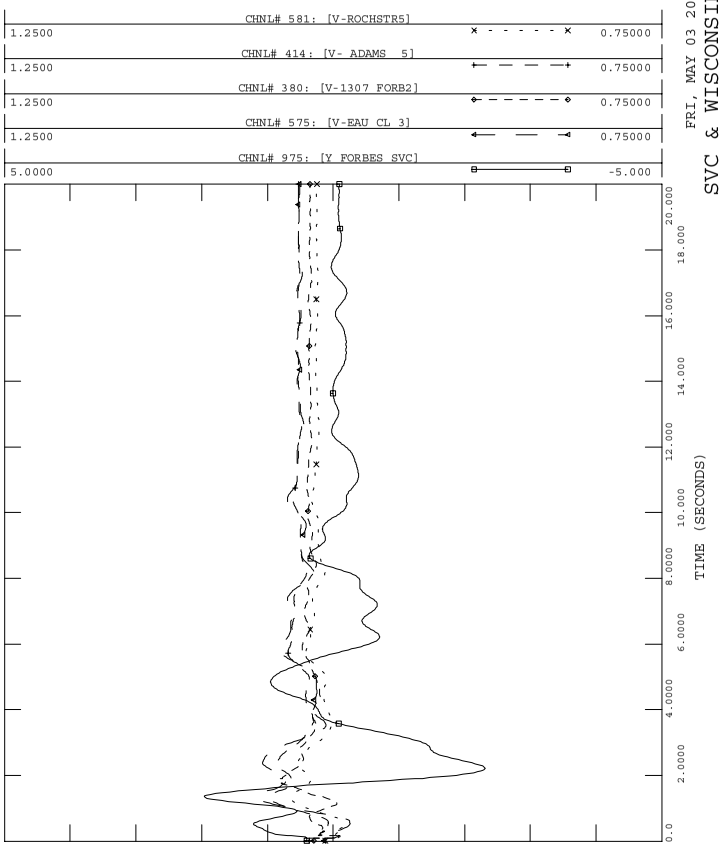
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
FRI, MAY 03 2002 12:02
FAST SW CAP VOLTAGES

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02

SVC & WISCONSIN VOLT



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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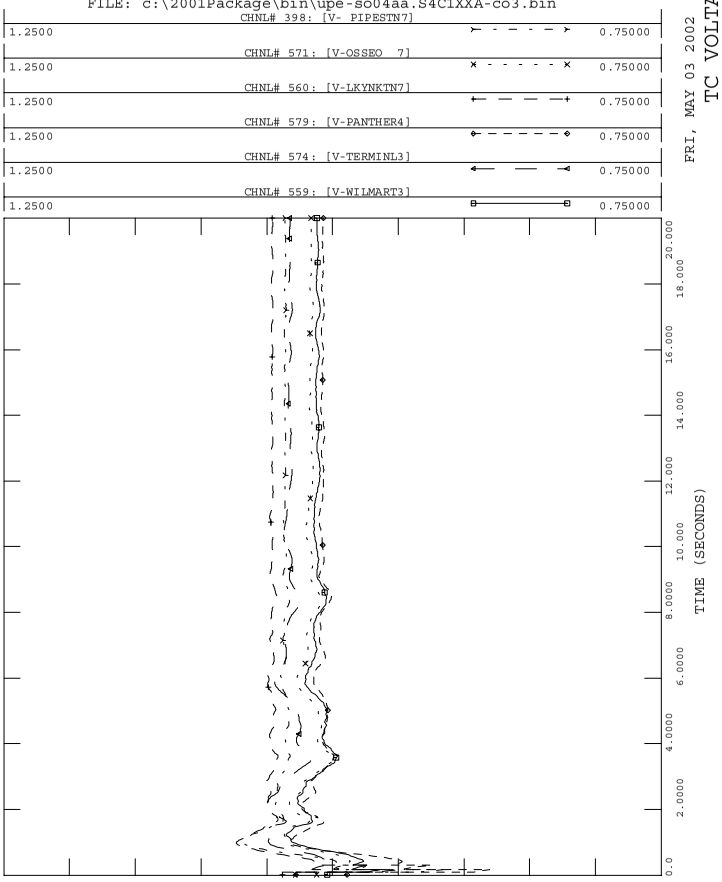
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02

TC VOLTAGES



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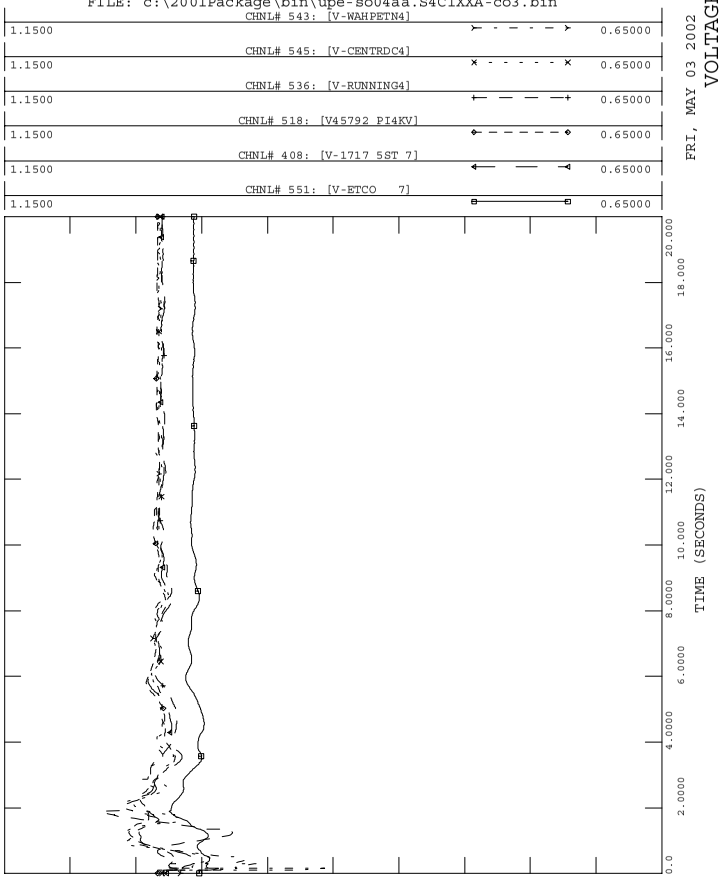
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02

VOLTAGES 6



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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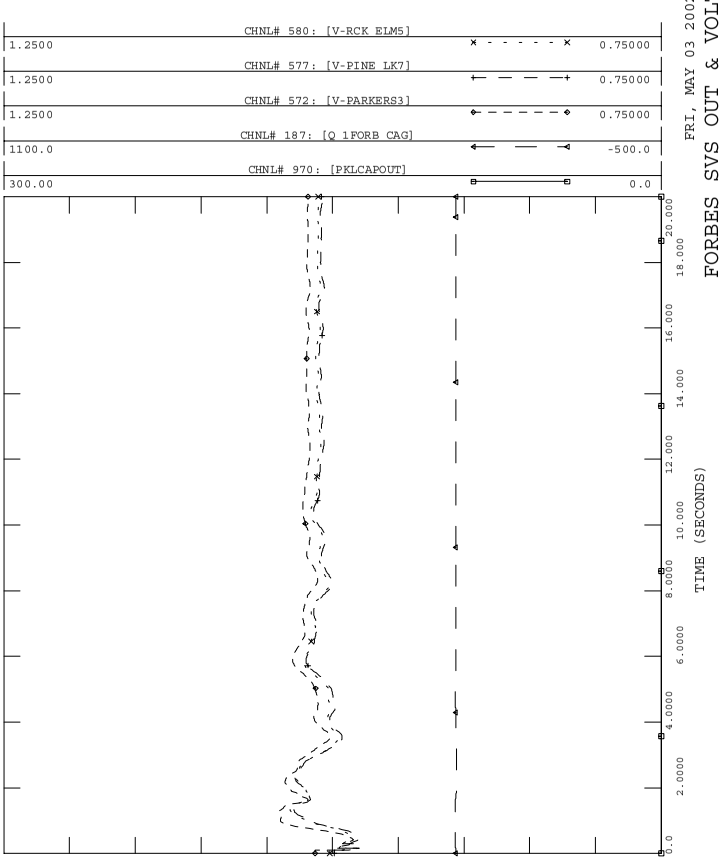
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02

FORBES SVS OUT & VOLTAGES



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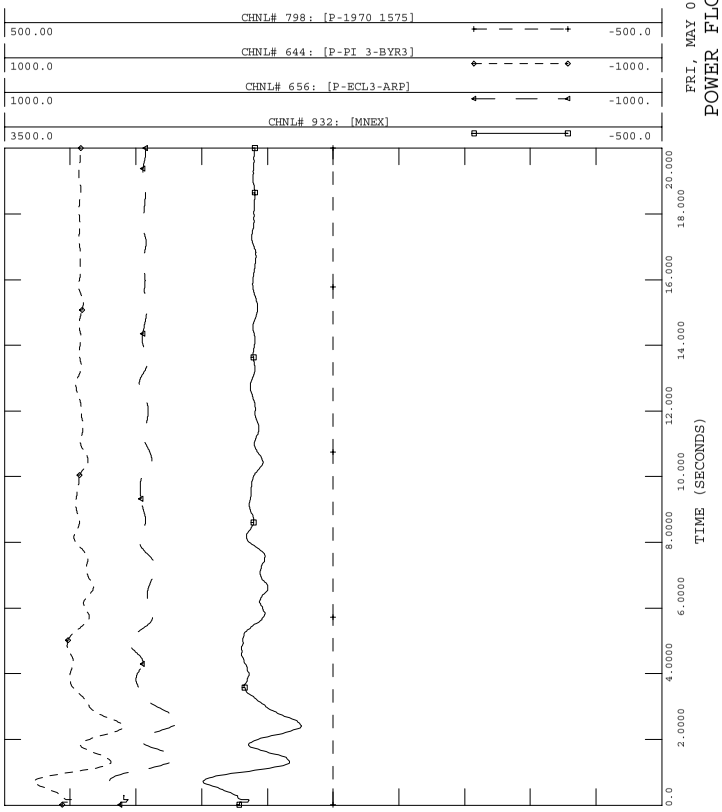
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02
POWER FLOW SUMS 2



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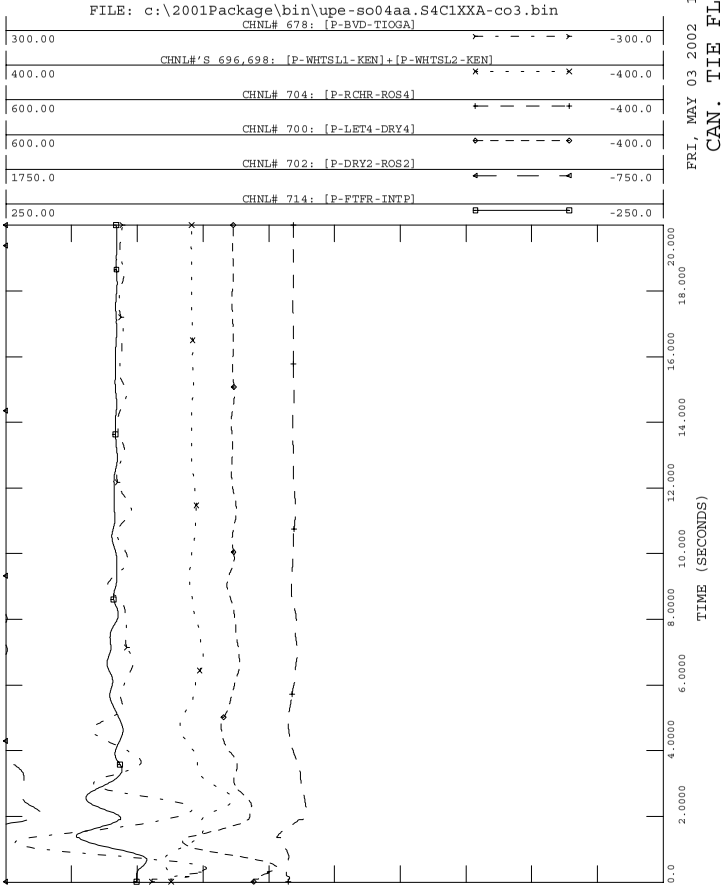
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02
CAN. TIE FLOWS



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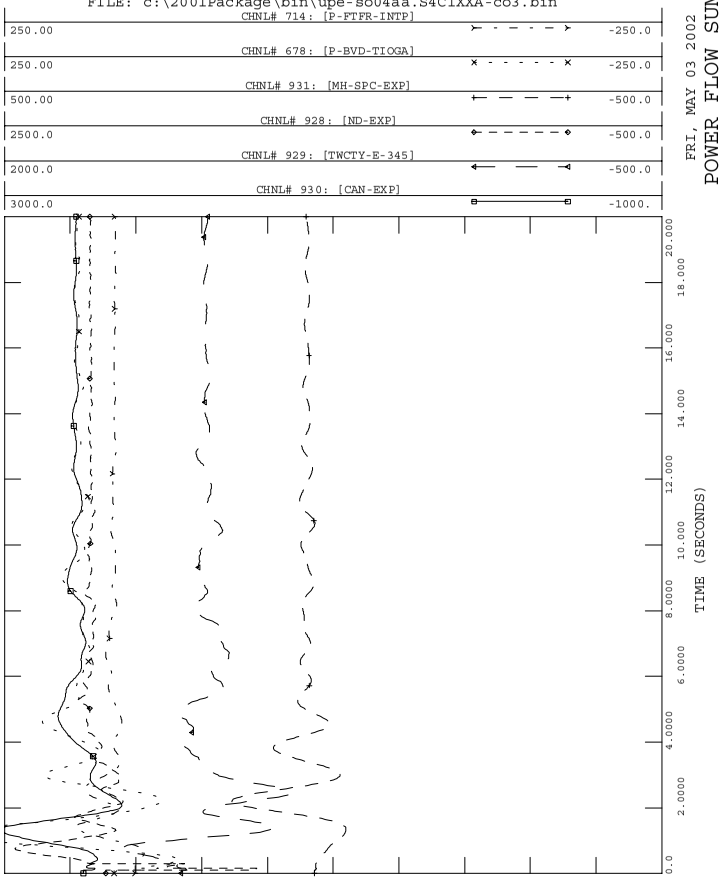
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02
POWER FLOW SUMS 1



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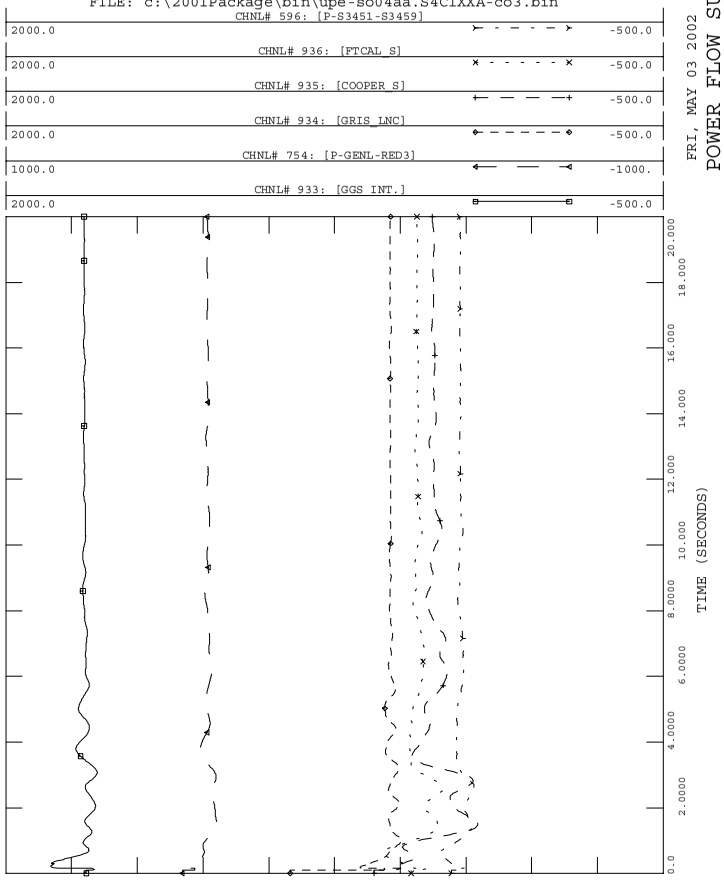
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02
POWER FLOW SUM 3



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
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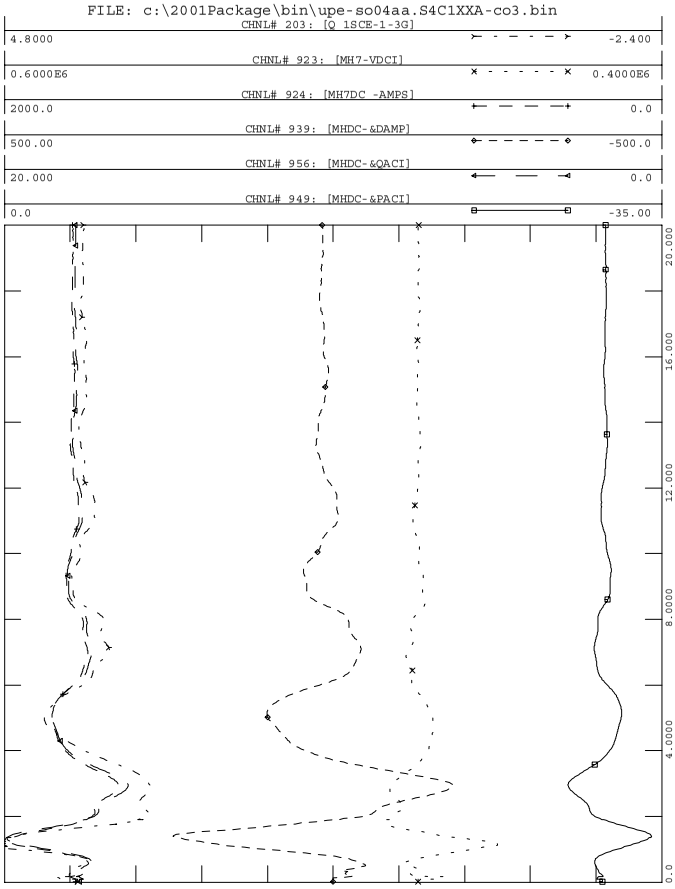
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02
MH DC PARAMETERS



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
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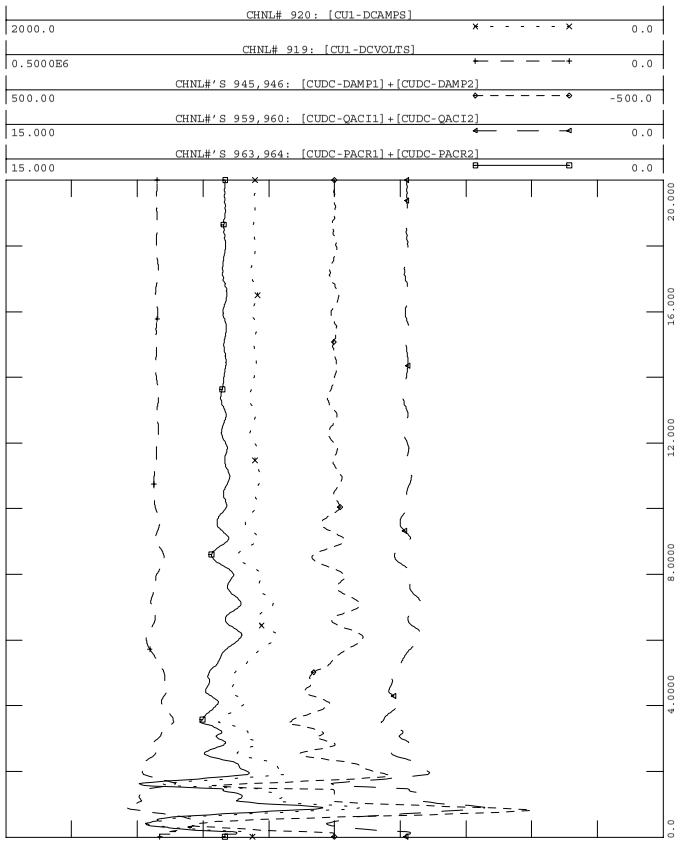
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02
CU DC #1



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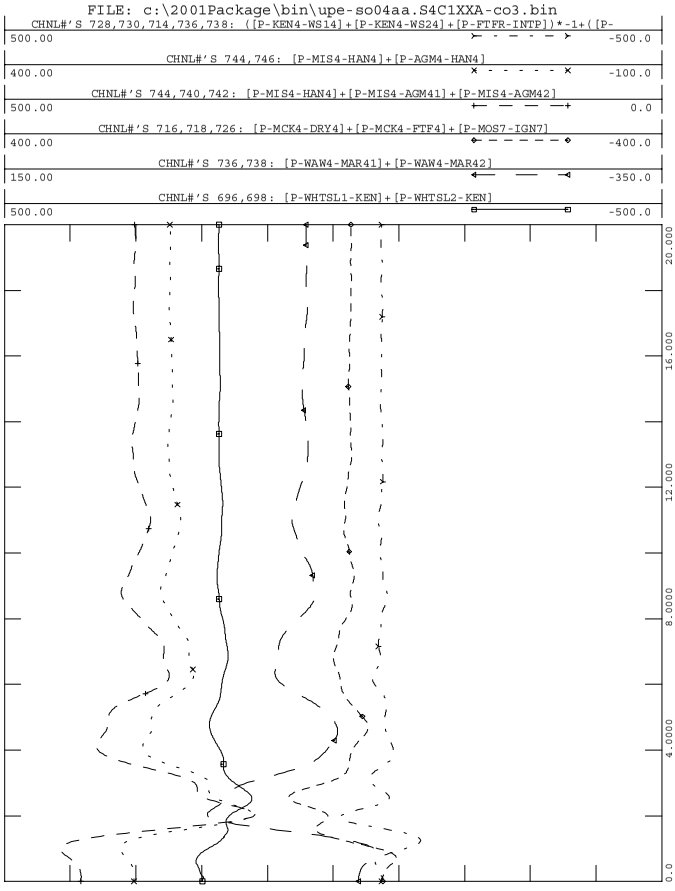
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02
OH TIE FLOWS



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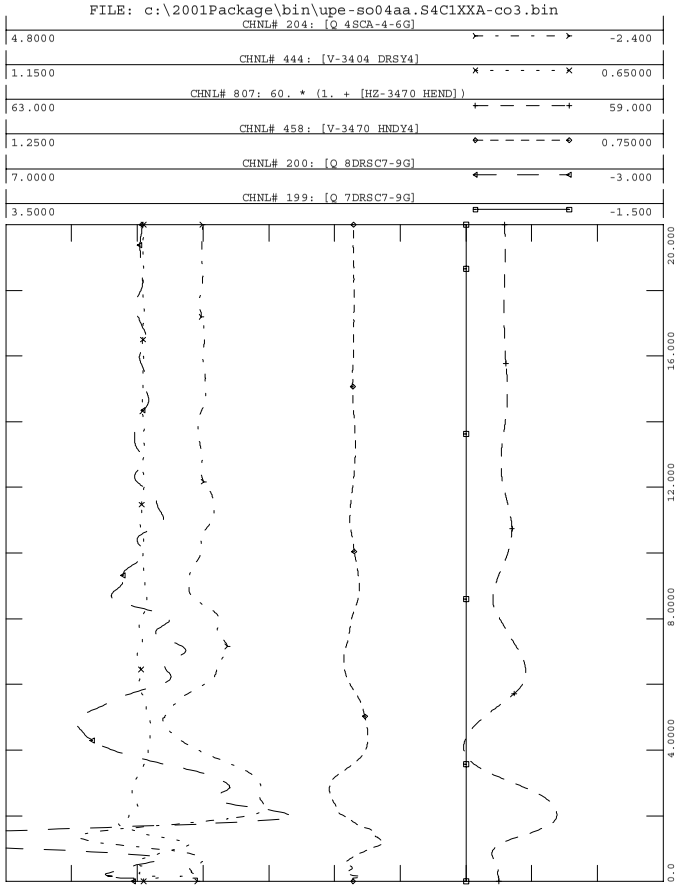
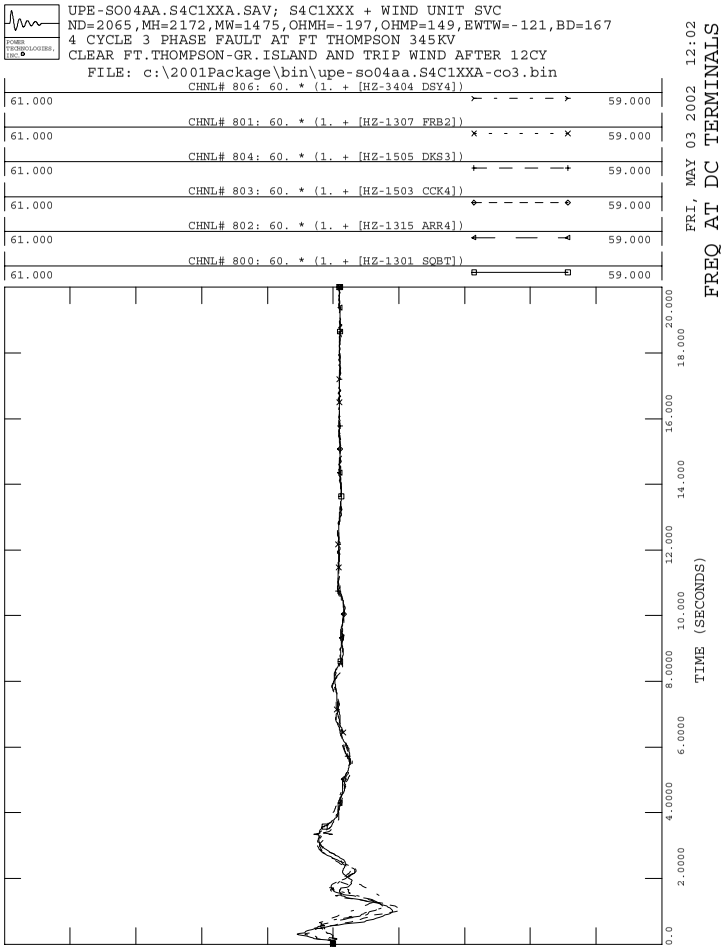
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

FRI, MAY 03 2002 12:02
MH DC PARAMETERS

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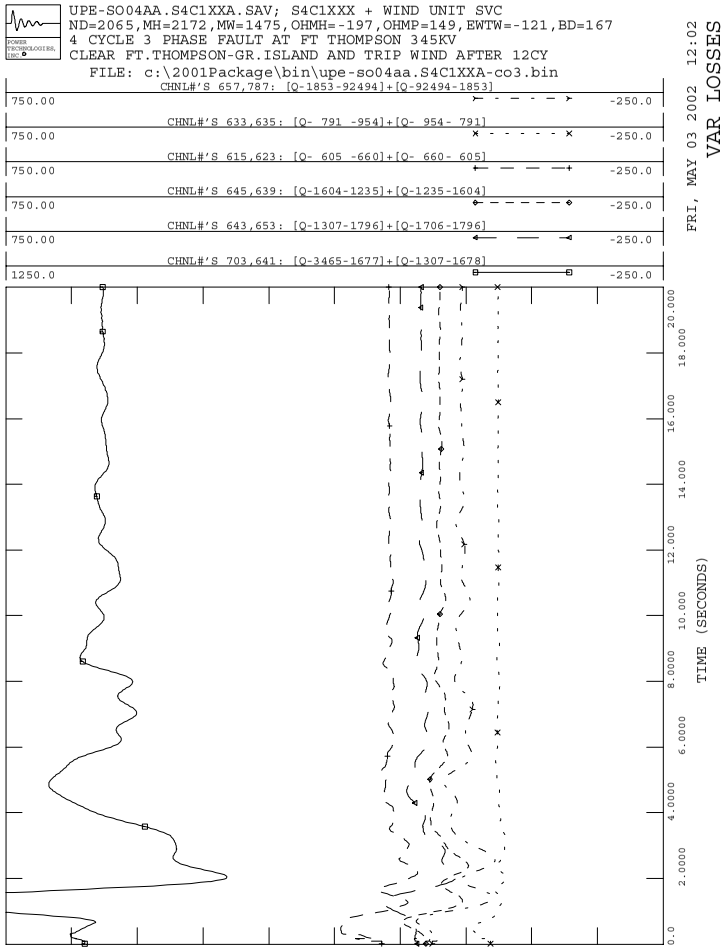
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
FRI, MAY 03 2002 12:02
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
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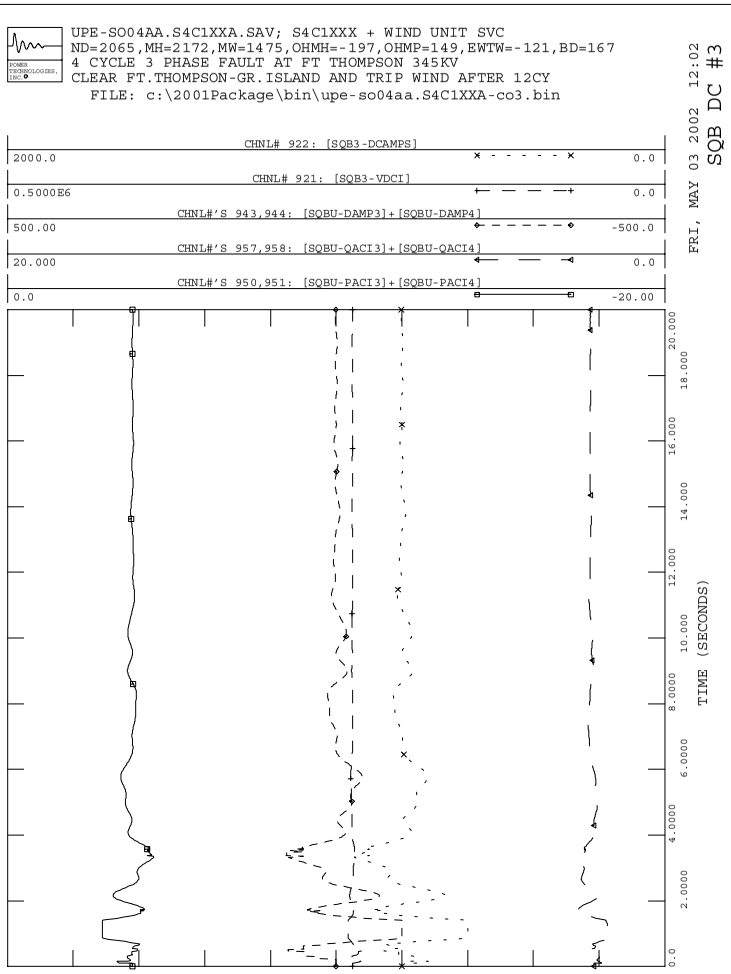
FRI, MAY 03 2002 12:02
VAR LOSSES
TIME (SECONDS)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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
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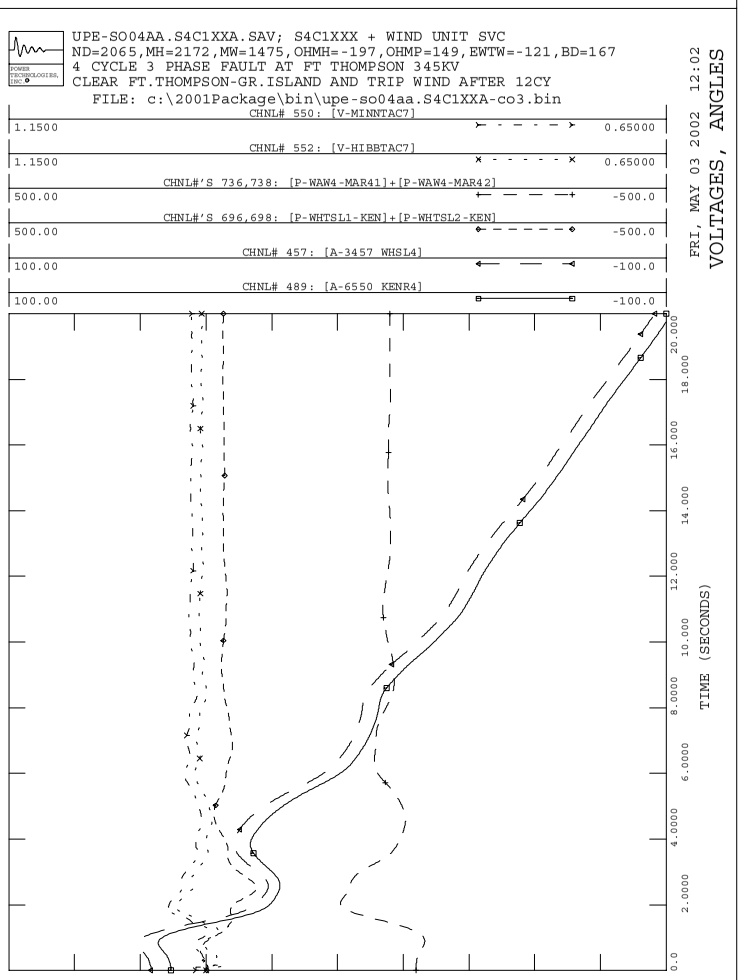
FRI, MAY 03 2002 12:02
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
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100.00
-100.0
FRI, MAY 03 2002 12:02
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

RELAY: SLINOS
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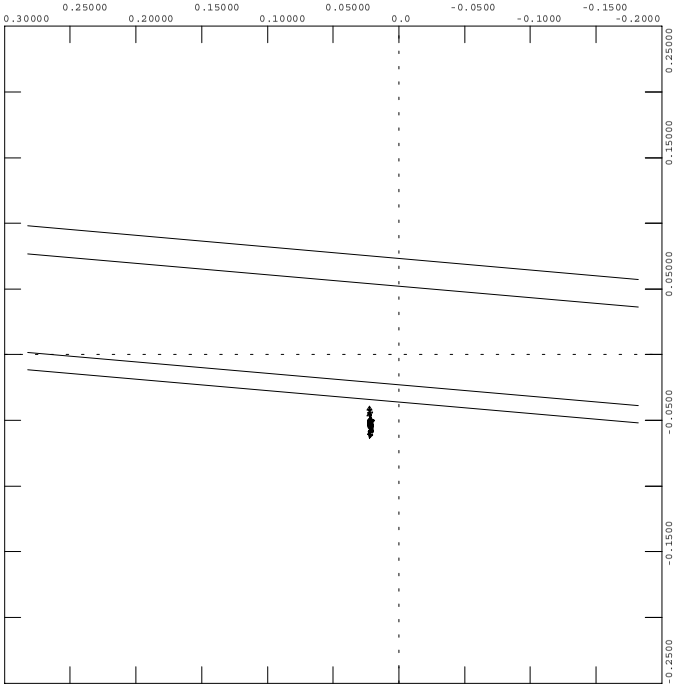
CHNL# 824: [X-FRB2-ROS2]



FRI, MAY 03 2002 12:02
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

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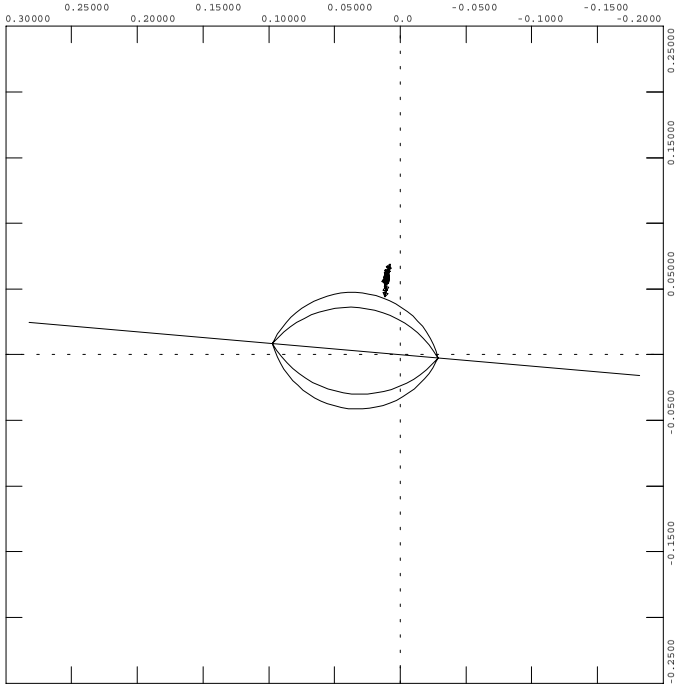

FRI, MAY 03 2002 12:02
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

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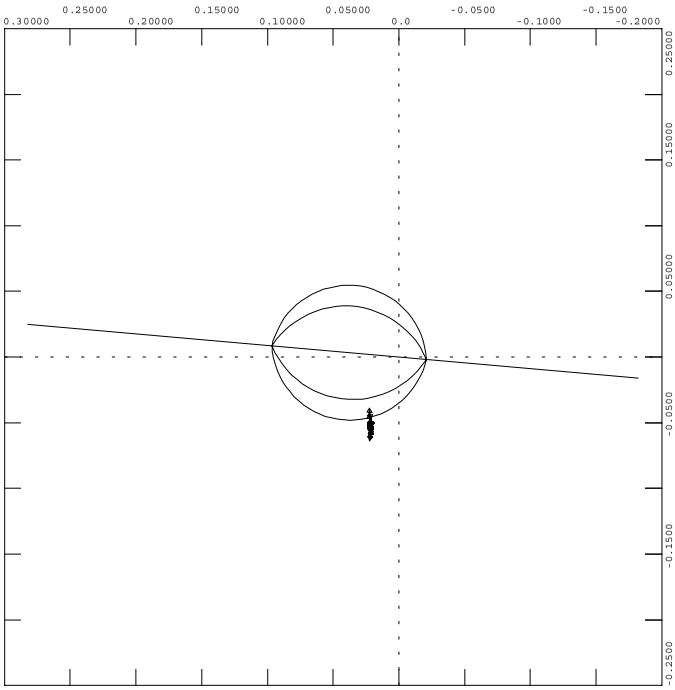

FRI, MAY 03 2002 12:02
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

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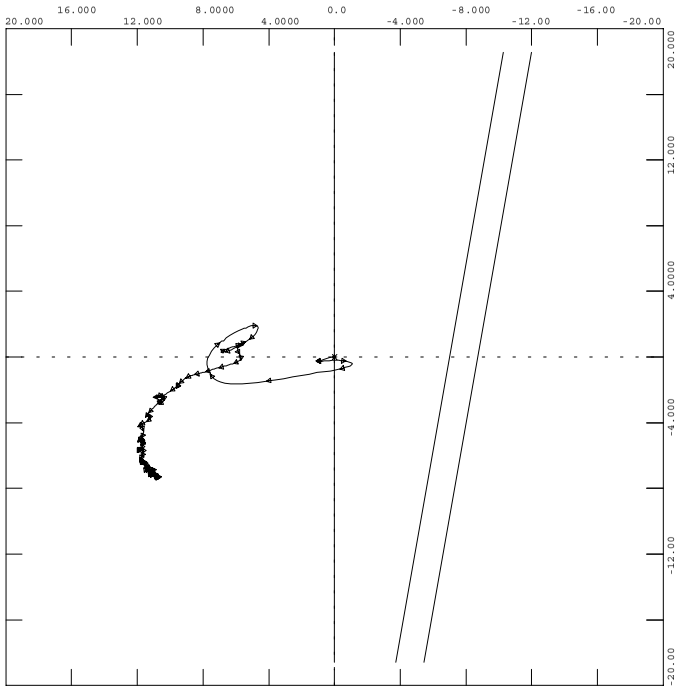

FRI, MAY 03 2002 12:02
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

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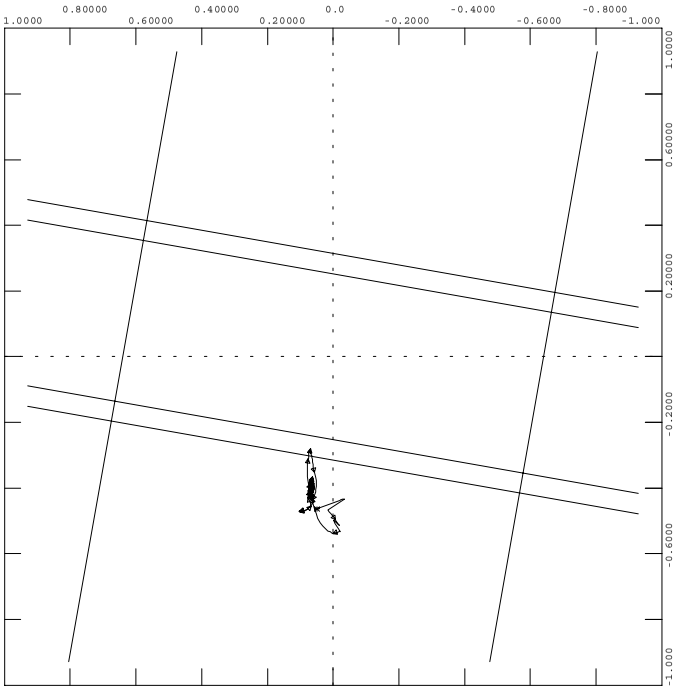

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

RELAY: SLINOS
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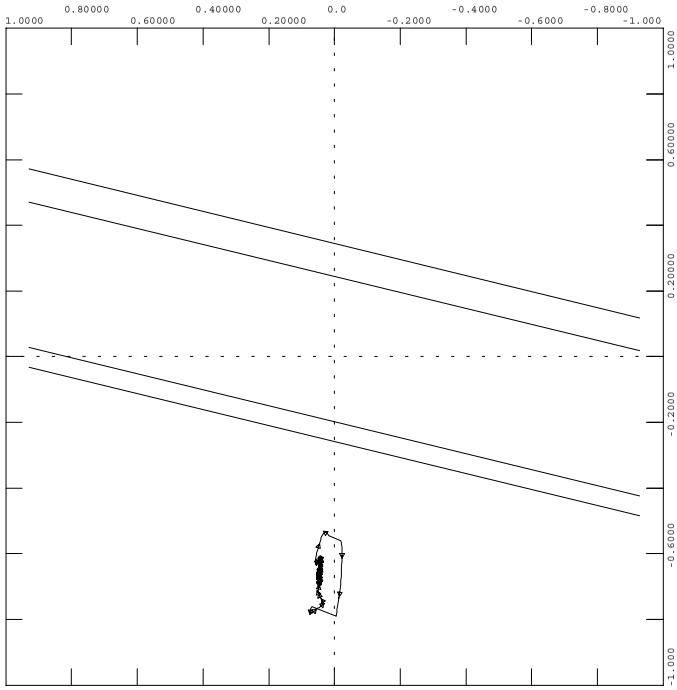
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

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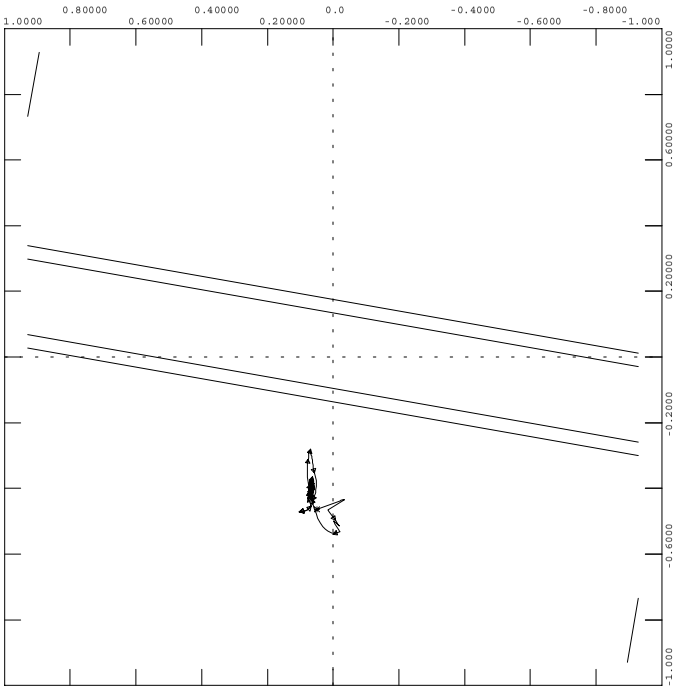
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

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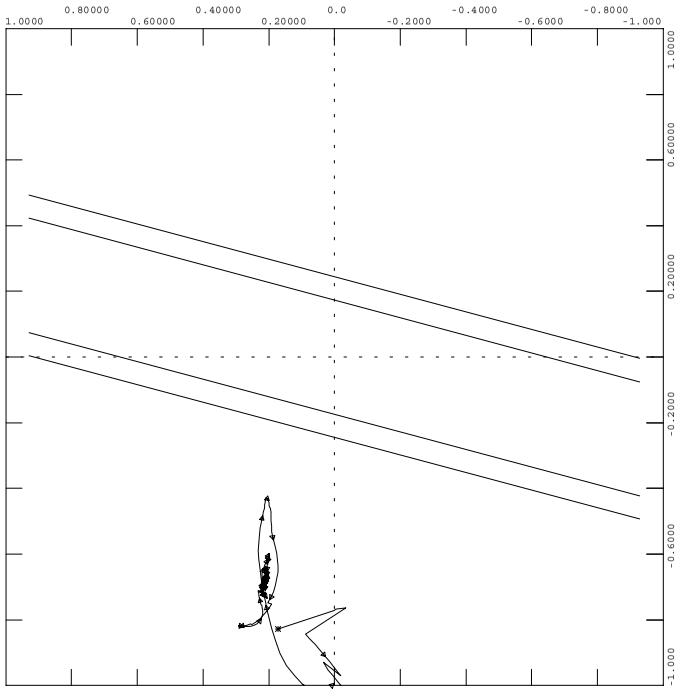

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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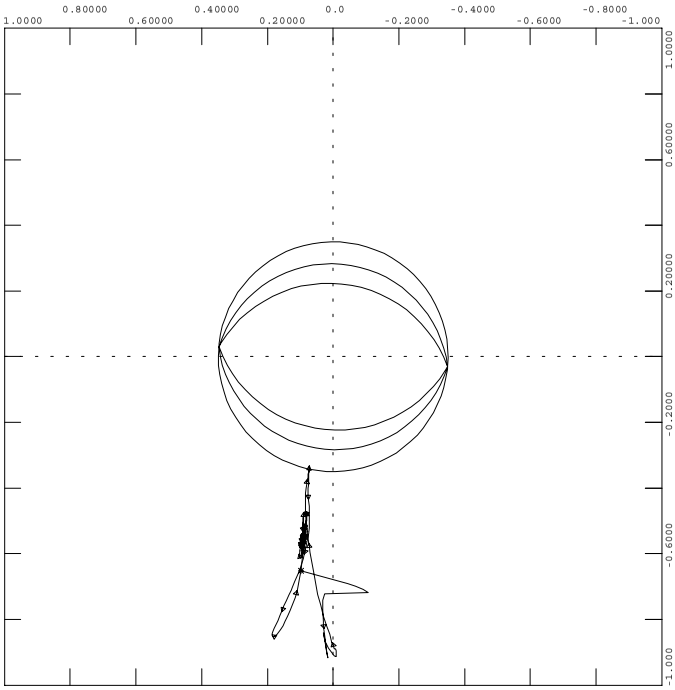

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

RELAY: SLLP
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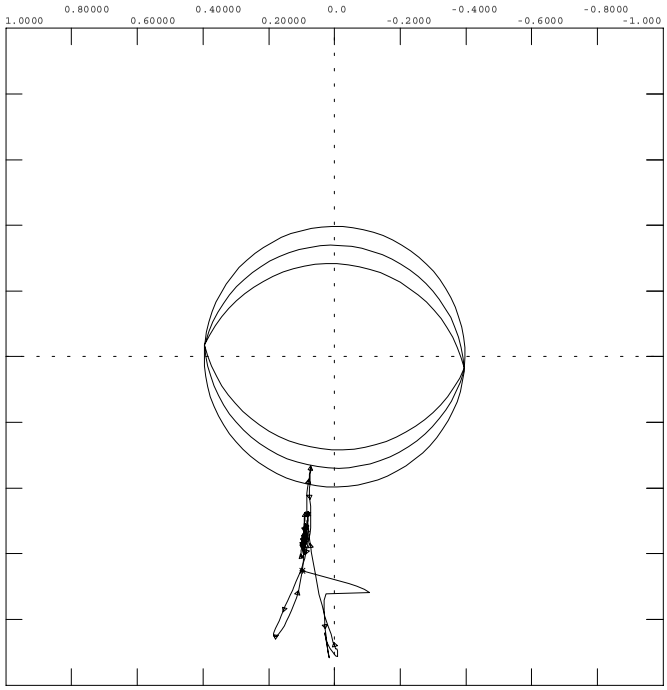
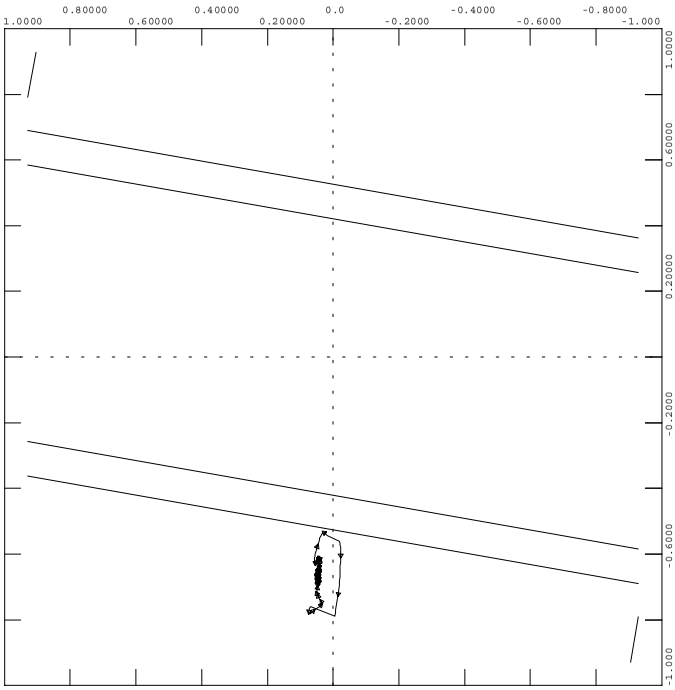
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

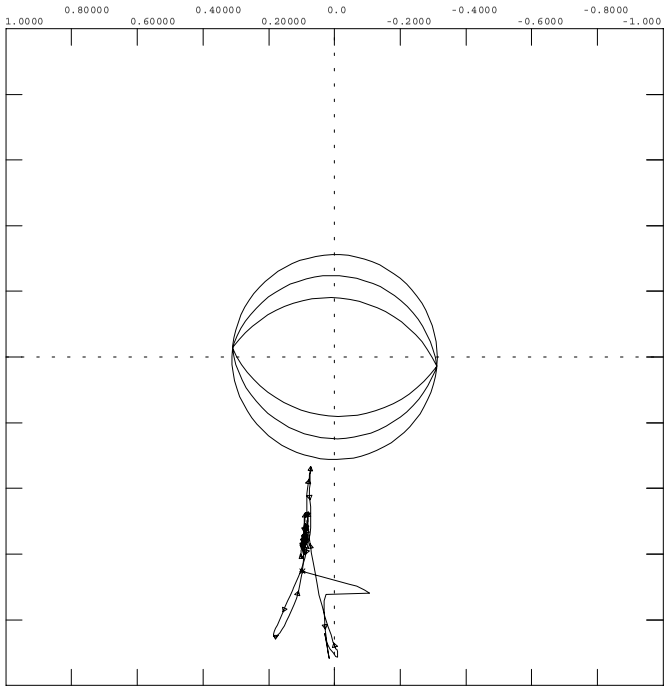
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
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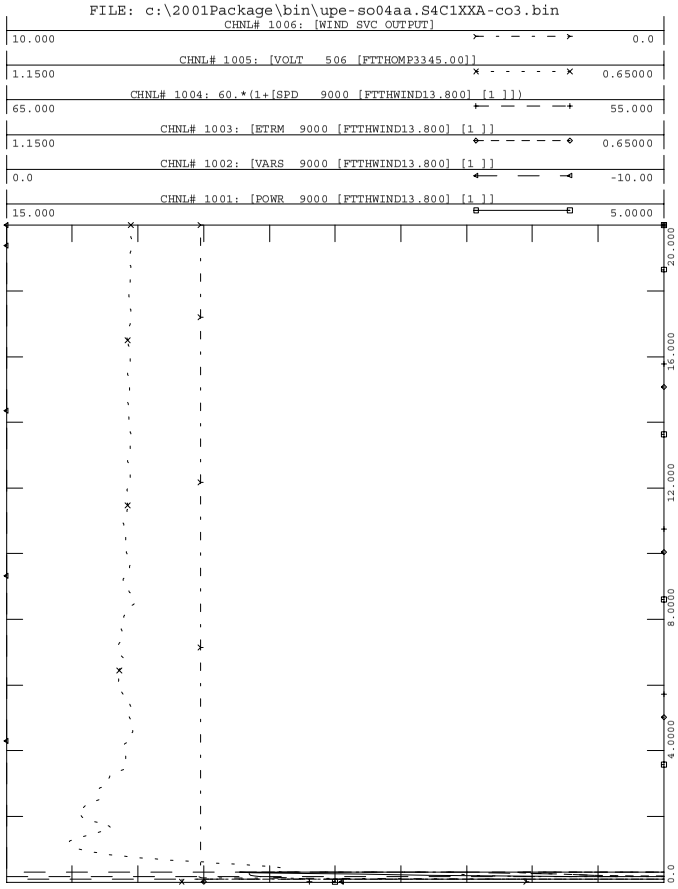
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

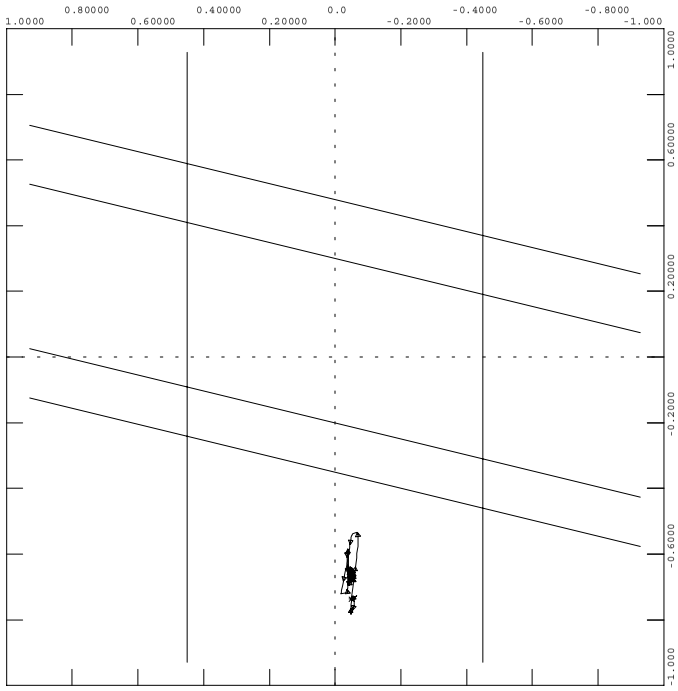


FRI, MAY 03 2002 12:02
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C1XXA-co3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



FRI, MAY 03 2002 12:02
MP-OH I.FALLS (779)

APPENDIX 26

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 4 (FT. THOMPSON)

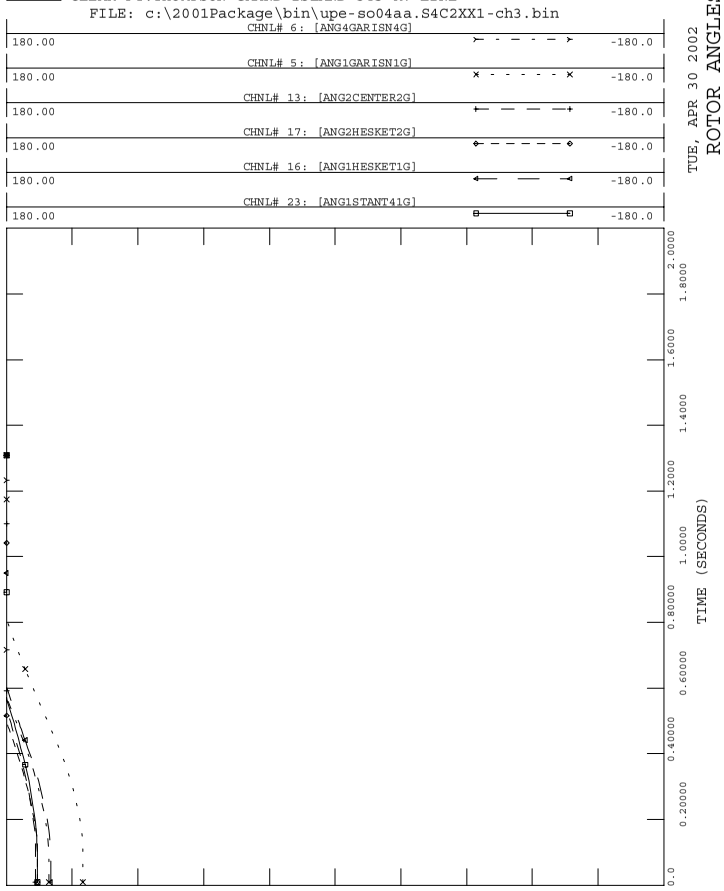
CASE S4C2XX1

CONTINGENCY CH3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Grand Island 345 kV line

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58
ROTOR ANGLES 2



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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TUE, APR 30 2002 9:58
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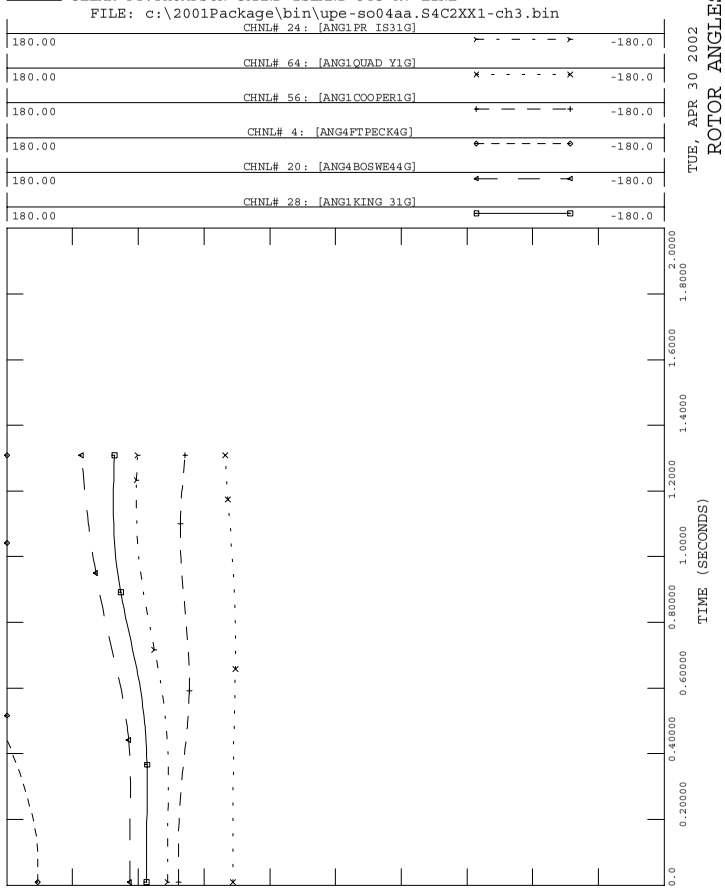

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58
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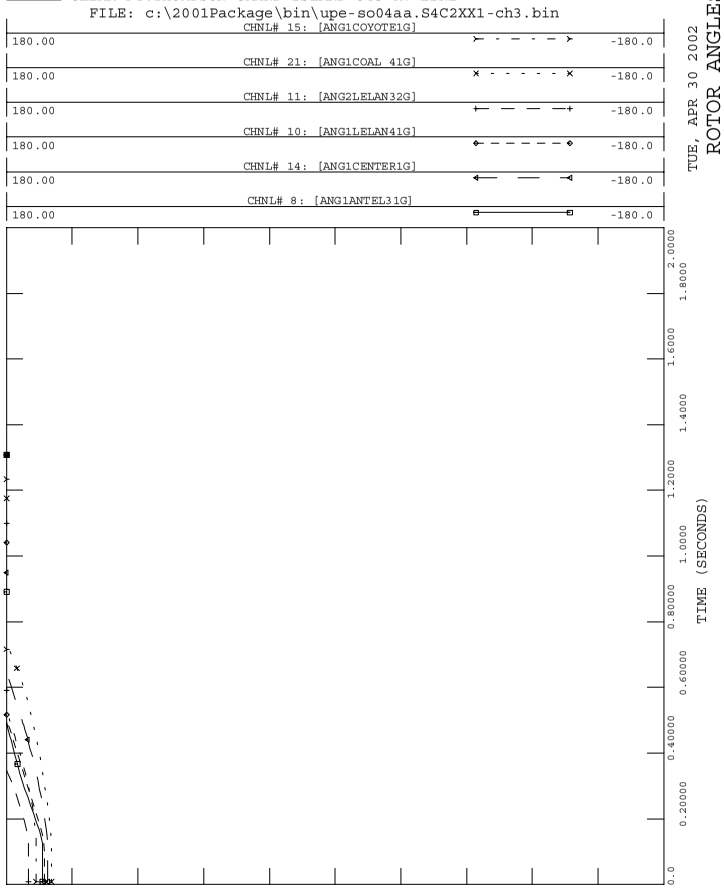

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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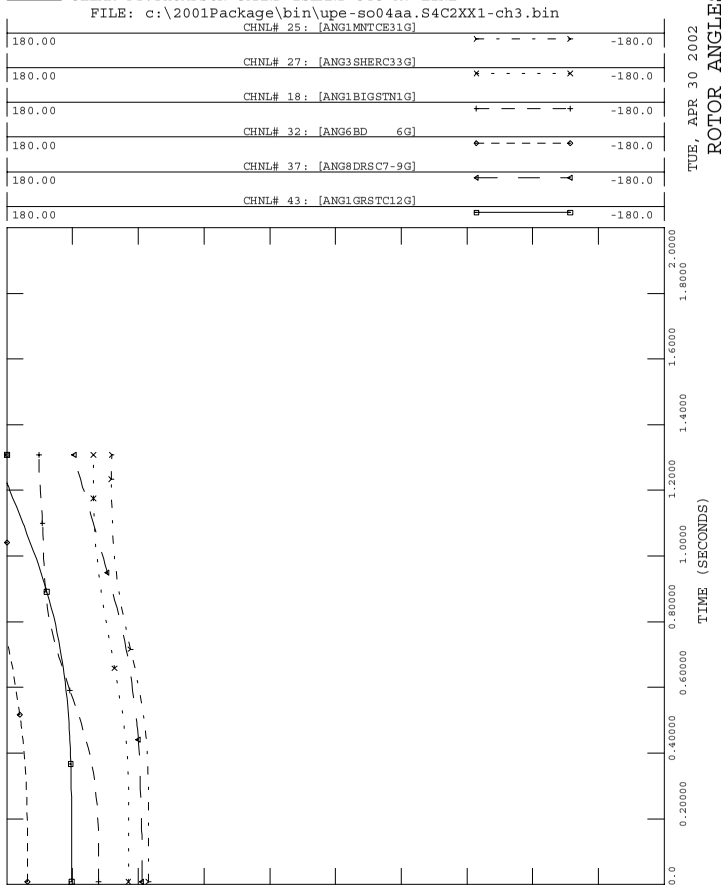
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58
ROTOR ANGLES 3



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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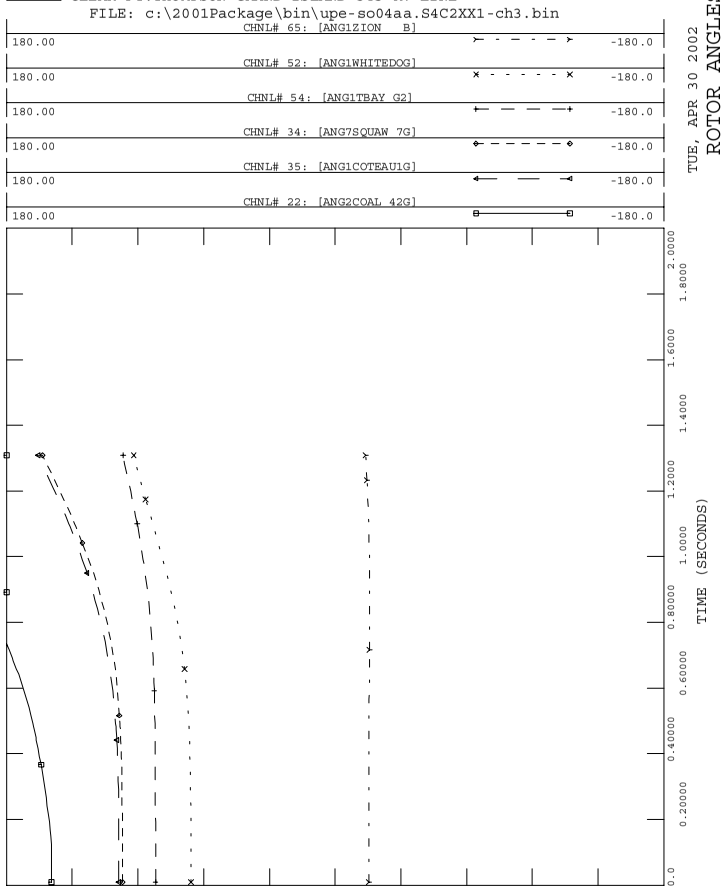
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58
ROTOR ANGLES 6



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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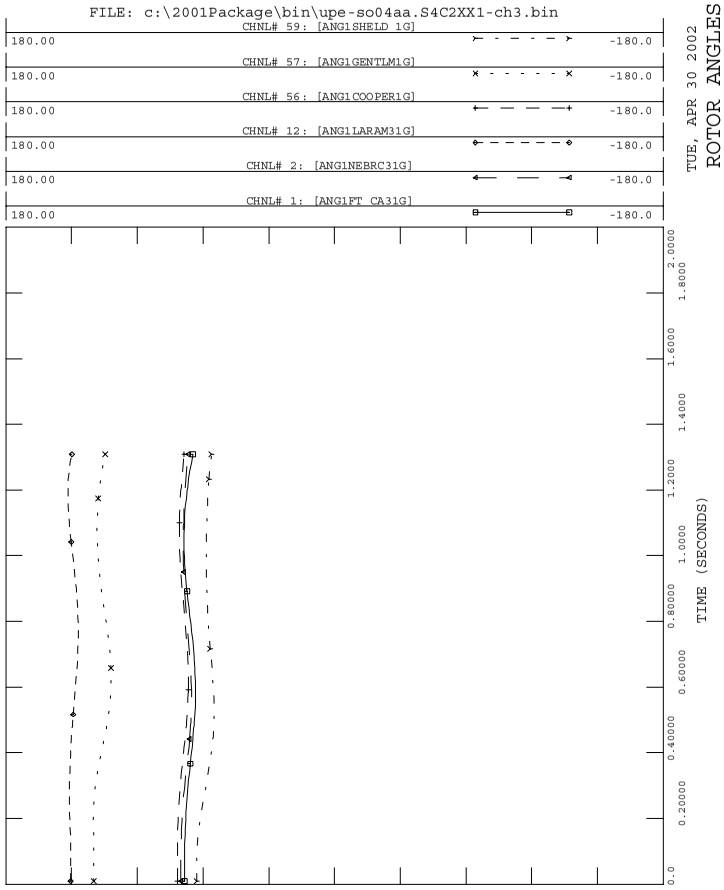
TUE, APR 30 2002 9:58
ROTOR ANGLES NB



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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TUE, APR 30 2002 9:58
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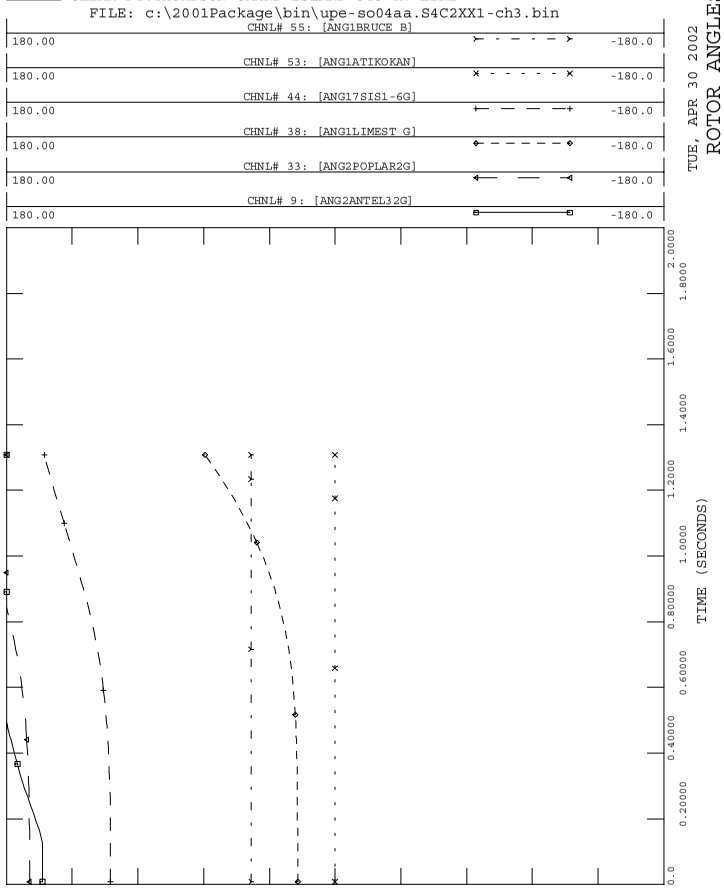

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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TUE, APR 30 2002 9:58
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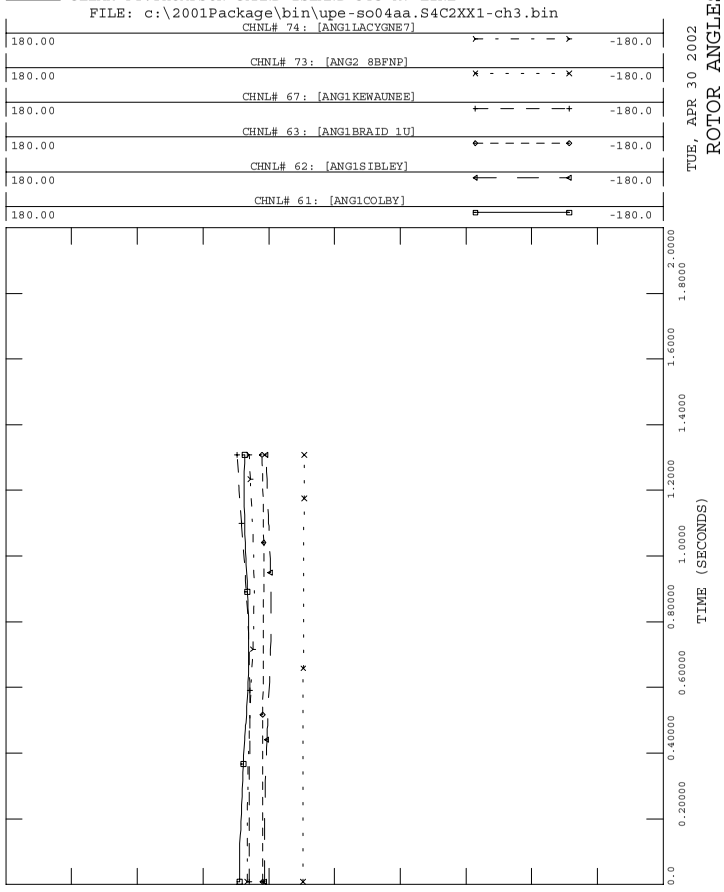

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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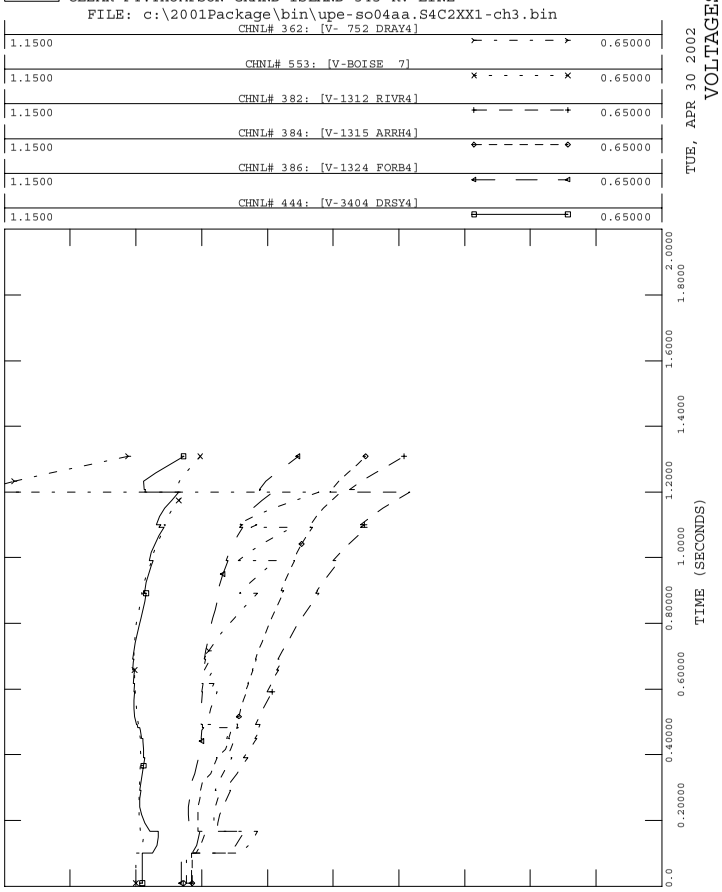
TUE, APR 30 2002 9:58
VOLTAGES 1



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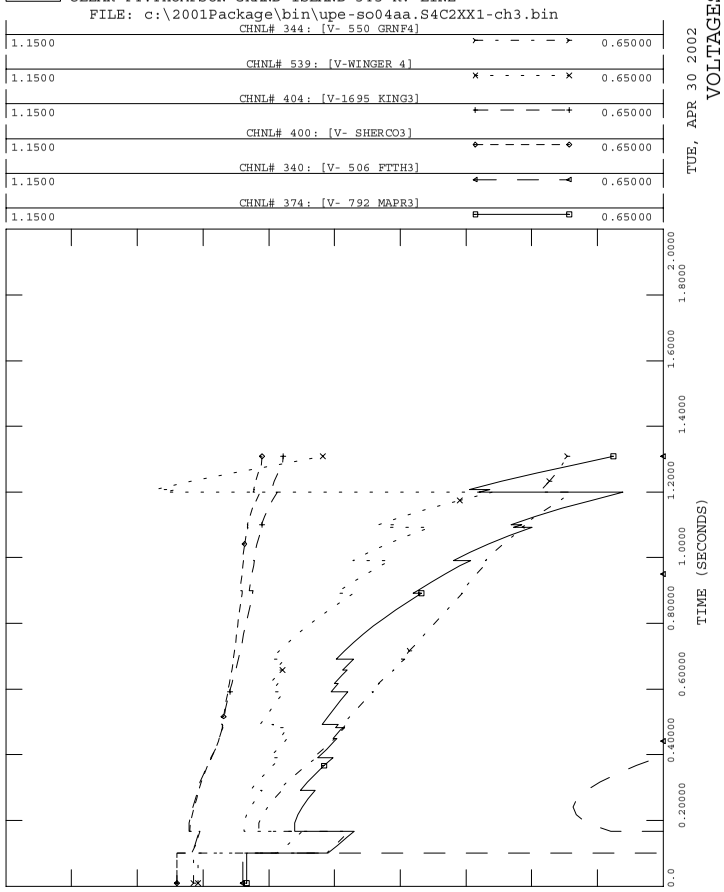
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58
VOLTAGES 3



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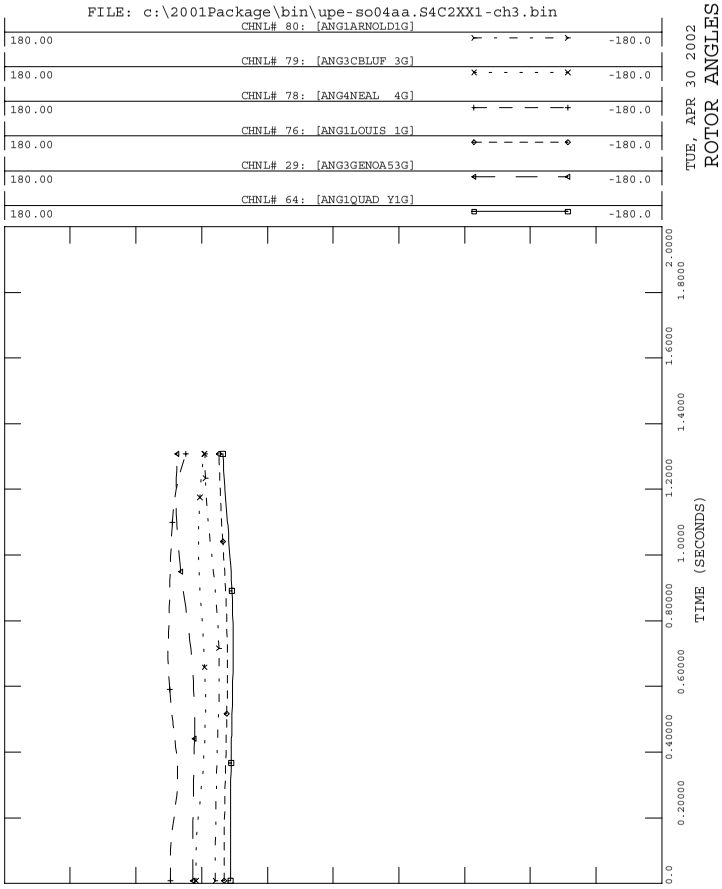
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58
ROTOR ANGLES IA



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CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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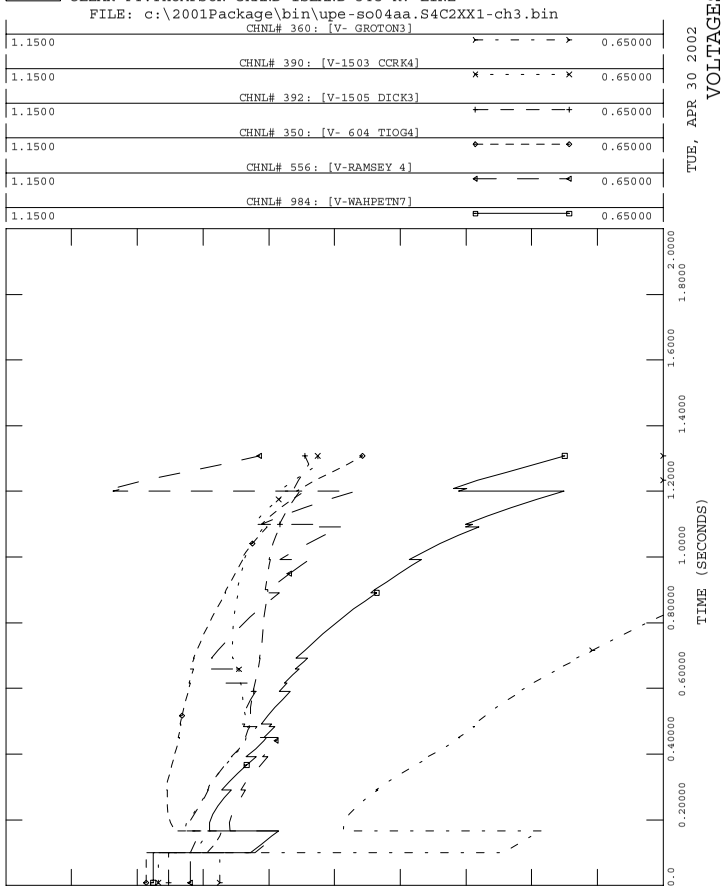
TUE, APR 30 2002 9:58
VOLTAGES 2



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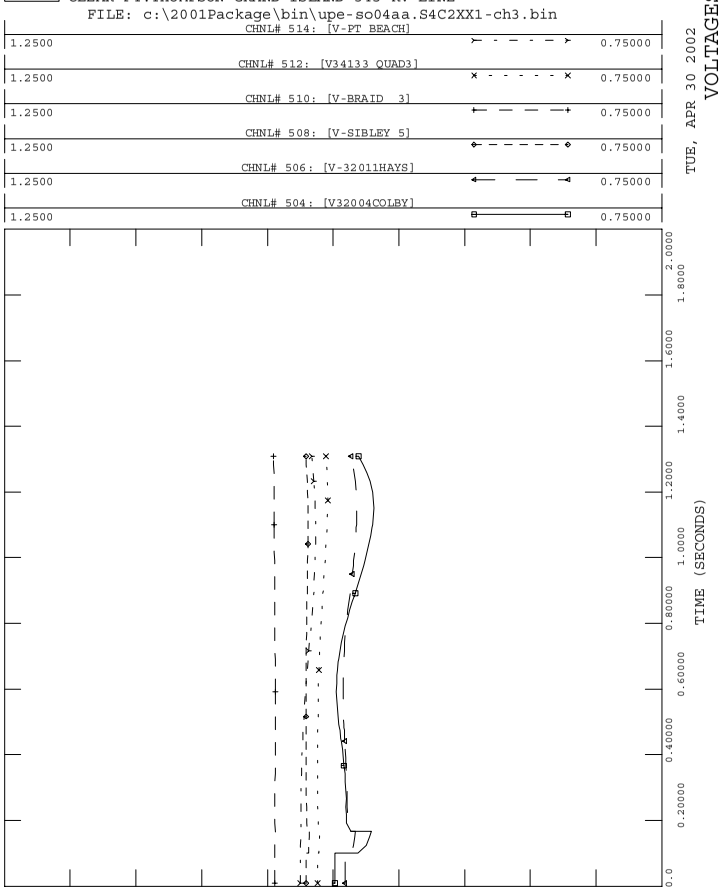
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58 VOLTAGES 5



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CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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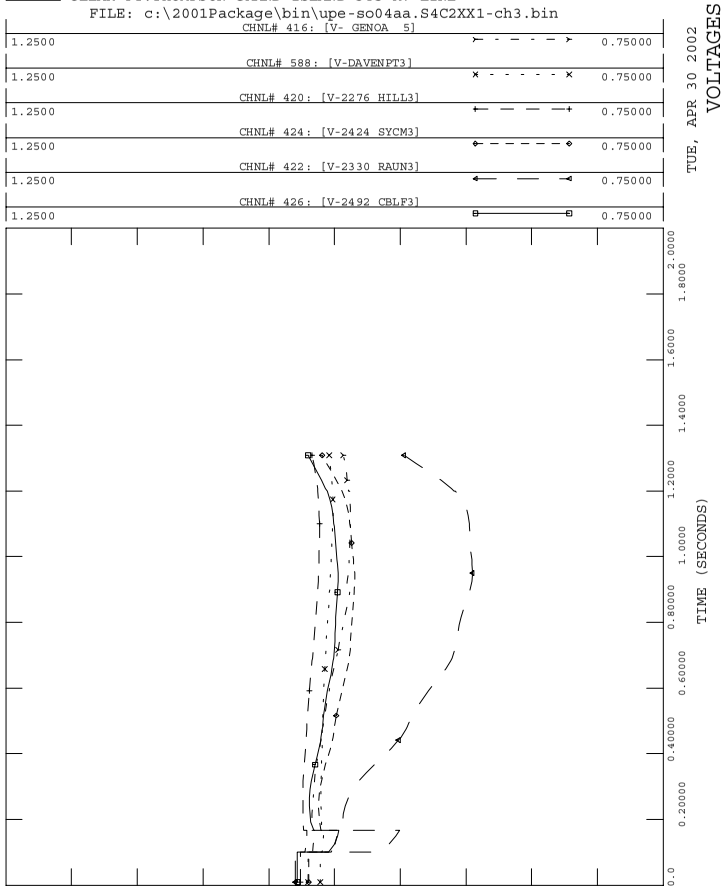
TUE, APR 30 2002 9:58 VOLTAGES IA



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CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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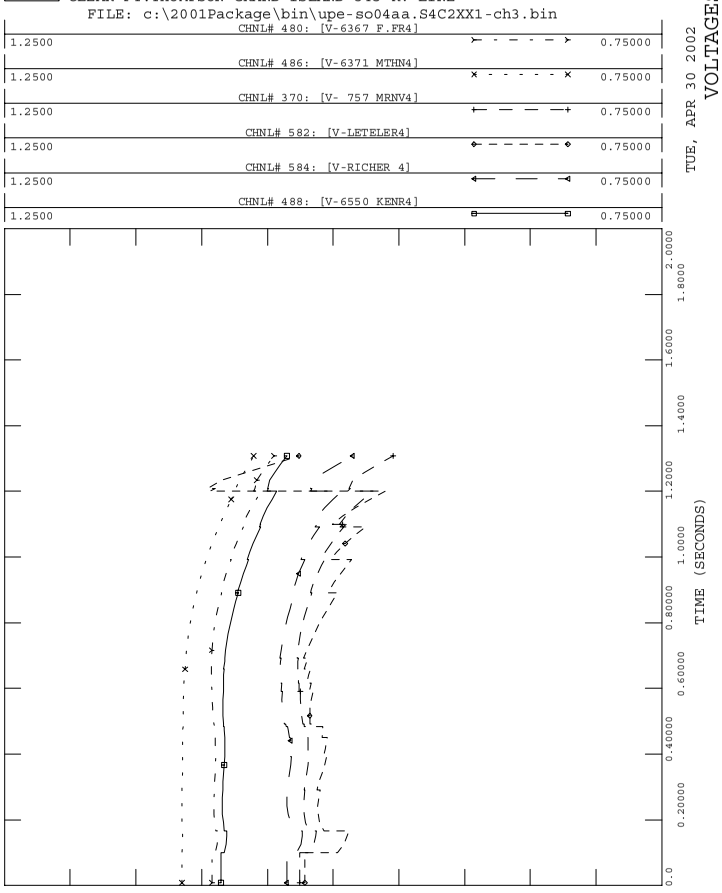
TUE, APR 30 2002 9:58 VOLTAGES 4



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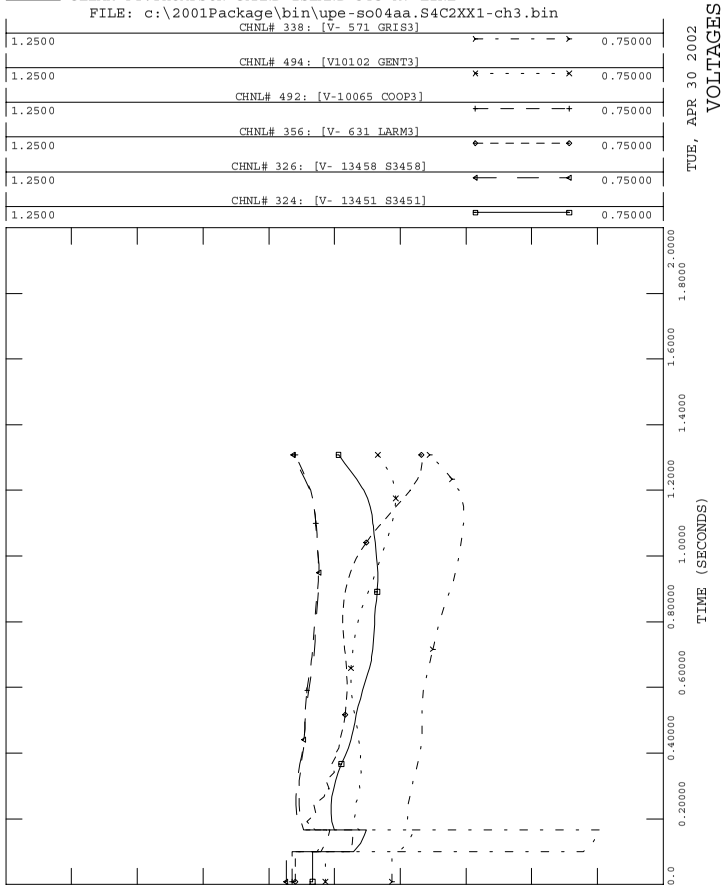
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58 VOLTAGES NB



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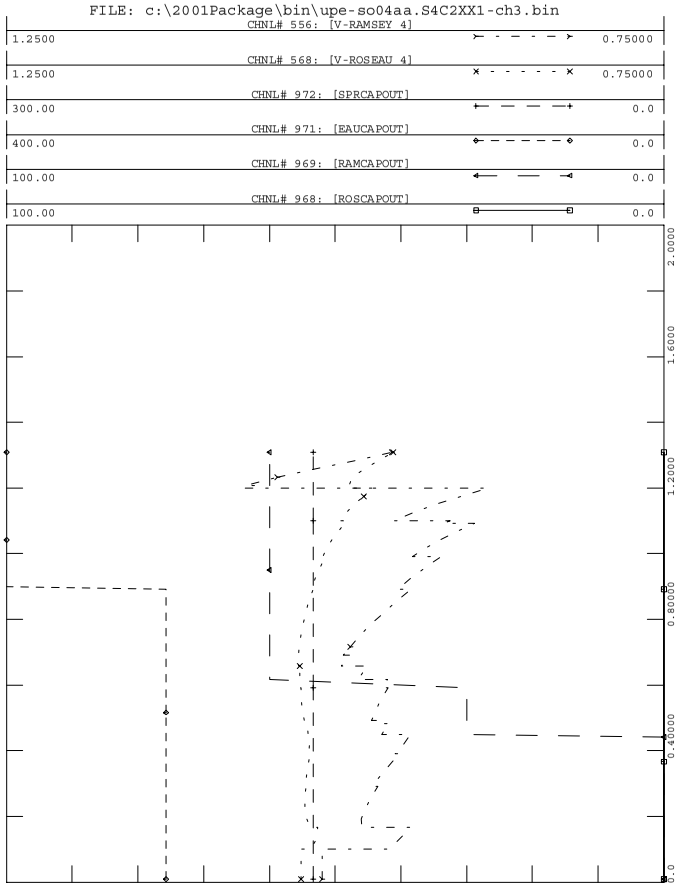
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58
FAST SW CAP OUT 2



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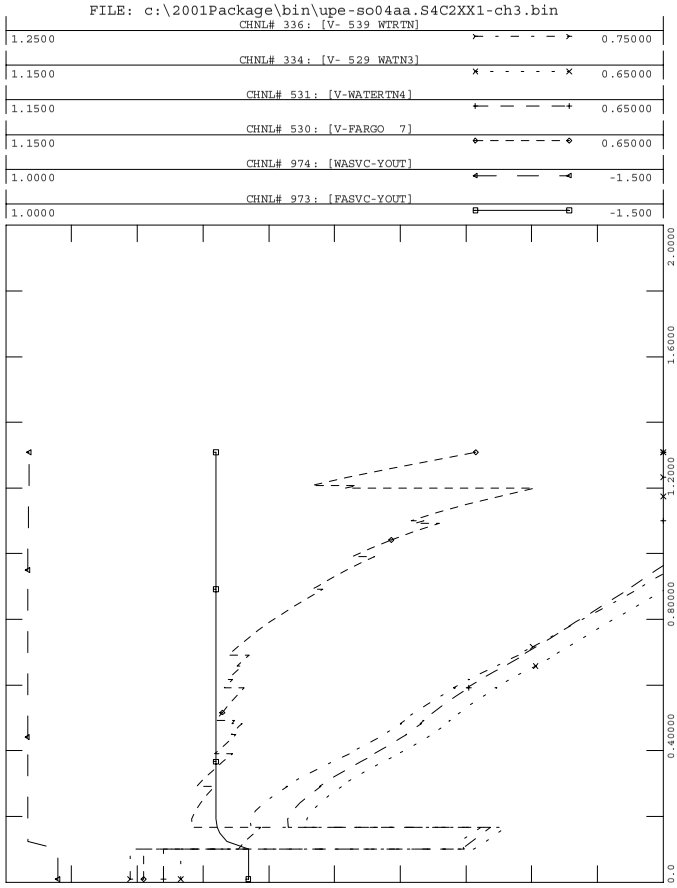
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58
FARGO/WATERTOWN SVS



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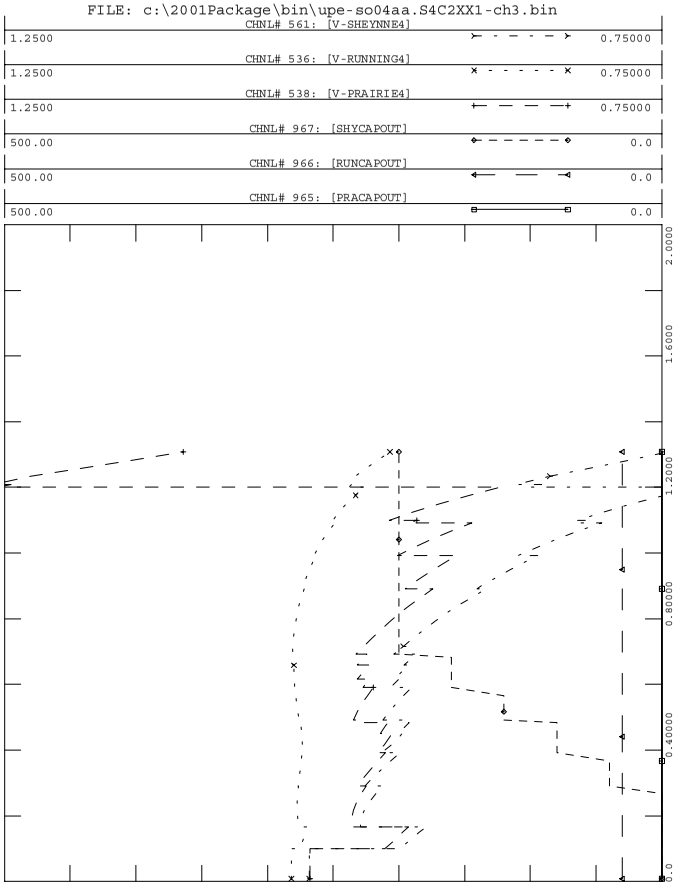
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58
FAST SW CAP OUT 1



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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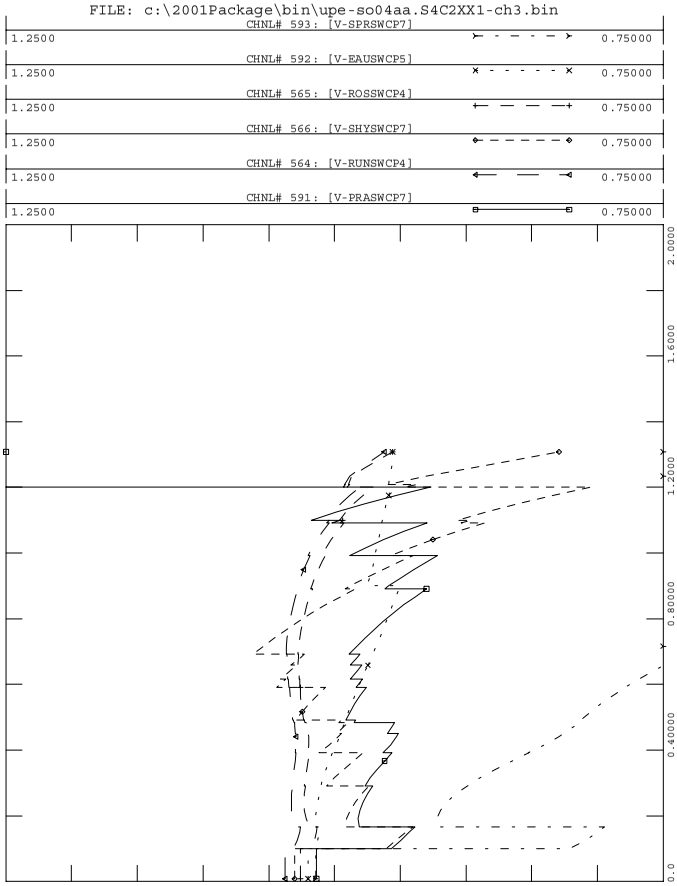
TUE, APR 30 2002 9:58
FAST SW CAP VOLTAGES



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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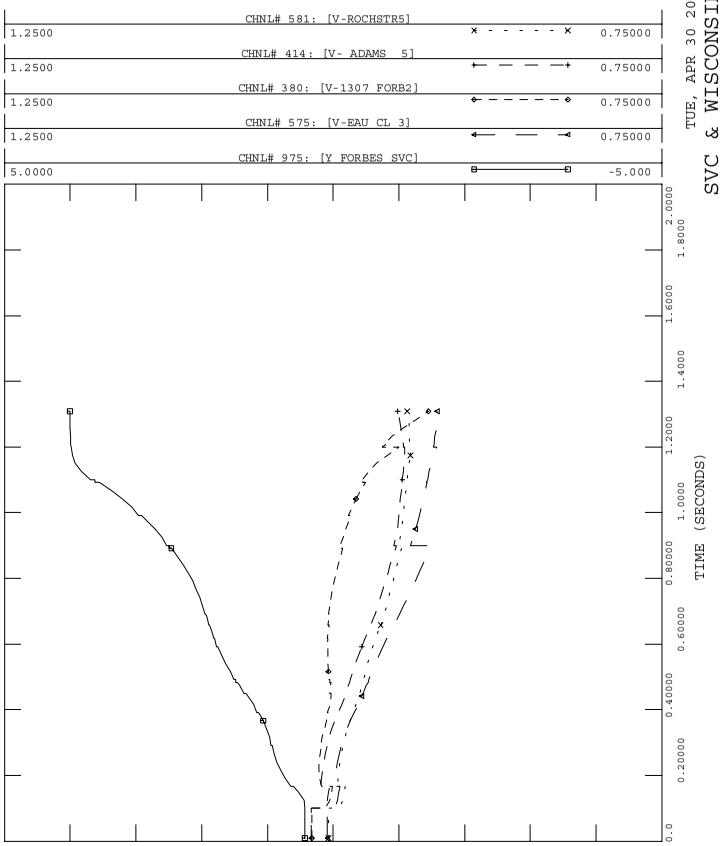
TUE, APR 30 2002 9:58

SVC & WISCONSIN VOLT



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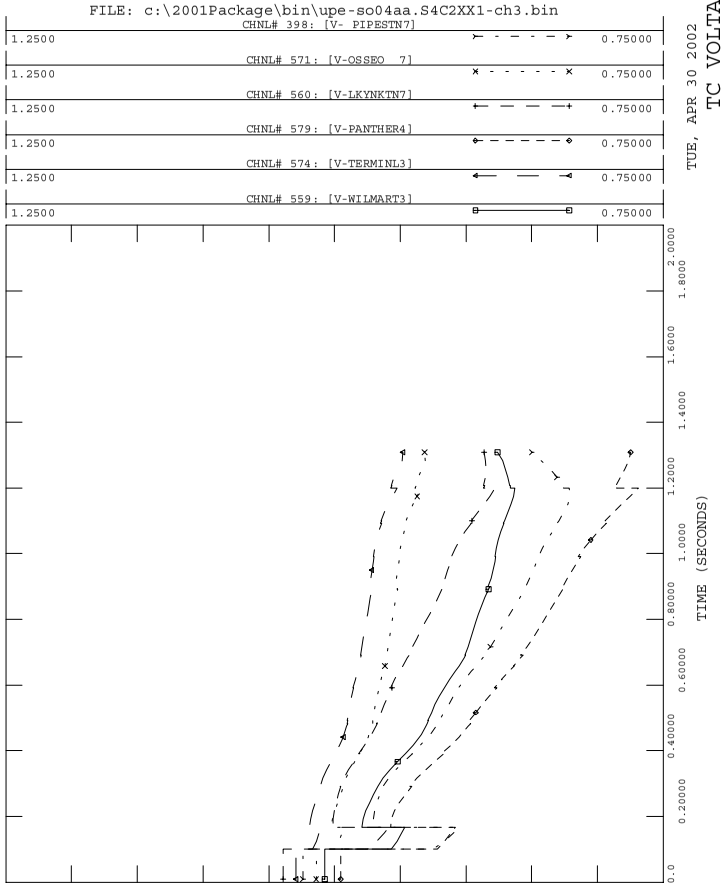
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58

TC VOLTAGES



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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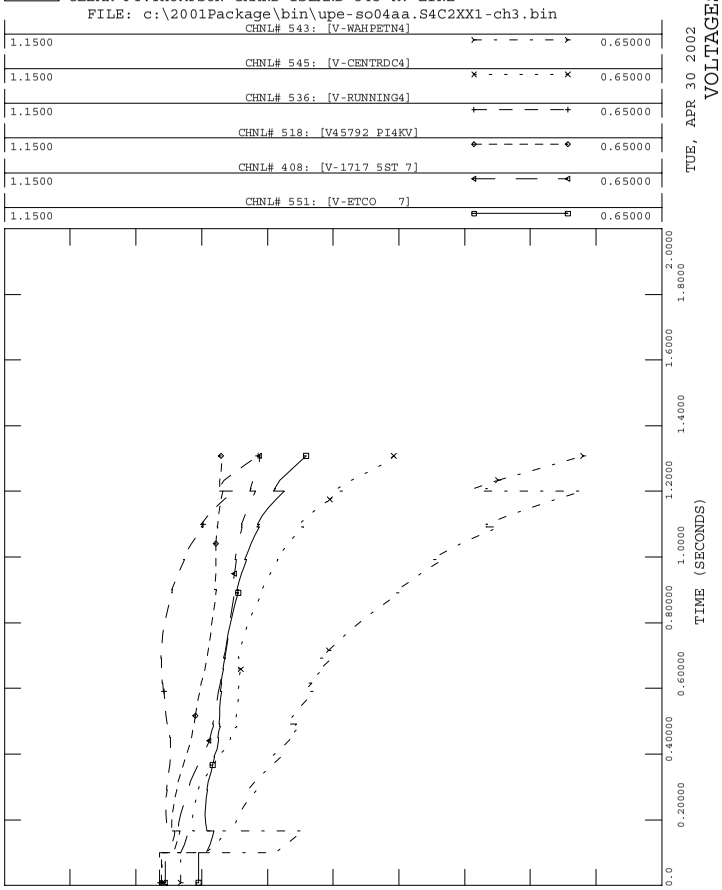
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58

VOLTAGES 6



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

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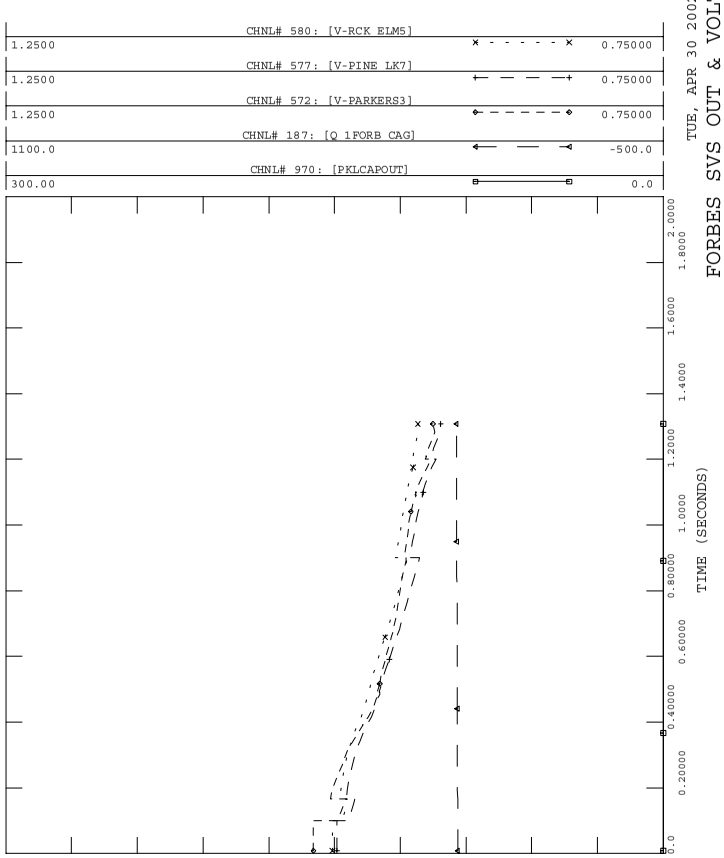
FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

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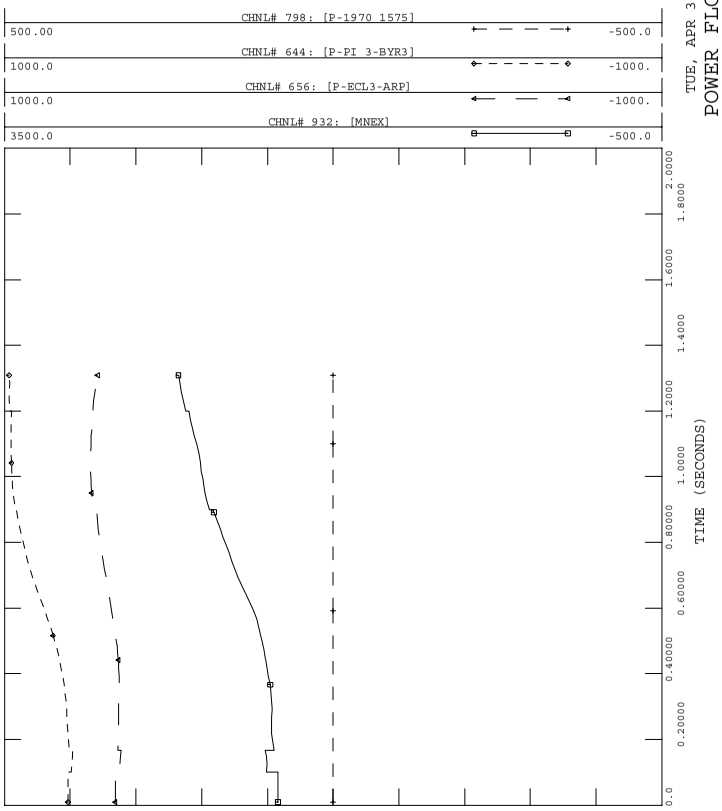
POWER FLOW SUMS 2



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

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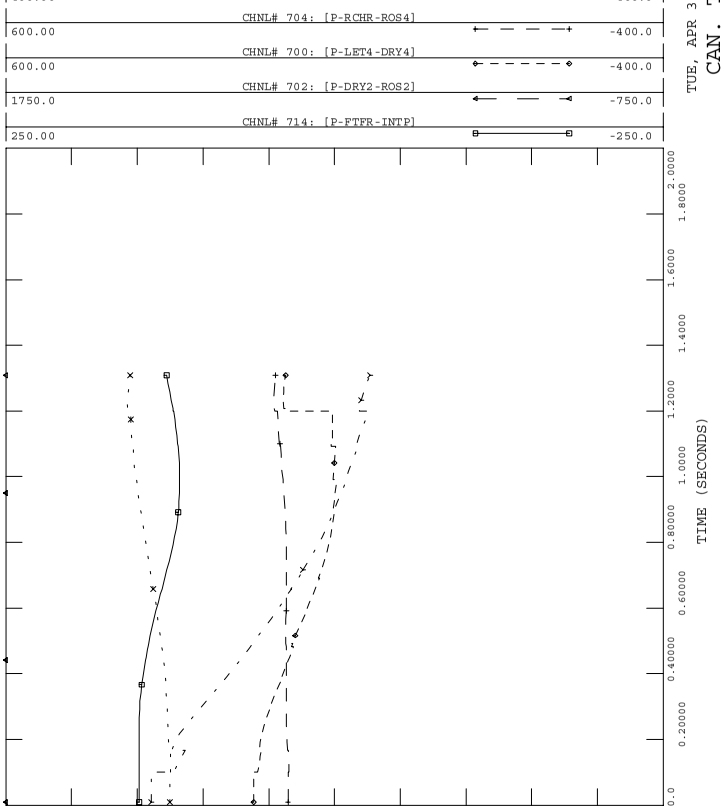
CAN. TIE FLOWS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

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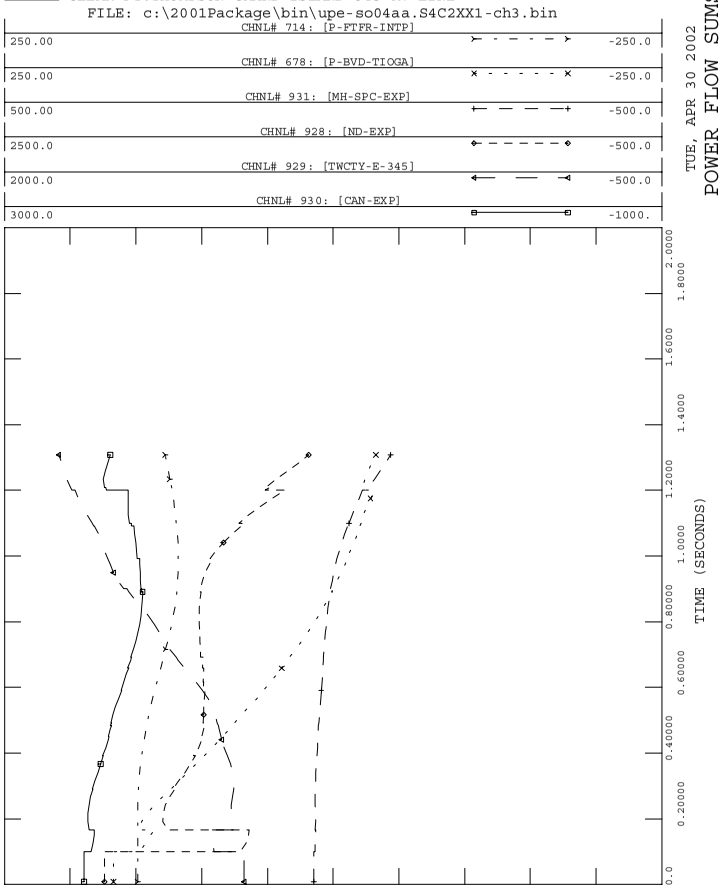
POWER FLOW SUMS 1



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

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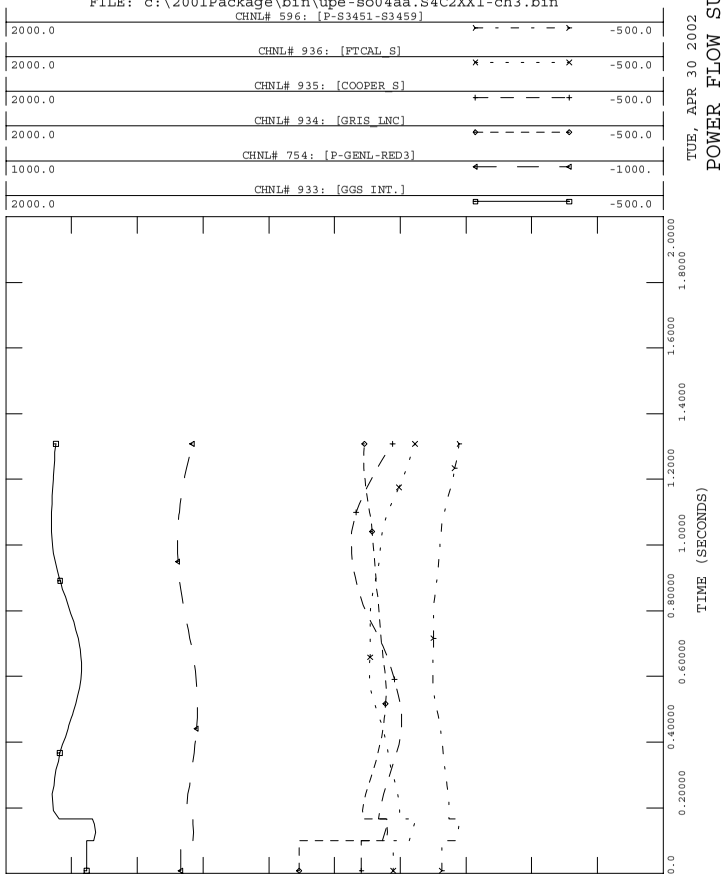
POWER FLOW SUM 3



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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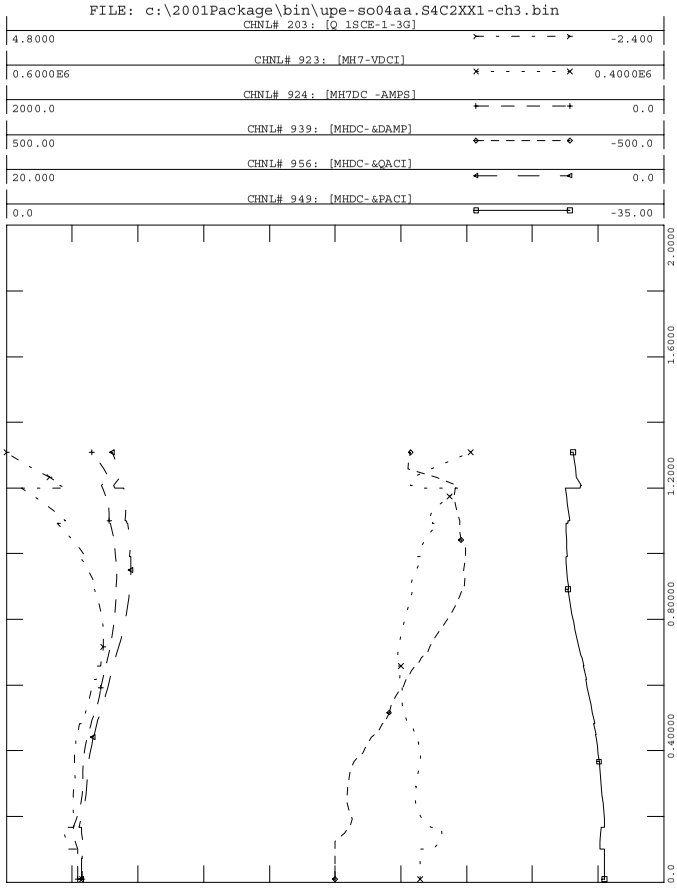
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58
MH DC PARAMETERS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

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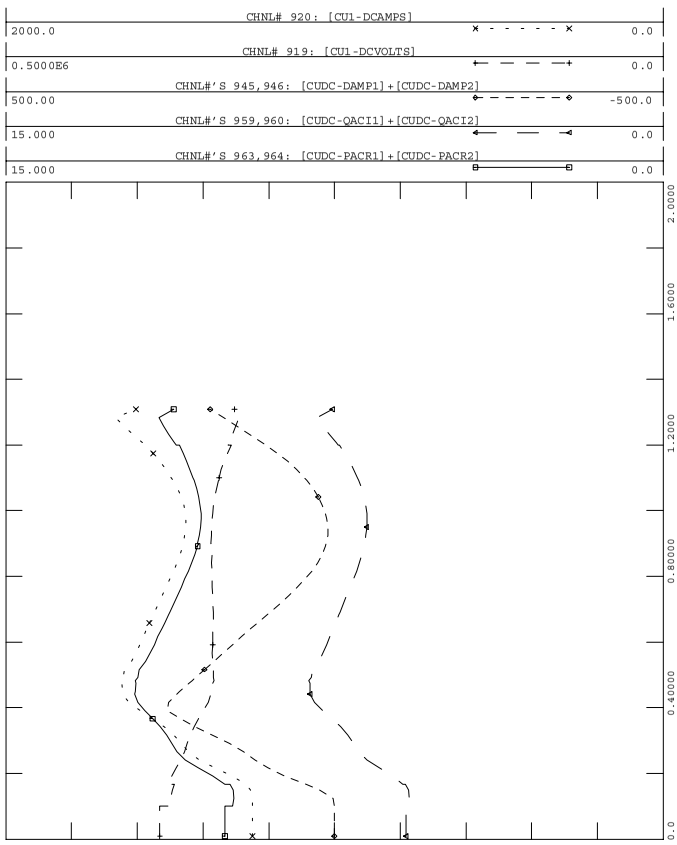
CU DC #1



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

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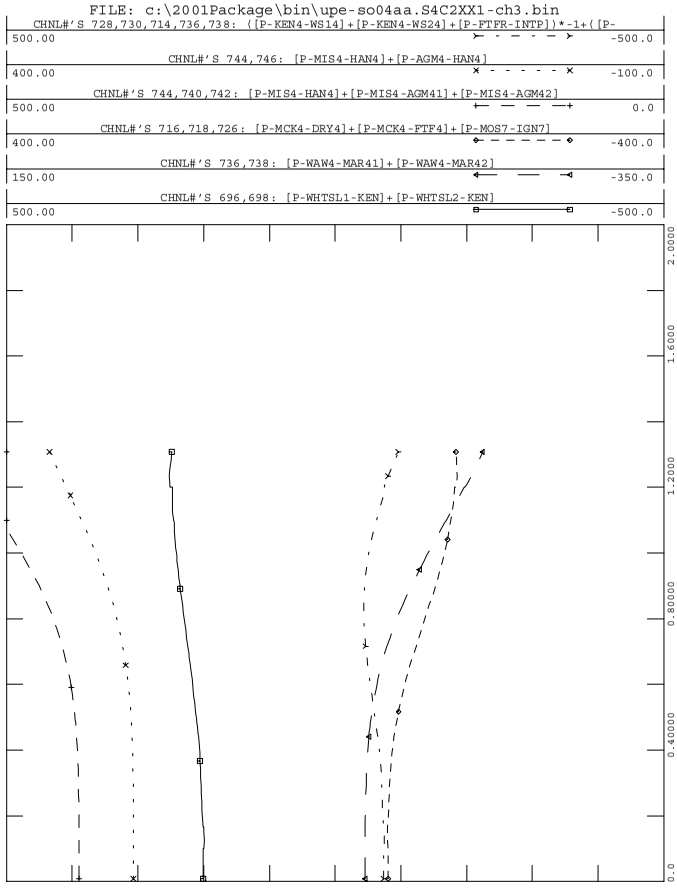
OH TIE FLOWS



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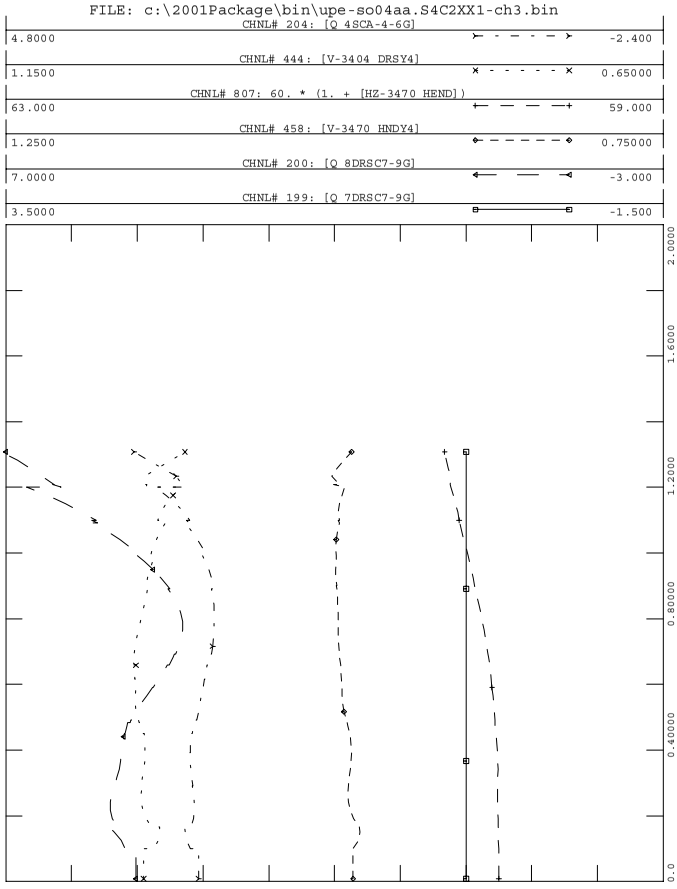
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

TUE, APR 30 2002 9:58
MH DC PARAMETERS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

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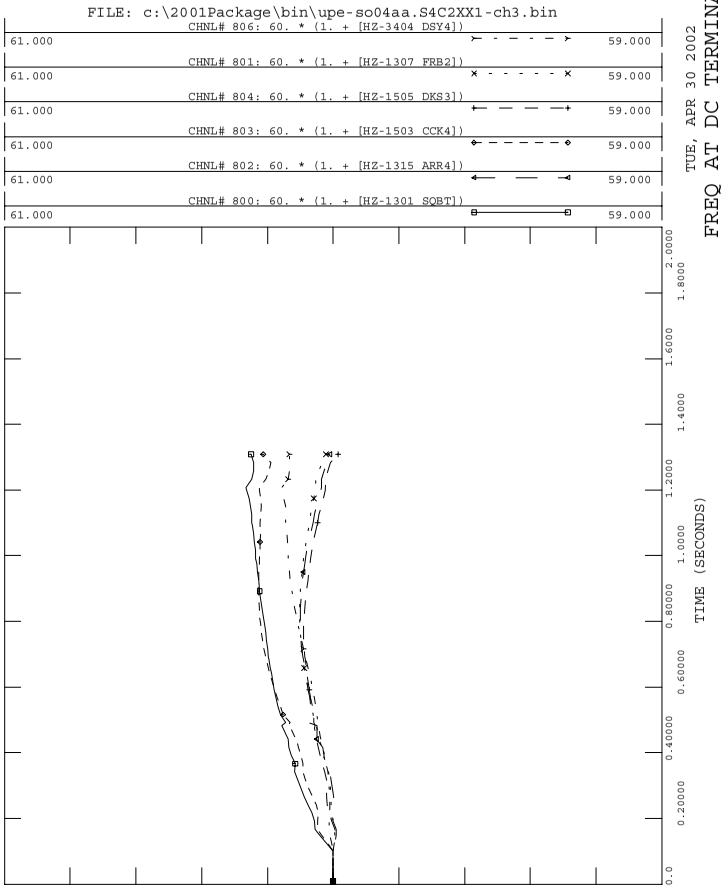
FREQ AT DC TERMINALS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

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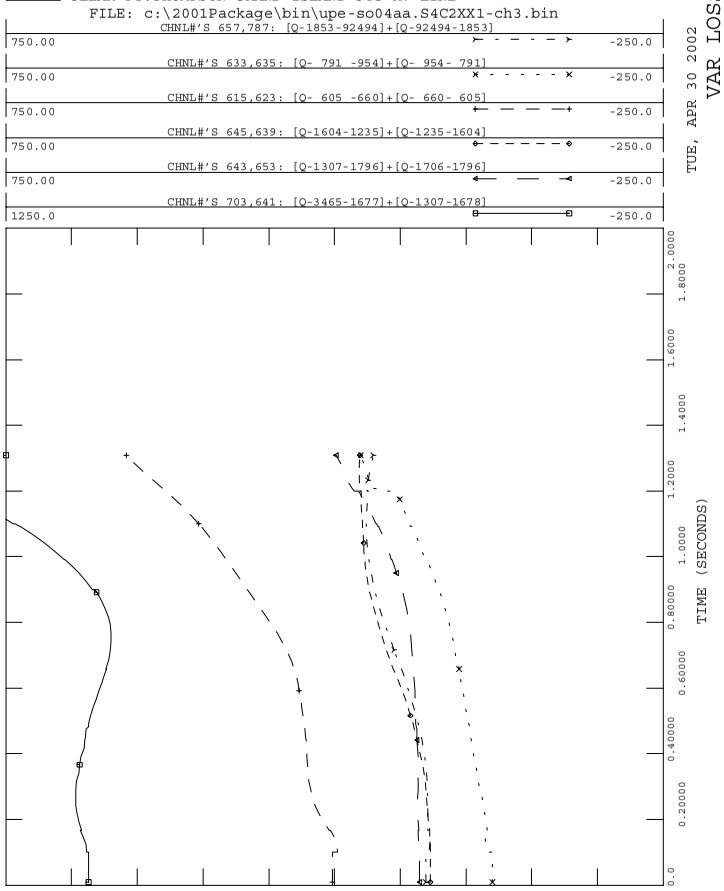
VAR LOSSES



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

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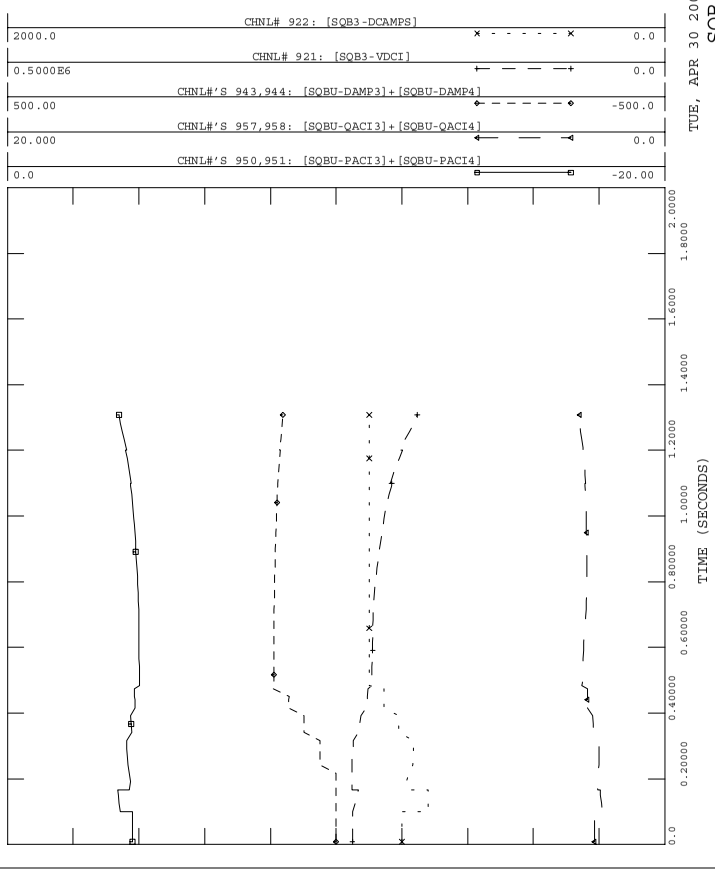
SQB DC #3



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

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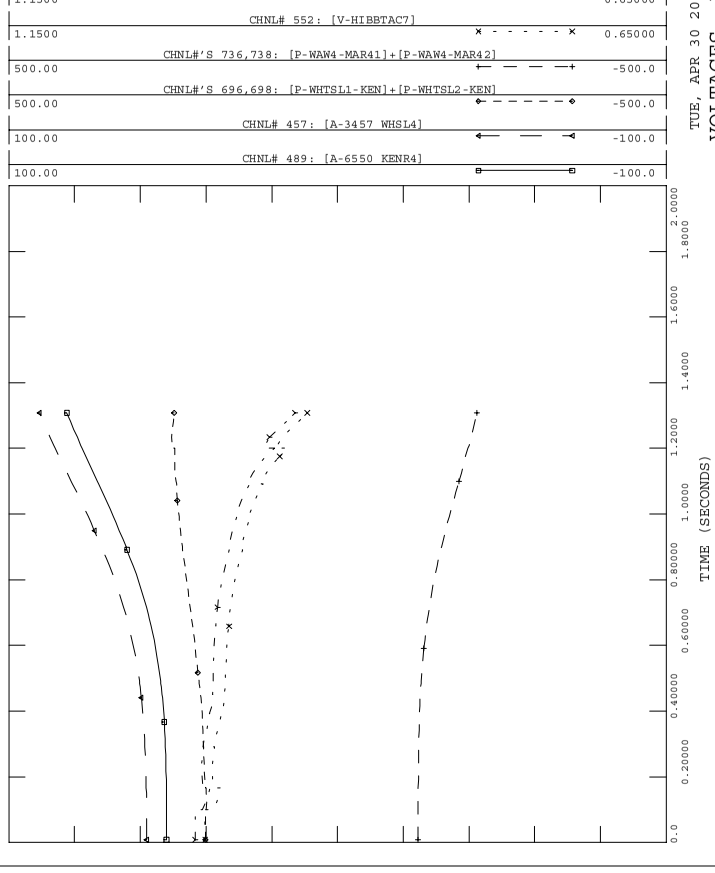
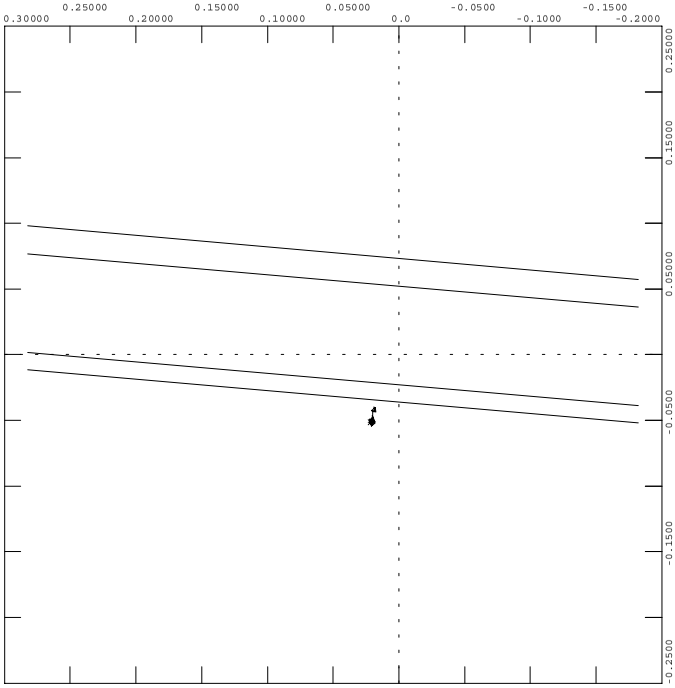
VOLTAGES, ANGLES



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 30 2002 9:58
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

RELAY: RELAYG
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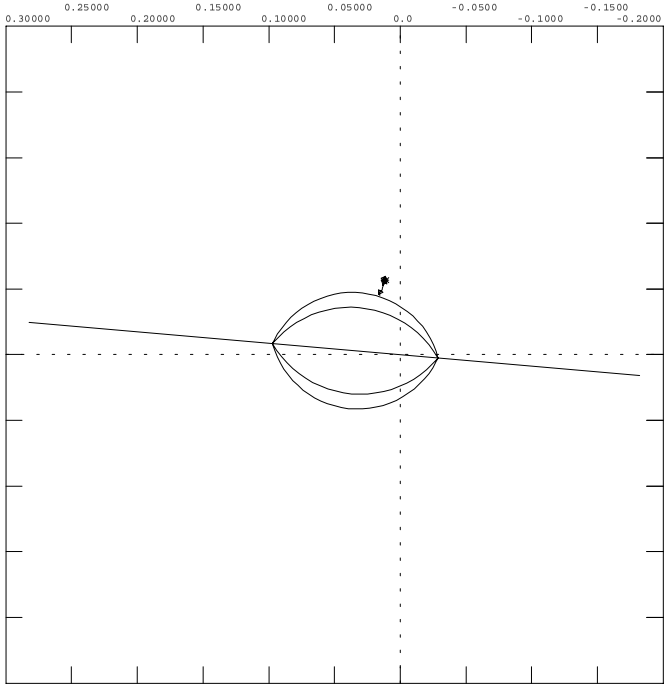
CHNL# 856: [X-DSY2-ROS2]



TUE, APR 30 2002 9:58
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

RELAY: RELAYG
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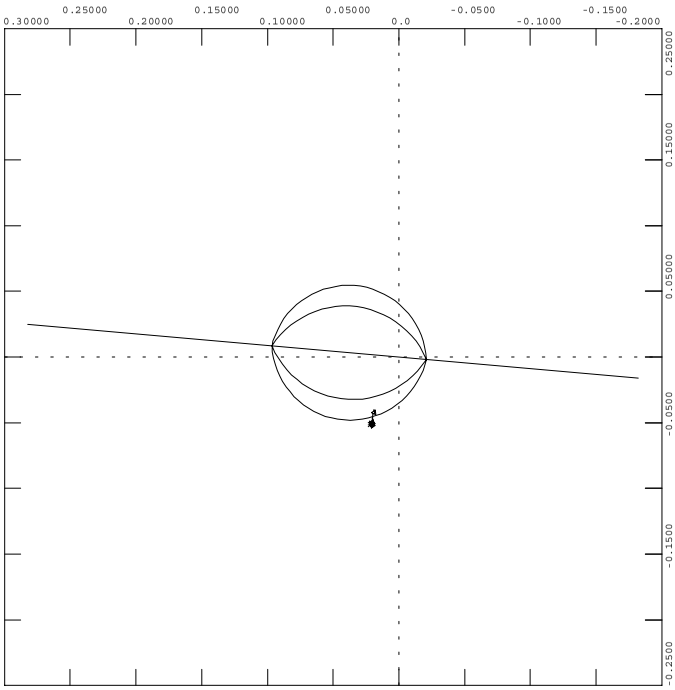
CHNL# 824: [X-FRB2-ROS2]

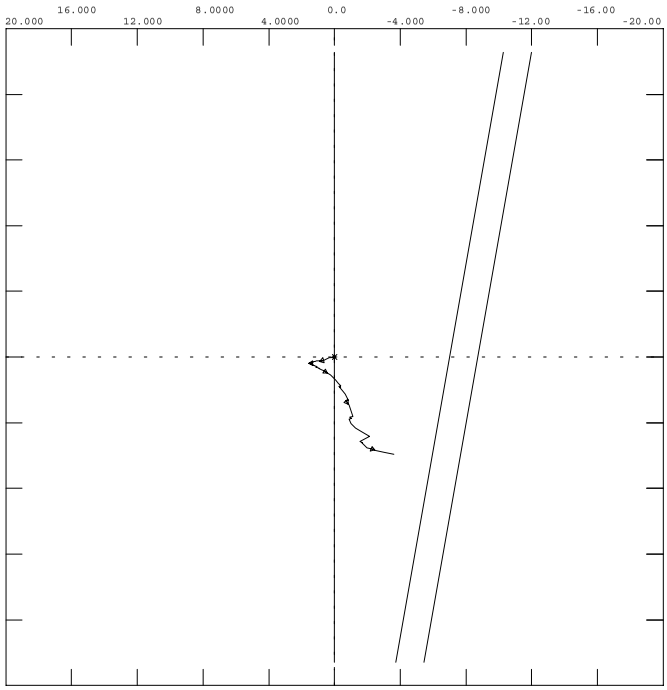


TUE, APR 30 2002 9:58
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]



TUE, APR 30 2002 9:58
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

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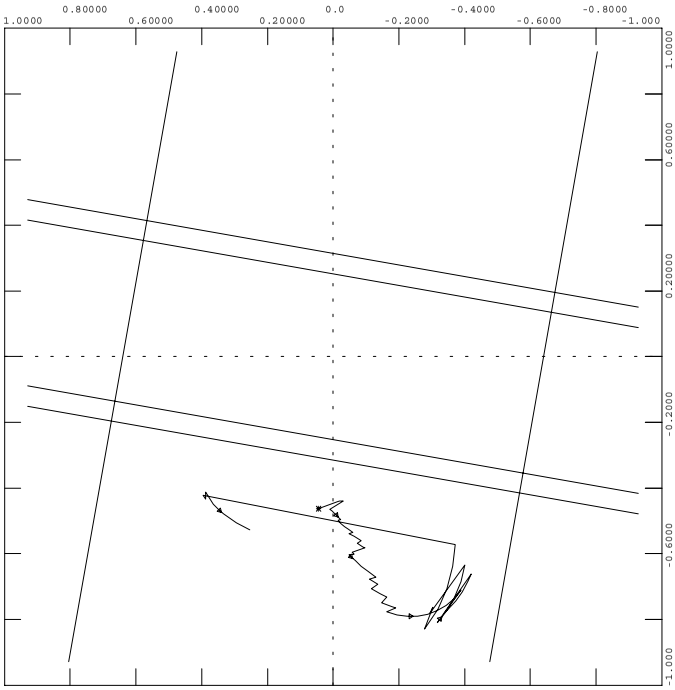
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
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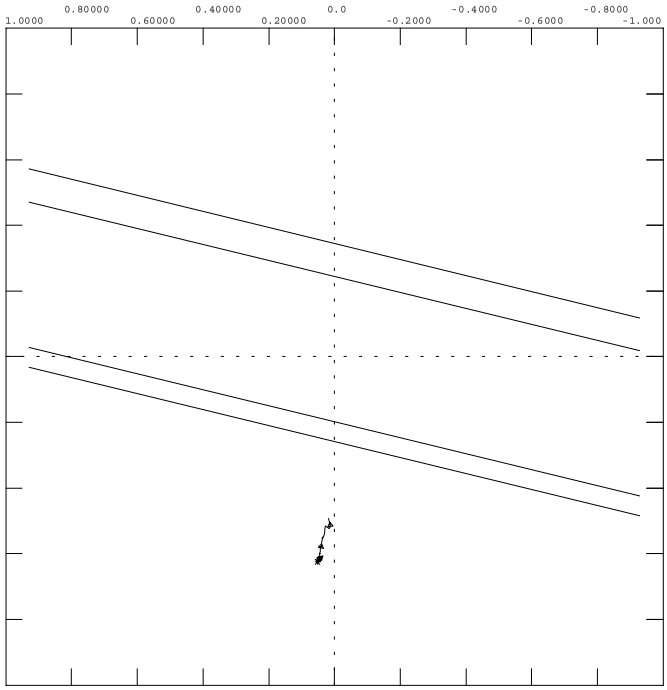

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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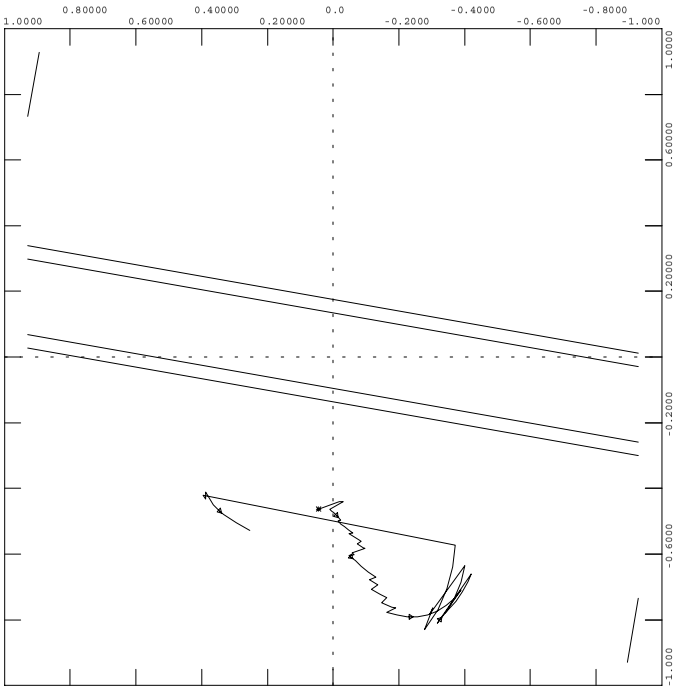
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

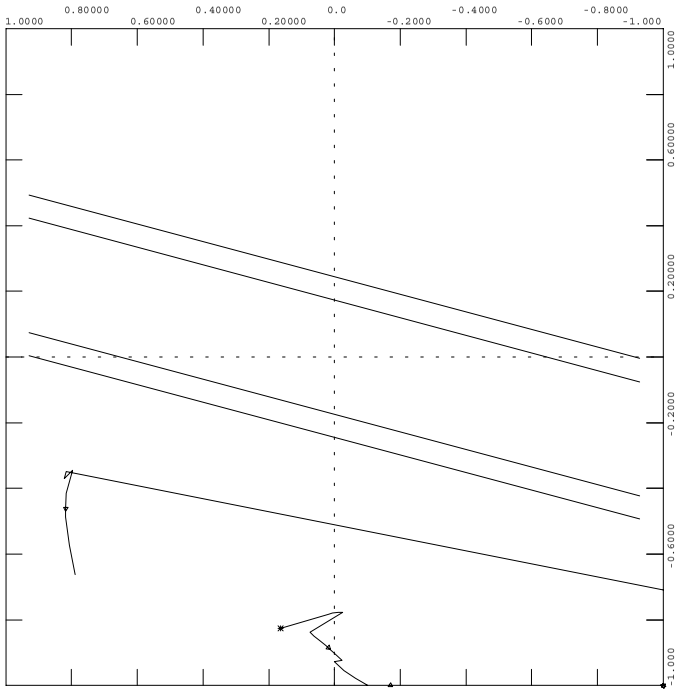
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

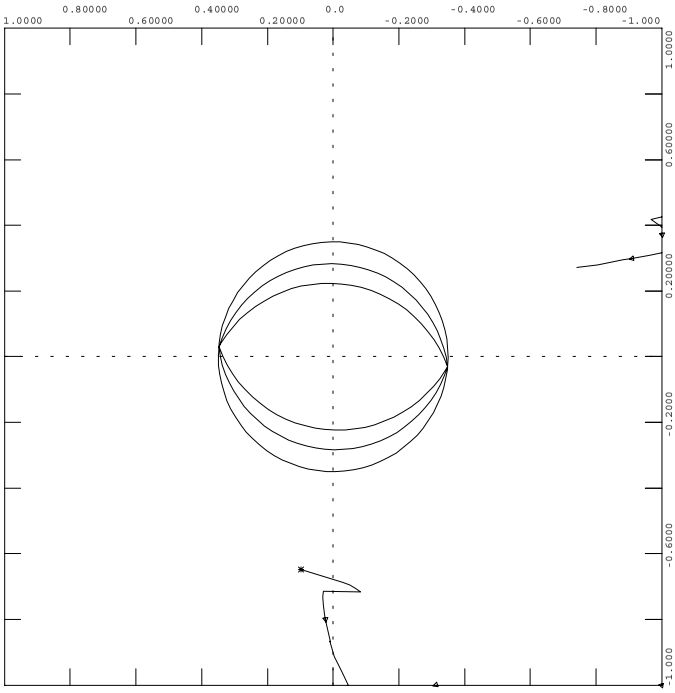
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

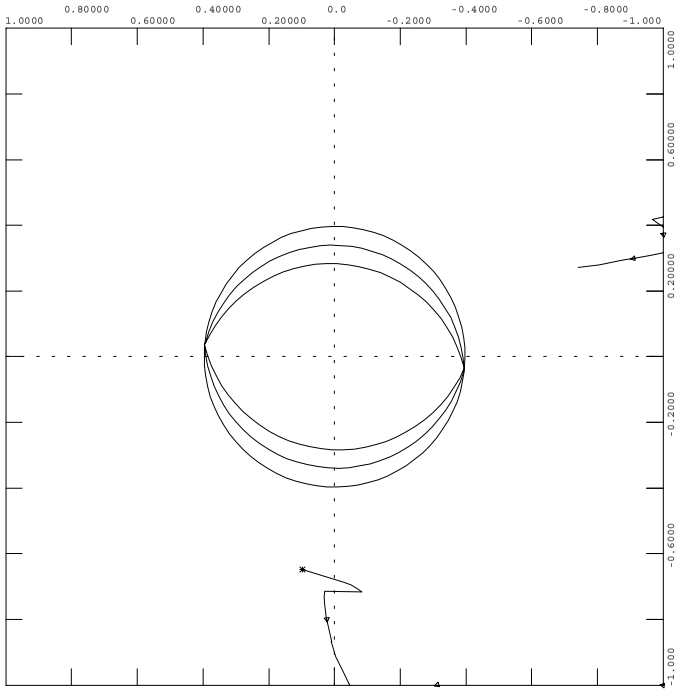


TUE, APR 30 2002 9:58
TIOGA-B.DAM-SOUTH (266)

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

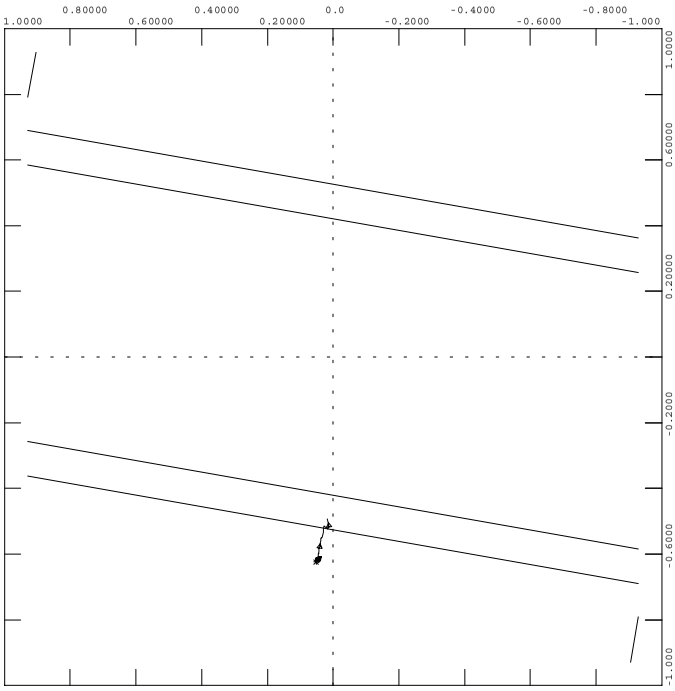


TUE, APR 30 2002 9:58
TIOGA-B.DAM-EMRG (267)

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

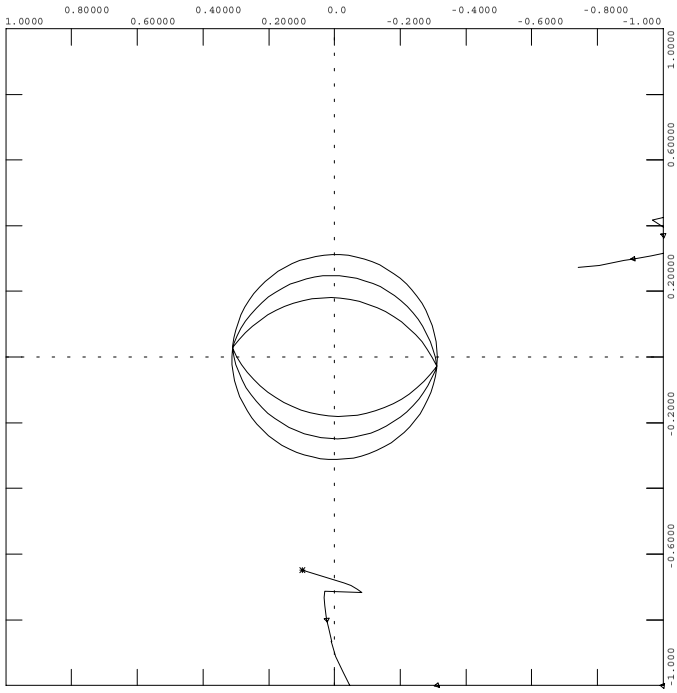


TUE, APR 30 2002 9:58
R50M-MORANVILLE-EMRG (777

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

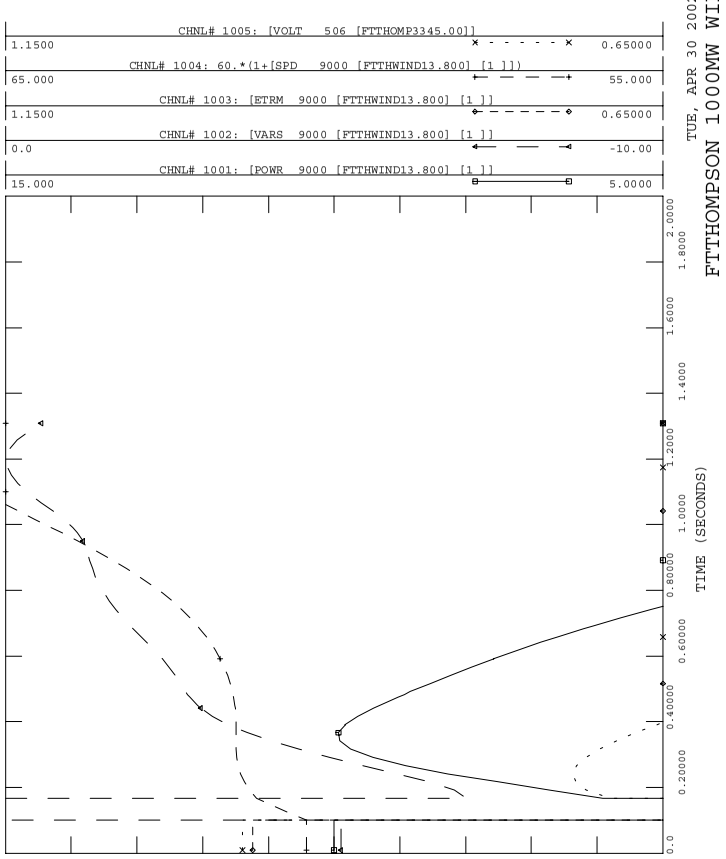
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



TUE, APR 30 2002 9:58
TIOGA-B.DAM-NORTH (268)

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

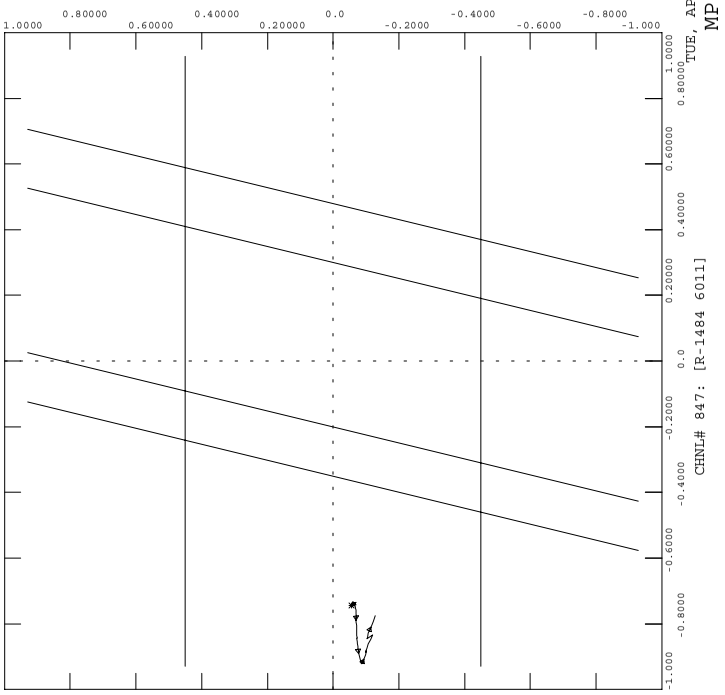


TUE, APR 30 2002 9:58
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ch3.bin

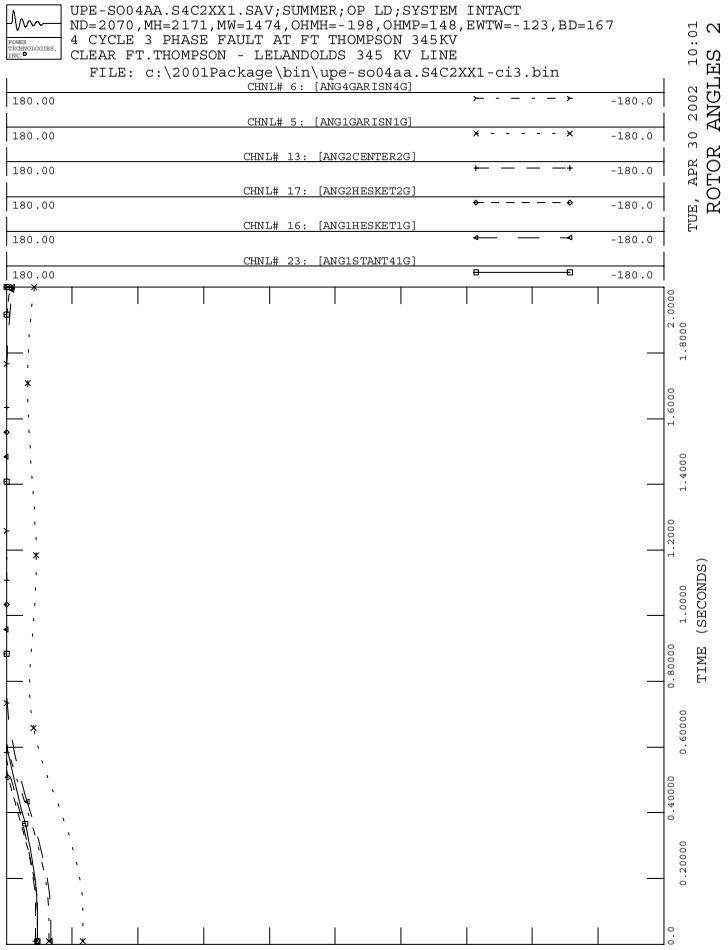
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

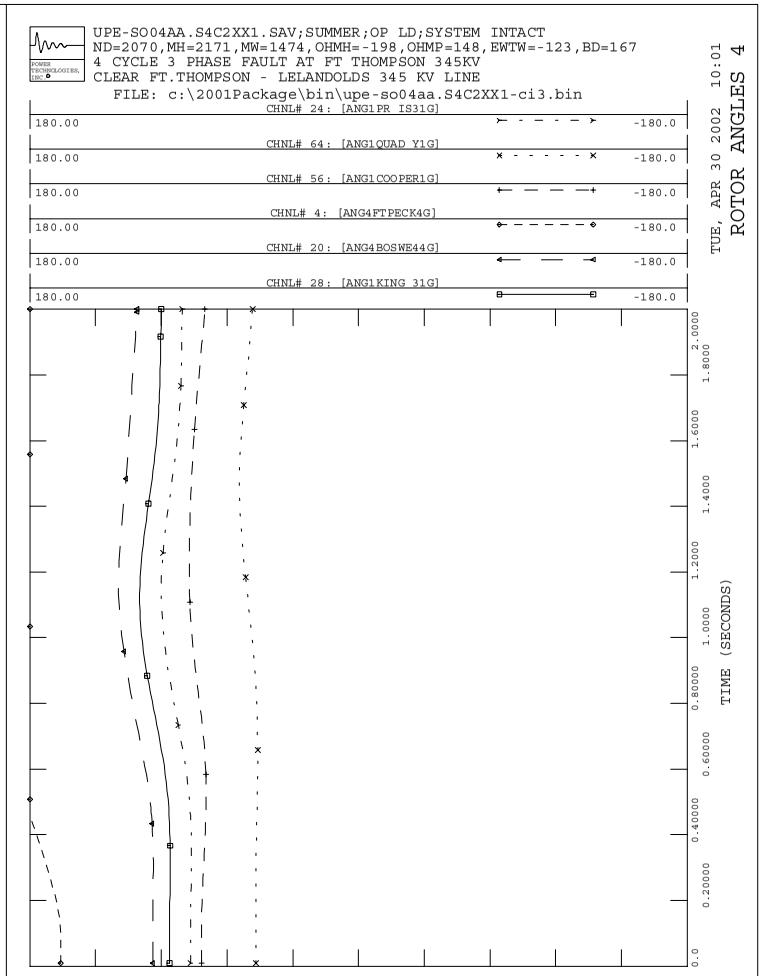


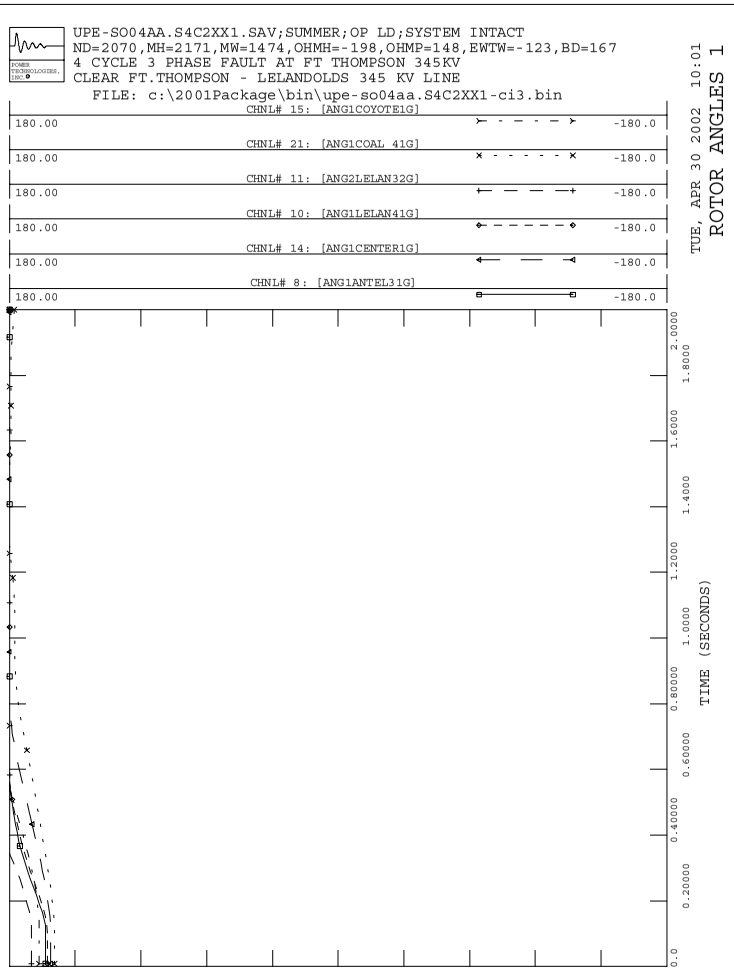
TUE, APR 30 2002 9:58
MP-OH I.FALLS (779)

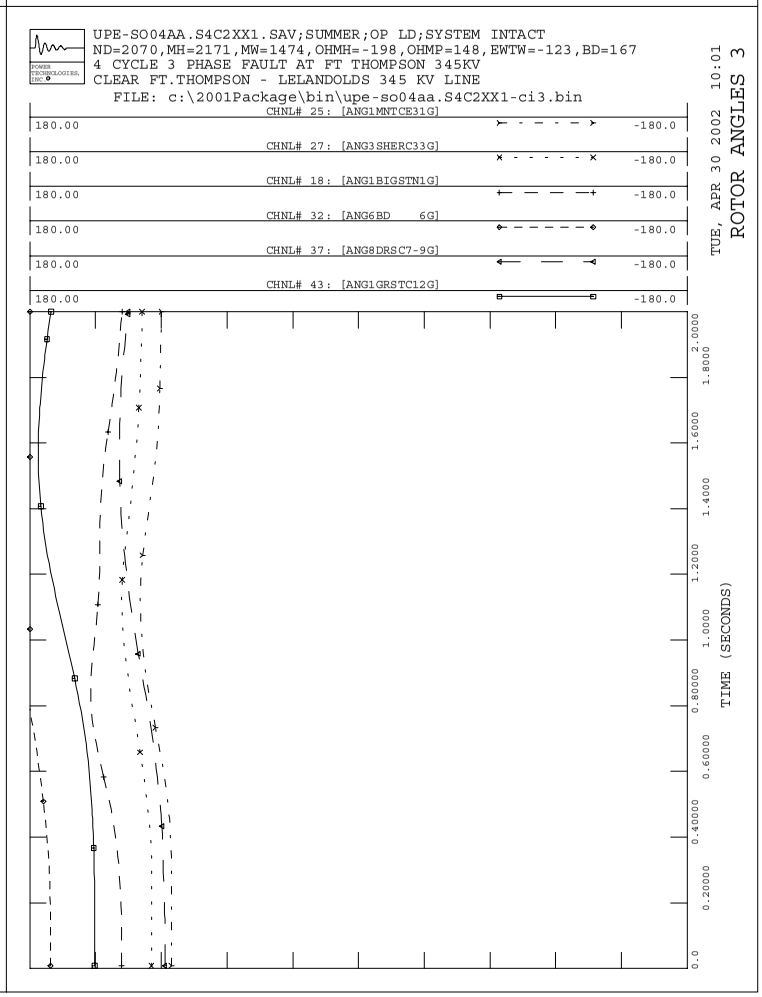
CONTINGENCY CI3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Leland Olds 345 kV line


UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TUE, APR 30 2002 10:01
ROTOR ANGLES 2
TIME (SECONDS)
0.0
0.20000
0.40000
0.60000
0.80000
1.0000
1.2000
1.4000
1.6000
1.8000
2.0000

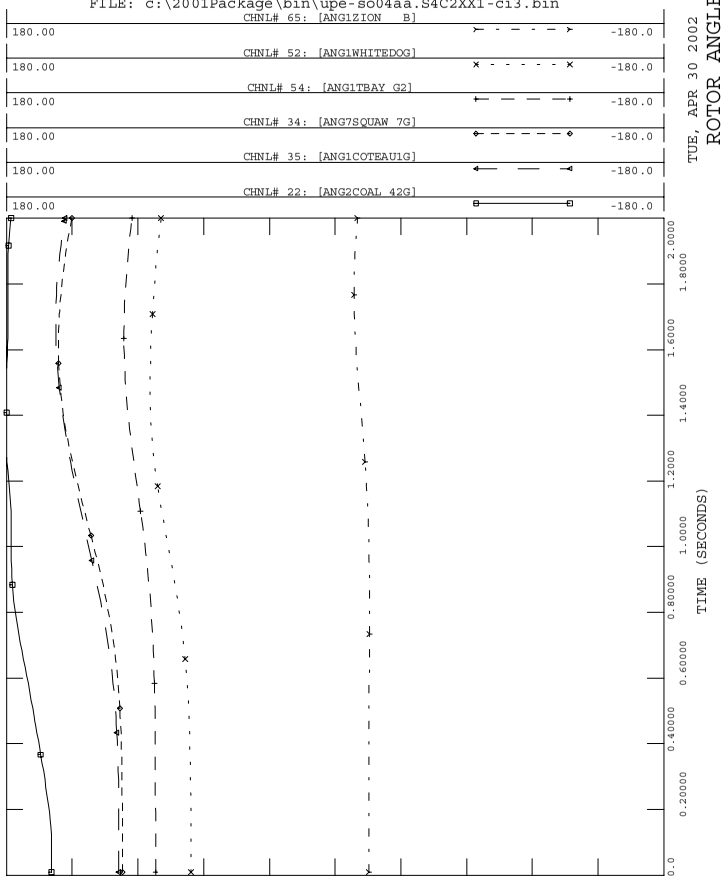

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TUE, APR 30 2002 10:01
ROTOR ANGLES 4
TIME (SECONDS)
0.0
0.20000
0.40000
0.60000
0.80000
1.0000
1.2000
1.4000
1.6000
1.8000
2.0000


UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TUE, APR 30 2002 10:01
ROTOR ANGLES 1
TIME (SECONDS)
0.0
0.20000
0.40000
0.60000
0.80000
1.0000
1.2000
1.4000
1.6000
1.8000
2.0000


UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TUE, APR 30 2002 10:01
ROTOR ANGLES 3
TIME (SECONDS)
0.0
0.20000
0.40000
0.60000
0.80000
1.0000
1.2000
1.4000
1.6000
1.8000
2.0000

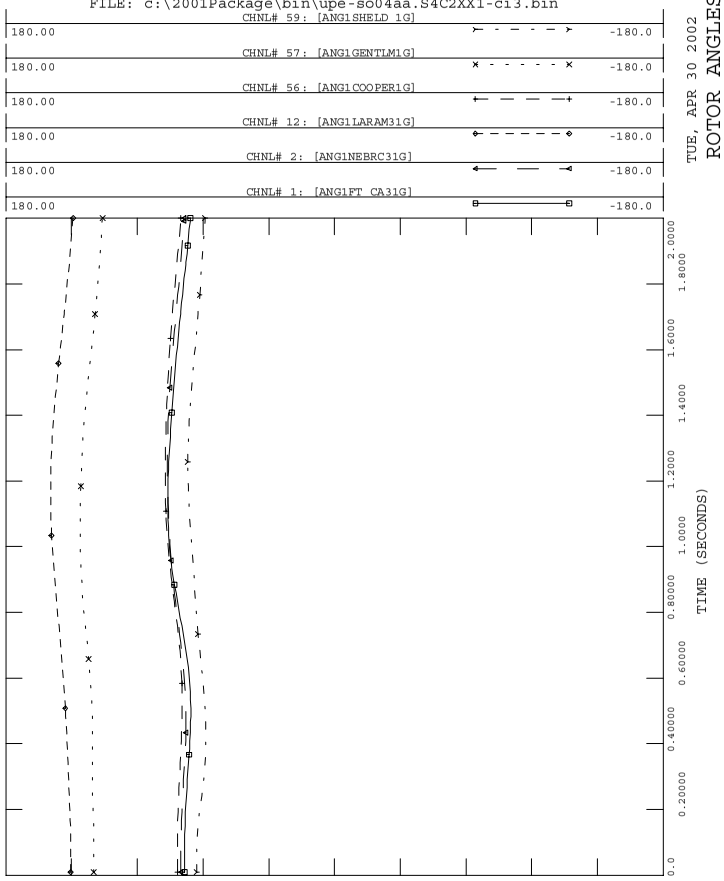
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
ROTOR ANGLES 6



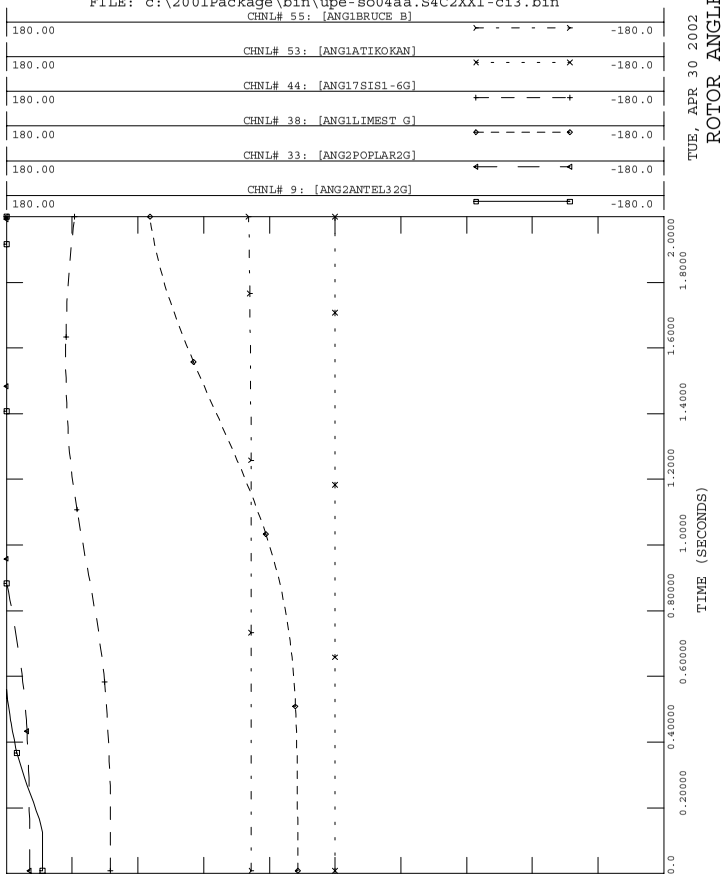
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
ROTOR ANGLES NB



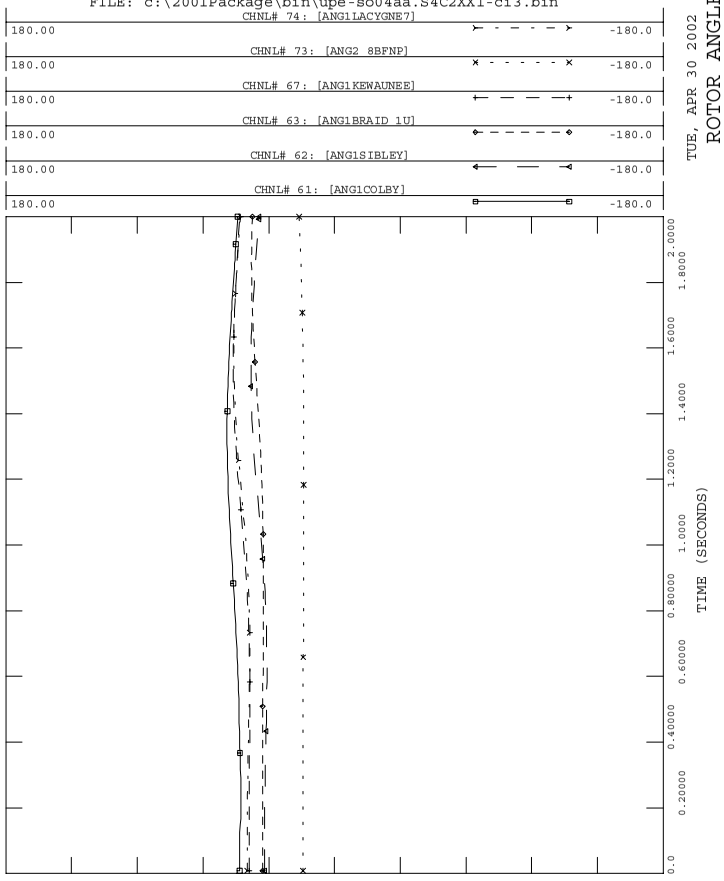
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
ROTOR ANGLES 5



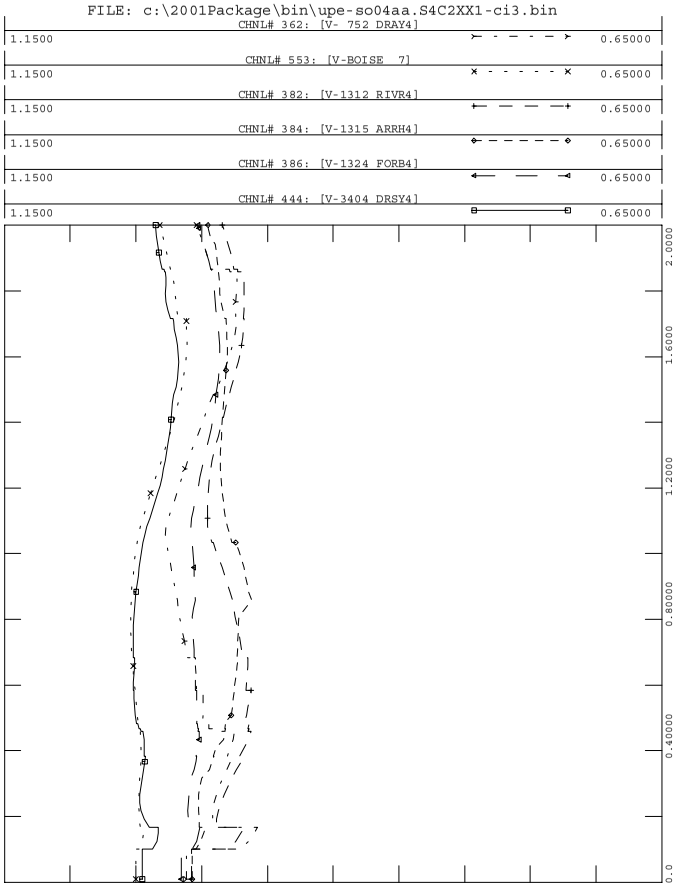
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
ROTOR ANGLES 7



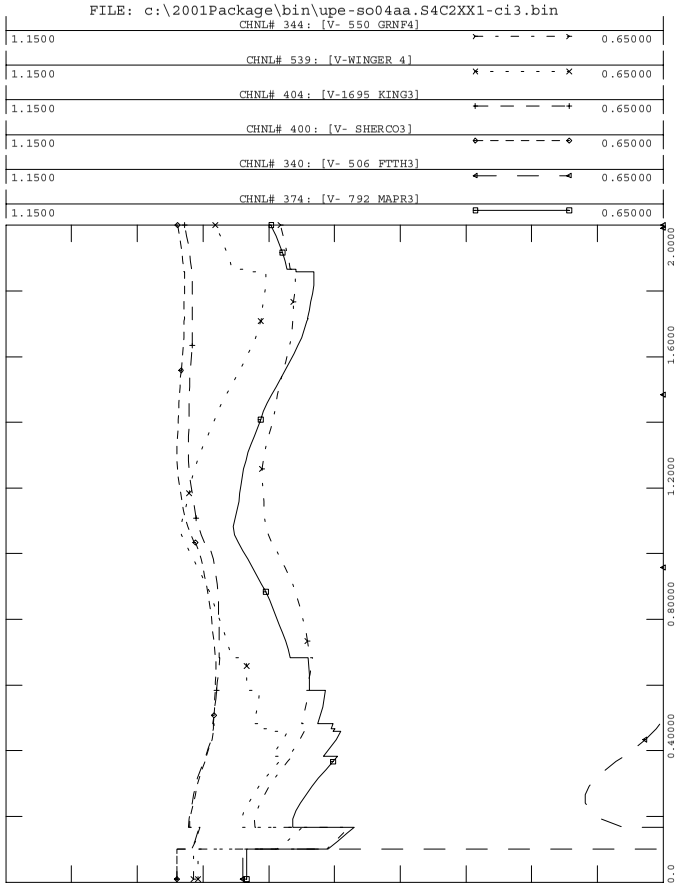
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
VOLTAGES 1



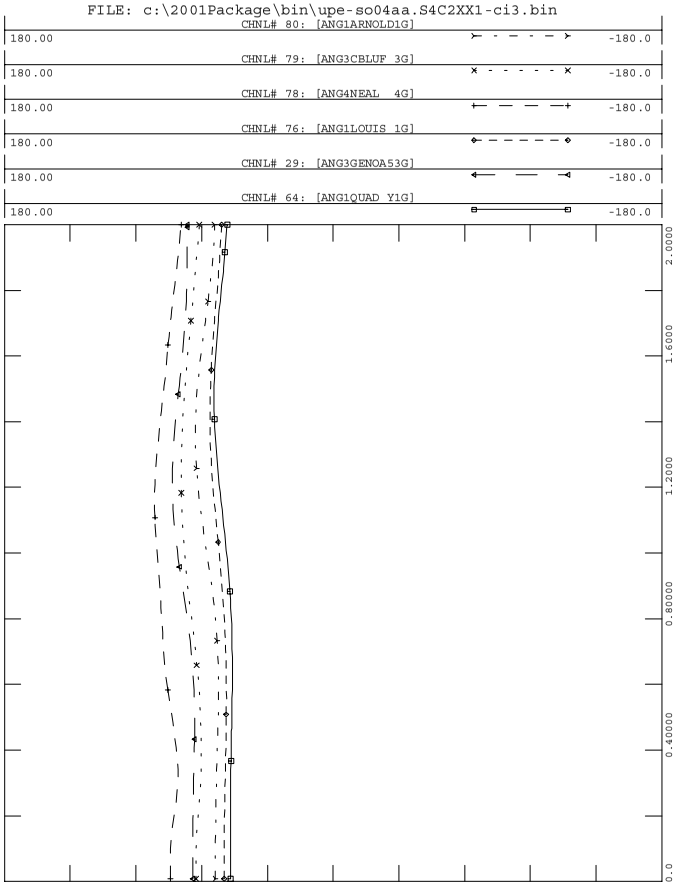
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
VOLTAGES 3



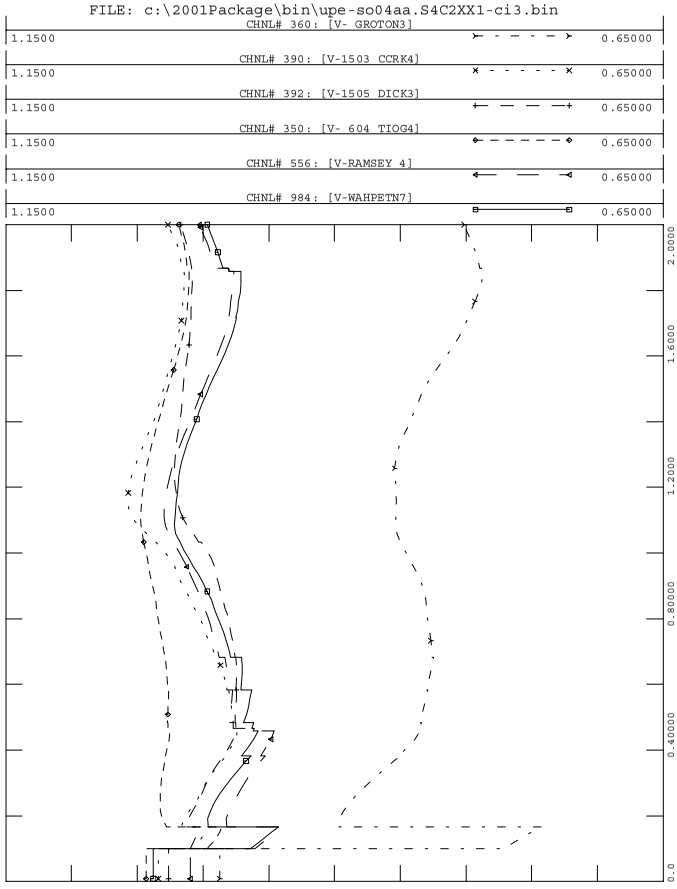
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
ROTOR ANGLES IA

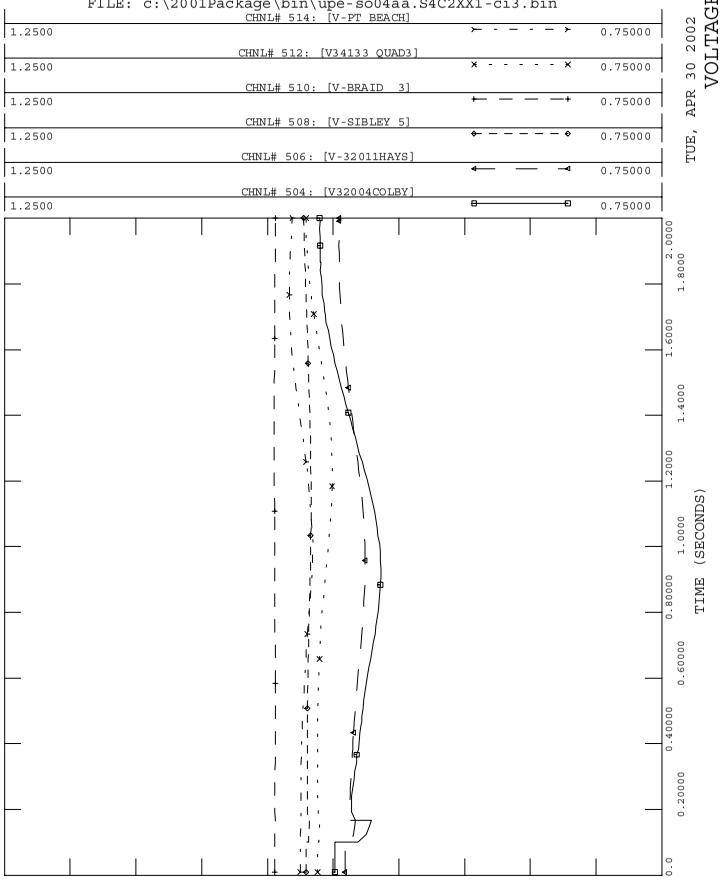


UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
VOLTAGES 2

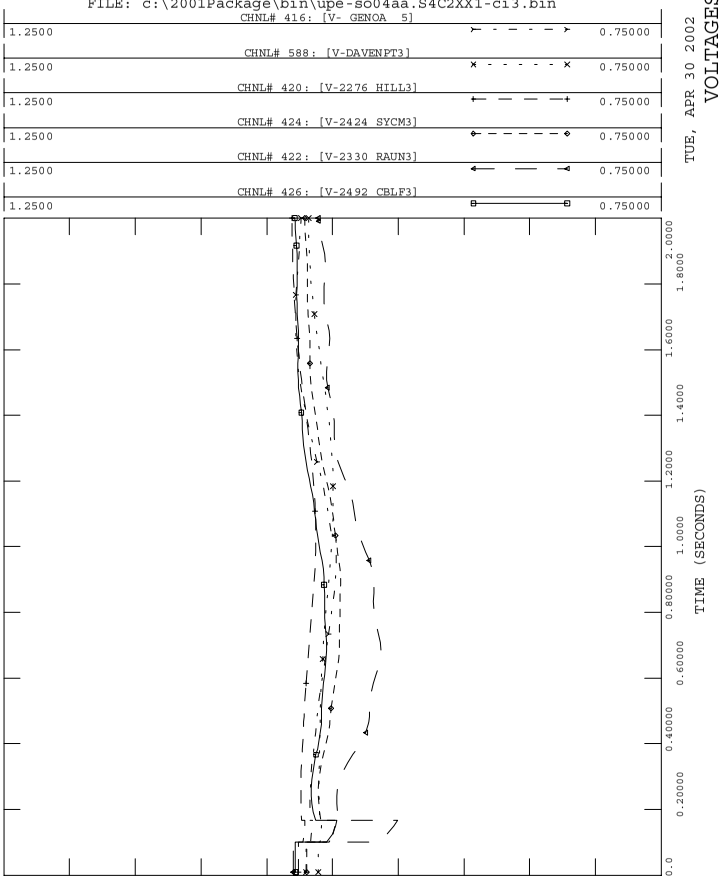


UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin



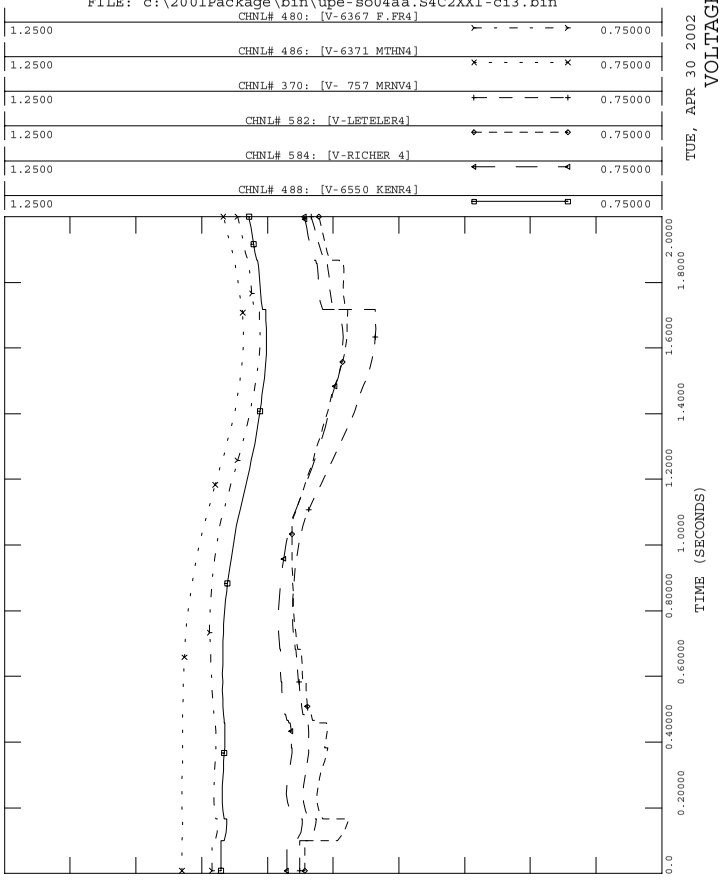
TUE, APR 30 2002 10:01
VOLTAGES 5

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin



TUE, APR 30 2002 10:01
VOLTAGES IA

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin



TUE, APR 30 2002 10:01
VOLTAGES 4

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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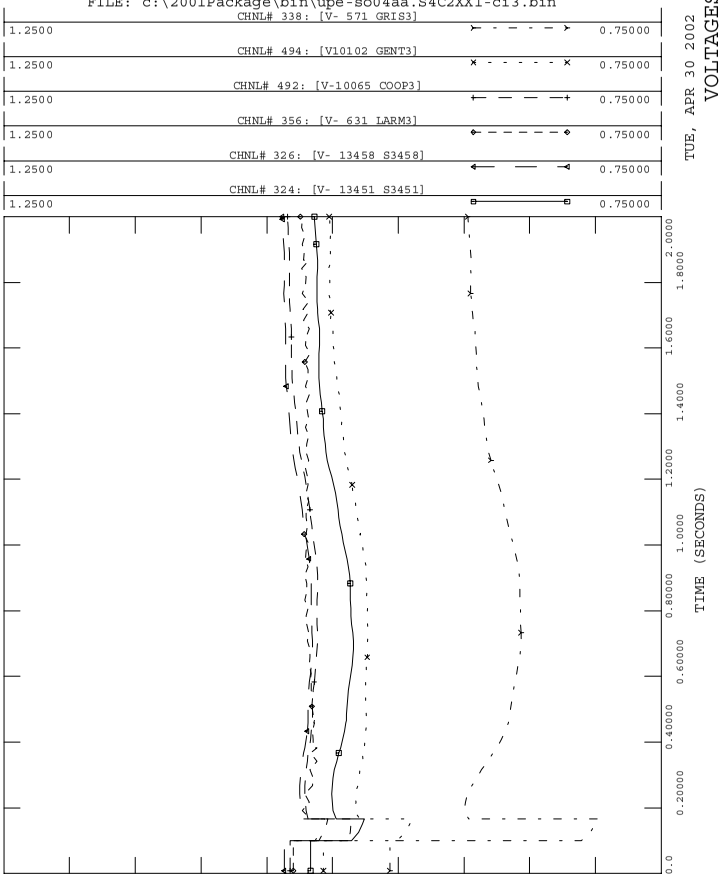
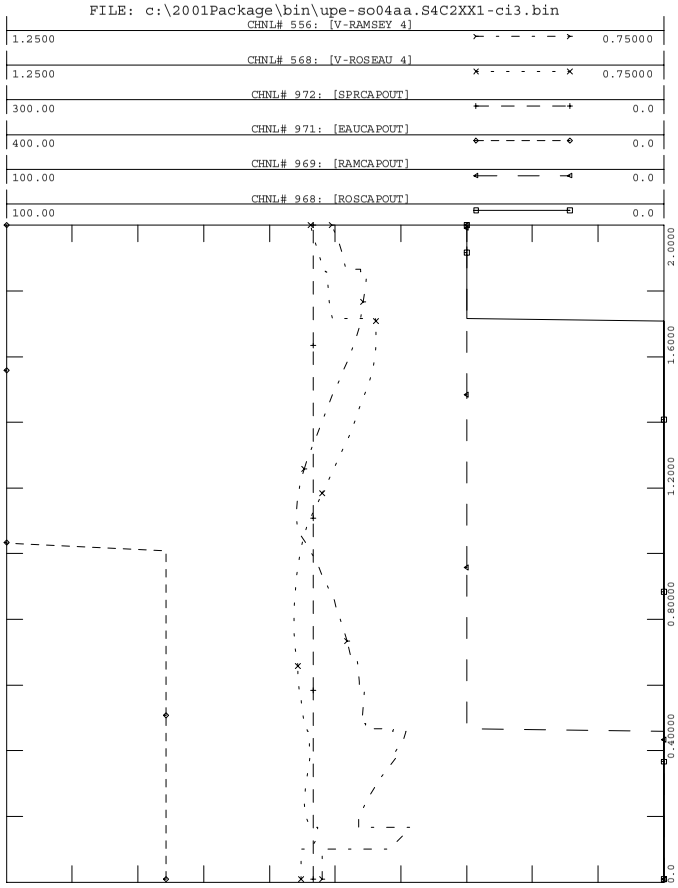
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin



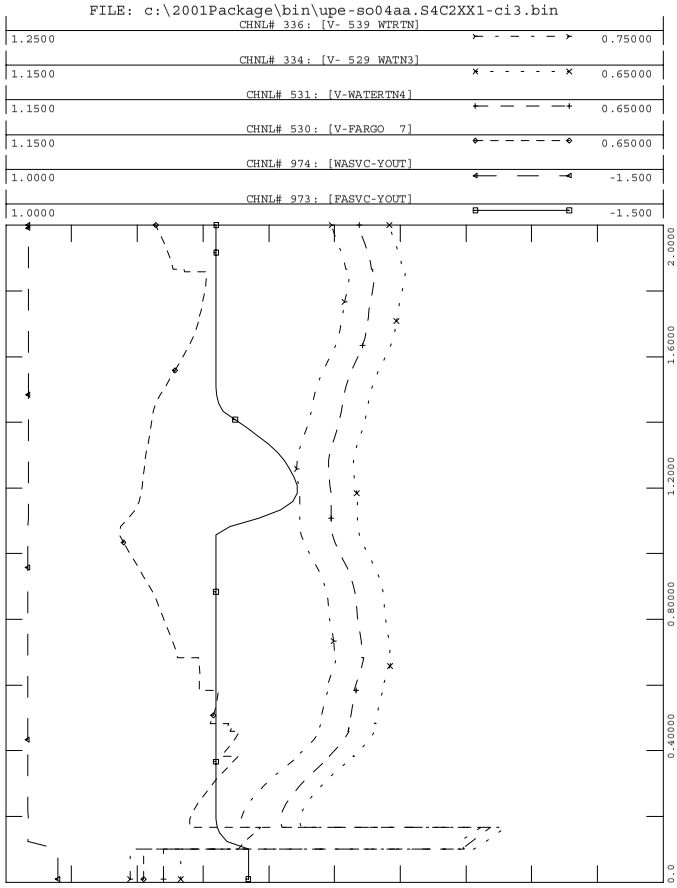
TUE, APR 30 2002 10:01
VOLTAGES NB

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin



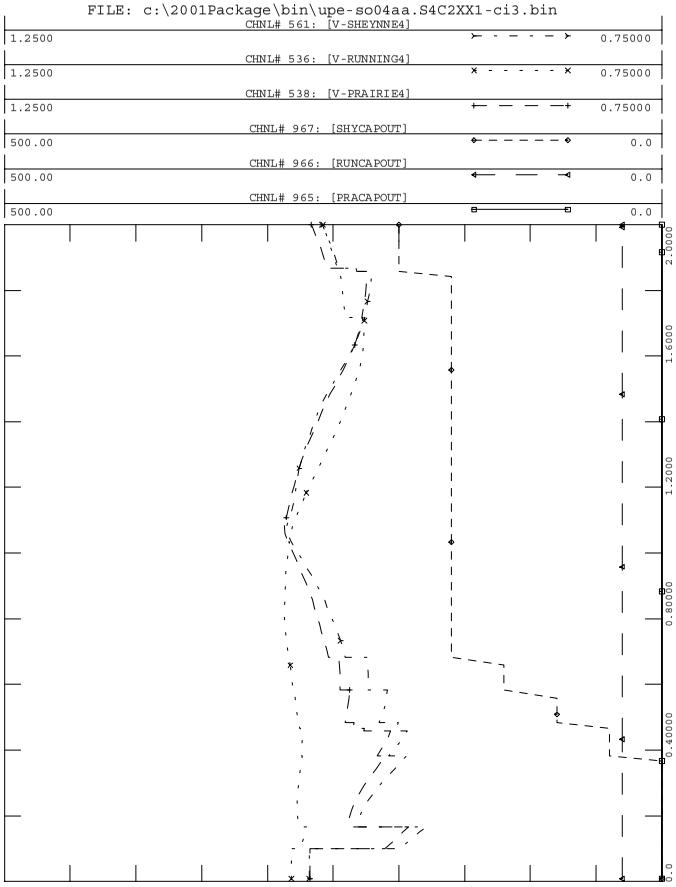
TUE, APR 30 2002 10:01
FAST SW CAP OUT 2

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin



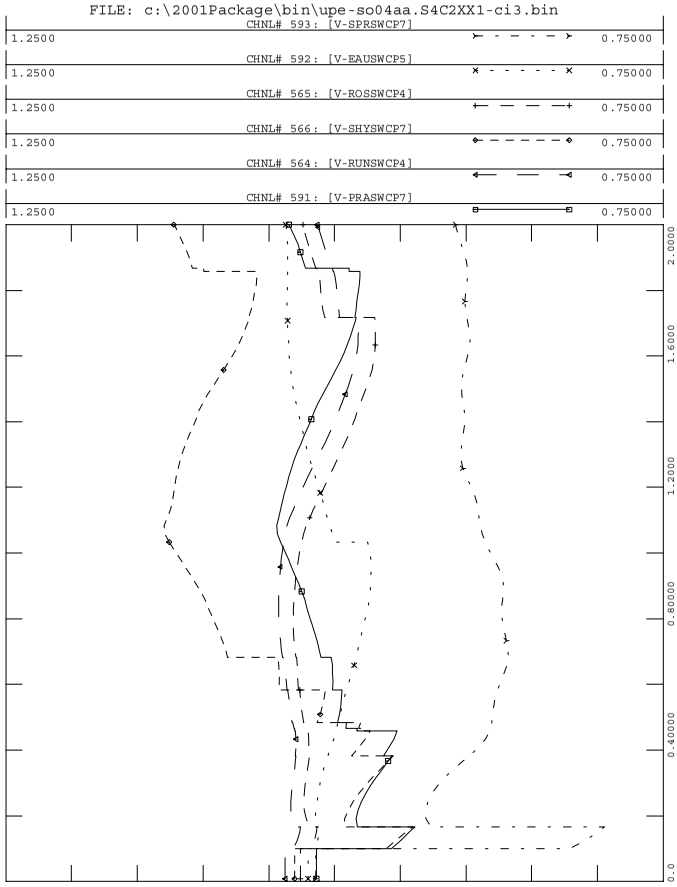
TUE, APR 30 2002 10:01
FARGO/WATERTOWN SVS

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin



TUE, APR 30 2002 10:01
FAST SW CAP OUT 1

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

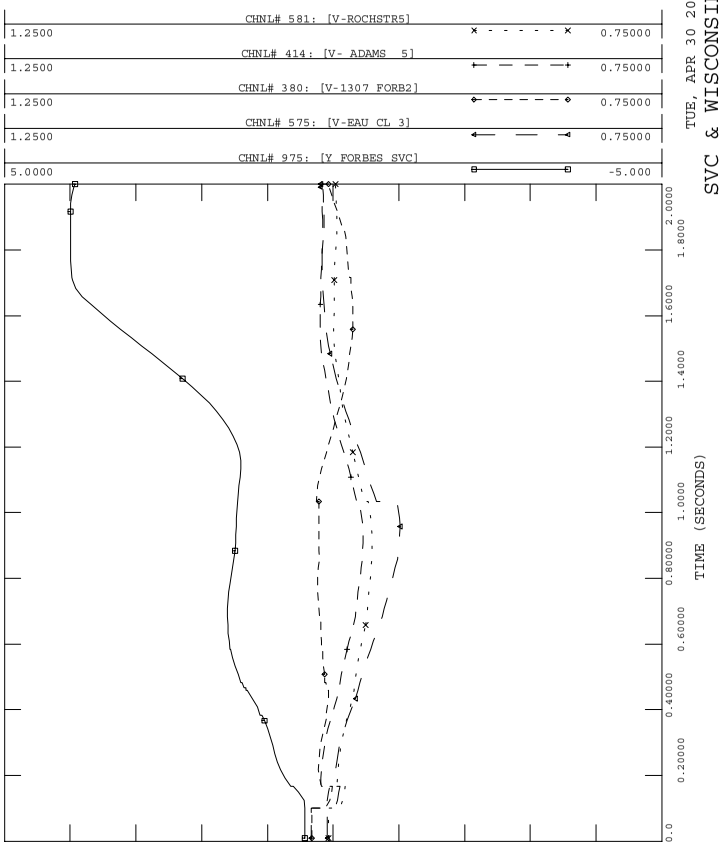


TUE, APR 30 2002 10:01
FAST SW CAP VOLTAGES

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01

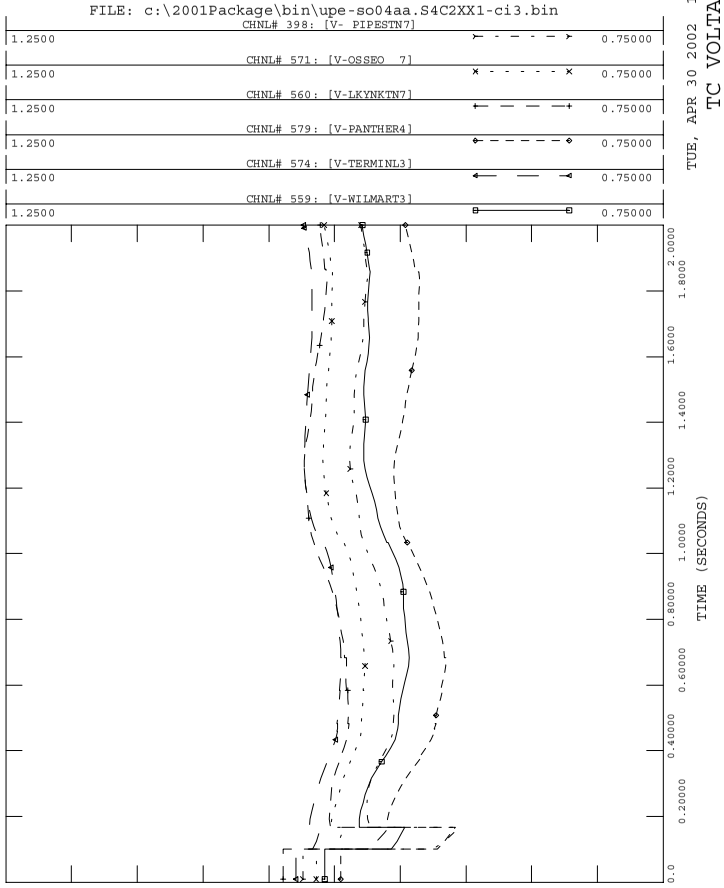
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01

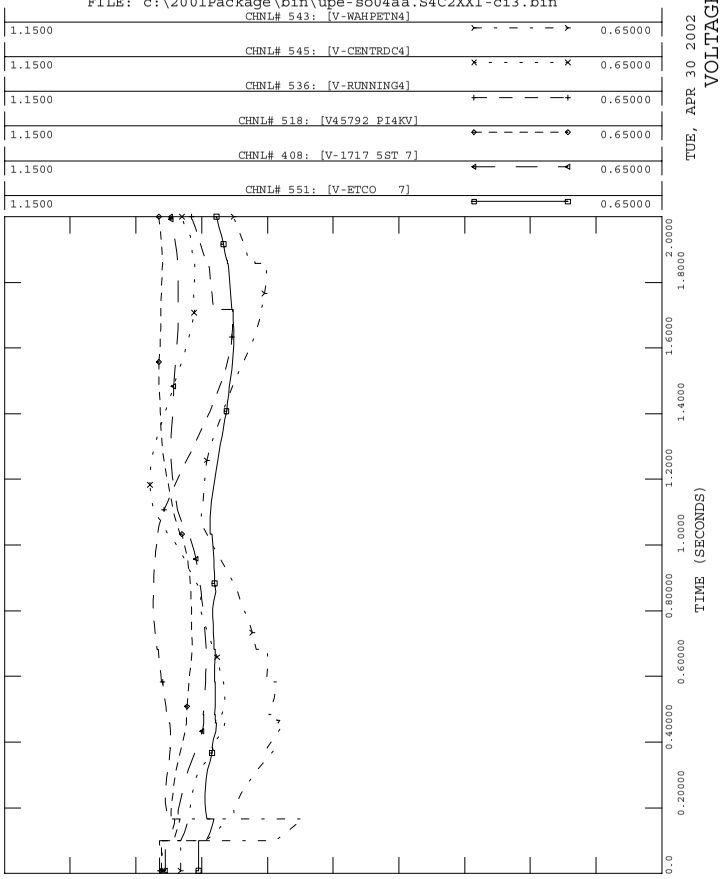
TC VOLTAGES



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01

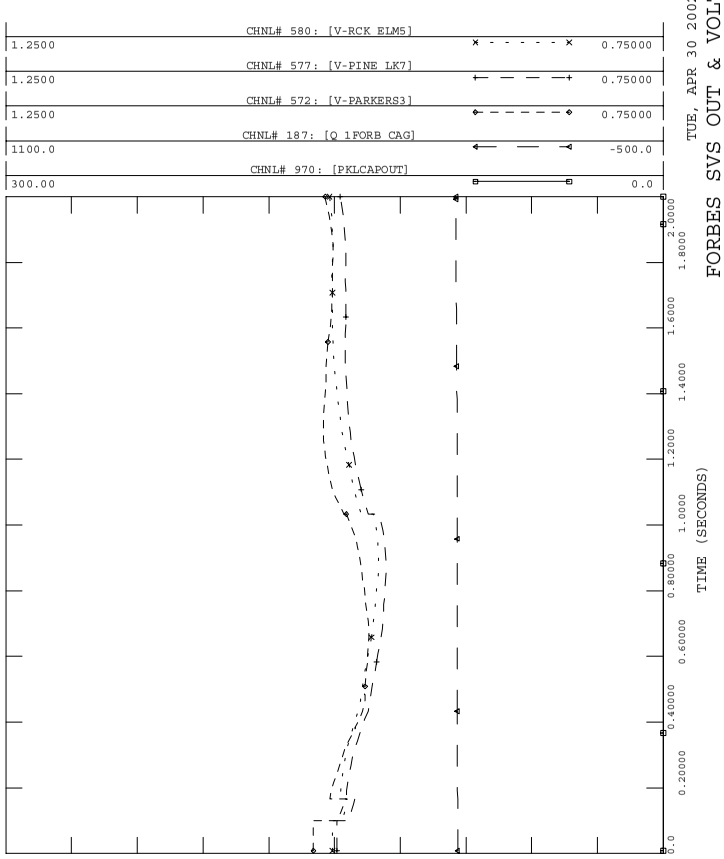
VOLTAGES 6



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

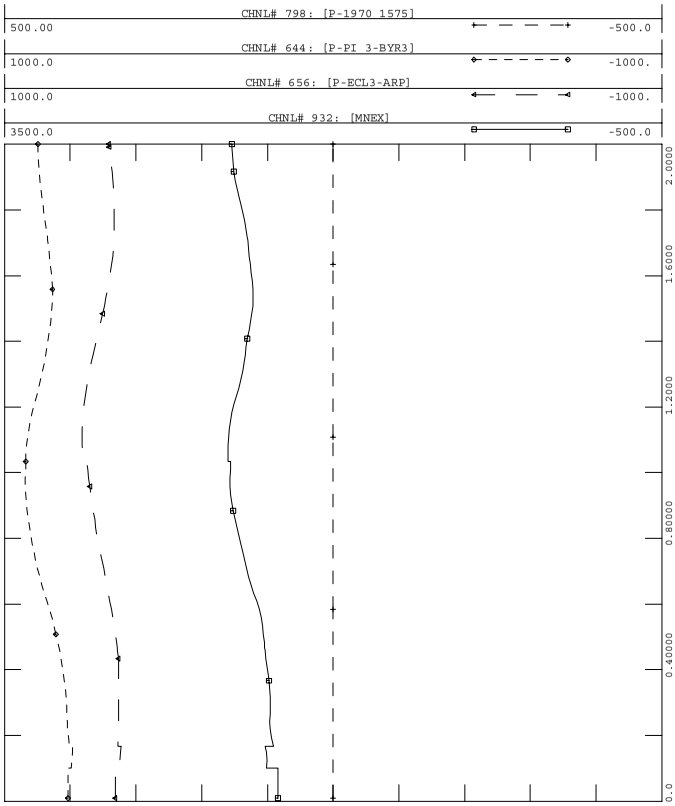
TUE, APR 30 2002 10:01

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
POWER FLOW SUMS 2



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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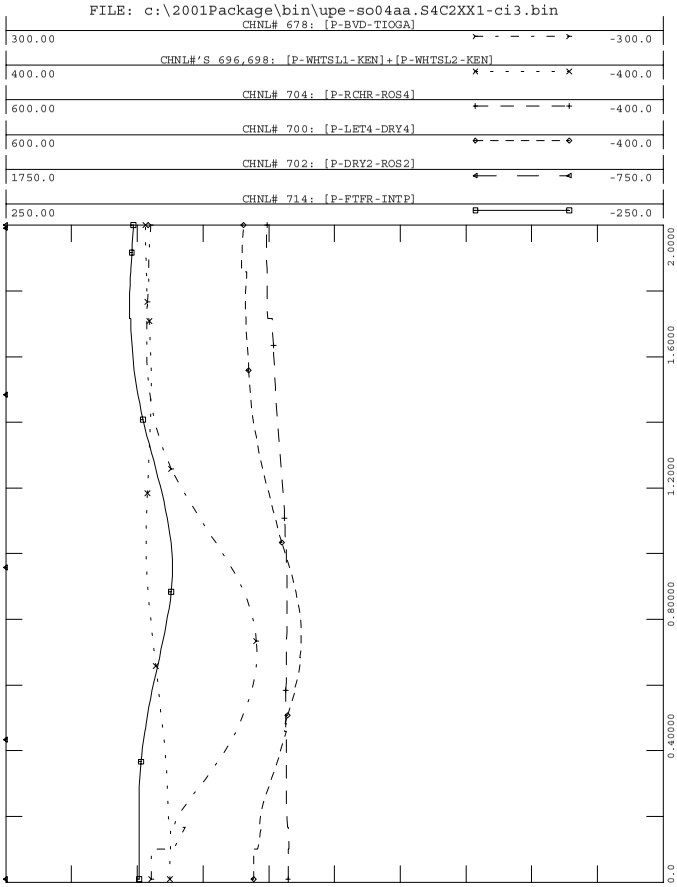
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
CAN. TIE FLOWS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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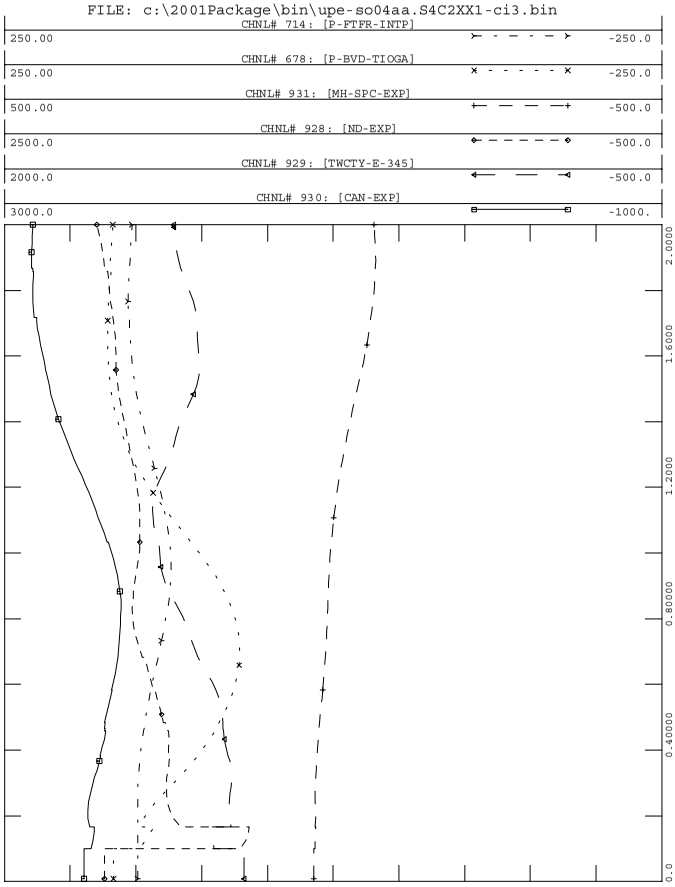
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
POWER FLOW SUMS 1



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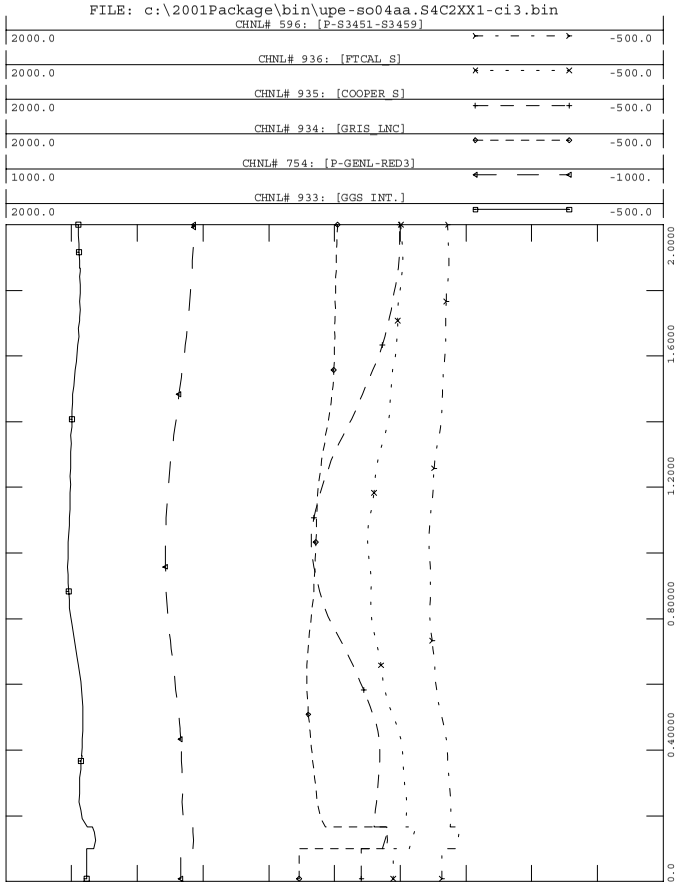
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
POWER FLOW SUM 3



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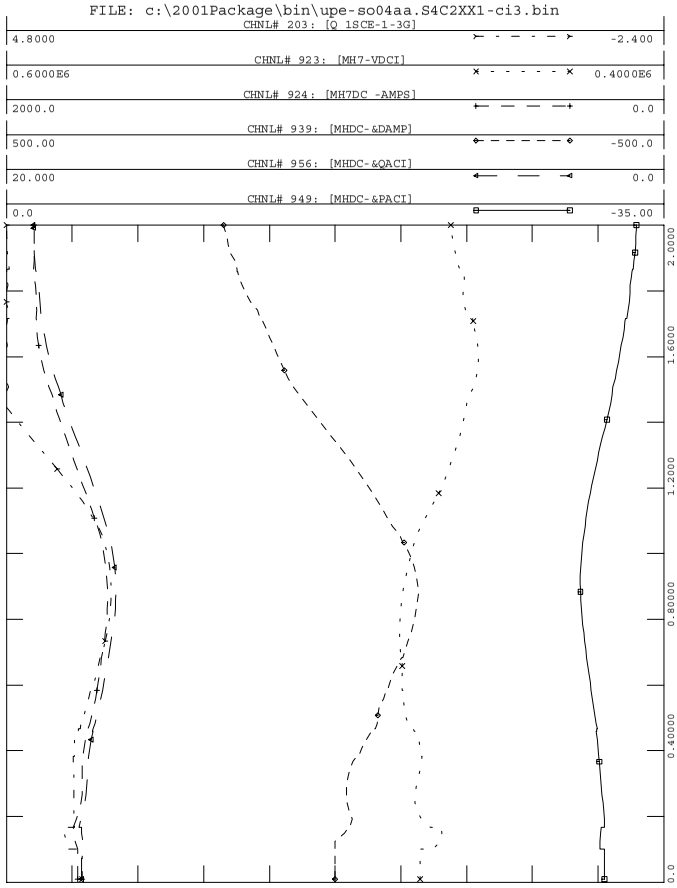
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
MH DC PARAMETERS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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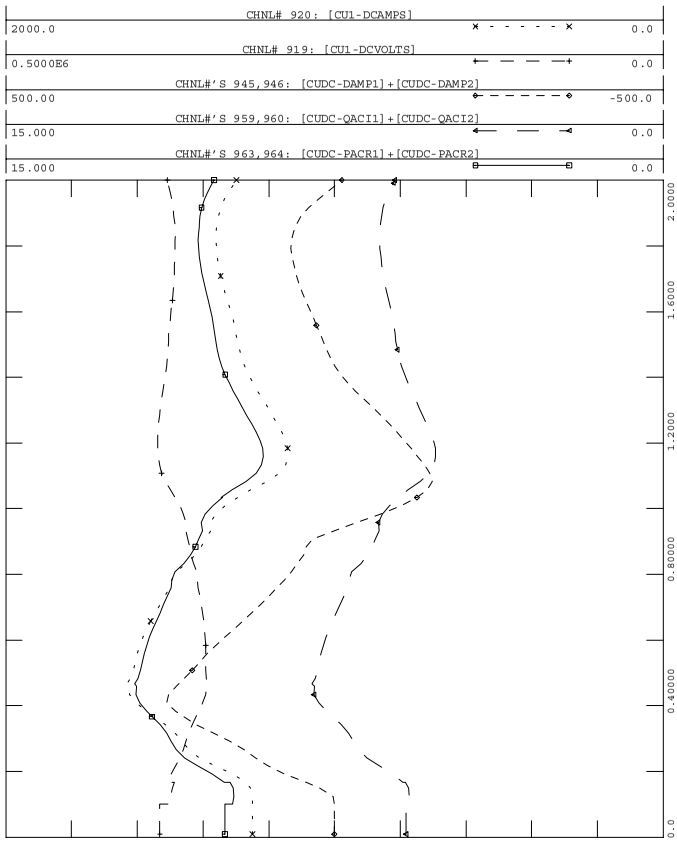
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
CU DC #1



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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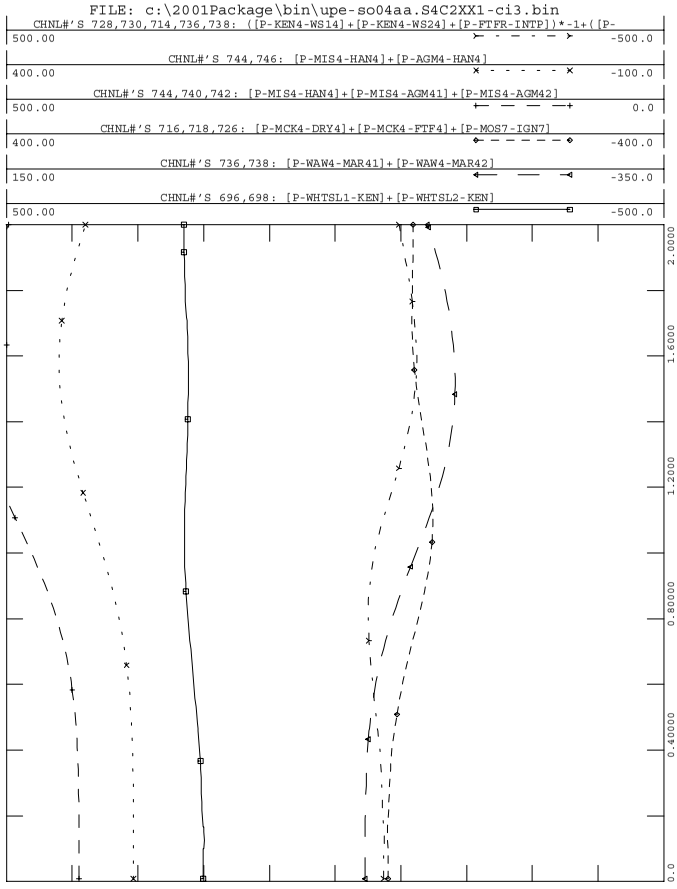
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01
OH TIE FLOWS



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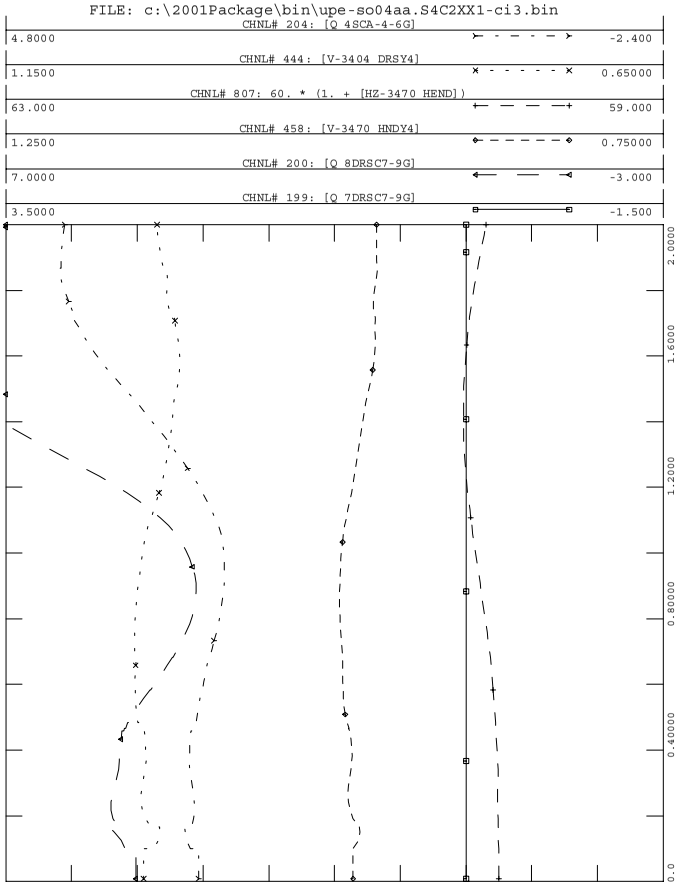
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

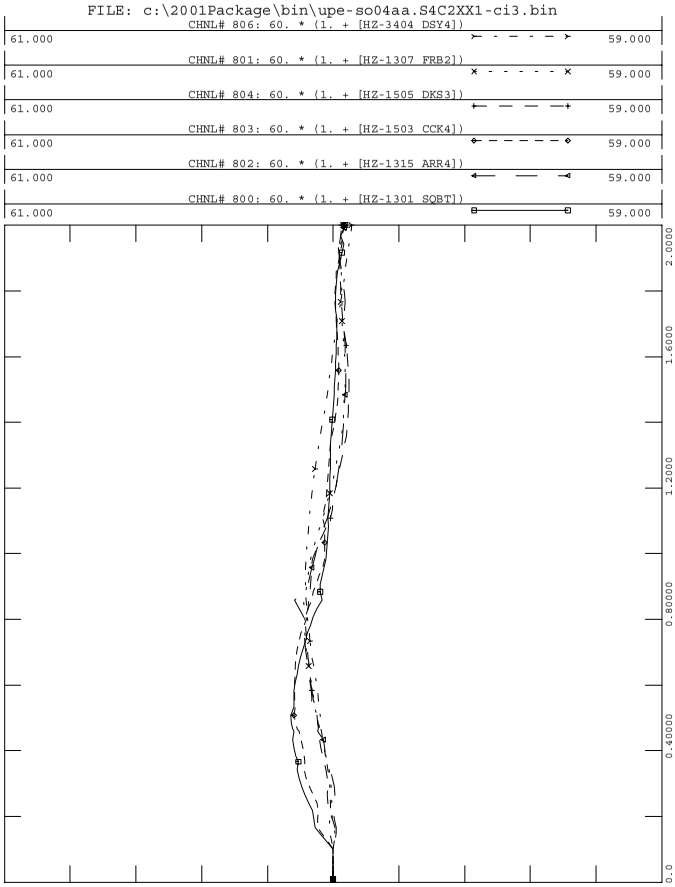
TUE, APR 30 2002 10:01
MH DC PARAMETERS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01

FREQ AT DC TERMINALS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

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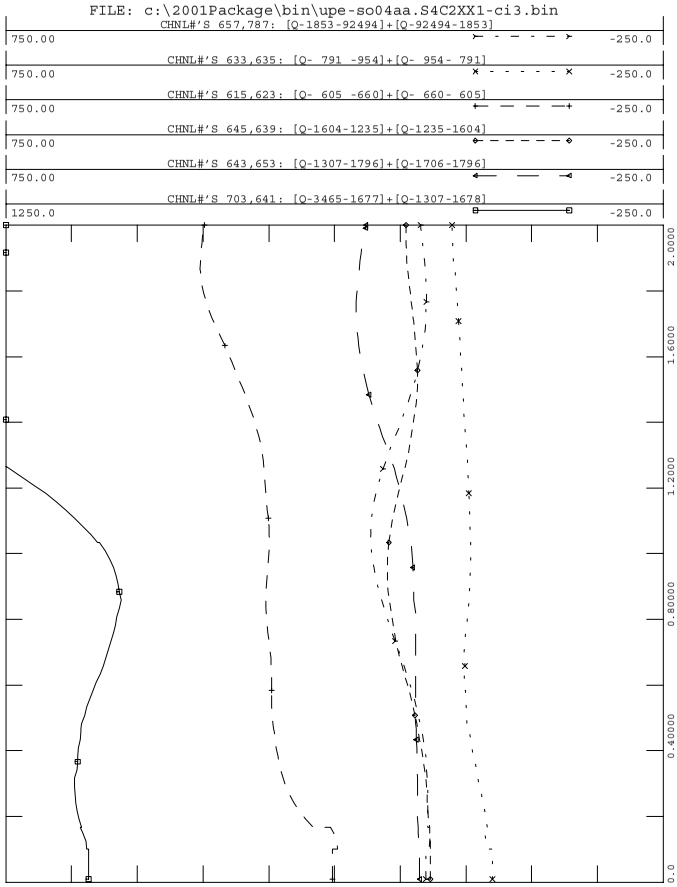
VAR LOSSES



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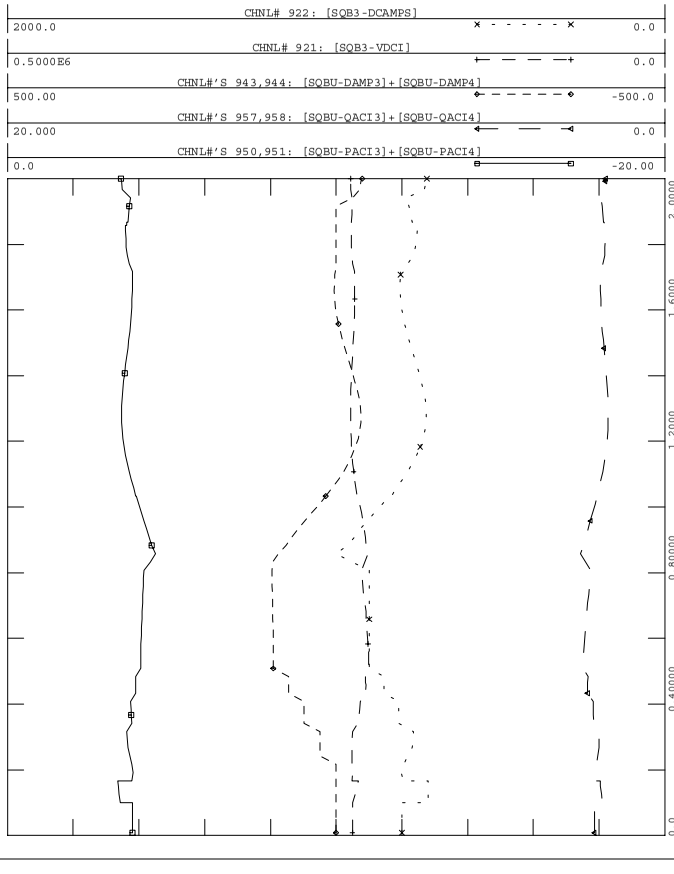
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01

SQB DC #3



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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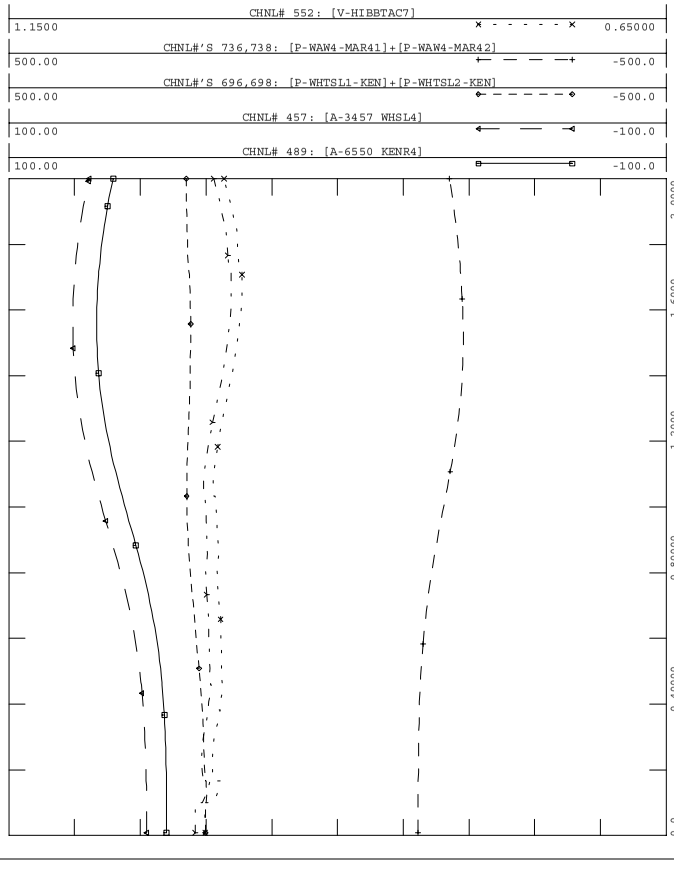
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

TUE, APR 30 2002 10:01

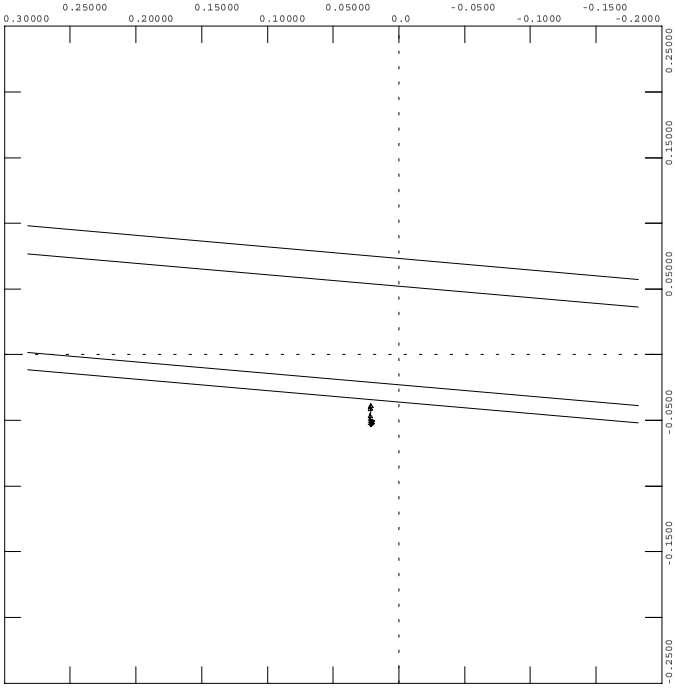
VOLTAGES, ANGLES



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



TUE, APR 30 2002 10:01
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

RELAY: RELAYG
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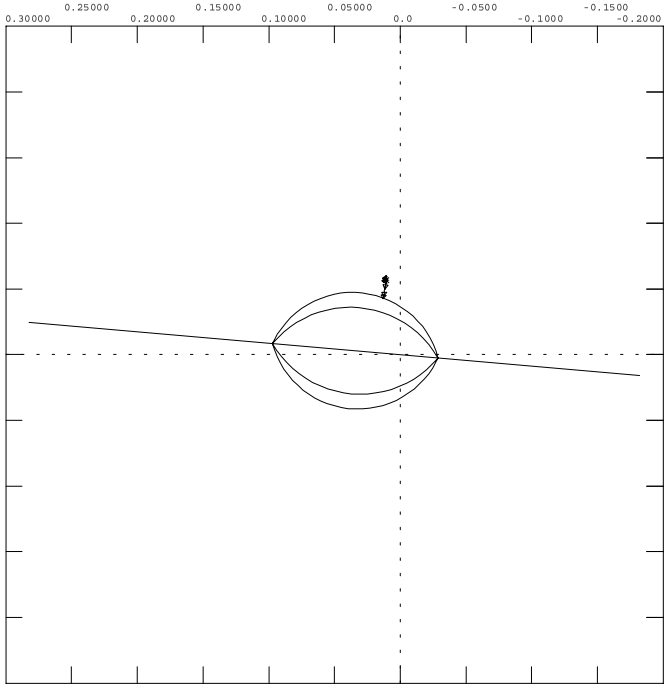

TUE, APR 30 2002 10:01
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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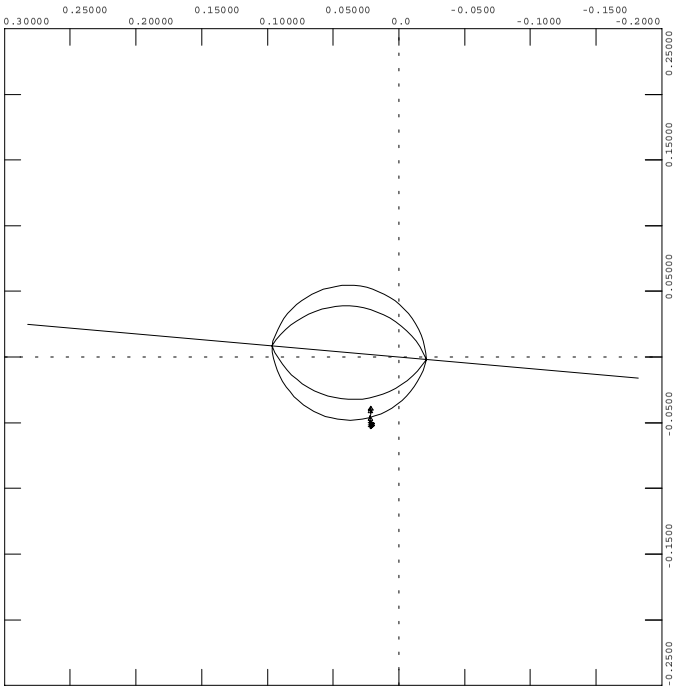
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

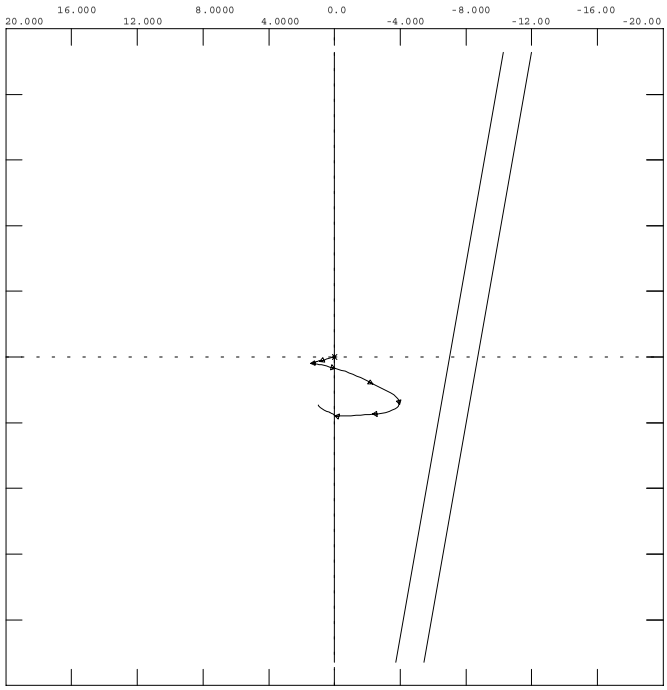


TUE, APR 30 2002 10:01
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]



TUE, APR 30 2002 10:01
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

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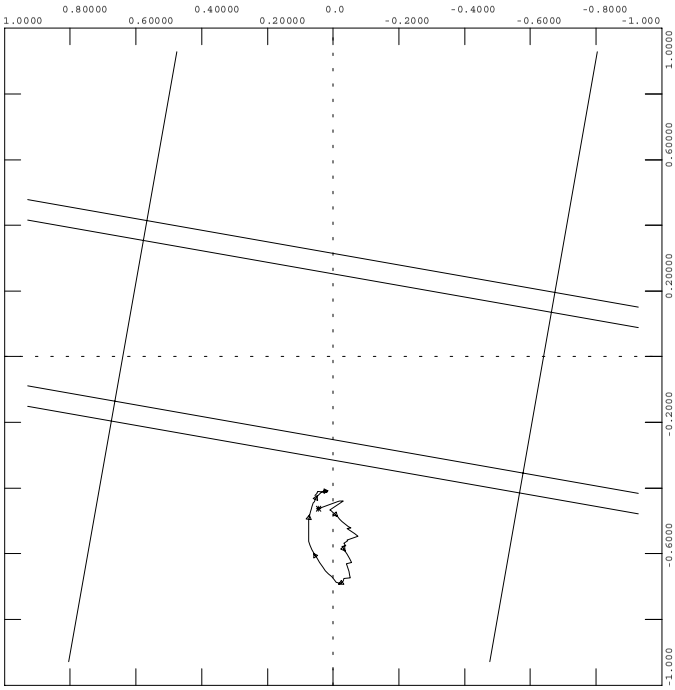
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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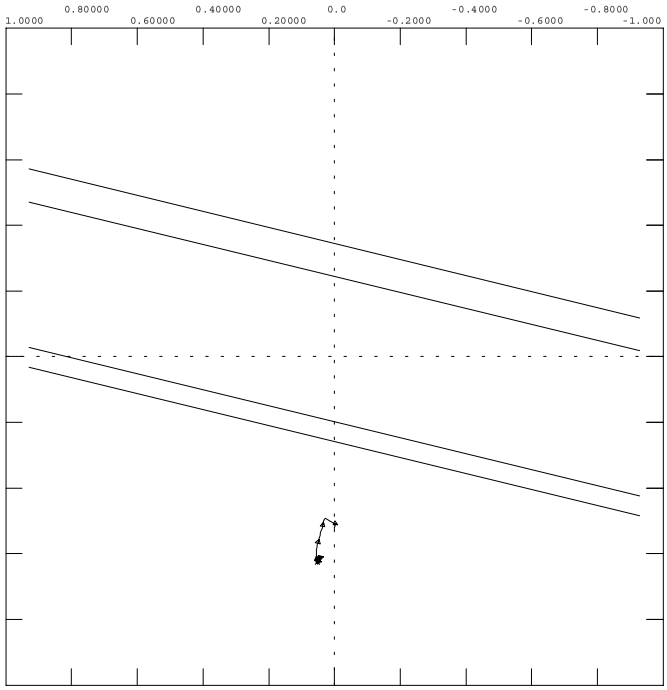
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

RELAY: SLINOS
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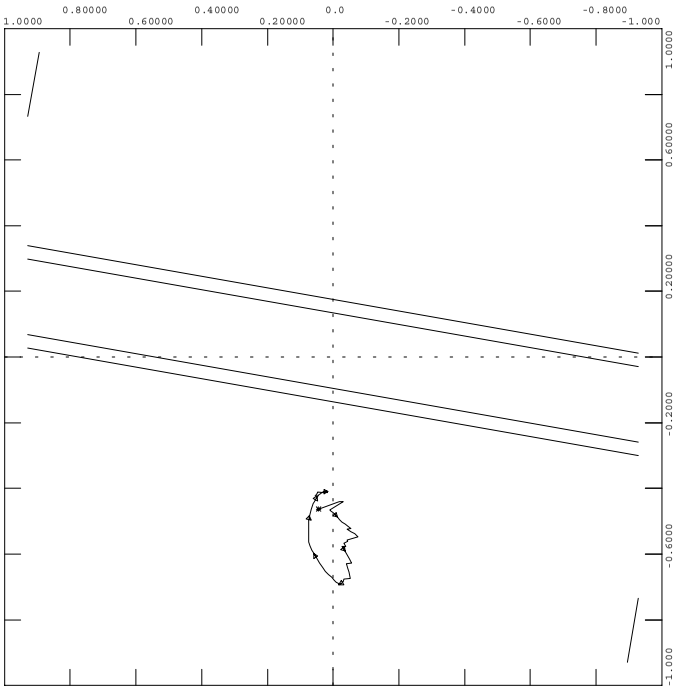
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

RELAY: SLINOS
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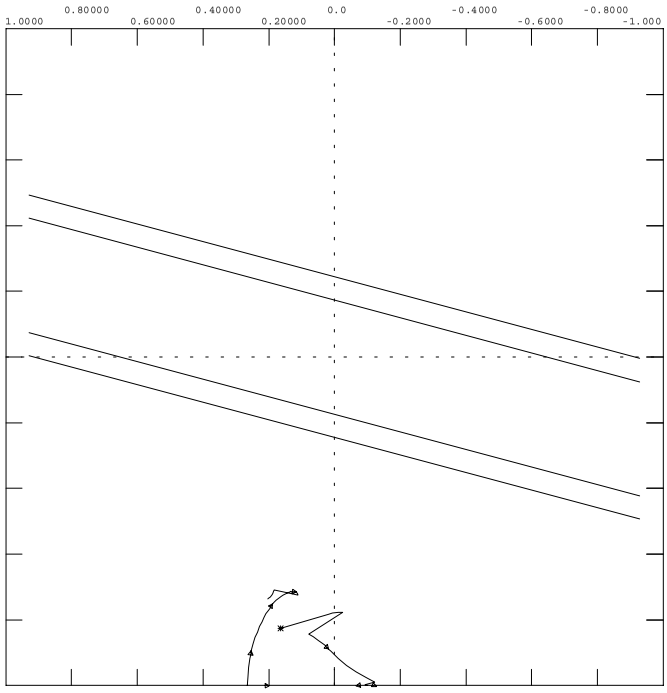

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

RELAY: SLLP
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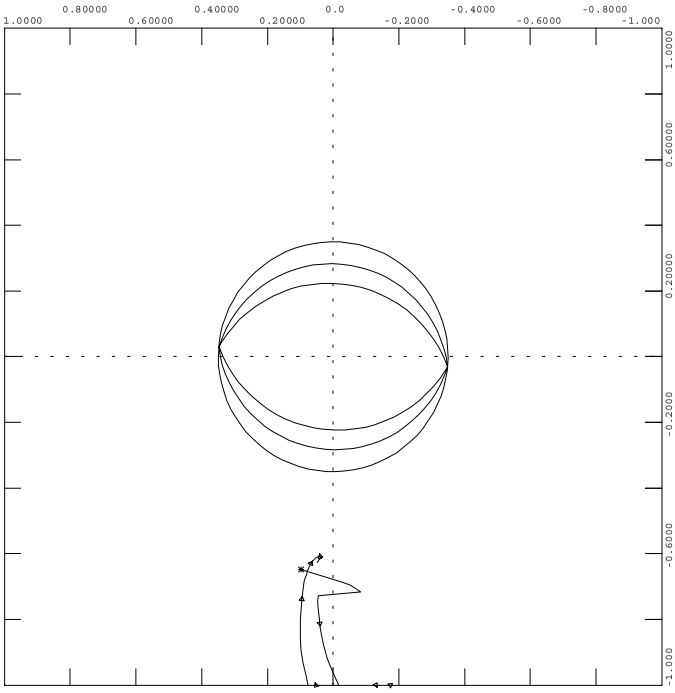
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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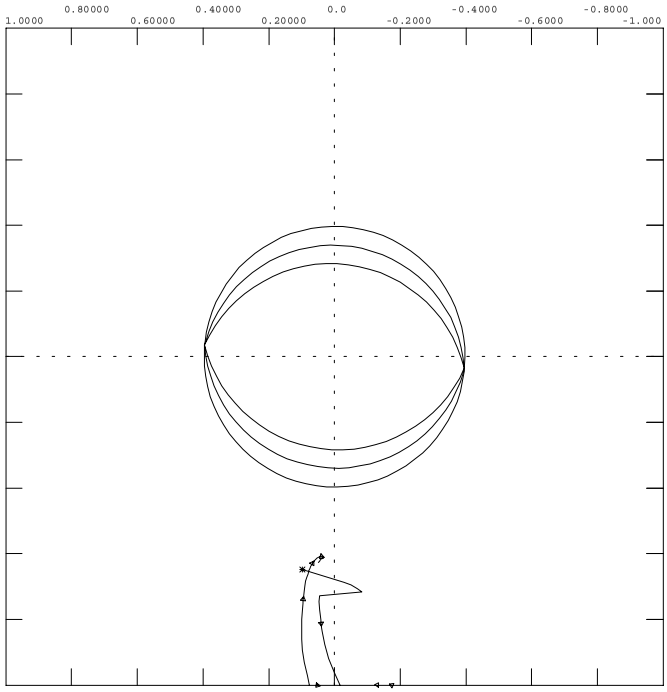
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

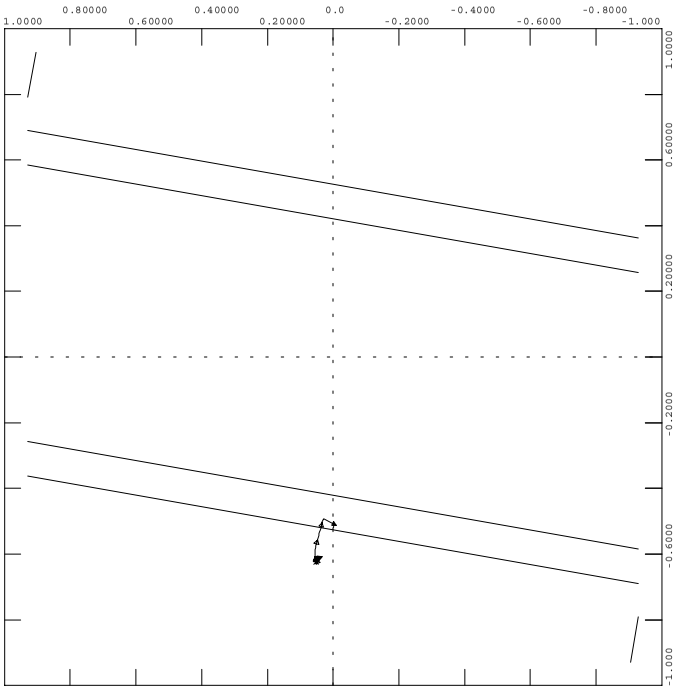
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

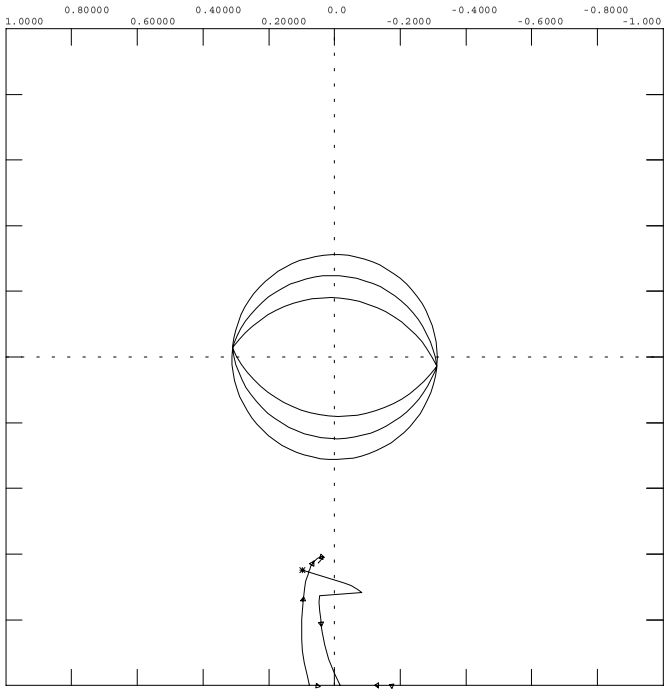
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



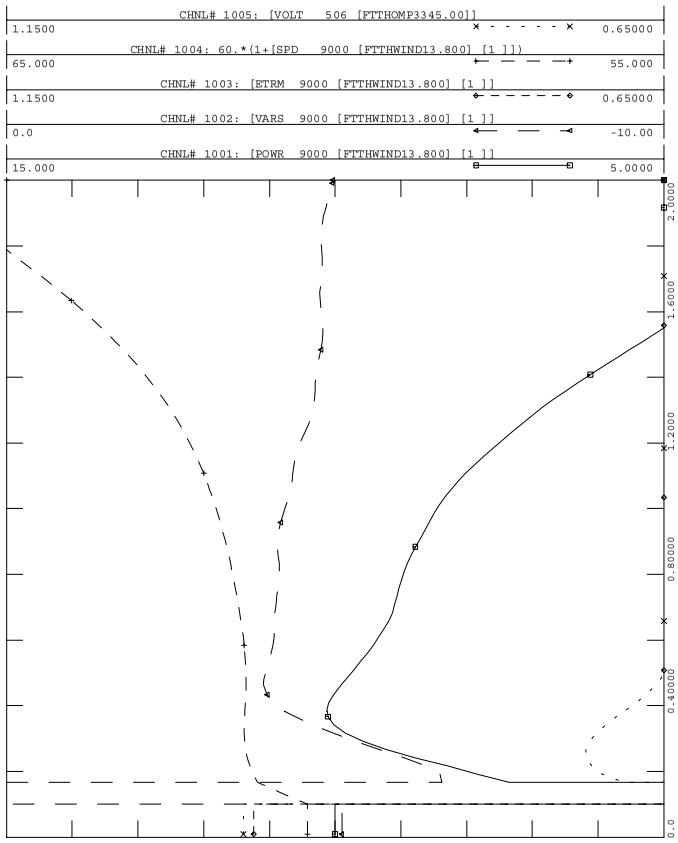
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

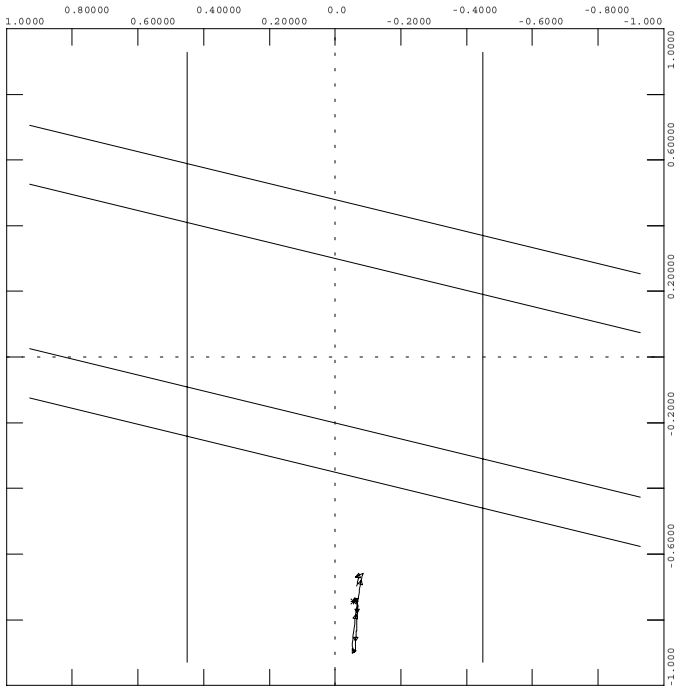


TUE, APR 30 2002 10:01
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



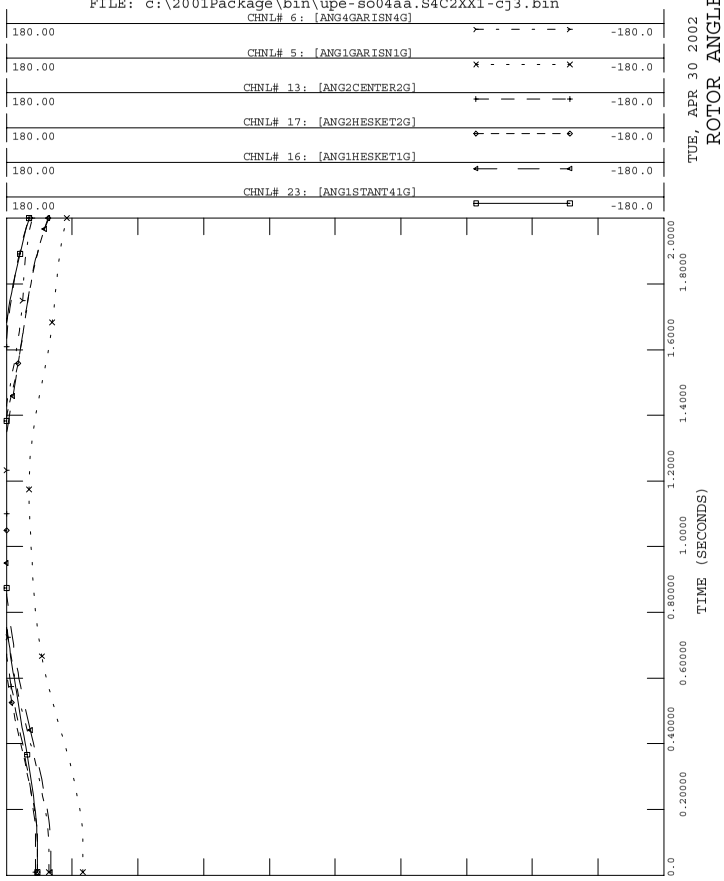
TUE, APR 30 2002 10:01
MP-OH I.FALLS (779)

CONTINGENCY CJ3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Huron 345 kV line

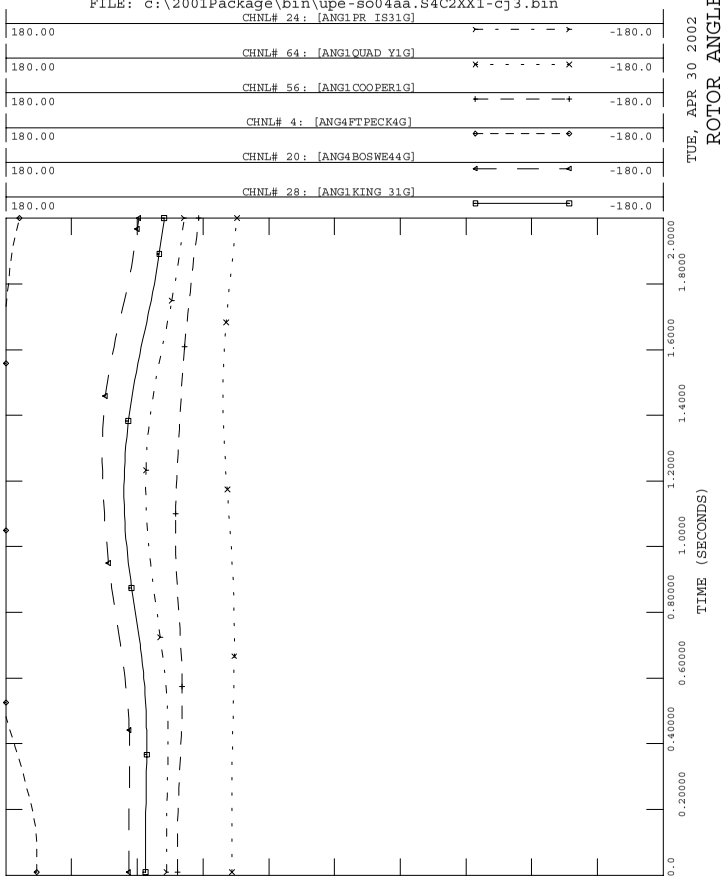
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
ROTOR ANGLES 2



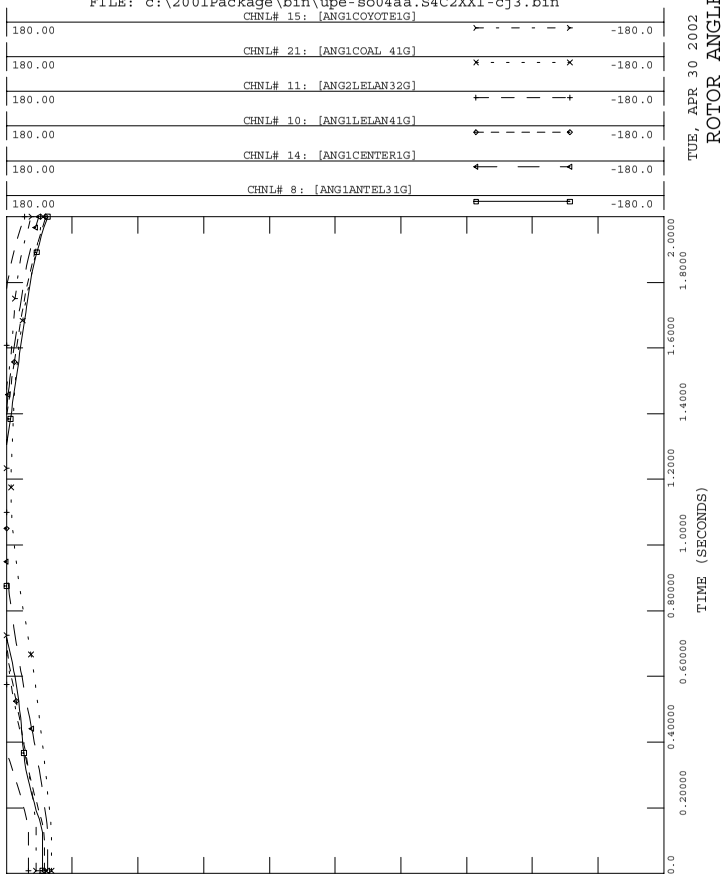
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
ROTOR ANGLES 4



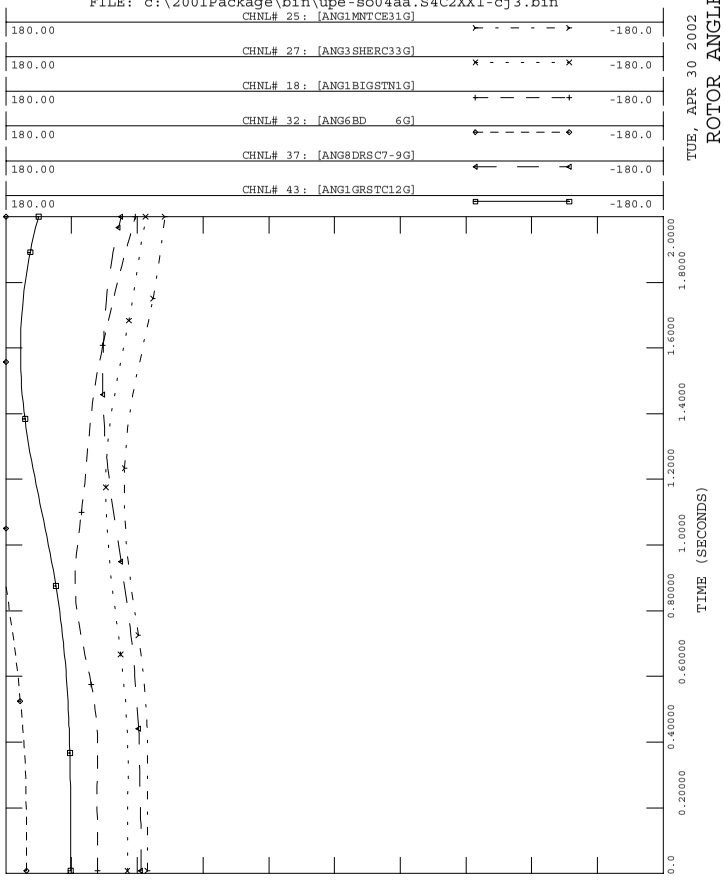
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

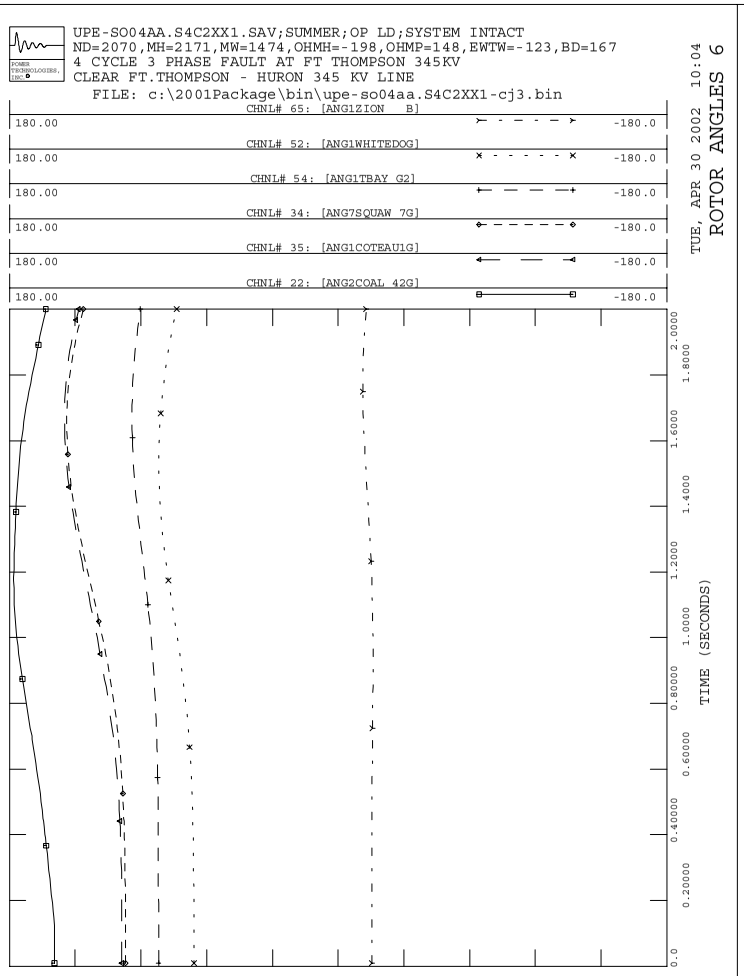
TUE, APR 30 2002 10:04
ROTOR ANGLES 1

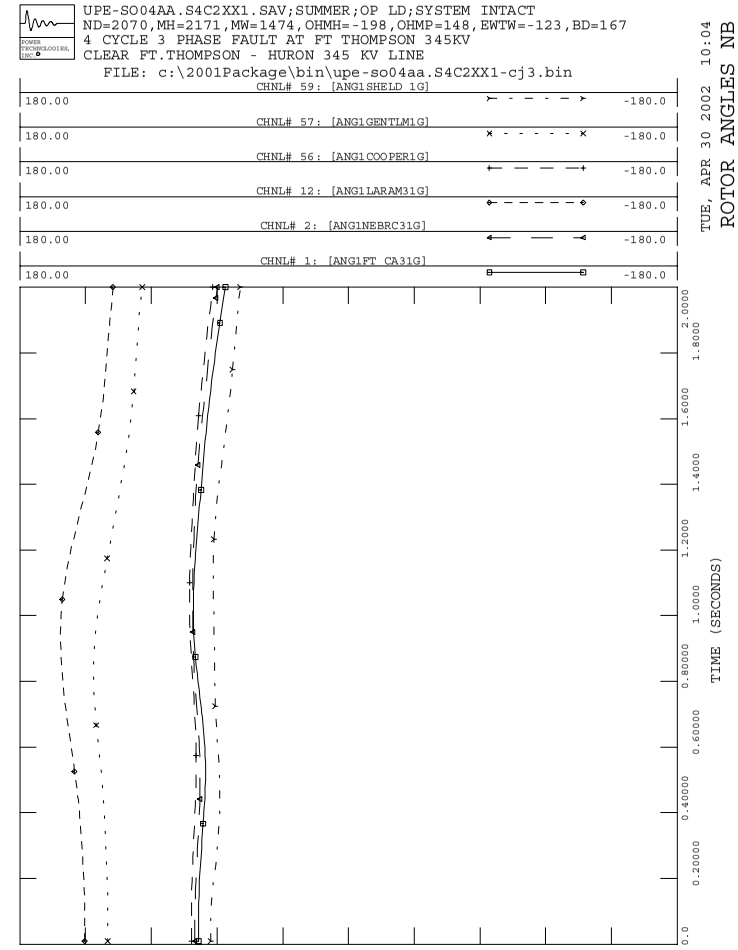


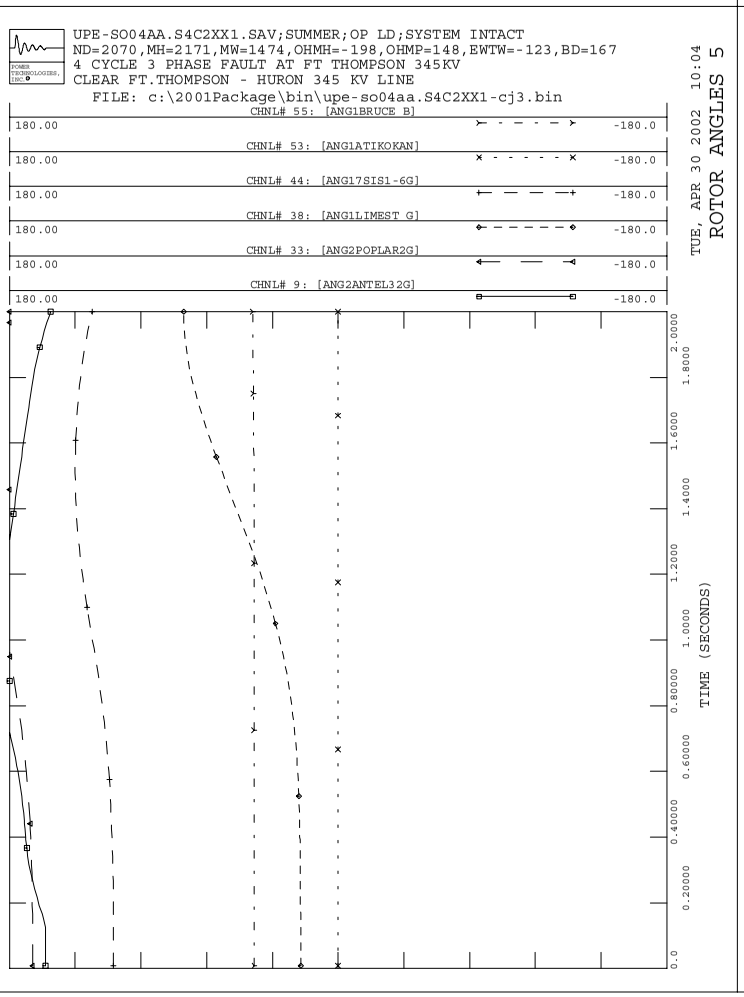
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

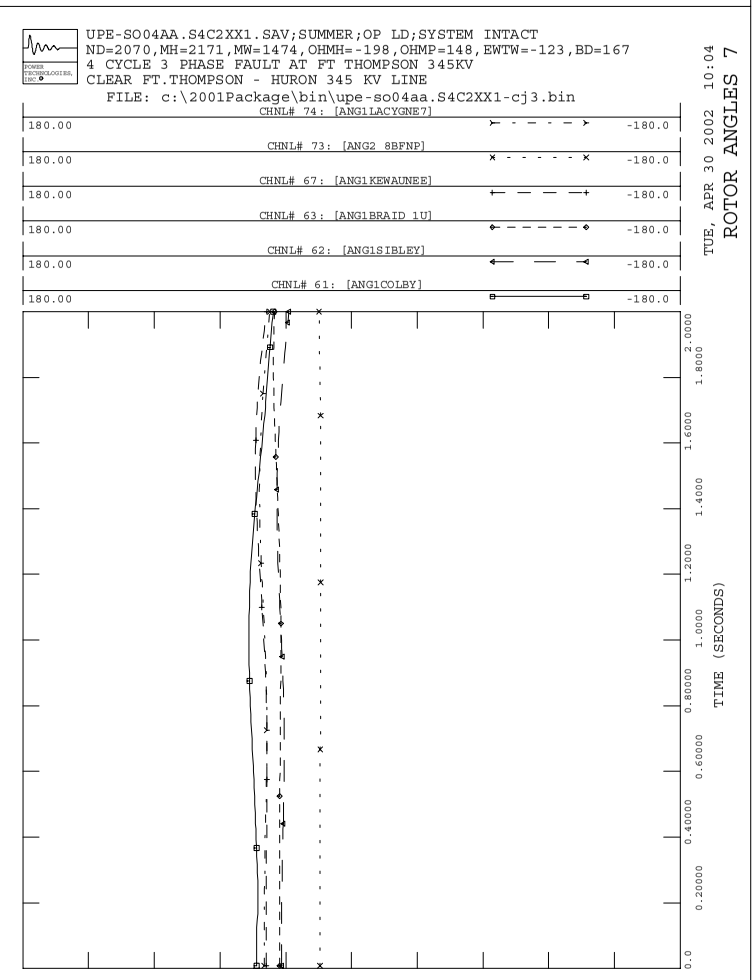
TUE, APR 30 2002 10:04
ROTOR ANGLES 3




UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 10:04
ROTOR ANGLES 6

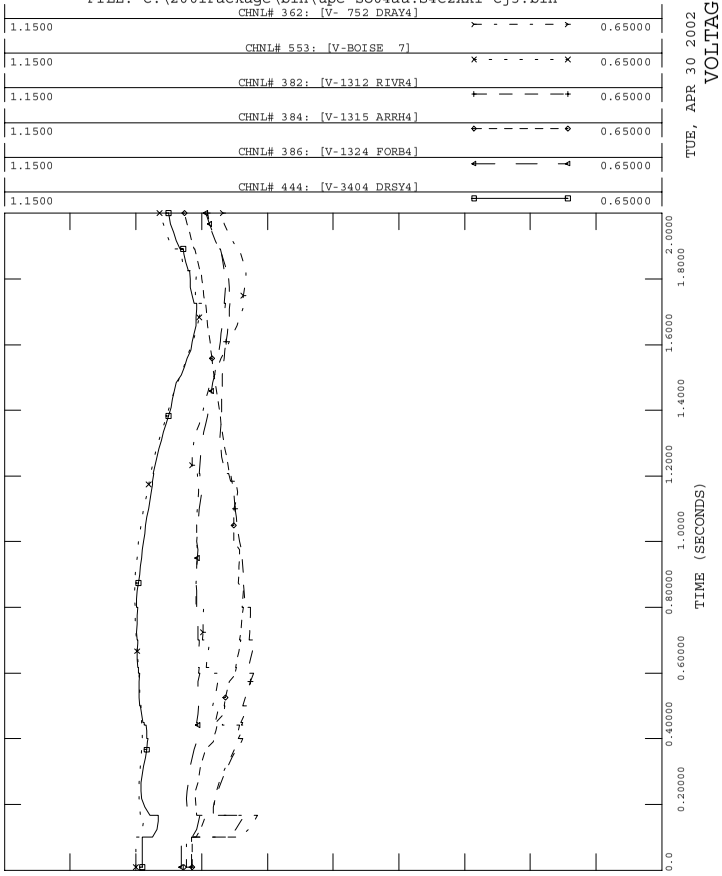

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 10:04
ROTOR ANGLES NB


UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 10:04
ROTOR ANGLES 5


UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
TUE, APR 30 2002 10:04
ROTOR ANGLES 7

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
VOLTAGES 1



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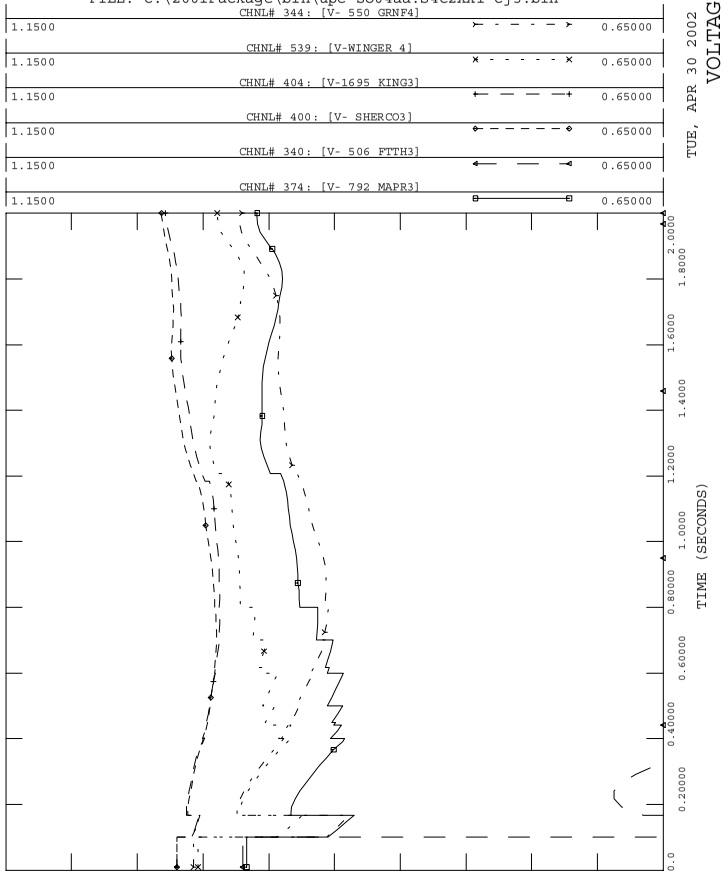
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
VOLTAGES 3



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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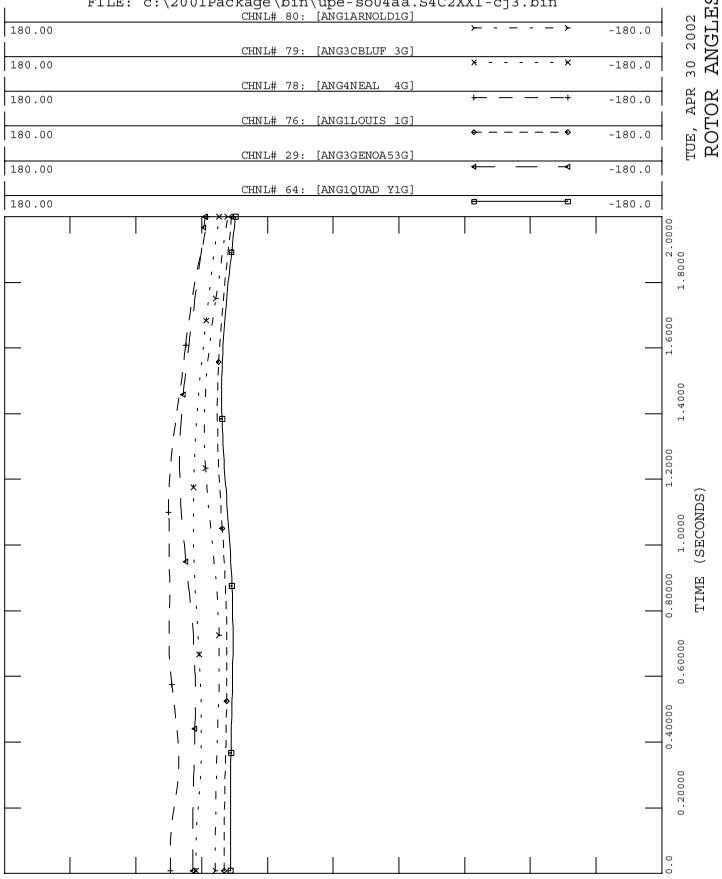
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
ROTOR ANGLES IA



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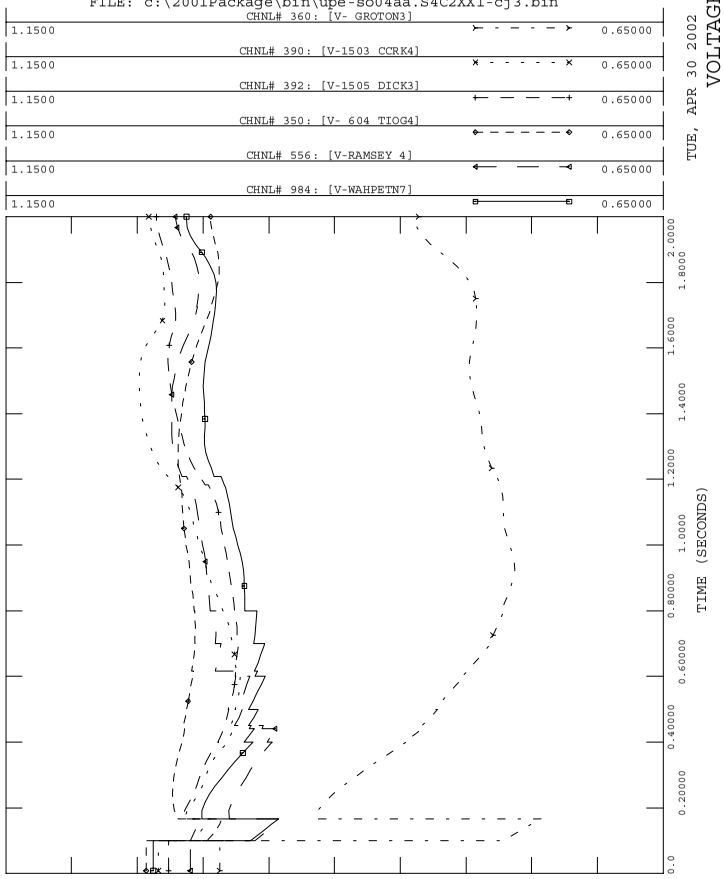
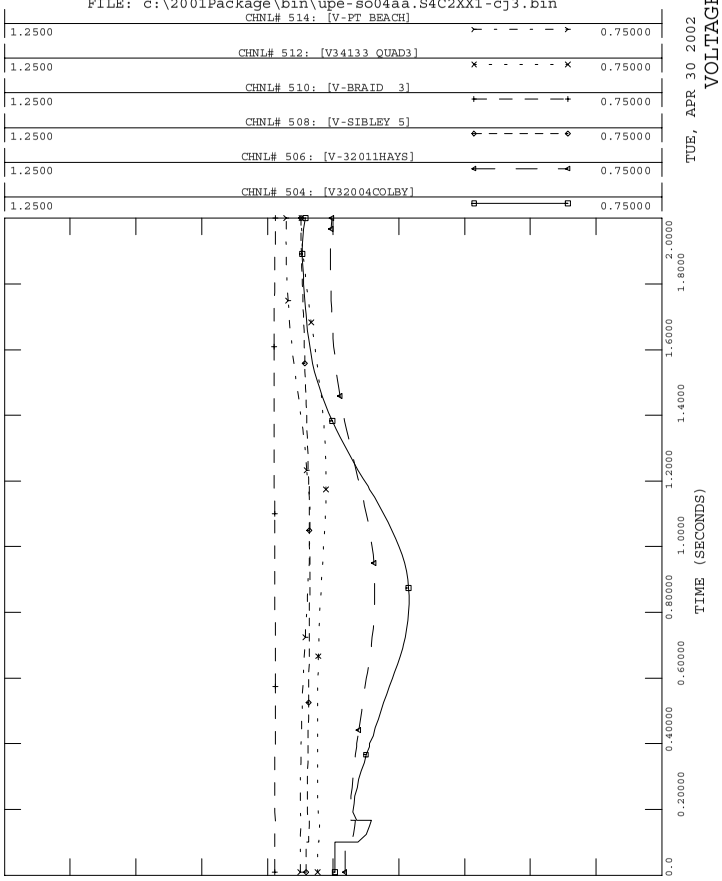
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
VOLTAGES 2



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
VOLTAGES 5



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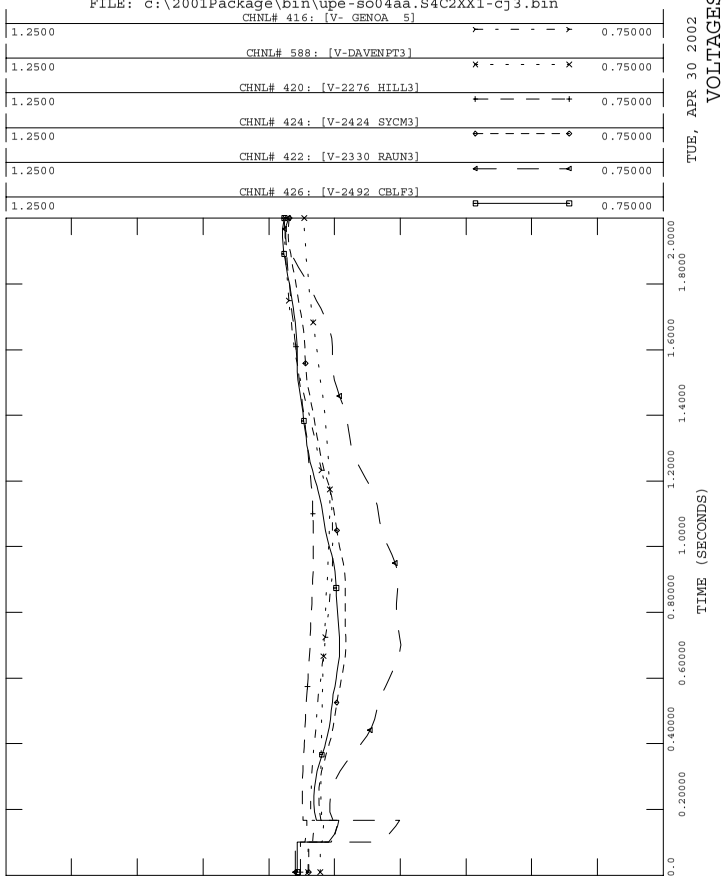
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
VOLTAGES IA



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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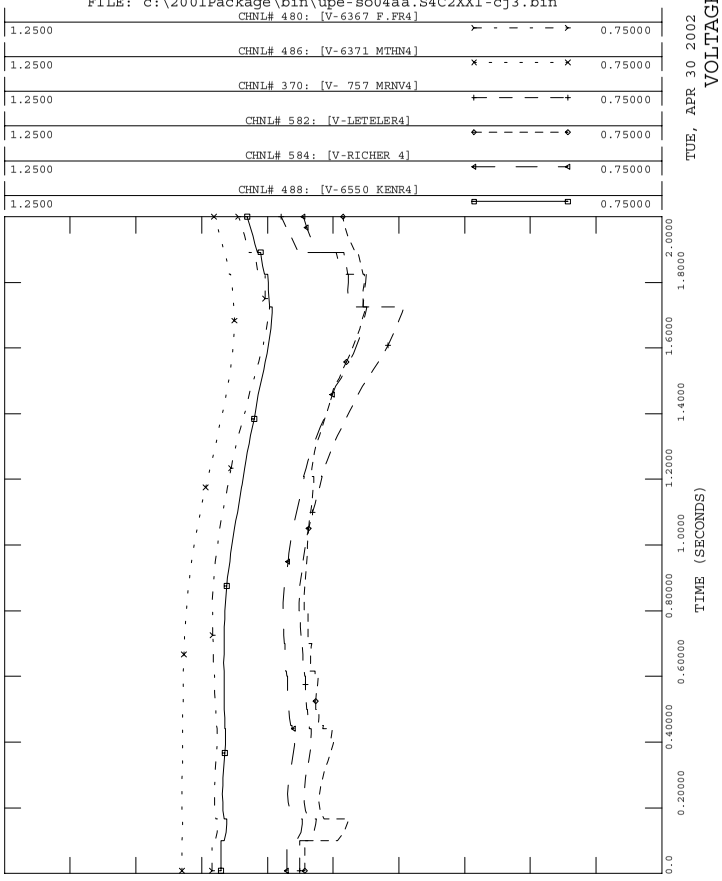
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
VOLTAGES 4



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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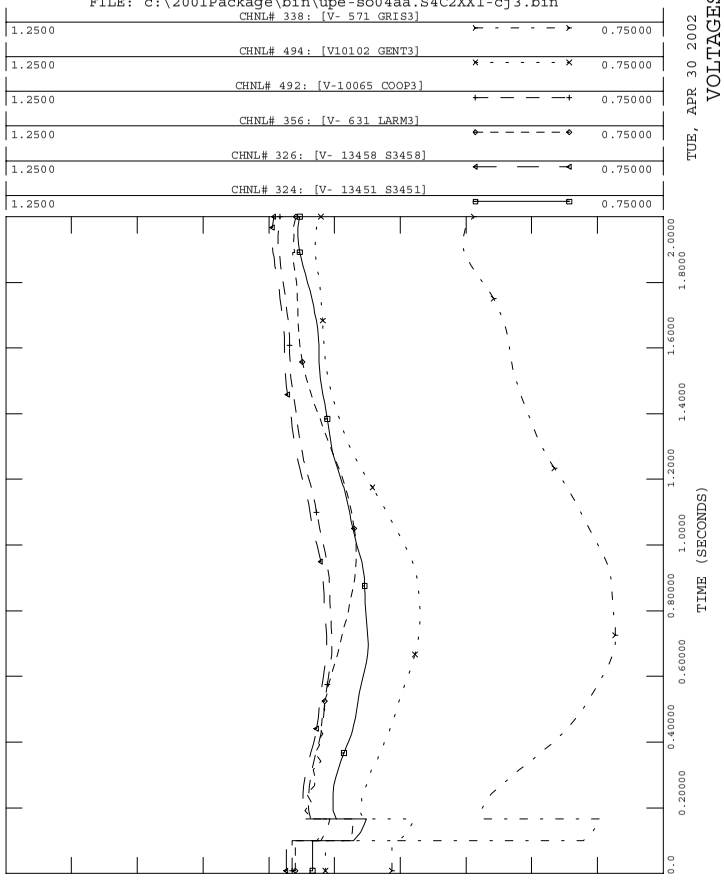
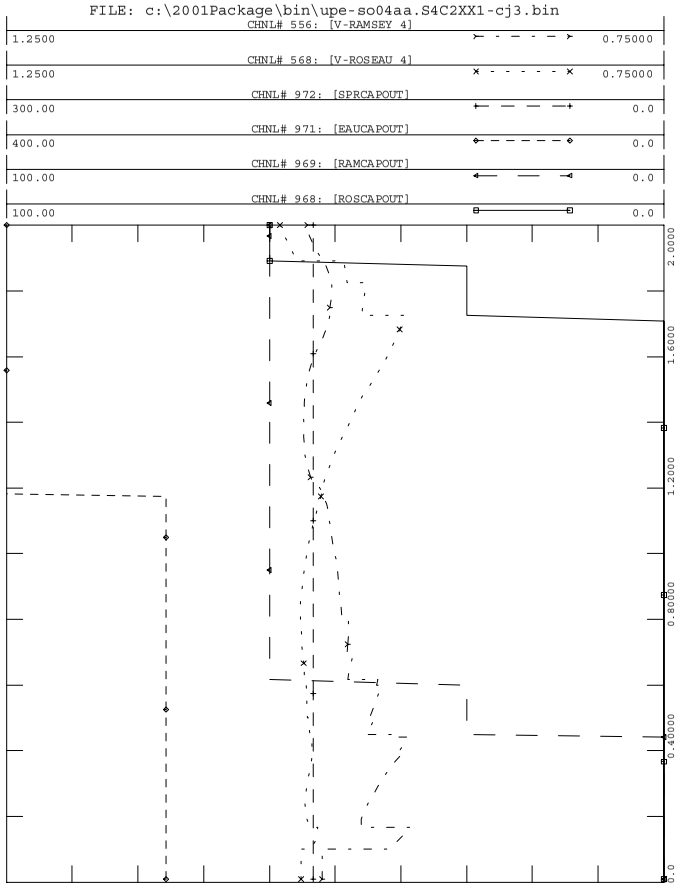
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
VOLTAGES NB



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
FAST SW CAP OUT 2



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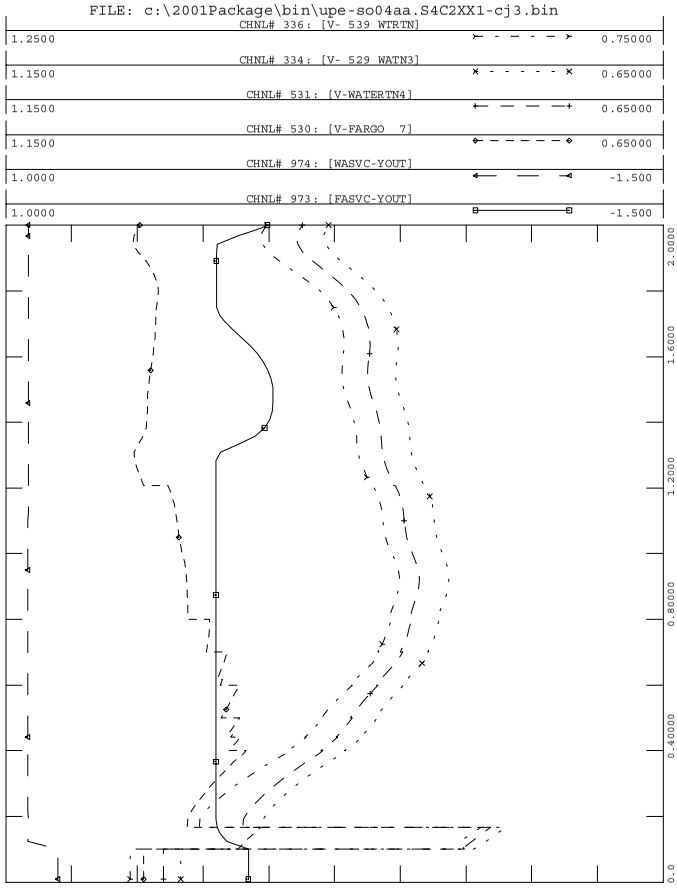
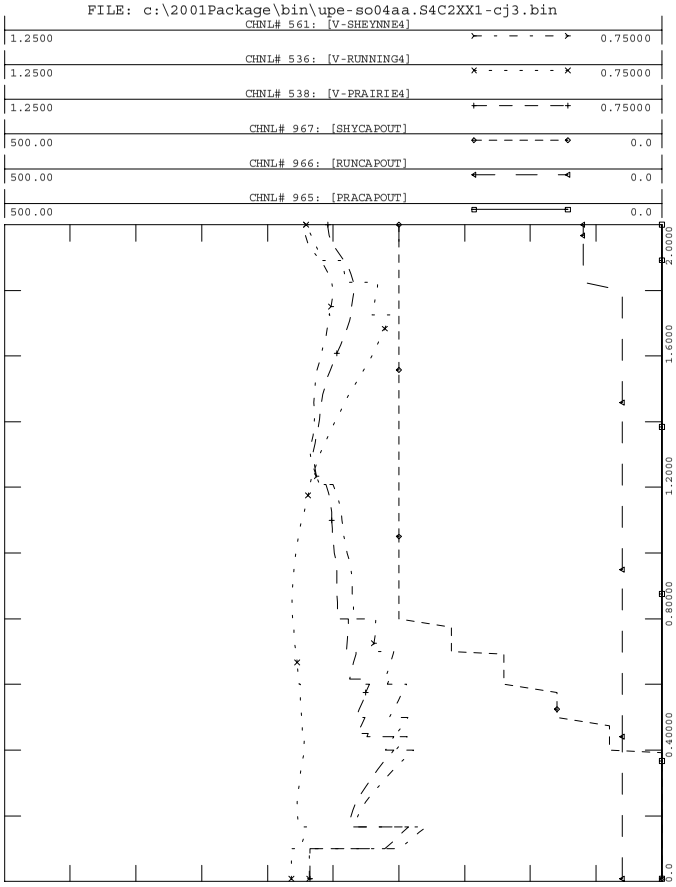
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
FARGO/WATERTOWN SVS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
FAST SW CAP OUT 1



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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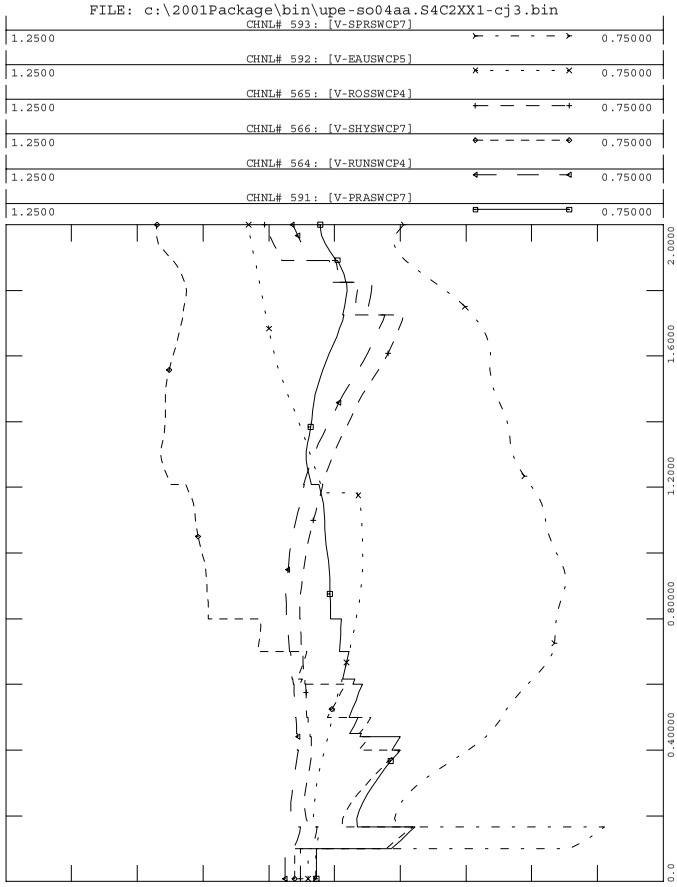
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

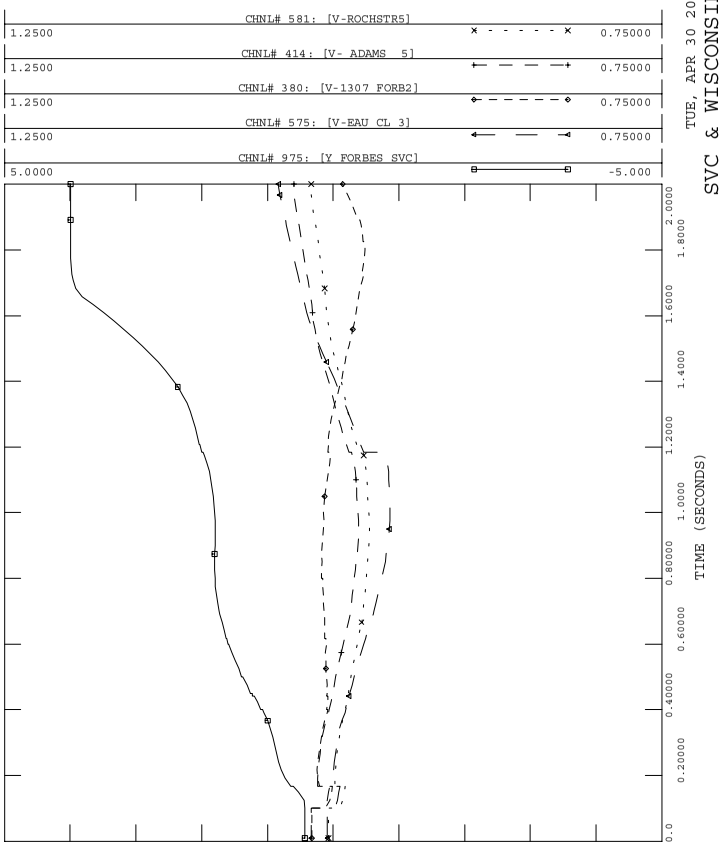
TUE, APR 30 2002 10:04
FAST SW CAP VOLTAGES



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04

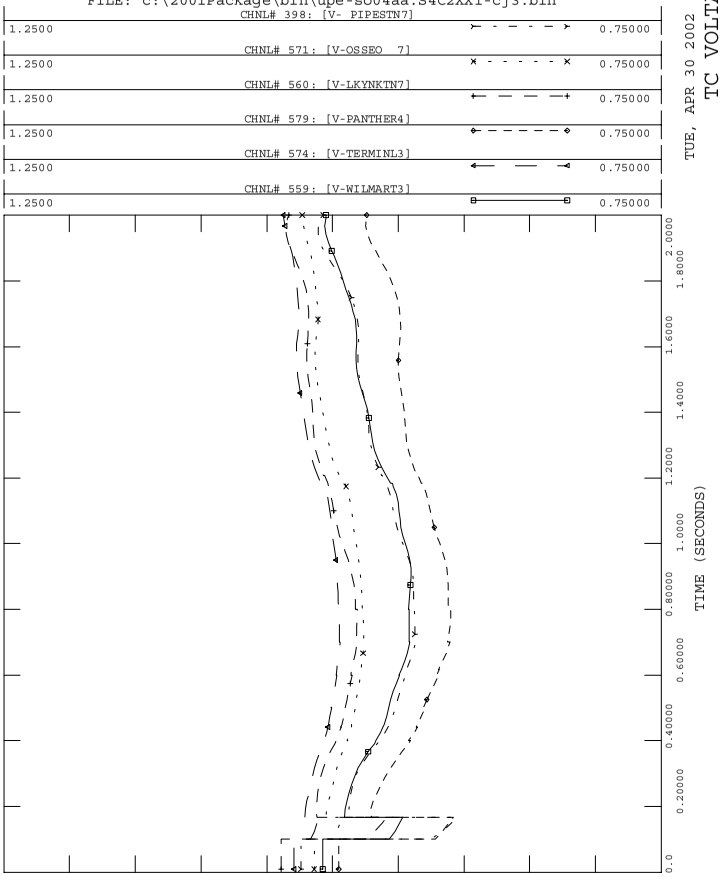
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04

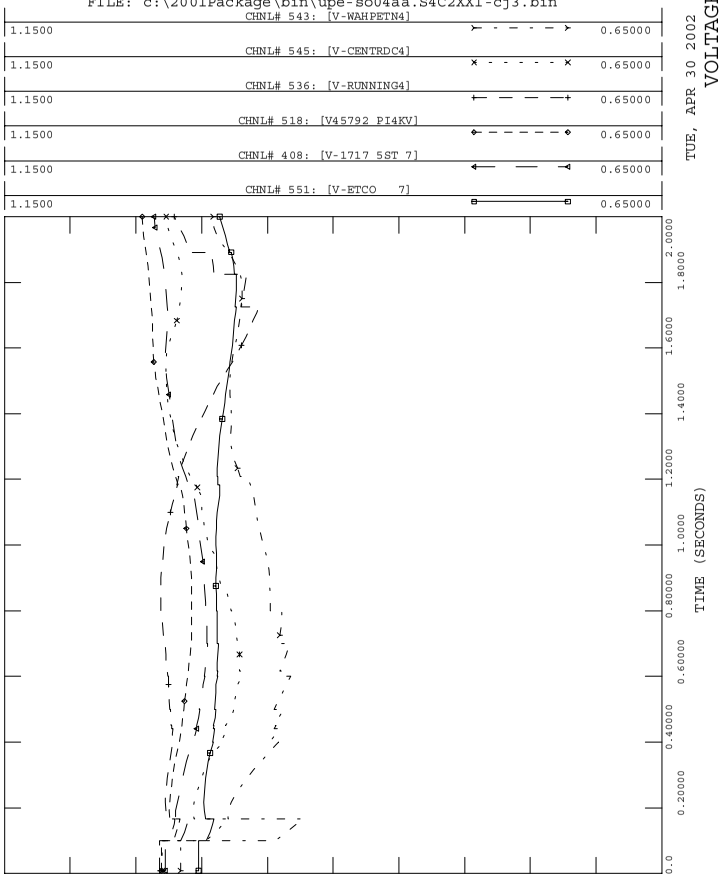
TC VOLTAGES



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04

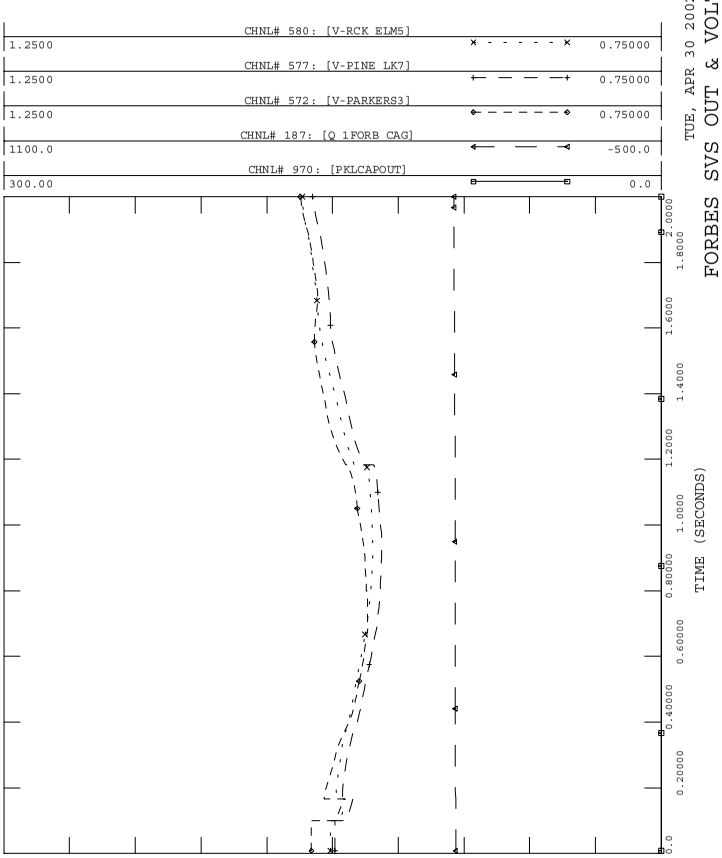
VOLTAGES 6



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

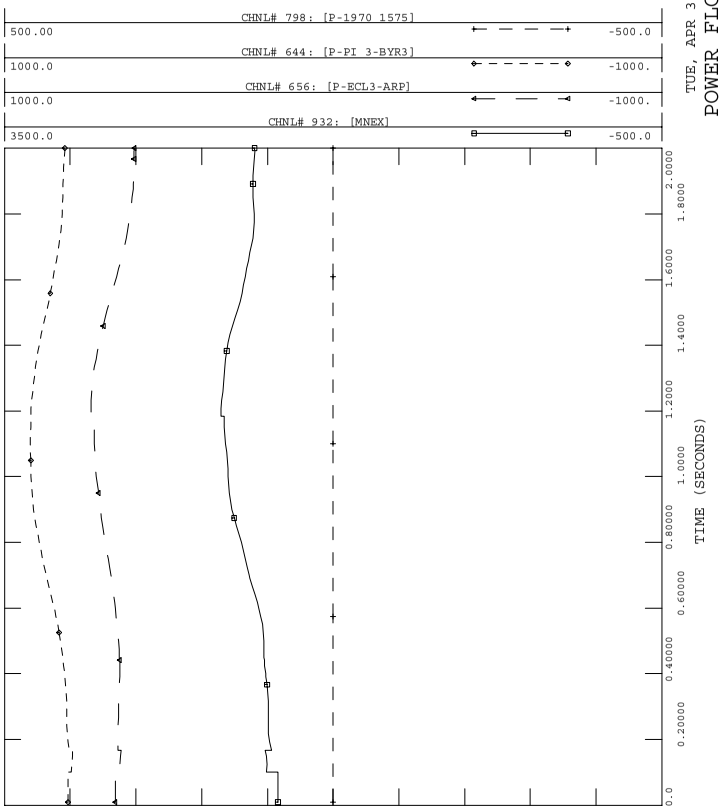
TUE, APR 30 2002 10:04

FORBES SVS OUT & VOLTAGES



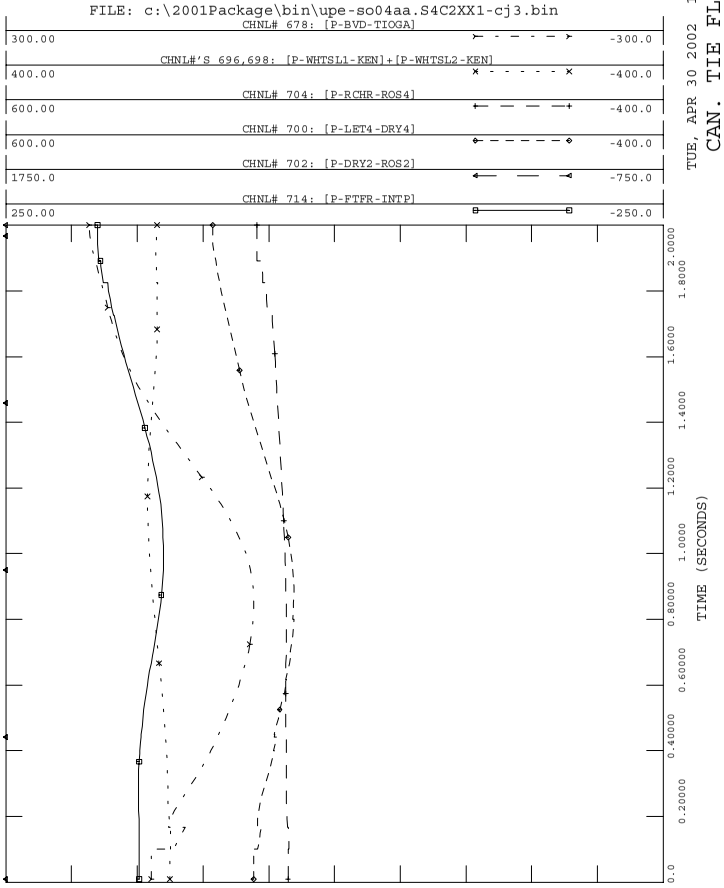
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
POWER FLOW SUMS 2



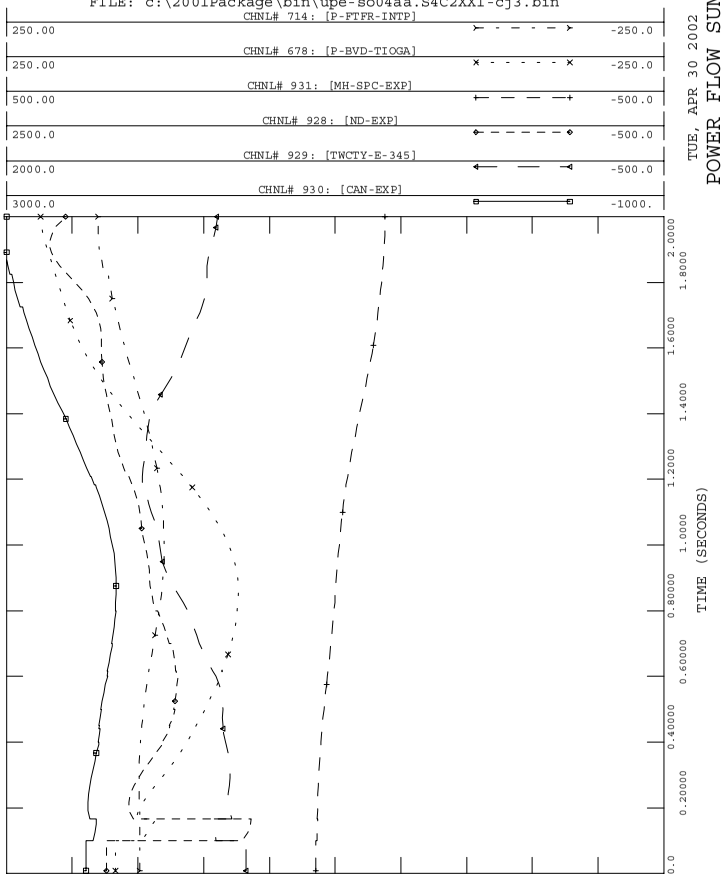
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
CAN. TIE FLOWS



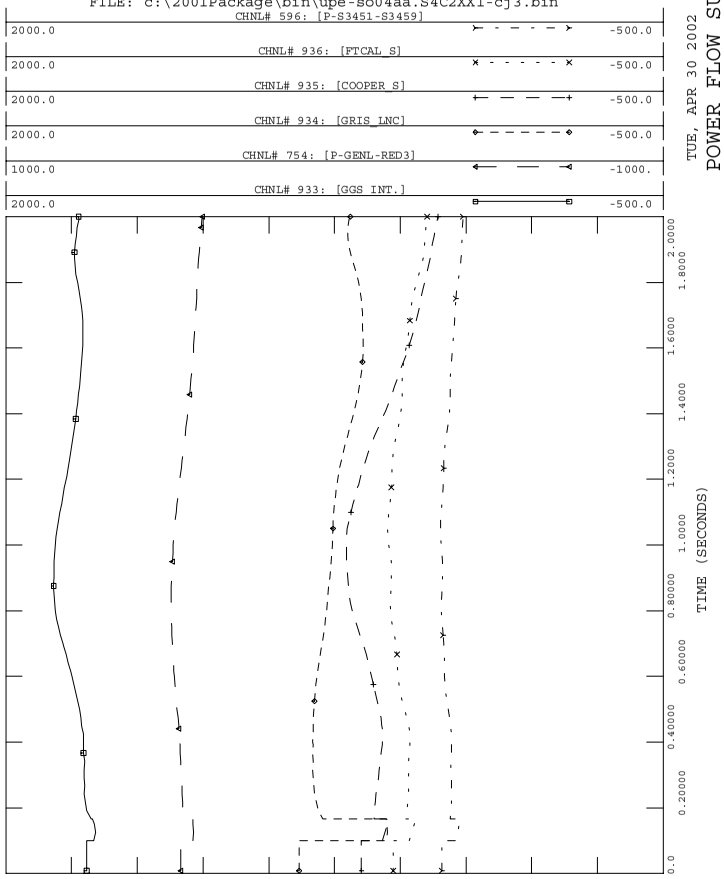
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
POWER FLOW SUMS 1



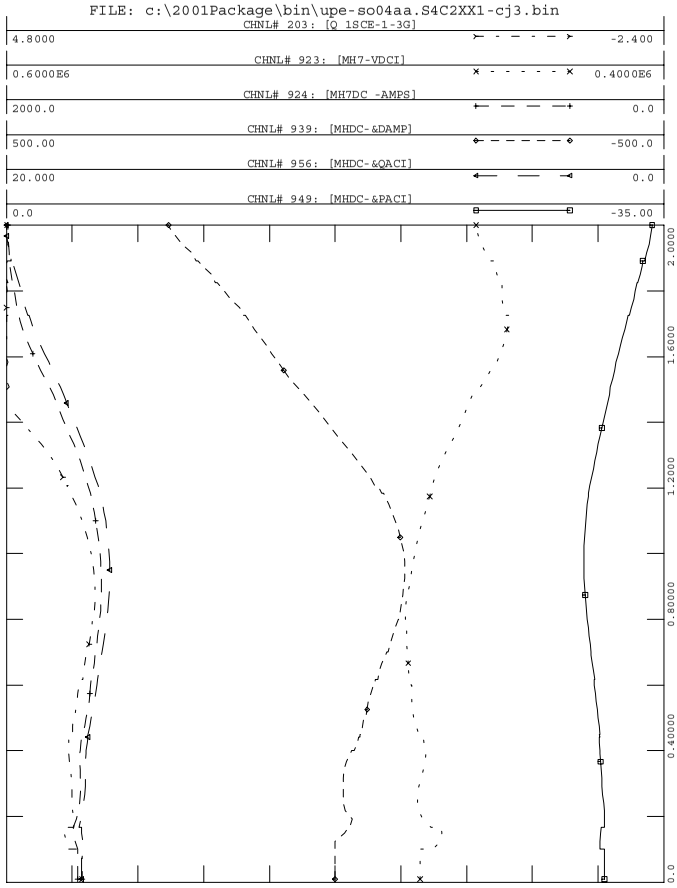
UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
POWER FLOW SUM 3



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
MH DC PARAMETERS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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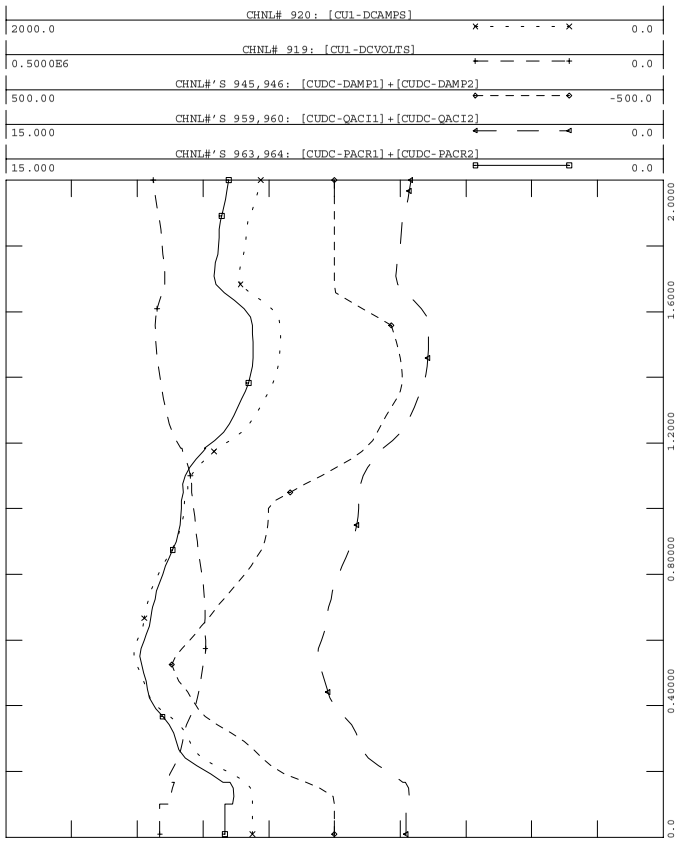
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
CU DC #1



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
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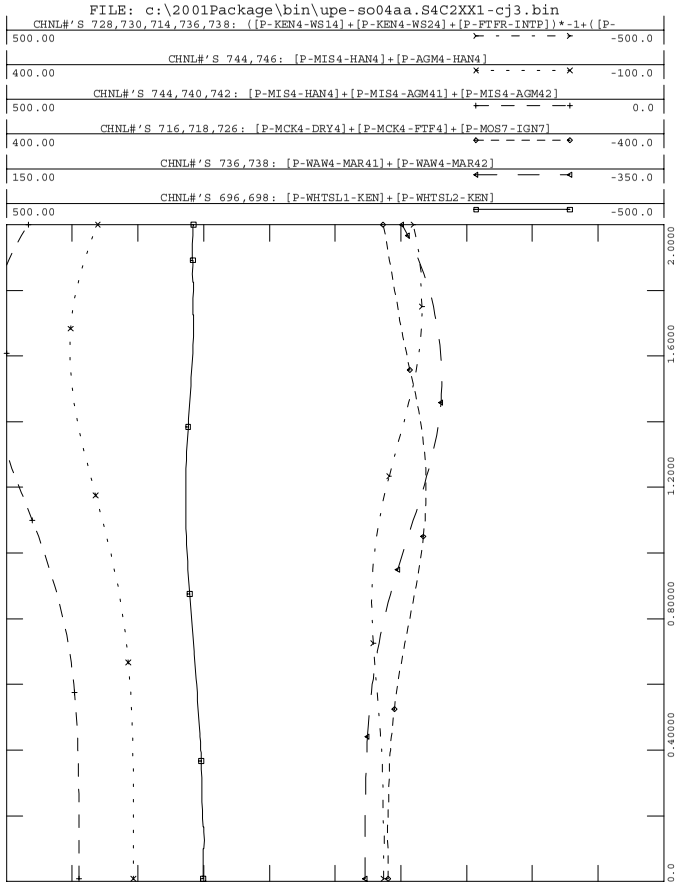
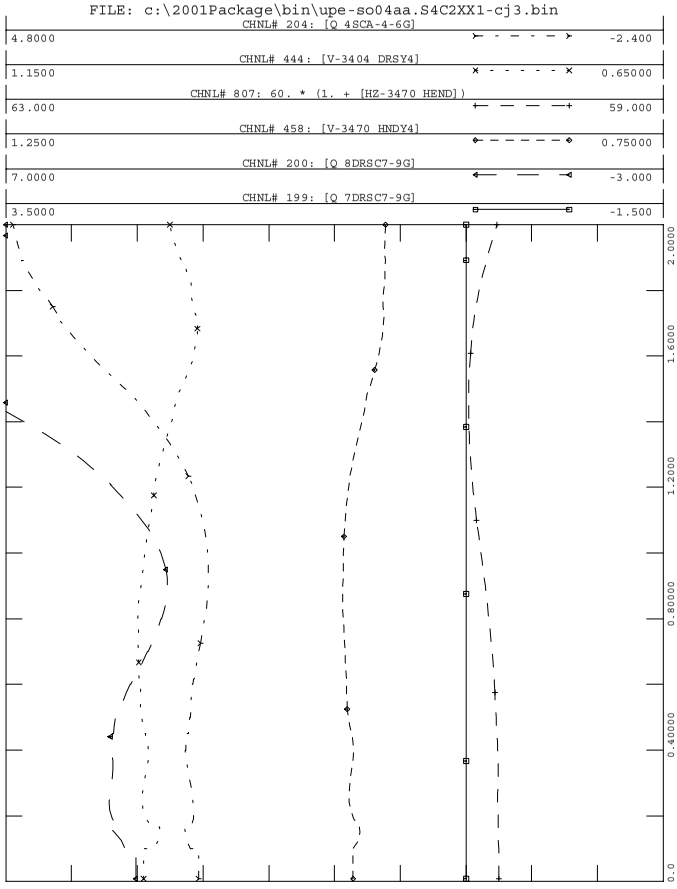
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04
OH TIE FLOWS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

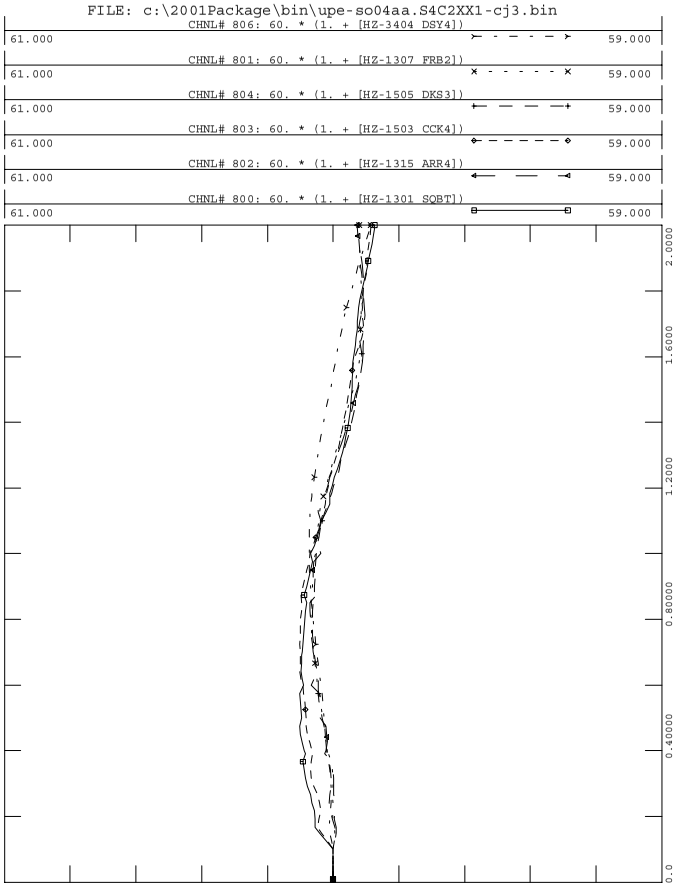
TUE, APR 30 2002 10:04
MH DC PARAMETERS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04

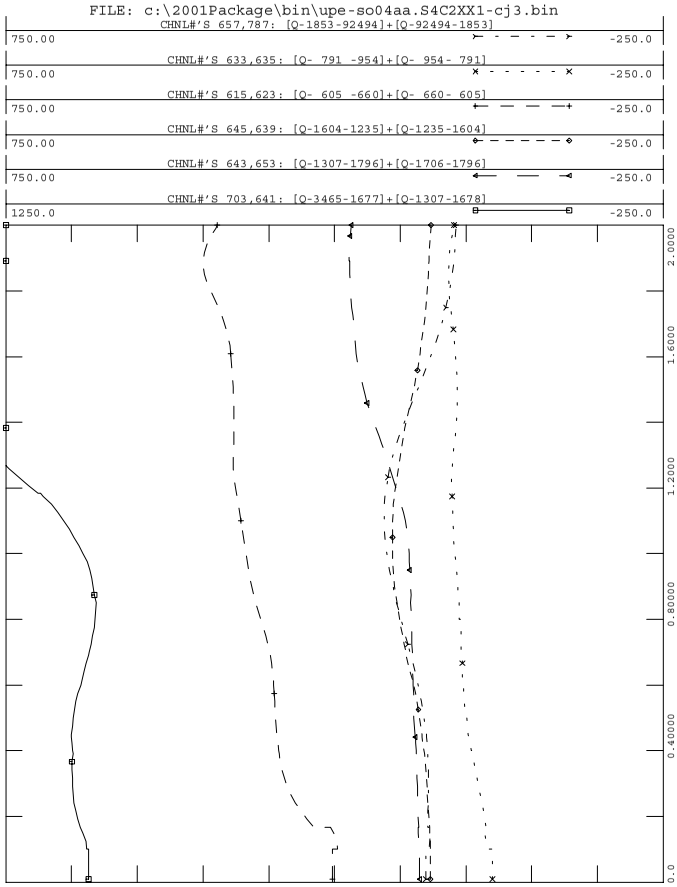
FREQ AT DC TERMINALS



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04

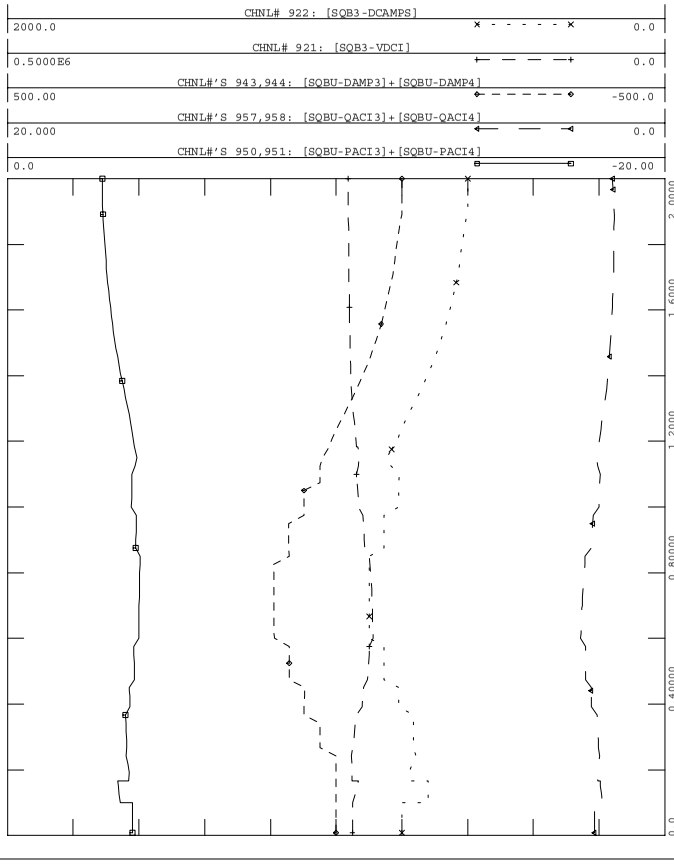
VAR LOSSES



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04

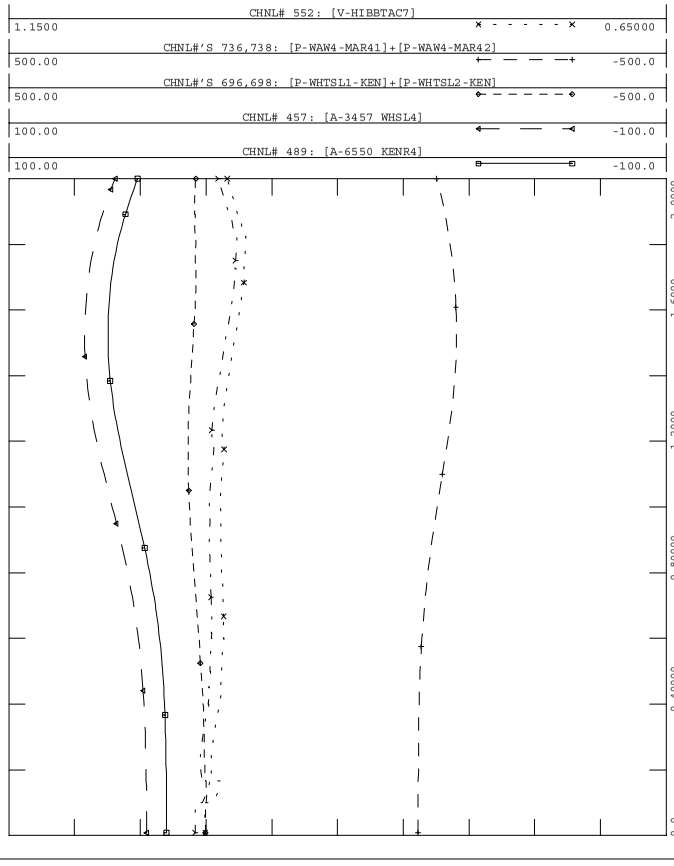
SQB DC #3



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

TUE, APR 30 2002 10:04

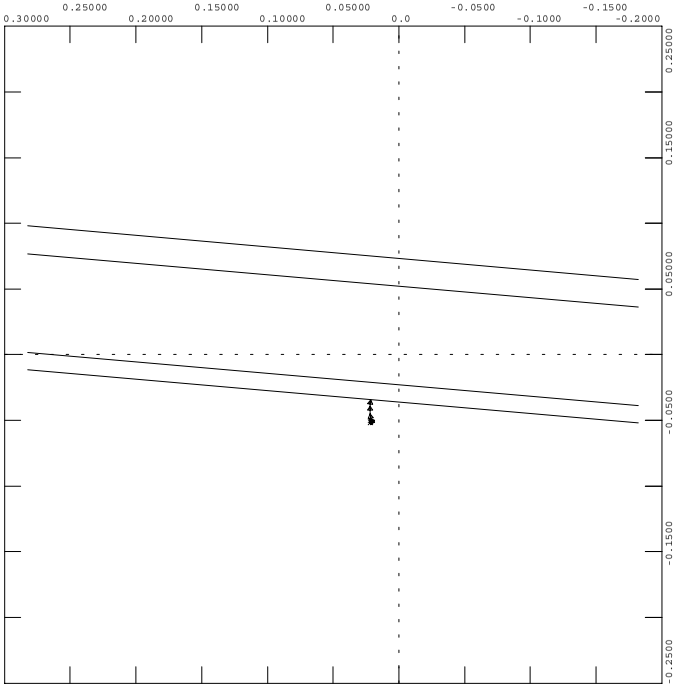
VOLTAGES, ANGLES



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

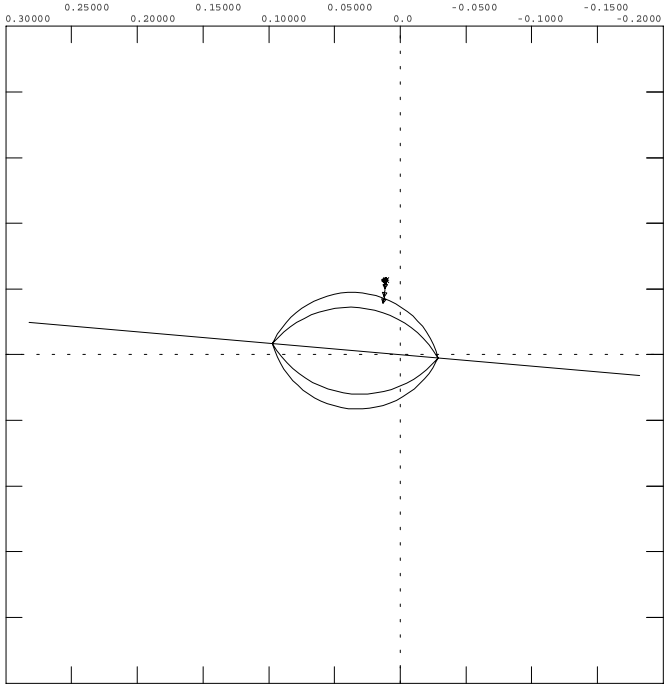


TUE, APR 30 2002 10:04
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

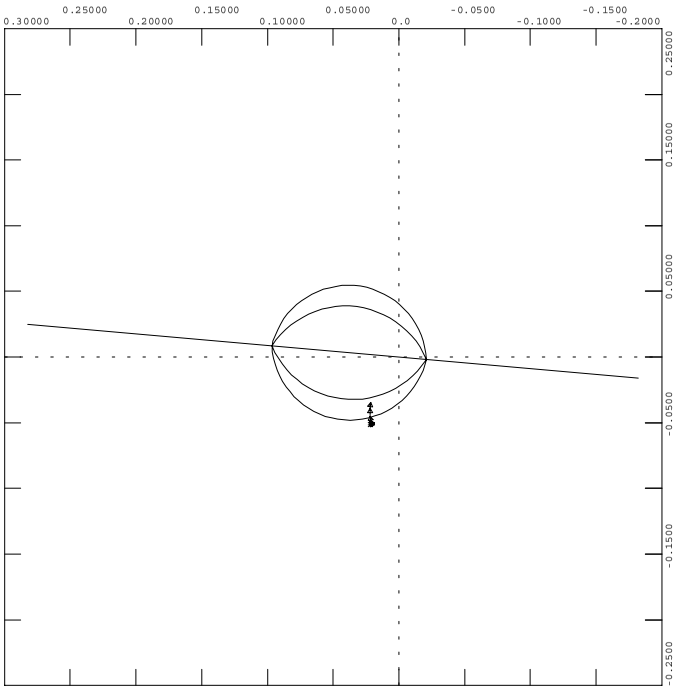


TUE, APR 30 2002 10:04
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

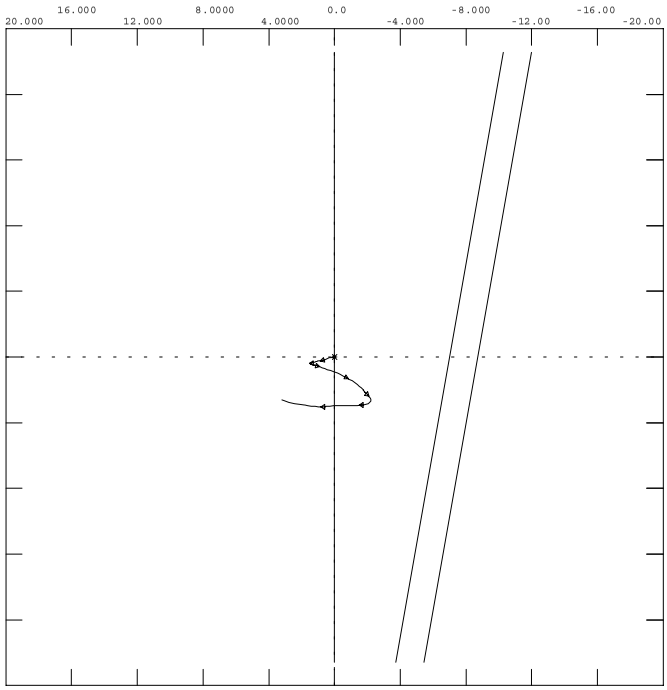


TUE, APR 30 2002 10:04
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

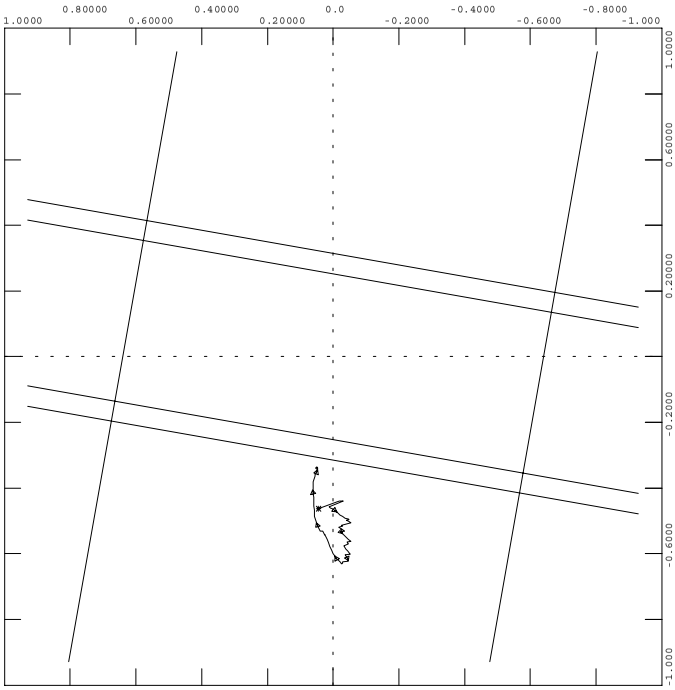


TUE, APR 30 2002 10:04
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

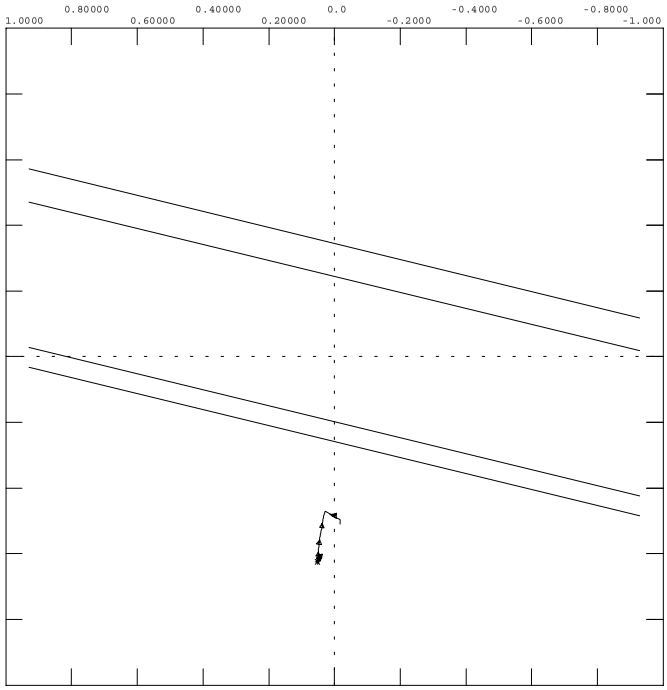
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

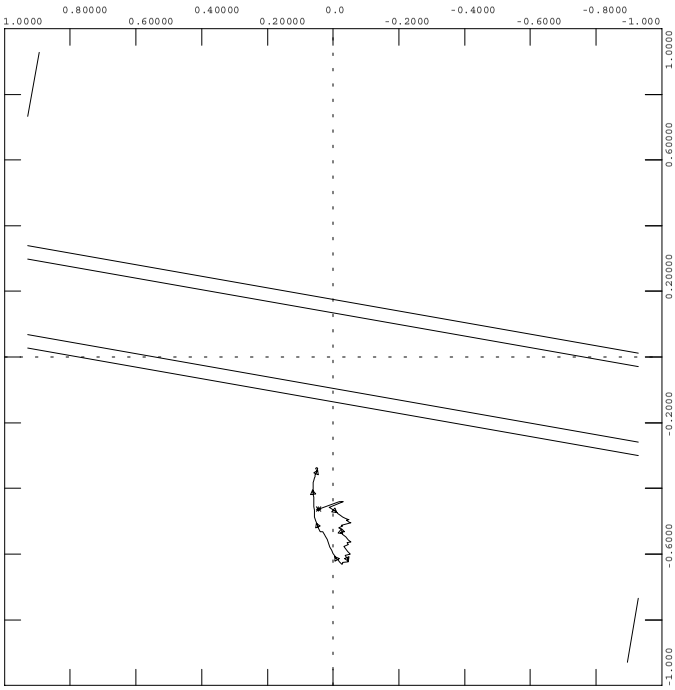
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

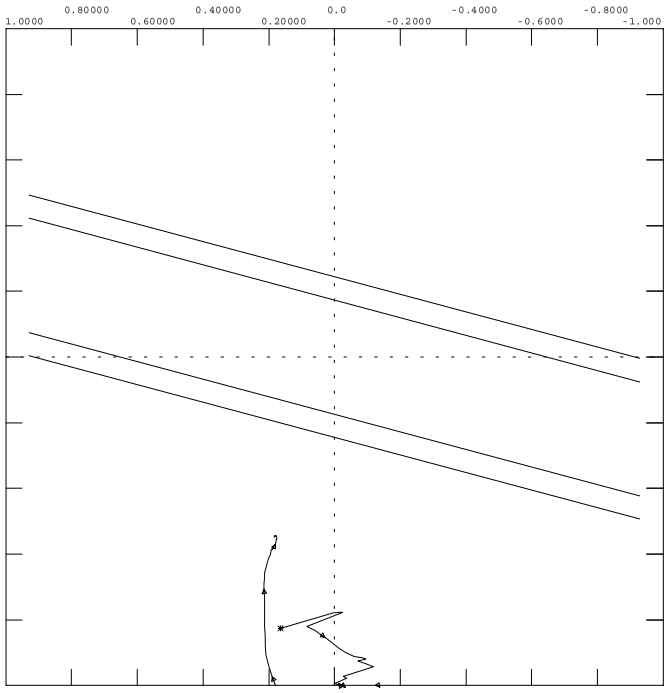
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

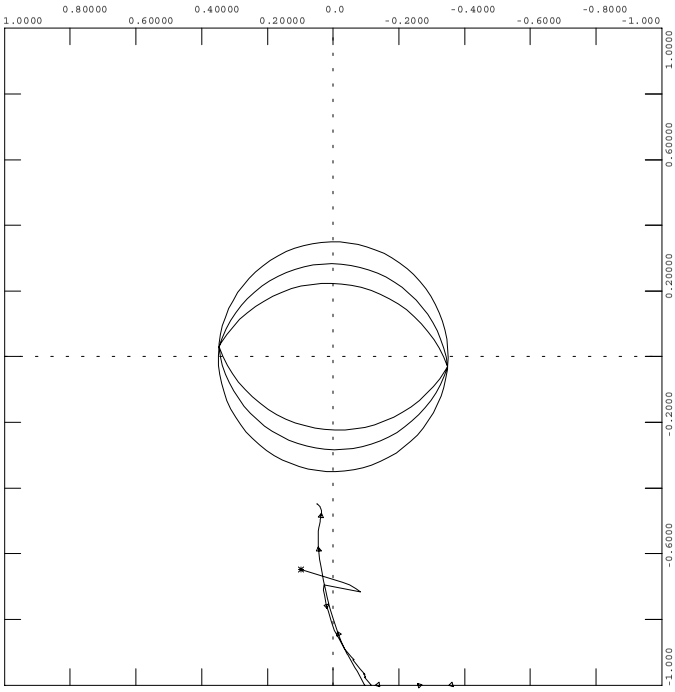
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

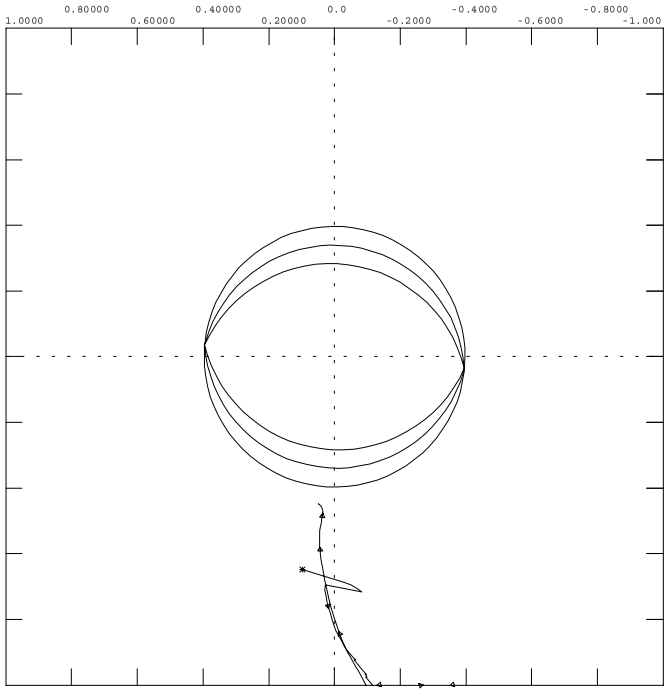


TUE, APR 30 2002 10:04
TIOGA-B.DAM-SOUTH (266)
CHNL# 813: [R-604 3203 1]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

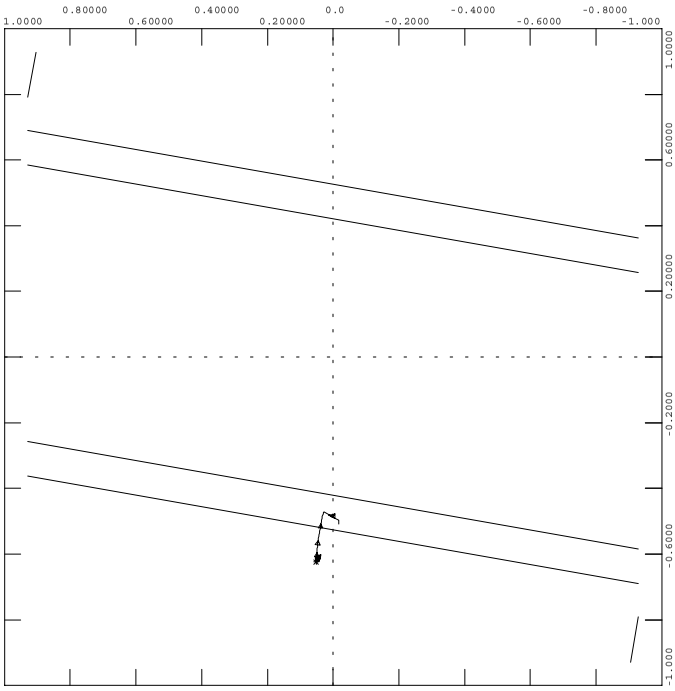


TUE, APR 30 2002 10:04
TIOGA-B.DAM-EMRG (267)
CHNL# 813: [R-604 3203 1]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

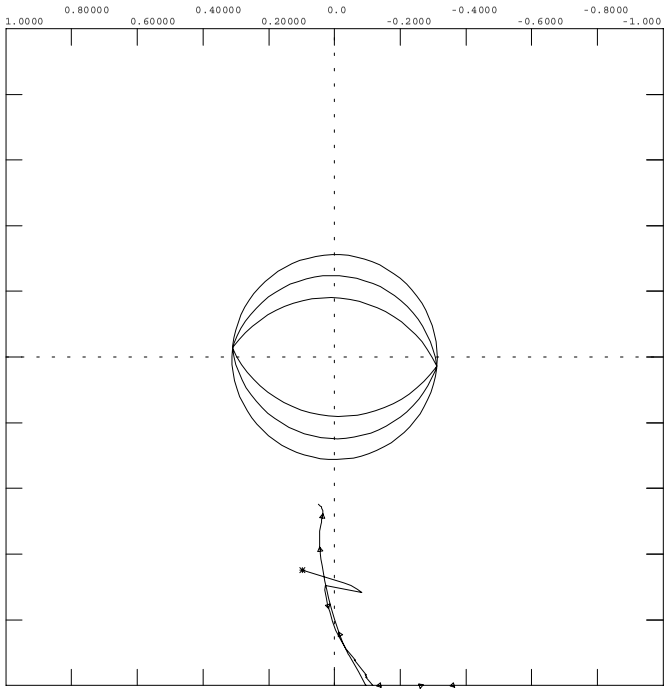


TUE, APR 30 2002 10:04
R50M-MORANVILLE-EMRG (777
CHNL# 821: [R-757 1679 1]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

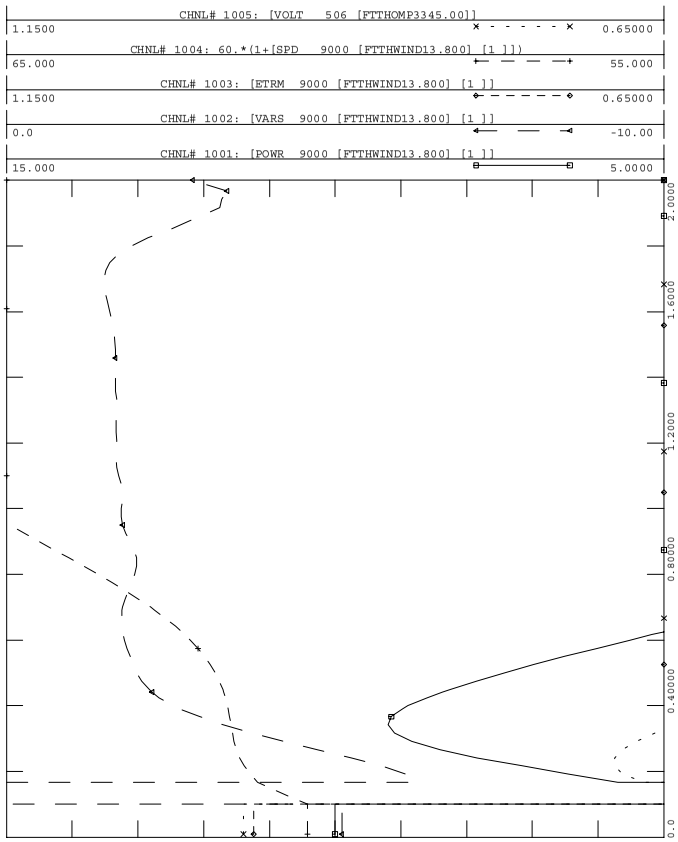
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



TUE, APR 30 2002 10:04
TIOGA-B.DAM-NORTH (268)
CHNL# 813: [R-604 3203 1]

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

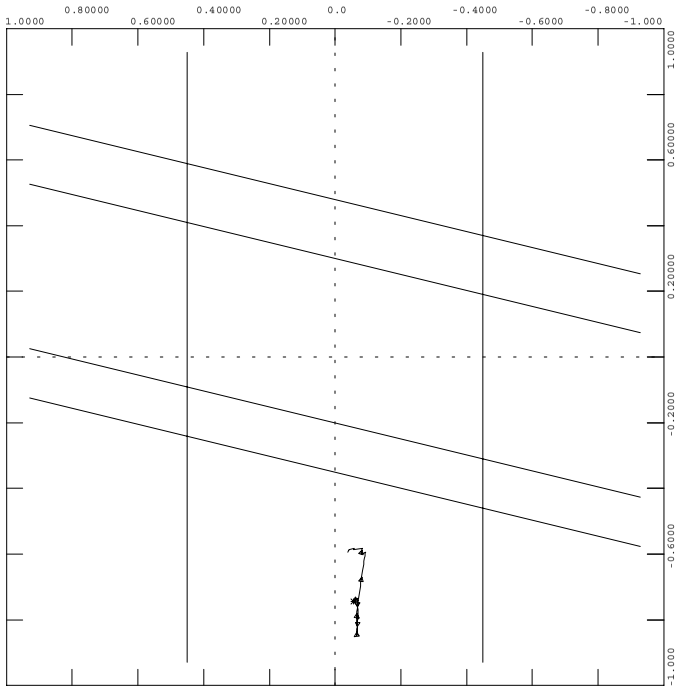


TUE, APR 30 2002 10:04
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C2XX1.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2XX1-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



TUE, APR 30 2002 10:04
MP-OH I.FALLS (779)

APPENDIX 27

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

SITE 4 (FT. THOMPSON)

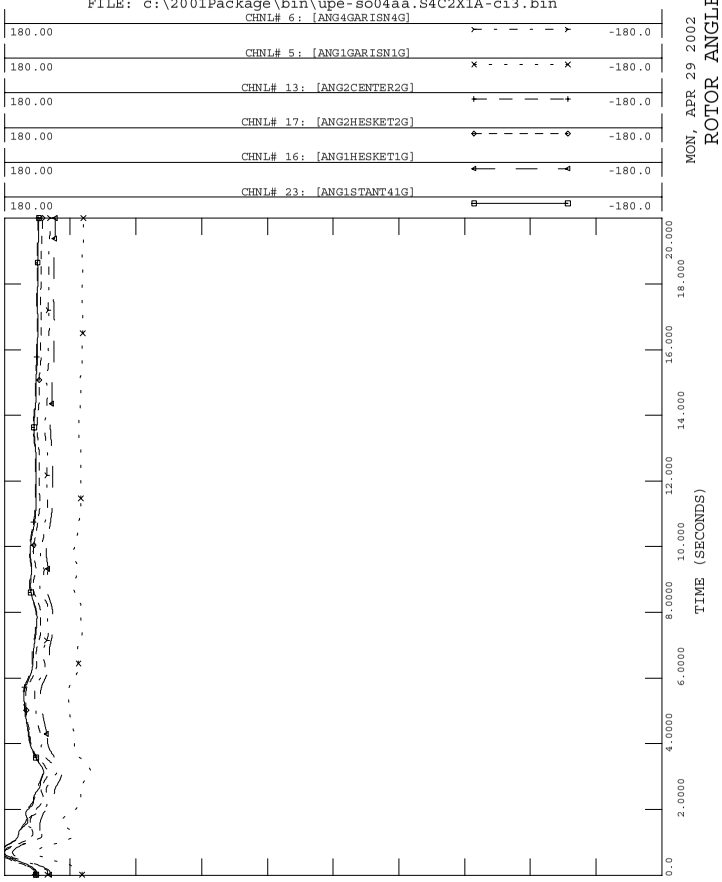
CASE S4C2X1A

CONTINGENCY CI3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Leland Olds 345 kV line

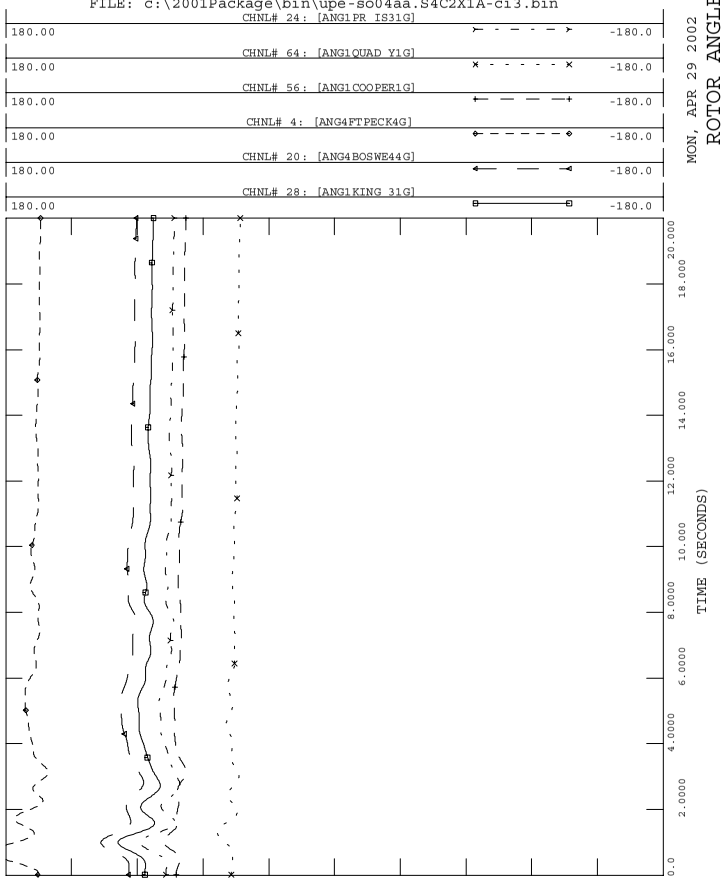
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

MON, APR 29 2002 23:14
ROTOR ANGLES 2



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

MON, APR 29 2002 23:14
ROTOR ANGLES 4



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FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

MON, APR 29 2002 23:14
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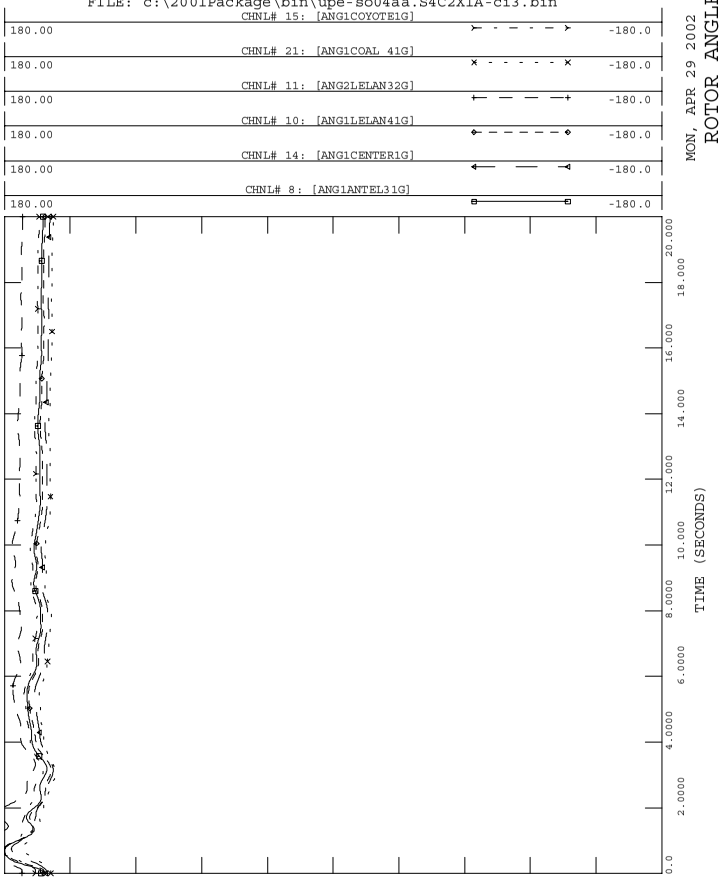

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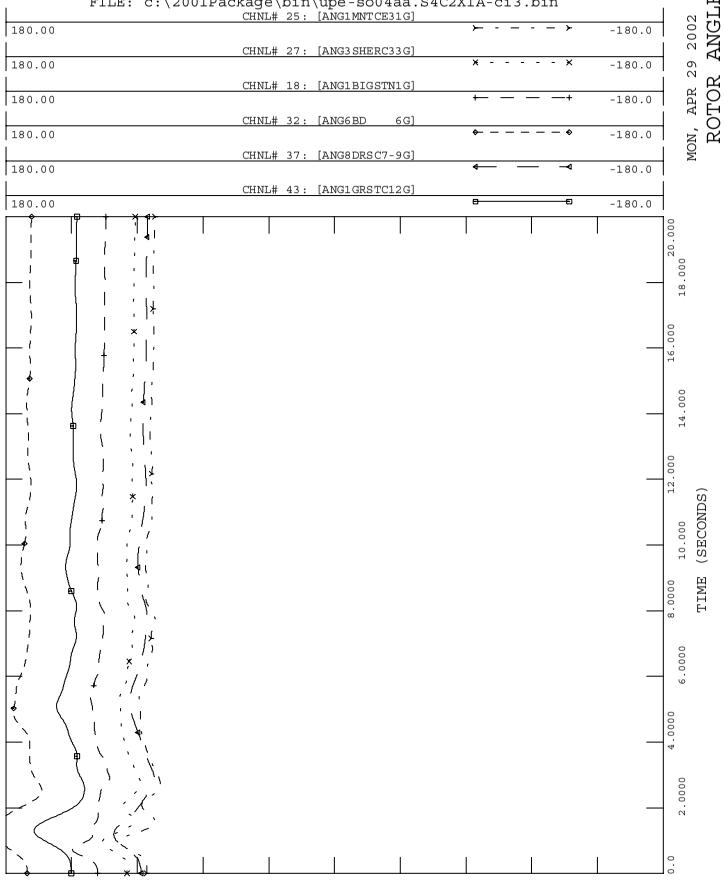
ROTOR ANGLES 3



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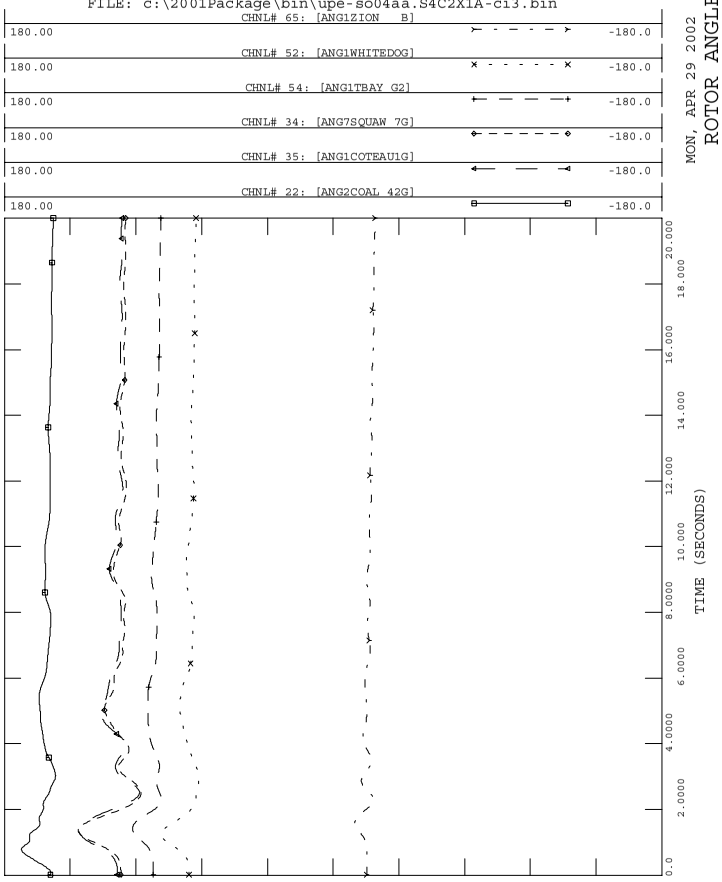
ROTOR ANGLES 6



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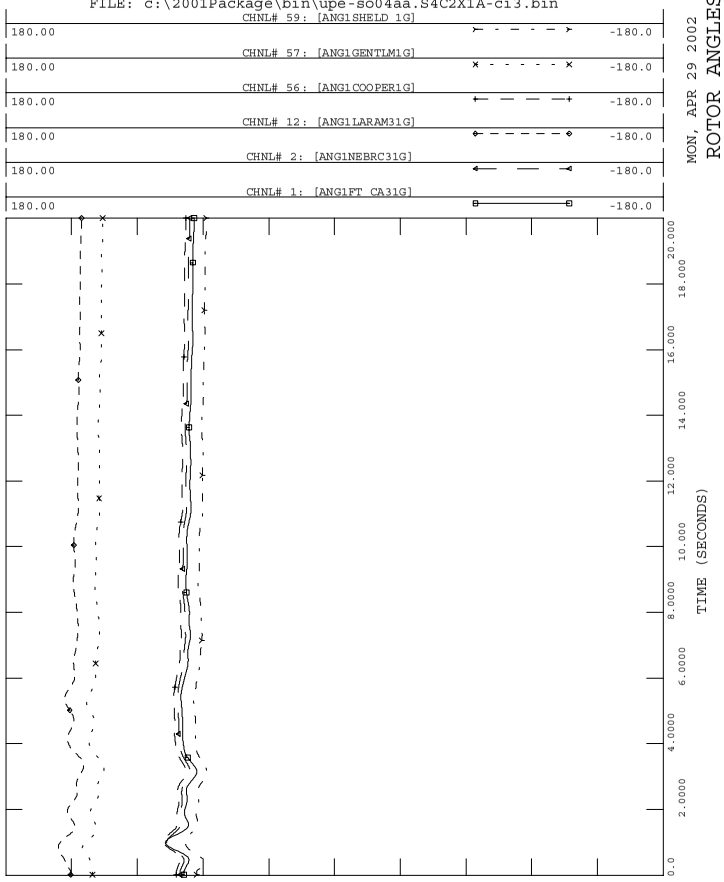
ROTOR ANGLES NB



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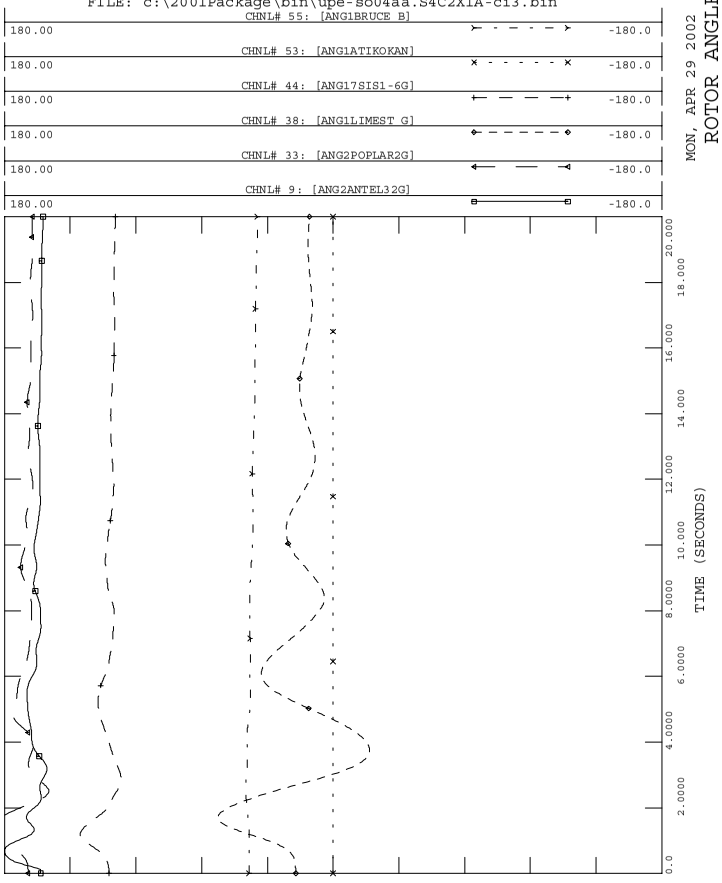
ROTOR ANGLES 5



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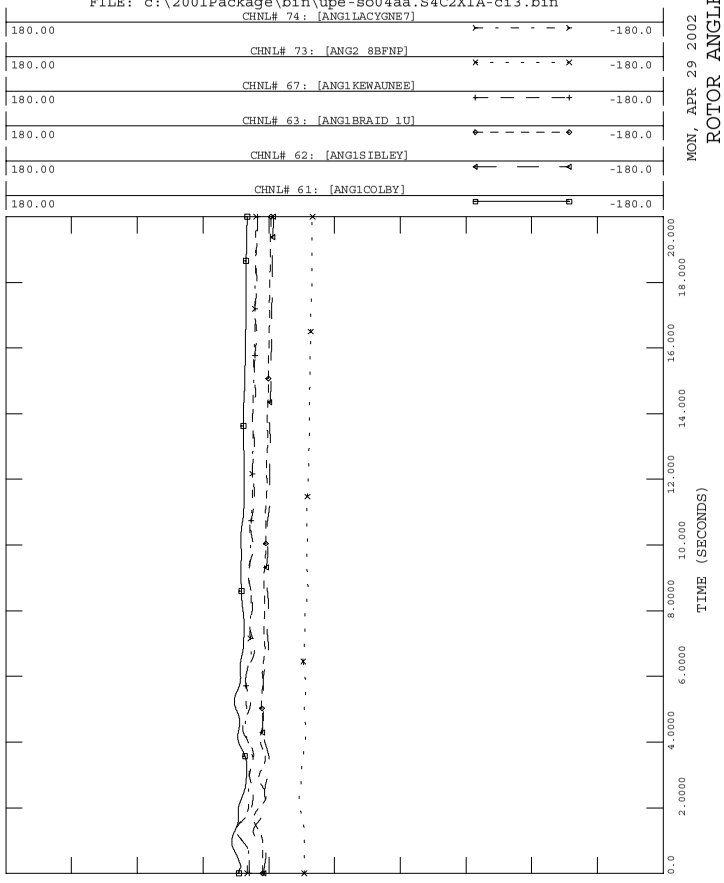
MON, APR 29 2002 23:14
ROTOR ANGLES 7



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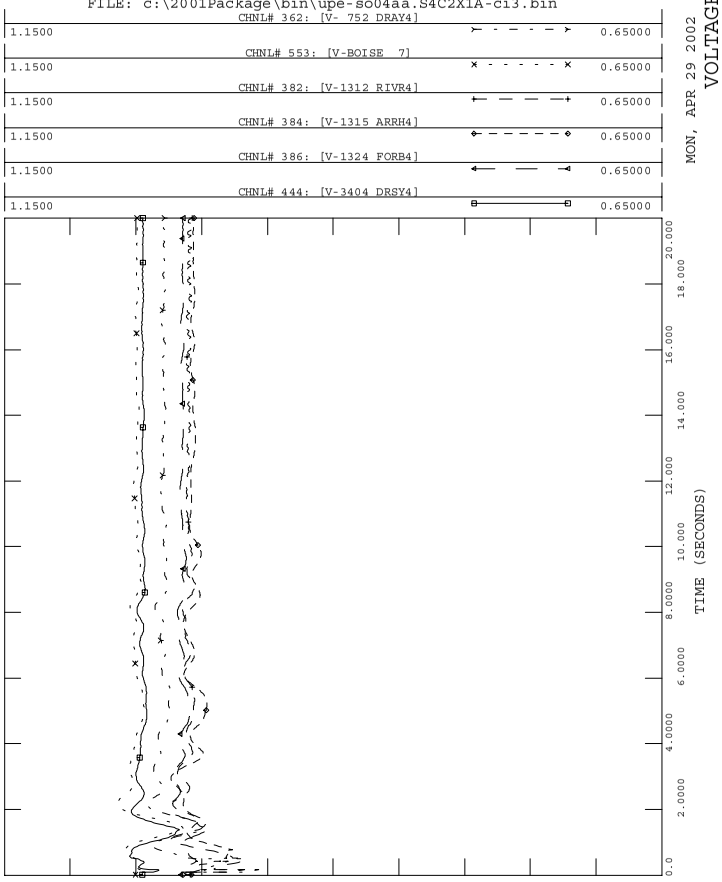
VOLTAGES 1



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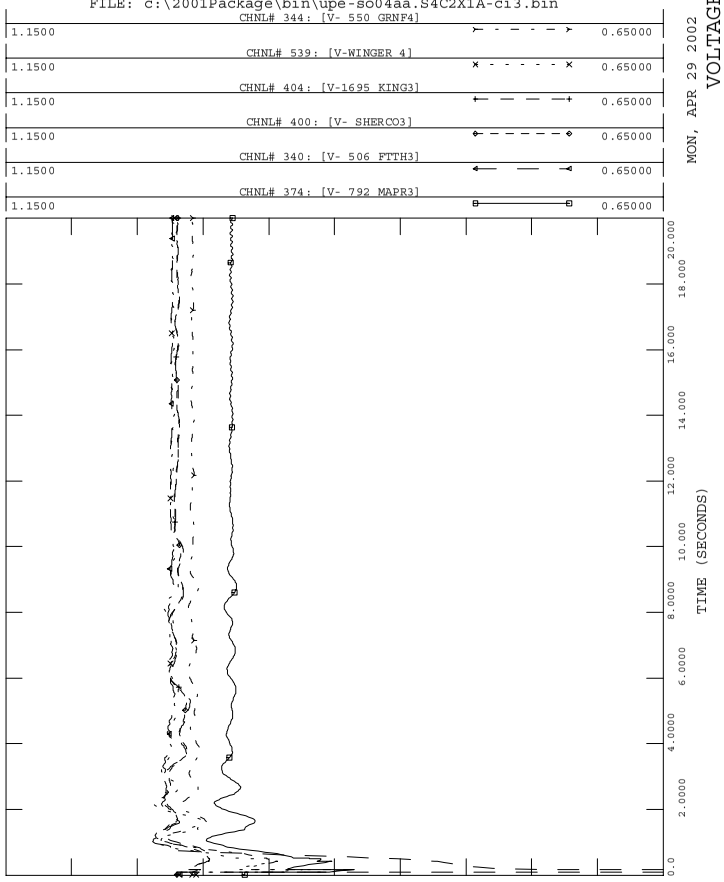
MON, APR 29 2002 23:14
VOLTAGES 3



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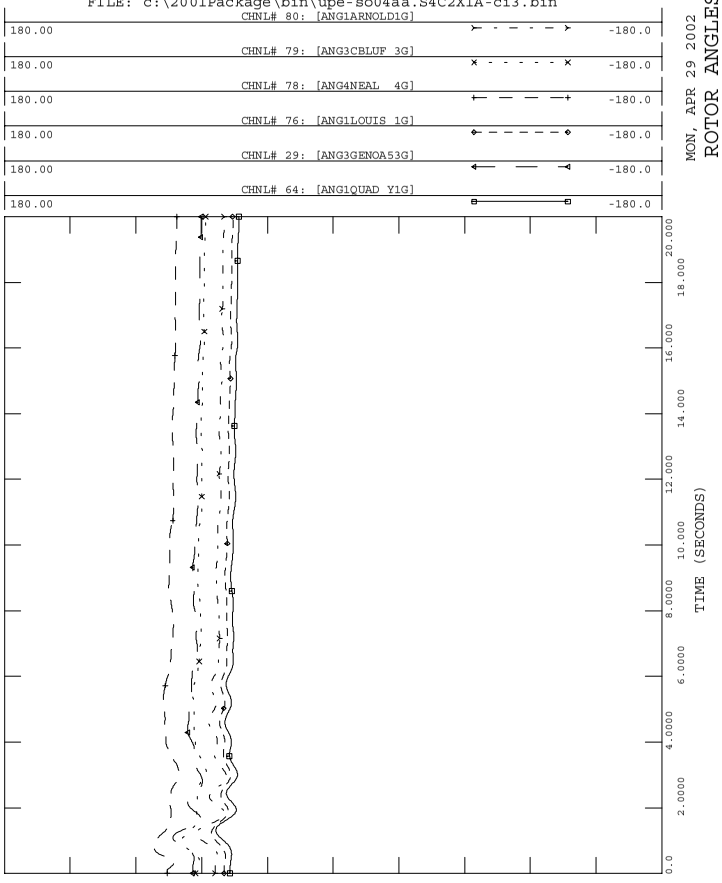
ROTOR ANGLES IA



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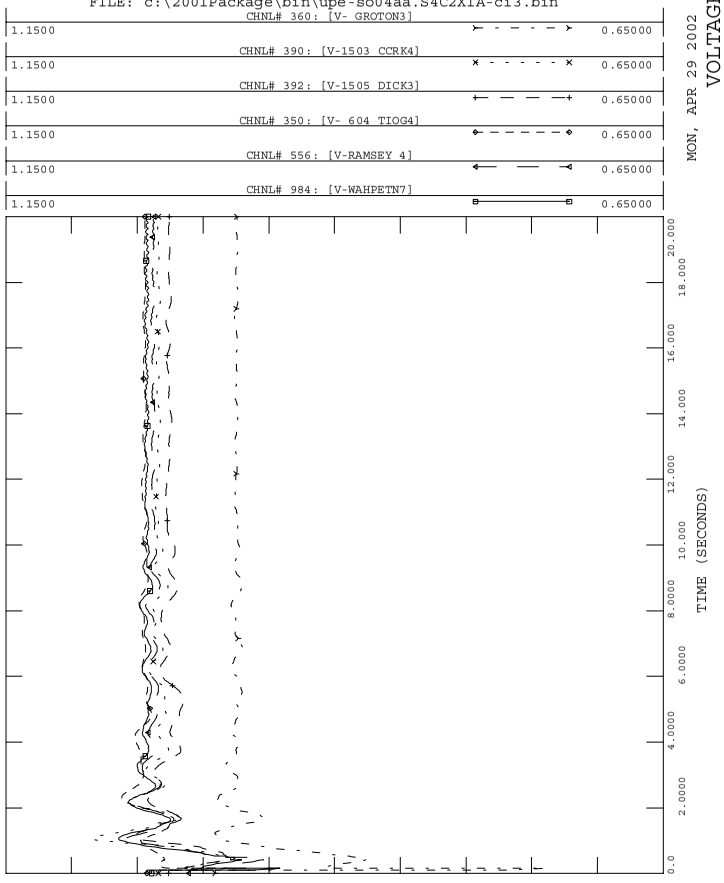
VOLTAGES 2



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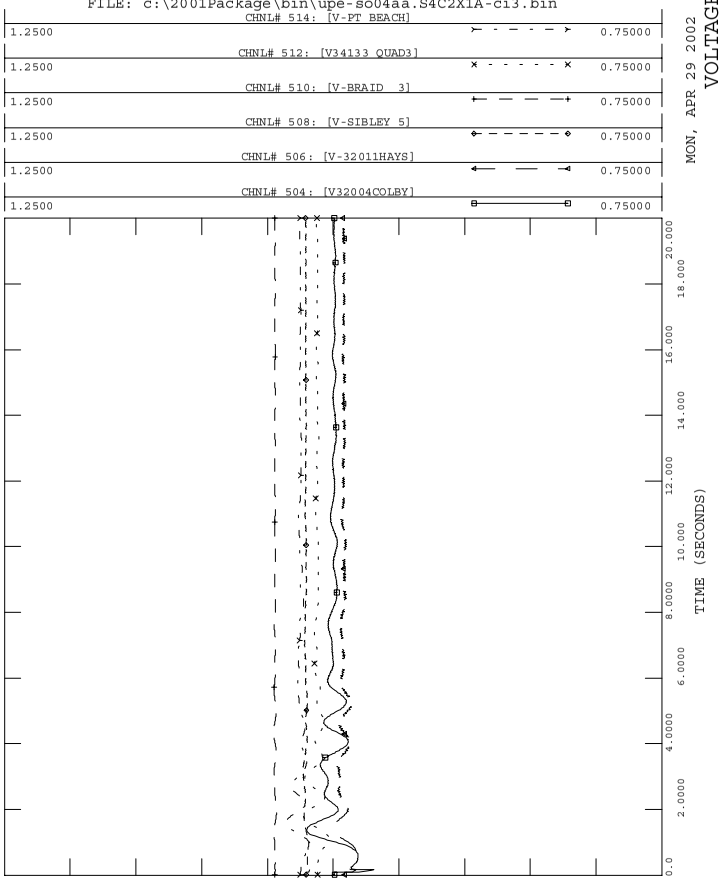
VOLTAGES 5



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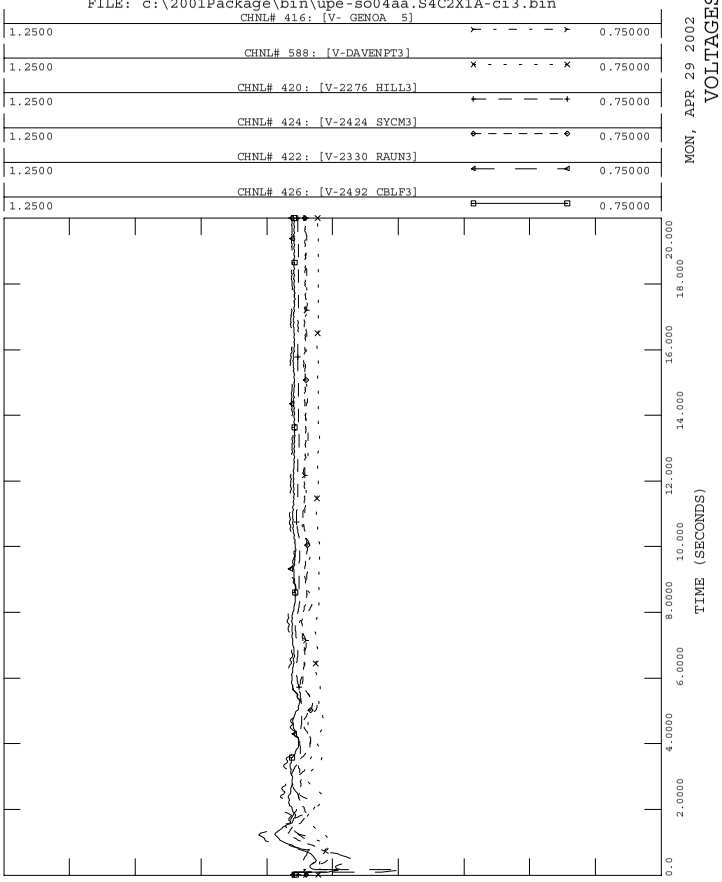
VOLTAGES IA



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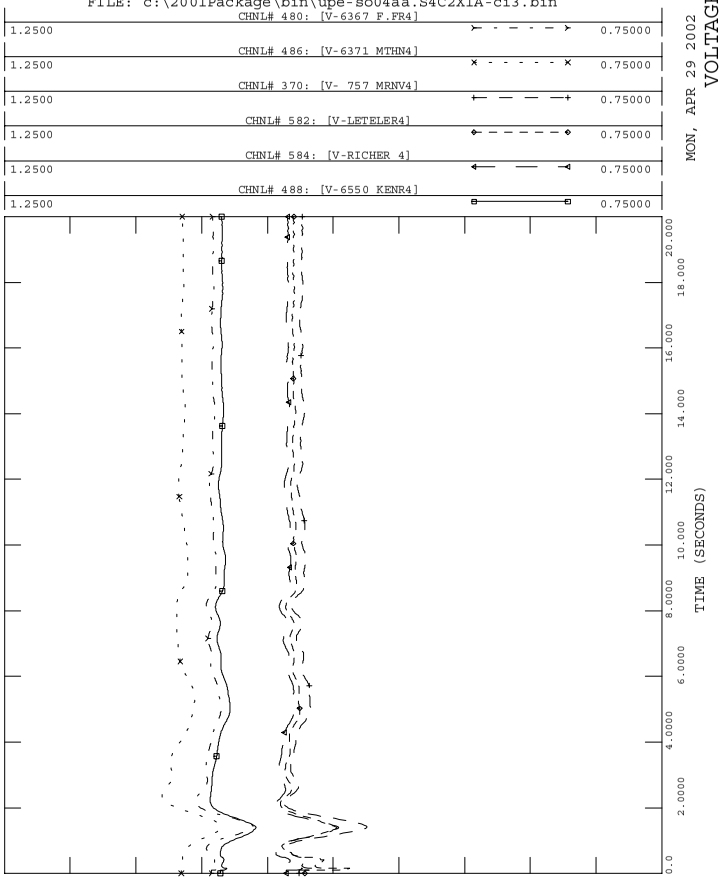
VOLTAGES 4



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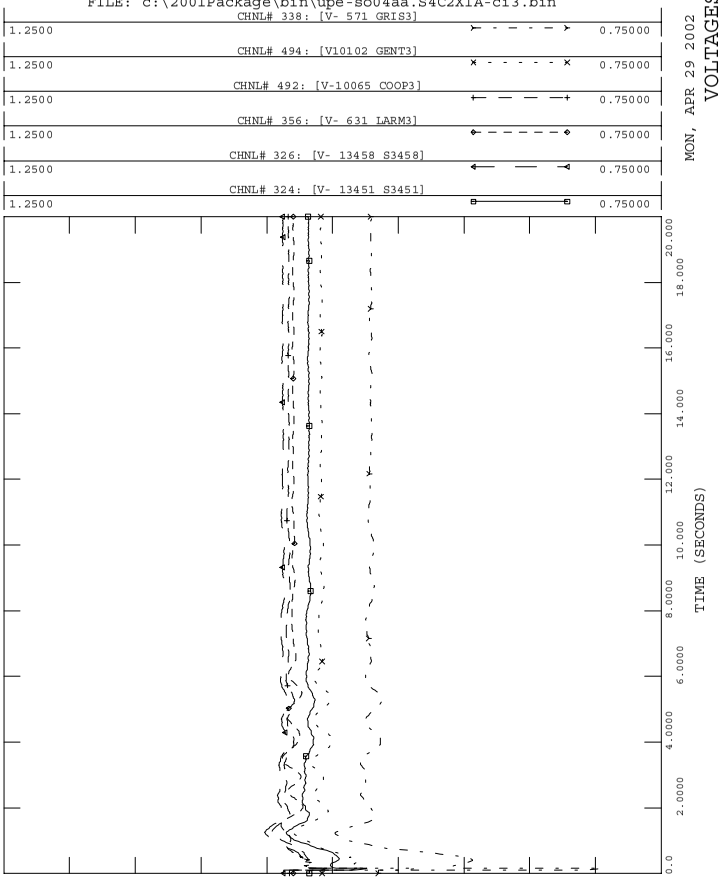
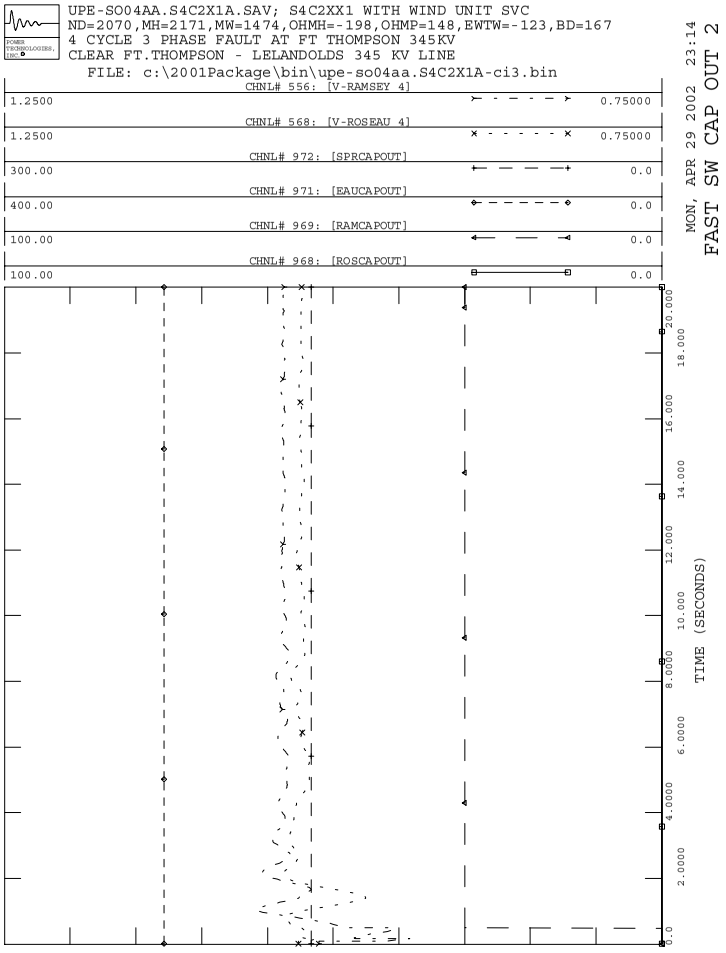
VOLTAGES NB

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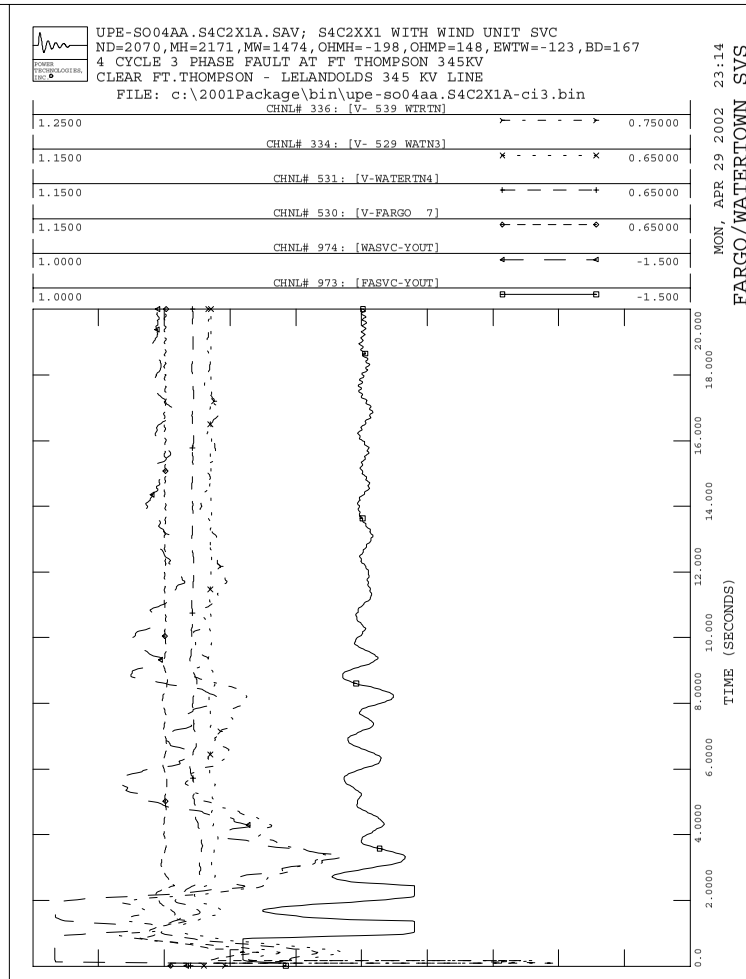
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
MON, APR 29 2002 23:14
FAST SW CAP OUT 2
TIME (SECONDS)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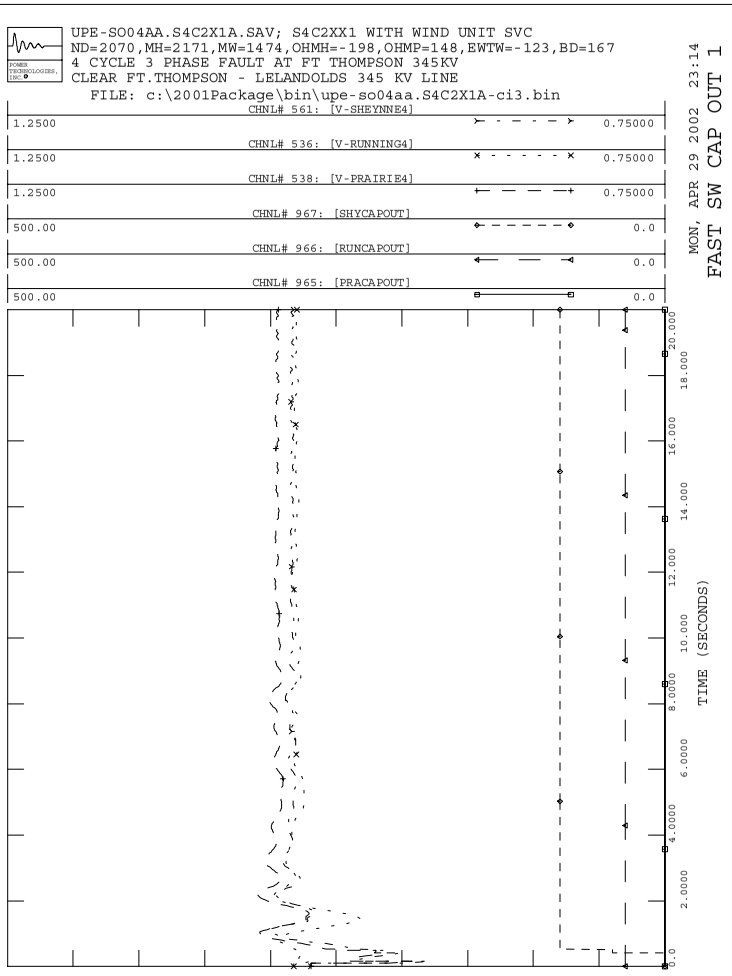
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
MON, APR 29 2002 23:14
FARGO/WATERTOWN SVS
TIME (SECONDS)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CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
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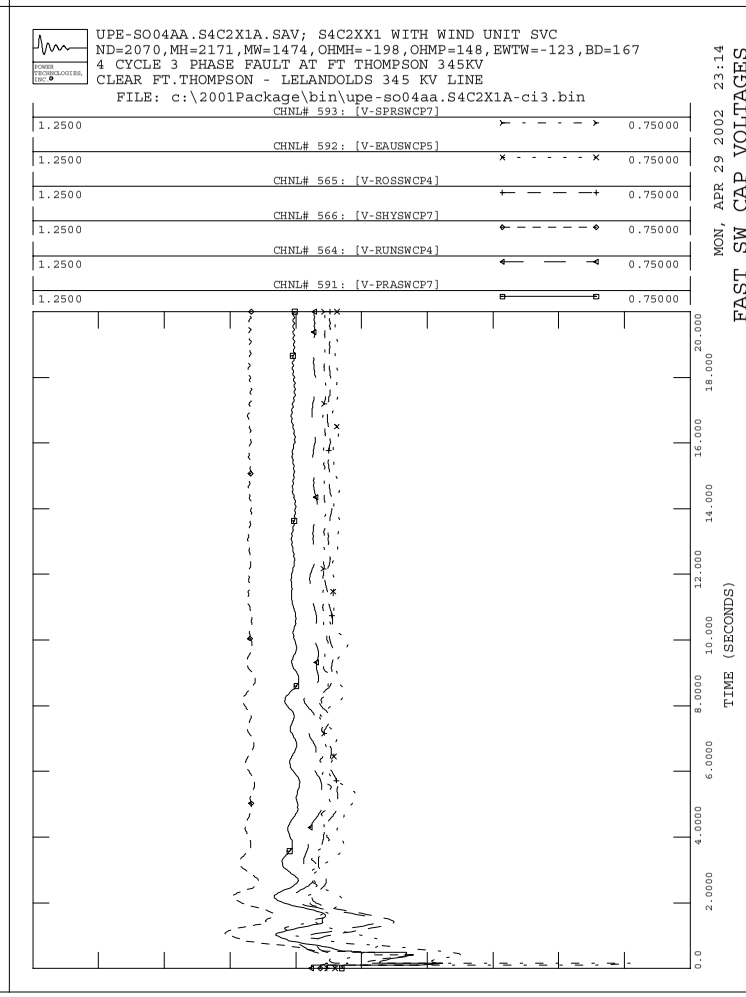
CHNL# 965: [PRACAPOUT]
MON, APR 29 2002 23:14
FAST SW CAP OUT 1
TIME (SECONDS)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FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
MON, APR 29 2002 23:14
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
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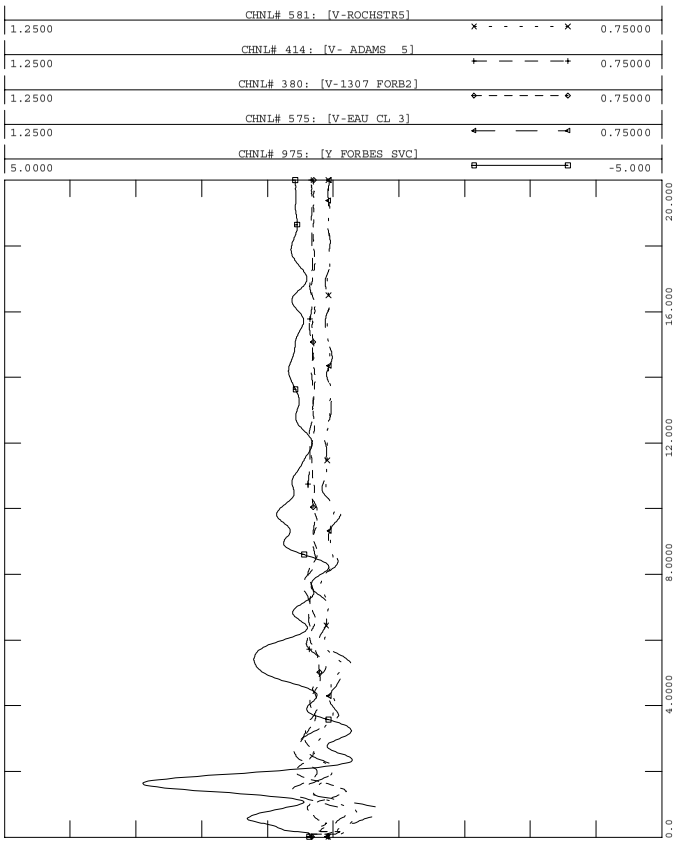
SVC & WISCONSIN VOLT



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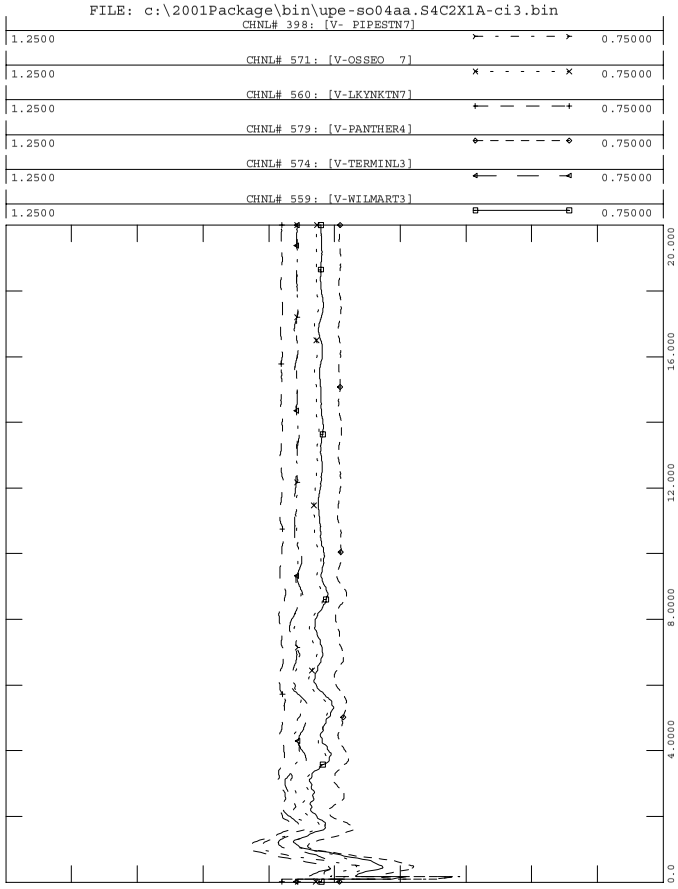
MON, APR 29 2002 23:14

TC VOLTAGES



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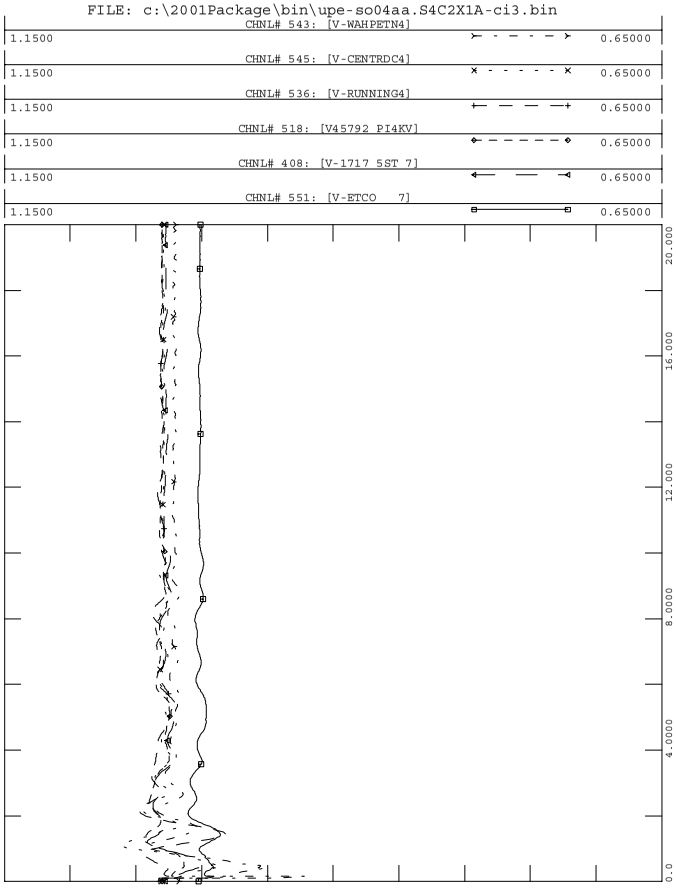
MON, APR 29 2002 23:14

VOLTAGES 6



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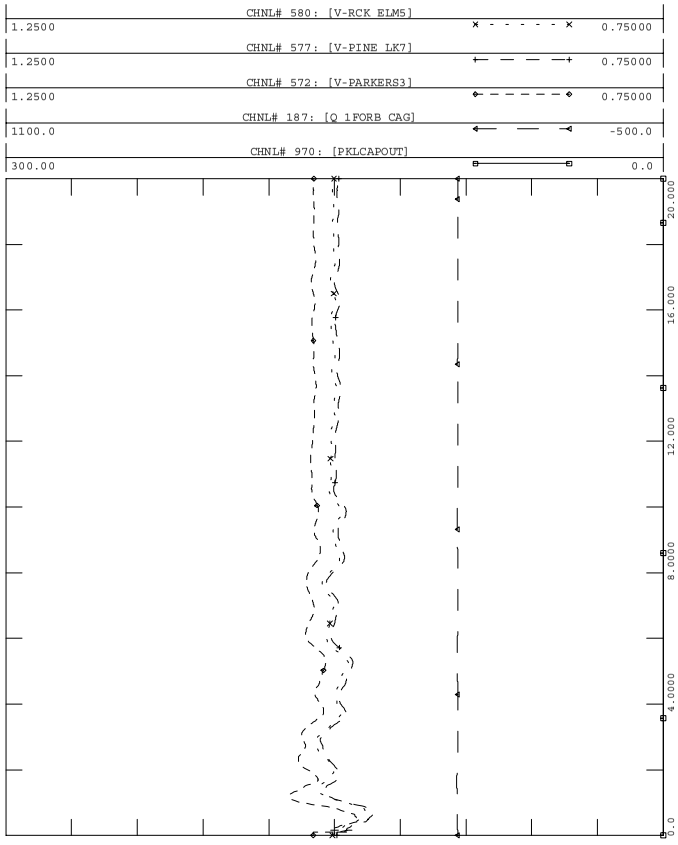
MON, APR 29 2002 23:14

FORBES SVS OUT & VOLTAGES



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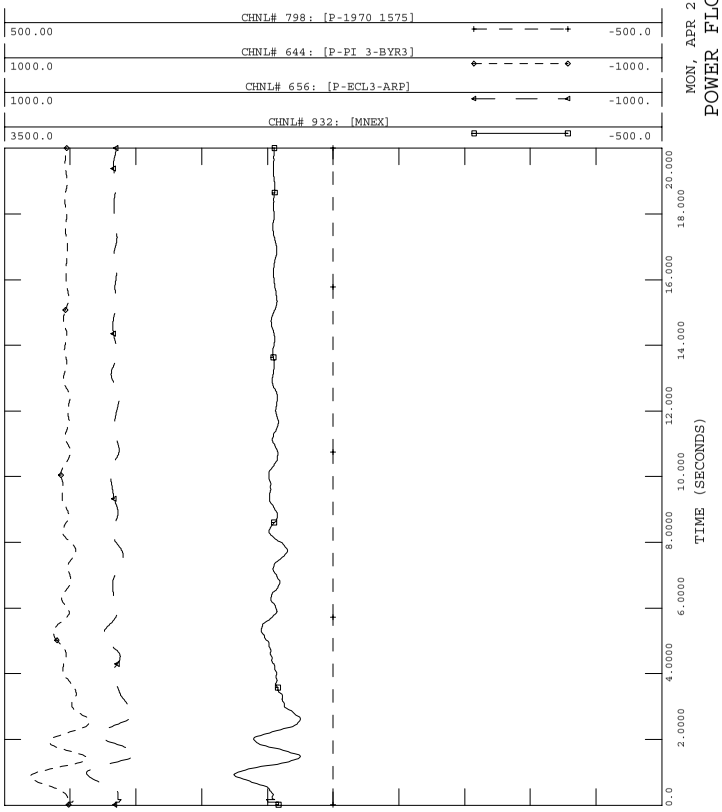
POWER FLOW SUMS 2



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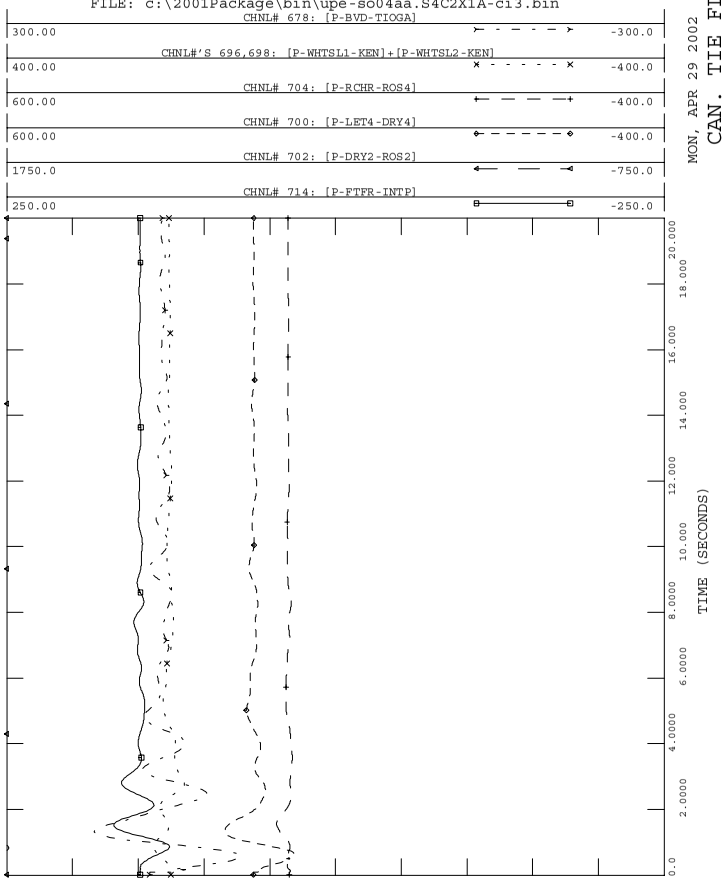
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

MON, APR 29 2002 23:14
CAN. TIE FLOWS



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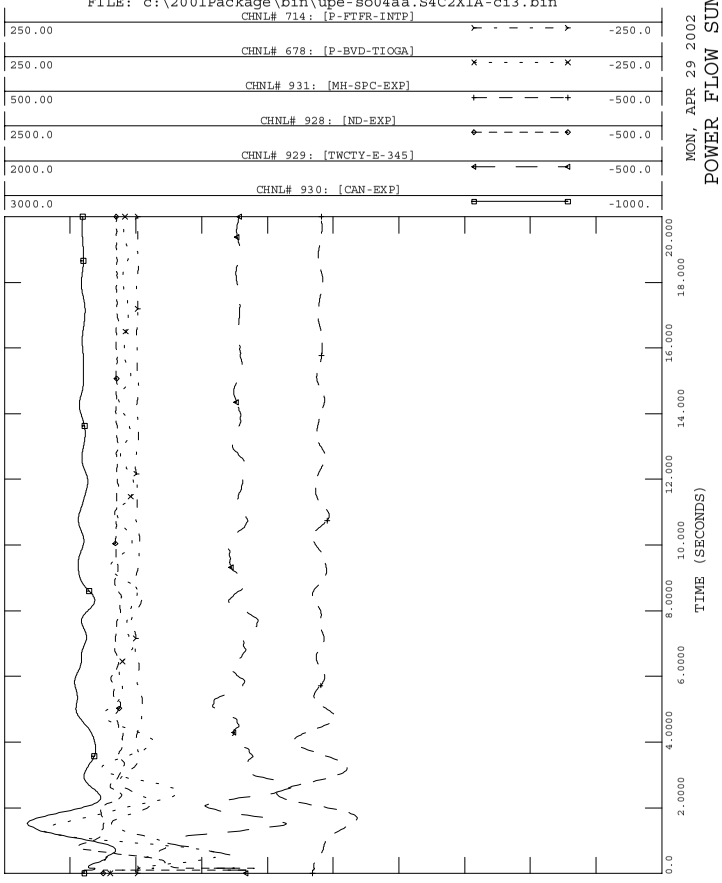
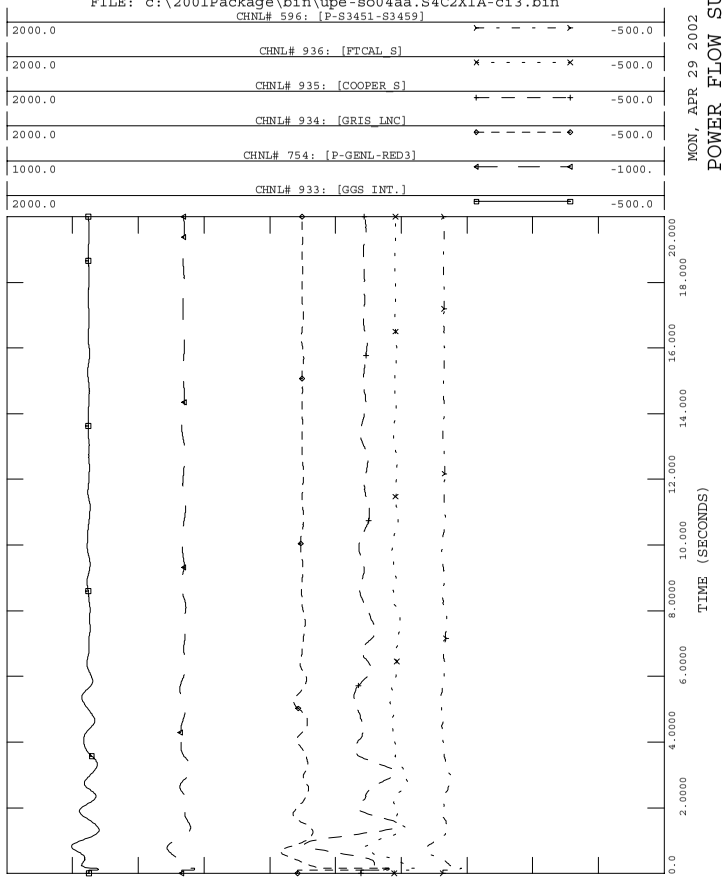
MON, APR 29 2002 23:14
POWER FLOW SUMS 1



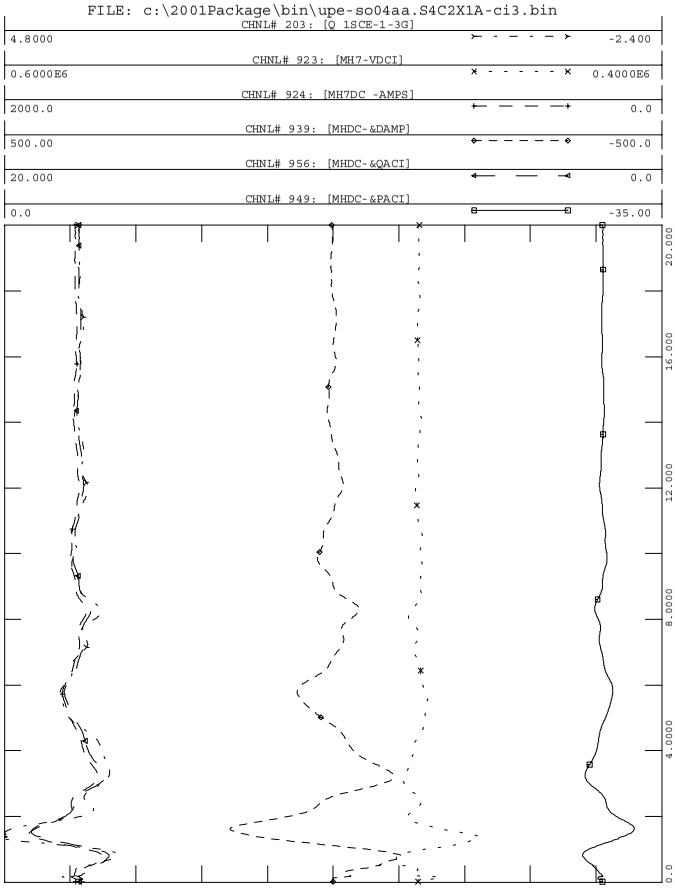
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

MON, APR 29 2002 23:14
POWER FLOW SUM 3



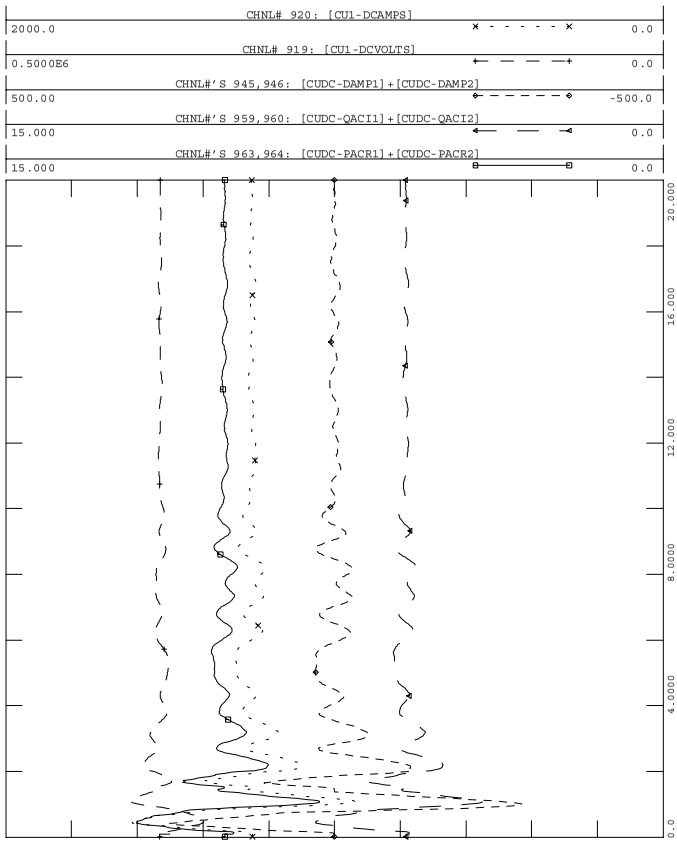
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

MON, APR 29 2002 23:14
MH DC PARAMETERS



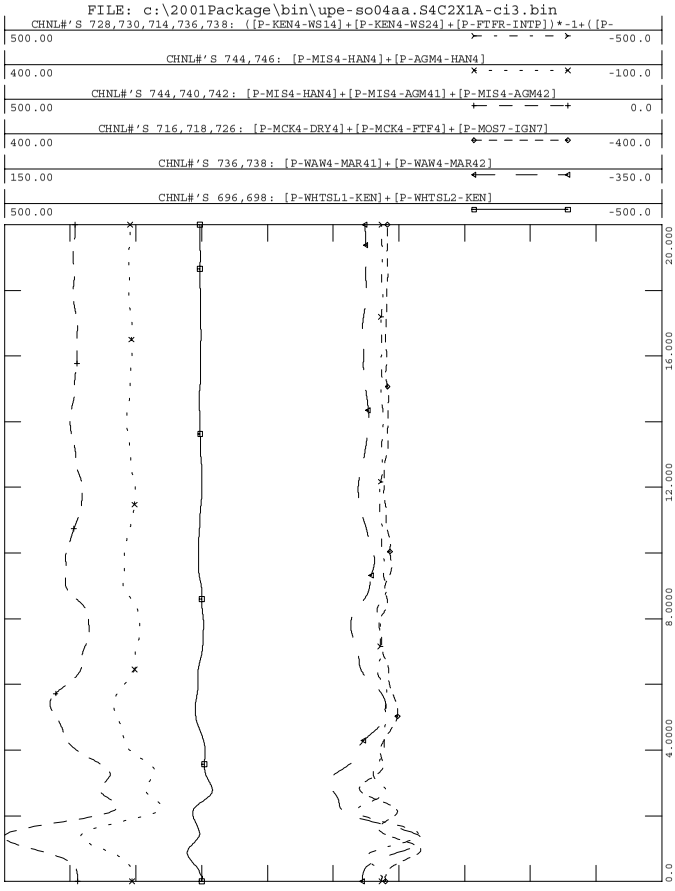
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

MON, APR 29 2002 23:14
CU DC #1



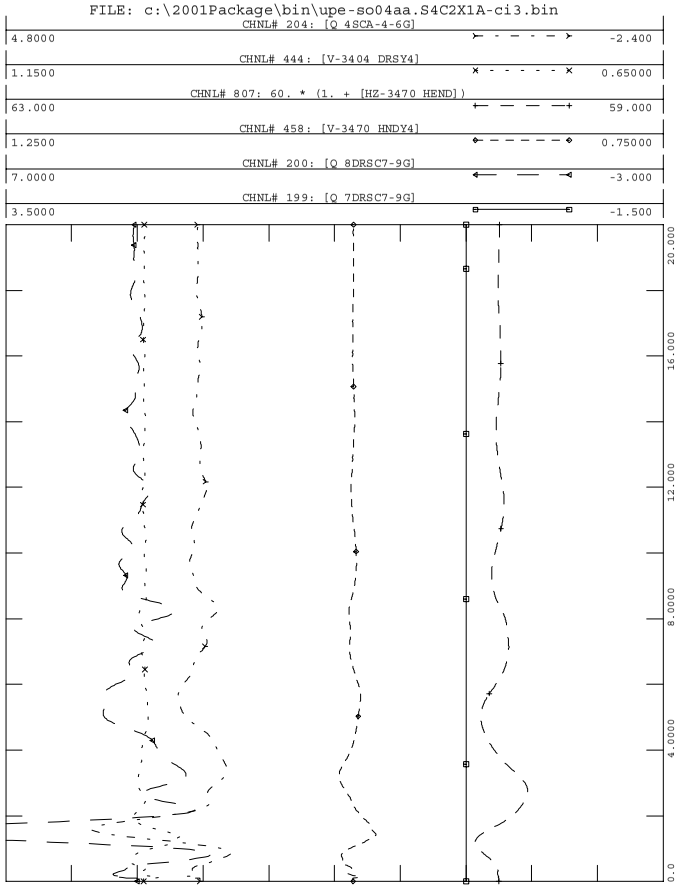
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

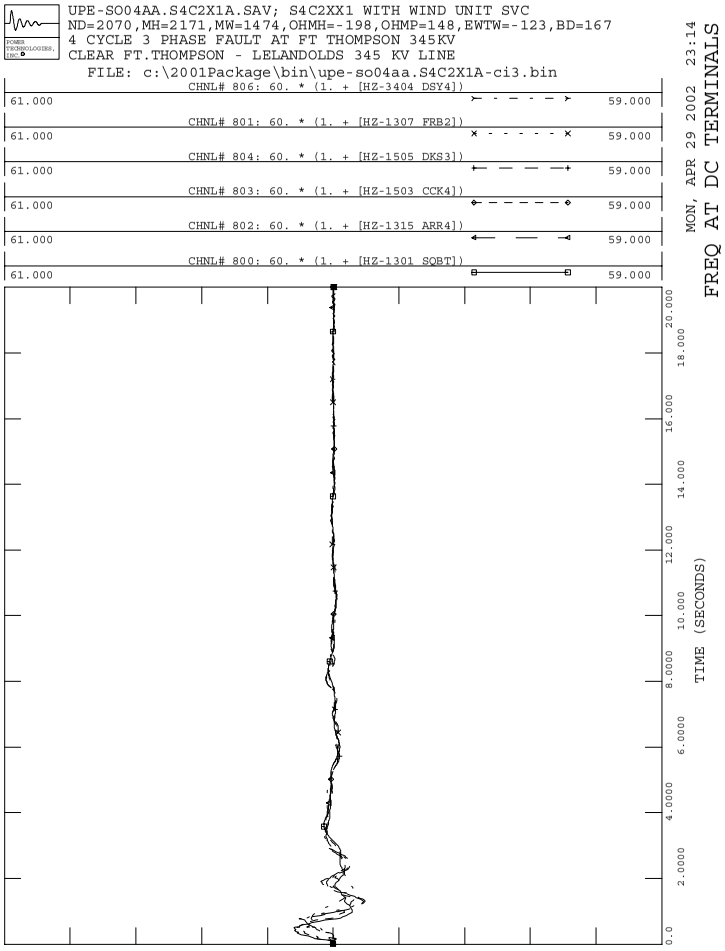
MON, APR 29 2002 23:14
OH TIE FLOWS

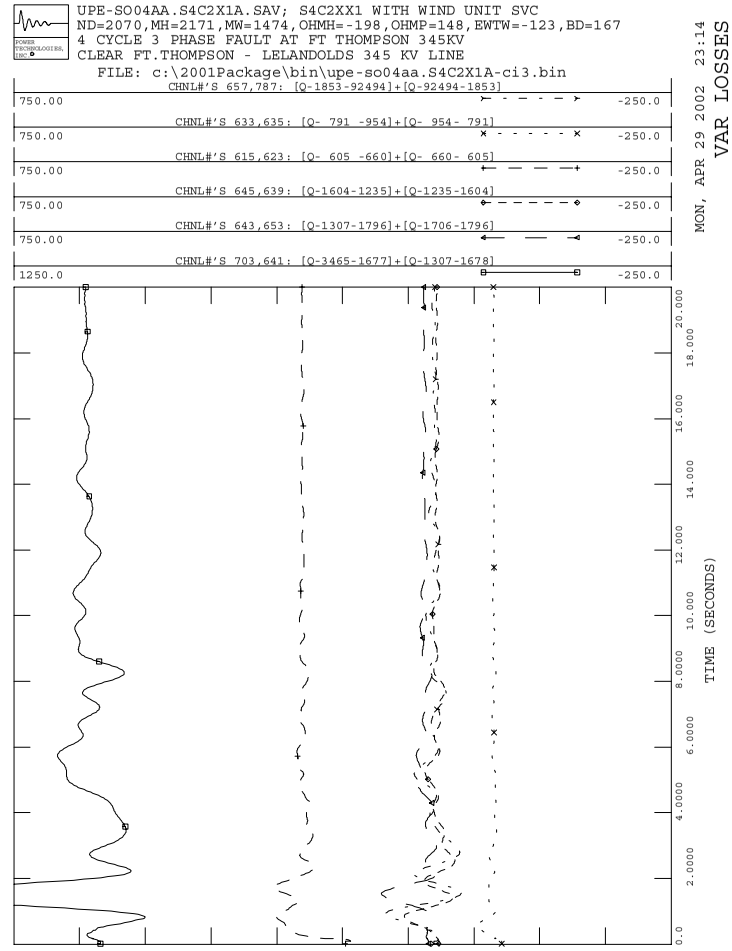


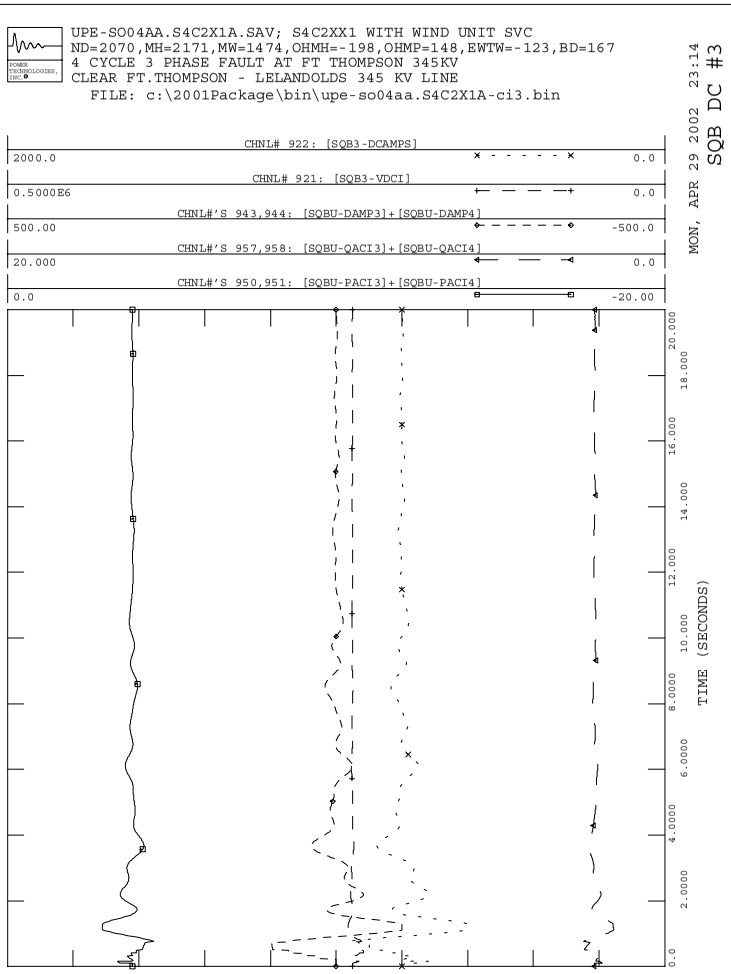
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

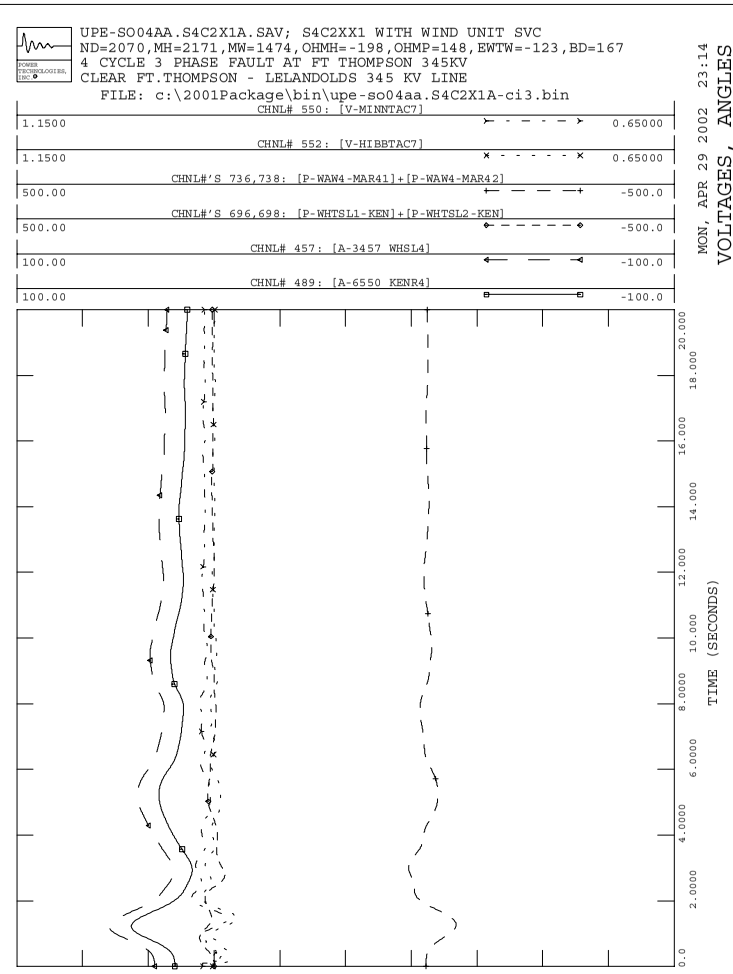
MON, APR 29 2002 23:14
MH DC PARAMETERS




UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
MON, APR 29 2002 23:14
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
MON, APR 29 2002 23:14
VAR LOSSES
TIME (SECONDS)

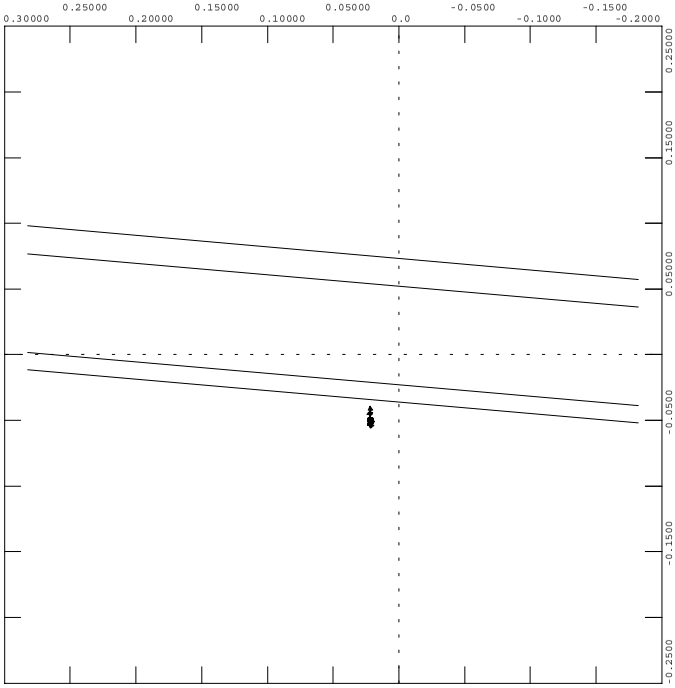

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
MON, APR 29 2002 23:14
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
MON, APR 29 2002 23:14
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

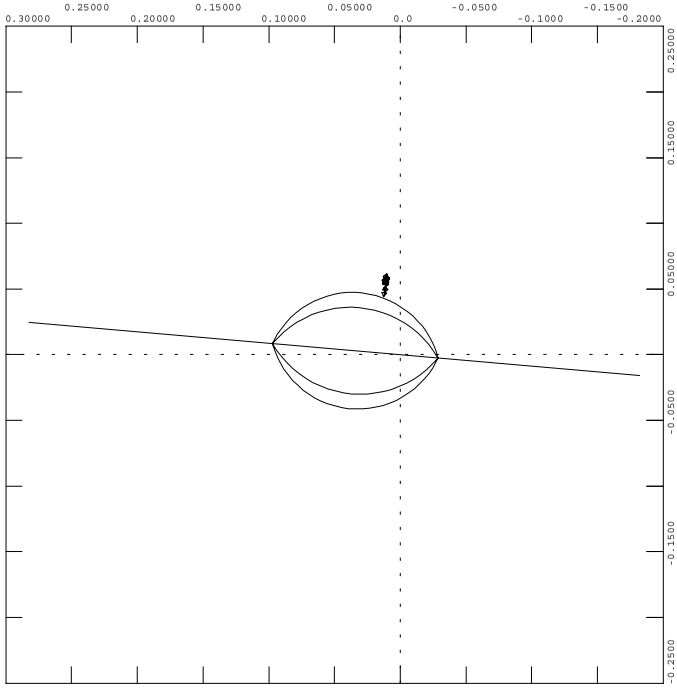


MON, APR 29 2002 23:14
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

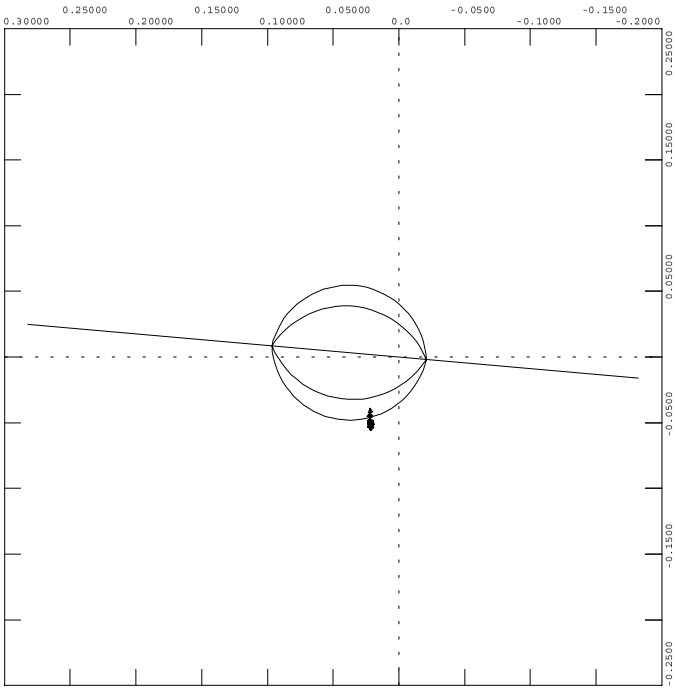


MON, APR 29 2002 23:14
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

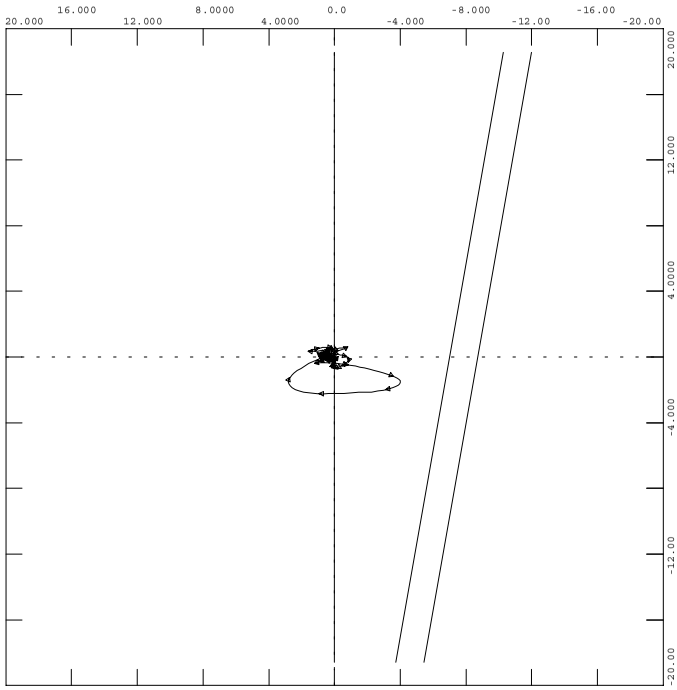


MON, APR 29 2002 23:14
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

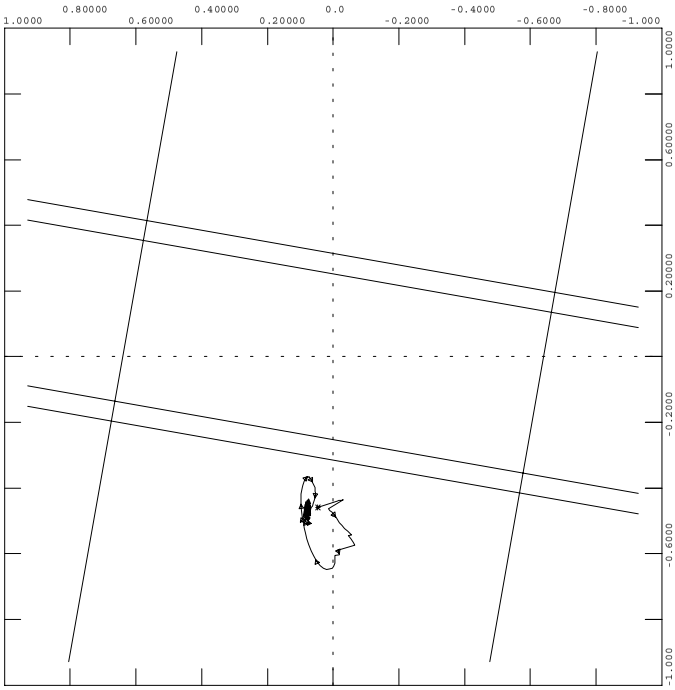


MON, APR 29 2002 23:14
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

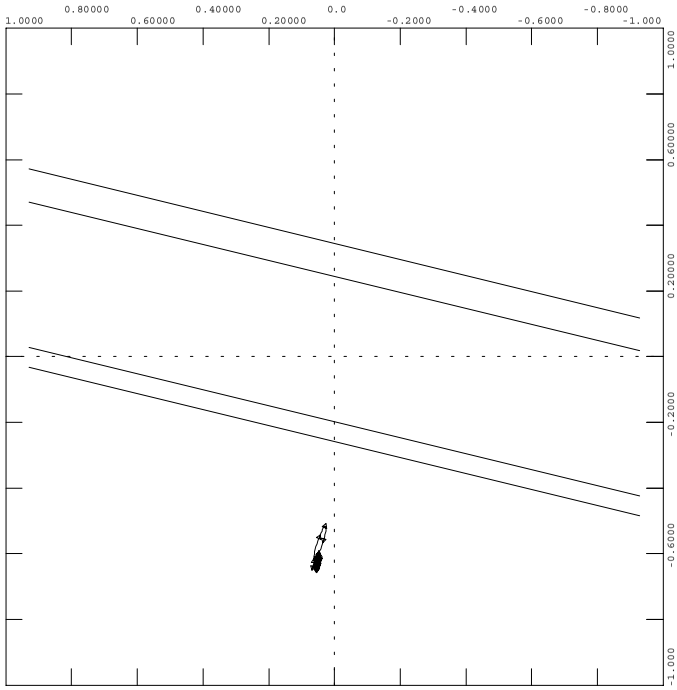
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

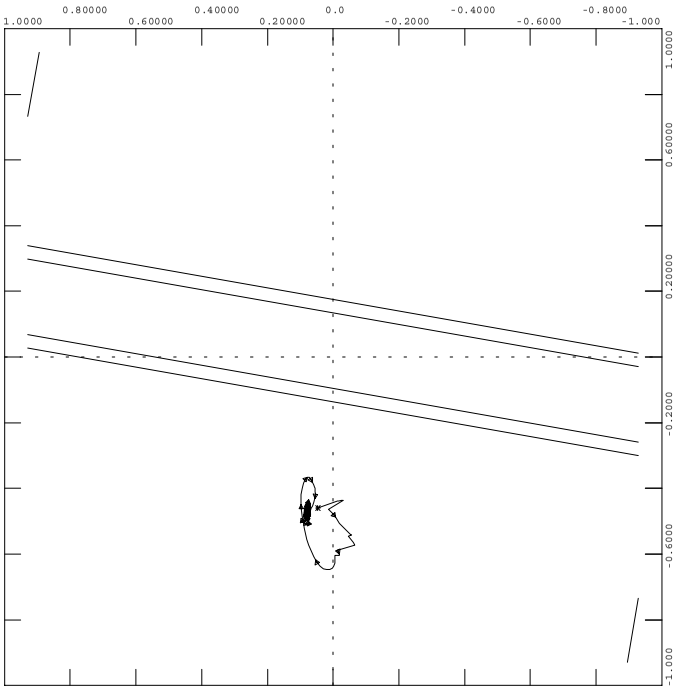
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

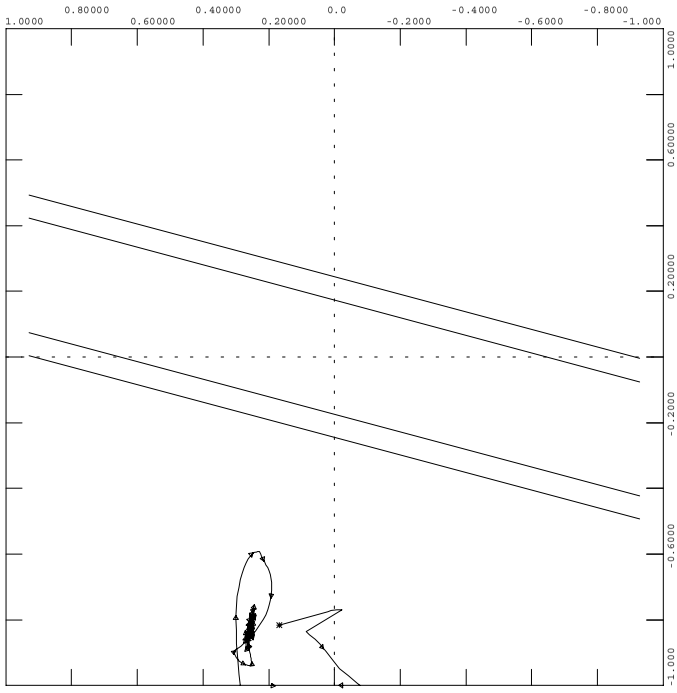
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

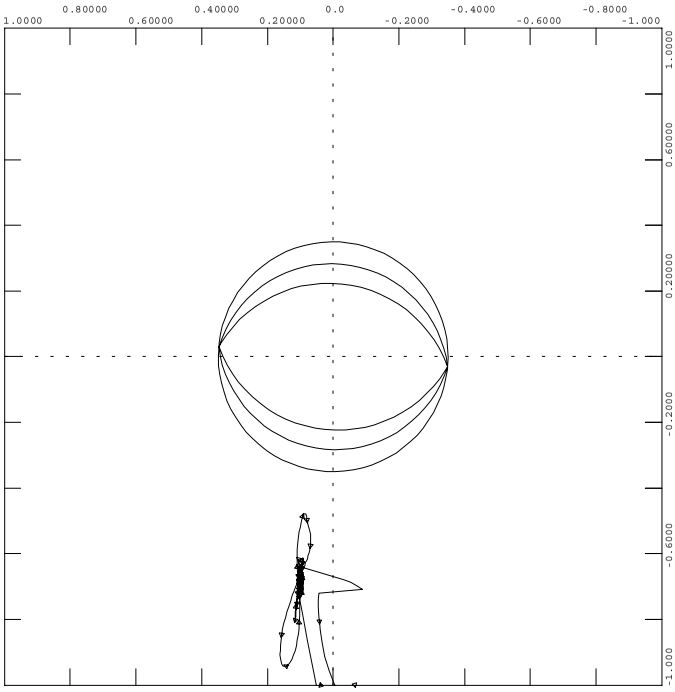
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

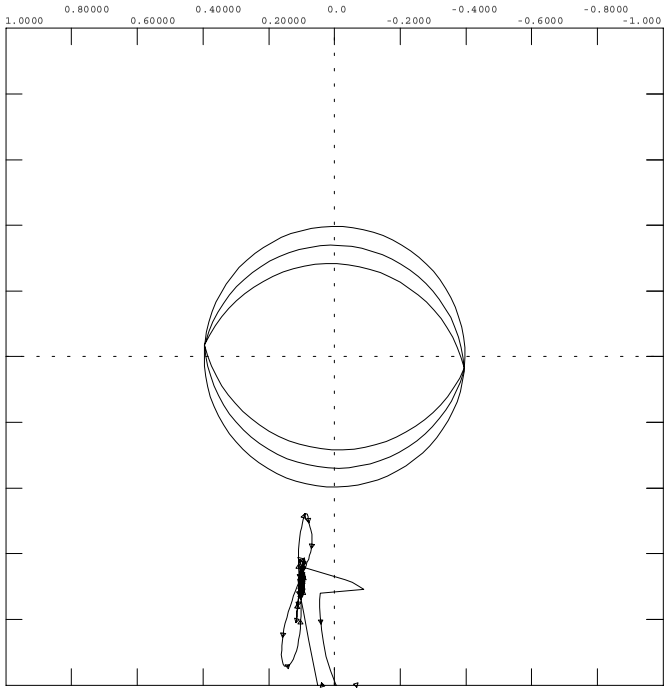
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

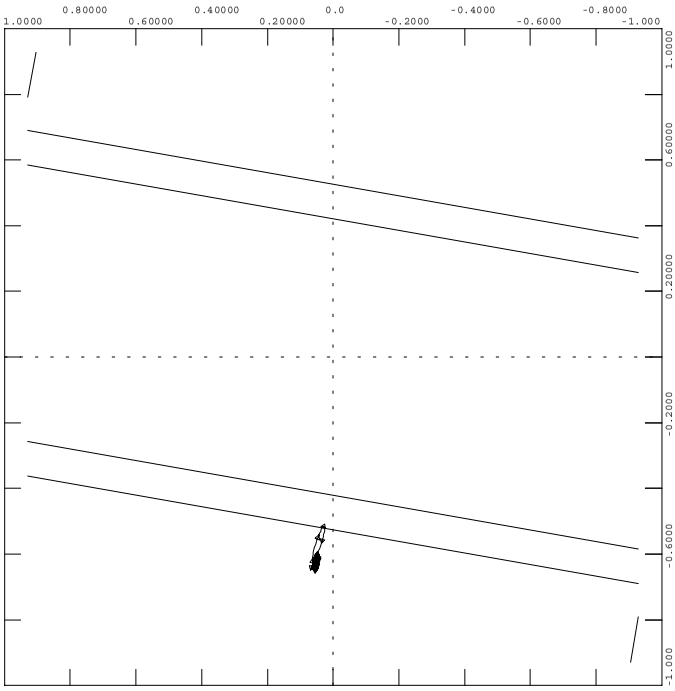
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

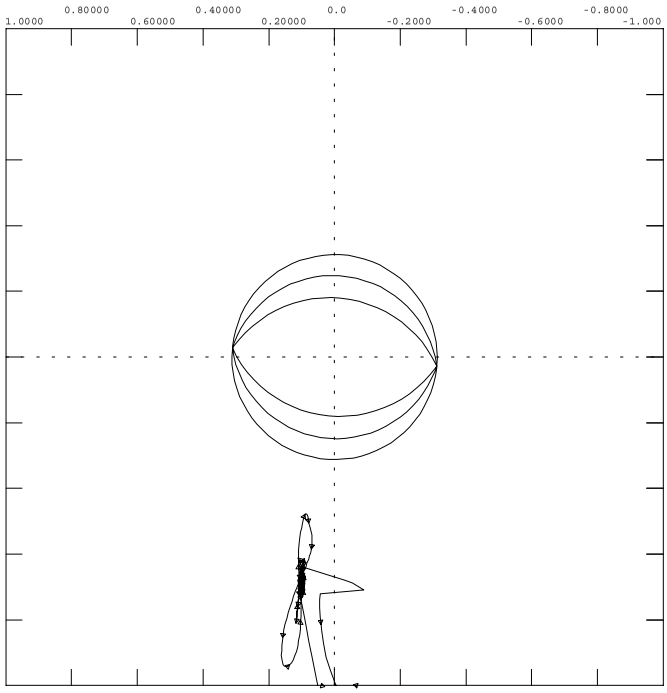
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



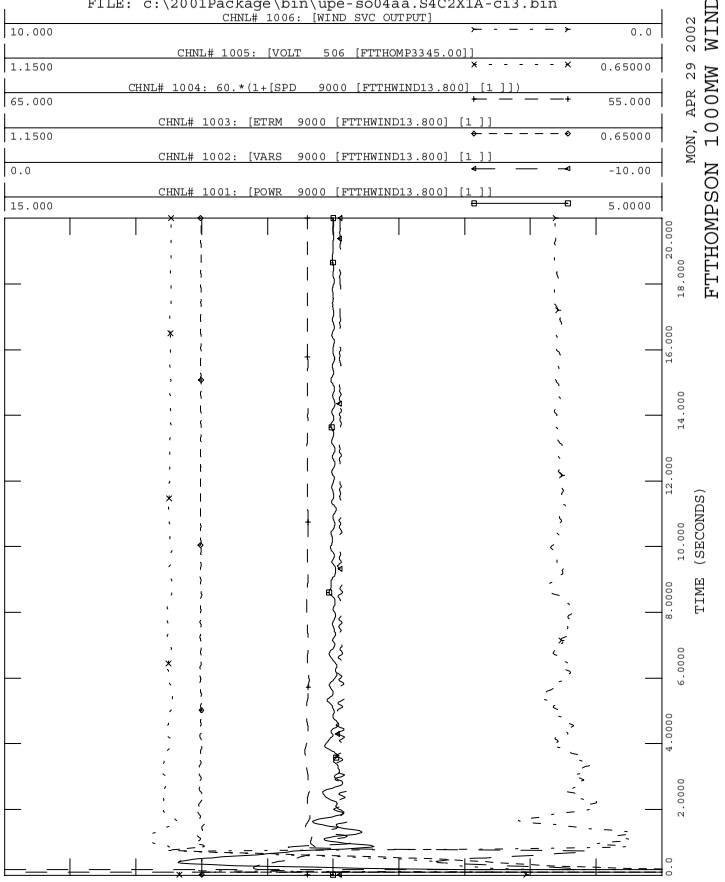
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

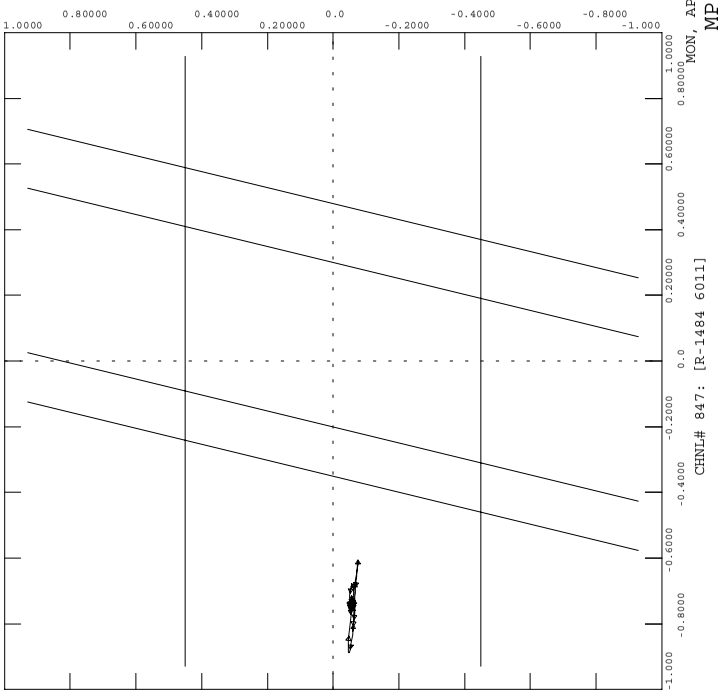


MON, APR 29 2002 23:14
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ci3.bin

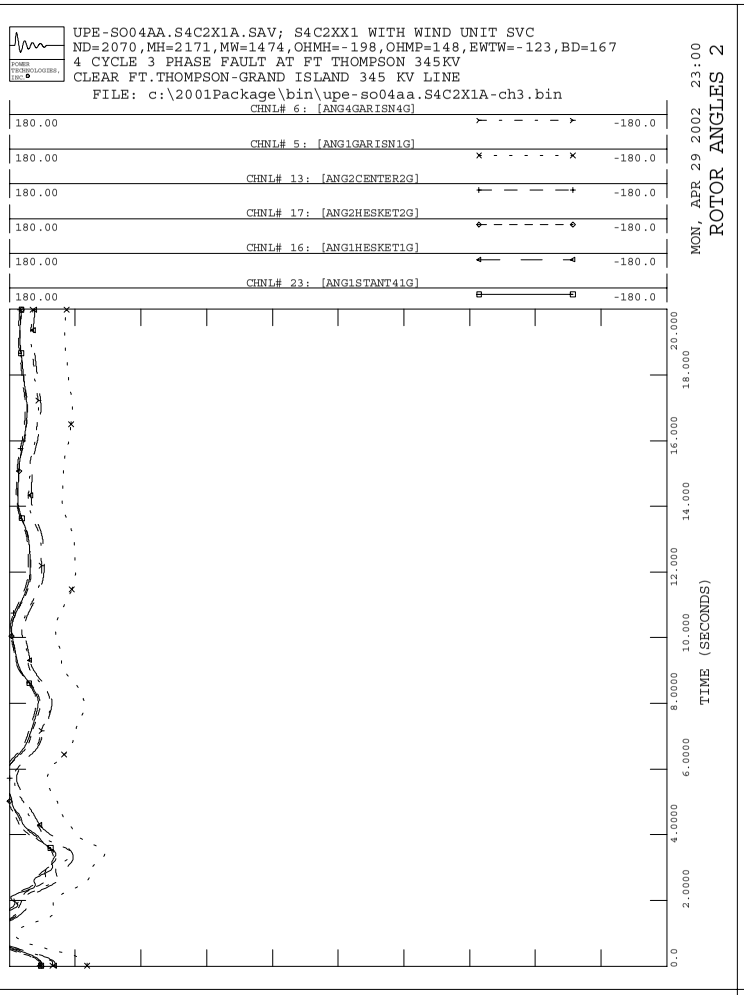
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

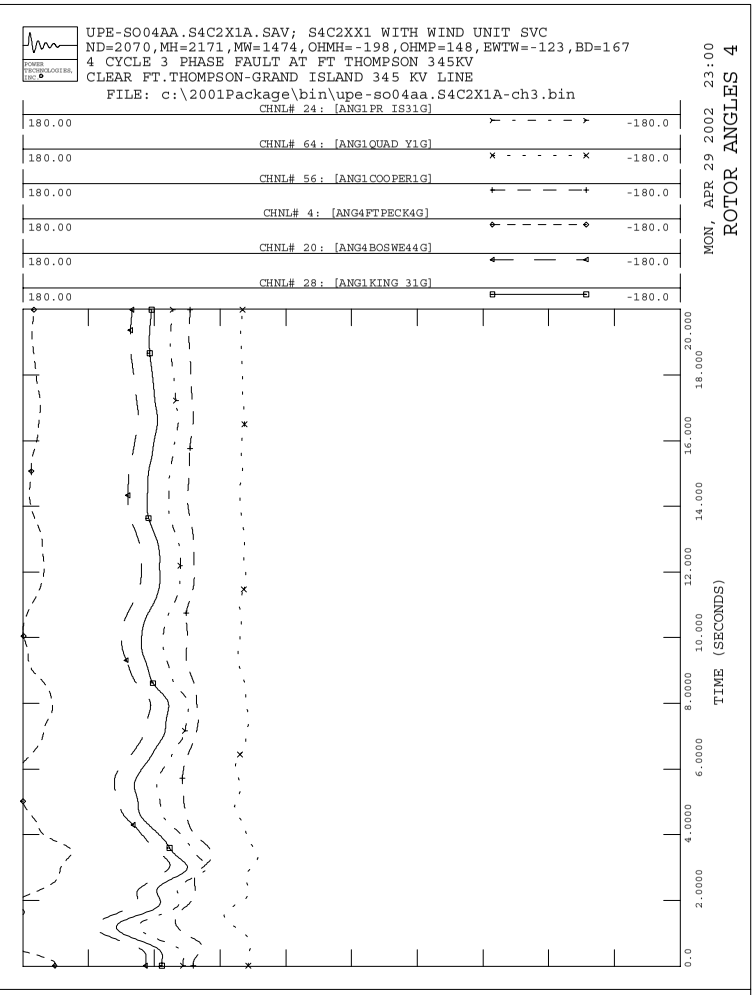


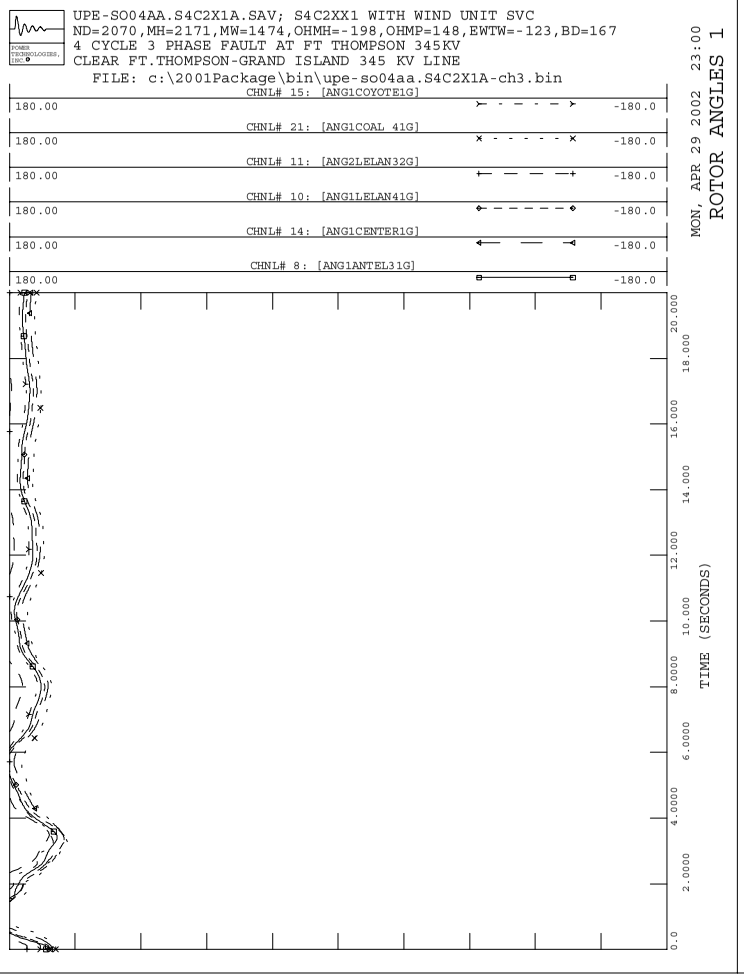
MON, APR 29 2002 23:14
MP-OH I.FALLS (779)

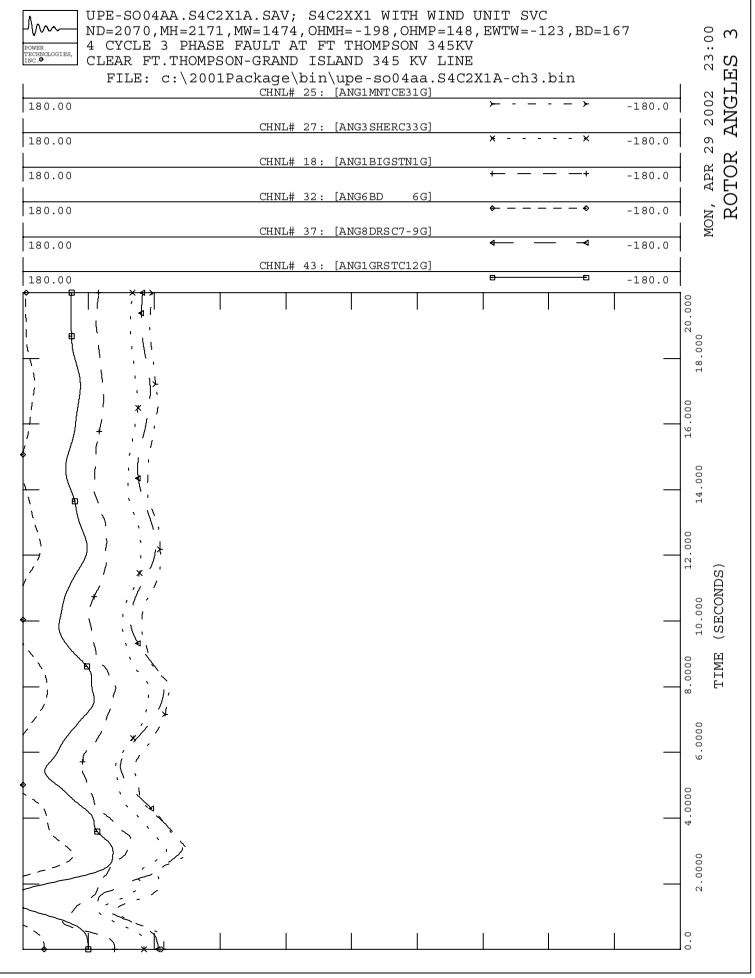
CONTINGENCY CH3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Grand Island 345 kV line

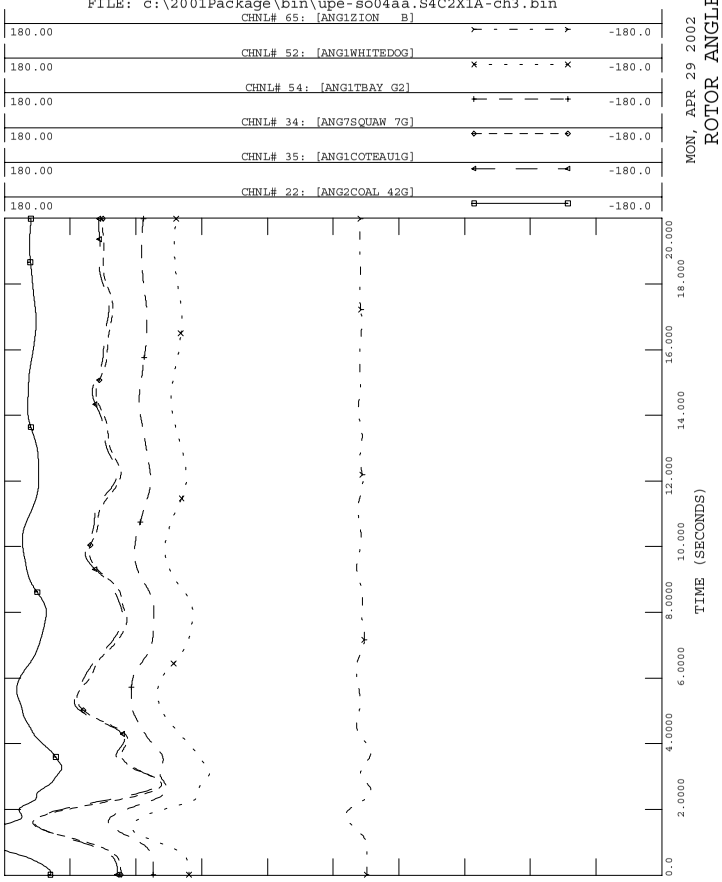

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
MON, APR 29 2002 23:00
ROTOR ANGLES 2
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
MON, APR 29 2002 23:00
ROTOR ANGLES 4
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
MON, APR 29 2002 23:00
ROTOR ANGLES 1
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

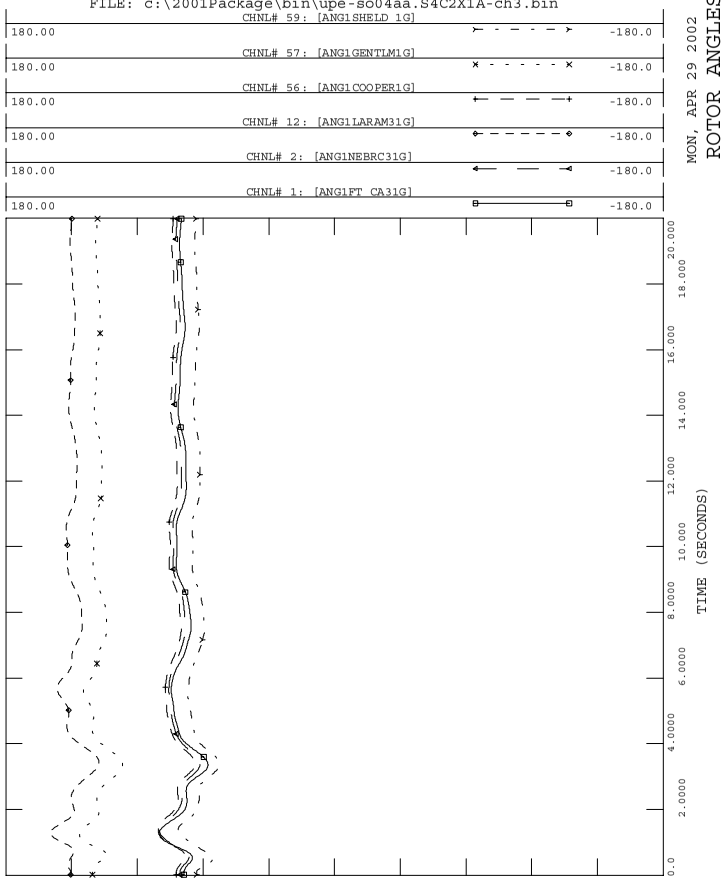

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
MON, APR 29 2002 23:00
ROTOR ANGLES 3
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



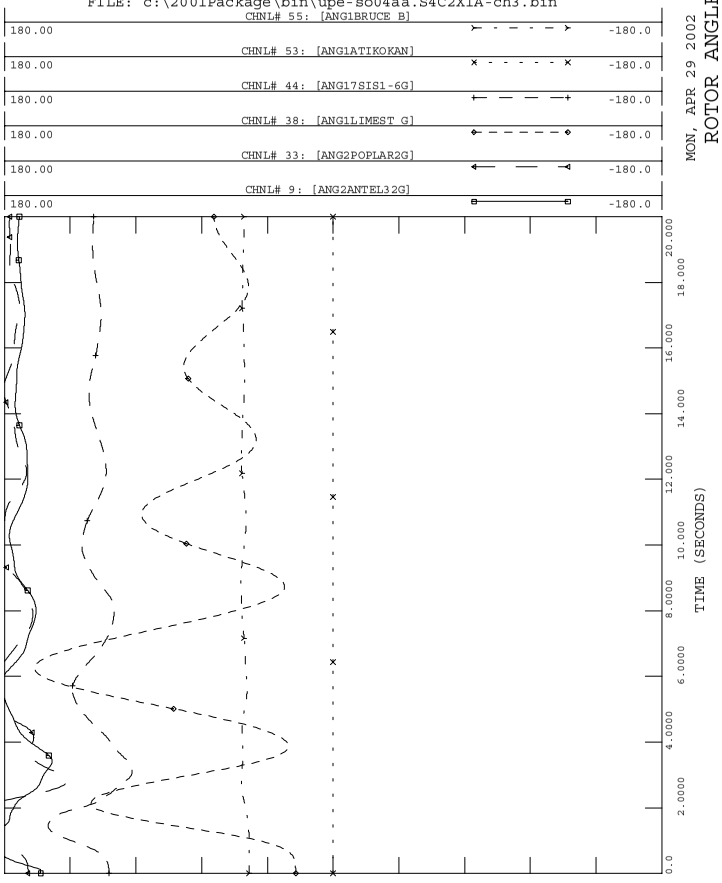
MON, APR 29 2002 23:00
ROTOR ANGLES 6

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



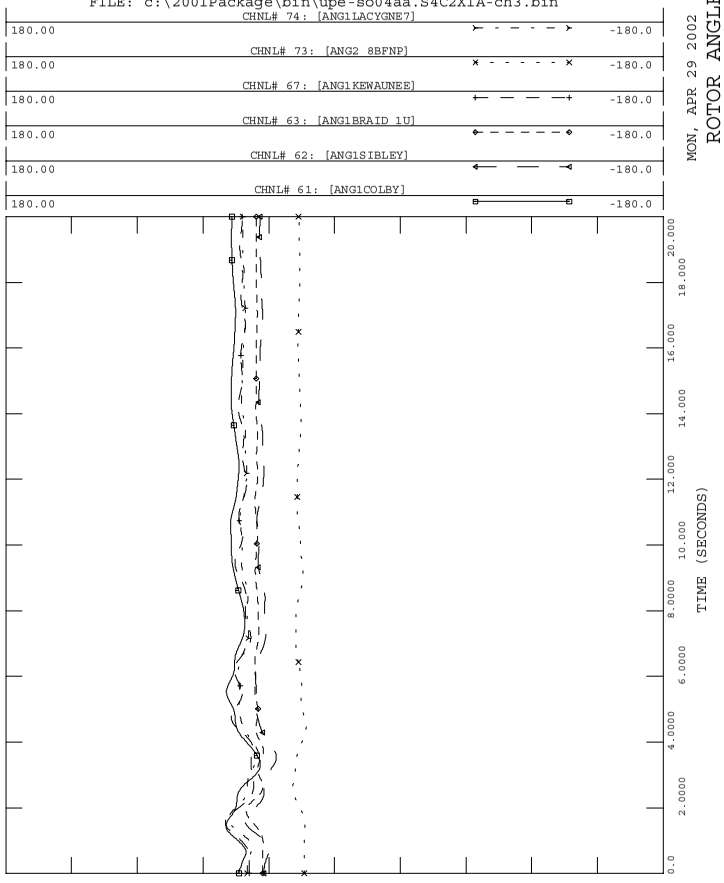
MON, APR 29 2002 23:00
ROTOR ANGLES NB

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



MON, APR 29 2002 23:00
ROTOR ANGLES 5

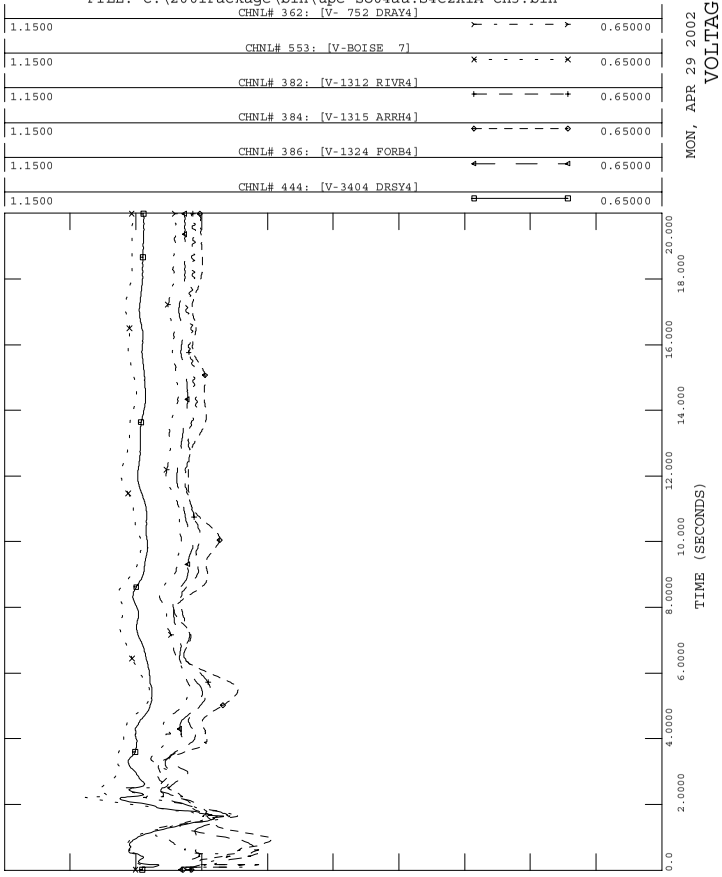
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



MON, APR 29 2002 23:00
ROTOR ANGLES 7

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

MON, APR 29 2002 23:00
VOLTAGES 1



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
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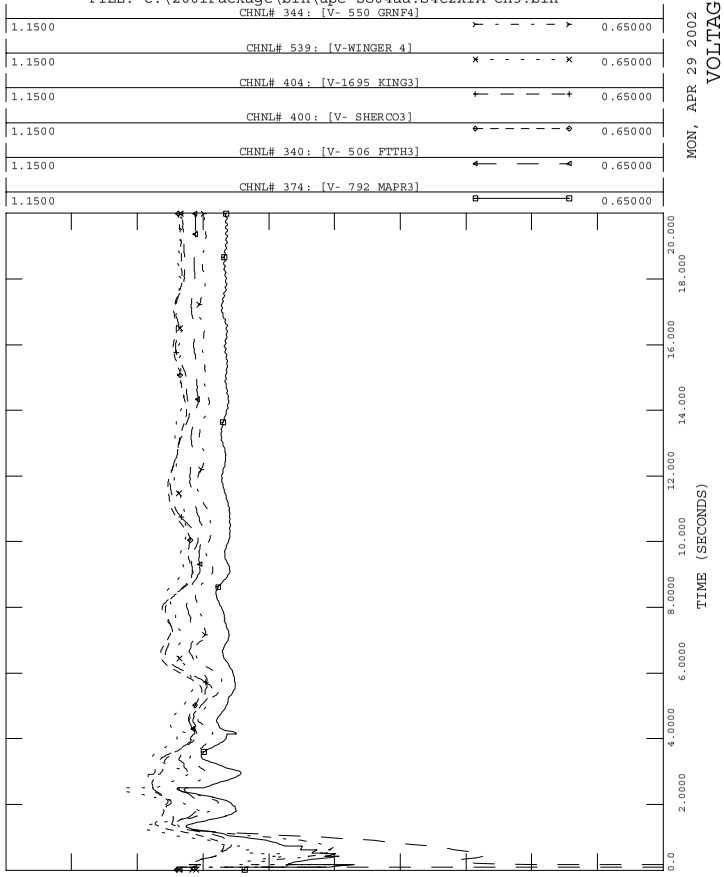
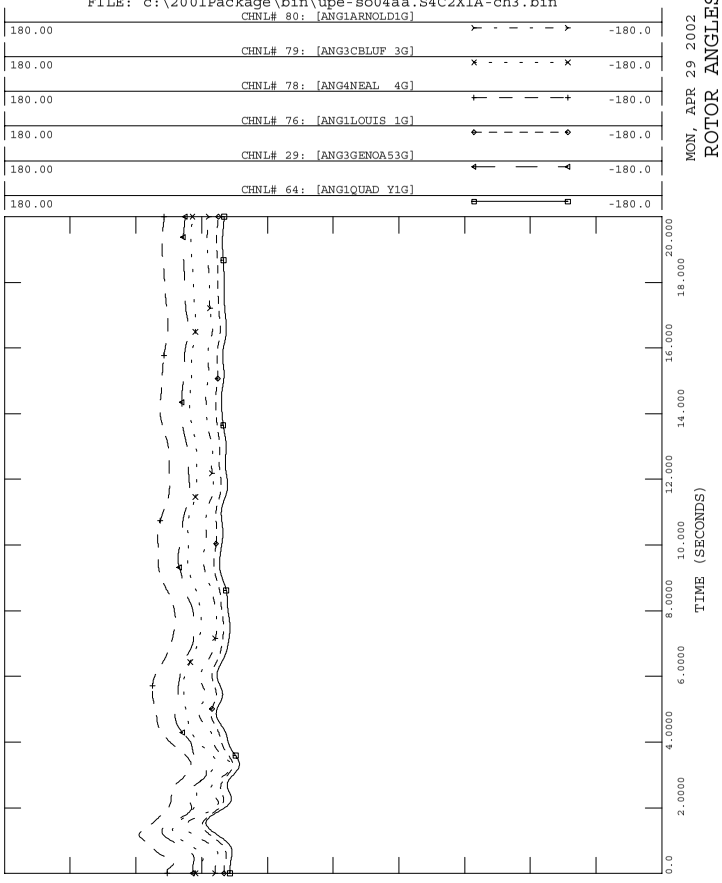
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

MON, APR 29 2002 23:00
VOLTAGES 3



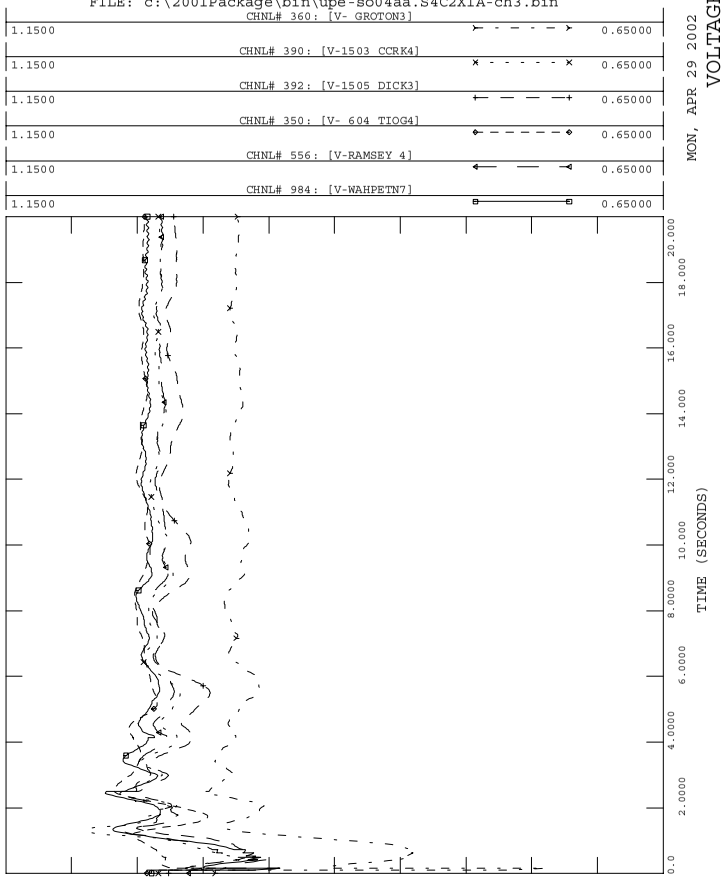
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

MON, APR 29 2002 23:00
ROTOR ANGLES IA



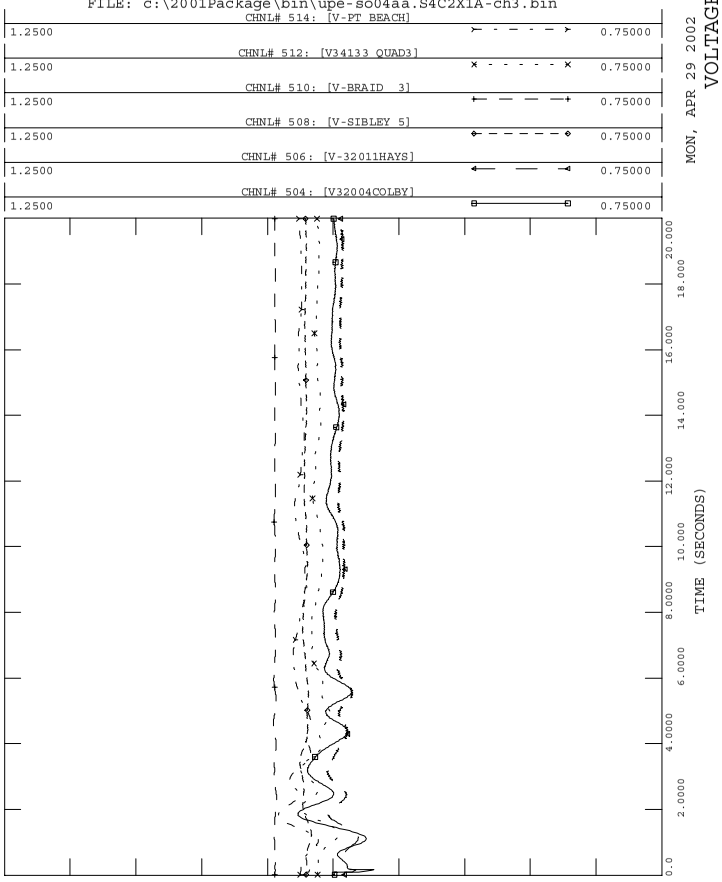
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

MON, APR 29 2002 23:00
VOLTAGES 2



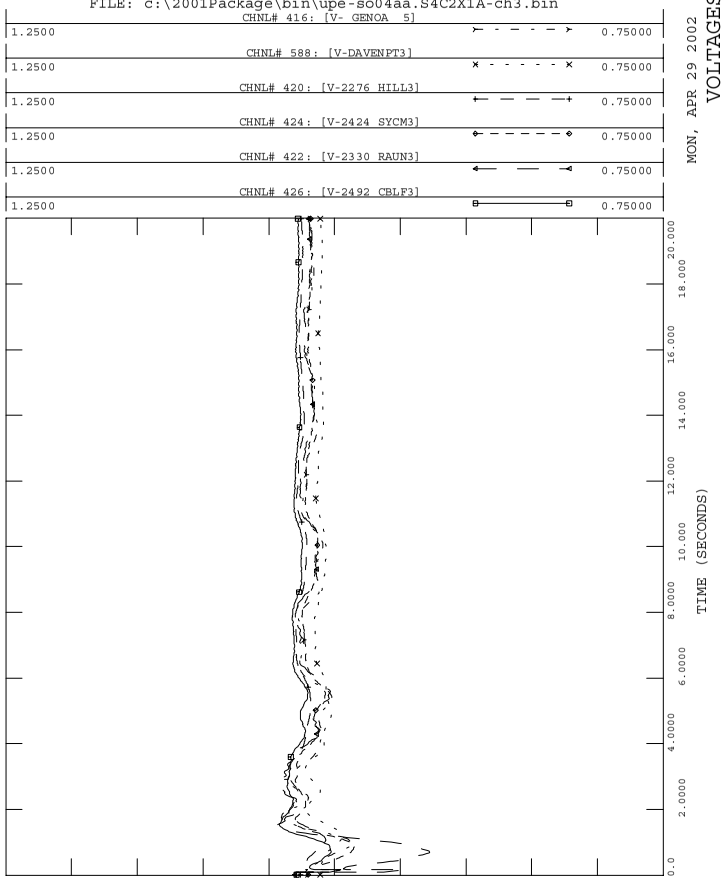
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

MON, APR 29 2002 23:00
VOLTAGES 5



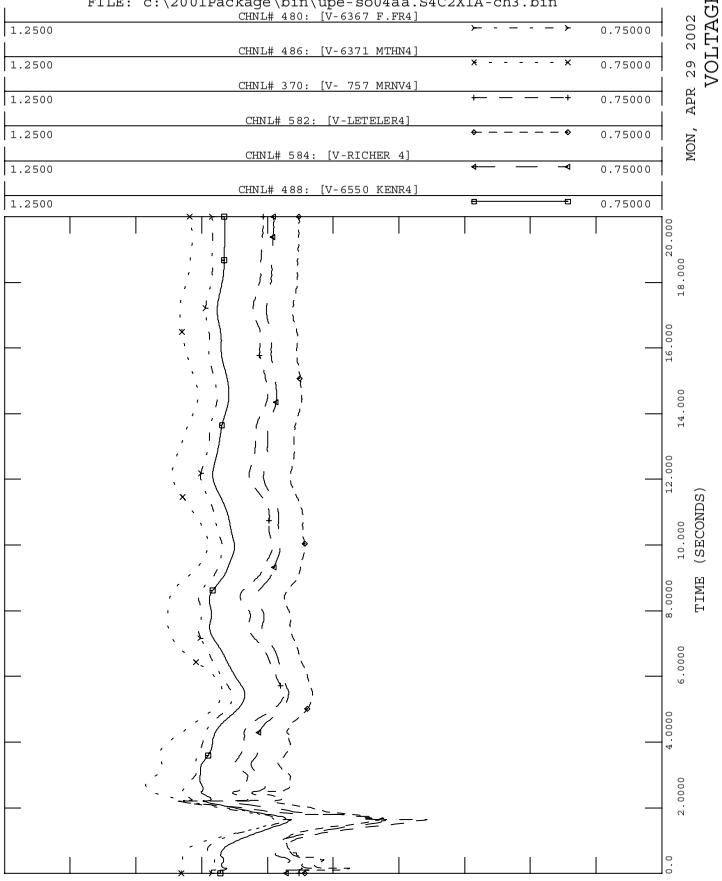
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

MON, APR 29 2002 23:00
VOLTAGES IA



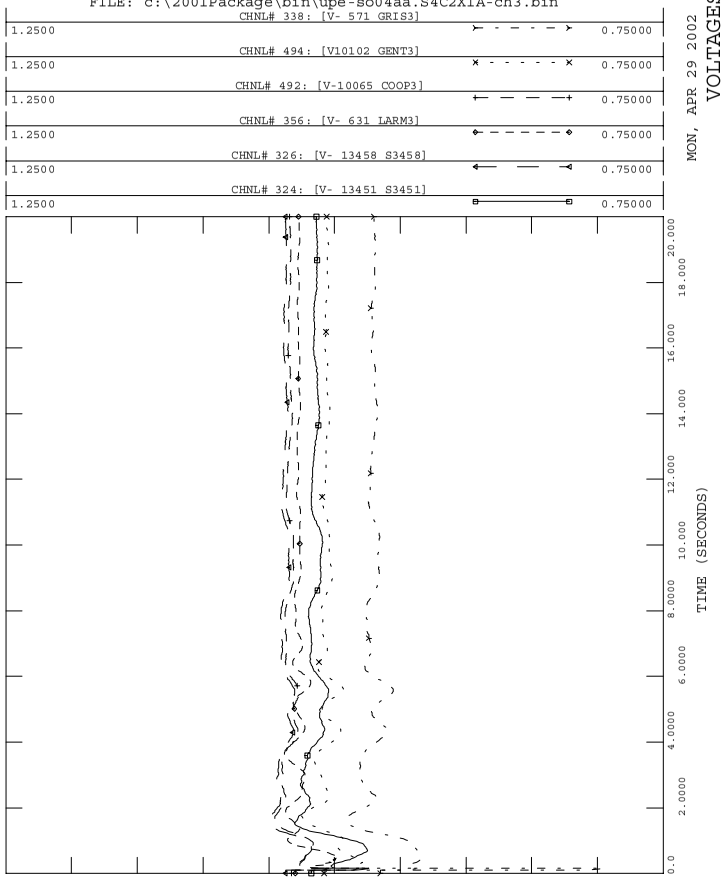
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

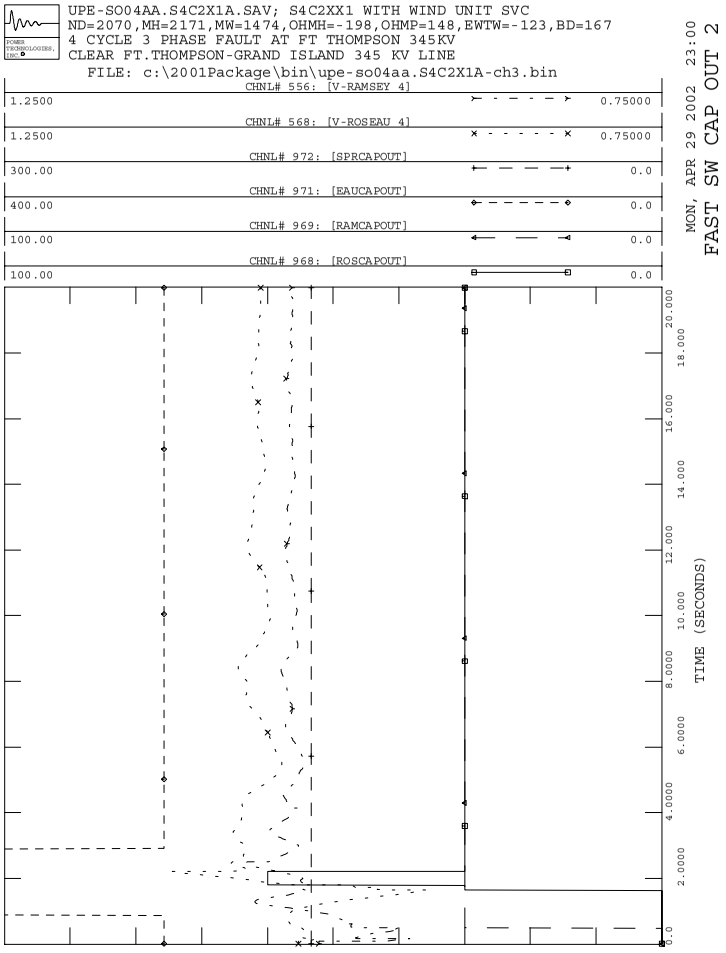
MON, APR 29 2002 23:00
VOLTAGES 4

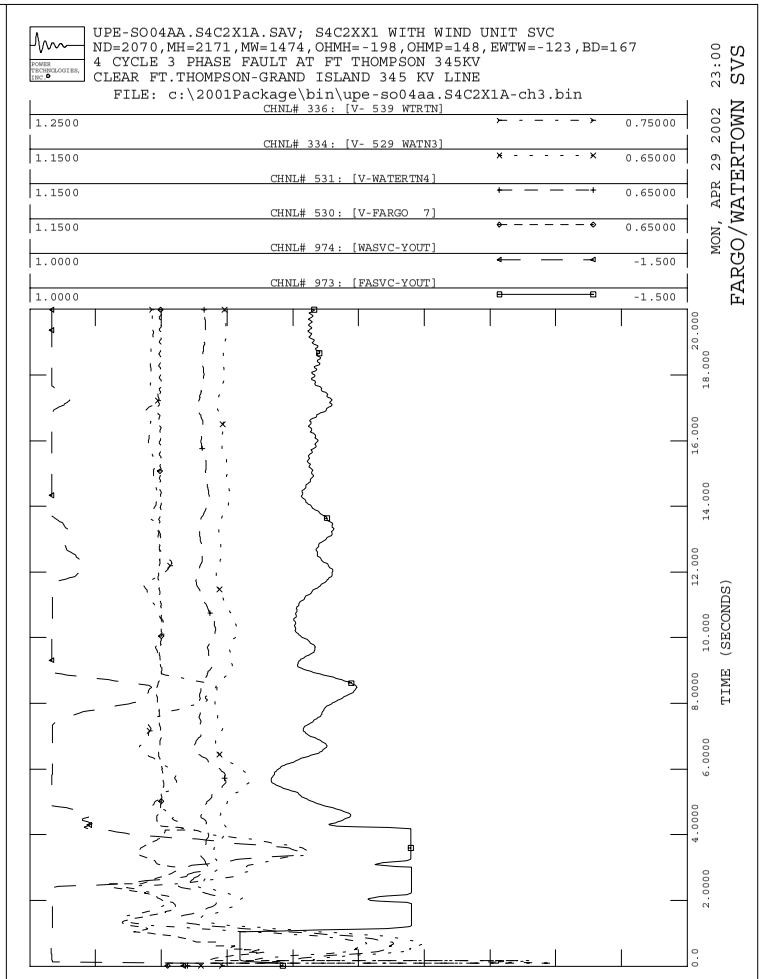


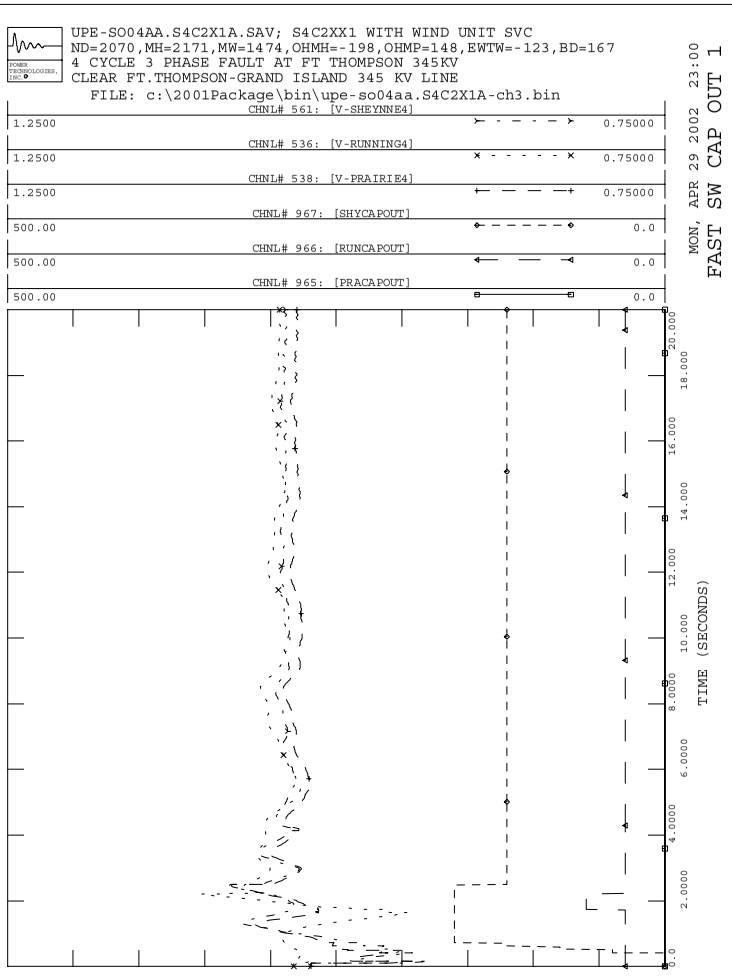
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

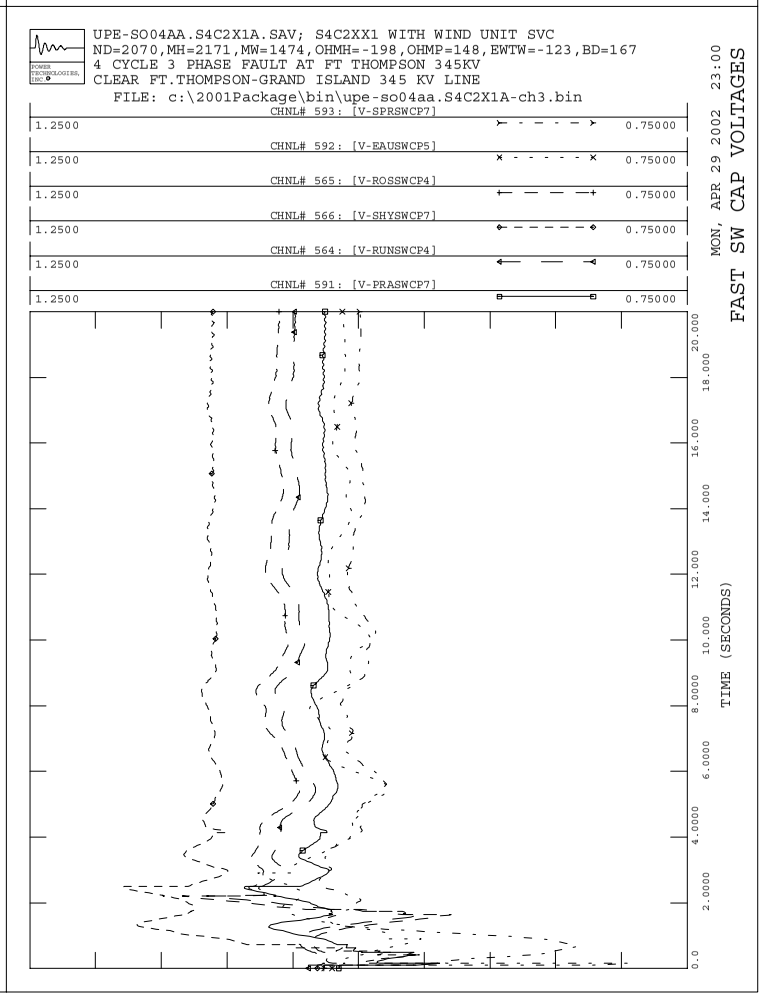
MON, APR 29 2002 23:00
VOLTAGES NB



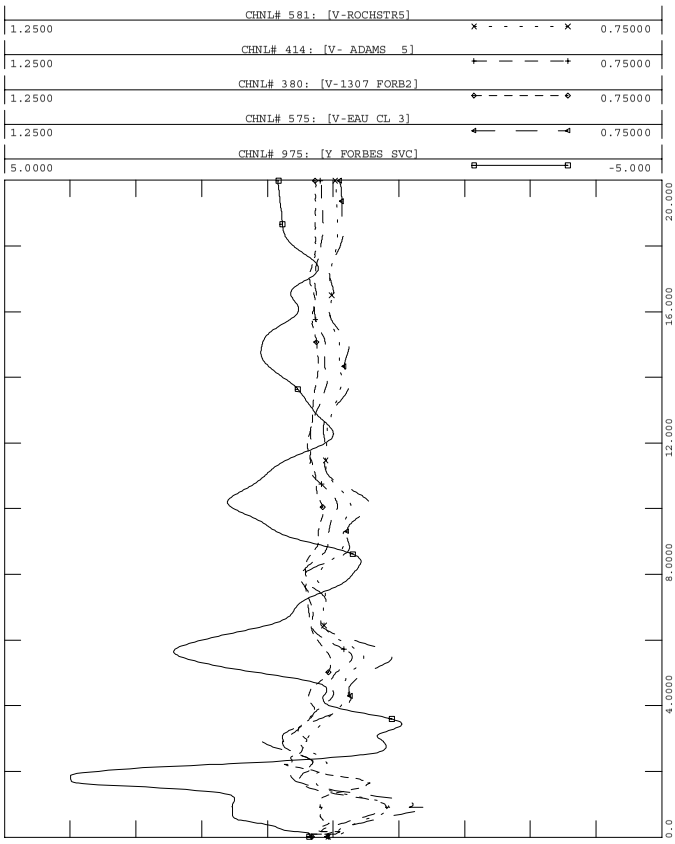

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
MON, APR 29 2002 23:00
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
MON, APR 29 2002 23:00
FARGO/WATERTOWN SVS
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
MON, APR 29 2002 23:00
FAST SW CAP OUT 1
TIME (SECONDS)

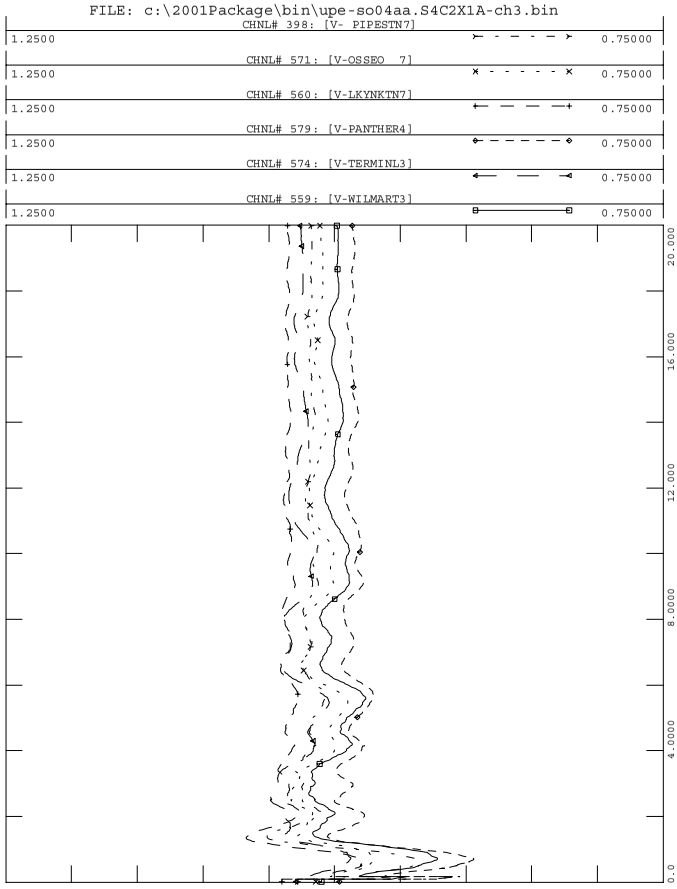

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
MON, APR 29 2002 23:00
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



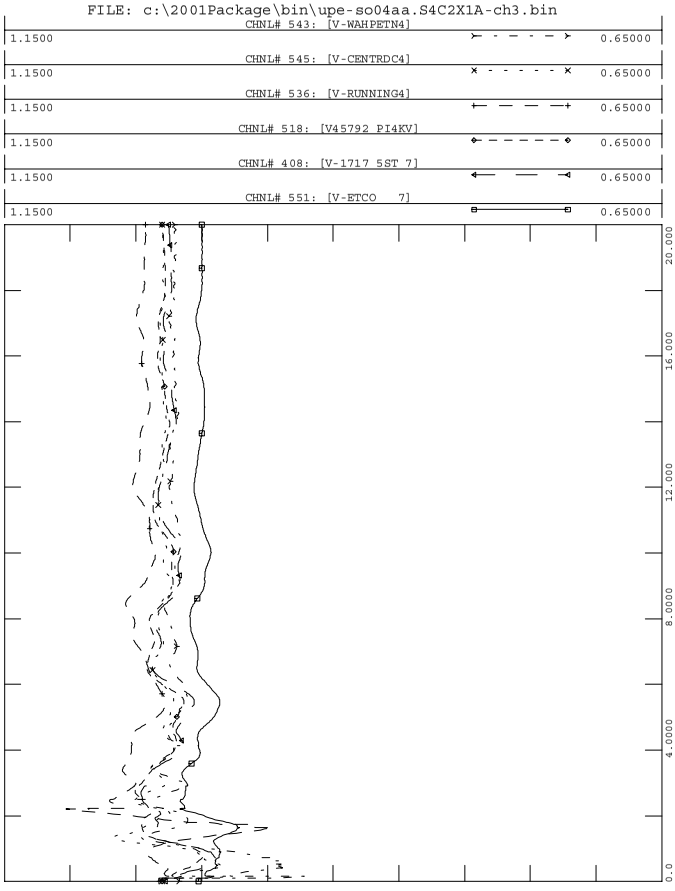
MON, APR 29 2002 23:00
SVC & WISCONSIN VOLT

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



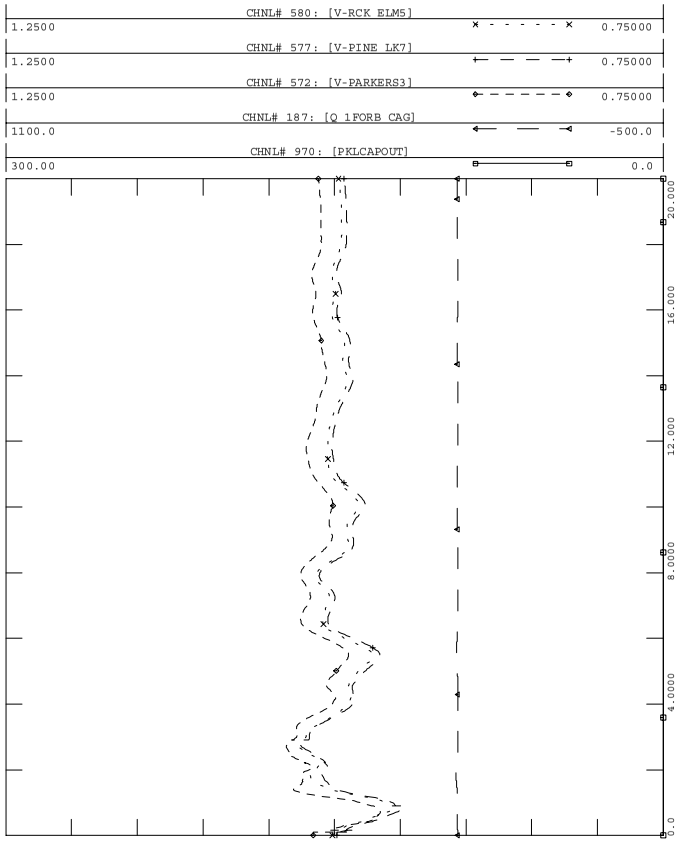
MON, APR 29 2002 23:00
TC VOLTAGES

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



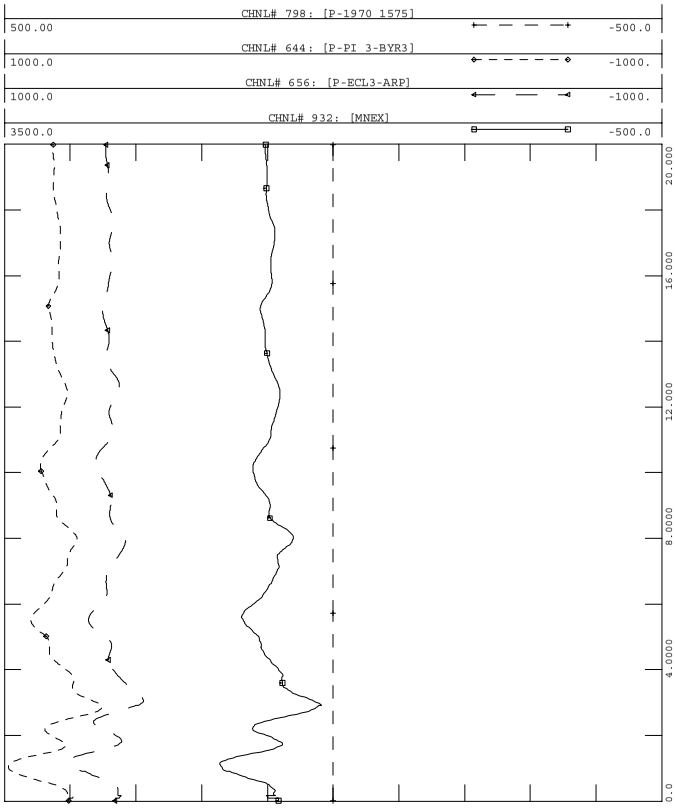
MON, APR 29 2002 23:00
VOLTAGES 6

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



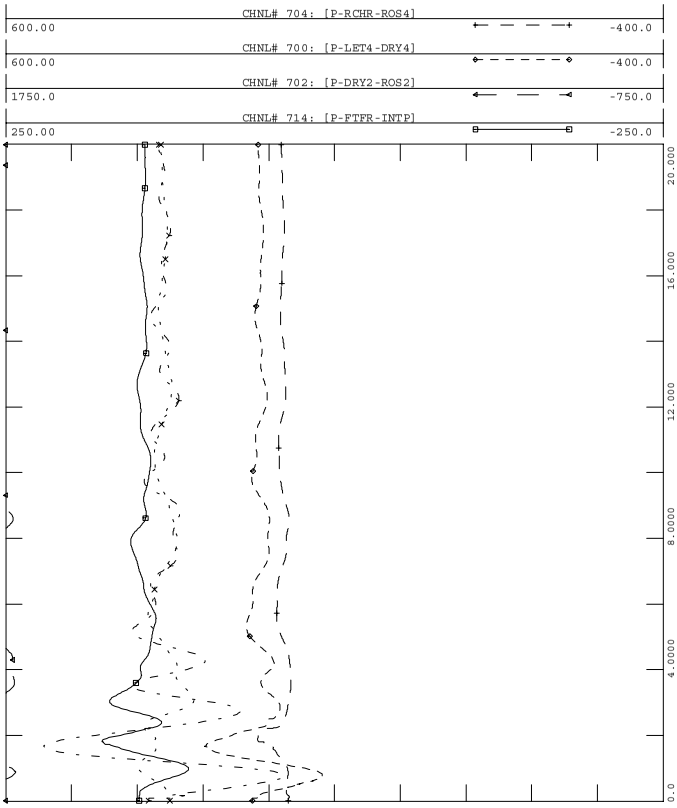
MON, APR 29 2002 23:00
FORBES SVS OUT & VOLTAGES

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



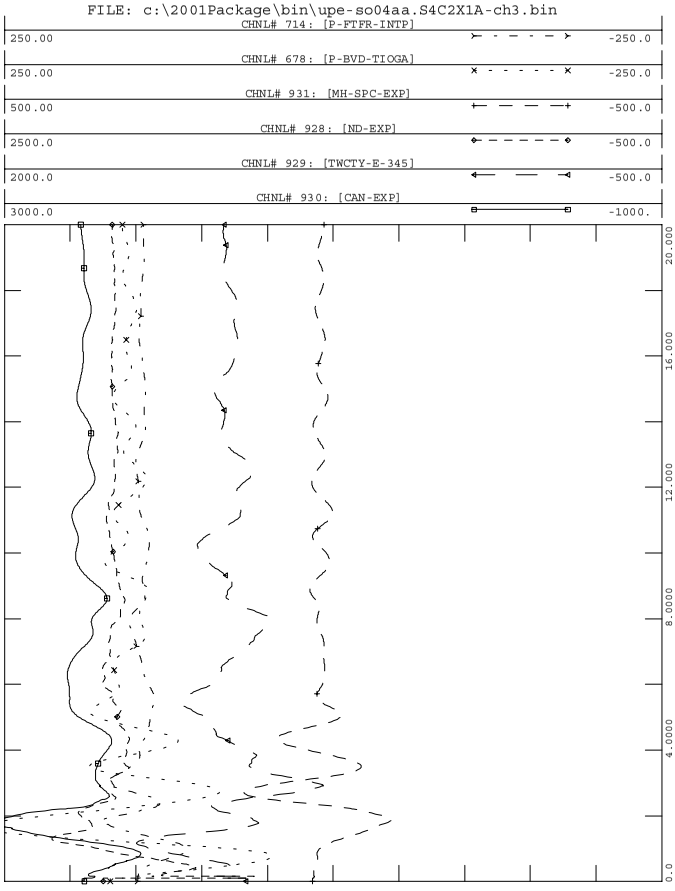
MON, APR 29 2002 23:00
POWER FLOW SUMS 2

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



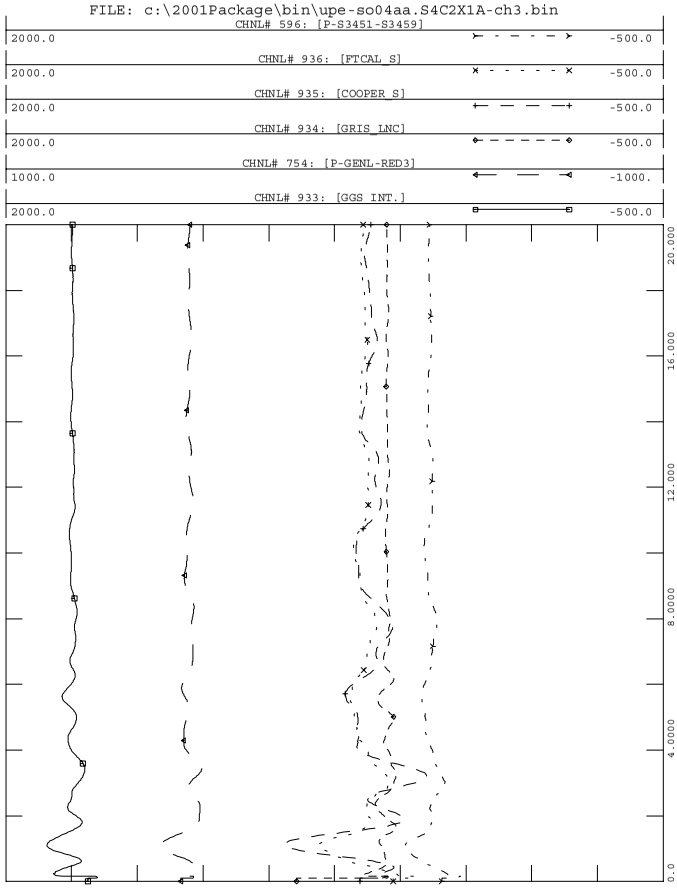
MON, APR 29 2002 23:00
CAN. TIE FLOWS

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



MON, APR 29 2002 23:00
POWER FLOW SUMS 1

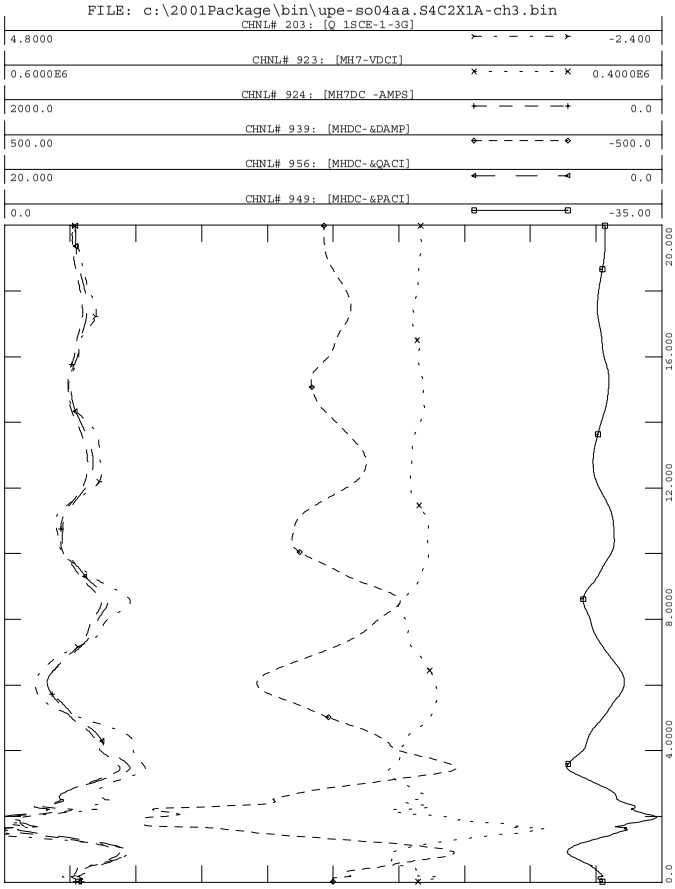
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin



MON, APR 29 2002 23:00
POWER FLOW SUM 3

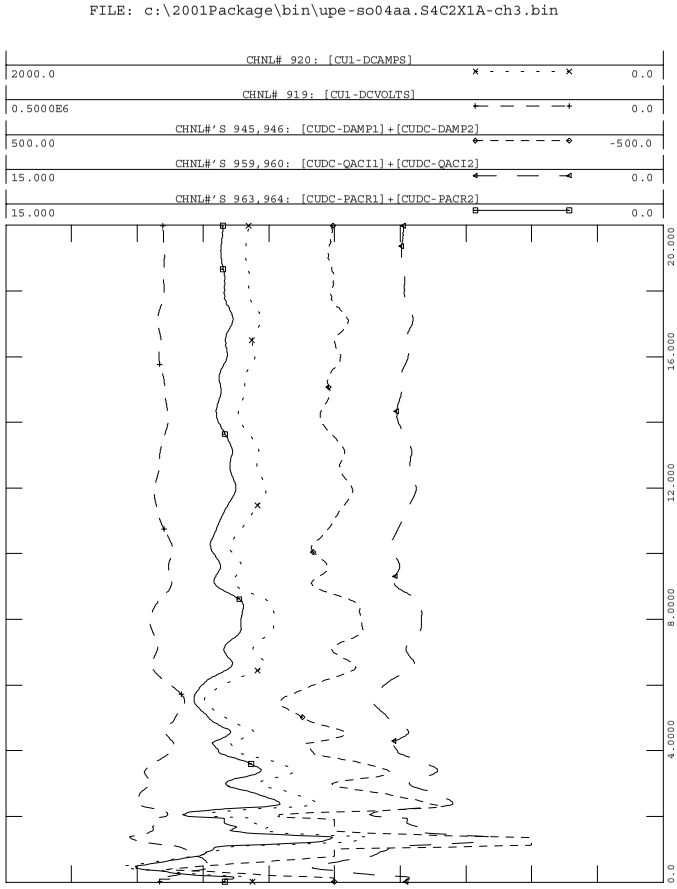
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

MON, APR 29 2002 23:00
MH DC PARAMETERS



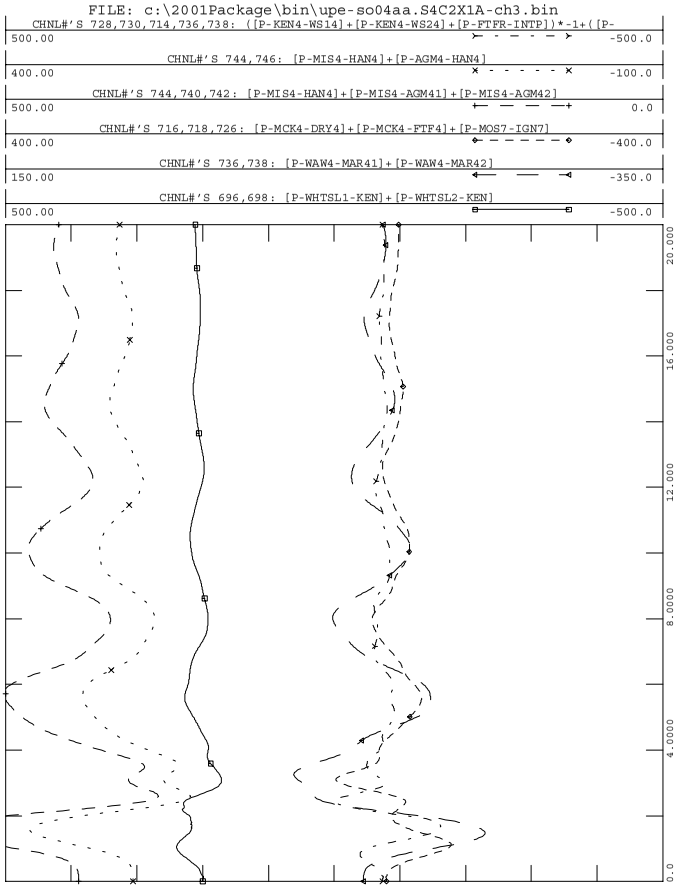
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

MON, APR 29 2002 23:00
CU DC #1



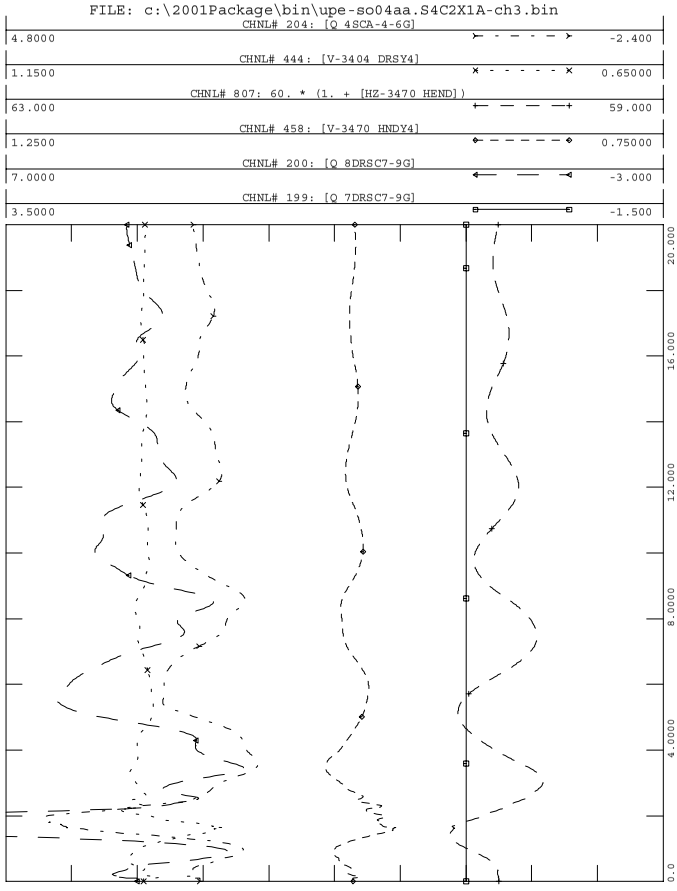
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

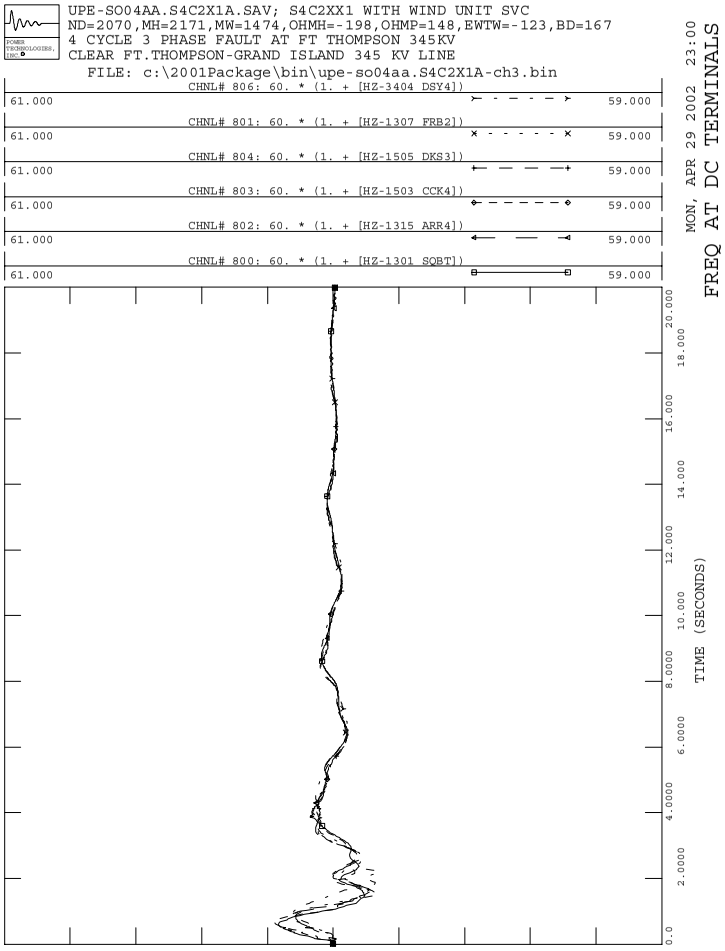
MON, APR 29 2002 23:00
OH TIE FLOWS

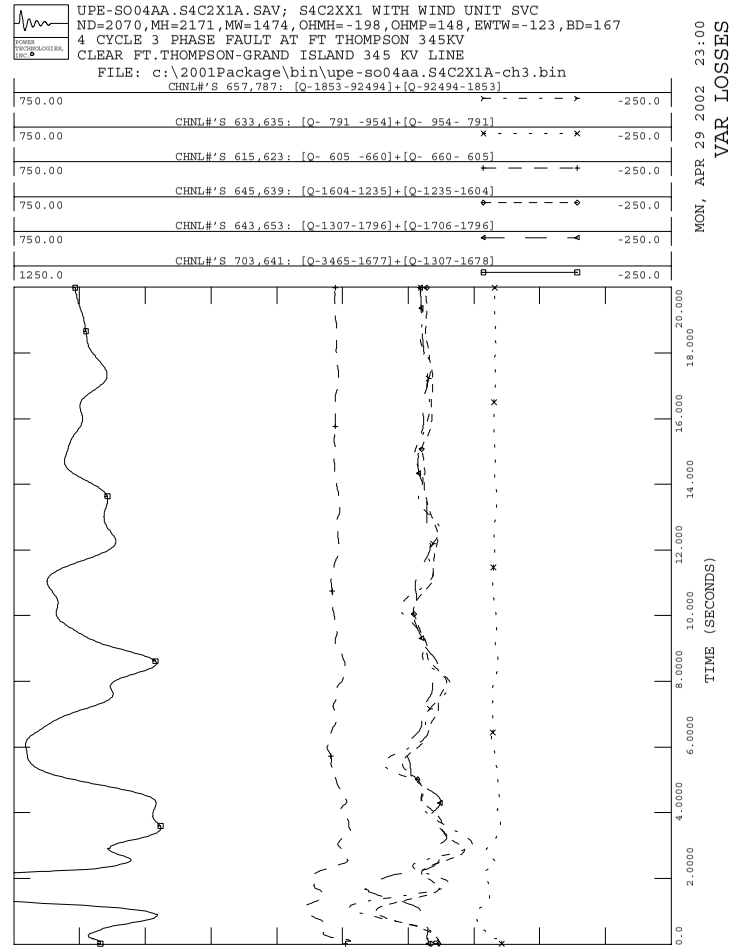


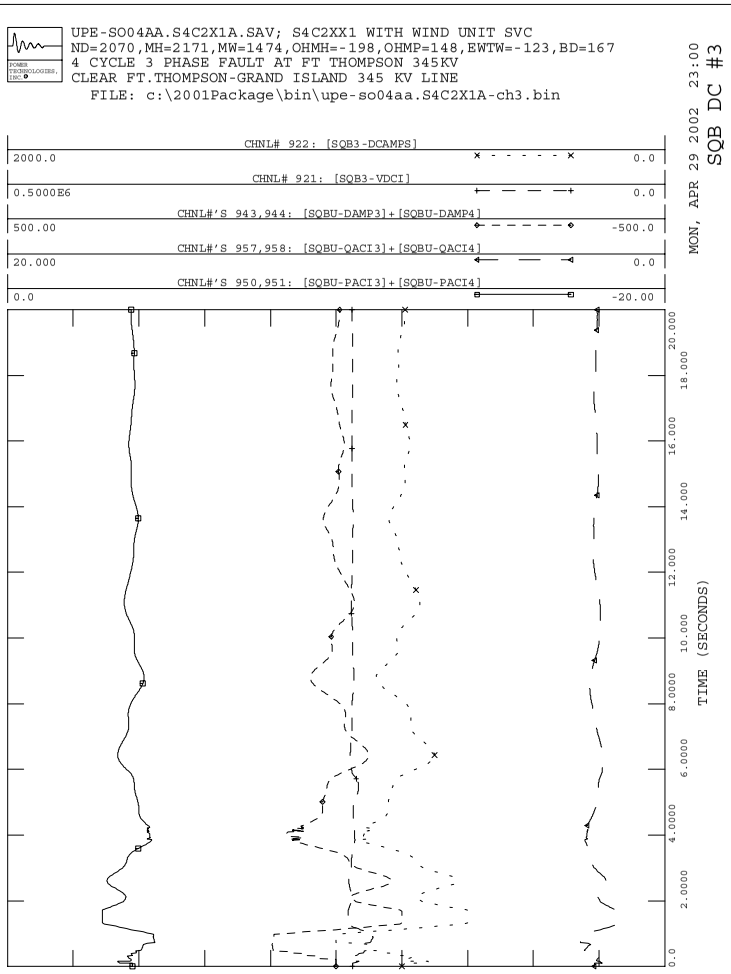
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

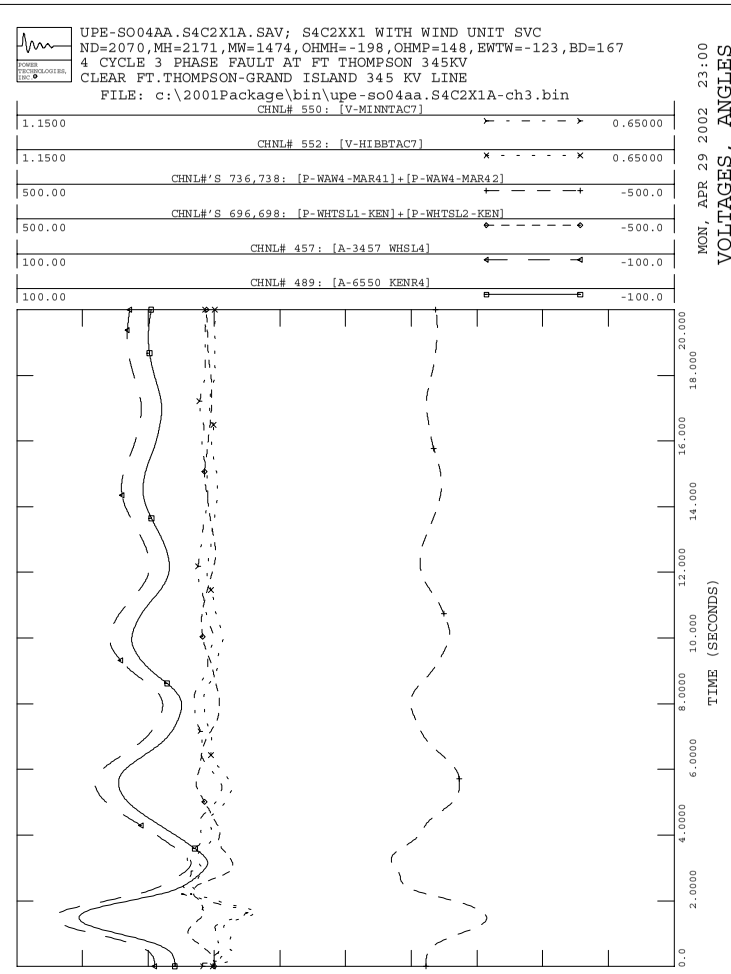
MON, APR 29 2002 23:00
MH DC PARAMETERS




UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
MON, APR 29 2002 23:00
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
MON, APR 29 2002 23:00
VAR LOSSES
TIME (SECONDS)

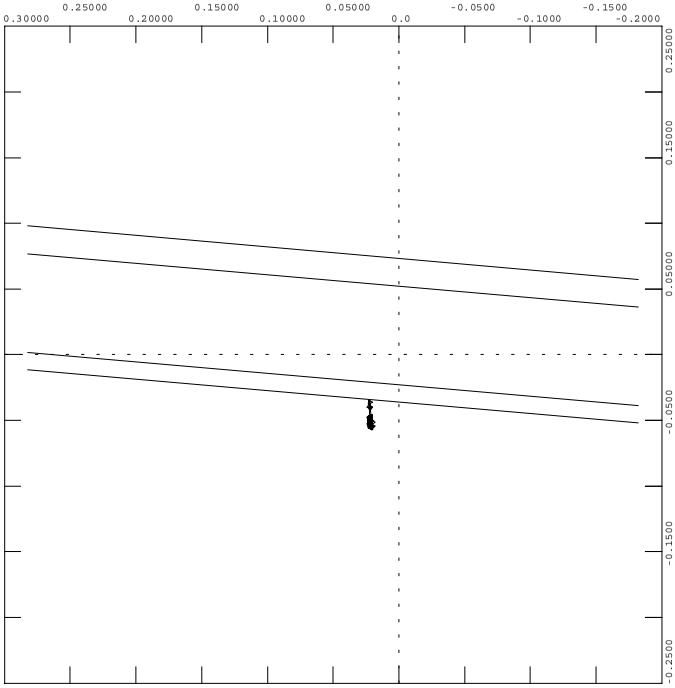

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
0.0
-20.00
MON, APR 29 2002 23:00
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
MON, APR 29 2002 23:00
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

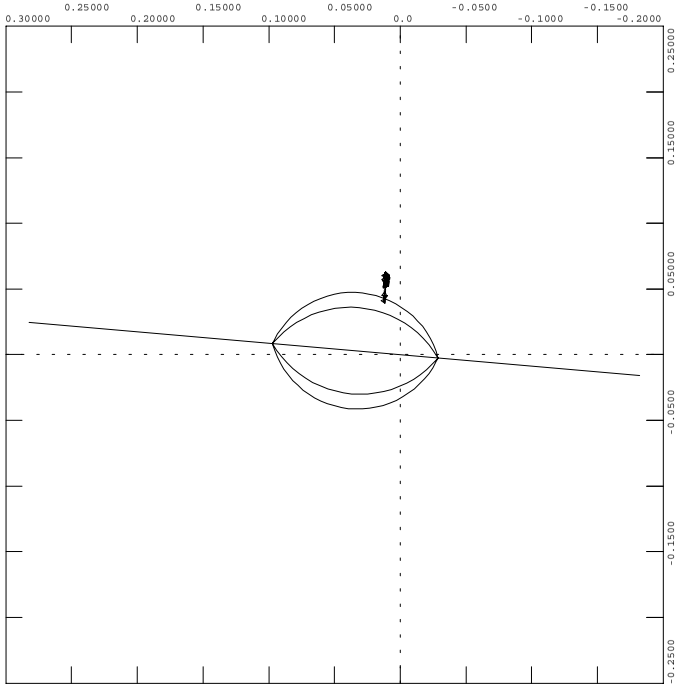


MON, APR 29 2002 23:00
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

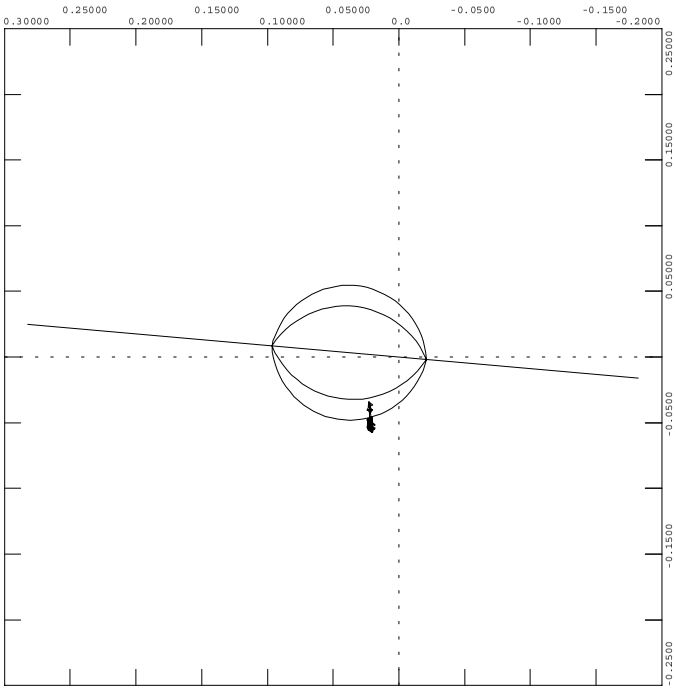


MON, APR 29 2002 23:00
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

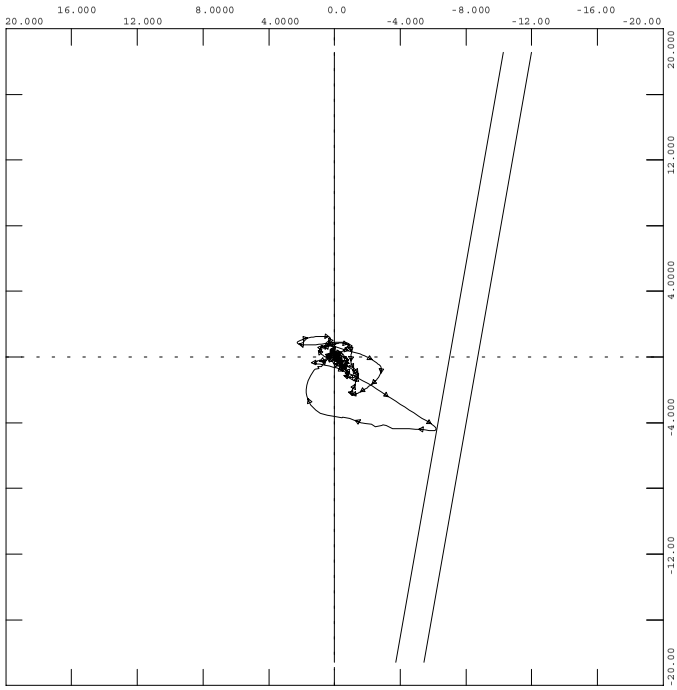


MON, APR 29 2002 23:00
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

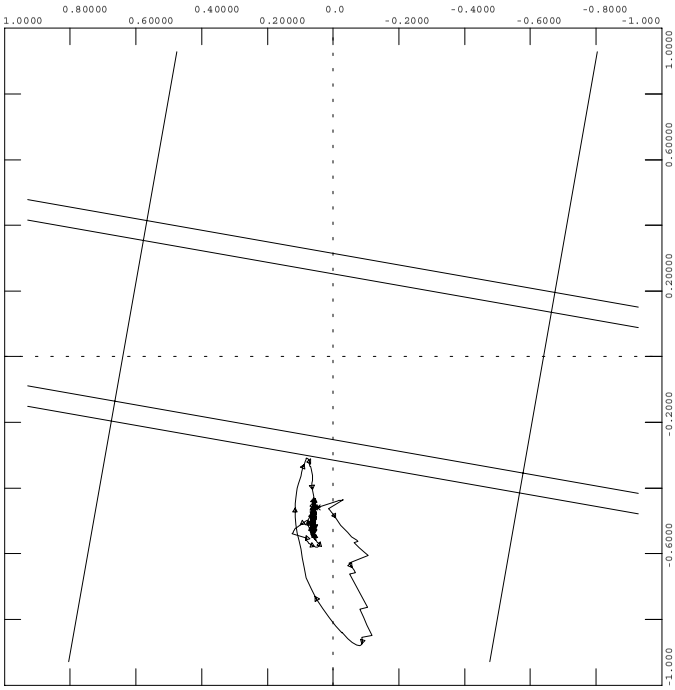


MON, APR 29 2002 23:00
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

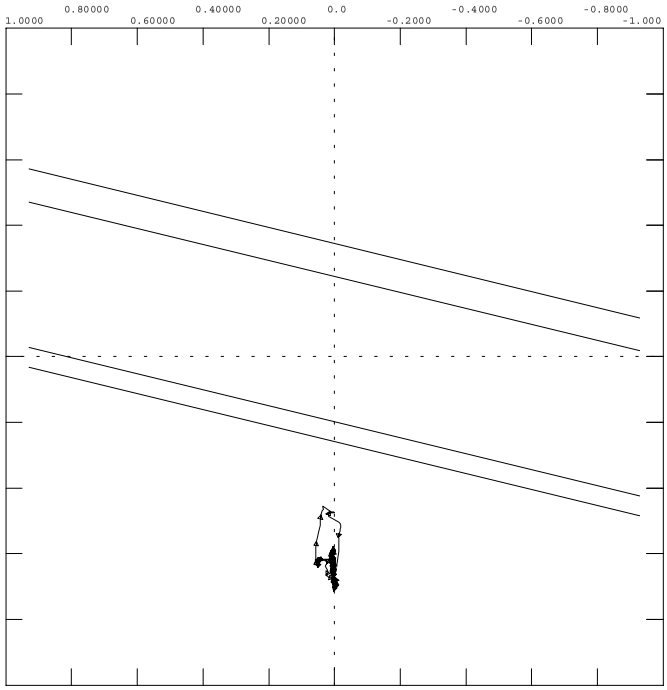
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

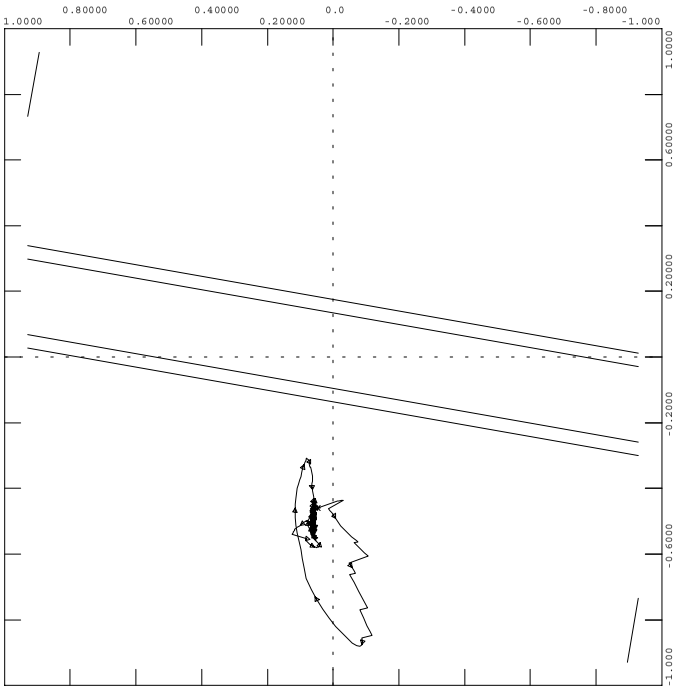
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

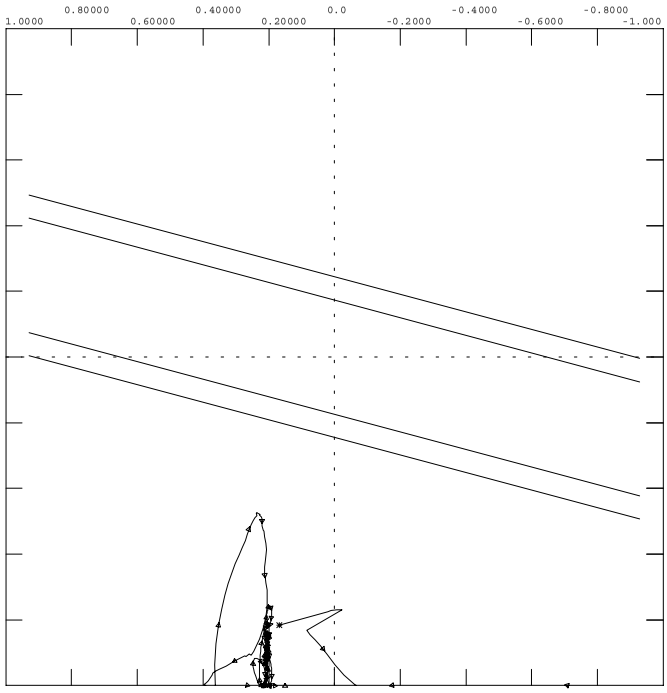
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

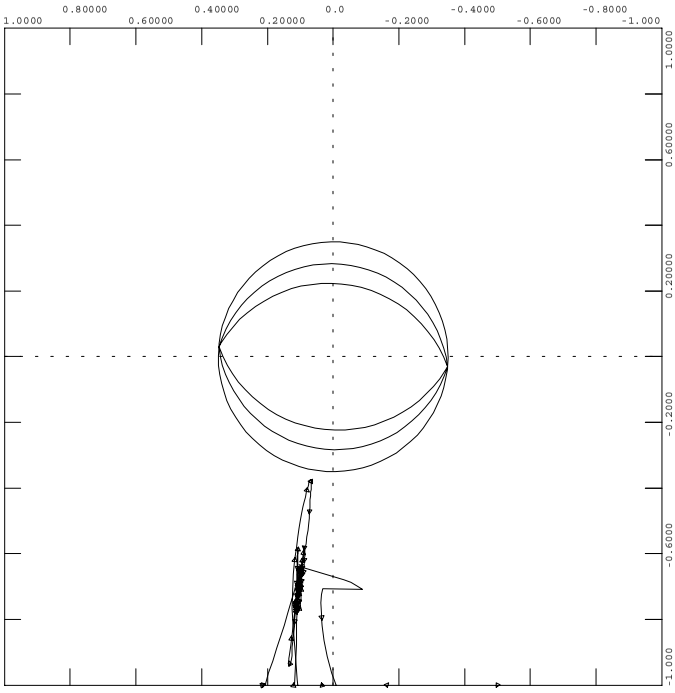
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

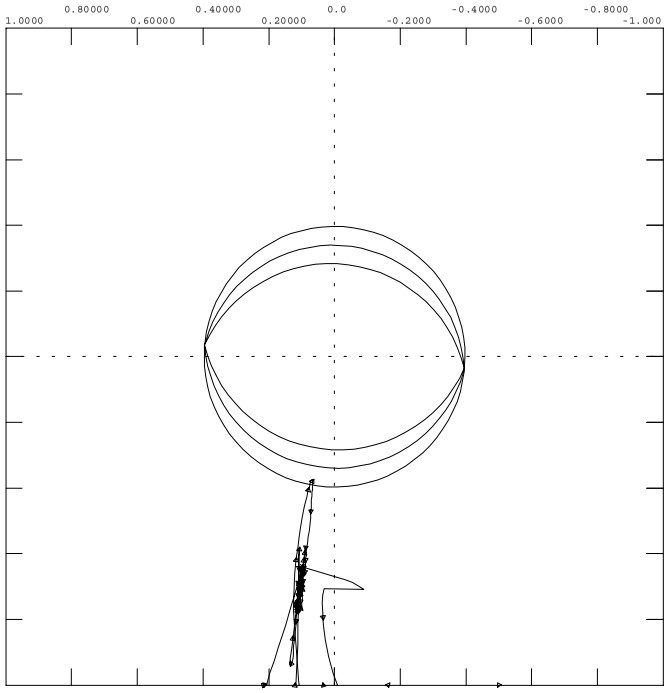
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

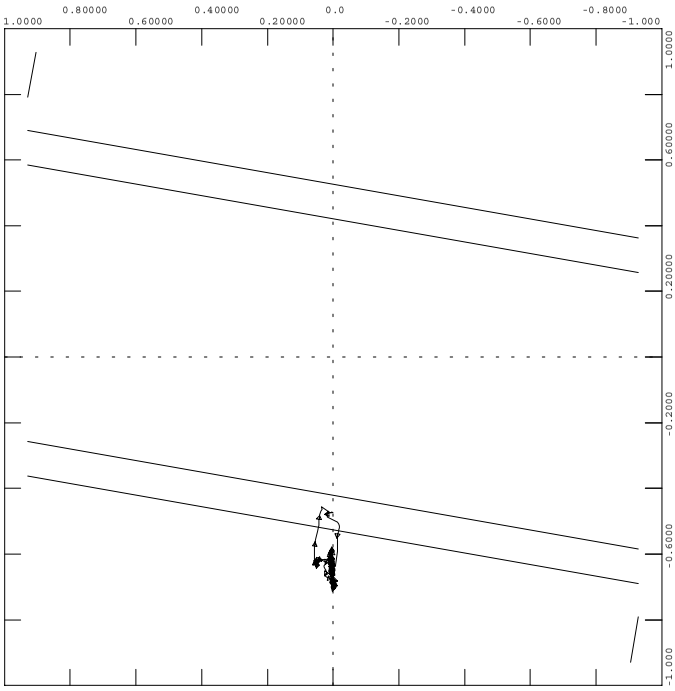
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

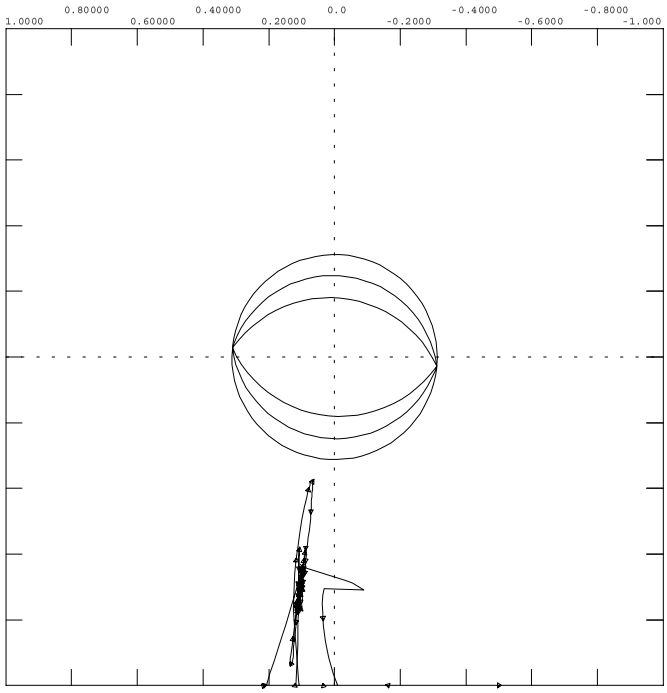
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



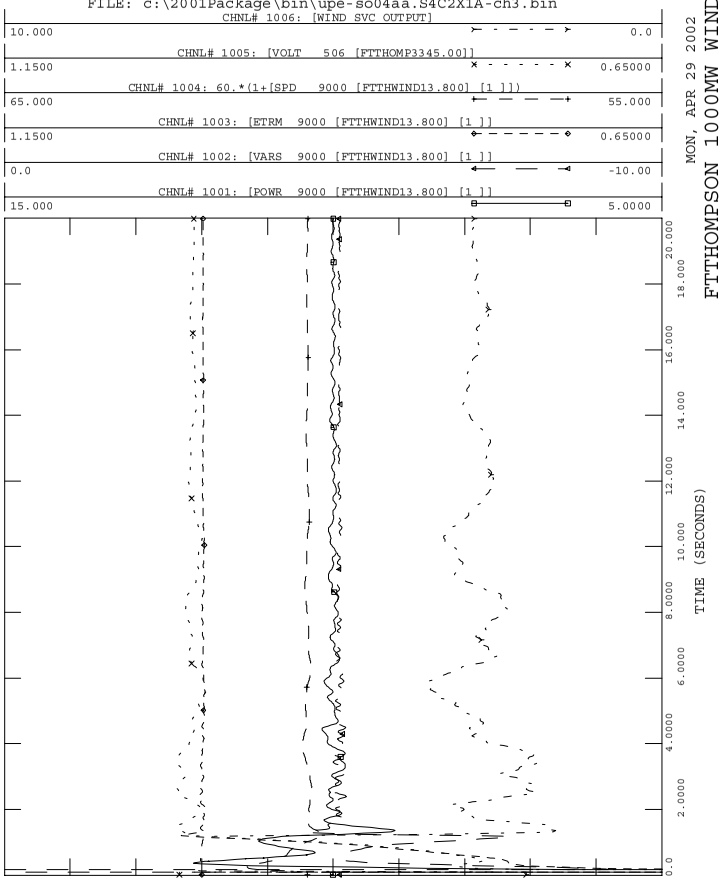
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

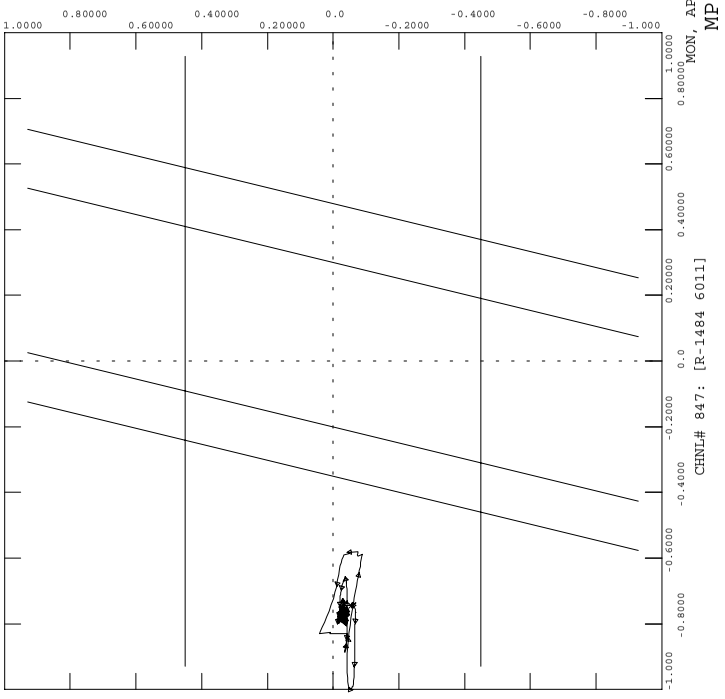


MON, APR 29 2002 23:00
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-ch3.bin

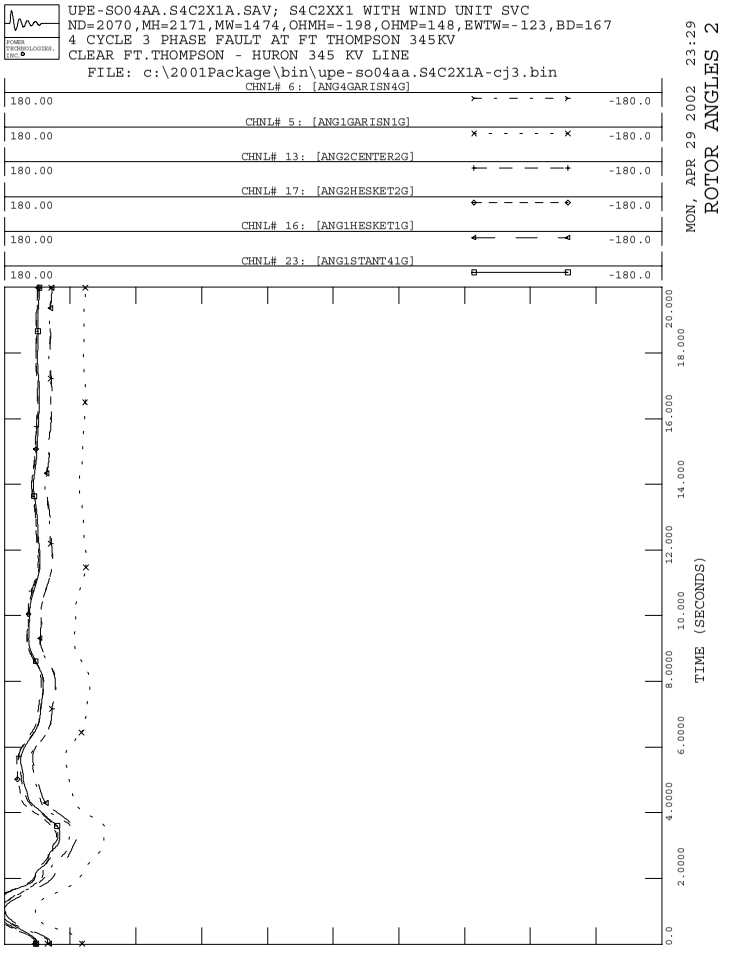
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

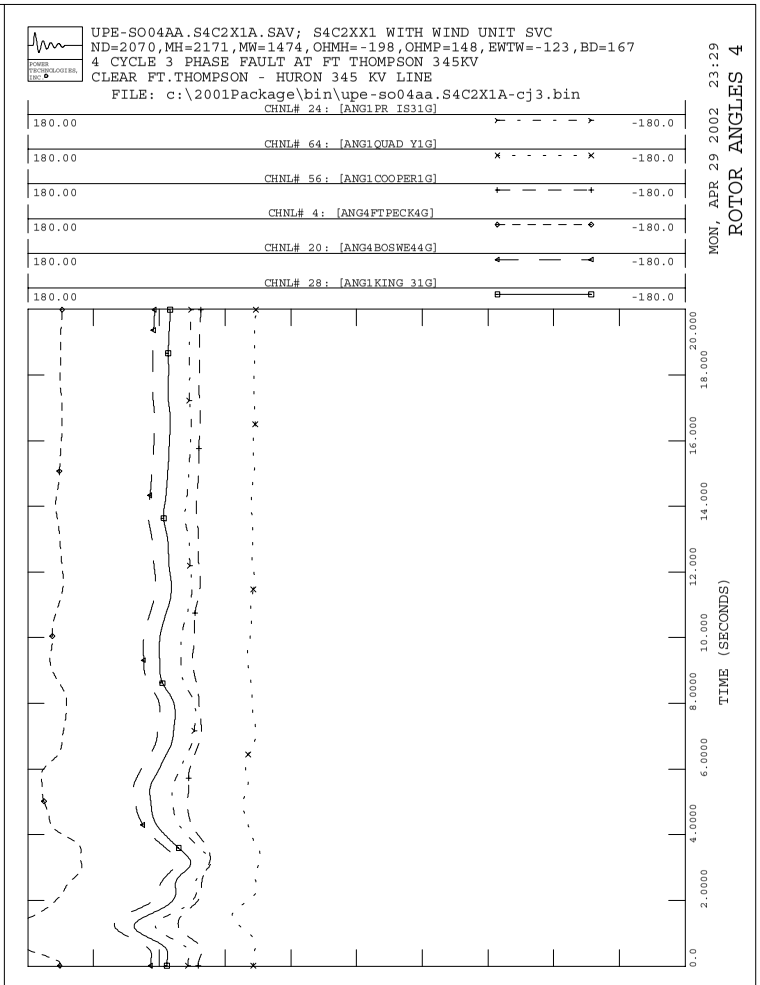


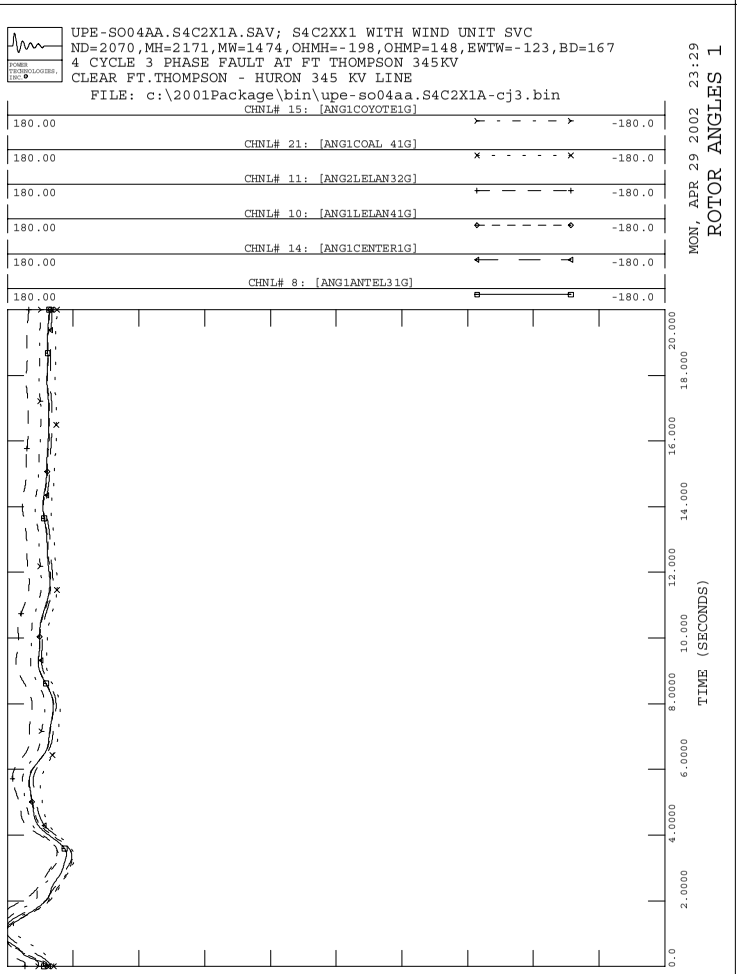
MON, APR 29 2002 23:00
MP-OH I.FALLS (779)

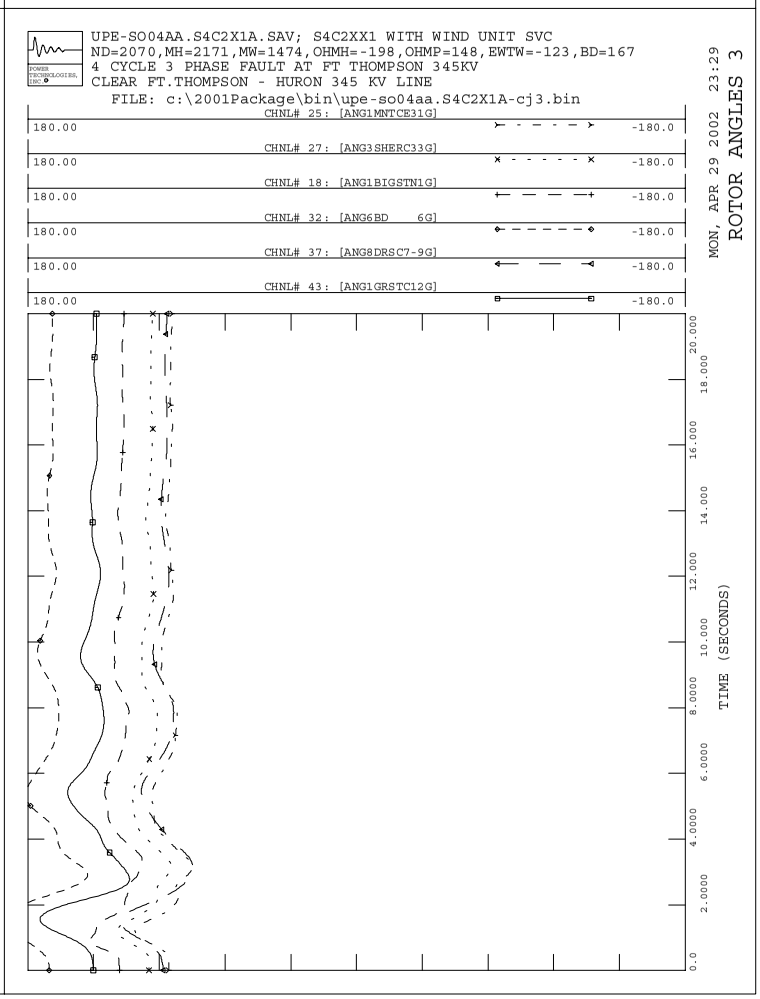
CONTINGENCY CJ3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Huron 345 kV line

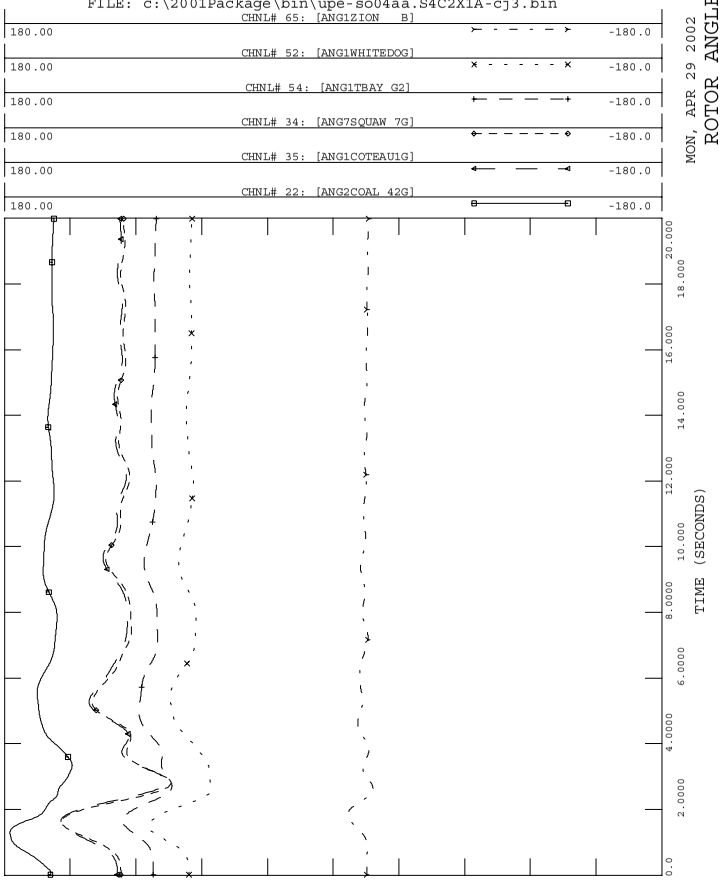

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
MON, APR 29 2002 23:29
ROTOR ANGLES 2


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
MON, APR 29 2002 23:29
ROTOR ANGLES 4


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
MON, APR 29 2002 23:29
ROTOR ANGLES 1

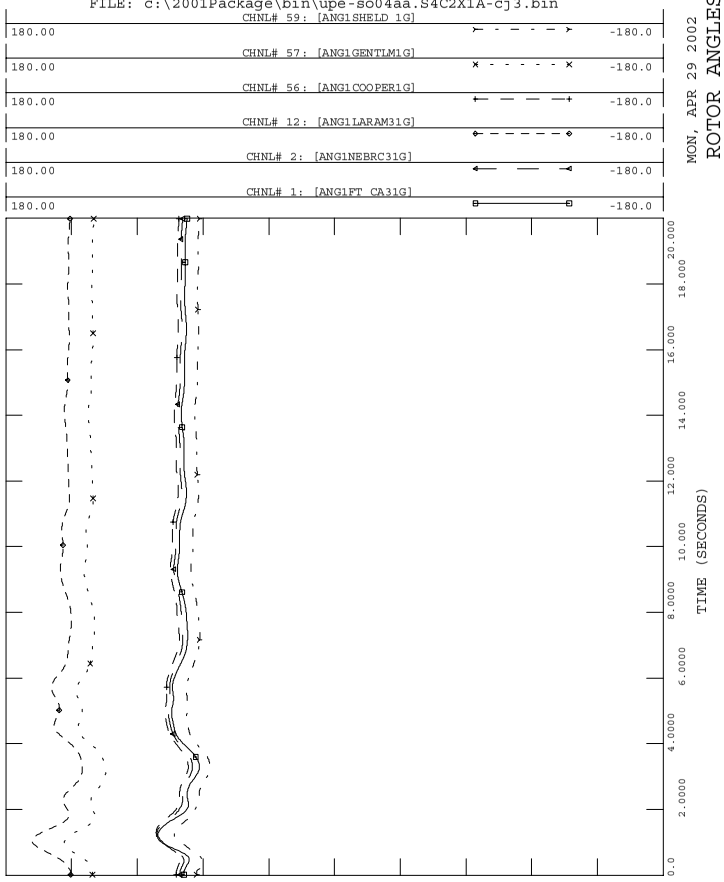

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
MON, APR 29 2002 23:29
ROTOR ANGLES 3

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin



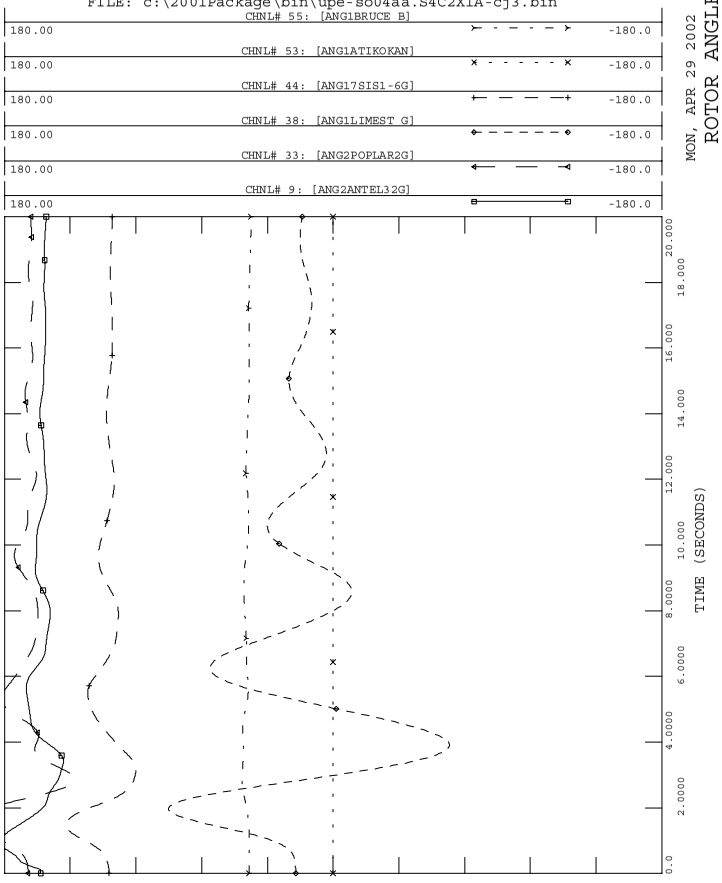
MON, APR 29 2002 23:29
ROTOR ANGLES 6

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin



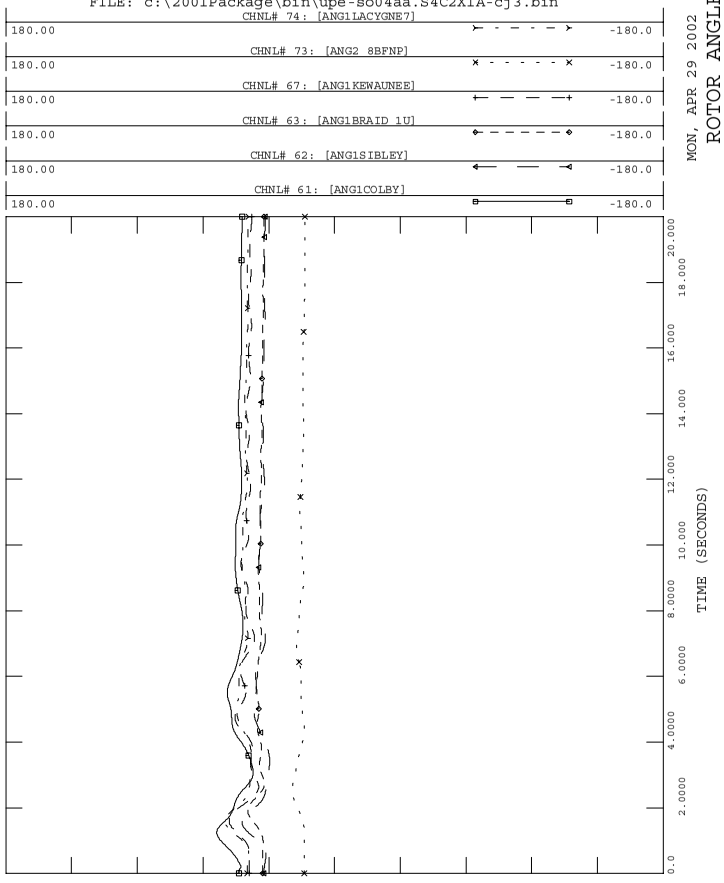
MON, APR 29 2002 23:29
ROTOR ANGLES NB

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

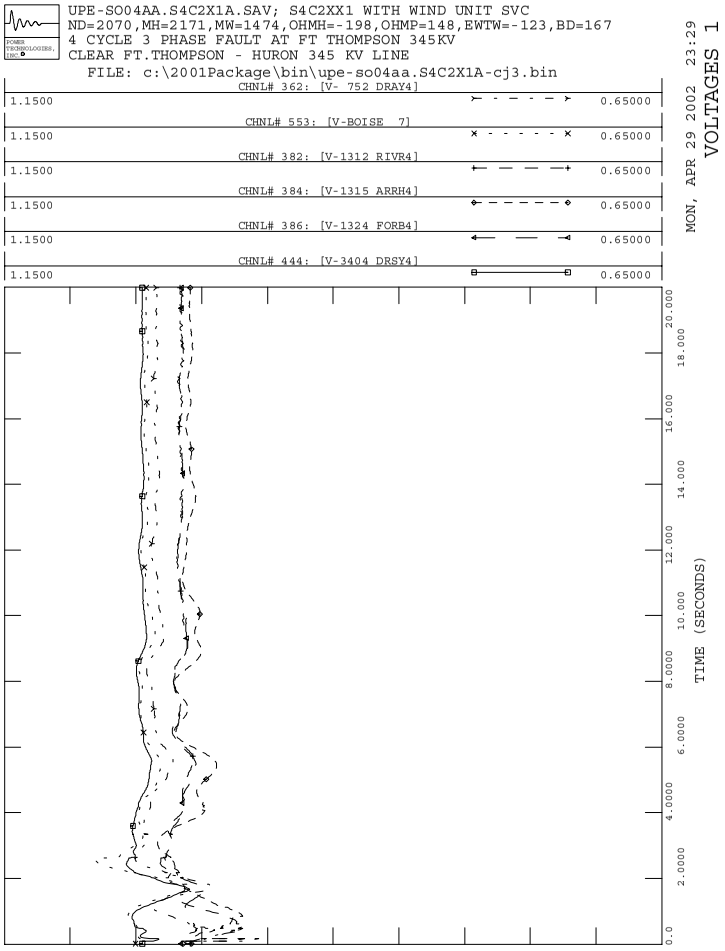


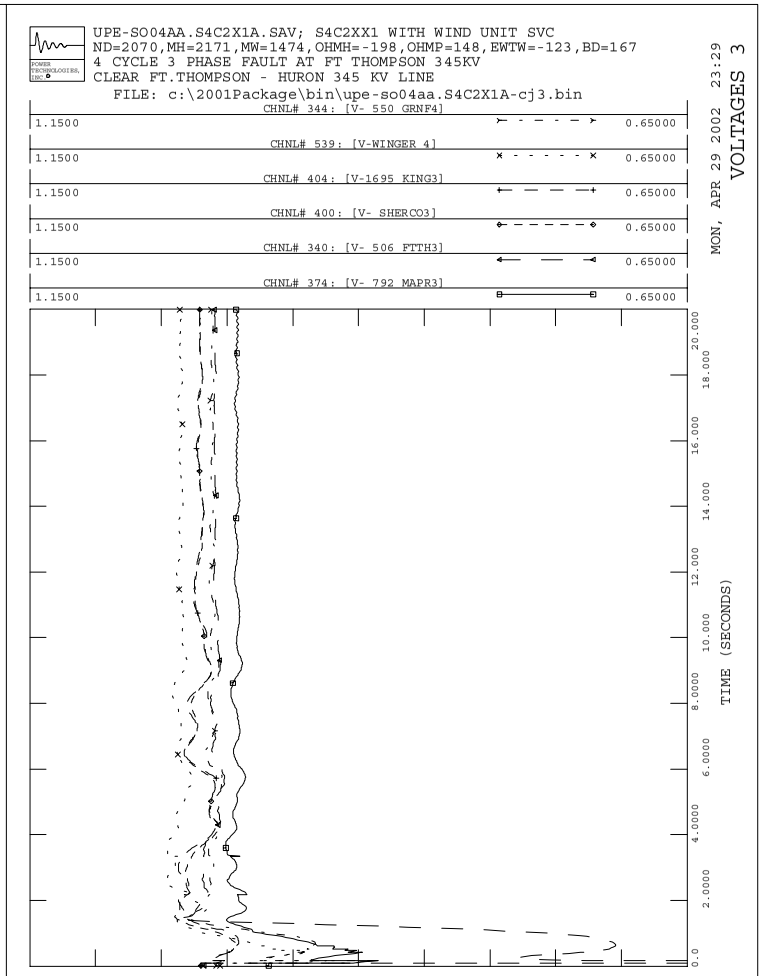
MON, APR 29 2002 23:29
ROTOR ANGLES 5

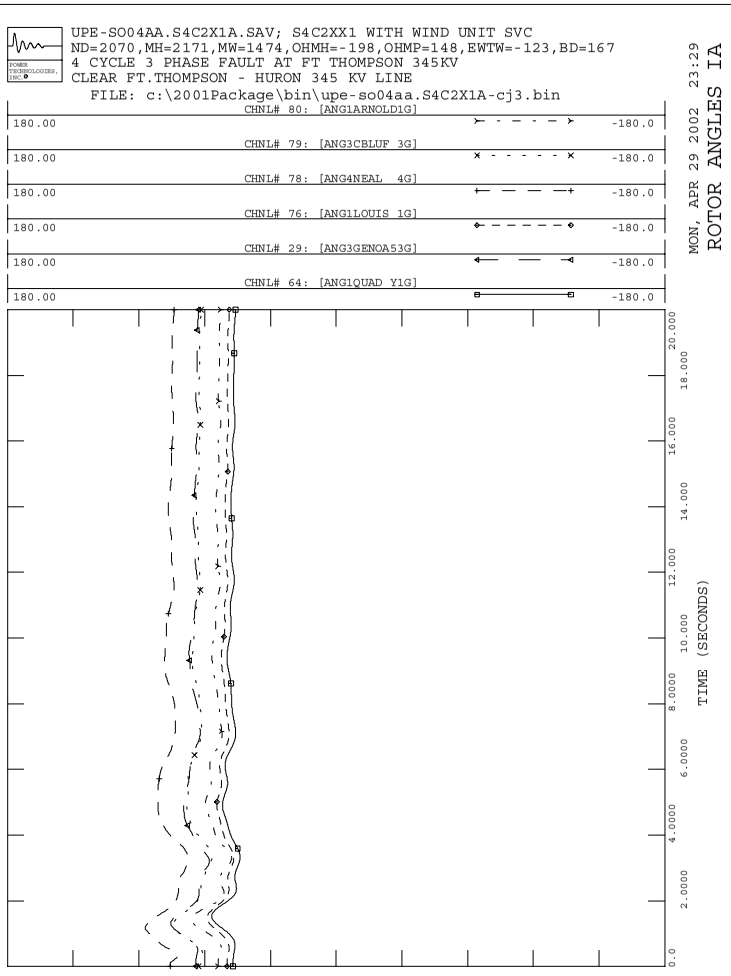
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

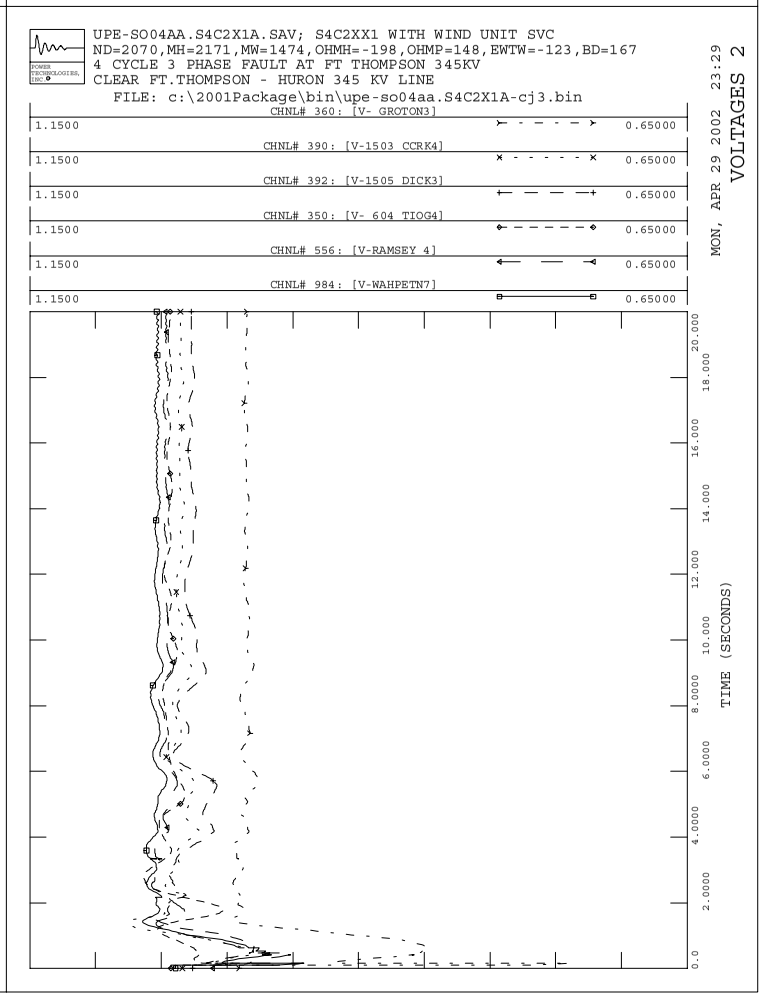


MON, APR 29 2002 23:29
ROTOR ANGLES 7


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 362: [V- 752 DRAY4]
CHNL# 553: [V-BOISE 7]
CHNL# 382: [V-1312 RIVR4]
CHNL# 384: [V-1315 ARRH4]
CHNL# 386: [V-1324 FORB4]
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
MON, APR 29 2002 23:29
VOLTAGES 1
TIME (SECONDS)

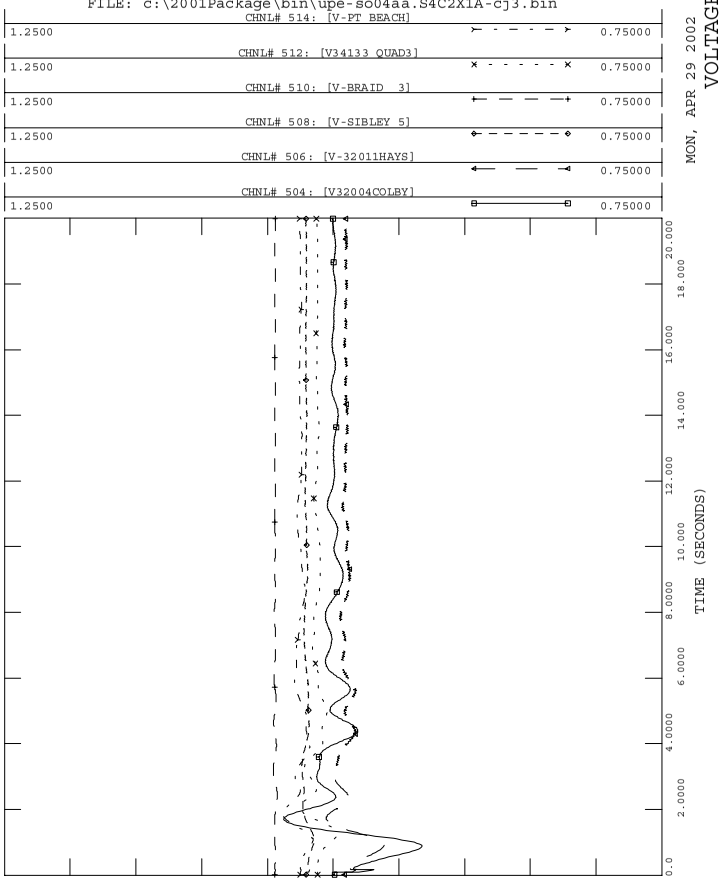

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 344: [V- 550 GRNF4]
CHNL# 539: [V-WINGER 4]
CHNL# 404: [V-1695 KING3]
CHNL# 400: [V- SHERCO3]
CHNL# 340: [V- 506 FTTH3]
CHNL# 374: [V- 792 MAPR3]
1.1500
0.65000
MON, APR 29 2002 23:29
VOLTAGES 3
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 80: [ANG1ARNOLD1G]
CHNL# 79: [ANG3CBLUF 3G]
CHNL# 78: [ANG4NEAL 4G]
CHNL# 76: [ANG1LOUIS 1G]
CHNL# 29: [ANG3GENOA53G]
CHNL# 64: [ANG1QUAD Y1G]
180.00
-180.0
MON, APR 29 2002 23:29
ROTOR ANGLES 1A
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 360: [V- GROTON3]
CHNL# 390: [V-1503 CCRK4]
CHNL# 392: [V-1505 DICK3]
CHNL# 350: [V- 604 TIOG4]
CHNL# 556: [V-RAMSEY 4]
CHNL# 984: [V-WAHPETN7]
1.1500
0.65000
MON, APR 29 2002 23:29
VOLTAGES 2
TIME (SECONDS)

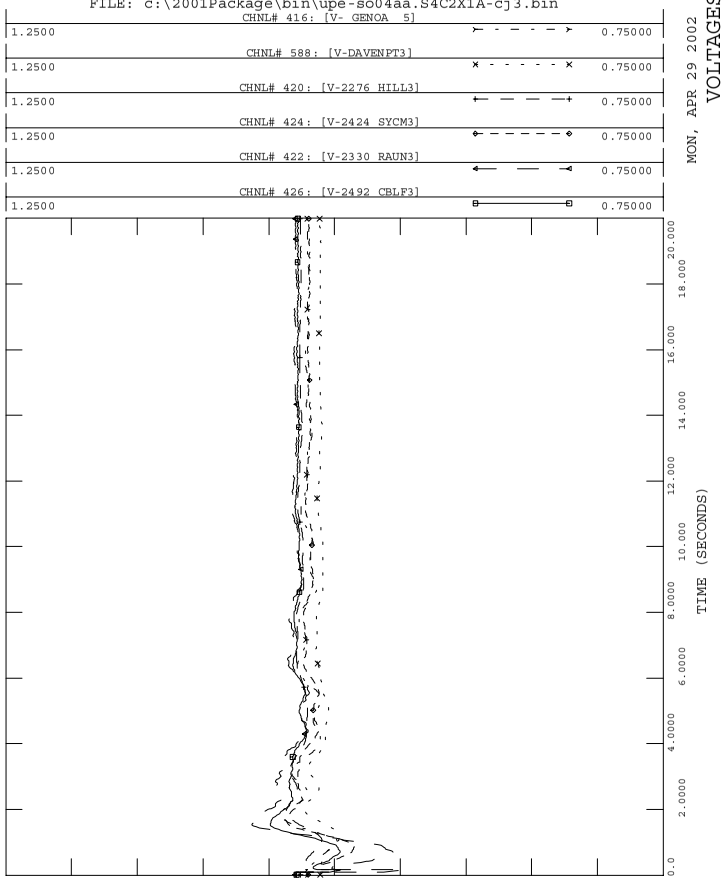
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

MON, APR 29 2002 23:29
VOLTAGES 5



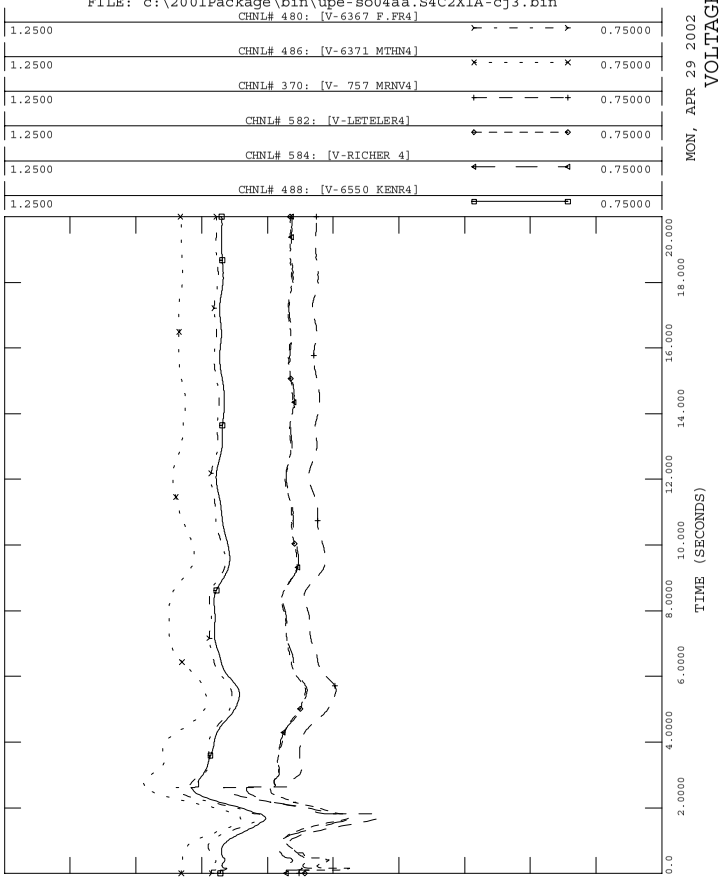
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

MON, APR 29 2002 23:29
VOLTAGES IA



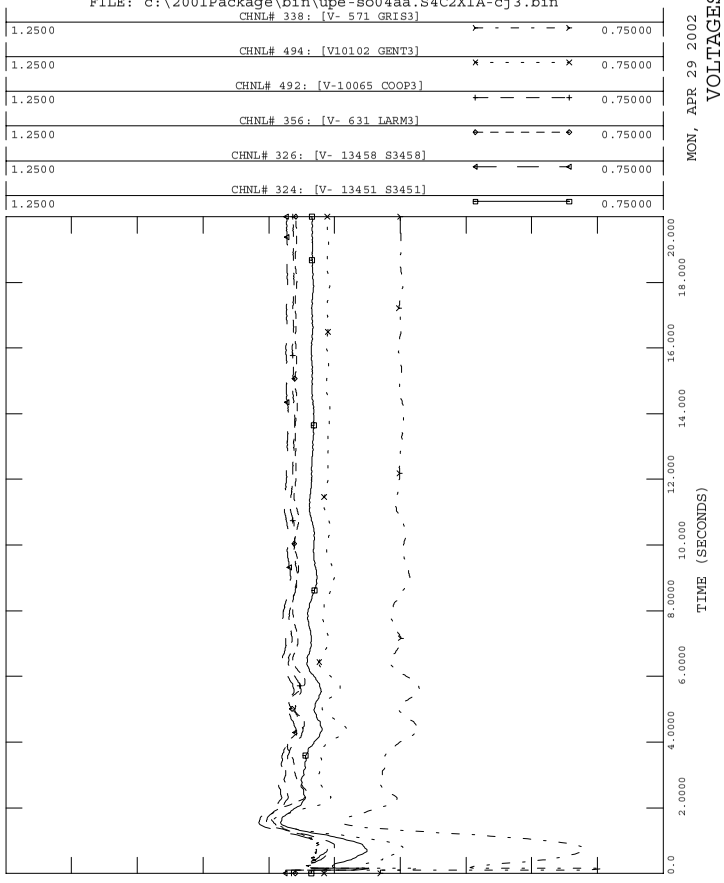
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

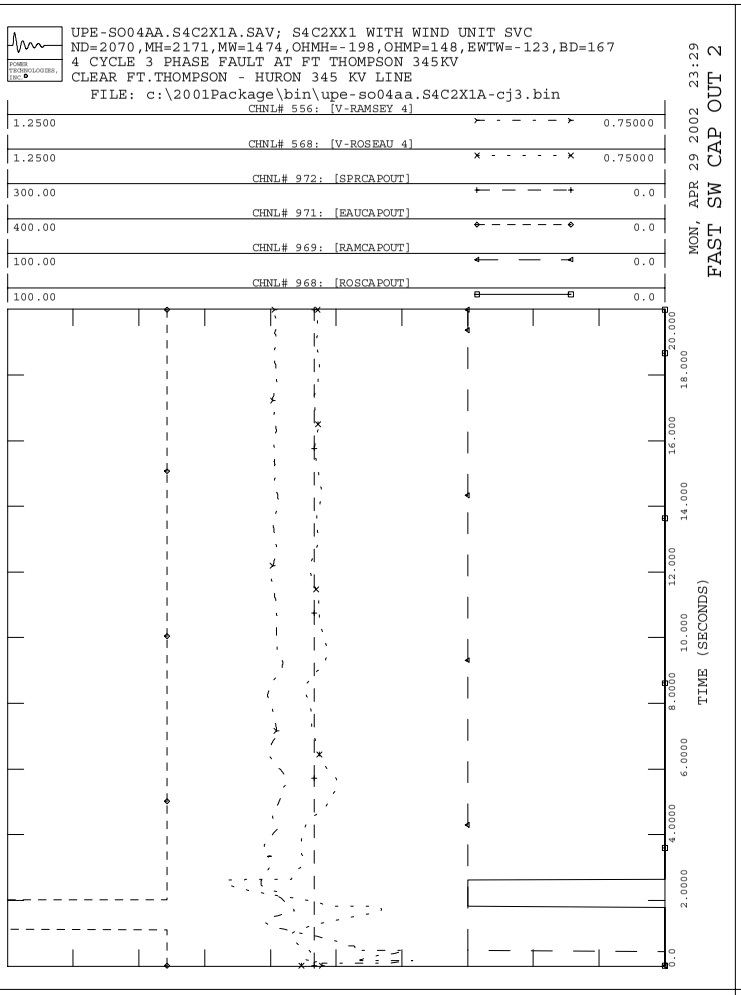
MON, APR 29 2002 23:29
VOLTAGES 4

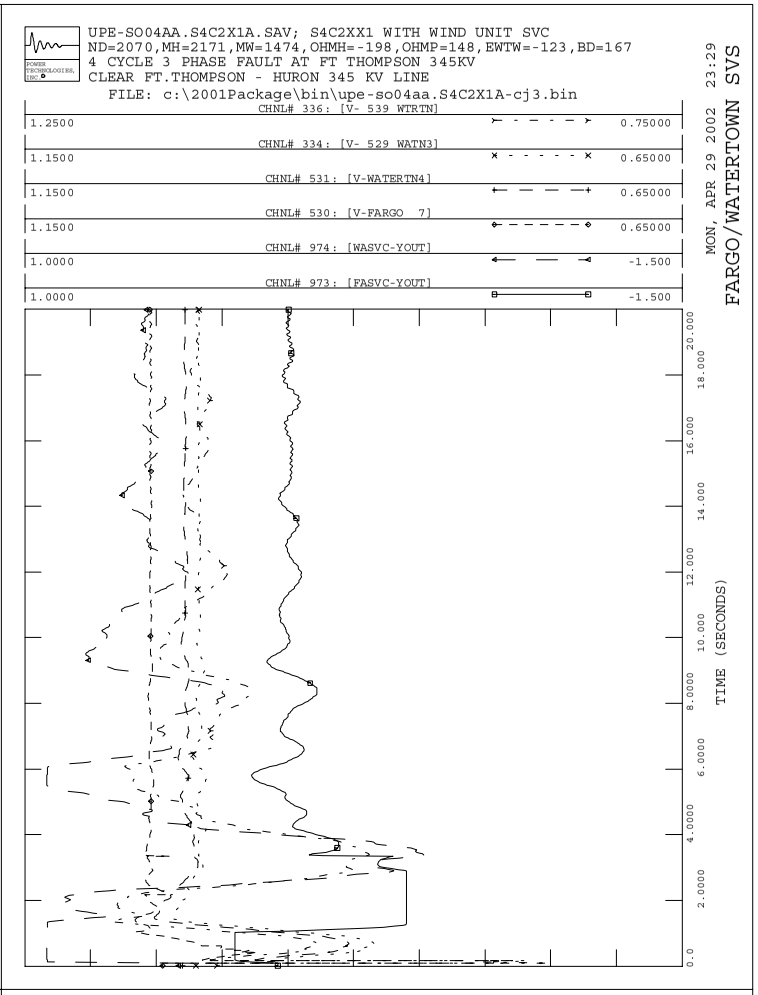


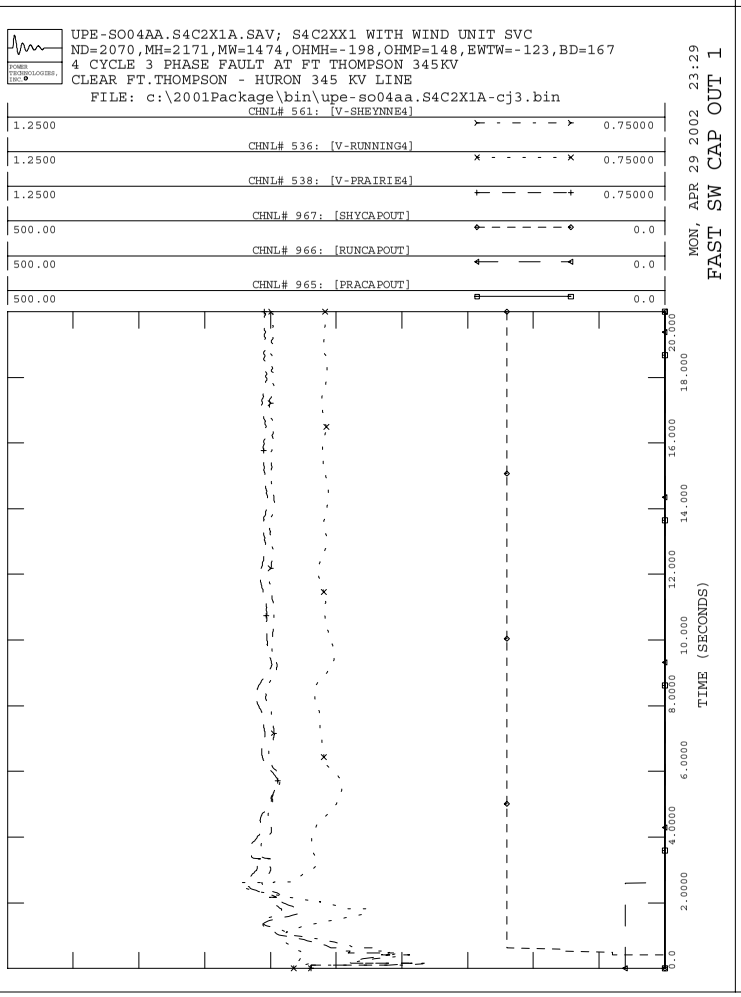
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

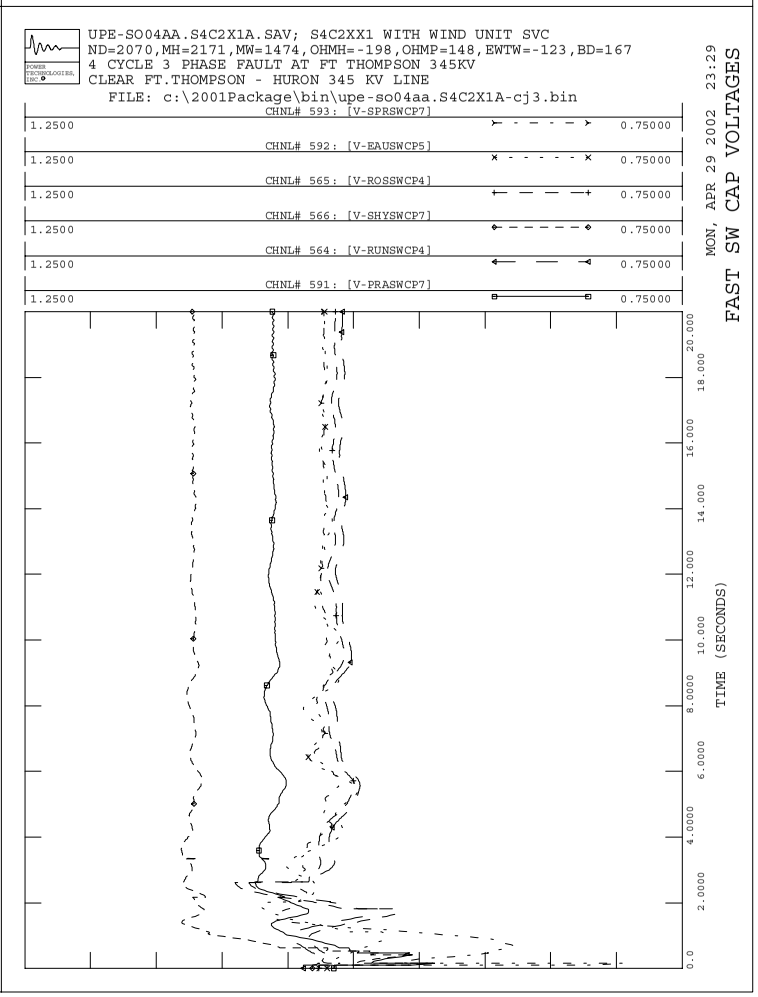
MON, APR 29 2002 23:29
VOLTAGES NB




UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
MON, APR 29 2002 23:29
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
MON, APR 29 2002 23:29
FARGO/WATERTOWN SVS
TIME (SECONDS)

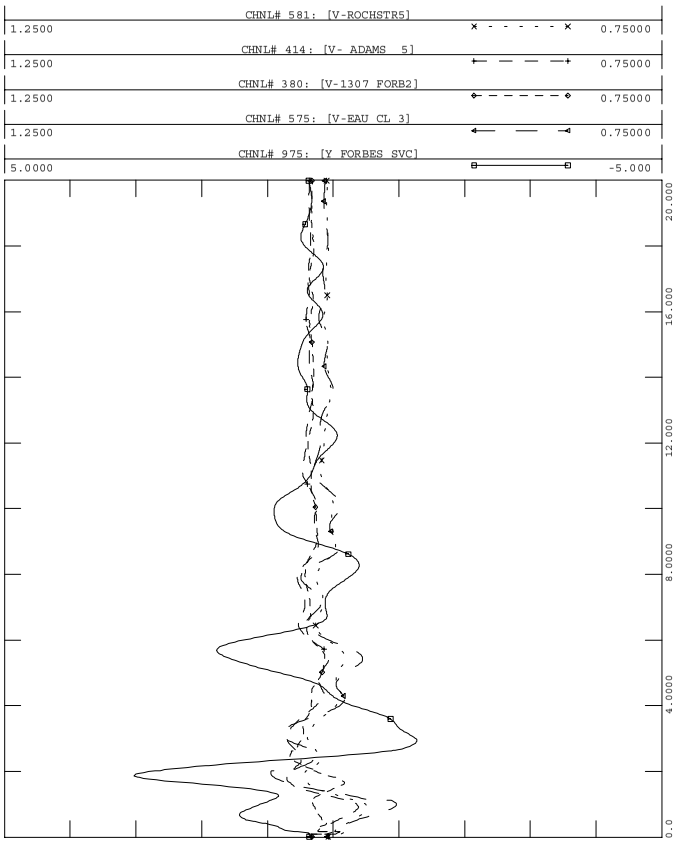

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
MON, APR 29 2002 23:29
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
MON, APR 29 2002 23:29
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

MON, APR 29 2002 23:29

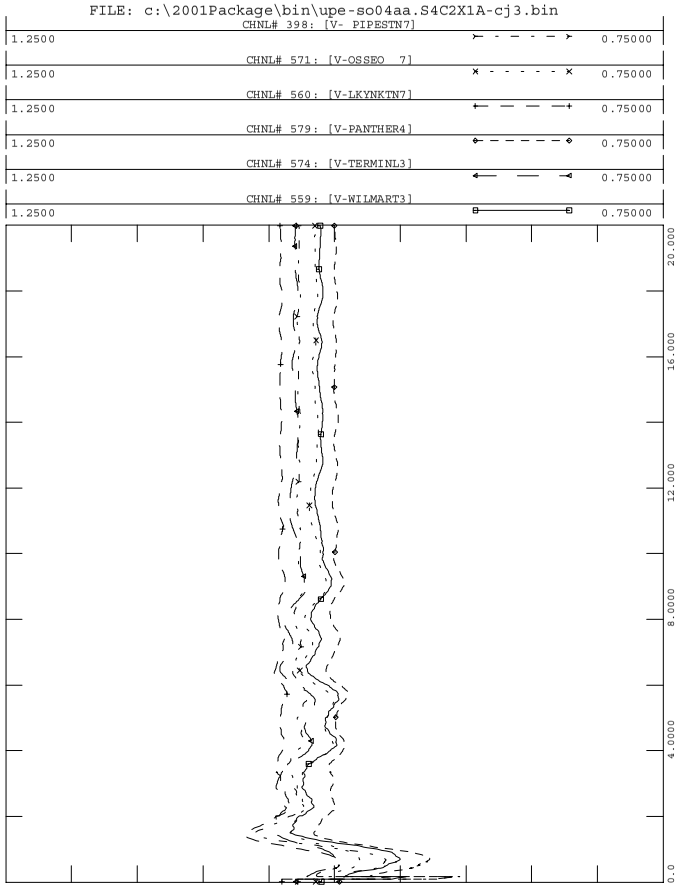
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

MON, APR 29 2002 23:29

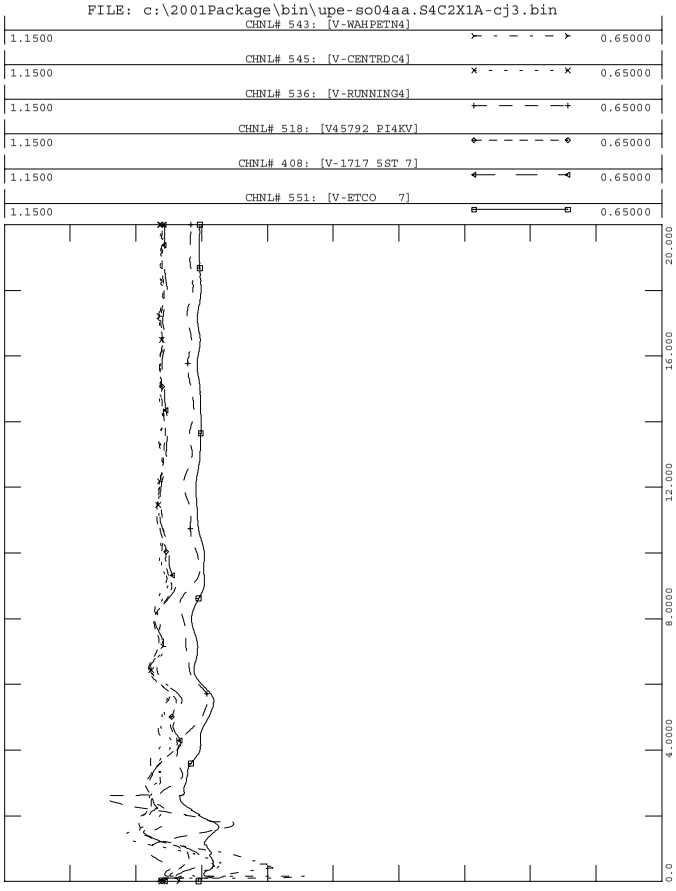
TC VOLTAGES



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

MON, APR 29 2002 23:29

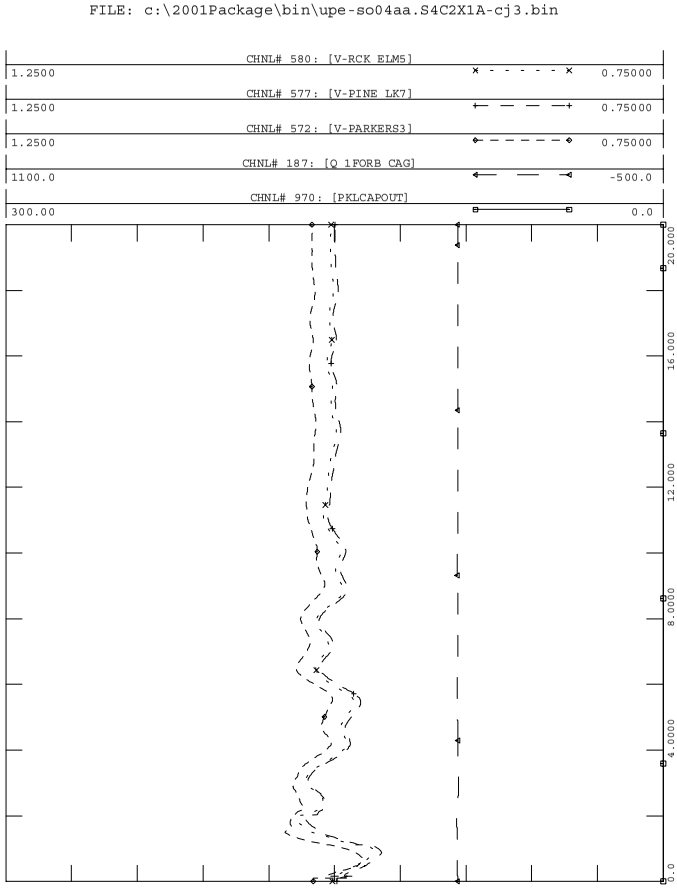
VOLTAGES 6



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

MON, APR 29 2002 23:29

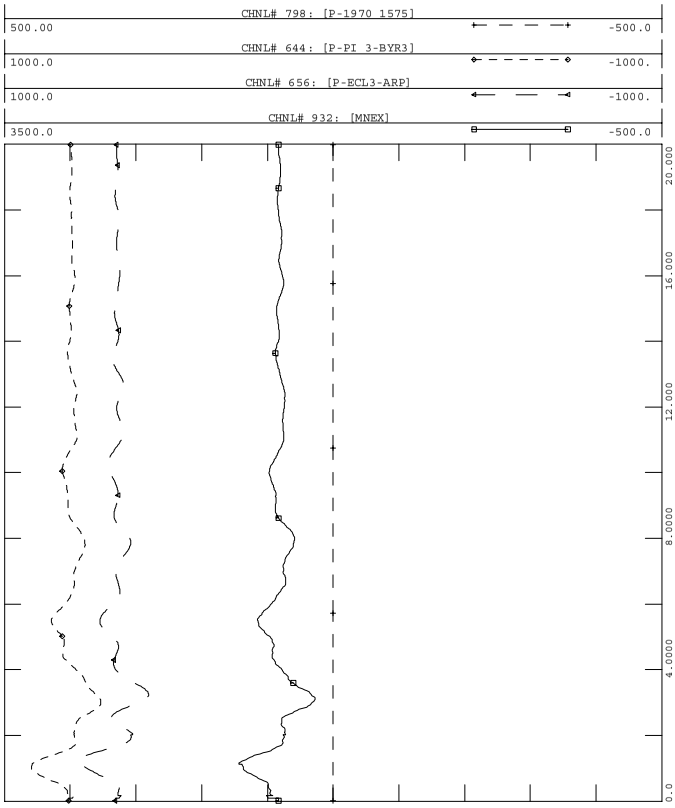
FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

MON, APR 29 2002 23:29

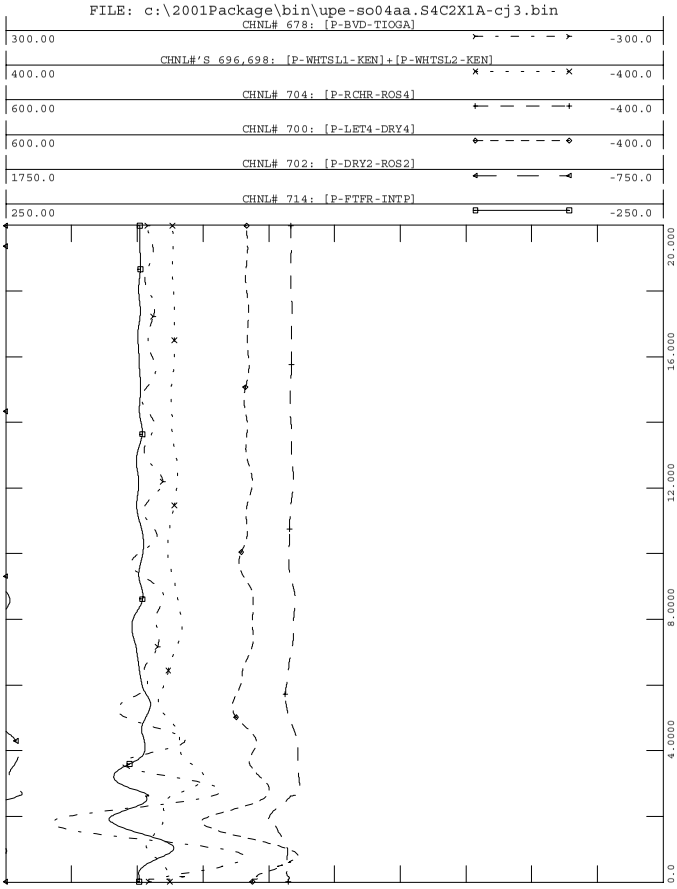
POWER FLOW SUMS 2



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

MON, APR 29 2002 23:29

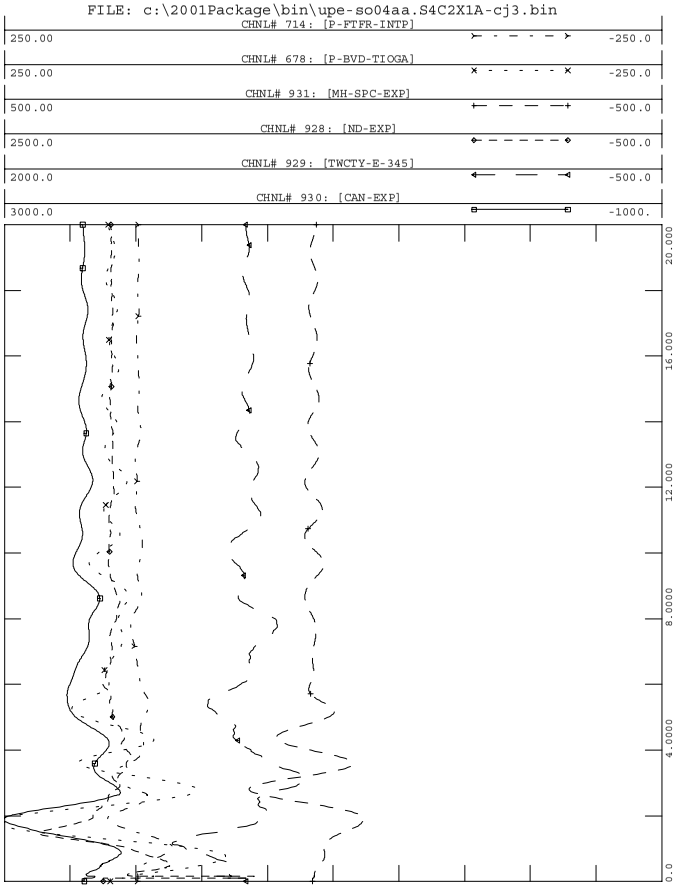
CAN. TIE FLOWS



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

MON, APR 29 2002 23:29

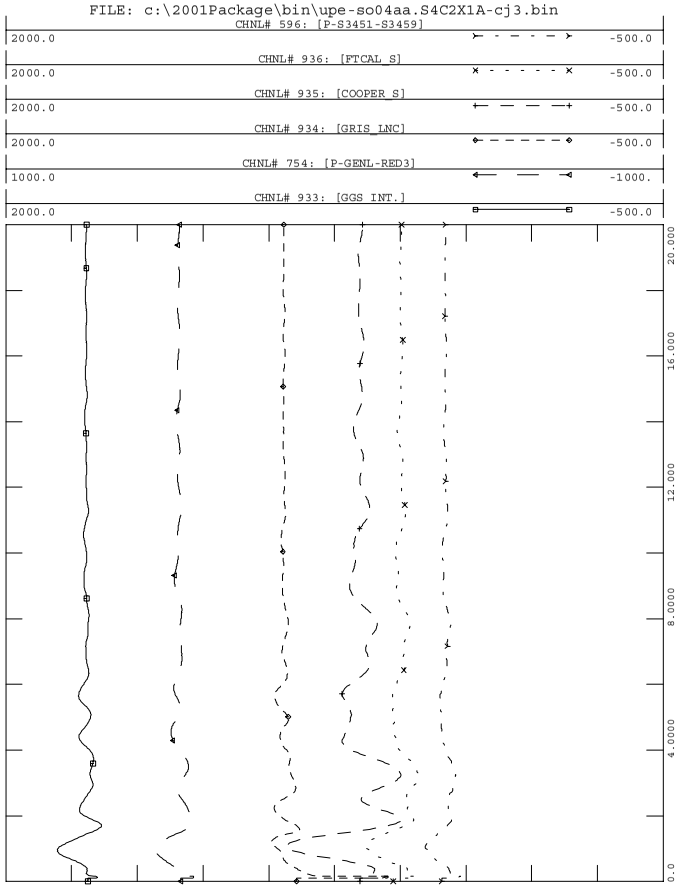
POWER FLOW SUMS 1



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

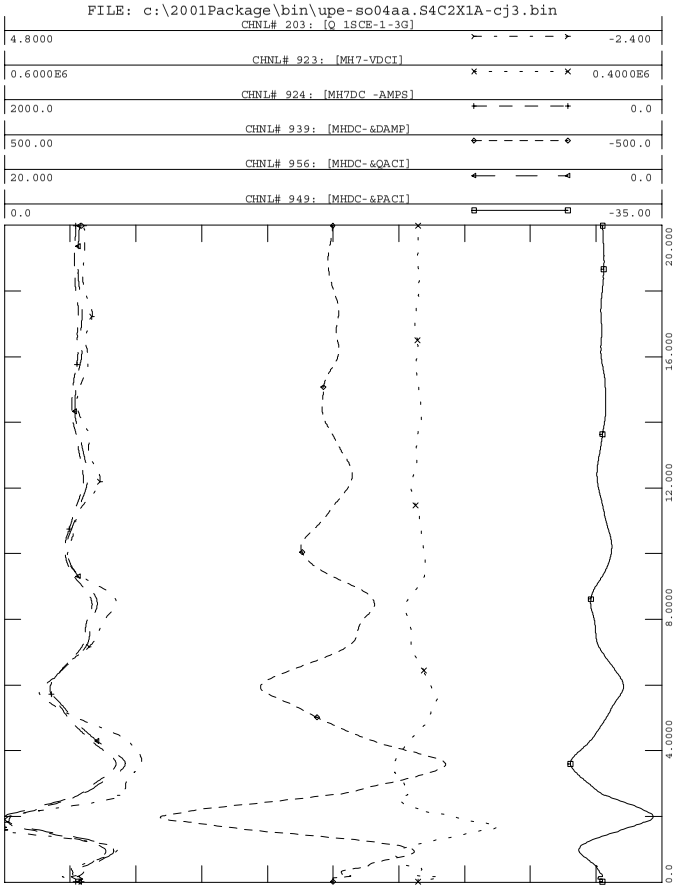
MON, APR 29 2002 23:29

POWER FLOW SUM 3



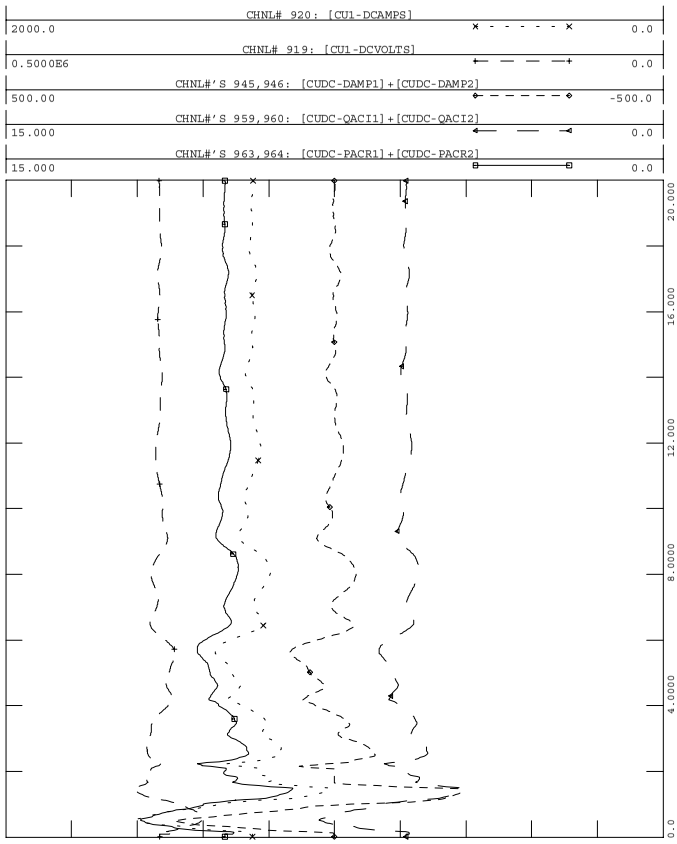
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

MON, APR 29 2002 23:29
MH DC PARAMETERS



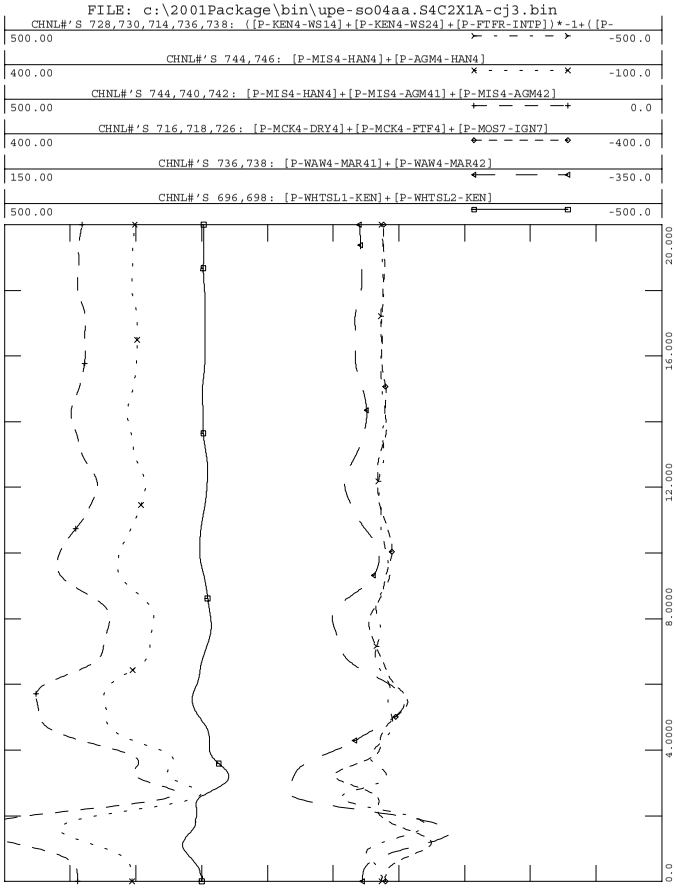
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

MON, APR 29 2002 23:29
CU DC #1



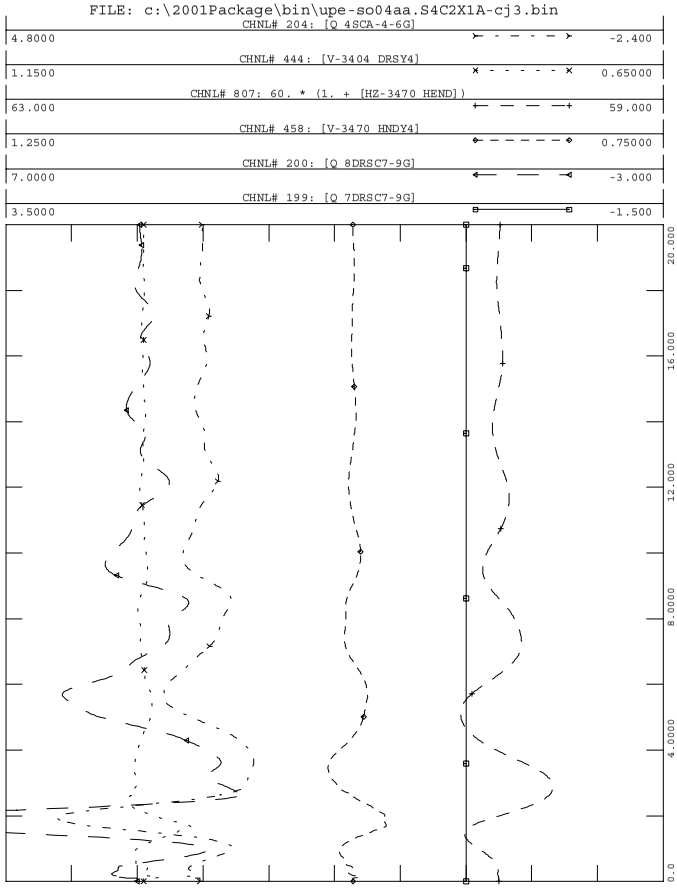
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

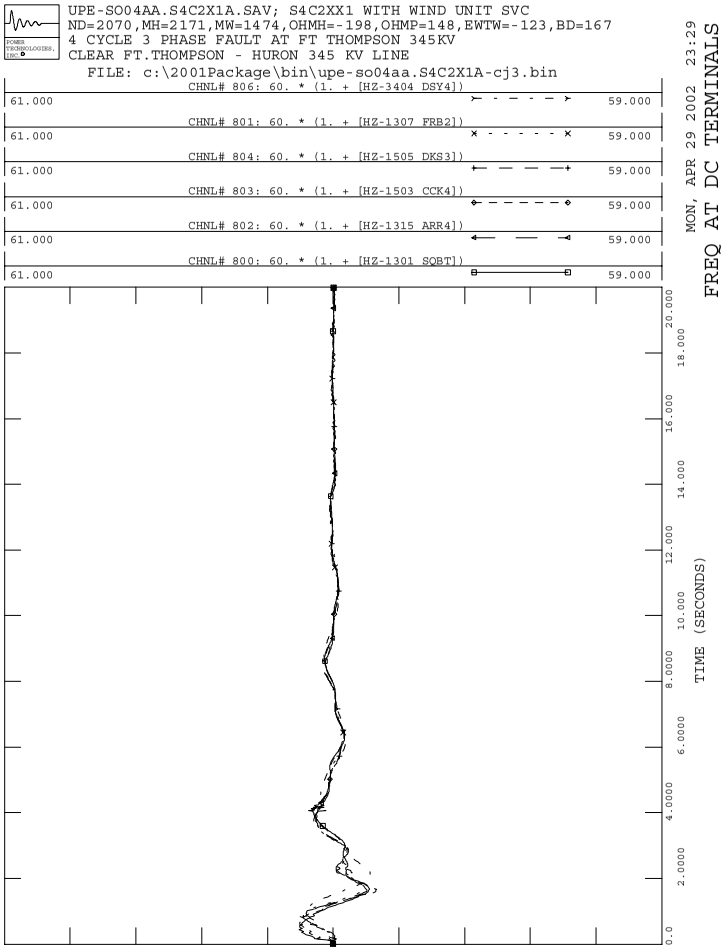
MON, APR 29 2002 23:29
OH TIE FLOWS

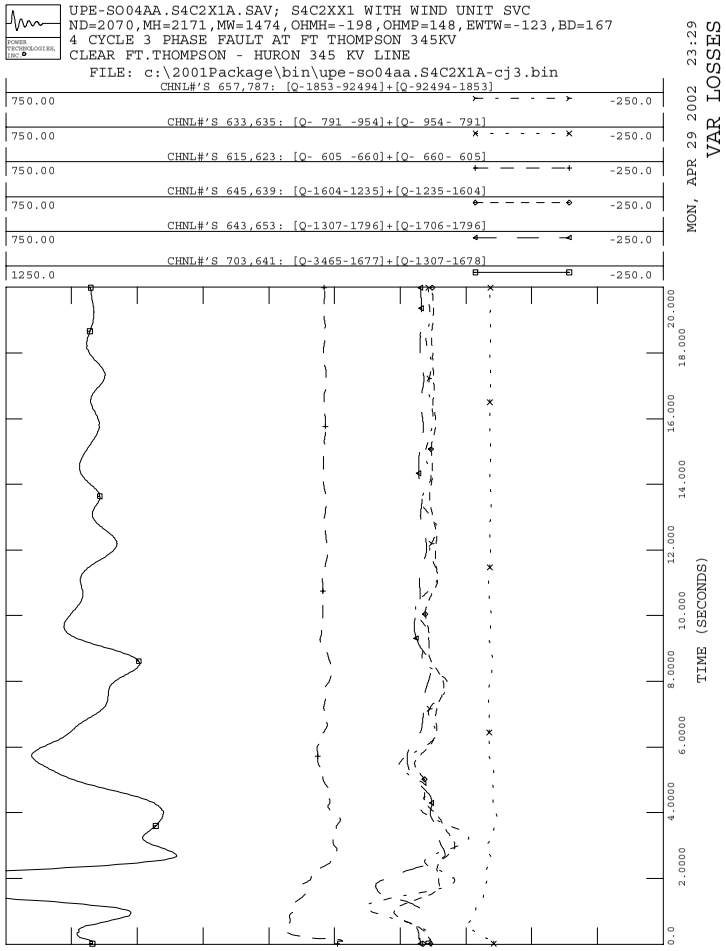


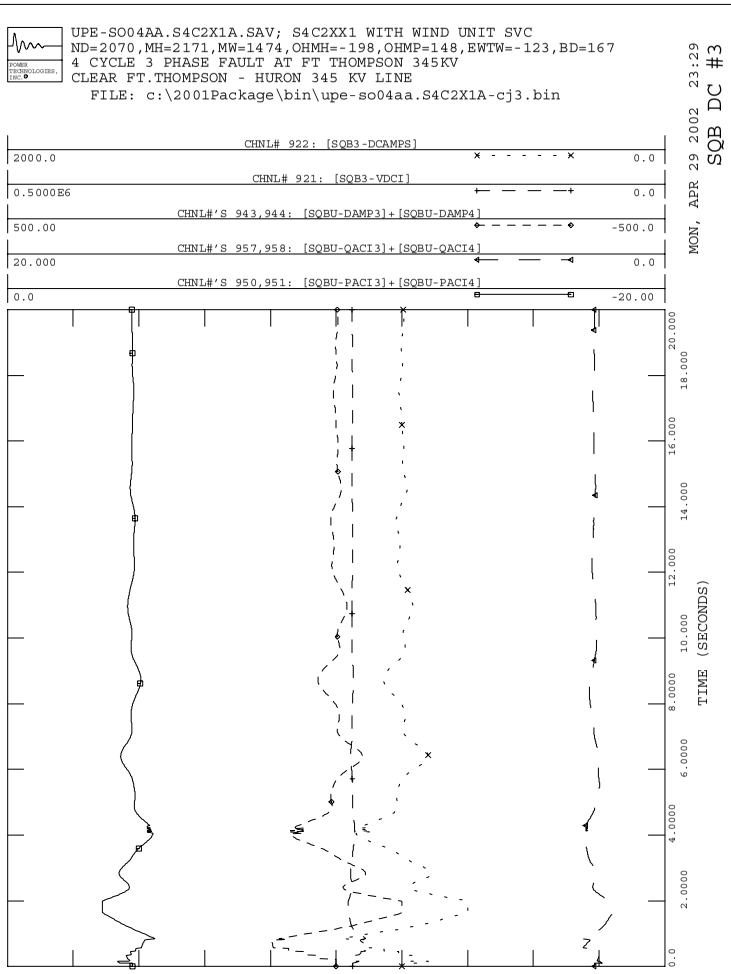
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

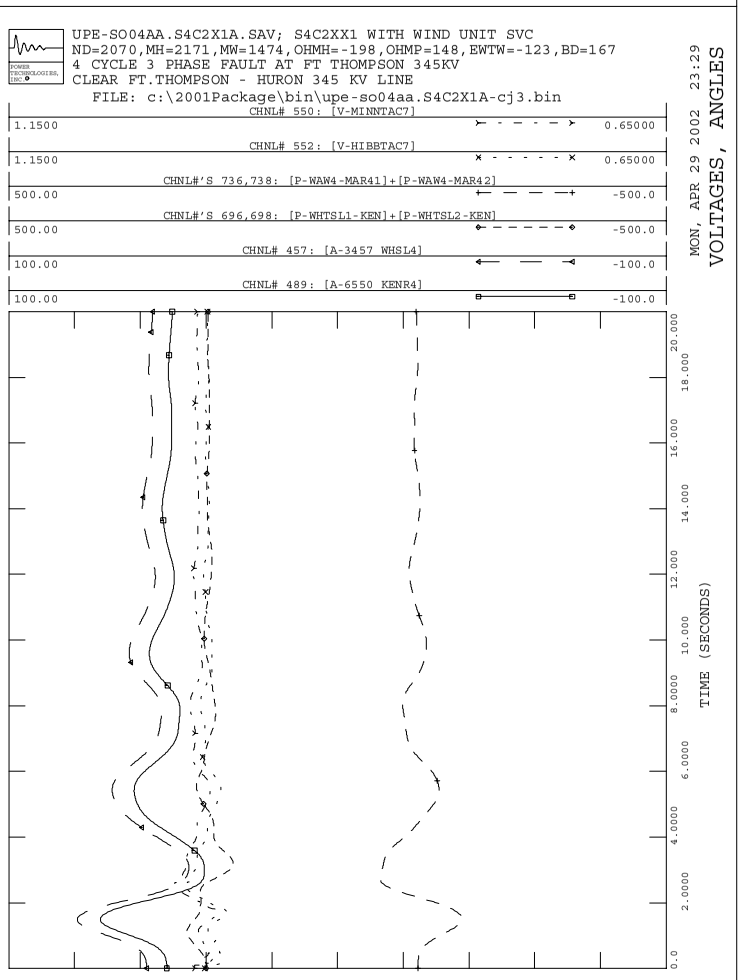
MON, APR 29 2002 23:29
MH DC PARAMETERS




UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
MON, APR 29 2002 23:29
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
MON, APR 29 2002 23:29
VAR LOSSES
TIME (SECONDS)

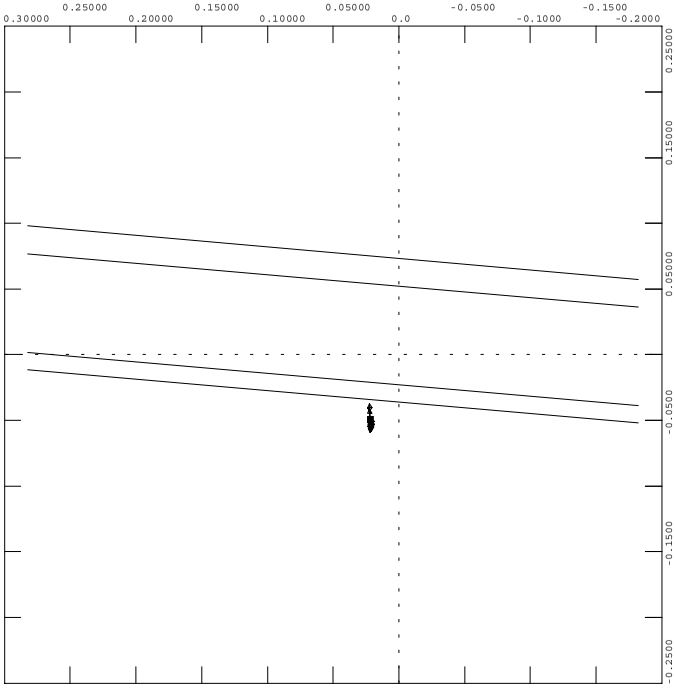

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
0.0
-20.00
MON, APR 29 2002 23:29
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
MON, APR 29 2002 23:29
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

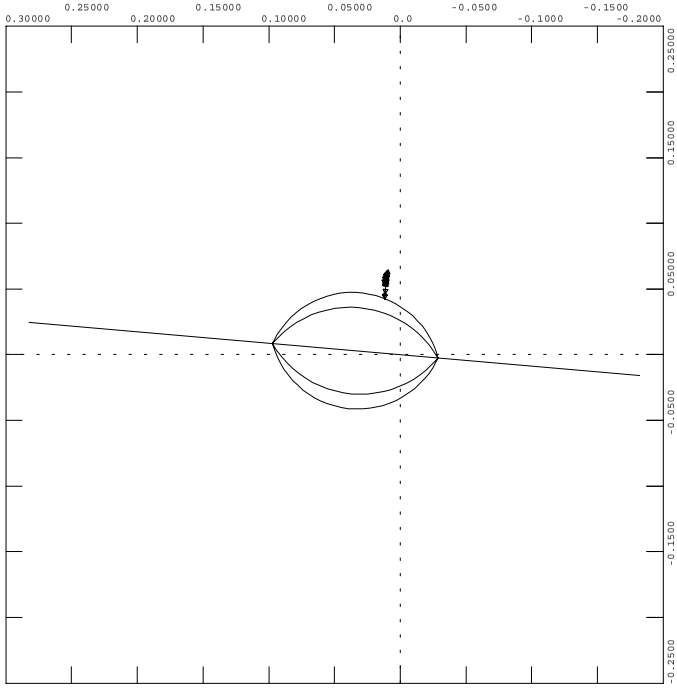


MON, APR 29 2002 23:29
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

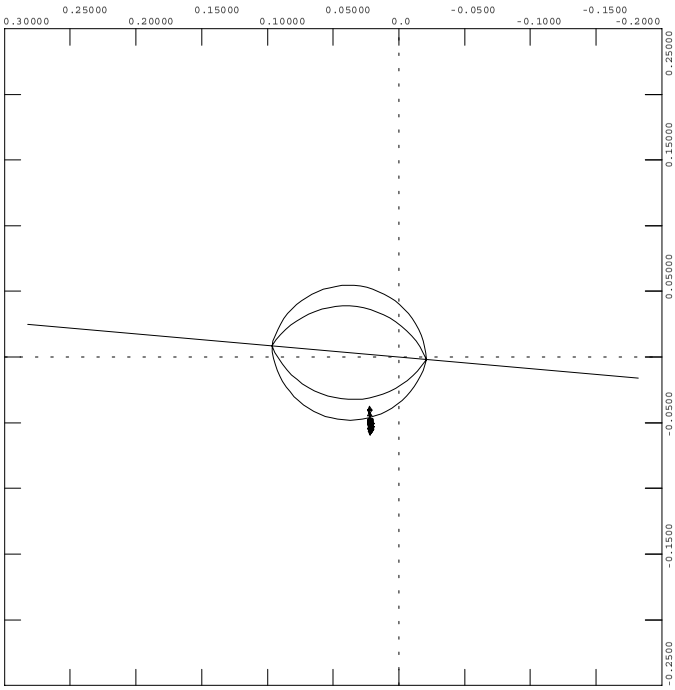


MON, APR 29 2002 23:29
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

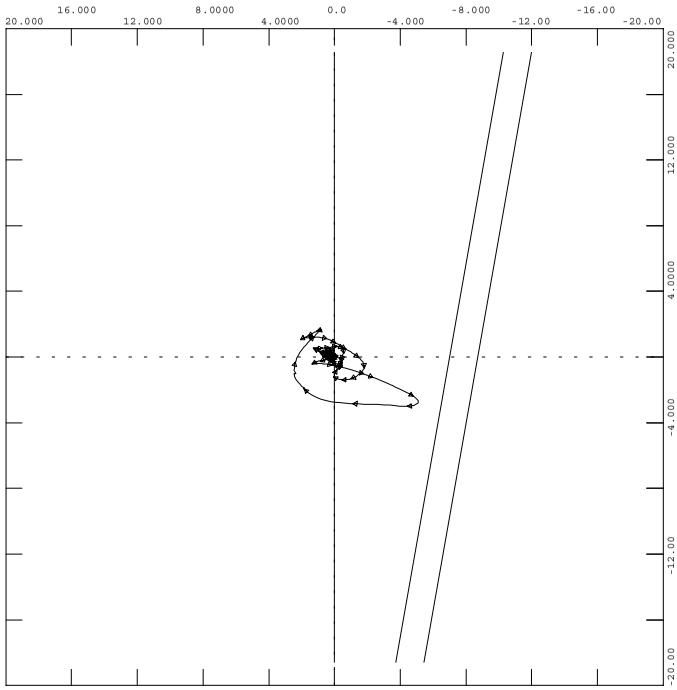


MON, APR 29 2002 23:29
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

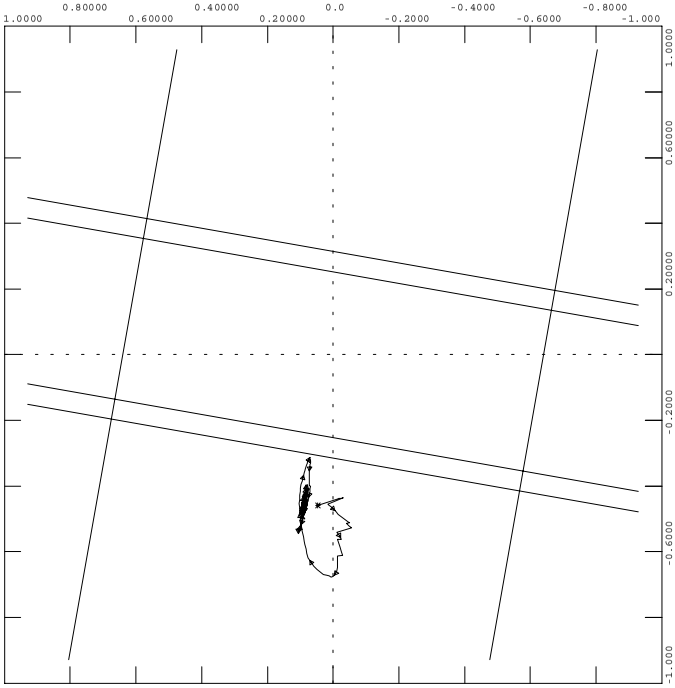


MON, APR 29 2002 23:29
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

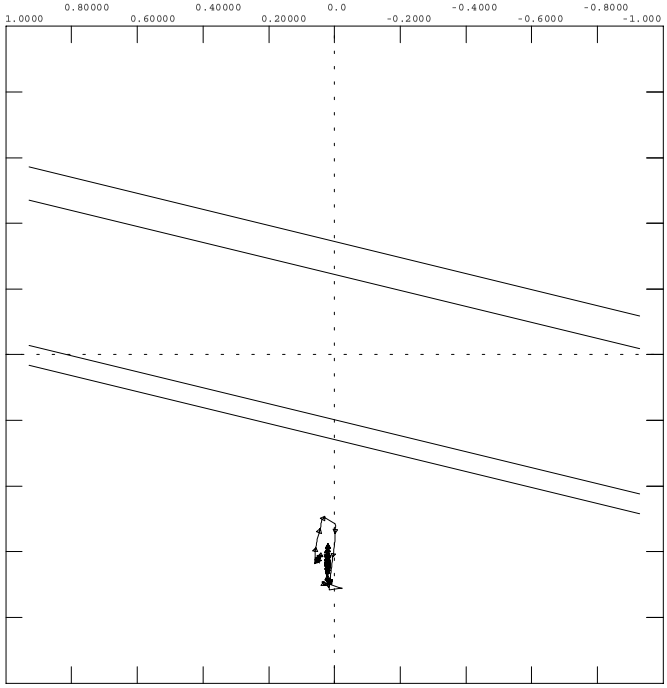
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

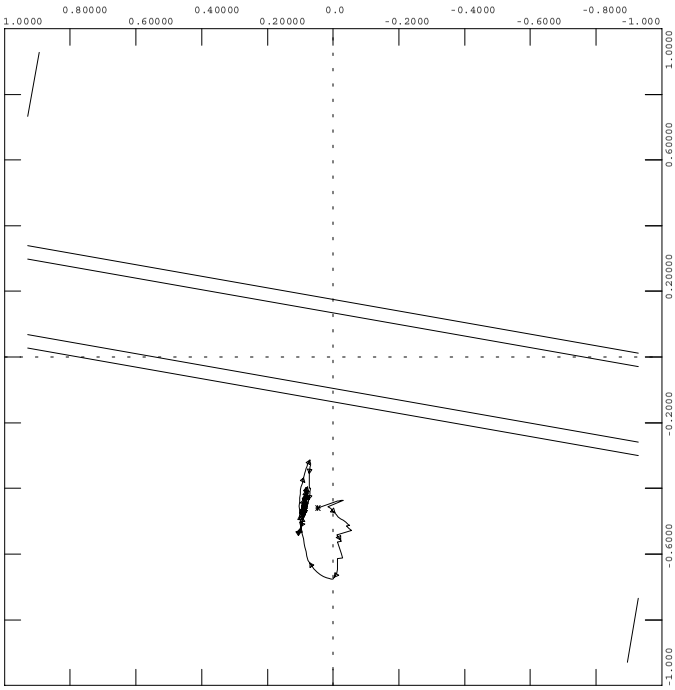
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

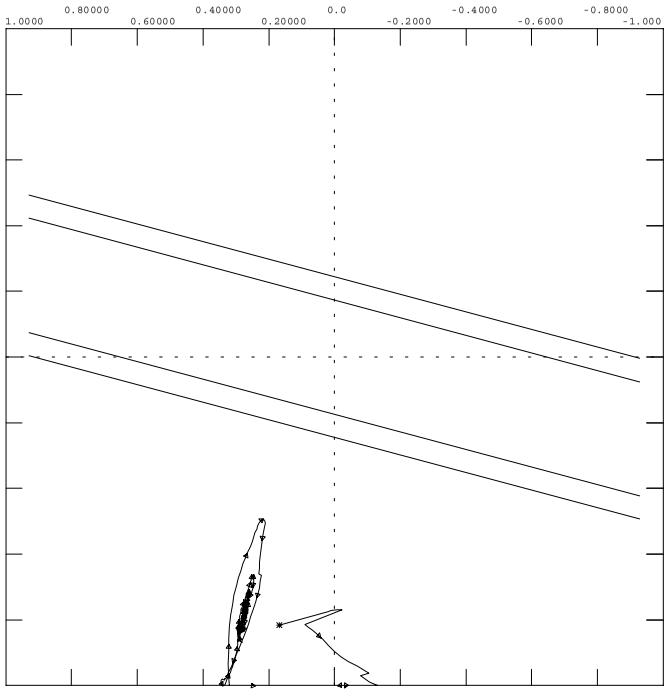
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

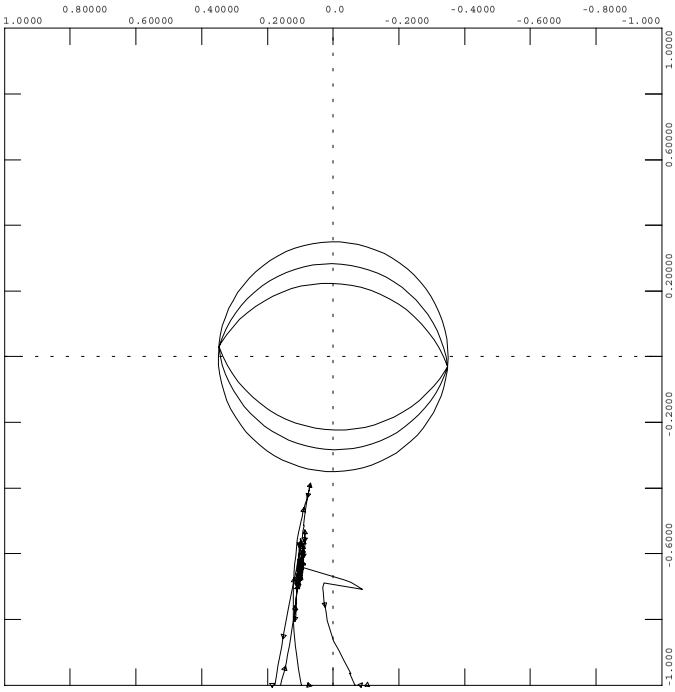
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

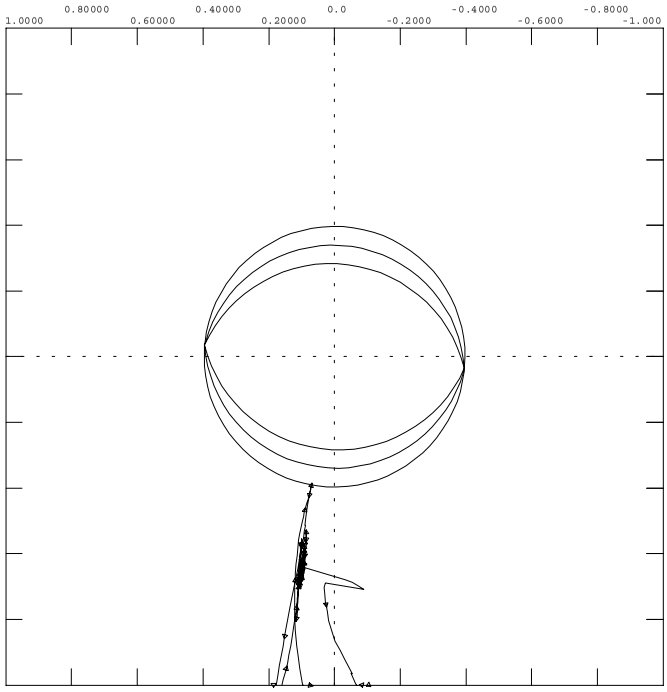
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

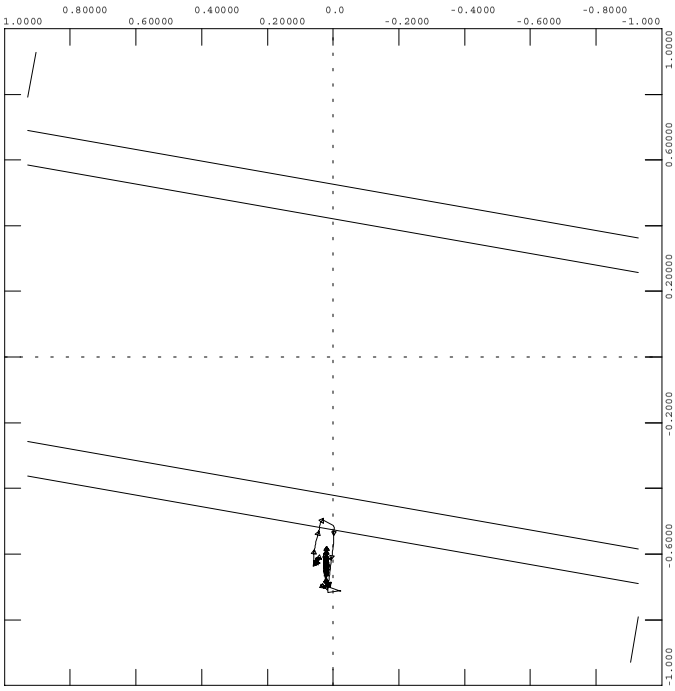
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

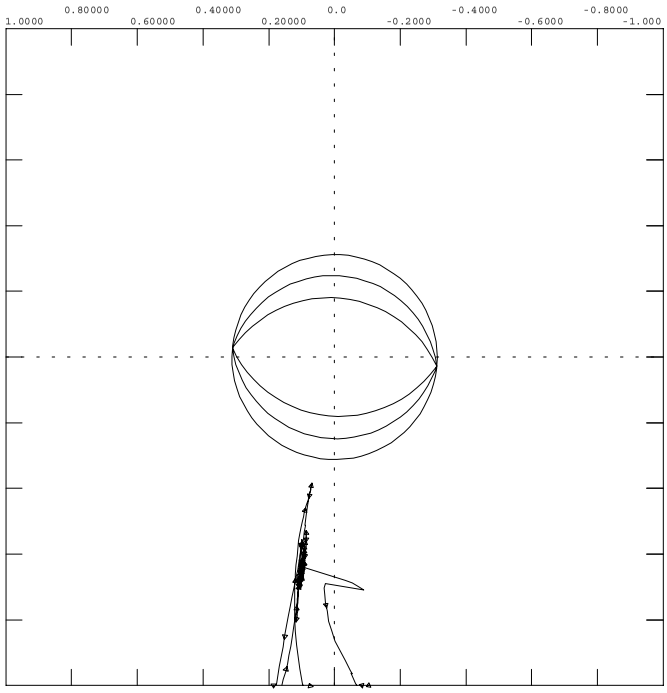
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



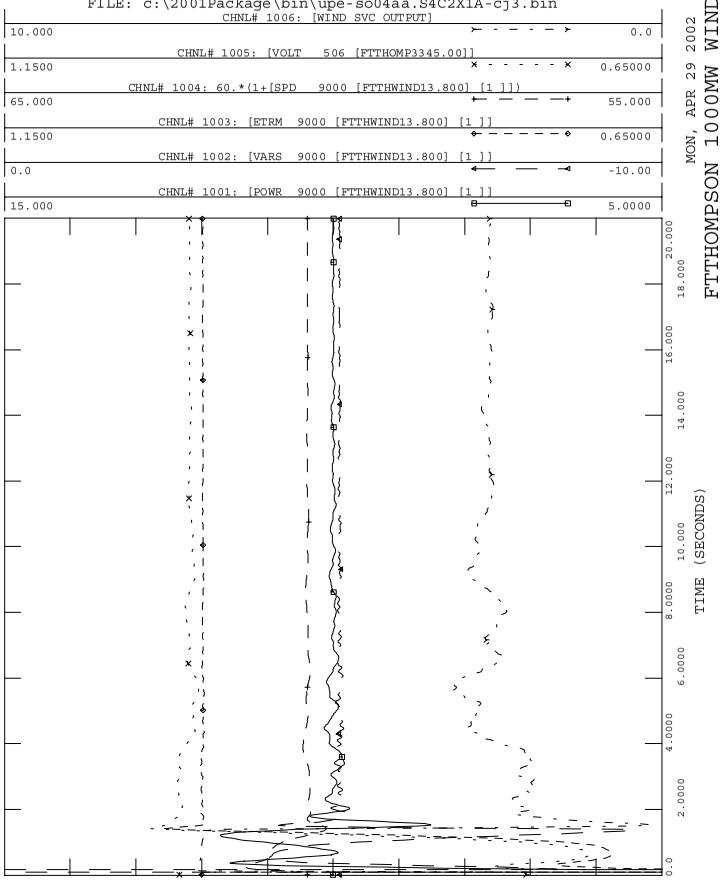
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

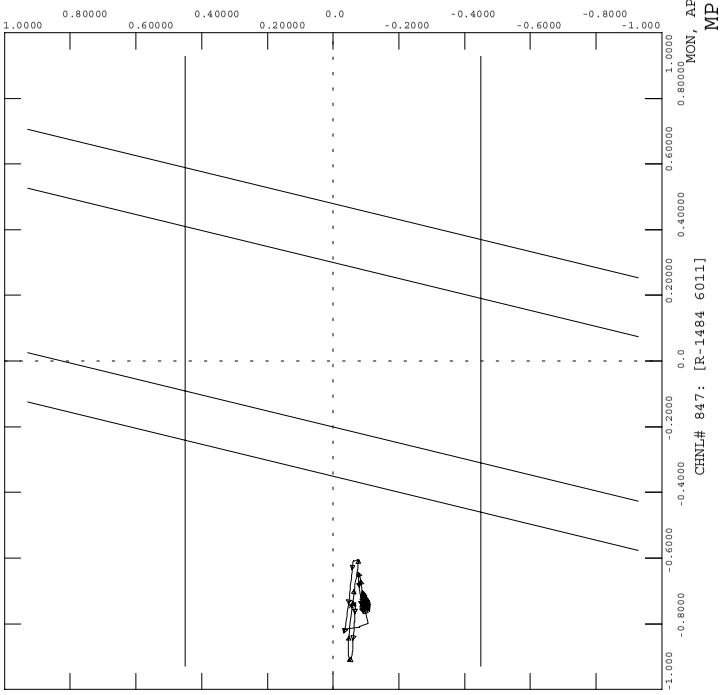


MON, APR 29 2002 23:29
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-cj3.bin

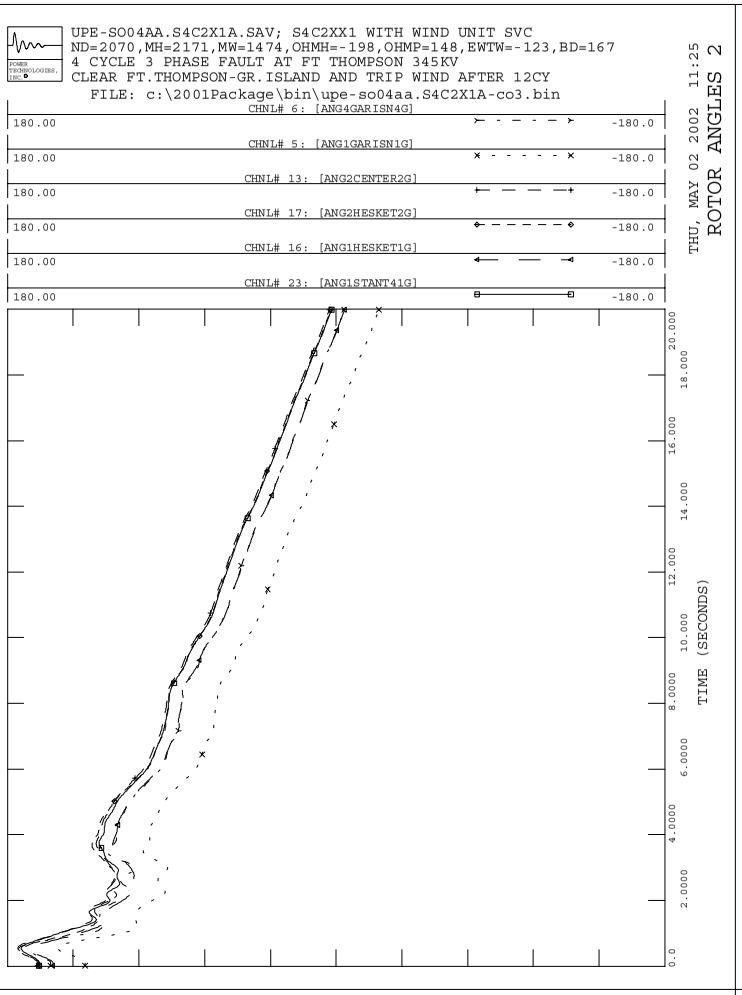
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

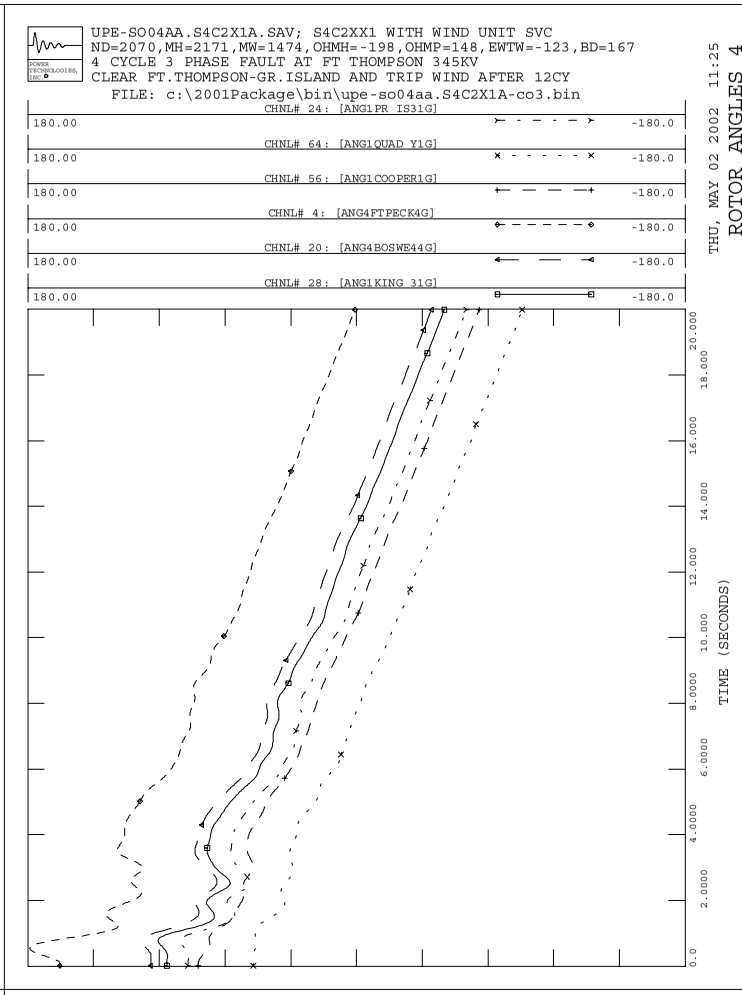


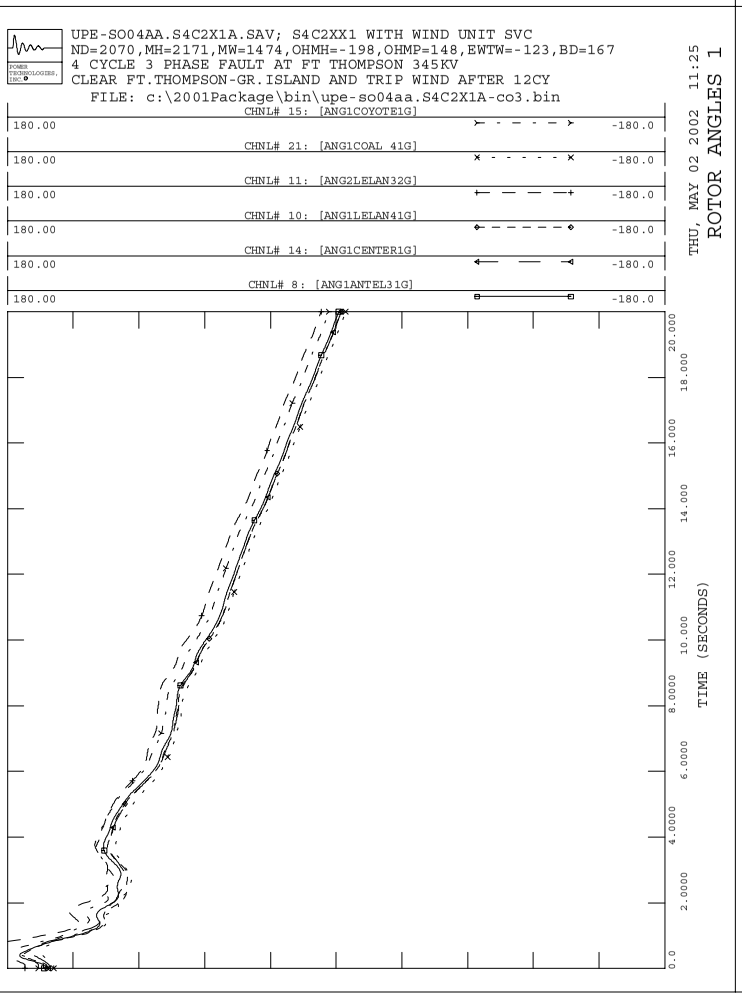
MON, APR 29 2002 23:29
MP-OH I.FALLS (779)

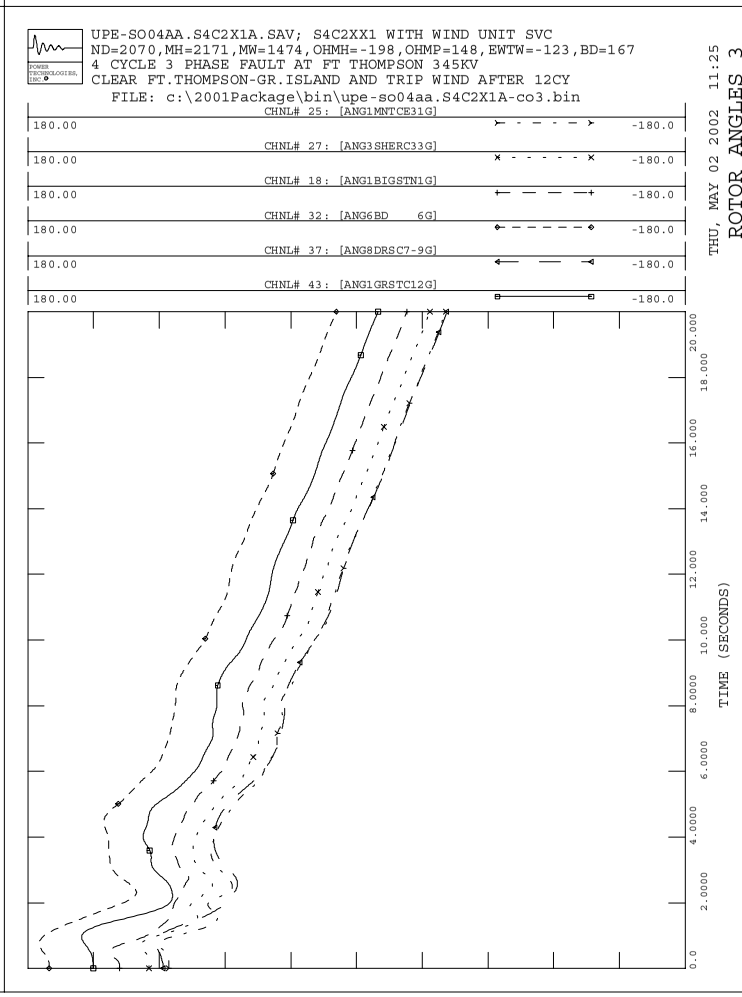
CONTINGENCY CO3

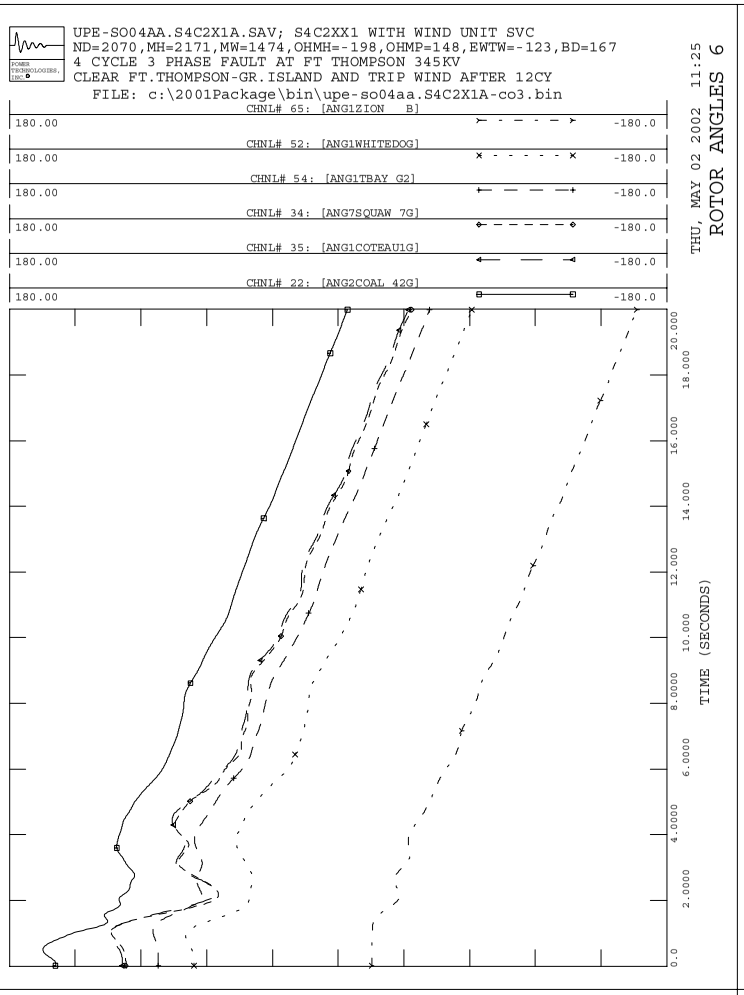
4 cycle 3 phase fault at Ft Thompson 345 kV. Clear Ft.Thompson-Gr.Island and trip wind unit after 12 cycles

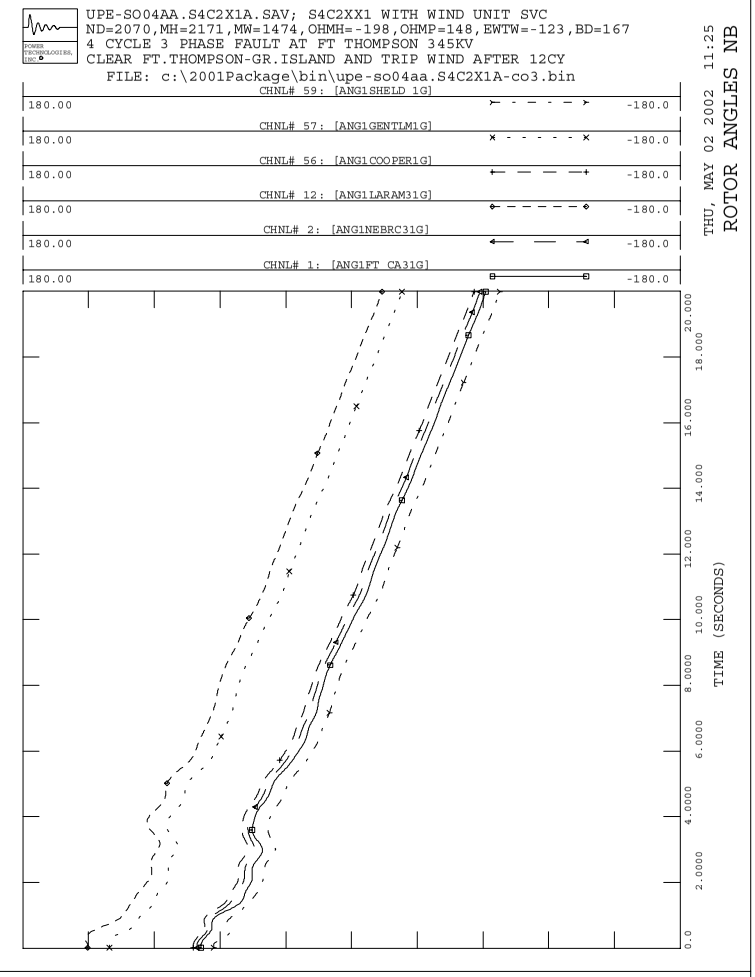

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
THU, MAY 02 2002 11:25
ROTOR ANGLES 2
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

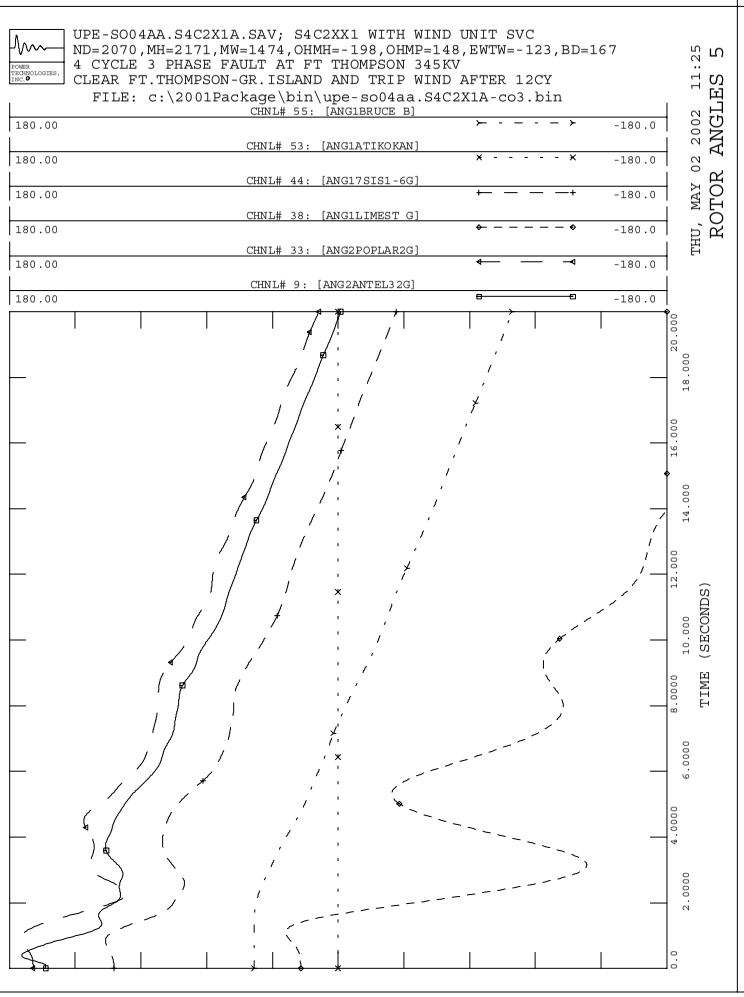

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
THU, MAY 02 2002 11:25
ROTOR ANGLES 4
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

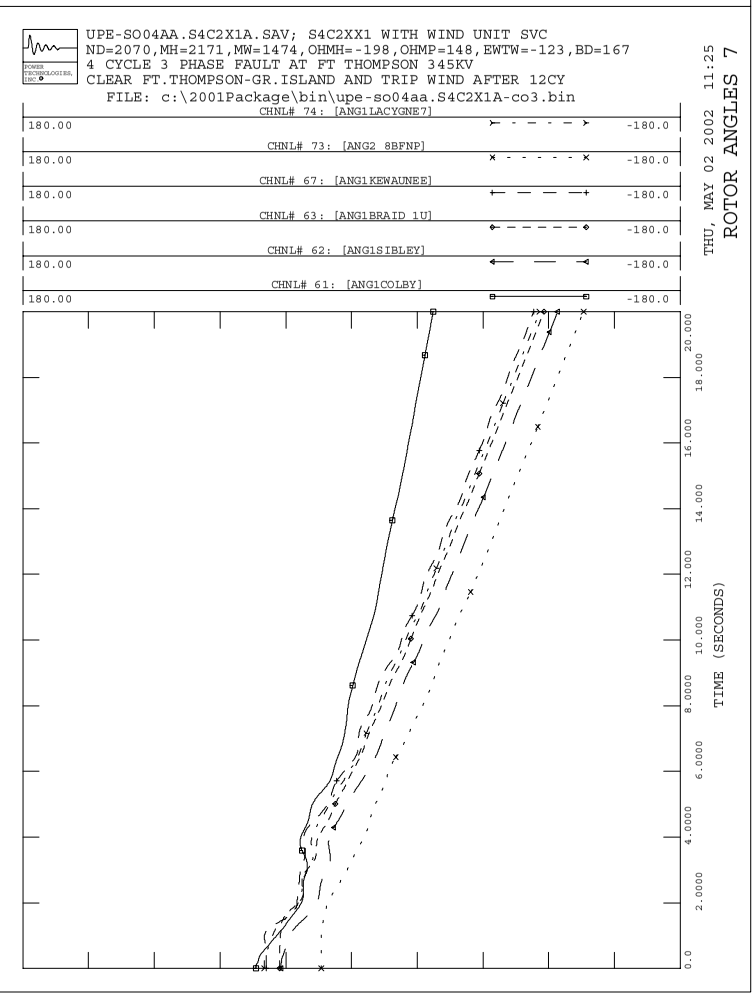

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
THU, MAY 02 2002 11:25
ROTOR ANGLES 1
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
THU, MAY 02 2002 11:25
ROTOR ANGLES 3
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

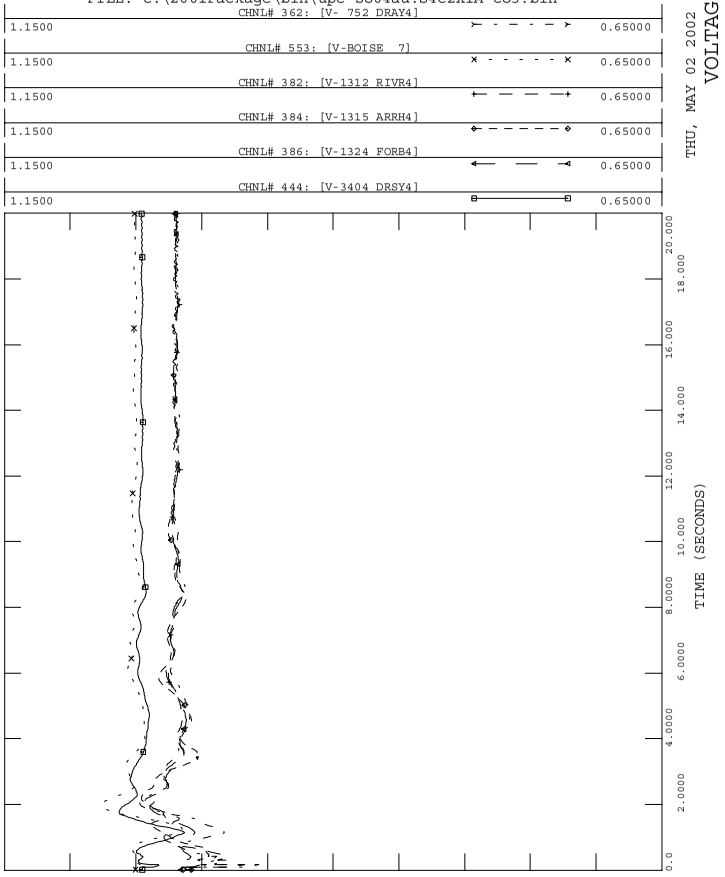

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 02 2002 11:25
ROTOR ANGLES 6


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 02 2002 11:25
ROTOR ANGLES NB


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 02 2002 11:25
ROTOR ANGLES 5

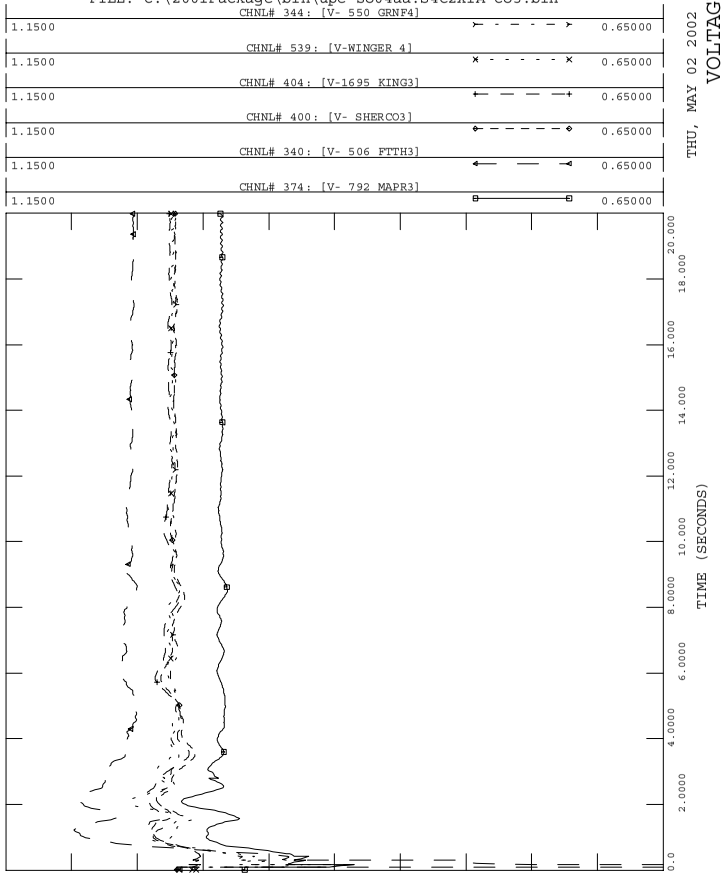

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
THU, MAY 02 2002 11:25
ROTOR ANGLES 7

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin



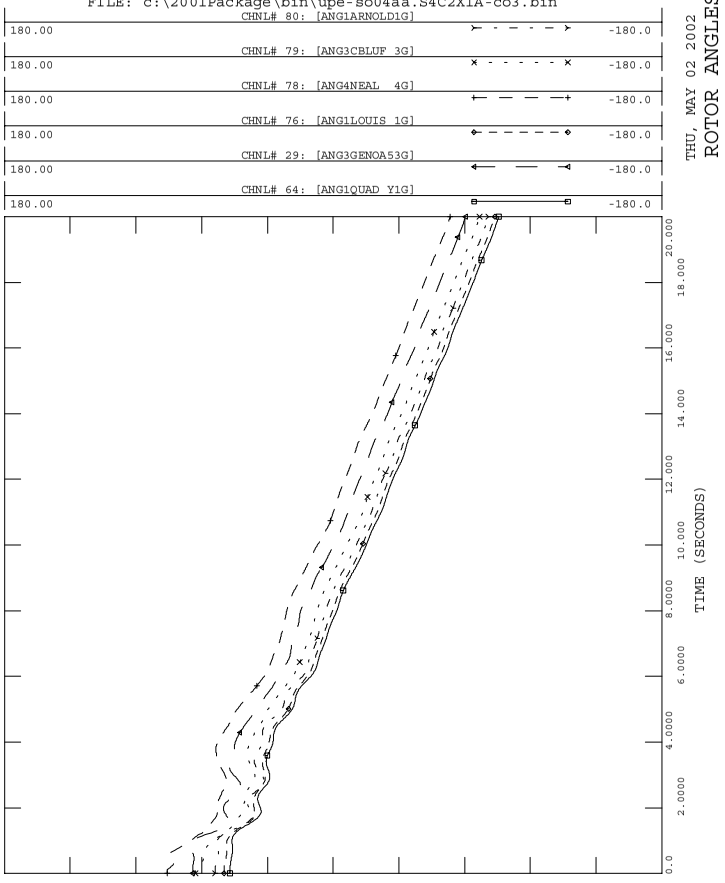
THU, MAY 02 2002 11:25
VOLTAGES 1

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin



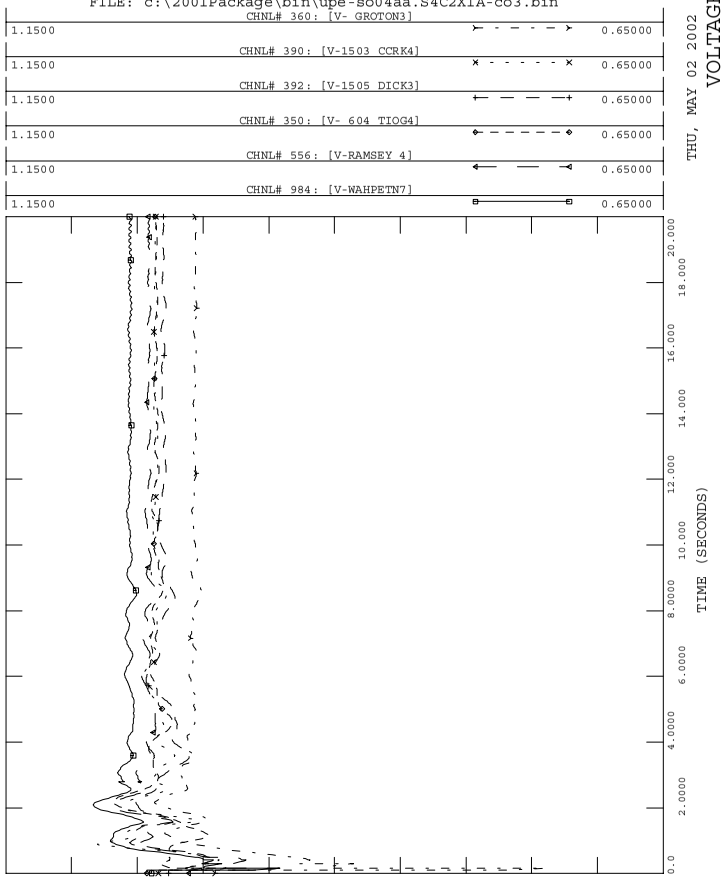
THU, MAY 02 2002 11:25
VOLTAGES 3

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin



THU, MAY 02 2002 11:25
ROTOR ANGLES IA

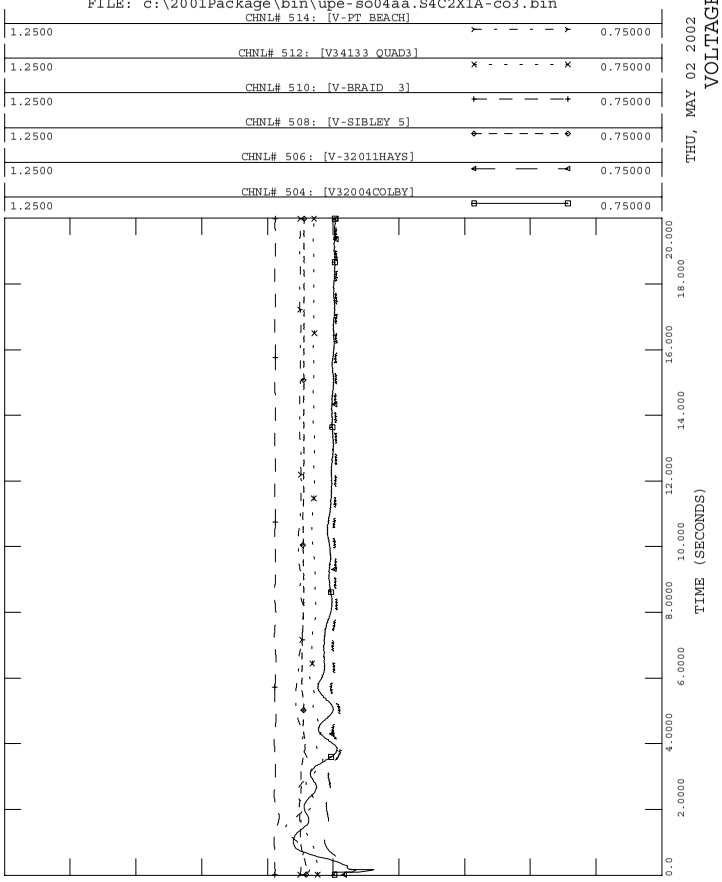
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin



THU, MAY 02 2002 11:25
VOLTAGES 2

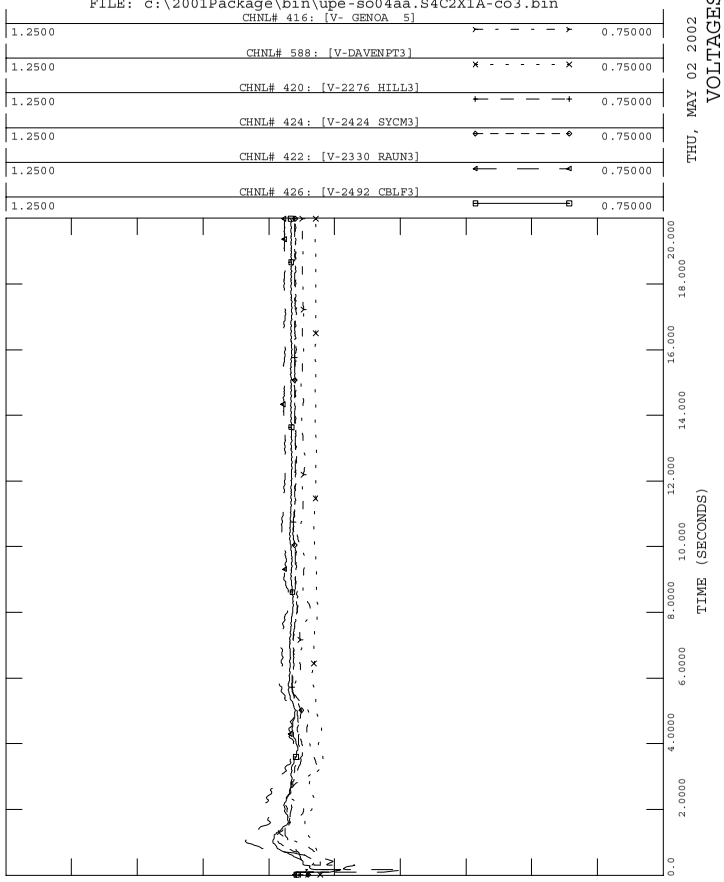
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

THU, MAY 02 2002 11:25
VOLTAGES 5



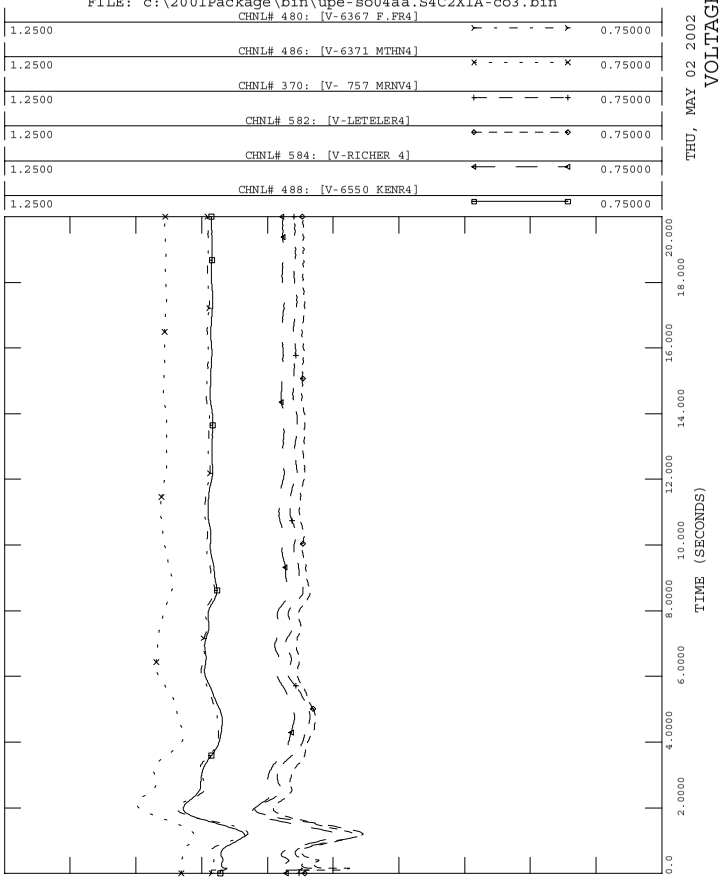
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

THU, MAY 02 2002 11:25
VOLTAGES IA



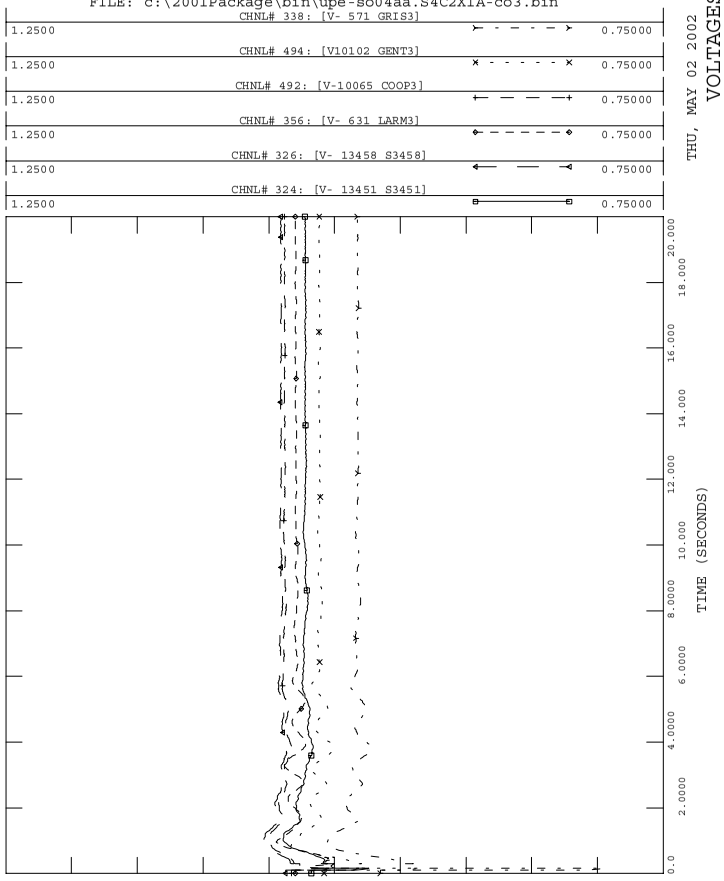
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

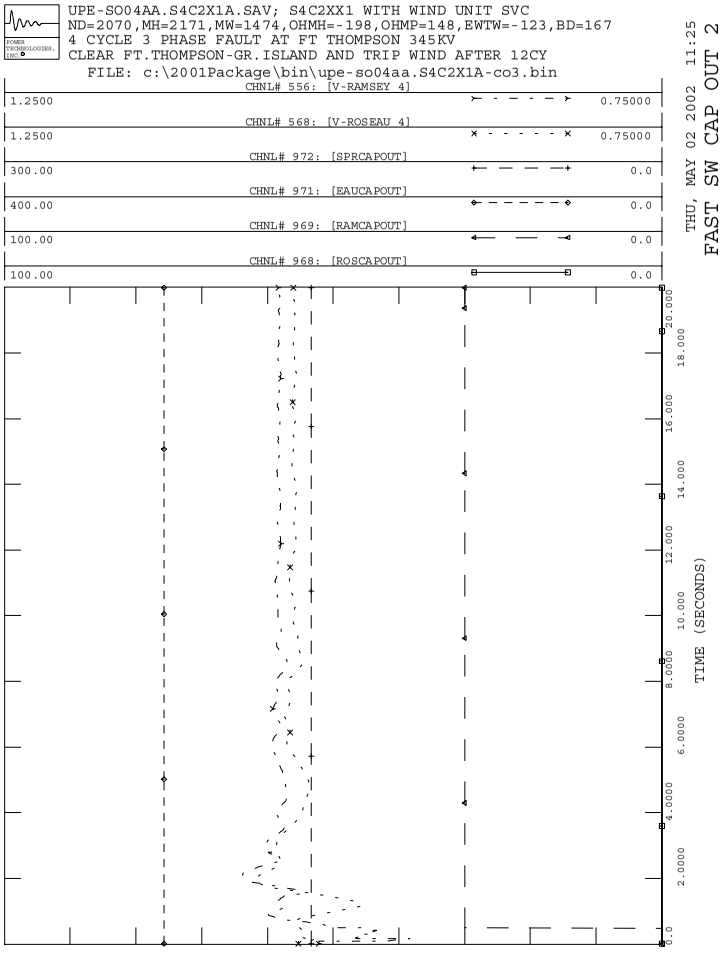
THU, MAY 02 2002 11:25
VOLTAGES 4



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

THU, MAY 02 2002 11:25
VOLTAGES NB

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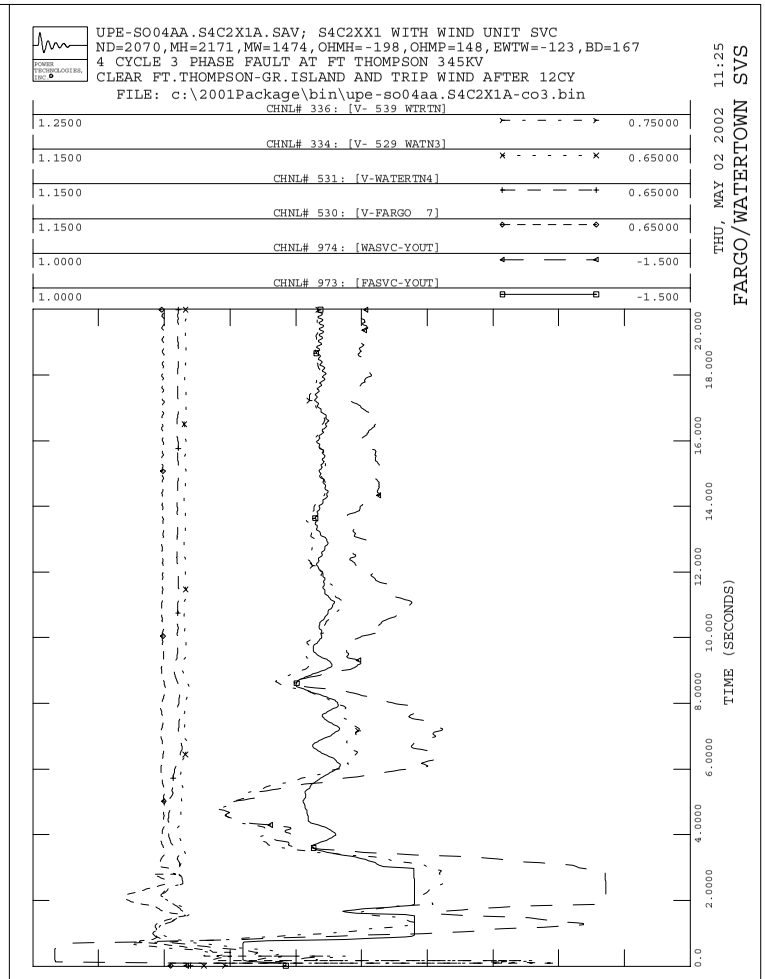
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
THU, MAY 02 2002 11:25
FAST SW CAP OUT 2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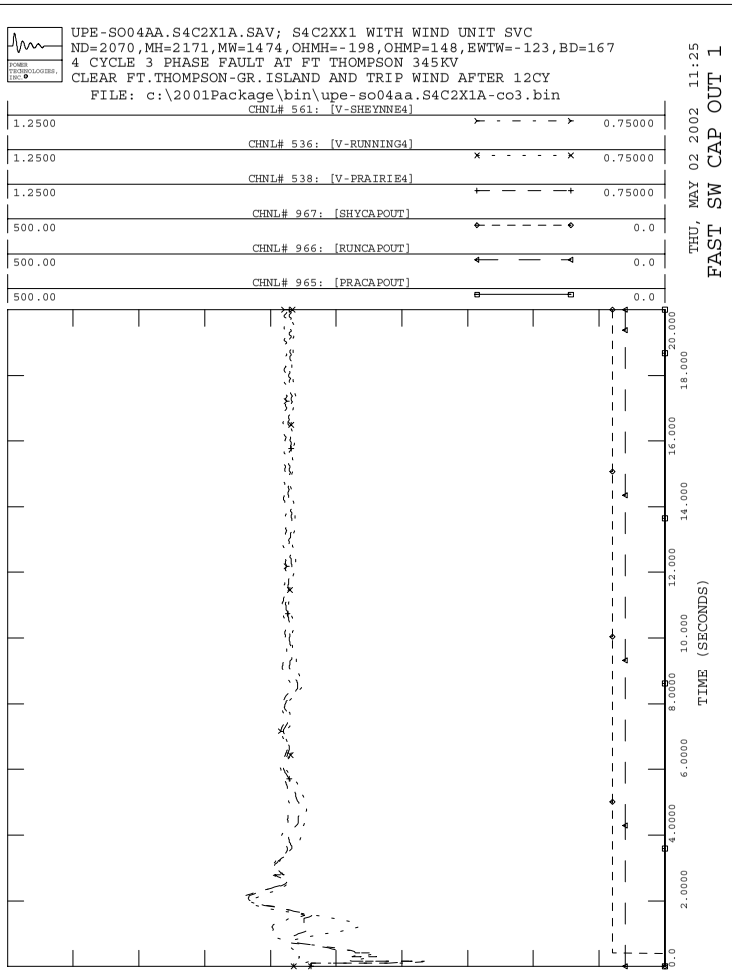
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
THU, MAY 02 2002 11:25
FARGO/WATERTOWN SVS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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
THU, MAY 02 2002 11:25
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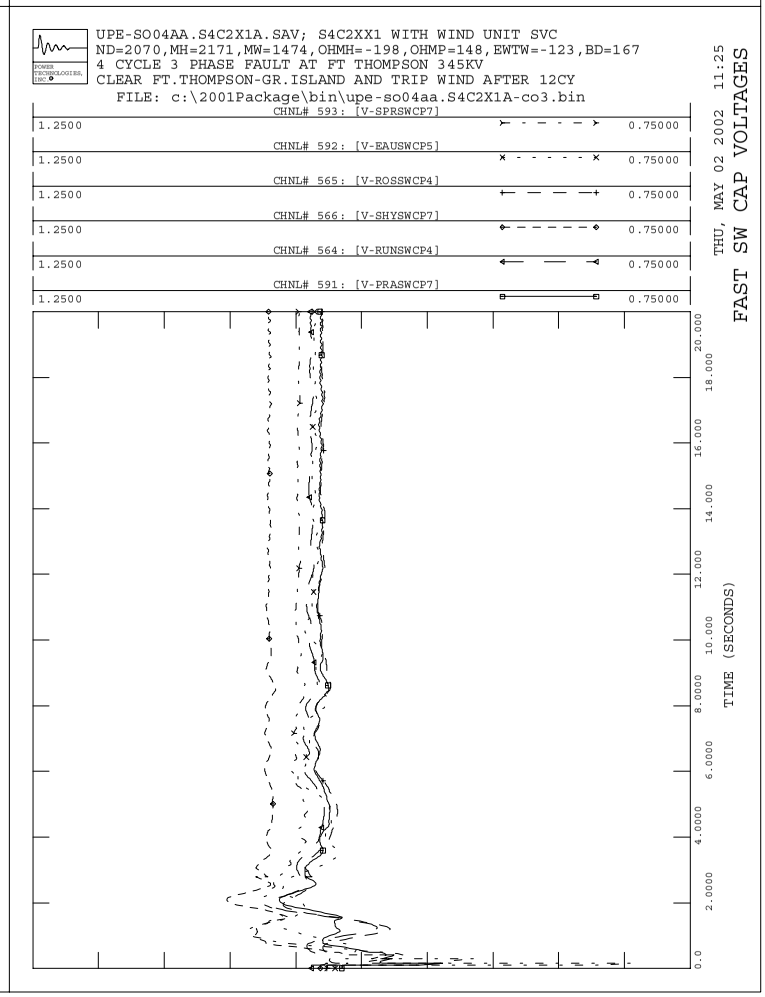
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
THU, MAY 02 2002 11:25
FAST SW CAP VOLTAGES

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
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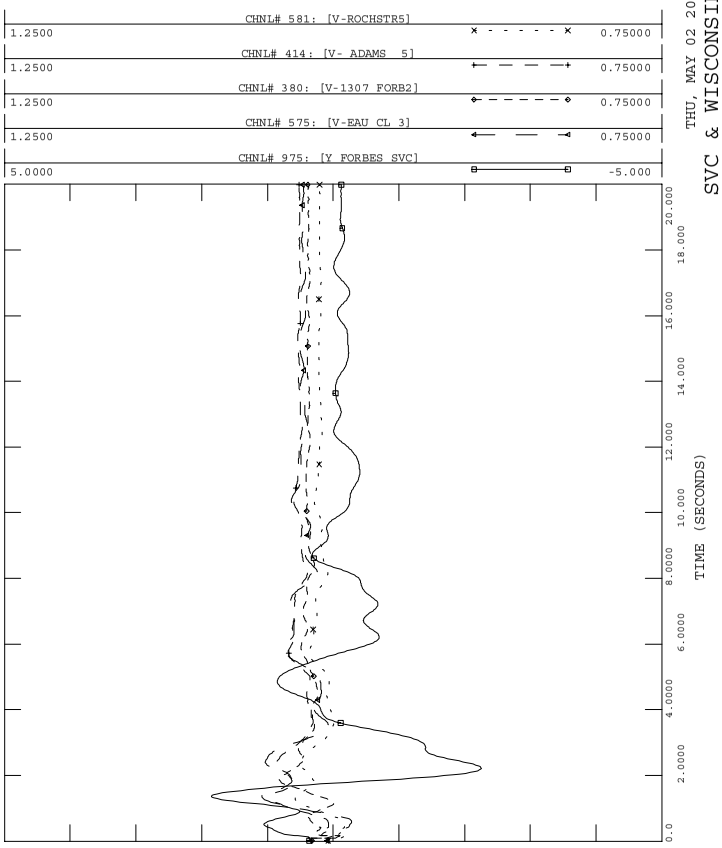
THU, MAY 02 2002 11:25

SVC & WISCONSIN VOLT



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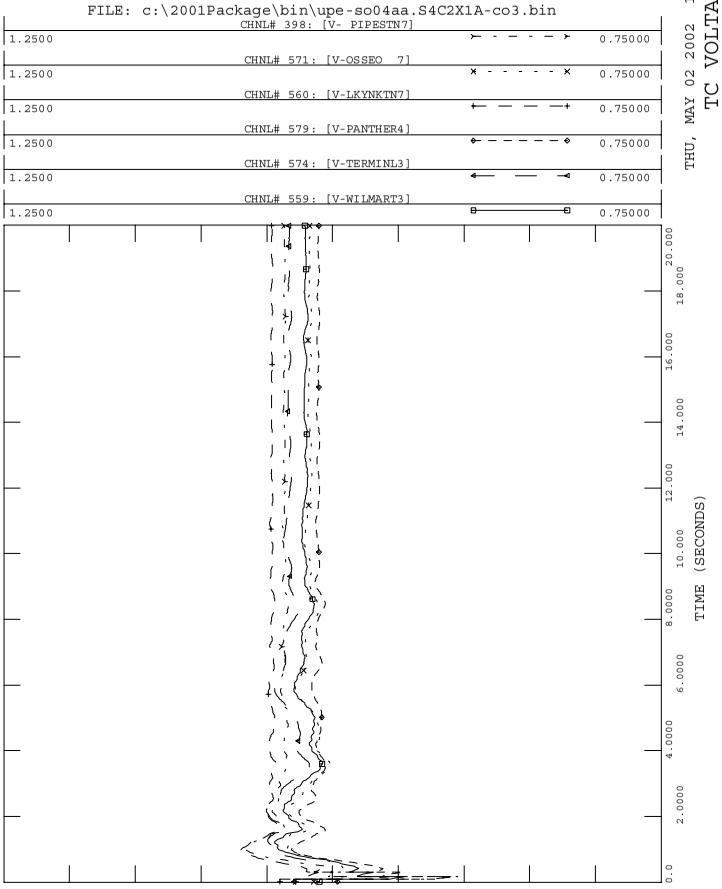
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

THU, MAY 02 2002 11:25

TC VOLTAGES



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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
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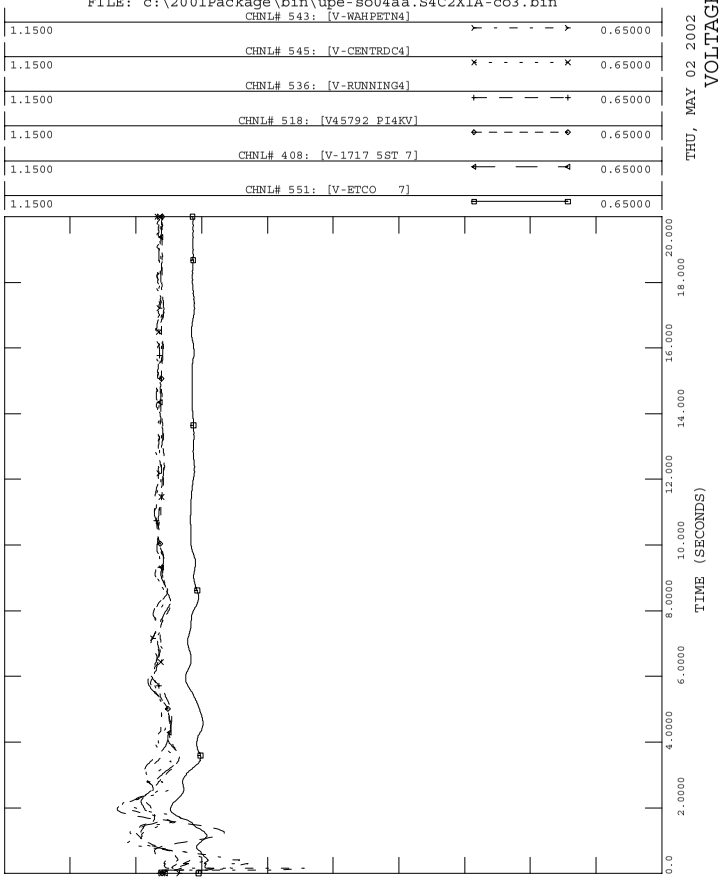
THU, MAY 02 2002 11:25

VOLTAGES 6



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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
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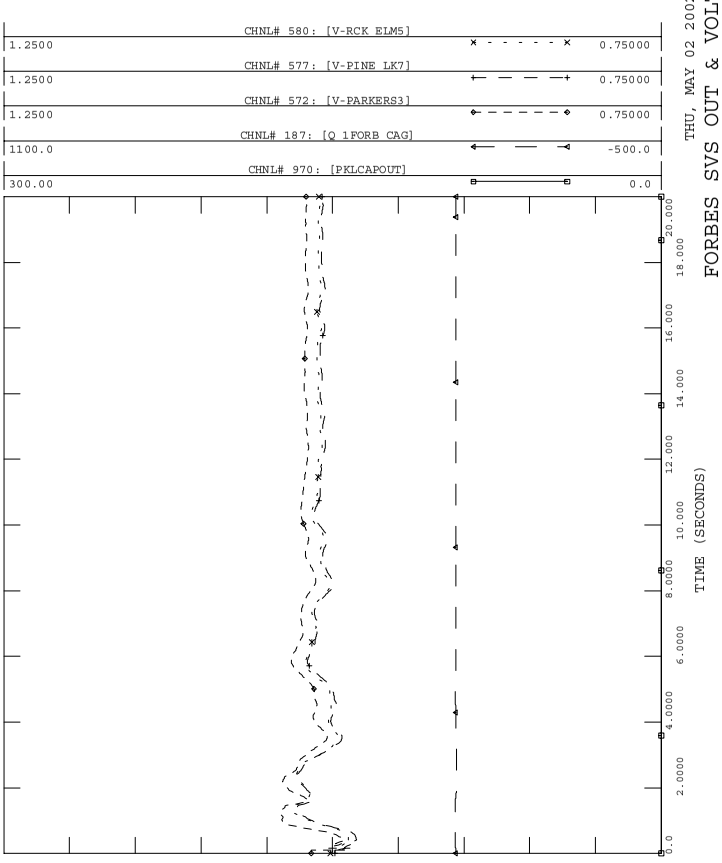
THU, MAY 02 2002 11:25

FORBES SVS OUT & VOLTAGES



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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
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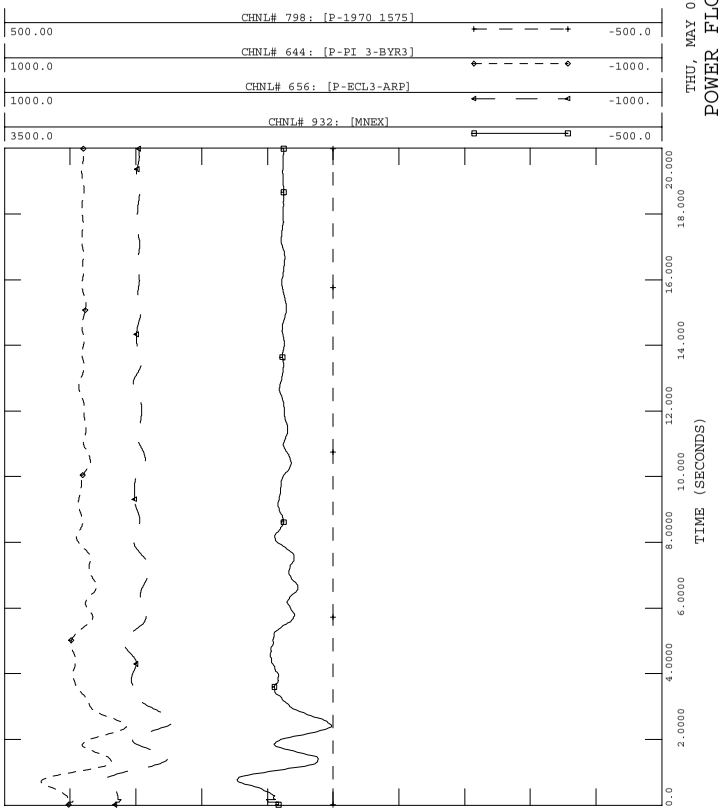
THU, MAY 02 2002 11:25
POWER FLOW SUMS 2



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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
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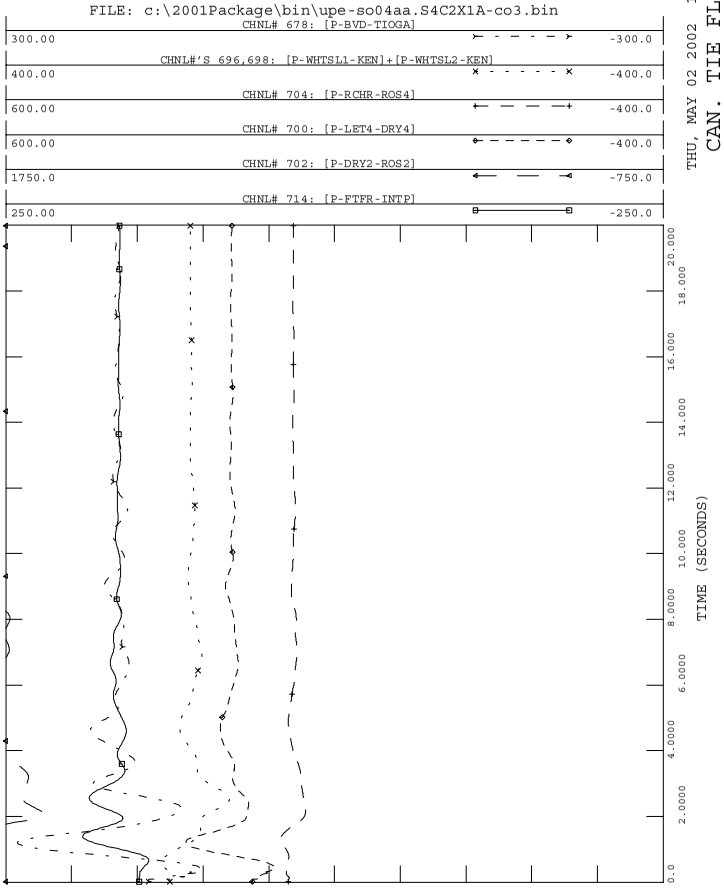
THU, MAY 02 2002 11:25
CAN. TIE FLOWS



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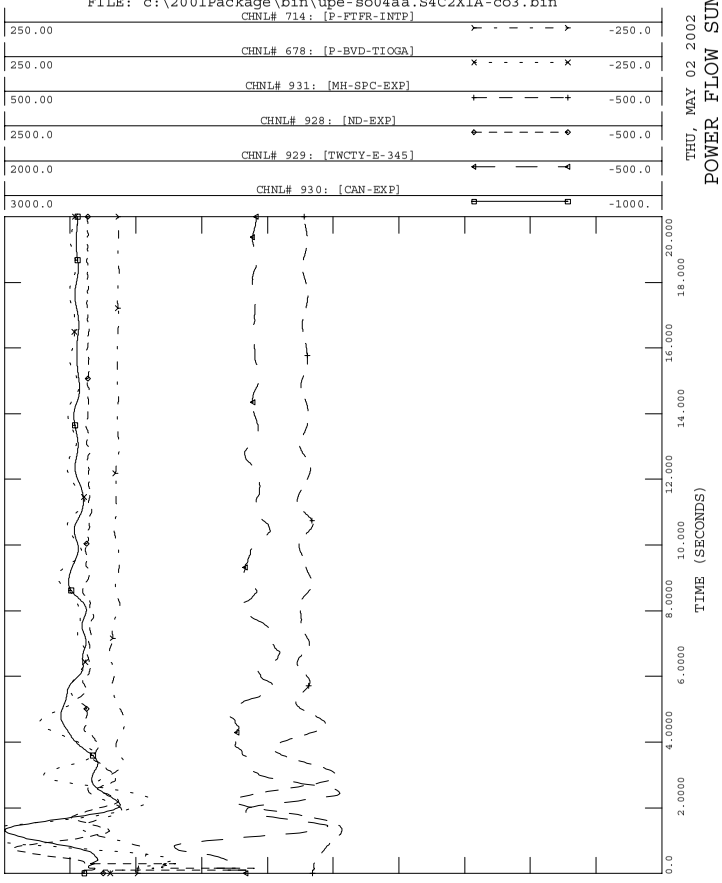

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
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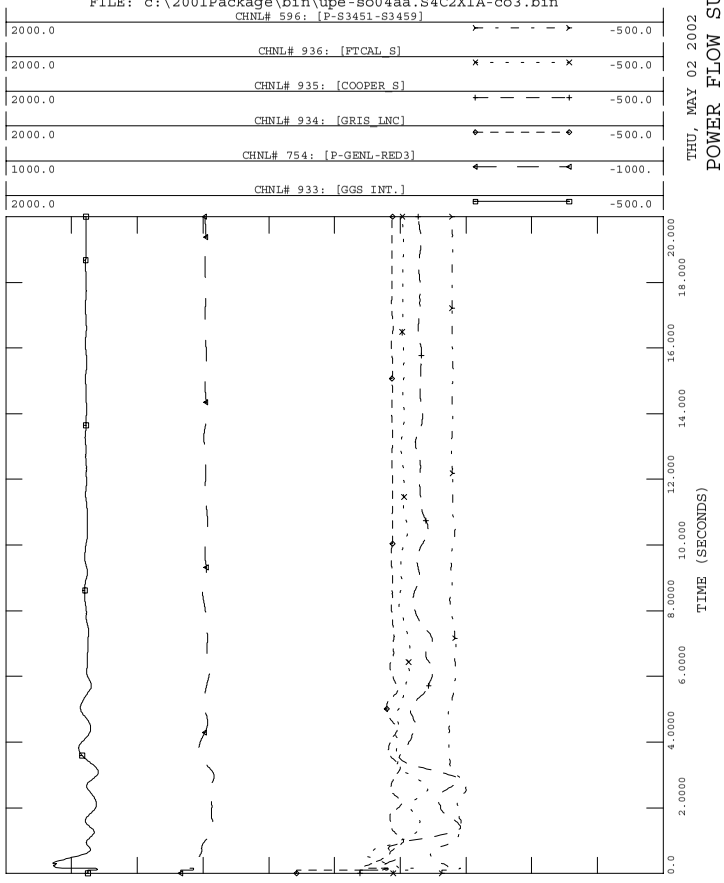
THU, MAY 02 2002 11:25
POWER FLOW SUM 3



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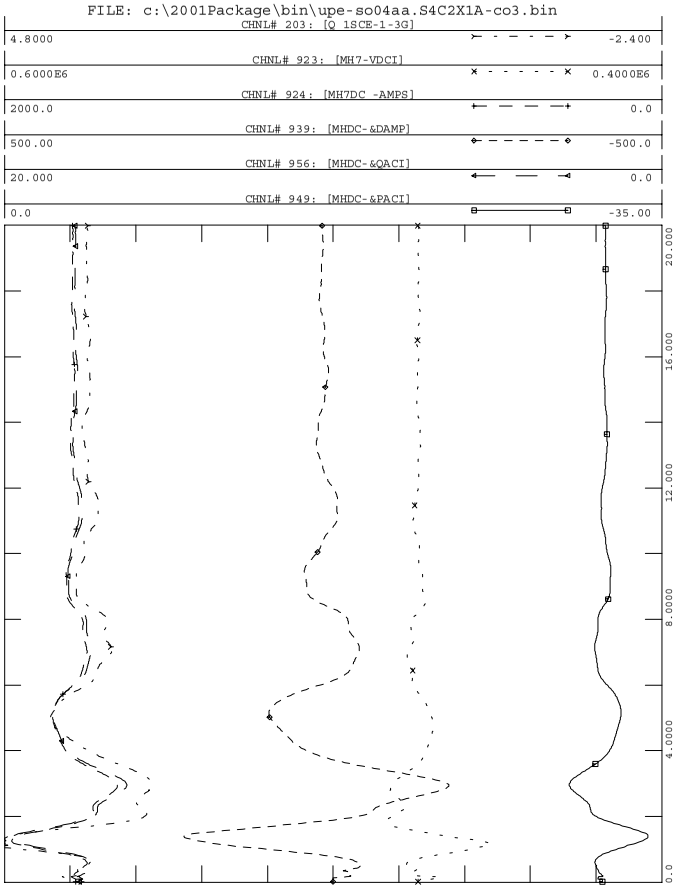
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

THU, MAY 02 2002 11:25
MH DC PARAMETERS



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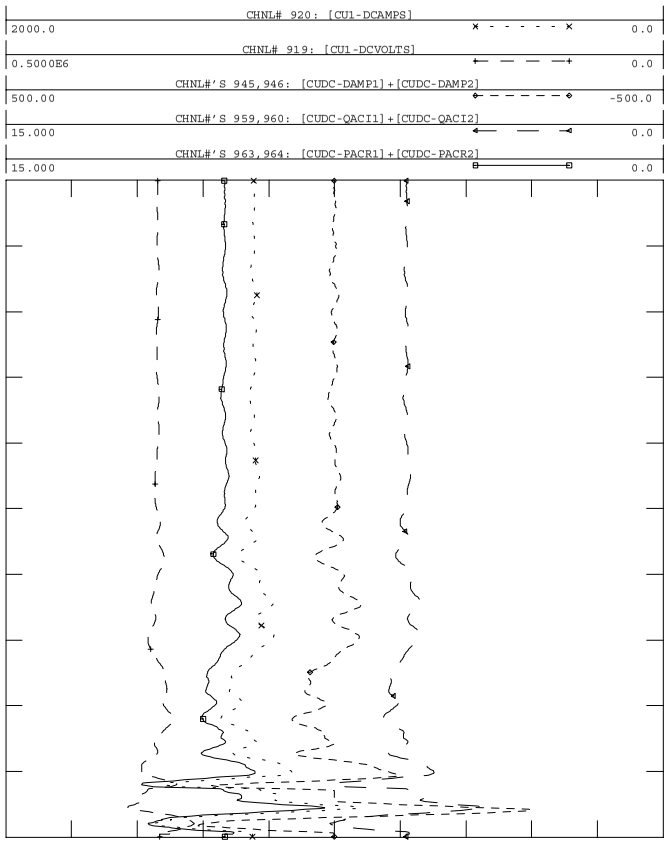
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

THU, MAY 02 2002 11:25
CU DC #1



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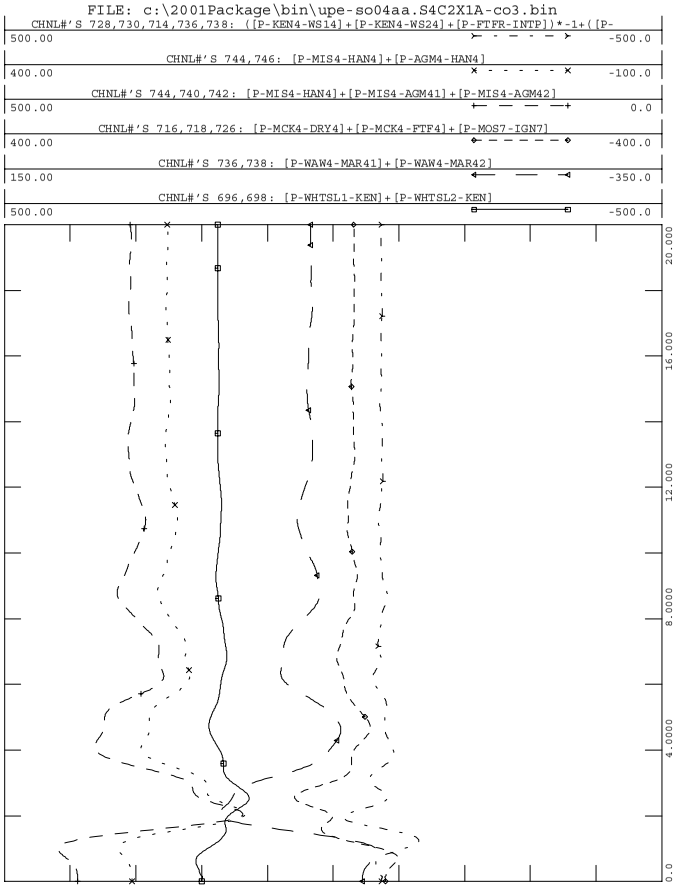
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

THU, MAY 02 2002 11:25
OH TIE FLOWS



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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

THU, MAY 02 2002 11:25
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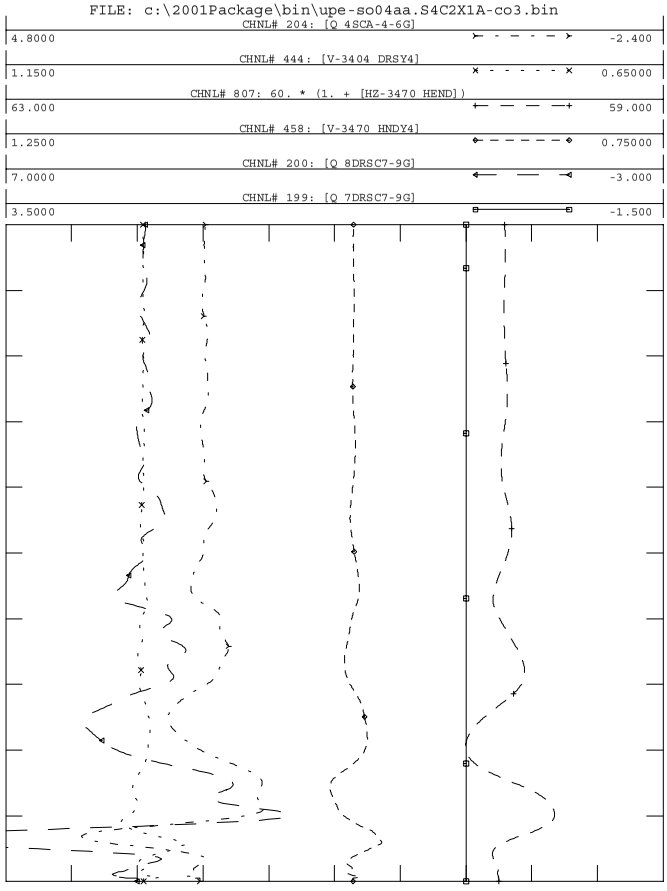

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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
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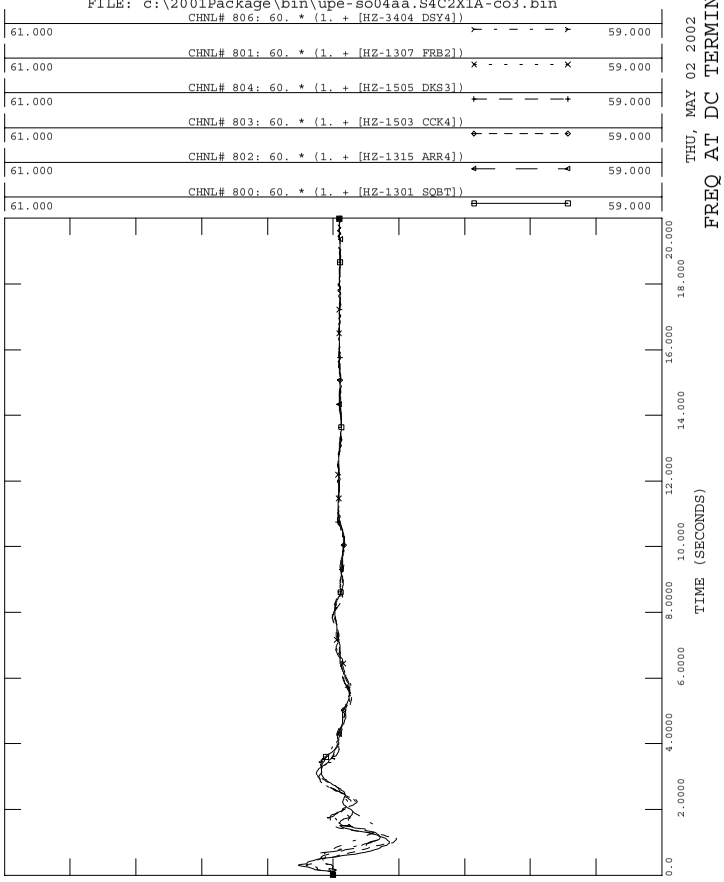
THU, MAY 02 2002 11:25

FREQ AT DC TERMINALS



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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
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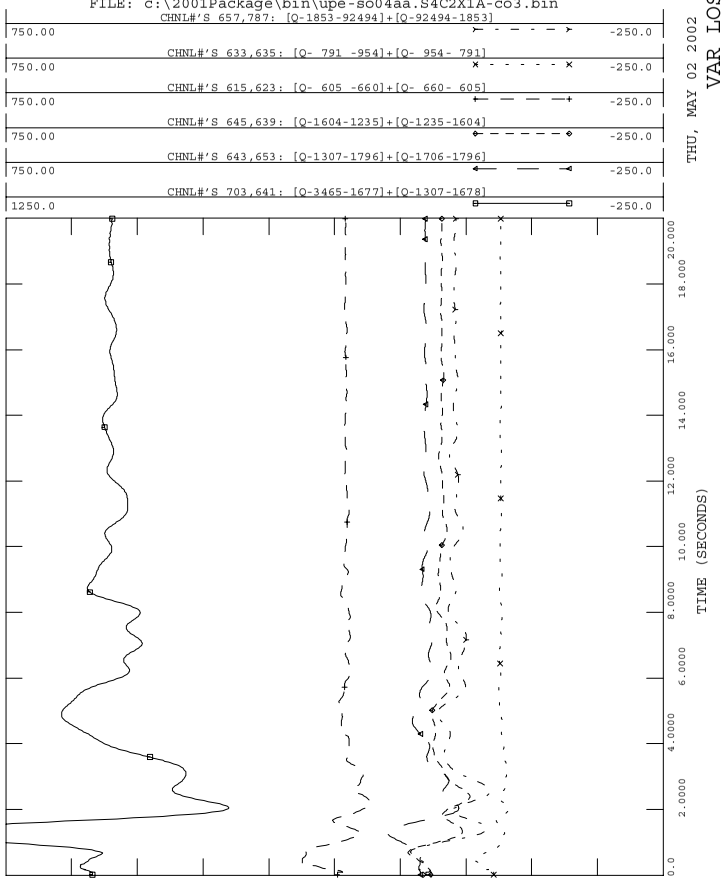
THU, MAY 02 2002 11:25

VAR LOSSES



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CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
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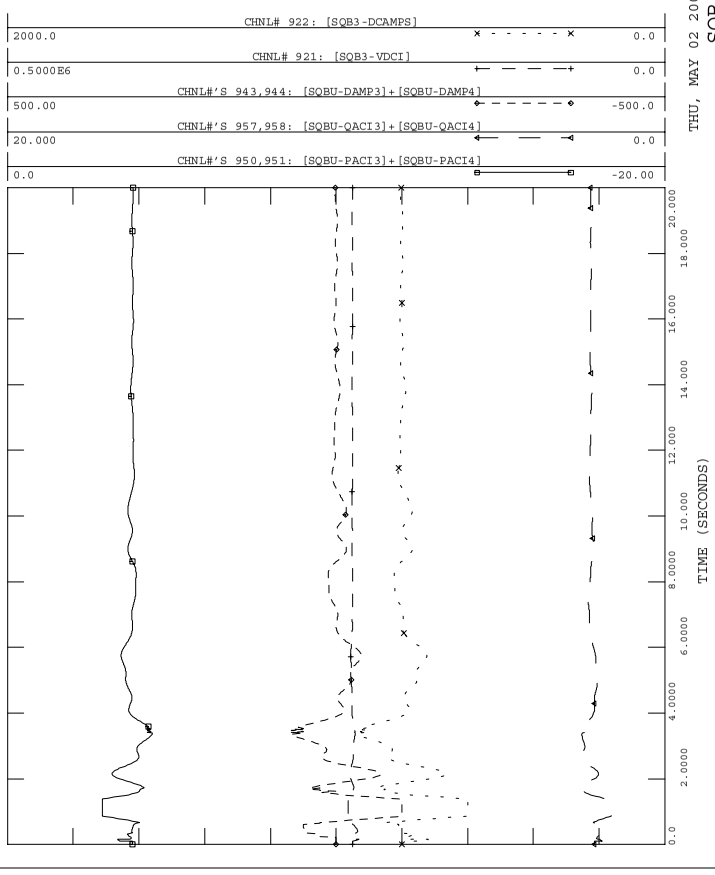
THU, MAY 02 2002 11:25

SQB DC #3



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
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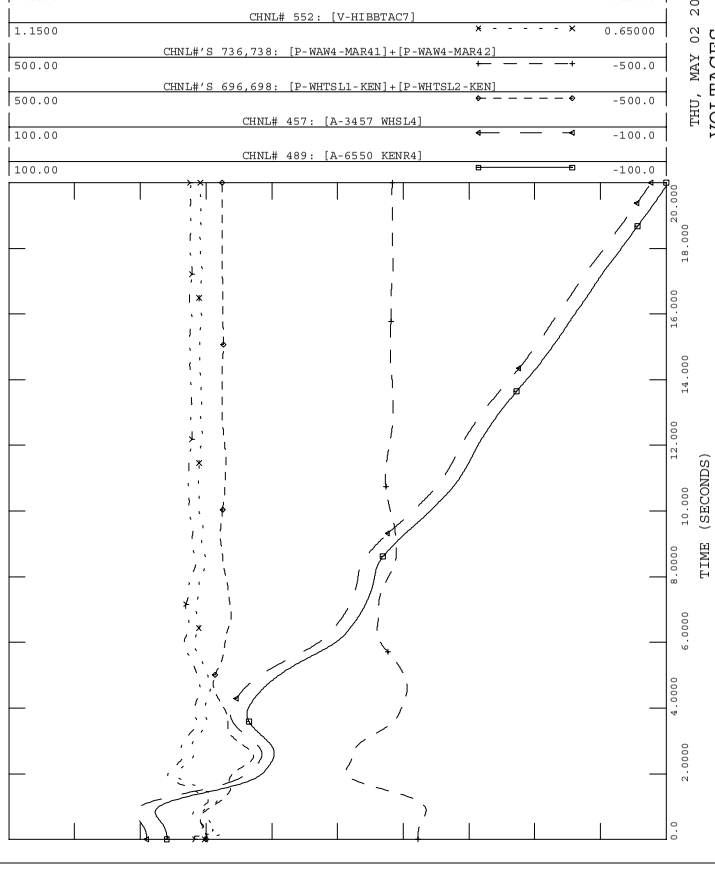
THU, MAY 02 2002 11:25

VOLTAGES, ANGLES



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

RELAY: SLINOS
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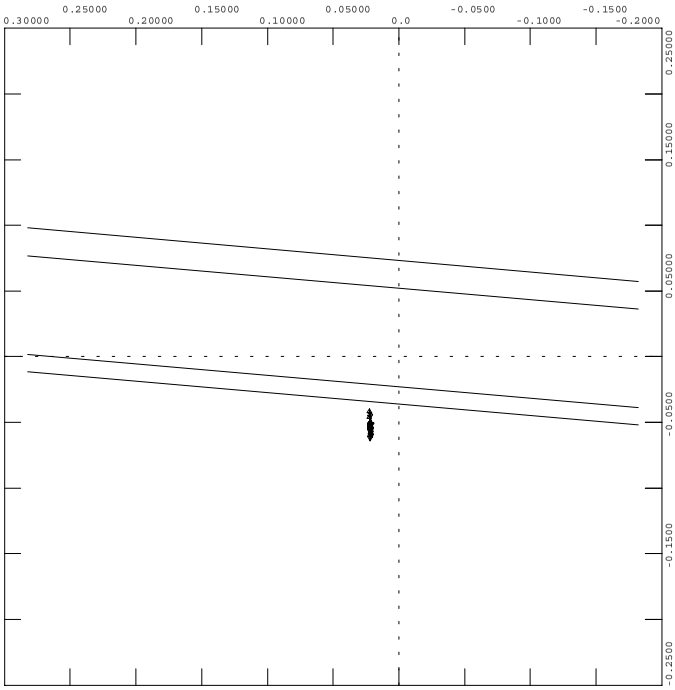

THU, MAY 02 2002 11:25
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

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ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

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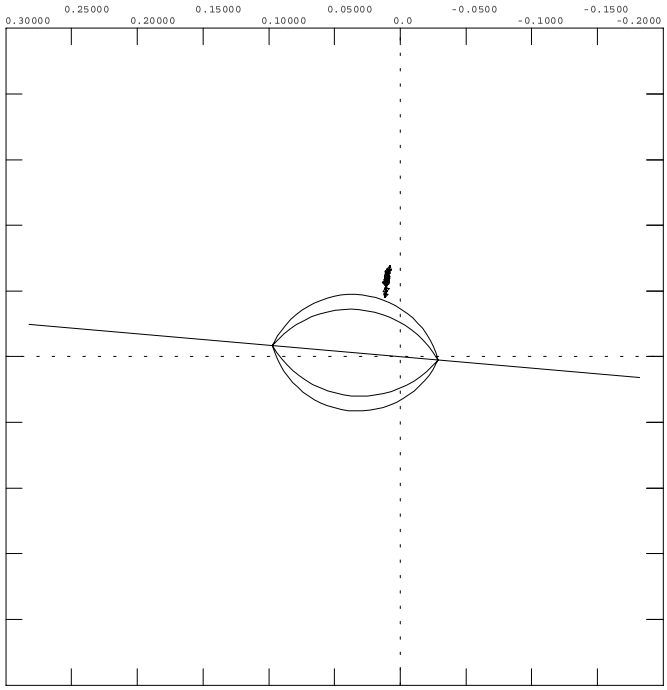

THU, MAY 02 2002 11:25
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

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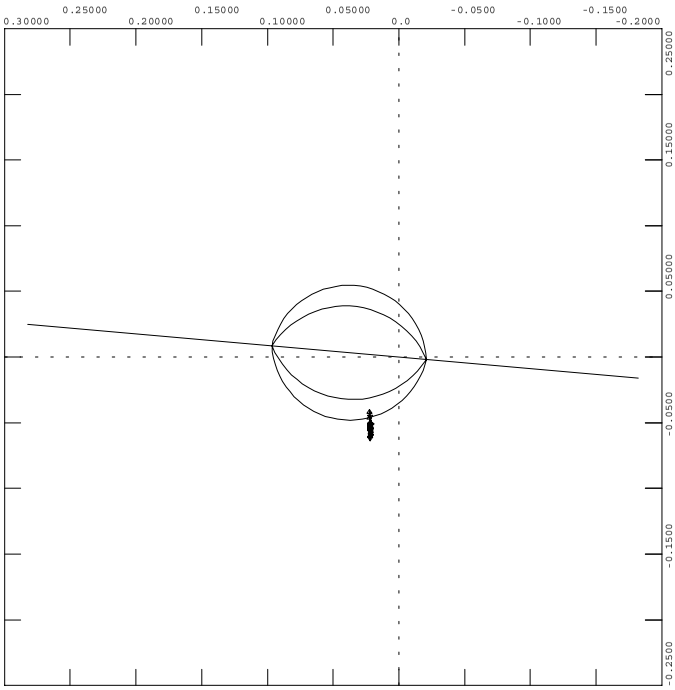

THU, MAY 02 2002 11:25
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

RELAY: SLINOS
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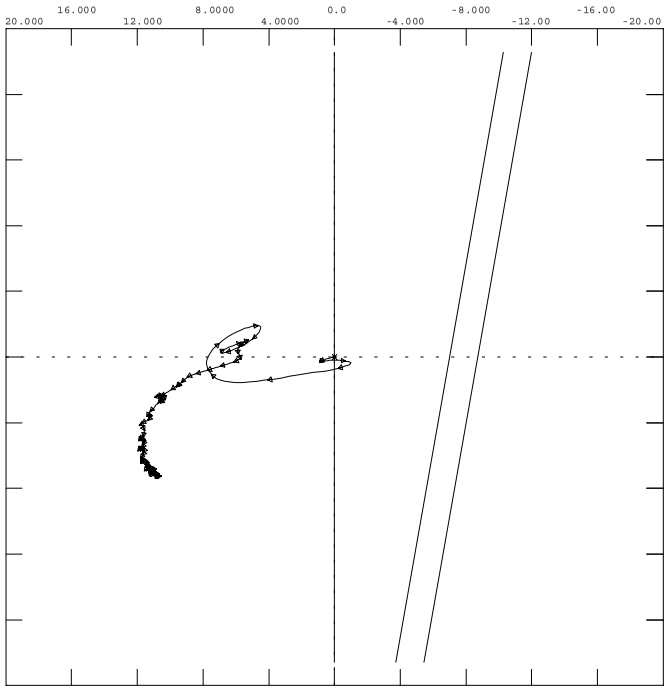
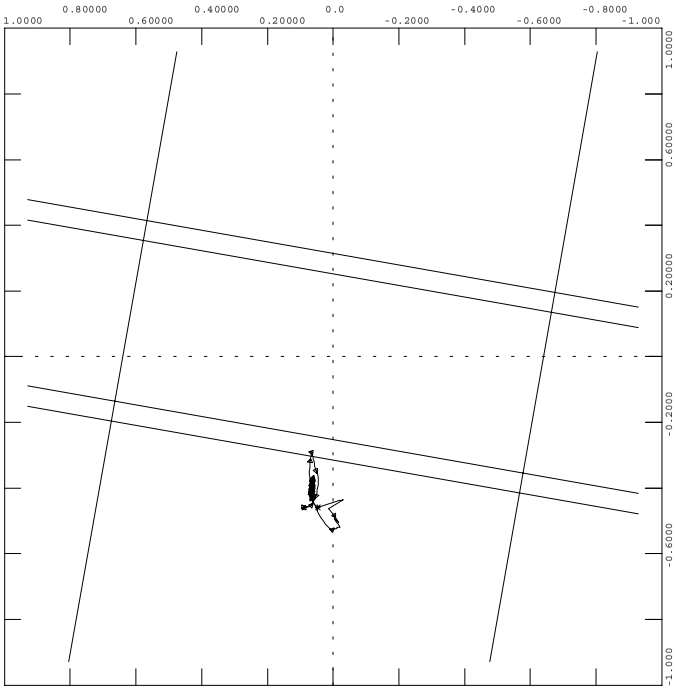


THU, MAY 02 2002 11:25
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

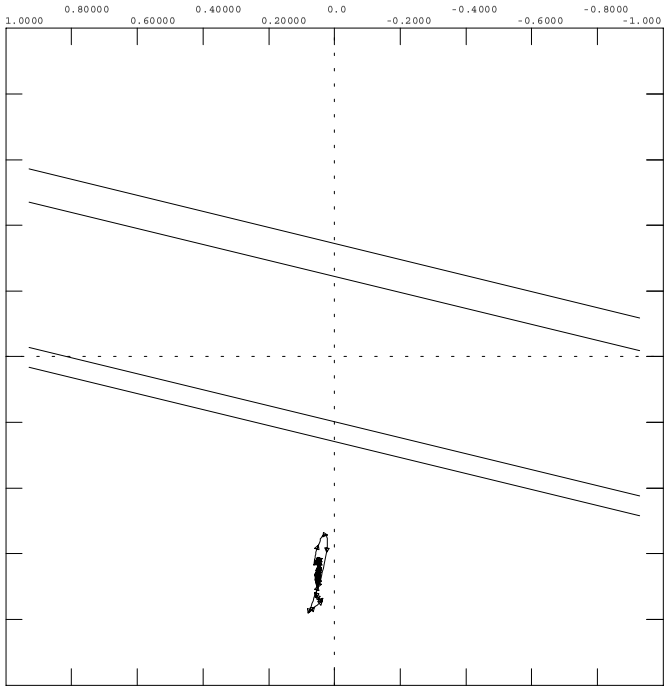
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

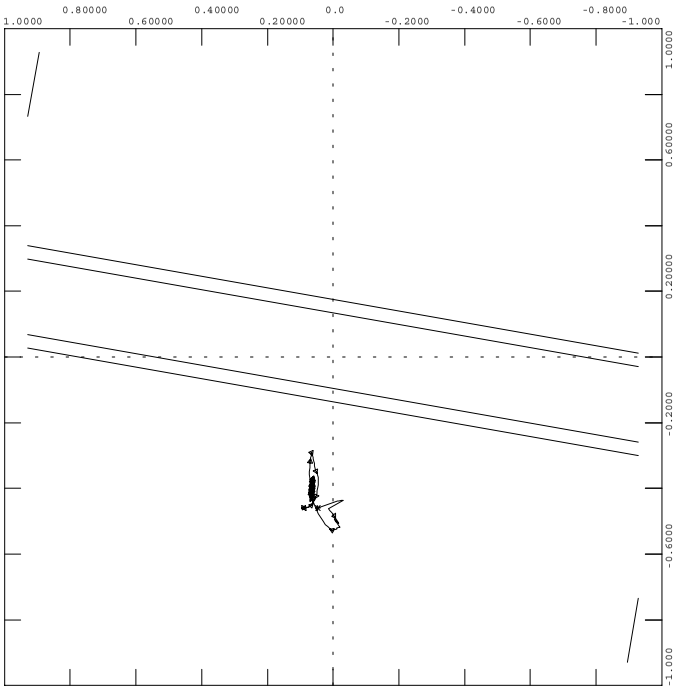
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

RELAY: SLINOS
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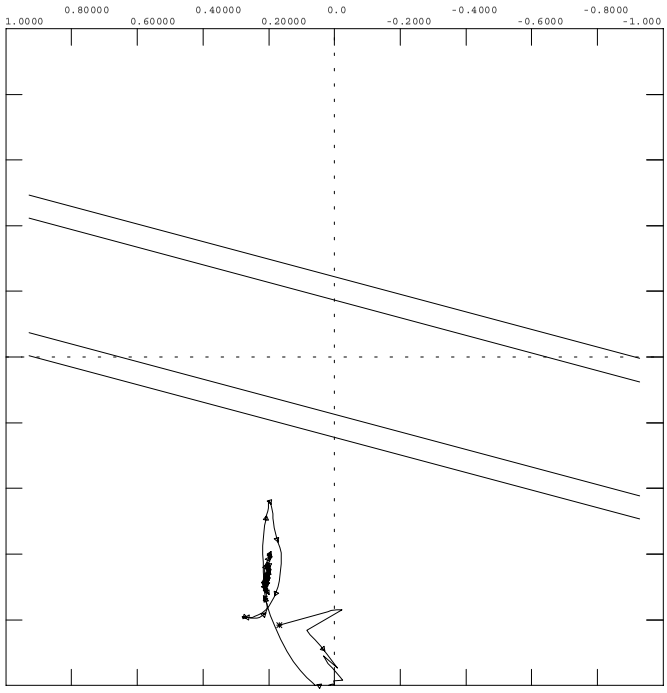
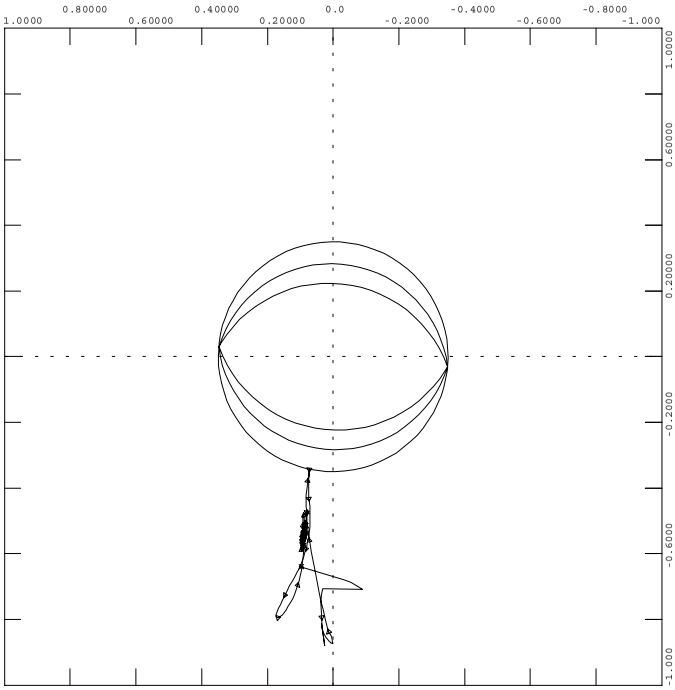
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

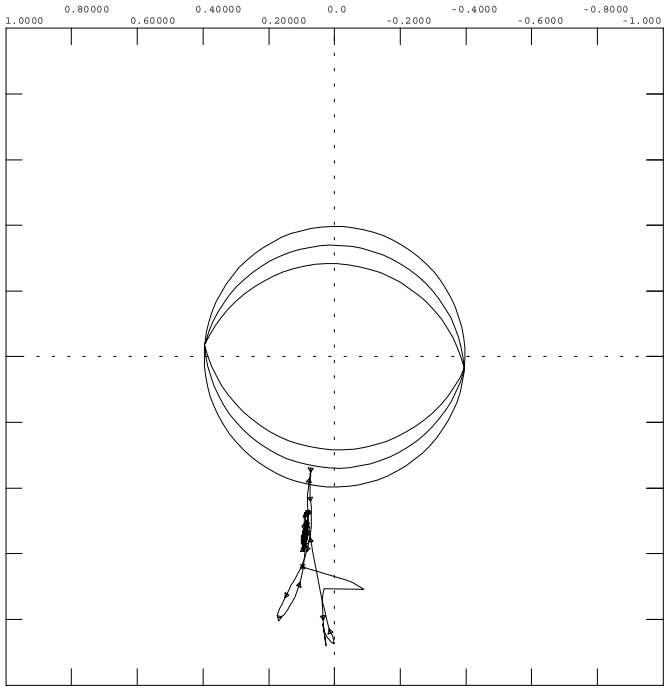
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

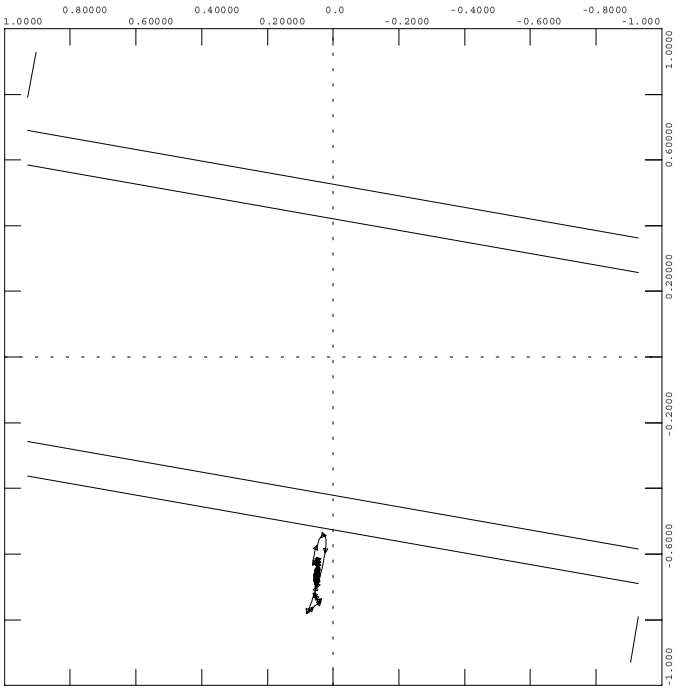
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

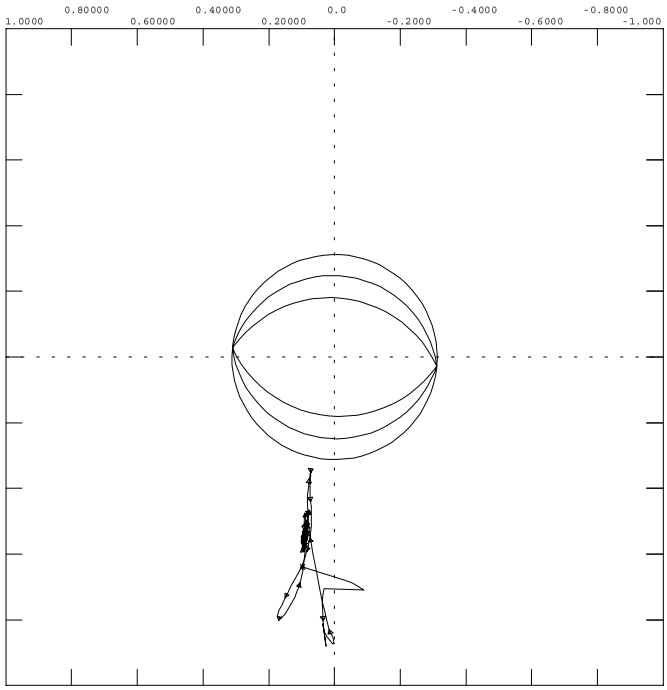
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

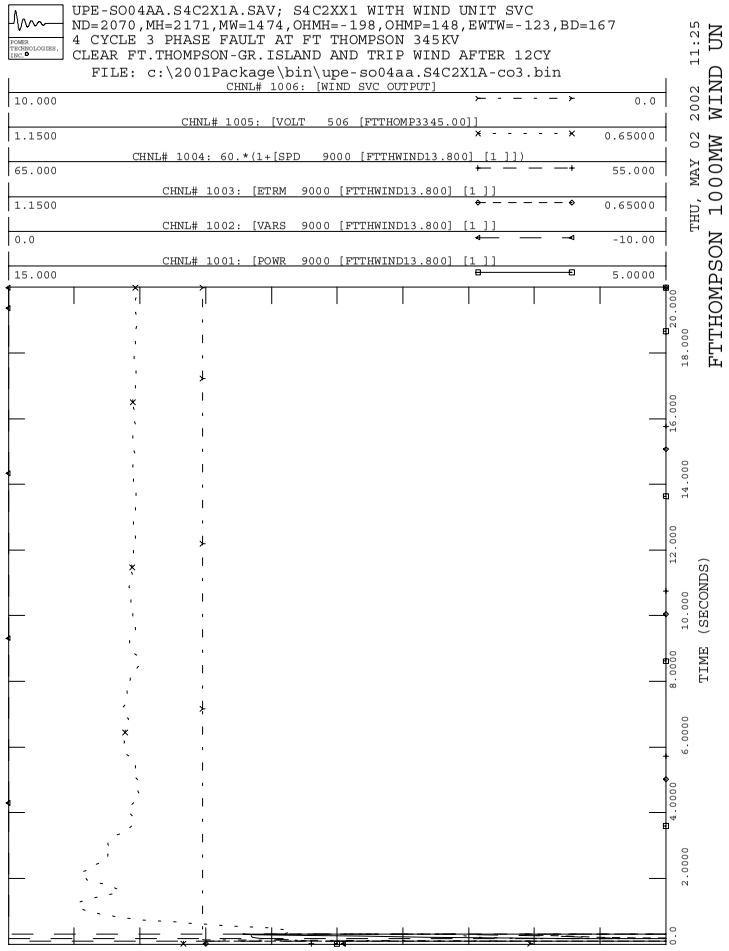


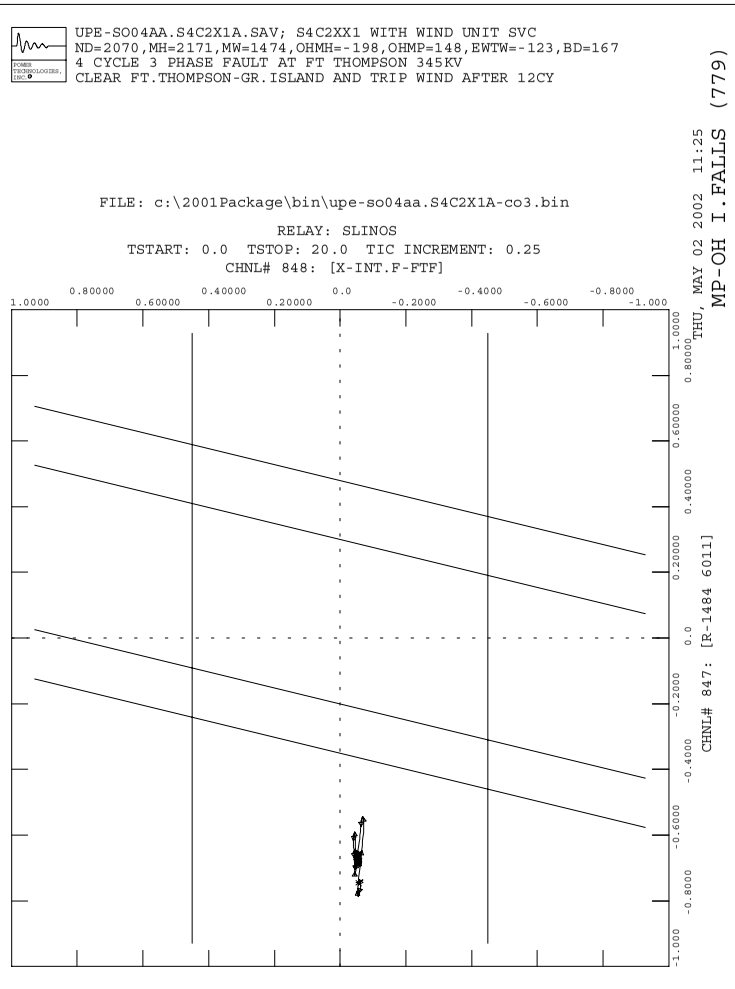
UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY

FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]




UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
CHNL# 1006: [WIND SVC OUTPUT]
10.000
0.0
CHNL# 1005: [VOLT 506 [FTTHOMP3345.00]]
1.1500
0.65000
CHNL# 1004: 60.*(1+[SPD 9000 [FTTHWIND13.800] [1]])
65.000
55.000
CHNL# 1003: [ETRM 9000 [FTTHWIND13.800] [1]]
1.1500
0.65000
CHNL# 1002: [VARS 9000 [FTTHWIND13.800] [1]]
0.0
-10.00
CHNL# 1001: [POWR 9000 [FTTHWIND13.800] [1]]
15.000
5.0000
0.0
2.0000
4.0000
6.0000
8.000
10.000
12.000
14.000
16.000
18.000
20.000
TIME (SECONDS)
THU, MAY 02 2002 11:25
FTTHOMPSON 1000MW WIND UN


UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GR.ISLAND AND TRIP WIND AFTER 12CY
FILE: c:\2001Package\bin\upe-so04aa.S4C2X1A-co3.bin
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]
1.0000
0.80000
0.60000
0.40000
0.20000
0.0
-0.2000
-0.4000
-0.6000
-0.8000
-1.000
CHNL# 847: [R-1484 6011]
THU, MAY 02 2002 11:25
MP-OH I.FALLS (779)

APPENDIX 28

SCREENING OF MAPP CONTINGENCIES

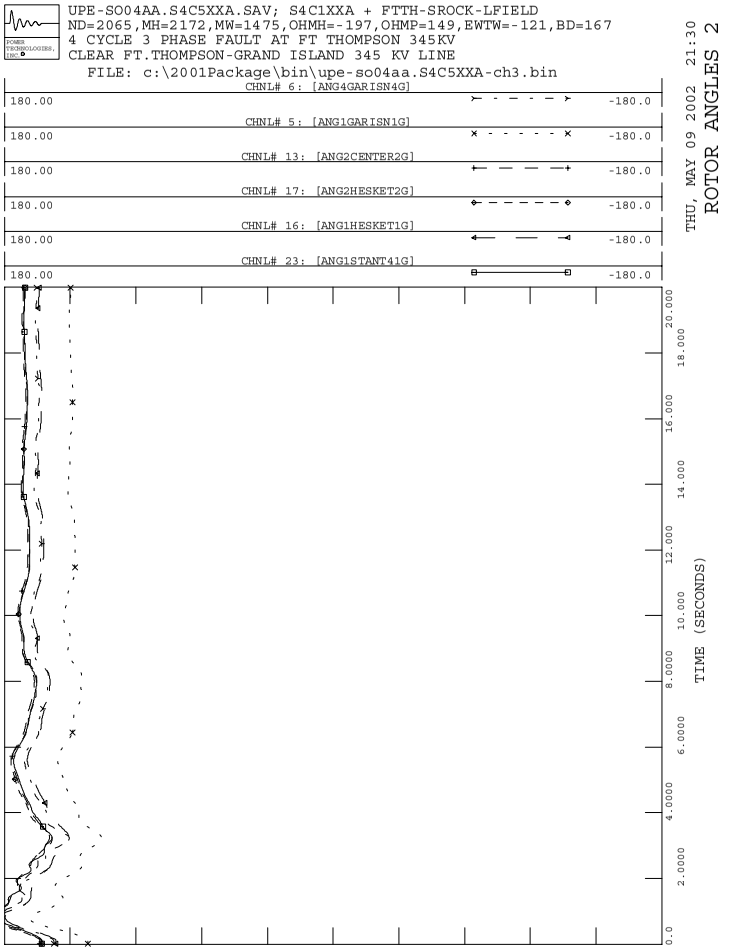
WITH DYNAMIC SIMULATION

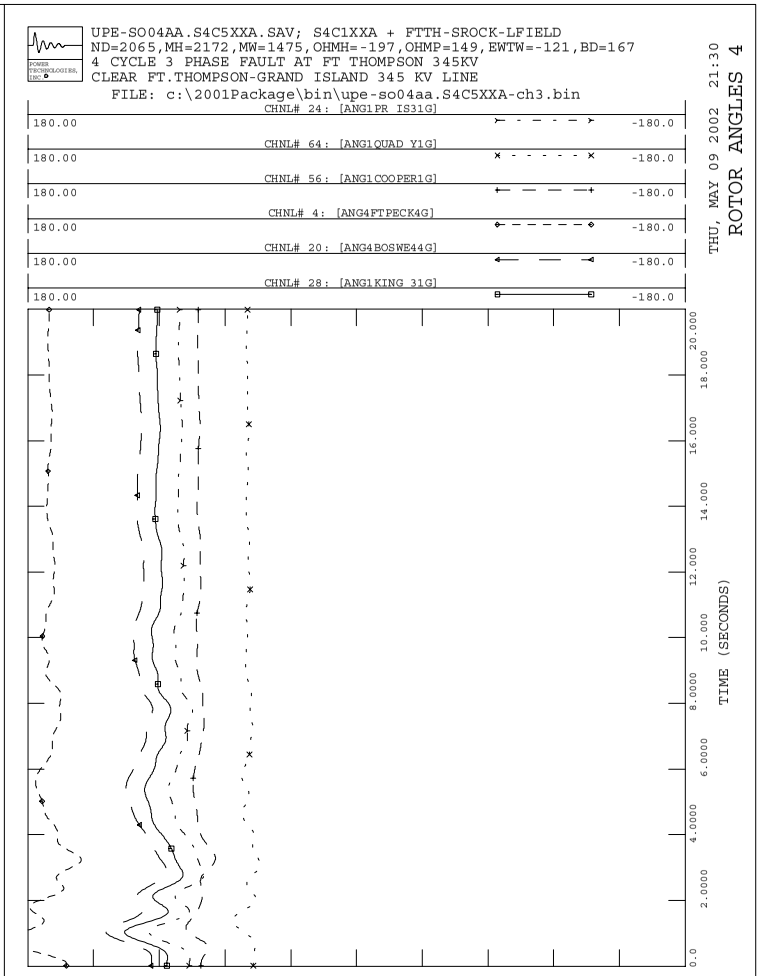
SITE 4 (FT. THOMPSON)

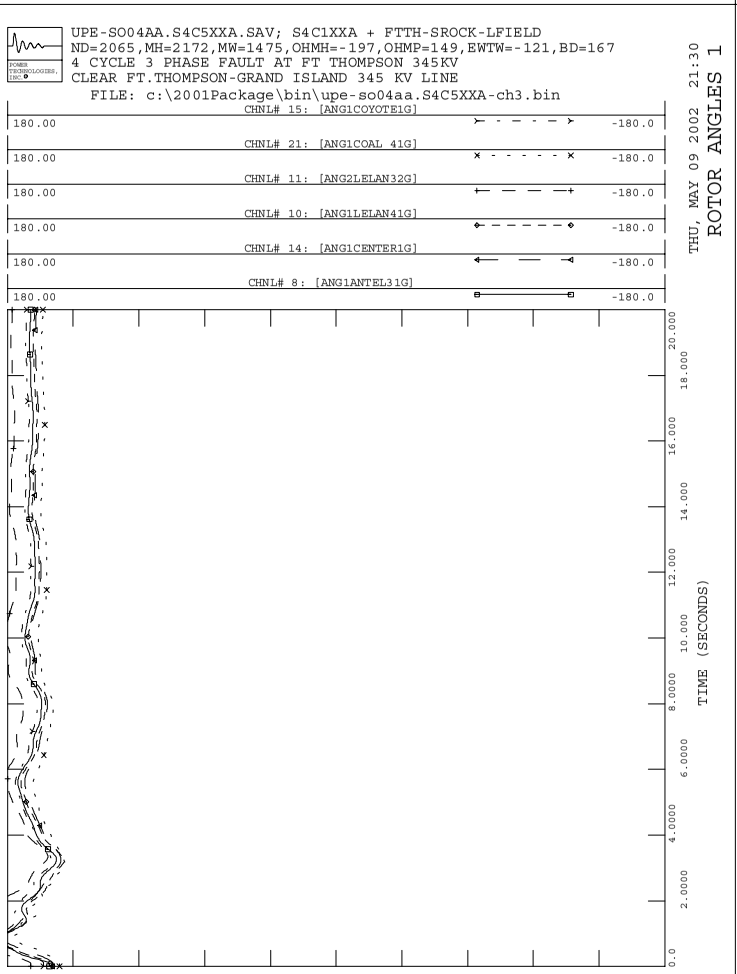
CASE S4C5XXA

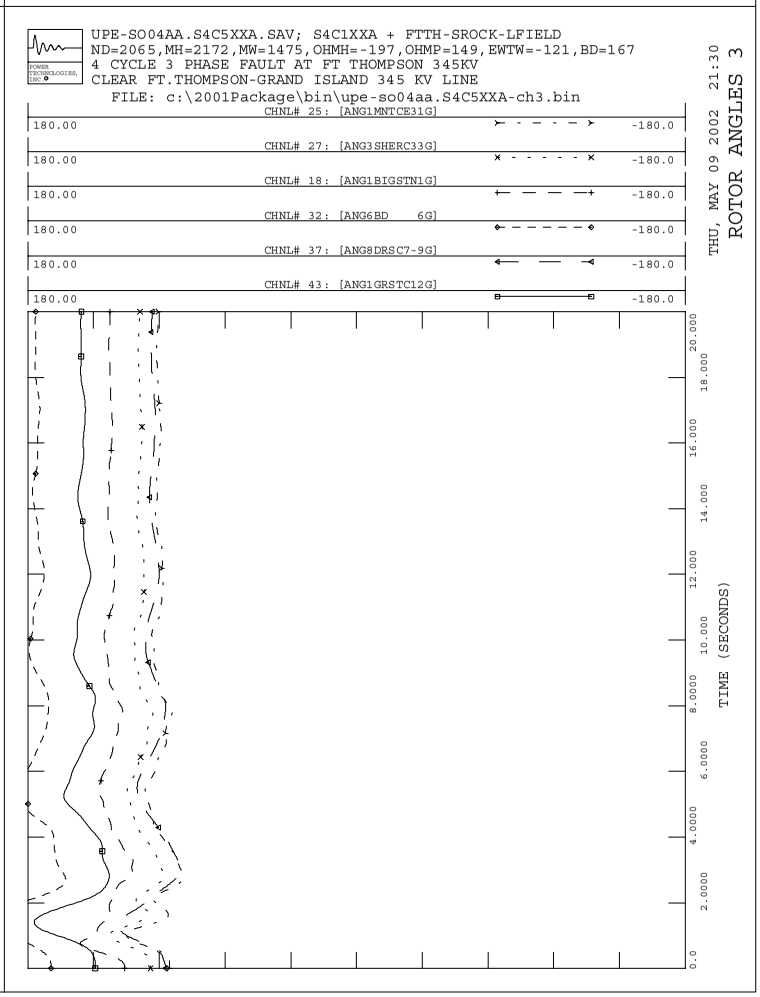
CONTINGENCY CH3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Grand Island 345 kV line


UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 09 2002 21:30
ROTOR ANGLES 2

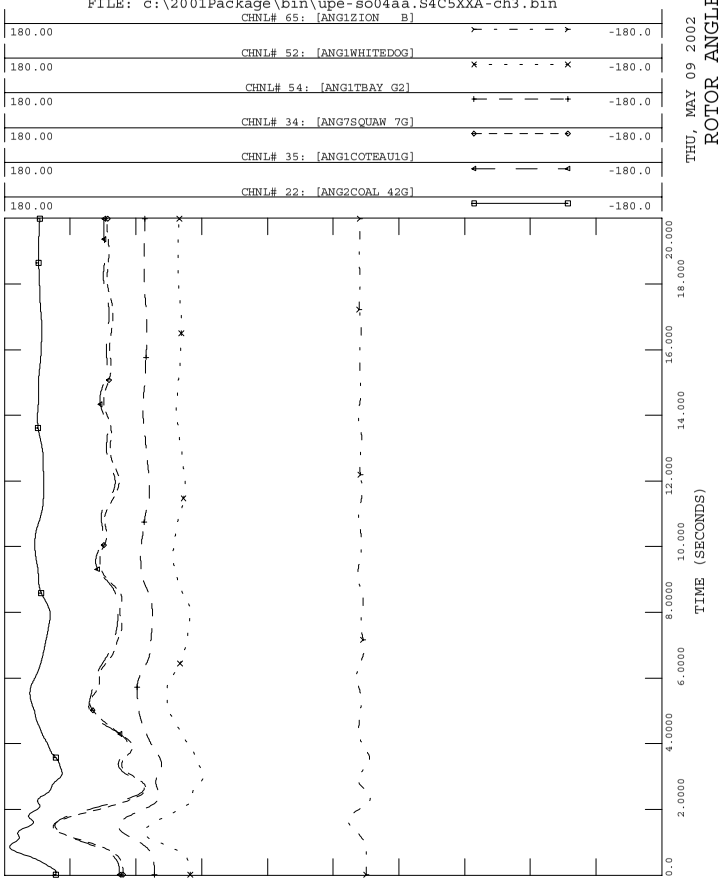

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 09 2002 21:30
ROTOR ANGLES 4


UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 09 2002 21:30
ROTOR ANGLES 1


UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 09 2002 21:30
ROTOR ANGLES 3

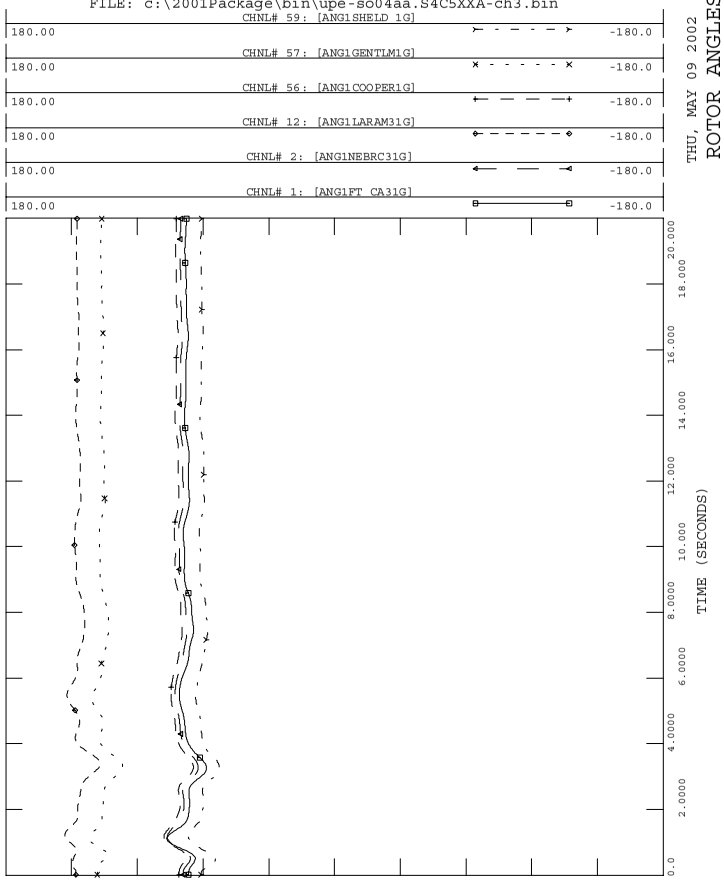
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
ROTOR ANGLES 6



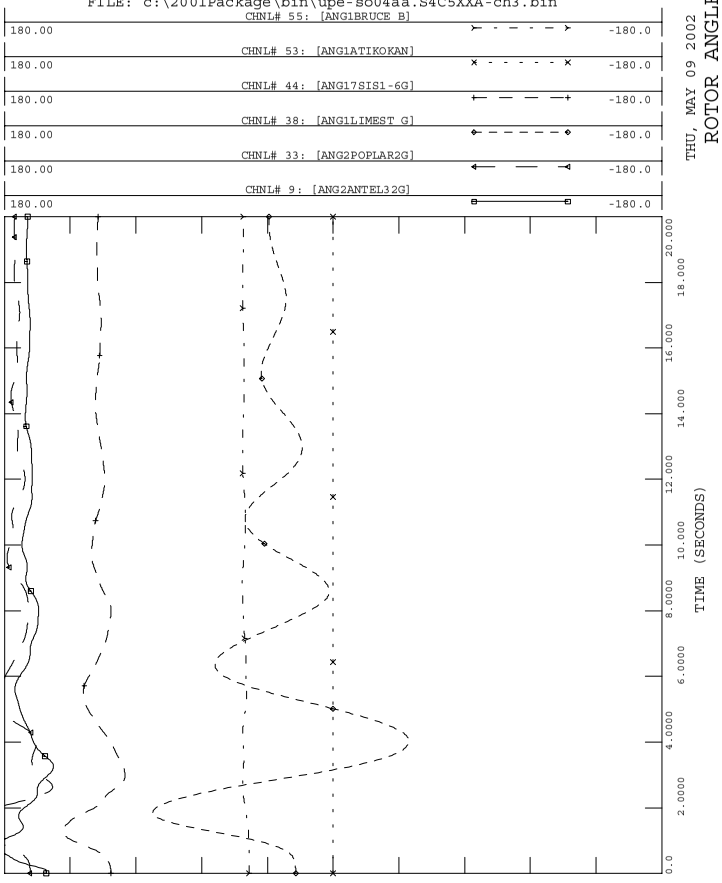
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
ROTOR ANGLES NB



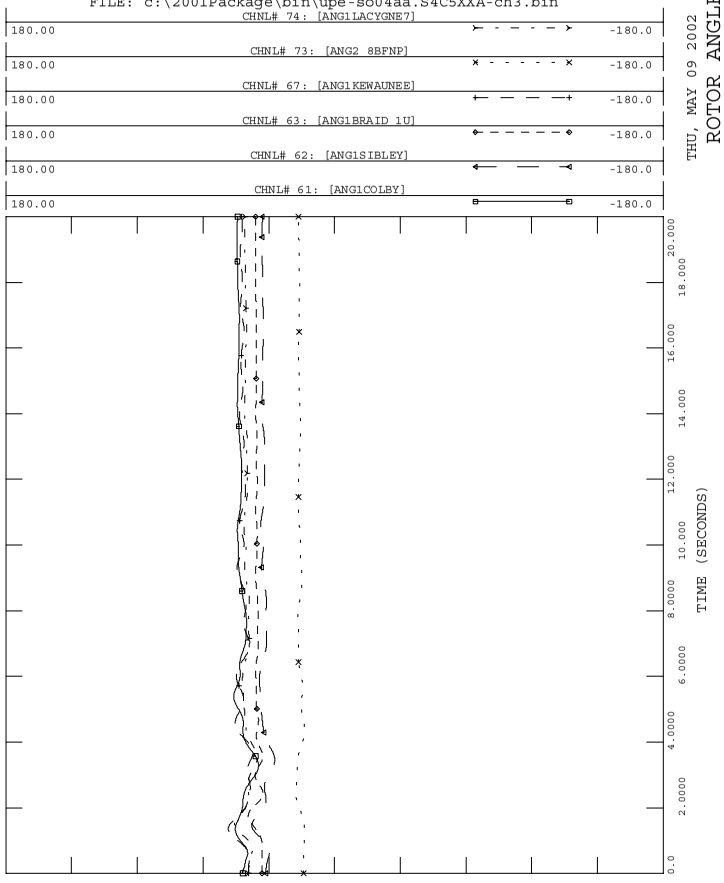
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
ROTOR ANGLES 5



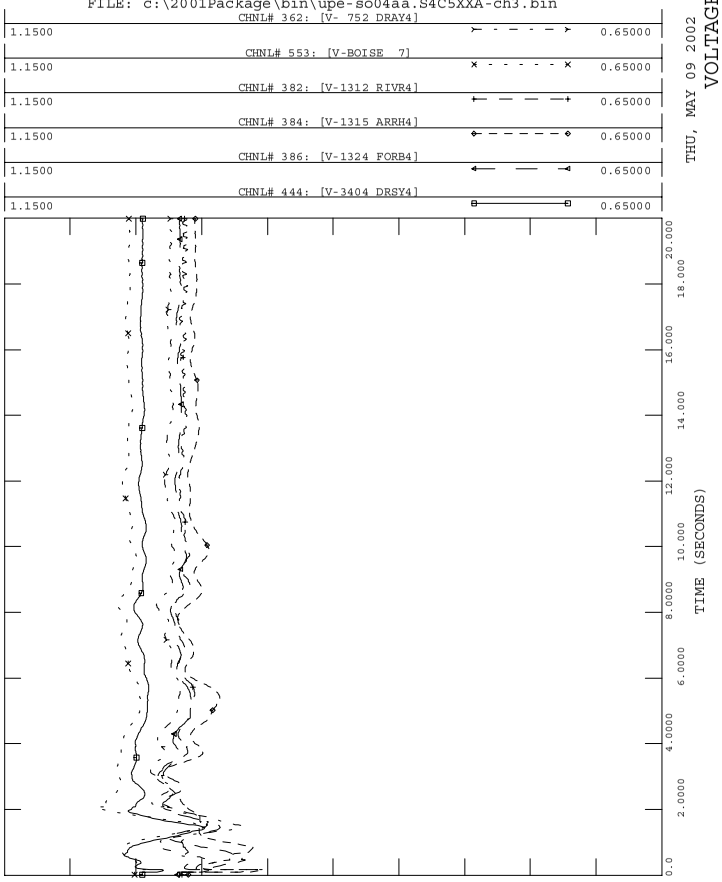
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
ROTOR ANGLES 7



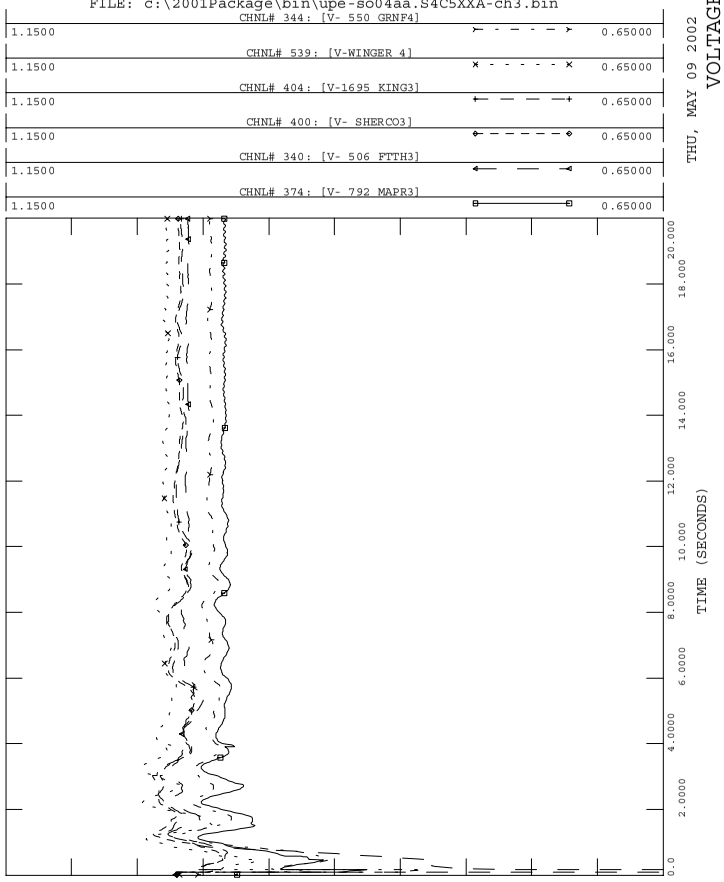
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
VOLTAGES 1



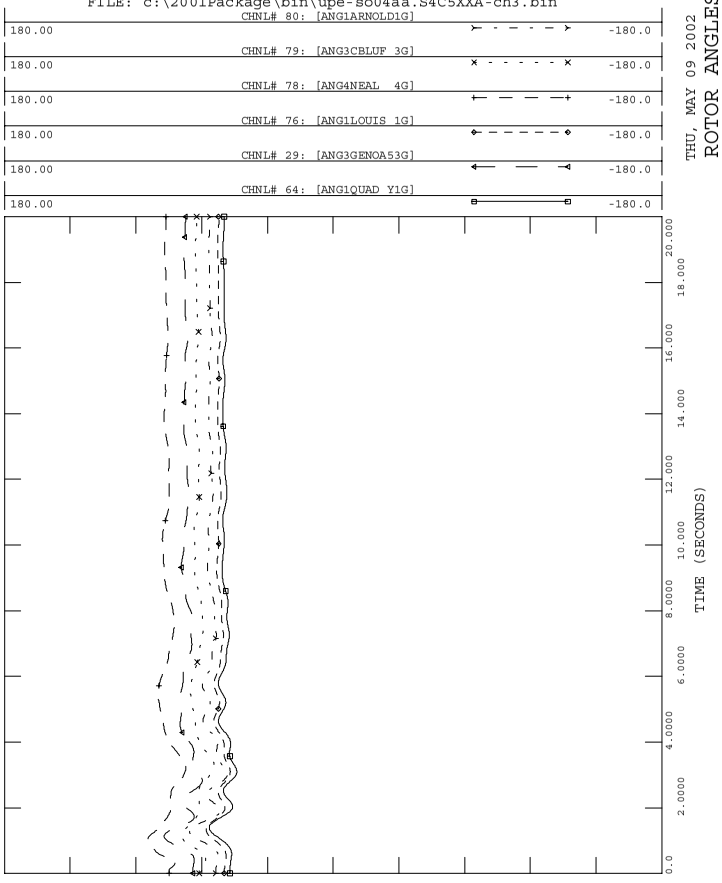
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
VOLTAGES 3



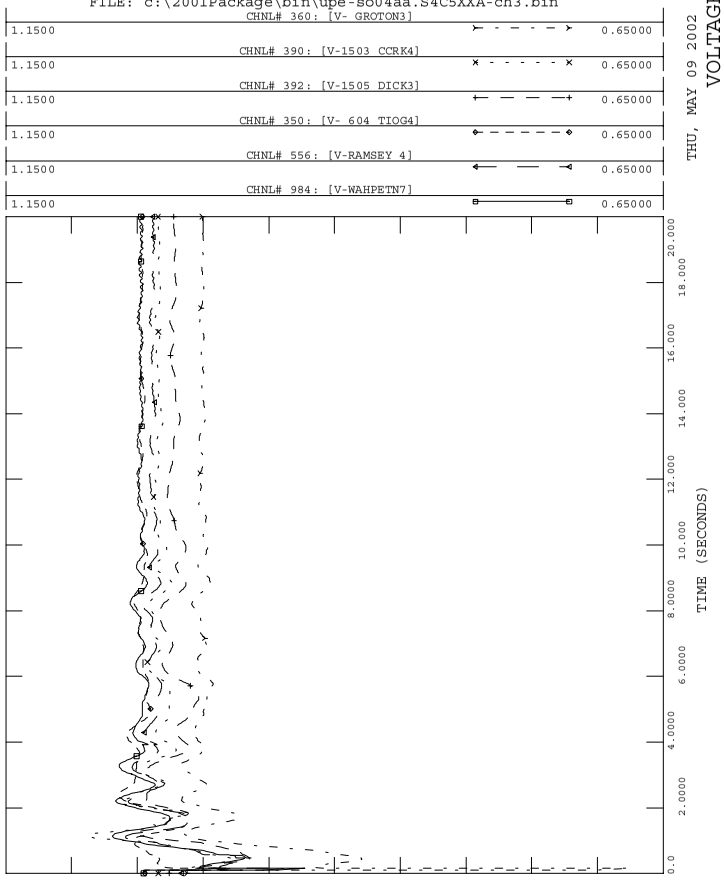
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
ROTOR ANGLES IA



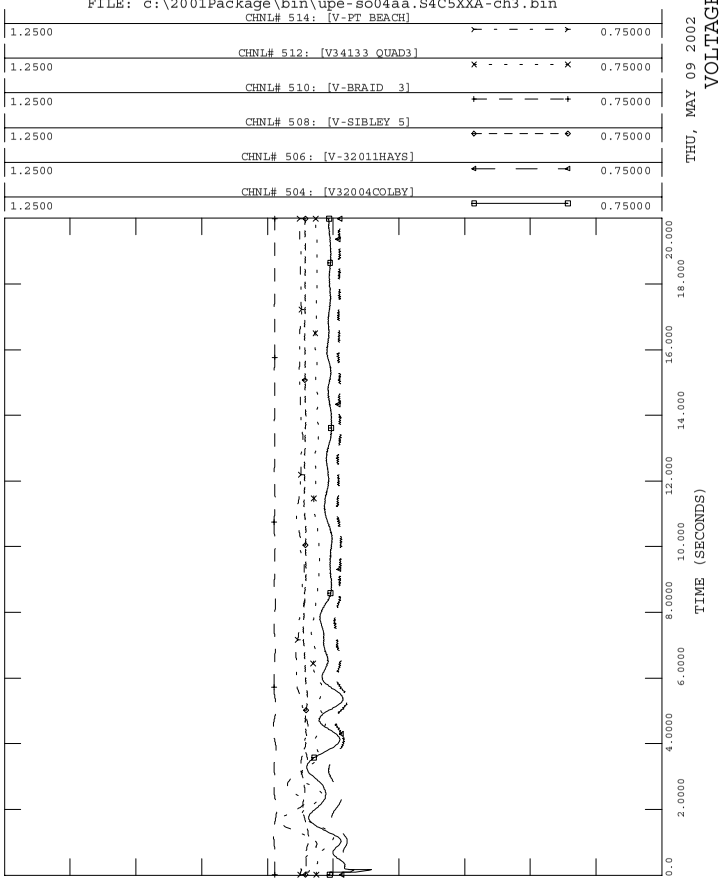
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
VOLTAGES 2



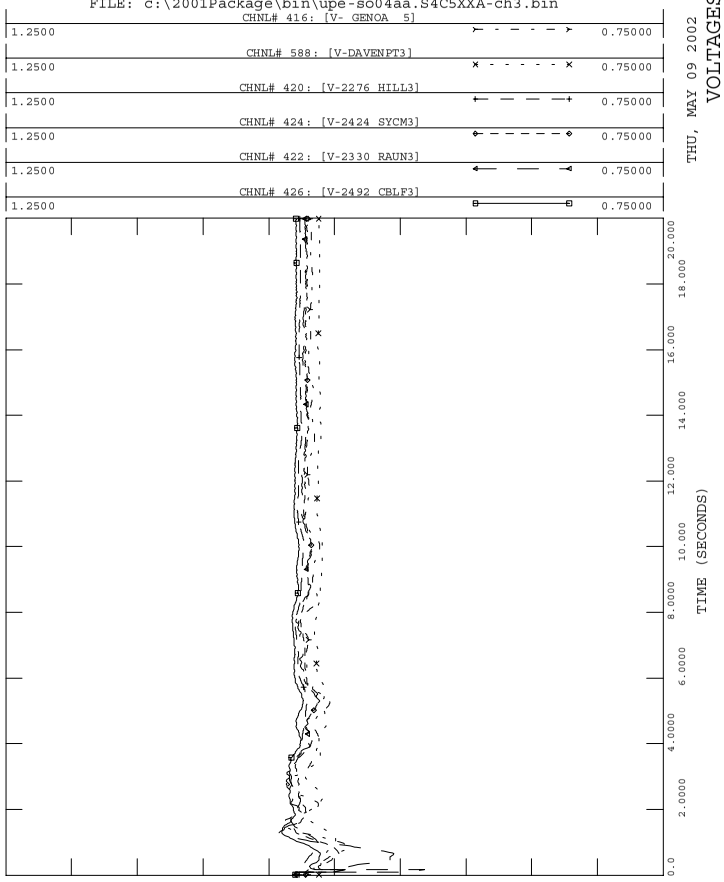
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
VOLTAGES 5



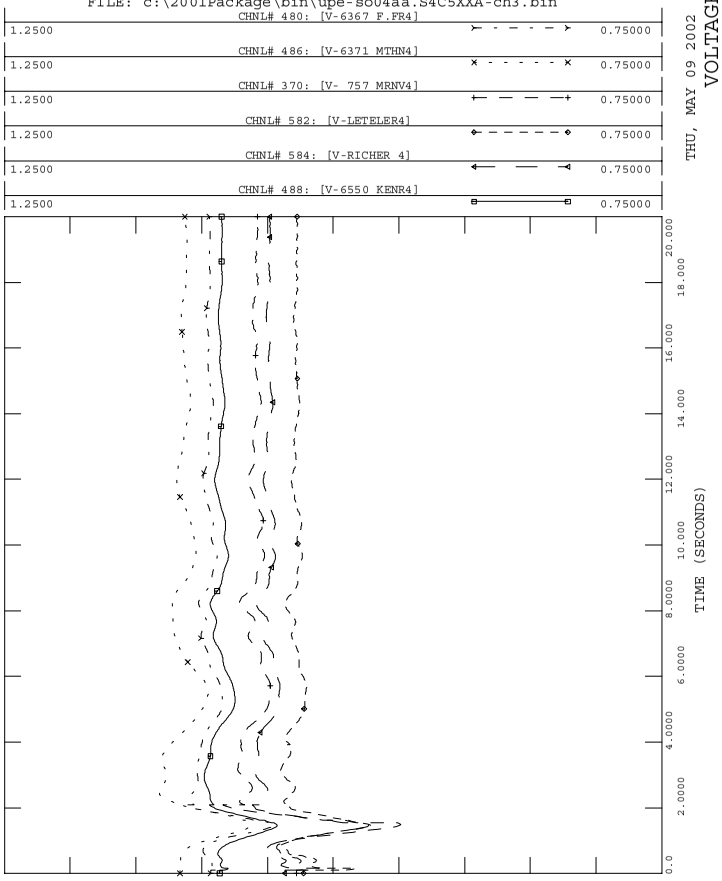
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
VOLTAGES IA



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
VOLTAGES 4



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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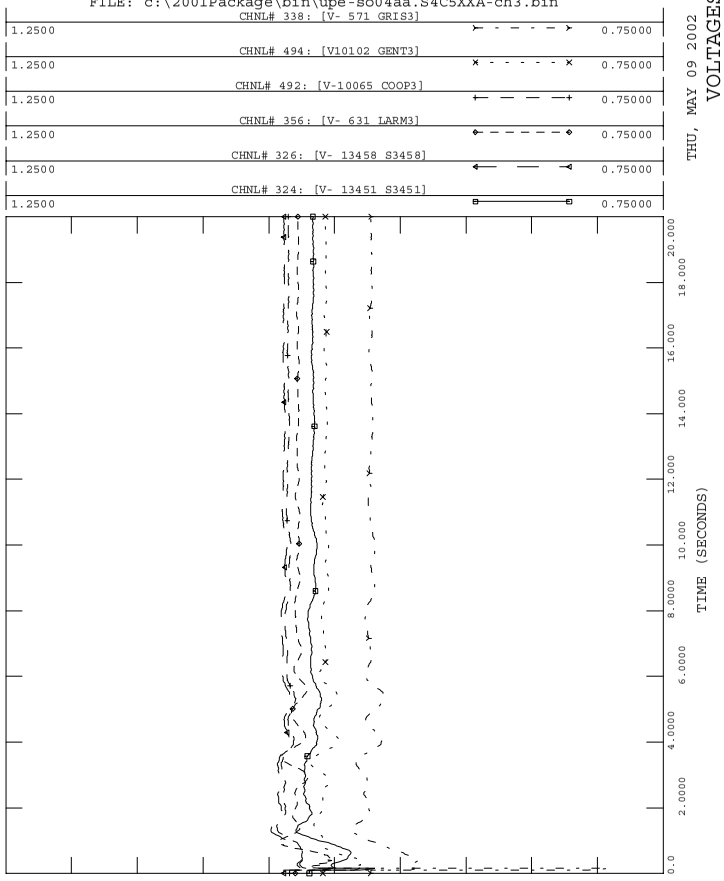
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
VOLTAGES NB



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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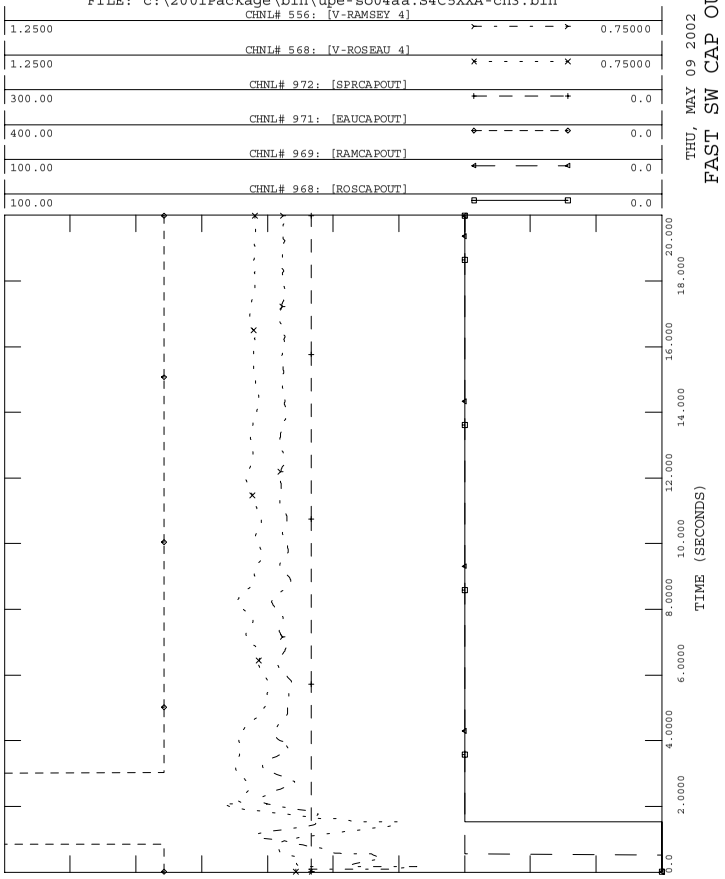
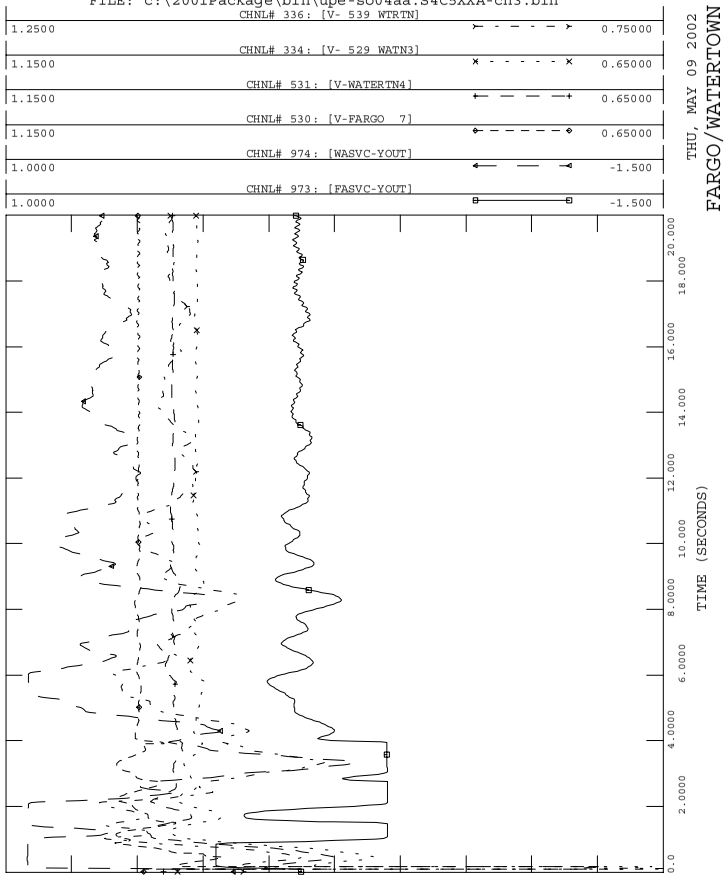


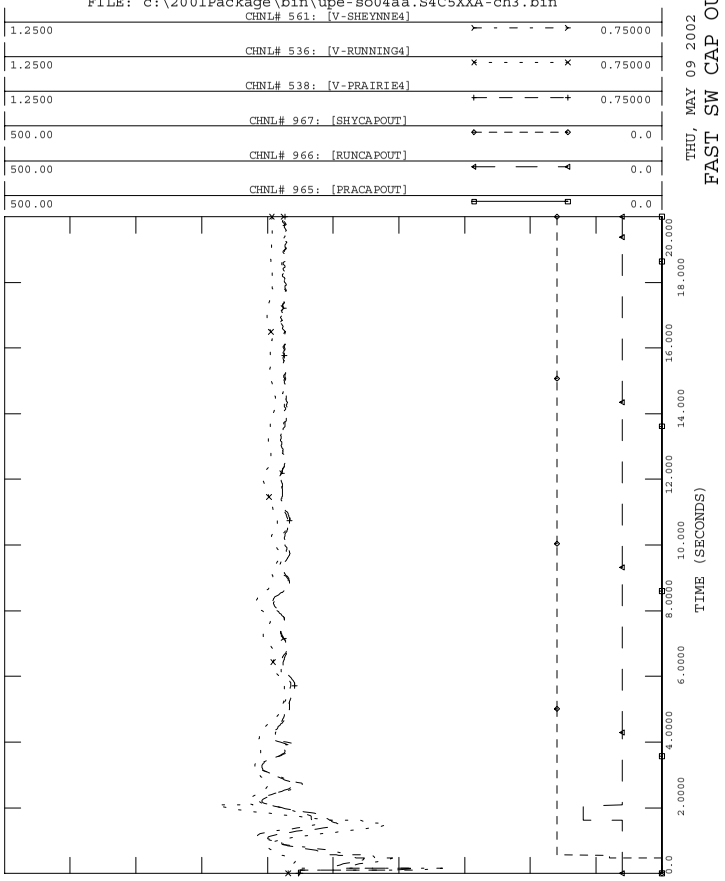
THU, MAY 09 2002 21:30
FAST SW CAP OUT 2

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin



THU, MAY 09 2002 21:30
FARGO/WATERTOWN SVS

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin



THU, MAY 09 2002 21:30
FAST SW CAP OUT 1

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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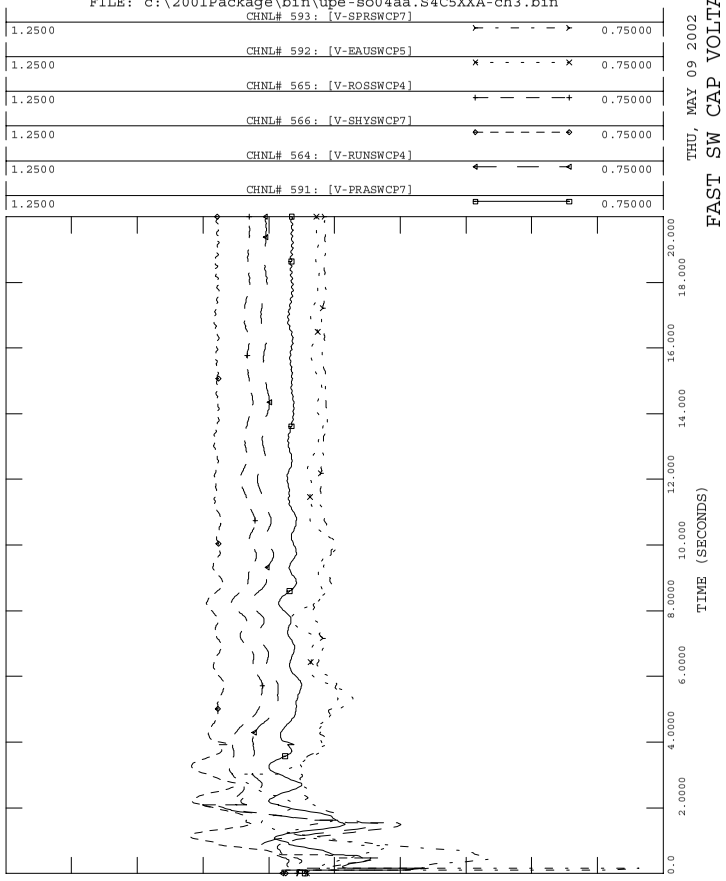
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

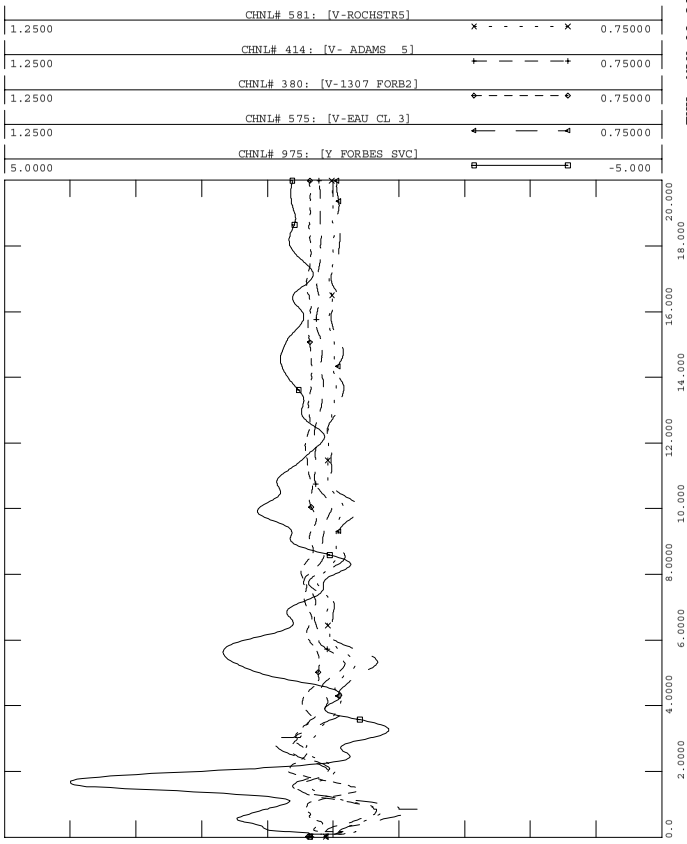


THU, MAY 09 2002 21:30
FAST SW CAP VOLTAGES

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30

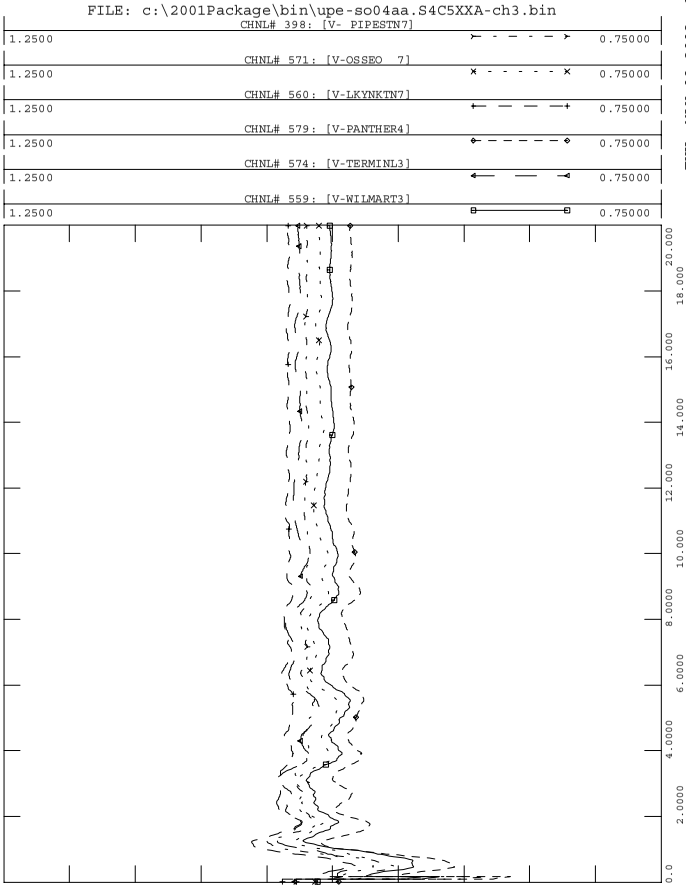
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30

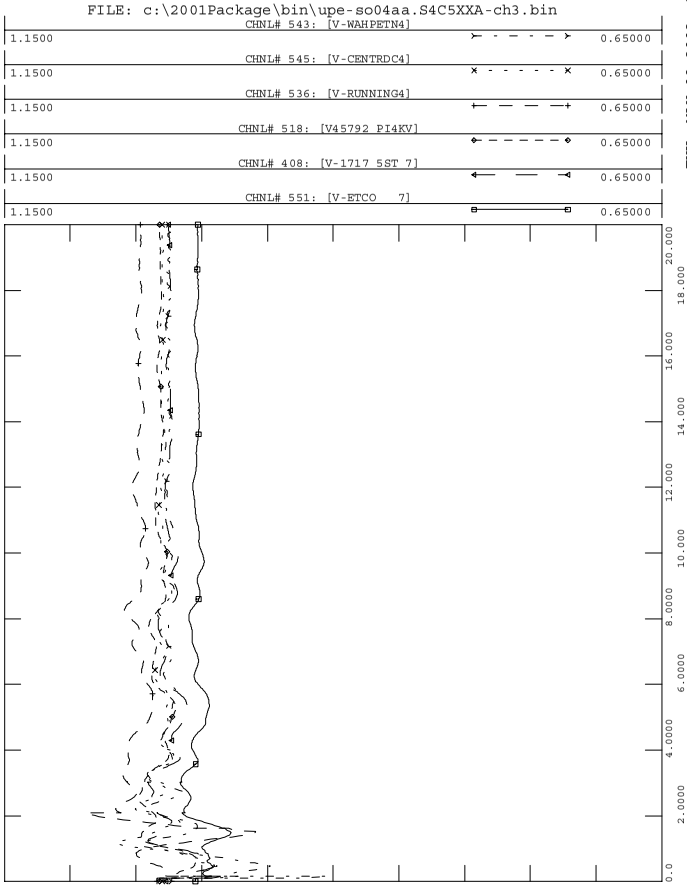
TC VOLTAGES



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30

VOLTAGES 6



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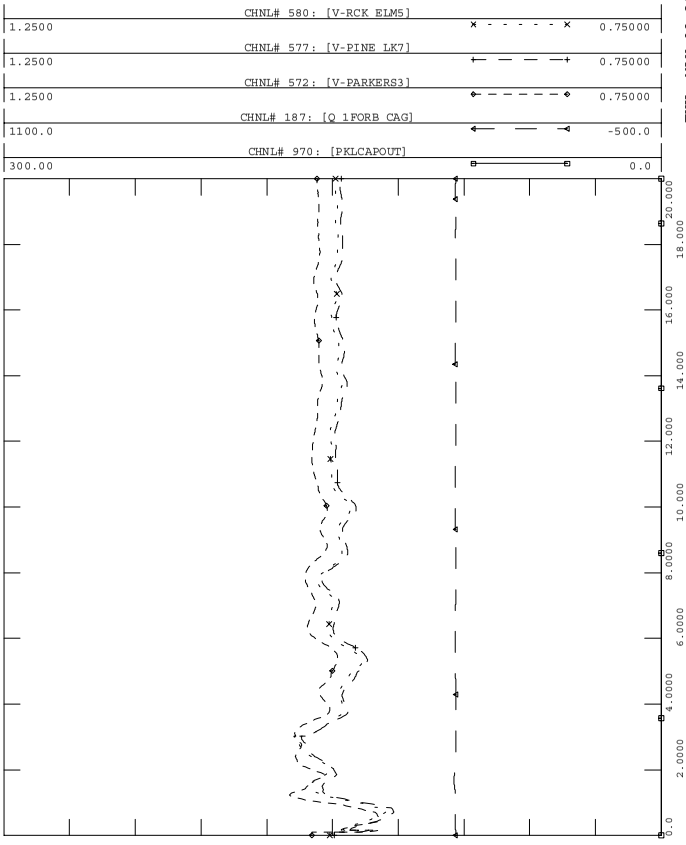
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30

FORBES SVS OUT & VOLTAGES



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
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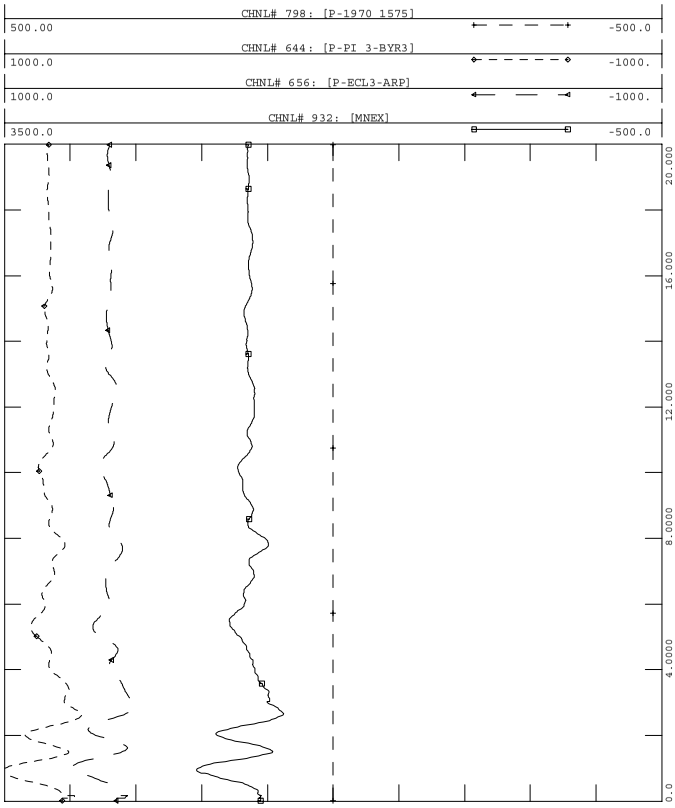
THU, MAY 09 2002 21:30
POWER FLOW SUMS 2



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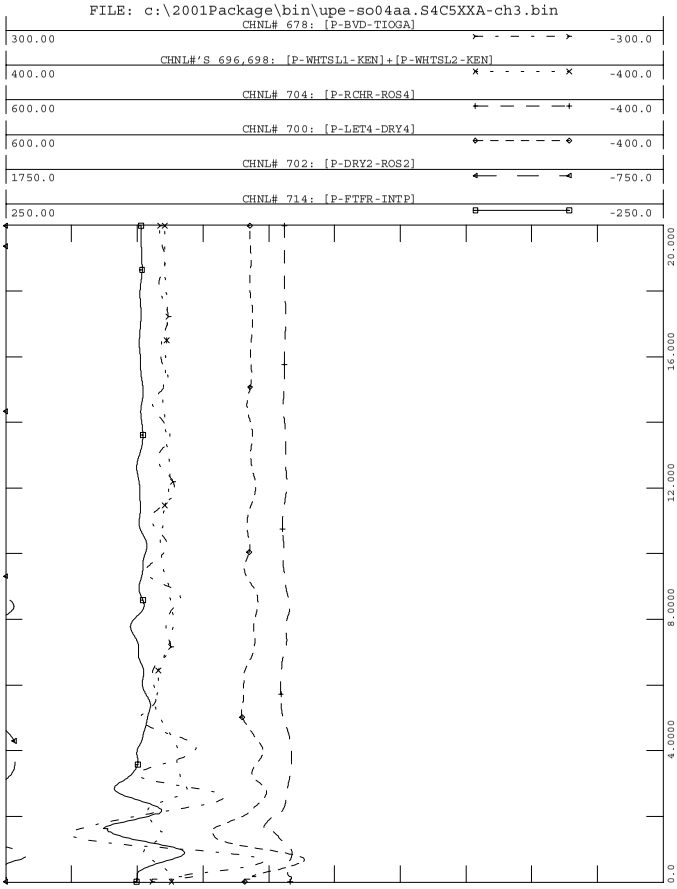
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
CAN. TIE FLOWS



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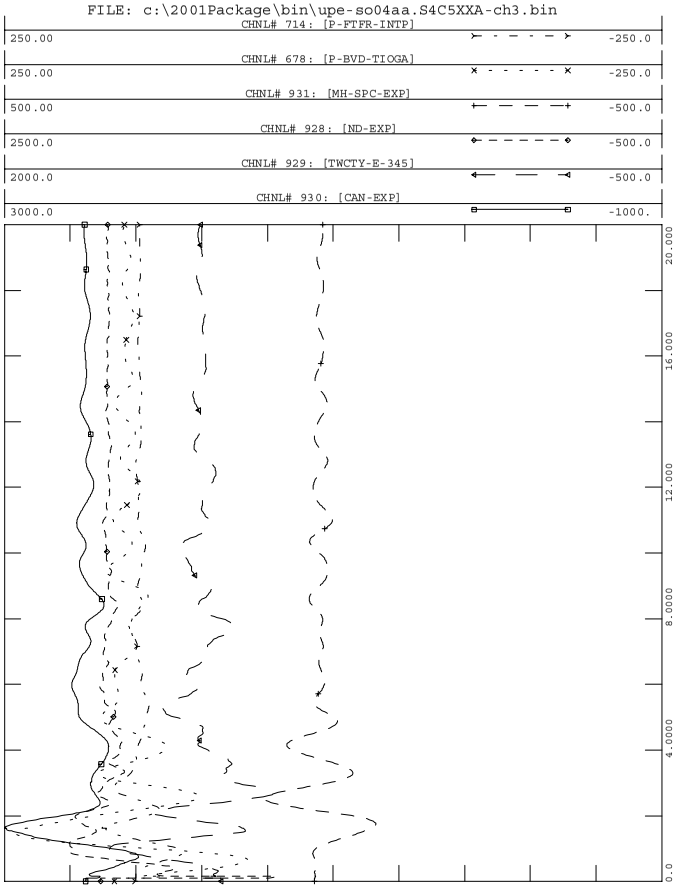
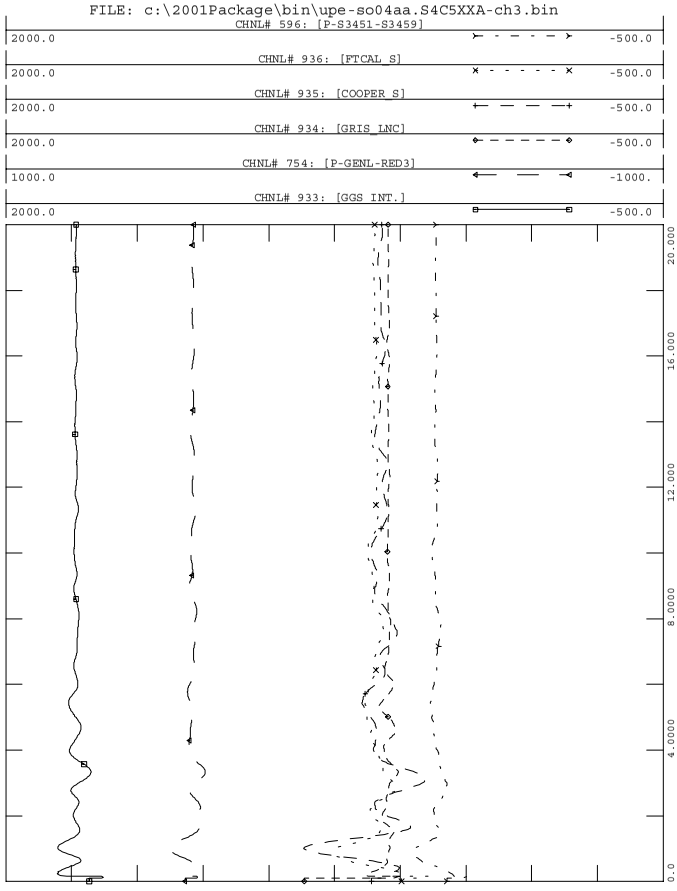
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
POWER FLOW SUMS 1



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
POWER FLOW SUM 3



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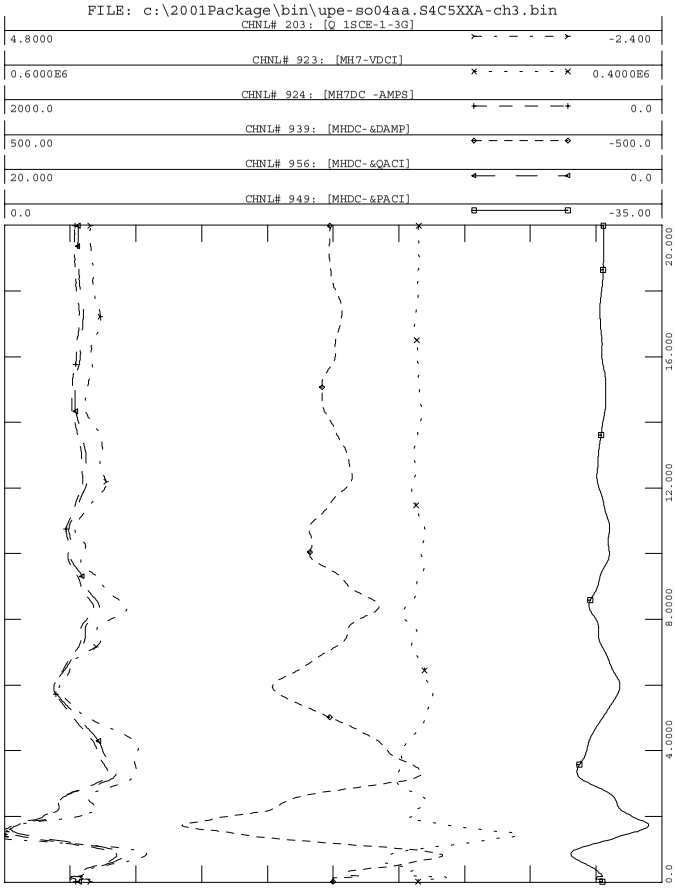
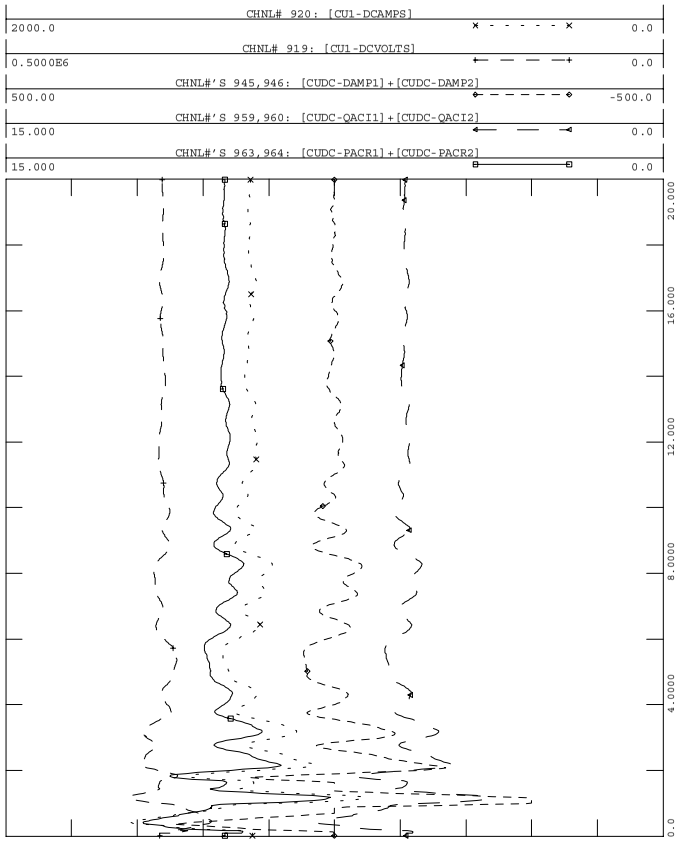
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
MH DC PARAMETERS



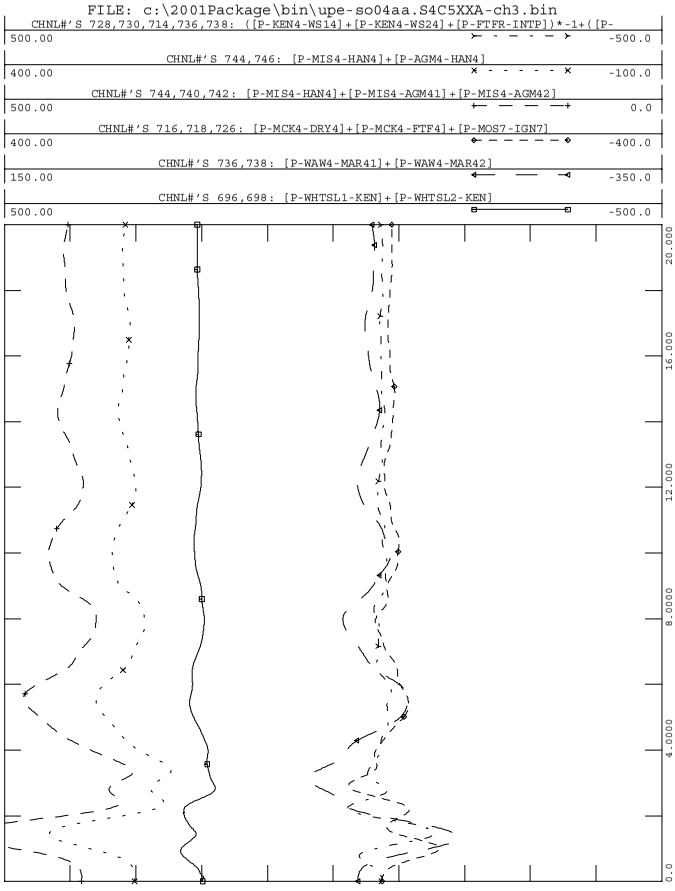
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
CU DC #1



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
OH TIE FLOWS



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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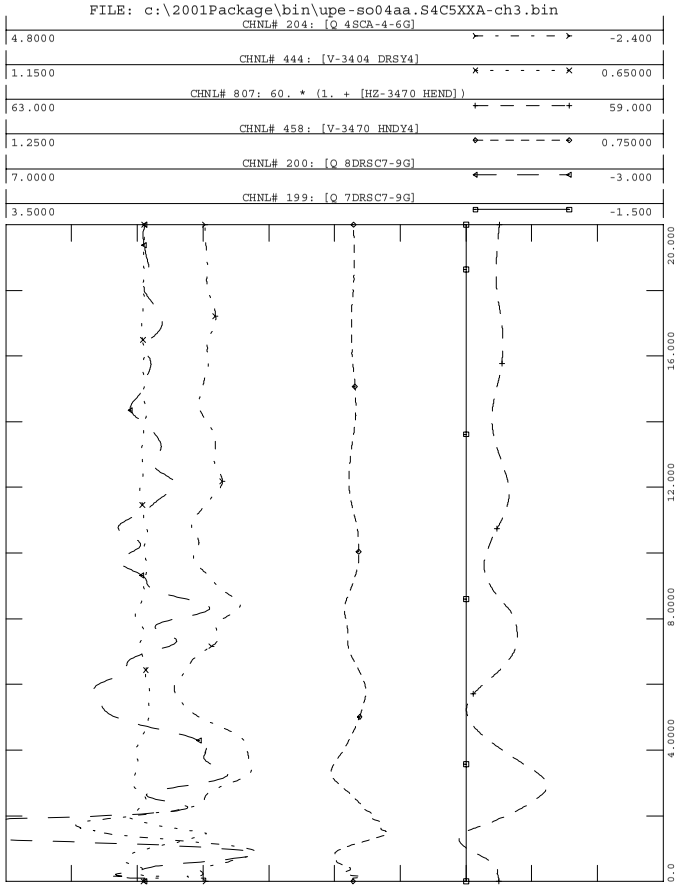
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30
MH DC PARAMETERS



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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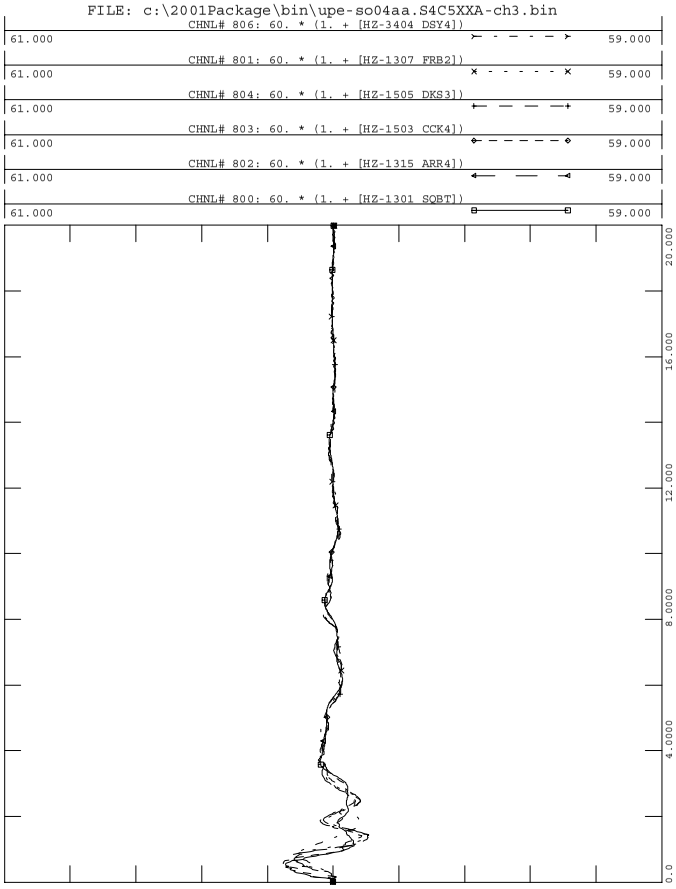
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30

FREQ AT DC TERMINALS



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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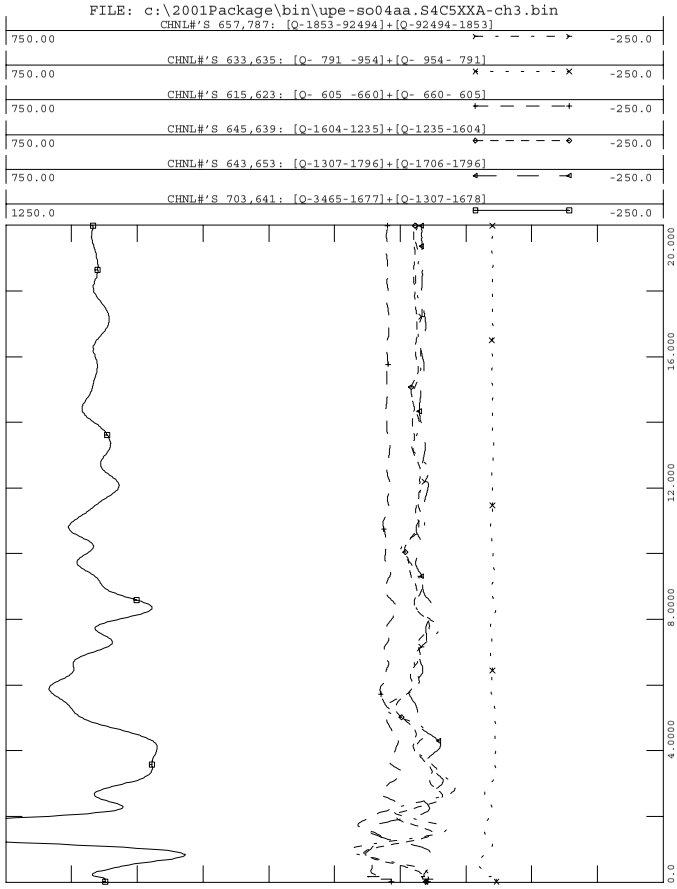
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30

VAR LOSSES



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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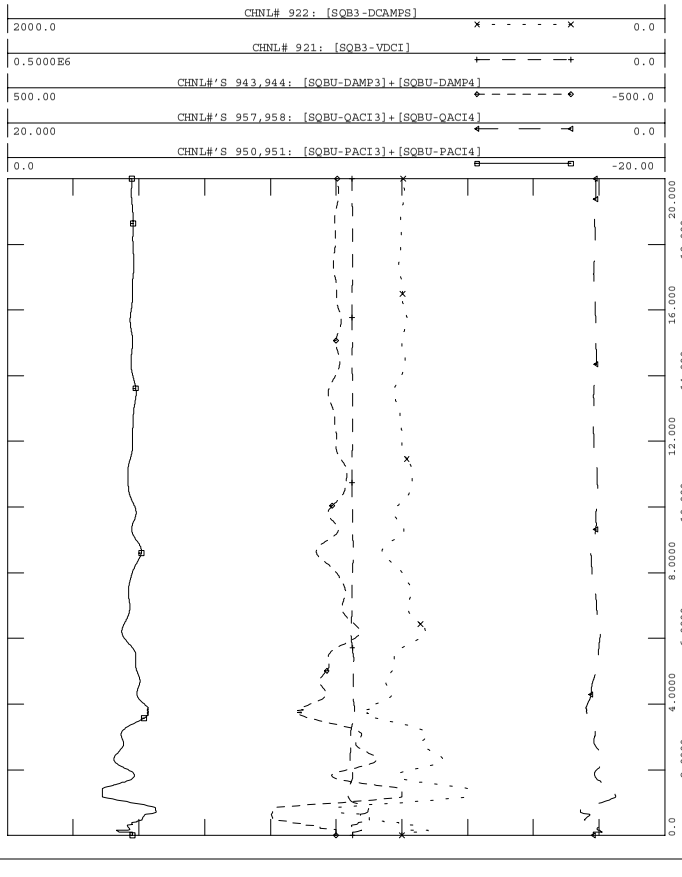
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30

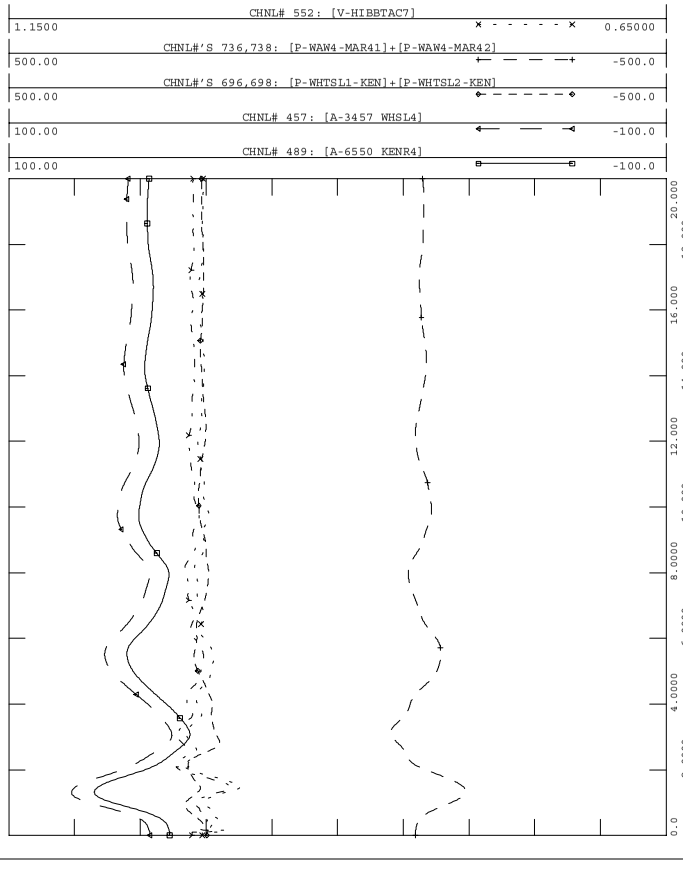
SQB DC #3



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

THU, MAY 09 2002 21:30

VOLTAGES, ANGLES



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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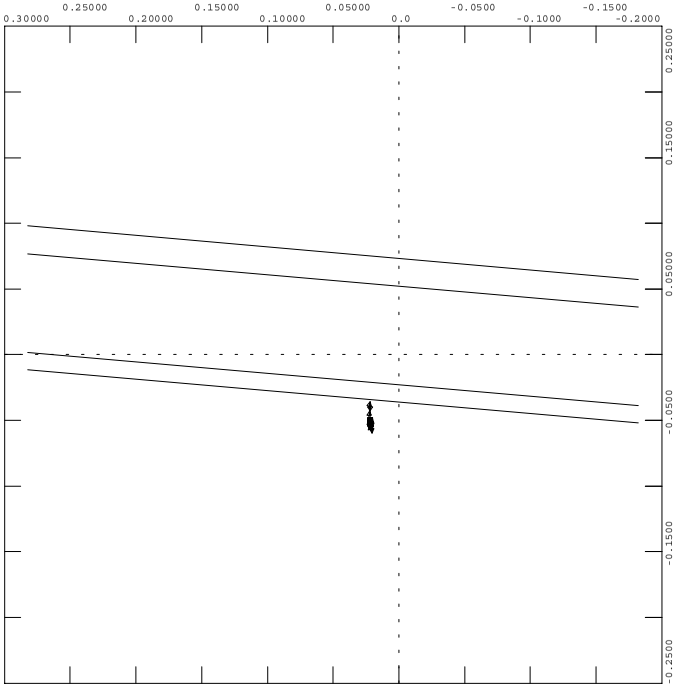
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, MAY 09 2002 21:30
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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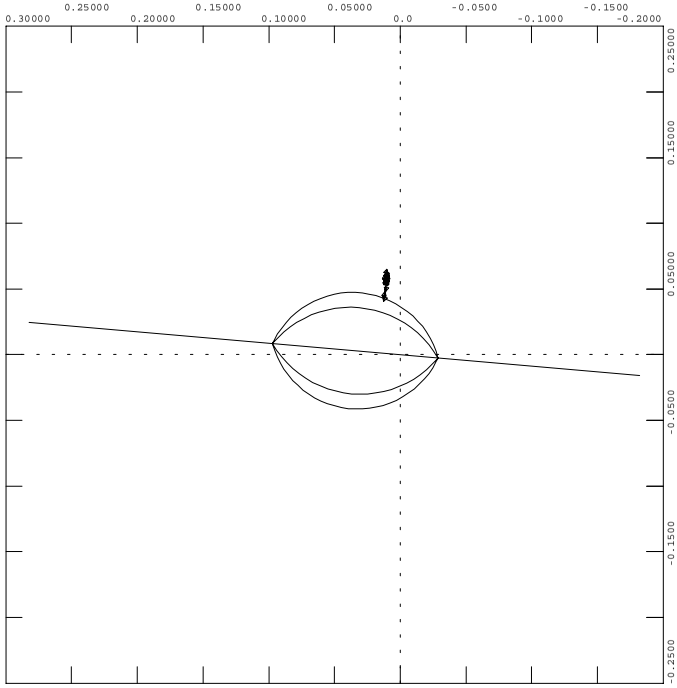
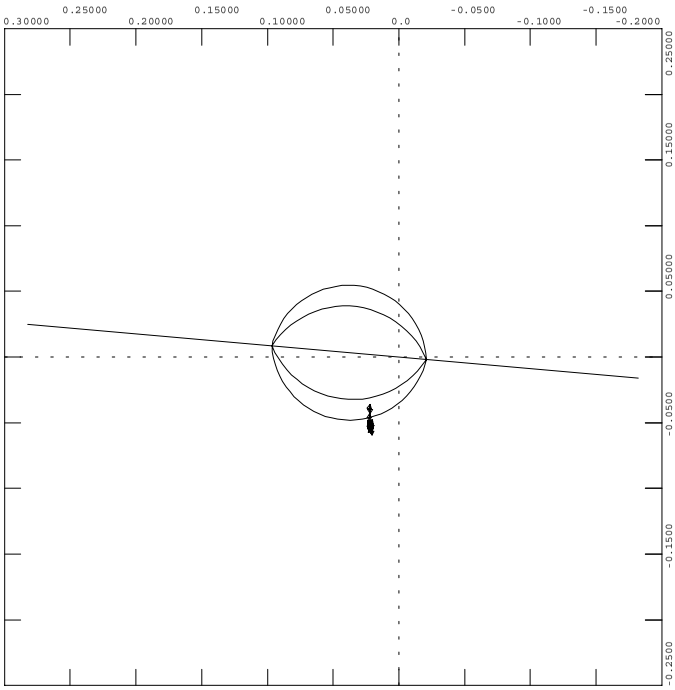


THU, MAY 09 2002 21:30
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, MAY 09 2002 21:30
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

RELAY: SLINOS
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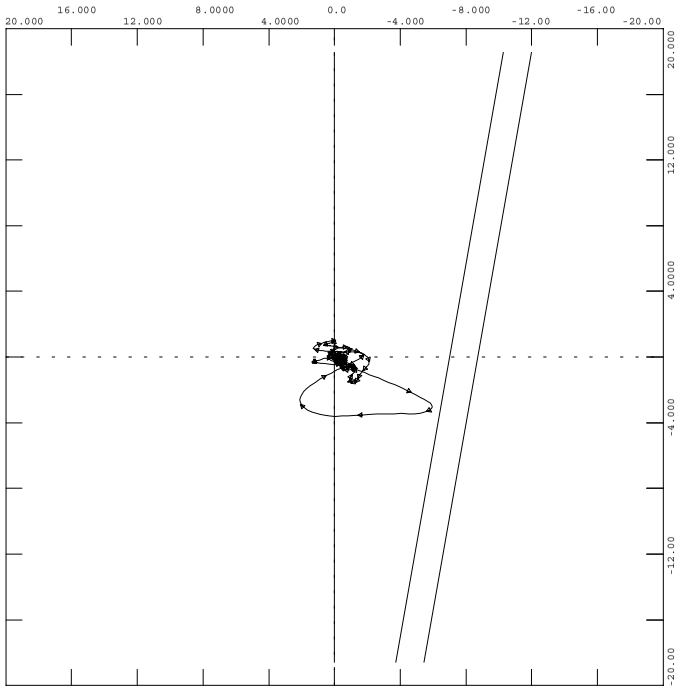
CHNL# 977: [DCAR-B]

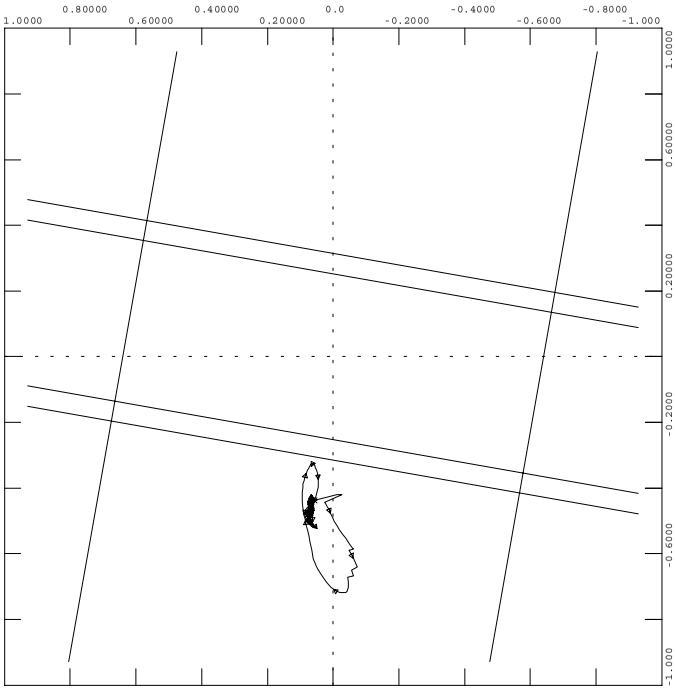


THU, MAY 09 2002 21:30
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

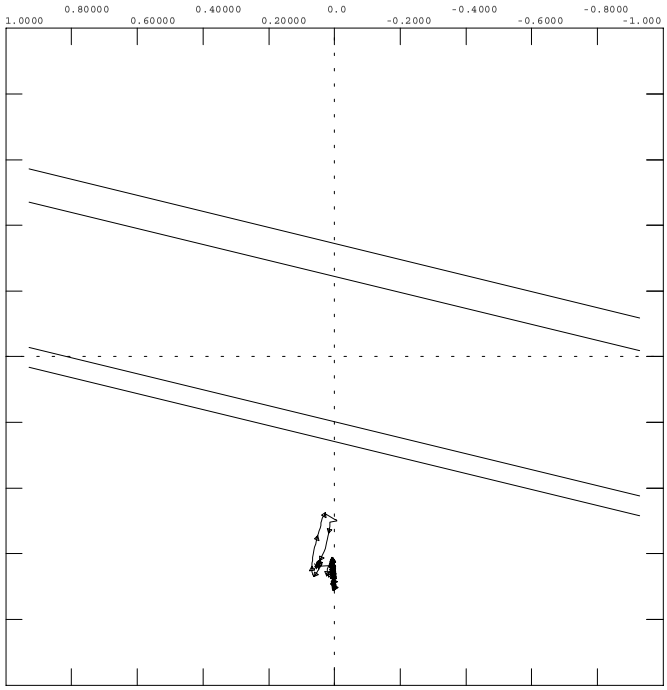
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

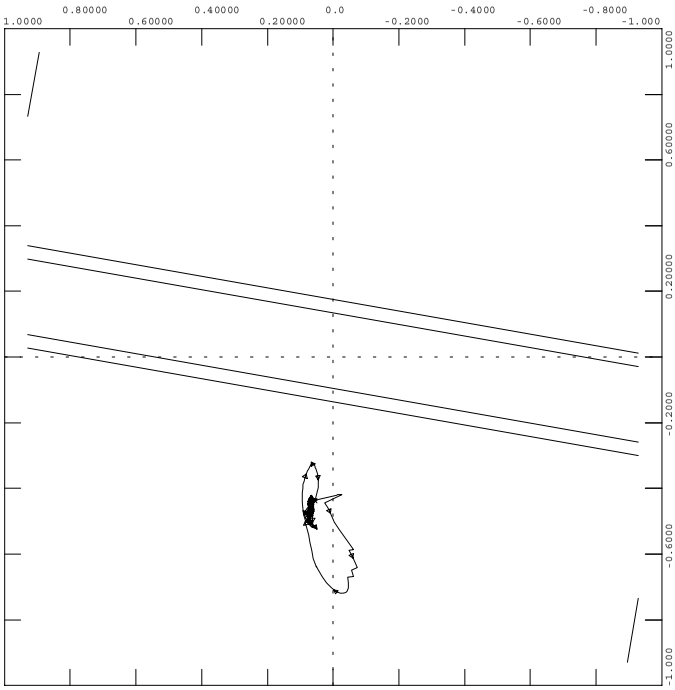
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

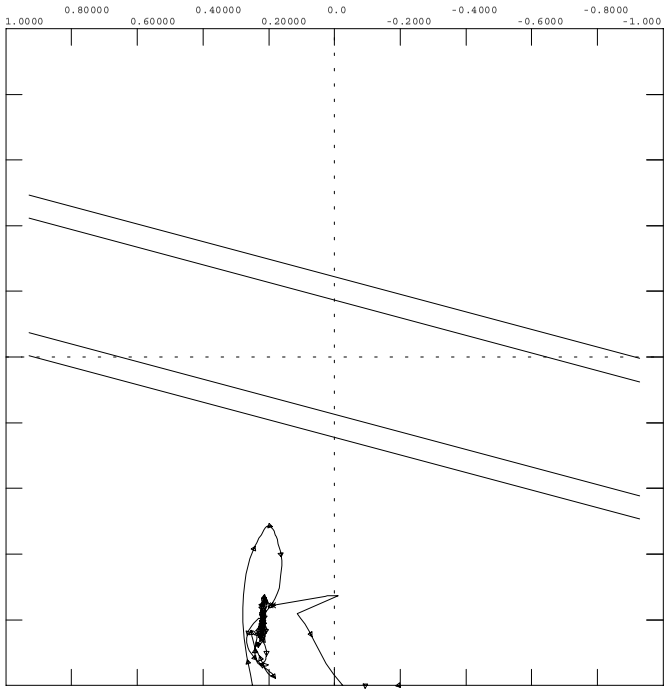
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

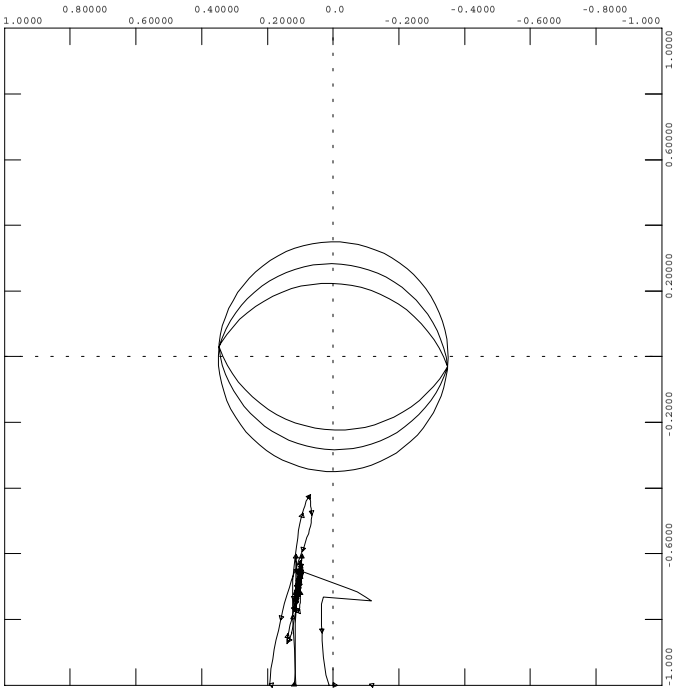
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

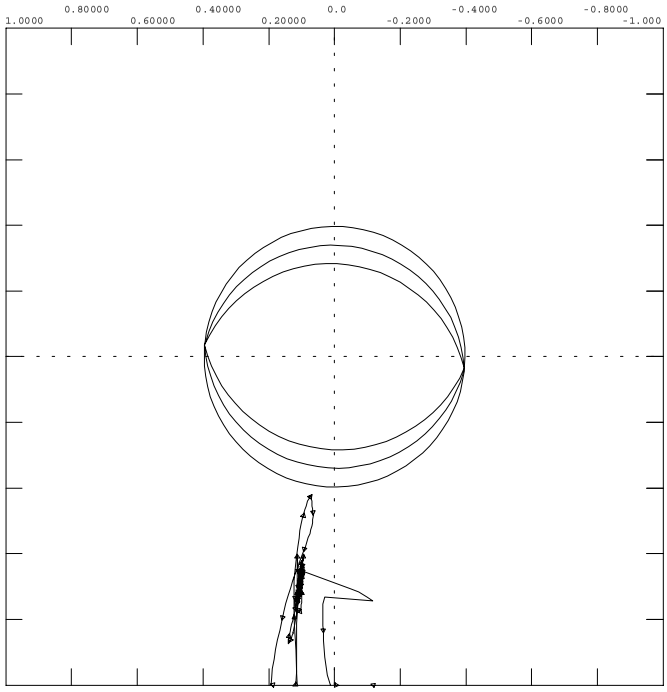


THU, MAY 09 2002 21:30
TIOGA-B.DAM-SOUTH (266)
CHNL# 813: [R-604 3203 1]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]

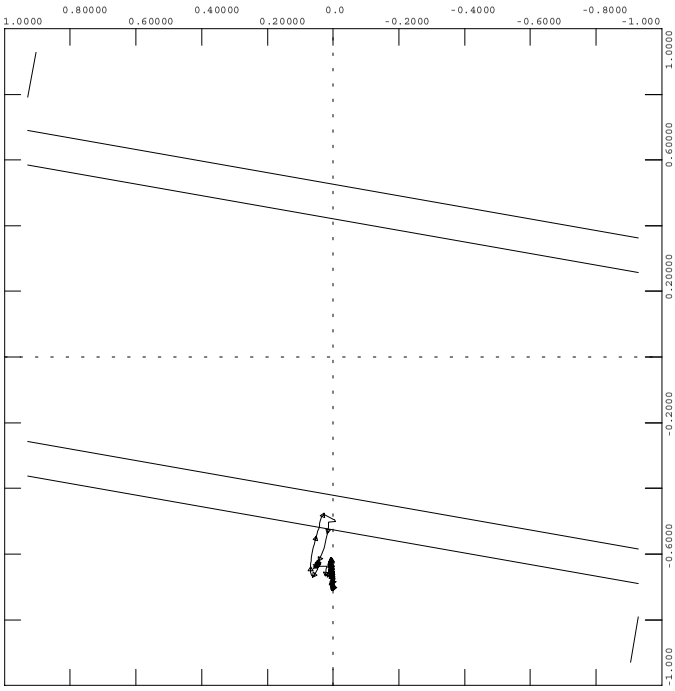


THU, MAY 09 2002 21:30
TIOGA-B.DAM-EMRG (267)
CHNL# 813: [R-604 3203 1]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

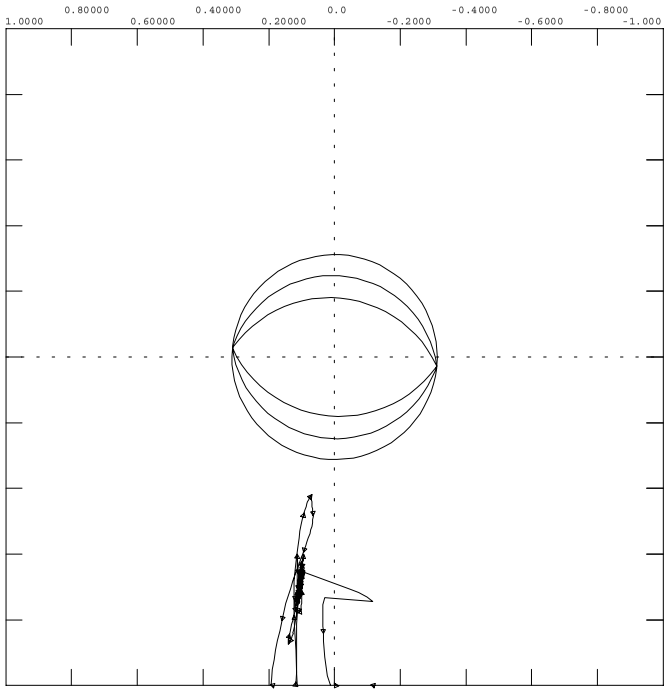


THU, MAY 09 2002 21:30
R50M-MORANVILLE-EMRG (777
CHNL# 821: [R-757 1679 1]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

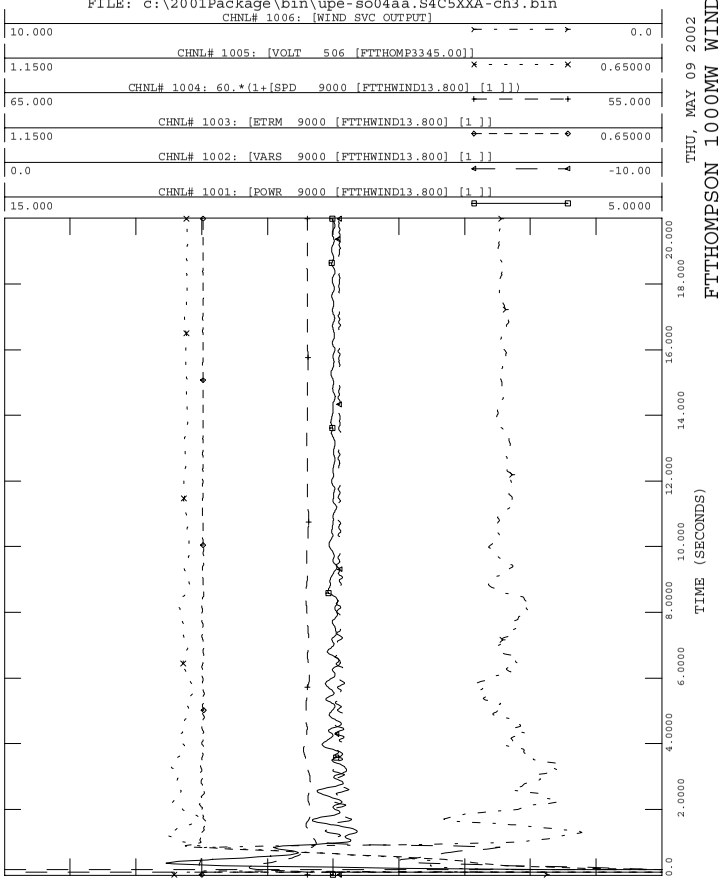
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



THU, MAY 09 2002 21:30
TIOGA-B.DAM-NORTH (268)
CHNL# 813: [R-604 3203 1]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

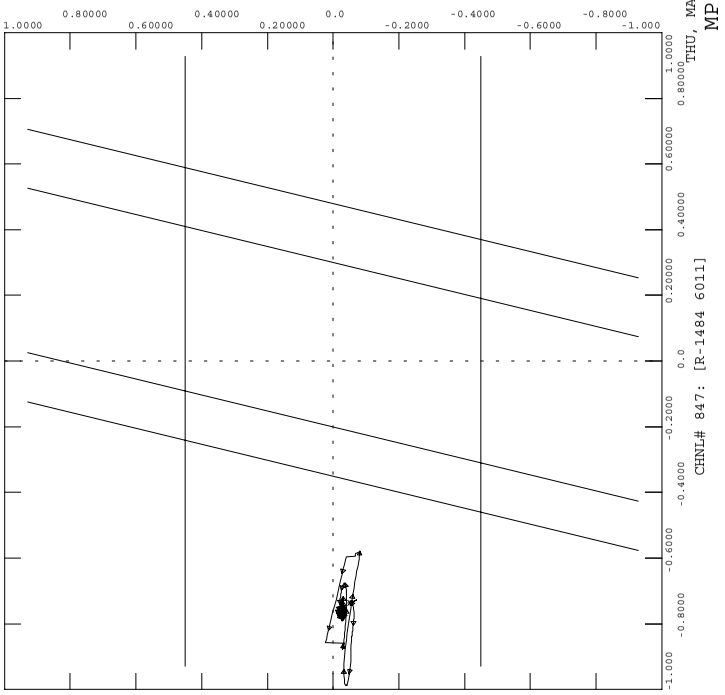


THU, MAY 09 2002 21:30
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



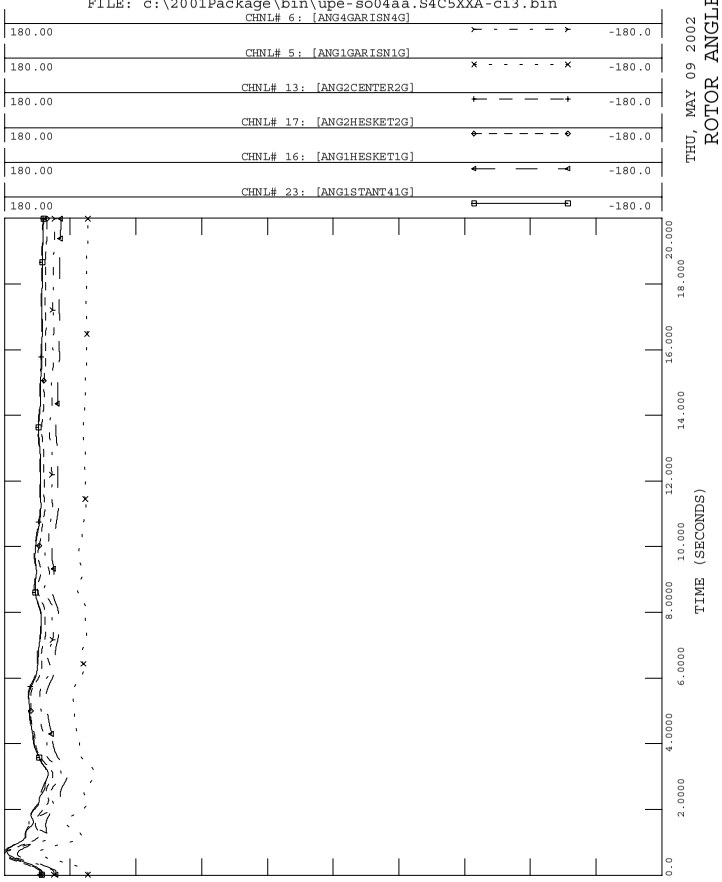
THU, MAY 09 2002 21:30
MP-OH I.FALLS (779)

CONTINGENCY CI3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Leland Olds 345 kV line

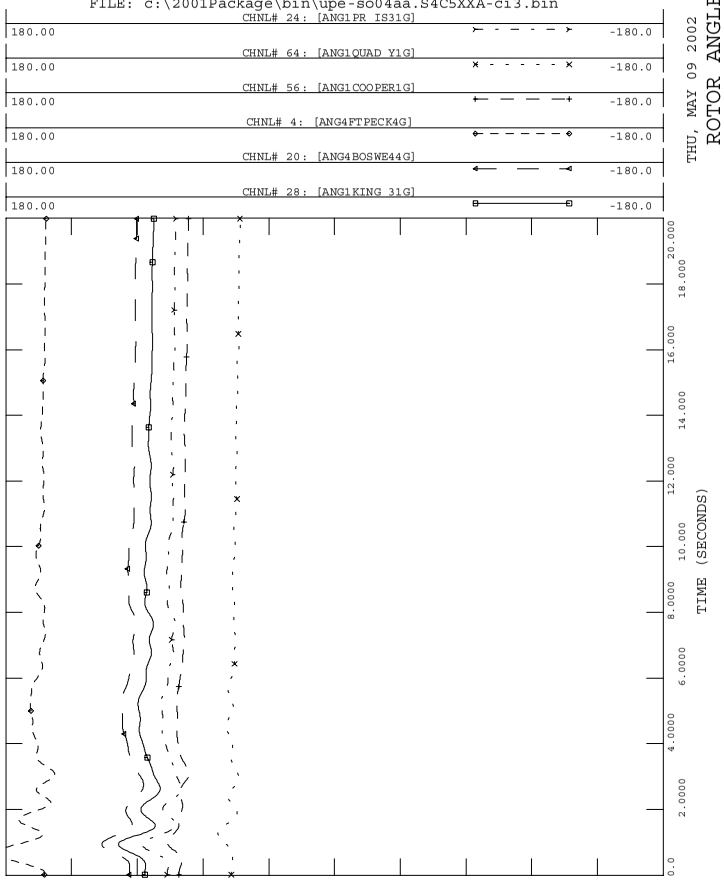
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
ROTOR ANGLES 2



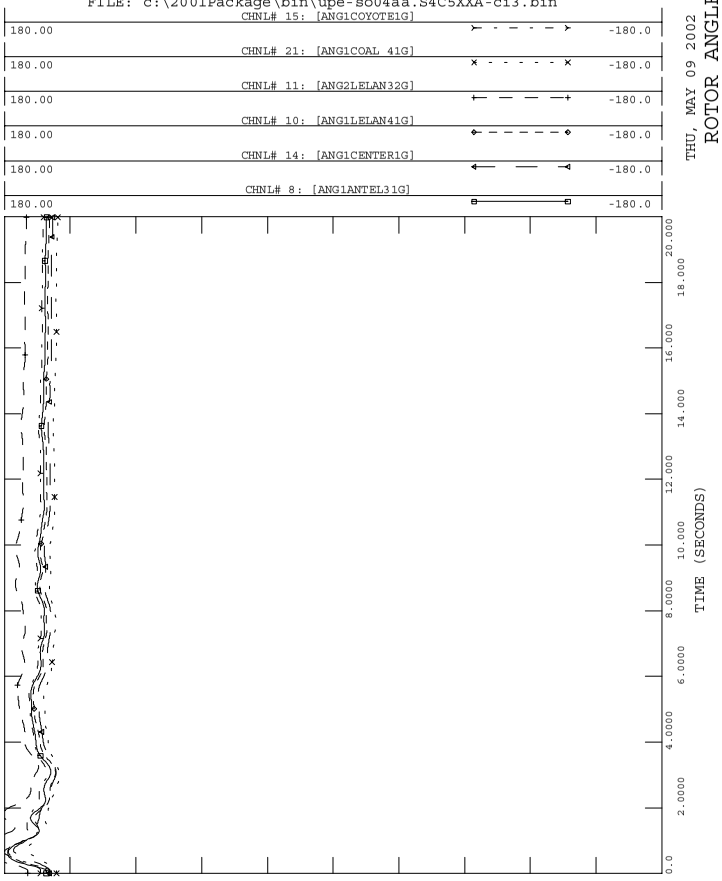
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
ROTOR ANGLES 4



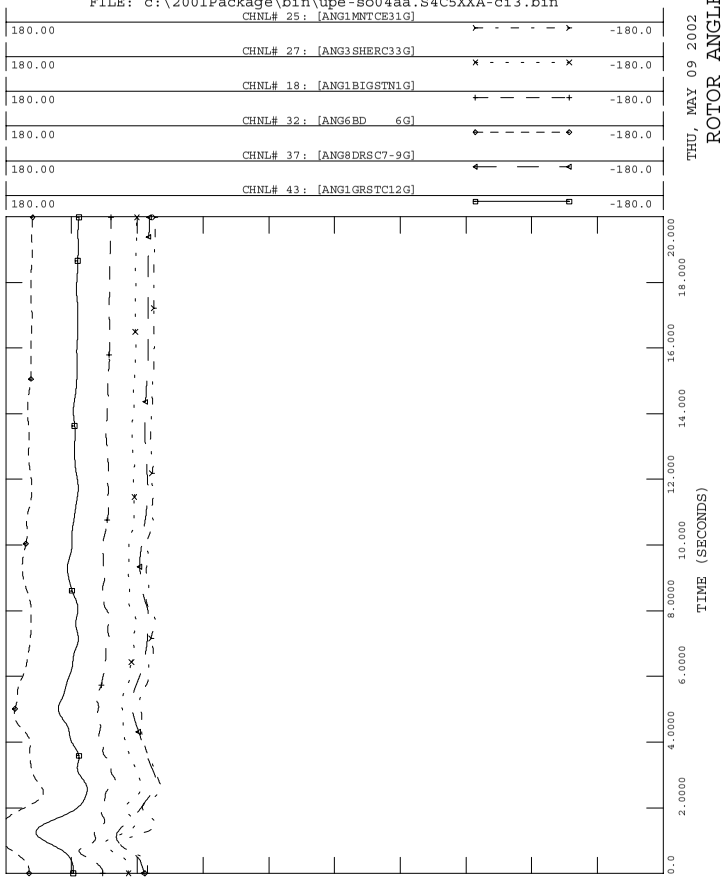
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
ROTOR ANGLES 1

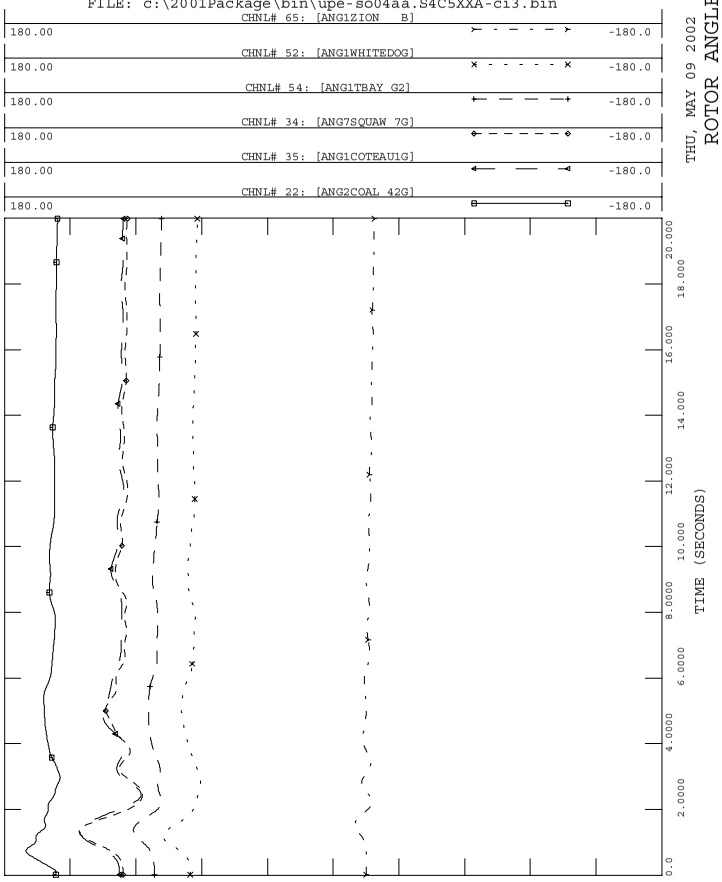


UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
ROTOR ANGLES 3

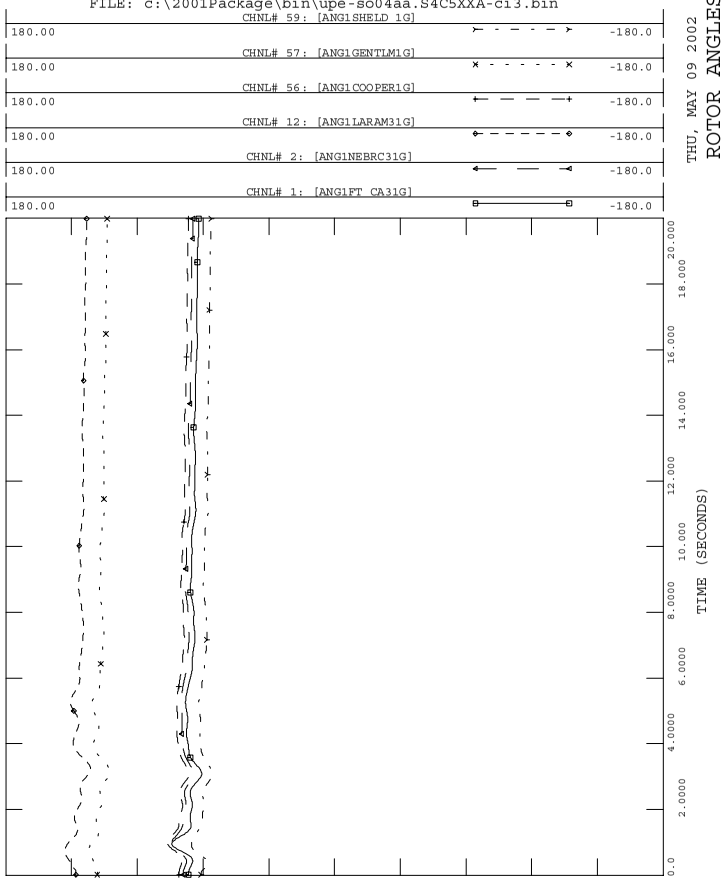


UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin



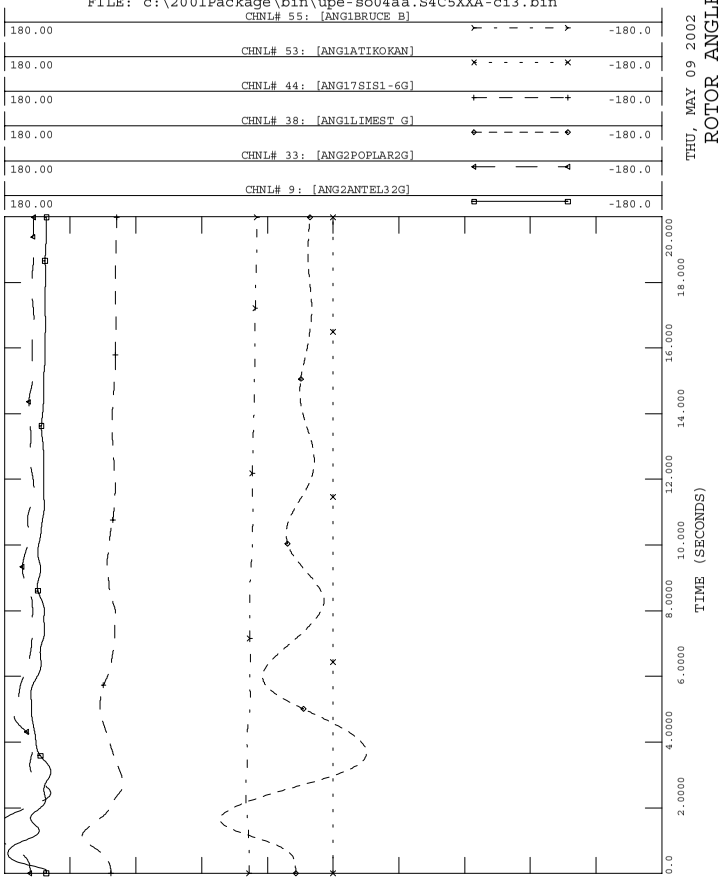
THU, MAY 09 2002 21:44
ROTOR ANGLES 6

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin



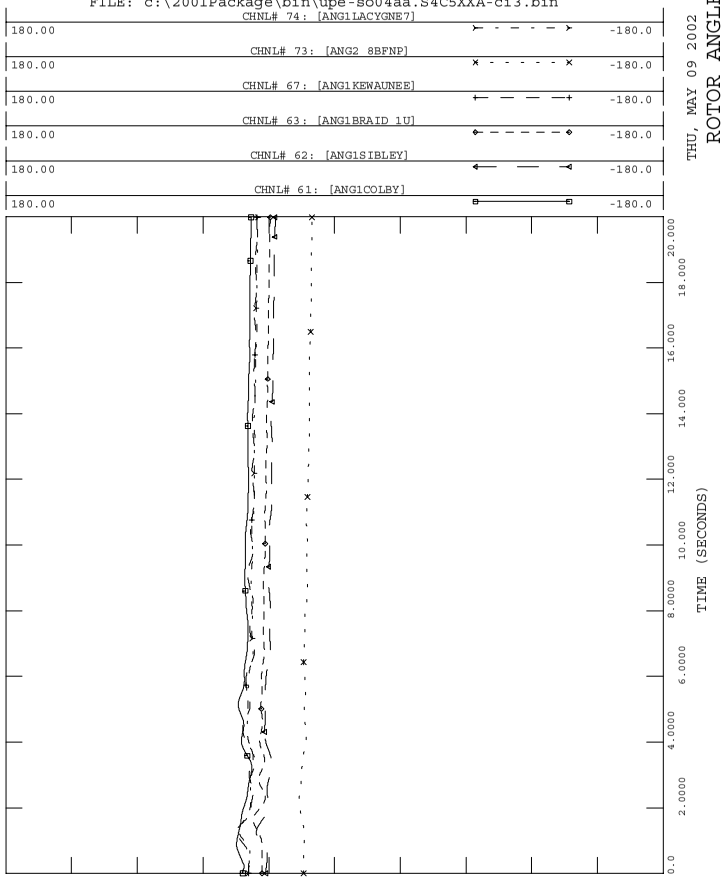
THU, MAY 09 2002 21:44
ROTOR ANGLES NB

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin



THU, MAY 09 2002 21:44
ROTOR ANGLES 5

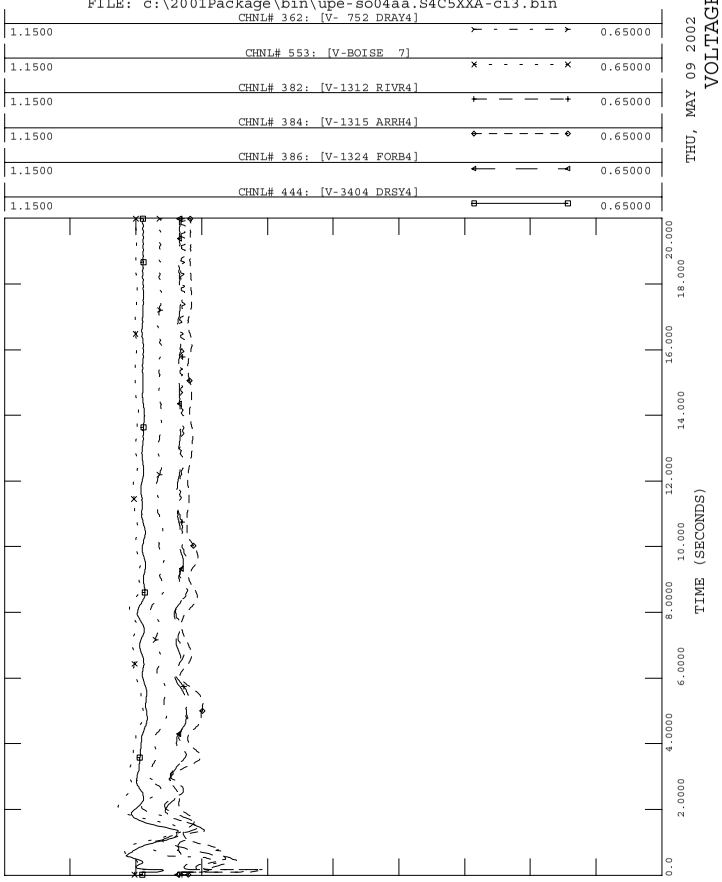
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin



THU, MAY 09 2002 21:44
ROTOR ANGLES 7

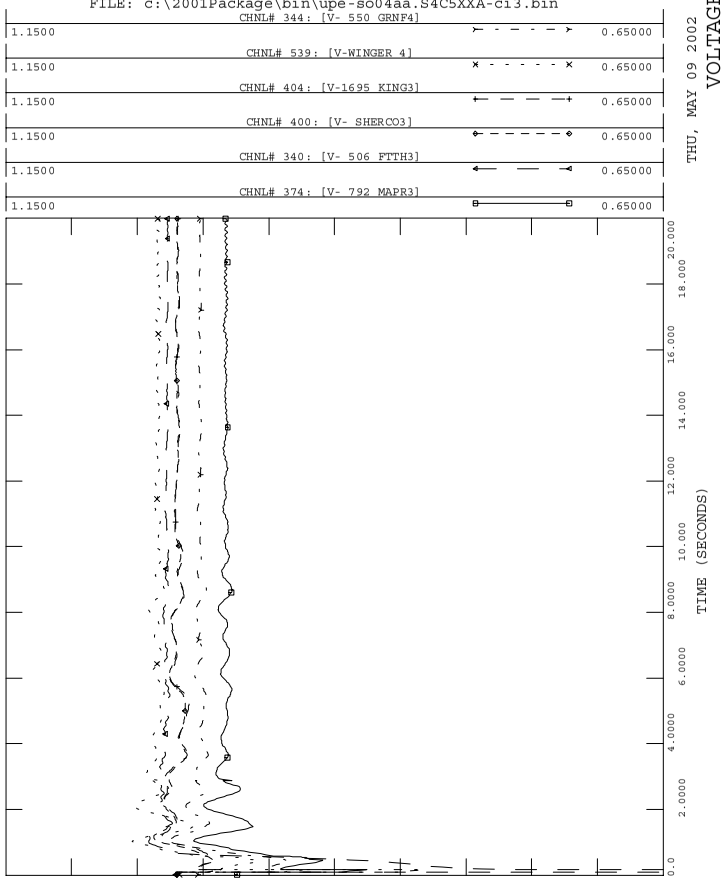
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
VOLTAGES 1



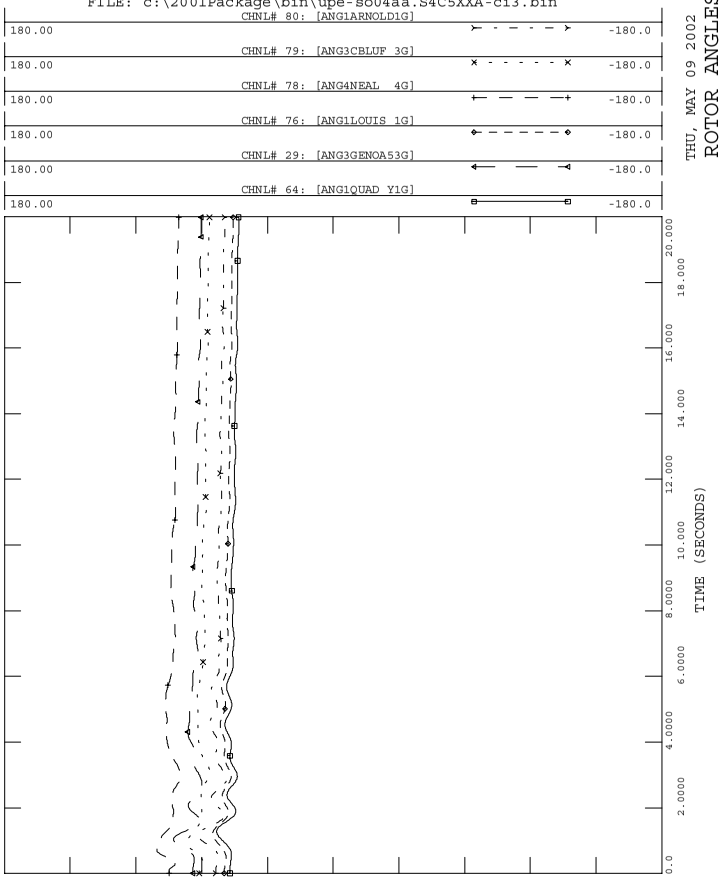
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
VOLTAGES 3



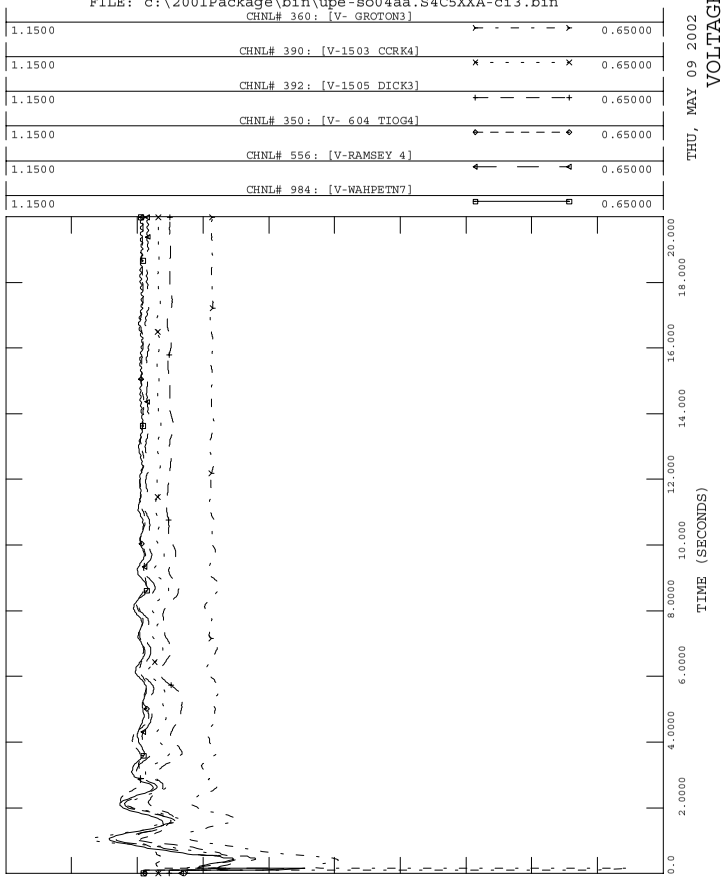
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
ROTOR ANGLES IA



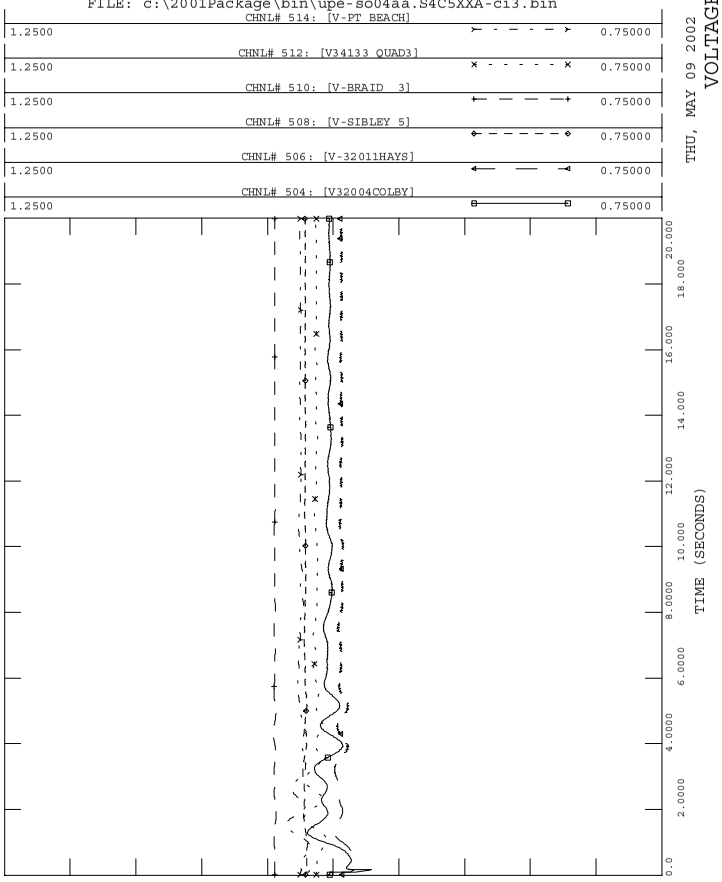
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
VOLTAGES 2



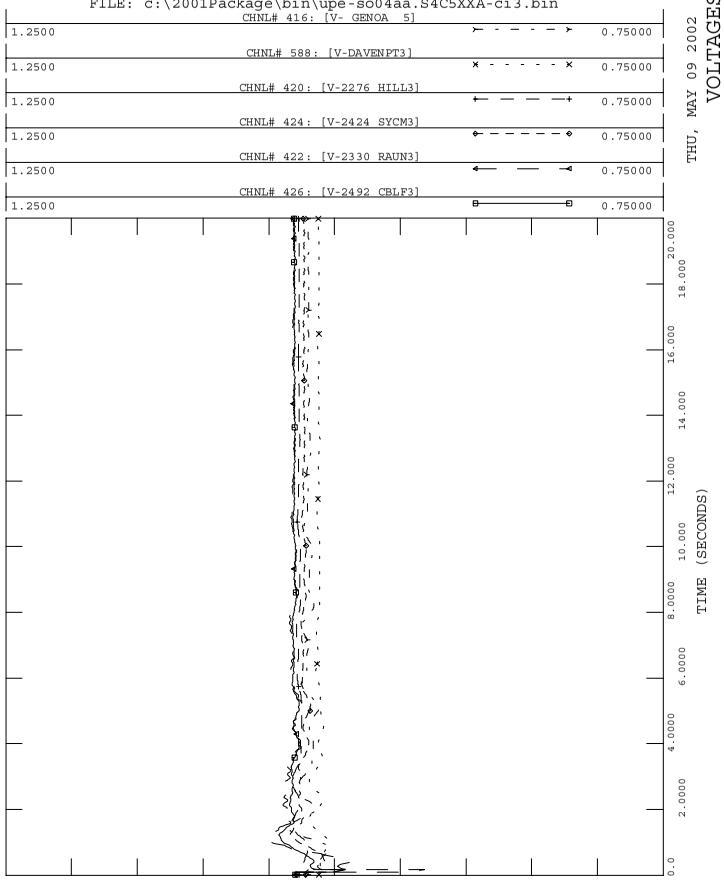
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
VOLTAGES 5



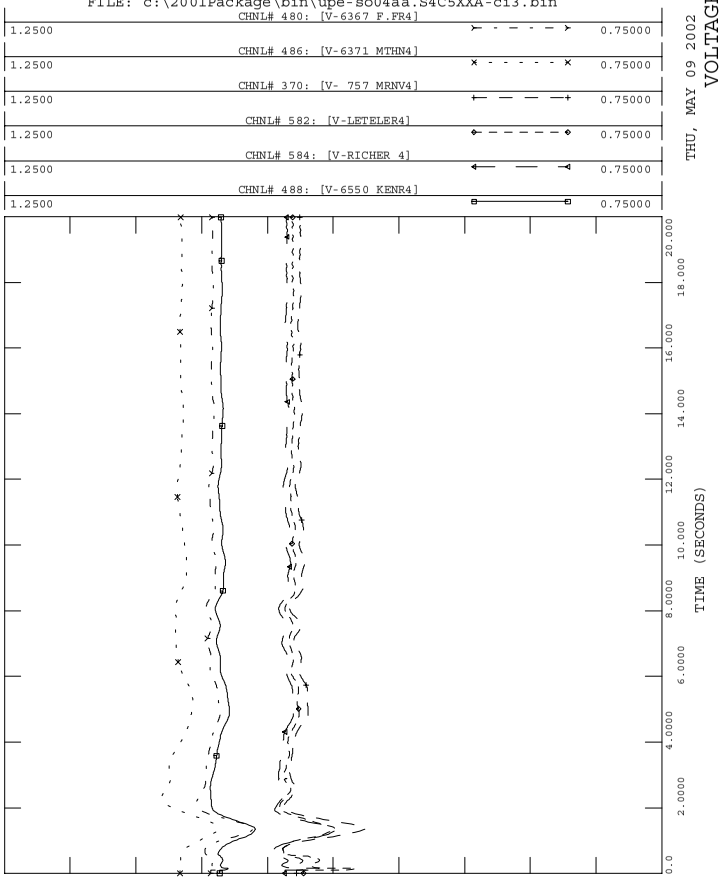
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
VOLTAGES IA



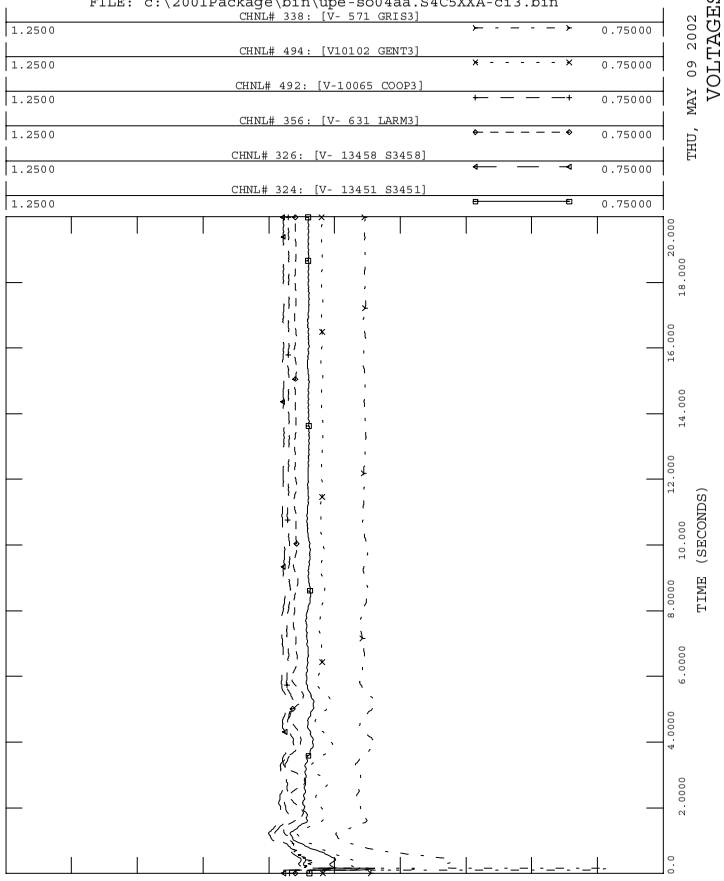
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
VOLTAGES 4



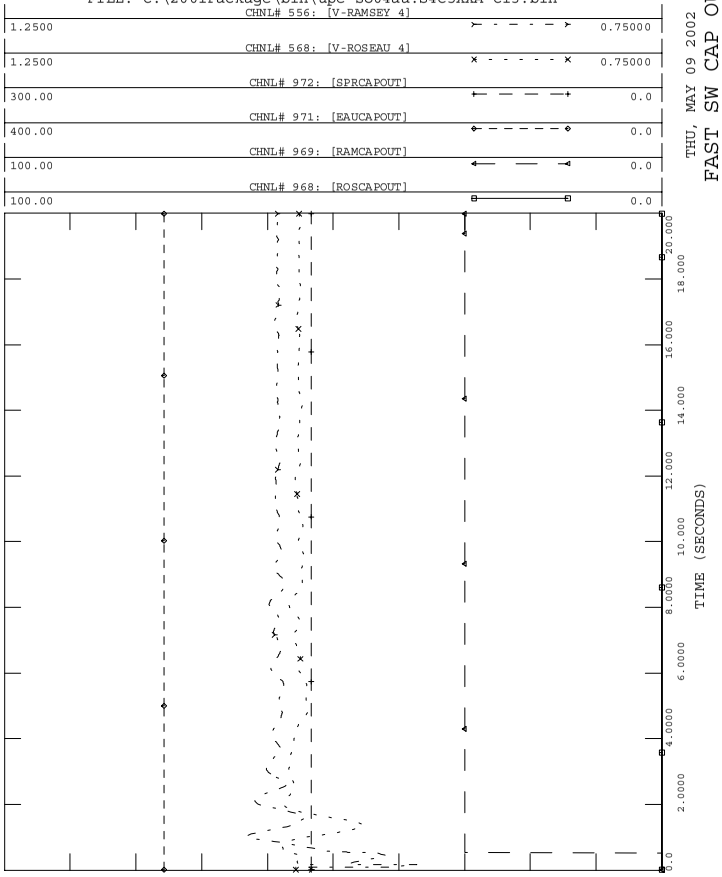
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
VOLTAGES NB



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
FAST SW CAP OUT 2



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
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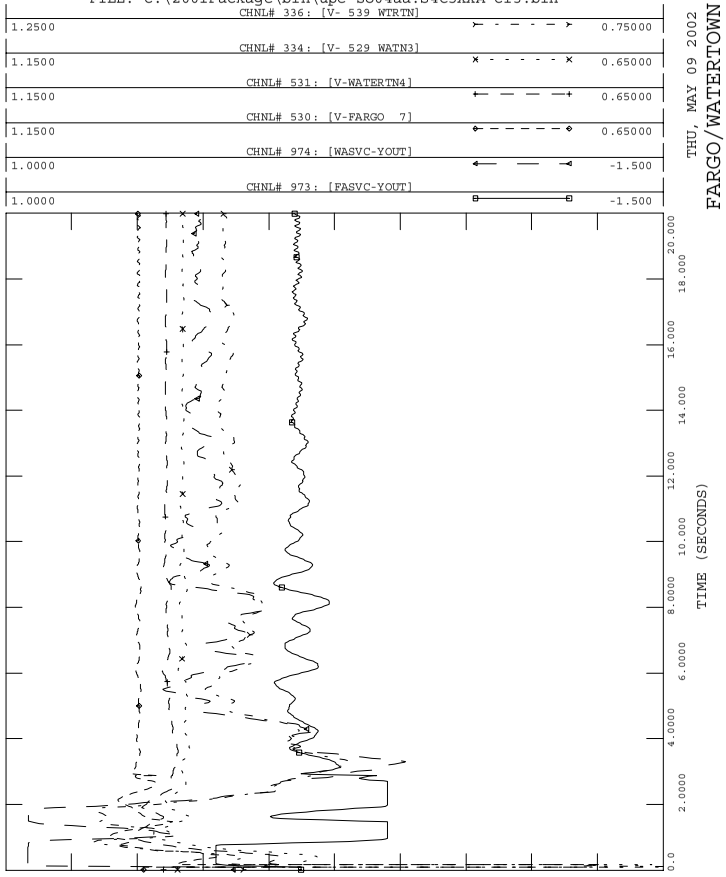
THU, MAY 09 2002 21:44
FARGO/WATERTOWN SVS



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
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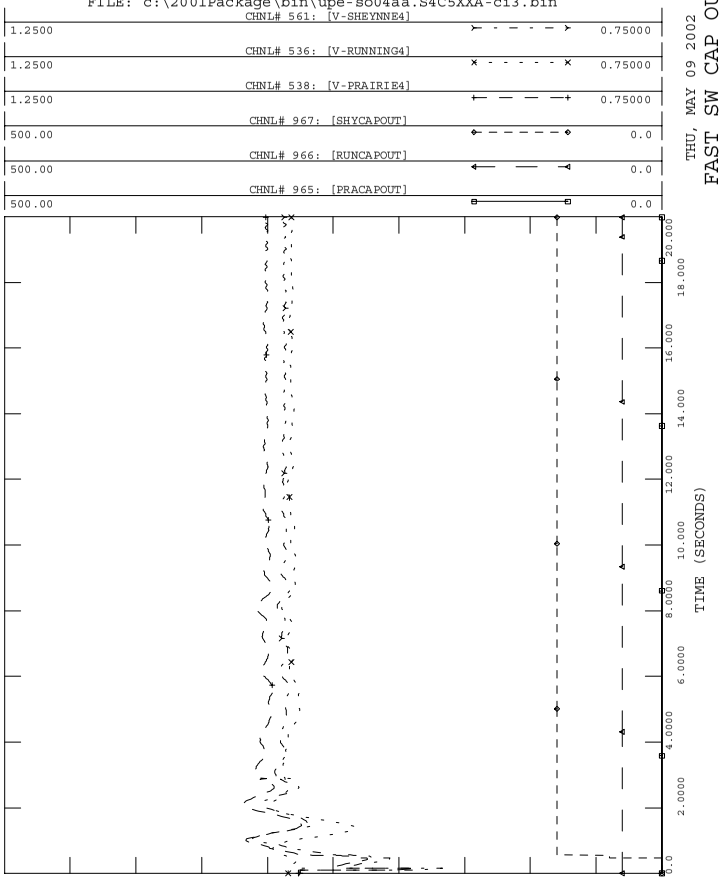
THU, MAY 09 2002 21:44
FAST SW CAP OUT 1



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CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
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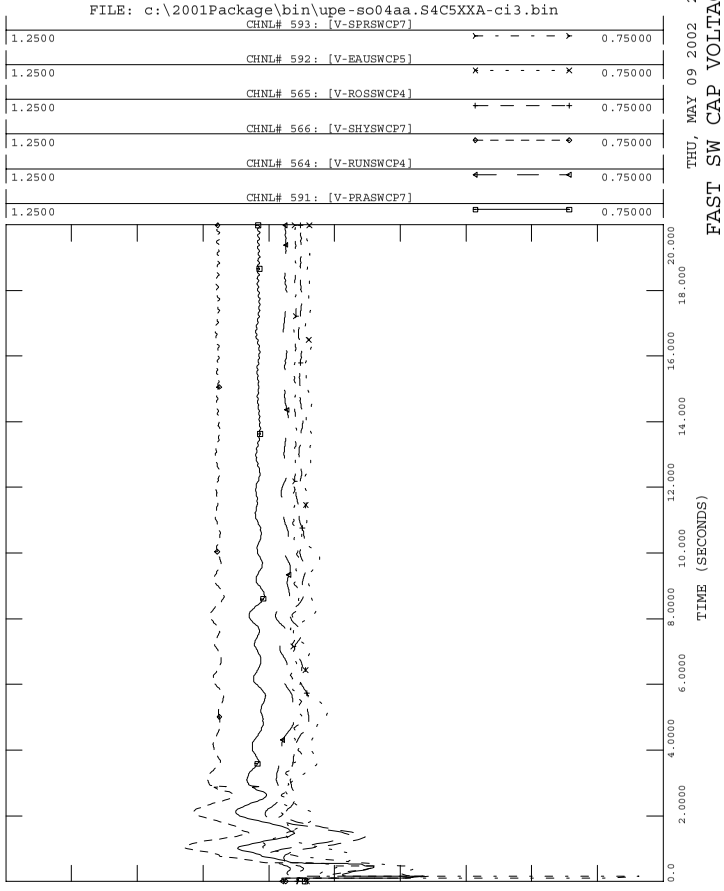
THU, MAY 09 2002 21:44
FAST SW CAP VOLTAGES



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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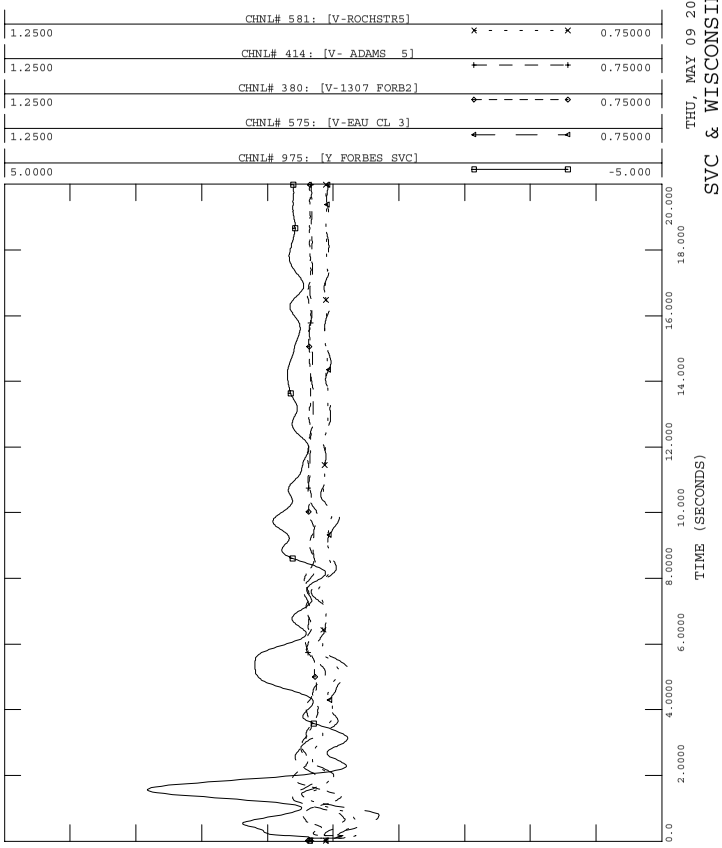
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44

SVC & WISCONSIN VOLT



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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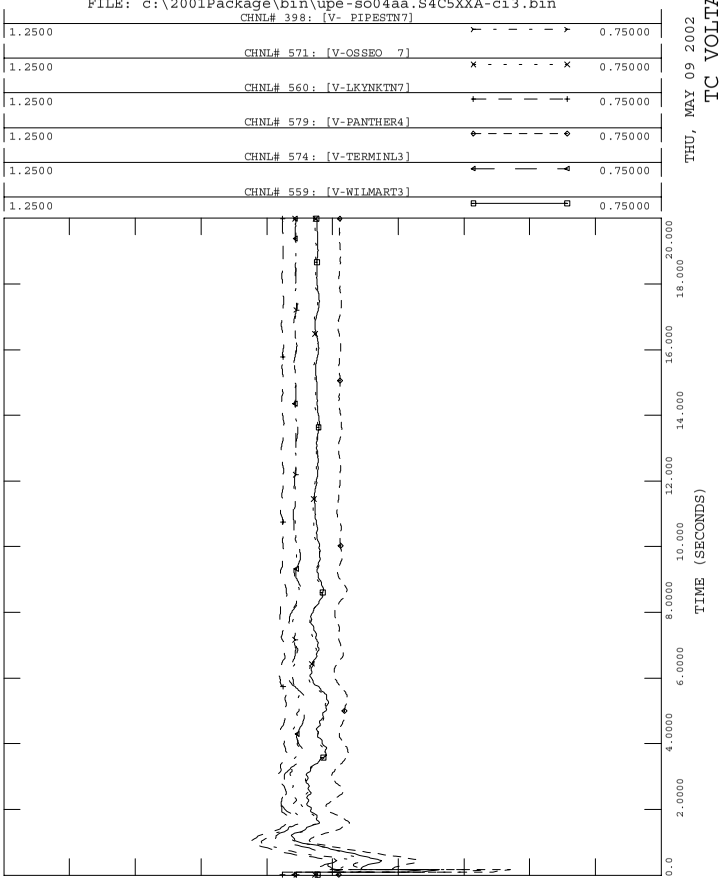
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44

TC VOLTAGES



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
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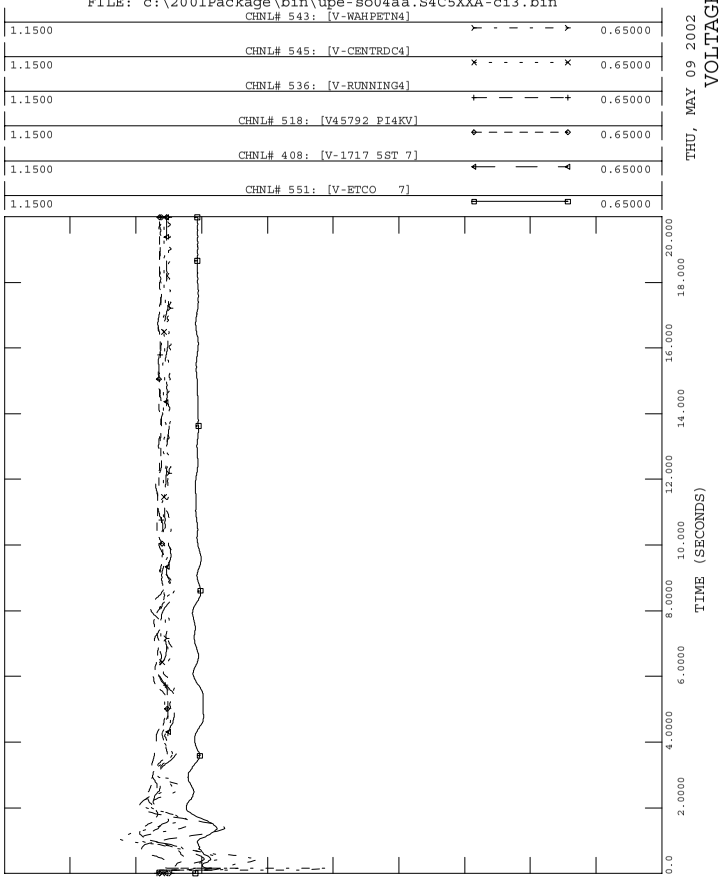
THU, MAY 09 2002 21:44

VOLTAGES 6



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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
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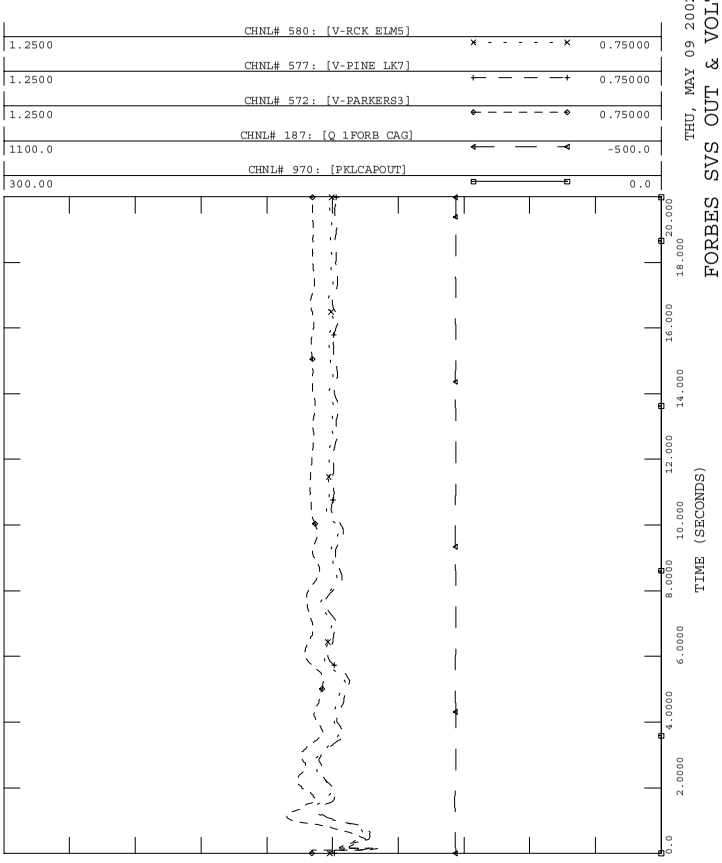
THU, MAY 09 2002 21:44

FORBES SVS OUT & VOLTAGES



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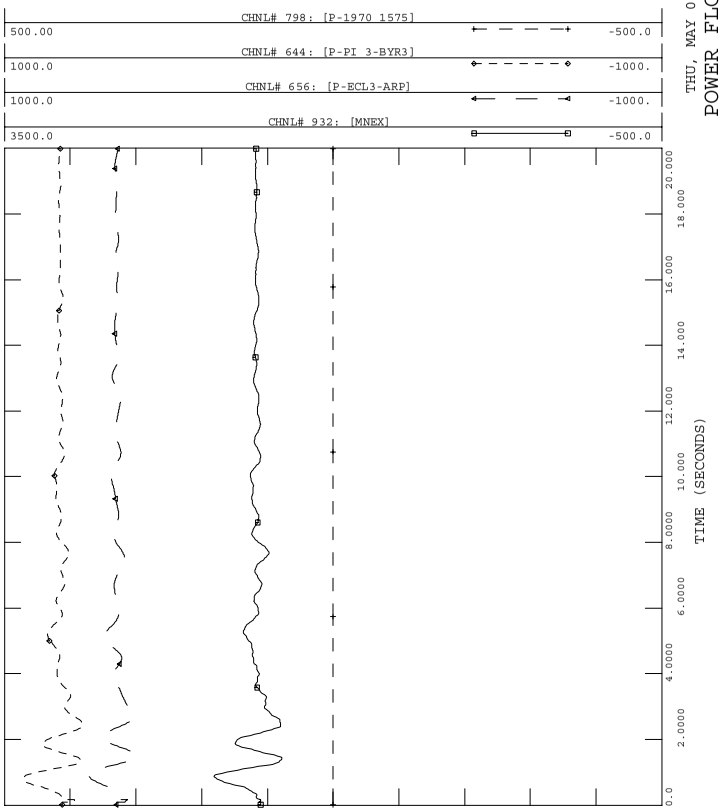
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
POWER FLOW SUMS 2



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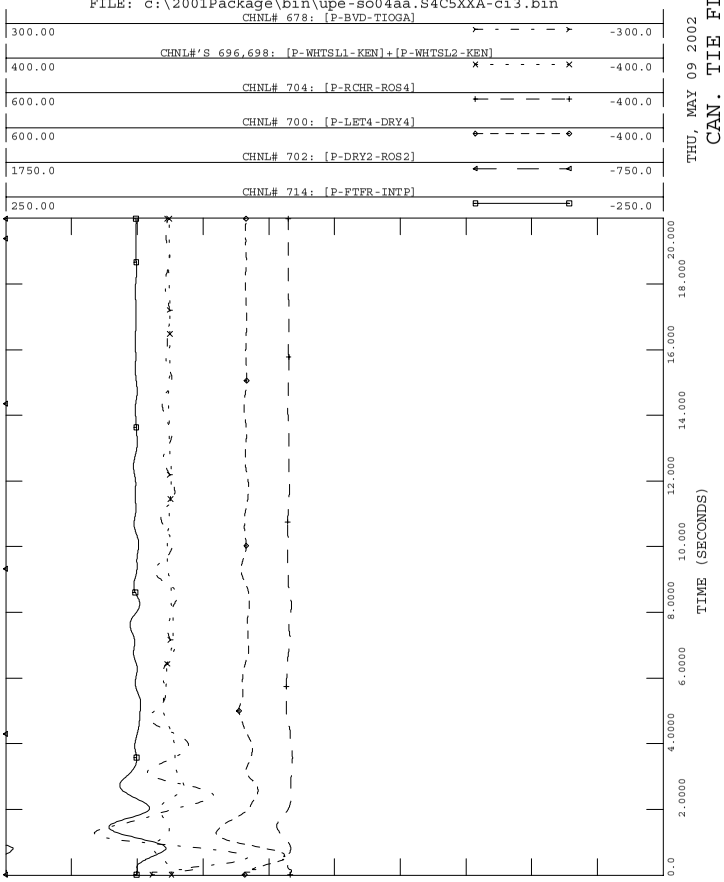
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
CAN. TIE FLOWS



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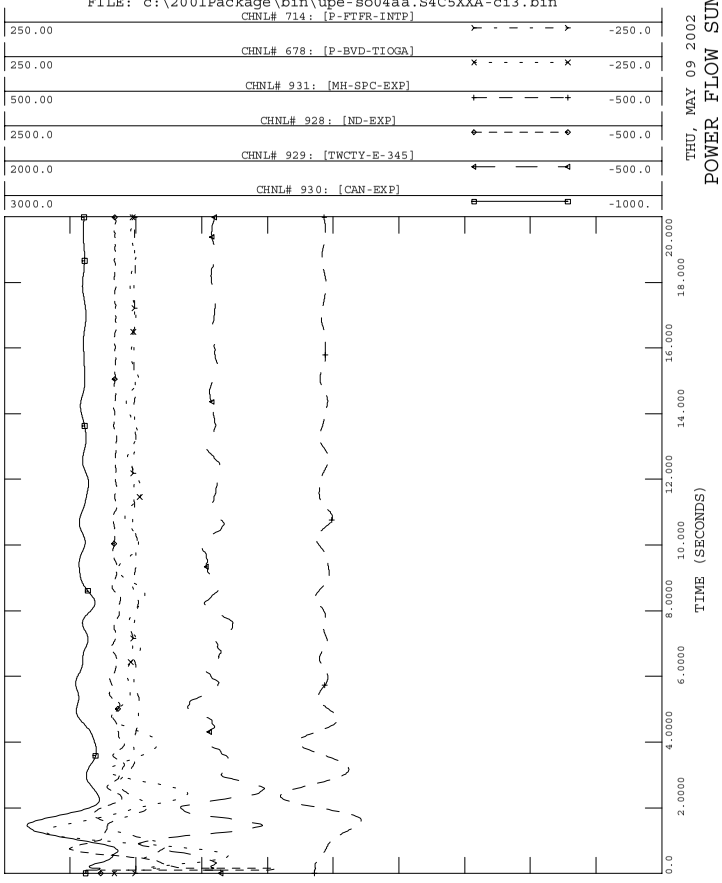
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
POWER FLOW SUMS 1



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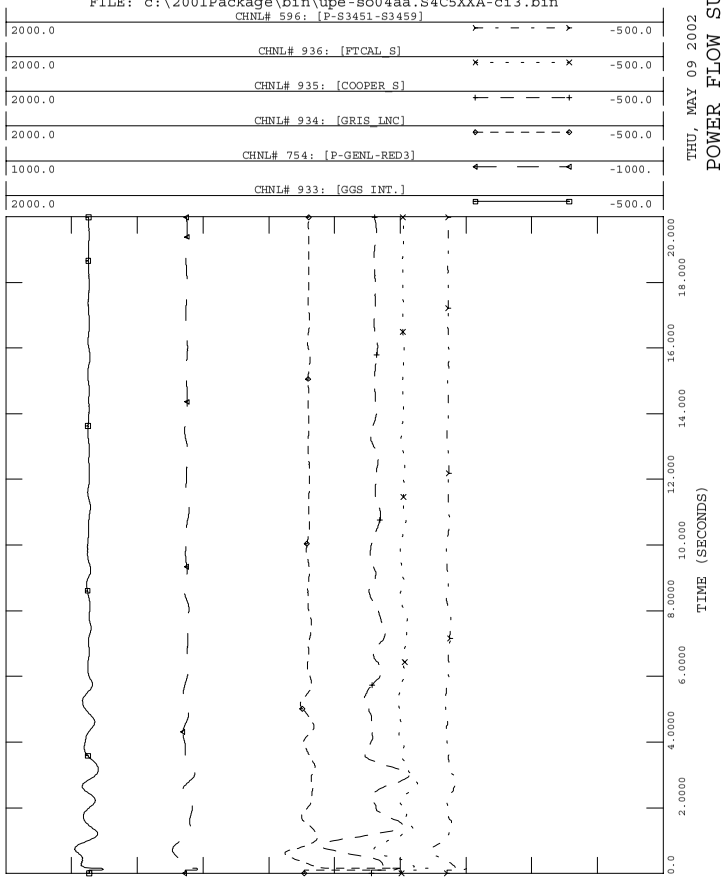
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
POWER FLOW SUM 3



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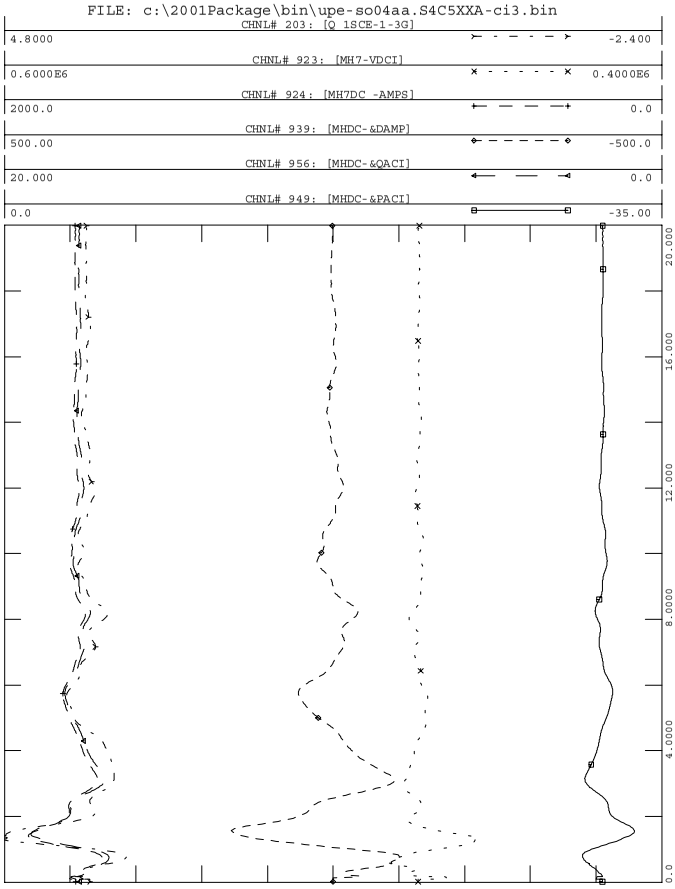
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
MH DC PARAMETERS



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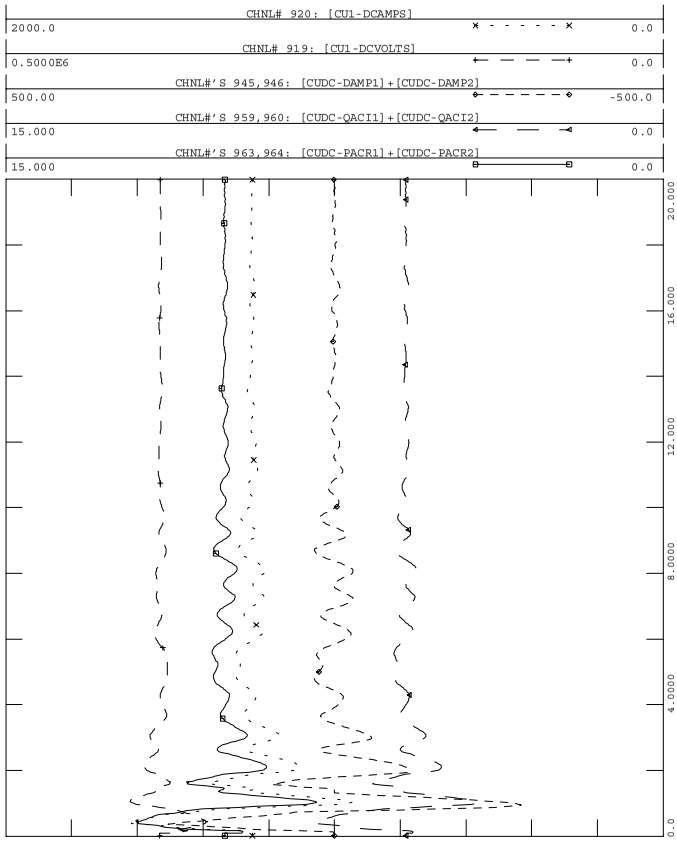
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
CU DC #1



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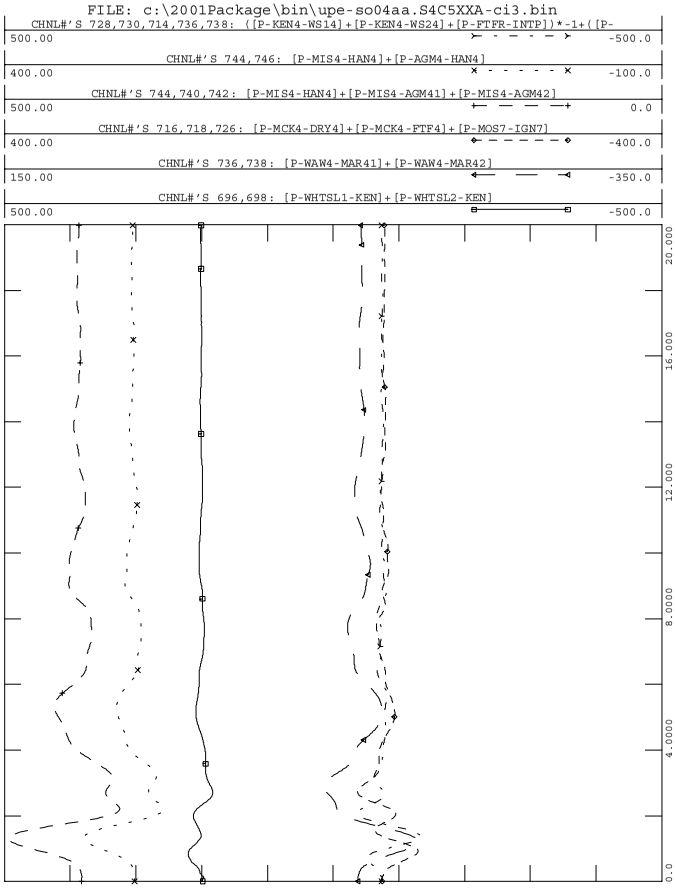
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
OH TIE FLOWS



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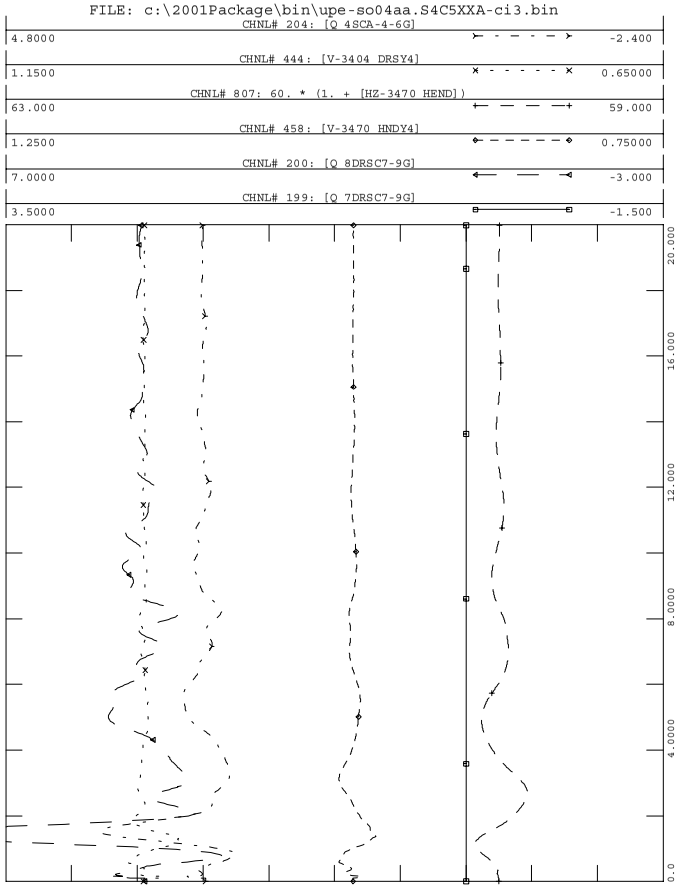
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44
MH DC PARAMETERS



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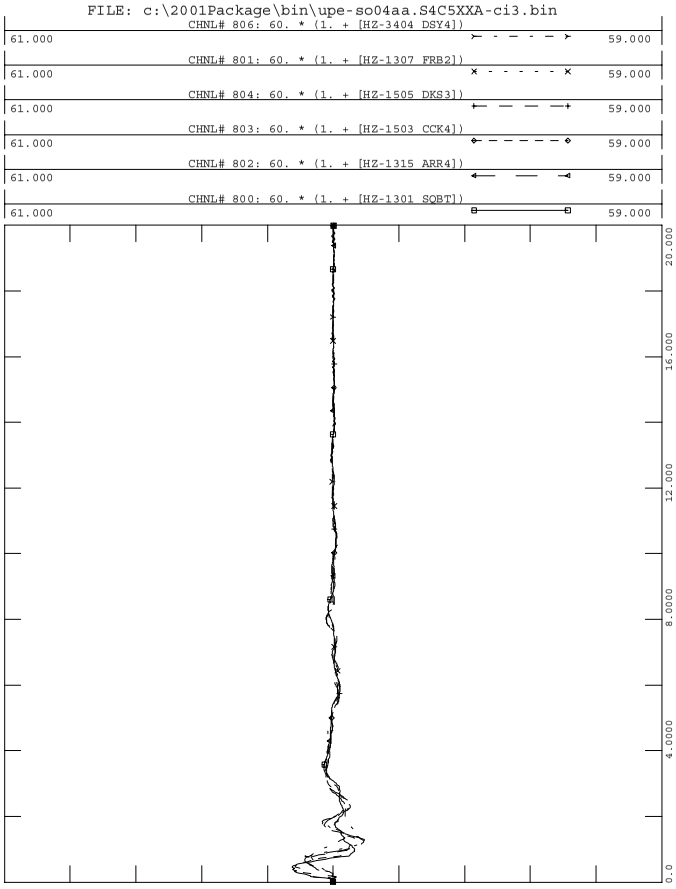
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44

FREQ AT DC TERMINALS



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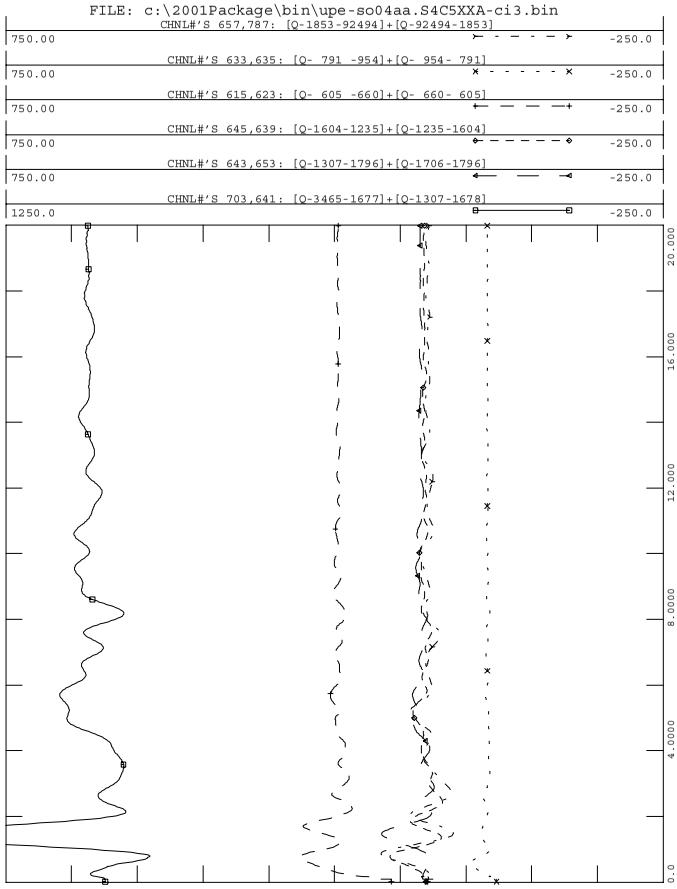
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44

VAR LOSSES



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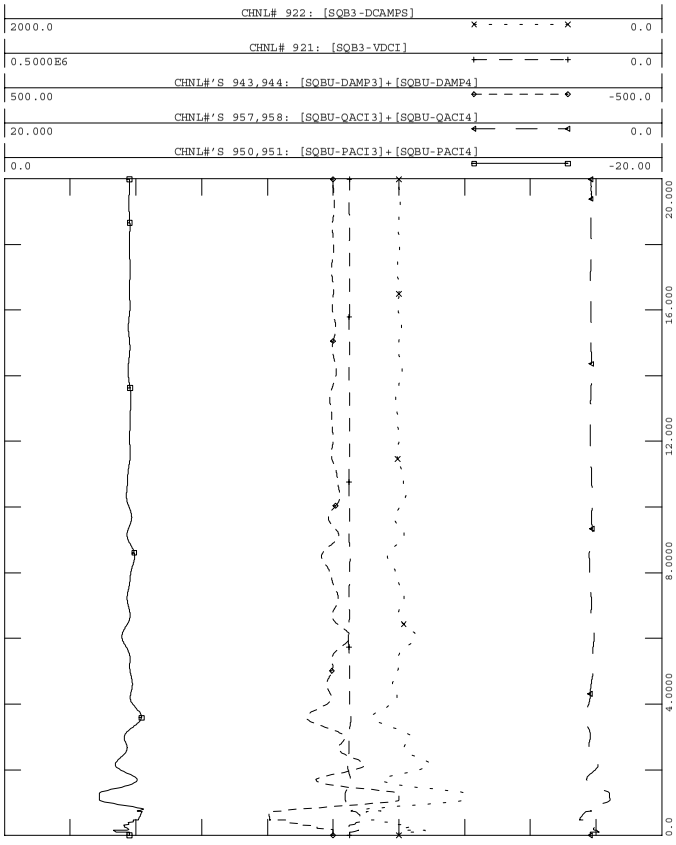
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44

SQB DC #3



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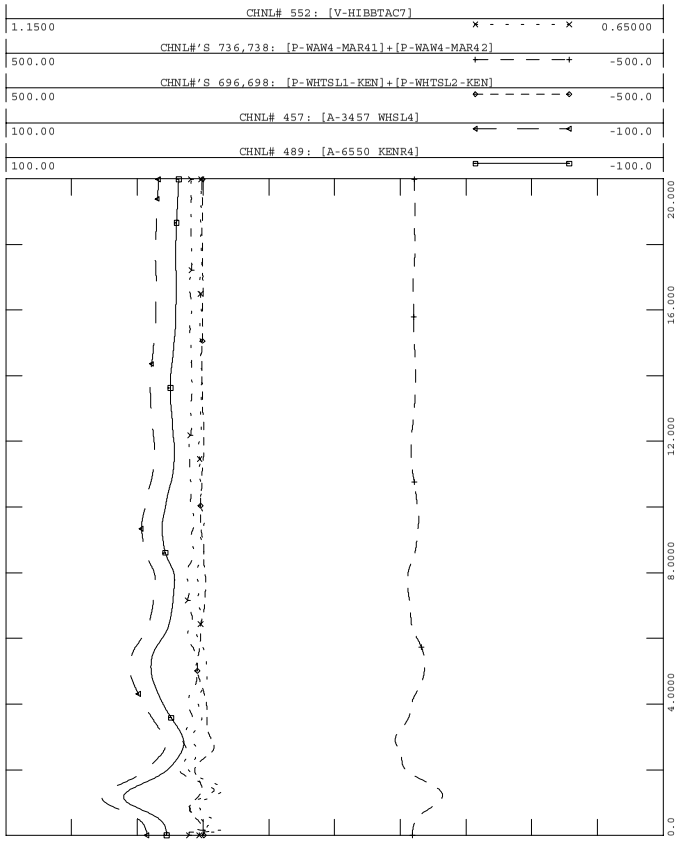
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

THU, MAY 09 2002 21:44

VOLTAGES, ANGLES



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CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

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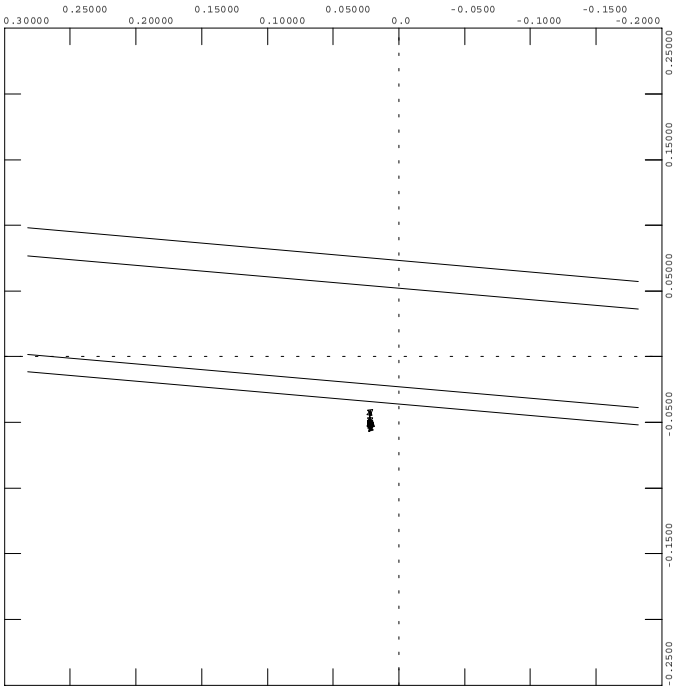
CHNL# 824: [X-FRB2-ROS2]



THU, MAY 09 2002 21:44
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

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ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

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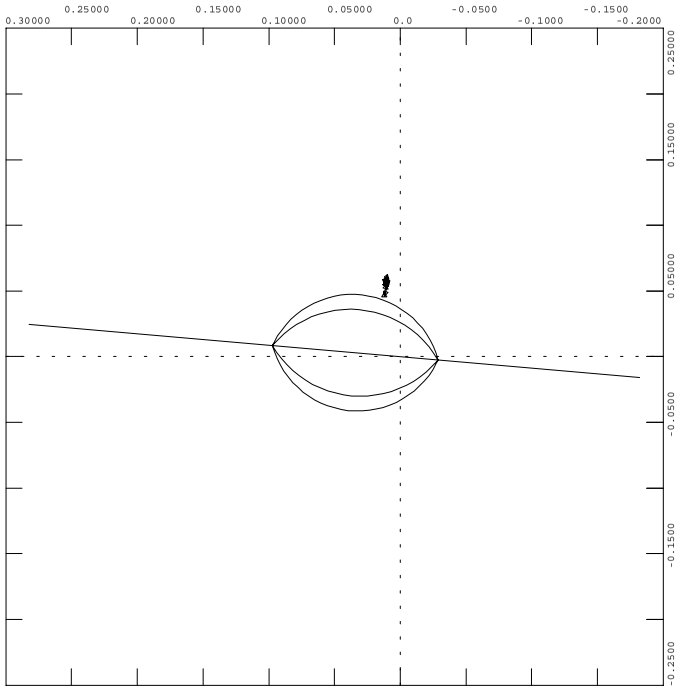

THU, MAY 09 2002 21:44
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

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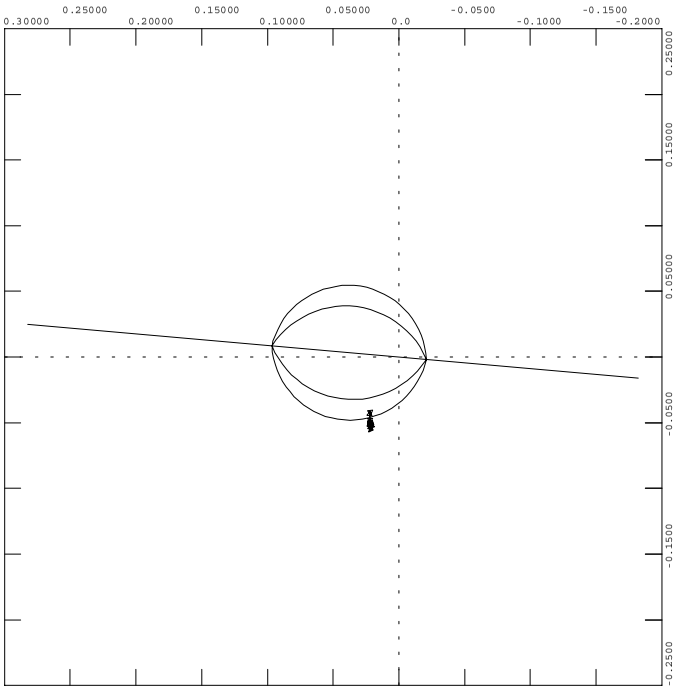

THU, MAY 09 2002 21:44
D602F-FORBES (612)
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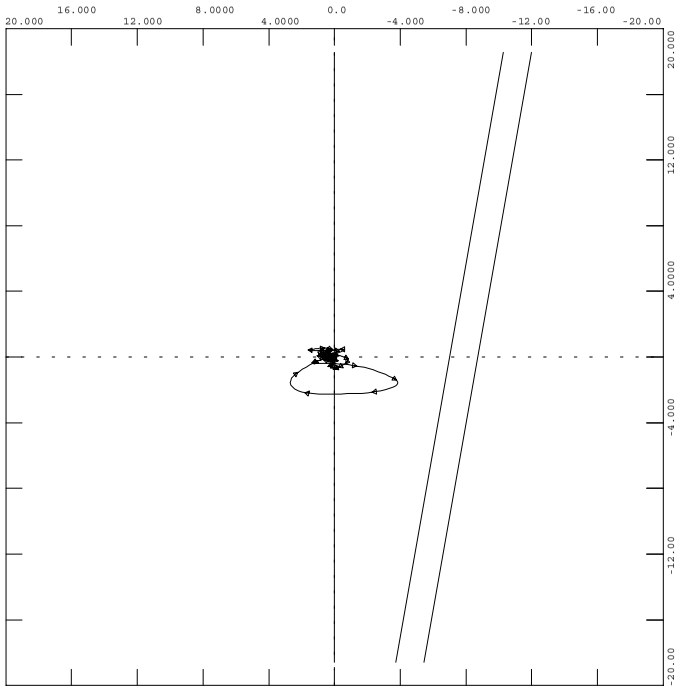
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]



THU, MAY 09 2002 21:44
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

RELAY: SLINOS
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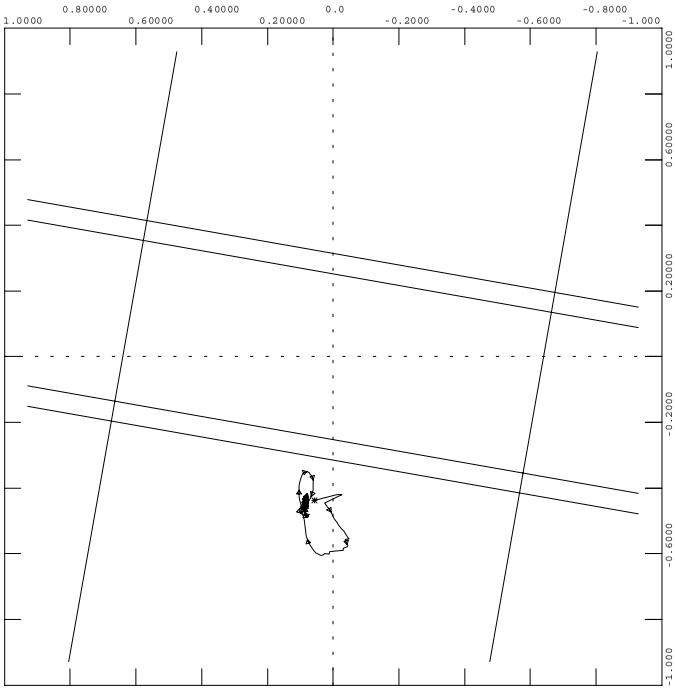
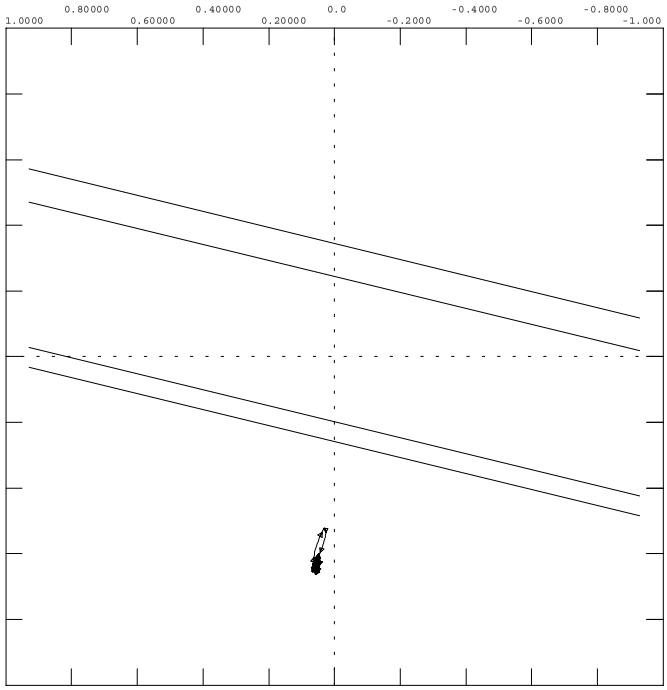
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

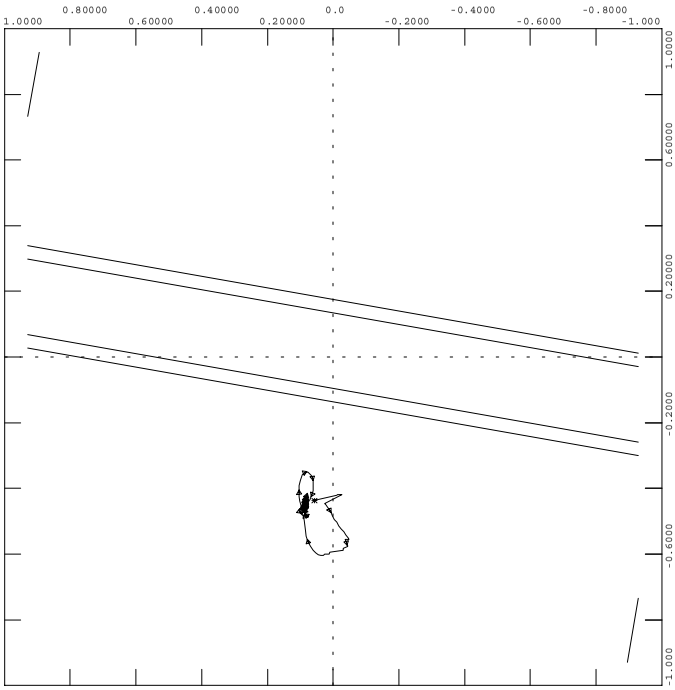
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

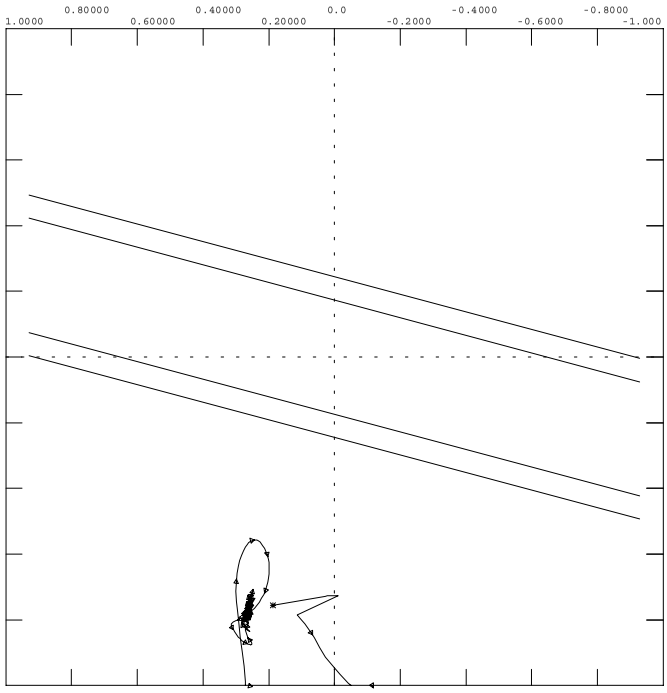
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

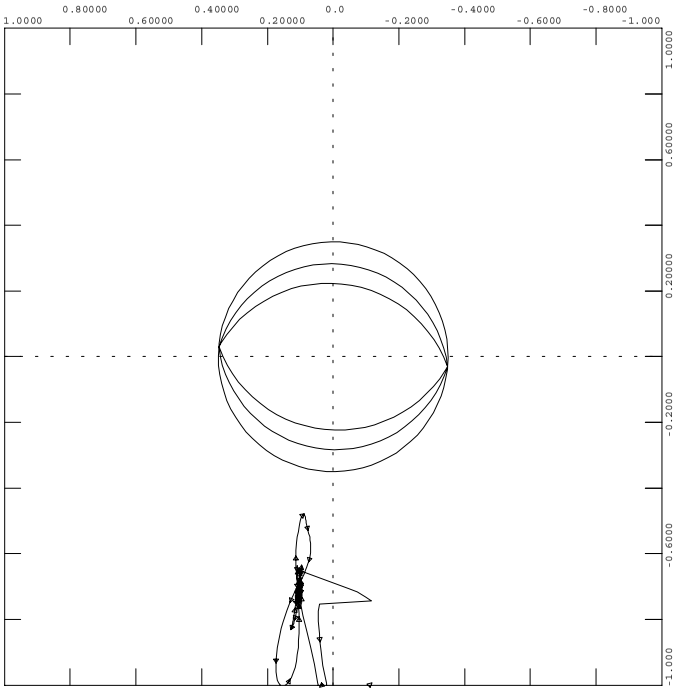
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

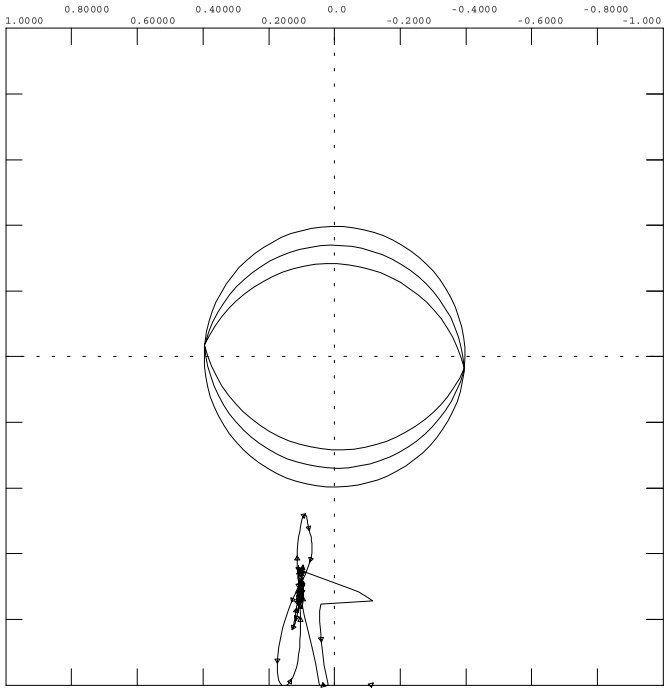
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

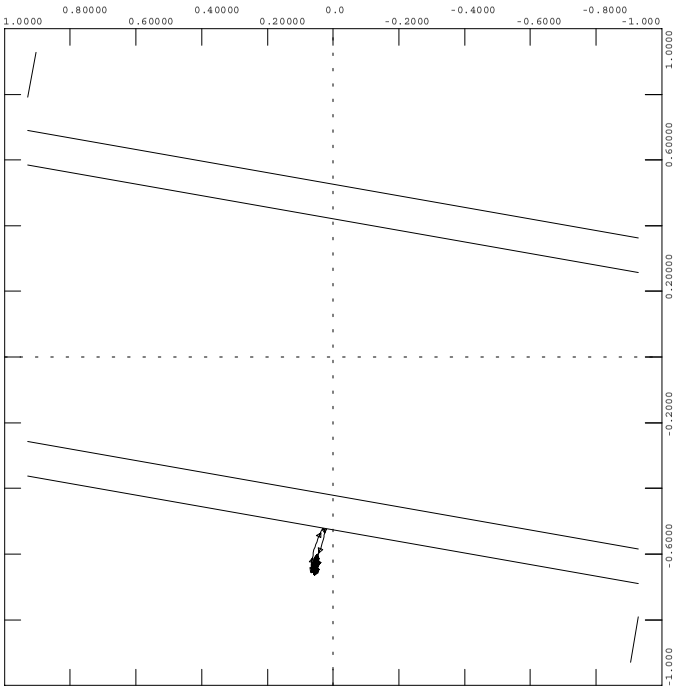
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

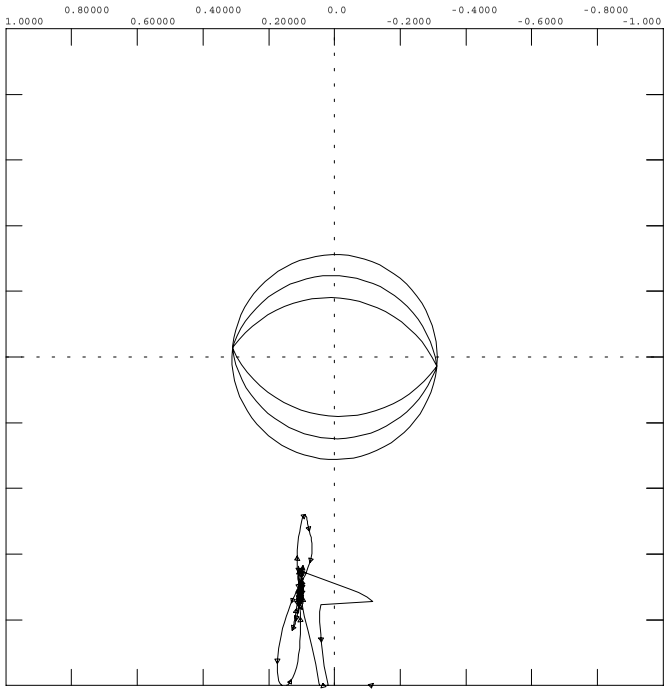
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



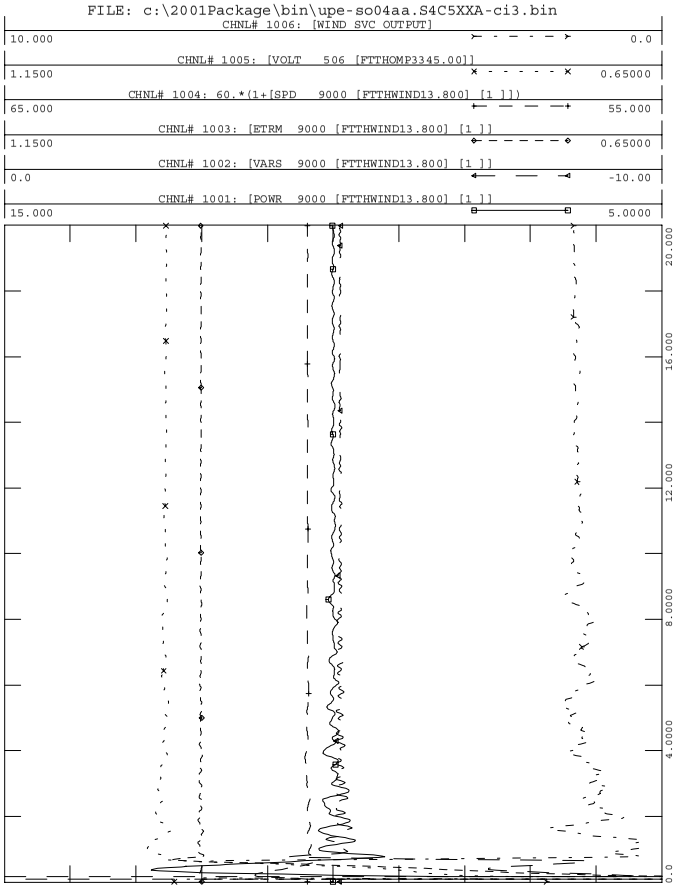
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

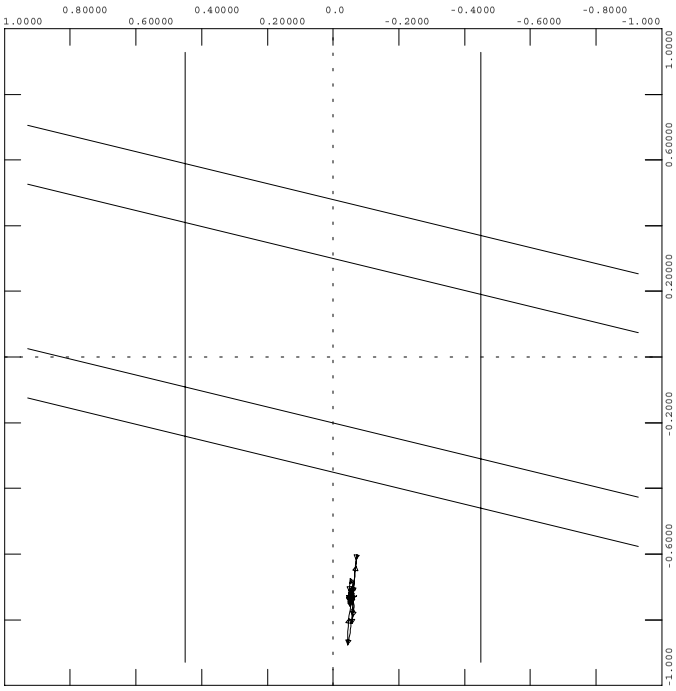


THU, MAY 09 2002 21:44
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



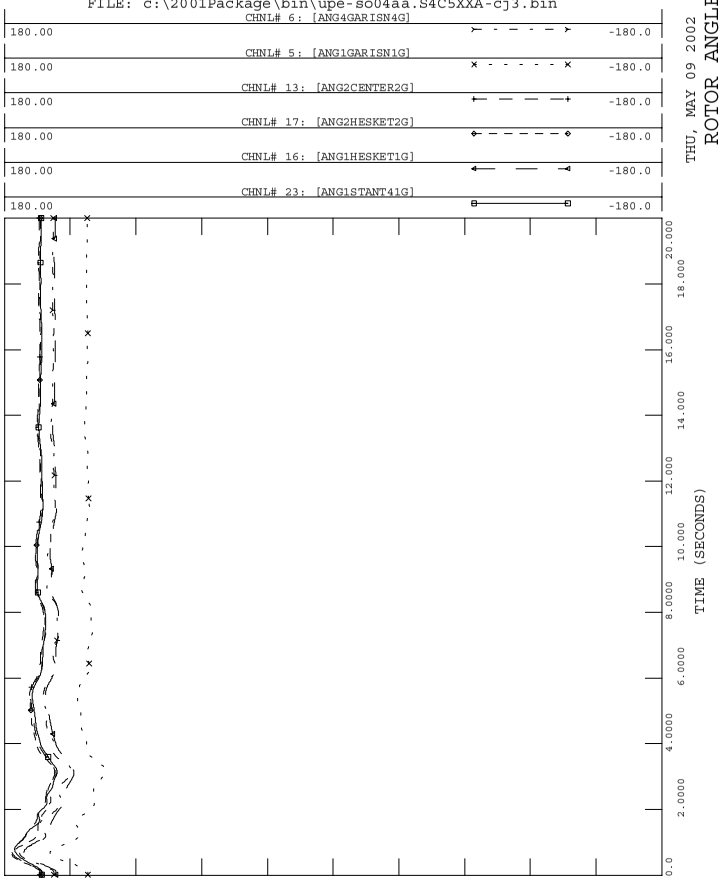
THU, MAY 09 2002 21:44
MP-OH I.FALLS (779)

CONTINGENCY CJ3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Huron 345 kV line

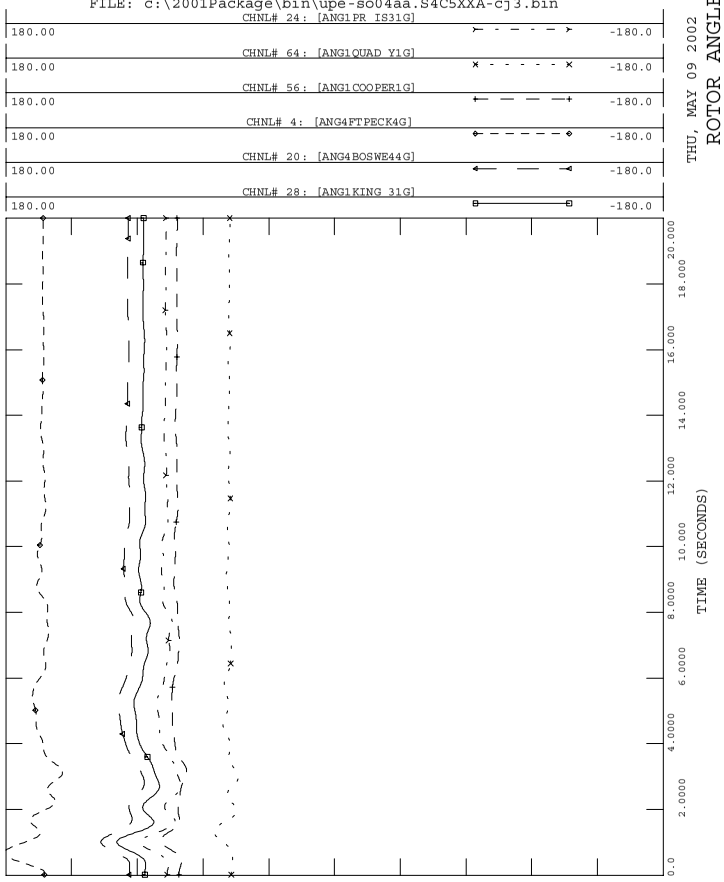
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
ROTOR ANGLES 2



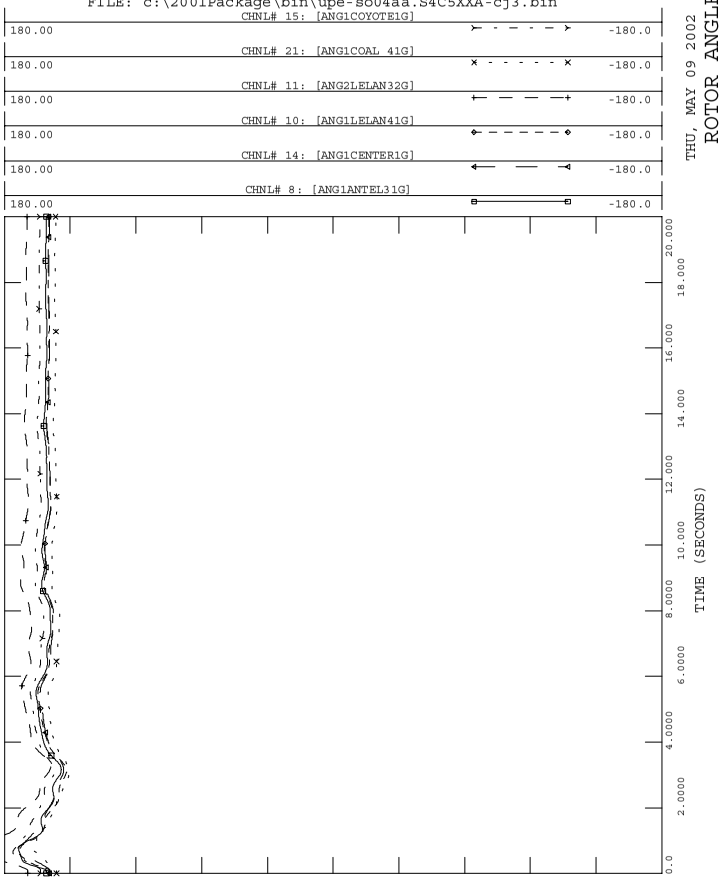
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
ROTOR ANGLES 4



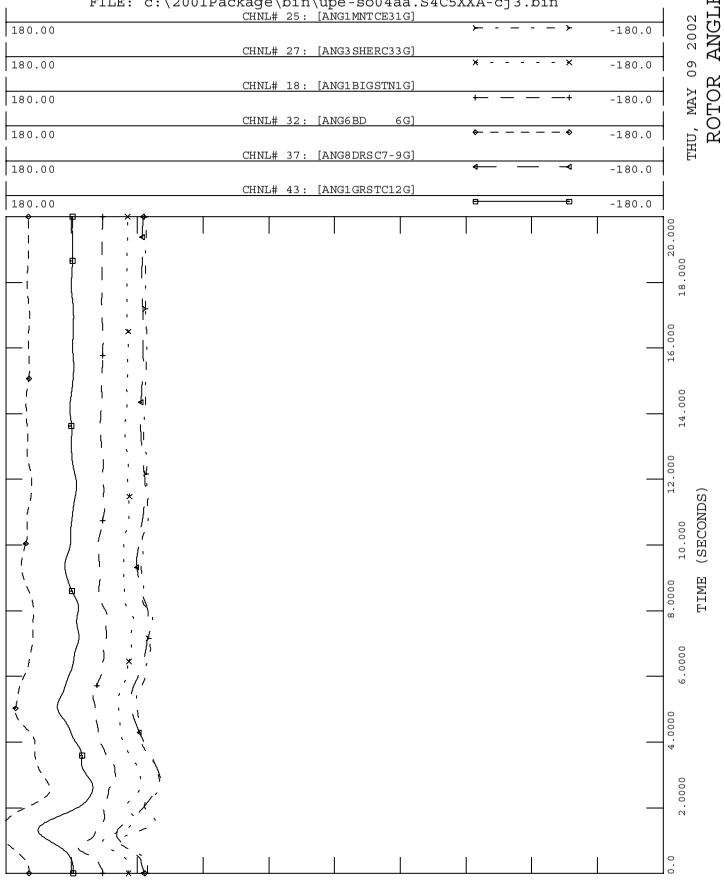
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
ROTOR ANGLES 1



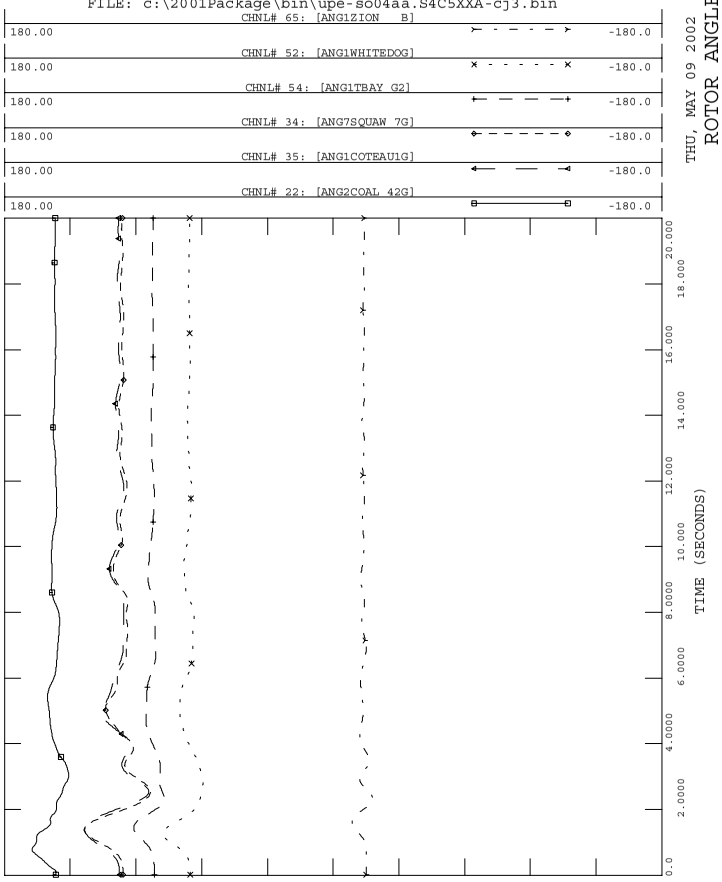
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
ROTOR ANGLES 3



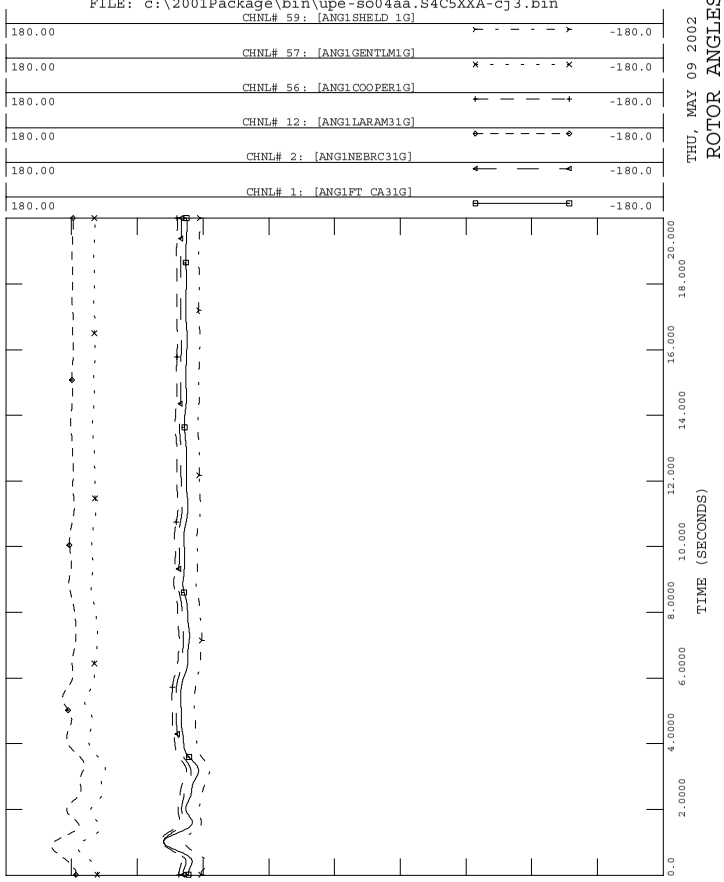
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
ROTOR ANGLES 6



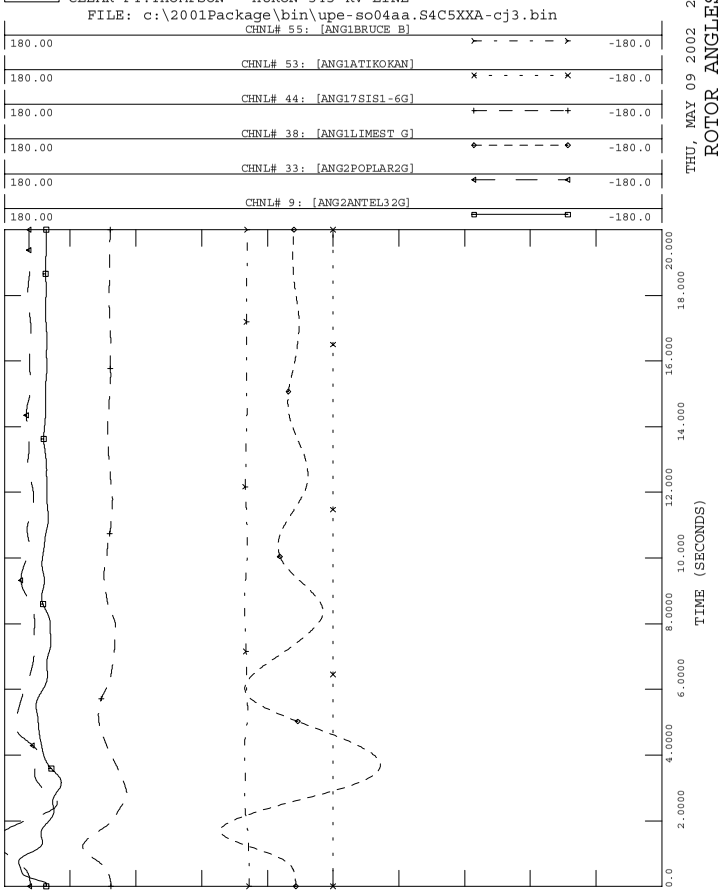
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
ROTOR ANGLES NB



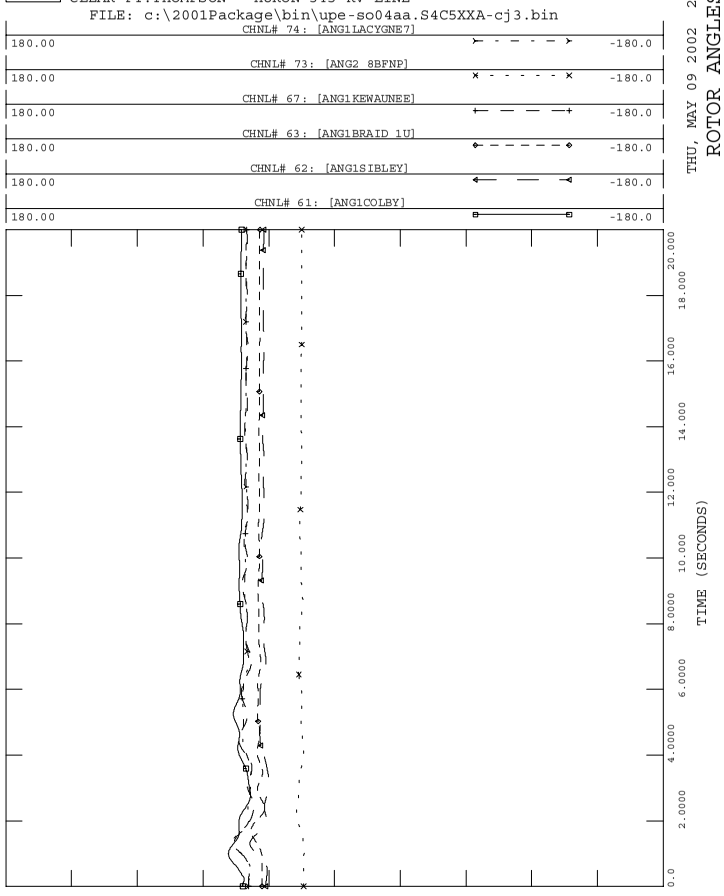
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
ROTOR ANGLES 5



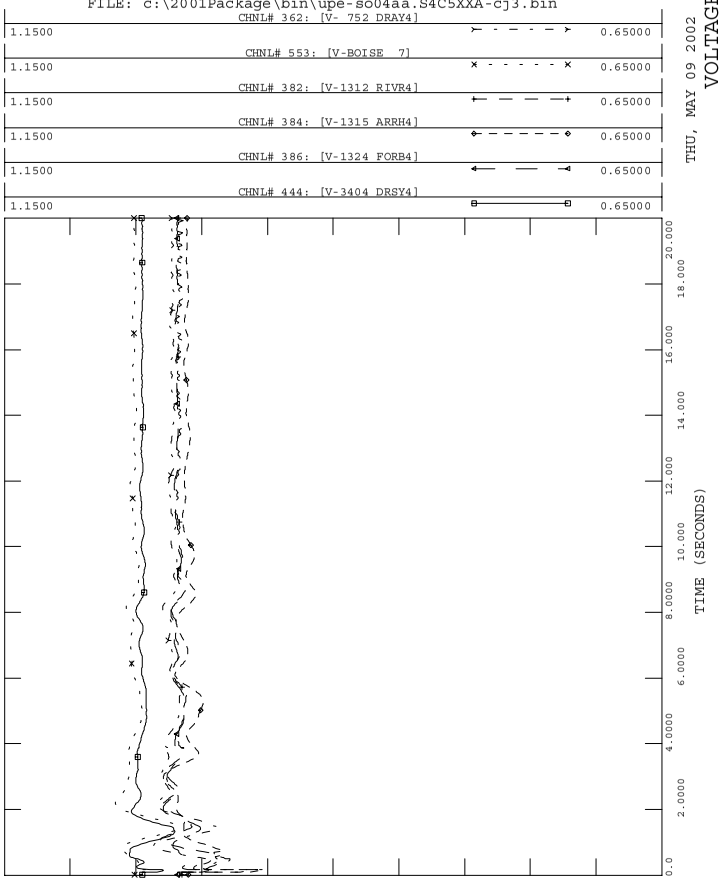
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
ROTOR ANGLES 7



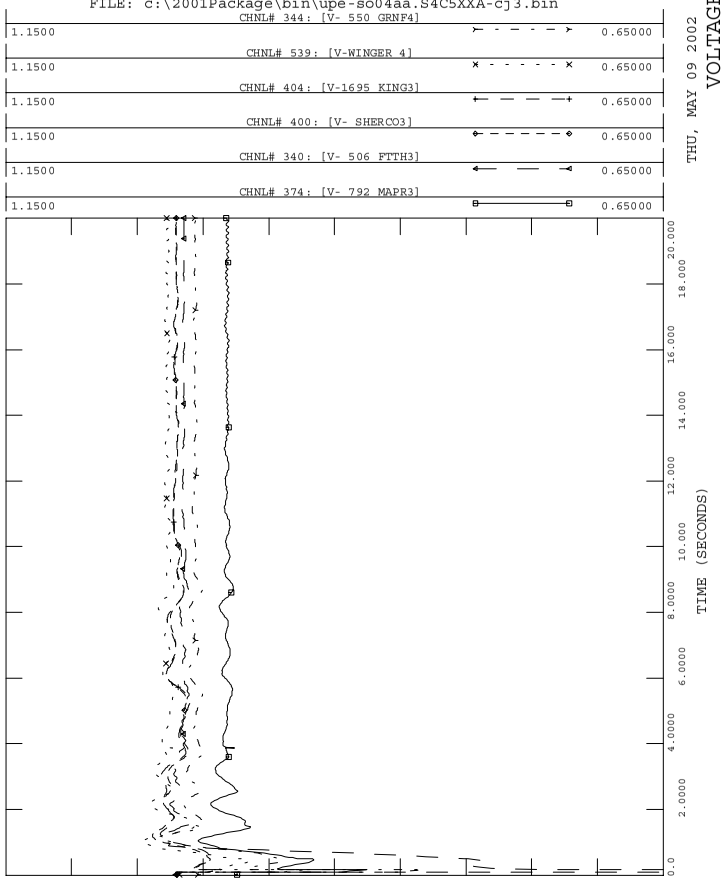
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
VOLTAGES 1



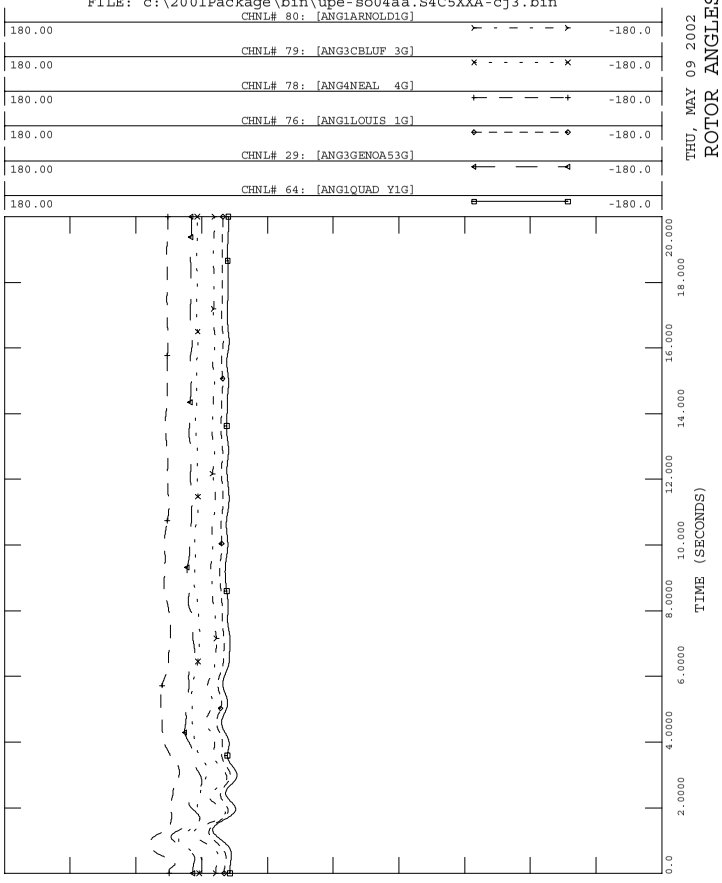
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
VOLTAGES 3



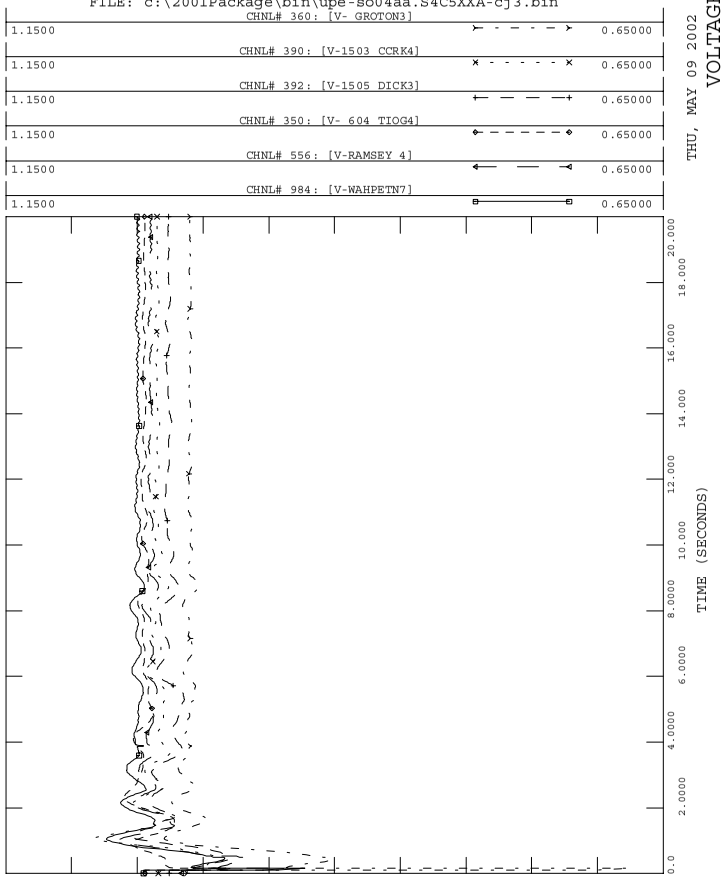
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
ROTOR ANGLES IA

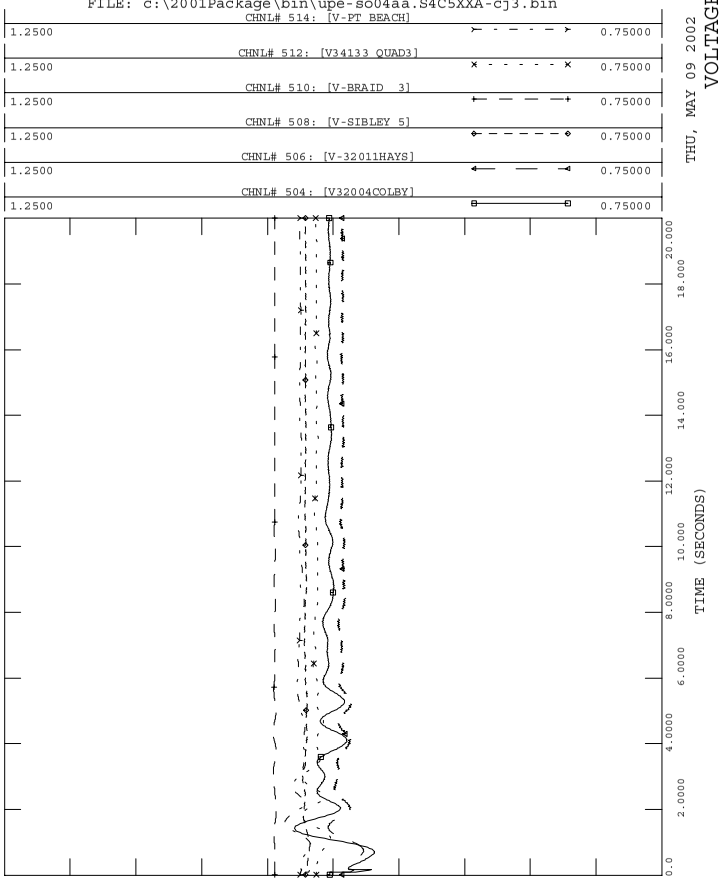


UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
VOLTAGES 2

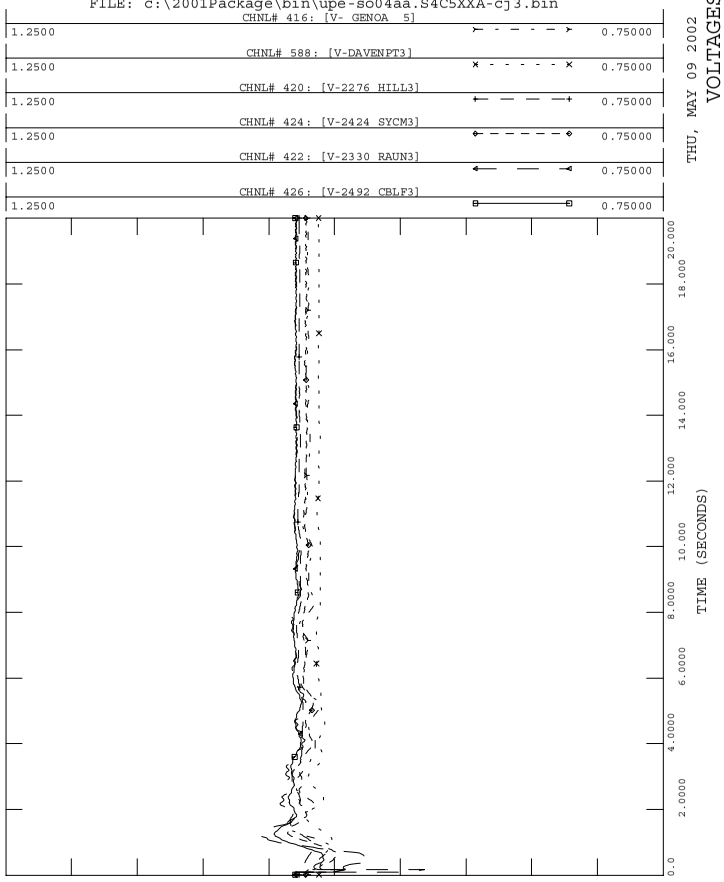


UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin



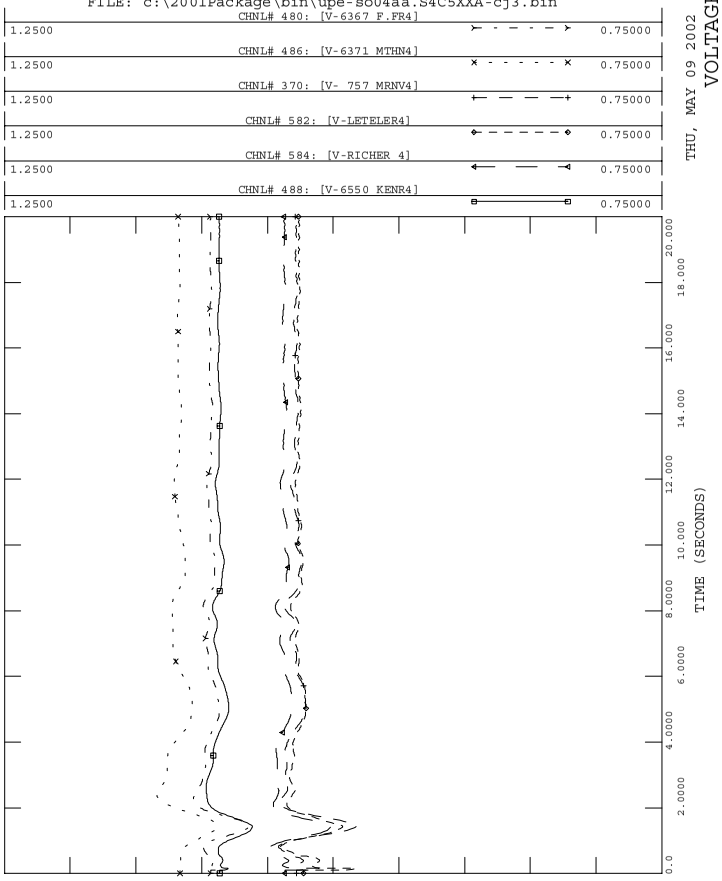
THU, MAY 09 2002 21:58
VOLTAGES 5

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin



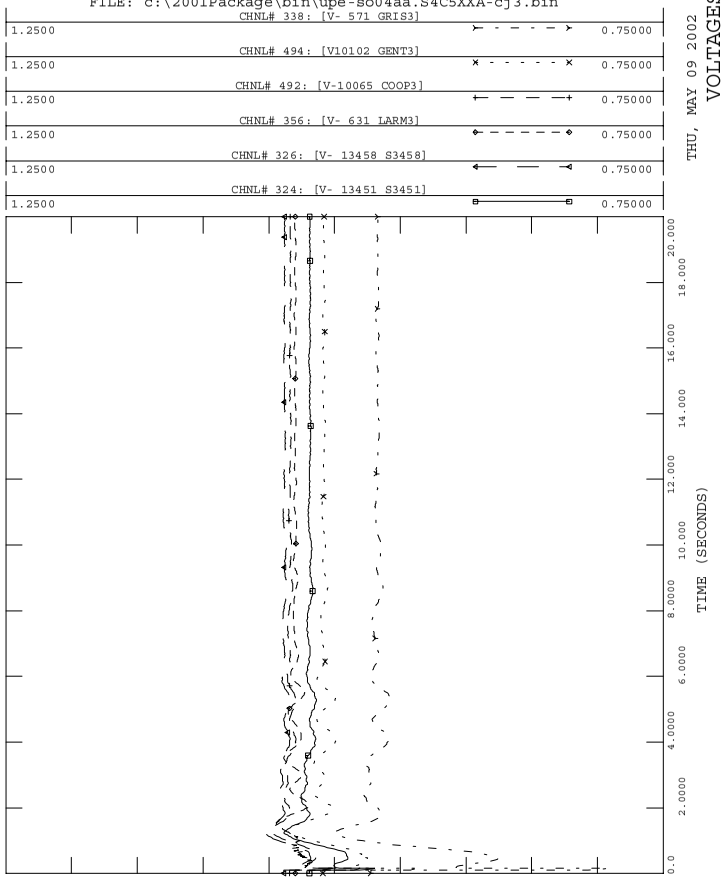
THU, MAY 09 2002 21:58
VOLTAGES IA

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin



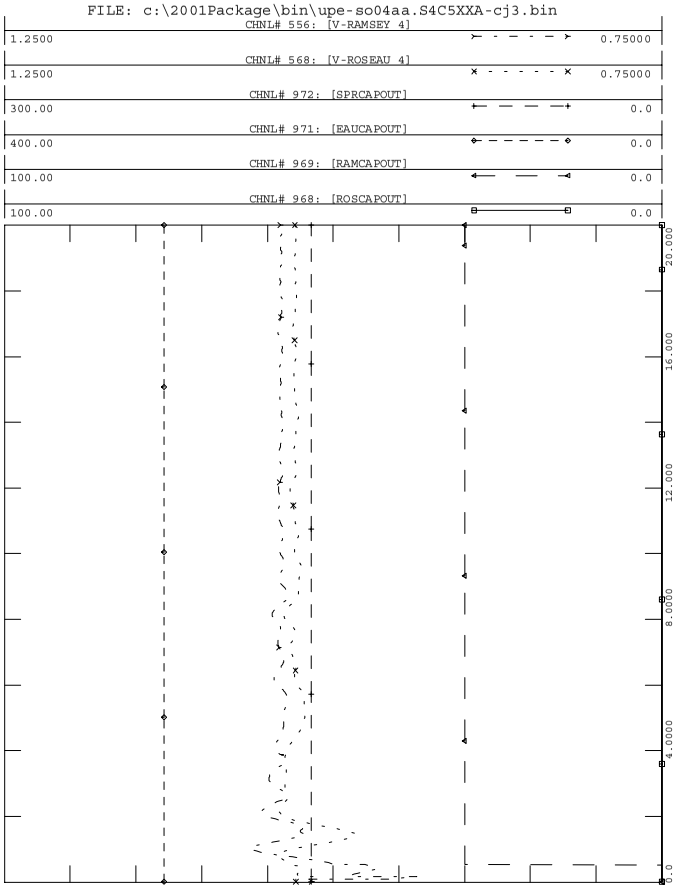
THU, MAY 09 2002 21:58
VOLTAGES 4

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin



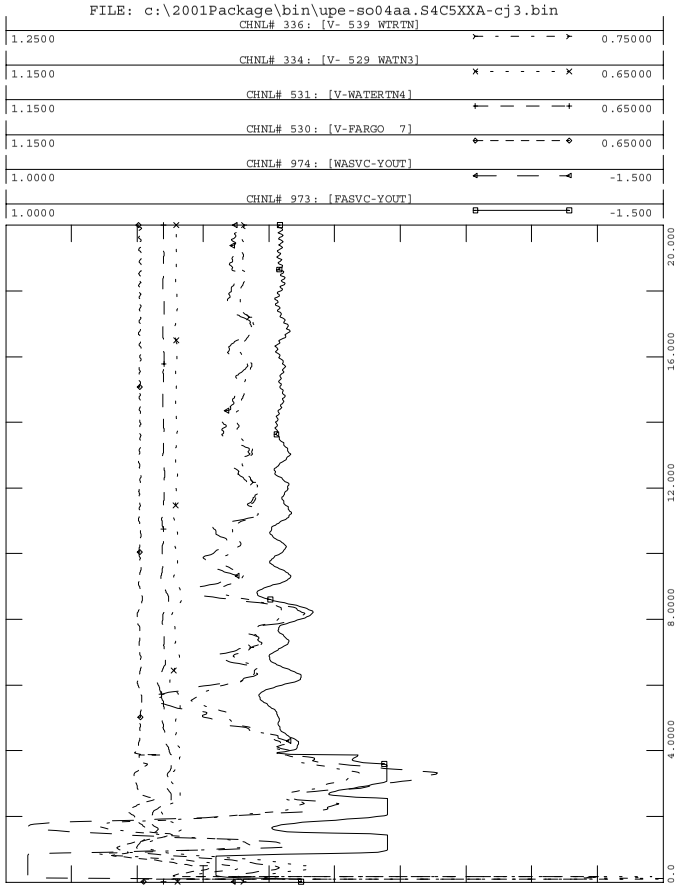
THU, MAY 09 2002 21:58
VOLTAGES NB

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin



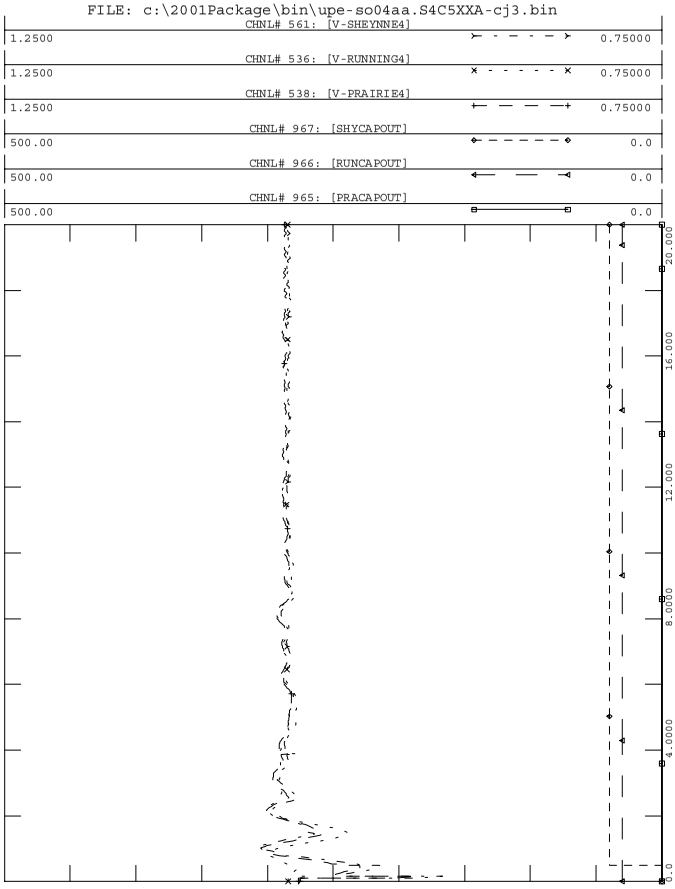
THU, MAY 09 2002 21:58
FAST SW CAP OUT 2

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin



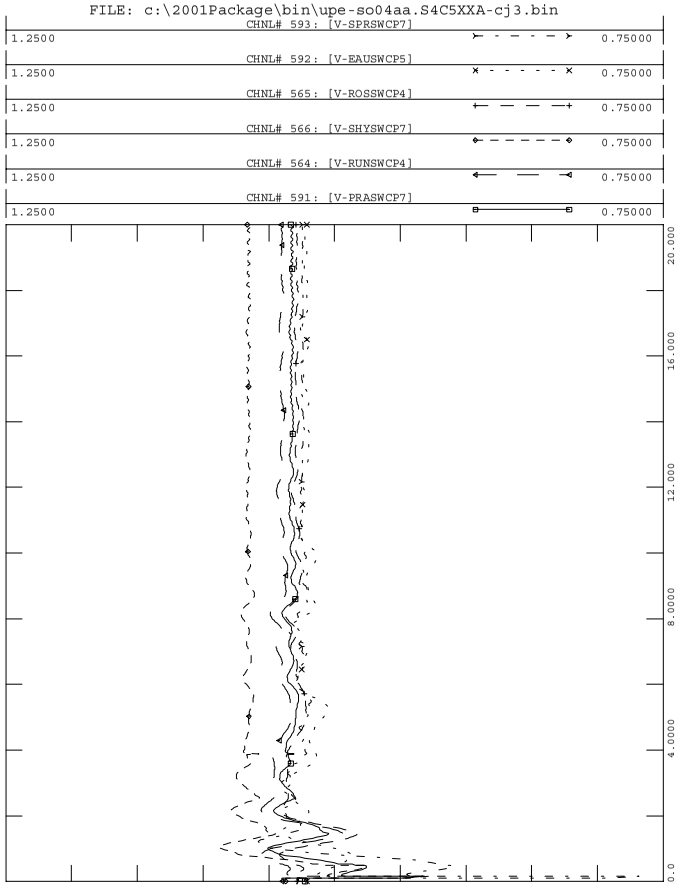
THU, MAY 09 2002 21:58
FARGO/WATERTOWN SVS

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin



THU, MAY 09 2002 21:58
FAST SW CAP OUT 1

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

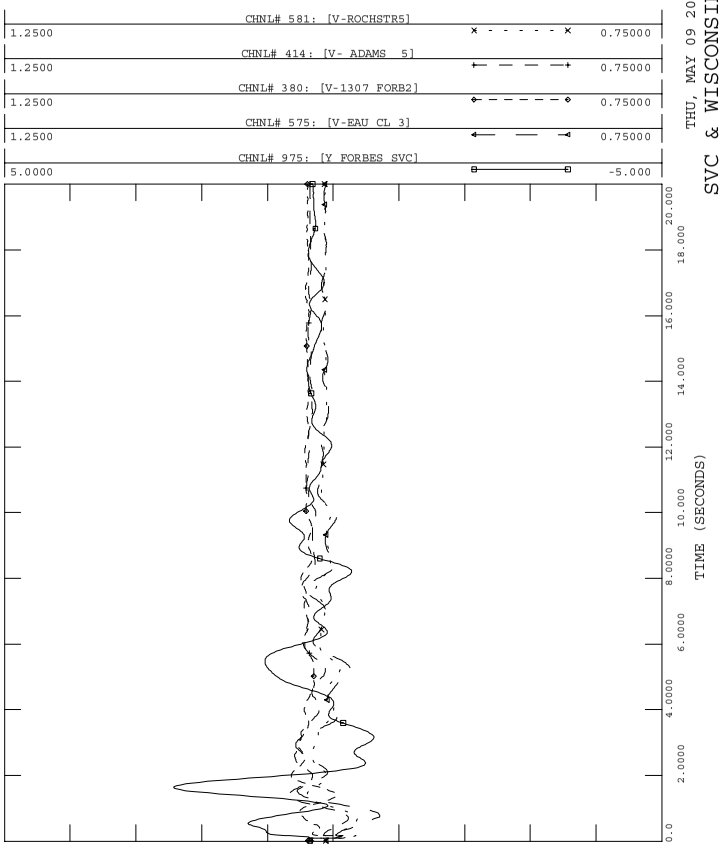


THU, MAY 09 2002 21:58
FAST SW CAP VOLTAGES

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58

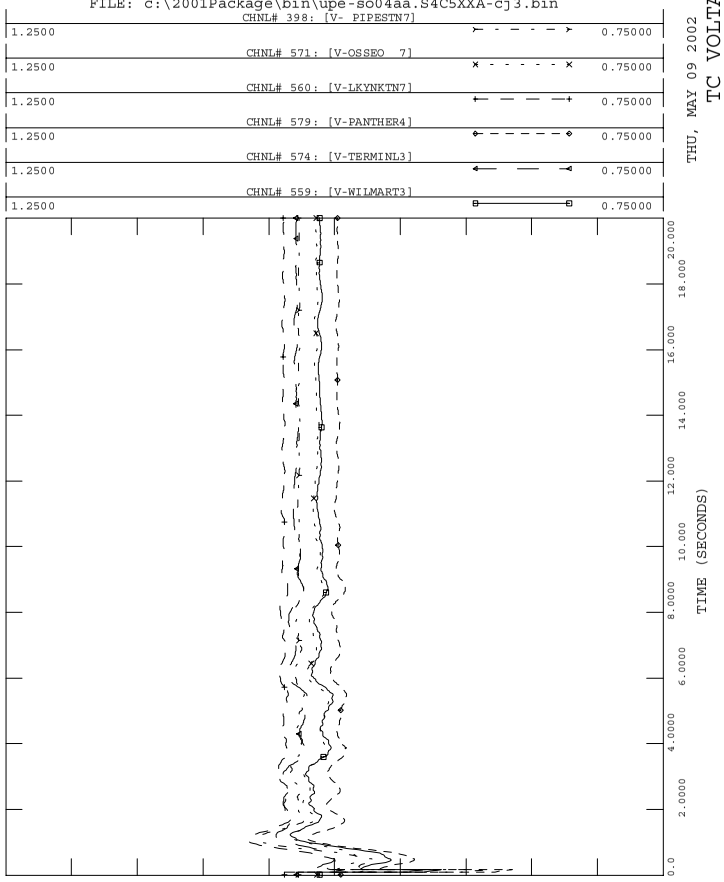
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58

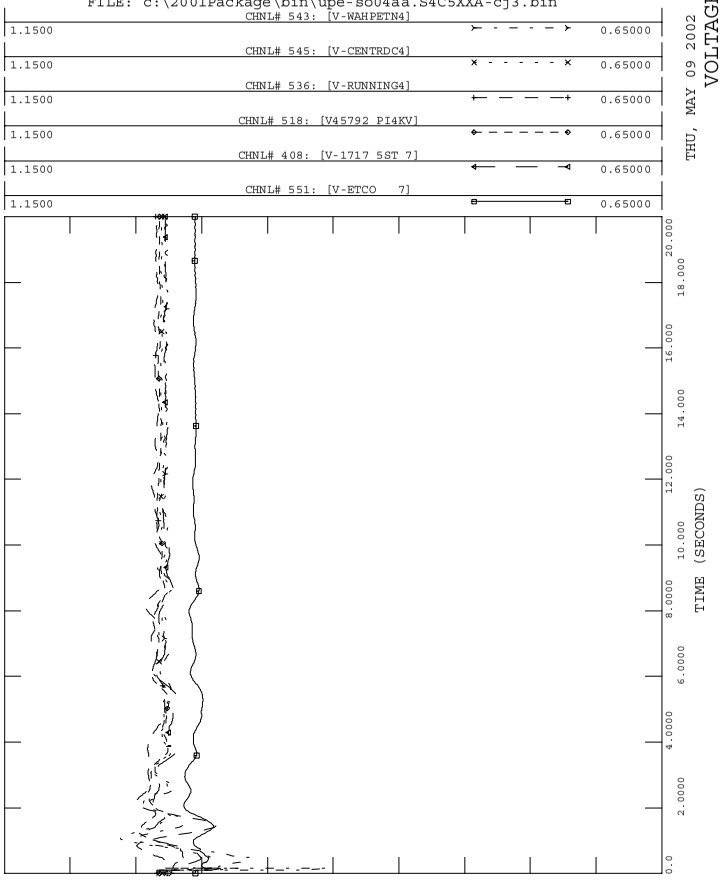
TC VOLTAGES



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58

VOLTAGES 6



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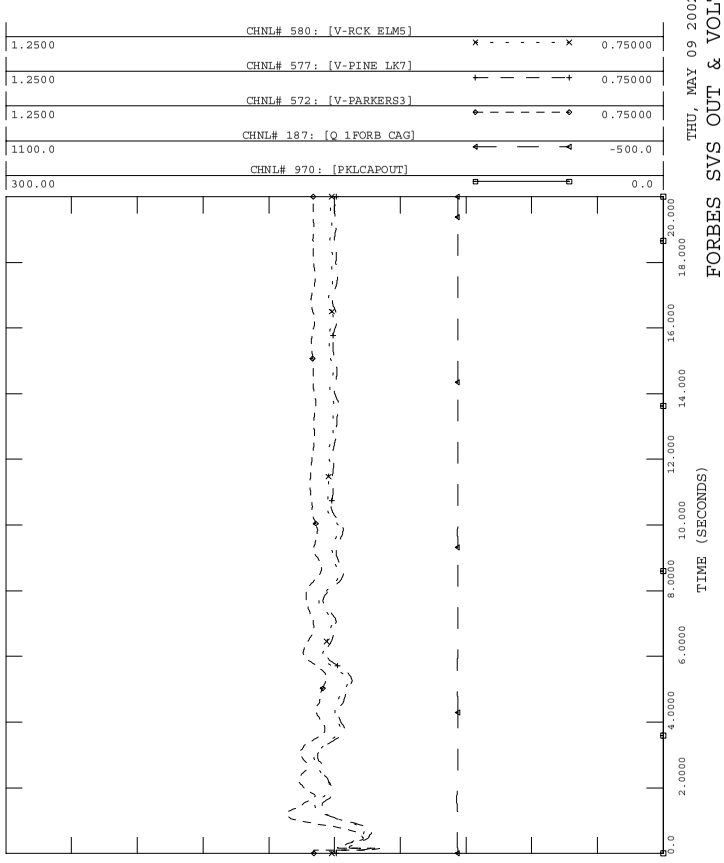
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58

FORBES SVS OUT & VOLTAGES



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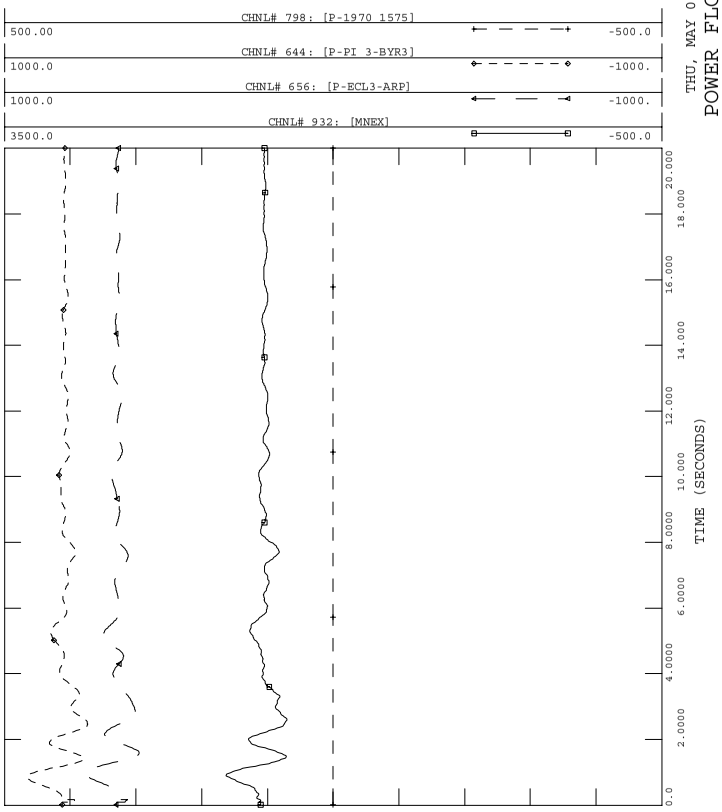
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
POWER FLOW SUMS 2



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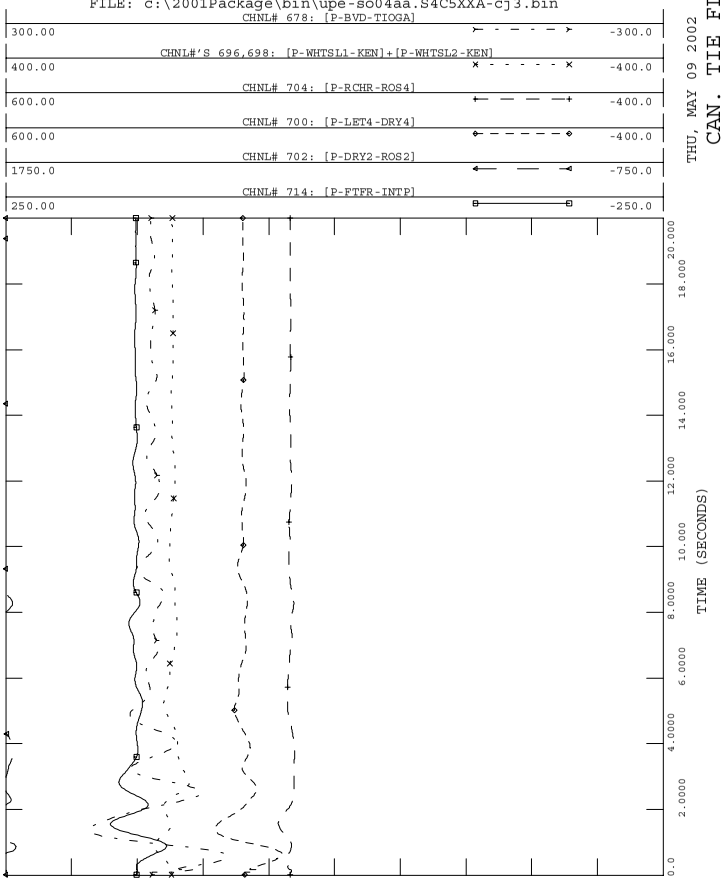
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
CAN. TIE FLOWS



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
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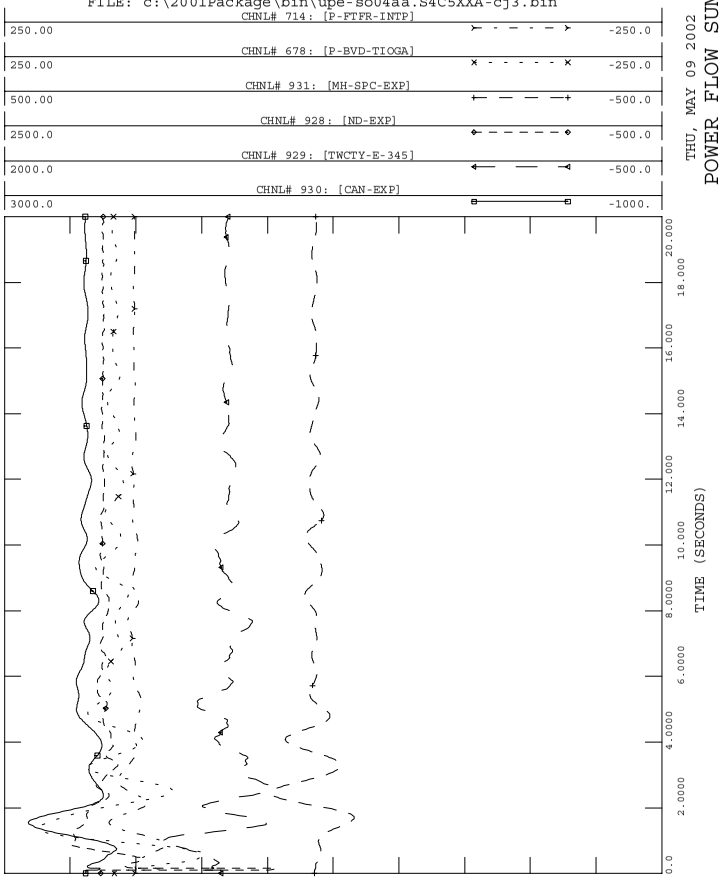
THU, MAY 09 2002 21:58
POWER FLOW SUMS 1



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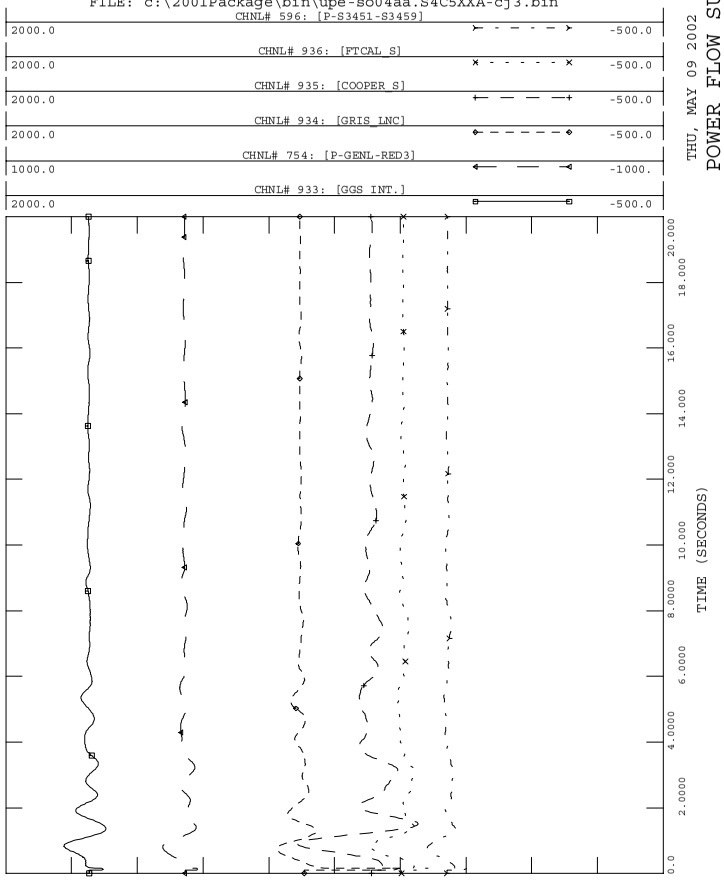
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
POWER FLOW SUM 3



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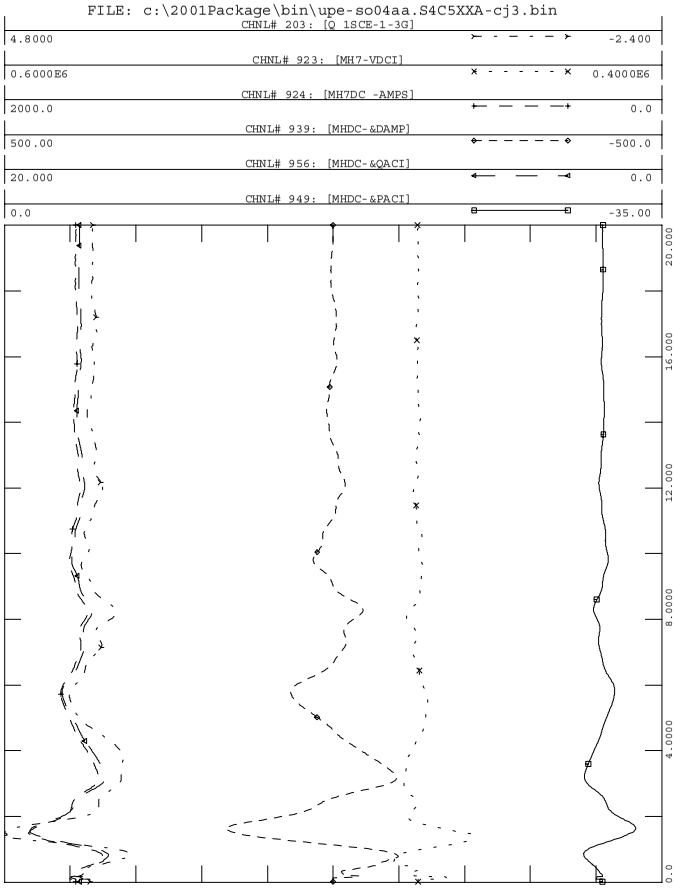
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
MH DC PARAMETERS



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ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
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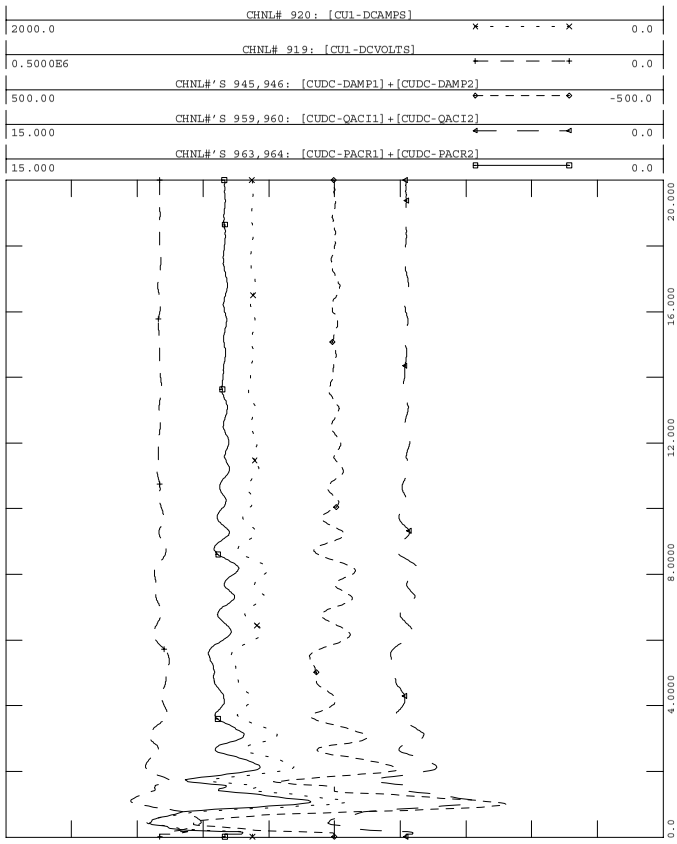
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
CU DC #1



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
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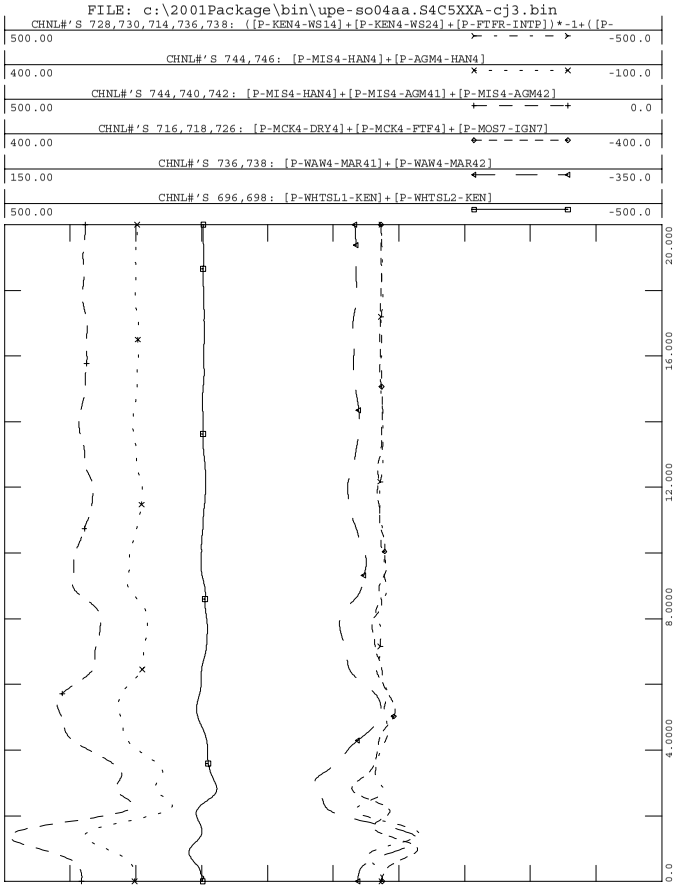
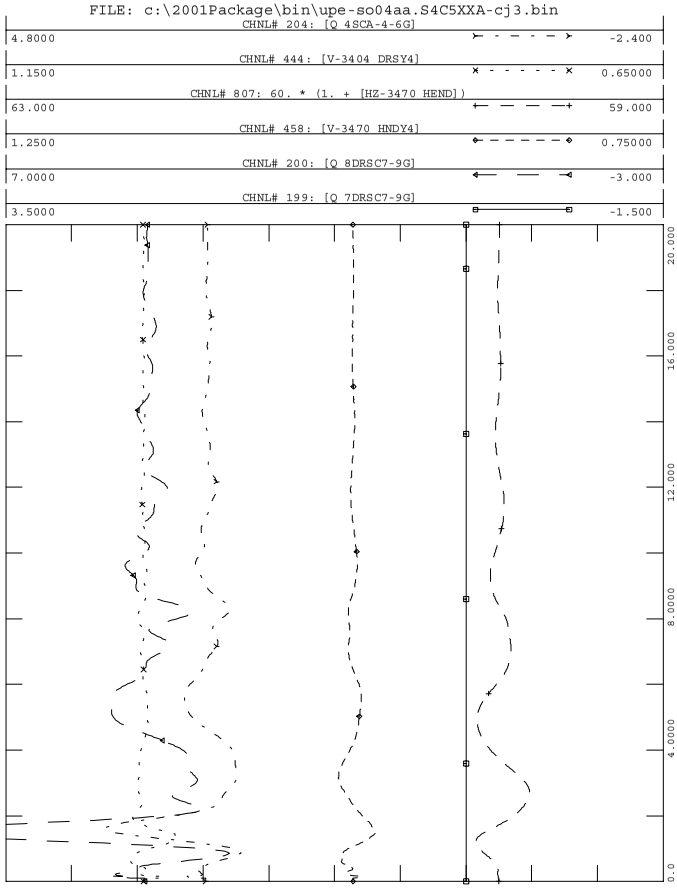
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
OH TIE FLOWS



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58
MH DC PARAMETERS



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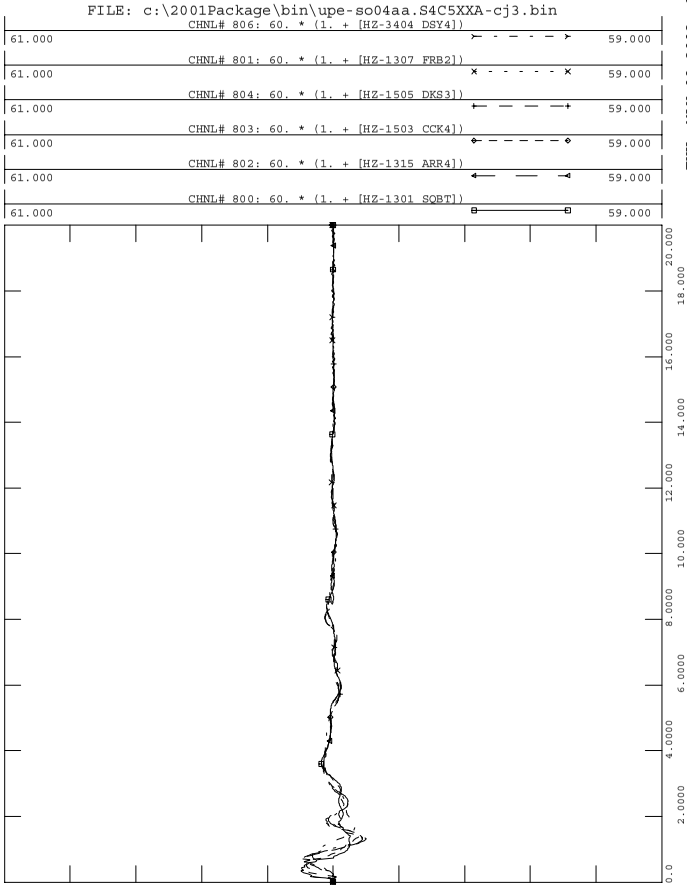
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58

FREQ AT DC TERMINALS



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
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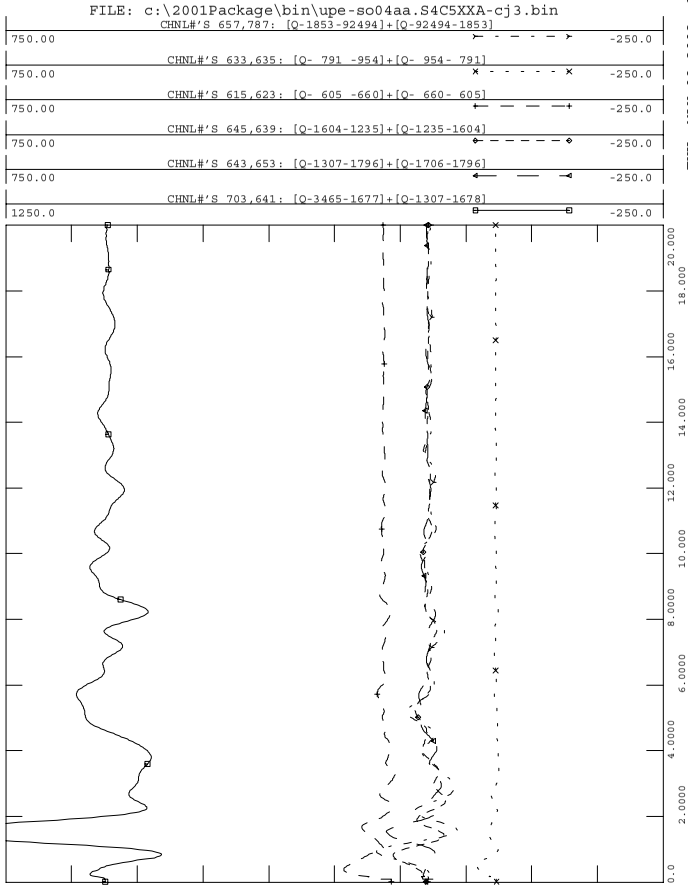
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58

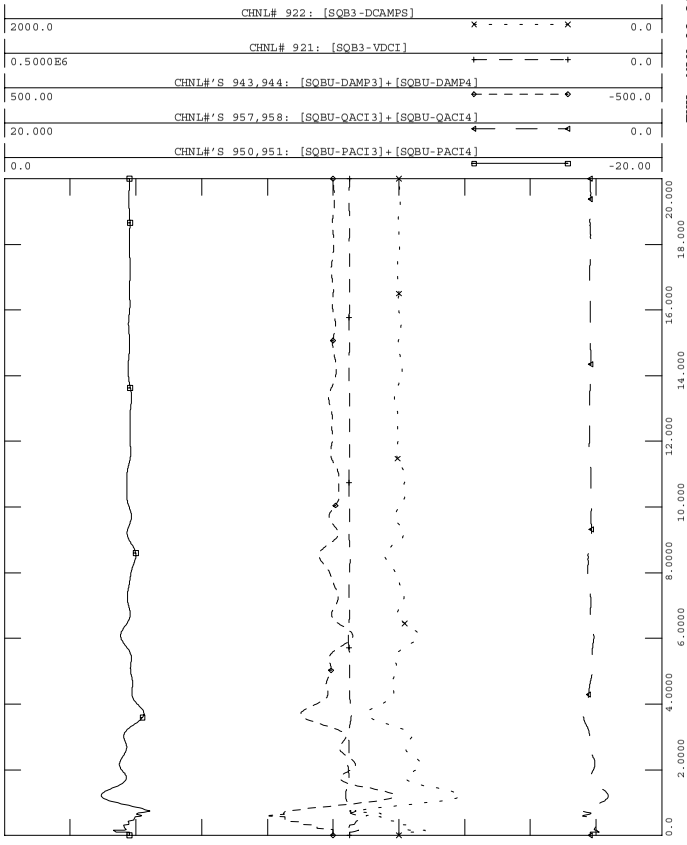
VAR LOSSES



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58

SQB DC #3



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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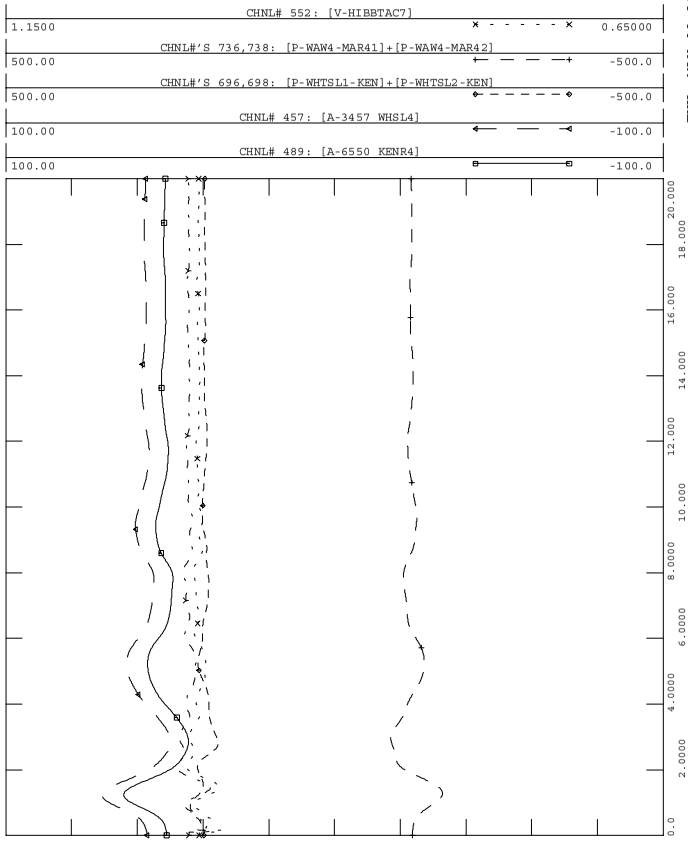
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

THU, MAY 09 2002 21:58

VOLTAGES, ANGLES



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

RELAY: SLINOS
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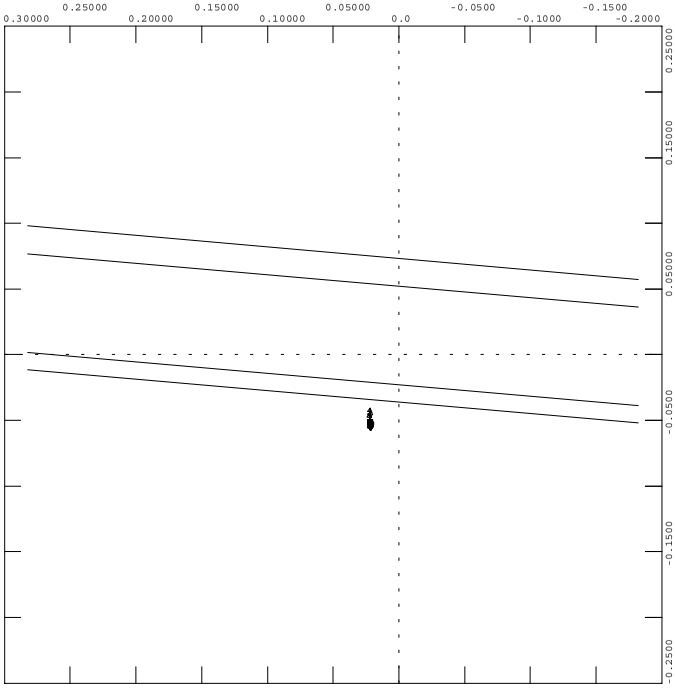
CHNL# 824: [X-FRB2-ROS2]



THU, MAY 09 2002 21:58
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

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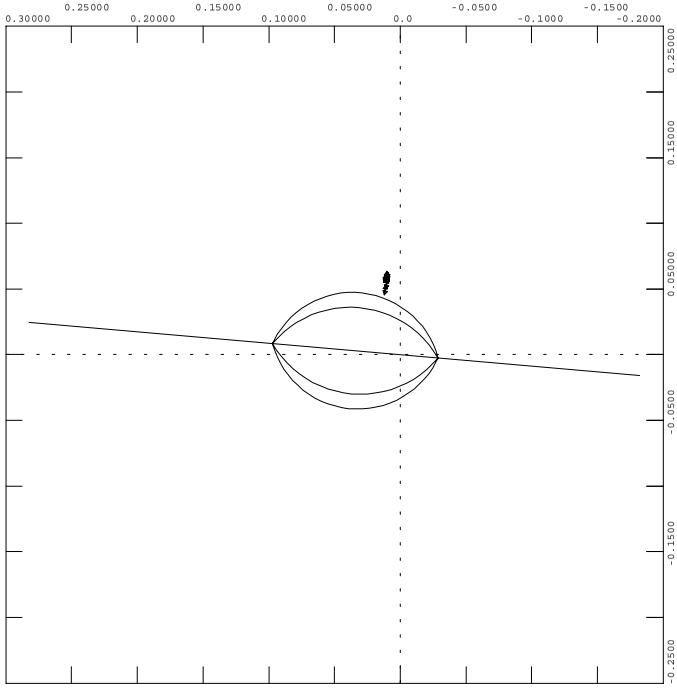

THU, MAY 09 2002 21:58
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

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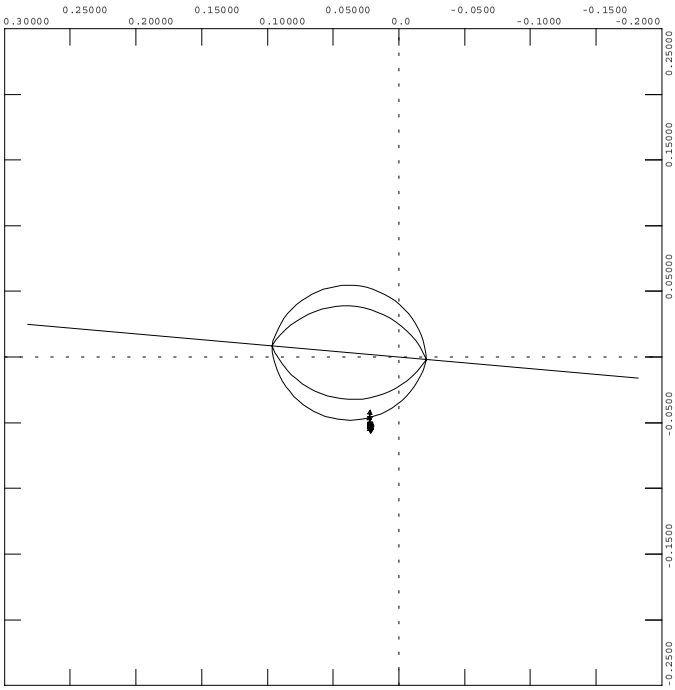

THU, MAY 09 2002 21:58
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

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ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

RELAY: SLINOS
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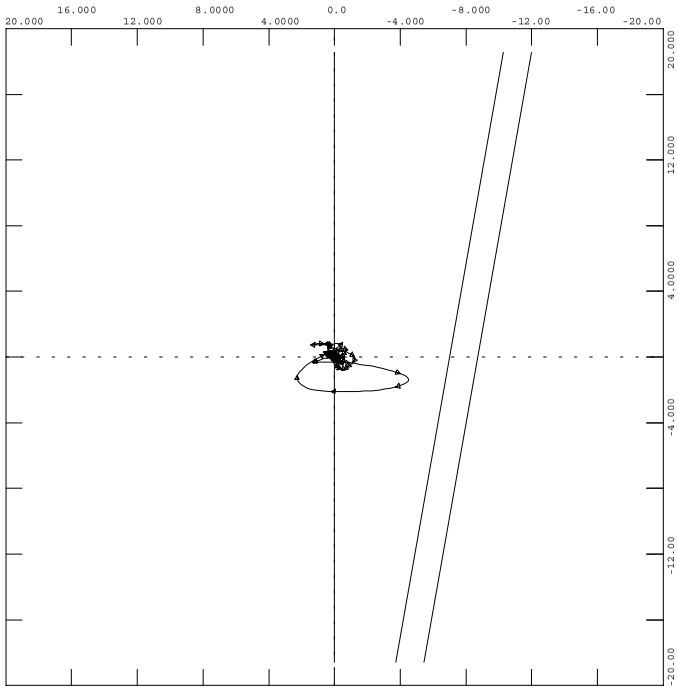
CHNL# 977: [DCAR-B]



THU, MAY 09 2002 21:58
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

RELAY: SLINOS
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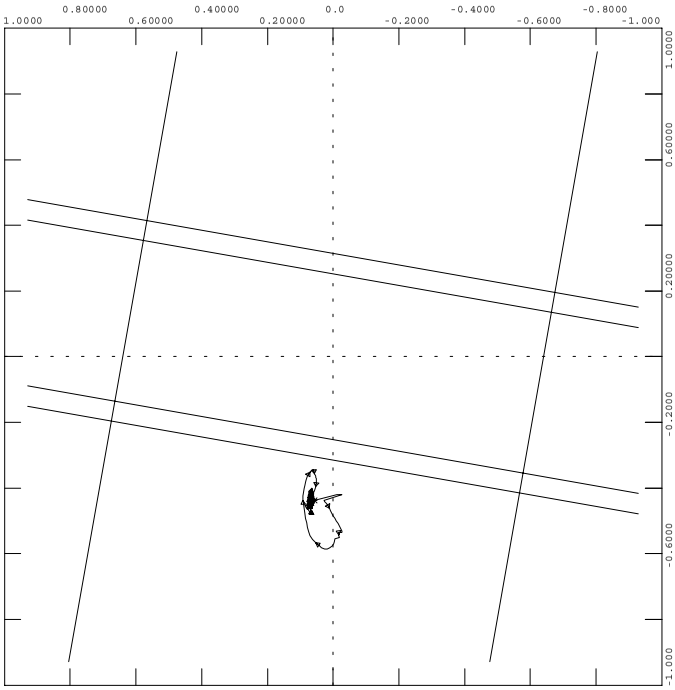
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

RELAY: SLINOS
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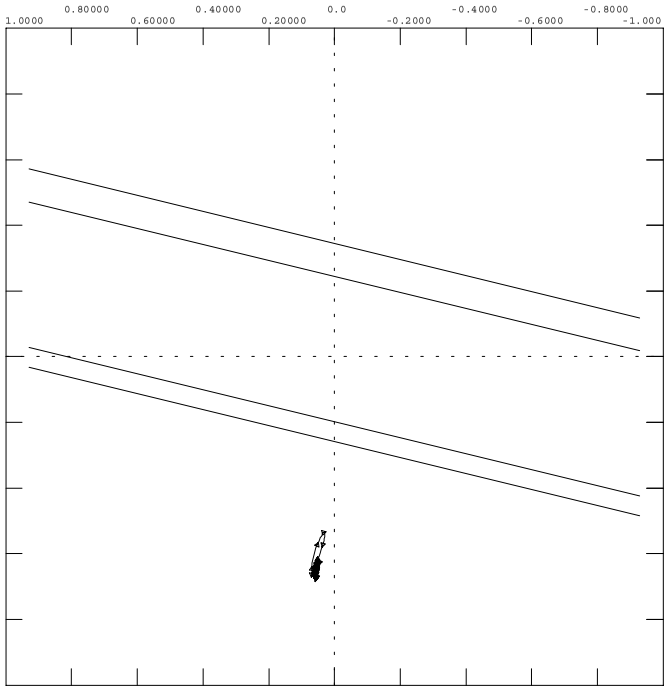

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
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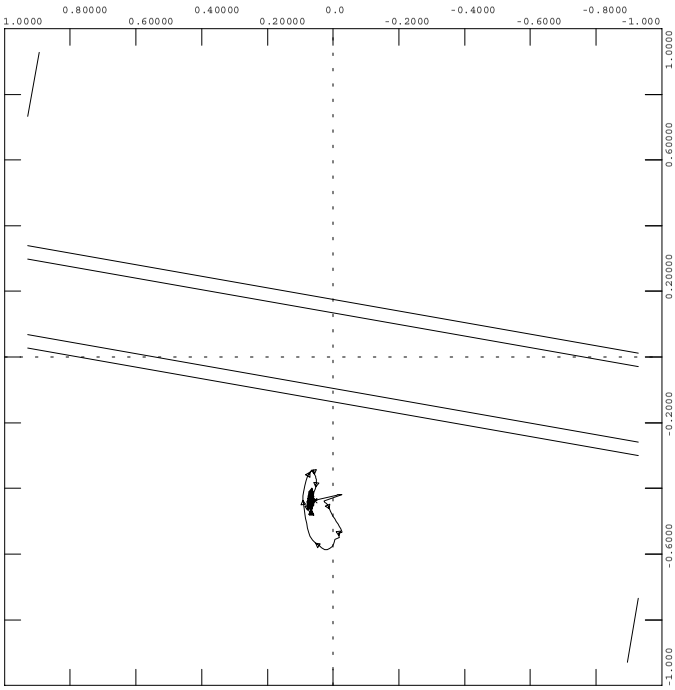

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
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4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

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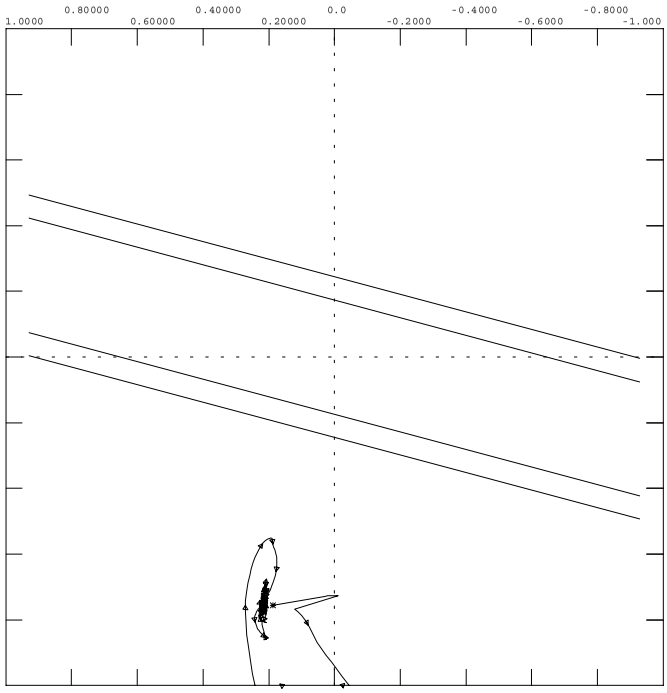

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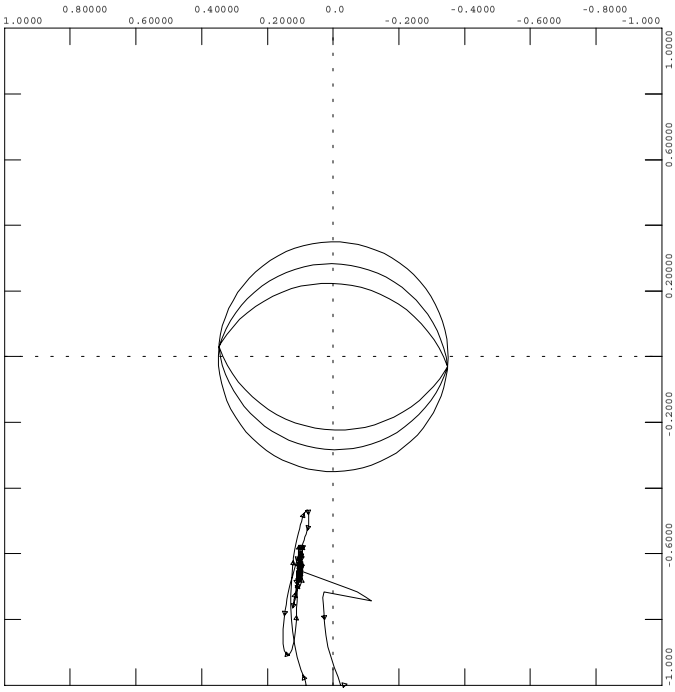
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

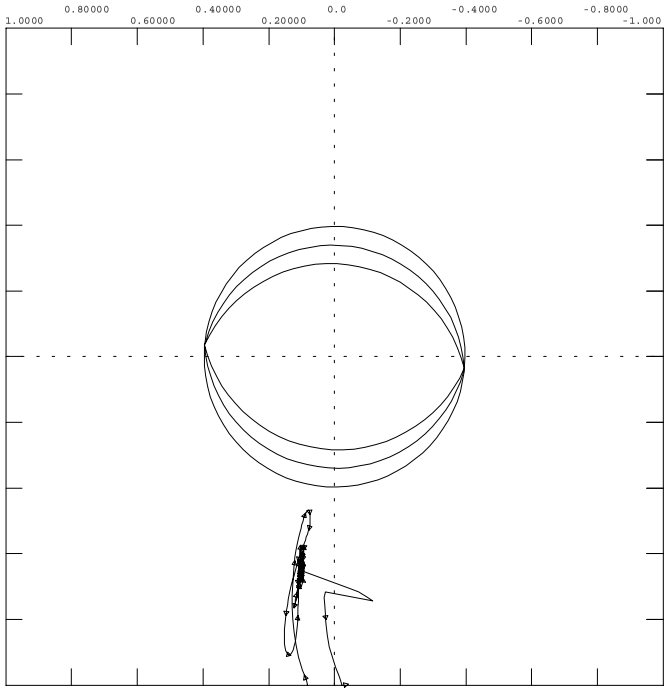
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

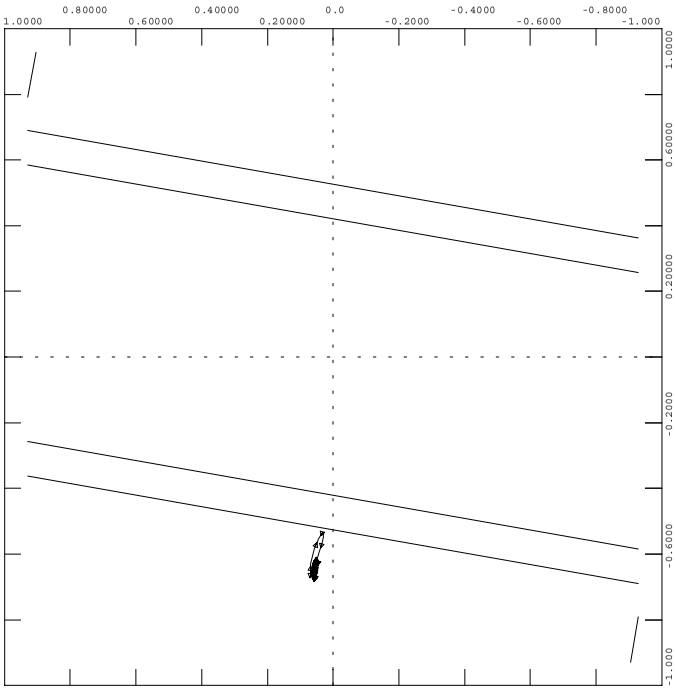
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

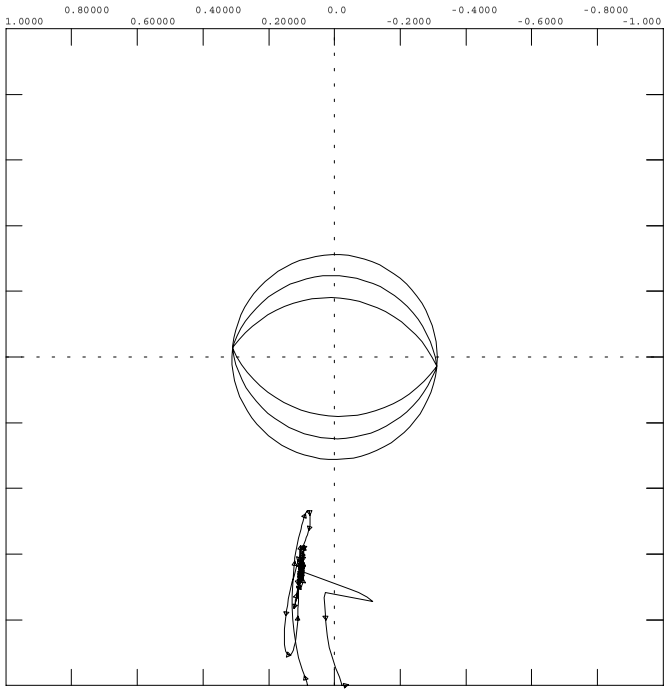
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



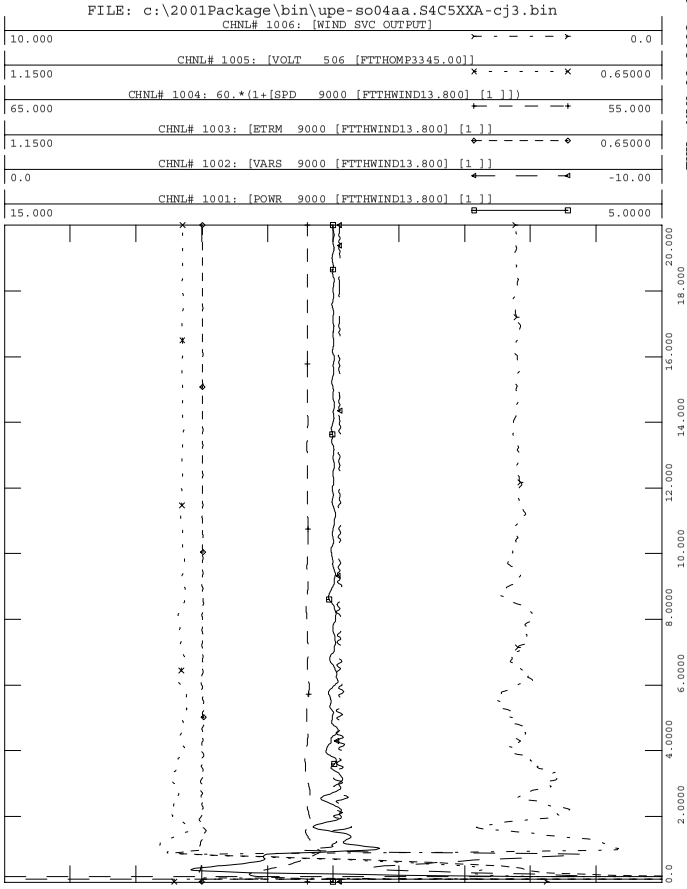
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

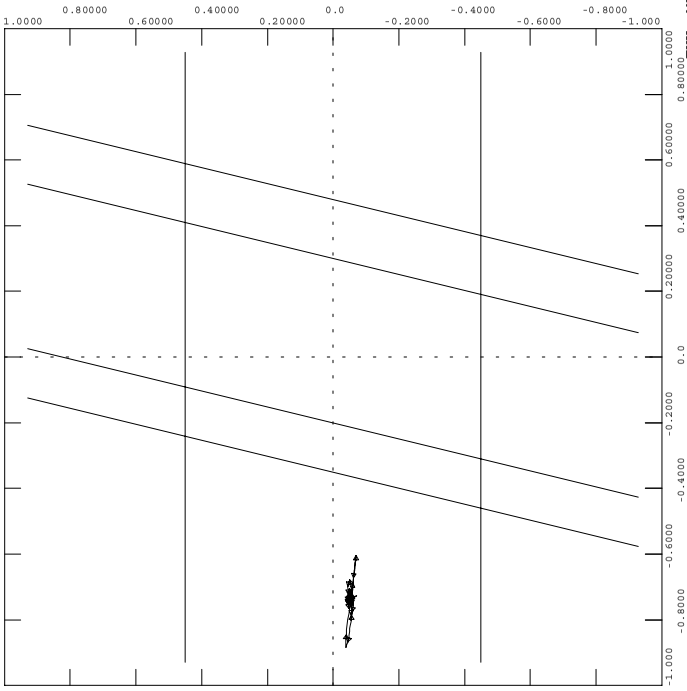


THU, MAY 09 2002 21:58
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



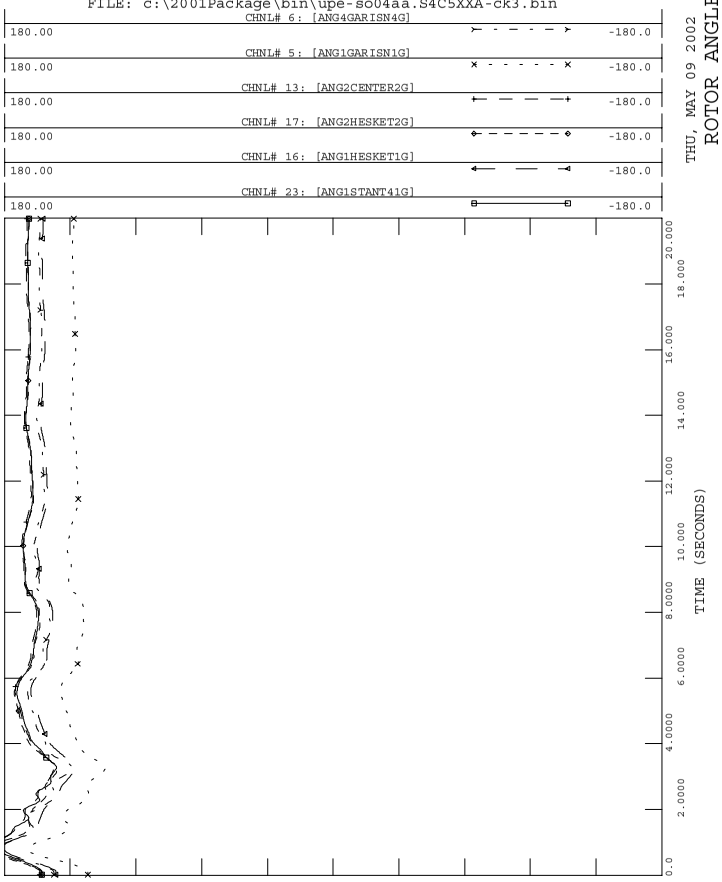
THU, MAY 09 2002 21:58
MP-OH I.FALLS (779)

CONTINGENCY CK3

4 cycle 3 phase fault at Ft Thompson 345kV. Clear the Ft Thompson – Split Rock 345 kV line

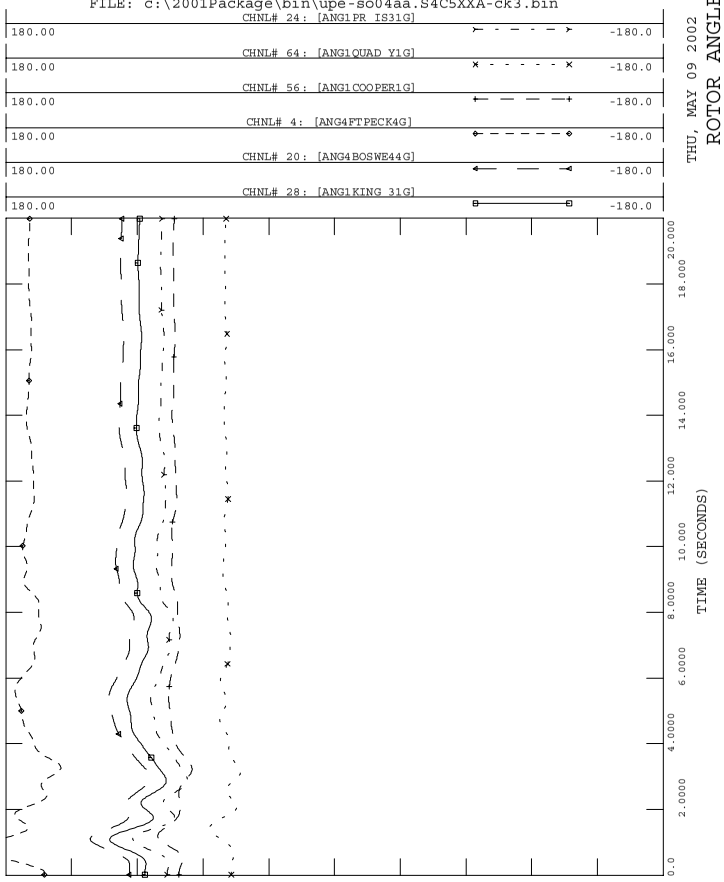
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:12
ROTOR ANGLES 2



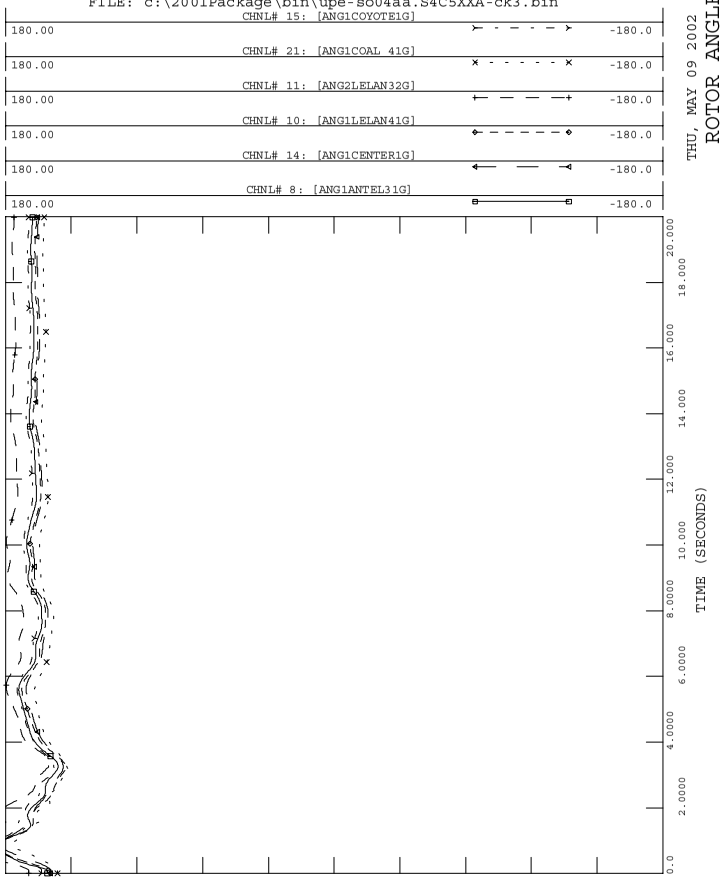
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:12
ROTOR ANGLES 4



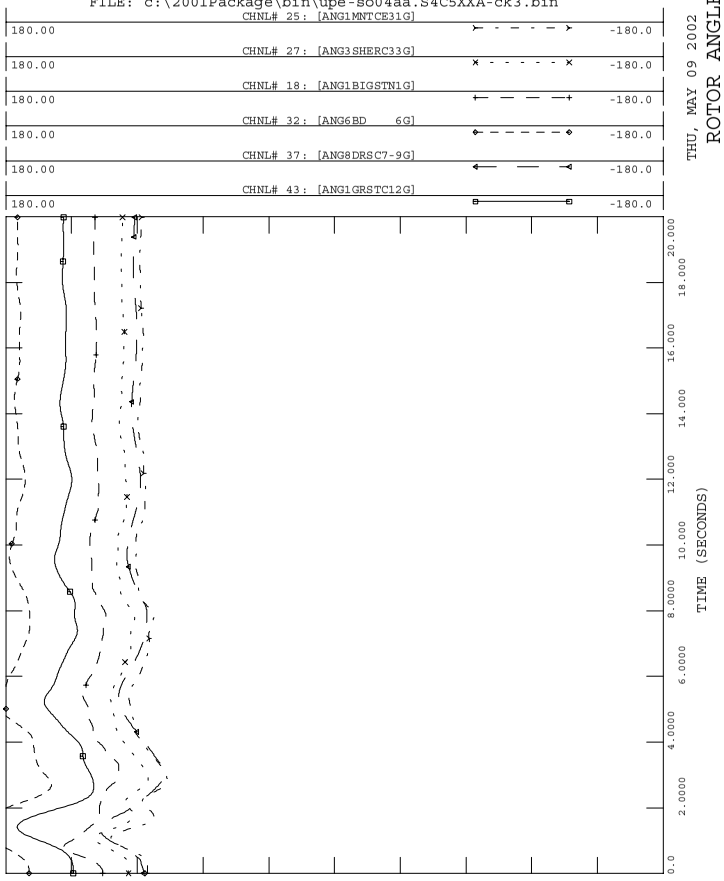
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:12
ROTOR ANGLES 1



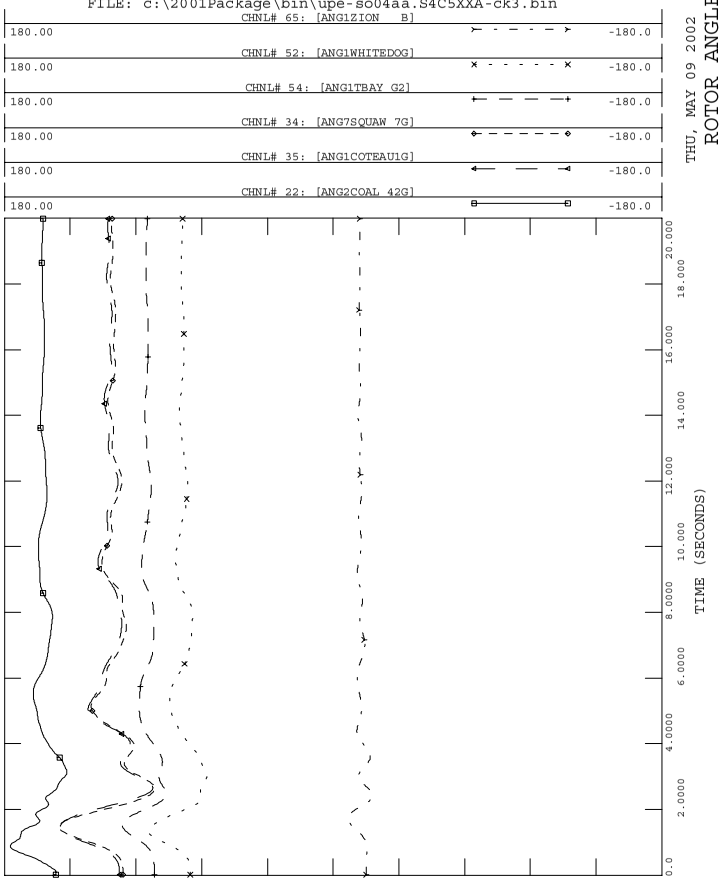
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:12
ROTOR ANGLES 3



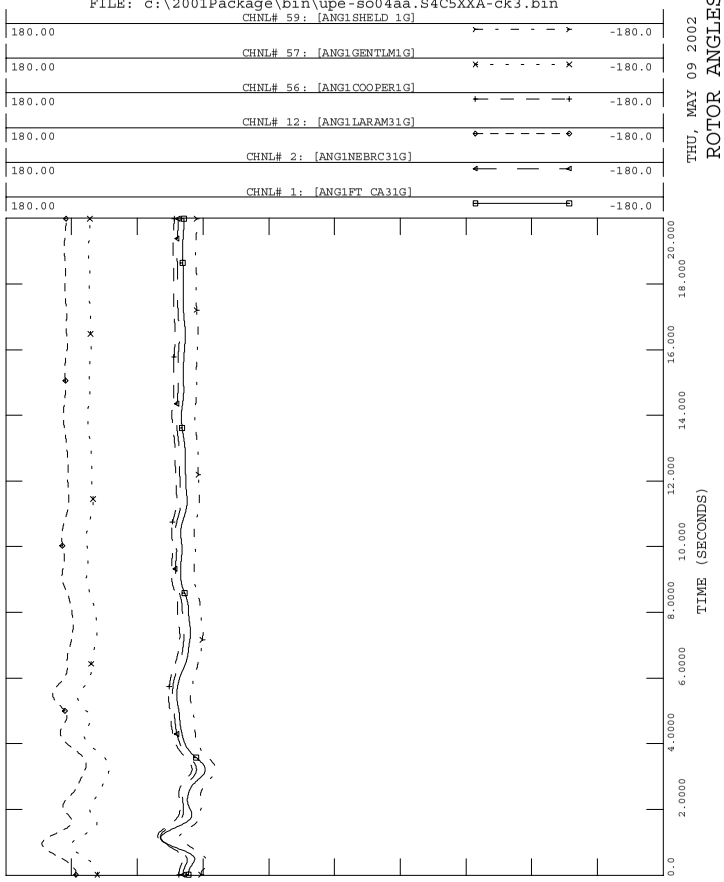
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
ROTOR ANGLES 6



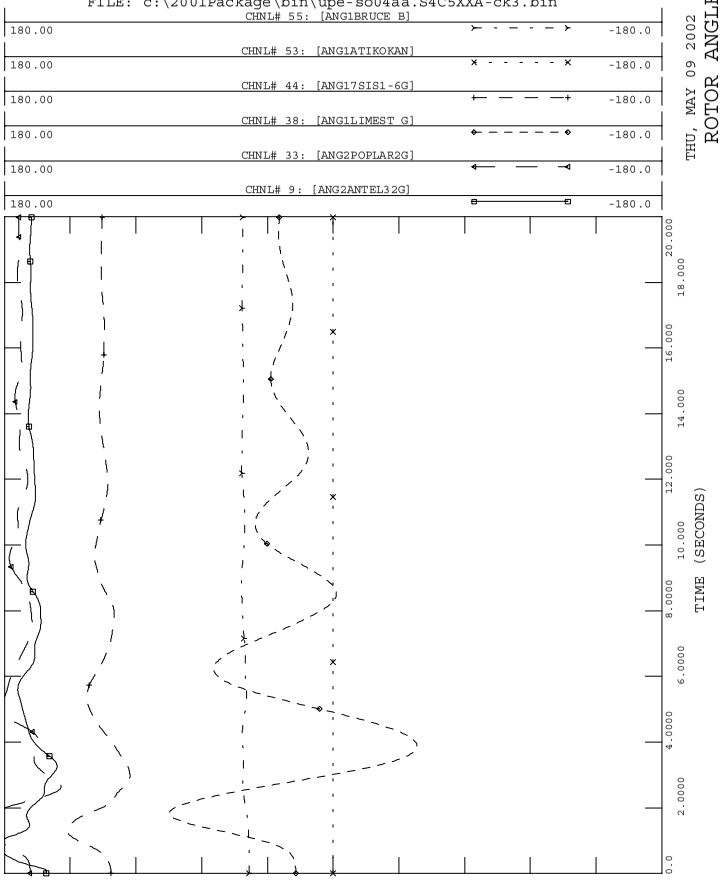
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
ROTOR ANGLES NB



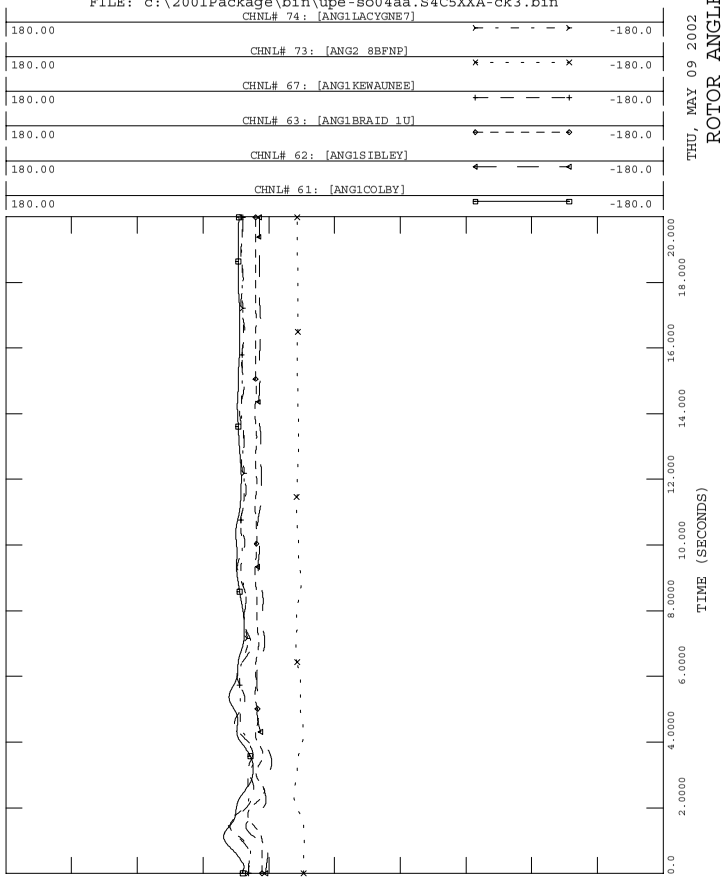
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:12
ROTOR ANGLES 5



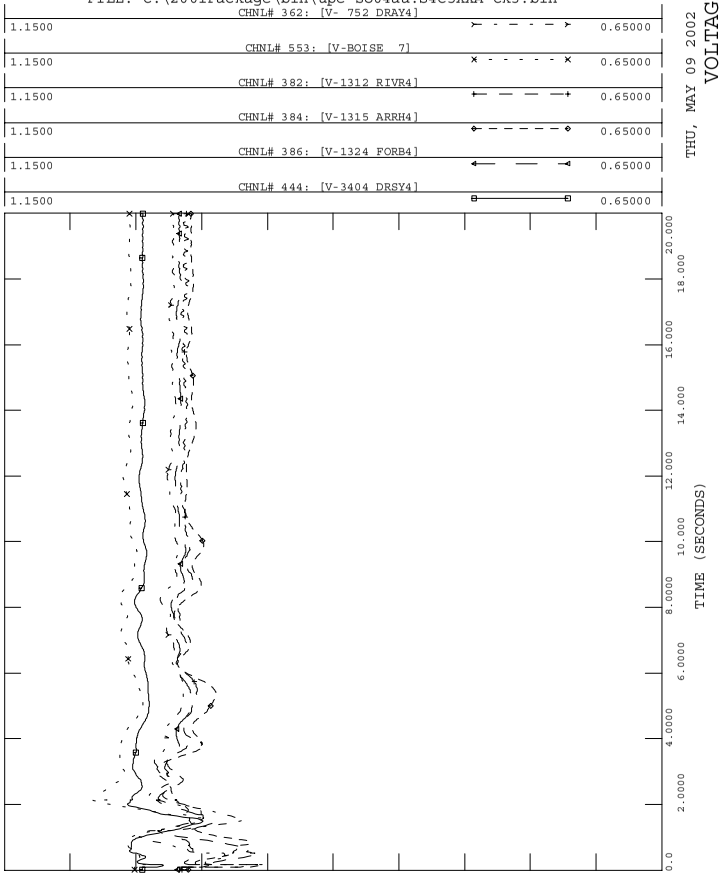
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
ROTOR ANGLES 7



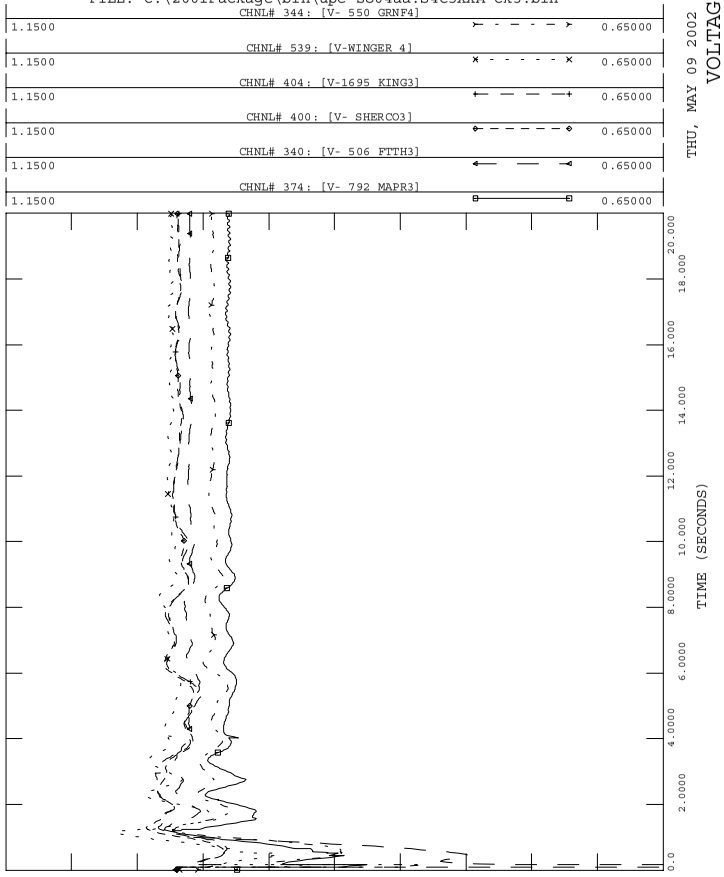
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
VOLTAGES 1



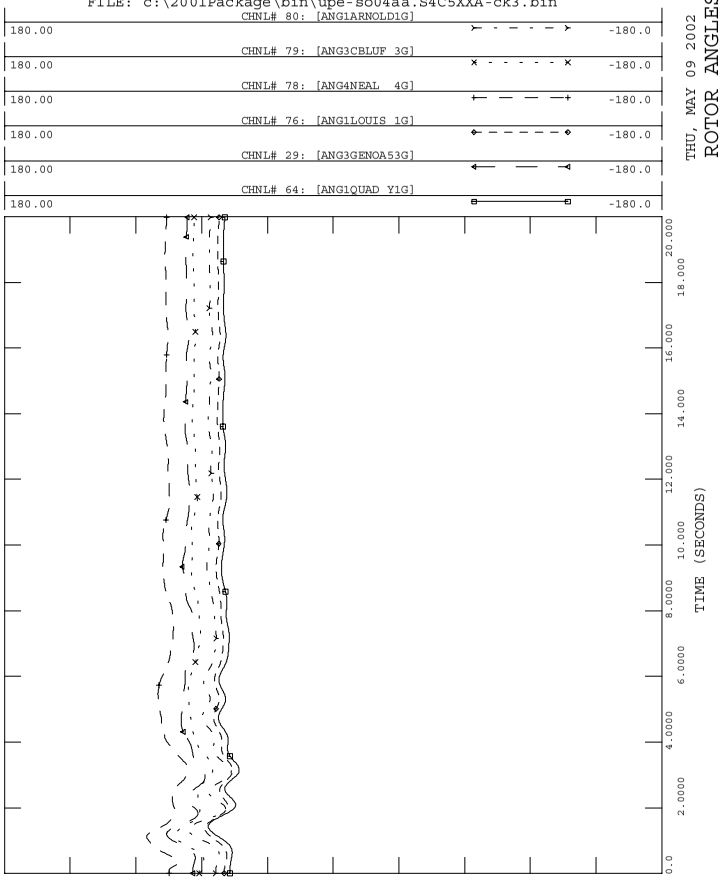
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
VOLTAGES 3



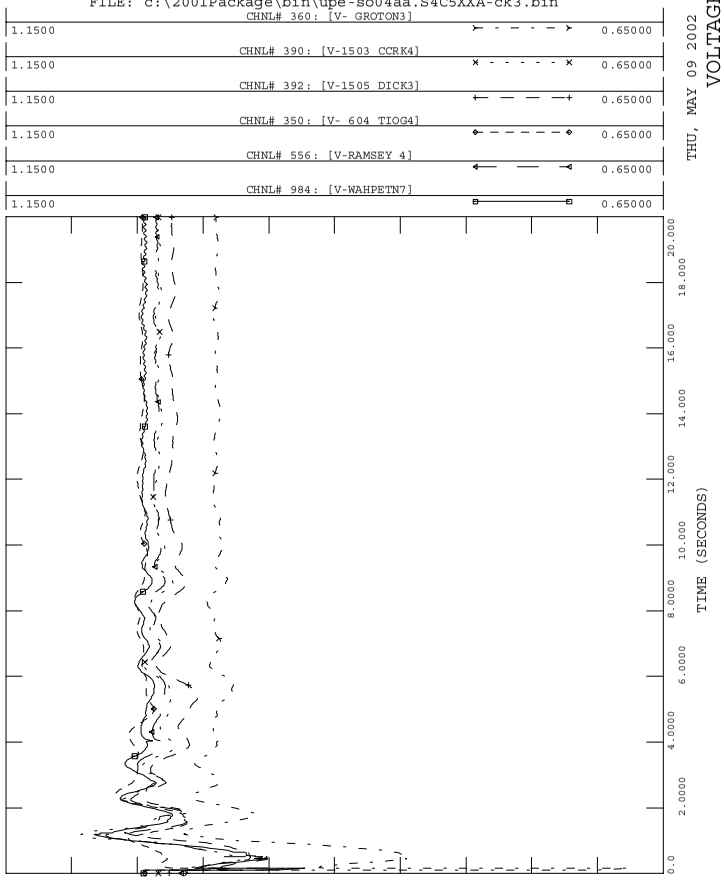
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
ROTOR ANGLES IA



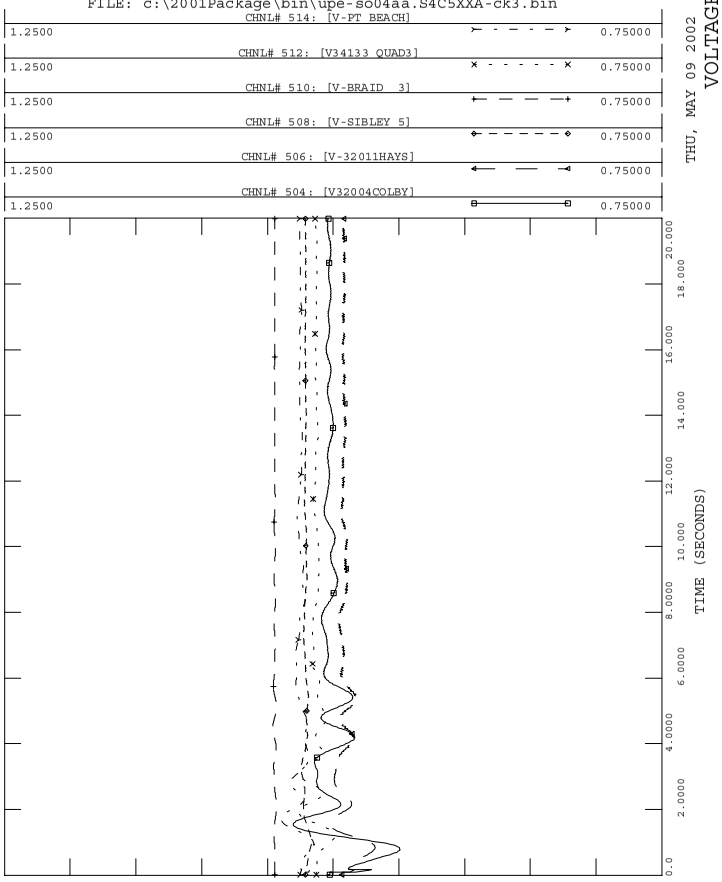
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
VOLTAGES 2



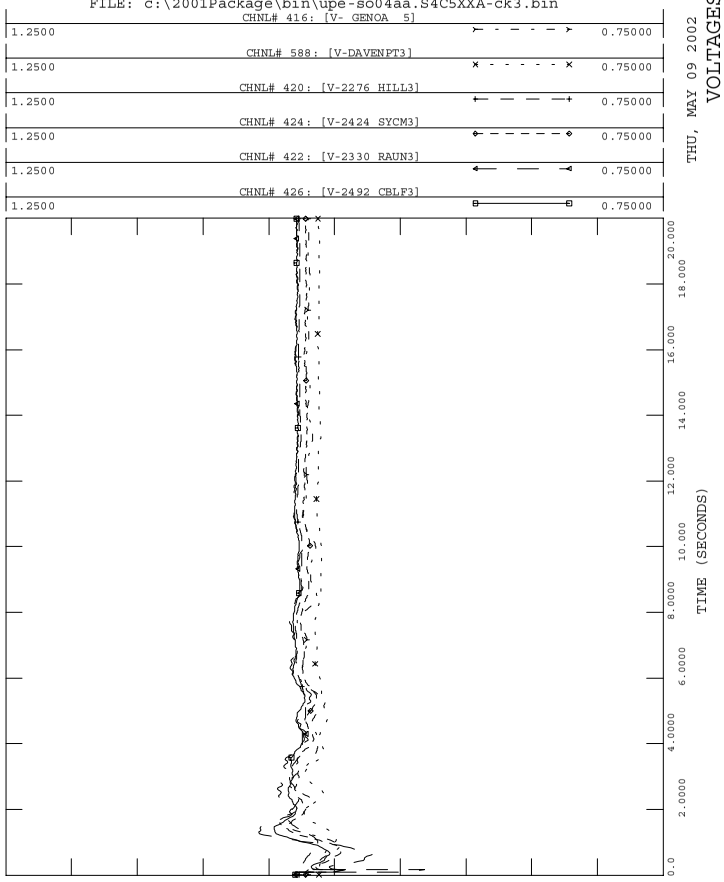
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
VOLTAGES 5



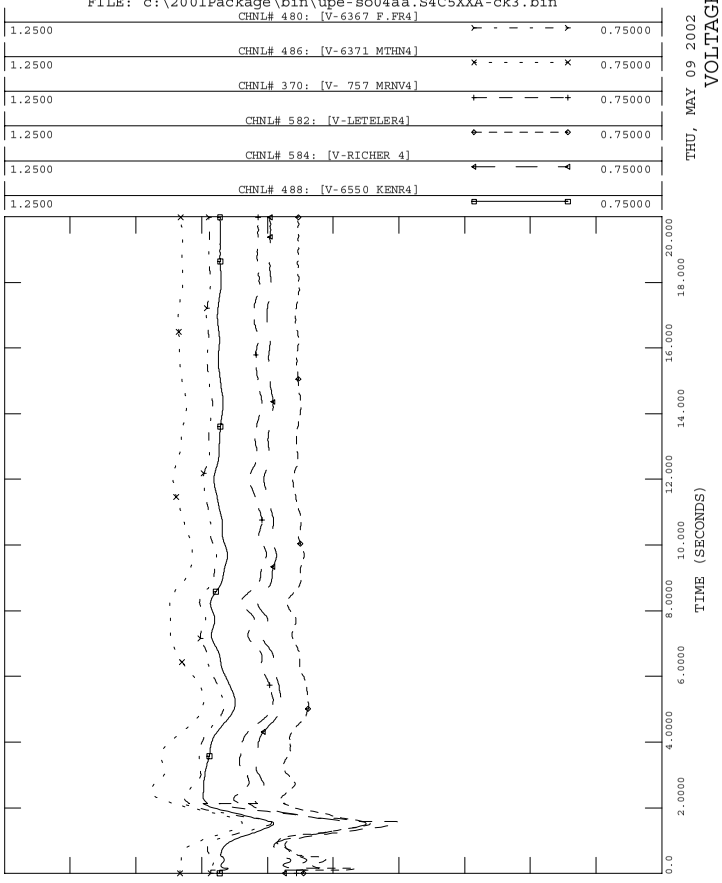
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
VOLTAGES IA



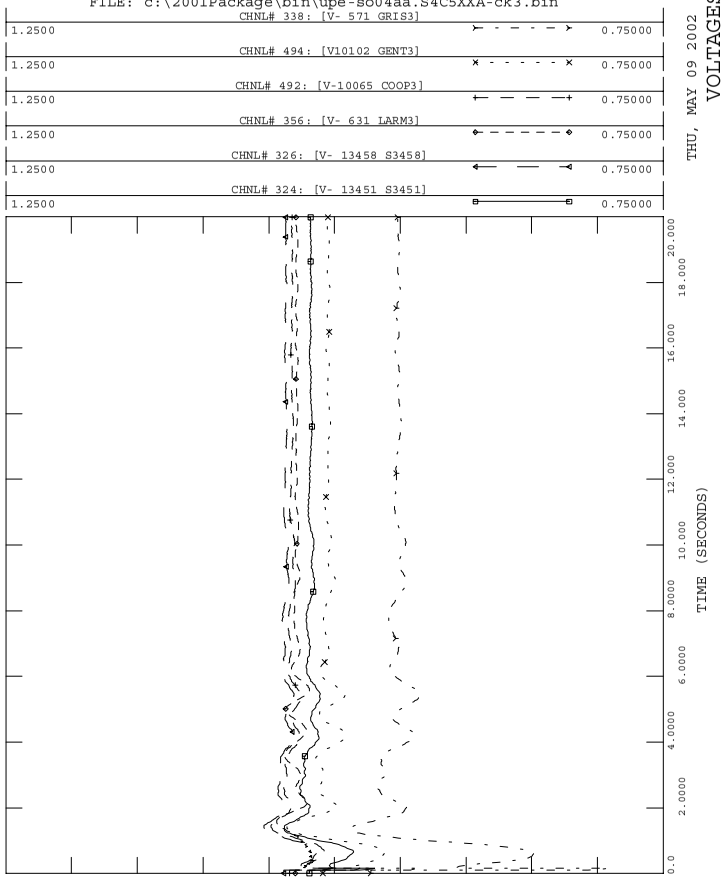
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

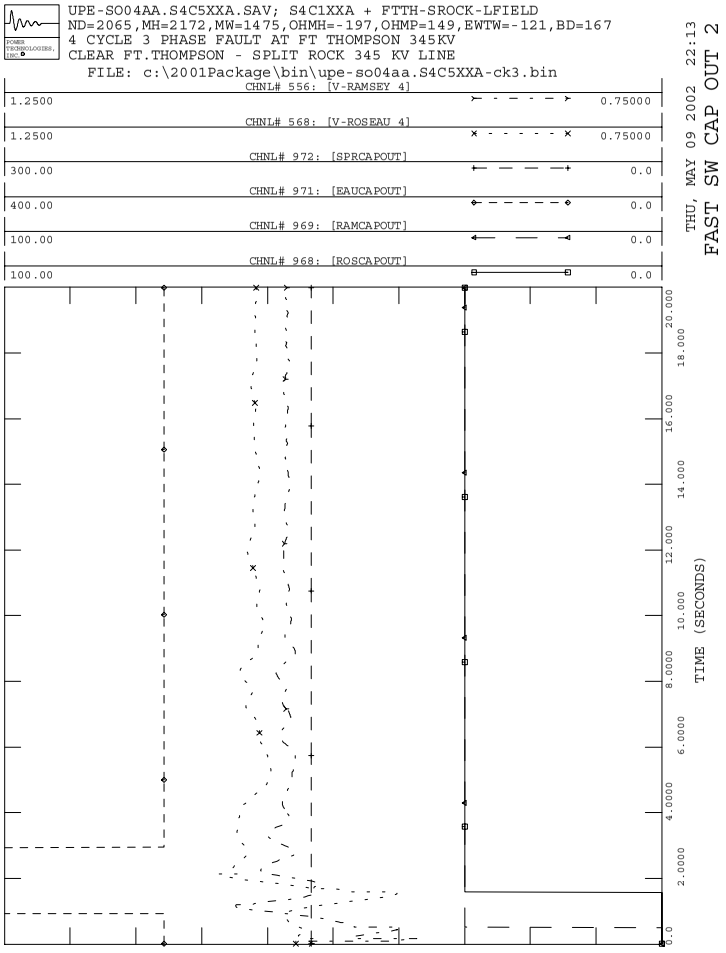
THU, MAY 09 2002 22:13
VOLTAGES 4

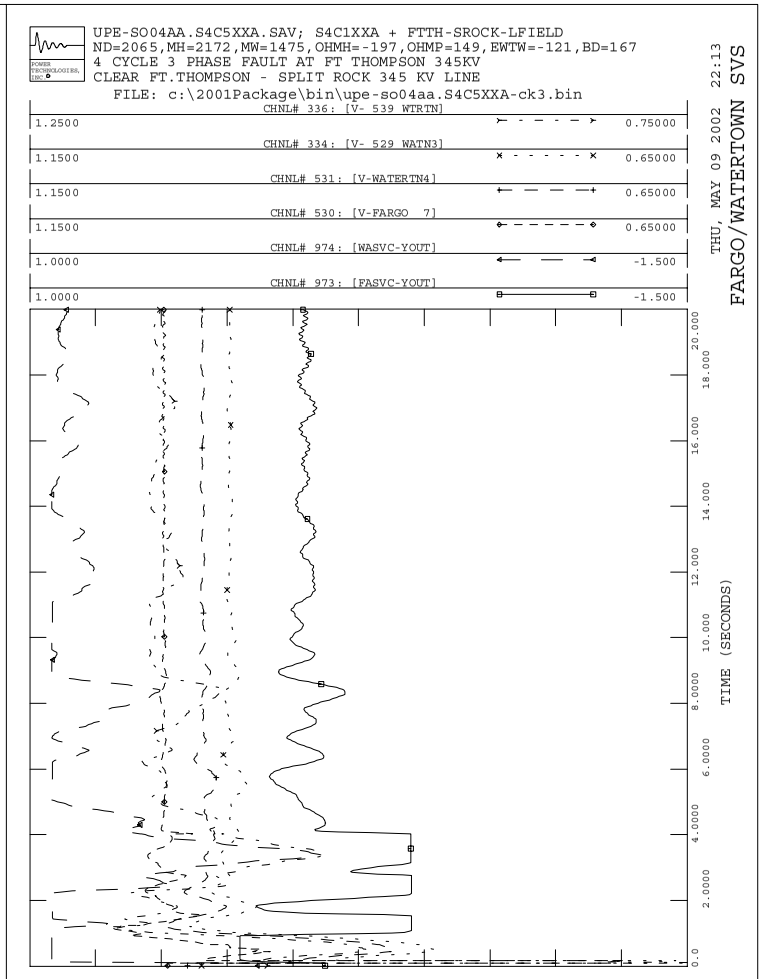


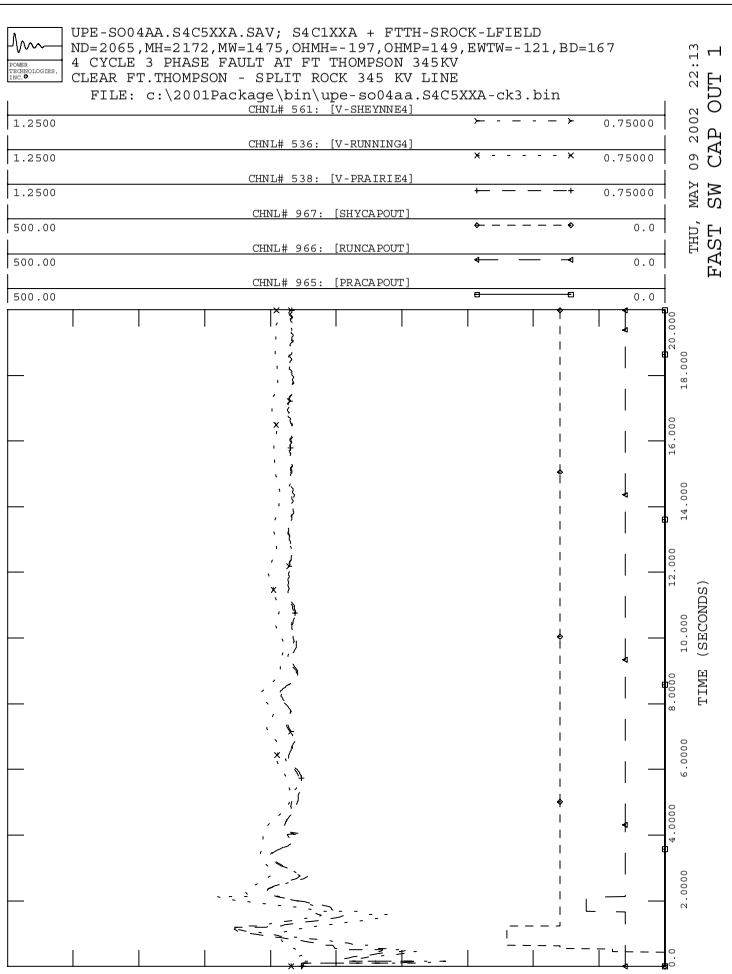
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

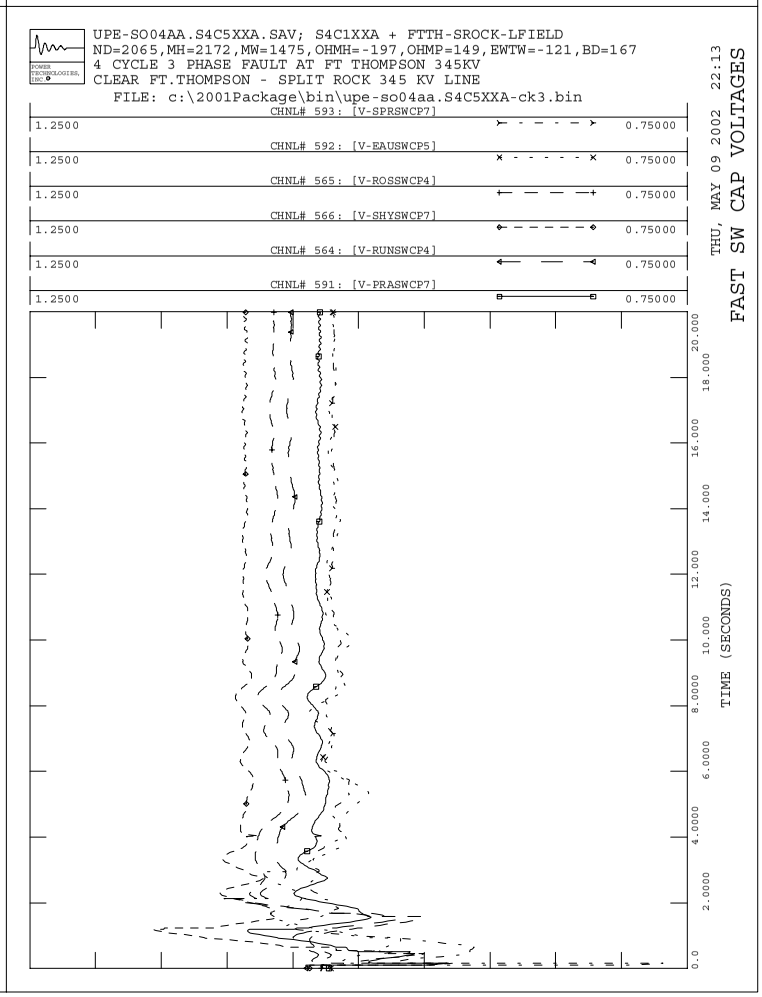
THU, MAY 09 2002 22:13
VOLTAGES NB




UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
THU, MAY 09 2002 22:13
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
THU, MAY 09 2002 22:13
FARGO/WATERTOWN SVS
TIME (SECONDS)

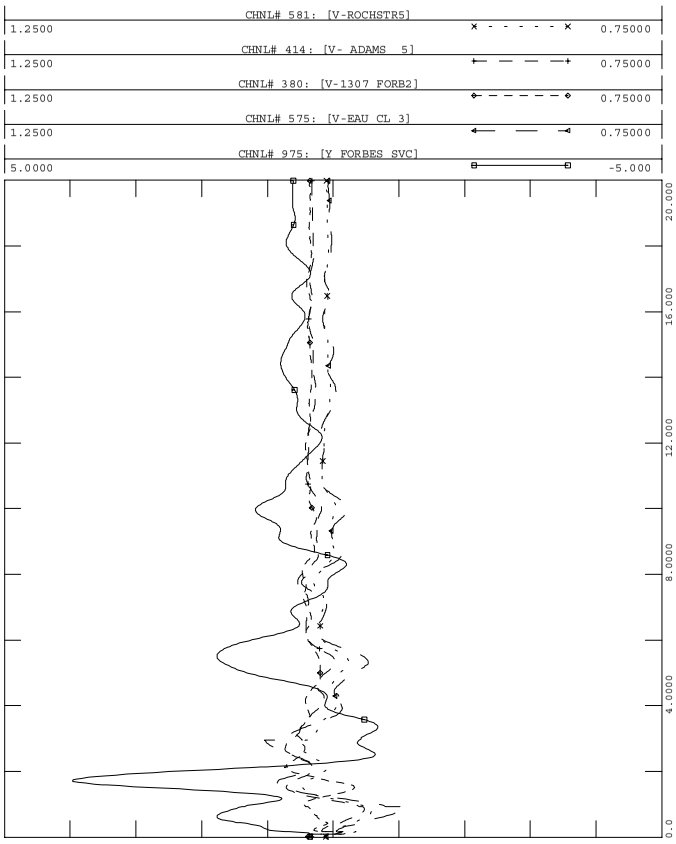

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
THU, MAY 09 2002 22:13
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
THU, MAY 09 2002 22:13
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13

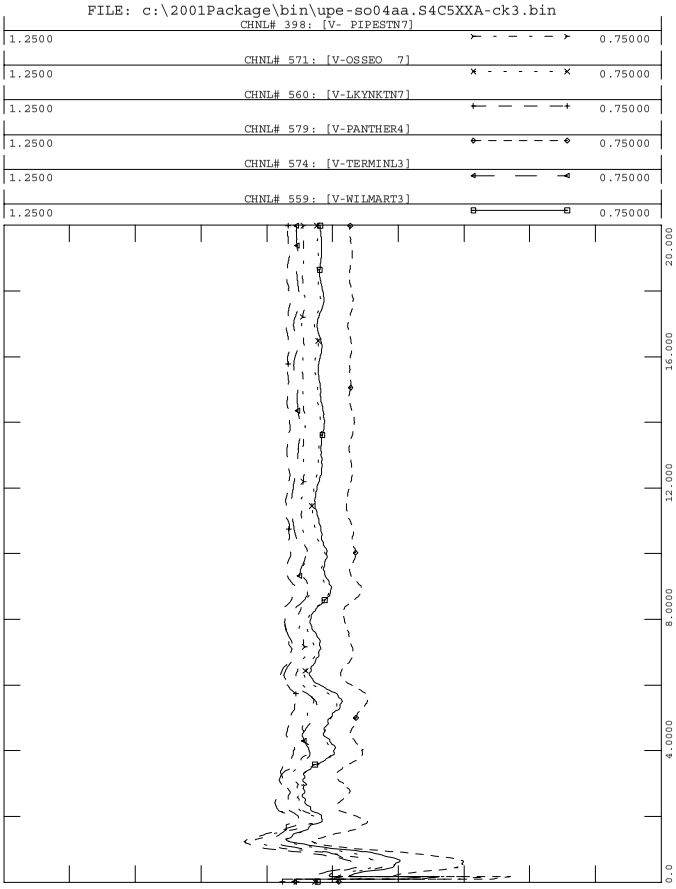
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13

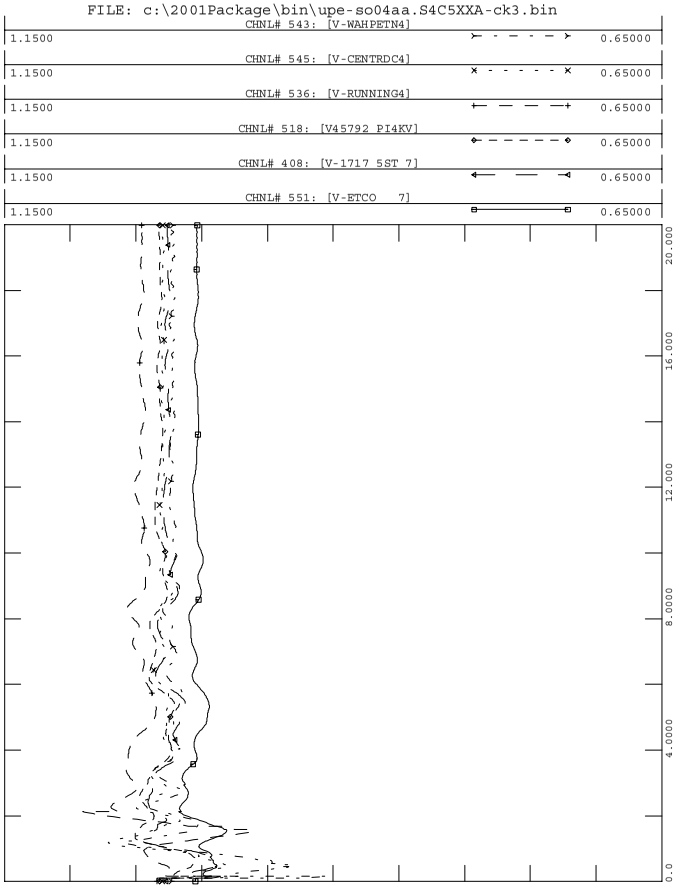
TC VOLTAGES



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13

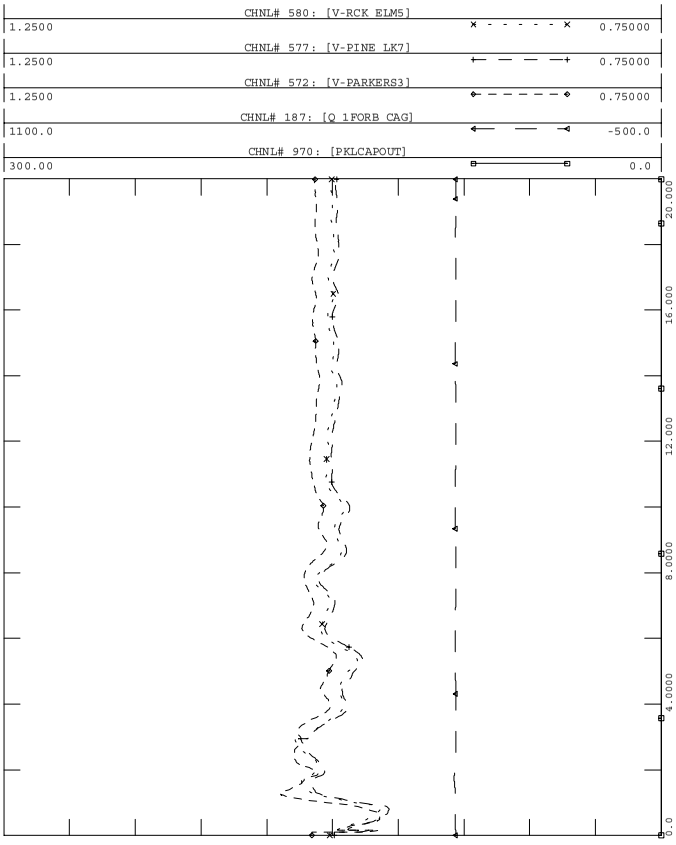
VOLTAGES 6



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

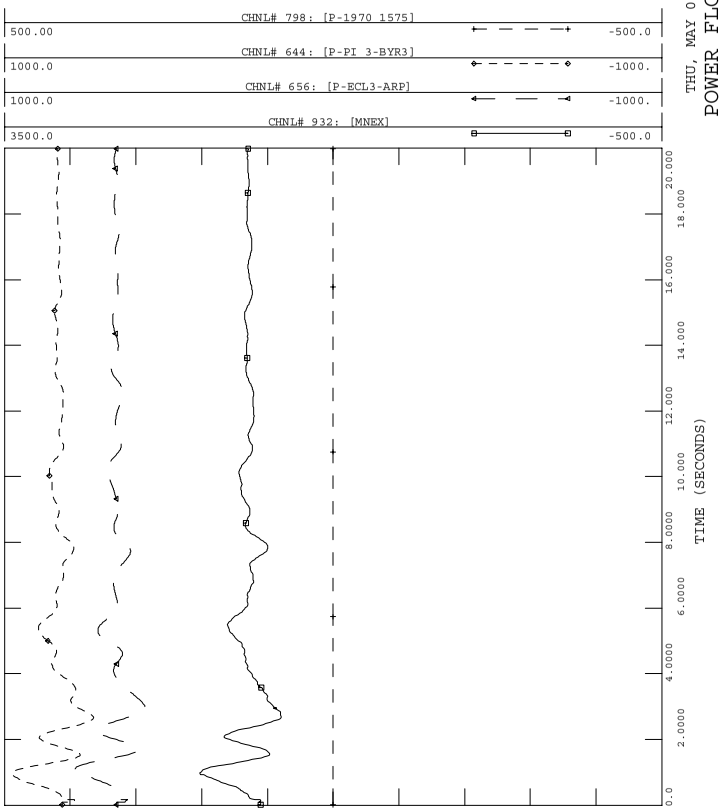
THU, MAY 09 2002 22:13

FORBES SVS OUT & VOLTAGES



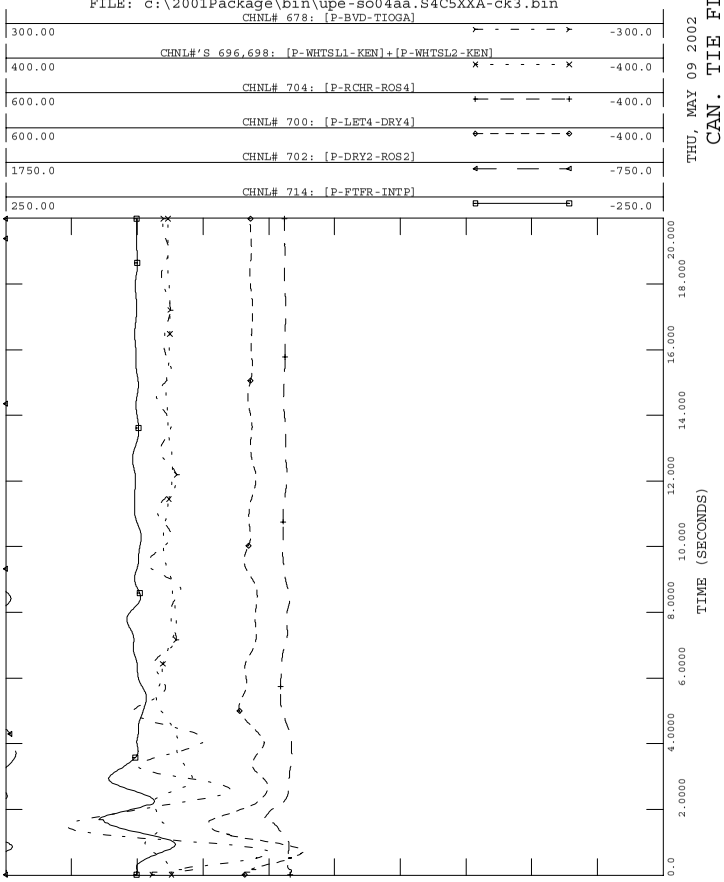
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
POWER FLOW SUMS 2



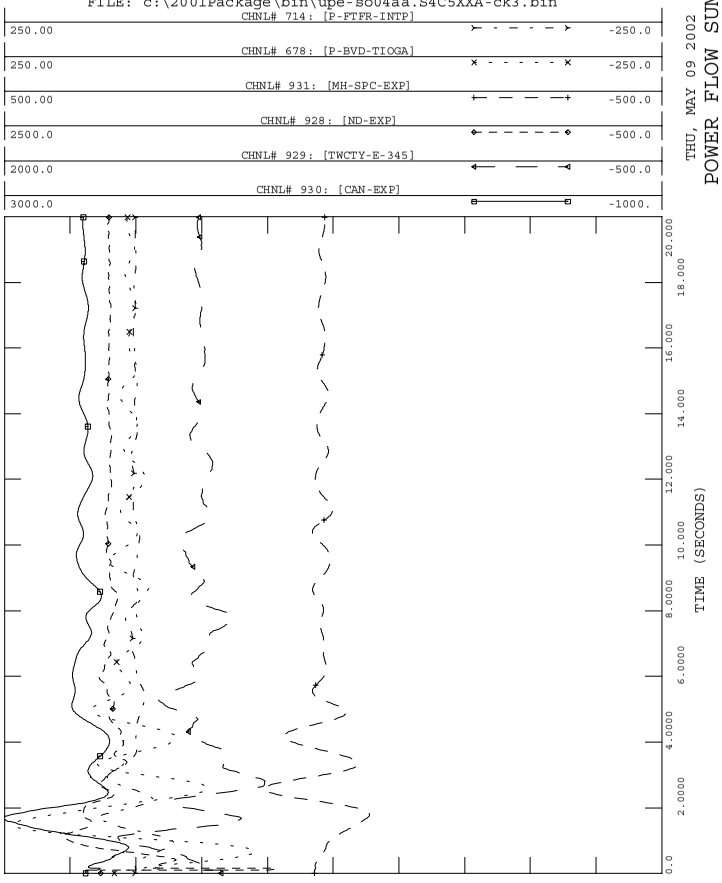
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
CAN. TIE FLOWS



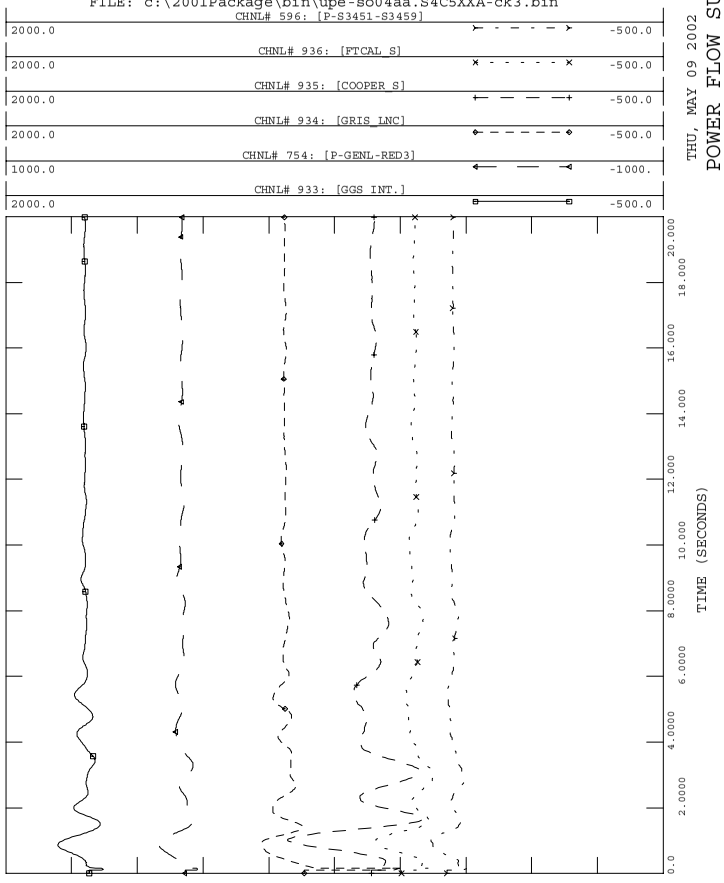
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
POWER FLOW SUMS 1



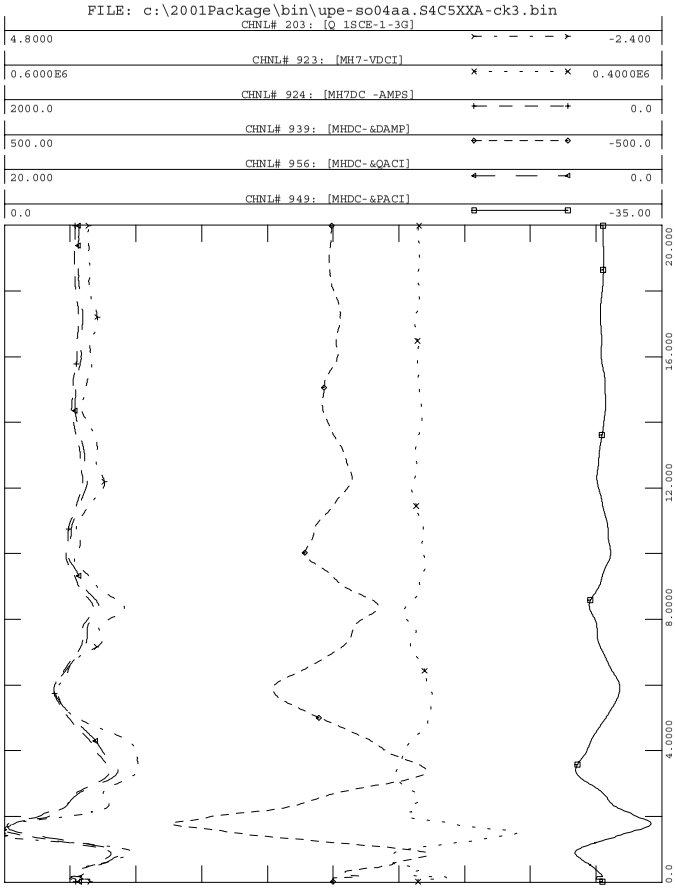
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
POWER FLOW SUM 3



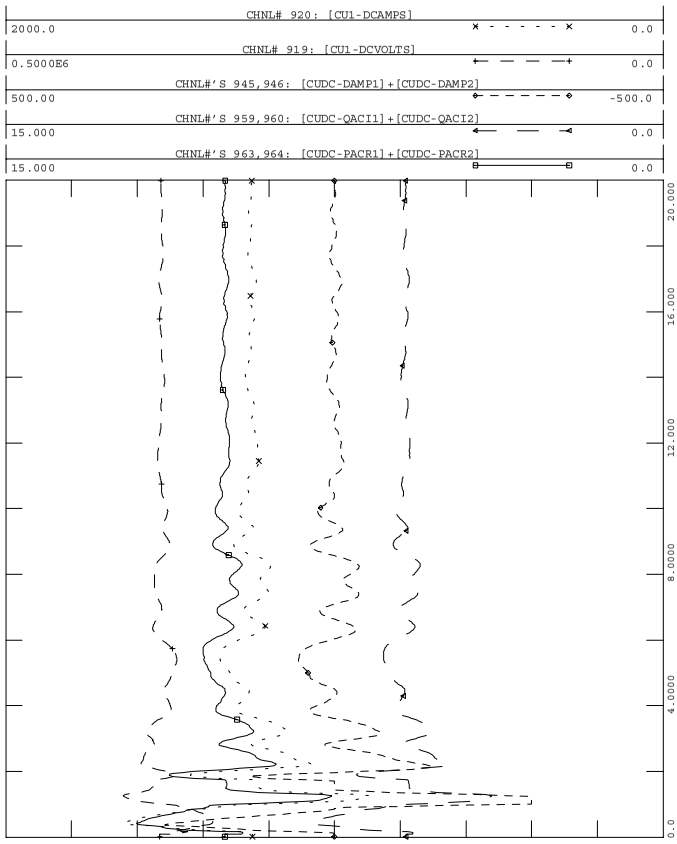
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
MH DC PARAMETERS



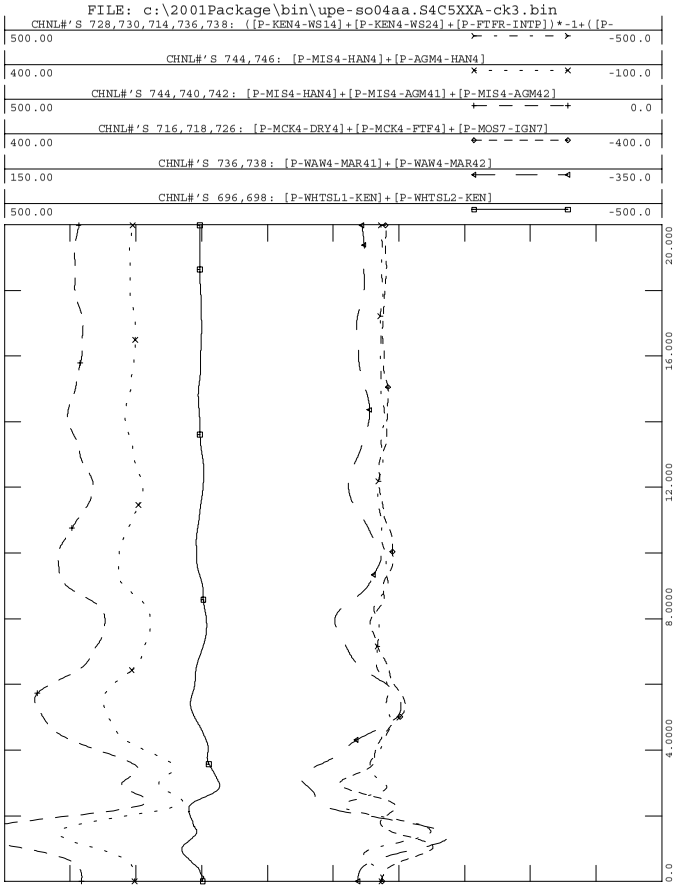
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
CU DC #1



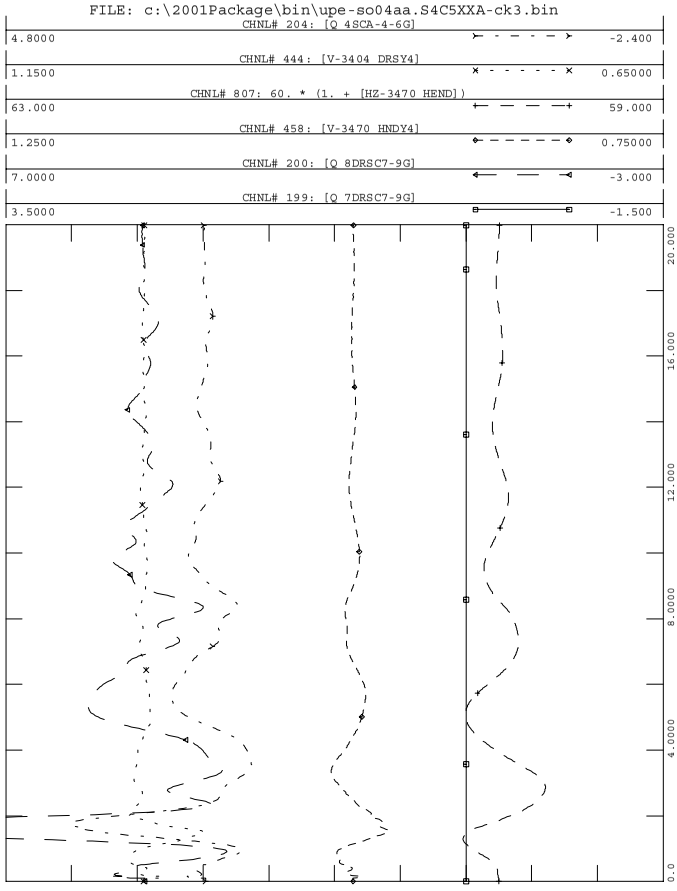
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
OH TIE FLOWS

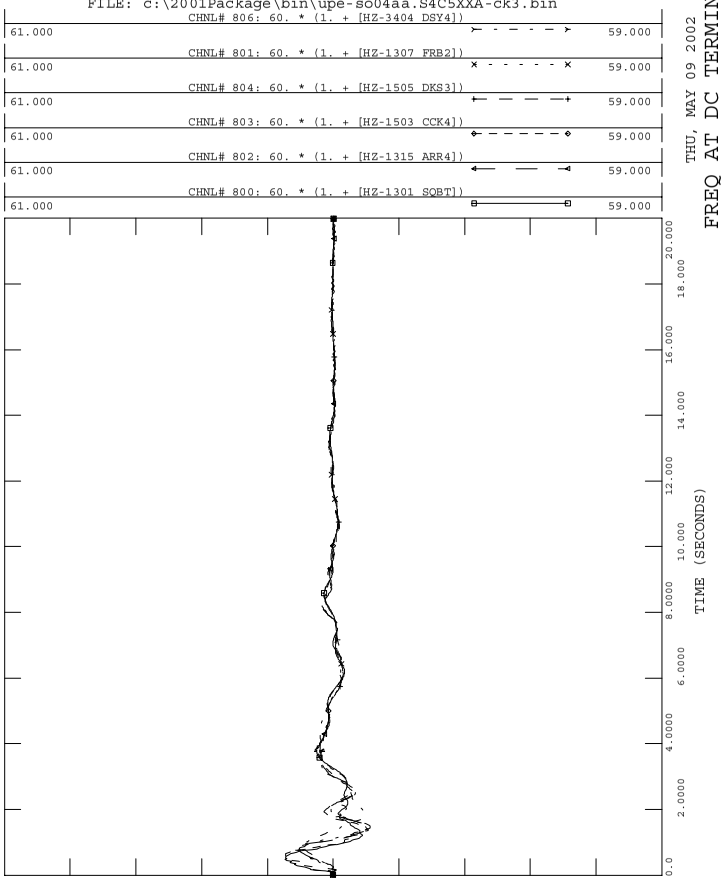


UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

THU, MAY 09 2002 22:13
MH DC PARAMETERS

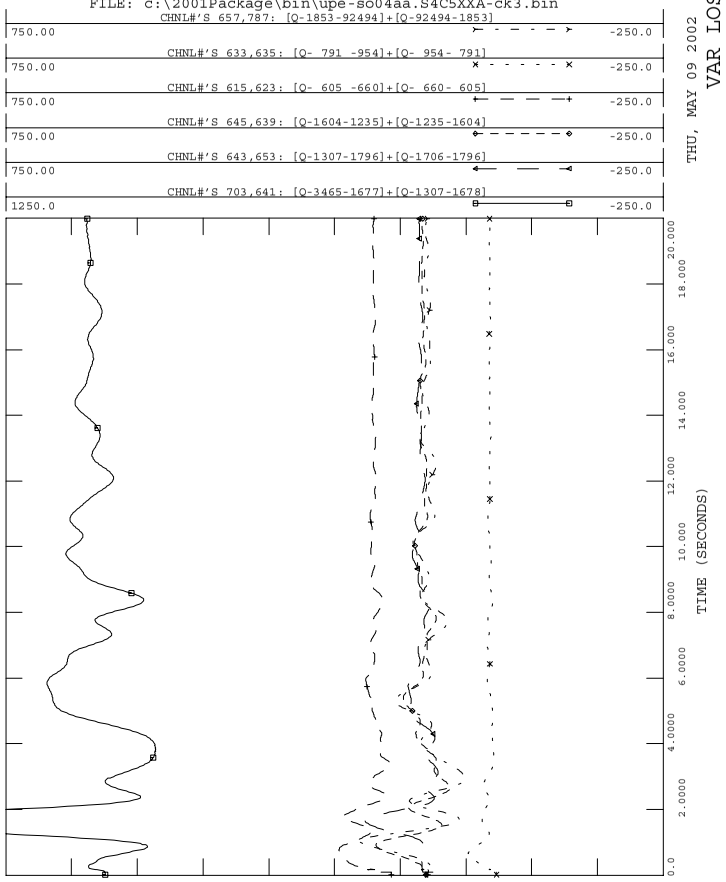


UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin



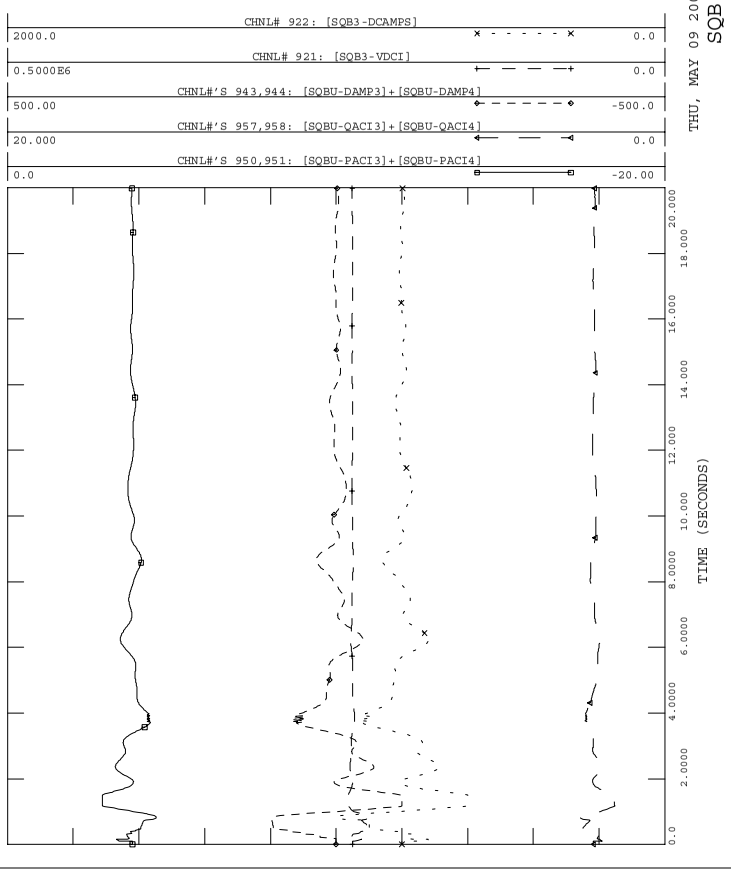
THU, MAY 09 2002 22:13
FREQ AT DC TERMINALS

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin



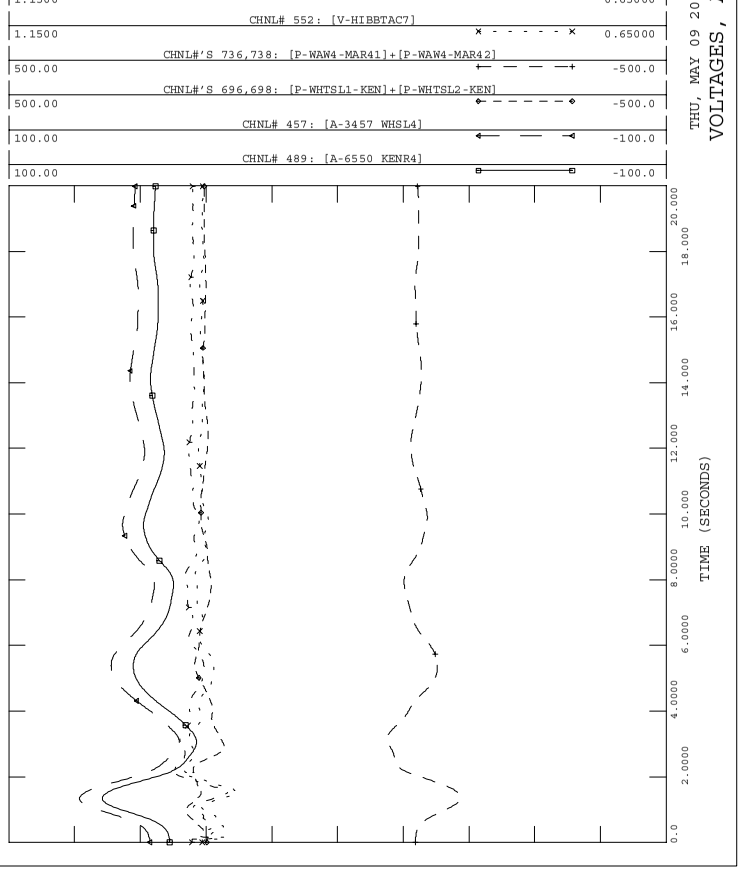
THU, MAY 09 2002 22:13
VAR LOSSES

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin



THU, MAY 09 2002 22:13
SQB DC #3

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

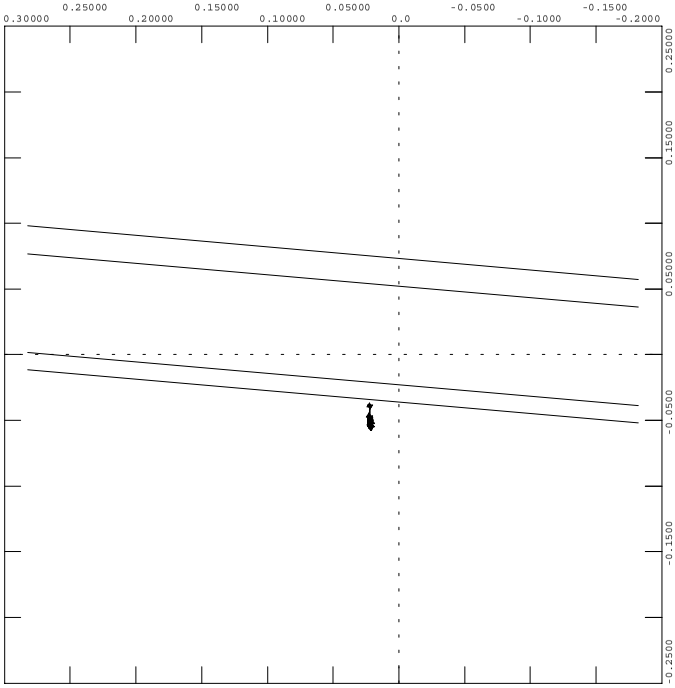


THU, MAY 09 2002 22:13
VOLTAGES, ANGLES

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, MAY 09 2002 22:13
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

RELAY: RELAYG
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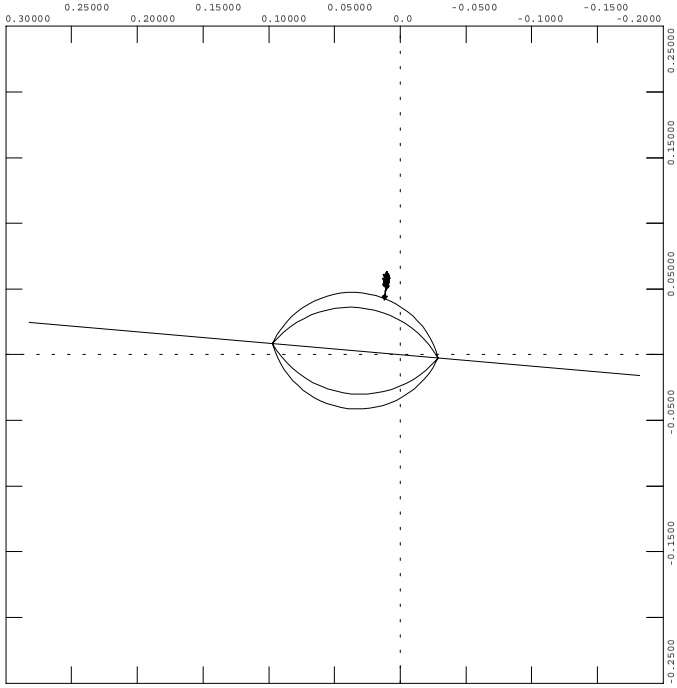

THU, MAY 09 2002 22:13
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

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ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

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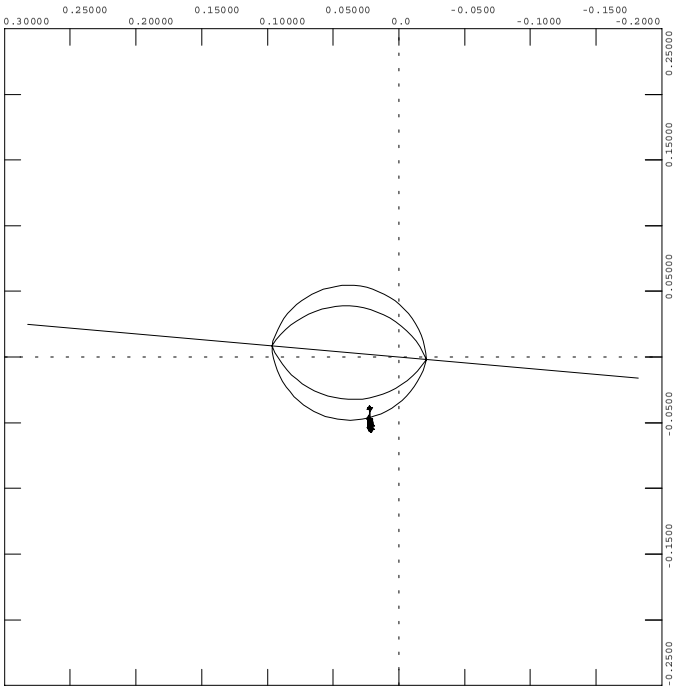
CHNL# 824: [X-FRB2-ROS2]

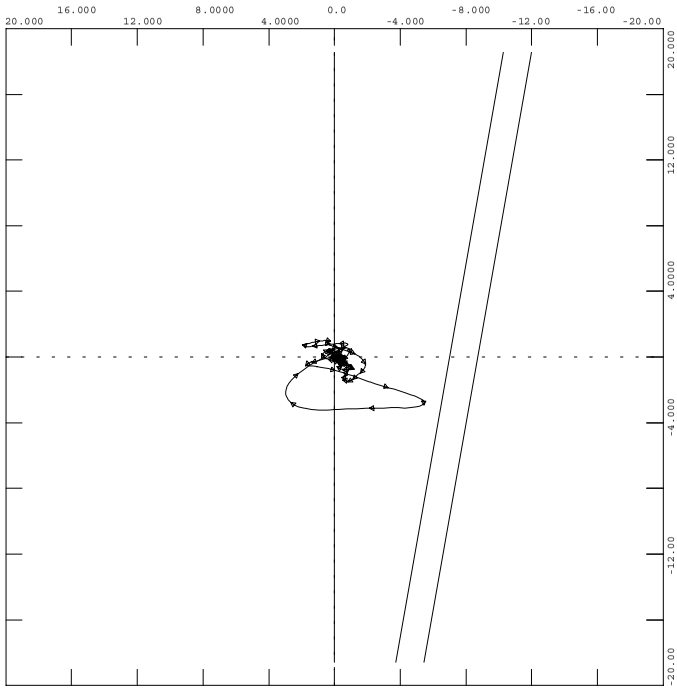


THU, MAY 09 2002 22:13
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

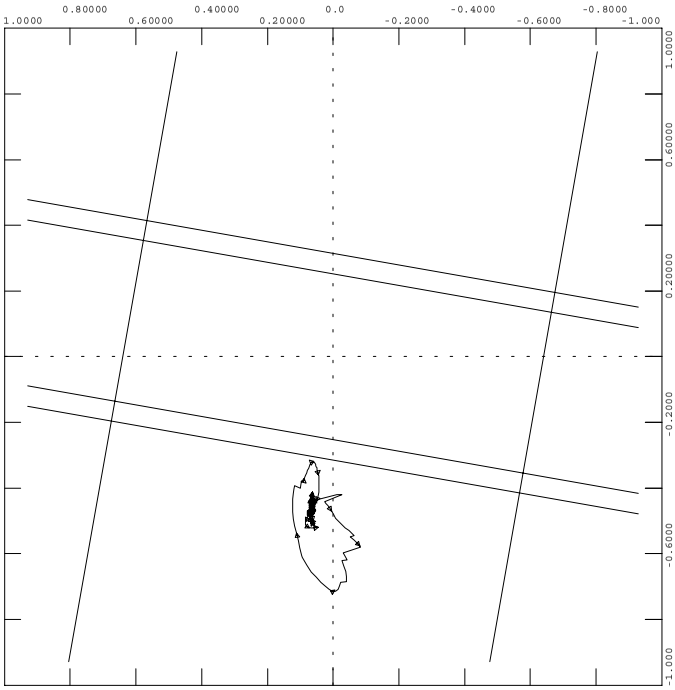


THU, MAY 09 2002 22:13
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

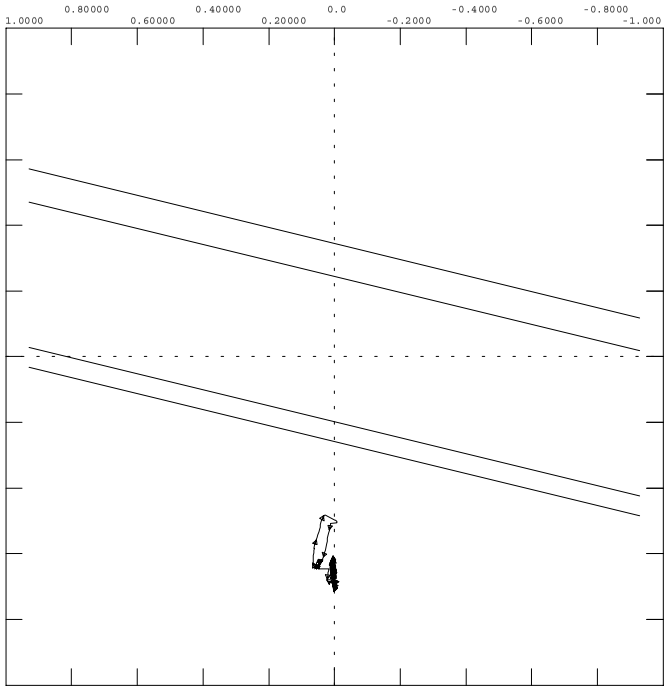
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

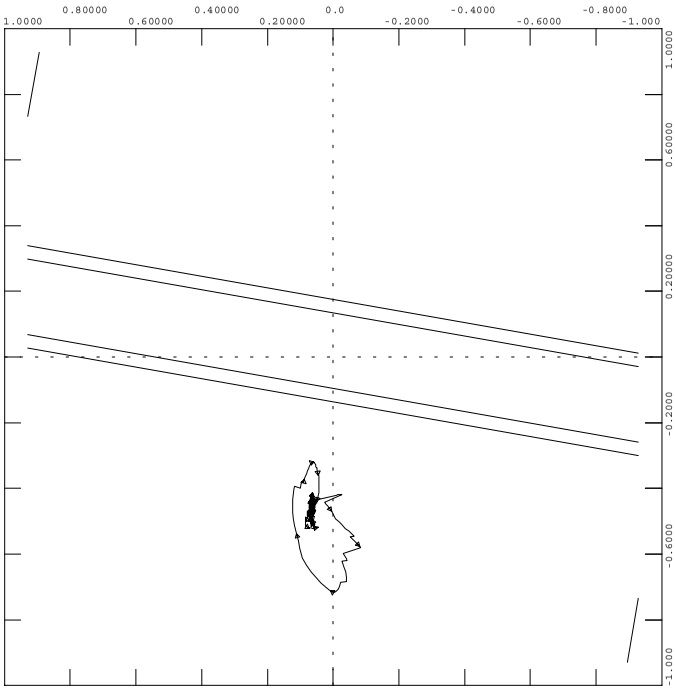
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

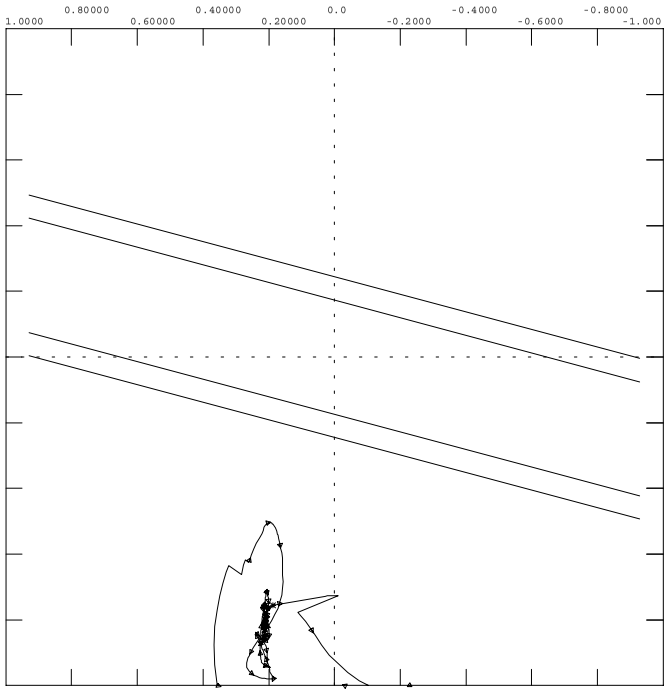
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

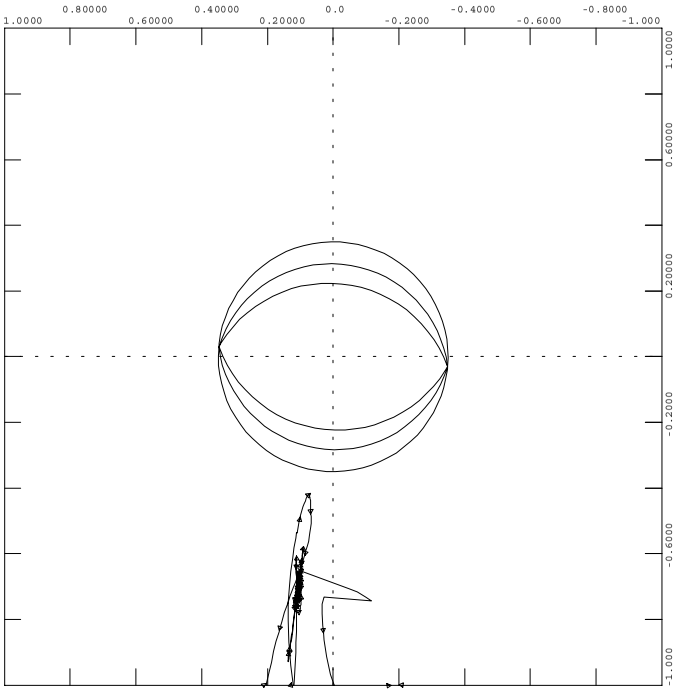
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

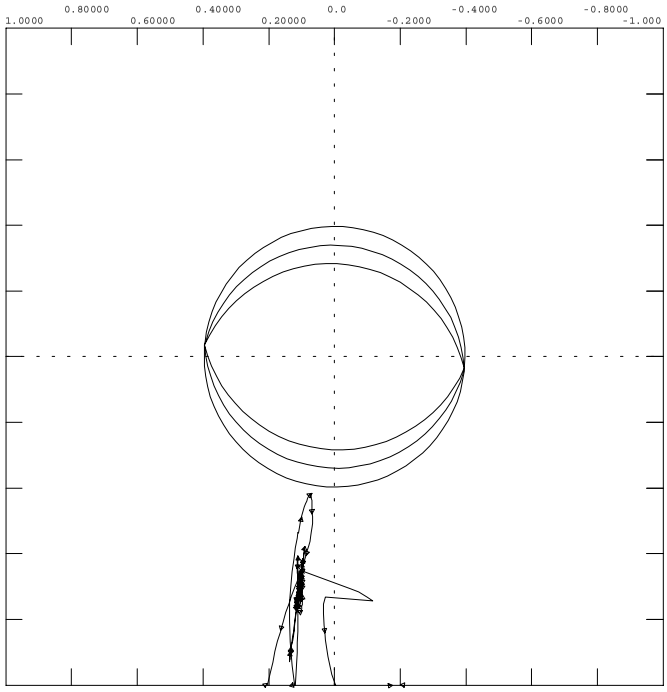
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

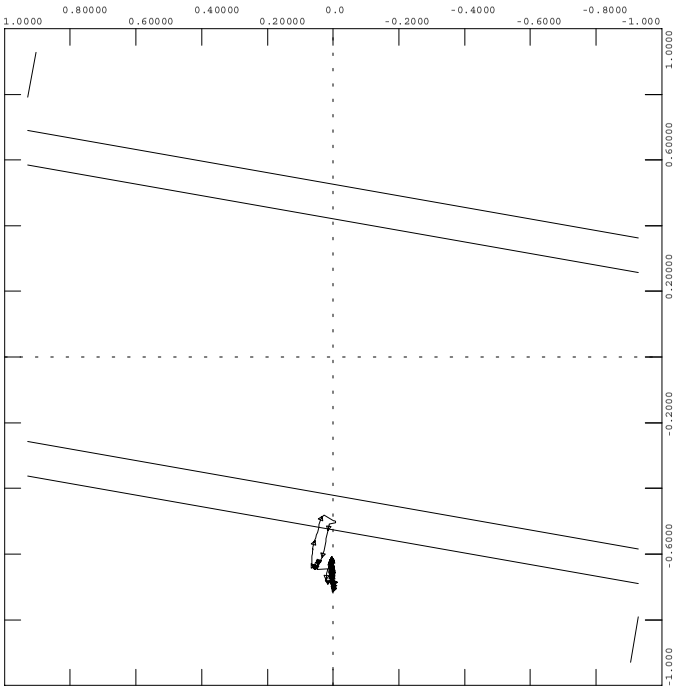
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

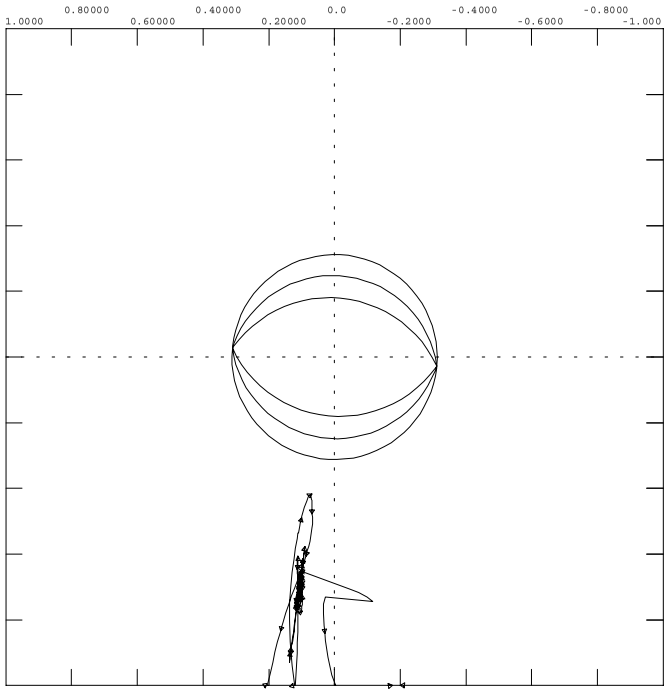
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



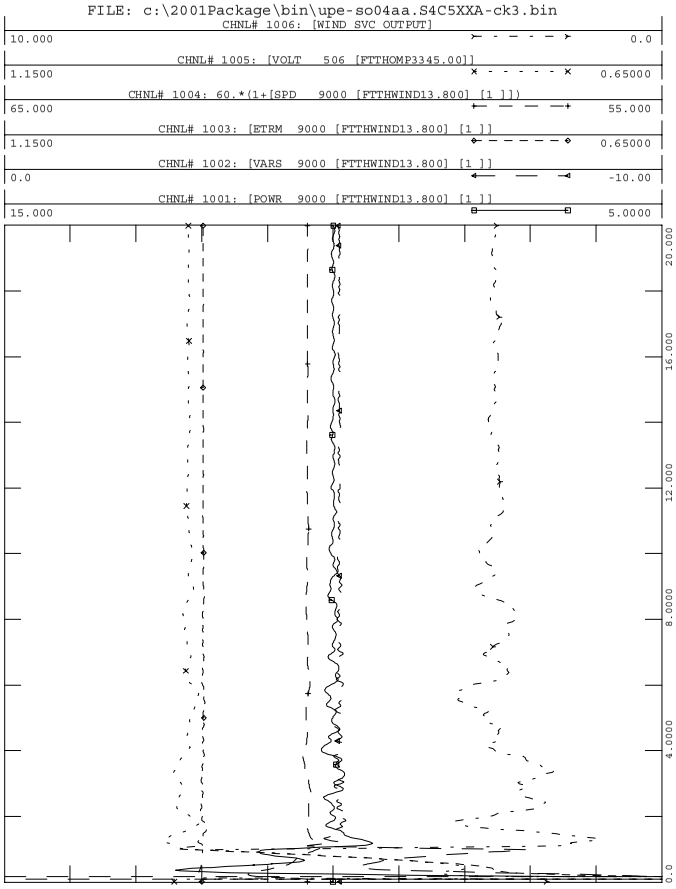
UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

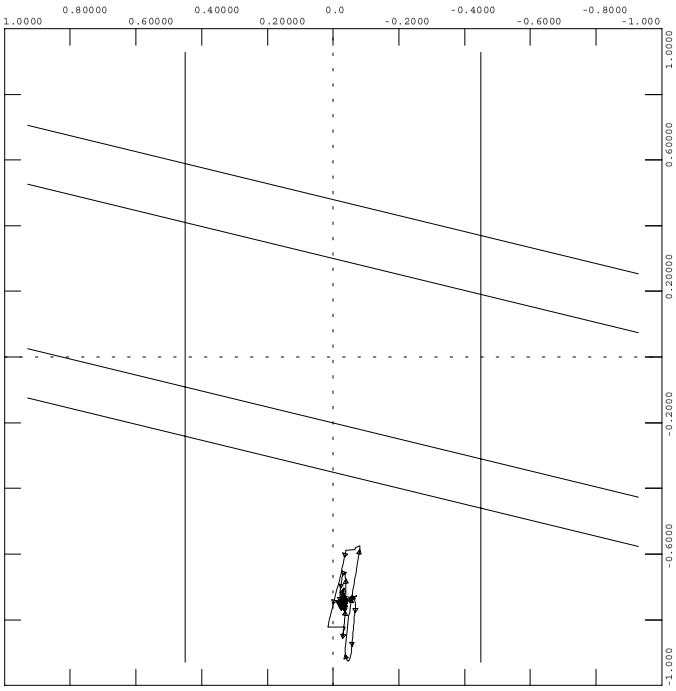


THU, MAY 09 2002 22:13
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C5XXA-ck3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



THU, MAY 09 2002 22:13
MP-OH I.FALLS (779)

APPENDIX 29

SCREENING OF MAPP CONTINGENCIES

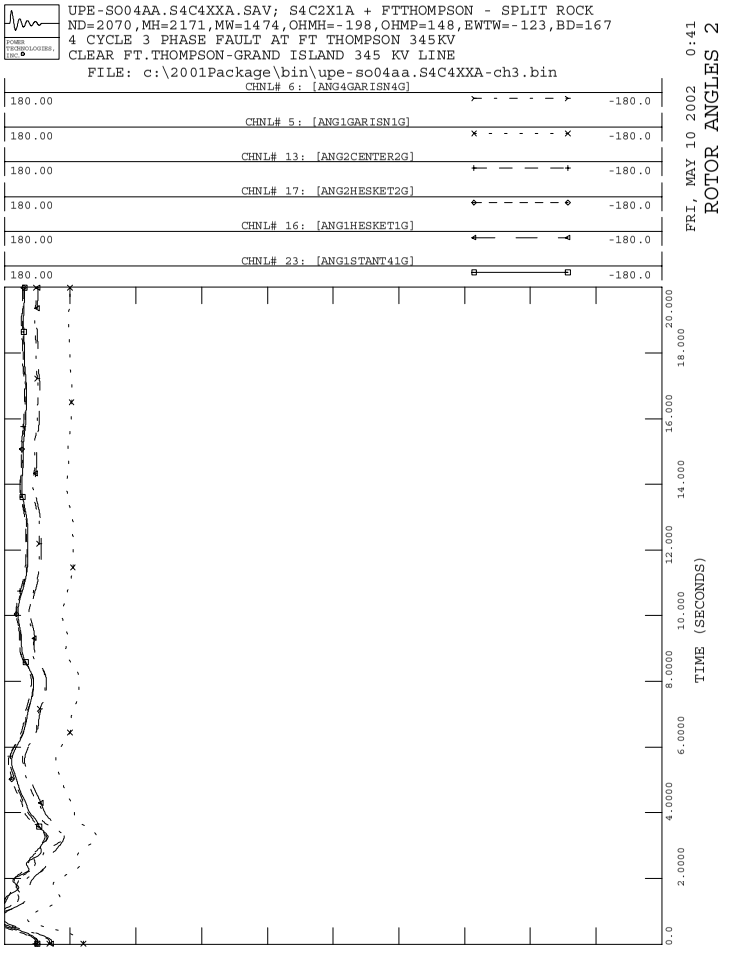
WITH DYNAMIC SIMULATION

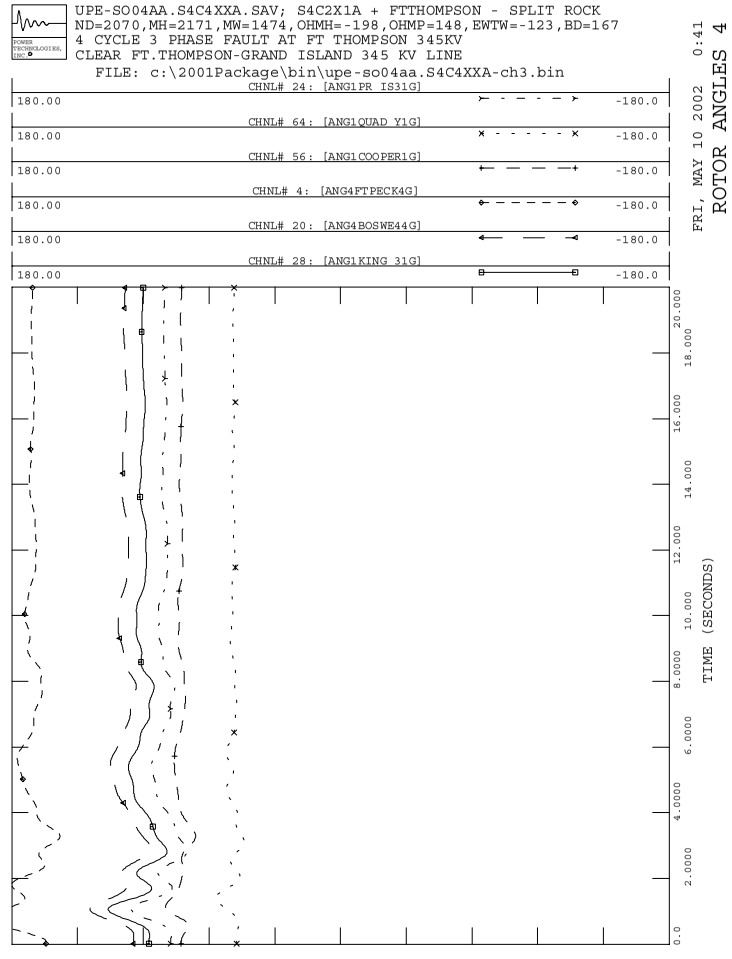
SITE 4 (FT. THOMPSON)

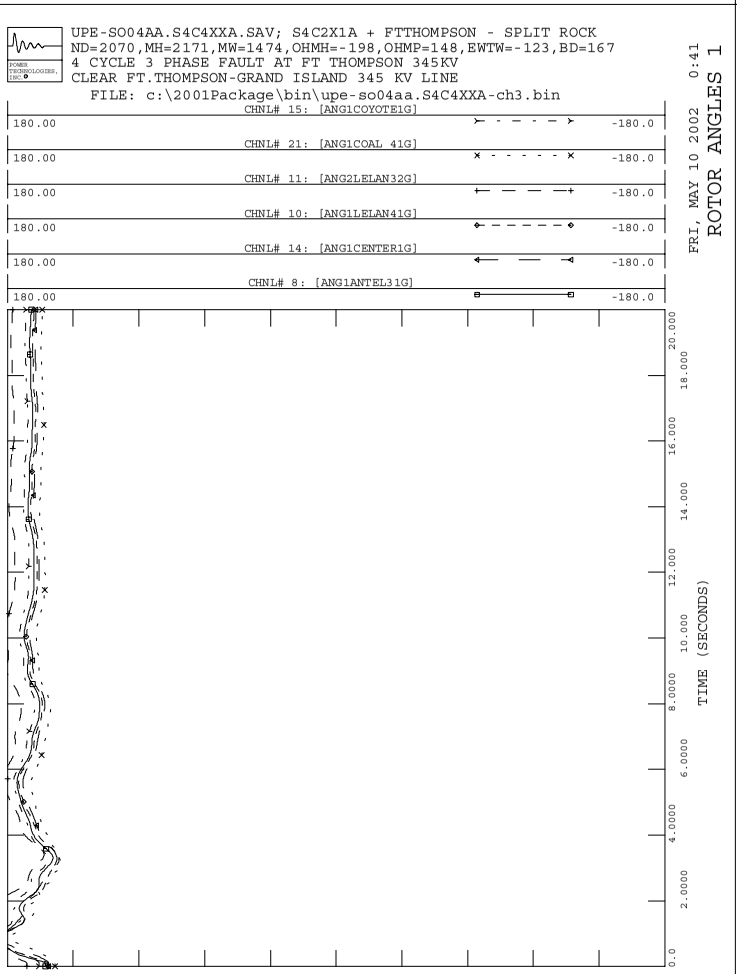
CASE S4C4XXA

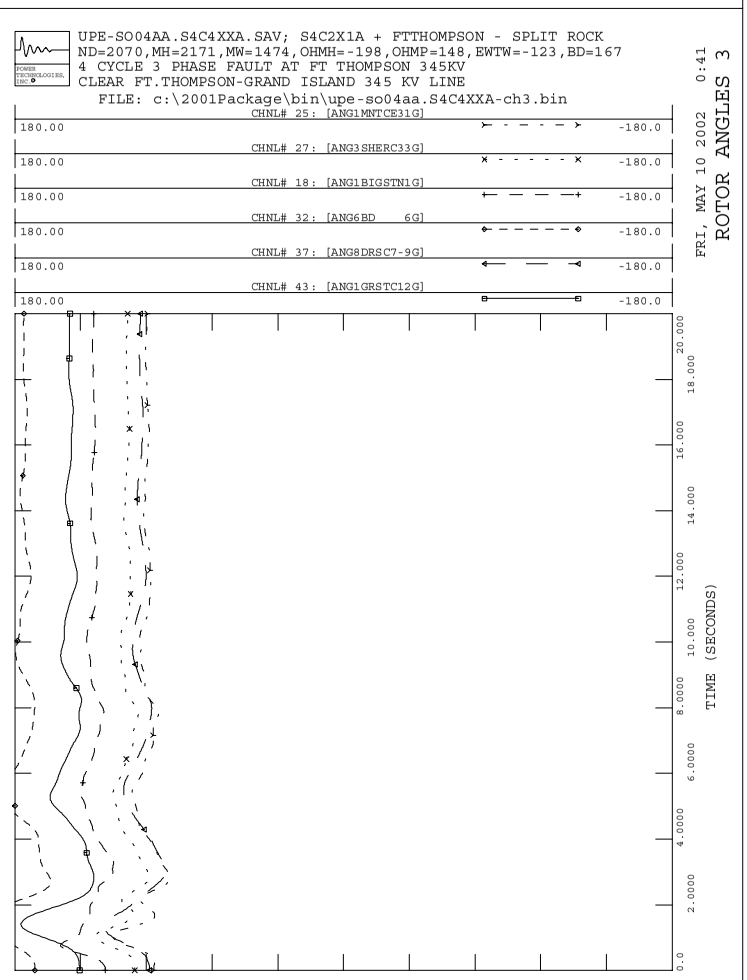
CONTINGENCY CH3

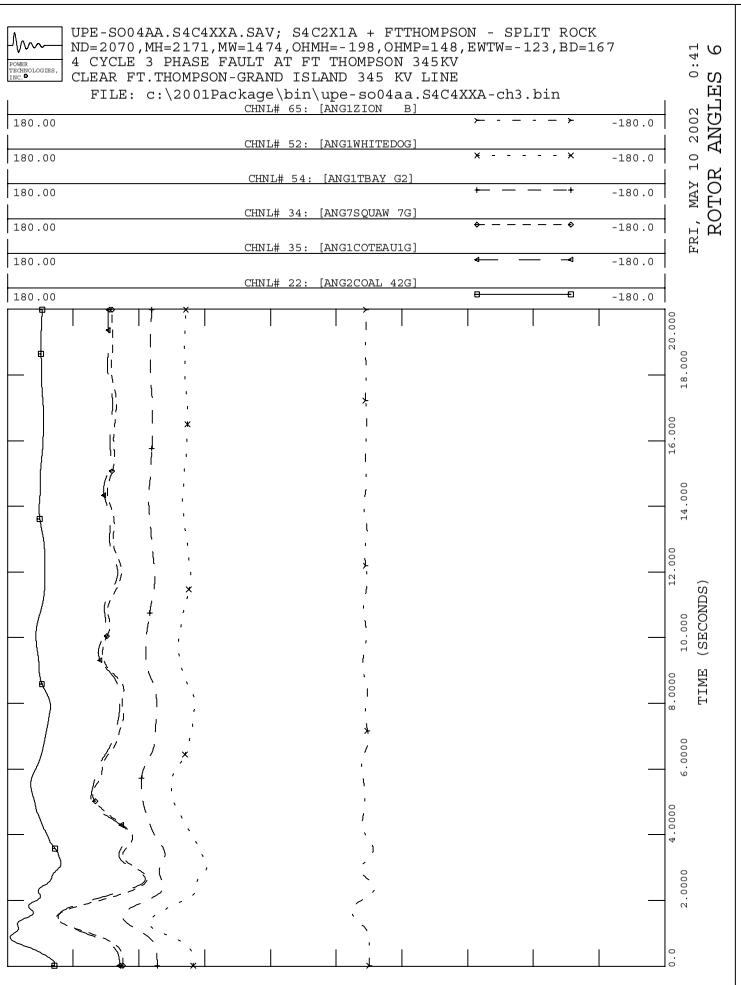
4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Grand Island 345 kV line

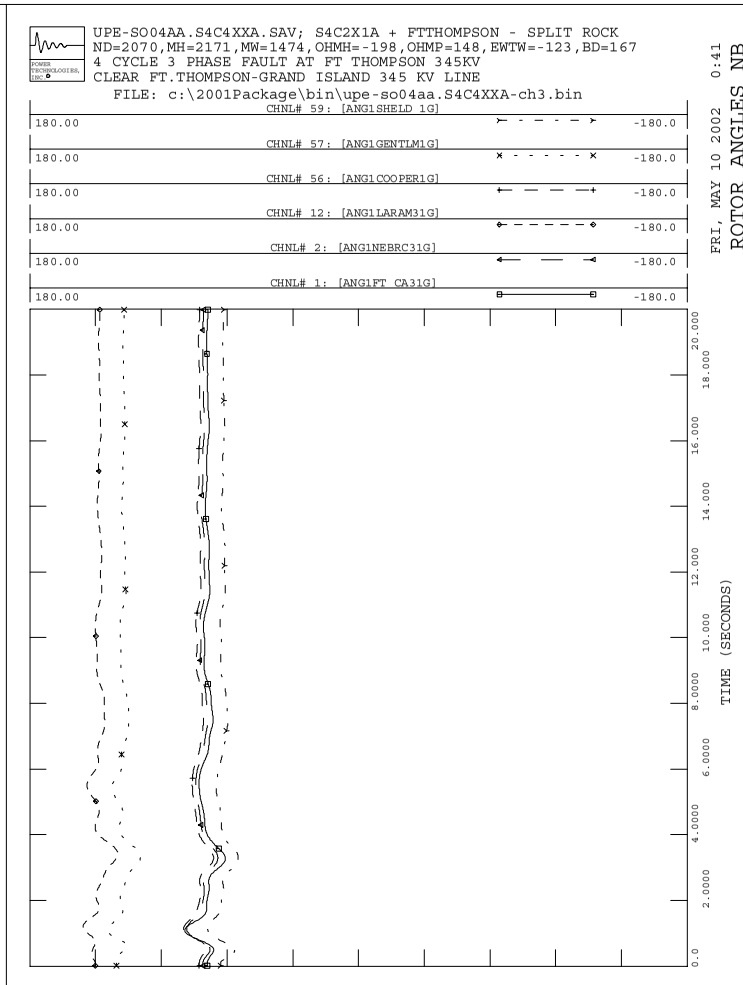

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 0:41
ROTOR ANGLES 2

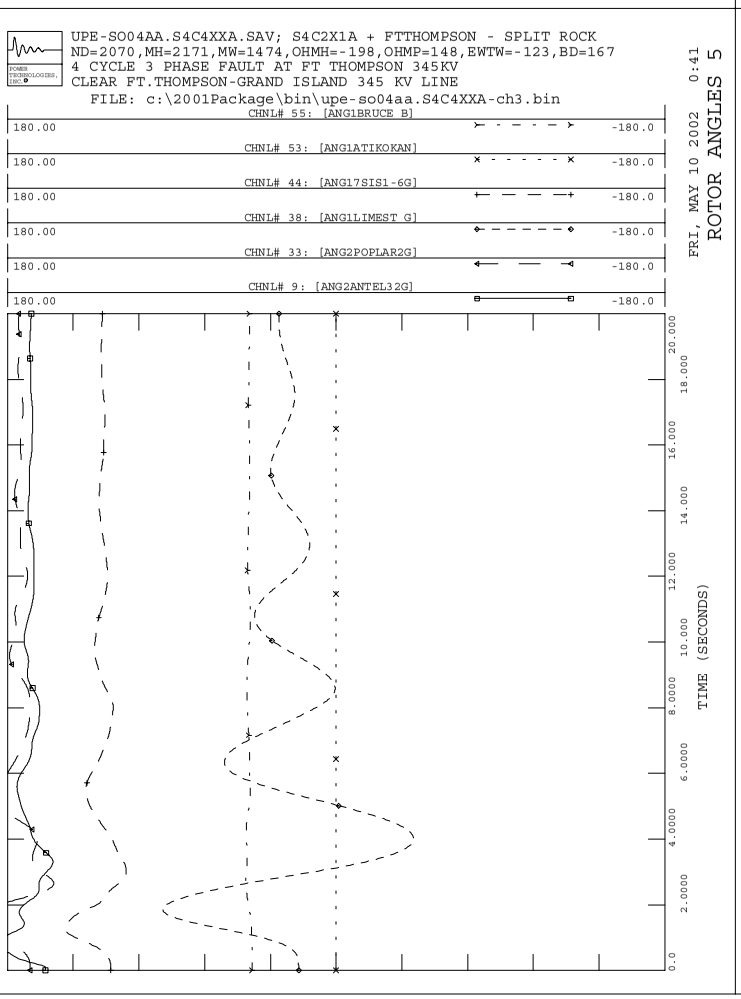

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 0:41
ROTOR ANGLES 4

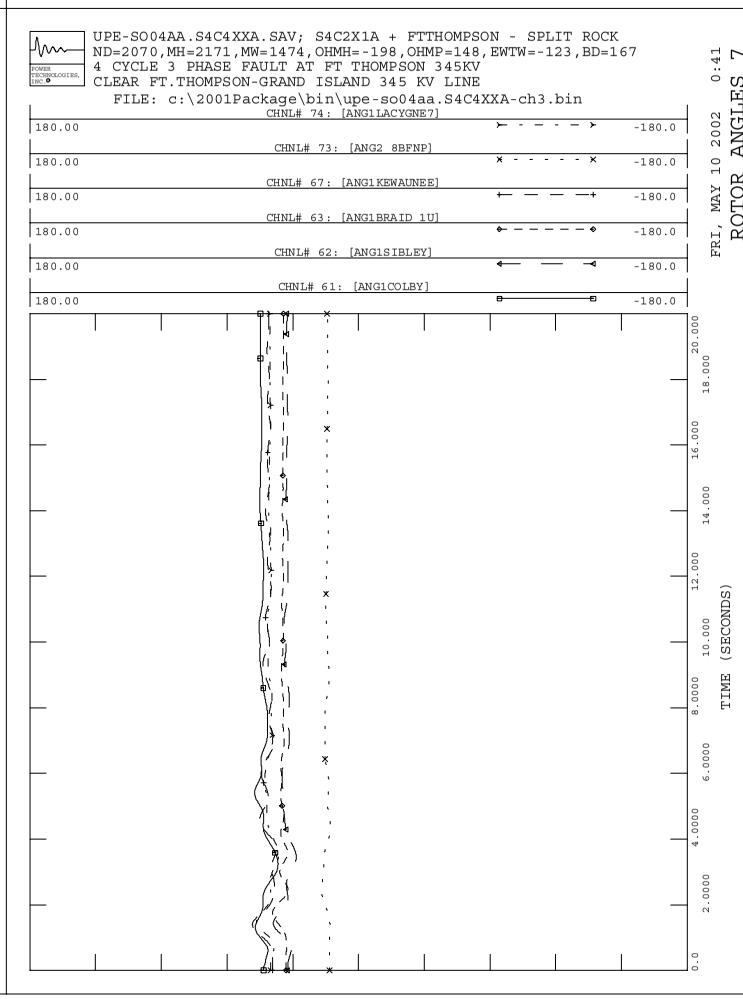

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 0:41
ROTOR ANGLES 1


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 0:41
ROTOR ANGLES 3


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
FRI, MAY 10 2002 0:41
ROTOR ANGLES 6
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

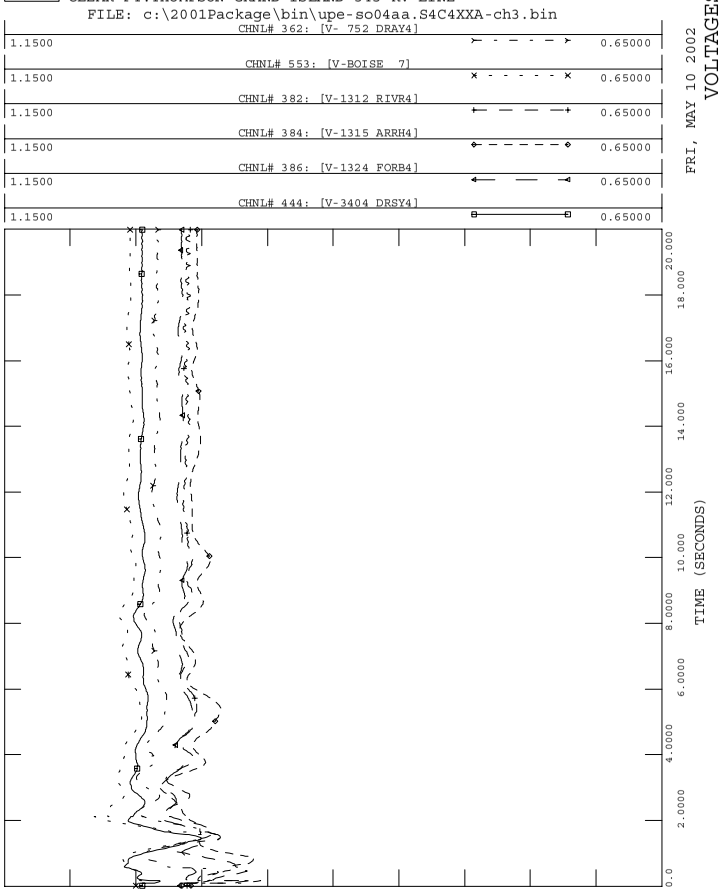

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
FRI, MAY 10 2002 0:41
ROTOR ANGLES NB
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
FRI, MAY 10 2002 0:41
ROTOR ANGLES 5
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
FRI, MAY 10 2002 0:41
ROTOR ANGLES 7
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

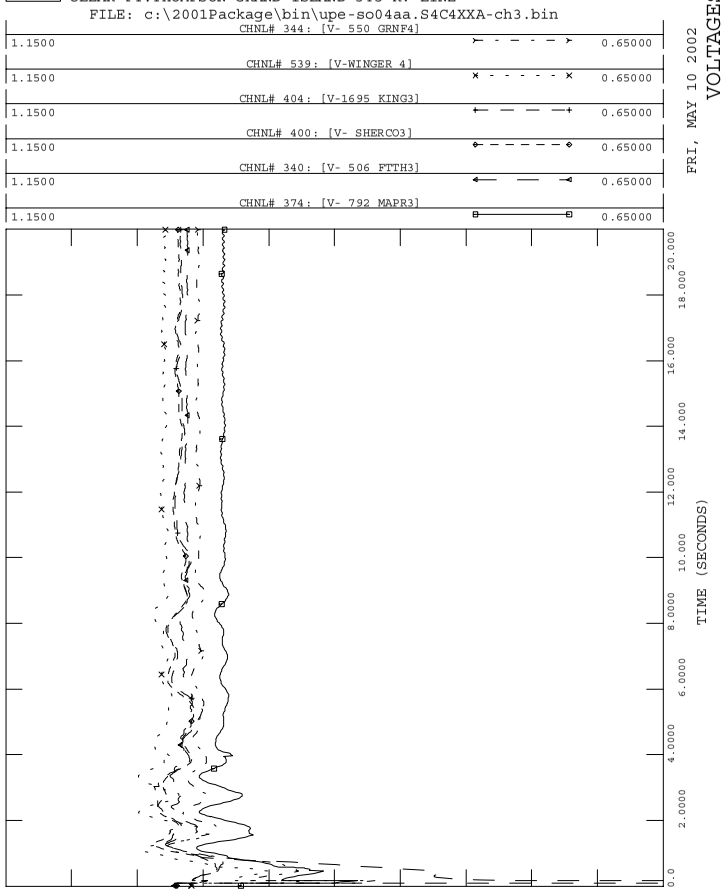
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41
VOLTAGES 1



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41
VOLTAGES 3



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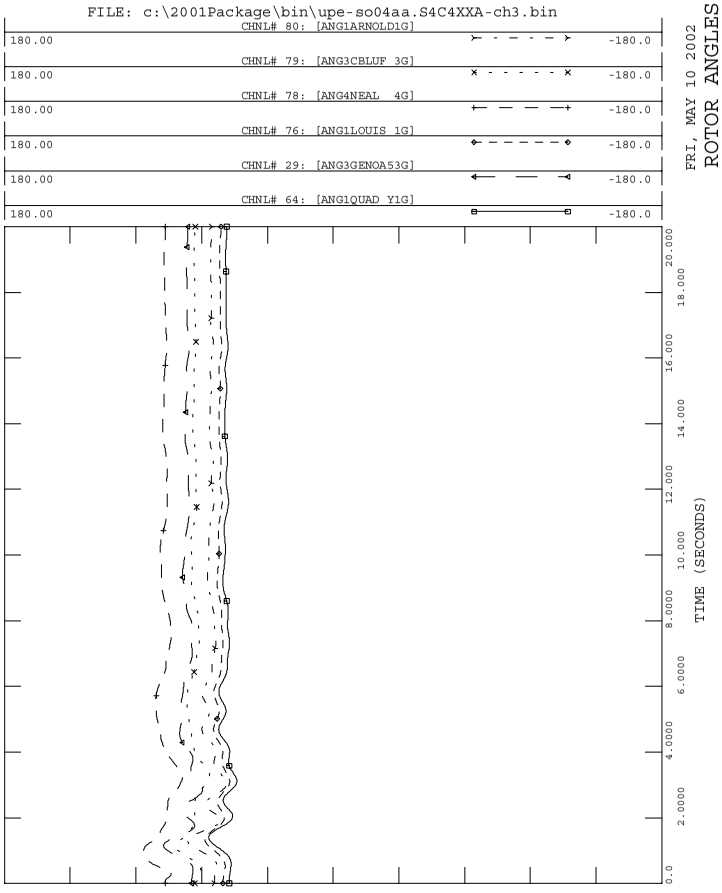
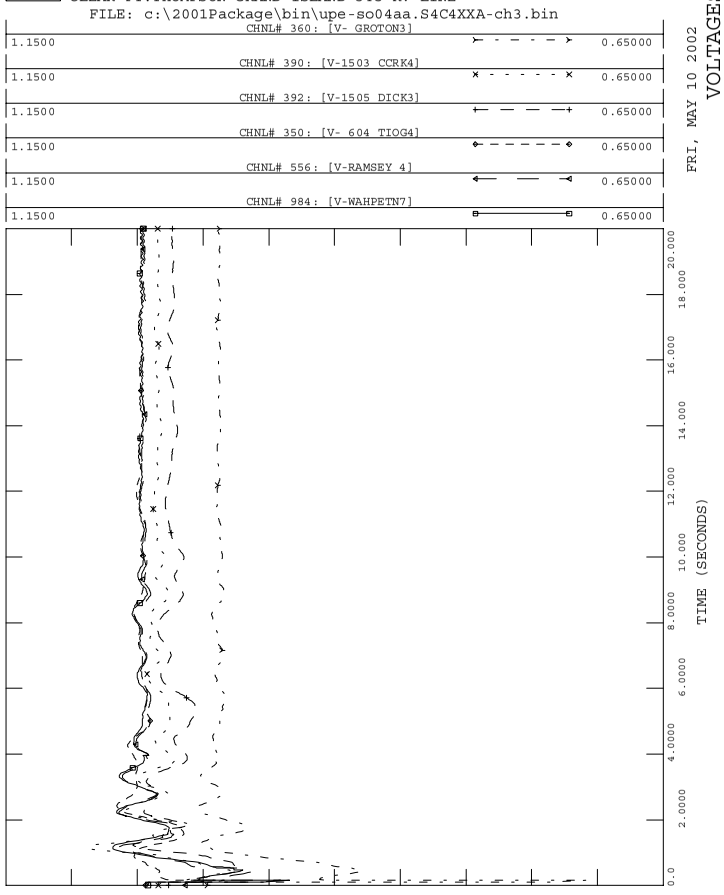
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41
ROTOR ANGLES IA



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

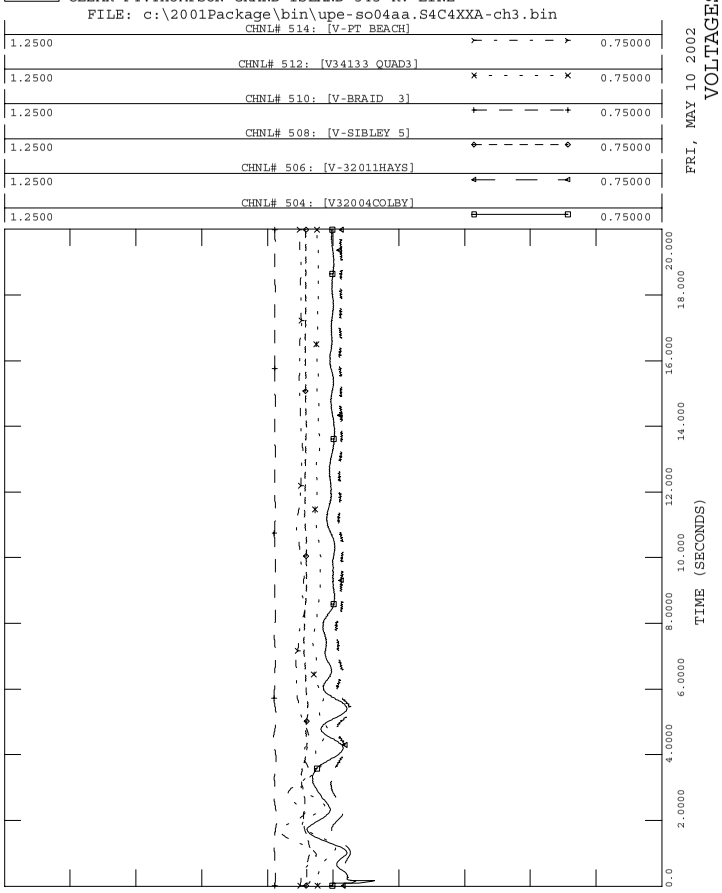
FRI, MAY 10 2002 0:41
VOLTAGES 2



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41

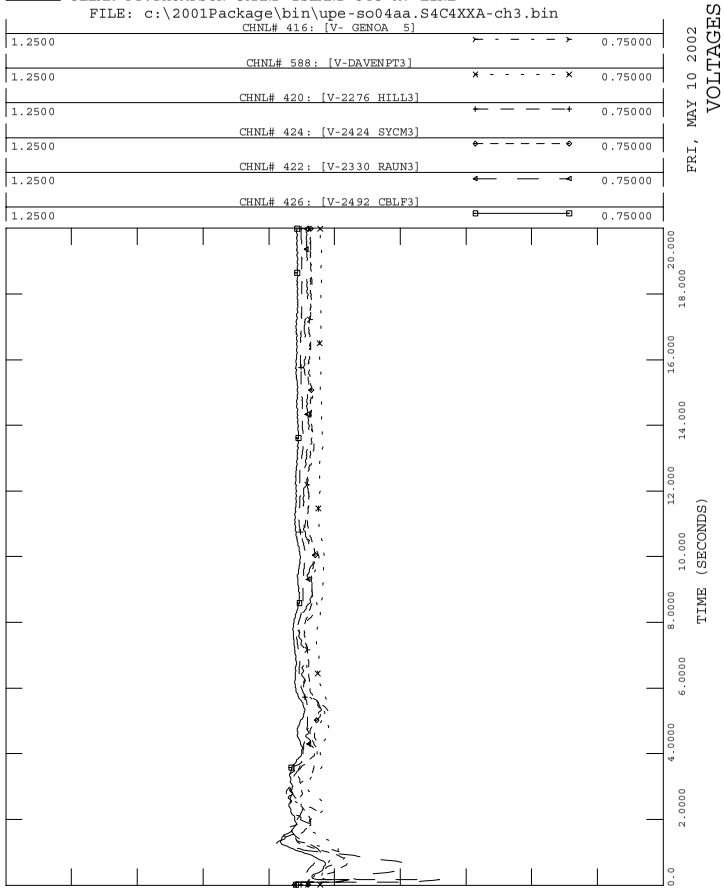
VOLTAGES 5



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41

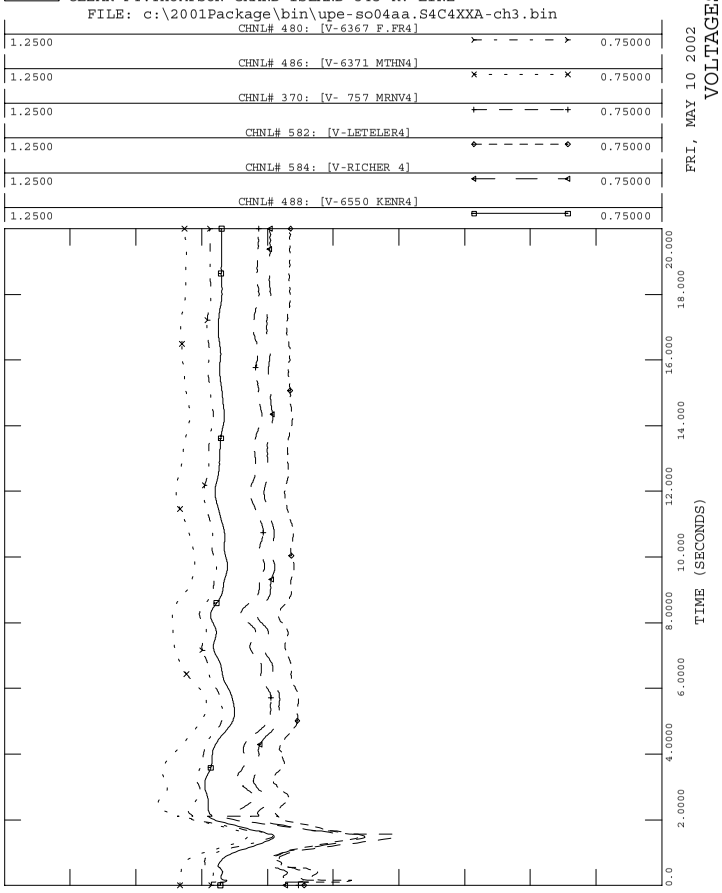
VOLTAGES IA



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41

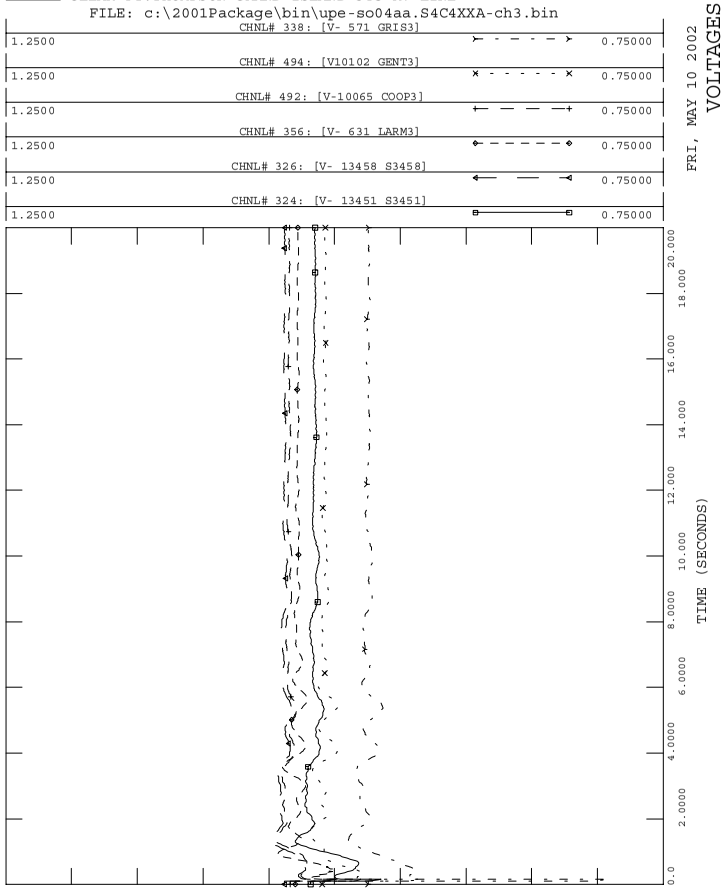
VOLTAGES 4

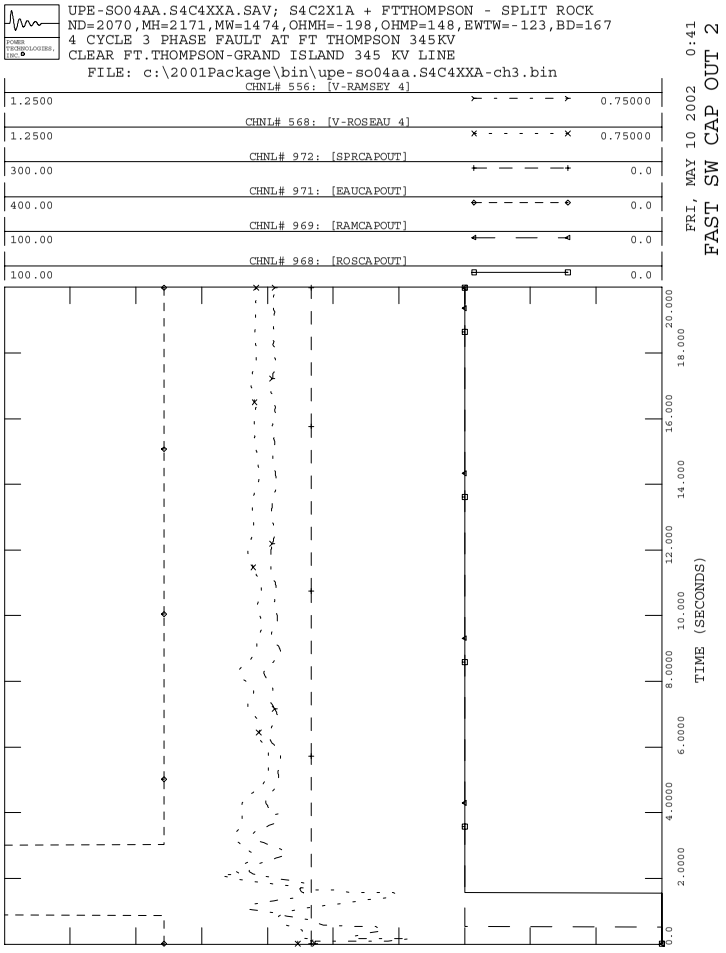


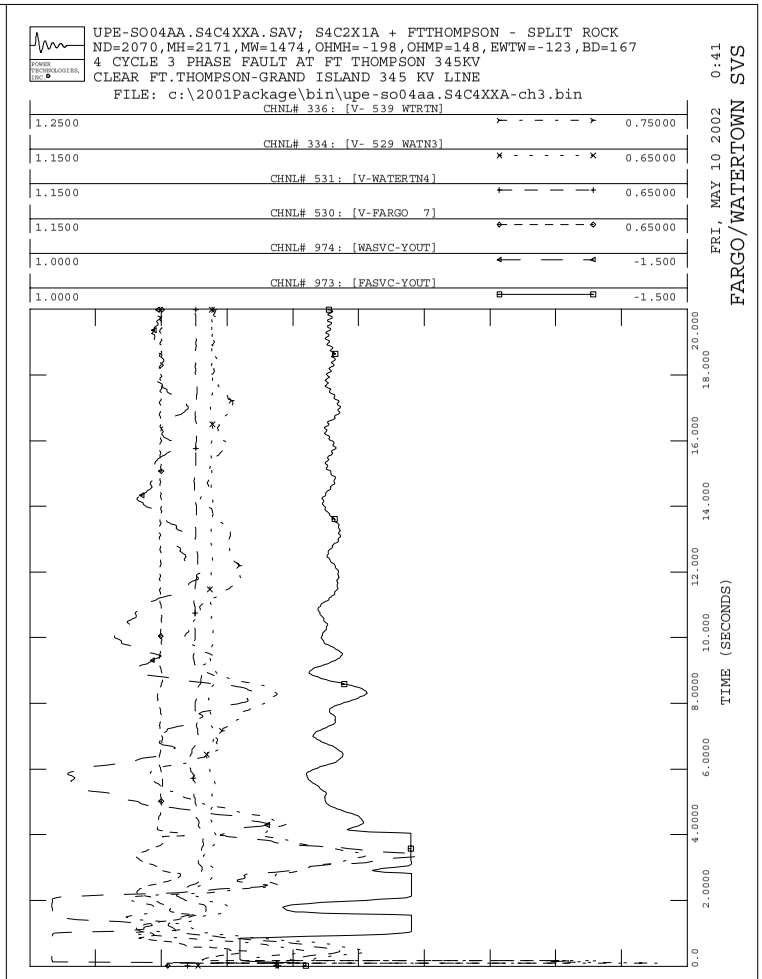
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

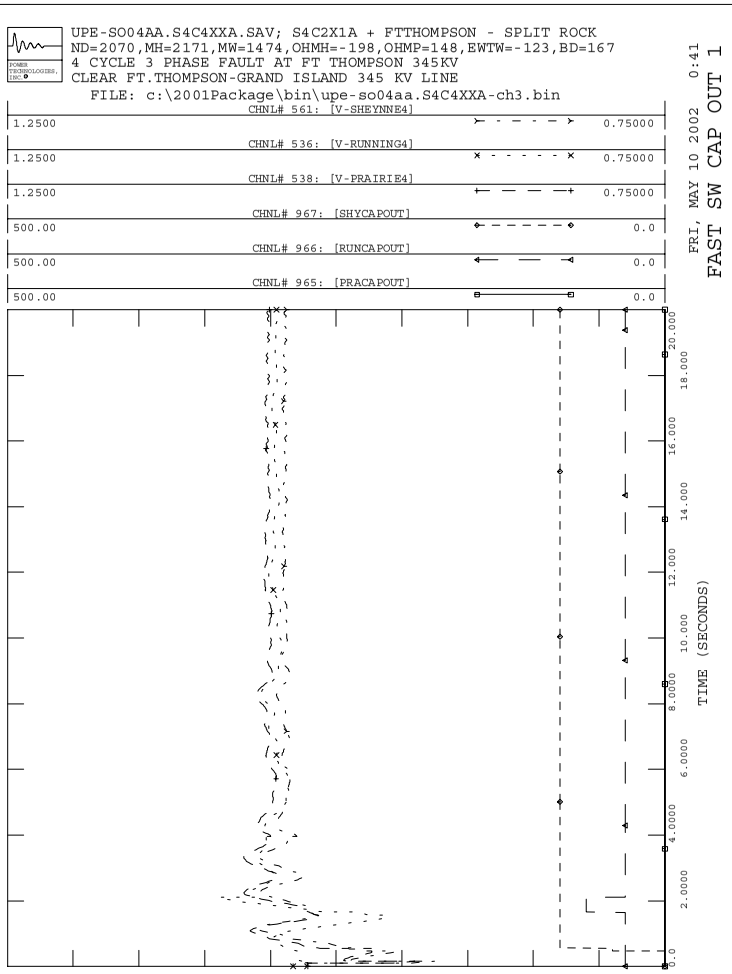
FRI, MAY 10 2002 0:41

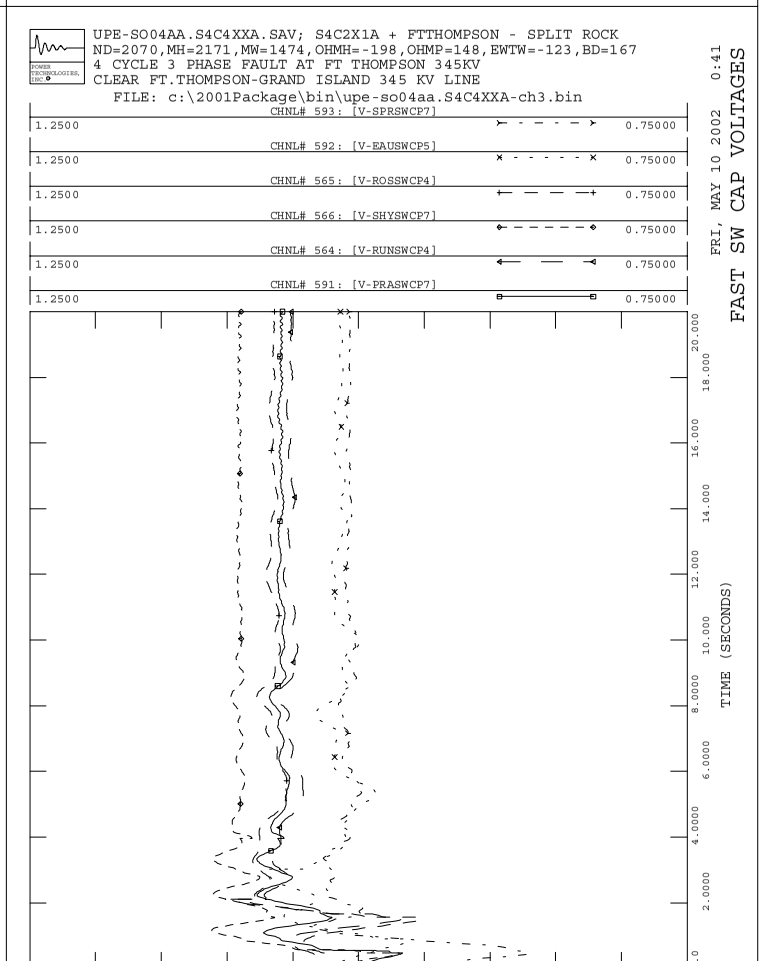
VOLTAGES NB




UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
FRI, MAY 10 2002 0:41
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
FRI, MAY 10 2002 0:41
FARGO/WATERTOWN SVS
TIME (SECONDS)

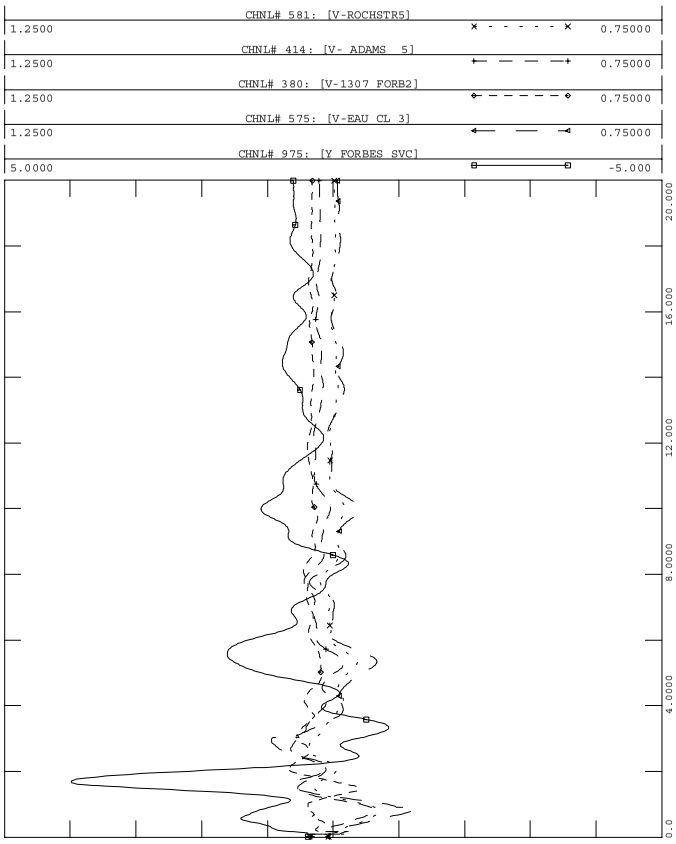

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
FRI, MAY 10 2002 0:41
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
FRI, MAY 10 2002 0:41
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41

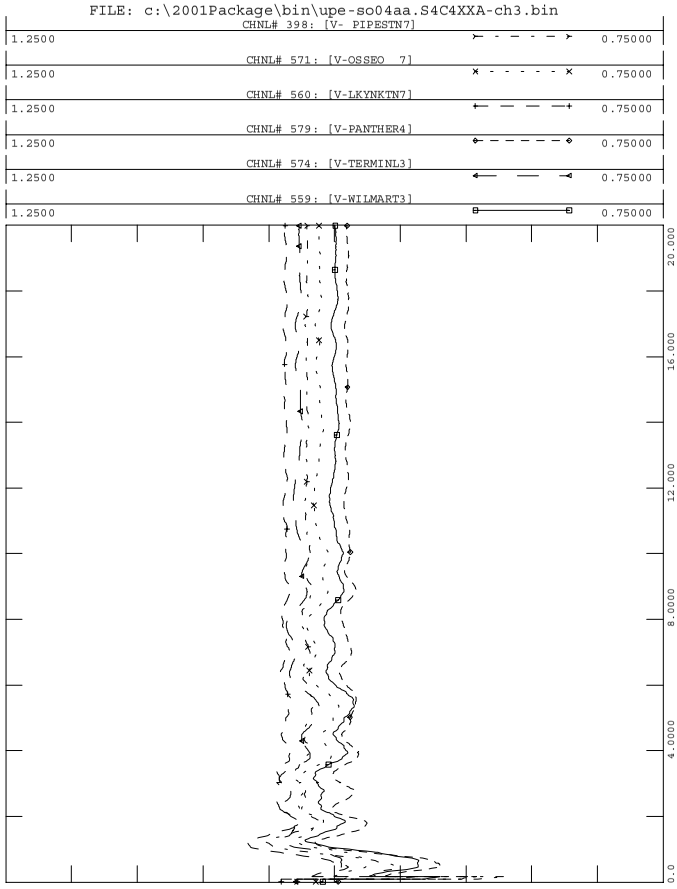
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41

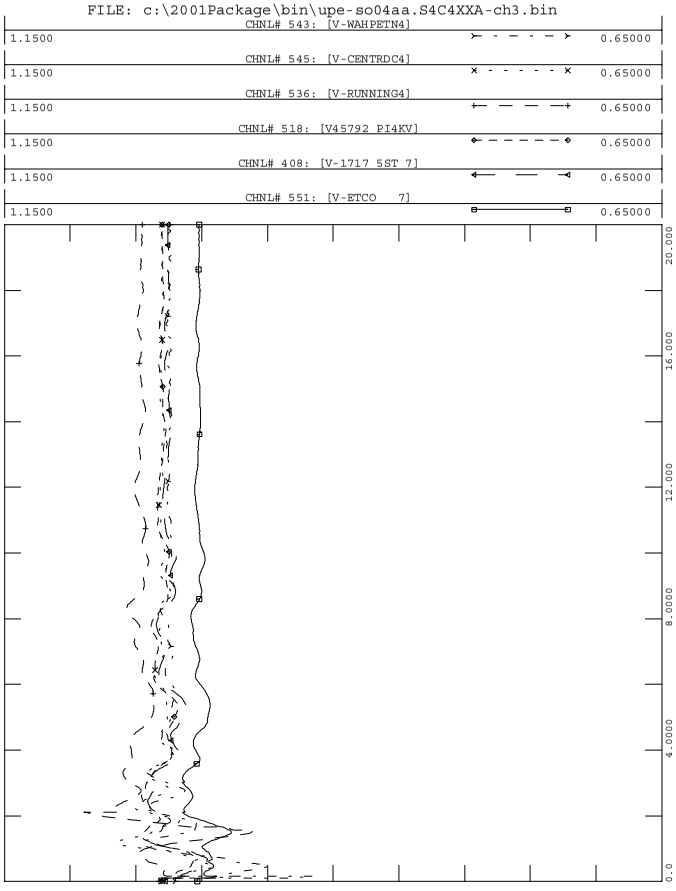
TC VOLTAGES



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41

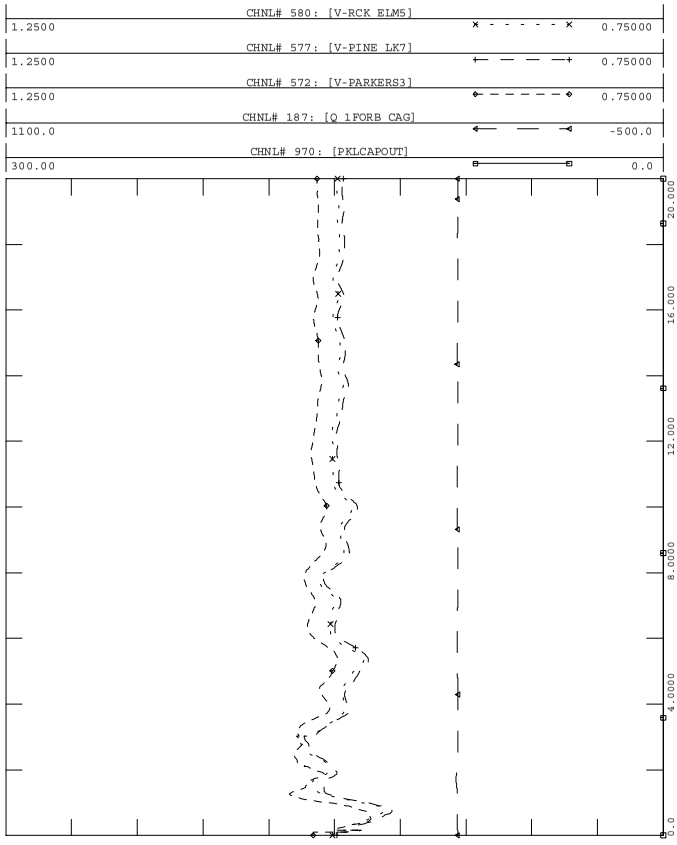
VOLTAGES 6



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

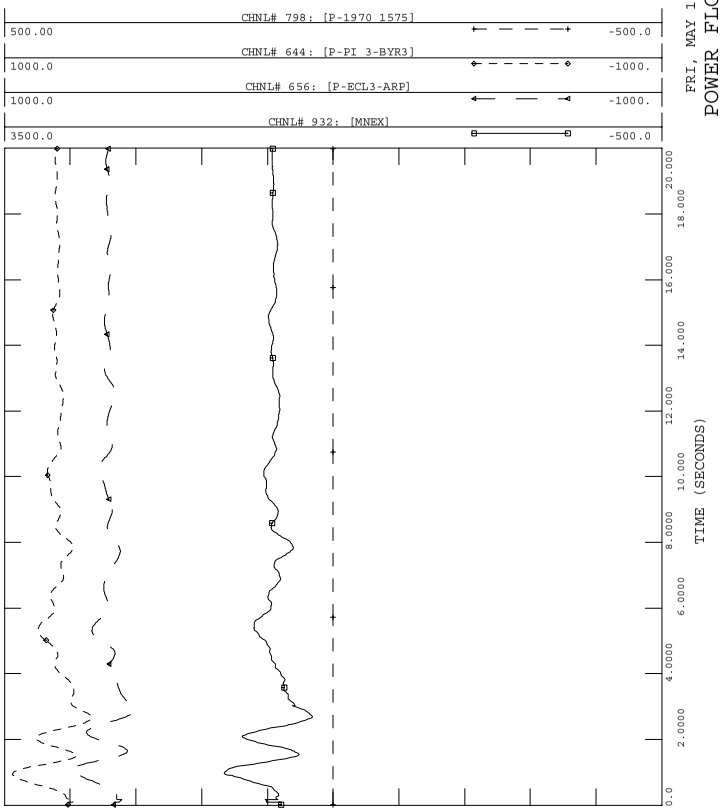
FRI, MAY 10 2002 0:41

FORBES SVS OUT & VOLTAGES



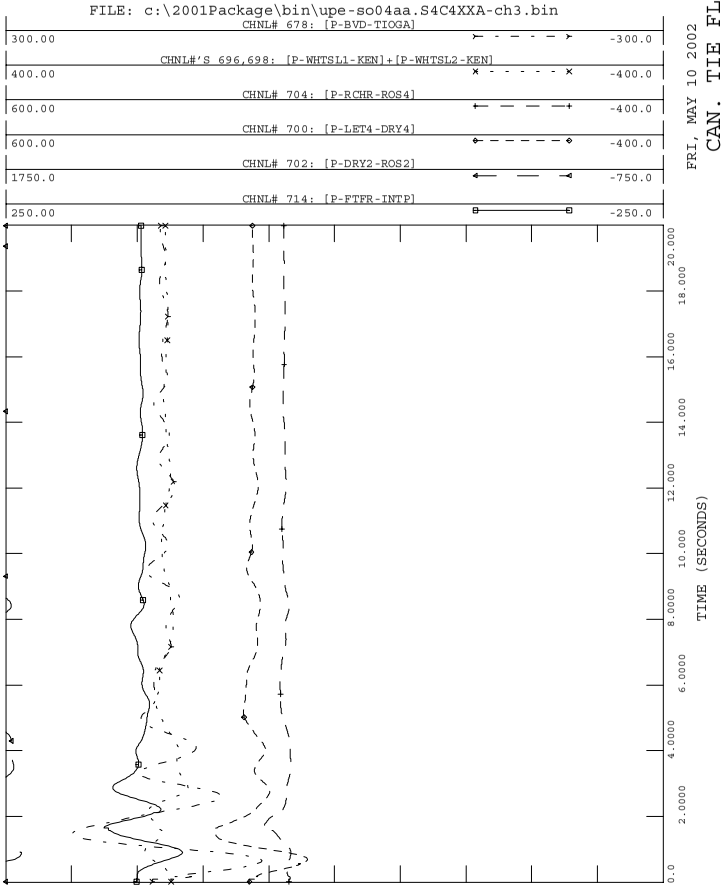
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41
POWER FLOW SUMS 2



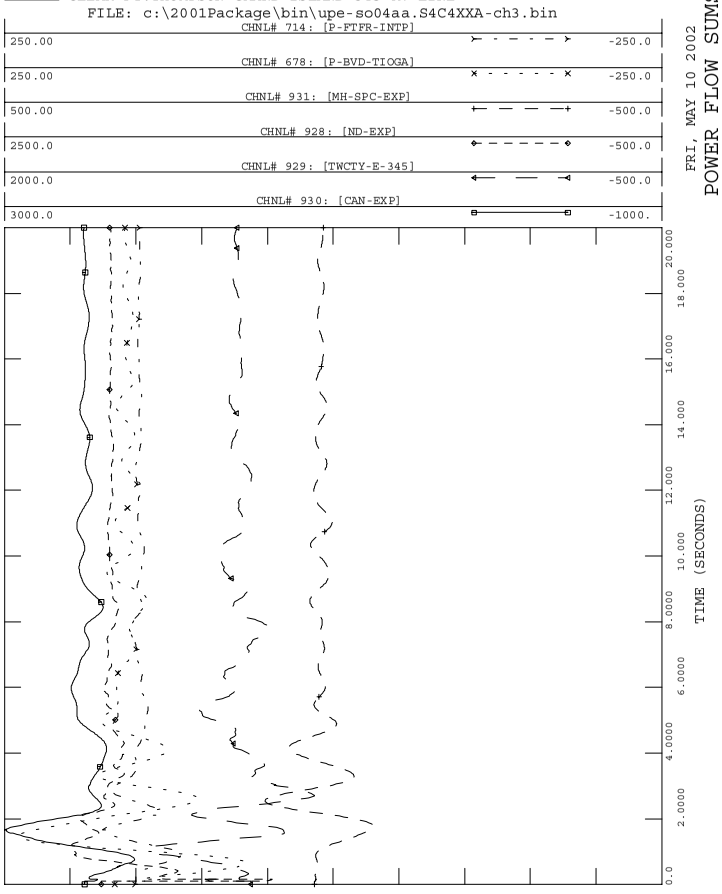
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41
CAN. TIE FLOWS



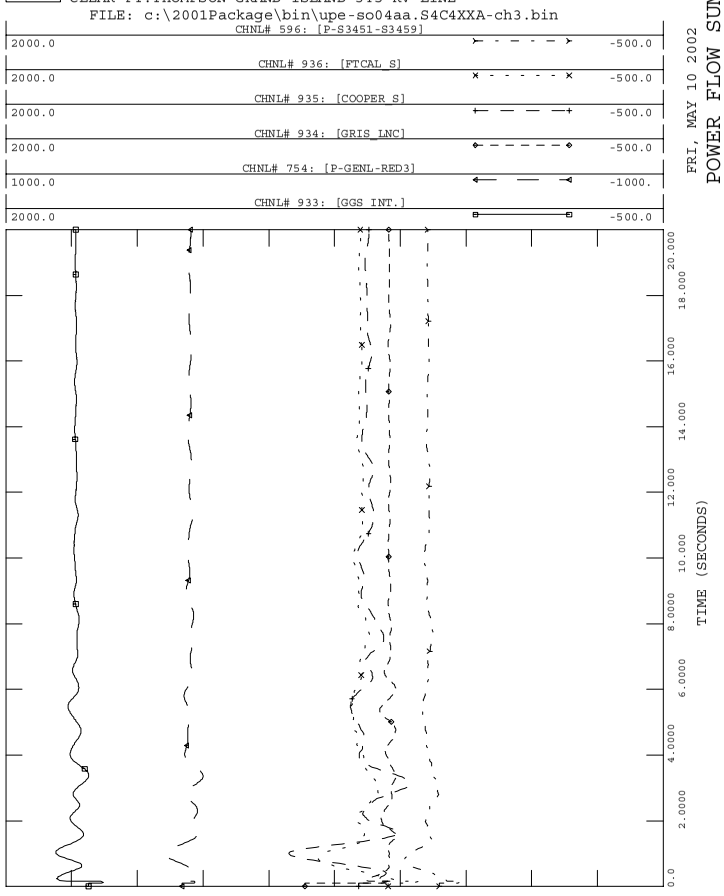
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41
POWER FLOW SUMS 1



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

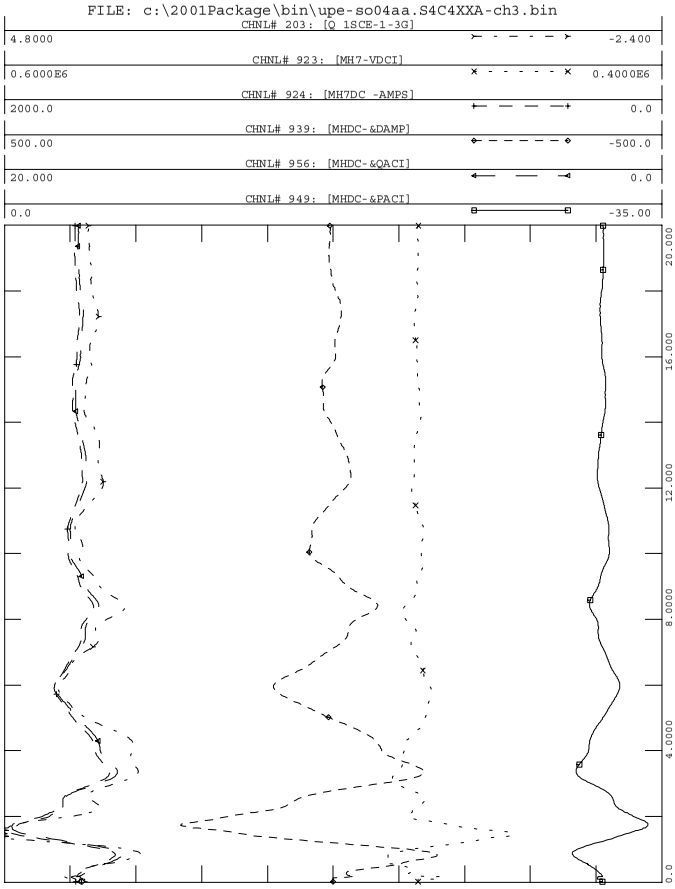
FRI, MAY 10 2002 0:41
POWER FLOW SUM 3



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41

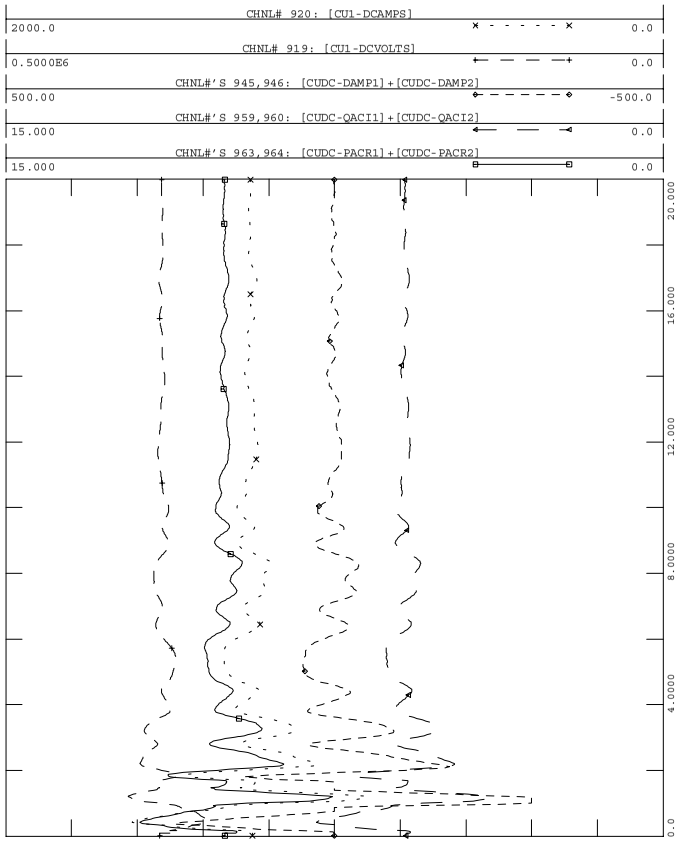
MH DC PARAMETERS



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41

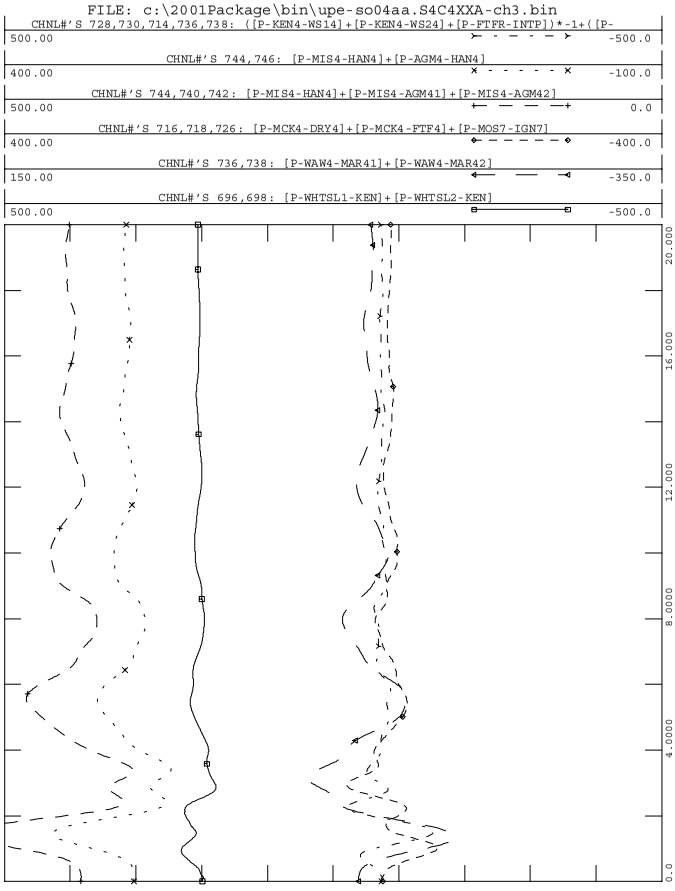
CU DC #1



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

FRI, MAY 10 2002 0:41

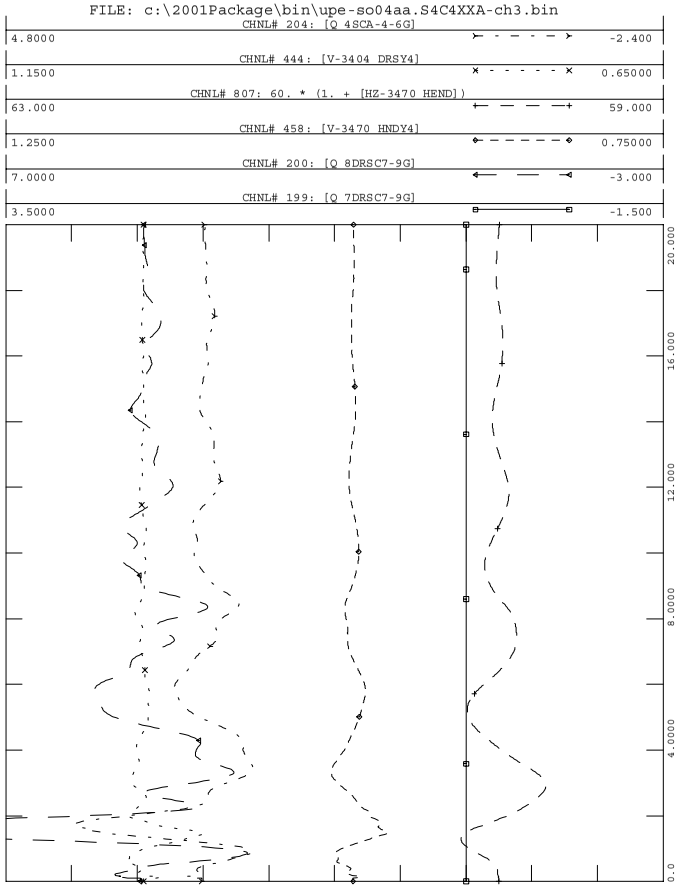
OH TIE FLOWS

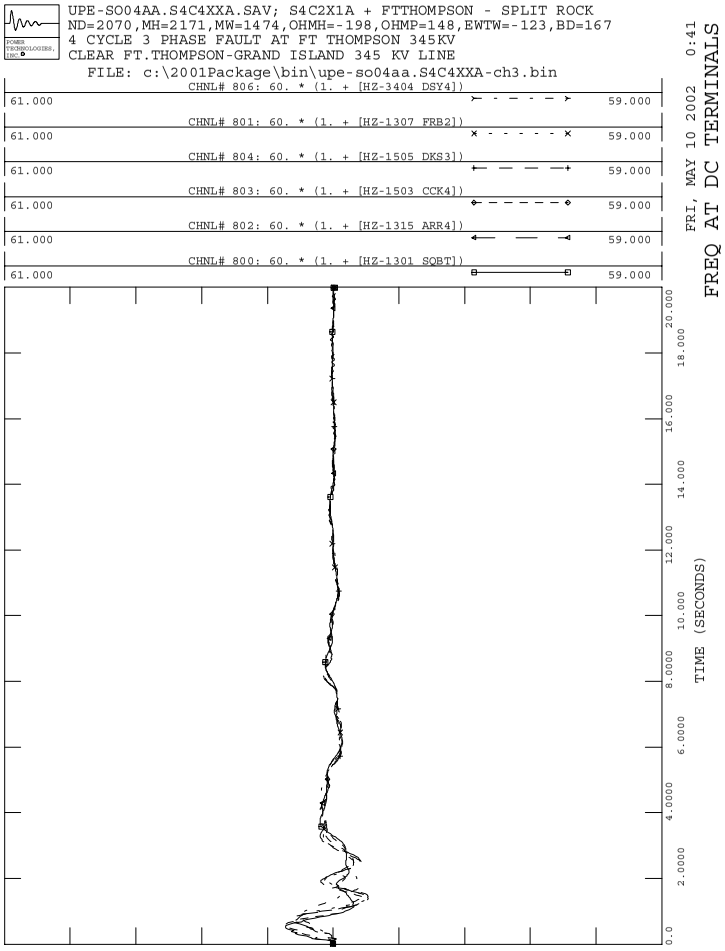


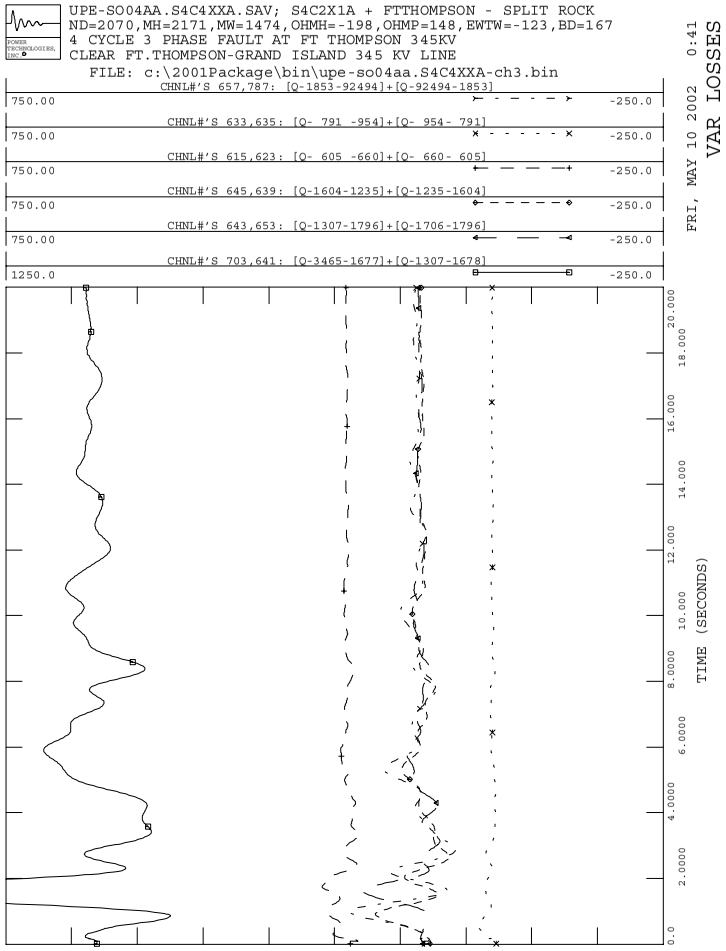
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

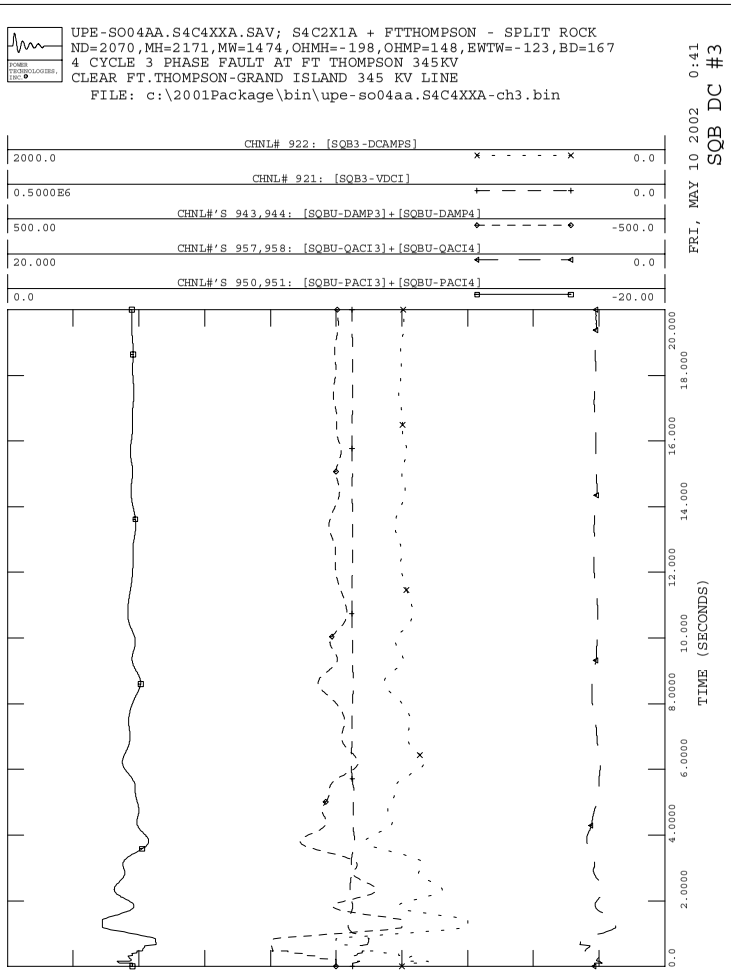
FRI, MAY 10 2002 0:41

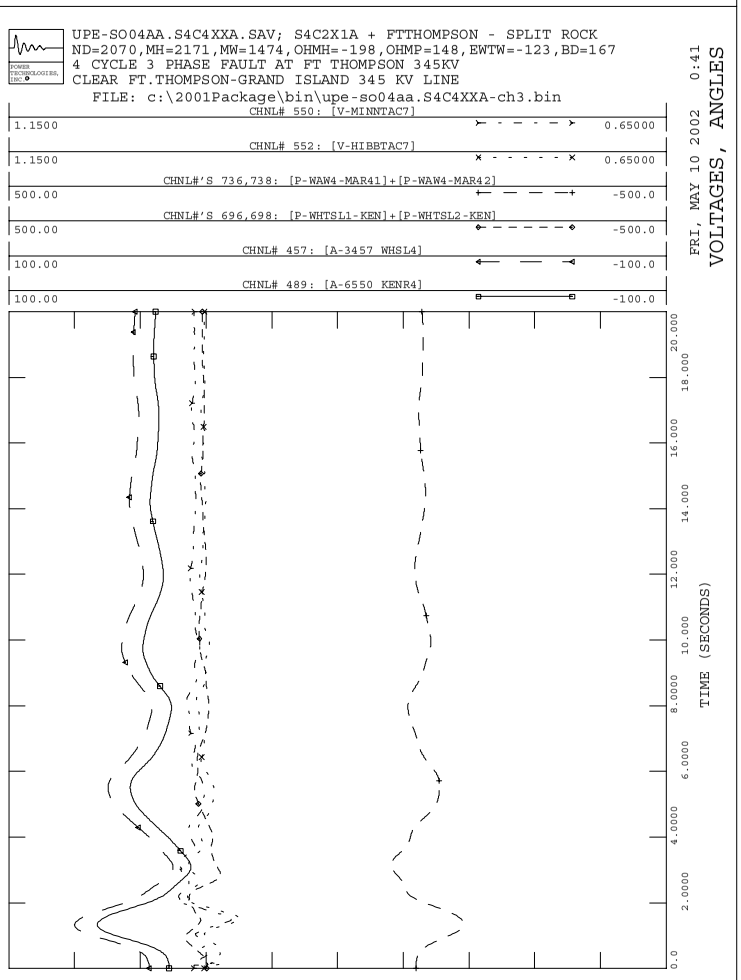
MH DC PARAMETERS




UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
FRI, MAY 10 2002 0:41
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
FRI, MAY 10 2002 0:41
VAR LOSSES
TIME (SECONDS)

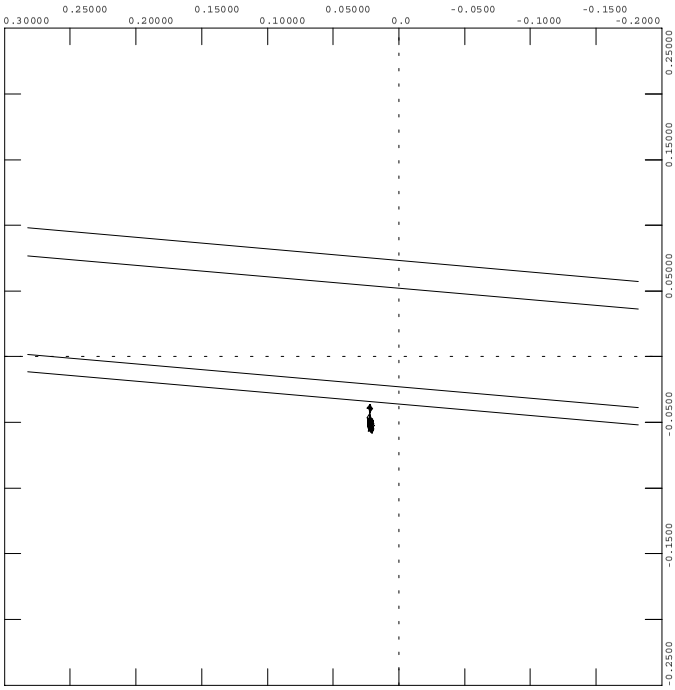

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
FRI, MAY 10 2002 0:41
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
FRI, MAY 10 2002 0:41
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

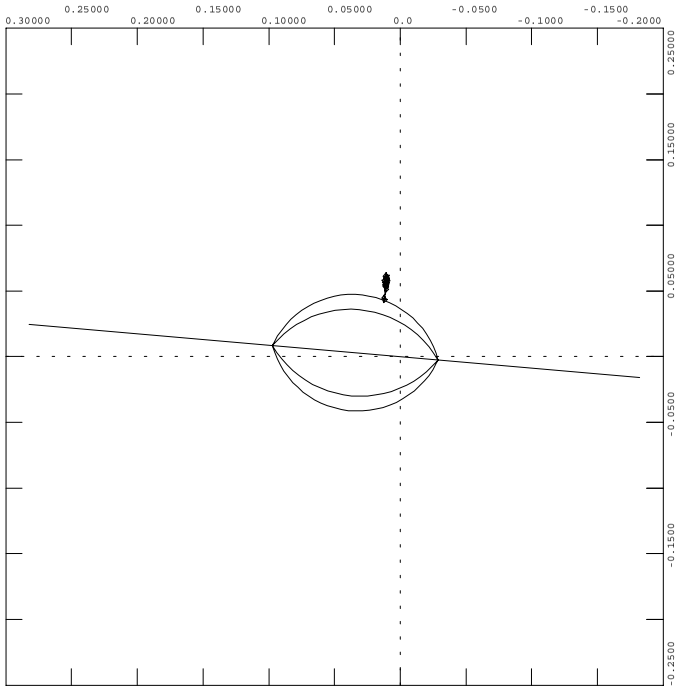


FRI, MAY 10 2002 0:41
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

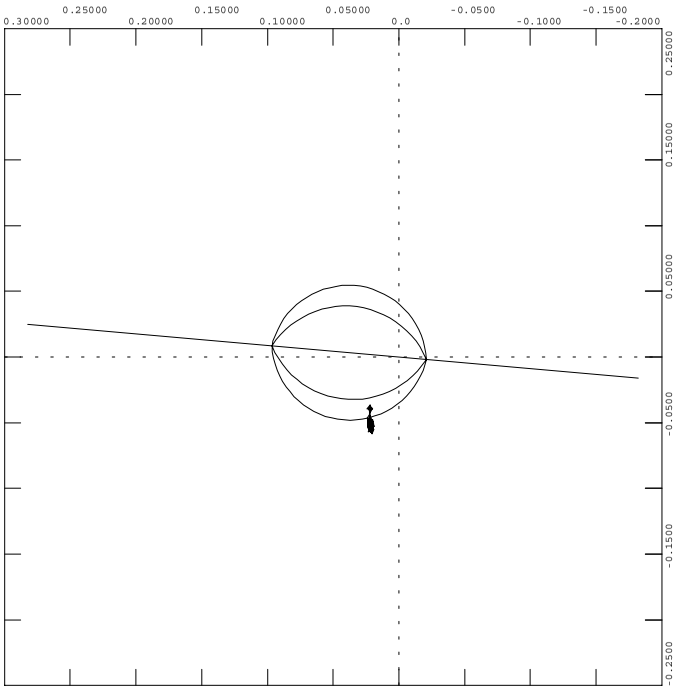


FRI, MAY 10 2002 0:41
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

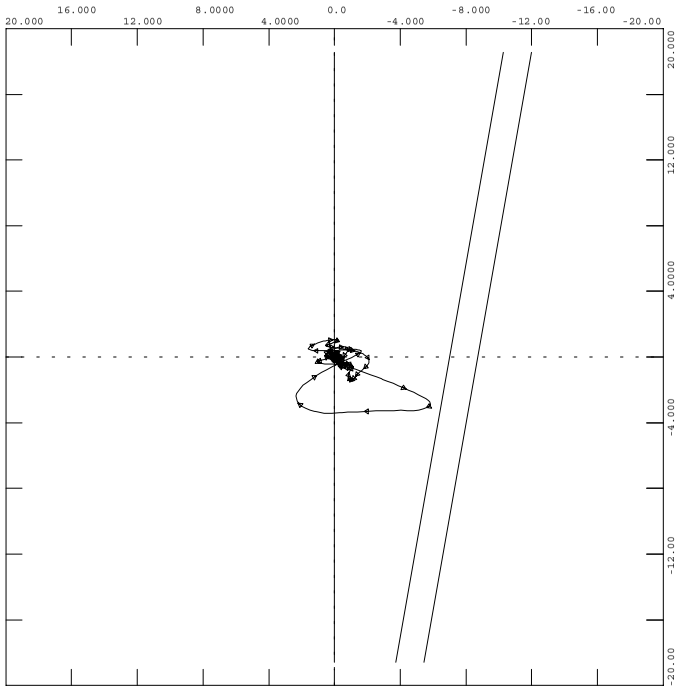


FRI, MAY 10 2002 0:41
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

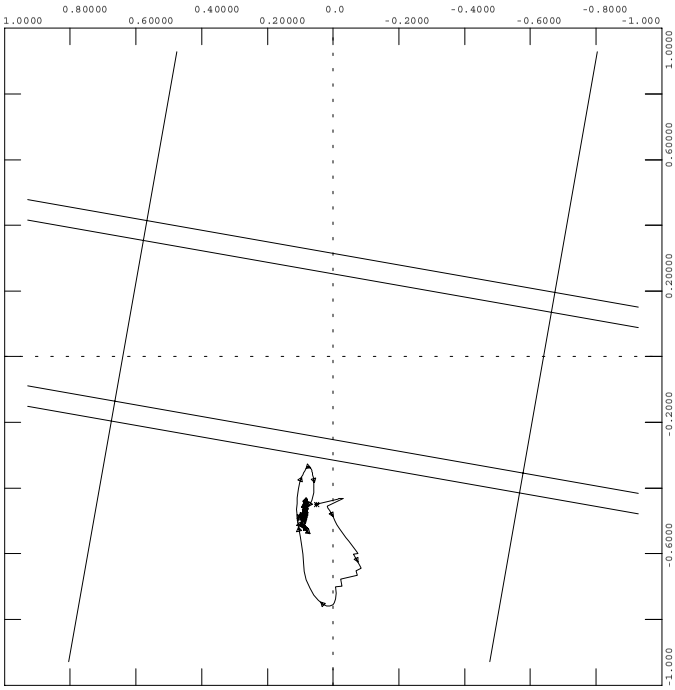


FRI, MAY 10 2002 0:41
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

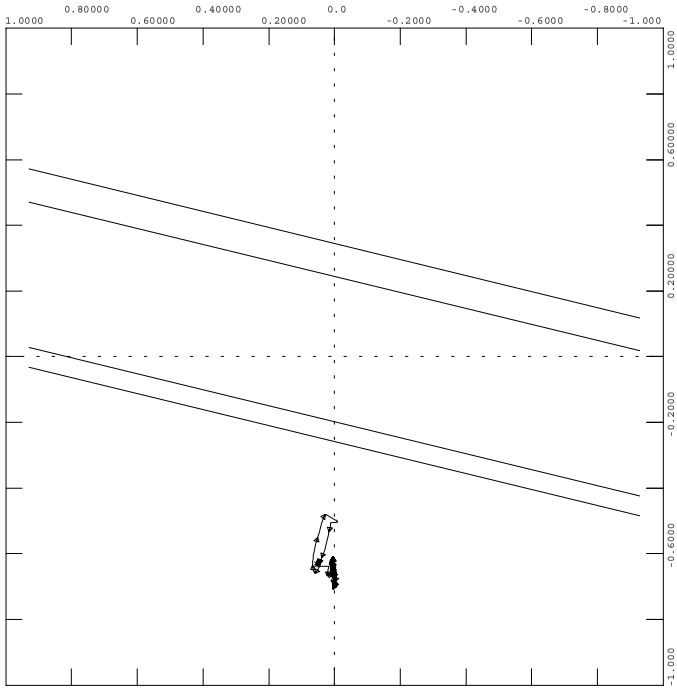
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

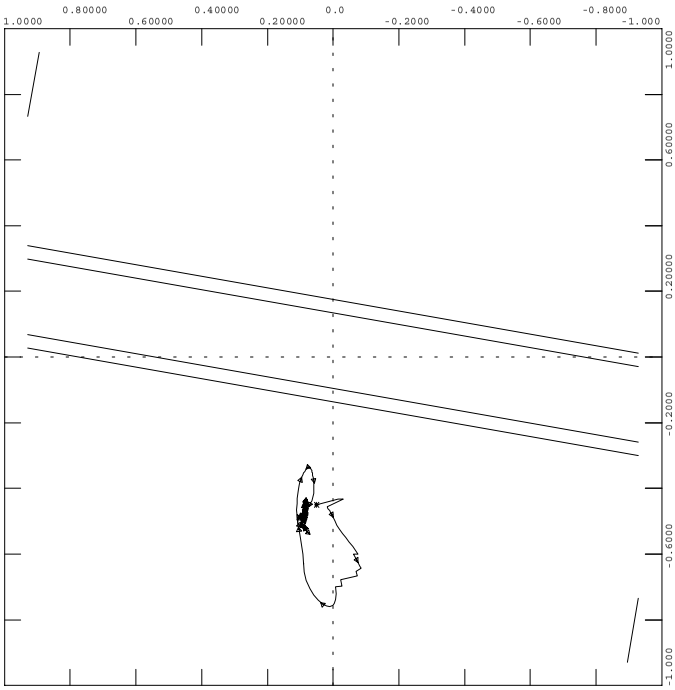
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

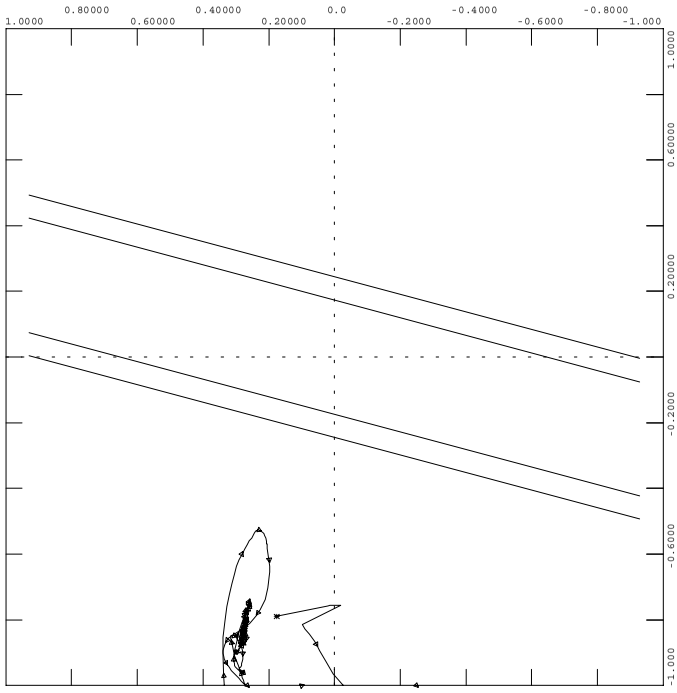
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

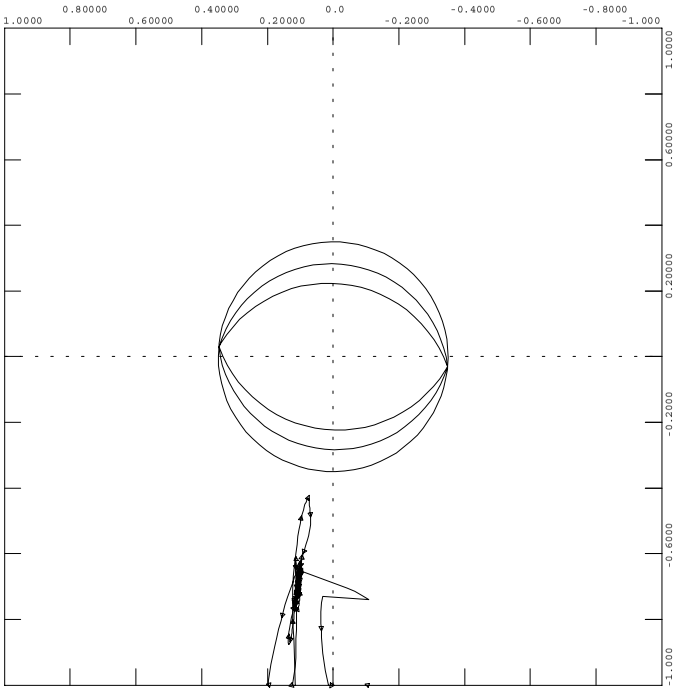
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

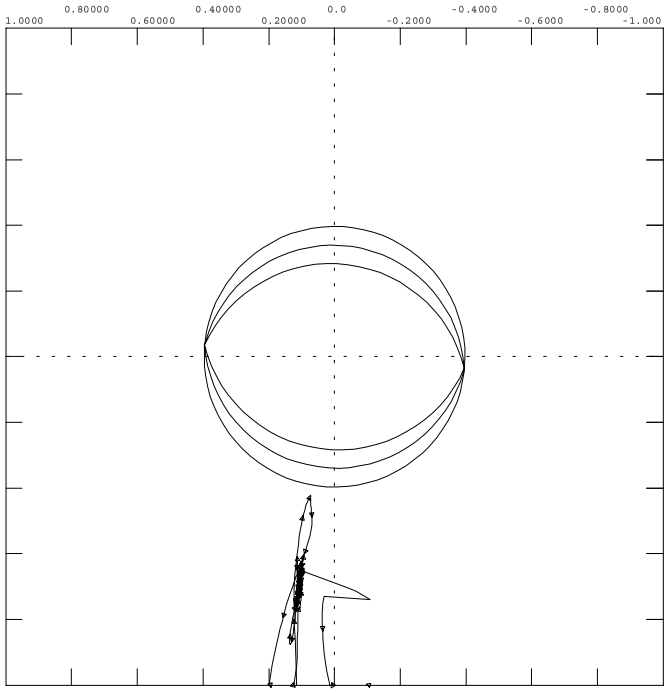
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

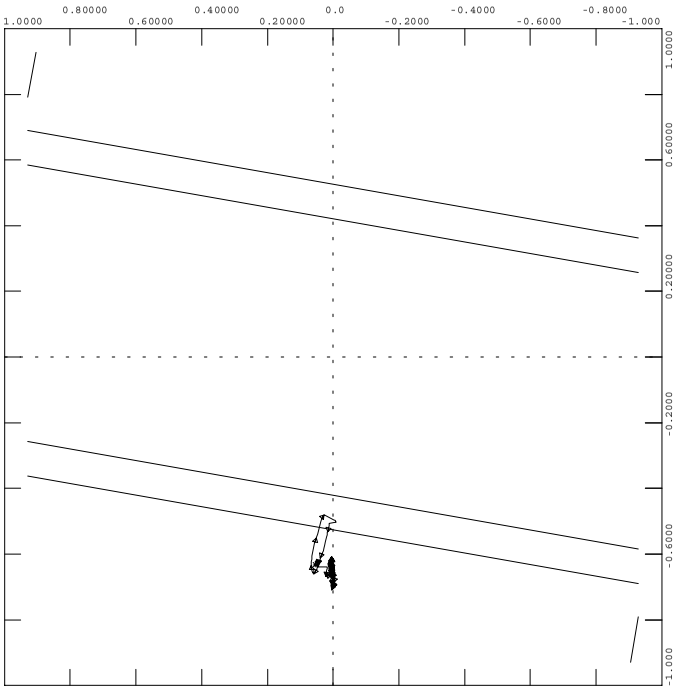
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

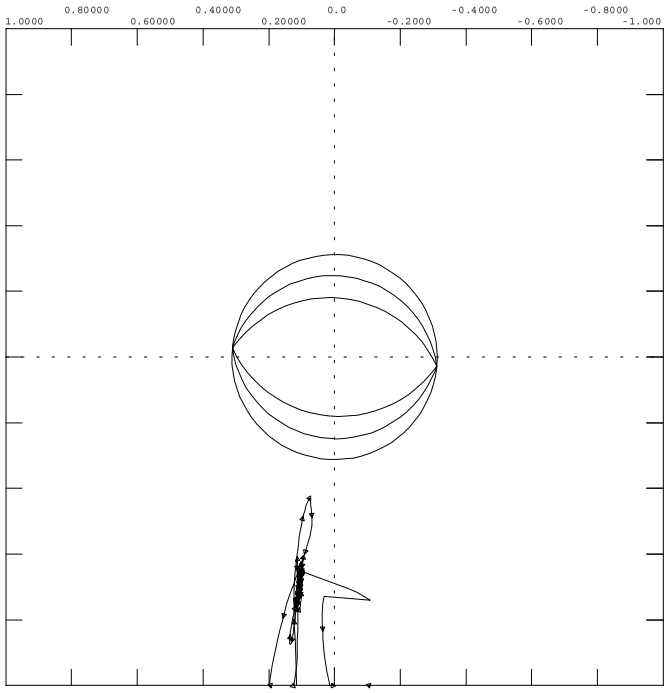
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

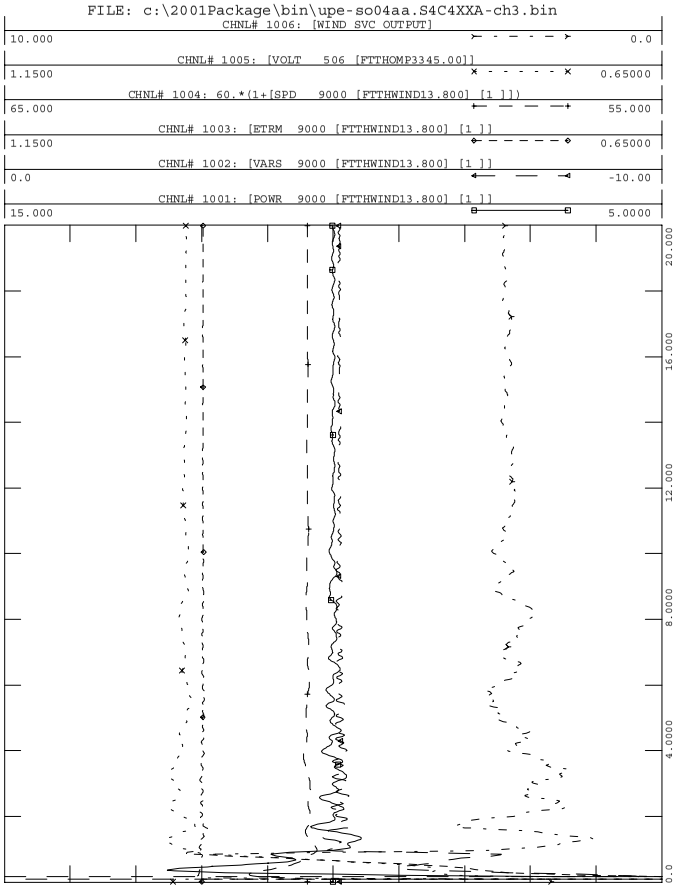
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

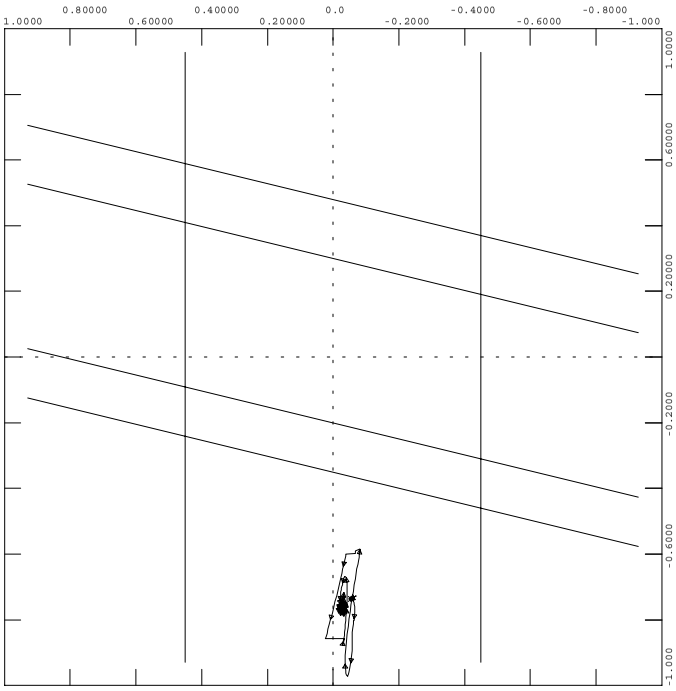


FRI, MAY 10 2002 0:41
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON-GRAND ISLAND 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ch3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



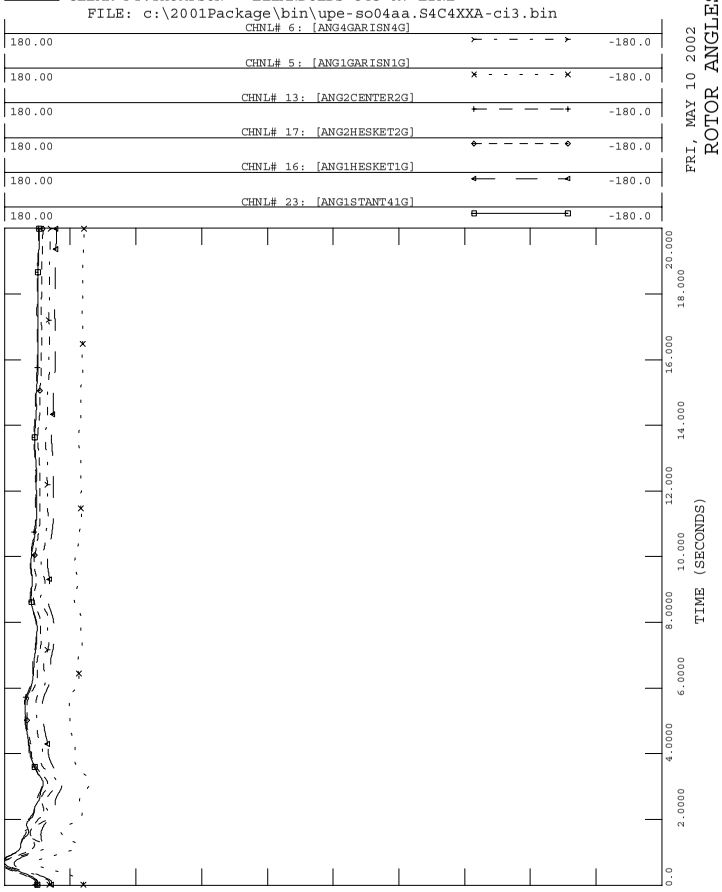
FRI, MAY 10 2002 0:41
MP-OH I.FALLS (779)
CHNL# 847: [R-1484 6011]

CONTINGENCY CI3

4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Leland Olds 345 kV line

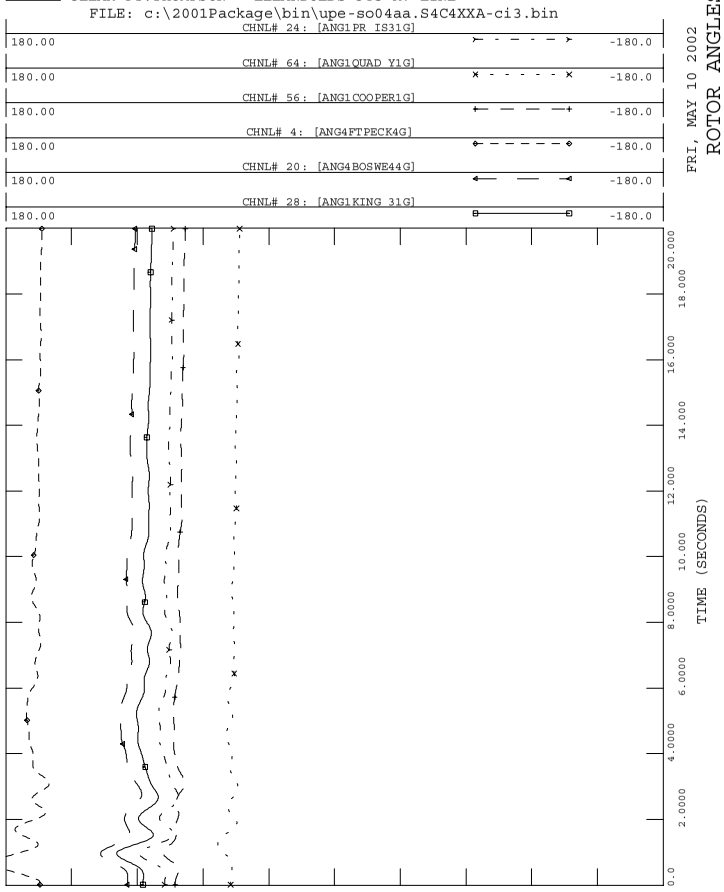
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
ROTOR ANGLES 2



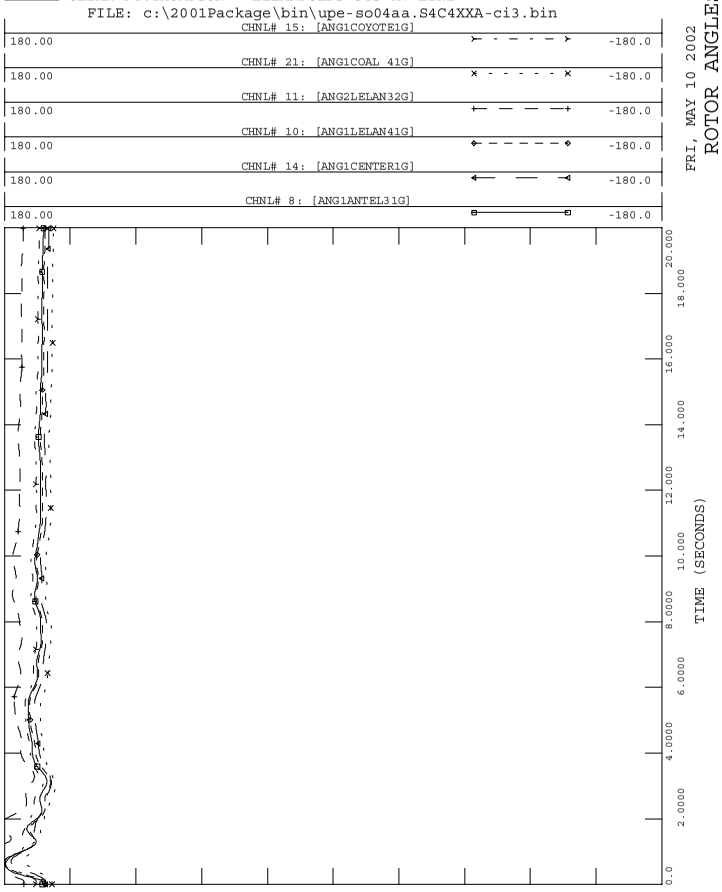
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
ROTOR ANGLES 4



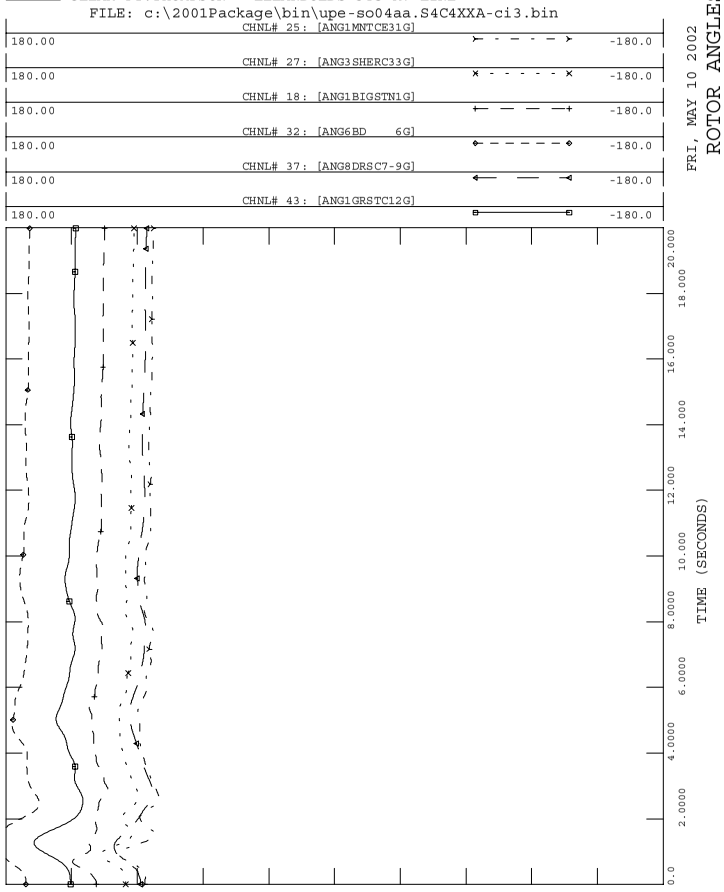
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
ROTOR ANGLES 1



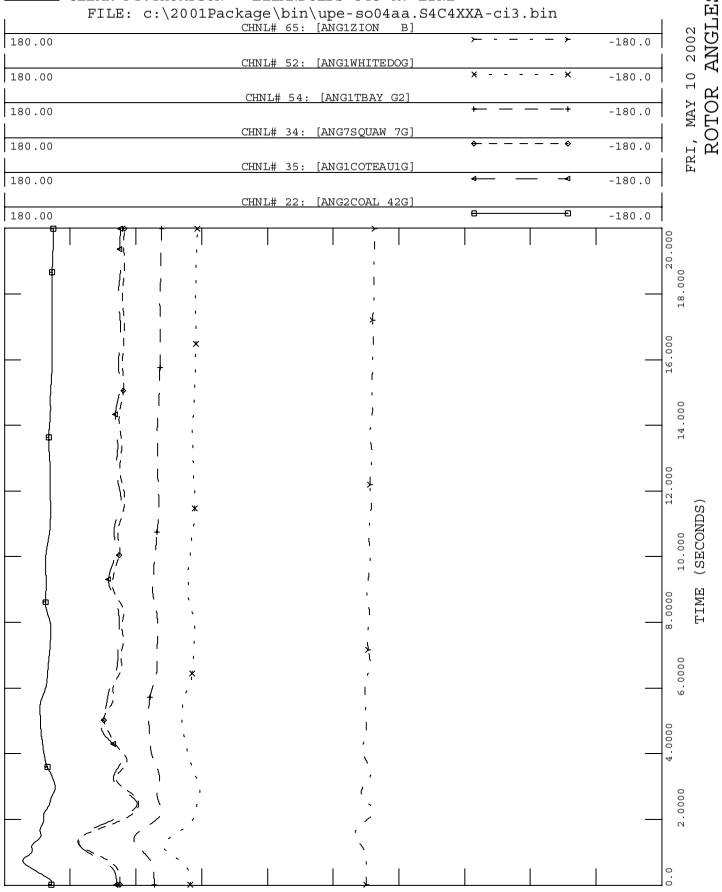
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
ROTOR ANGLES 3



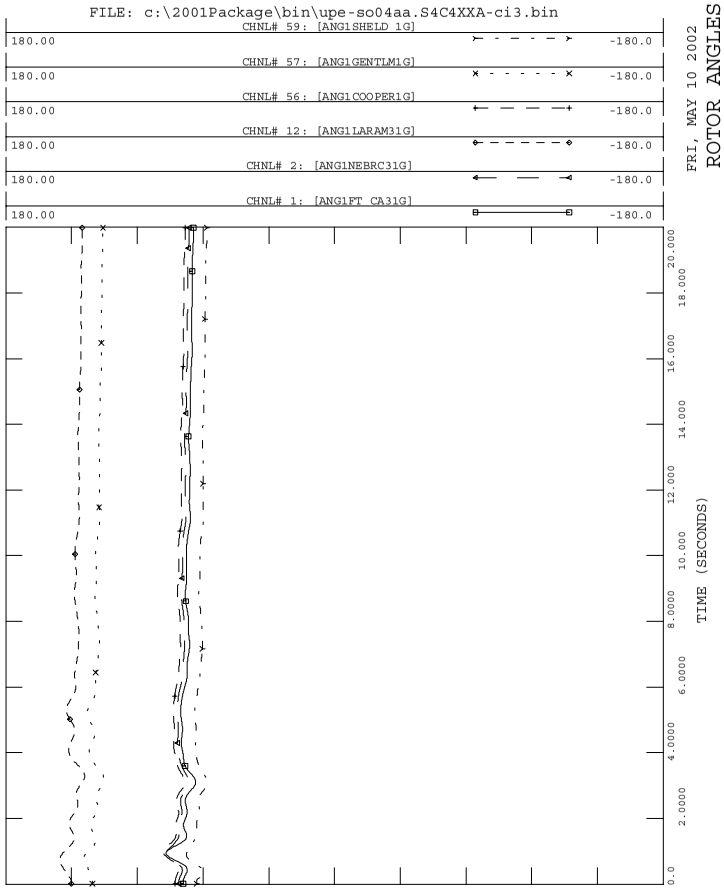
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
ROTOR ANGLES 6



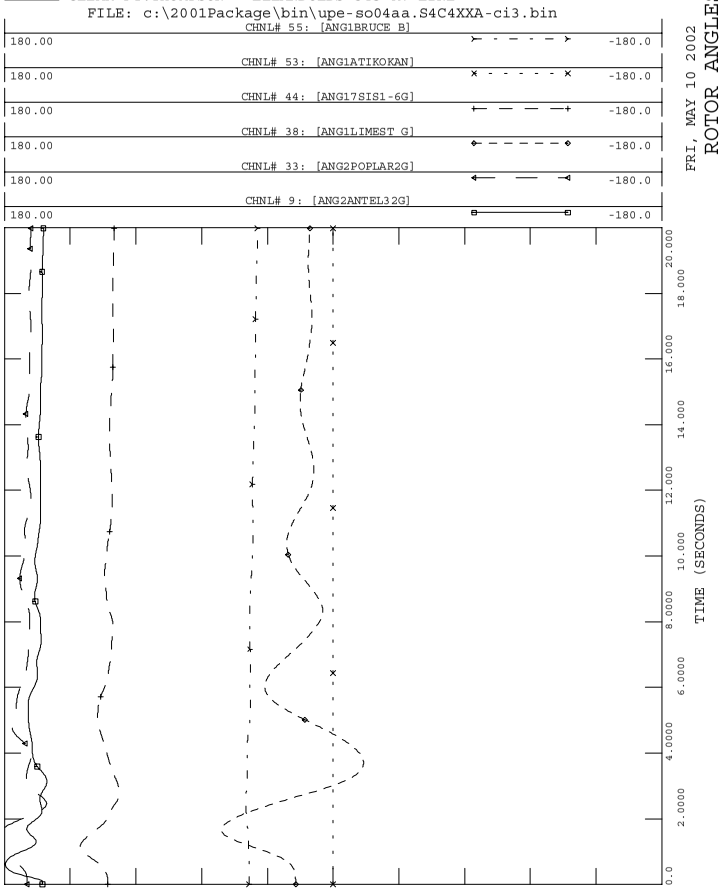
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
ROTOR ANGLES NB



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
ROTOR ANGLES 5



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
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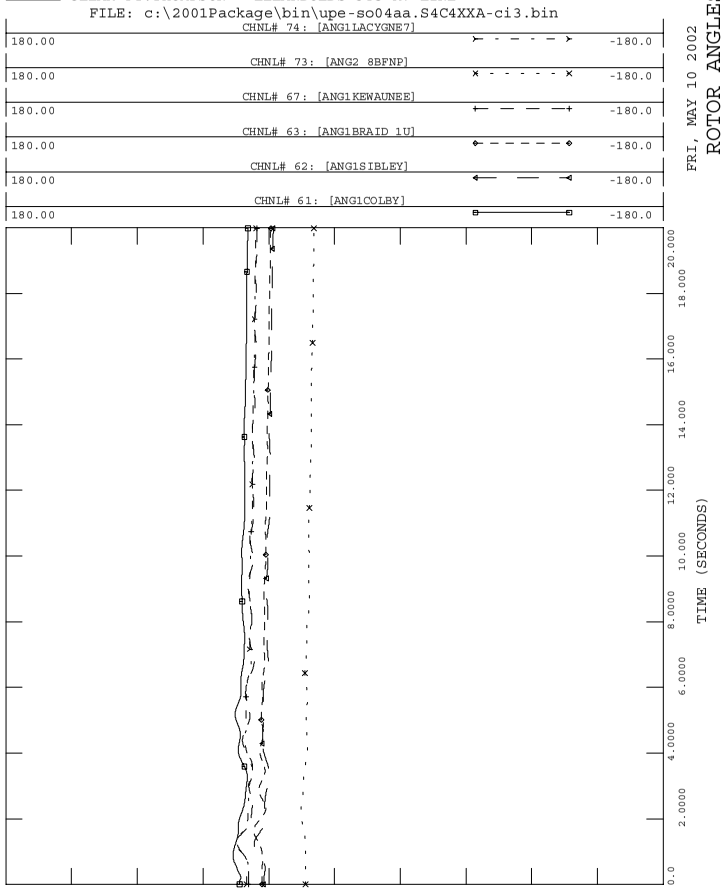
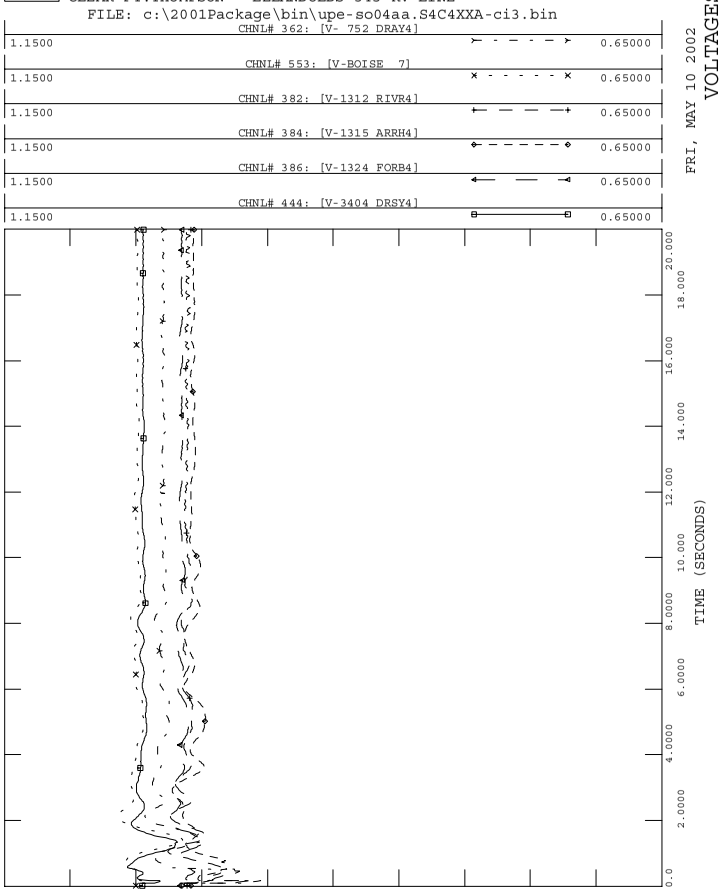


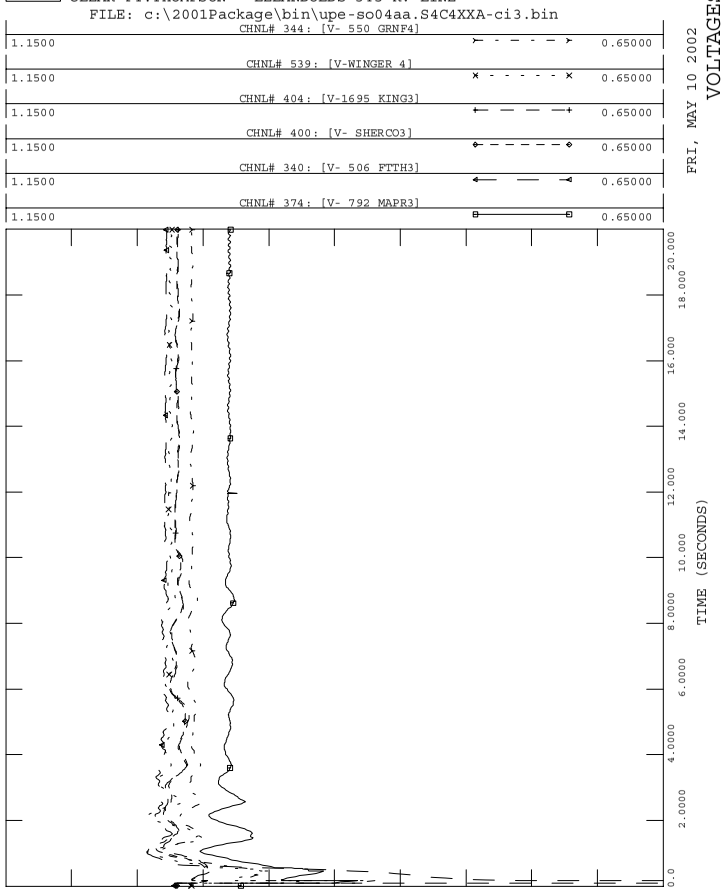
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
VOLTAGES 1



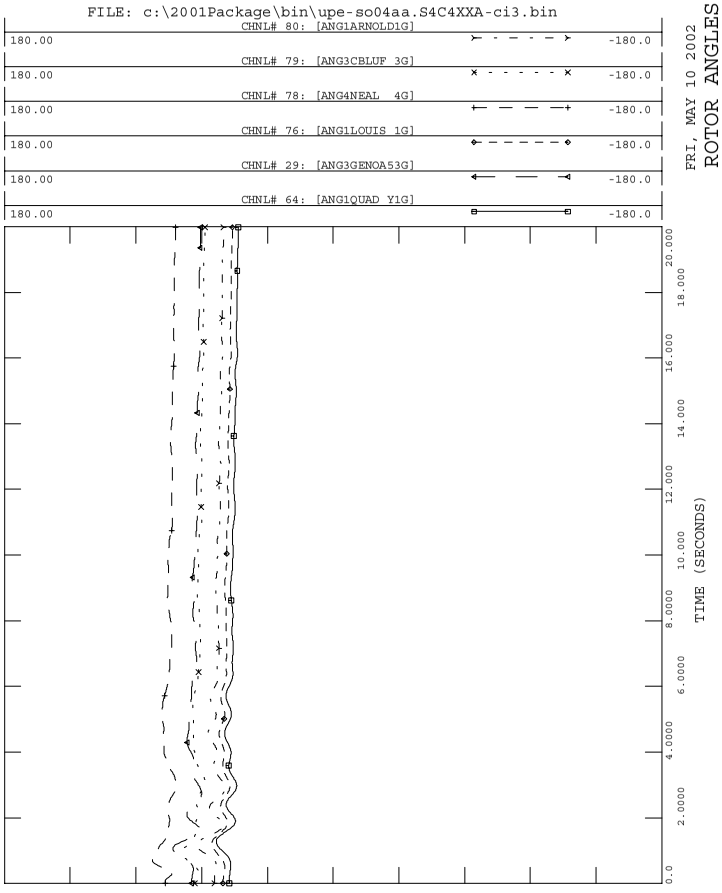
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
VOLTAGES 3



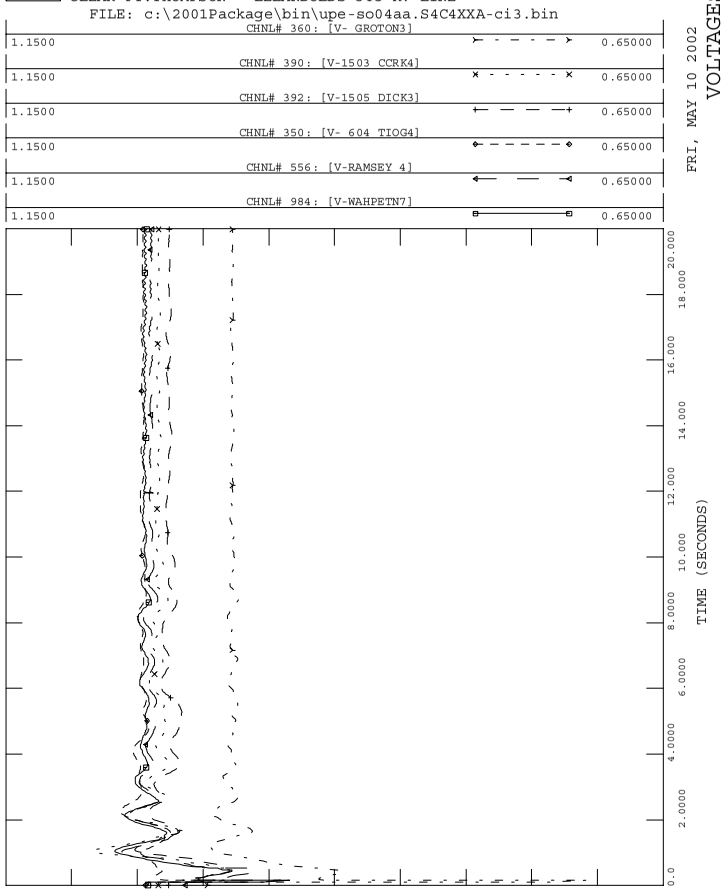
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
ROTOR ANGLES IA



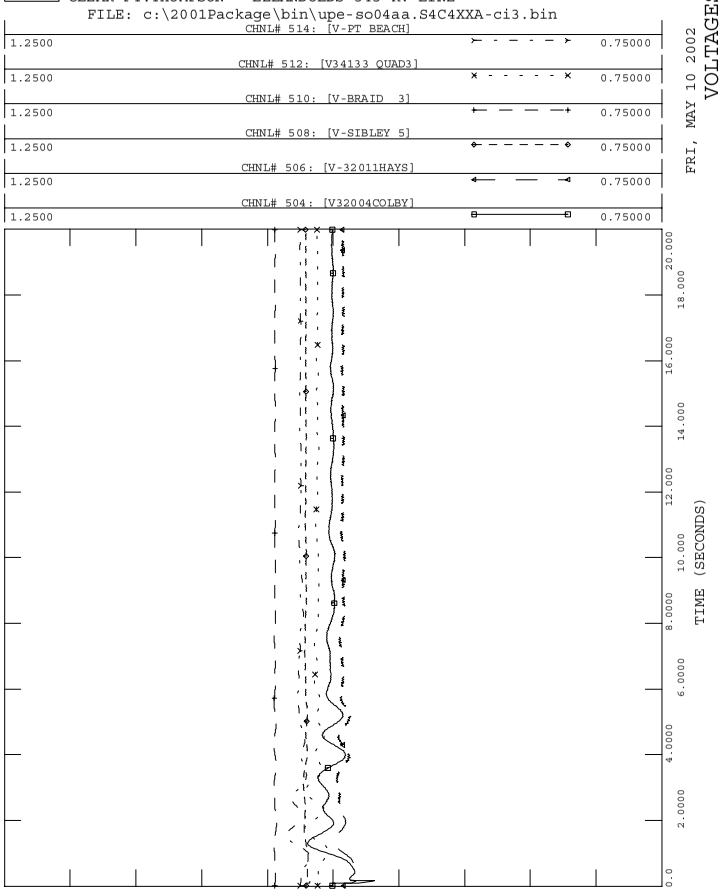
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
VOLTAGES 2



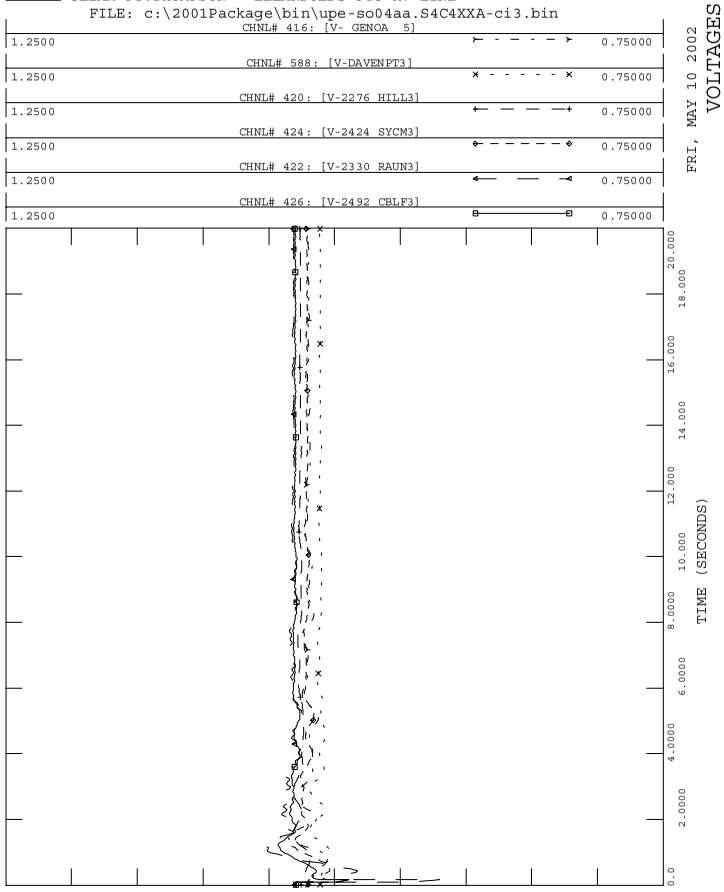
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55 VOLTAGES 5



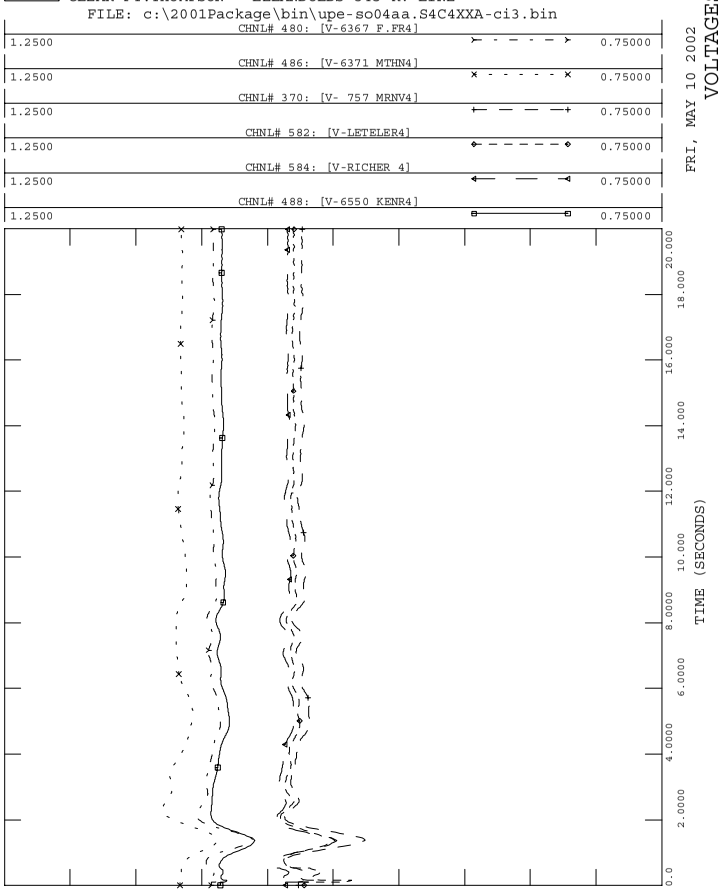
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55 VOLTAGES IA



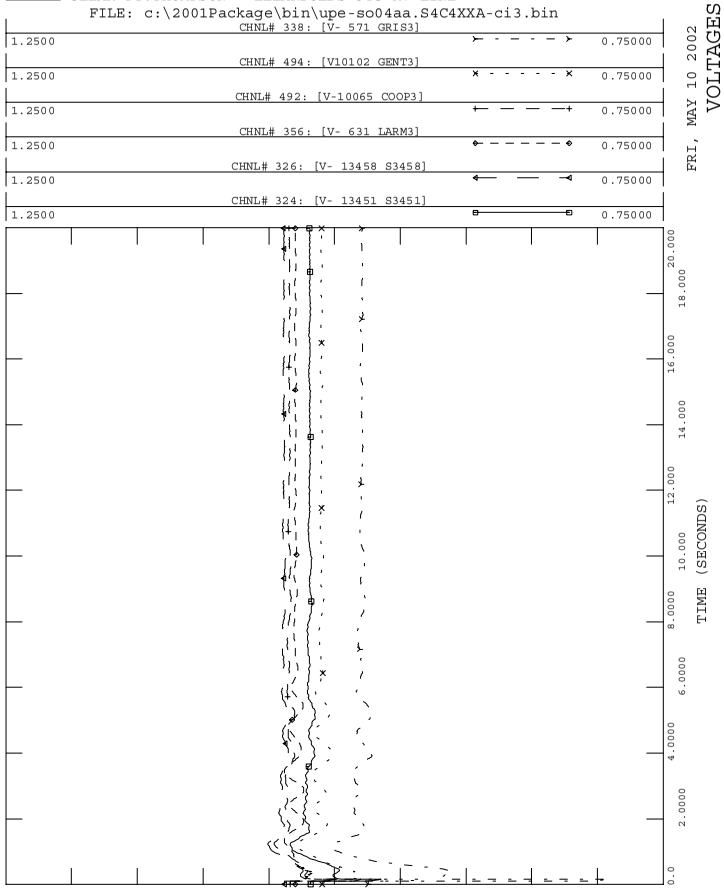
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55 VOLTAGES 4

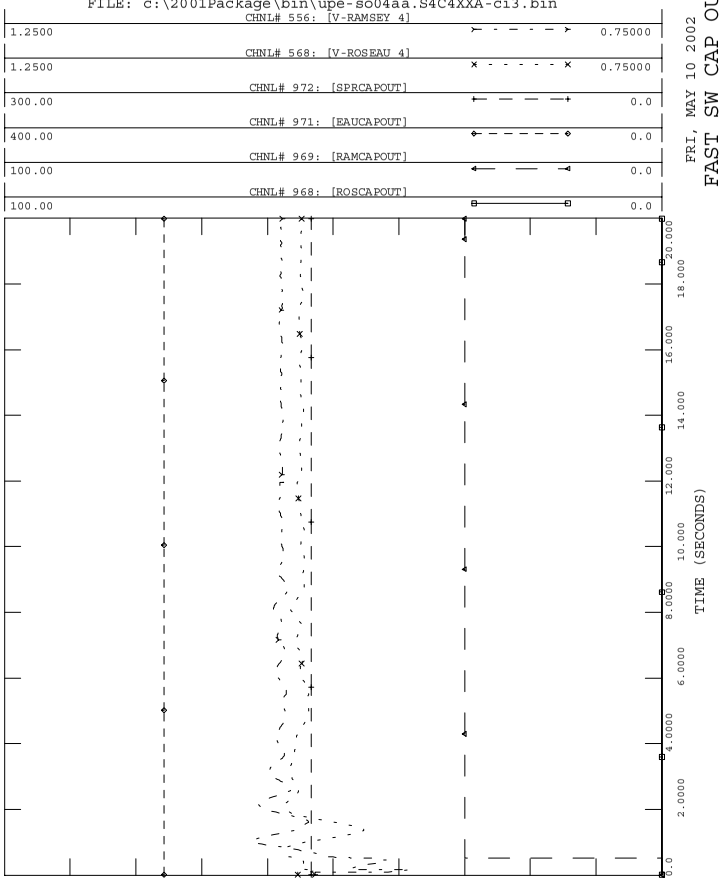


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55 VOLTAGES NB

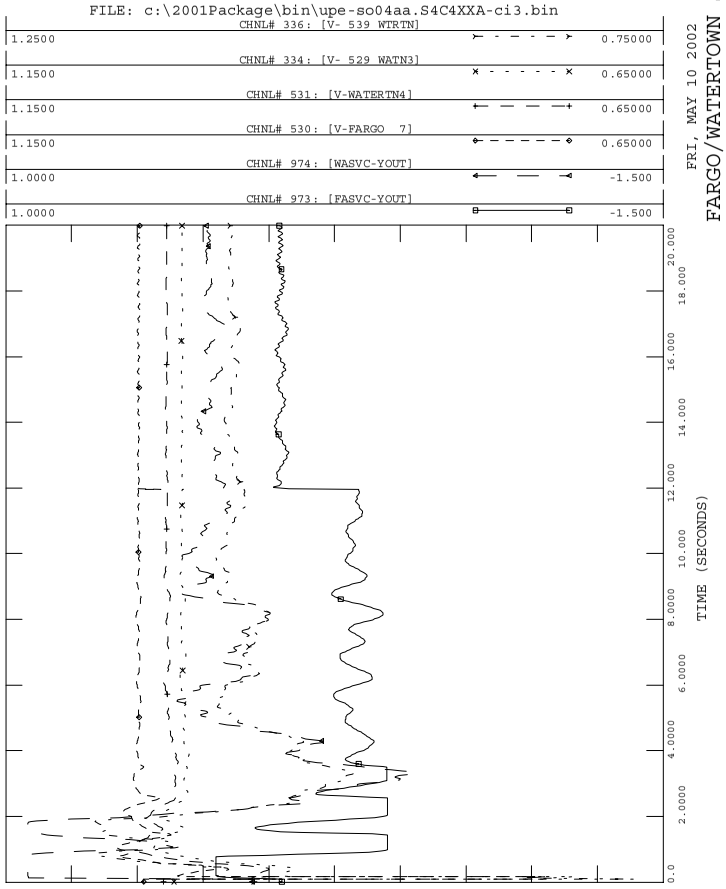


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin



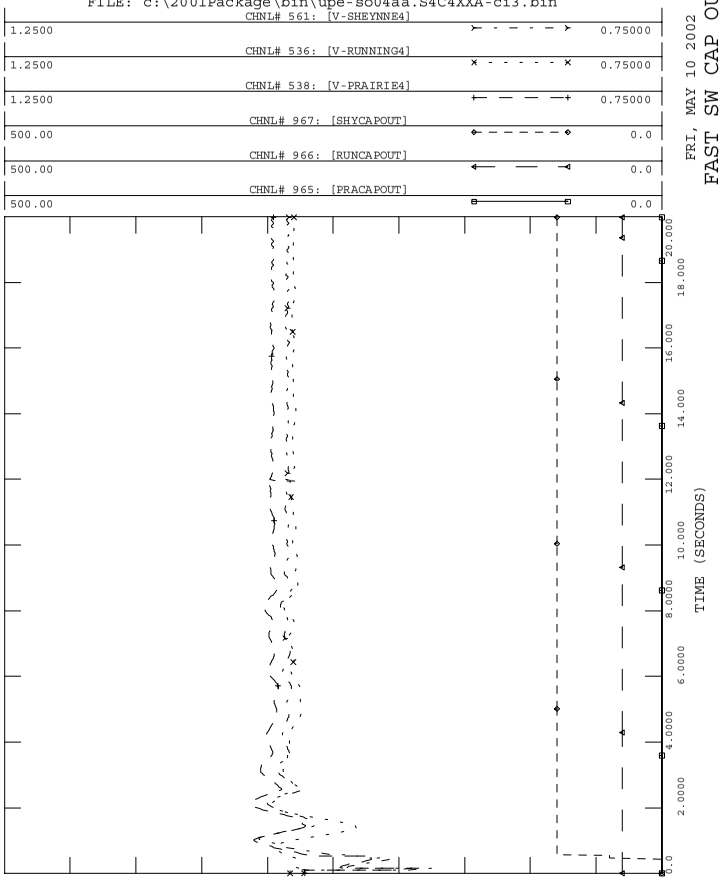
FRI, MAY 10 2002 0:55
FAST SW CAP OUT 2

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin



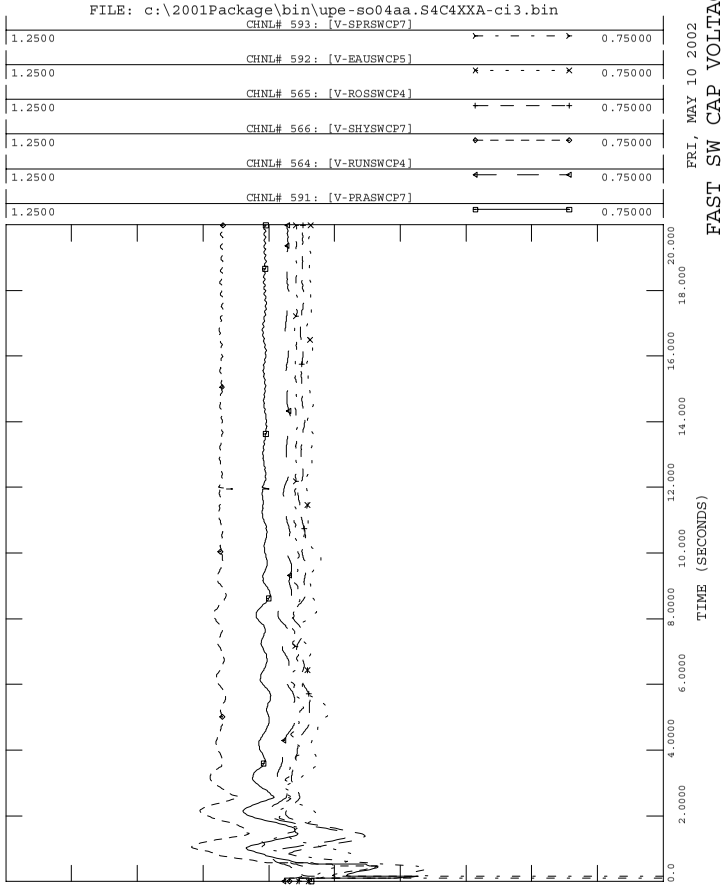
FRI, MAY 10 2002 0:55
FARGO/WATERTOWN SVS

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin



FRI, MAY 10 2002 0:55
FAST SW CAP OUT 1

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

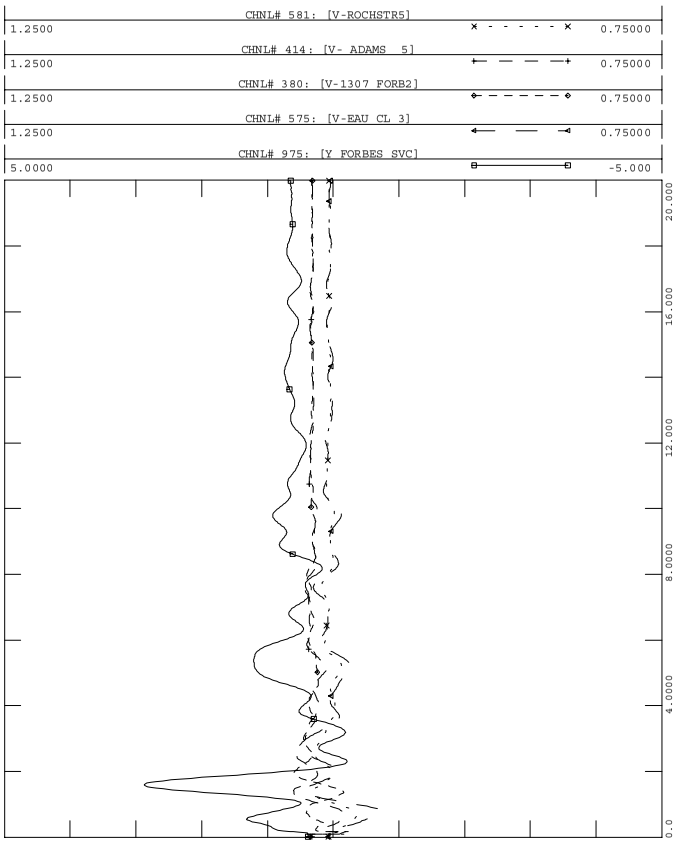


FRI, MAY 10 2002 0:55
FAST SW CAP VOLTAGES

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55

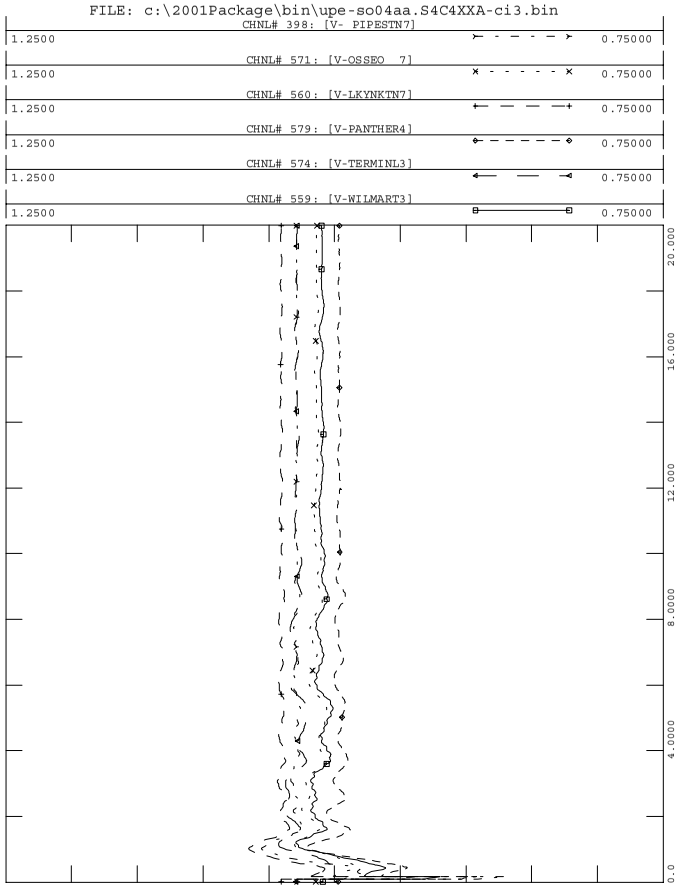
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55

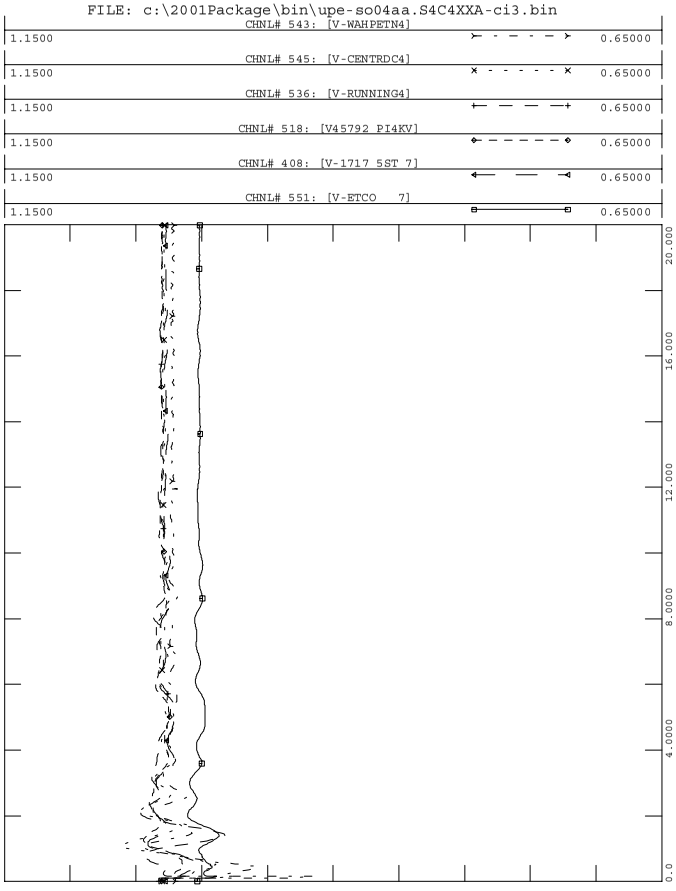
TC VOLTAGES



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55

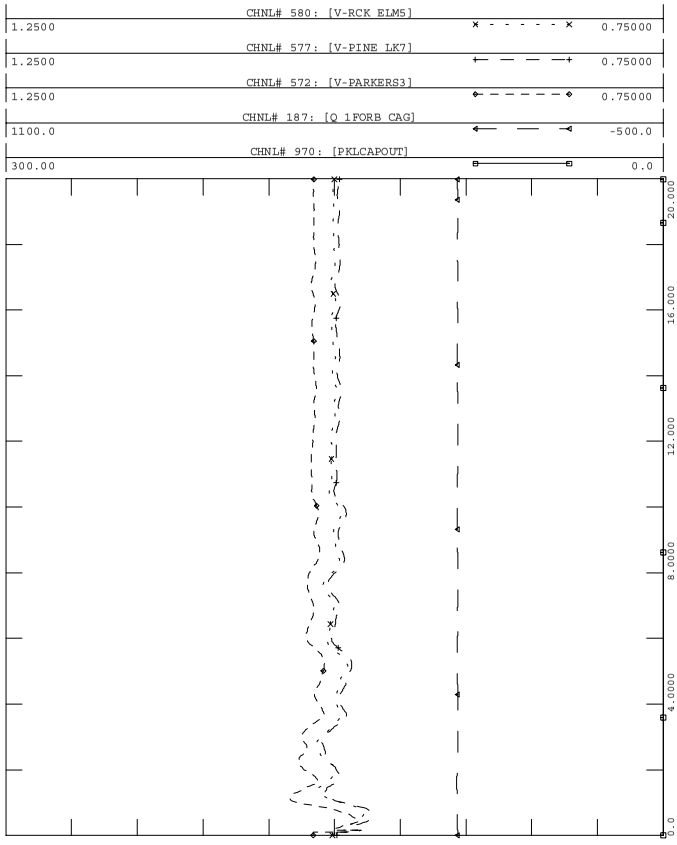
VOLTAGES 6



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

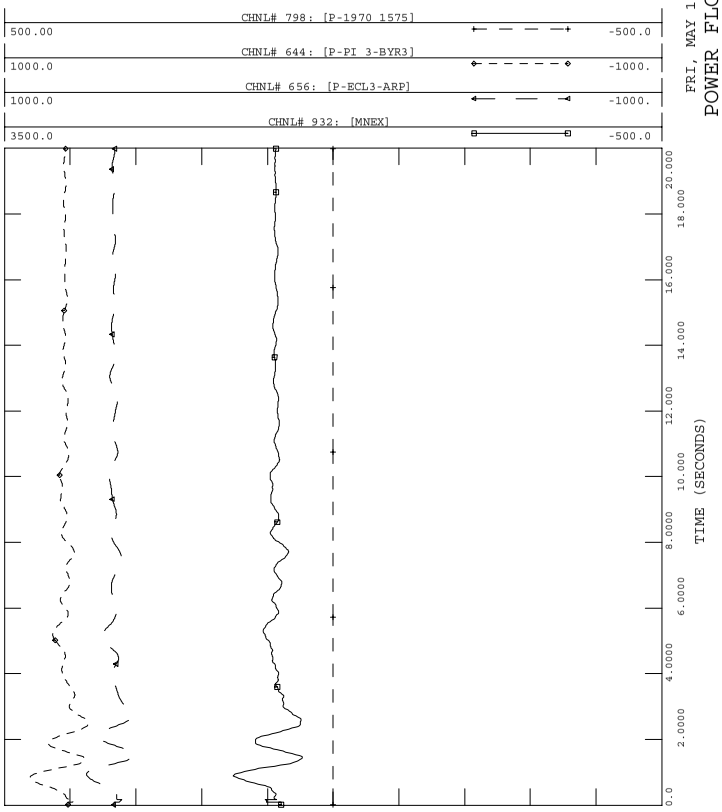
FRI, MAY 10 2002 0:55

FORBES SVS OUT & VOLTAGES



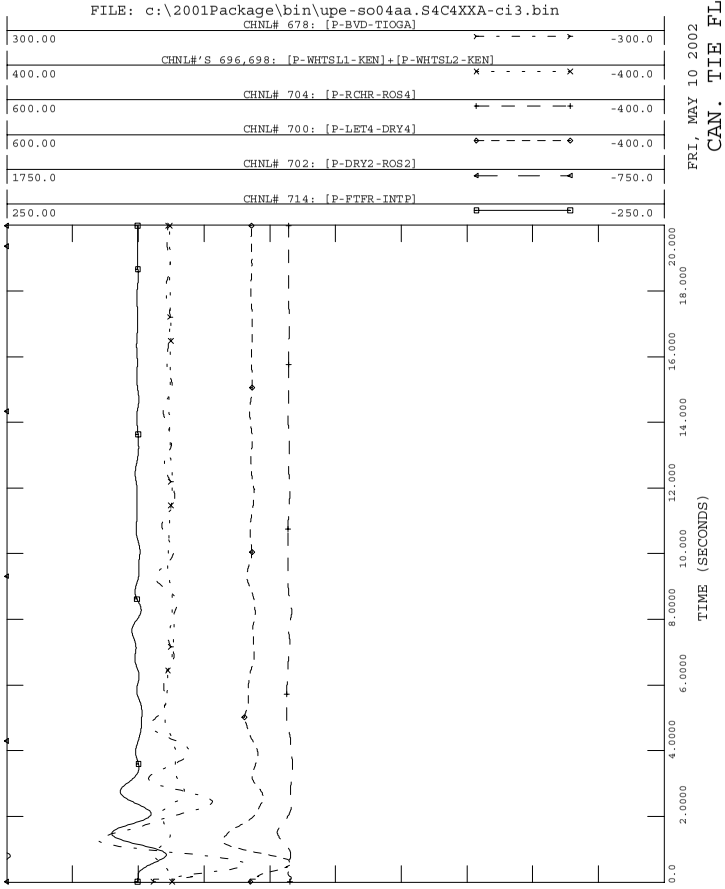
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
POWER FLOW SUMS 2



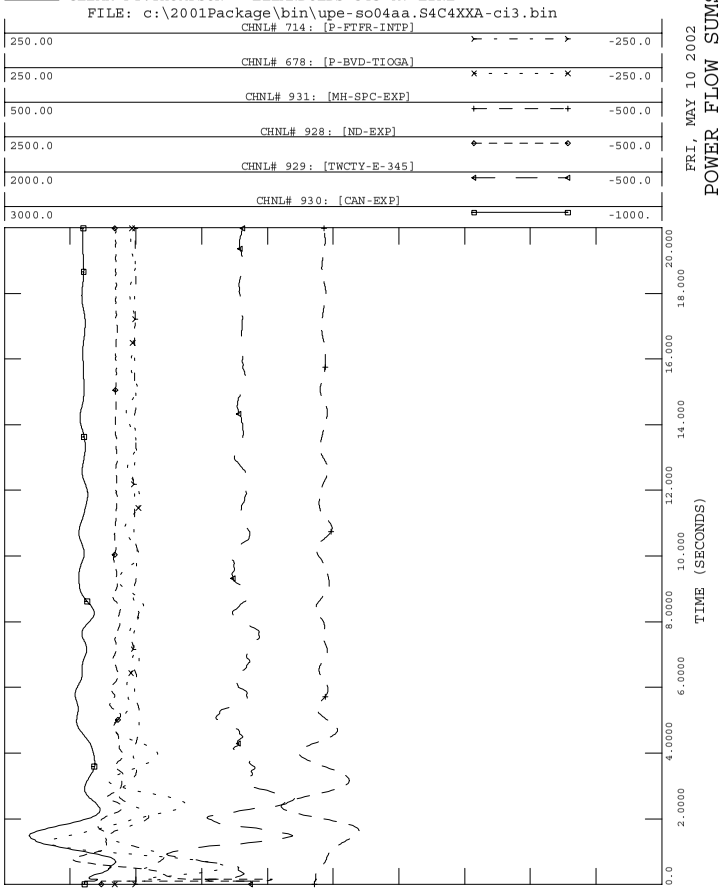
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
CAN. TIE FLOWS



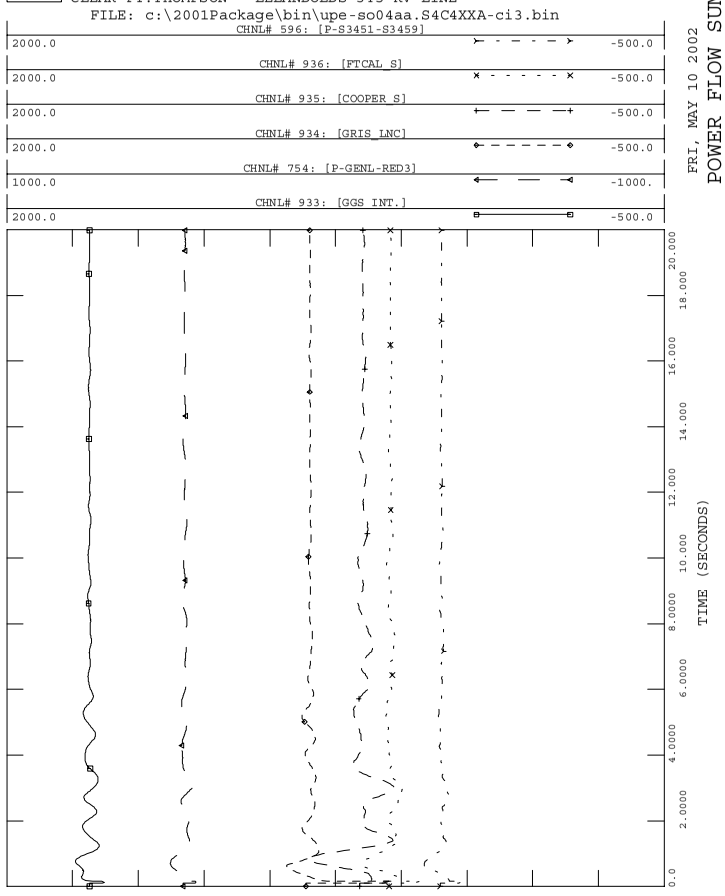
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
POWER FLOW SUMS 1



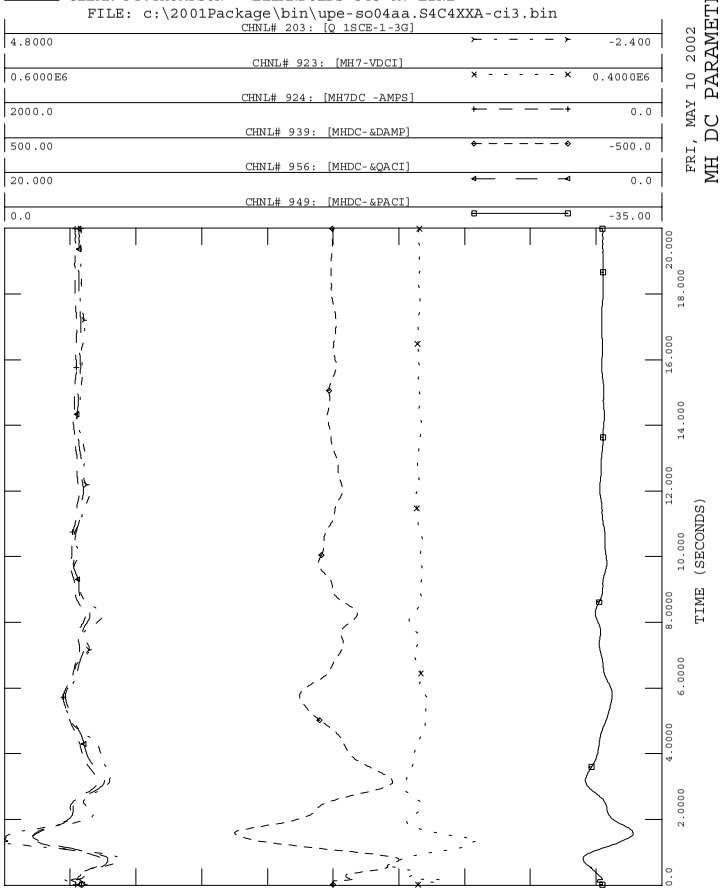
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
POWER FLOW SUM 3



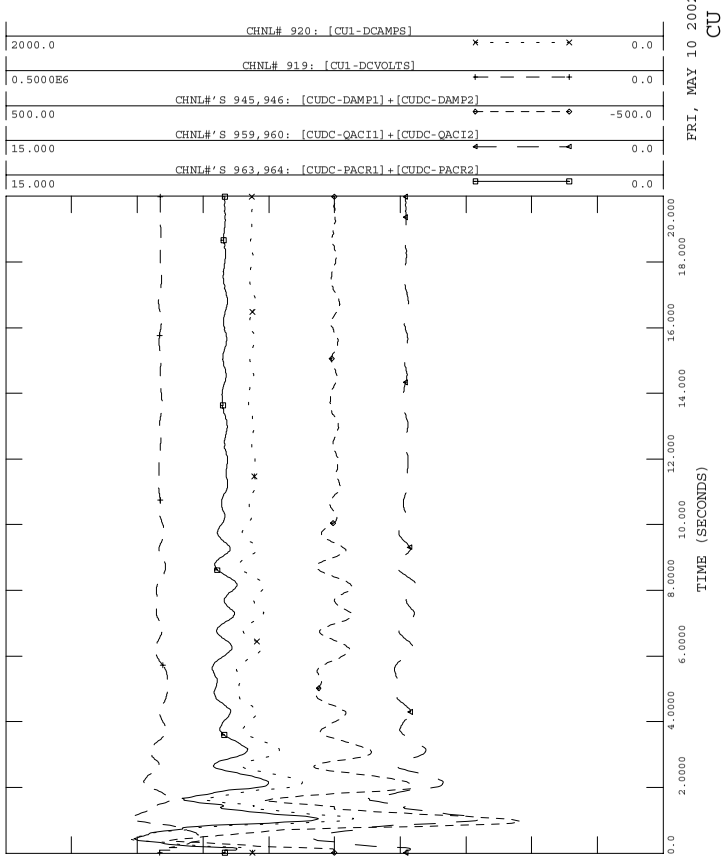
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
MH DC PARAMETERS



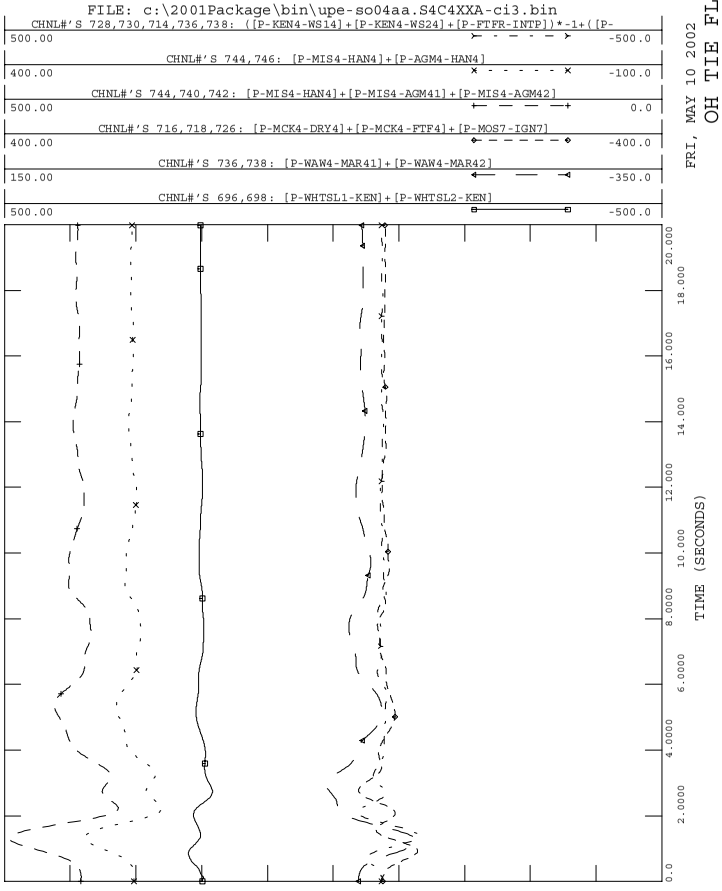
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
CU DC #1



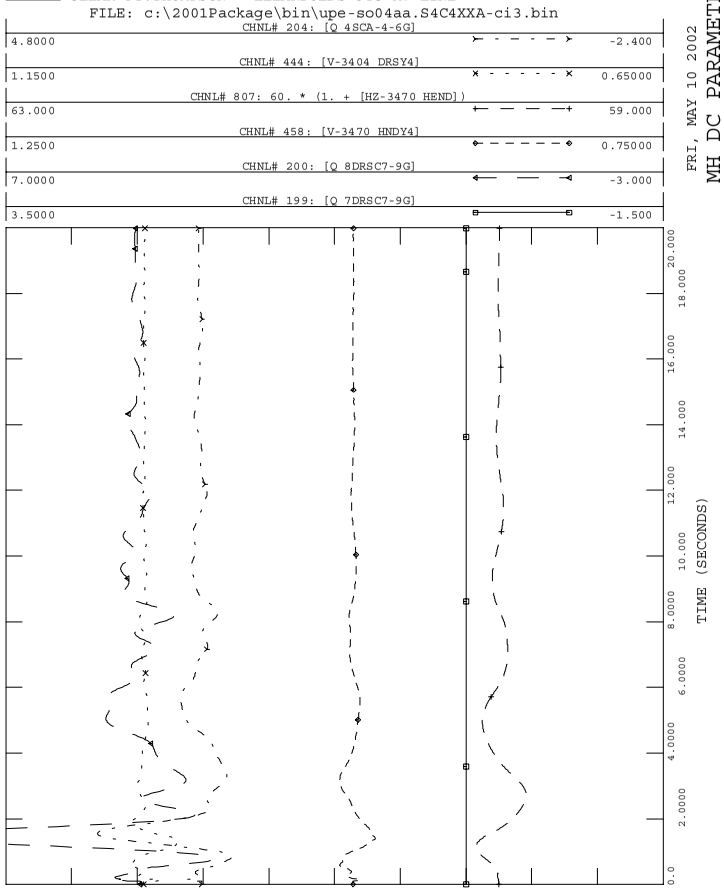
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55
OH TIE FLOWS



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

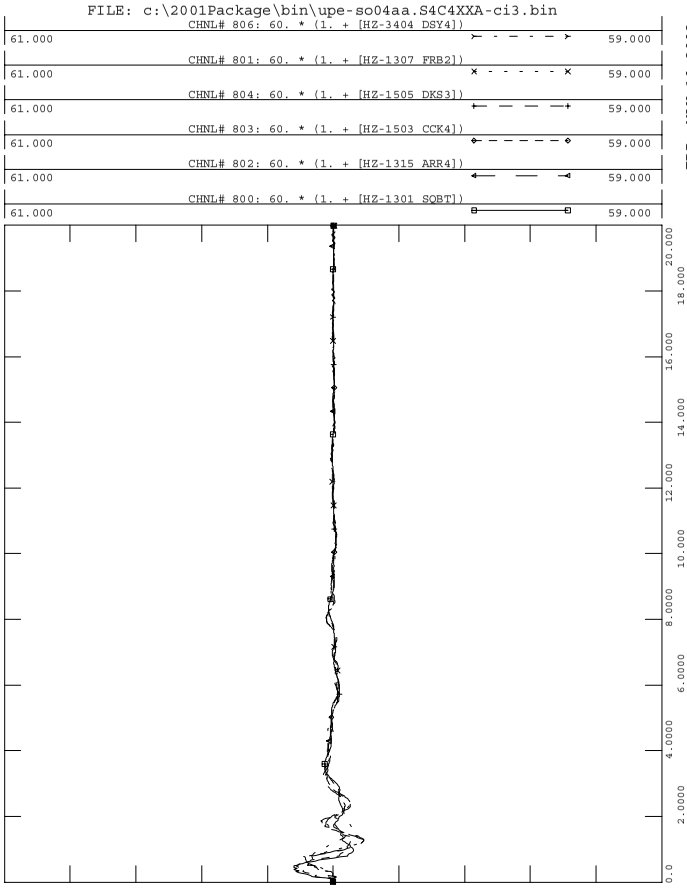
FRI, MAY 10 2002 0:55
MH DC PARAMETERS



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55

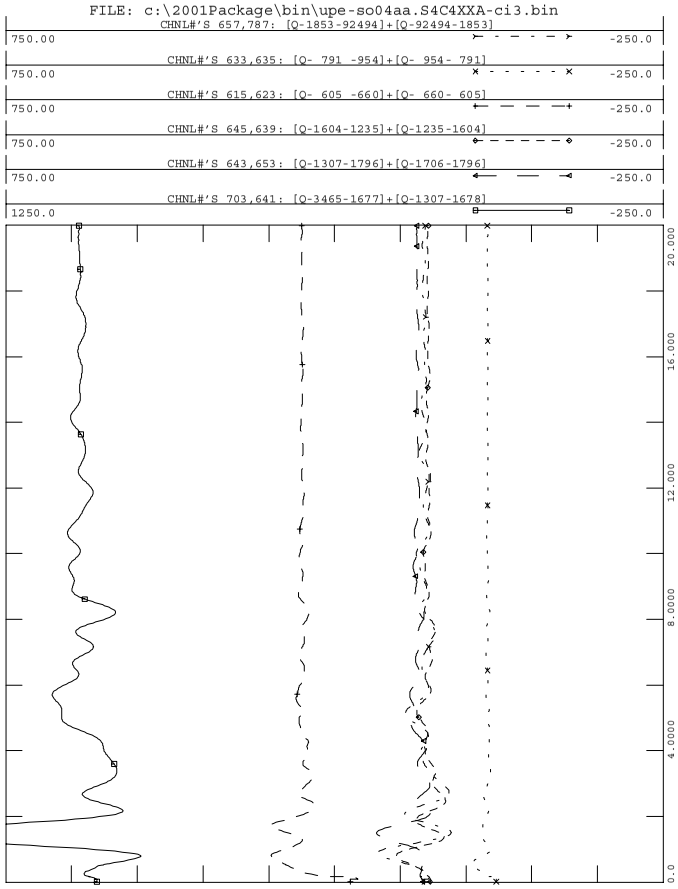
FREQ AT DC TERMINALS



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55

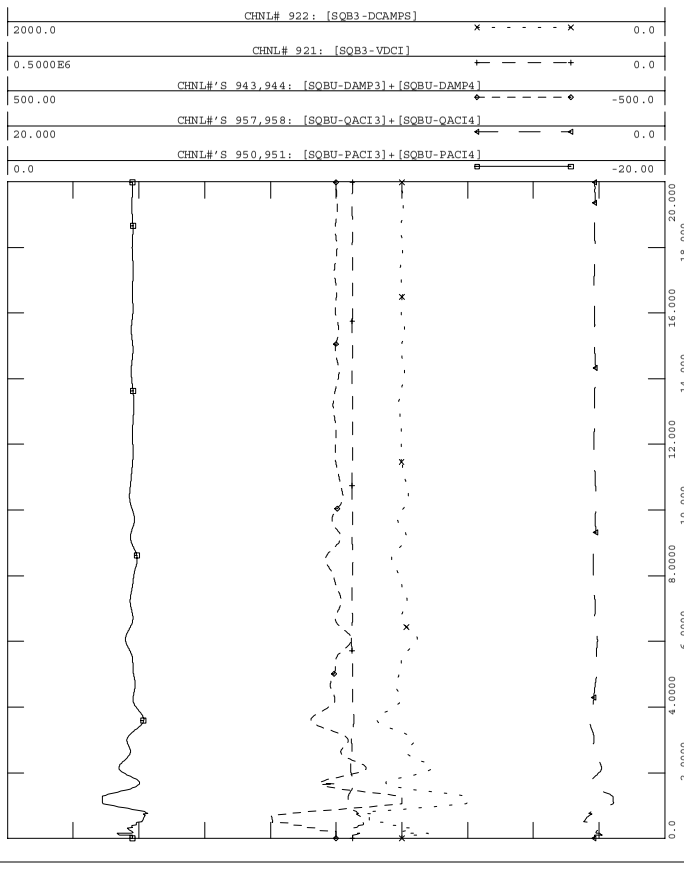
VAR LOSSES



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55

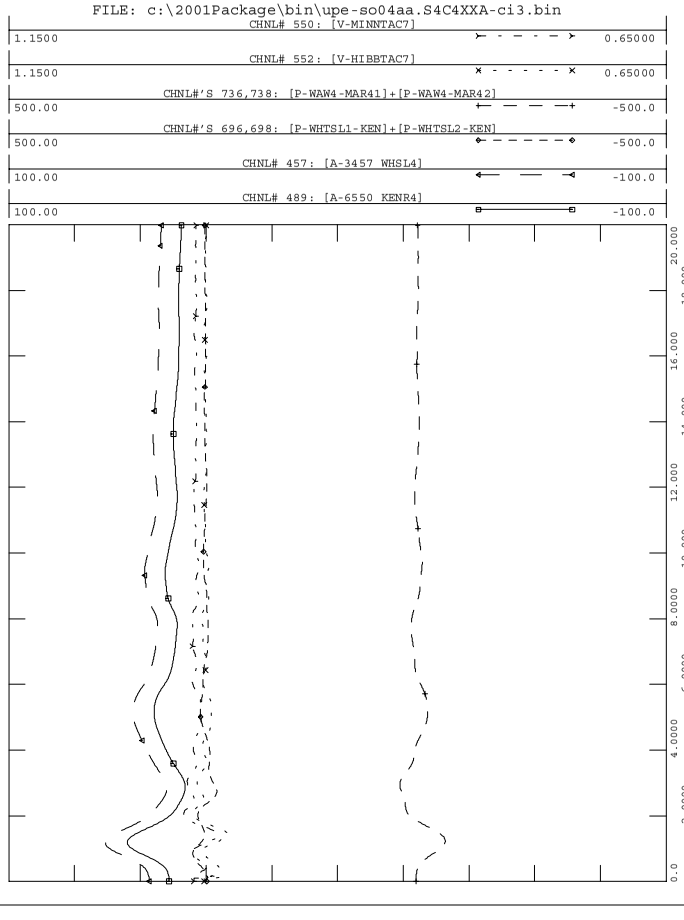
SQB DC #3



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

FRI, MAY 10 2002 0:55

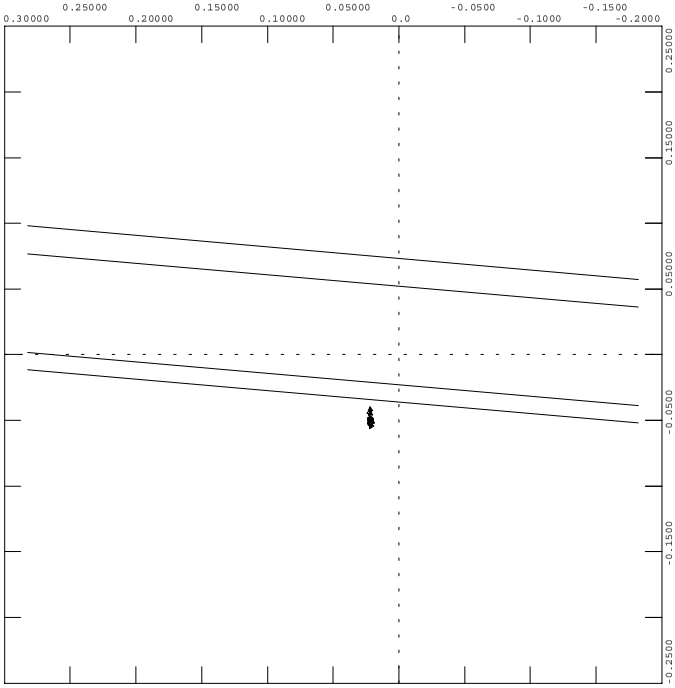
VOLTAGES, ANGLES



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



FRI, MAY 10 2002 0:55
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

RELAY: RELAYG
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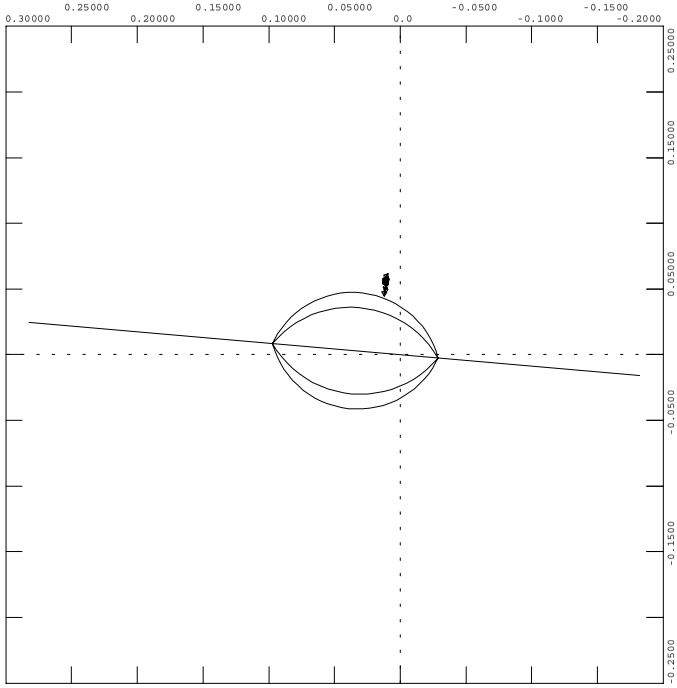
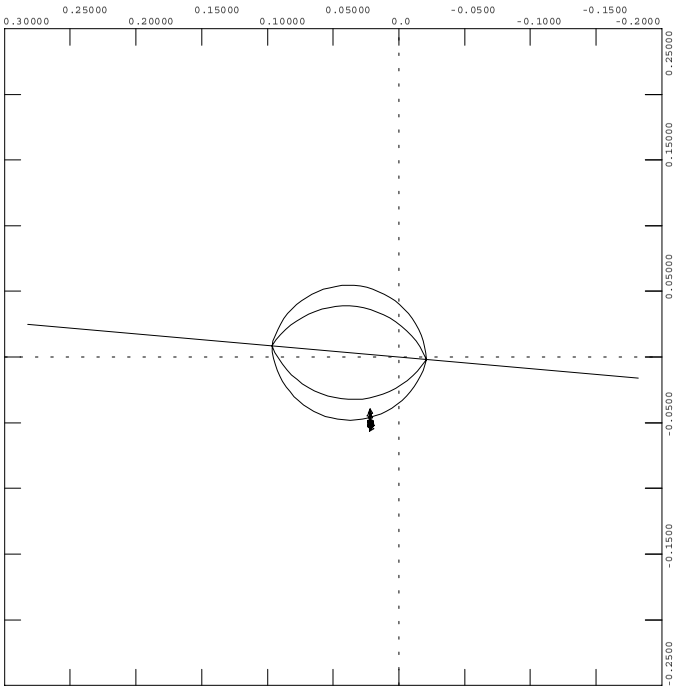


FRI, MAY 10 2002 0:55
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

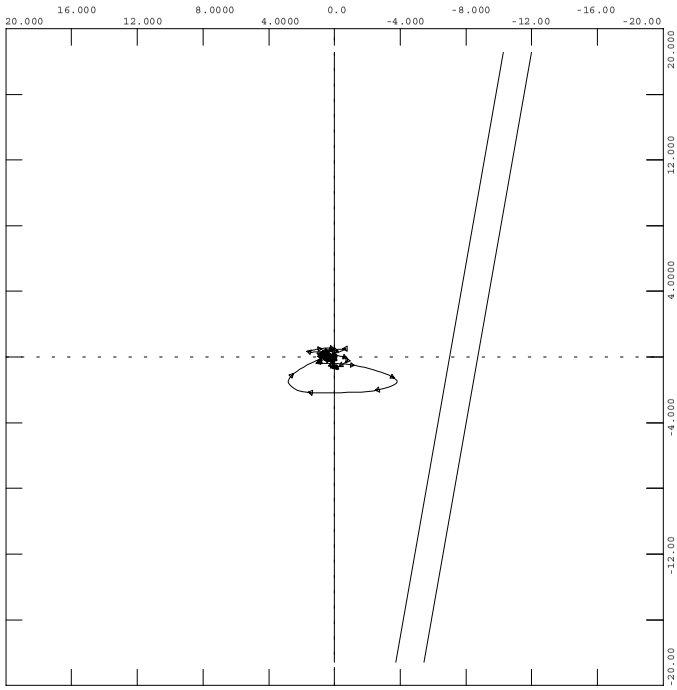


FRI, MAY 10 2002 0:55
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

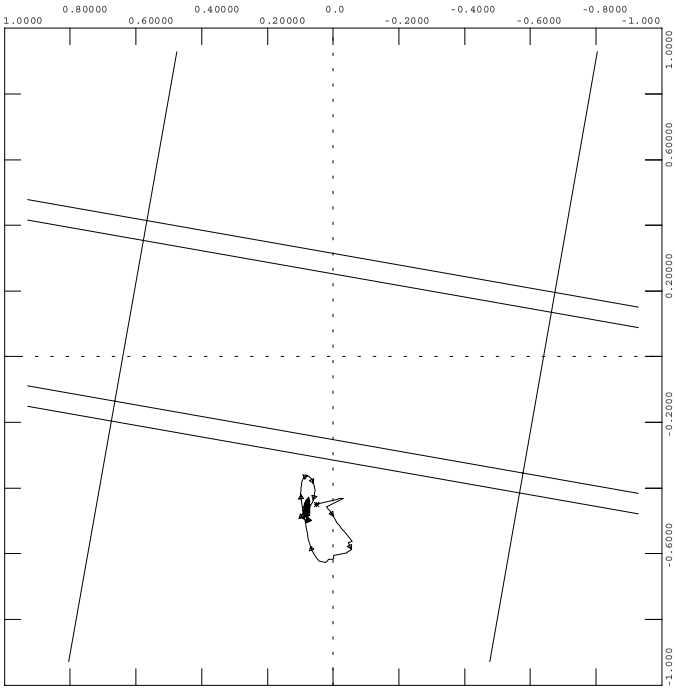


FRI, MAY 10 2002 0:55
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

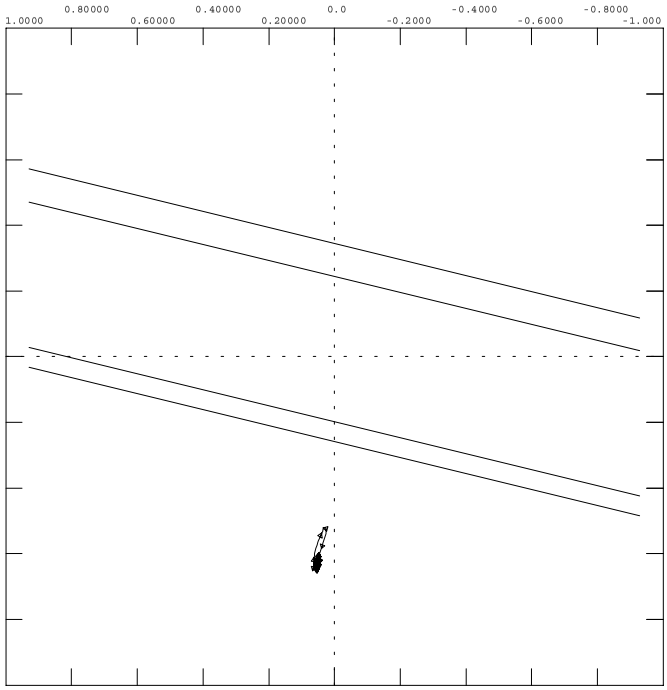
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

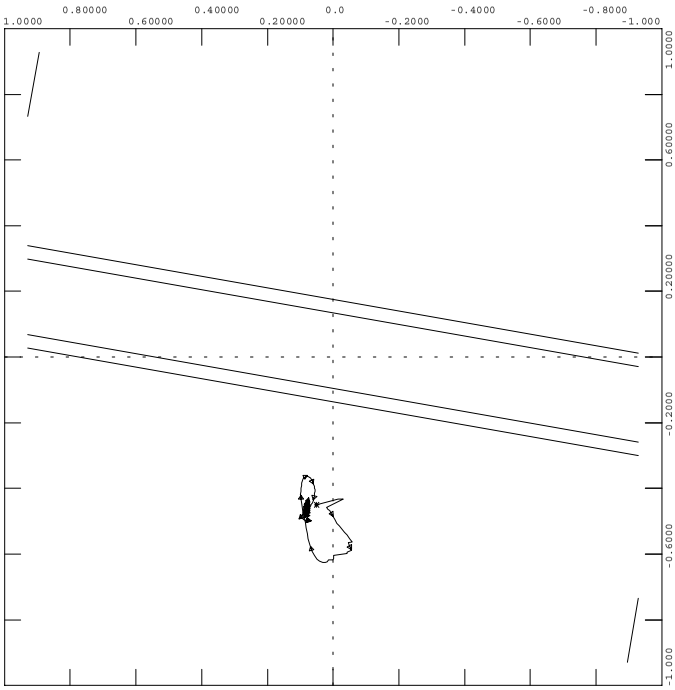
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

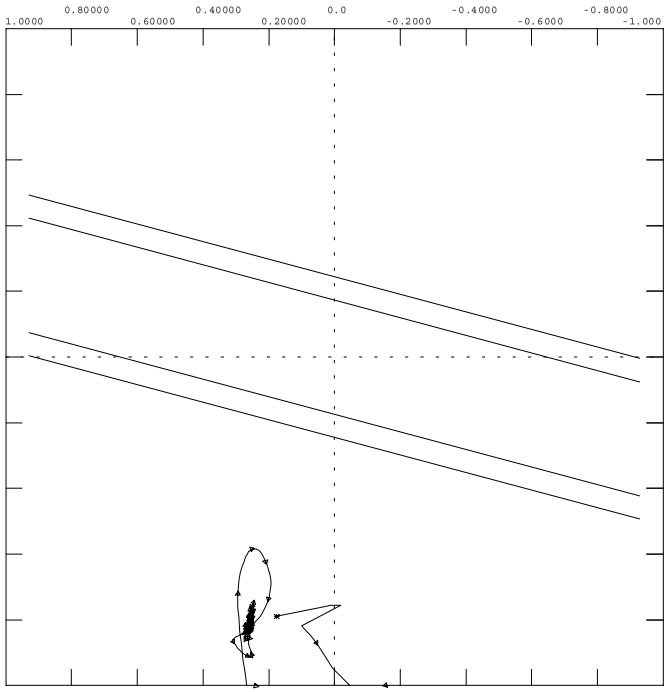
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

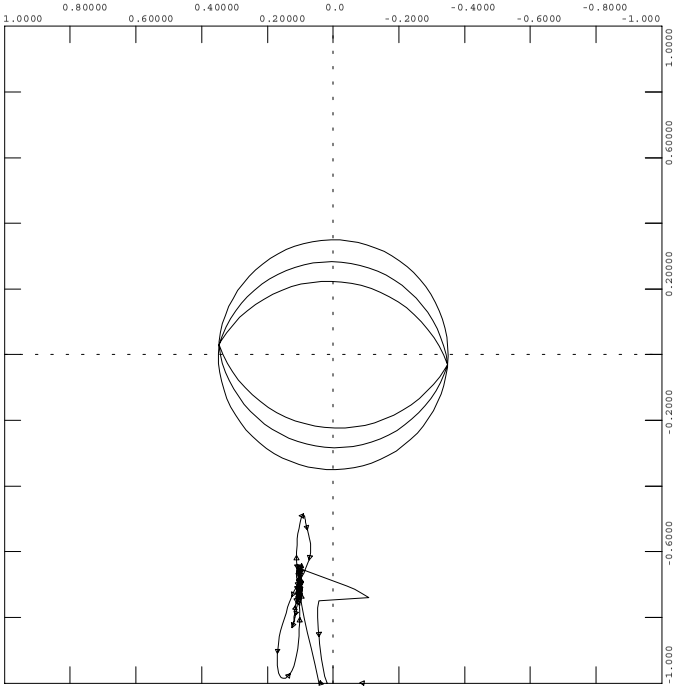
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

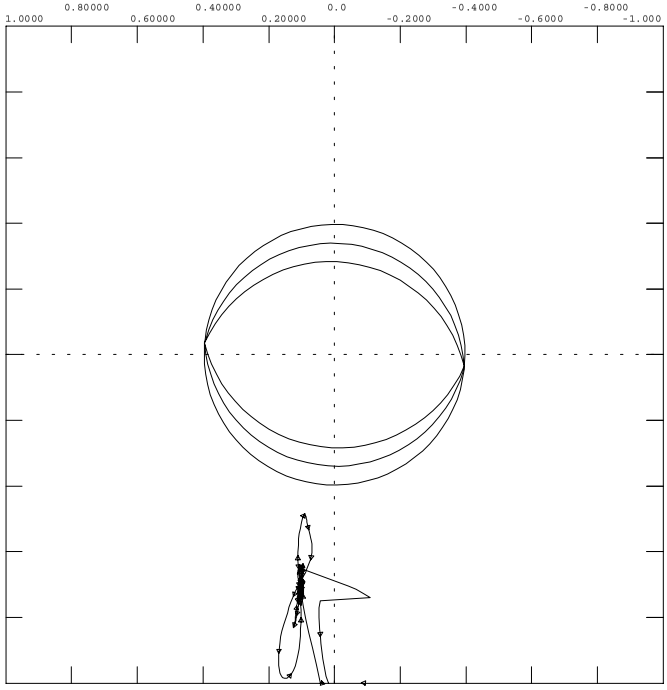
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

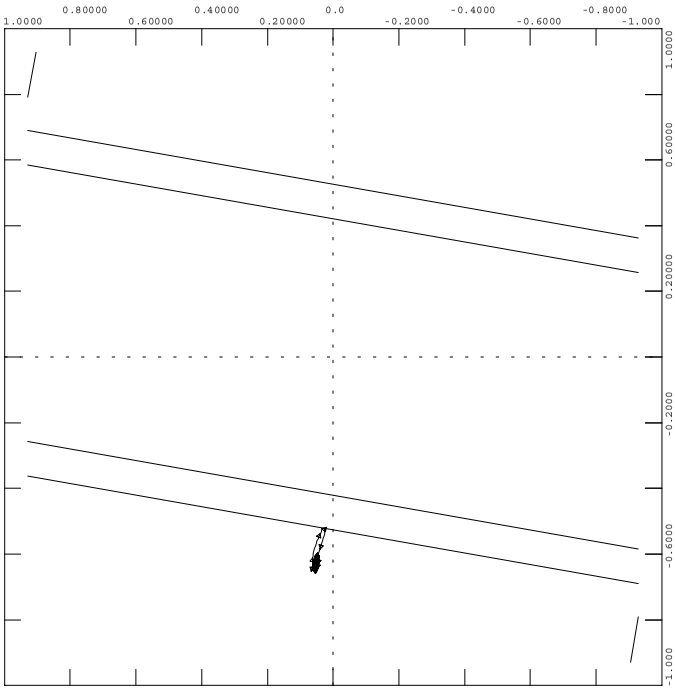
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

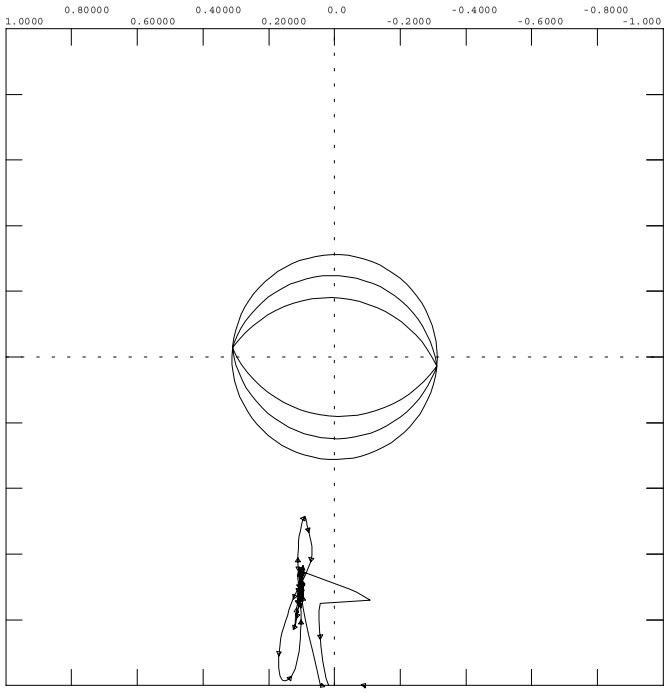
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



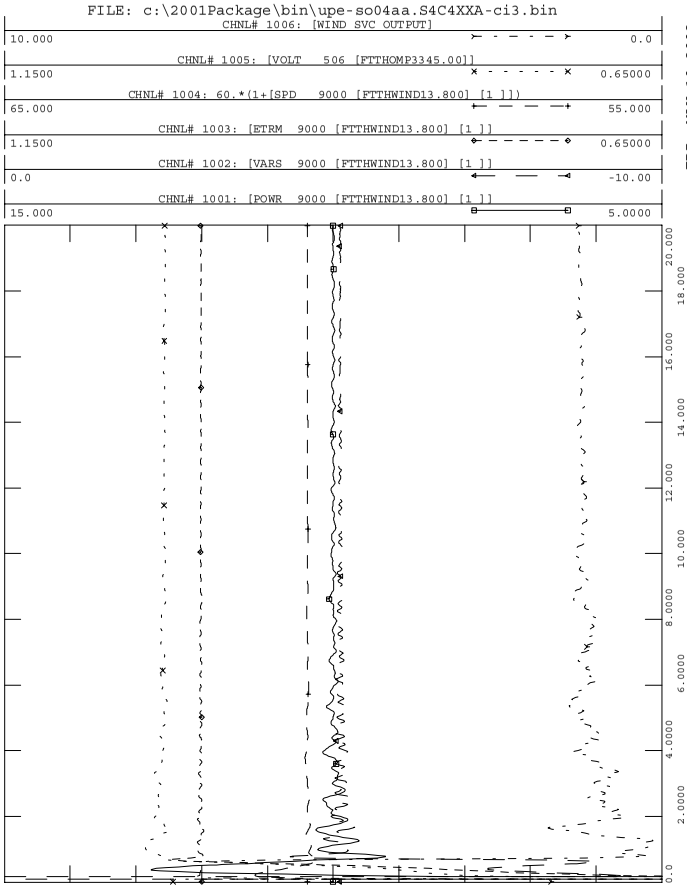
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

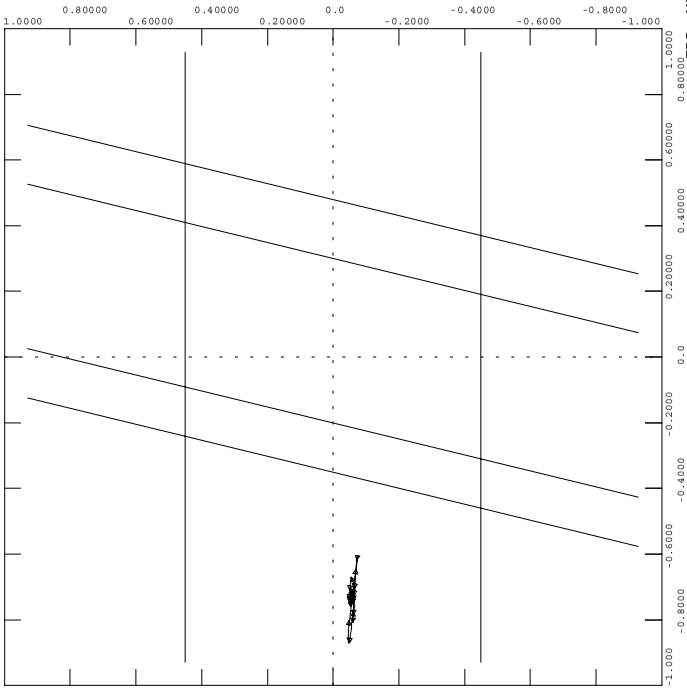


FRI, MAY 10 2002 0:55
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - LELANDOLDS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ci3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

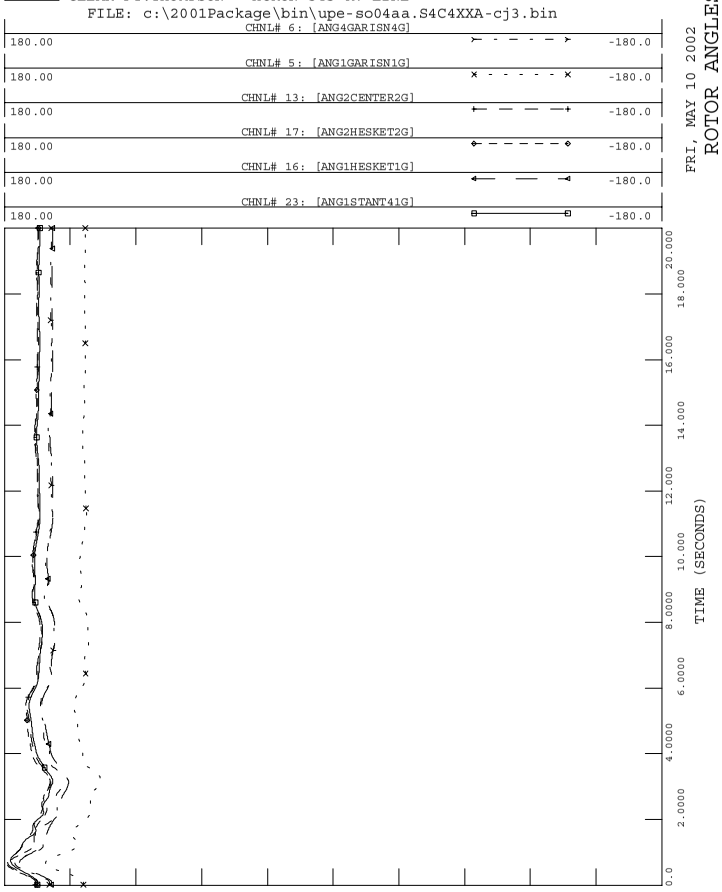


FRI, MAY 10 2002 0:55
MP-OH I.FALLS (779)

CONTINGENCY CJ3

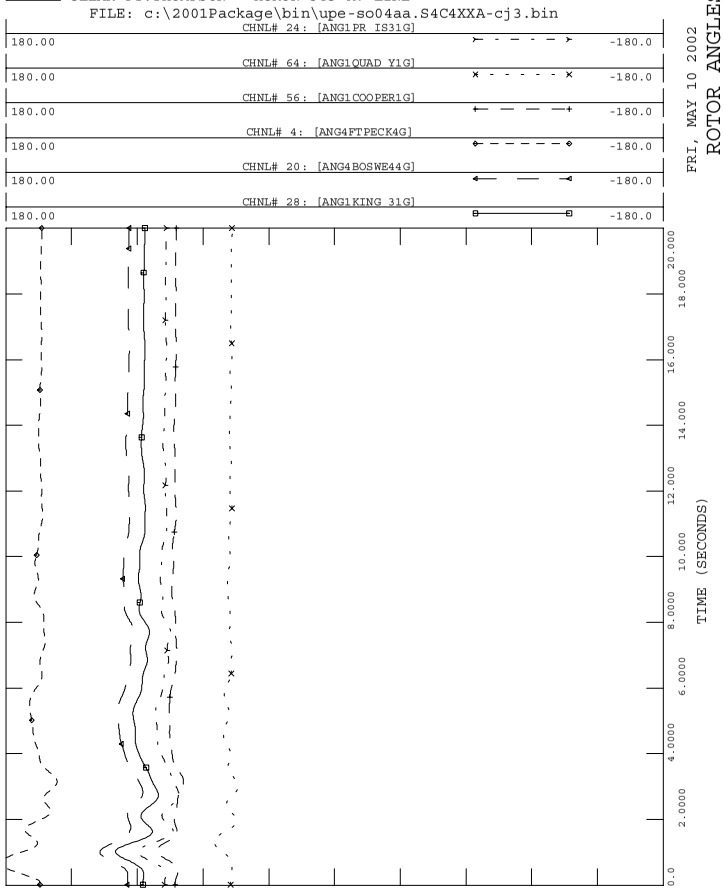
4 cycle 3 phase fault at Ft Thompson 345 kV. Clear the Ft Thompson – Huron 345 kV line

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin



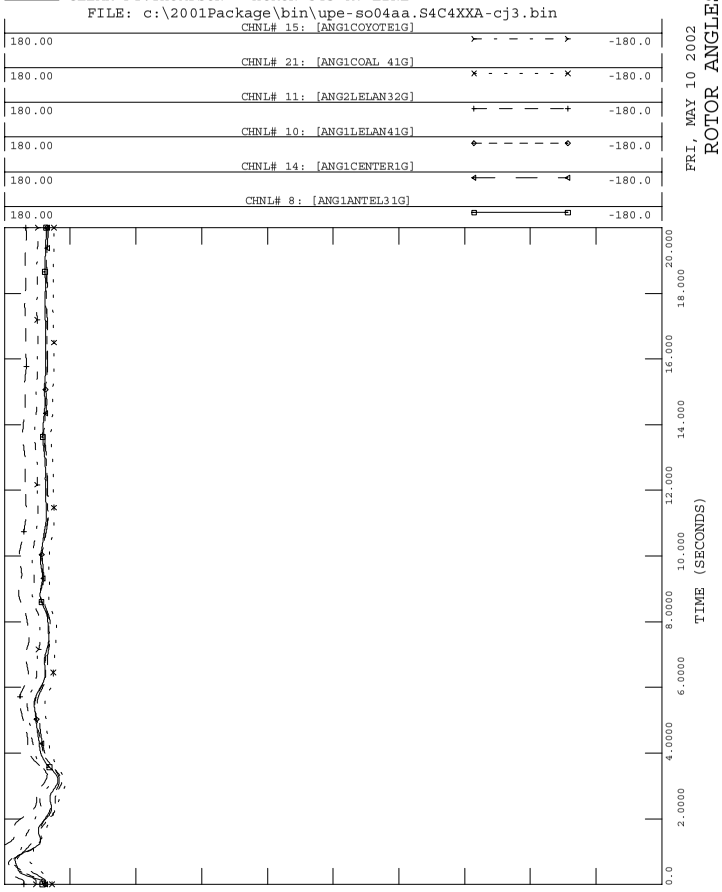
FRI, MAY 10 2002 1:09
ROTOR ANGLES 2

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin



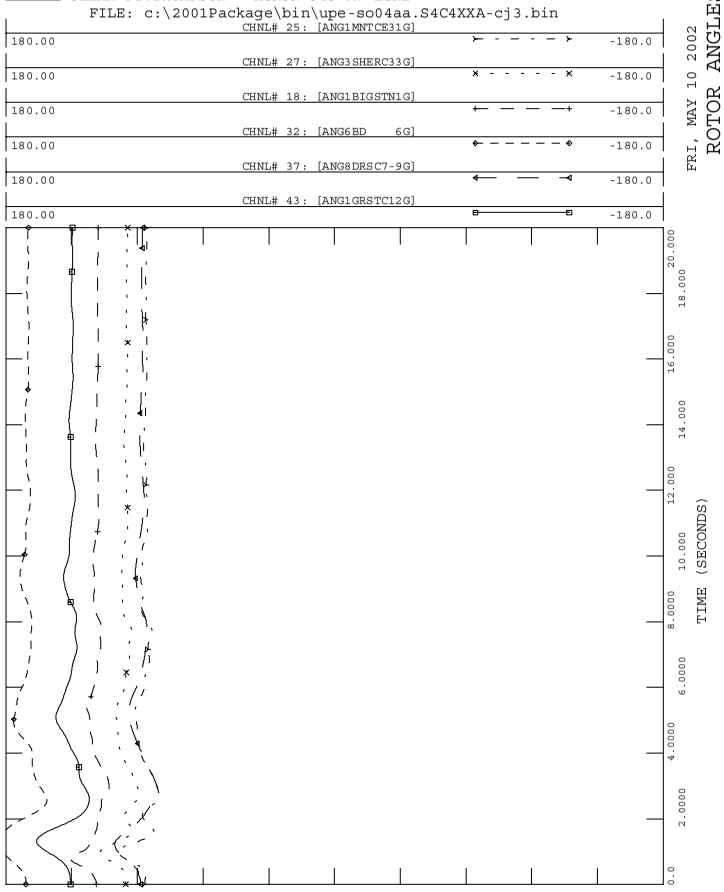
FRI, MAY 10 2002 1:09
ROTOR ANGLES 4

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin



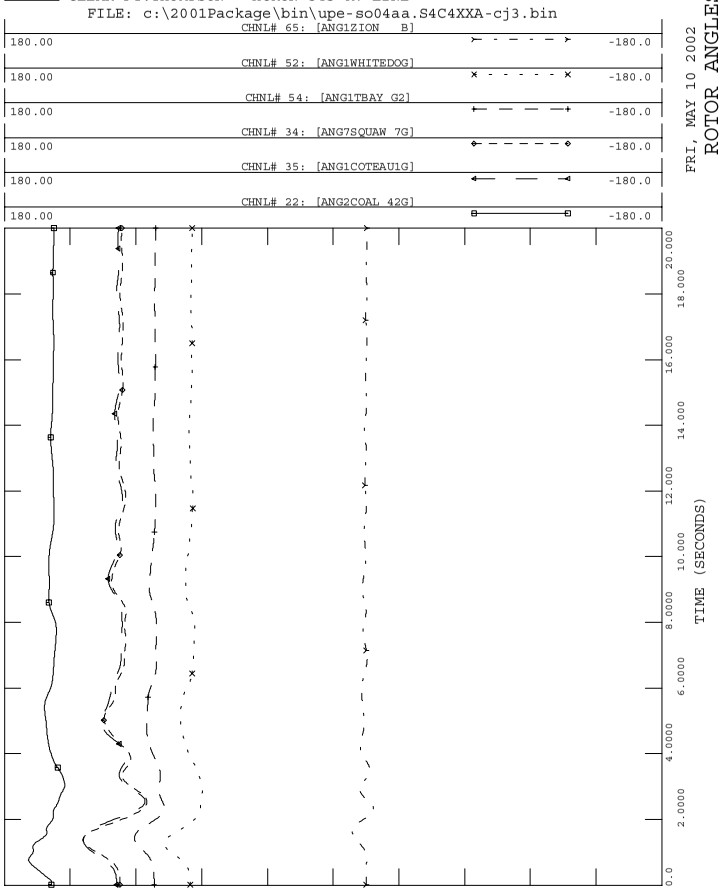
FRI, MAY 10 2002 1:09
ROTOR ANGLES 1

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin



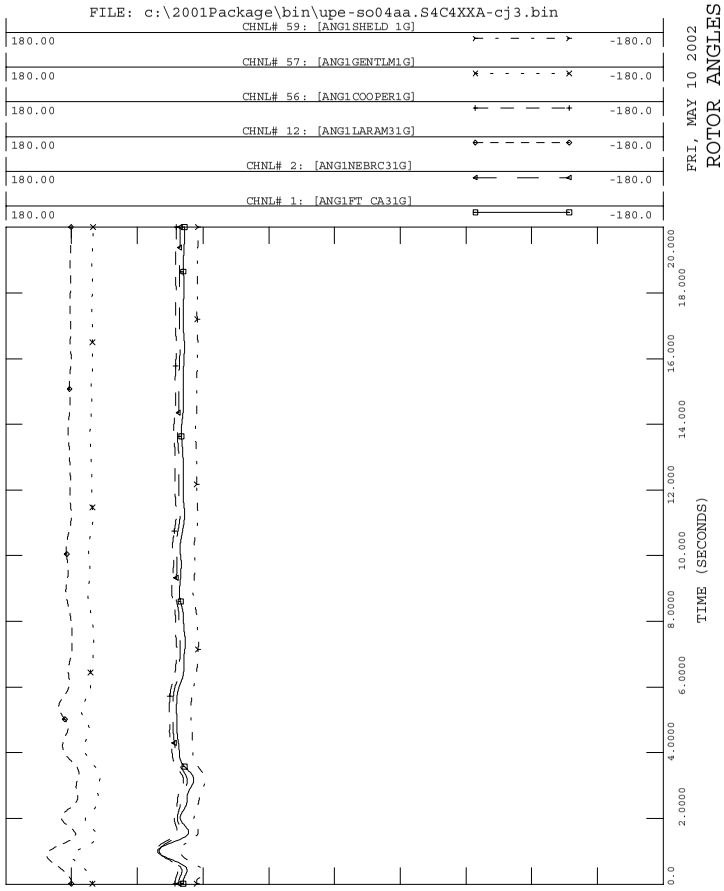
FRI, MAY 10 2002 1:09
ROTOR ANGLES 3

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin



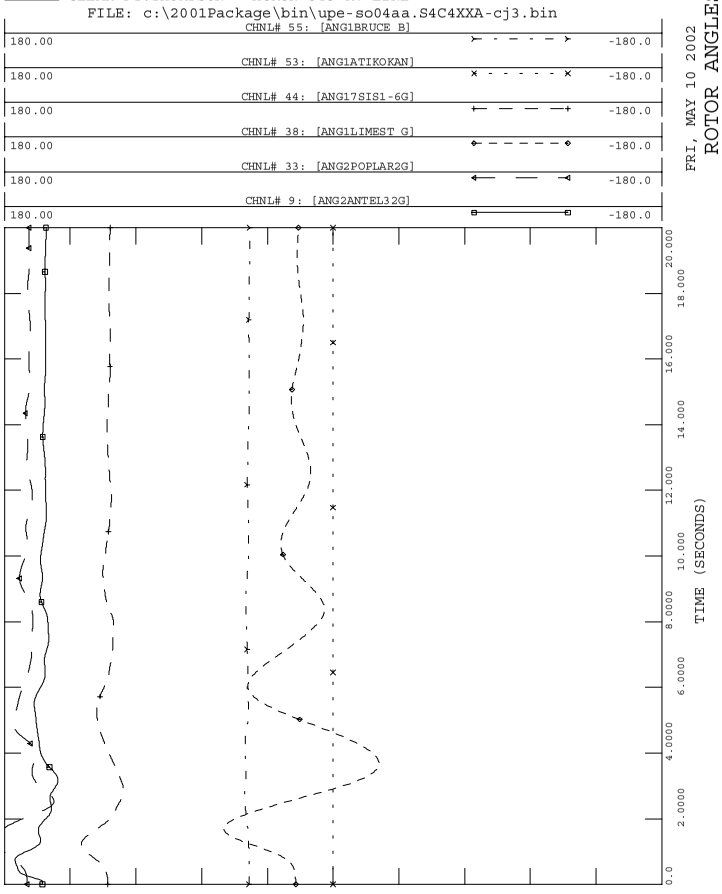
FRI, MAY 10 2002 1:09
ROTOR ANGLES 6

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin



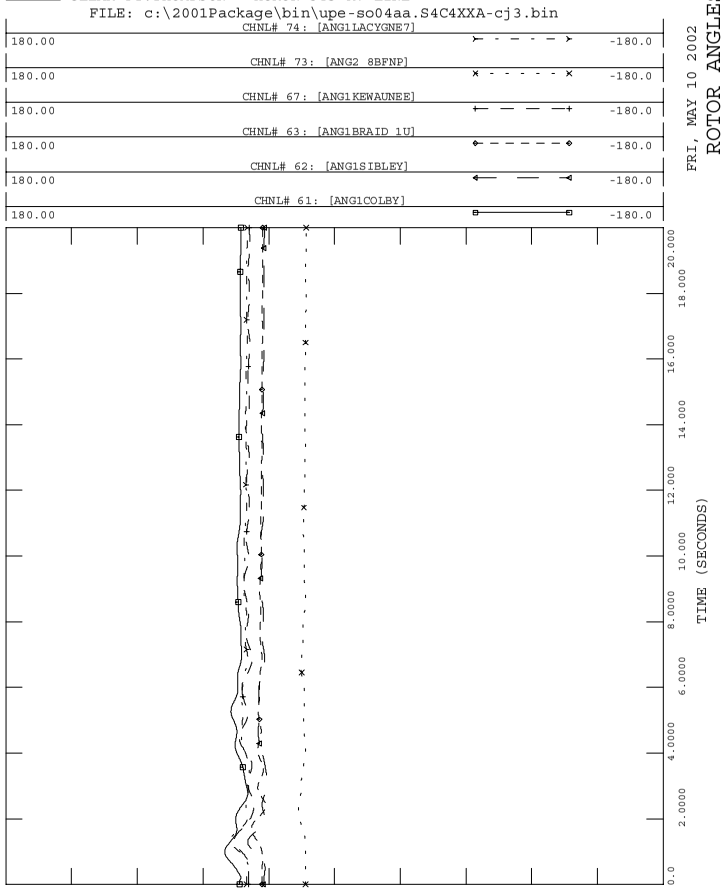
FRI, MAY 10 2002 1:09
ROTOR ANGLES NB

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin



FRI, MAY 10 2002 1:09
ROTOR ANGLES 5

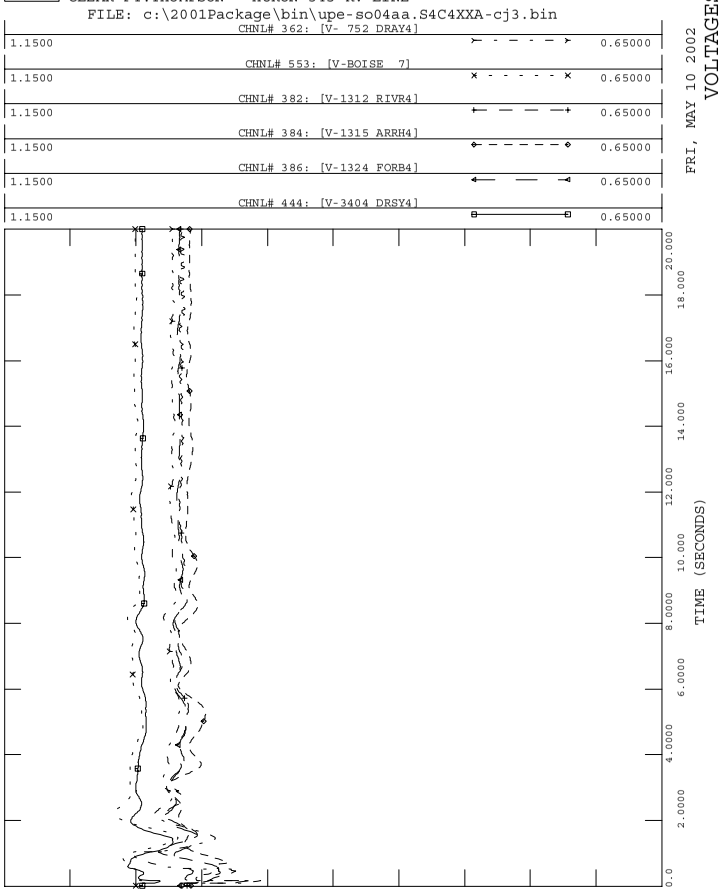
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin



FRI, MAY 10 2002 1:09
ROTOR ANGLES 7

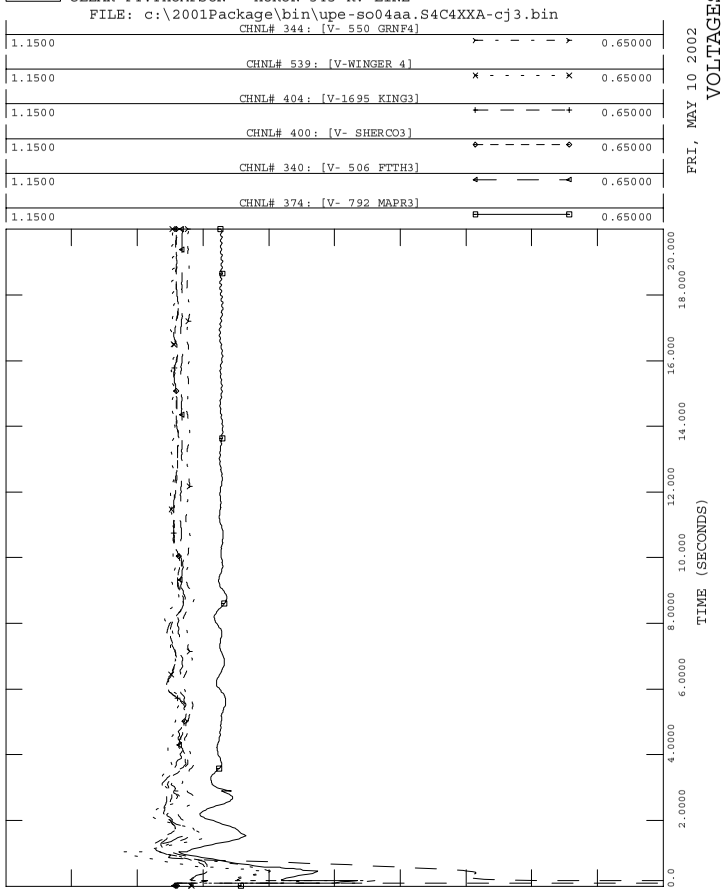
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09
VOLTAGES 1



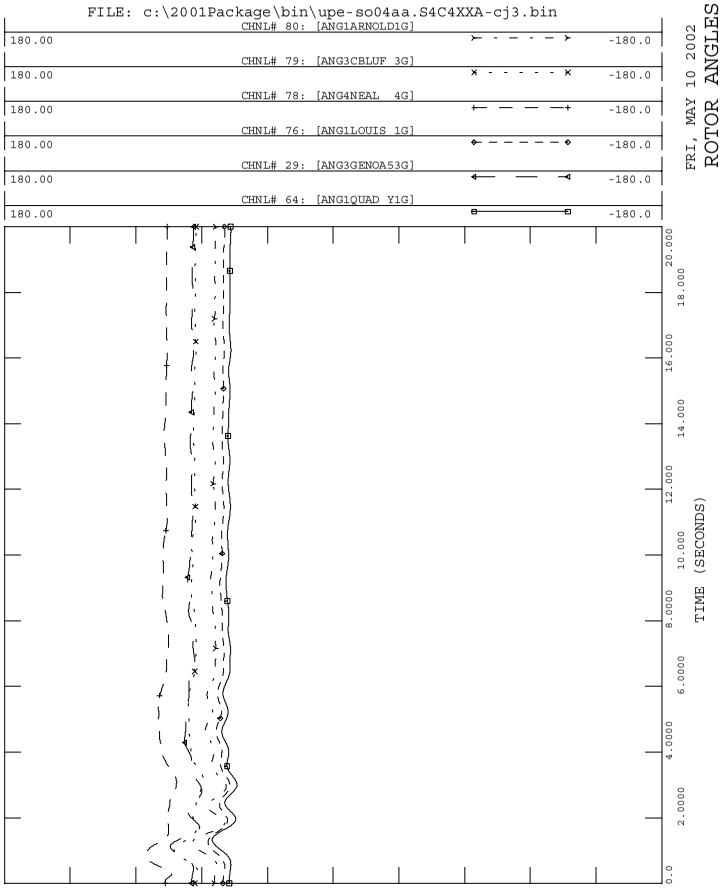
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09
VOLTAGES 3



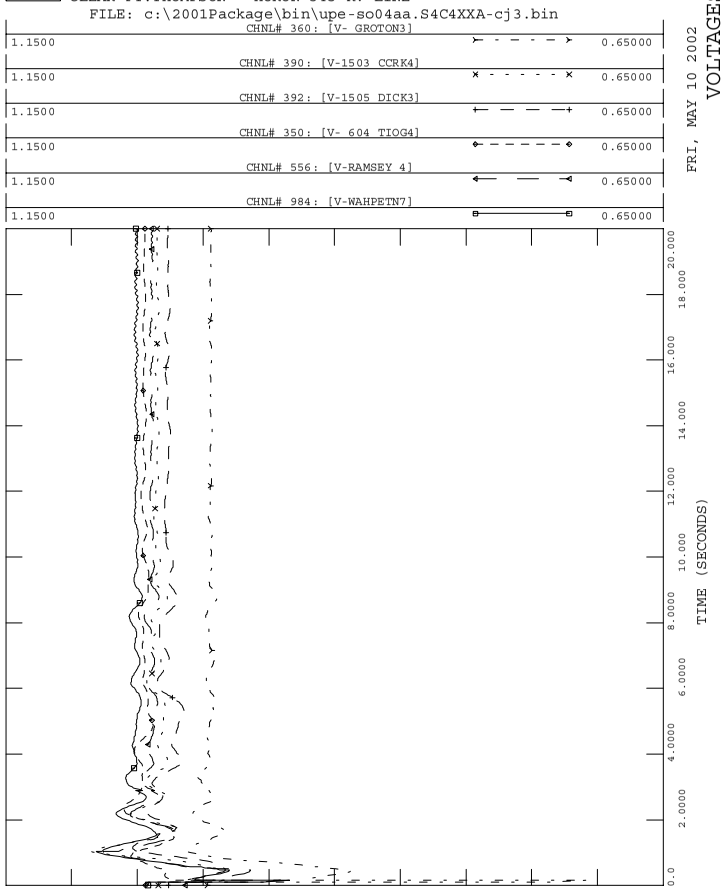
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09
ROTOR ANGLES IA



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

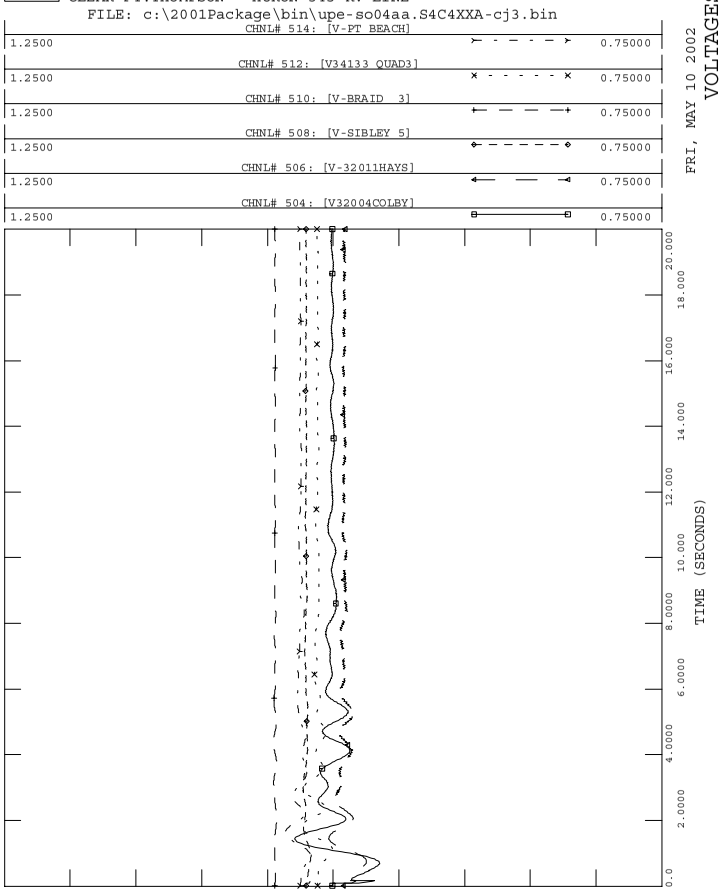
FRI, MAY 10 2002 1:09
VOLTAGES 2



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

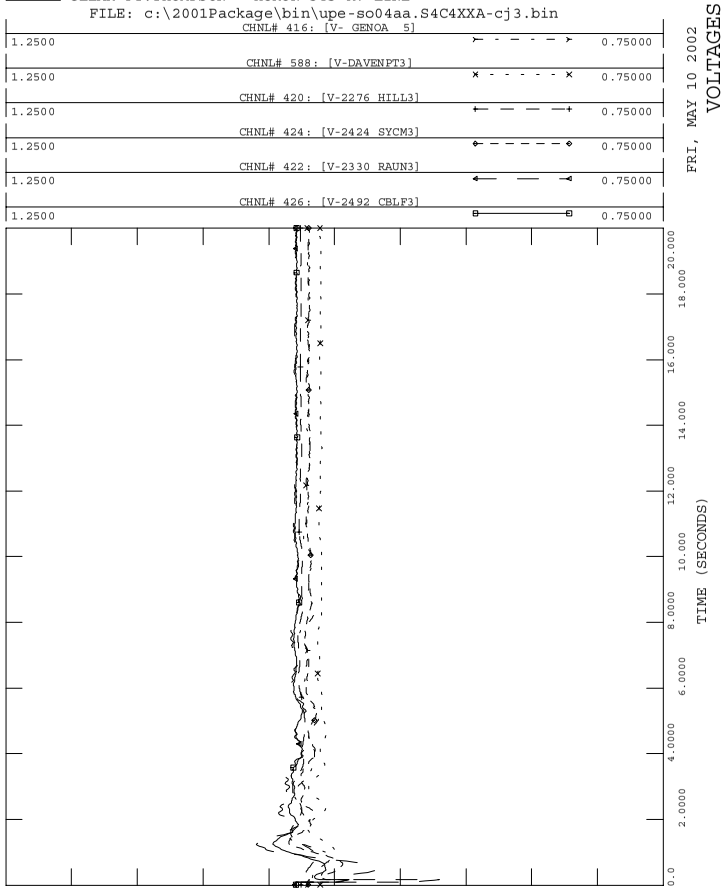
VOLTAGES 5



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

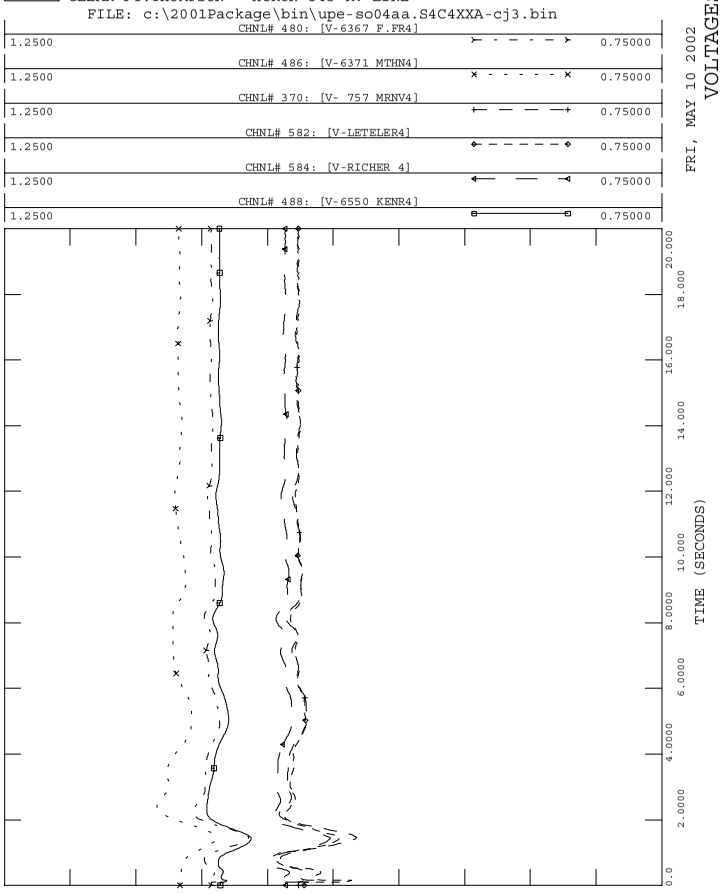
VOLTAGES IA



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

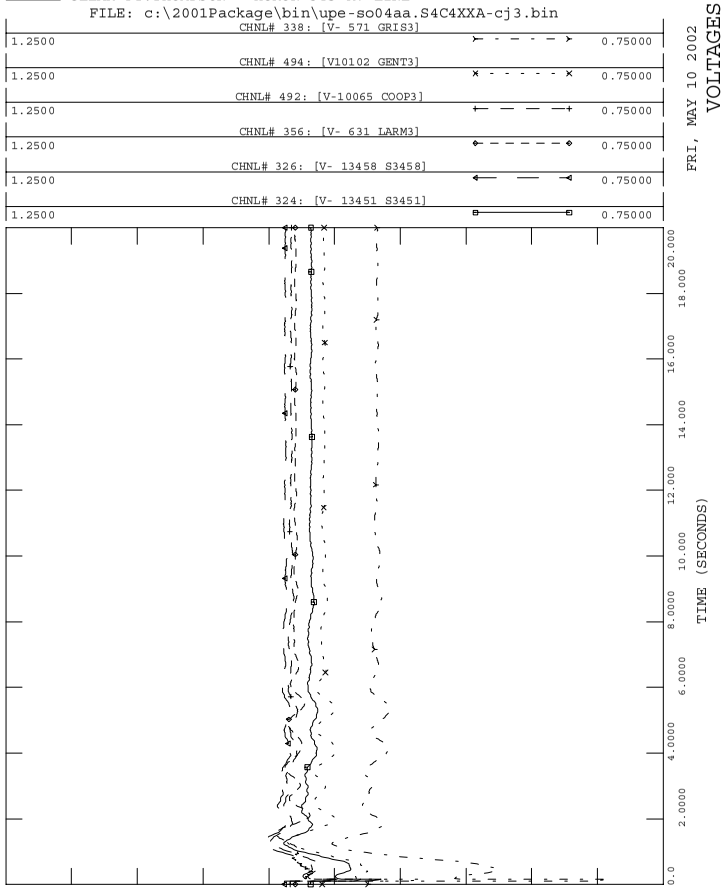
VOLTAGES 4

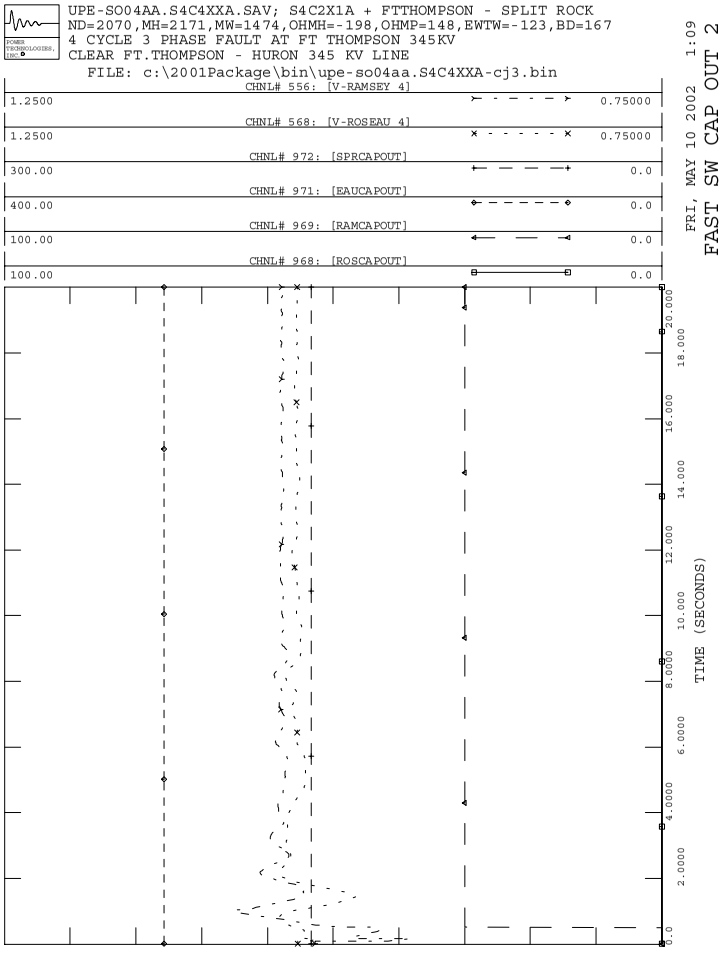


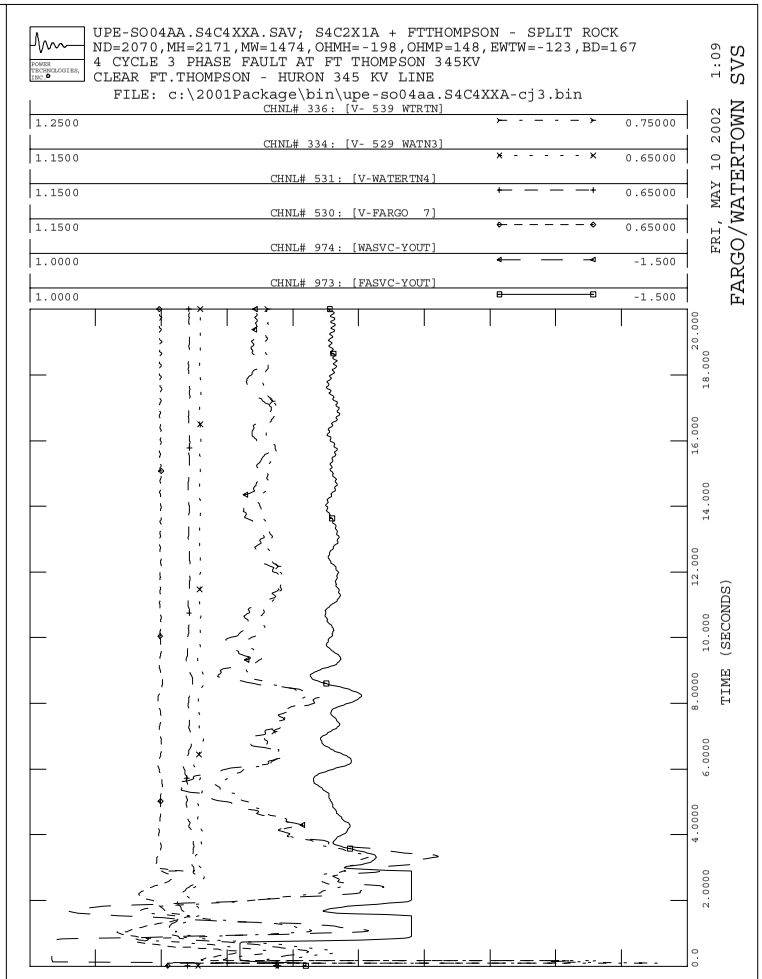
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

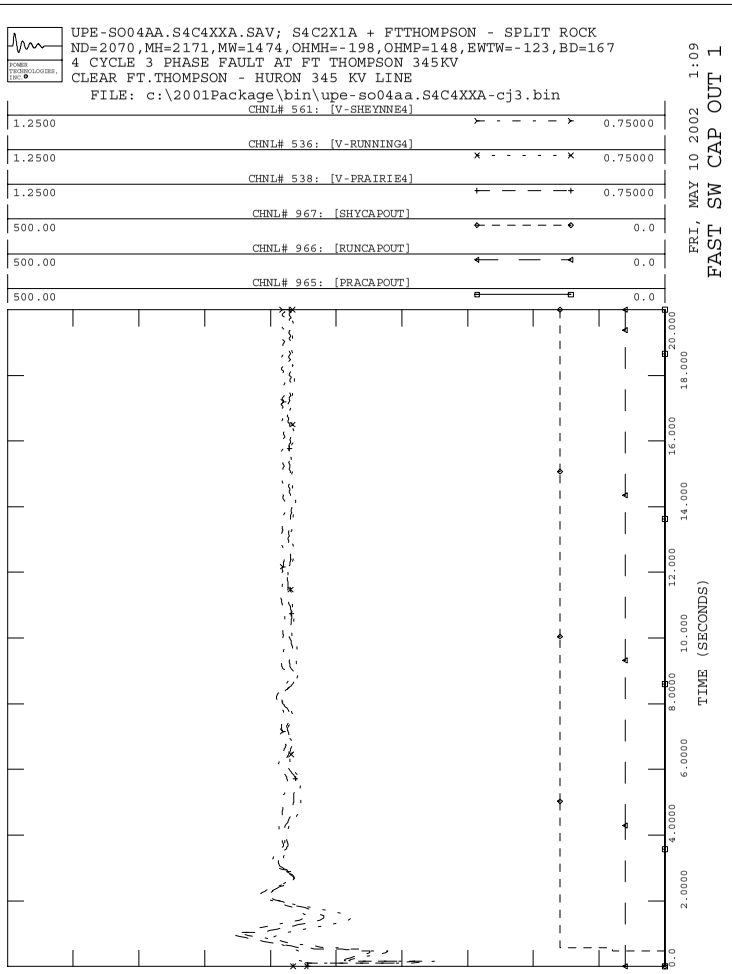
FRI, MAY 10 2002 1:09

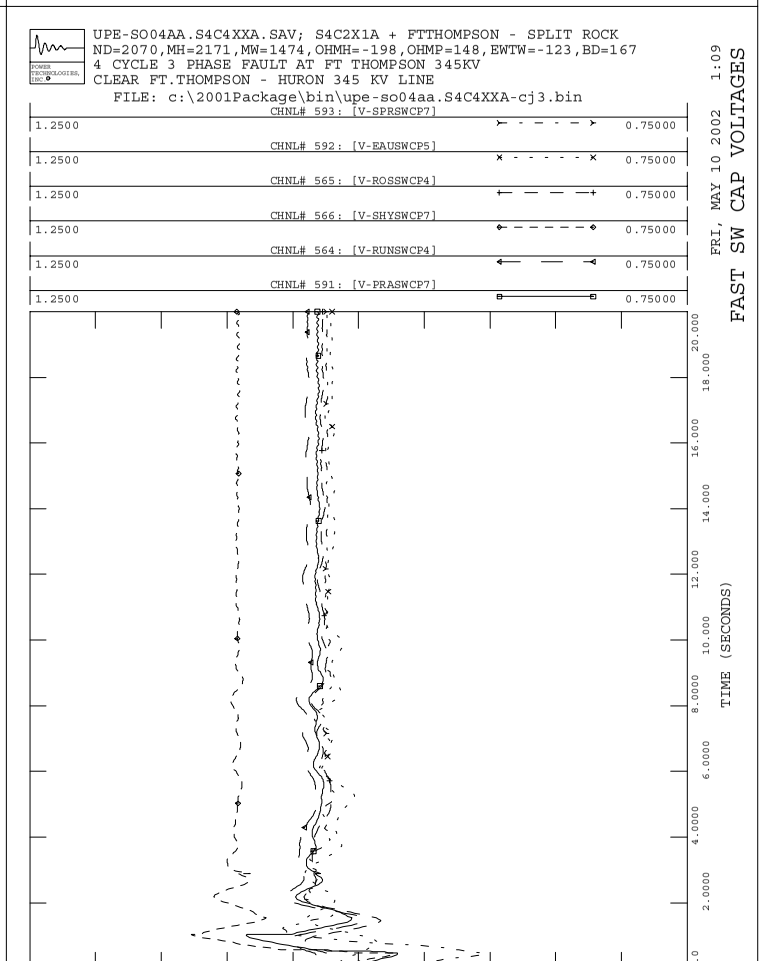
VOLTAGES NB




UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
FRI, MAY 10 2002 1:09
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
FRI, MAY 10 2002 1:09
FARGO/WATERTOWN SVS
TIME (SECONDS)

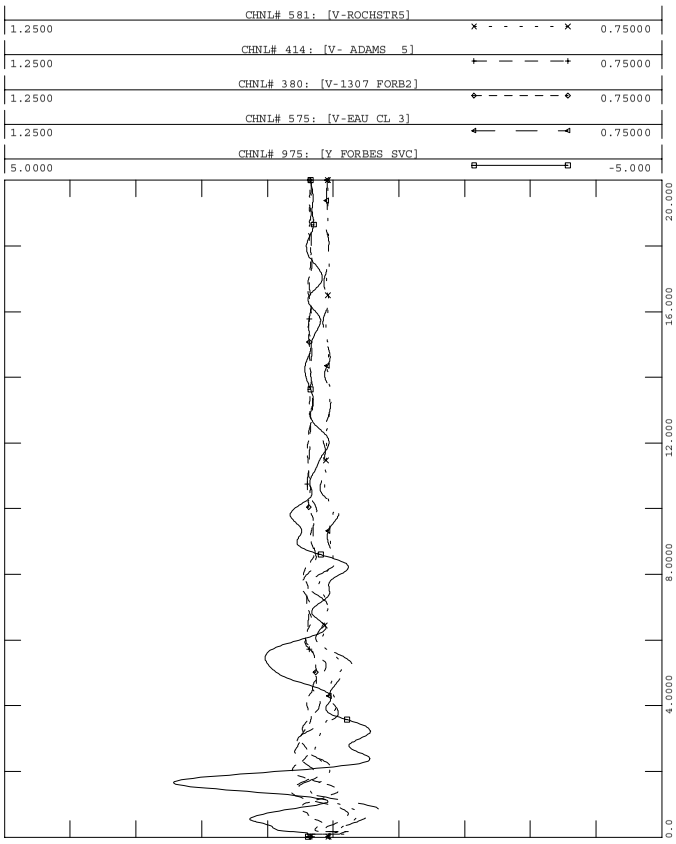

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
FRI, MAY 10 2002 1:09
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
FRI, MAY 10 2002 1:09
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

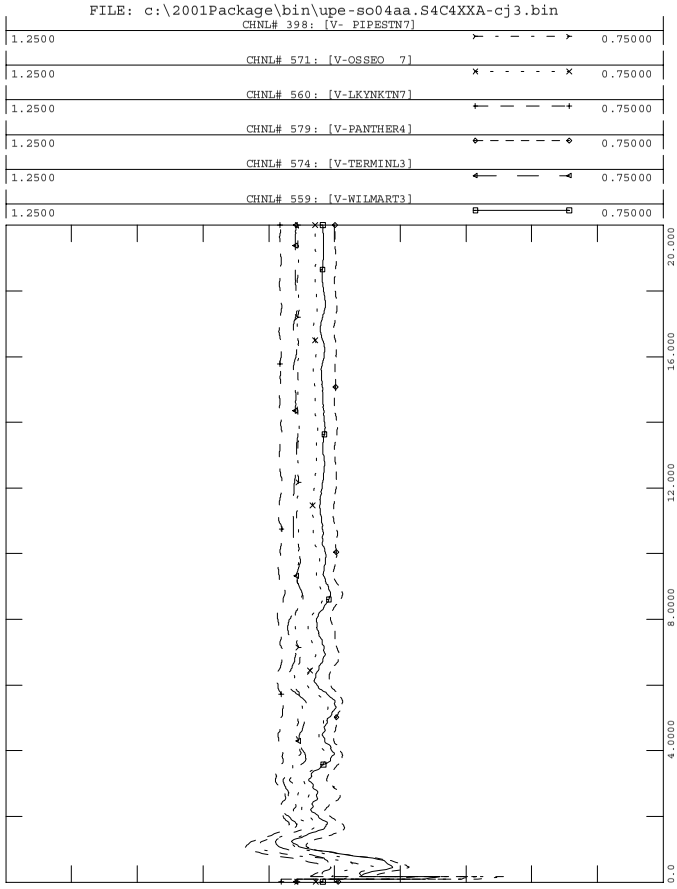
SVC & WISCONSIN VOLT



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

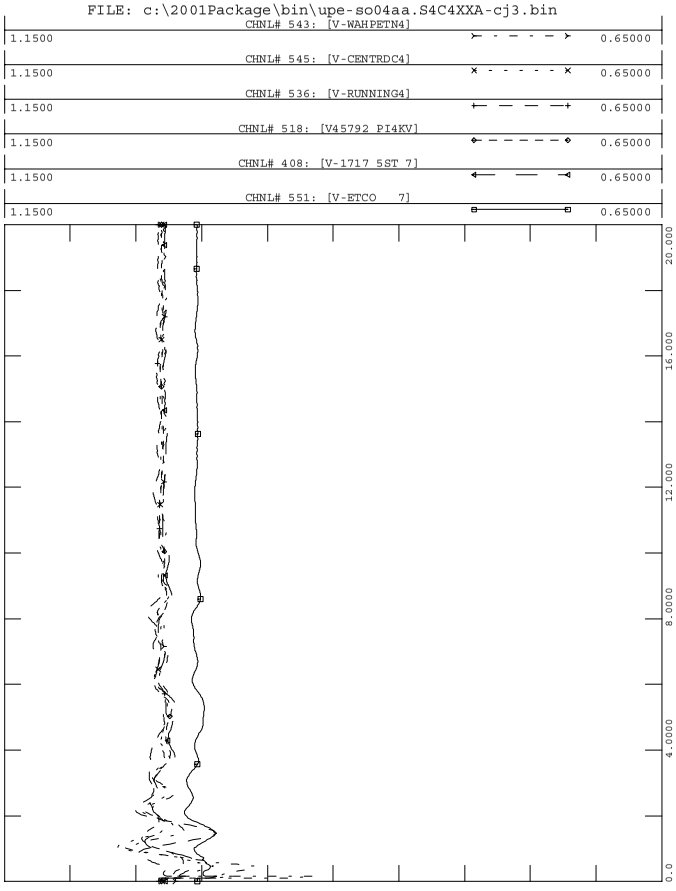
TC VOLTAGES



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

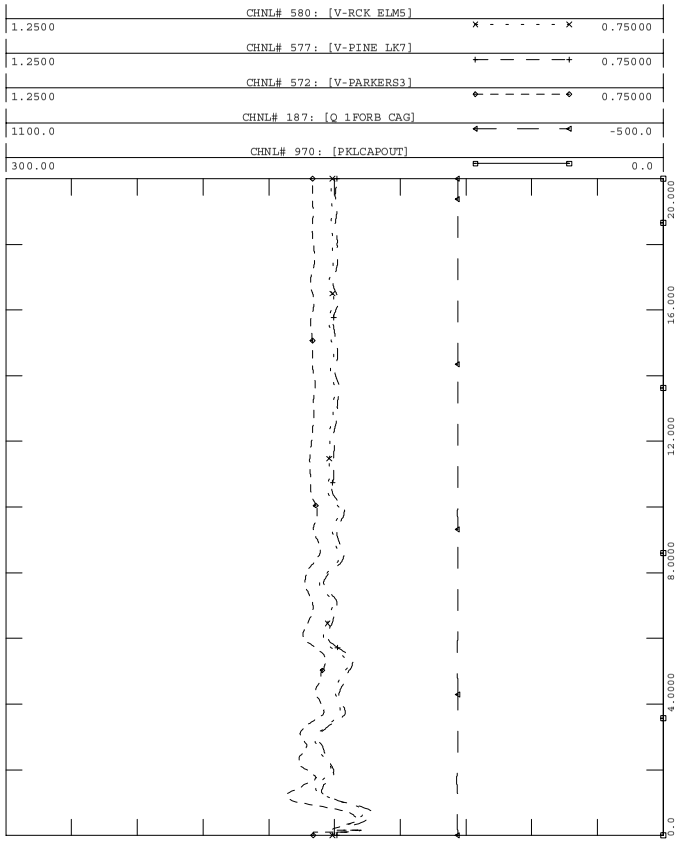
VOLTAGES 6



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

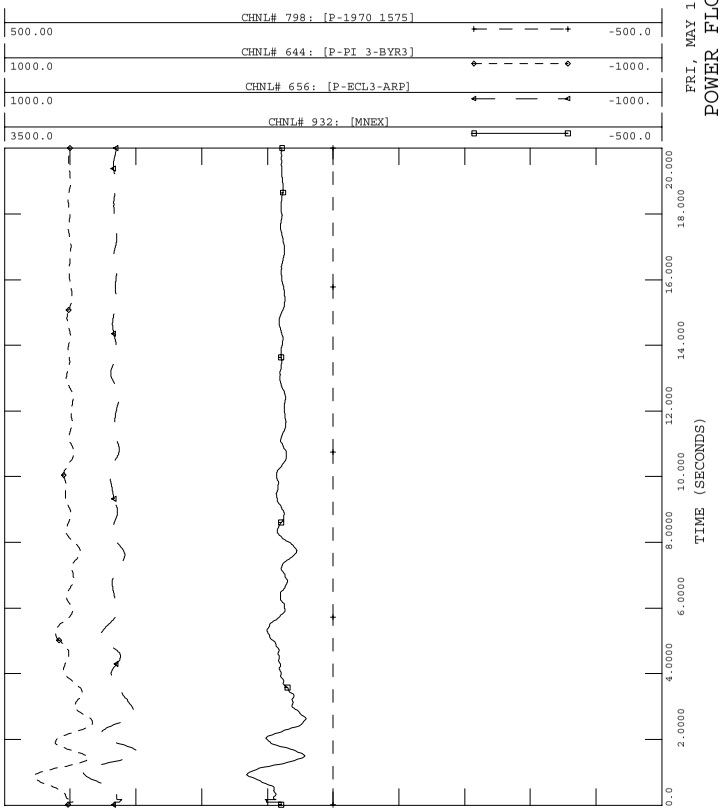
FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

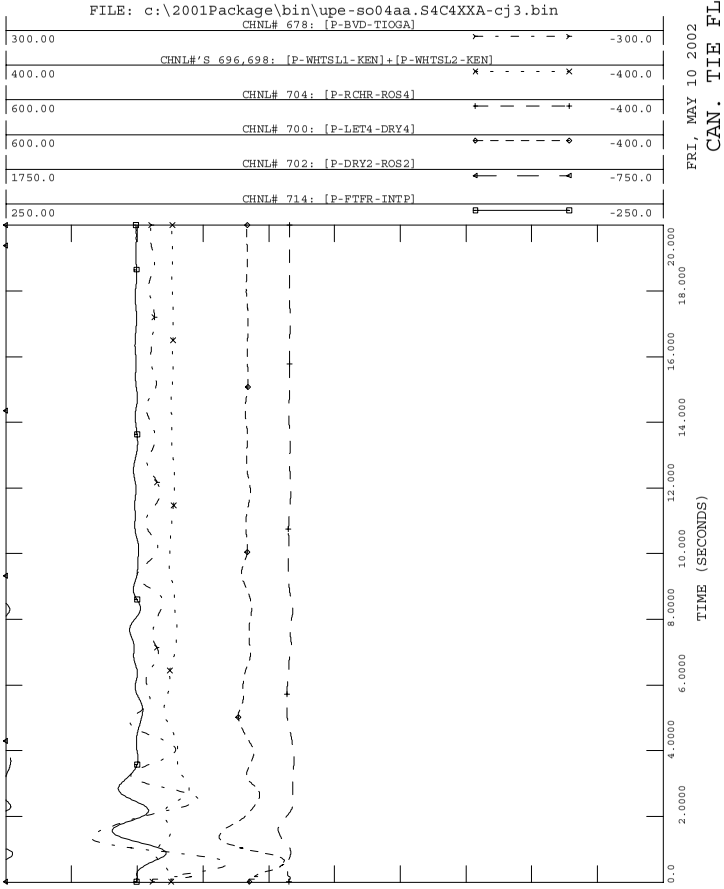
POWER FLOW SUMS 2



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

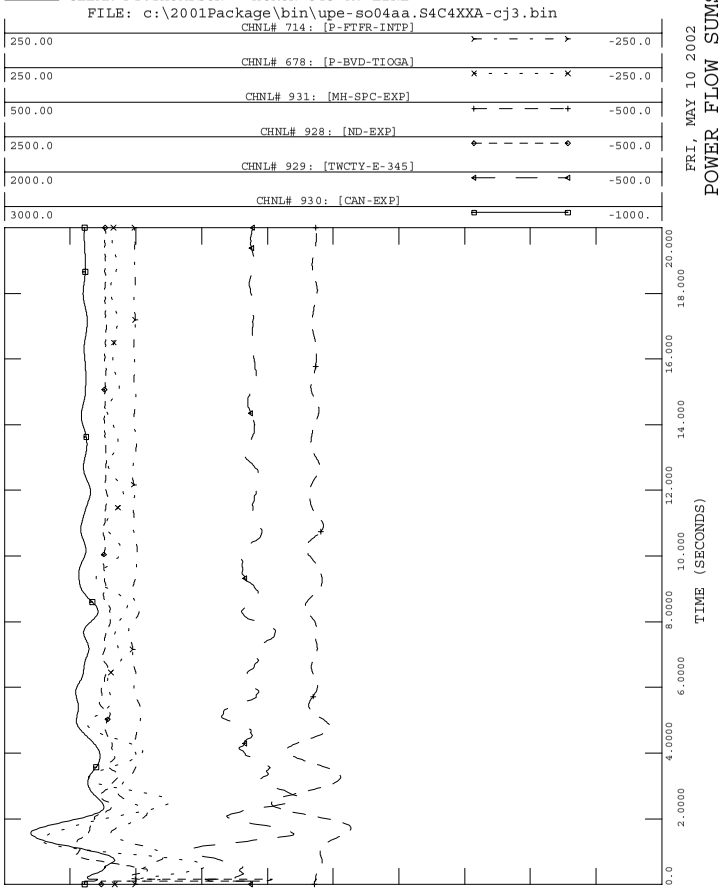
CAN. TIE FLOWS



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

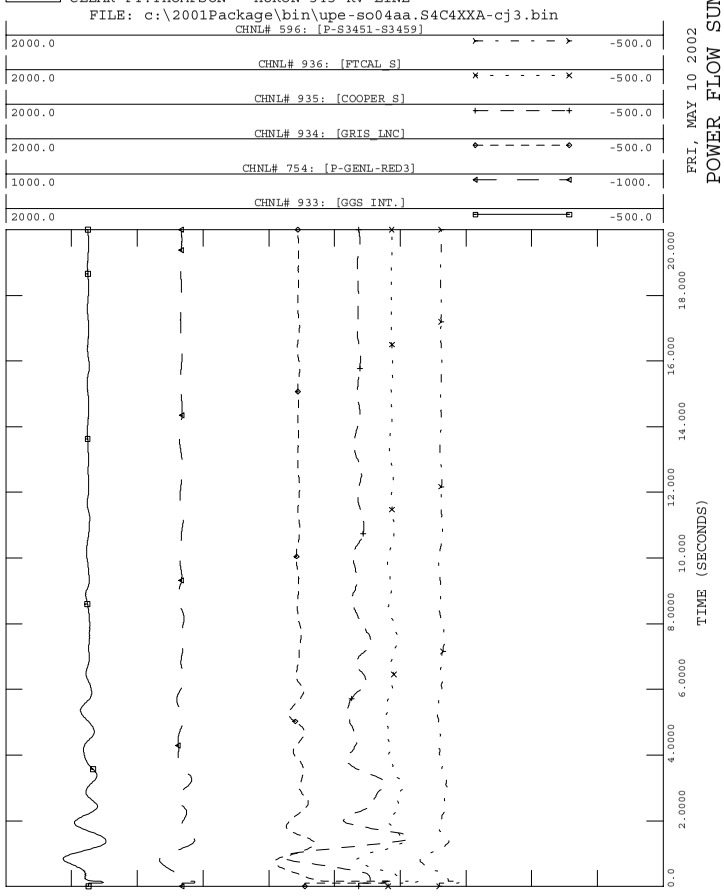
POWER FLOW SUMS 1



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

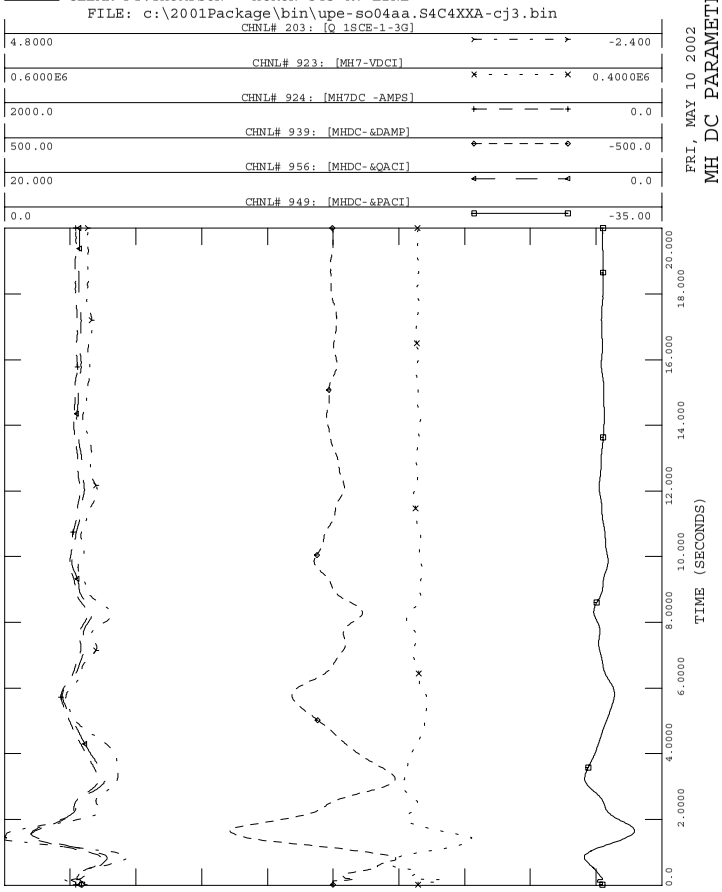
POWER FLOW SUM 3



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

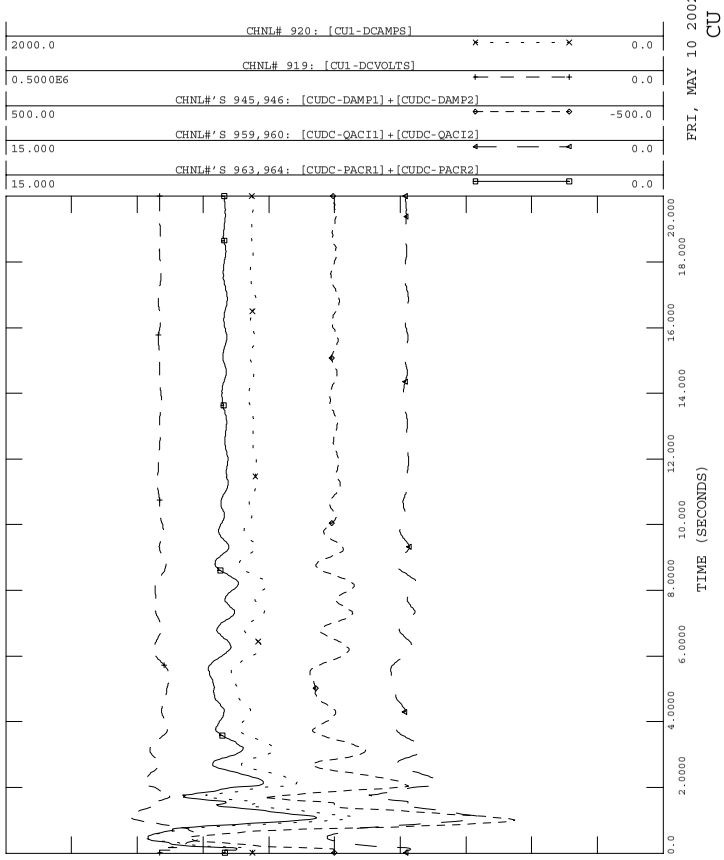
MH DC PARAMETERS



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

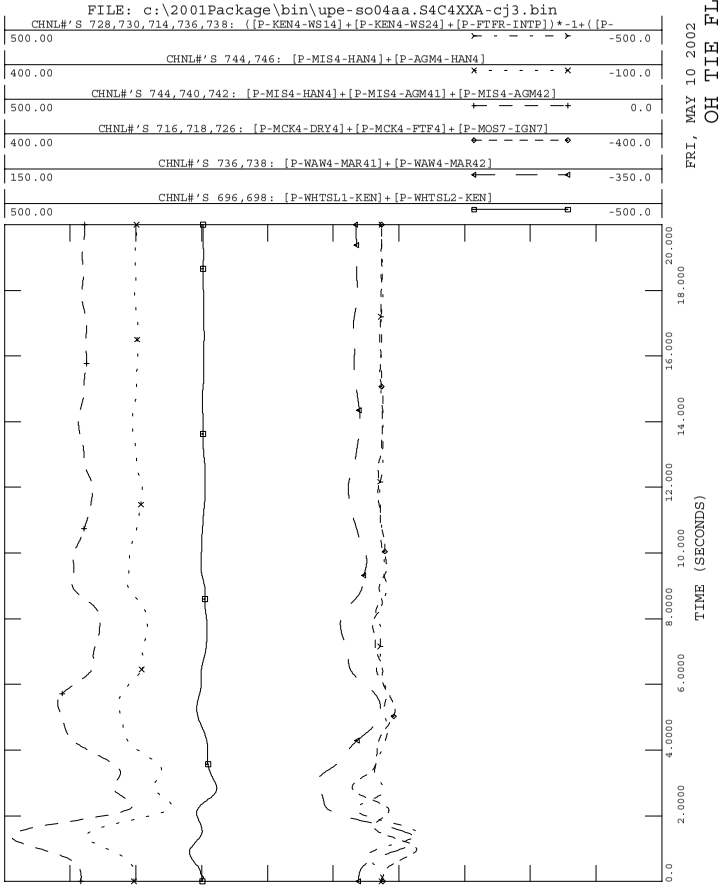
CU DC #1



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

FRI, MAY 10 2002 1:09

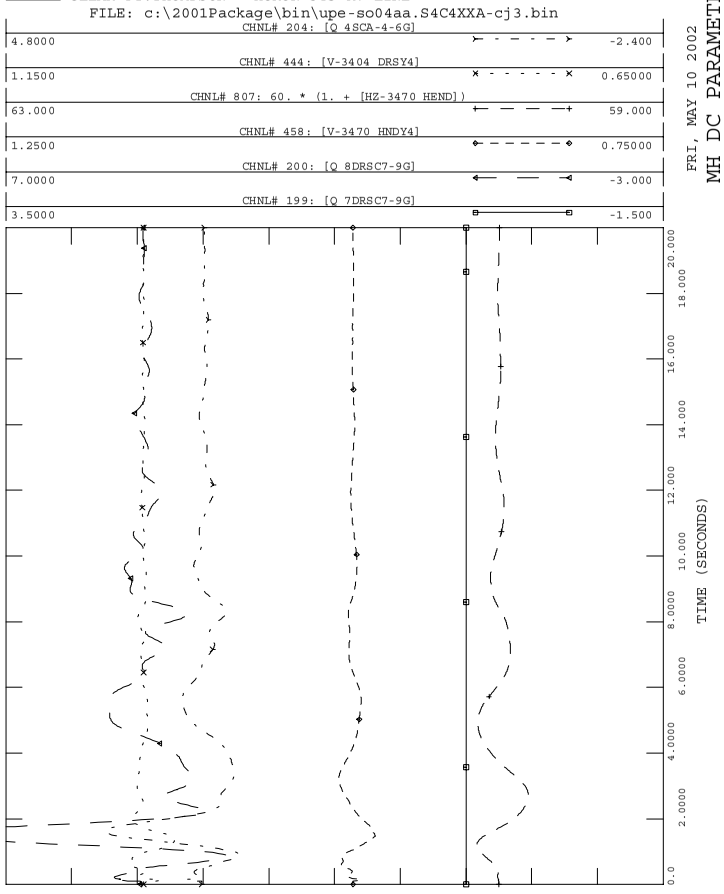
OH TIE FLOWS

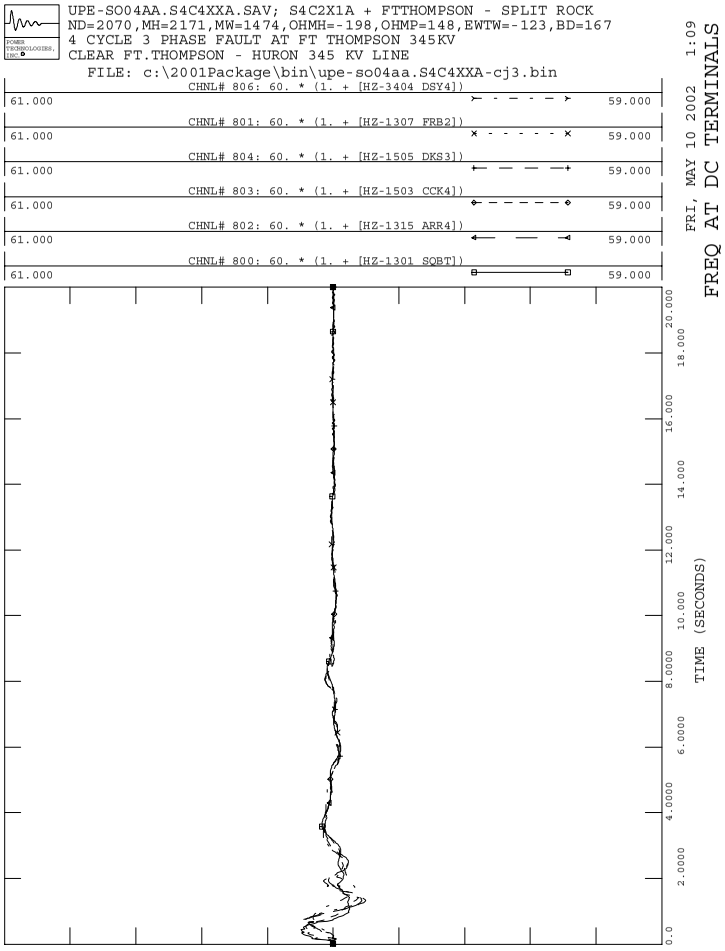


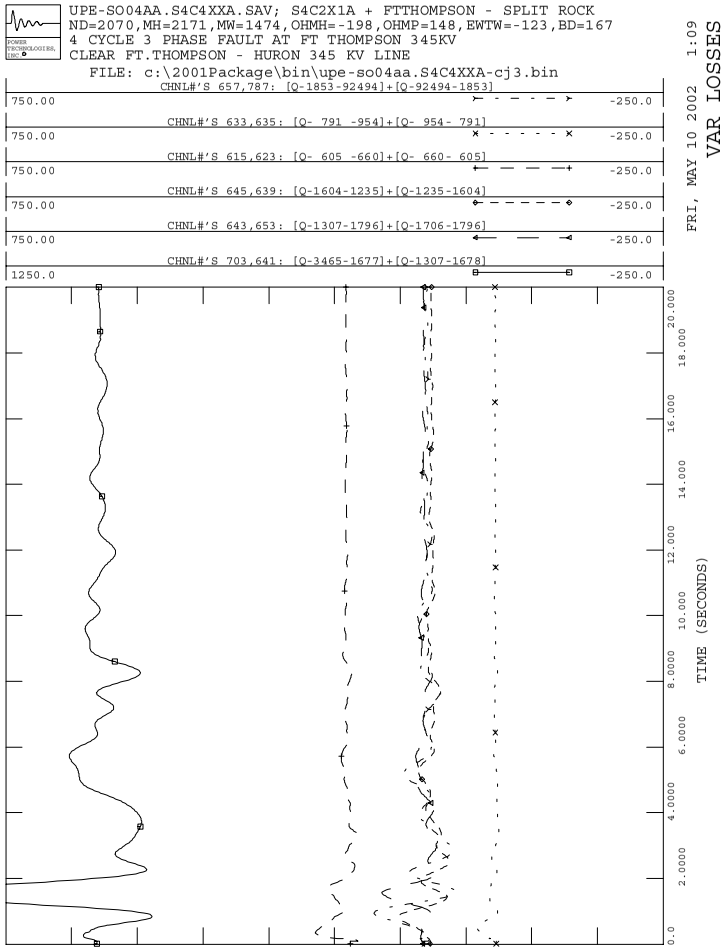
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

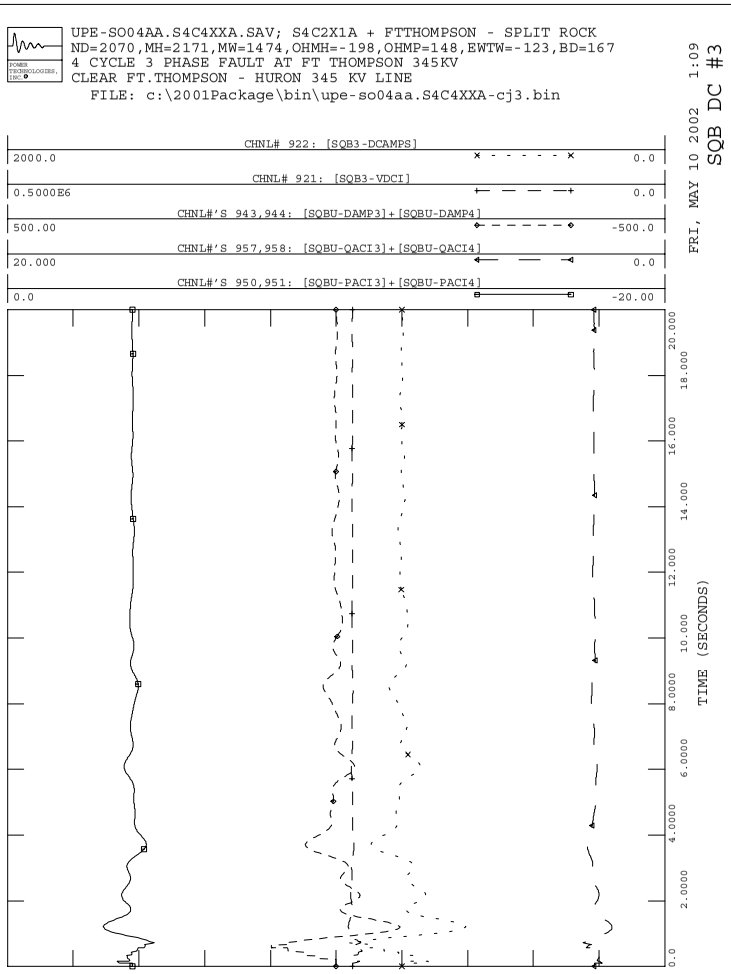
FRI, MAY 10 2002 1:09

MH DC PARAMETERS




UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
FRI, MAY 10 2002 1:09
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
FRI, MAY 10 2002 1:09
VAR LOSSES
TIME (SECONDS)


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
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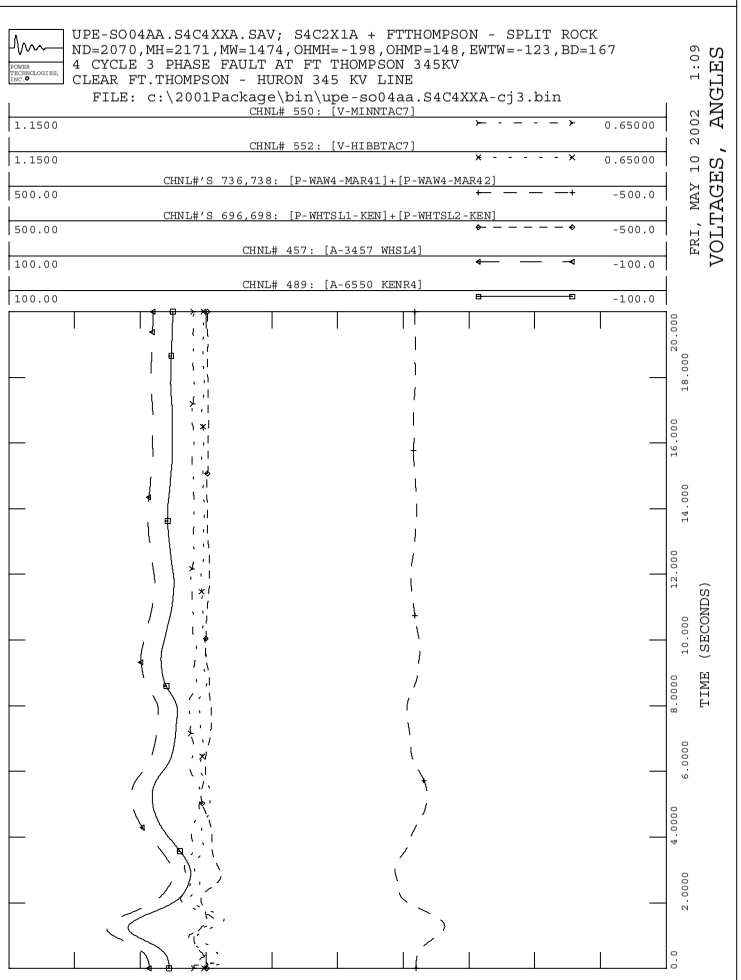
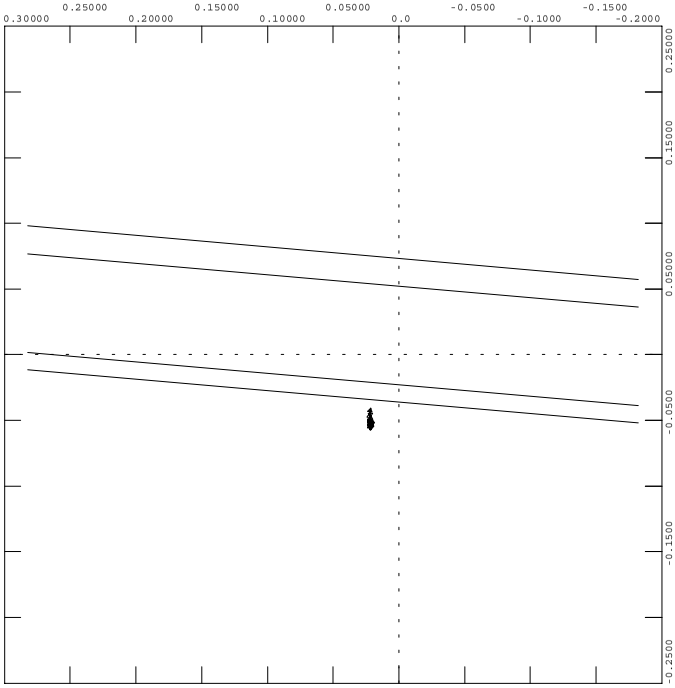
-500.0
20.000
-20.00
FRI, MAY 10 2002 1:09
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
FRI, MAY 10 2002 1:09
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

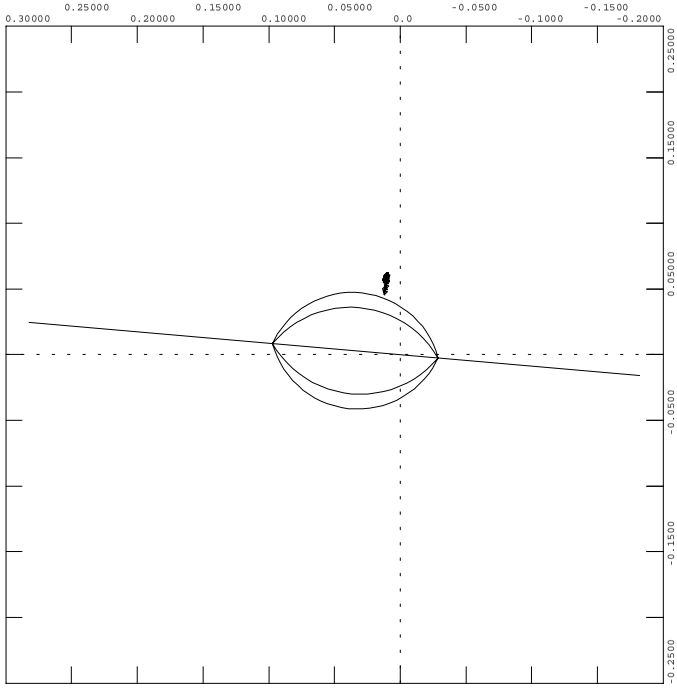


FRI, MAY 10 2002 1:09
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

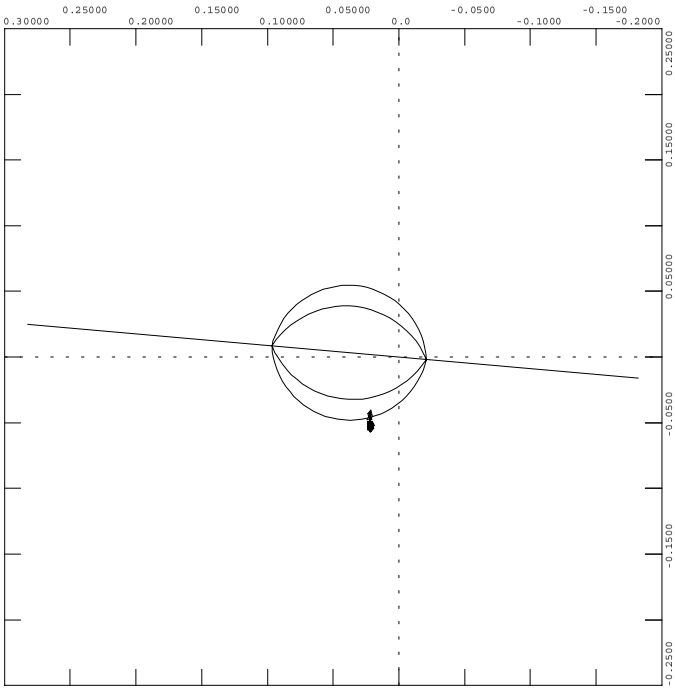


FRI, MAY 10 2002 1:09
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

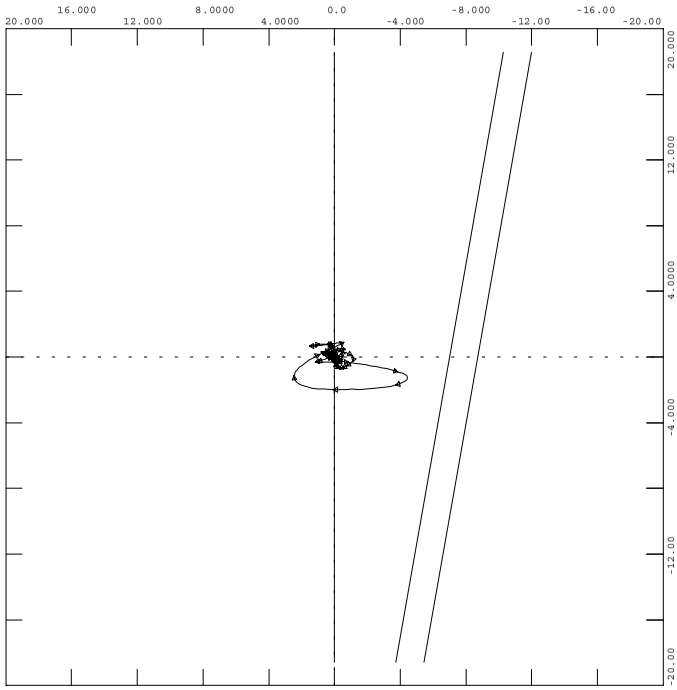


FRI, MAY 10 2002 1:09
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

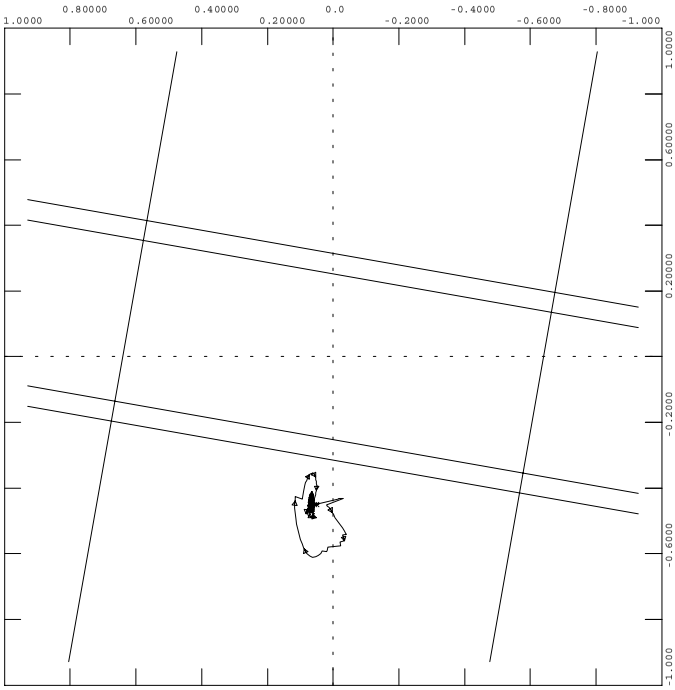


FRI, MAY 10 2002 1:09
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

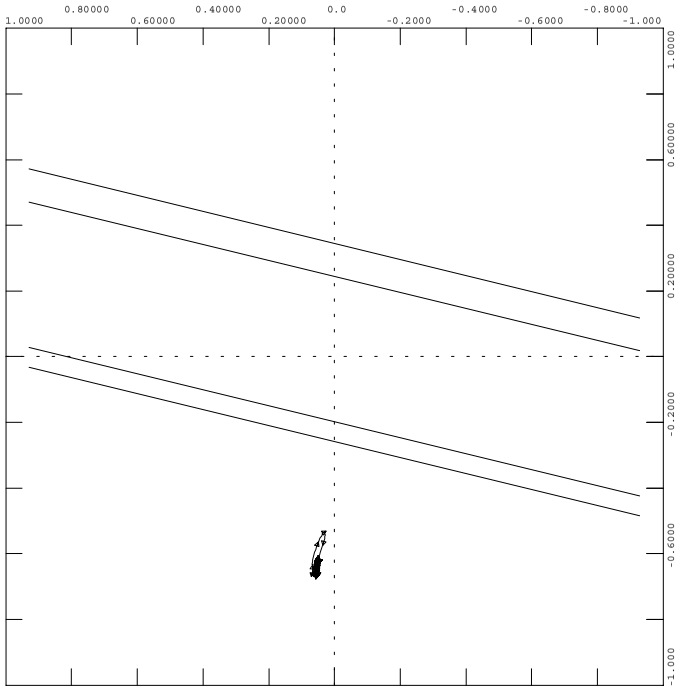
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

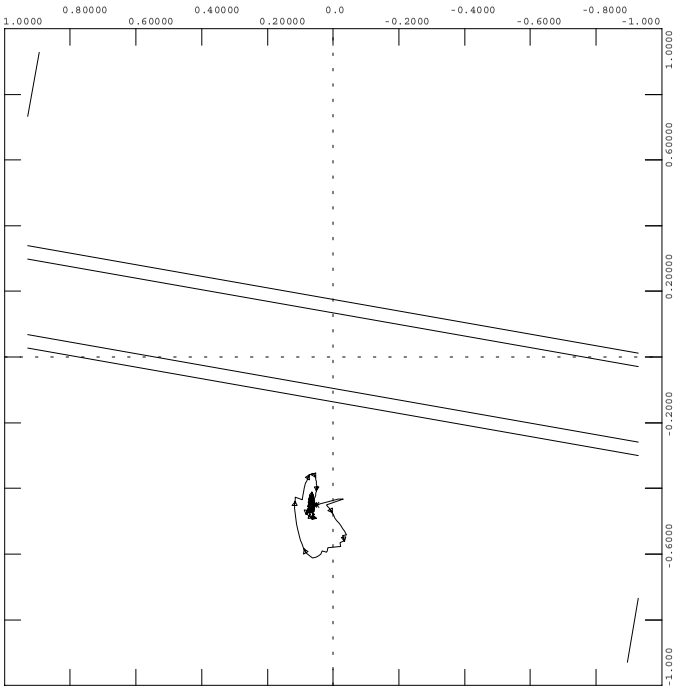
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

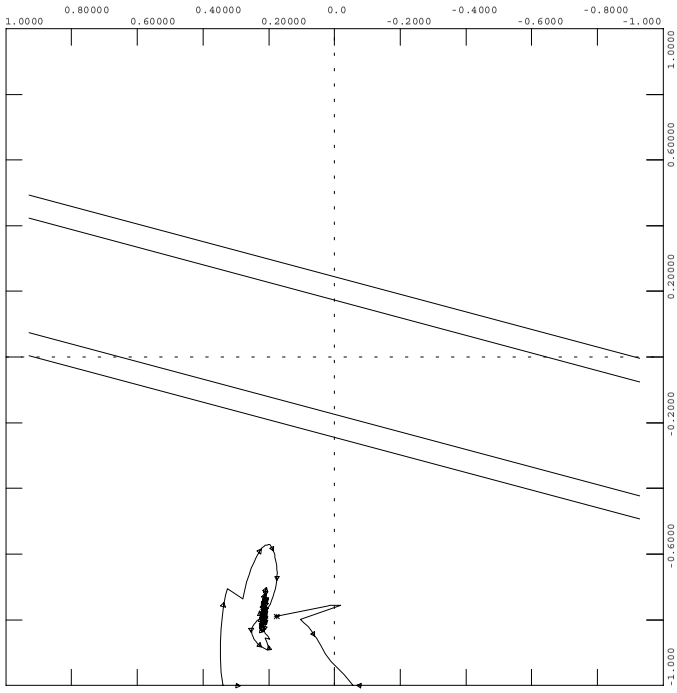
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

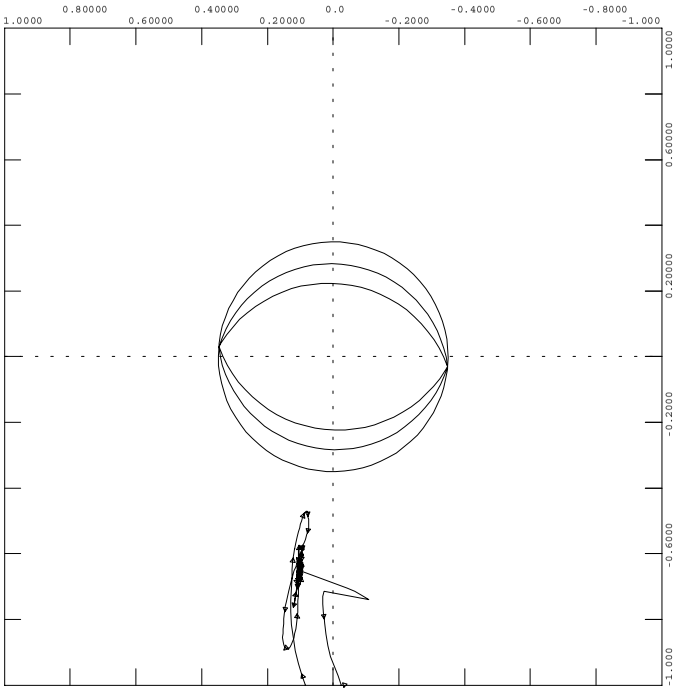
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

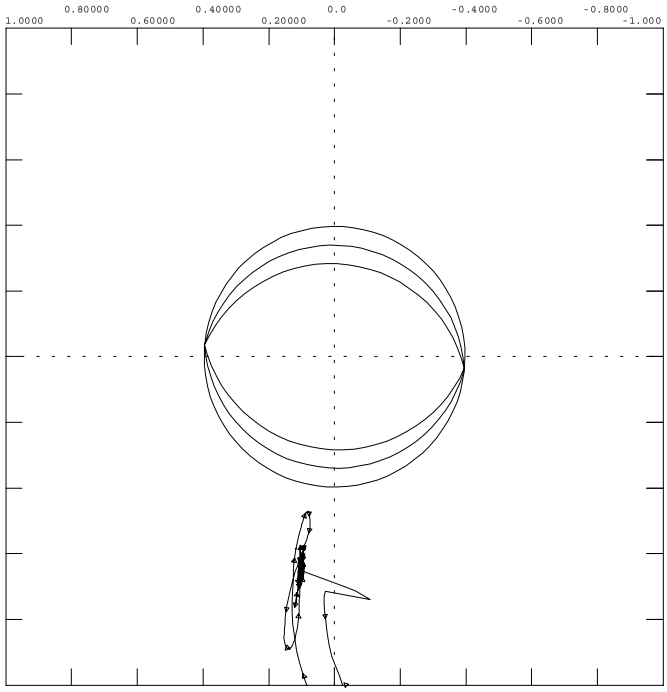
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

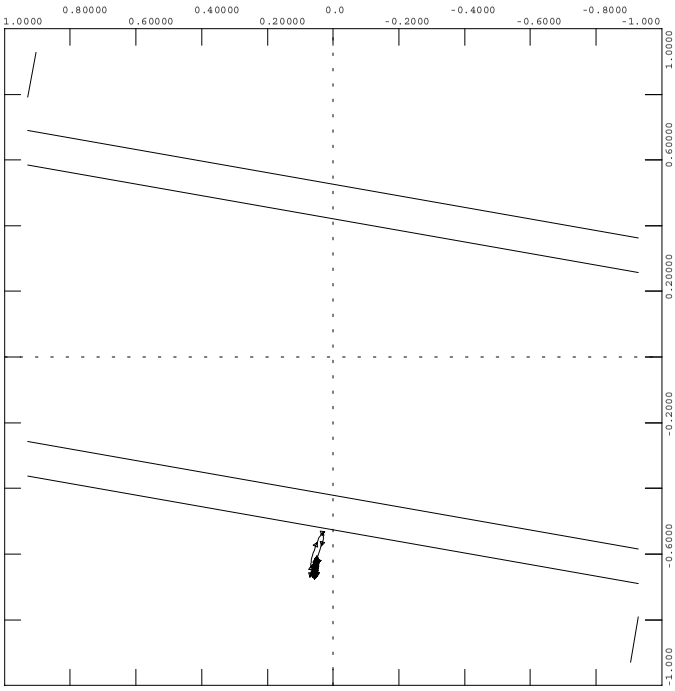
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

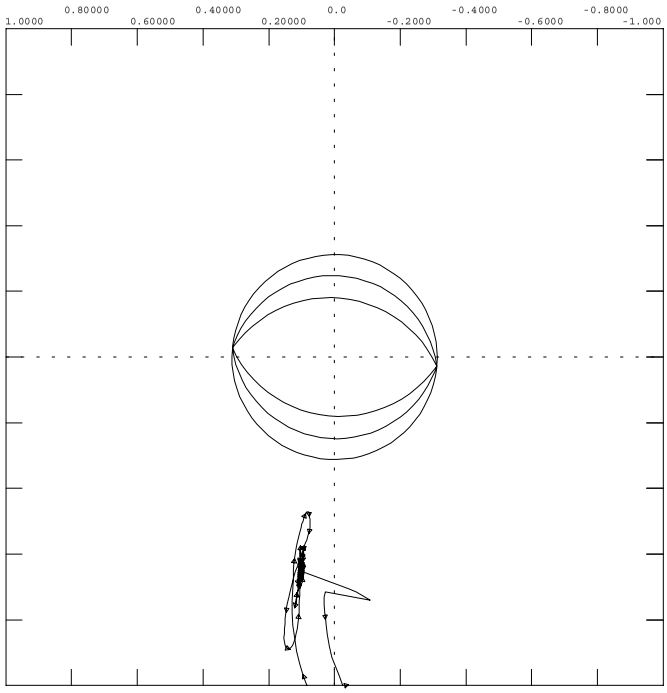
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



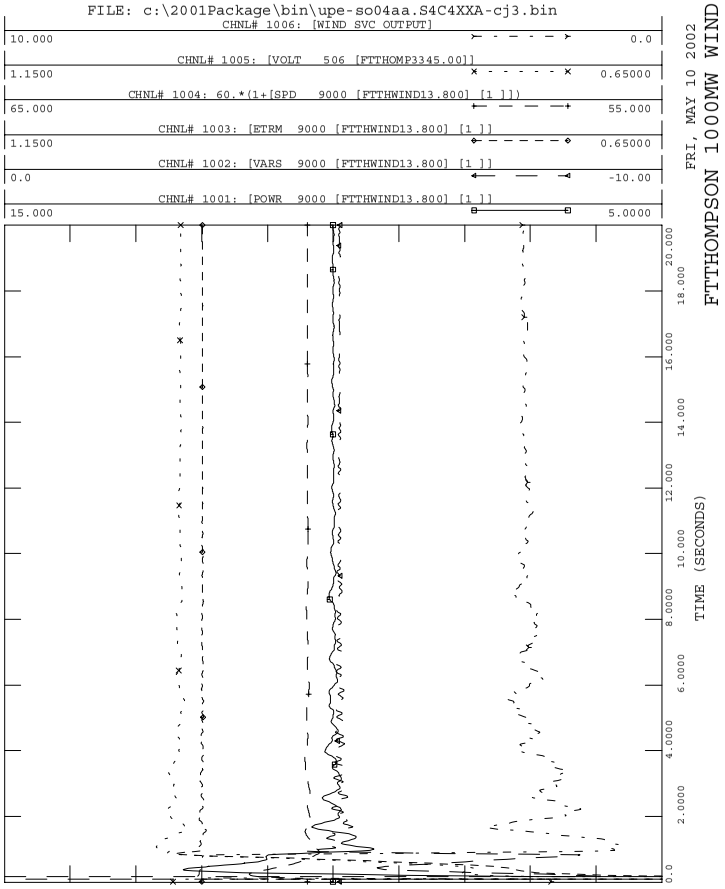
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

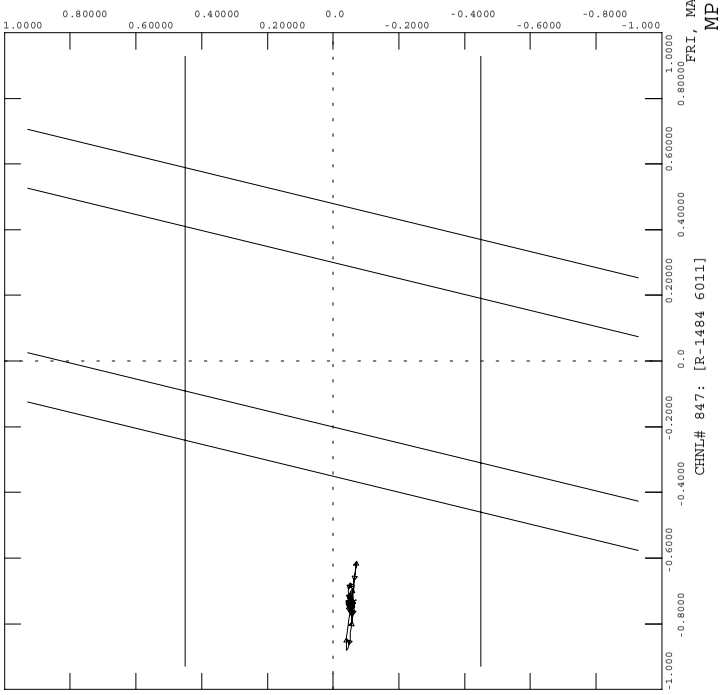


FRI, MAY 10 2002 1:09
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-cj3.bin

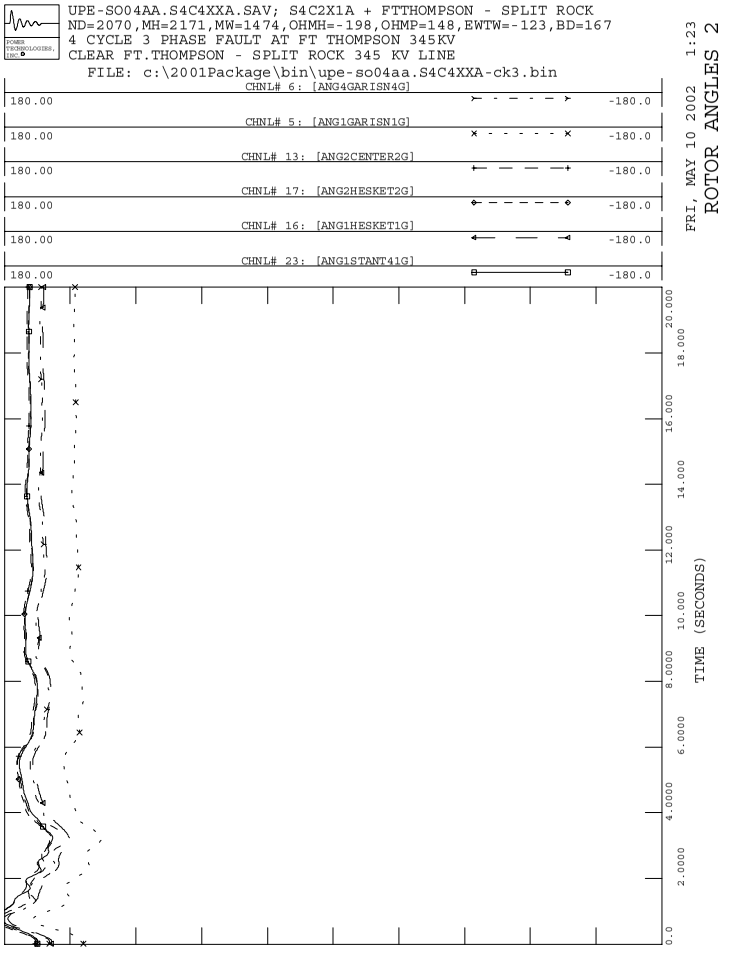
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

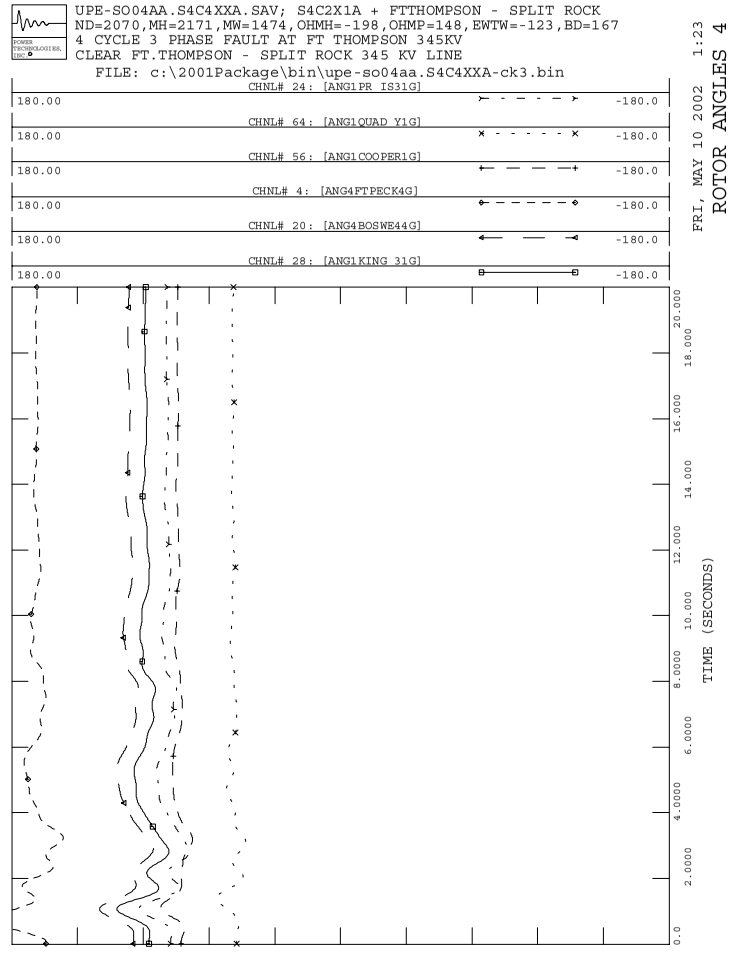


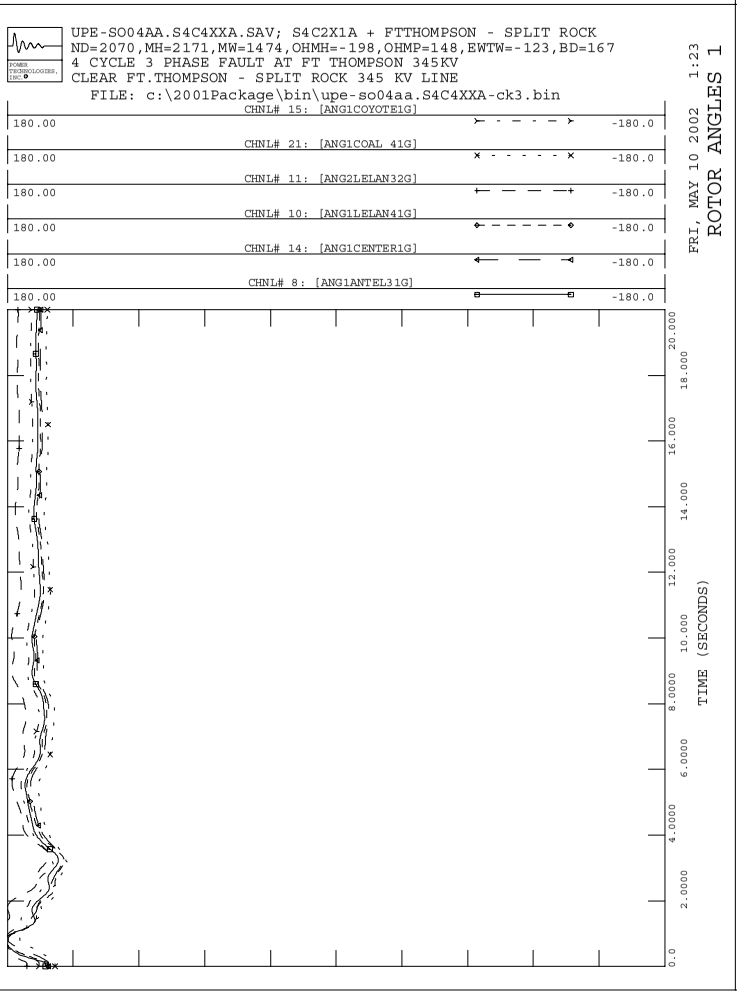
FRI, MAY 10 2002 1:09
MP-OH I.FALLS (779)

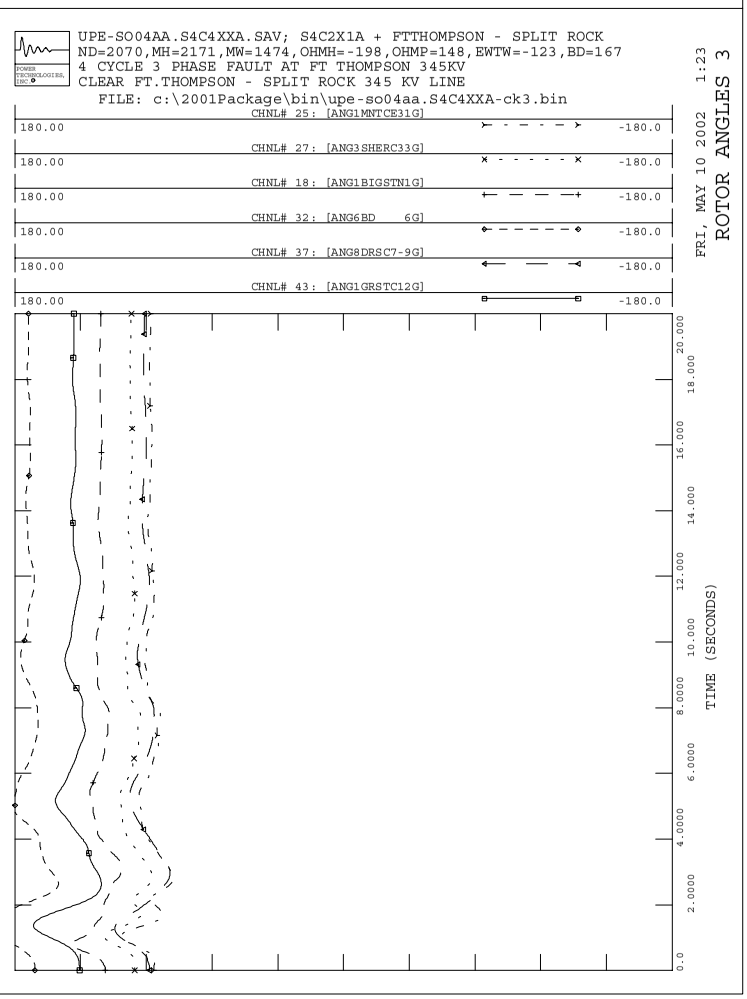
CONTINGENCY CK3

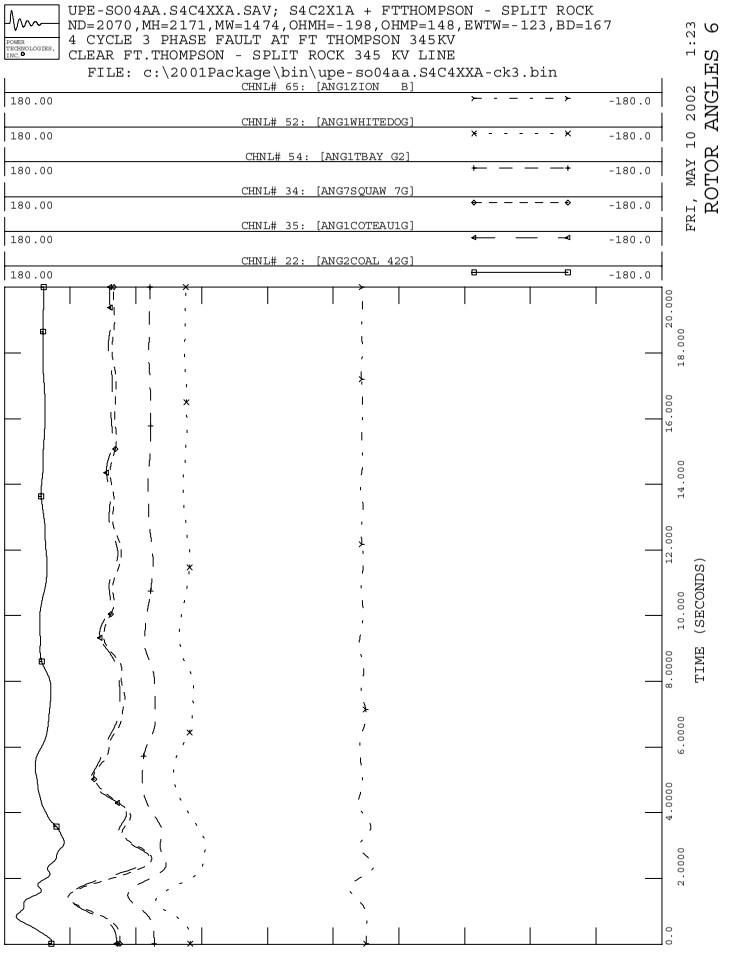
4 cycle 3 phase fault at Ft Thompson 345kV. Clear the Ft Thompson – Split Rock 345 kV line

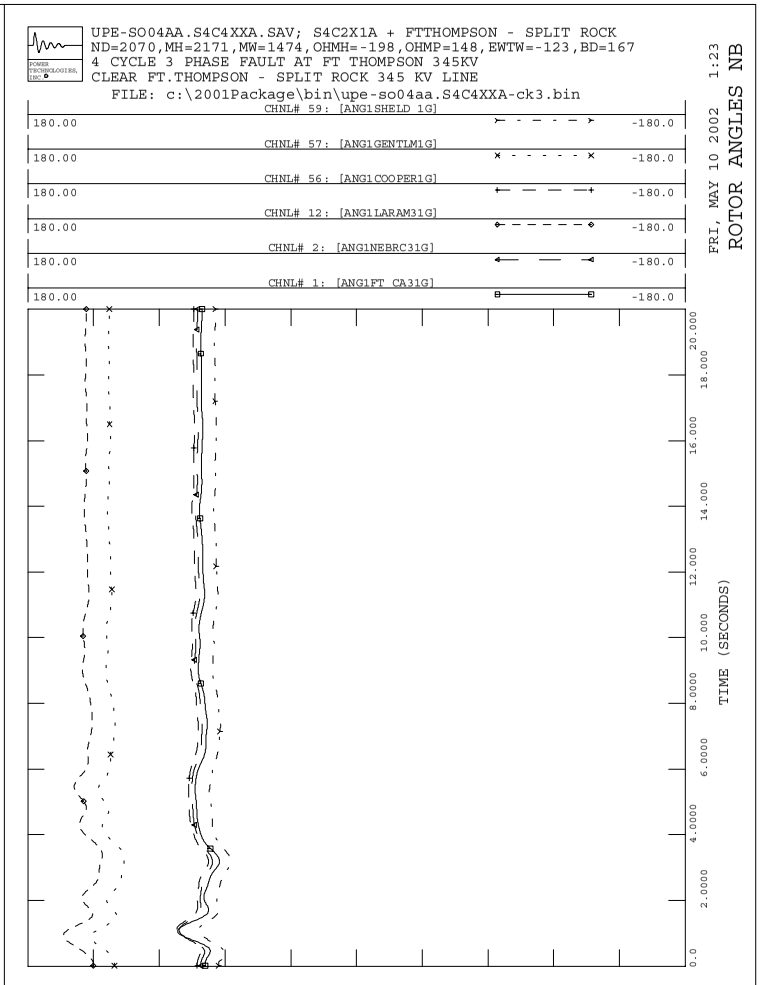

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 1:23
ROTOR ANGLES 2

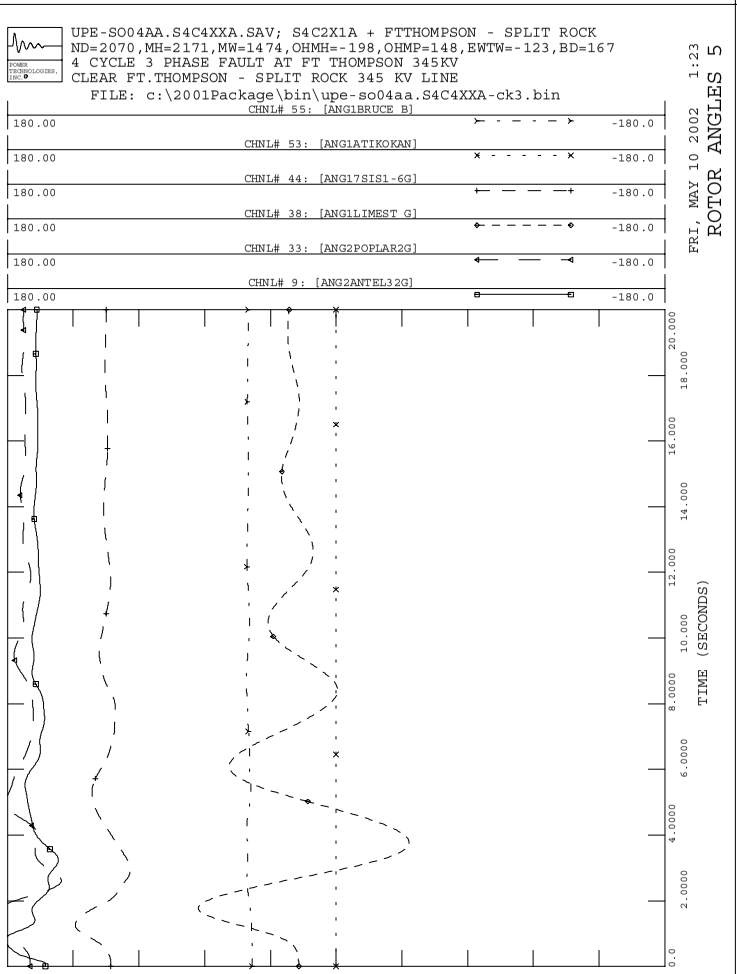

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 1:23
ROTOR ANGLES 4

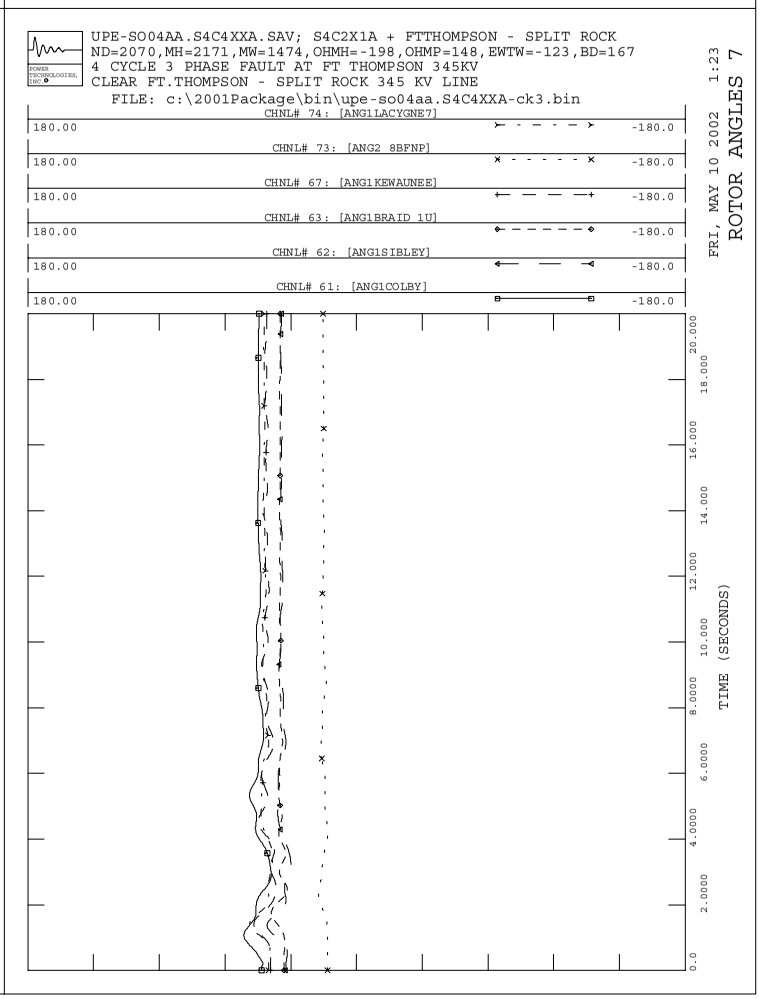

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 1:23
ROTOR ANGLES 1


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 1:23
ROTOR ANGLES 3


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 1:23
ROTOR ANGLES 6

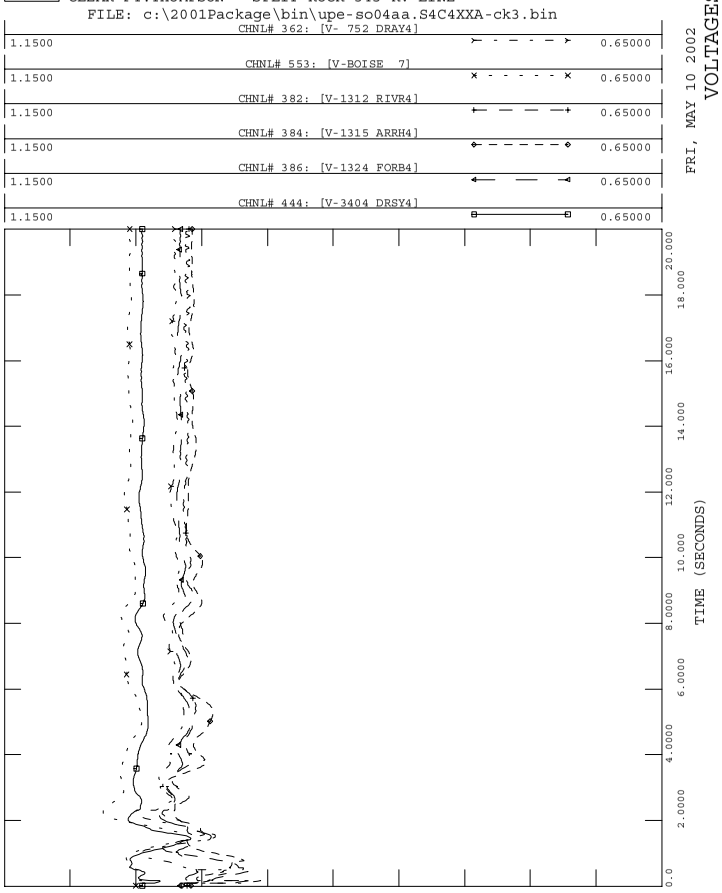

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 1:23
ROTOR ANGLES NB


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 1:23
ROTOR ANGLES 5


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 10 2002 1:23
ROTOR ANGLES 7

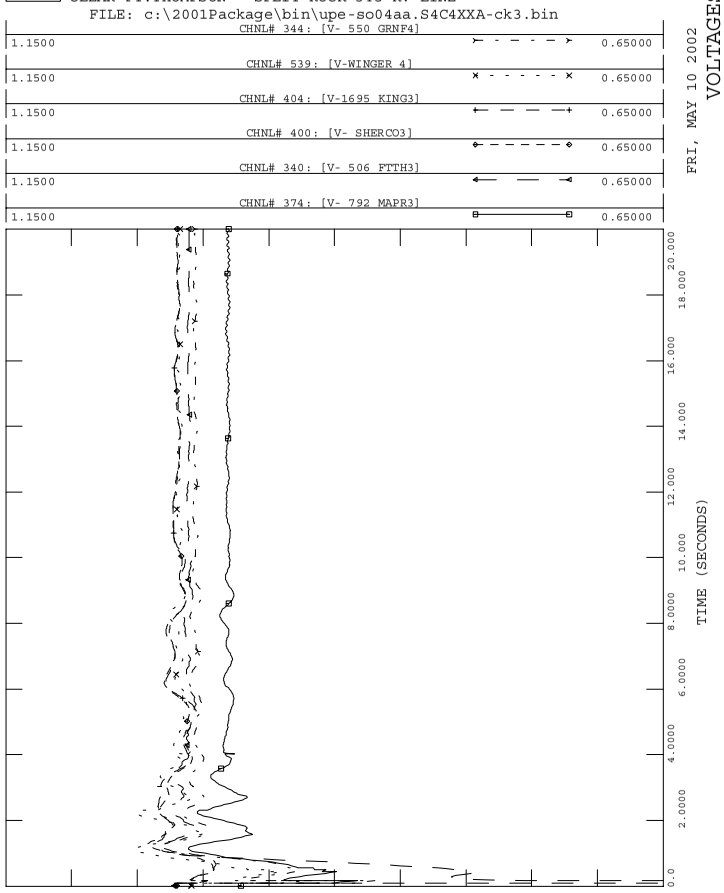
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23
VOLTAGES 1



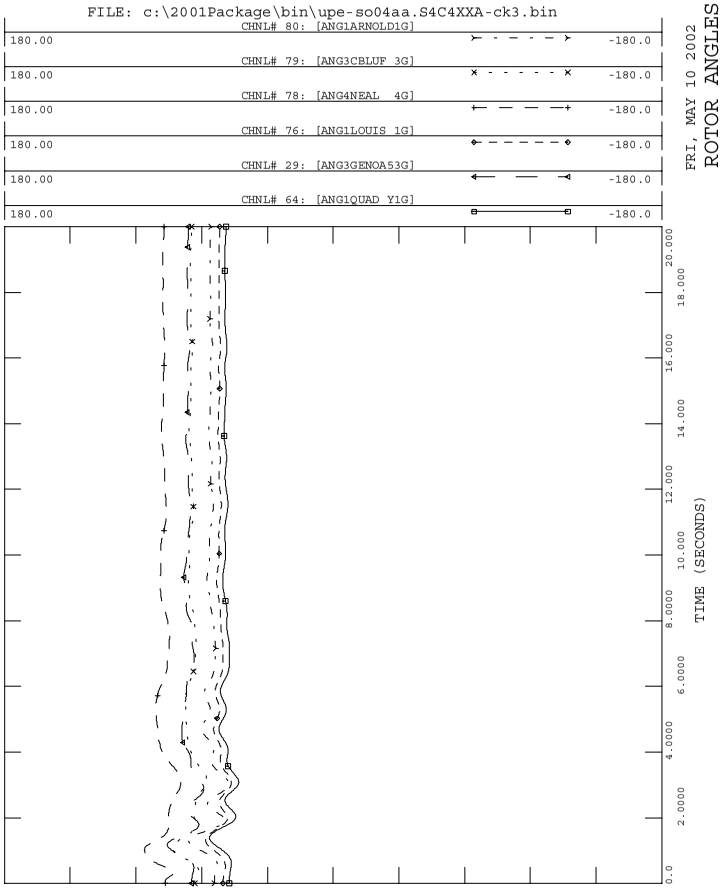
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23
VOLTAGES 3



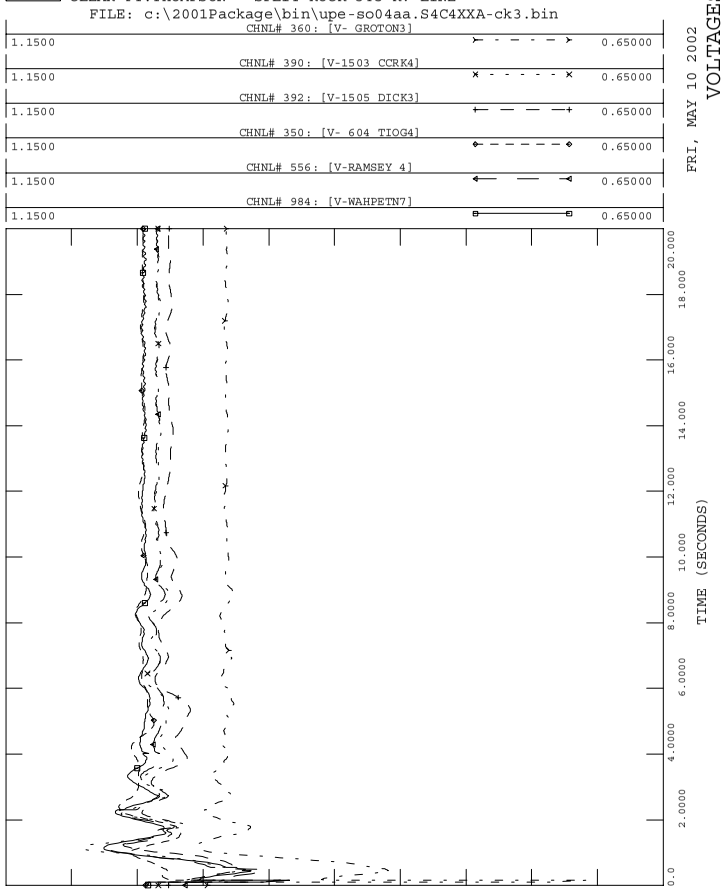
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23
ROTOR ANGLES IA



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

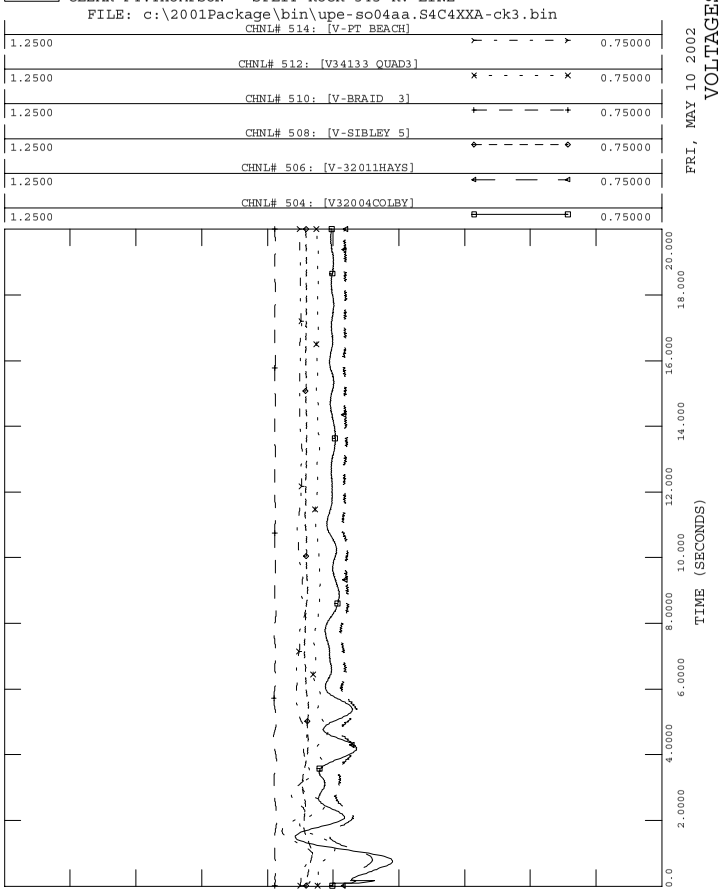
FRI, MAY 10 2002 1:23
VOLTAGES 2



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23

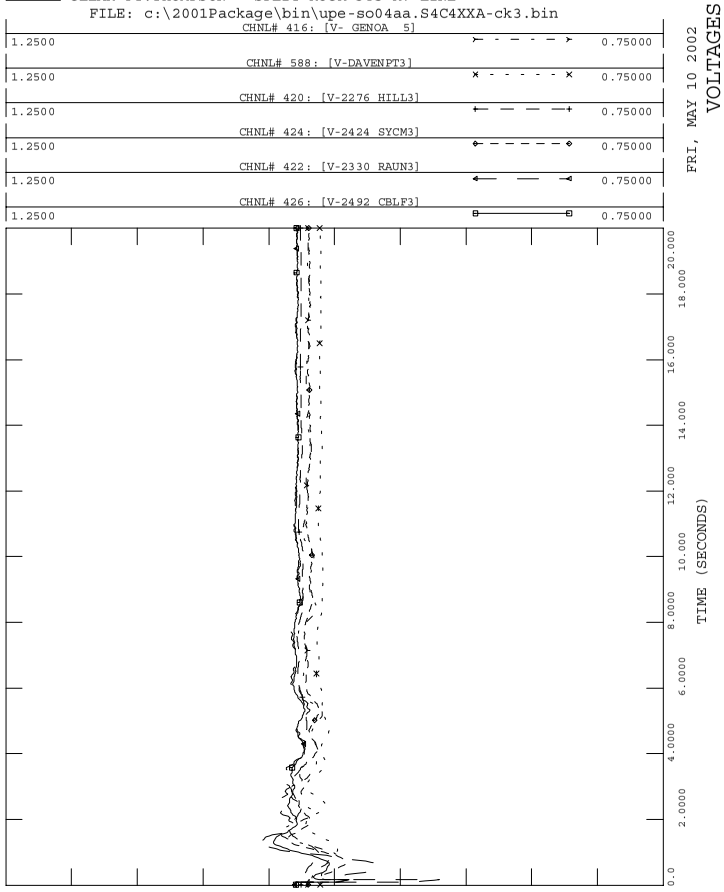
VOLTAGES 5



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23

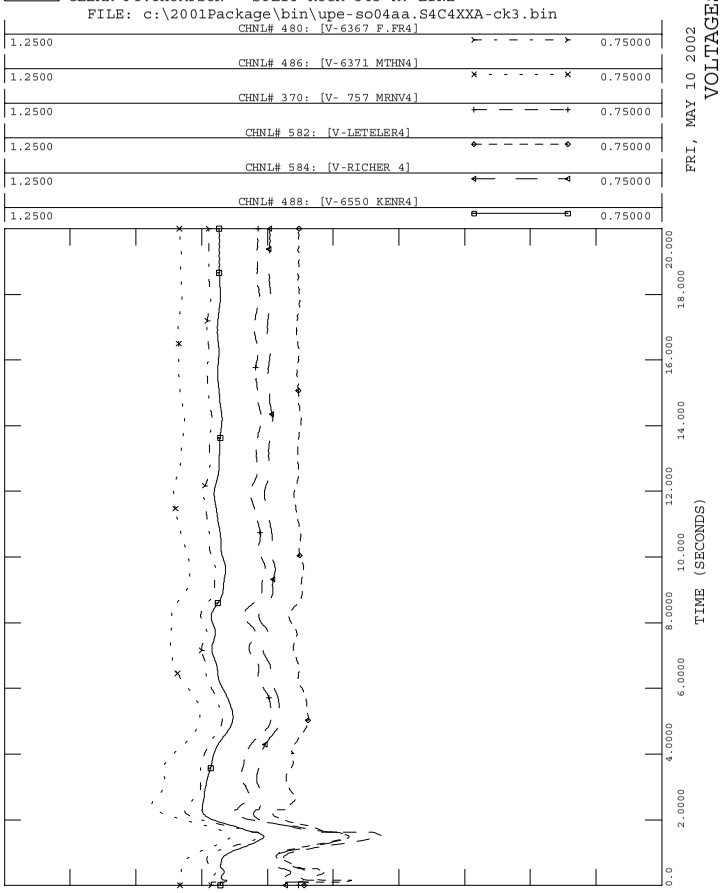
VOLTAGES IA



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23

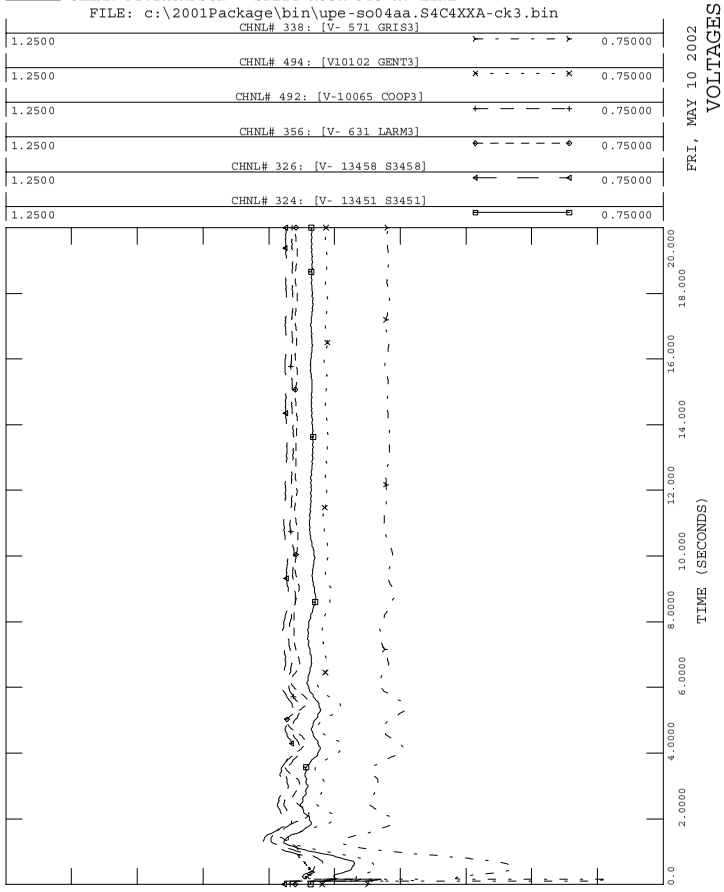
VOLTAGES 4

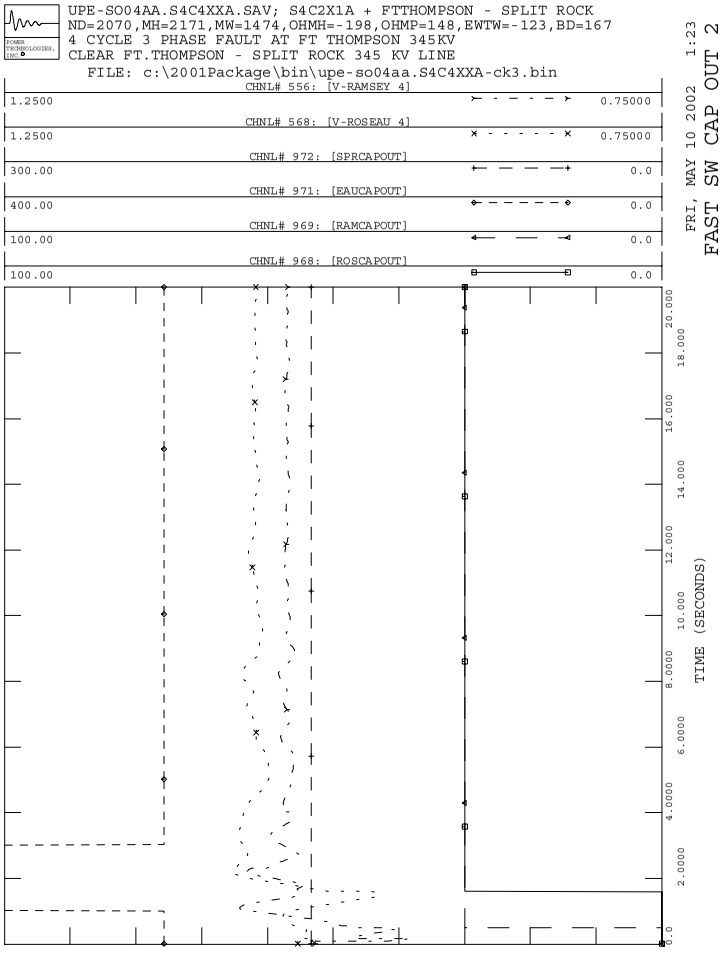


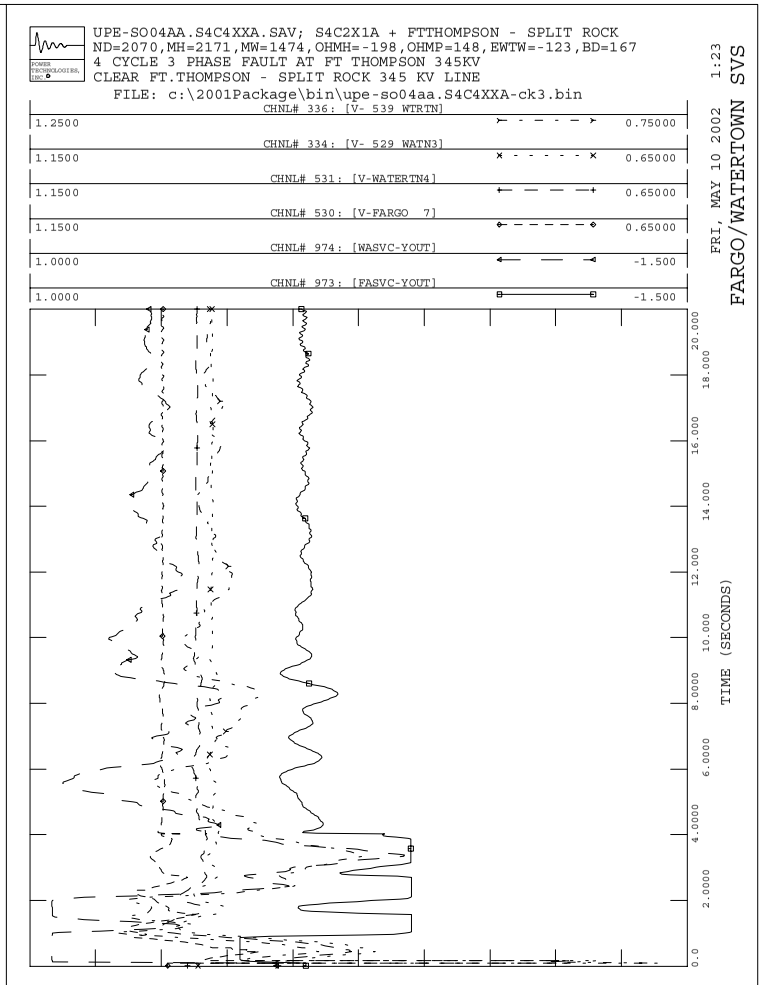
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

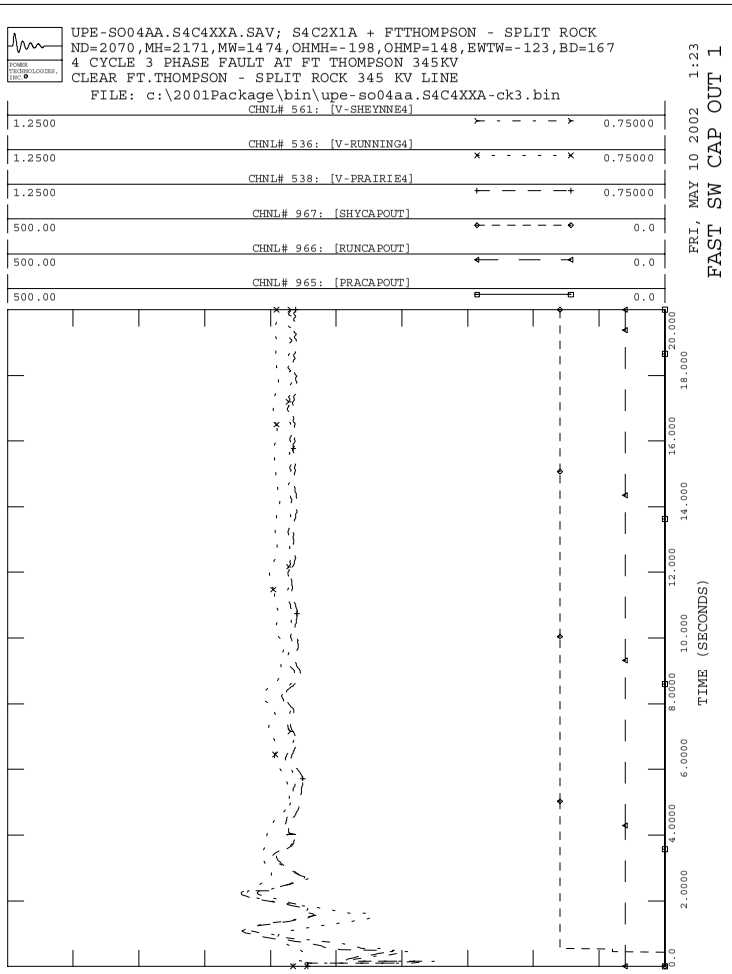
FRI, MAY 10 2002 1:23

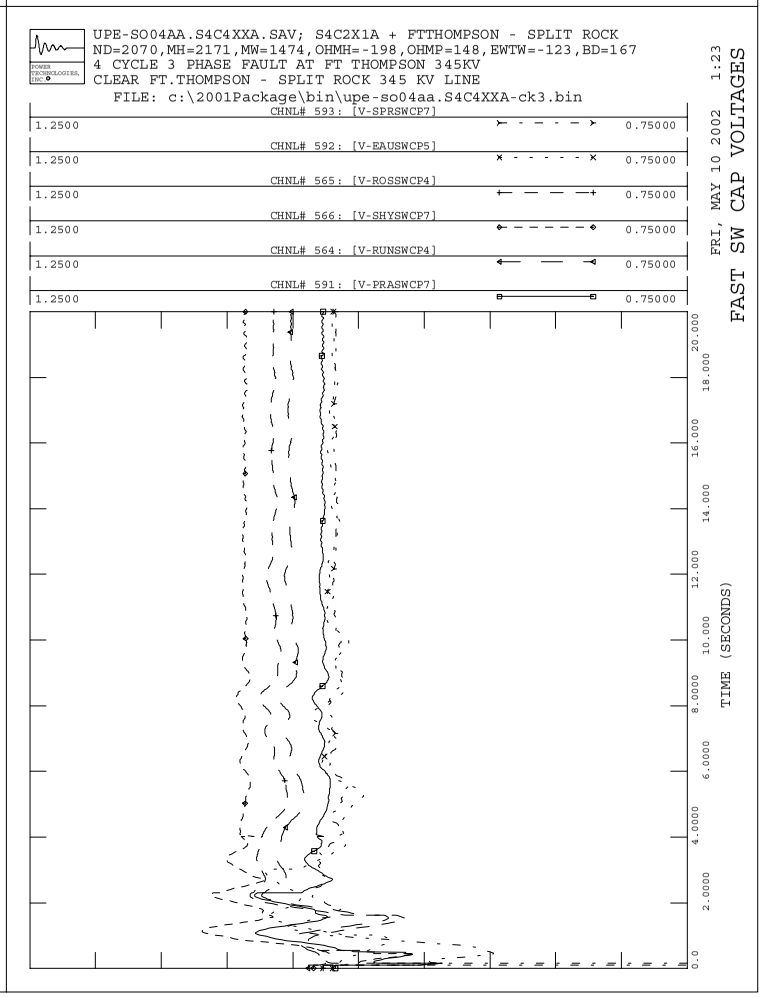
VOLTAGES NB




UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
FRI, MAY 10 2002 1:23
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
FRI, MAY 10 2002 1:23
FARGO/WATERTOWN SVS
TIME (SECONDS)

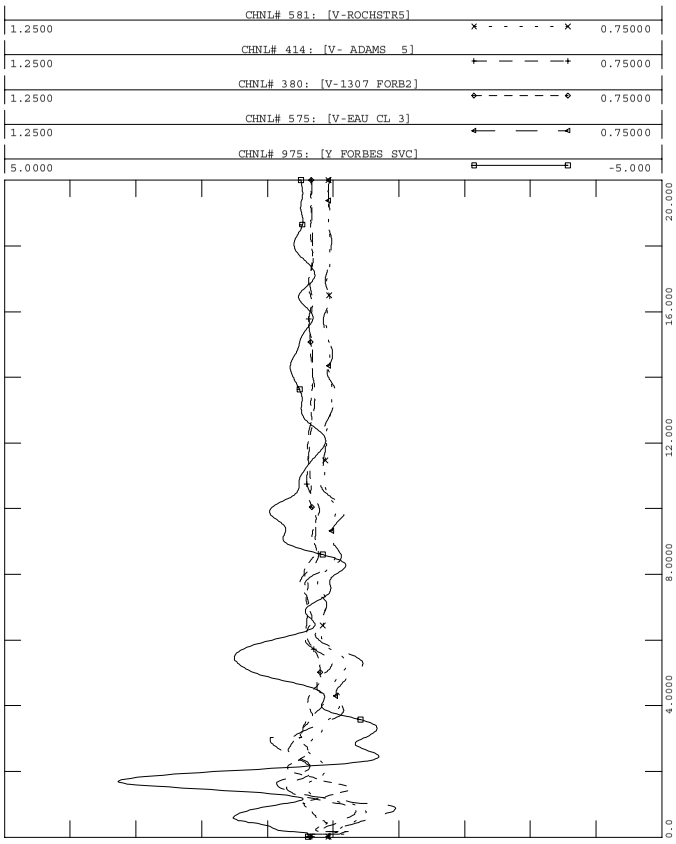

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
FRI, MAY 10 2002 1:23
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
FRI, MAY 10 2002 1:23
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23

SVC & WISCONSIN VOLT



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

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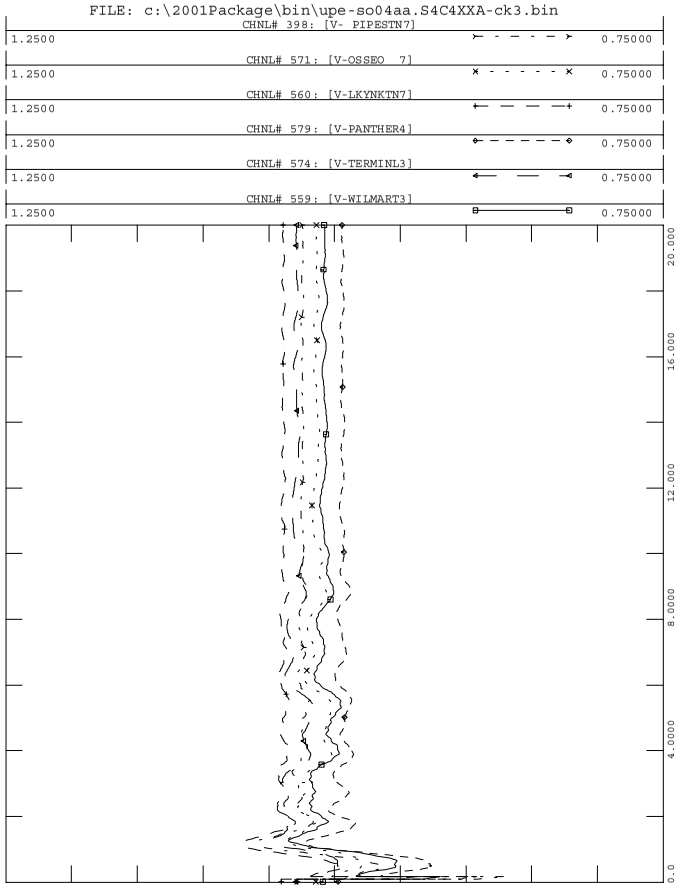
TC VOLTAGES



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

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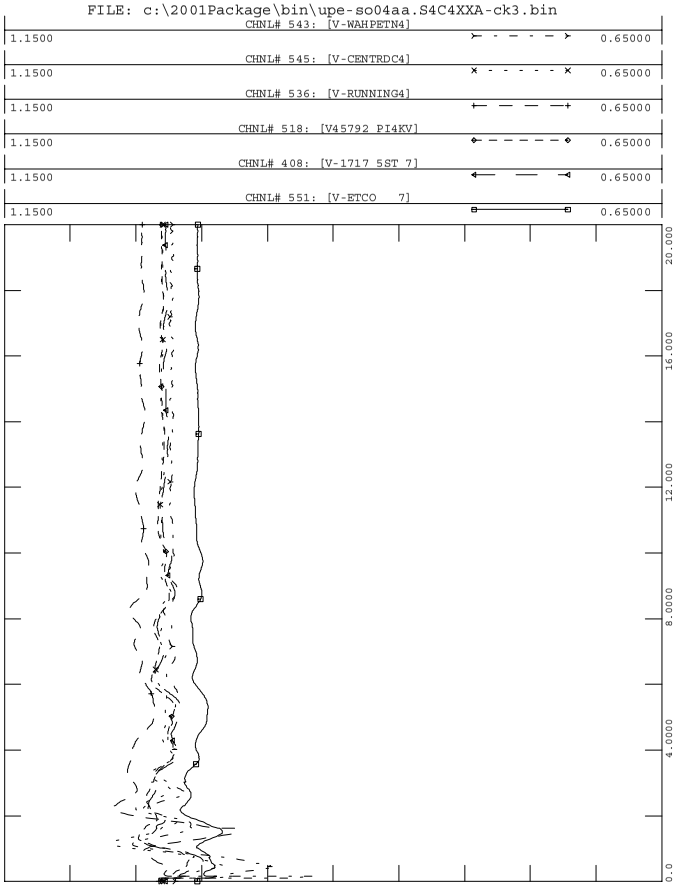
VOLTAGES 6



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

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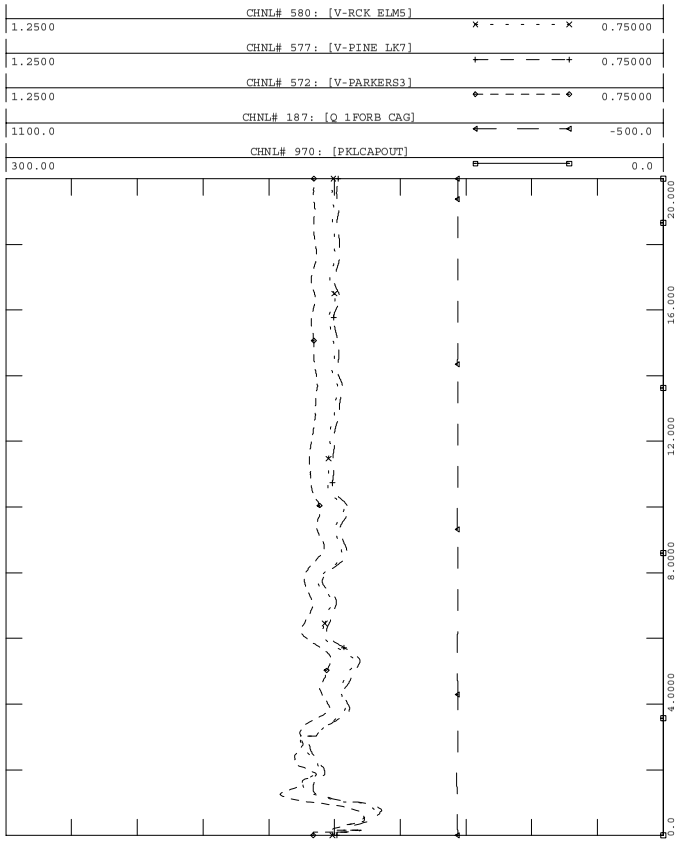
FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

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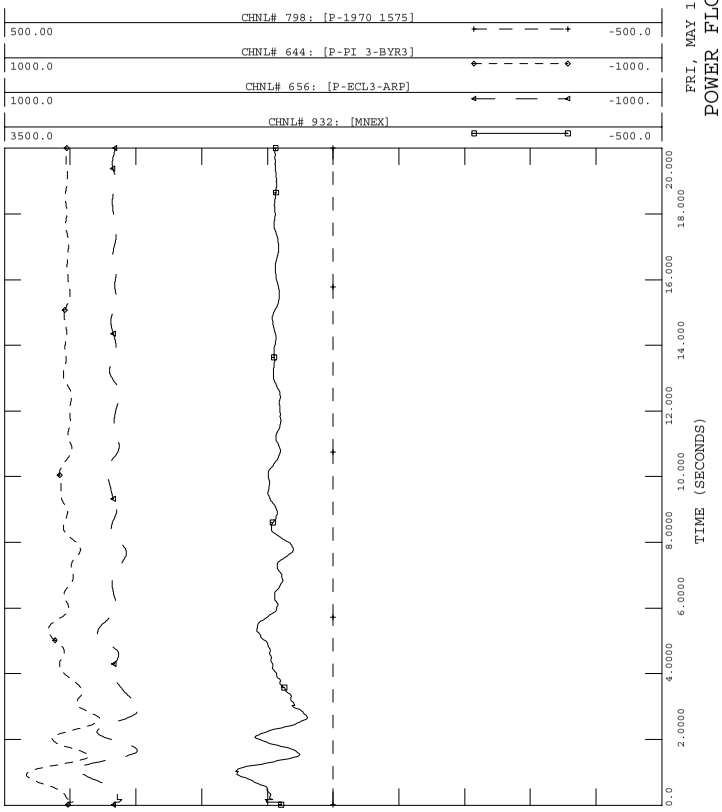
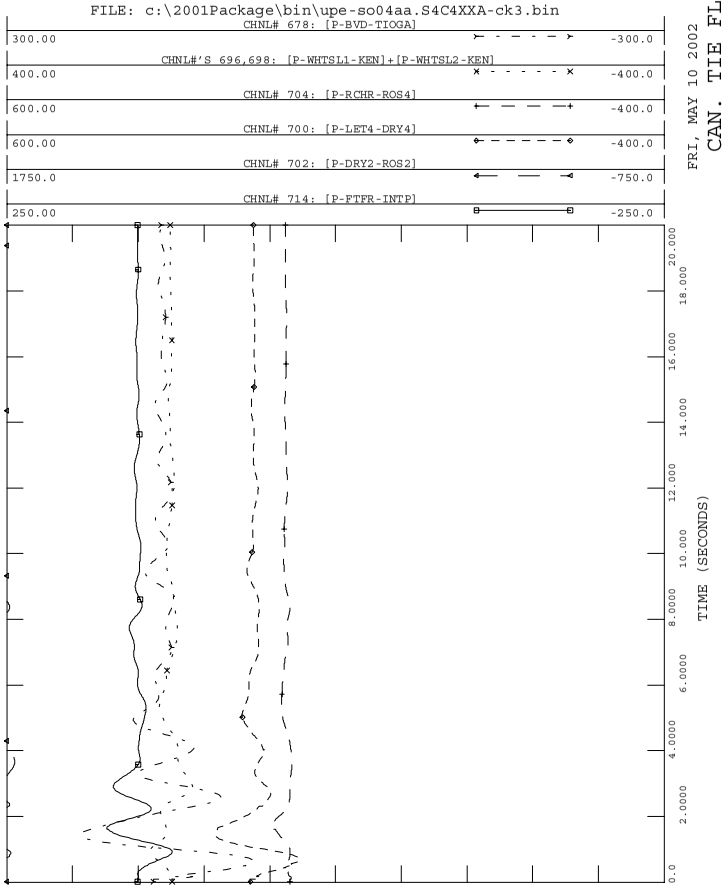
POWER FLOW SUMS 2



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23

CAN. TIE FLOWS



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
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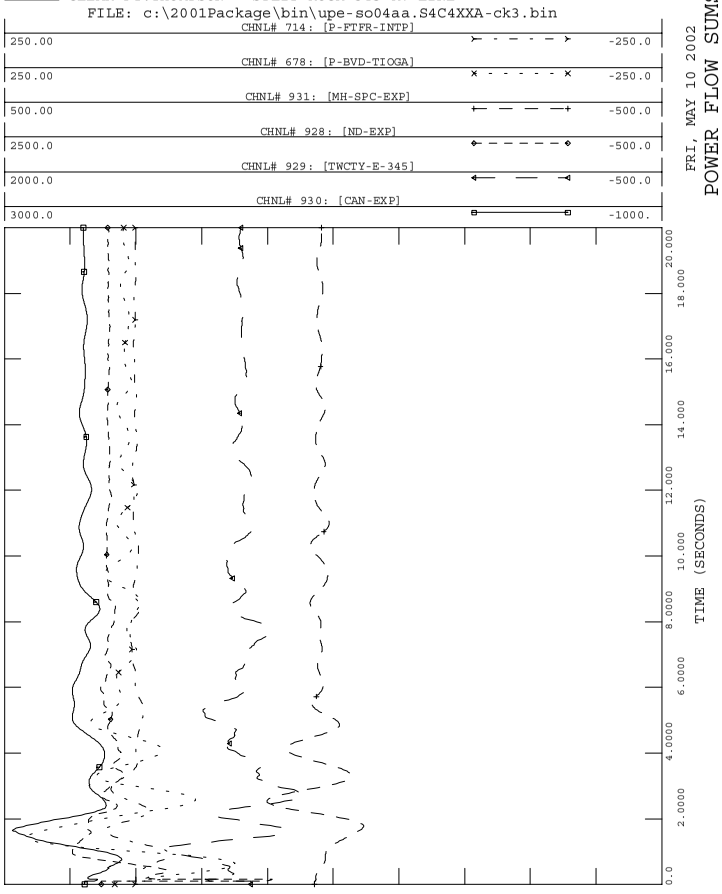
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23

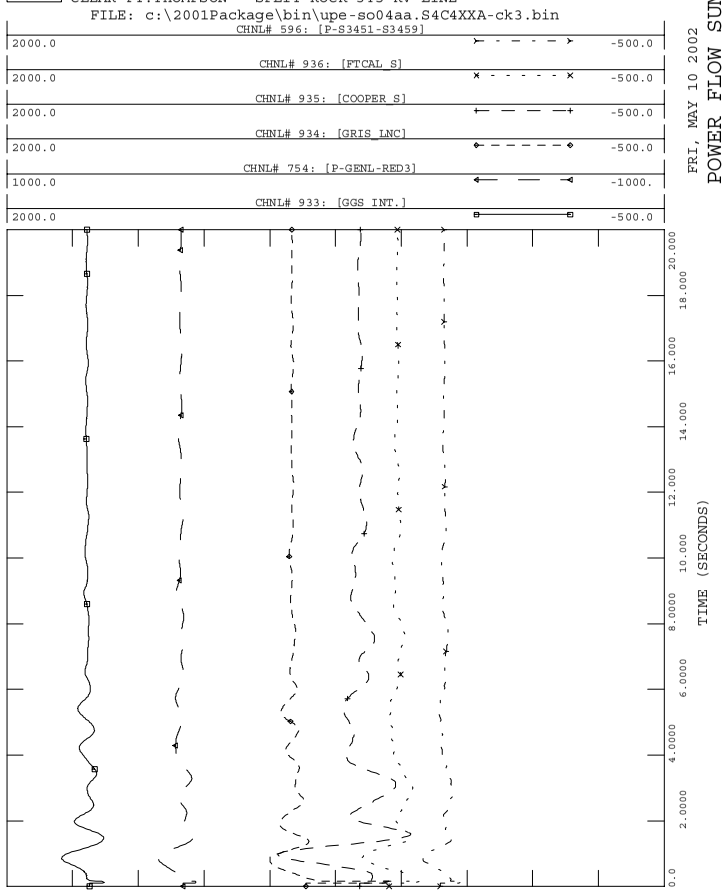
POWER FLOW SUMS 1



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

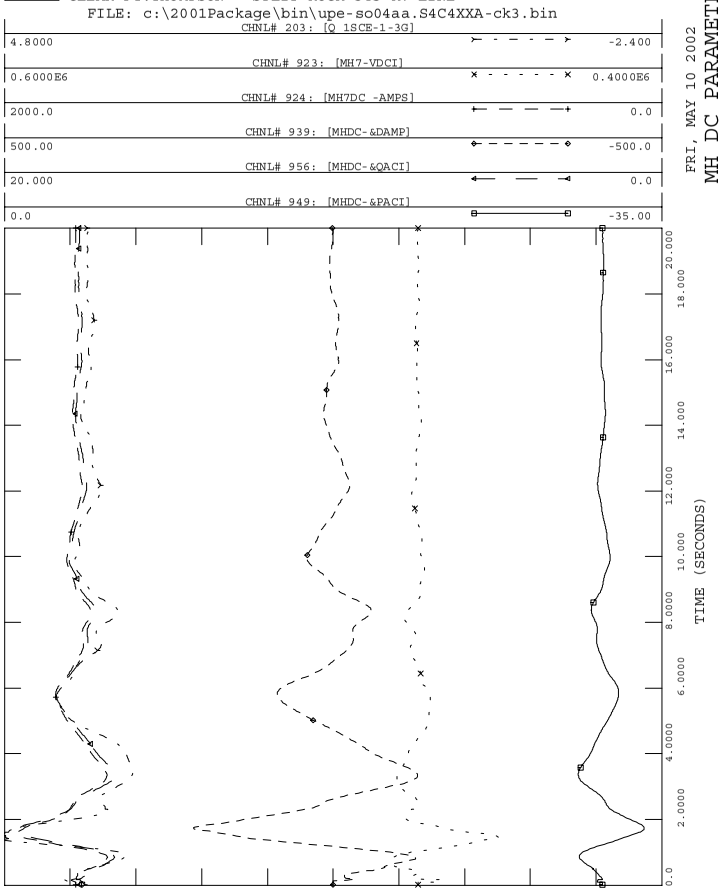
FRI, MAY 10 2002 1:23

POWER FLOW SUM 3



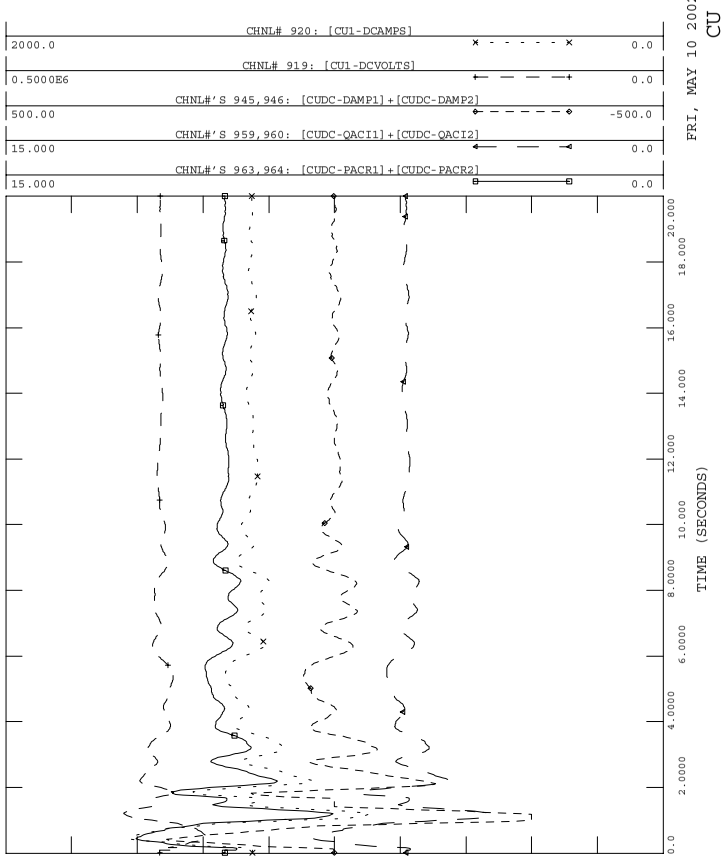
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23
MH DC PARAMETERS



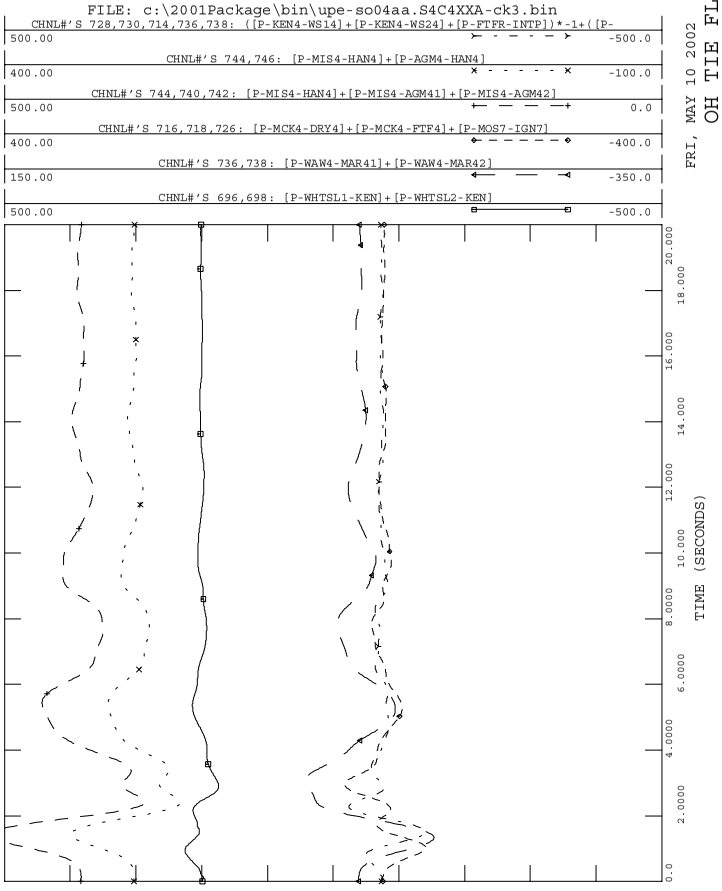
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23
CU DC #1



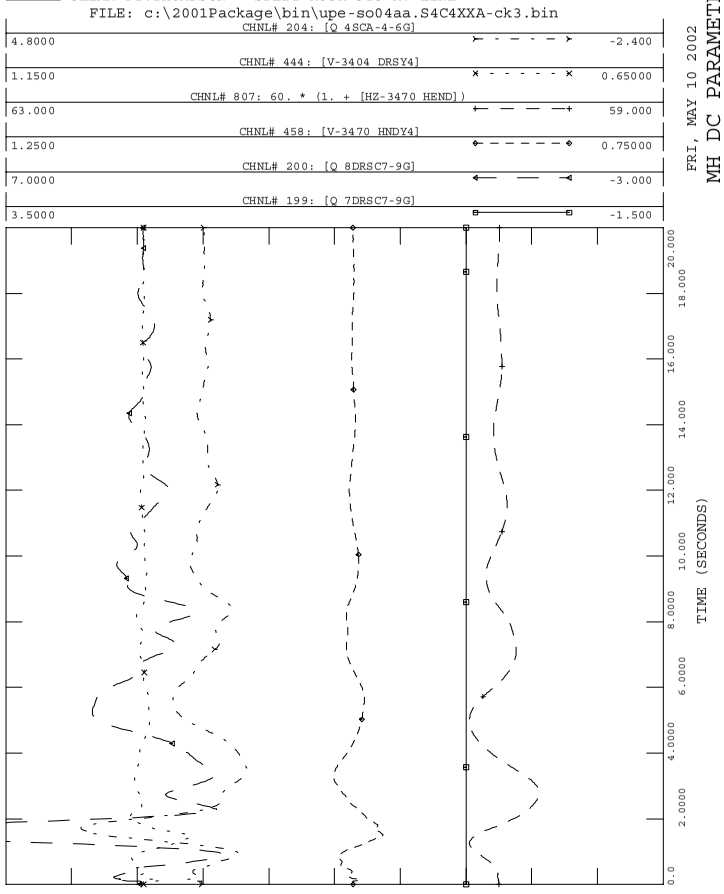
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23
OH TIE FLOWS



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

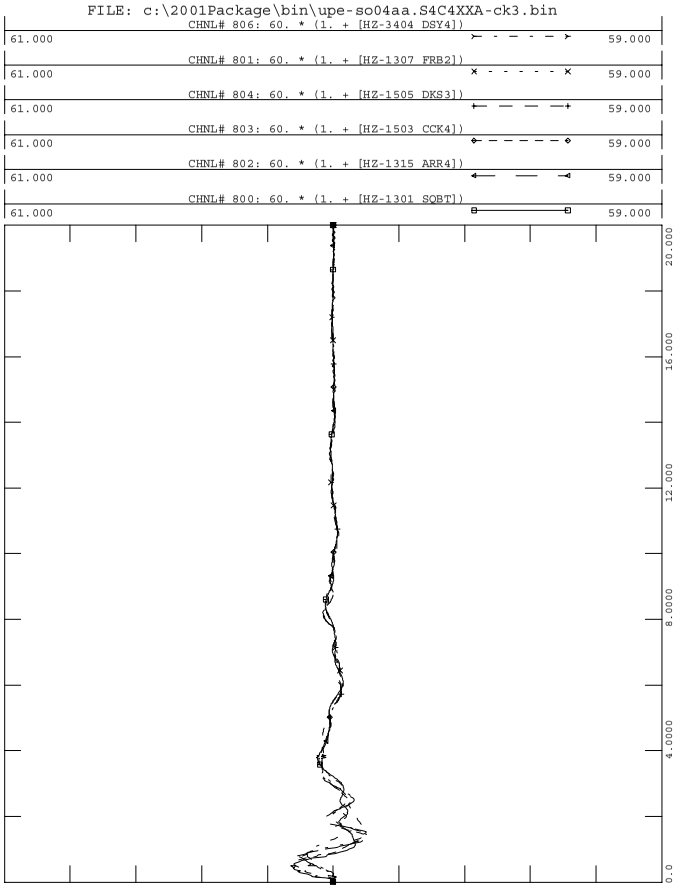
FRI, MAY 10 2002 1:23
MH DC PARAMETERS



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23

FREQ AT DC TERMINALS



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
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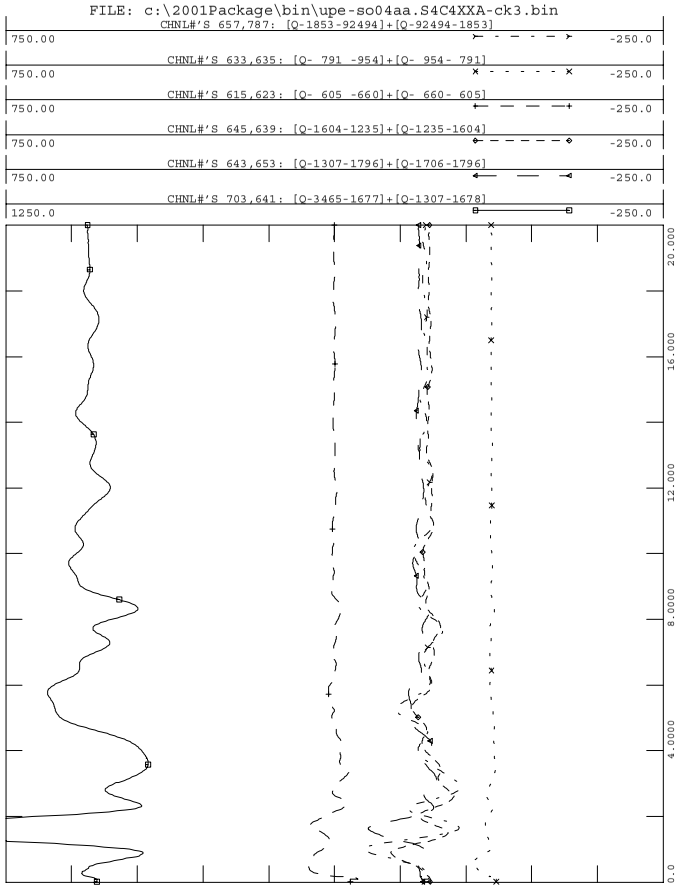
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23

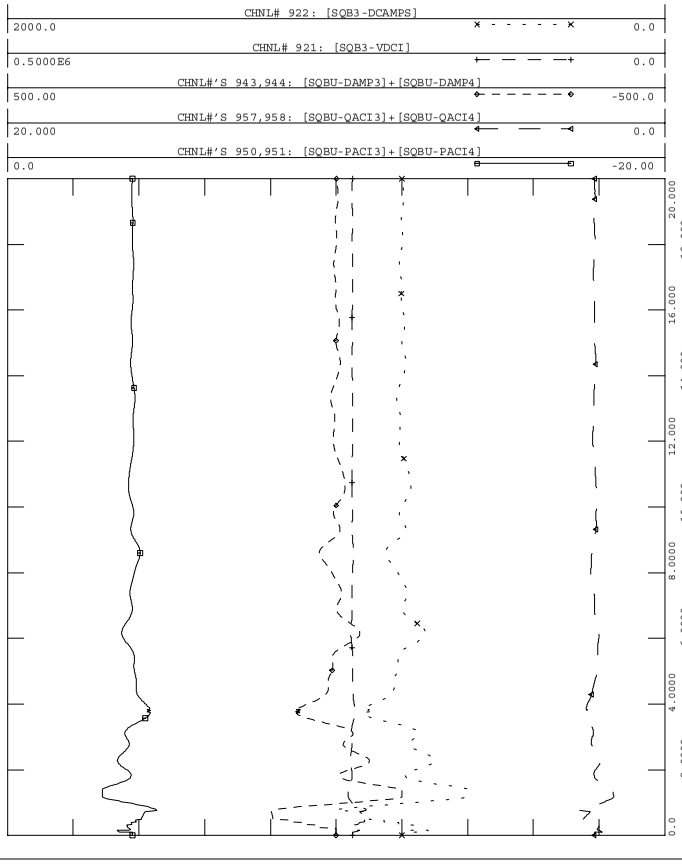
VAR LOSSES



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23

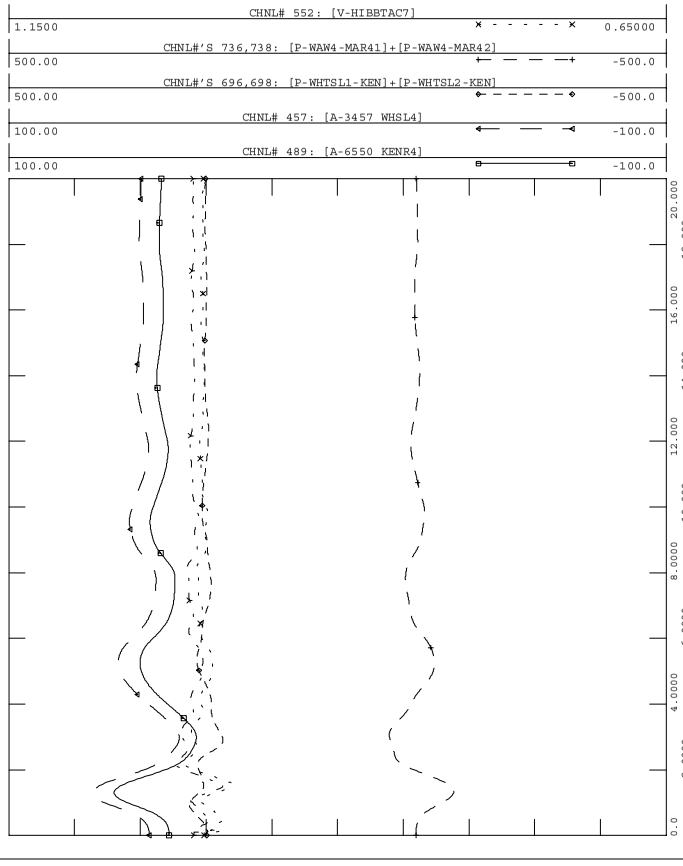
SQB DC #3



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

FRI, MAY 10 2002 1:23

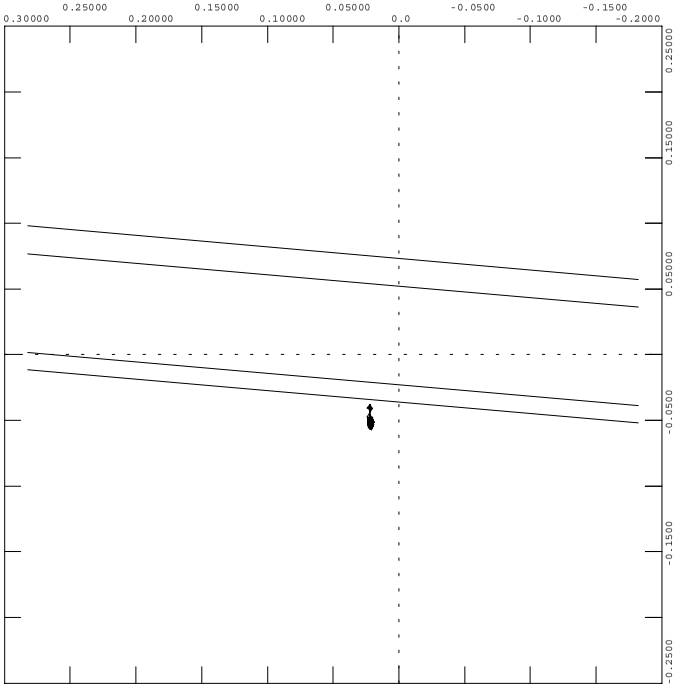
VOLTAGES, ANGLES



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



FRI, MAY 10 2002 1:23
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

RELAY: RELAYG
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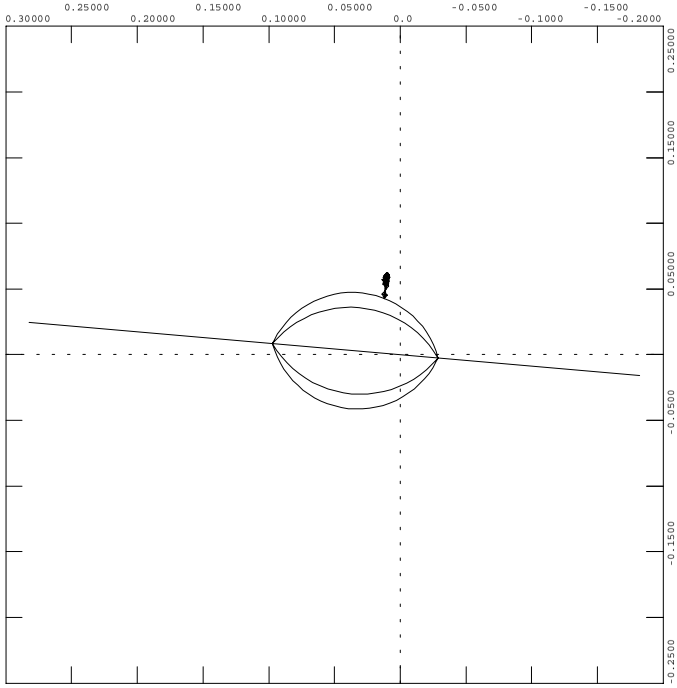
CHNL# 856: [X-DSY2-ROS2]

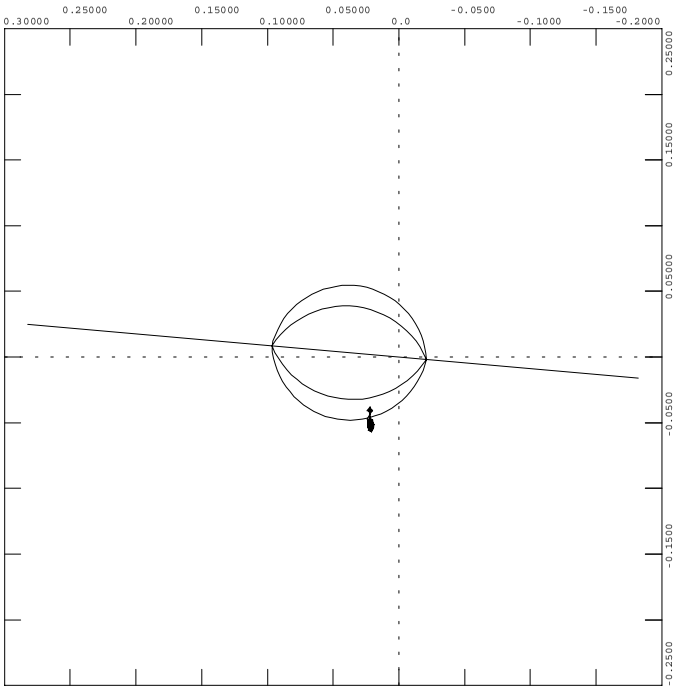


FRI, MAY 10 2002 1:23
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

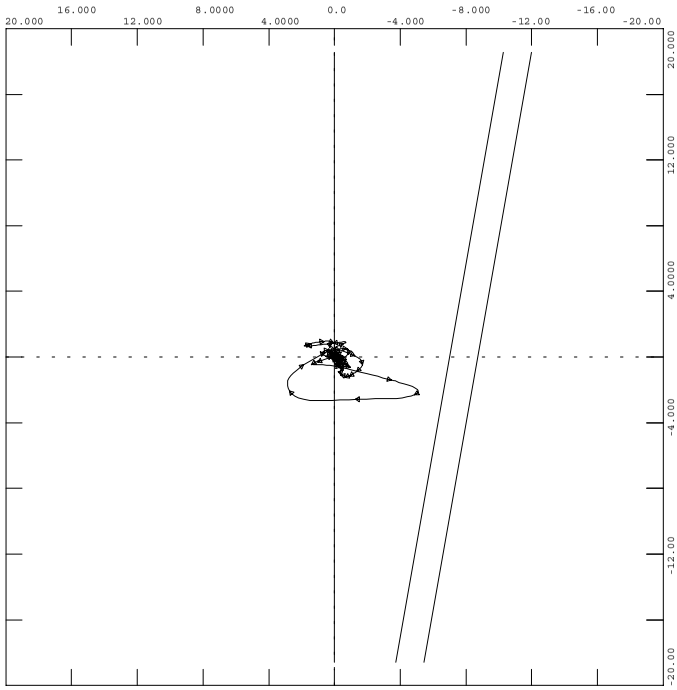


FRI, MAY 10 2002 1:23
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

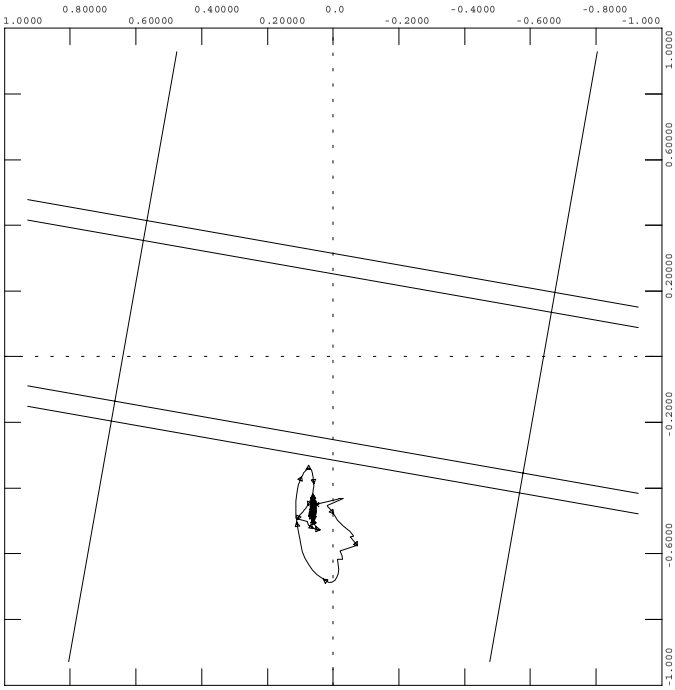


FRI, MAY 10 2002 1:23
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

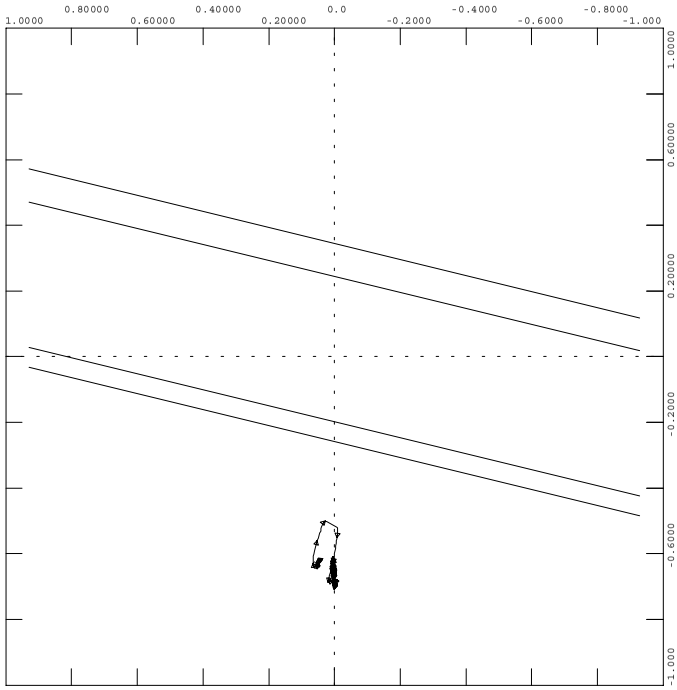


FRI, MAY 10 2002 1:23
L20D-DRAYTON-EMRG (776)

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

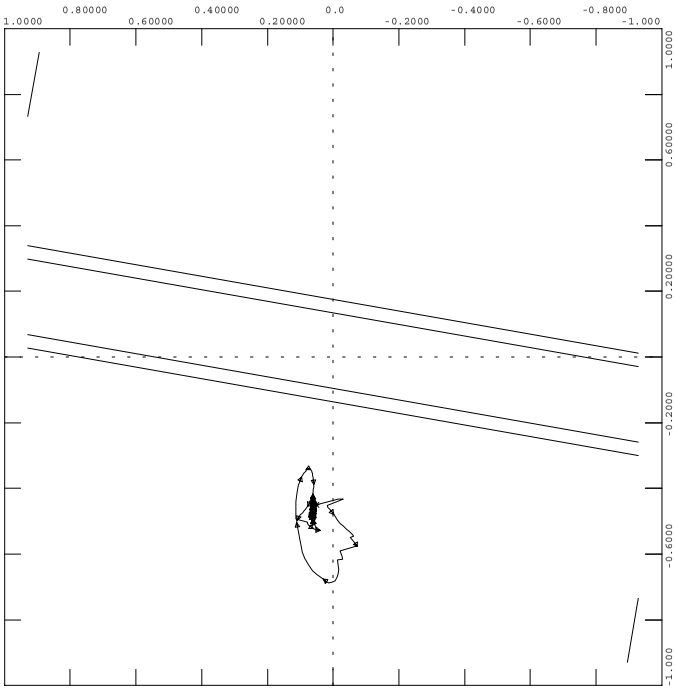


FRI, MAY 10 2002 1:23
R50M AT MORANVILLE (520)

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

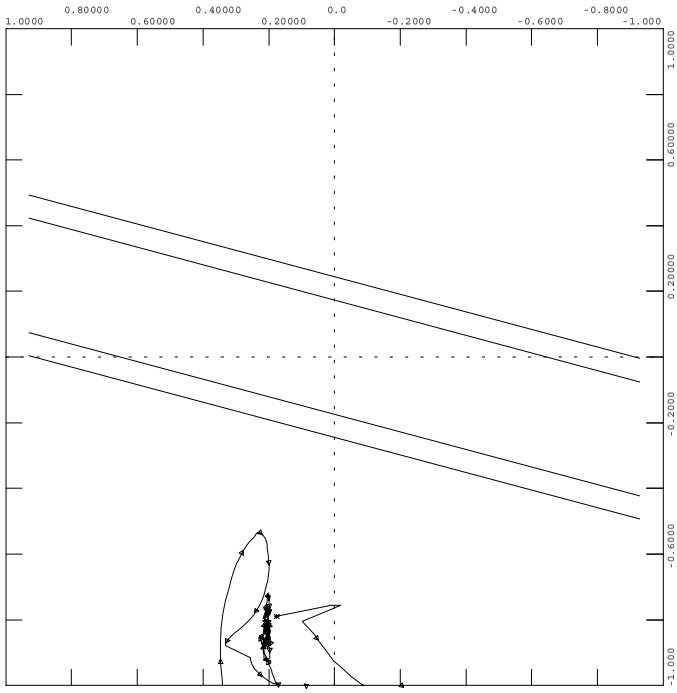


FRI, MAY 10 2002 1:23
L20D AT DRAYTON (506)

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

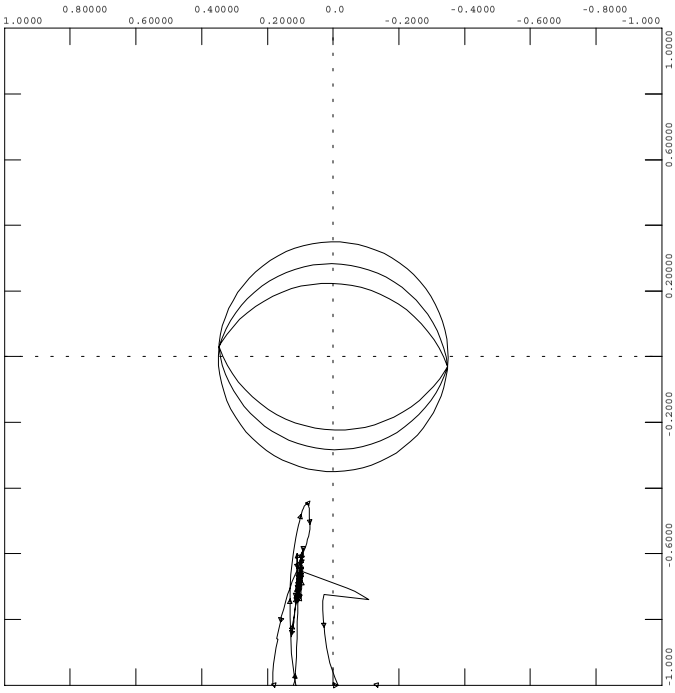


FRI, MAY 10 2002 1:23
L20D-PRAIRIE (510)

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

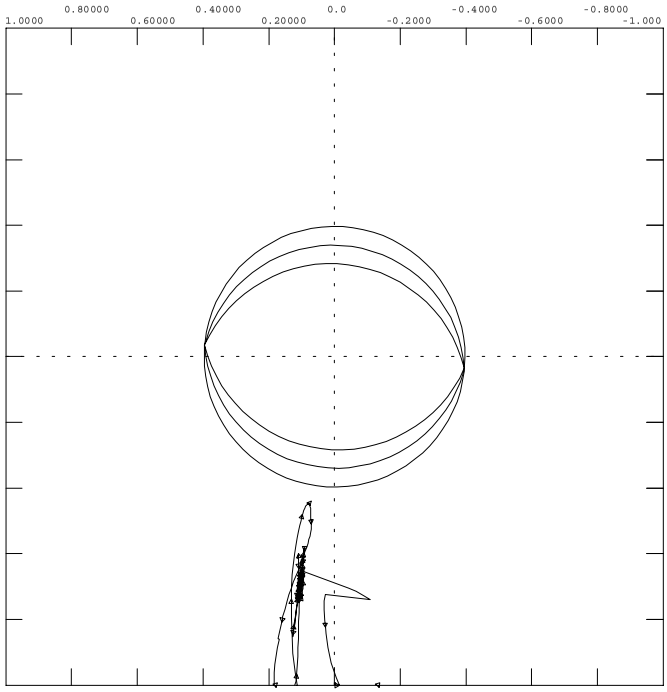
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

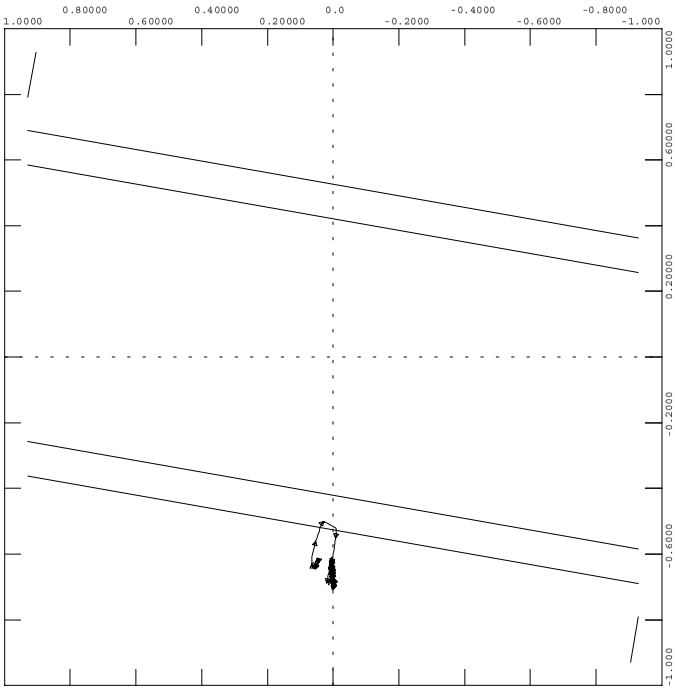
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

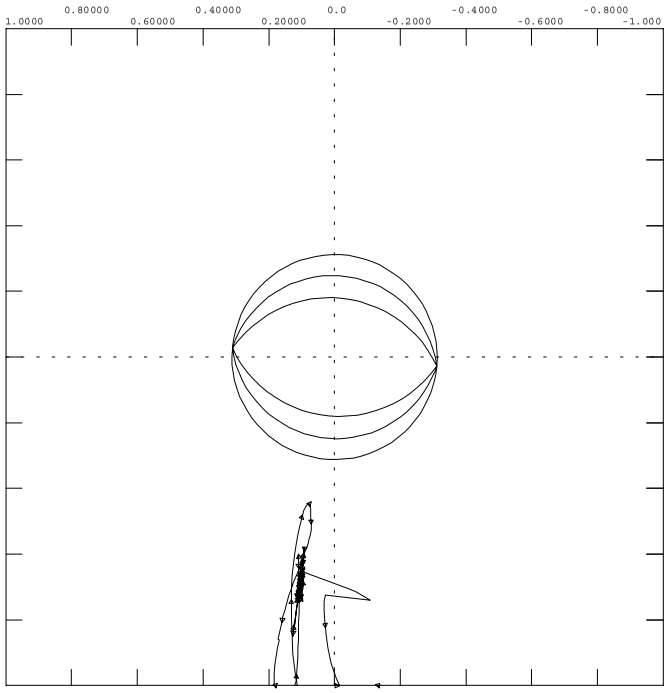
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



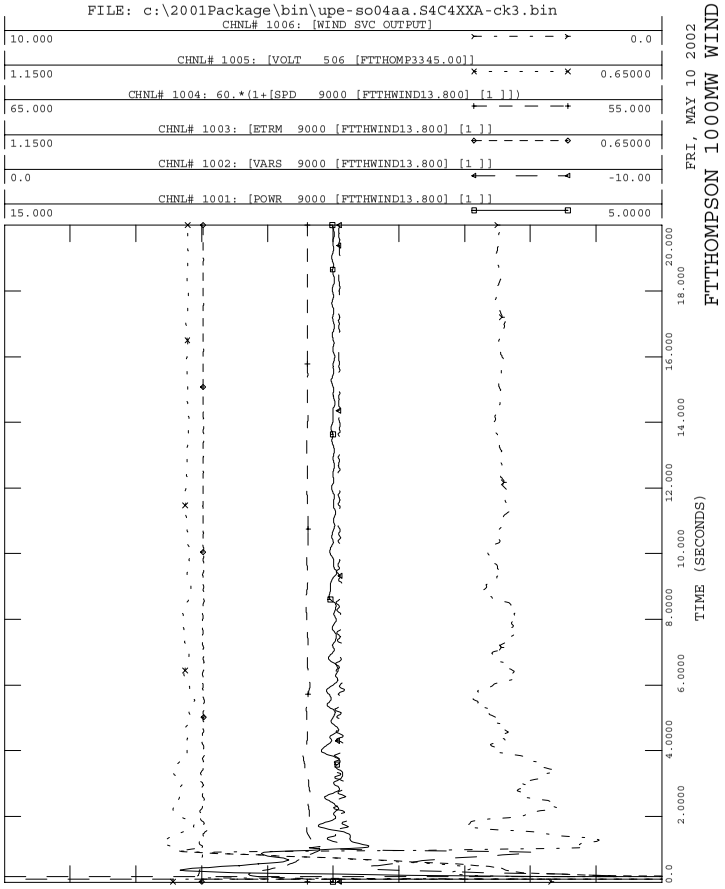
UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

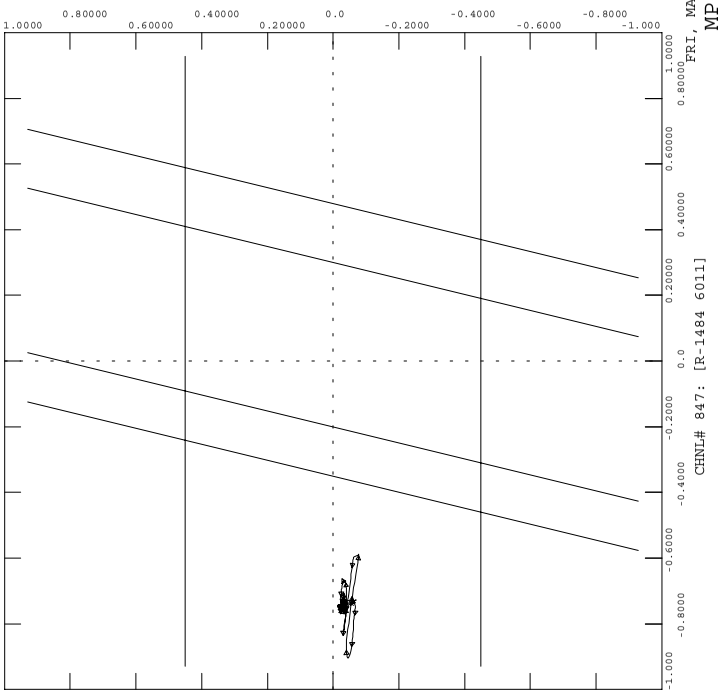


FRI, MAY 10 2002 1:23
FTTHOMPSON 1000MW WIND UN

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167
4 CYCLE 3 PHASE FAULT AT FT THOMPSON 345KV
CLEAR FT.THOMPSON - SPLIT ROCK 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S4C4XXA-ck3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



FRI, MAY 10 2002 1:23
MP-OH I.FALLS (779)

APPENDIX 30

SCREENING OF MAPP CONTINGENCIES

WITH DYNAMIC SIMULATION

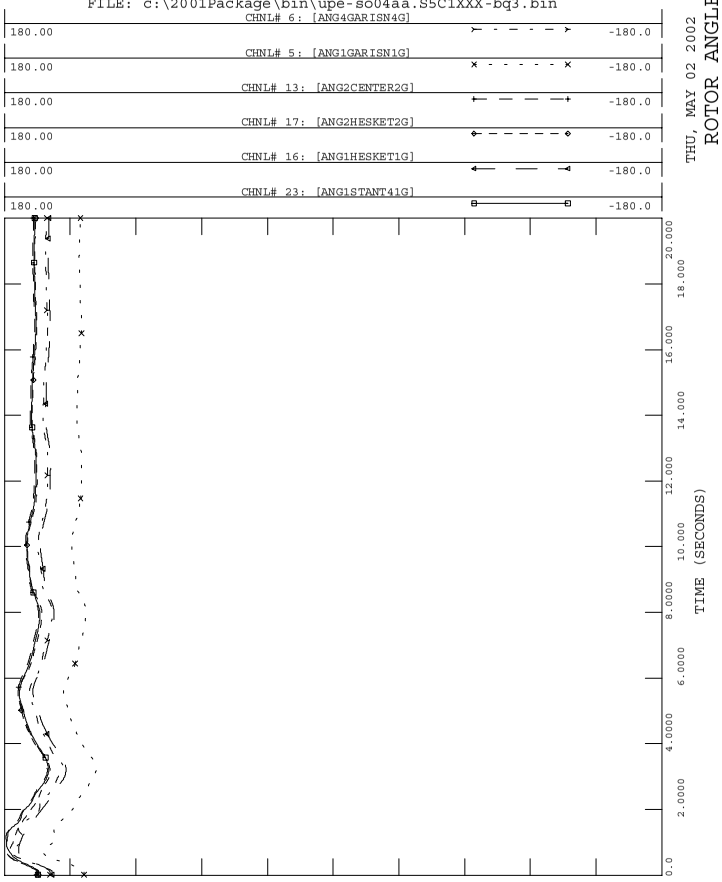
SITE 5 (WATERTOWN)

CASE S5C1XXX

CONTINGENCY BQ3

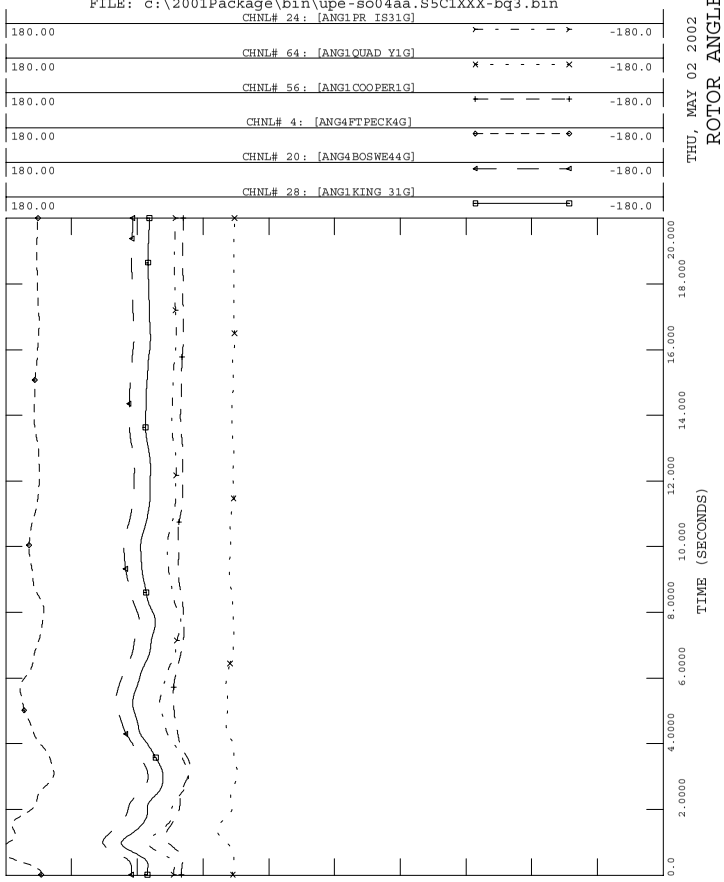
4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-Groton 345 kV line.

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin



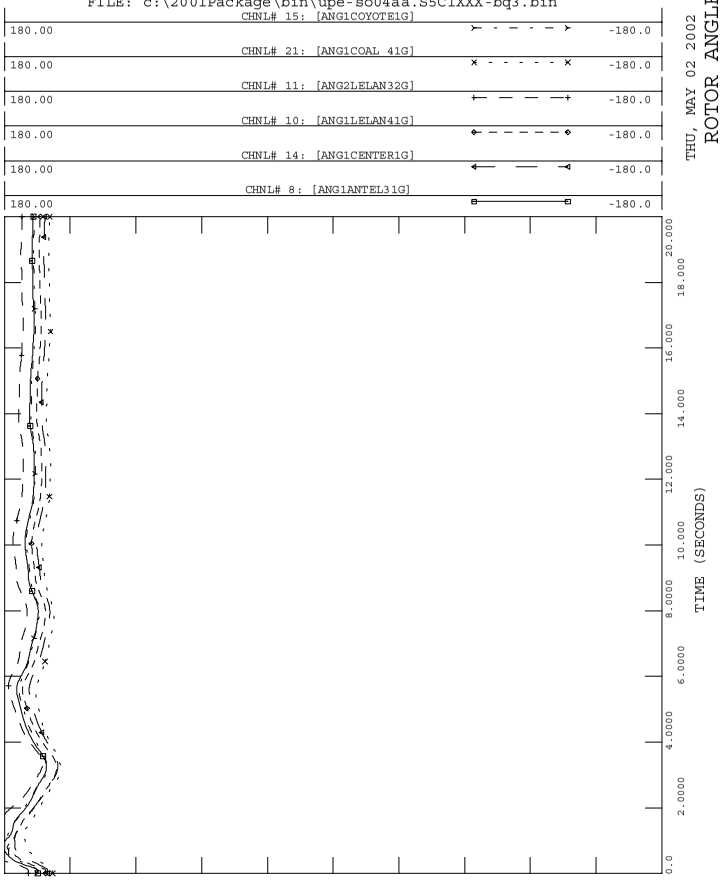
THU, MAY 02 2002 19:30
ROTOR ANGLES 2

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin



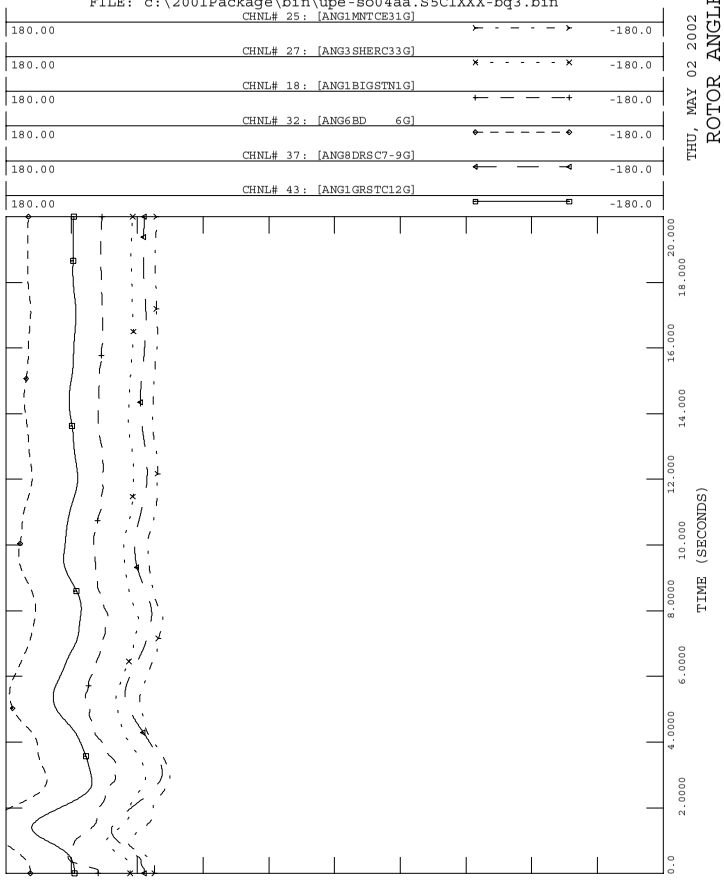
THU, MAY 02 2002 19:30
ROTOR ANGLES 4

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin



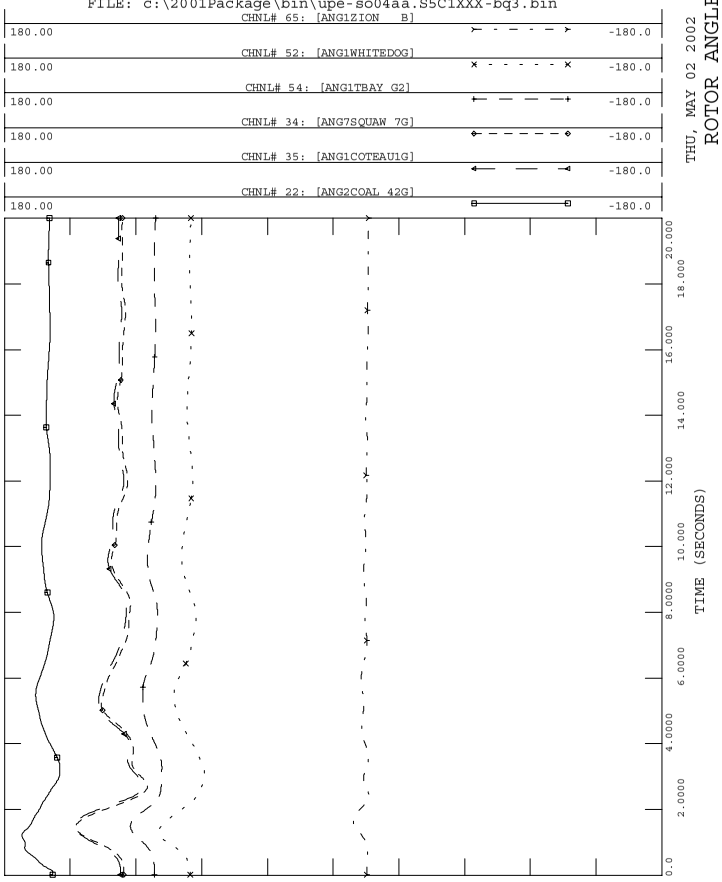
THU, MAY 02 2002 19:30
ROTOR ANGLES 1

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin



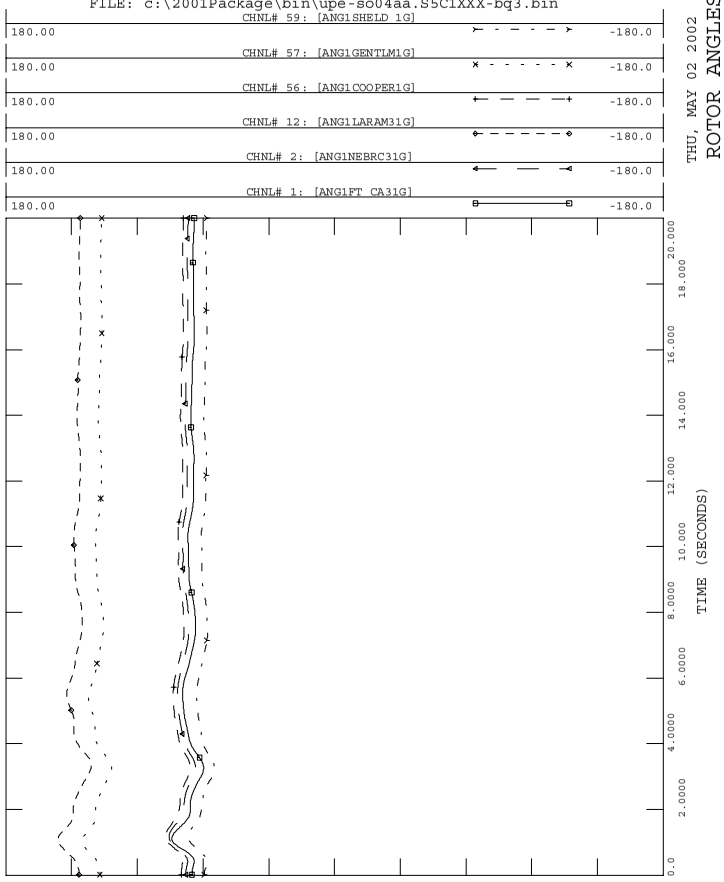
THU, MAY 02 2002 19:30
ROTOR ANGLES 3

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin



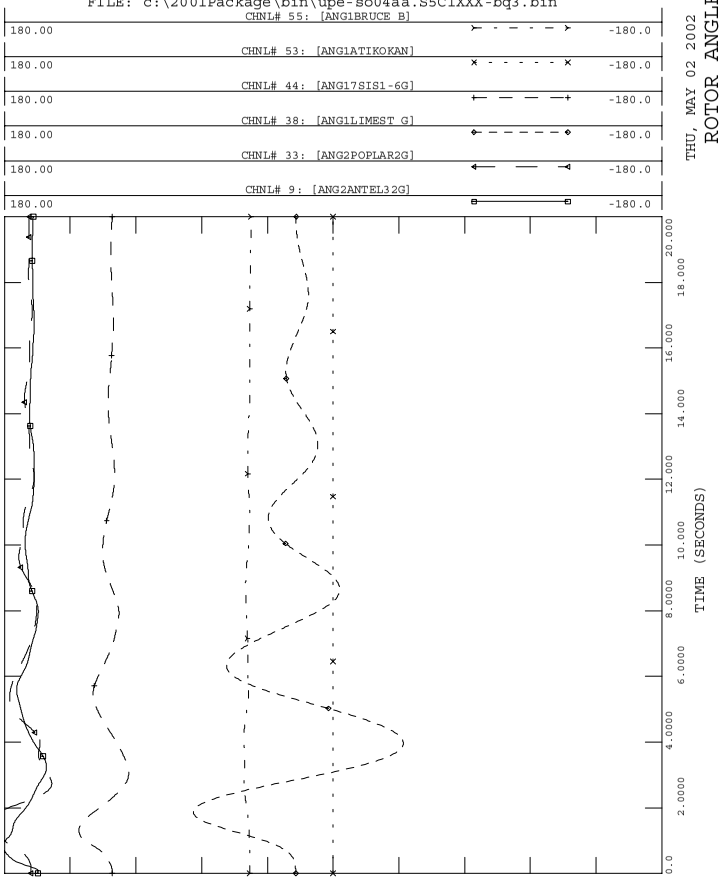
THU, MAY 02 2002 19:30
ROTOR ANGLES 6

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin



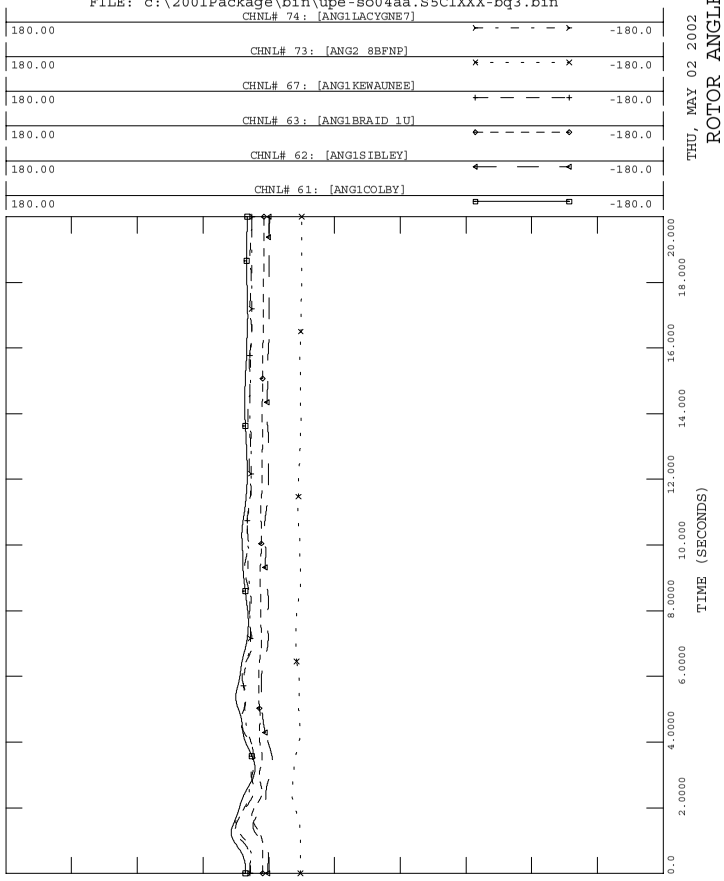
THU, MAY 02 2002 19:30
ROTOR ANGLES NB

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin



THU, MAY 02 2002 19:30
ROTOR ANGLES 5

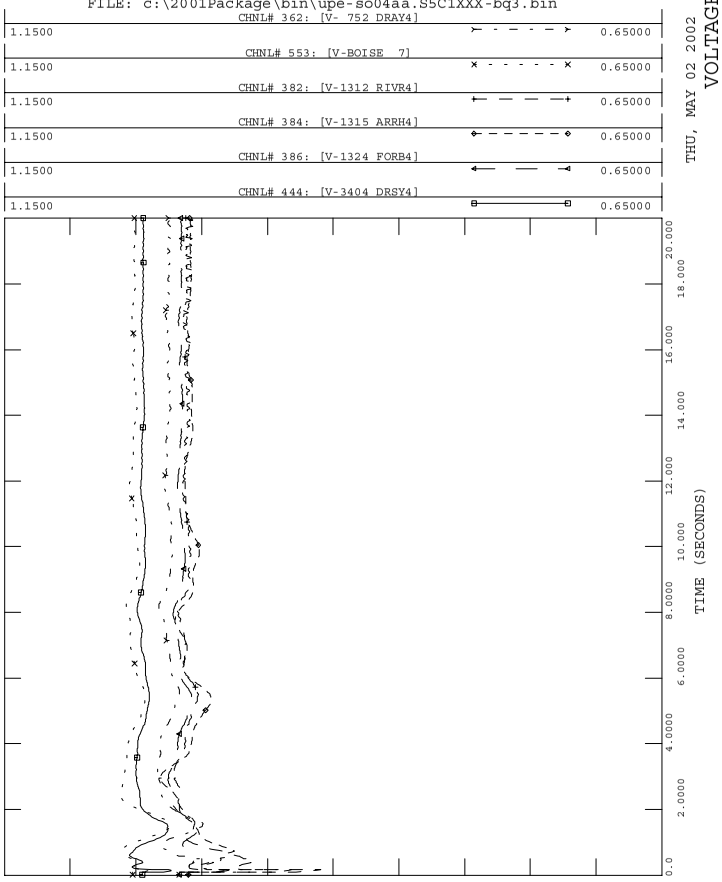
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin



THU, MAY 02 2002 19:30
ROTOR ANGLES 7

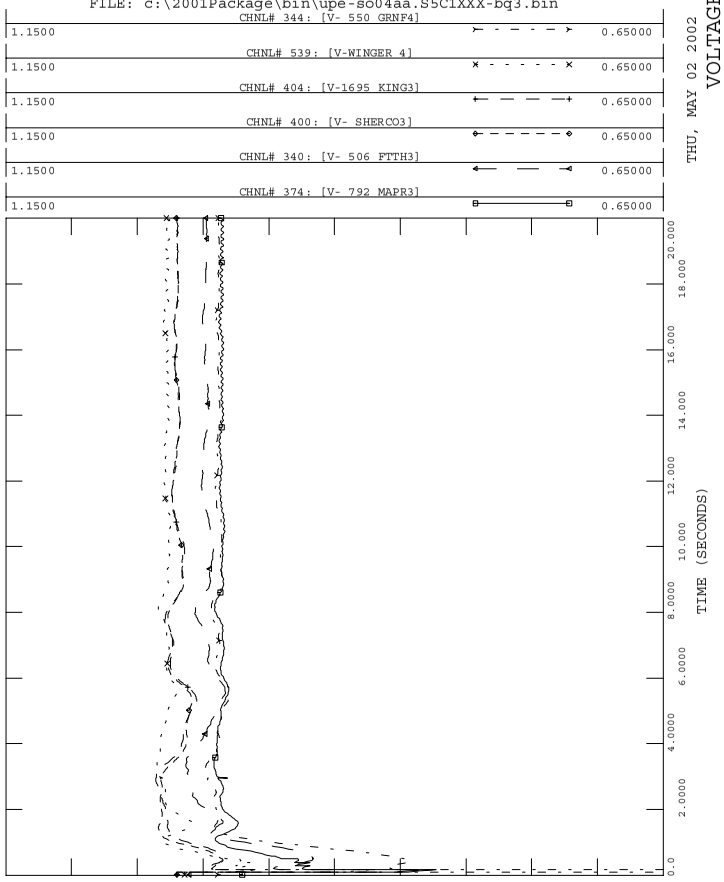
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30
VOLTAGES 1



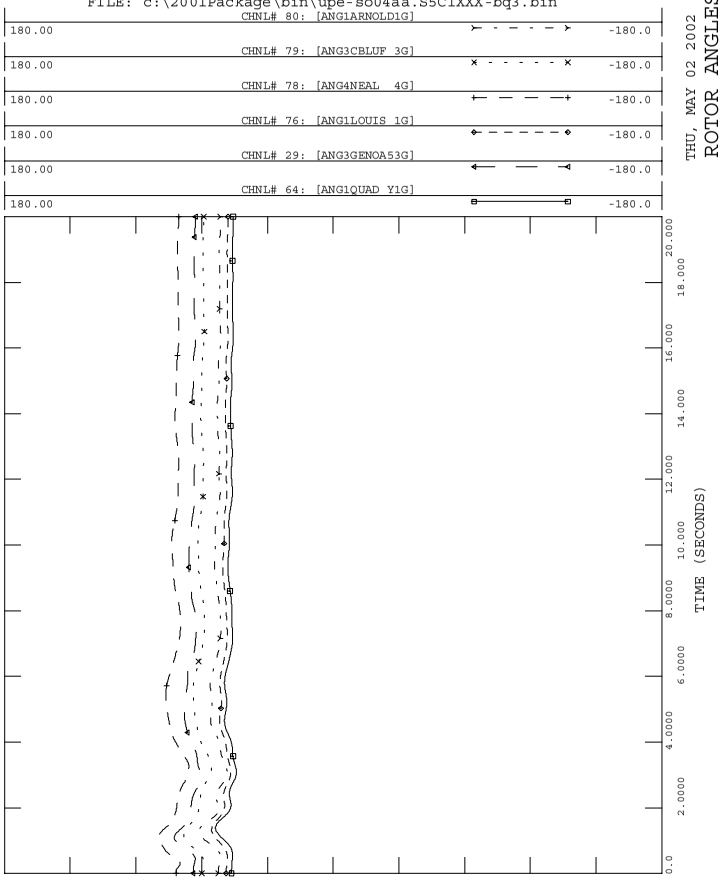
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30
VOLTAGES 3



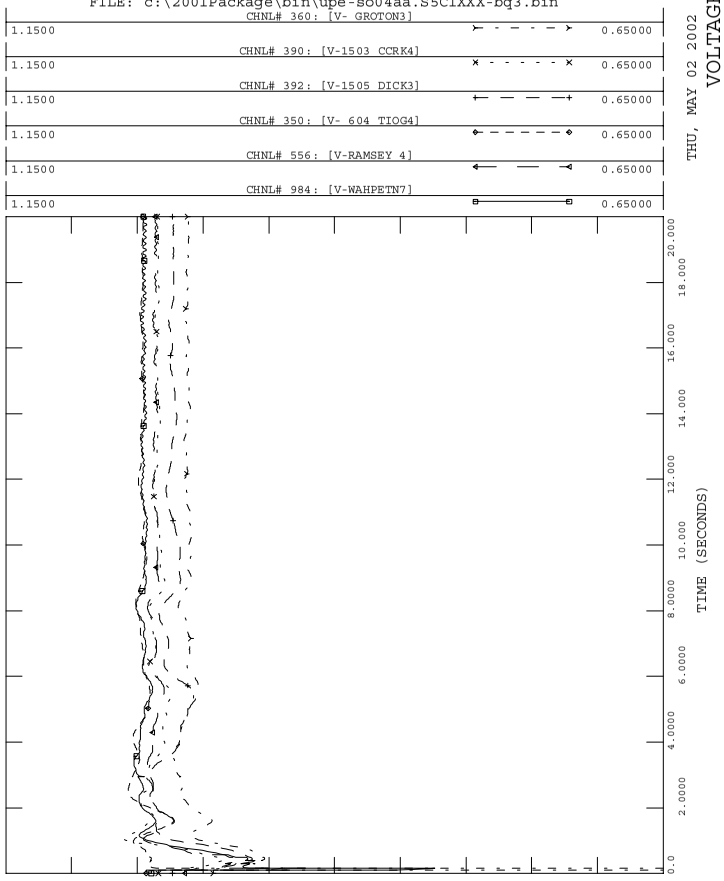
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30
ROTOR ANGLES IA



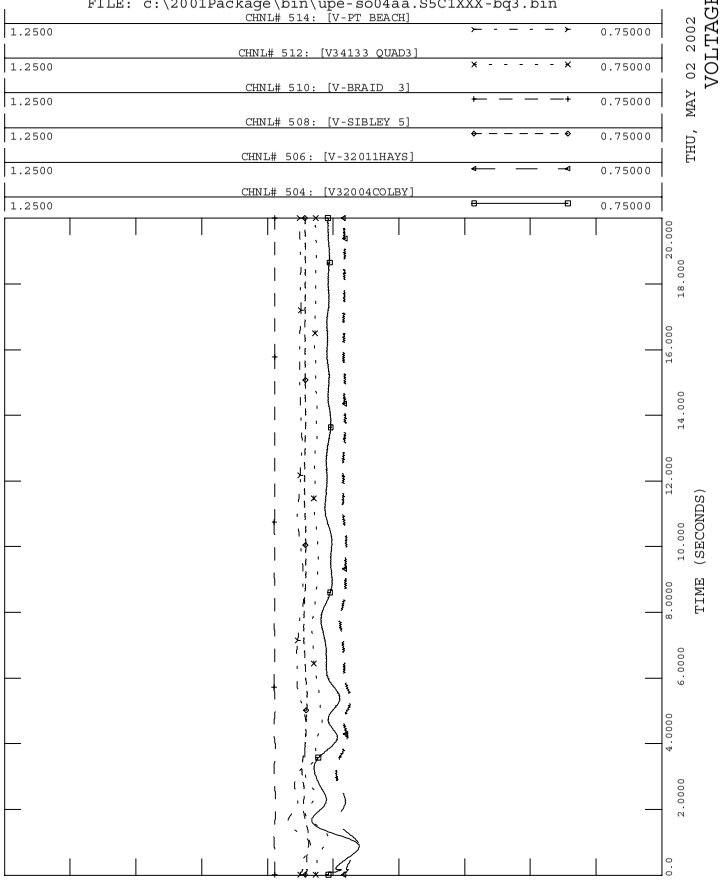
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30
VOLTAGES 2



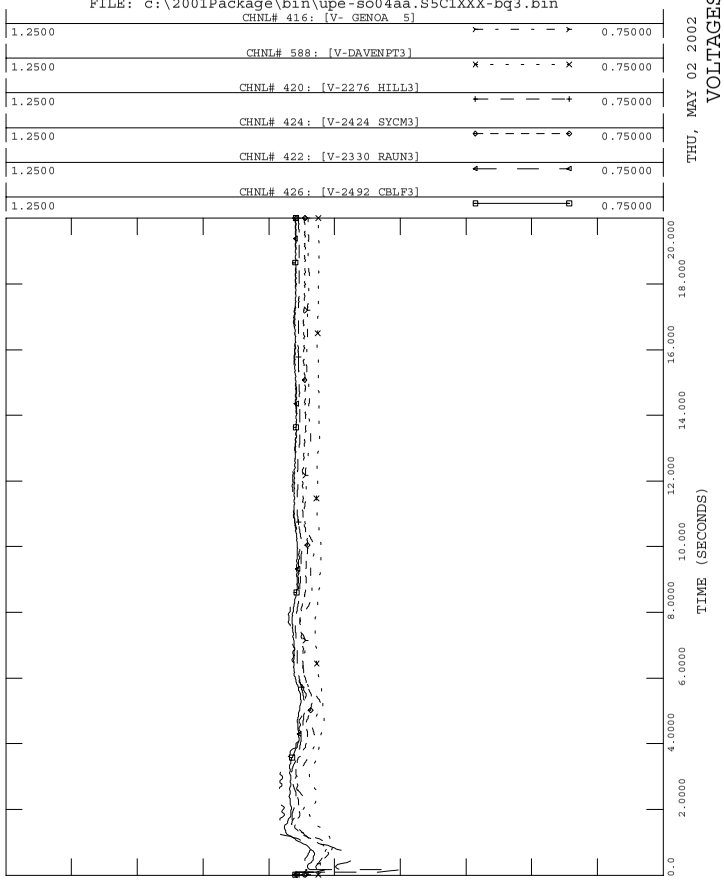
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30
VOLTAGES 5



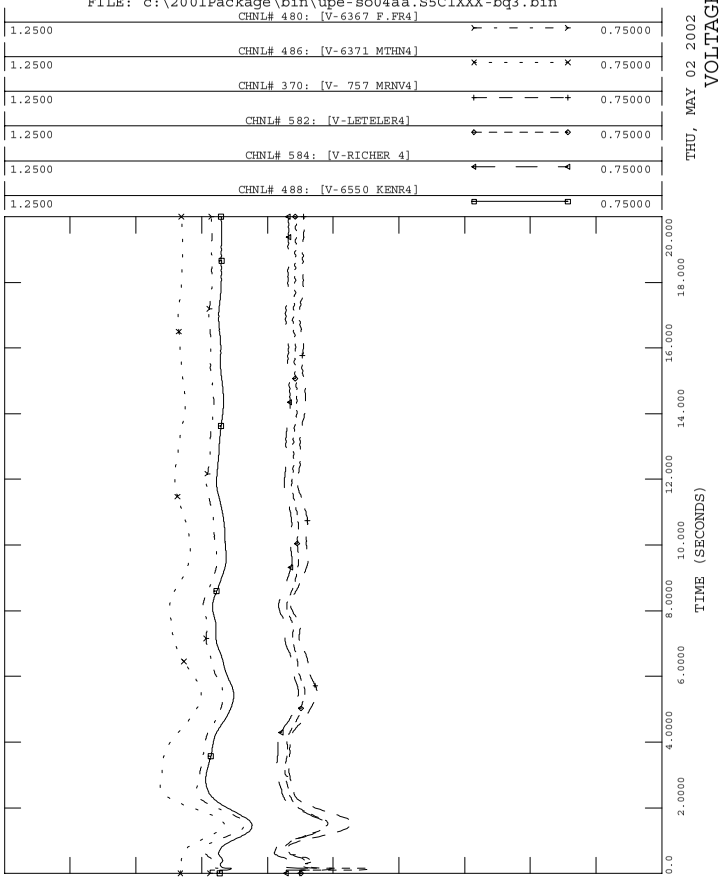
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30
VOLTAGES IA



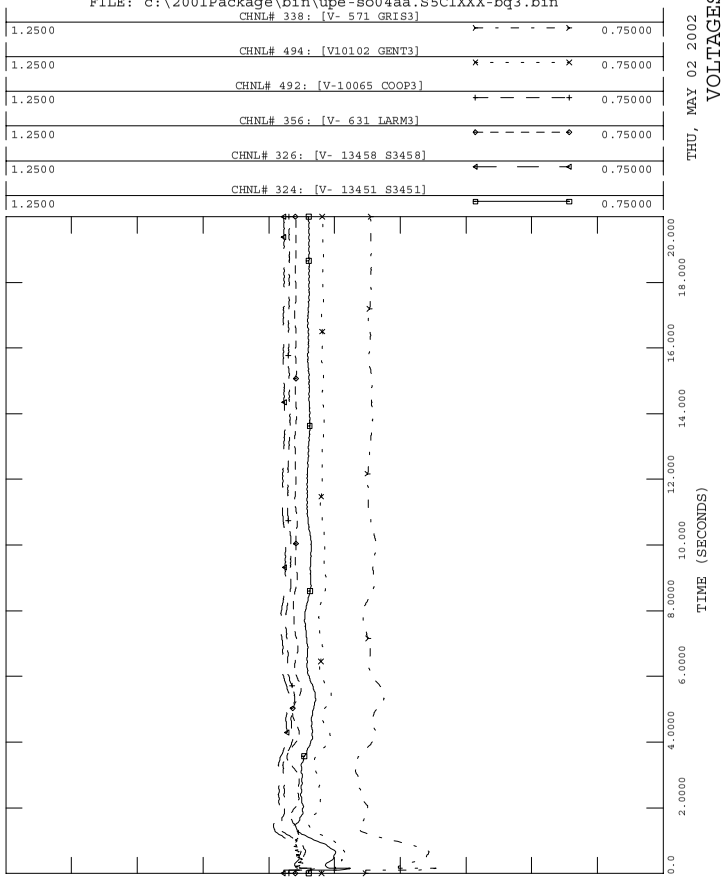
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30
VOLTAGES 4

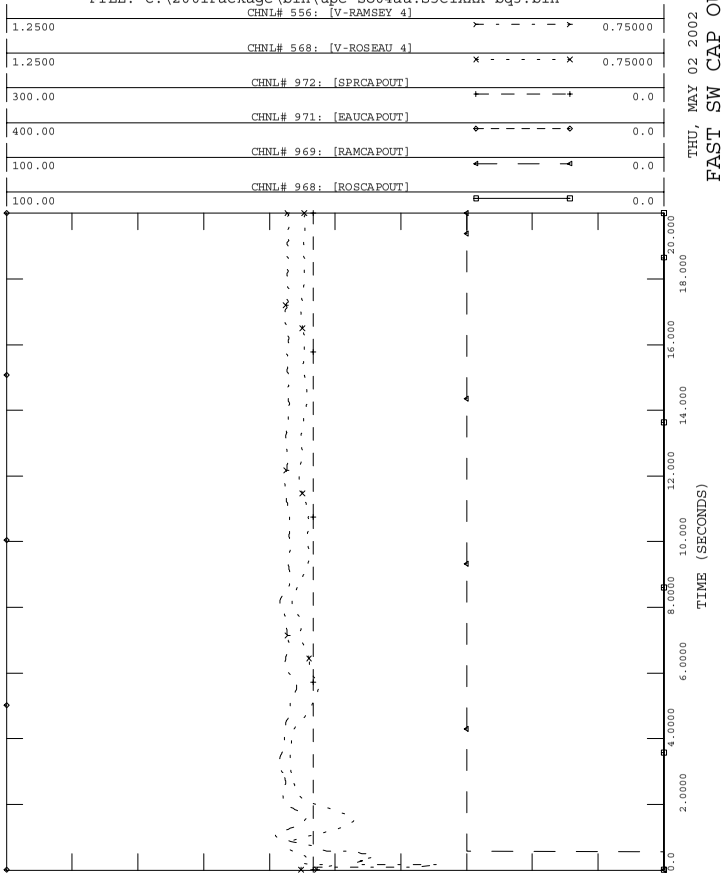


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30
VOLTAGES NB

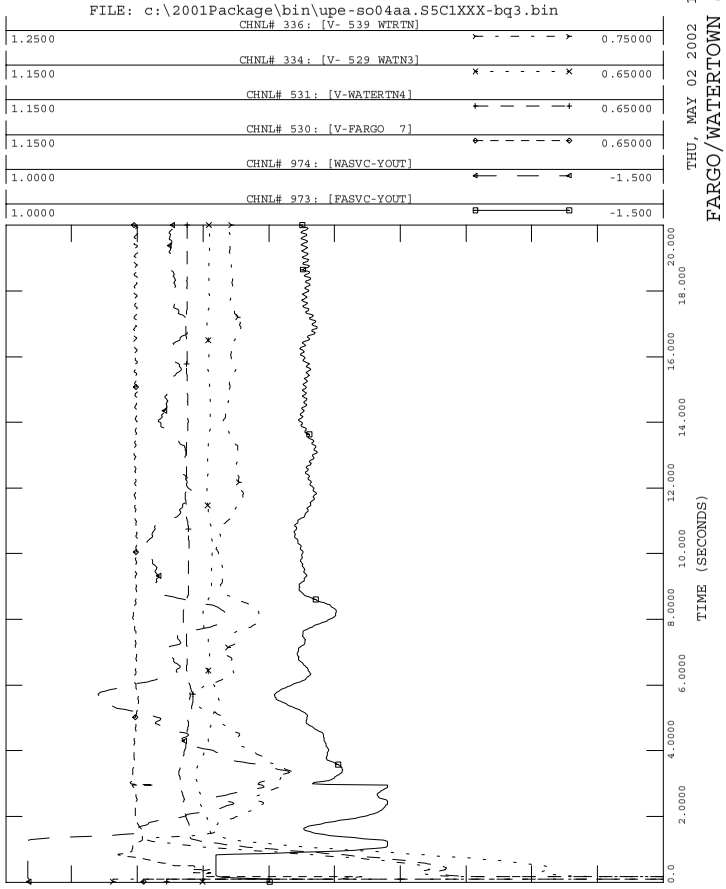


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin



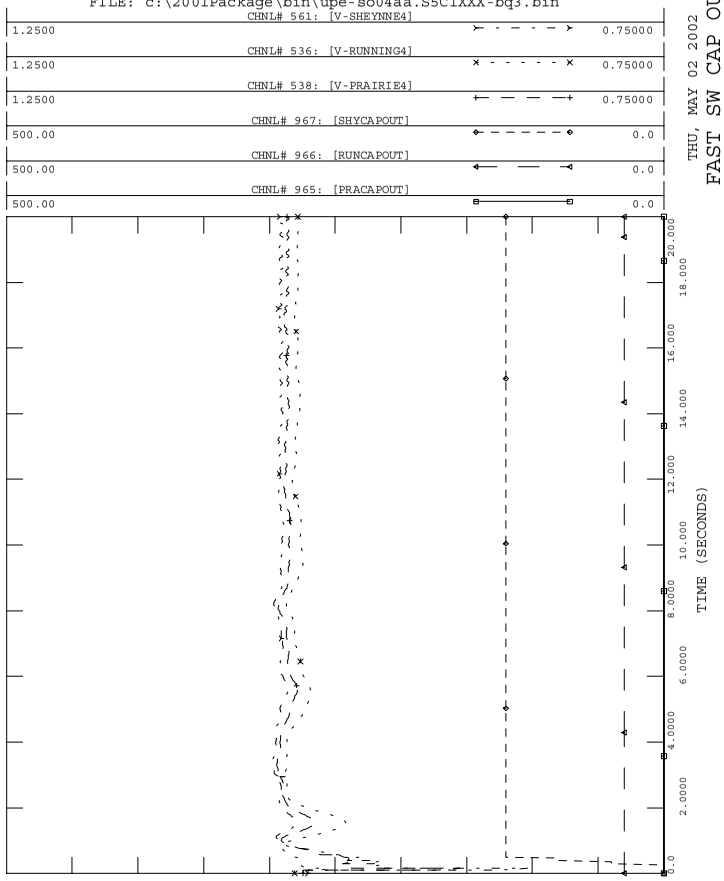
THU, MAY 02 2002 19:30
FAST SW CAP OUT 2

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin



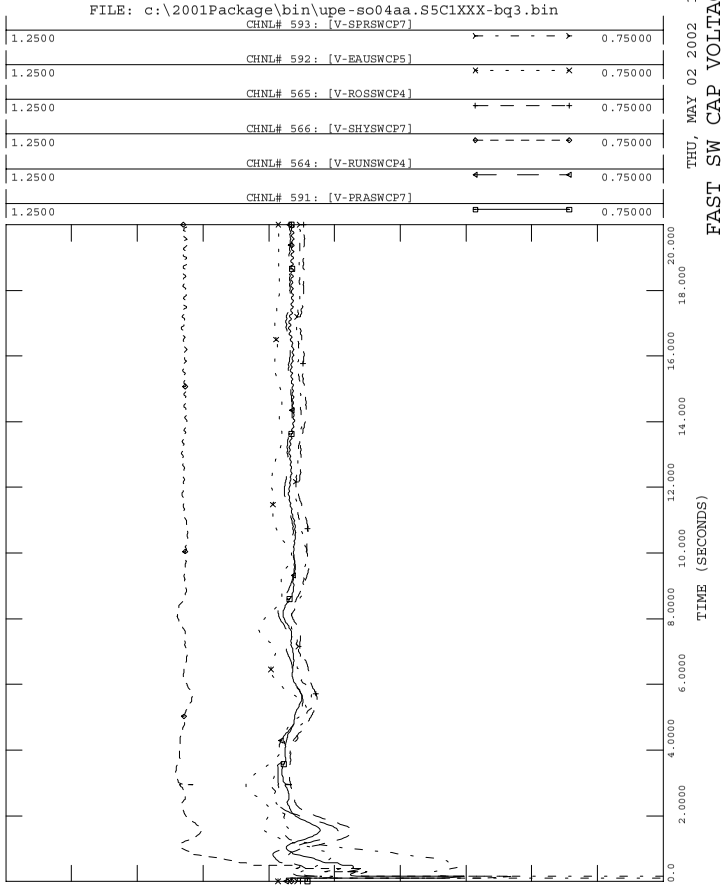
THU, MAY 02 2002 19:30
FARGO/WATERTOWN SVS

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin



THU, MAY 02 2002 19:30
FAST SW CAP OUT 1

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

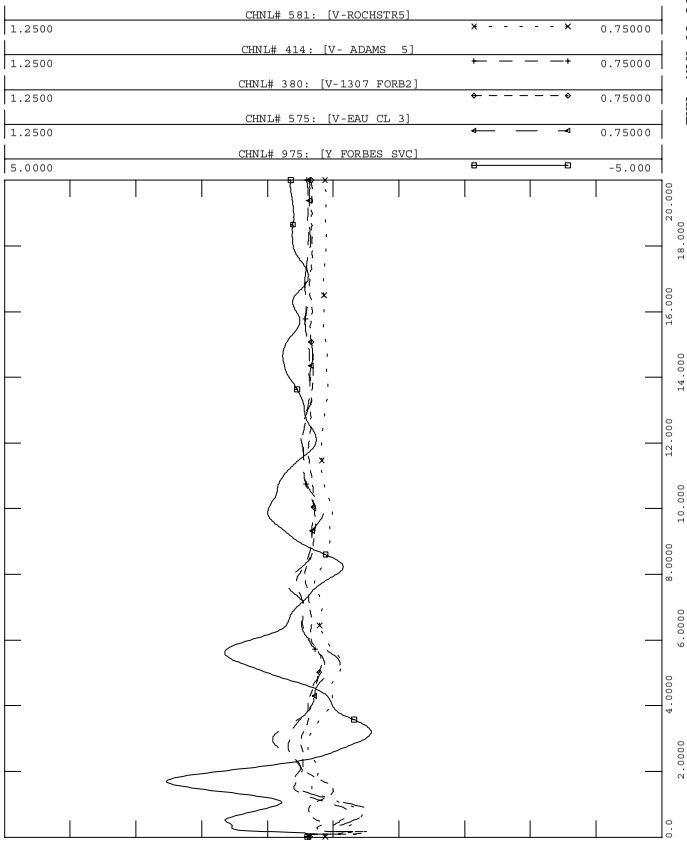


THU, MAY 02 2002 19:30
FAST SW CAP VOLTAGES

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30

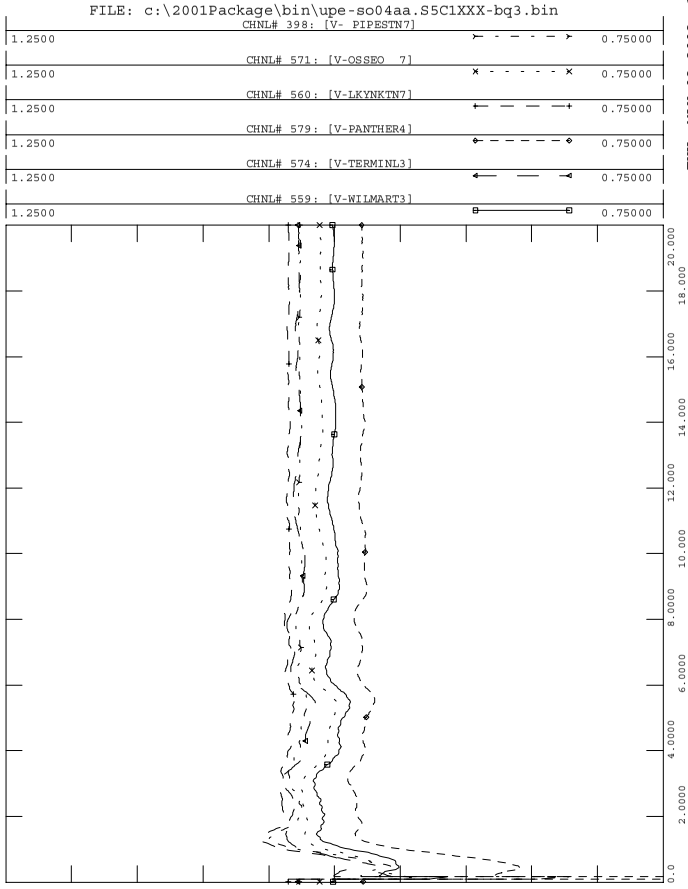
SVC & WISCONSIN VOLT



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30

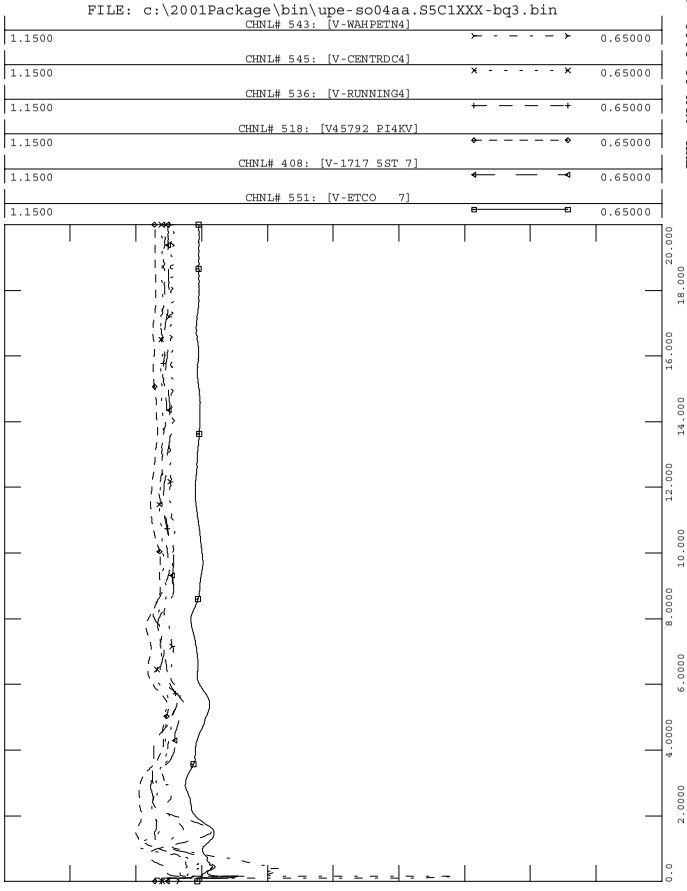
TC VOLTAGES



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30

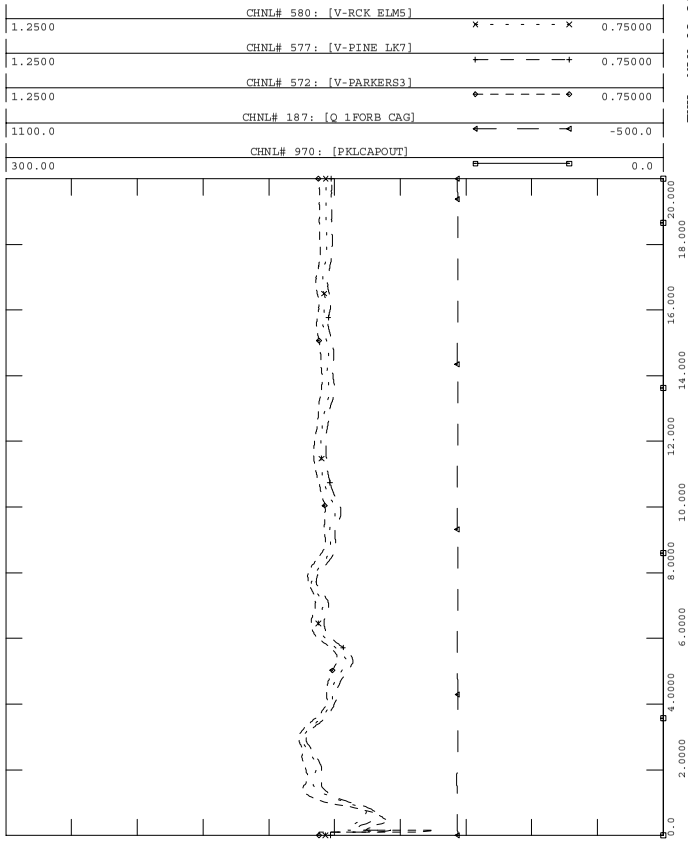
VOLTAGES 6



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

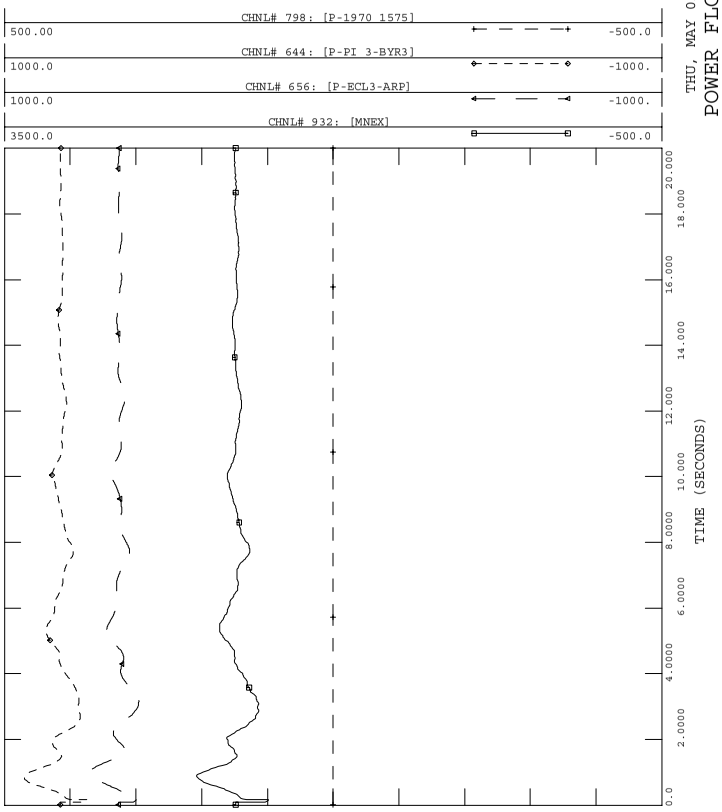
THU, MAY 02 2002 19:30

FORBES SVS OUT & VOLTAGES



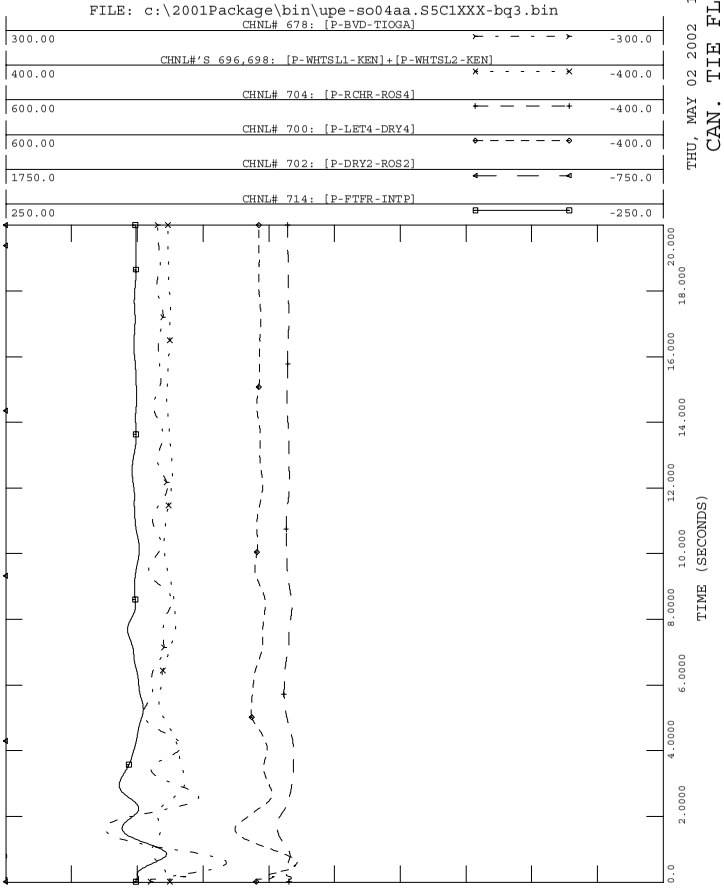
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30
POWER FLOW SUMS 2



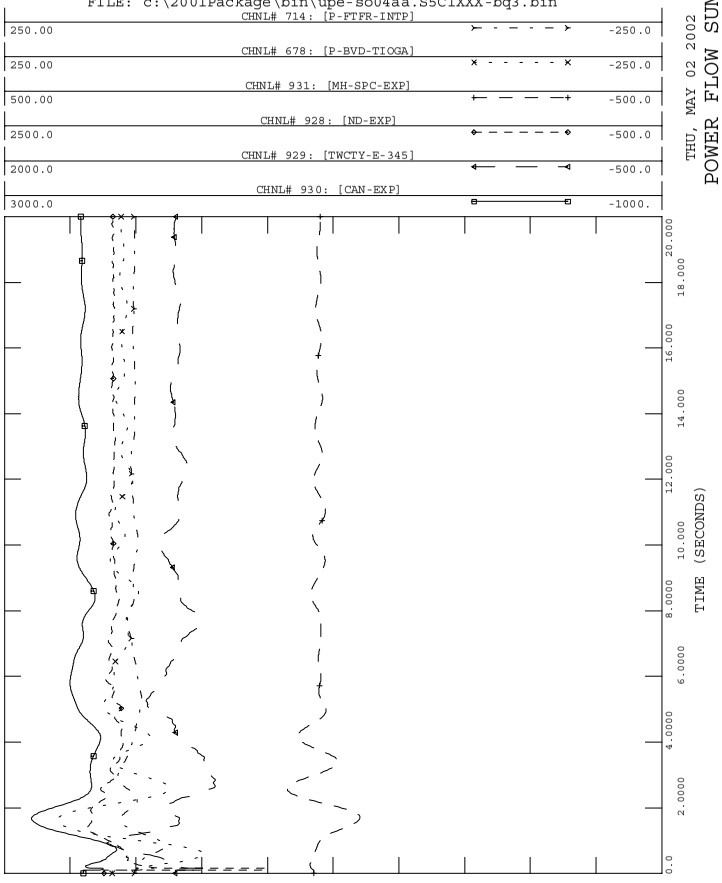
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

THU, MAY 02 2002 19:30
CAN. TIE FLOWS



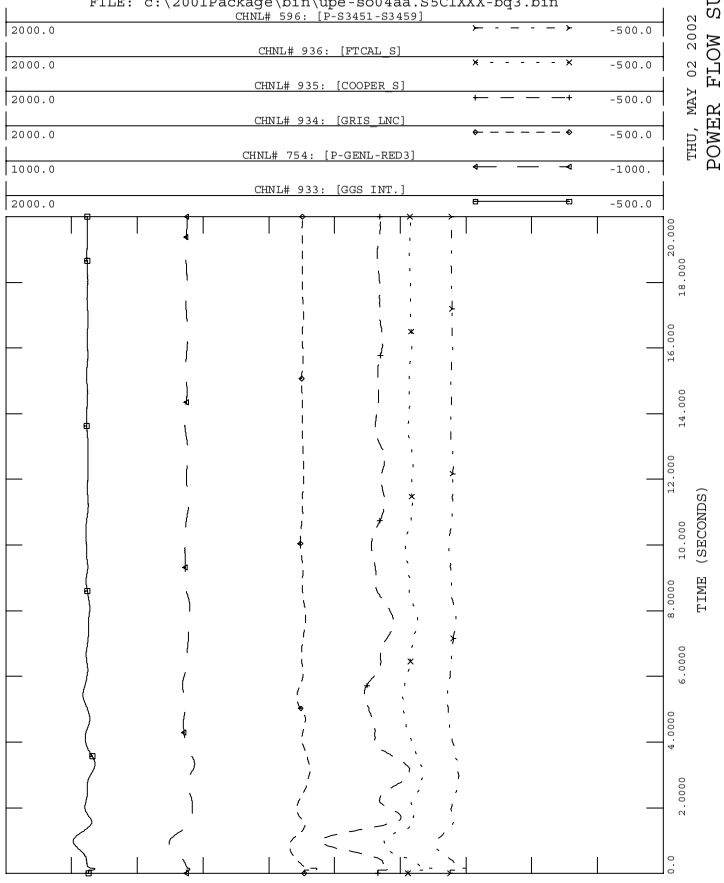
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

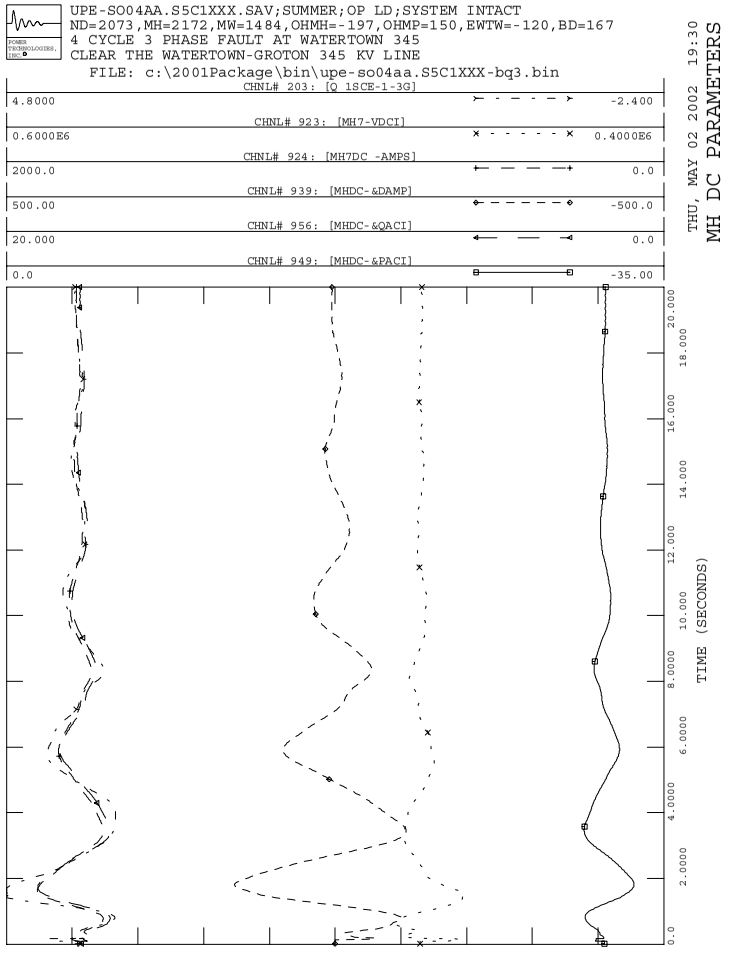
THU, MAY 02 2002 19:30
POWER FLOW SUMS 1

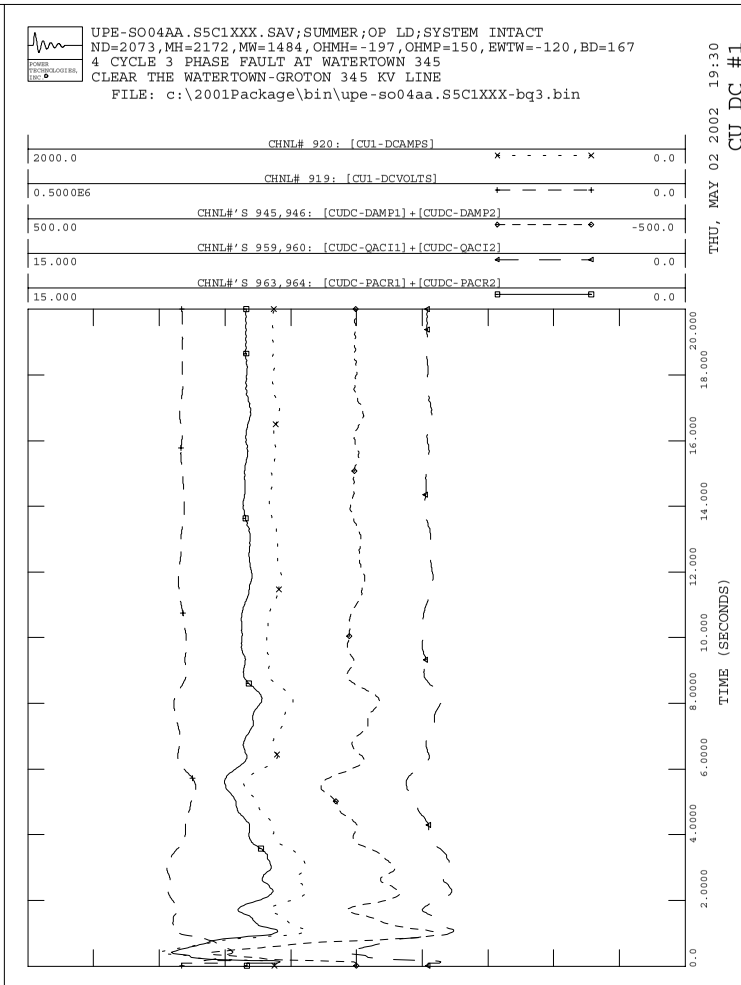


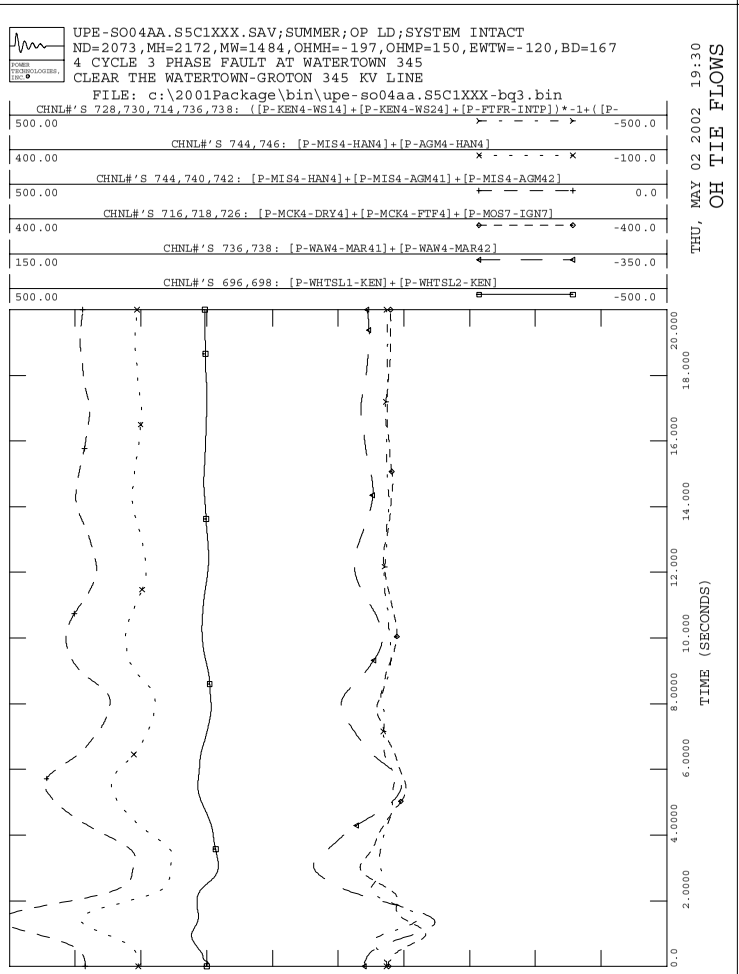
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

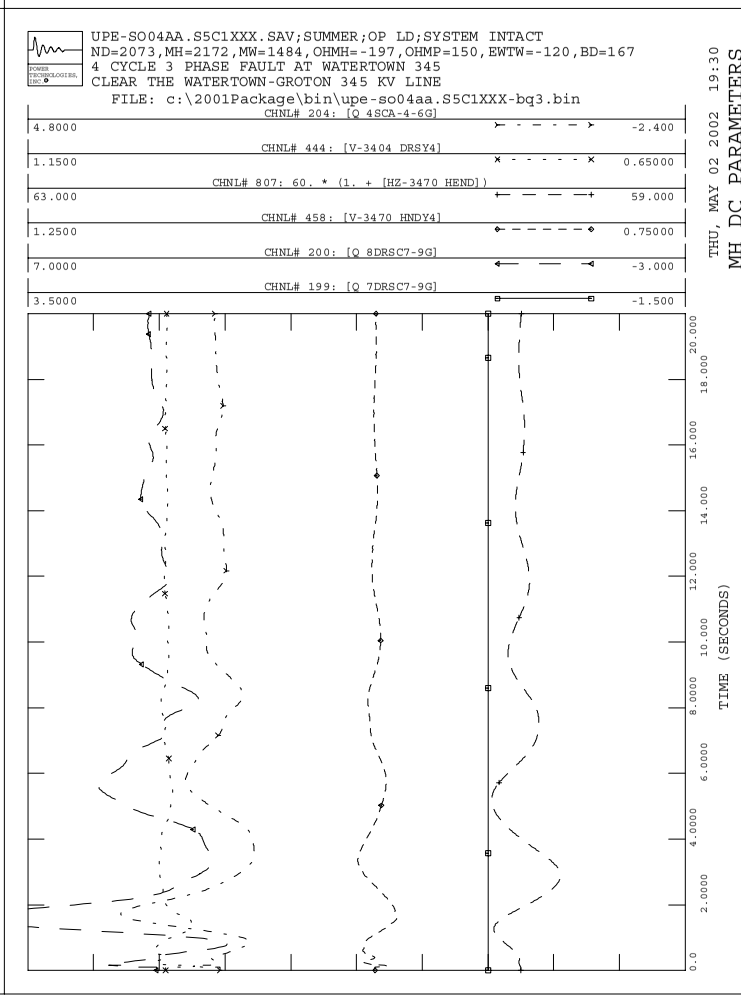
THU, MAY 02 2002 19:30
POWER FLOW SUM 3

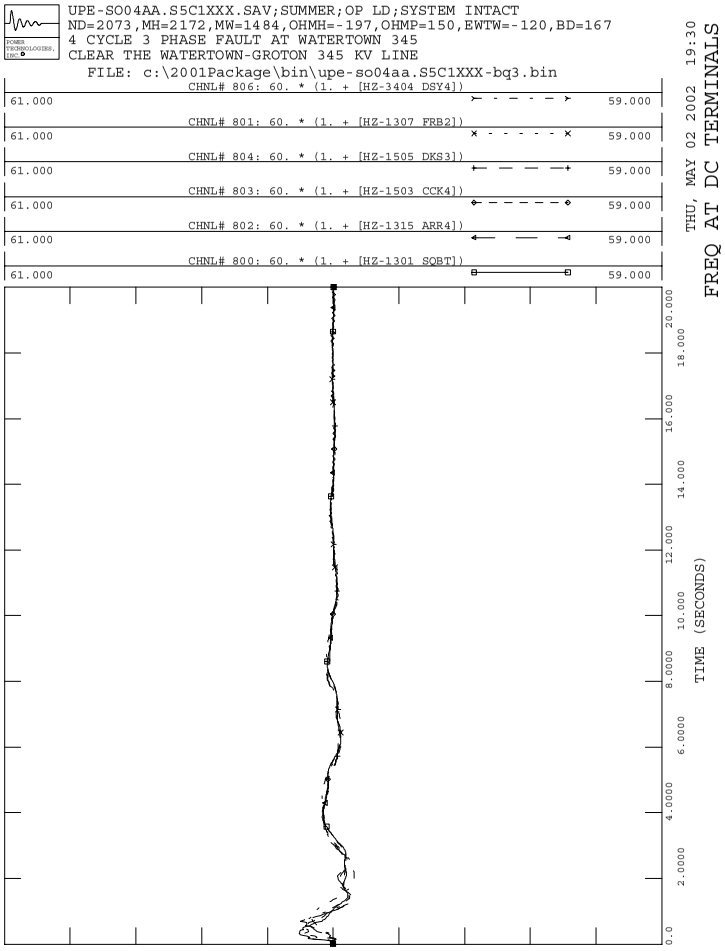


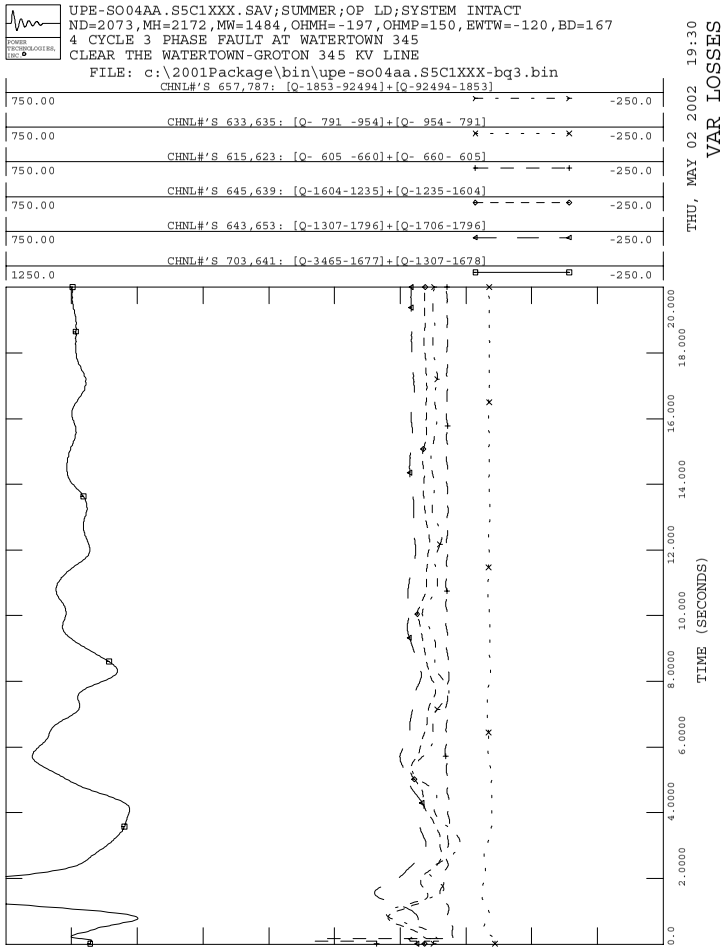

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
THU, MAY 02 2002 19:30
MH DC PARAMETERS
TIME (SECONDS)

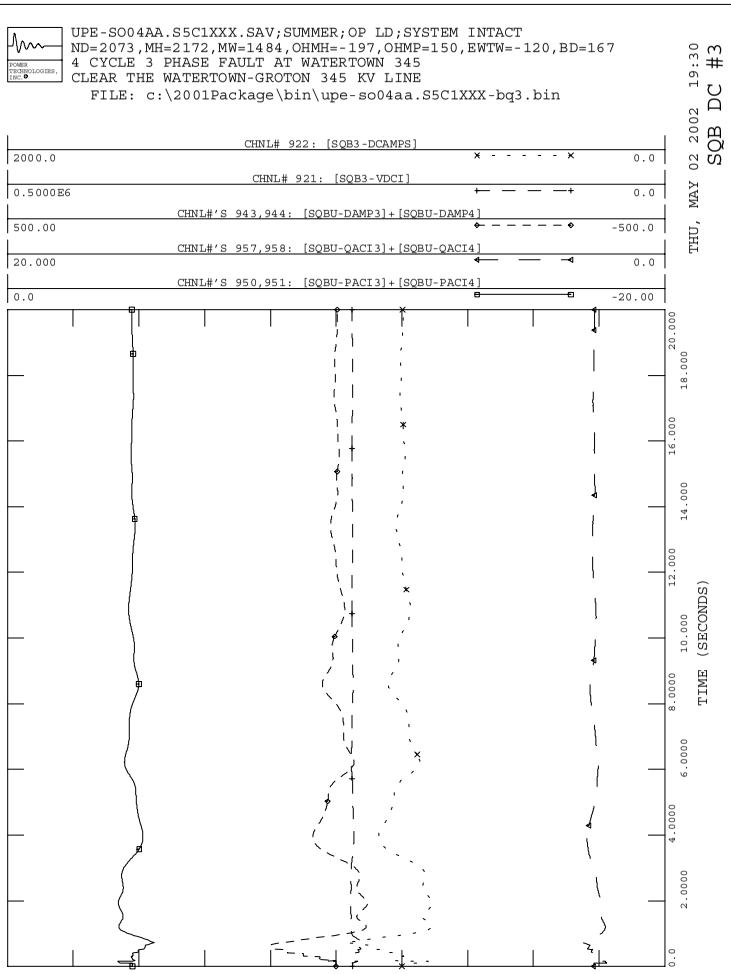

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
THU, MAY 02 2002 19:30
CU DC #1
TIME (SECONDS)

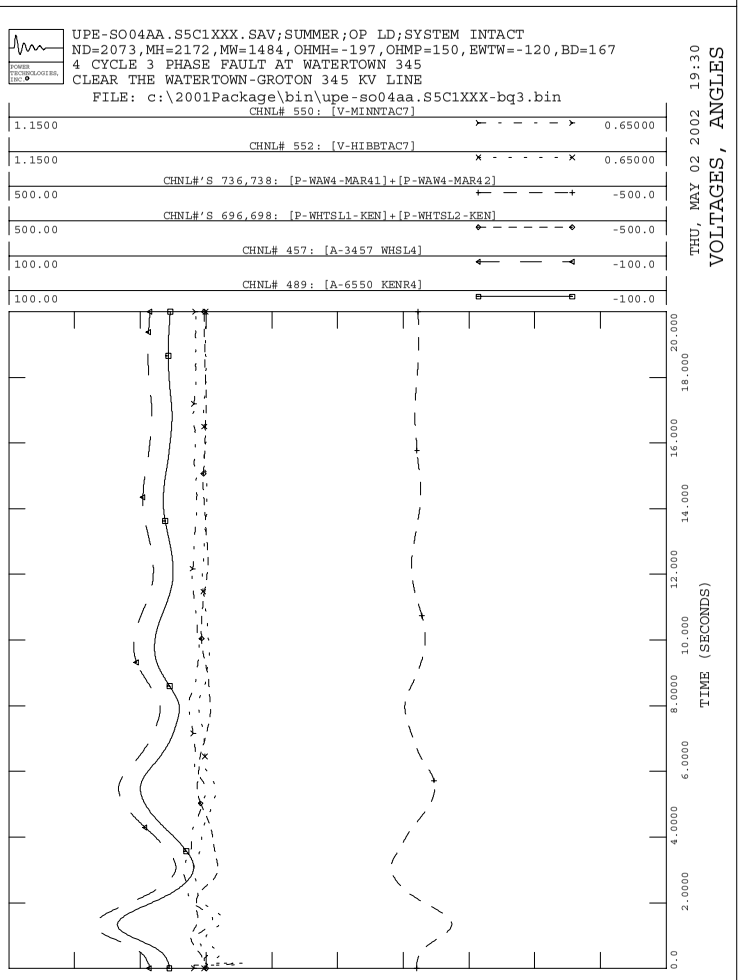

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
THU, MAY 02 2002 19:30
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
THU, MAY 02 2002 19:30
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
THU, MAY 02 2002 19:30
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
1250.0
-250.0
THU, MAY 02 2002 19:30
VAR LOSSES
TIME (SECONDS)

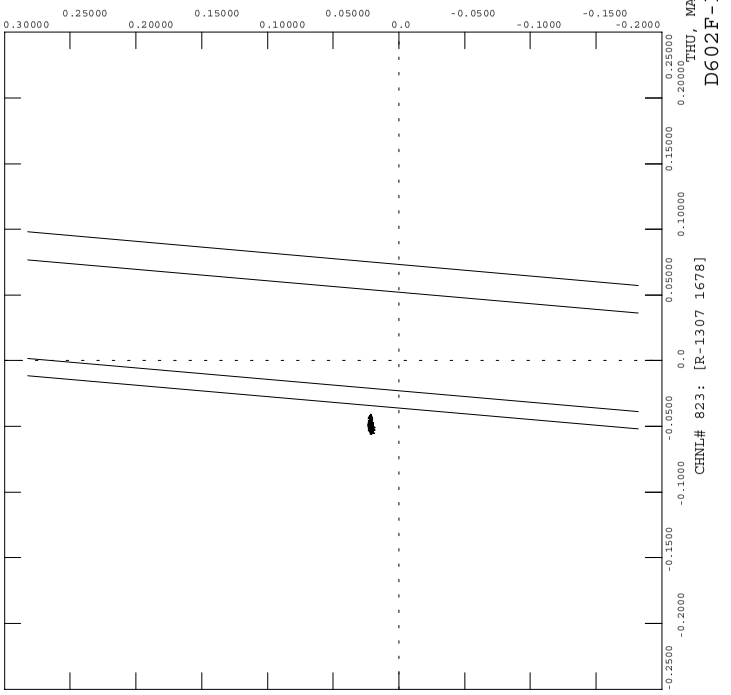

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.5000E6
500.00
20.000
0.0
-500.0
-20.00
THU, MAY 02 2002 19:30
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
THU, MAY 02 2002 19:30
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

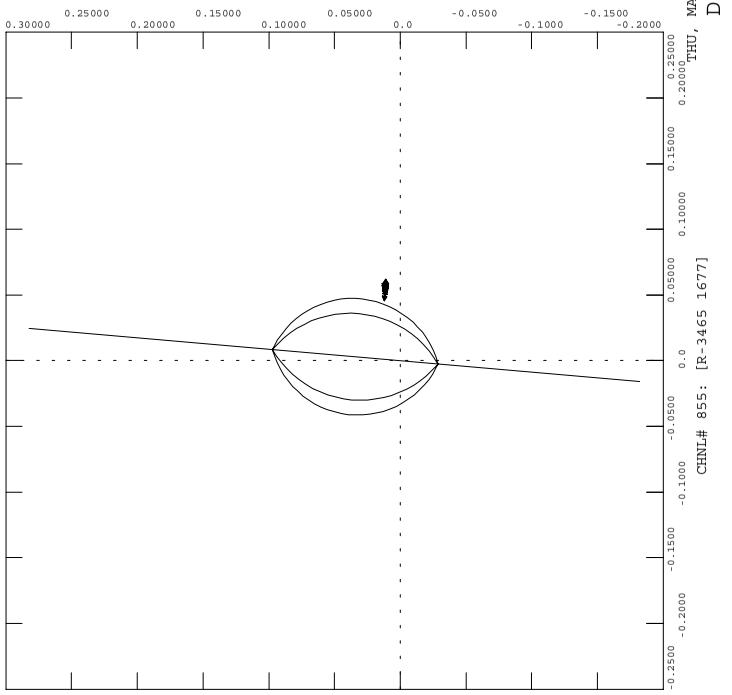
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

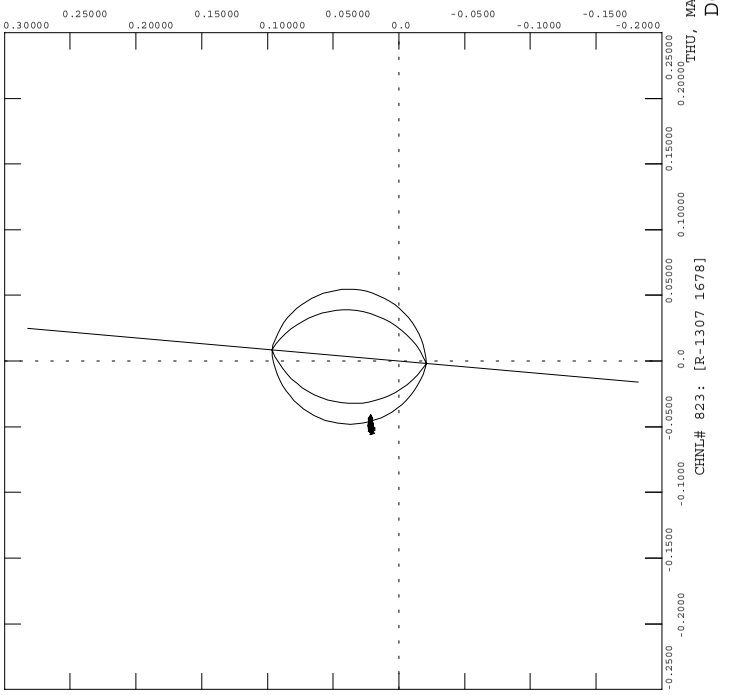
RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

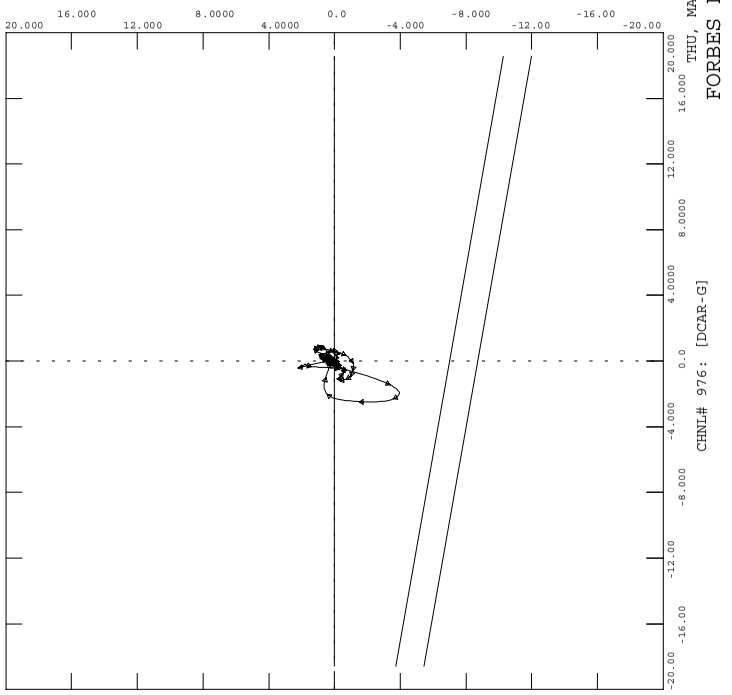
RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

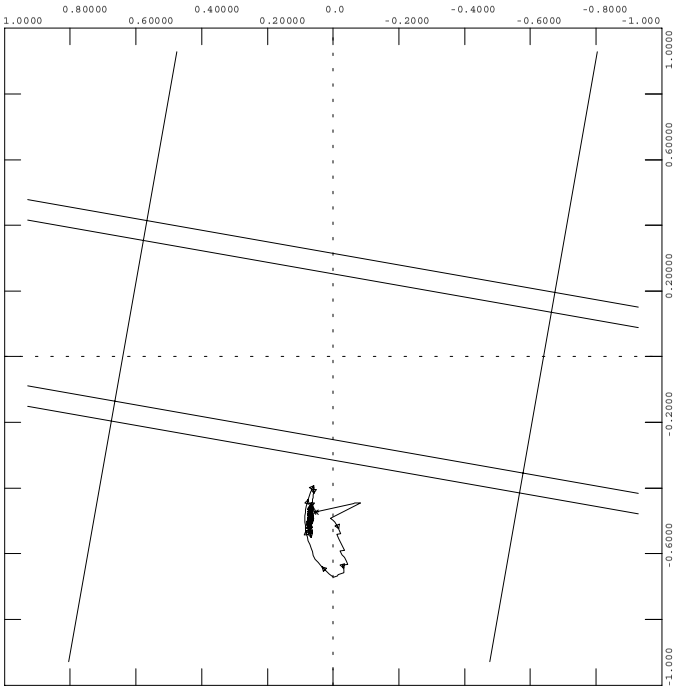
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

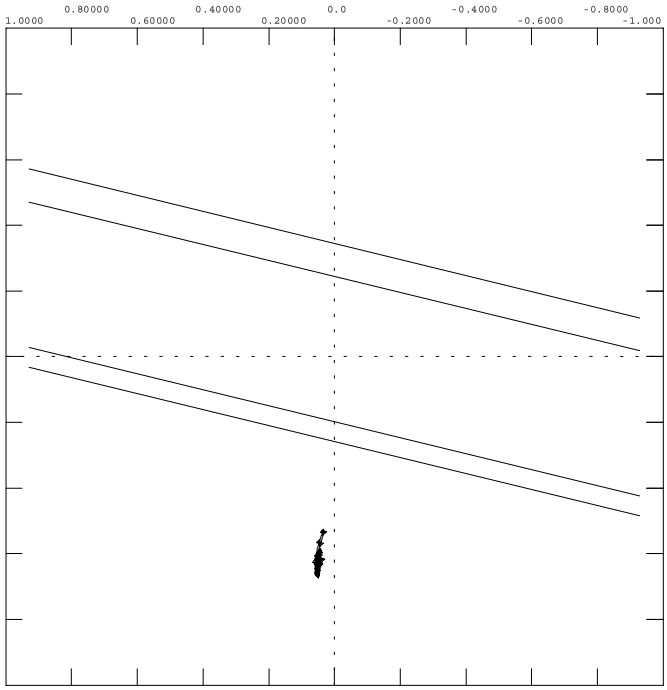
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

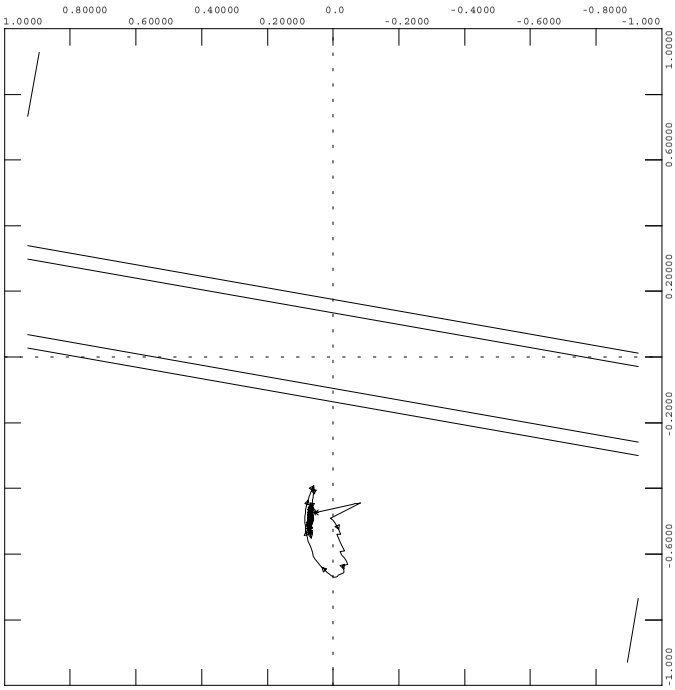
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

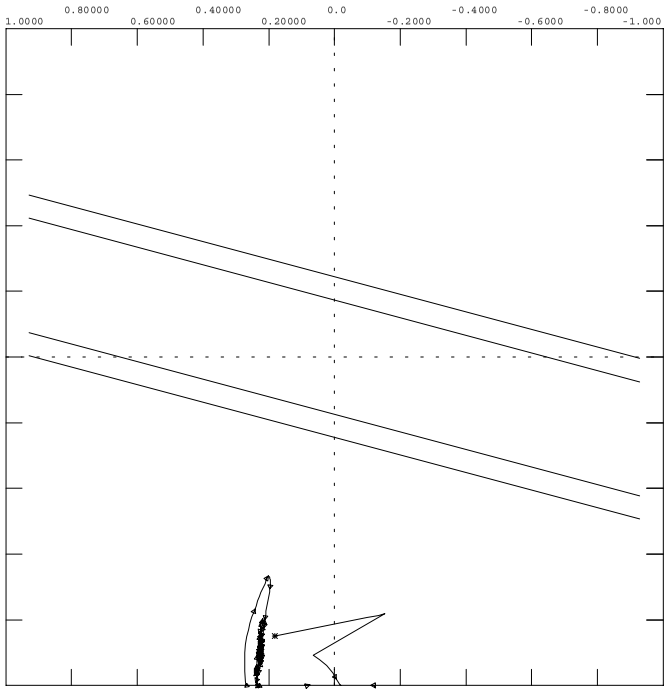
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

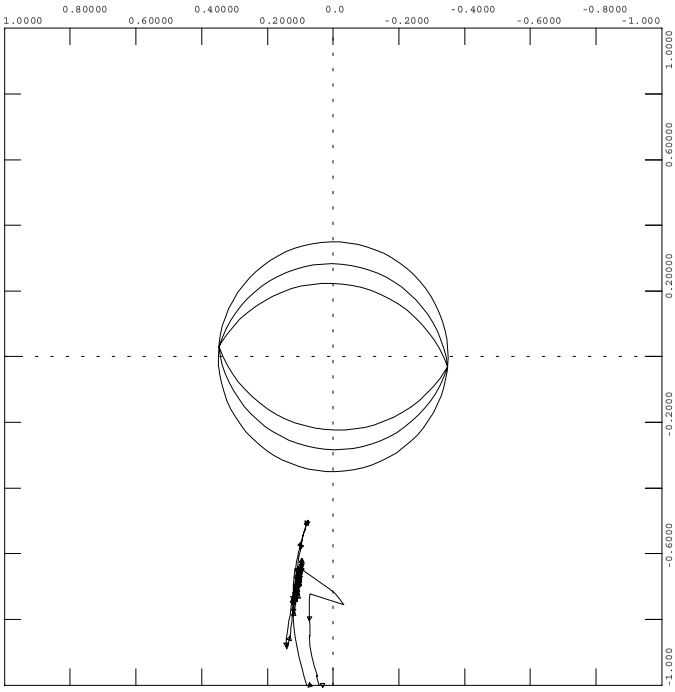
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

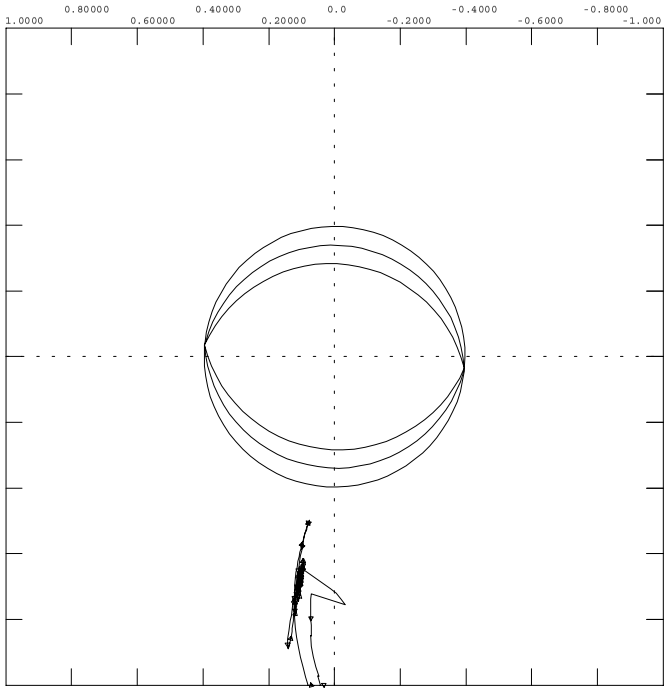
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

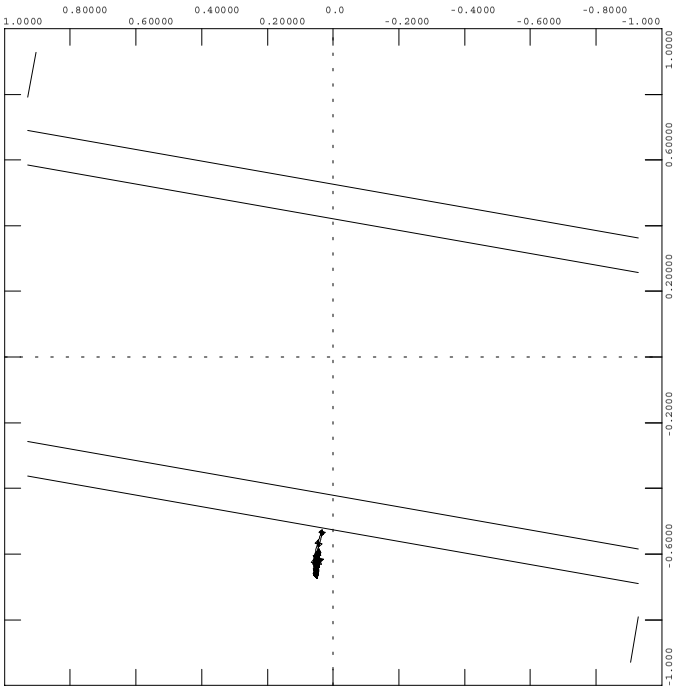
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

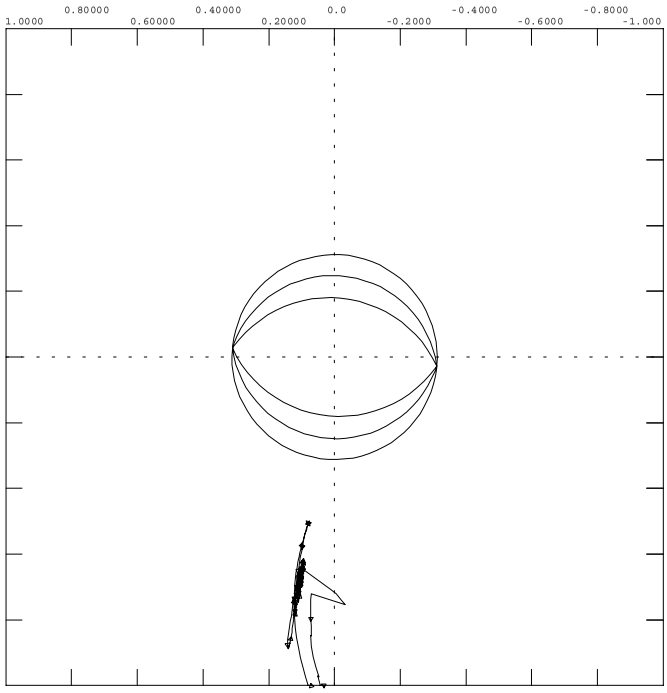
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



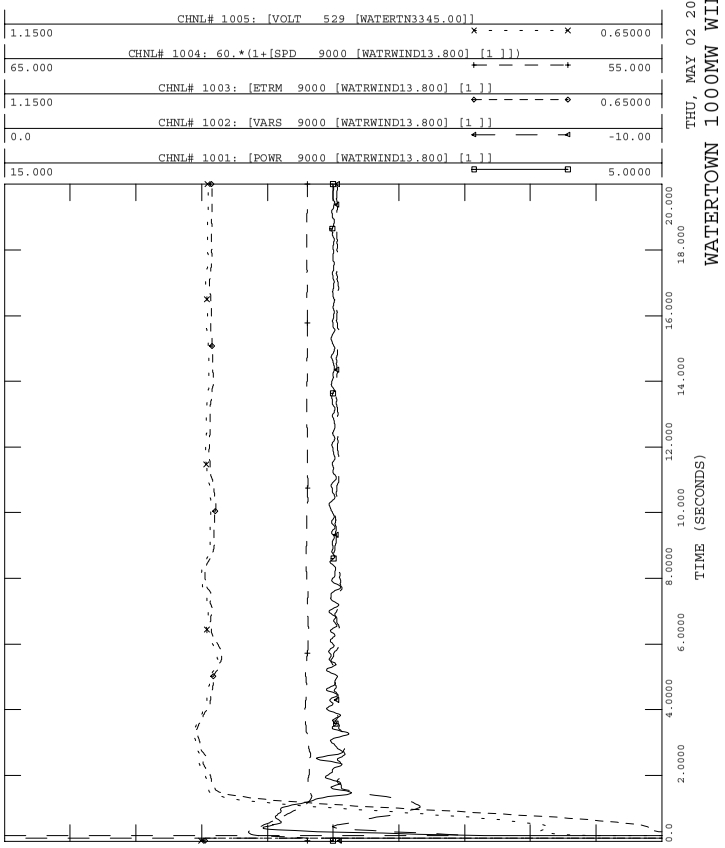
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

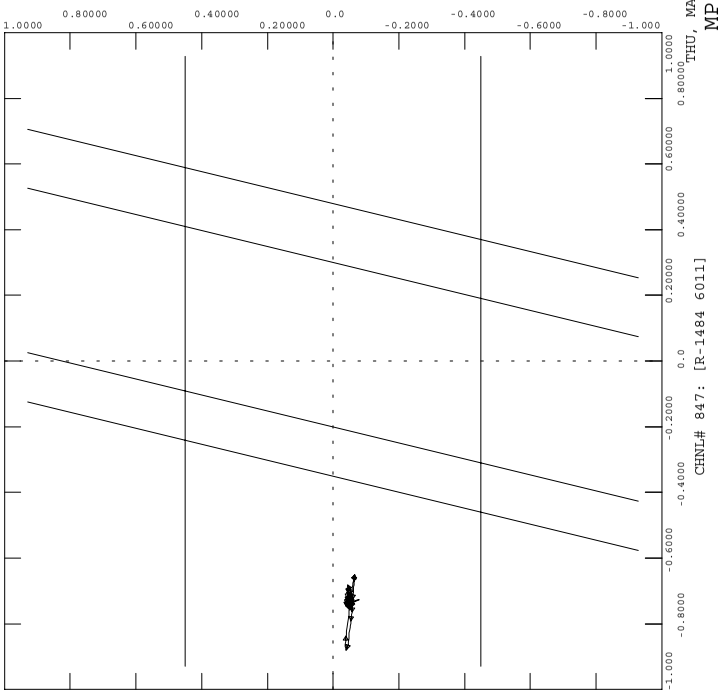


THU, MAY 02 2002 19:30
WATERTOWN 1000MW WIND UNI

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-bq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

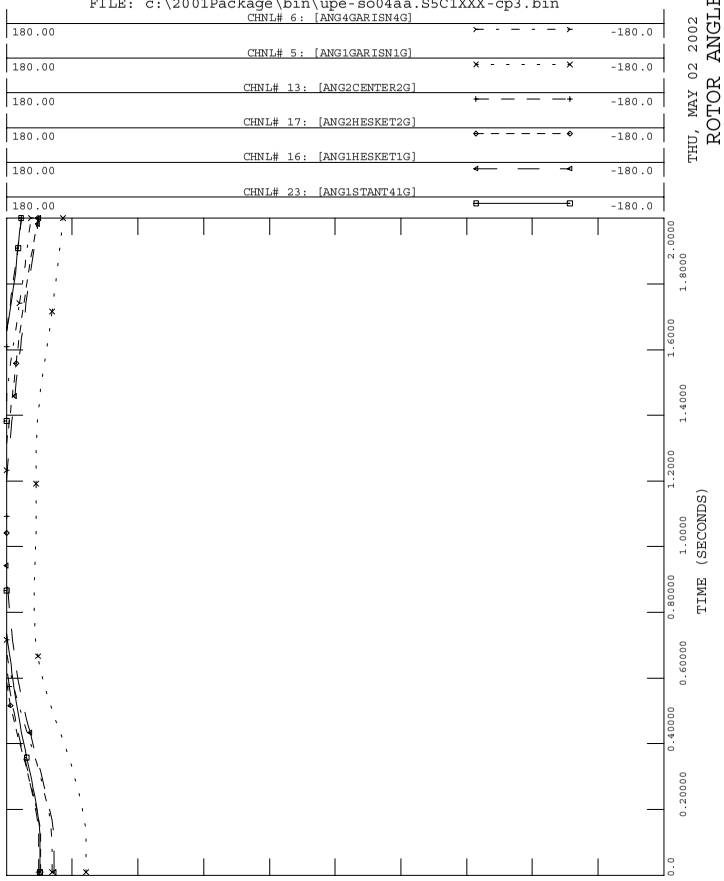


THU, MAY 02 2002 19:30
MP-OH I.FALLS (779)

CONTINGENCY CP3

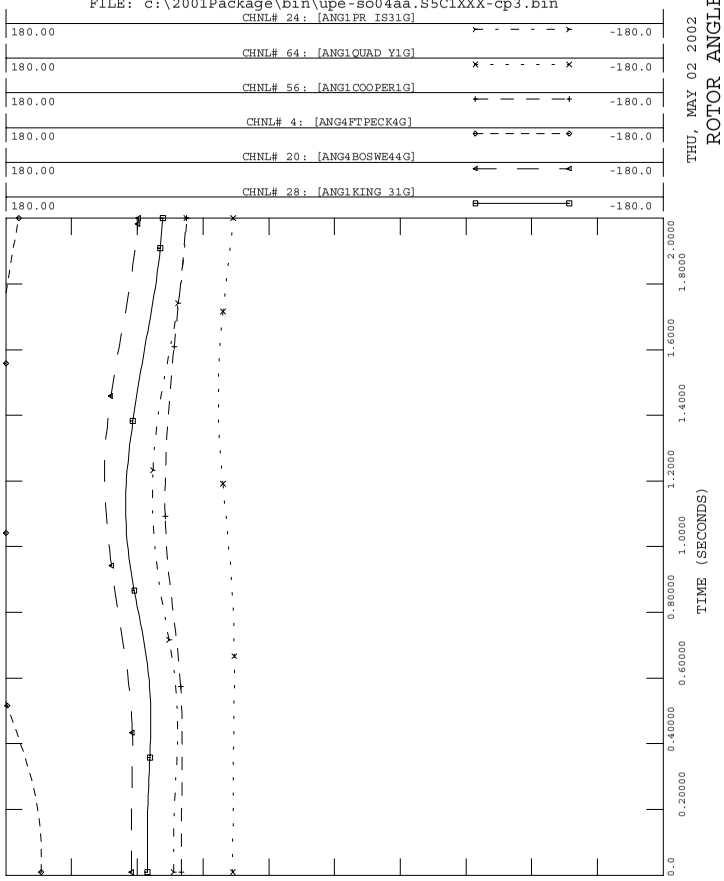
4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-Gr. Falls 345 kV line

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin



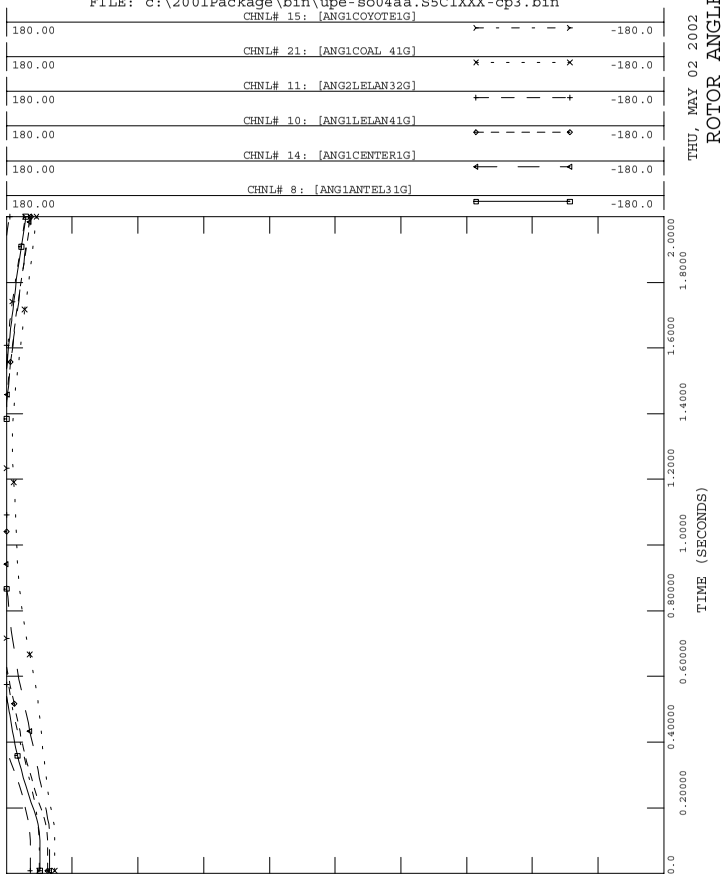
THU, MAY 02 2002 12:40
ROTOR ANGLES 2

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin



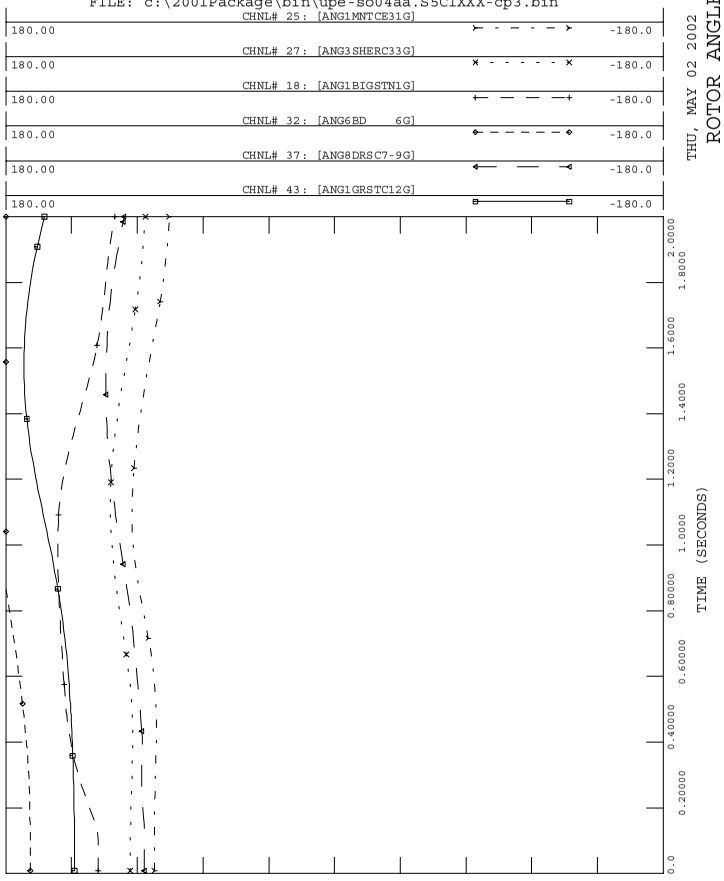
THU, MAY 02 2002 12:40
ROTOR ANGLES 4

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

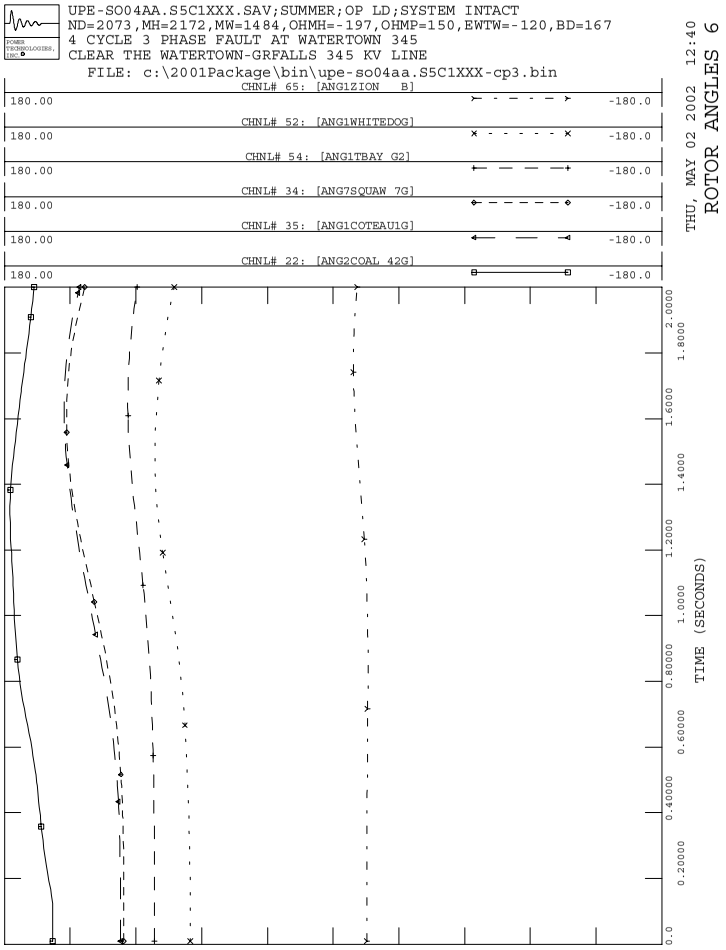


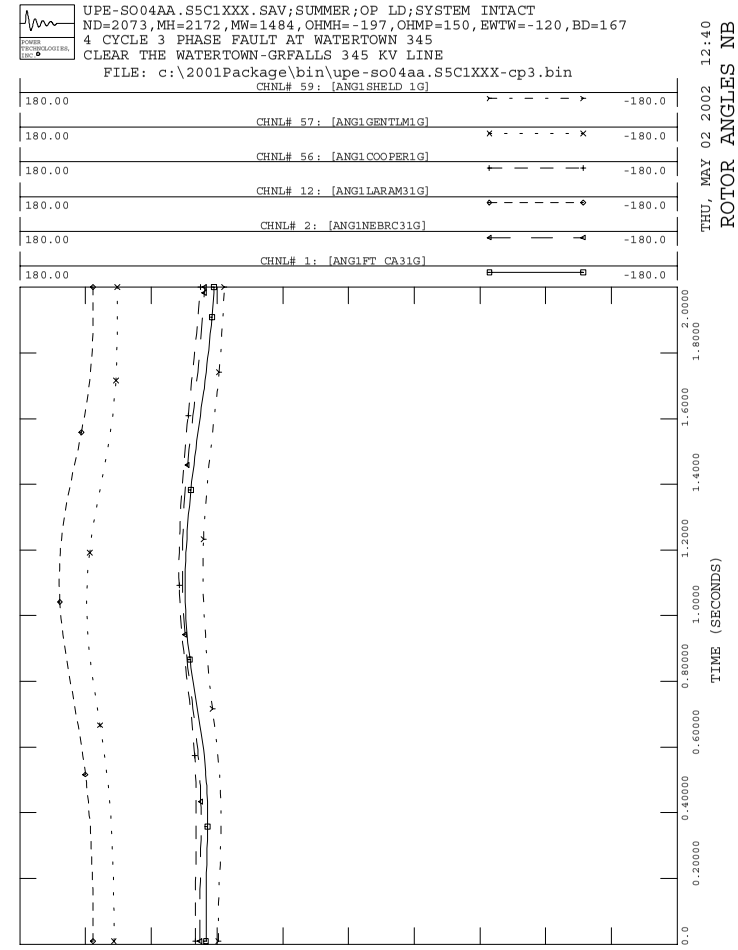
THU, MAY 02 2002 12:40
ROTOR ANGLES 1

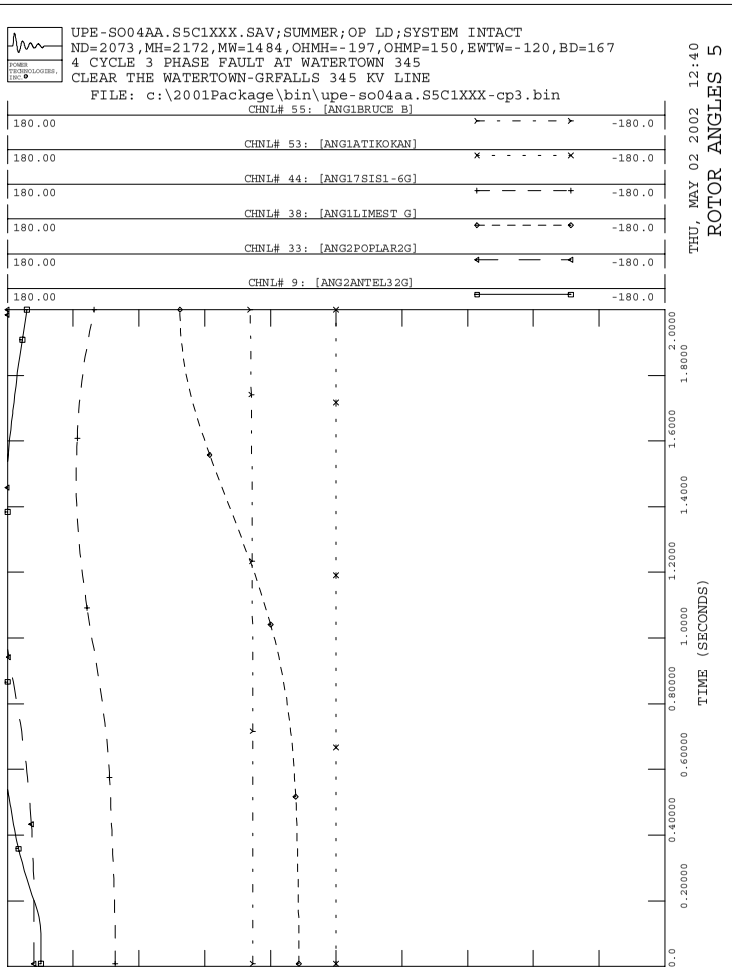
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

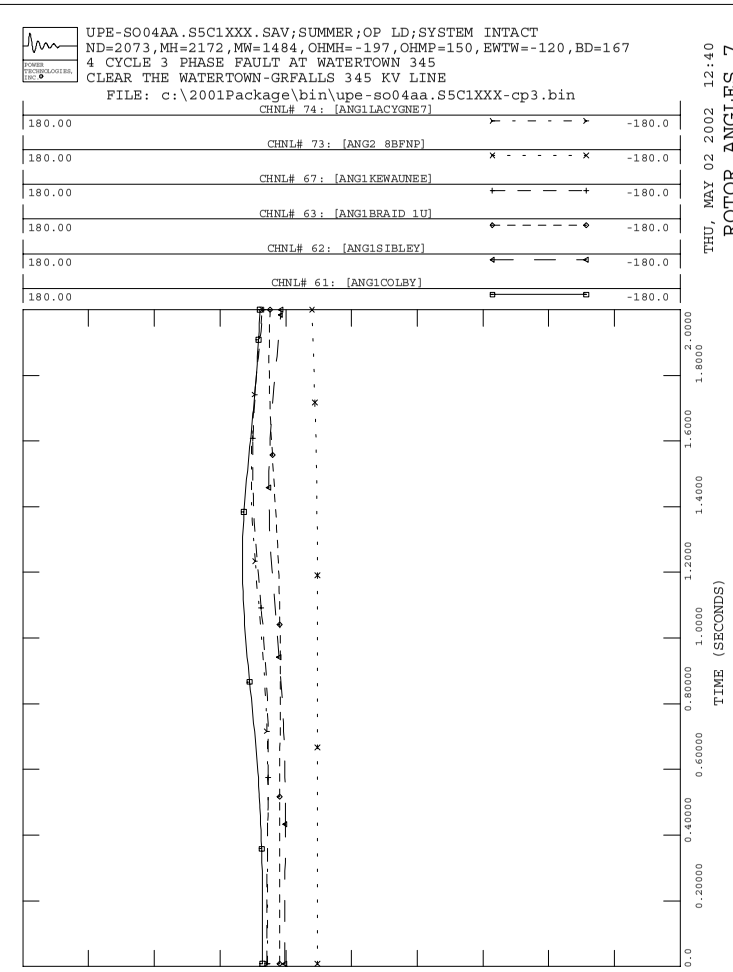


THU, MAY 02 2002 12:40
ROTOR ANGLES 3


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 02 2002 12:40
ROTOR ANGLES 6

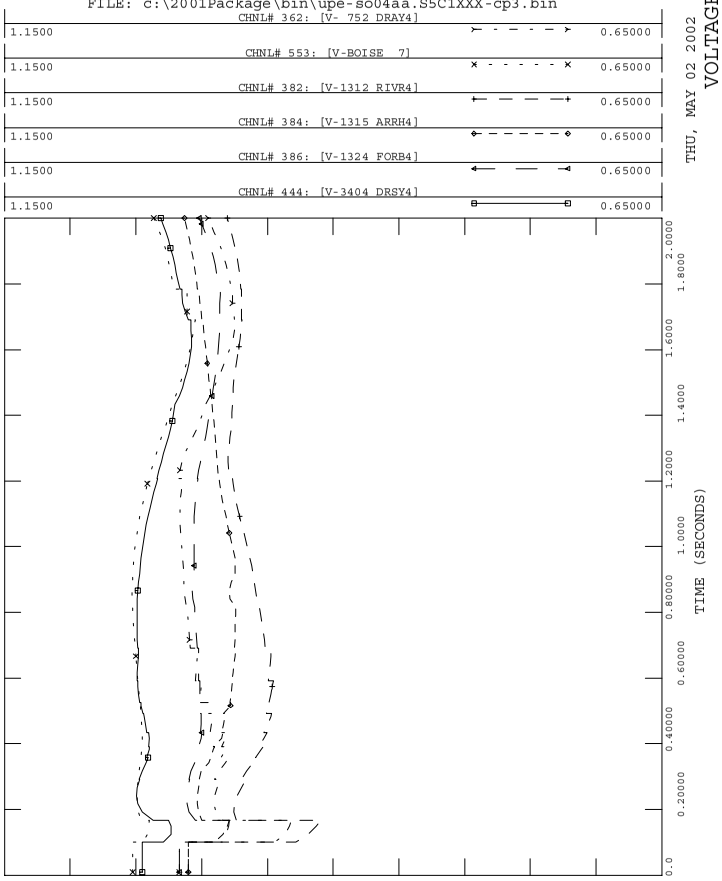

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 02 2002 12:40
ROTOR ANGLES NB


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
THU, MAY 02 2002 12:40
ROTOR ANGLES 5


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
THU, MAY 02 2002 12:40
ROTOR ANGLES 7

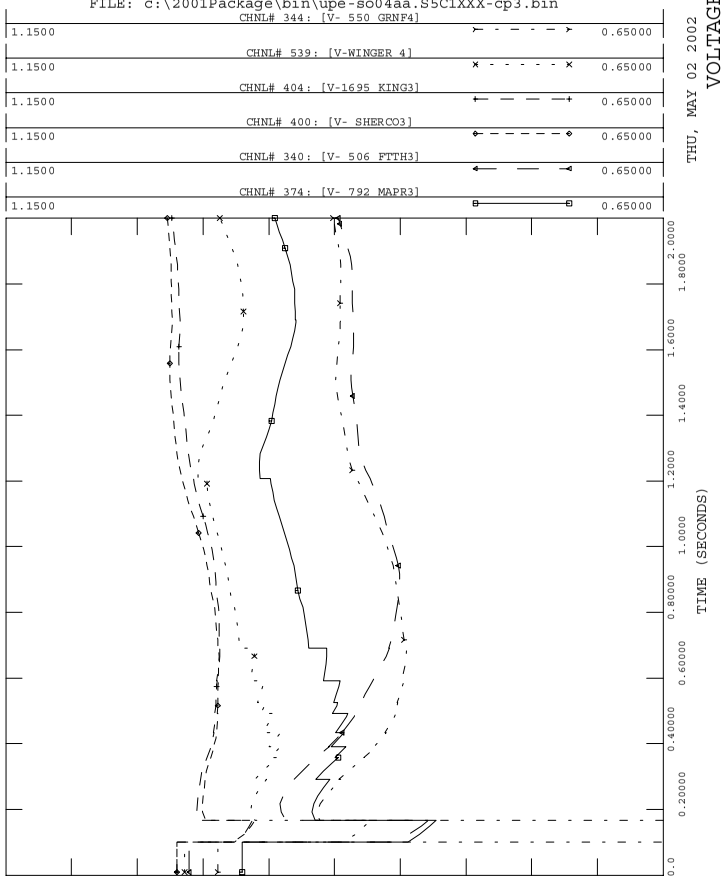
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
VOLTAGES 1



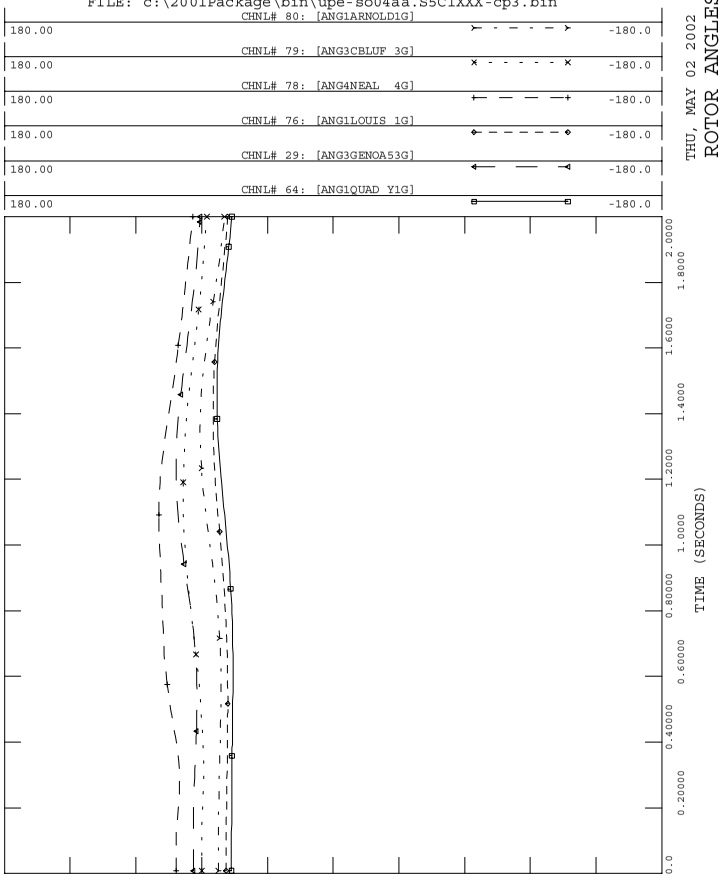
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
VOLTAGES 3



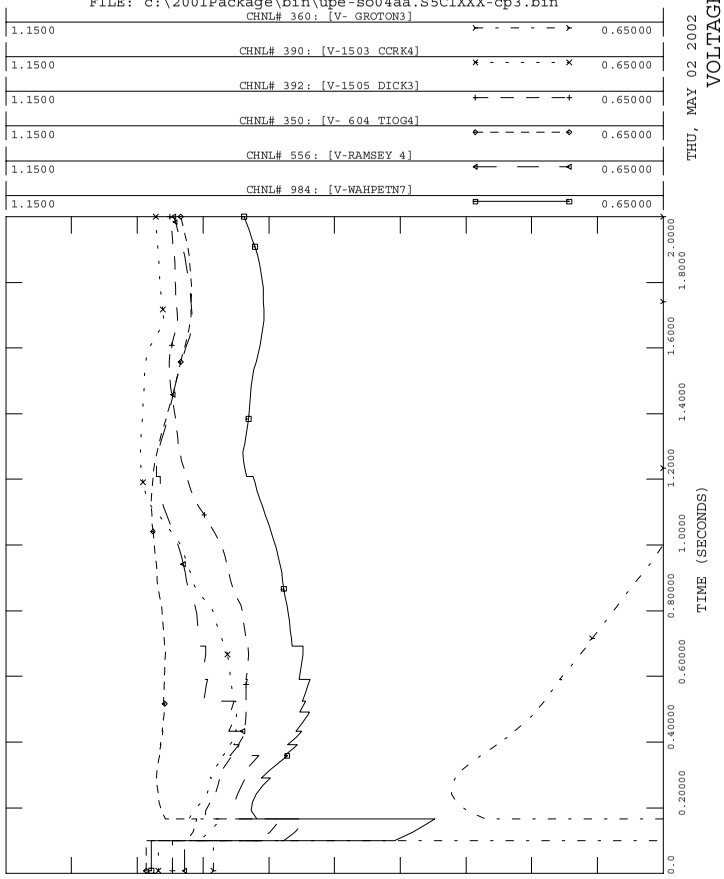
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
ROTOR ANGLES IA



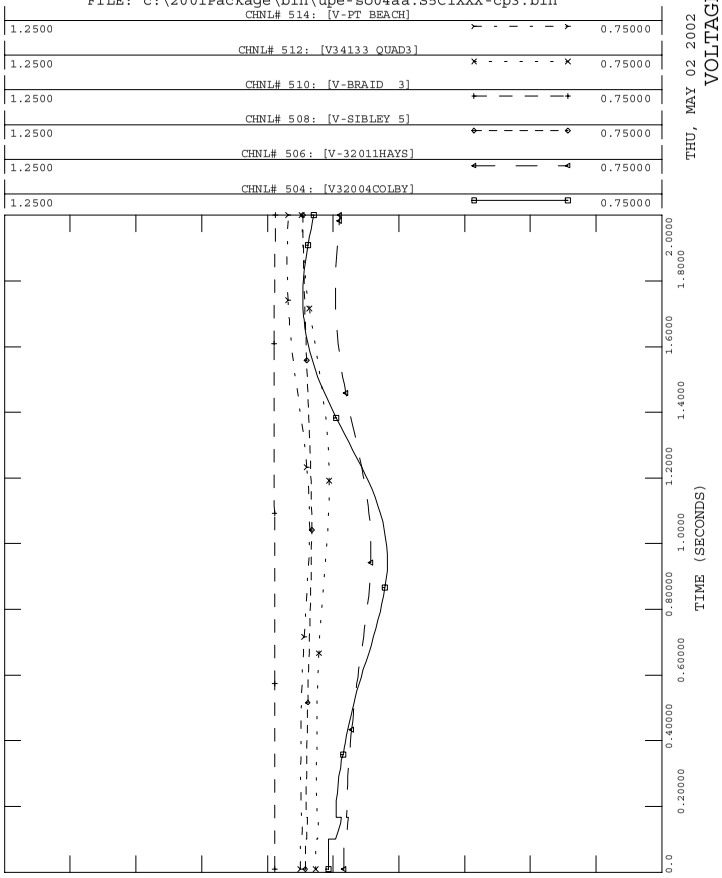
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
VOLTAGES 2



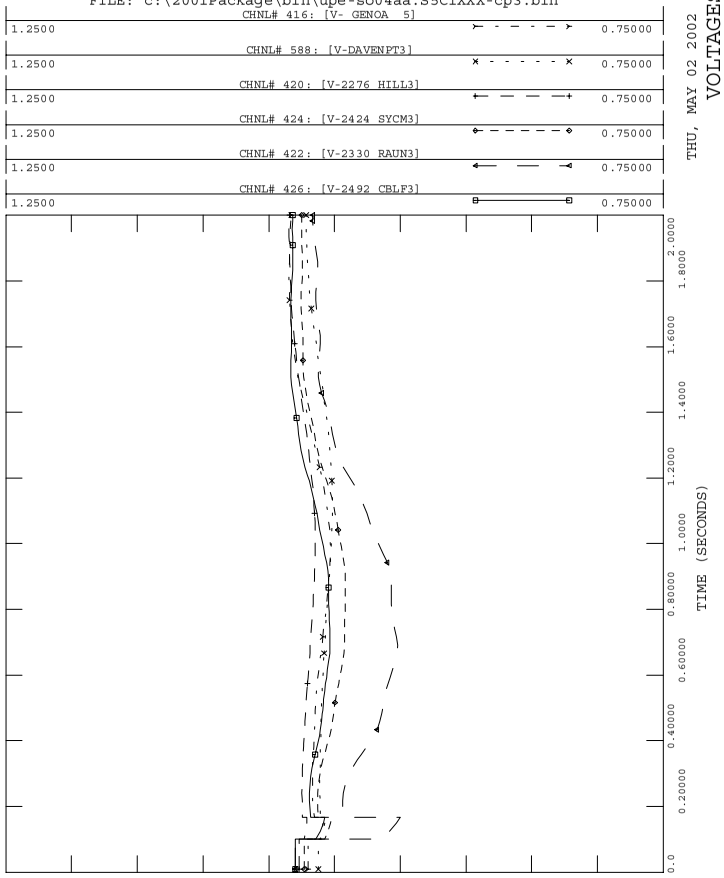
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
VOLTAGES 5



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
VOLTAGES IA



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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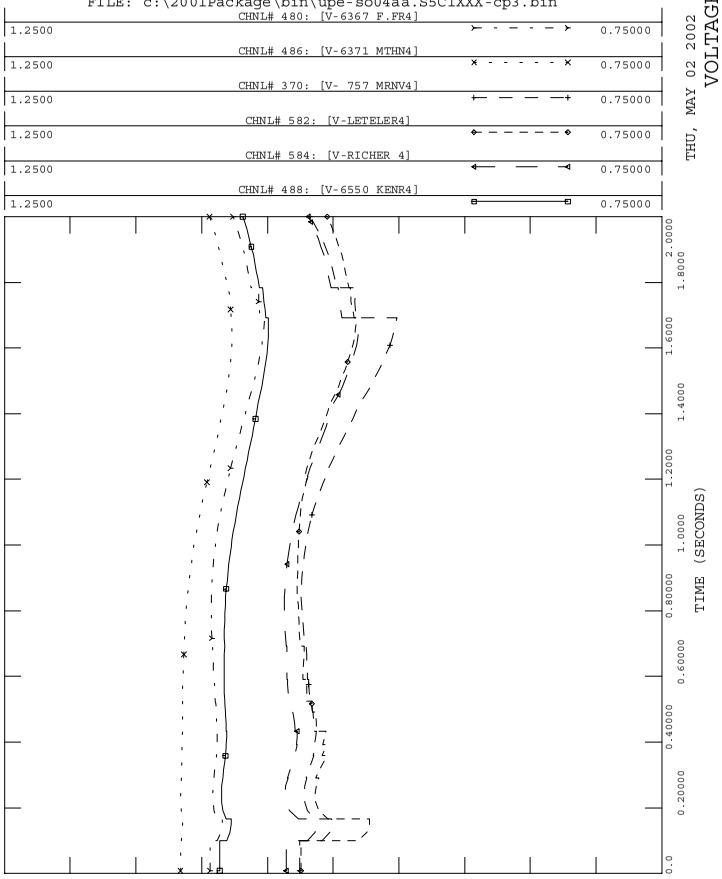
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
VOLTAGES 4



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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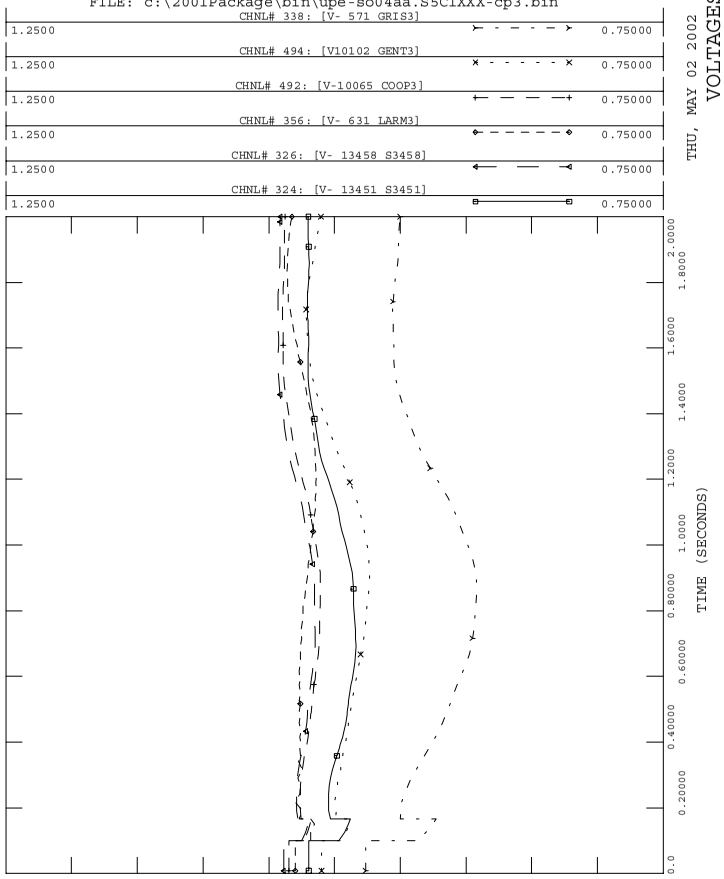
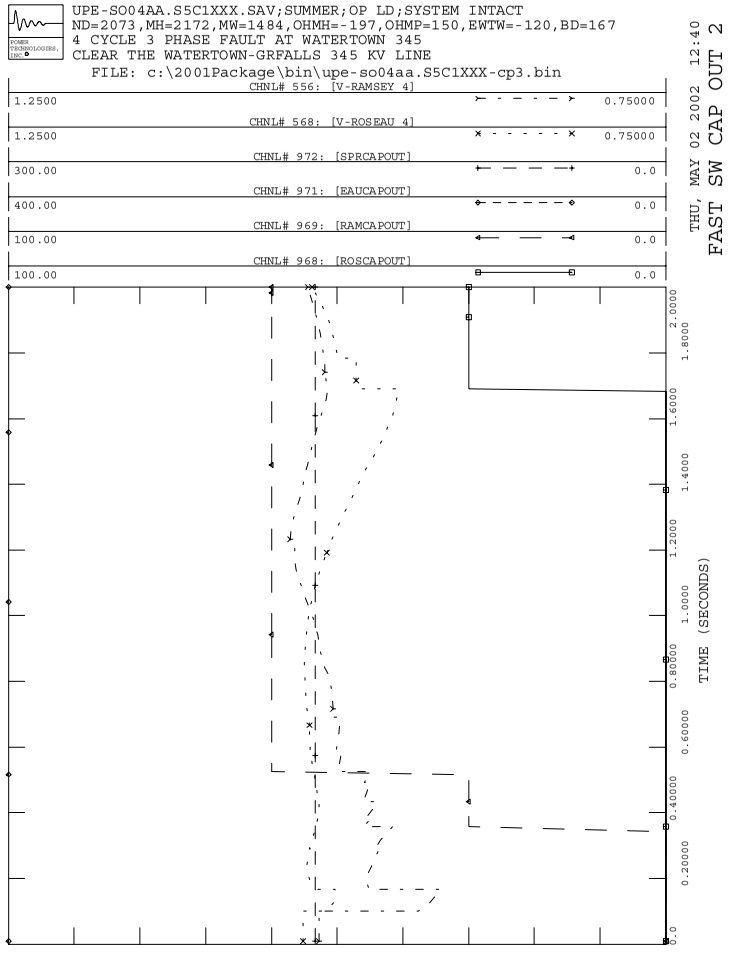
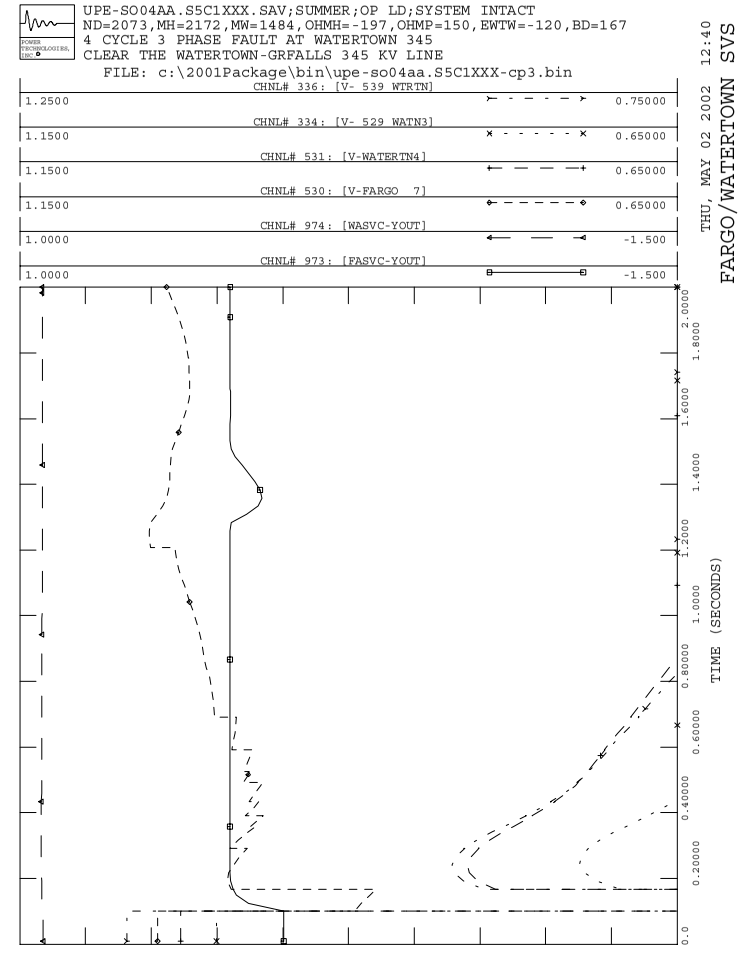
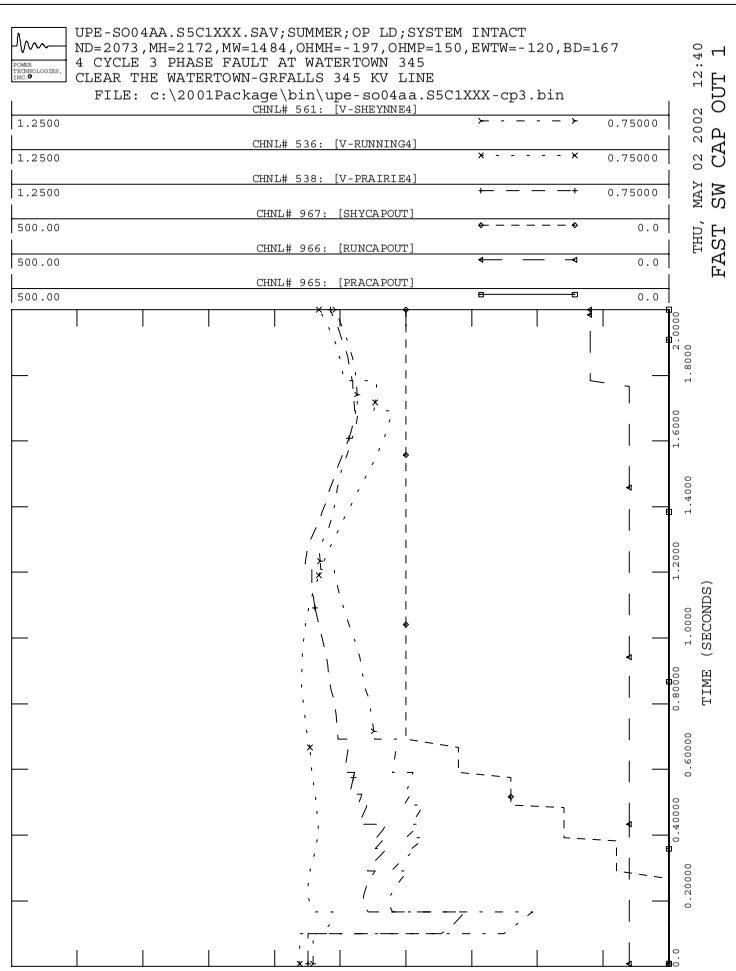
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

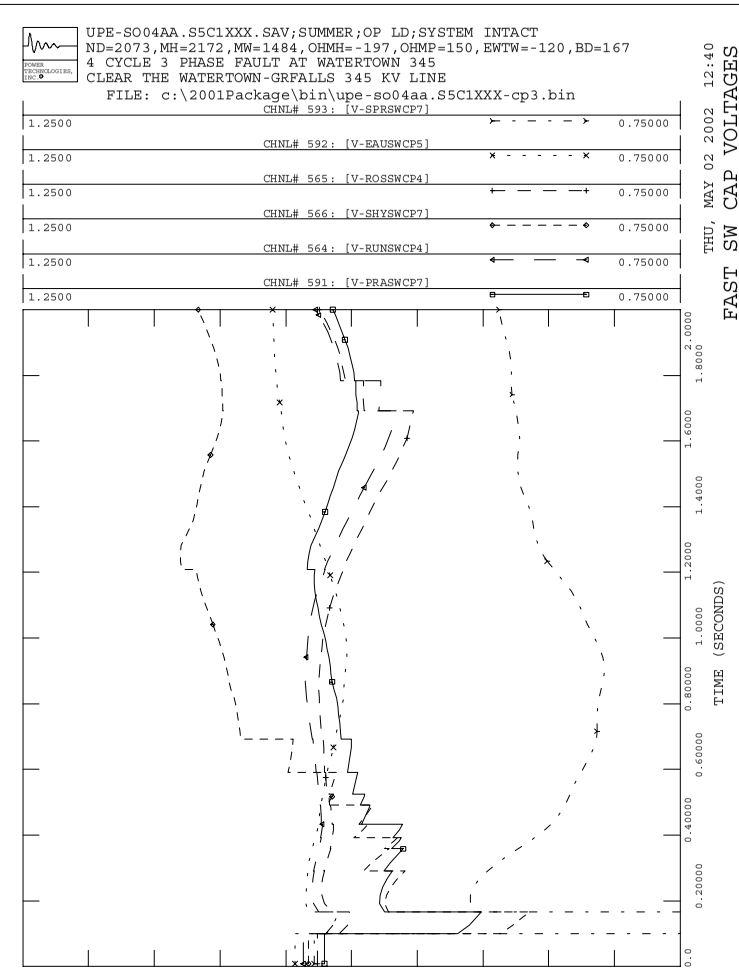
THU, MAY 02 2002 12:40
VOLTAGES NB




UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
THU, MAY 02 2002 12:40
FAST SW CAP OUT 2


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
THU, MAY 02 2002 12:40
FARGO/WATERTOWN SVS

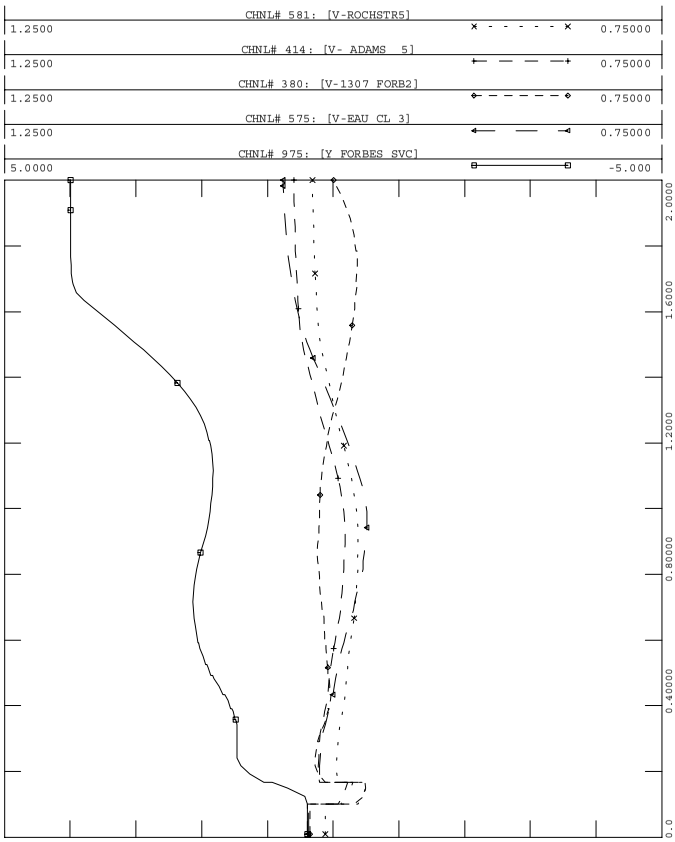

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
THU, MAY 02 2002 12:40
FAST SW CAP OUT 1


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
THU, MAY 02 2002 12:40
FAST SW CAP VOLTAGES

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40

SVC & WISCONSIN VOLT



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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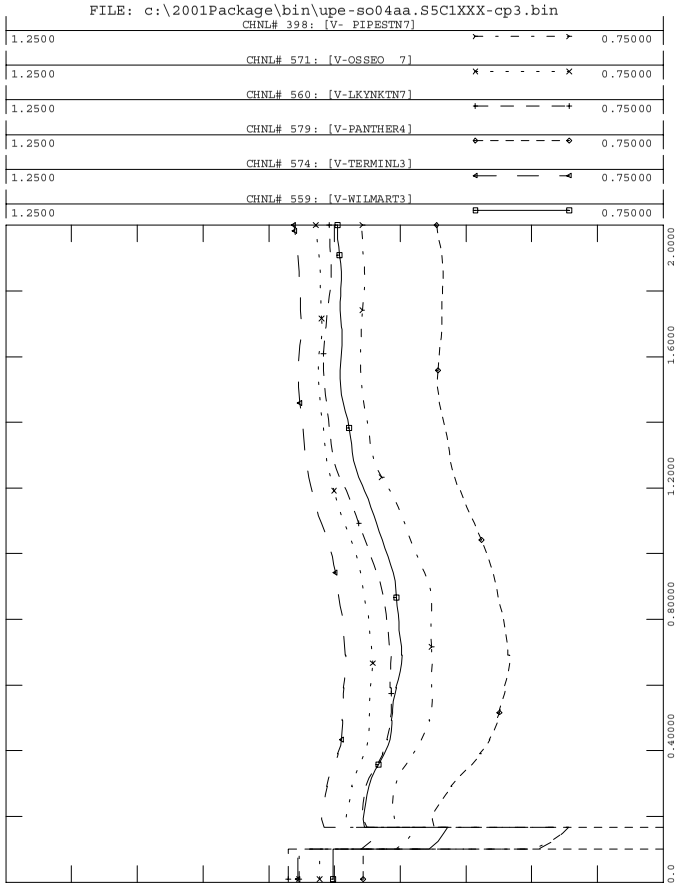
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40

TC VOLTAGES



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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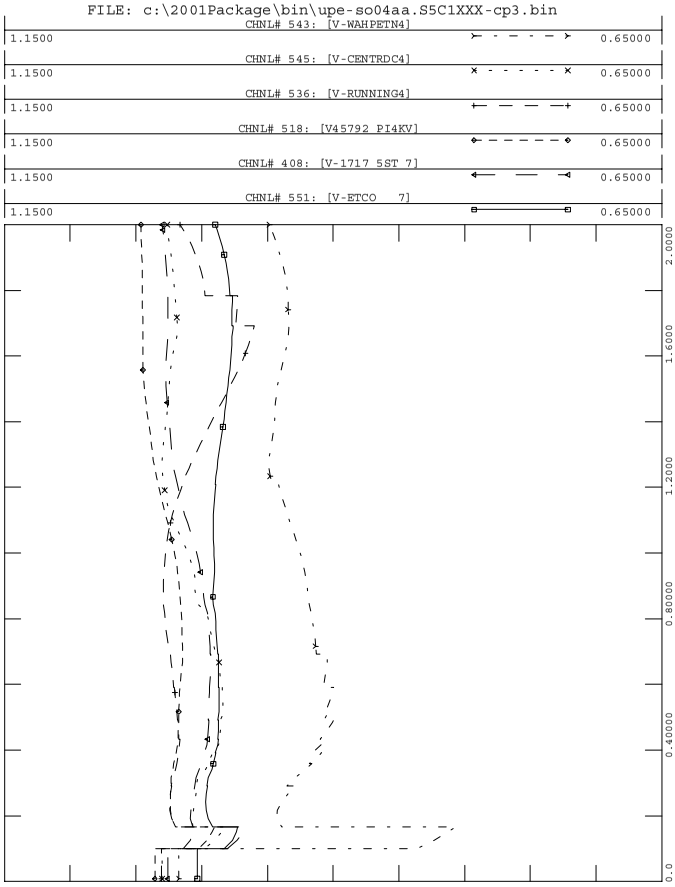
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40

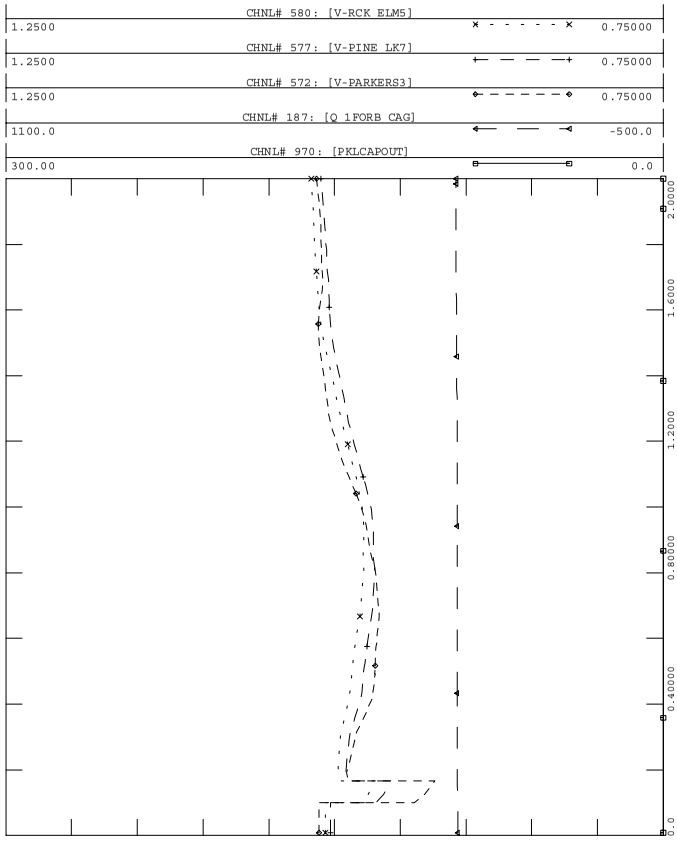
VOLTAGES 6



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40

FORBES SVS OUT & VOLTAGES



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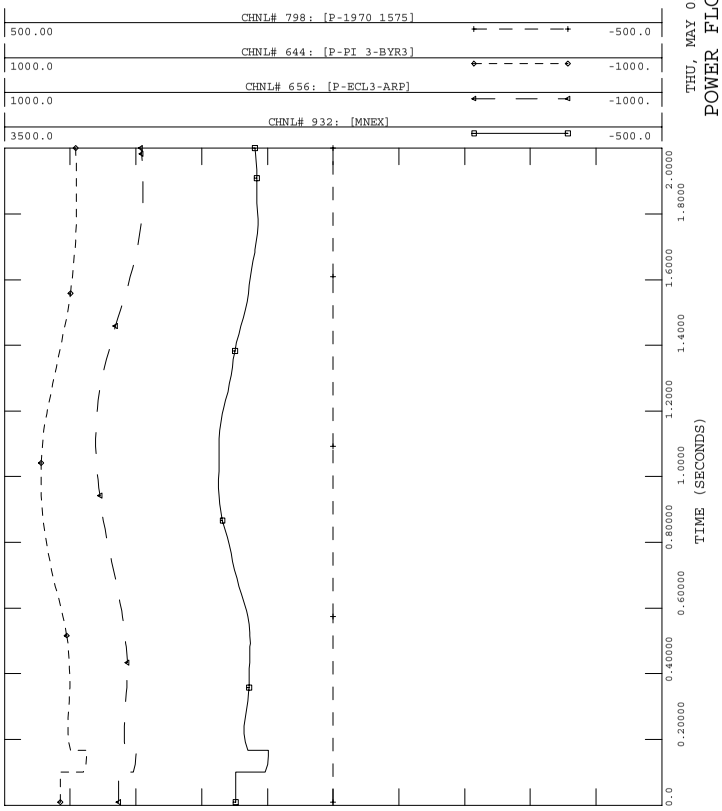
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
POWER FLOW SUMS 2



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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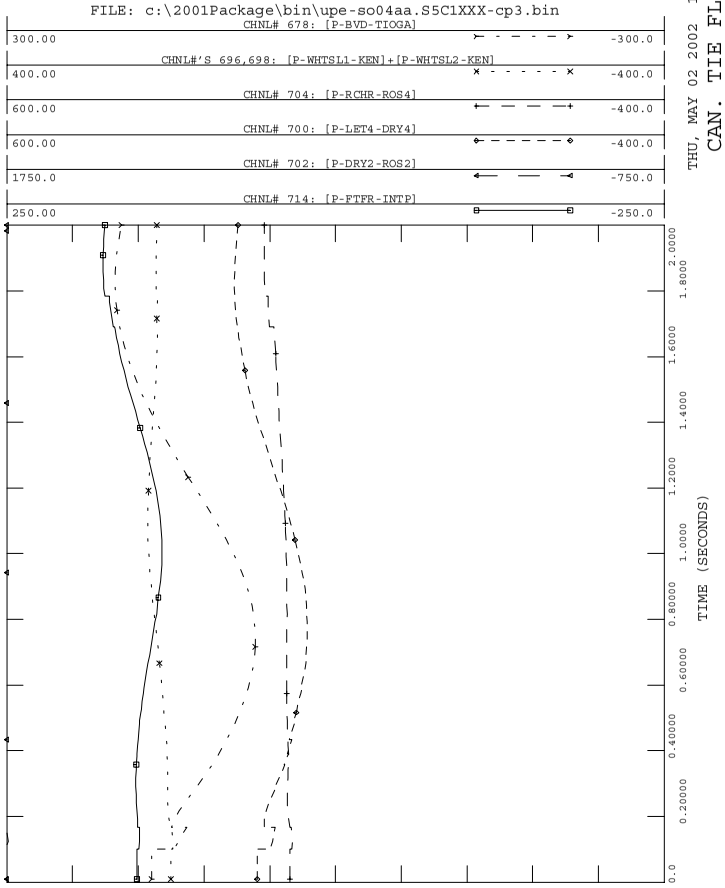
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
CAN. TIE FLOWS



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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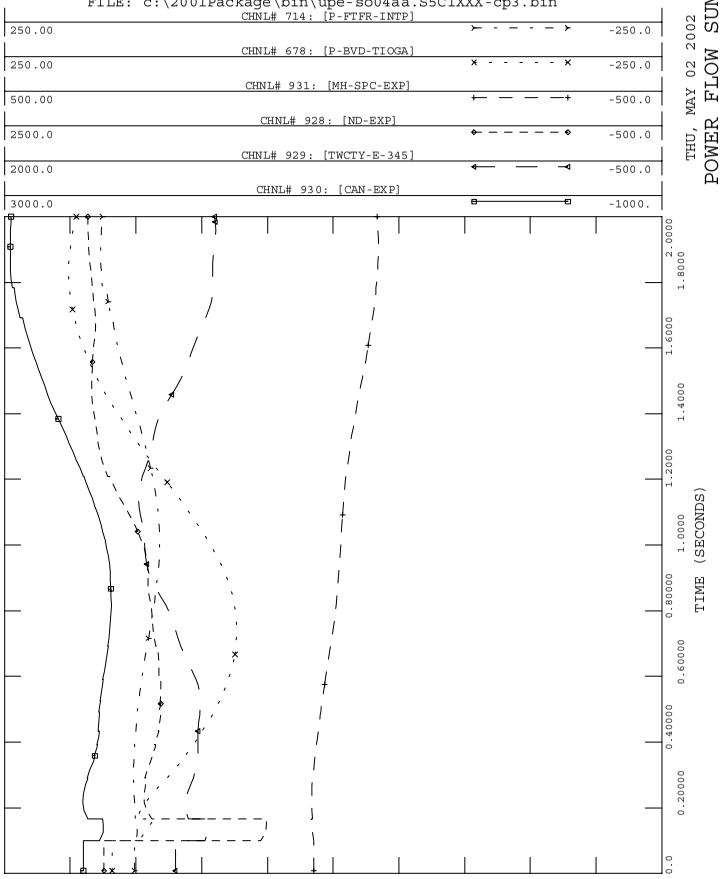
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
POWER FLOW SUMS 1



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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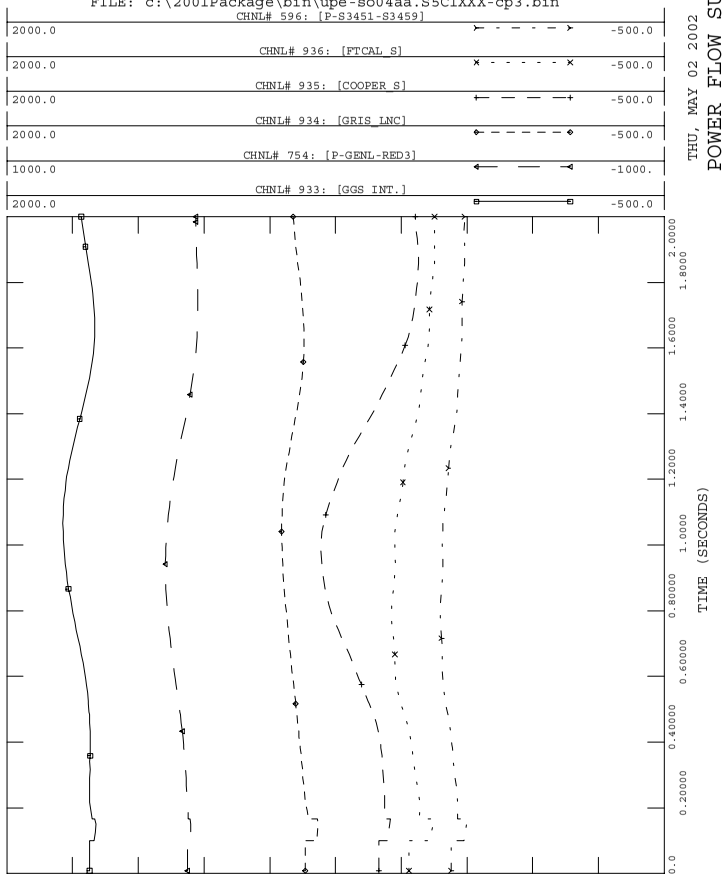
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
POWER FLOW SUM 3



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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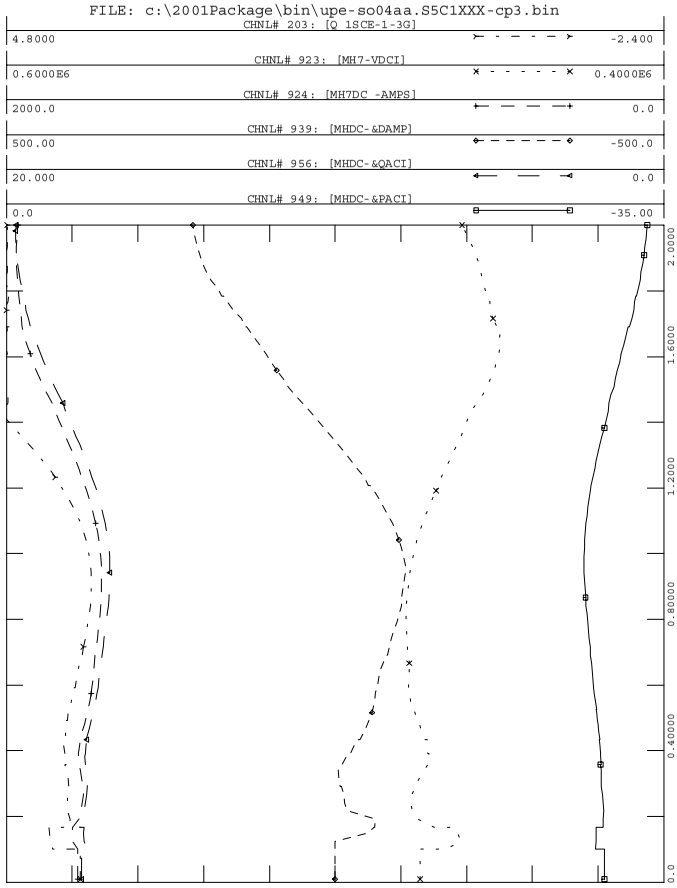
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
MH DC PARAMETERS



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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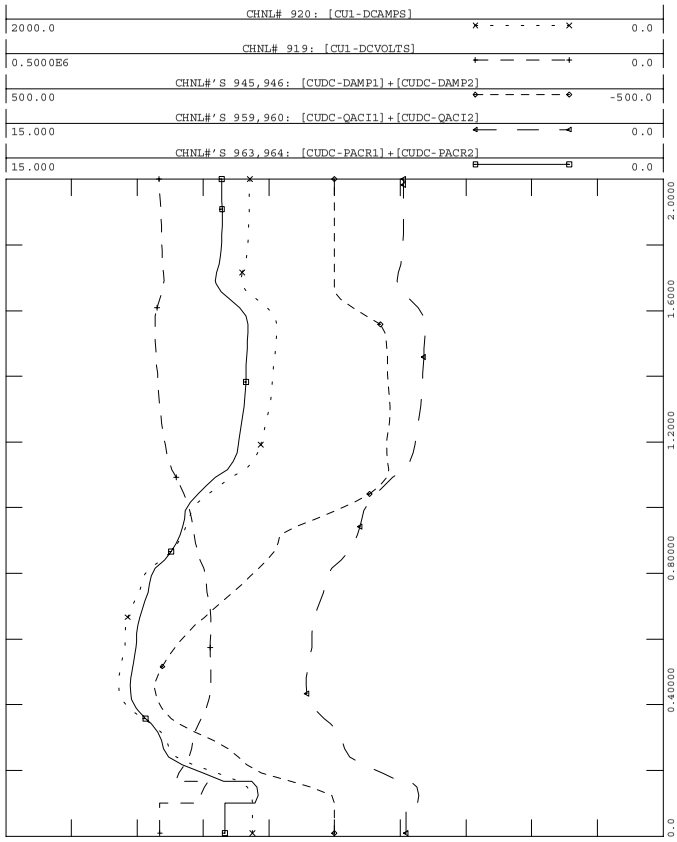
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
CU DC #1



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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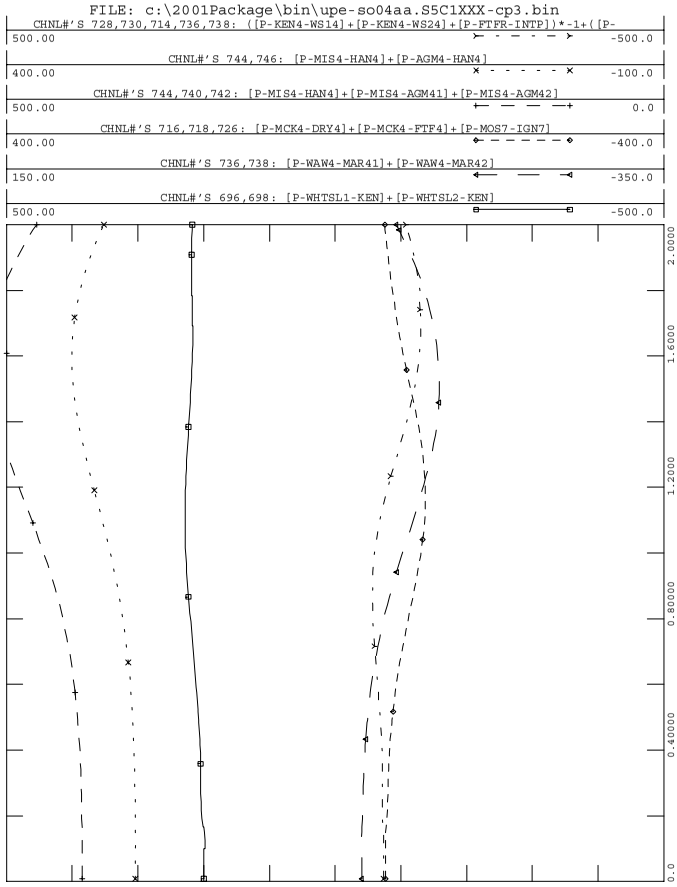
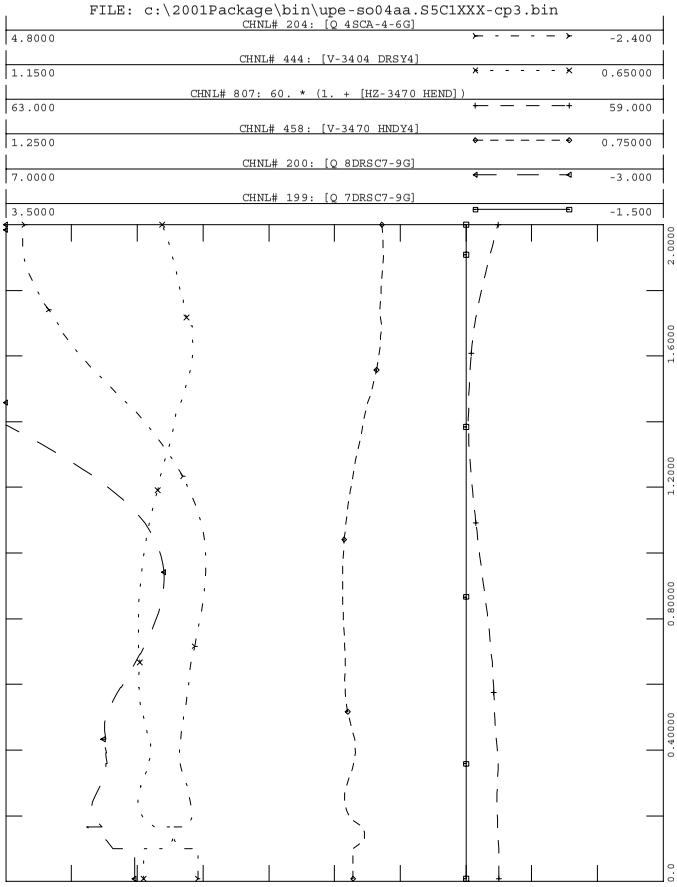
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40
OH TIE FLOWS



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

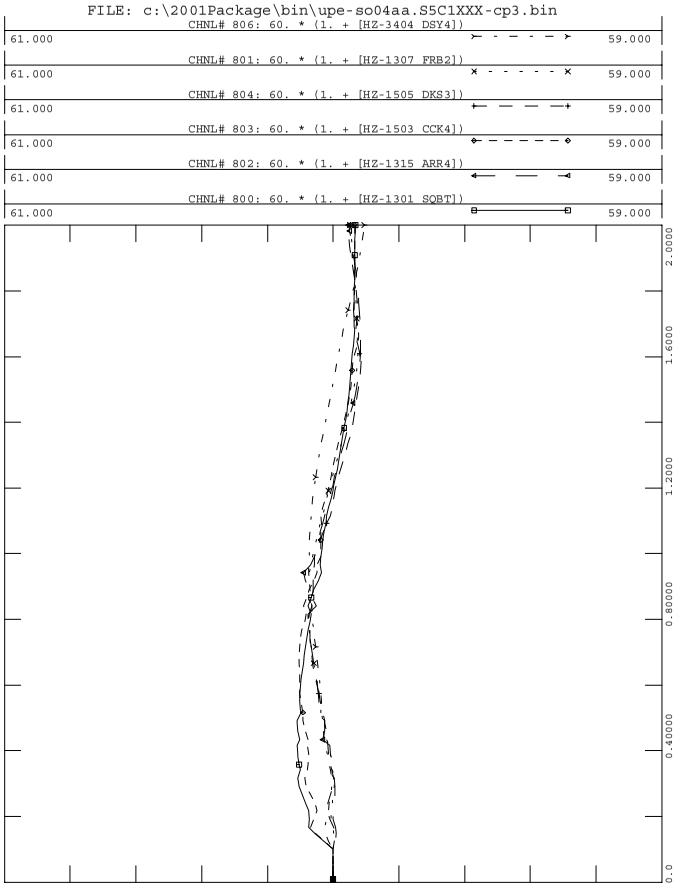
THU, MAY 02 2002 12:40
MH DC PARAMETERS



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40

FREQ AT DC TERMINALS



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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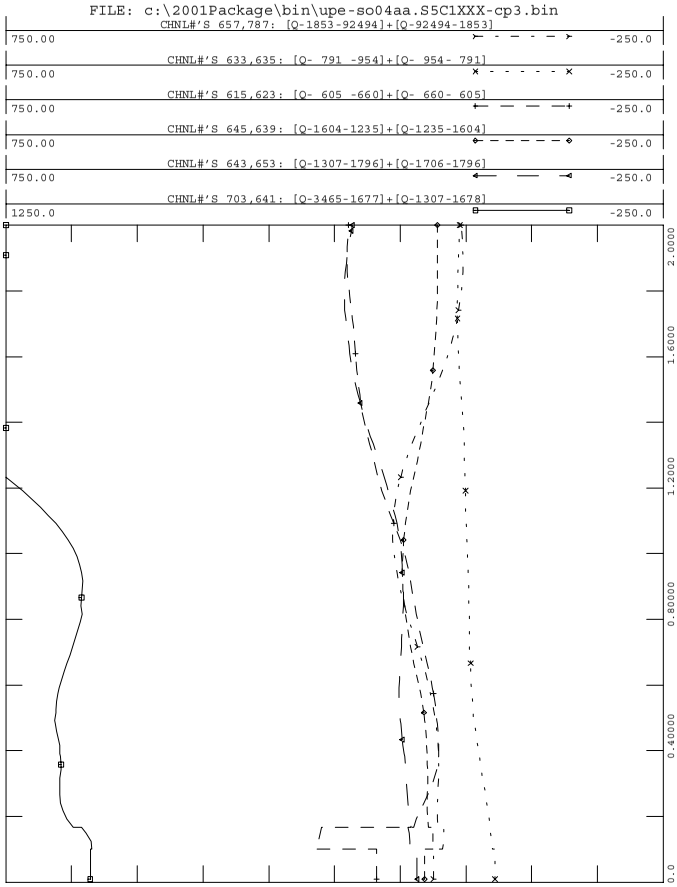
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40

VAR LOSSES



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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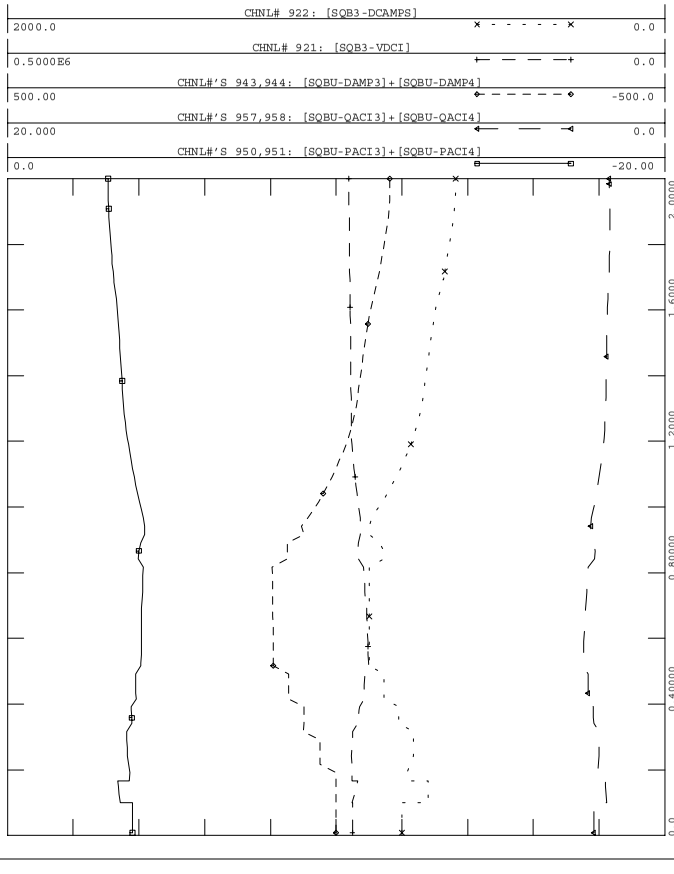
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40

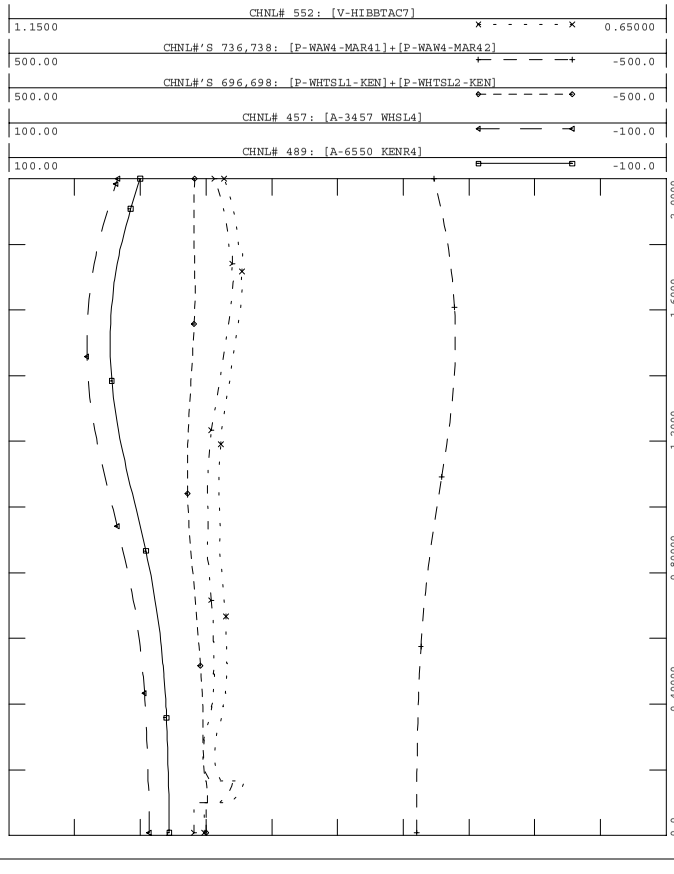
SQB DC #3



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

THU, MAY 02 2002 12:40

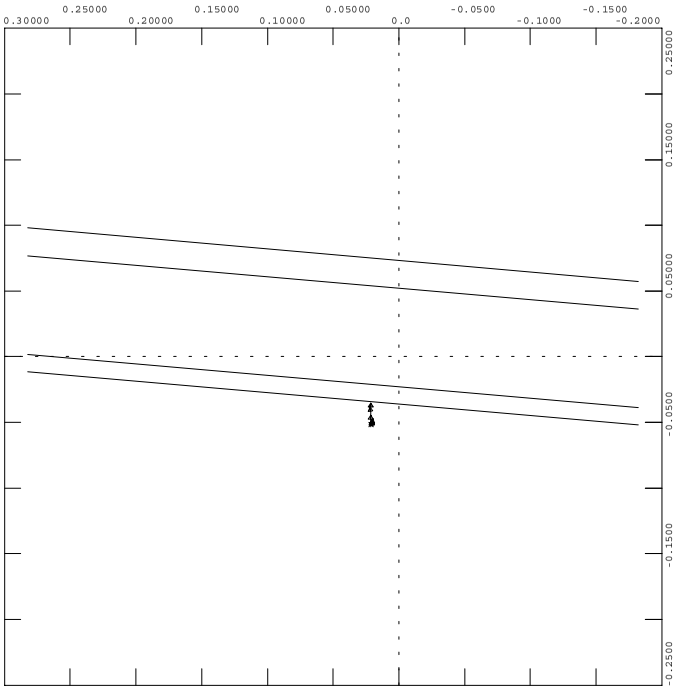
VOLTAGES, ANGLES



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



THU, MAY 02 2002 12:40
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

RELAY: RELAYG
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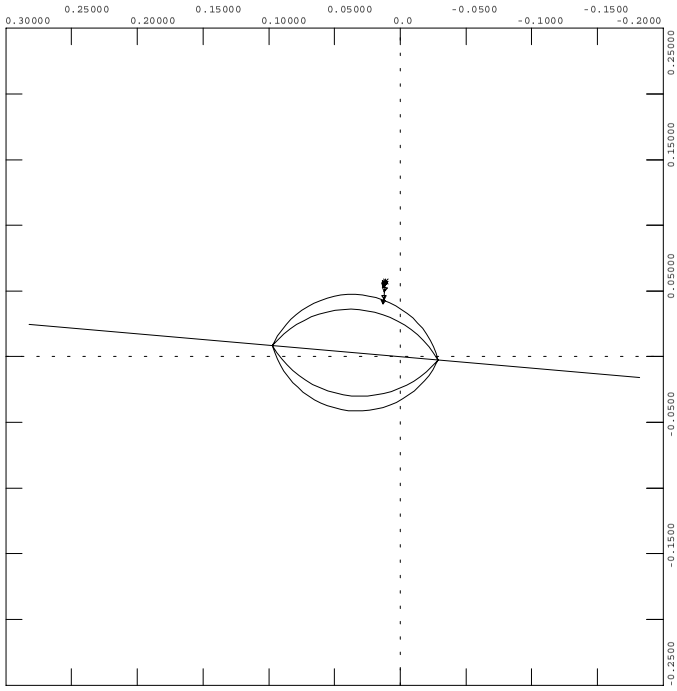

THU, MAY 02 2002 12:40
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
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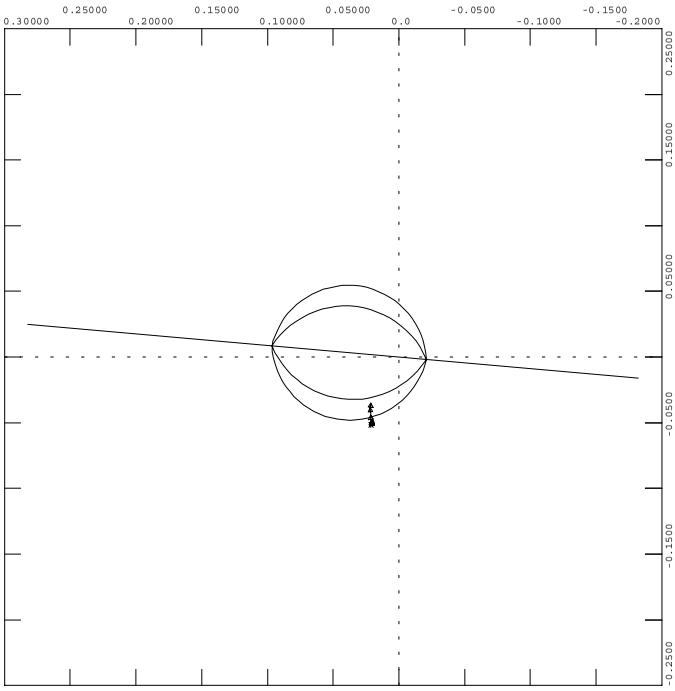
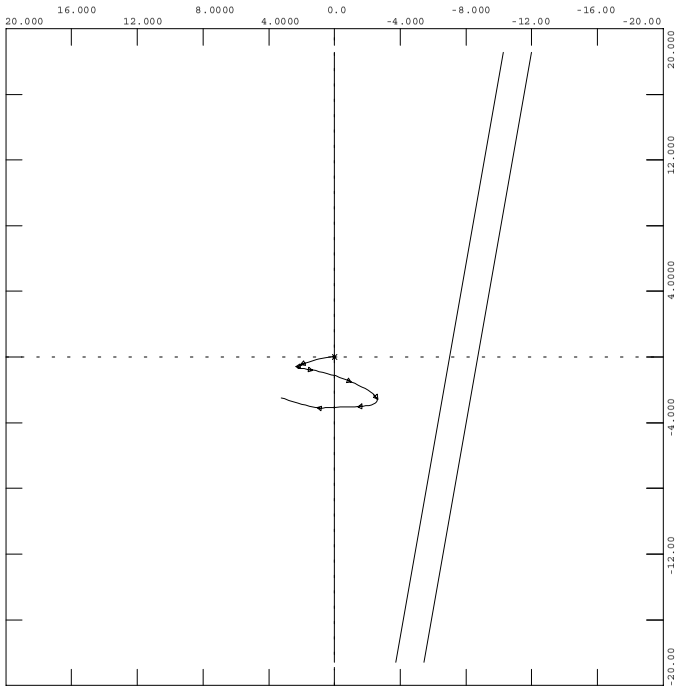


THU, MAY 02 2002 12:40
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

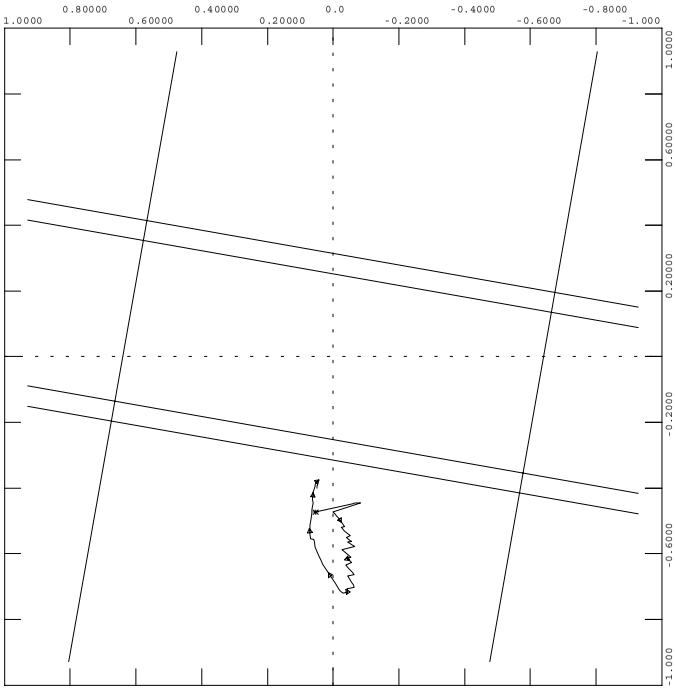


THU, MAY 02 2002 12:40
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

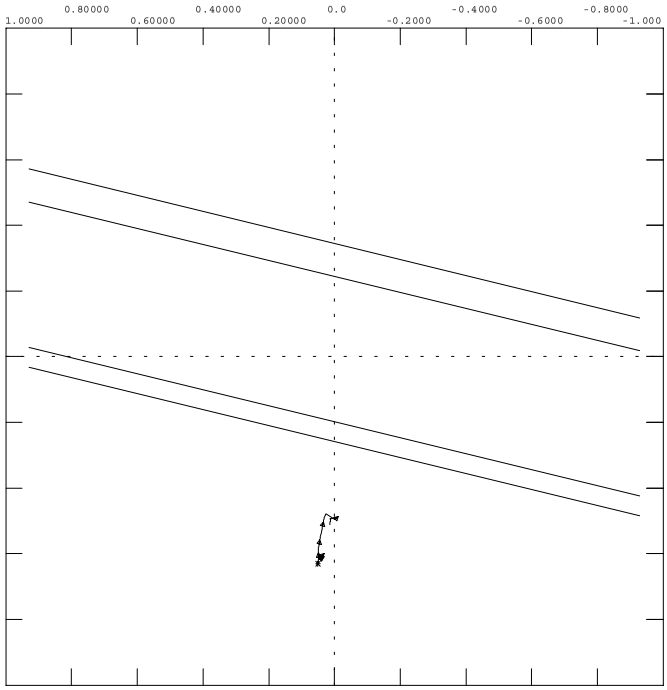
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

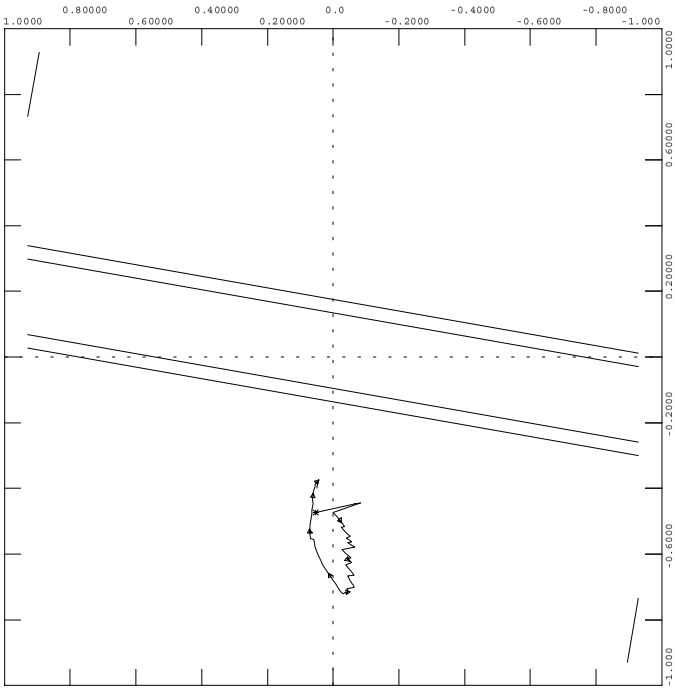
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

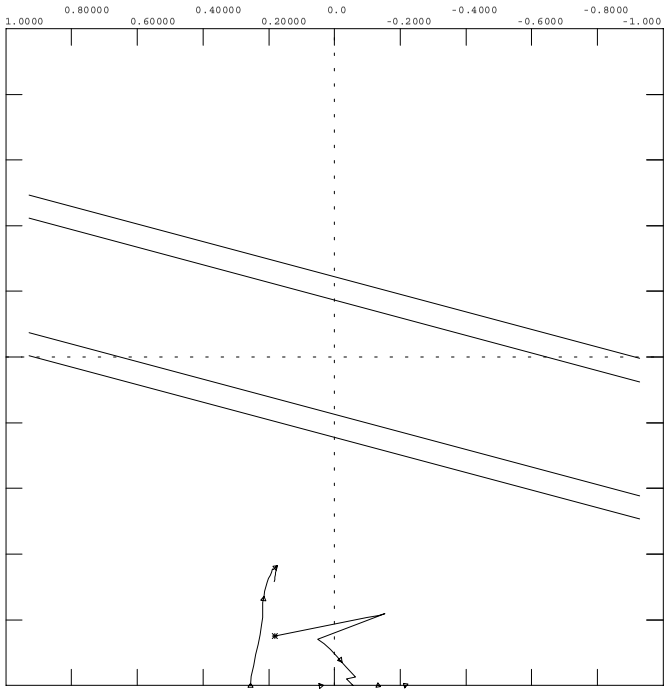
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

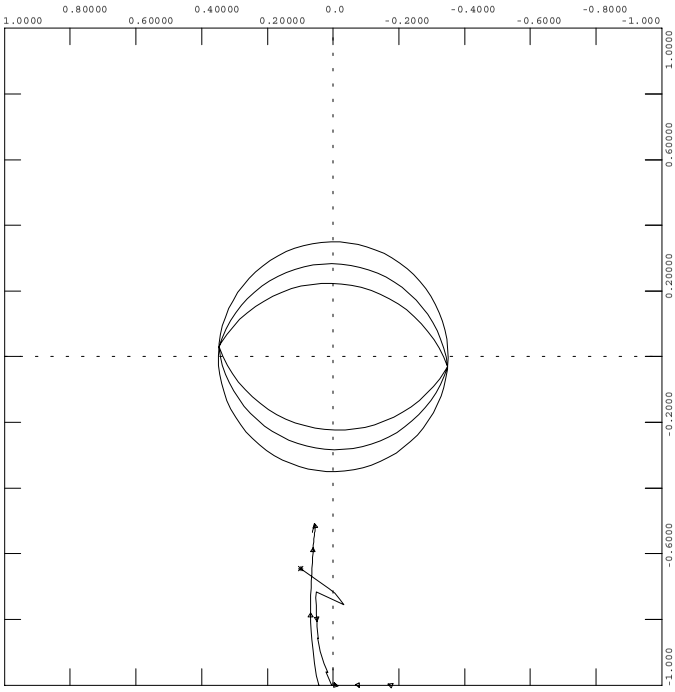
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

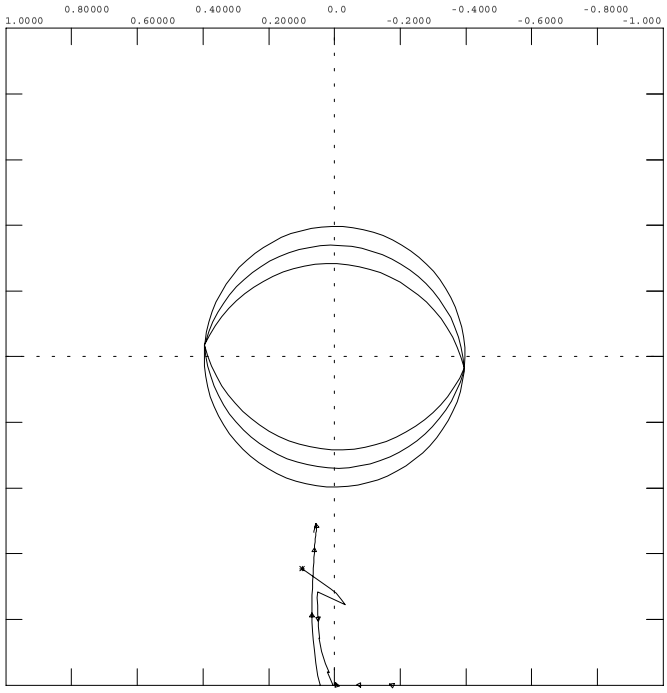
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

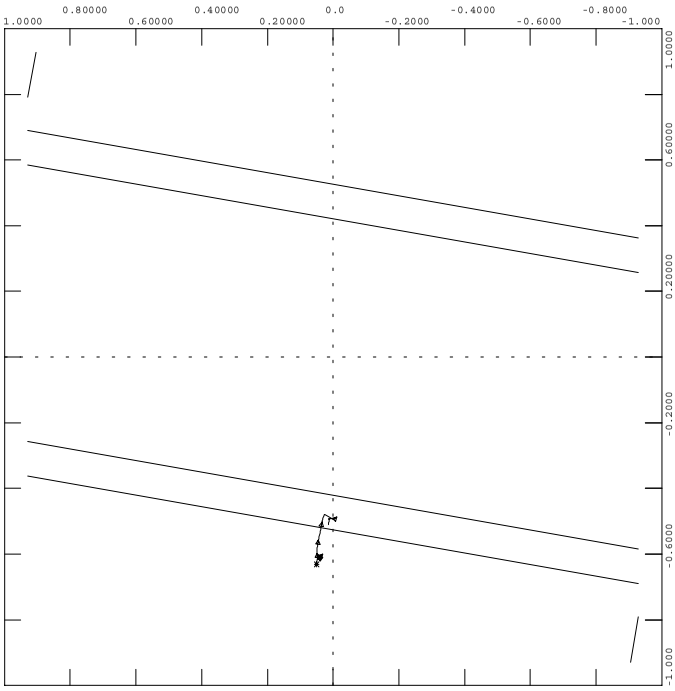
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

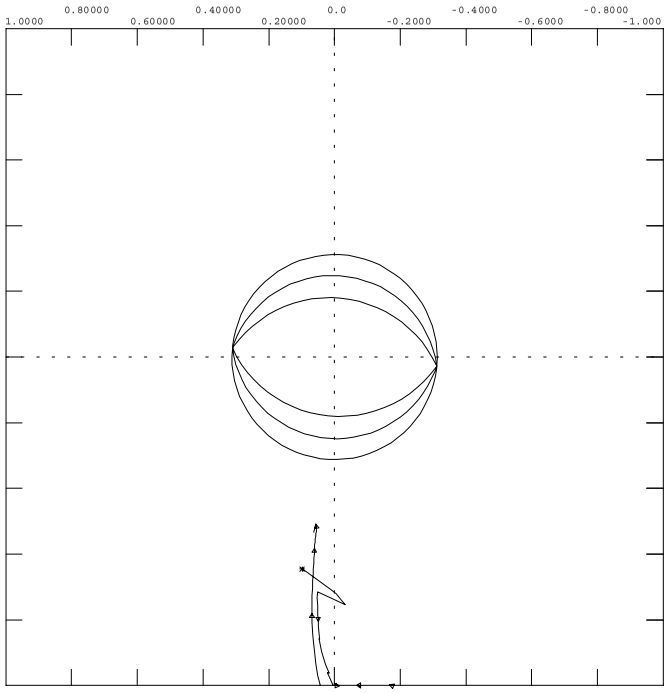
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



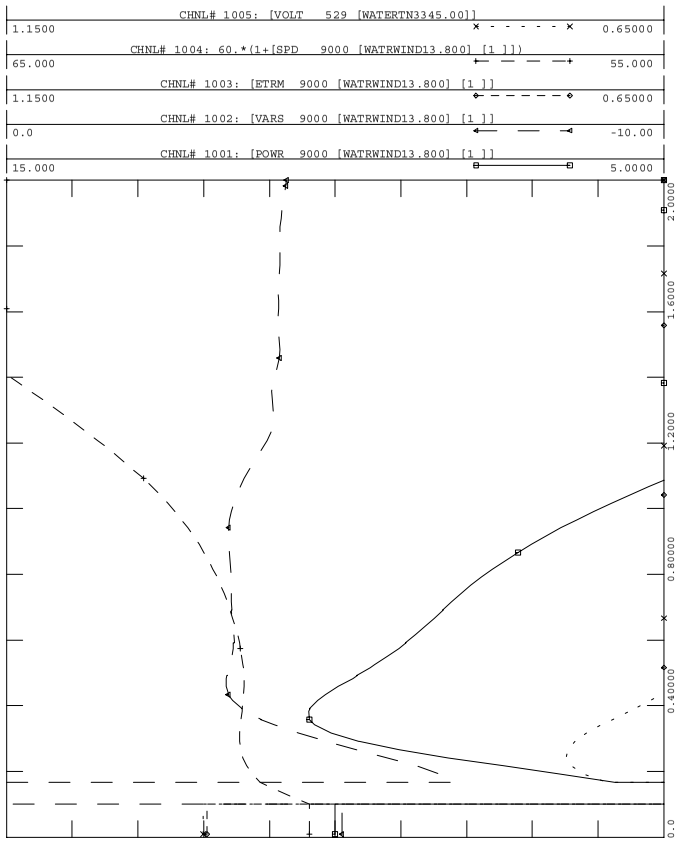
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

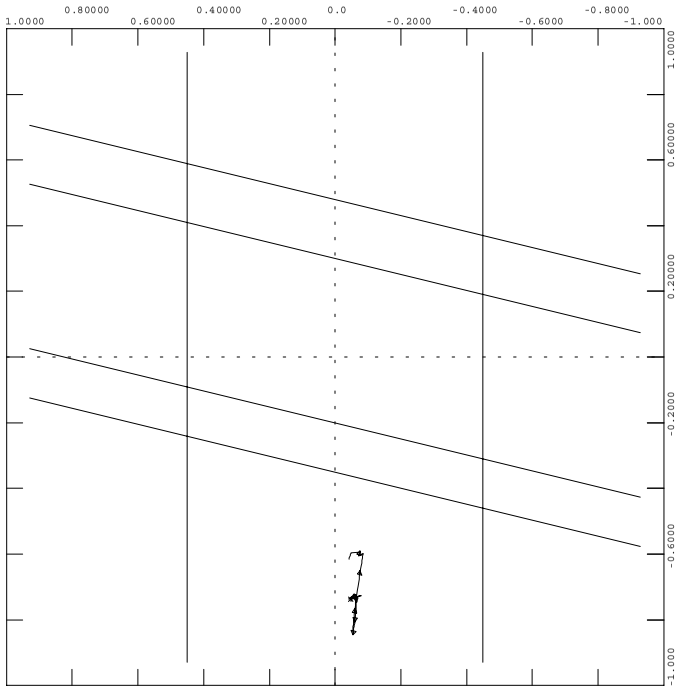


THU, MAY 02 2002 12:40
WATERTOWN 1000MW WIND UNI

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cp3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



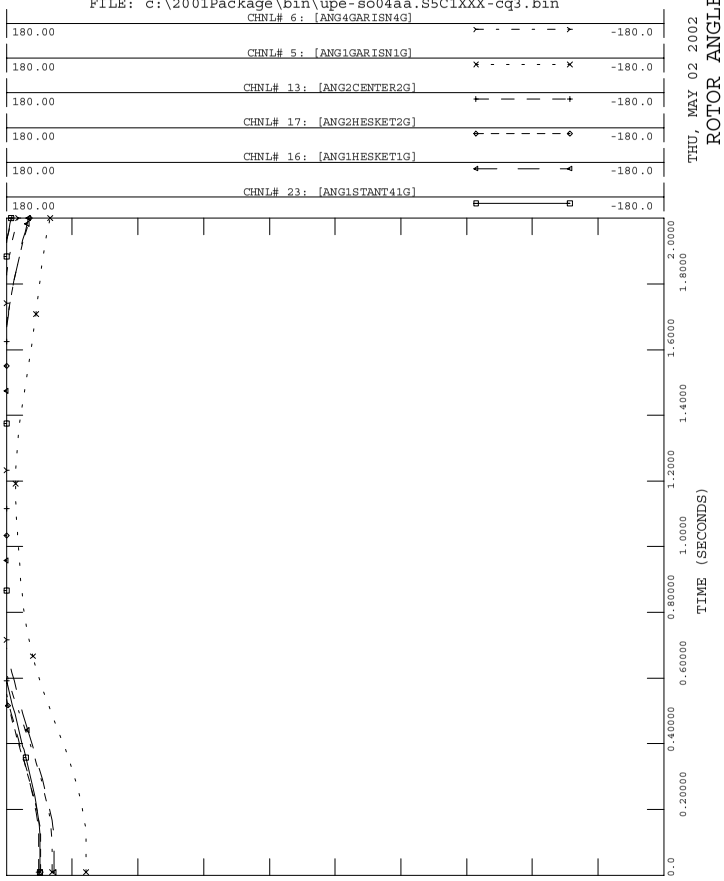
THU, MAY 02 2002 12:40
MP-OH I.FALLS (779)

CONTINGENCY CQ3

4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-White 345 kV line

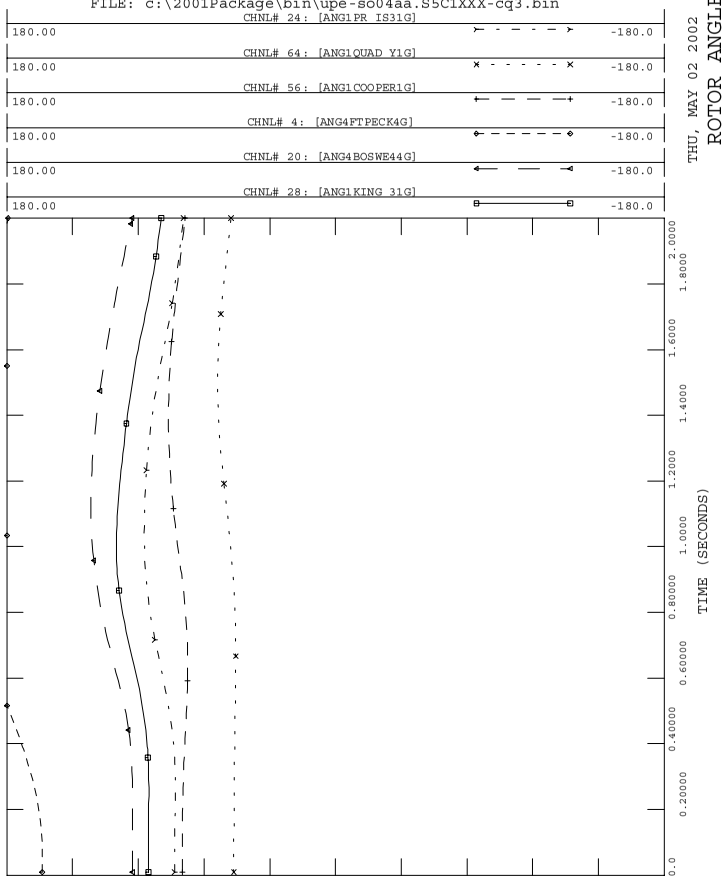
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
ROTOR ANGLES 2



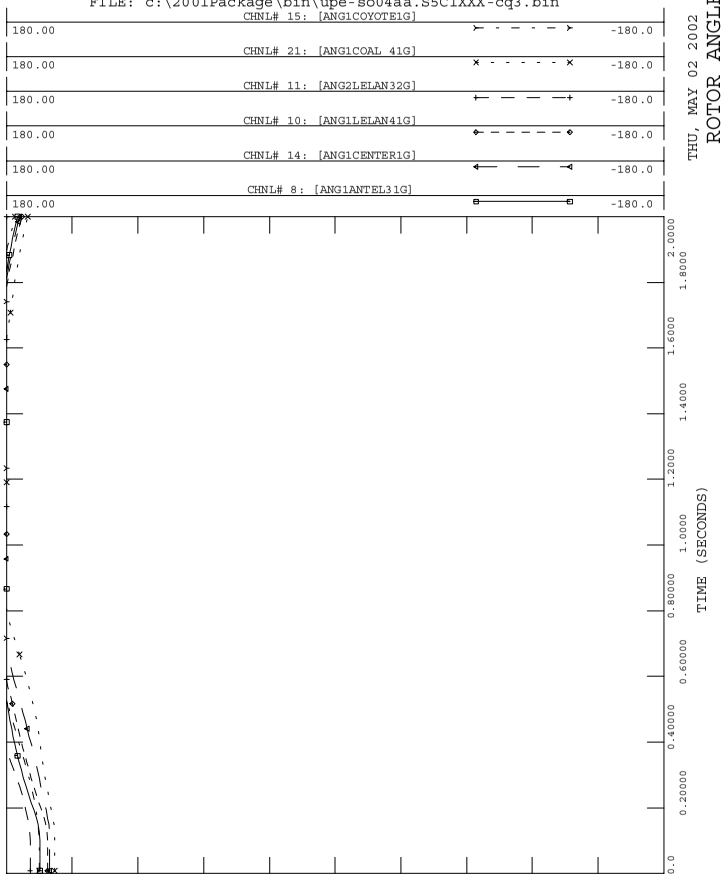
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
ROTOR ANGLES 4



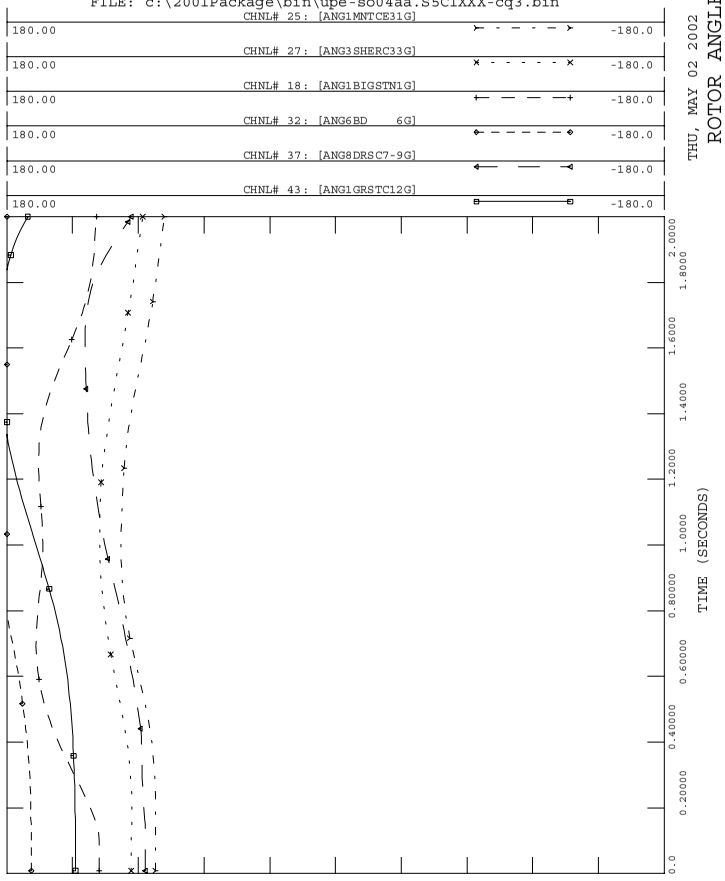
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
ROTOR ANGLES 1

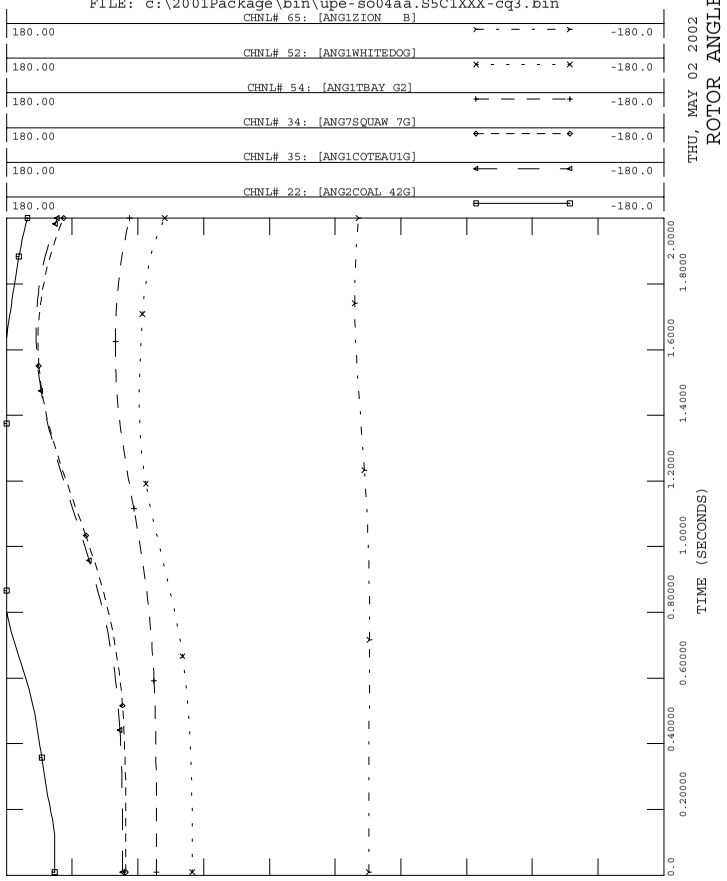


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
ROTOR ANGLES 3

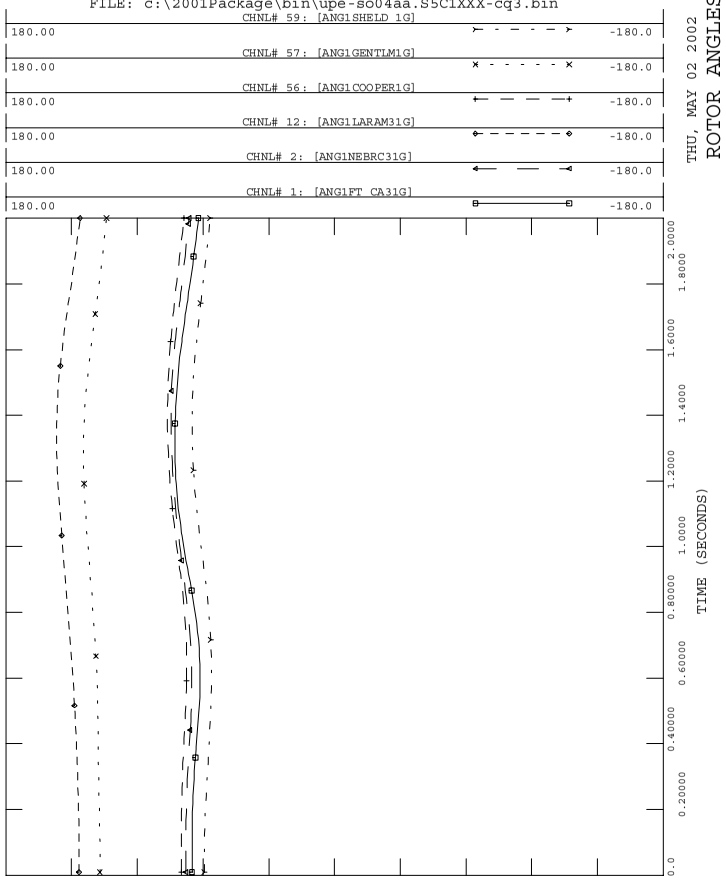


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin



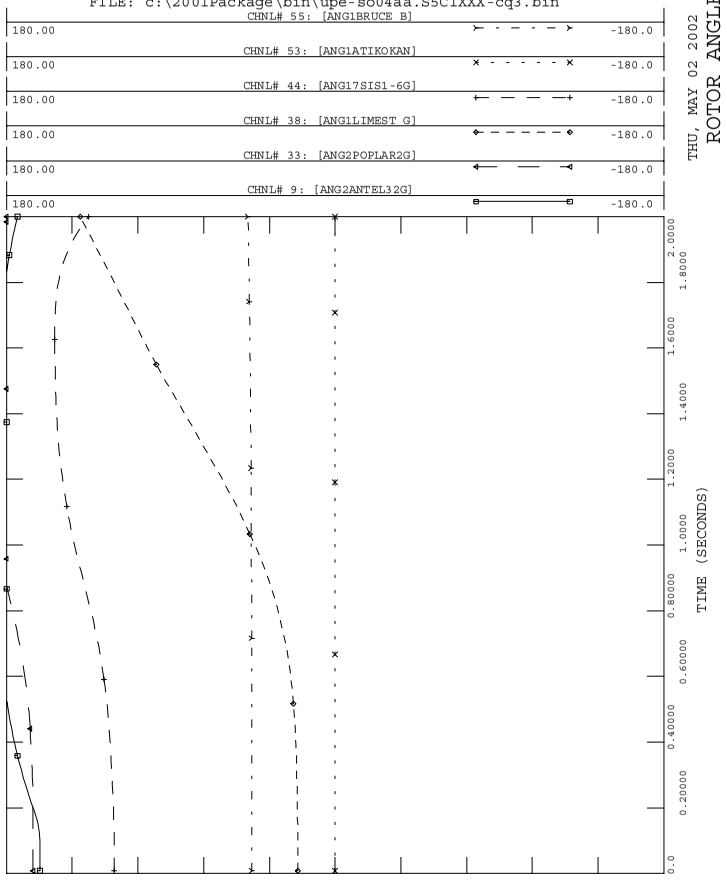
THU, MAY 02 2002 12:42
ROTOR ANGLES 6

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin



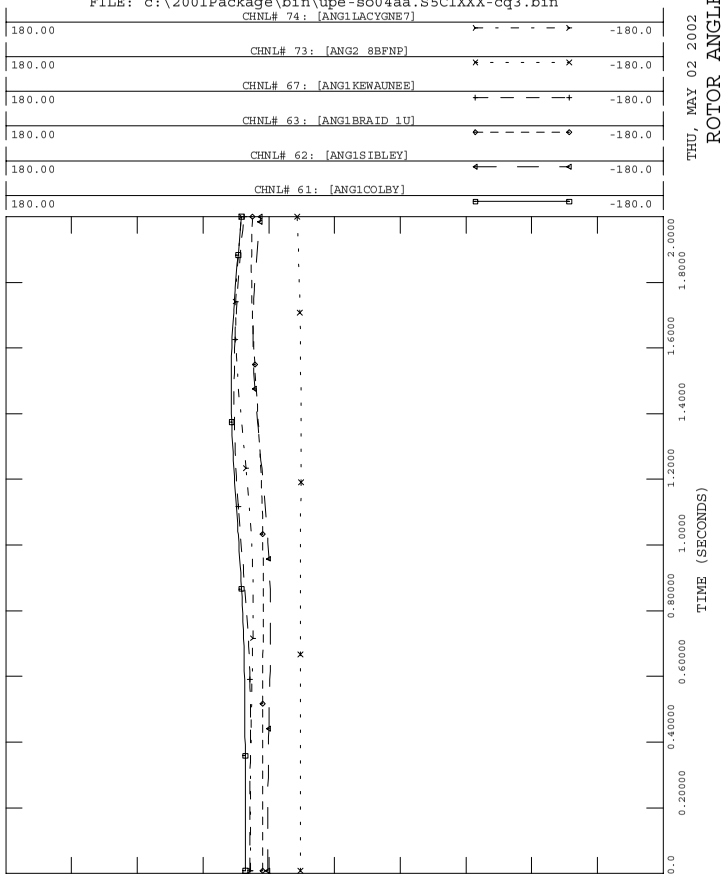
THU, MAY 02 2002 12:42
ROTOR ANGLES NB

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin



THU, MAY 02 2002 12:42
ROTOR ANGLES 5

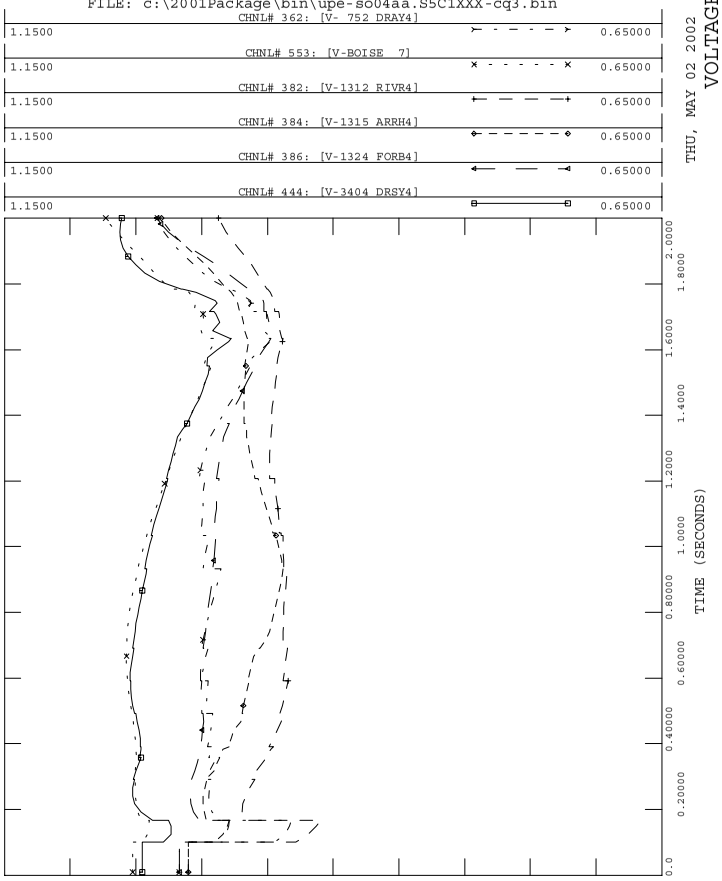
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin



THU, MAY 02 2002 12:42
ROTOR ANGLES 7

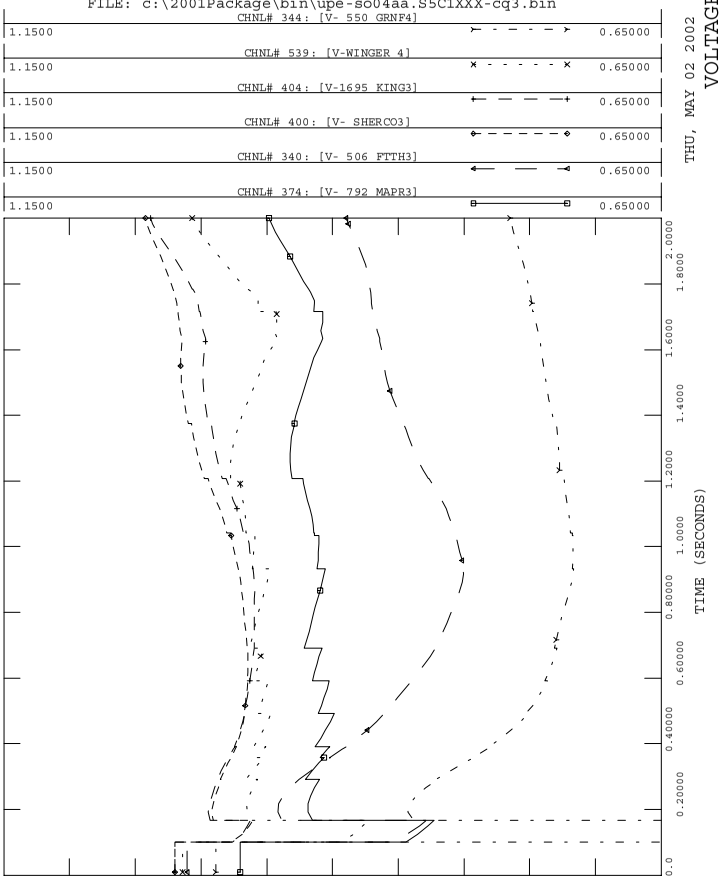
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
VOLTAGES 1



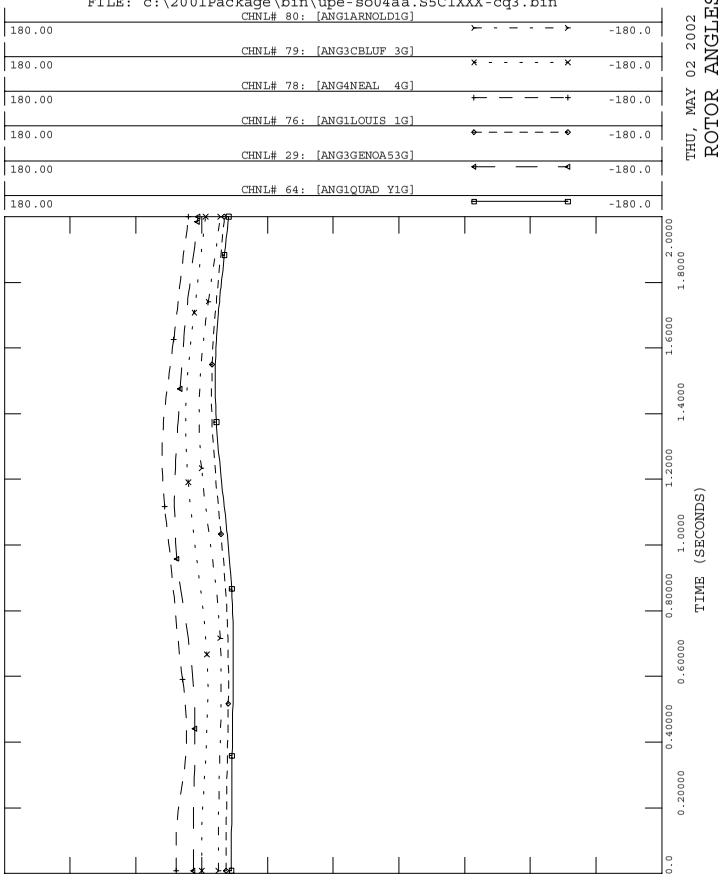
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
VOLTAGES 3



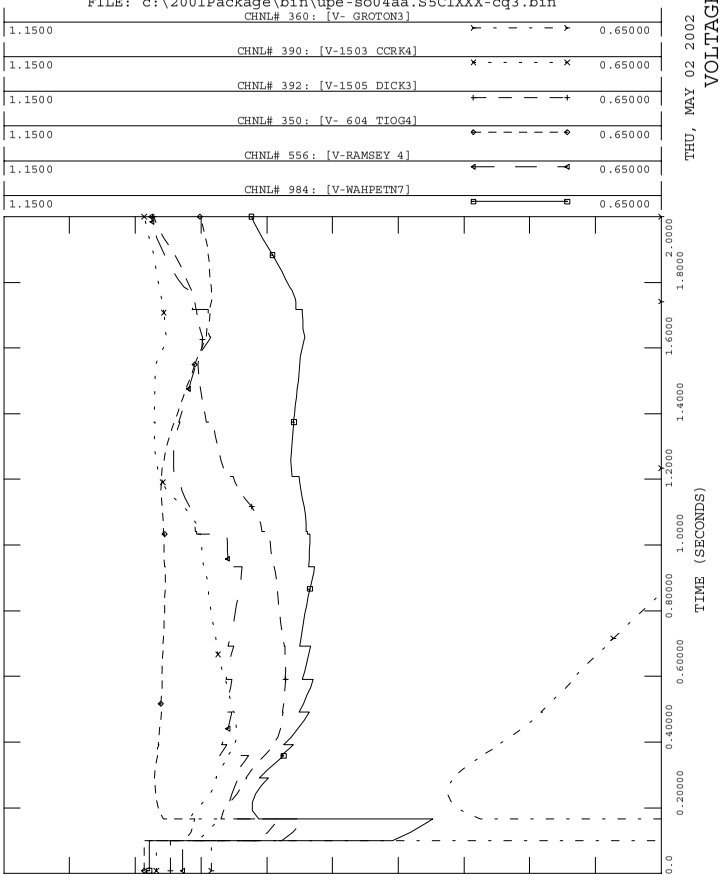
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
ROTOR ANGLES IA



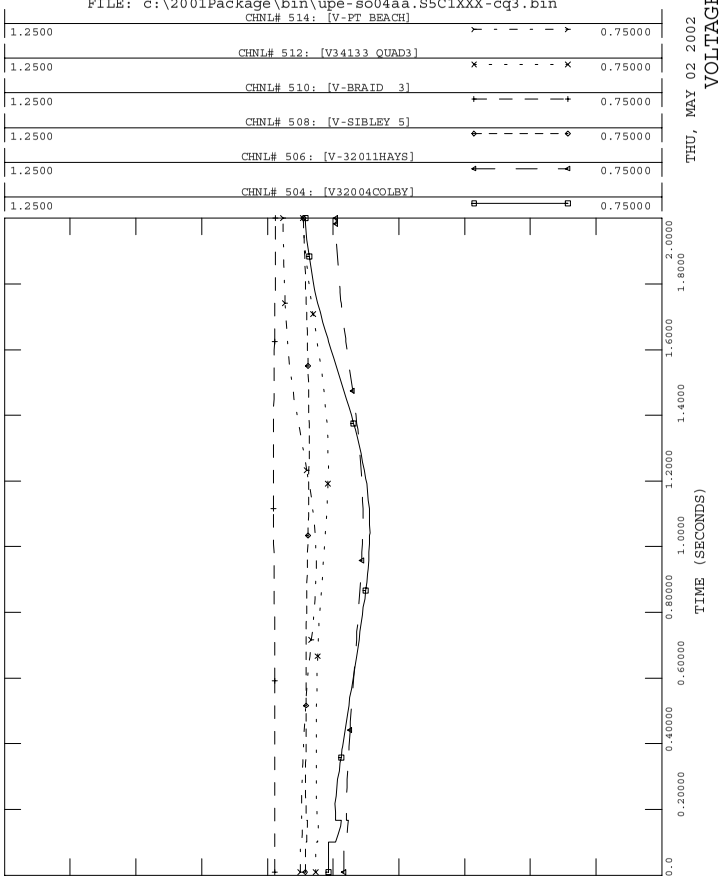
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
VOLTAGES 2



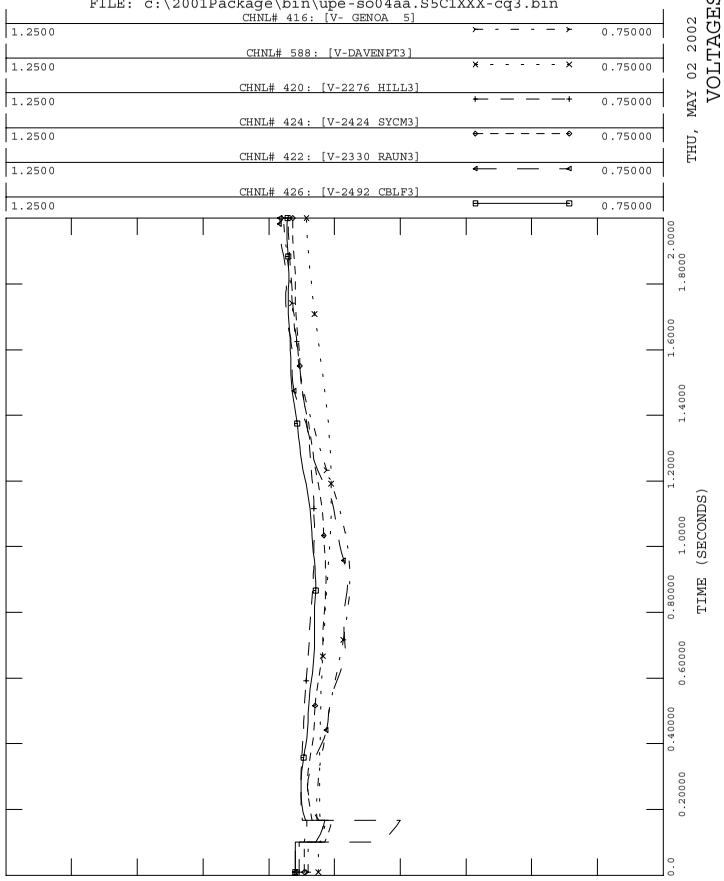
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
VOLTAGES 5



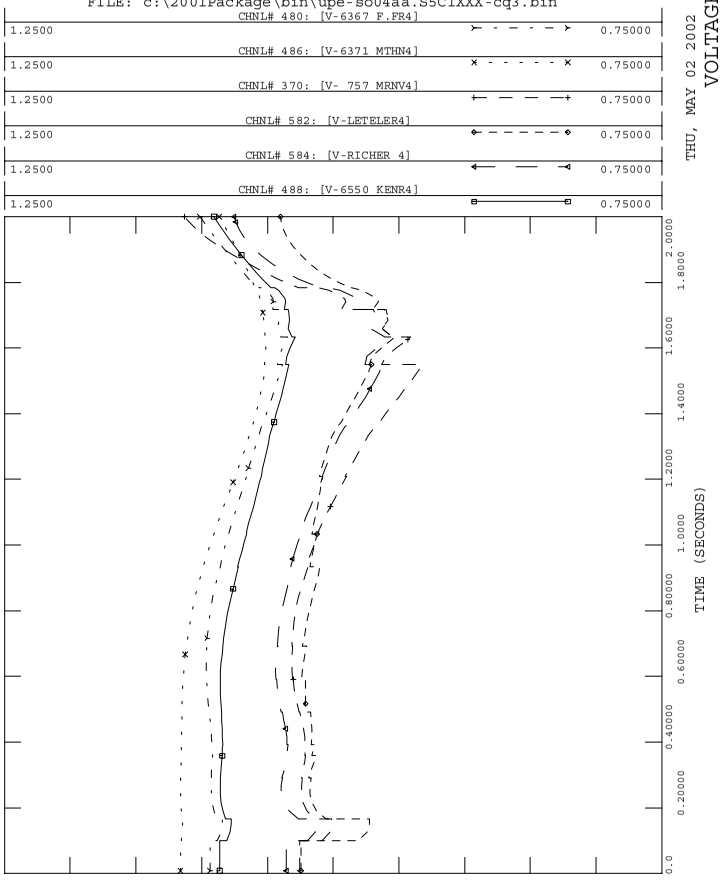
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
VOLTAGES IA



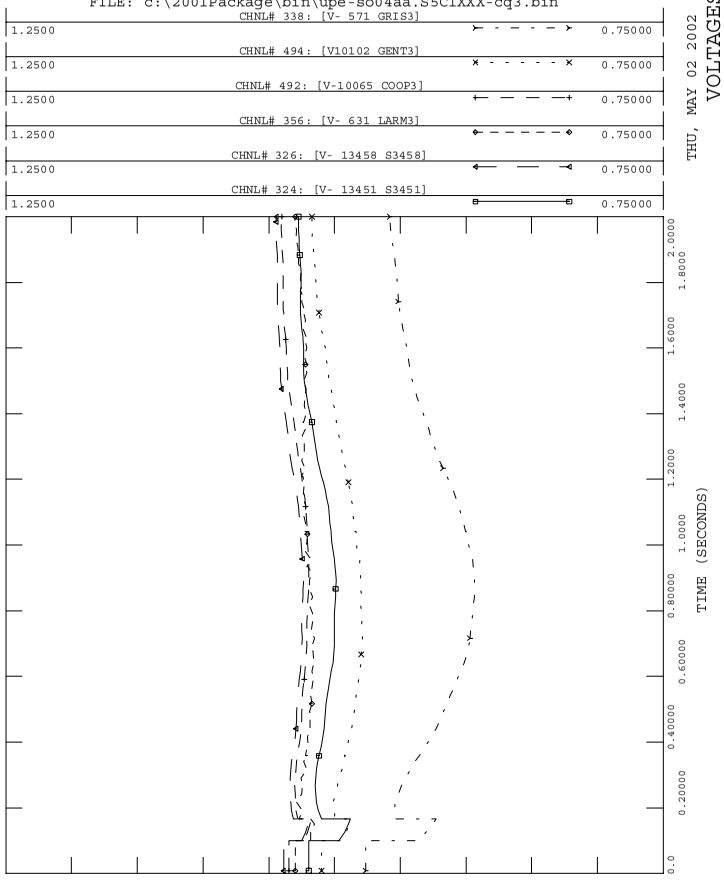
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

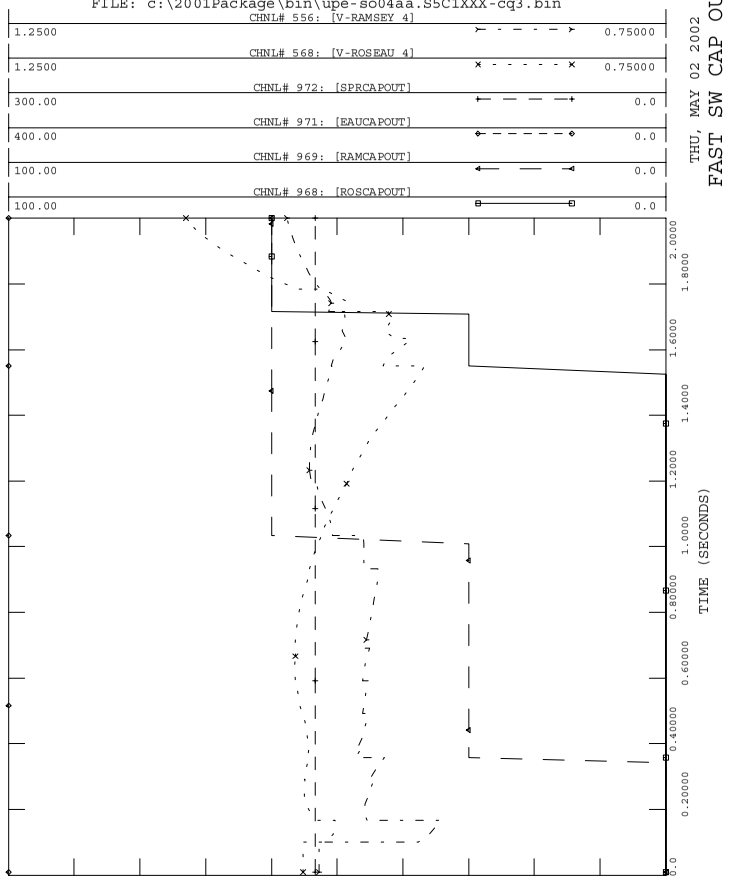
THU, MAY 02 2002 12:42
VOLTAGES 4

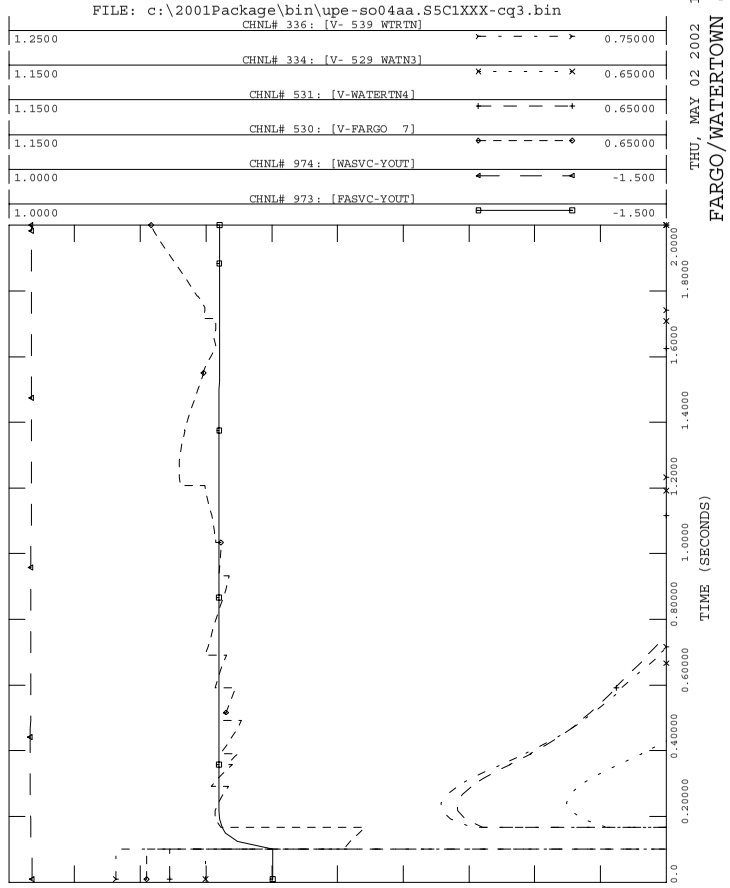


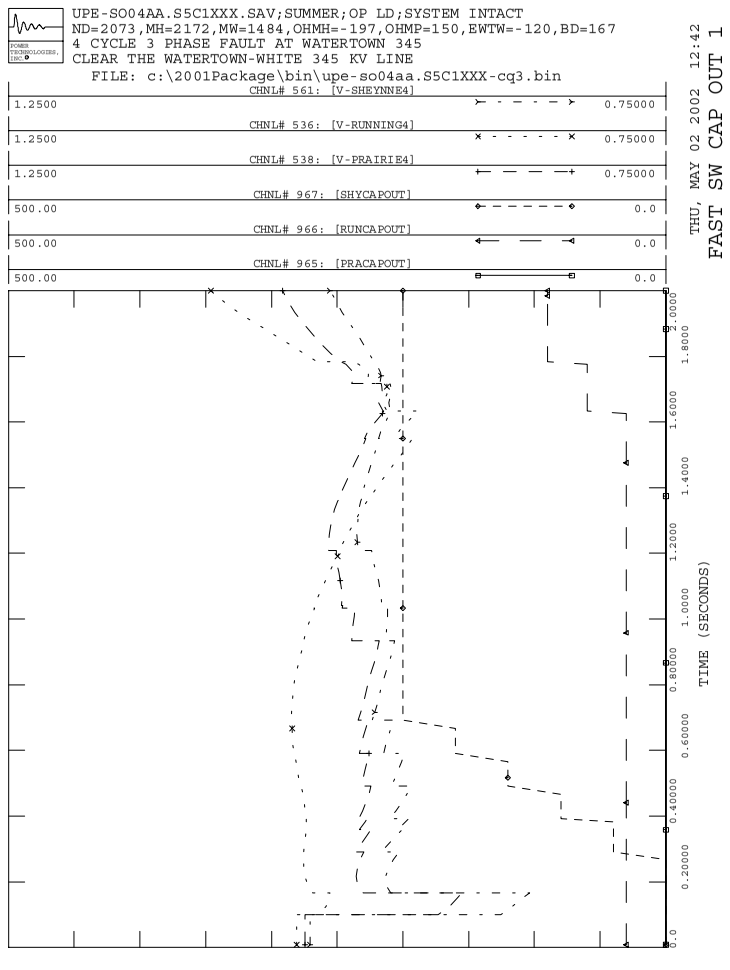
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

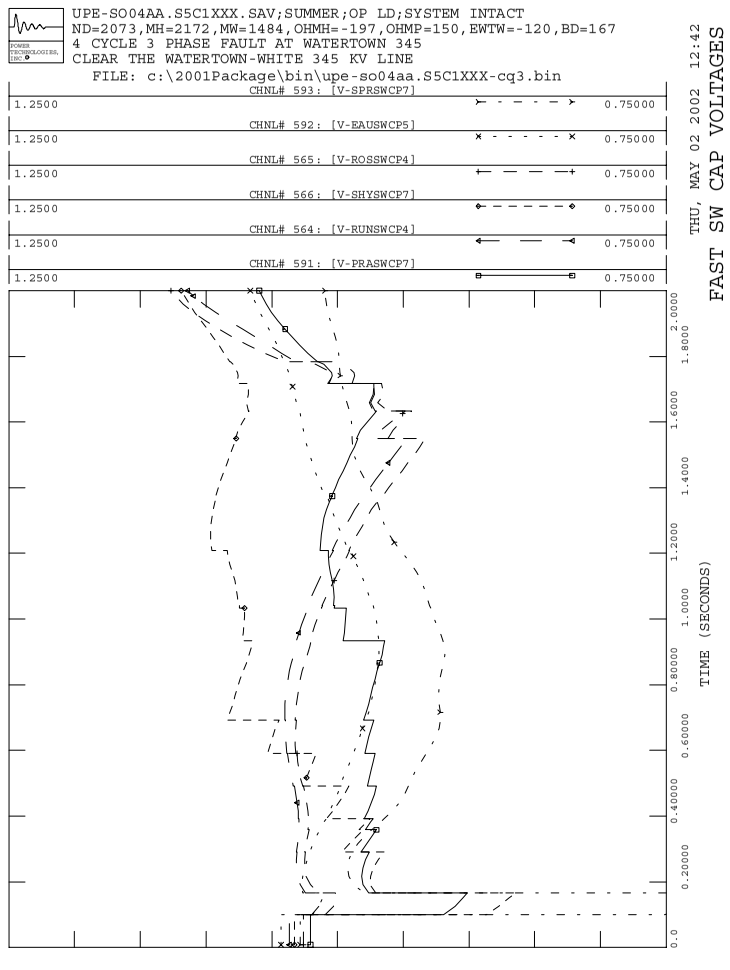
THU, MAY 02 2002 12:42
VOLTAGES NB




UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
THU, MAY 02 2002 12:42
FAST SW CAP OUT 2


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
THU, MAY 02 2002 12:42
FARGO/WATERTOWN SVS

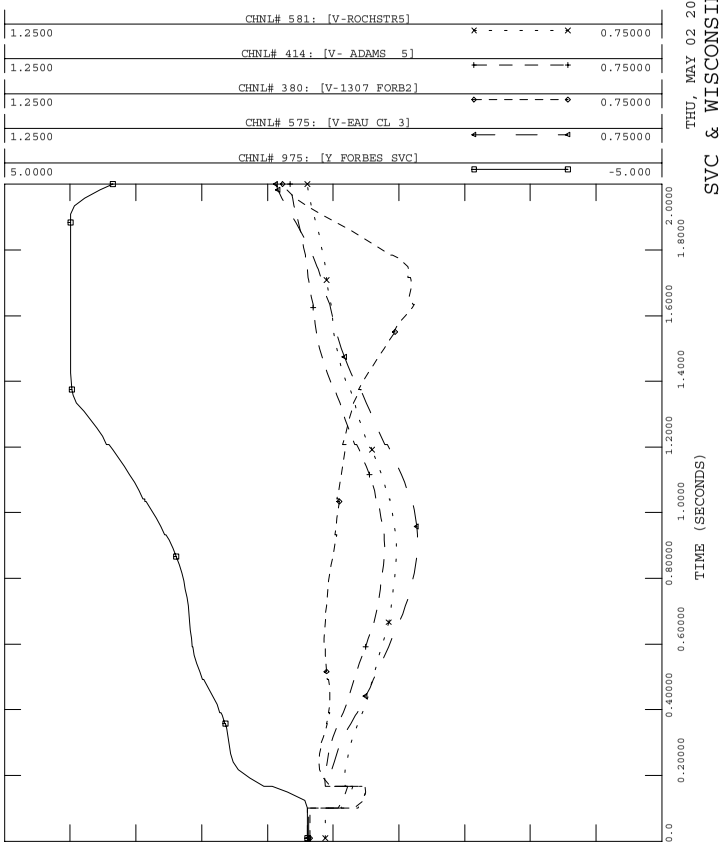

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
THU, MAY 02 2002 12:42
FAST SW CAP OUT 1


UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
THU, MAY 02 2002 12:42
FAST SW CAP VOLTAGES

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42

SVC & WISCONSIN VOLT



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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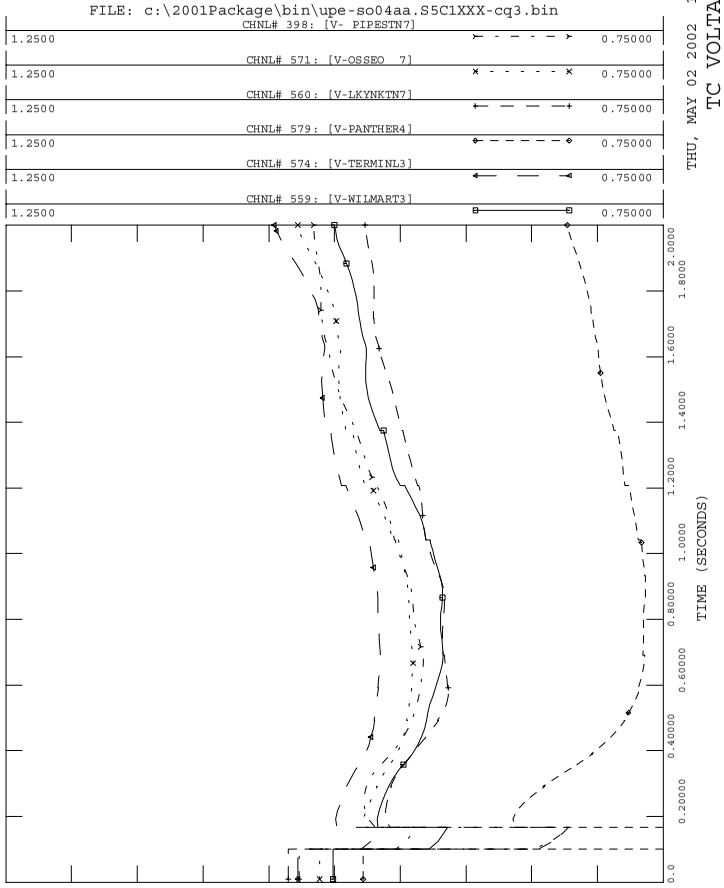
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42

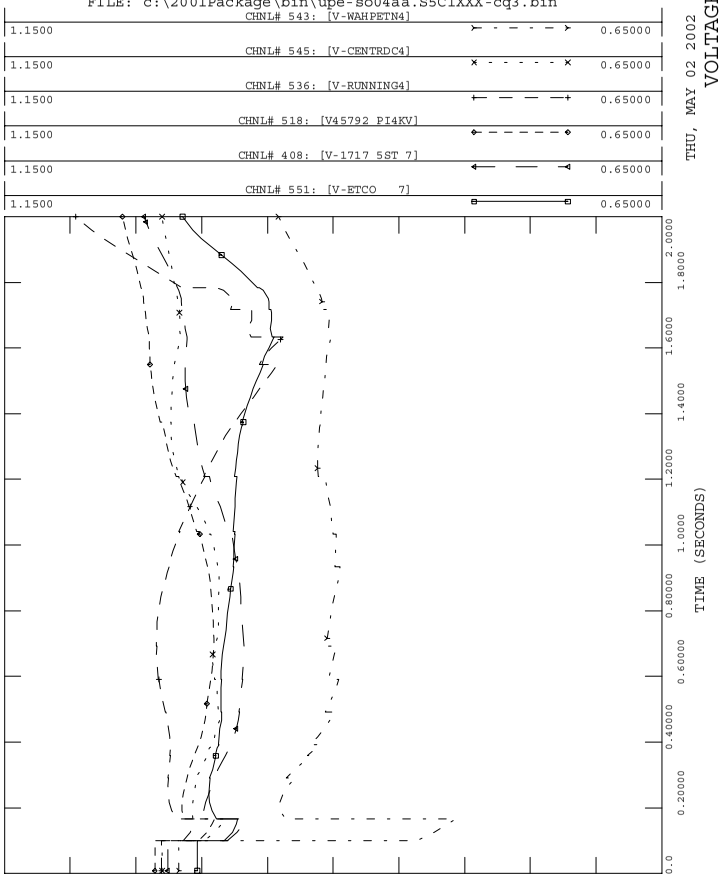
TC VOLTAGES



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42

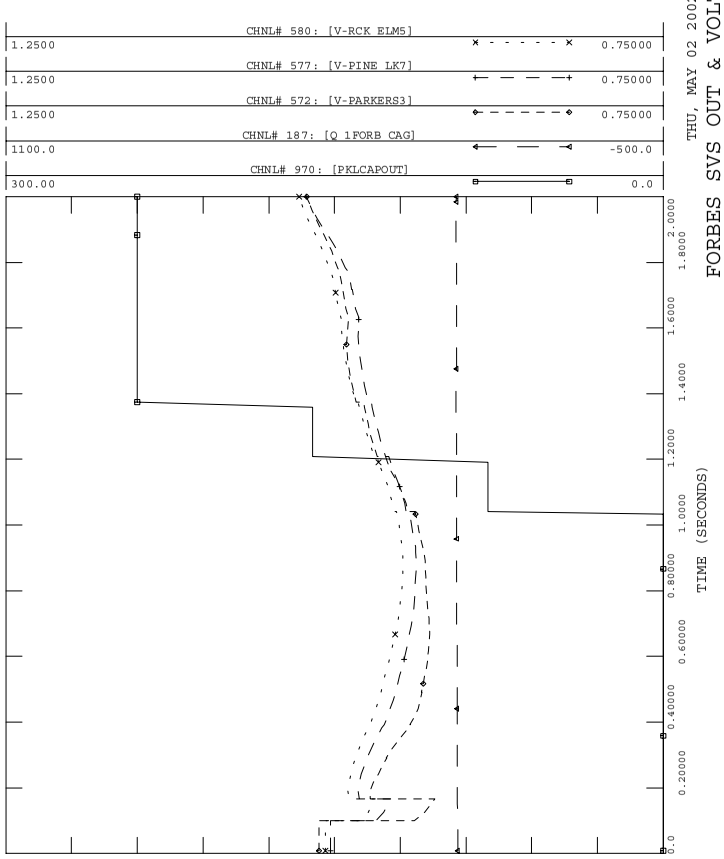
VOLTAGES 6



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

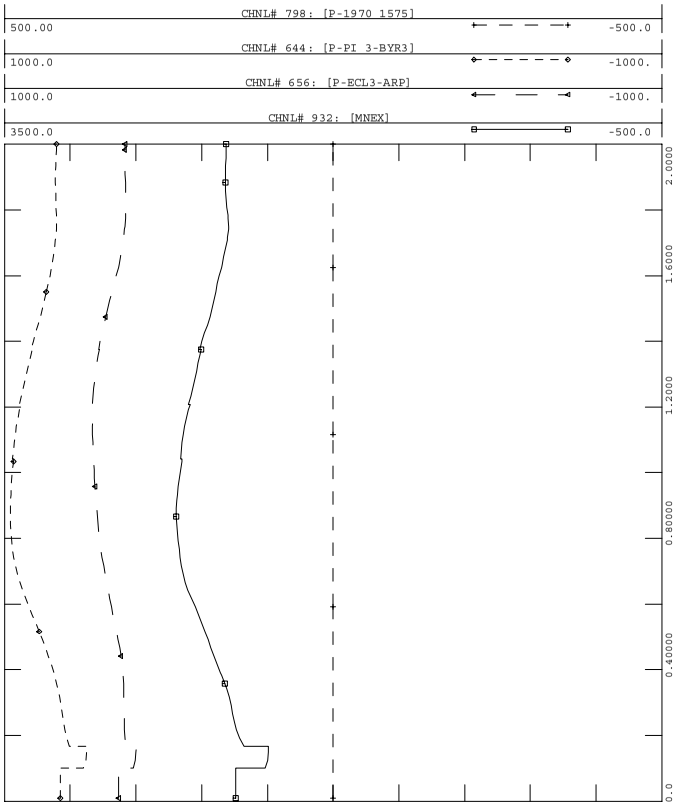
THU, MAY 02 2002 12:42

FORBES SVS OUT & VOLTAGES



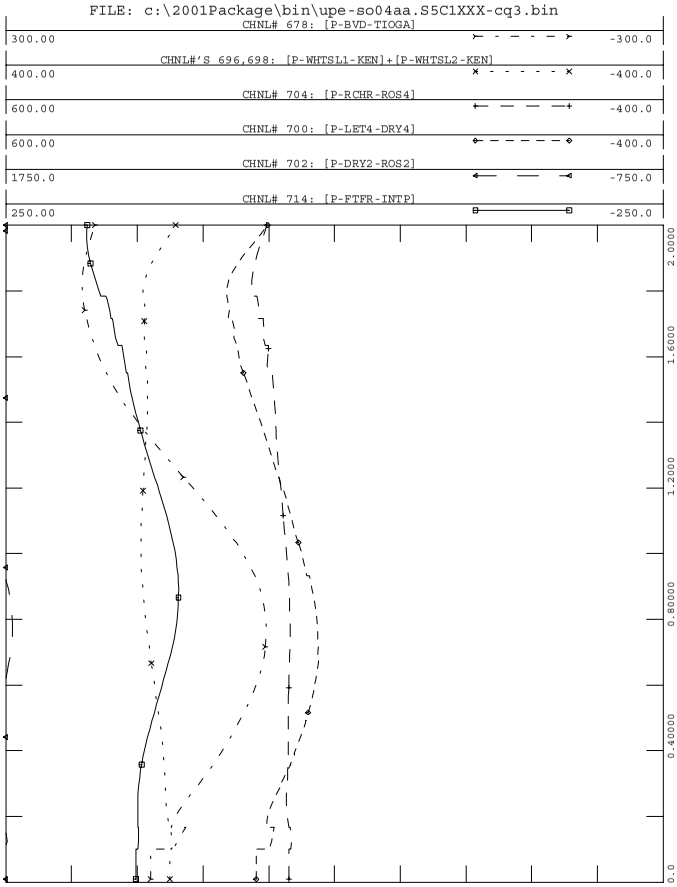
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
POWER FLOW SUMS 2



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
CAN. TIE FLOWS



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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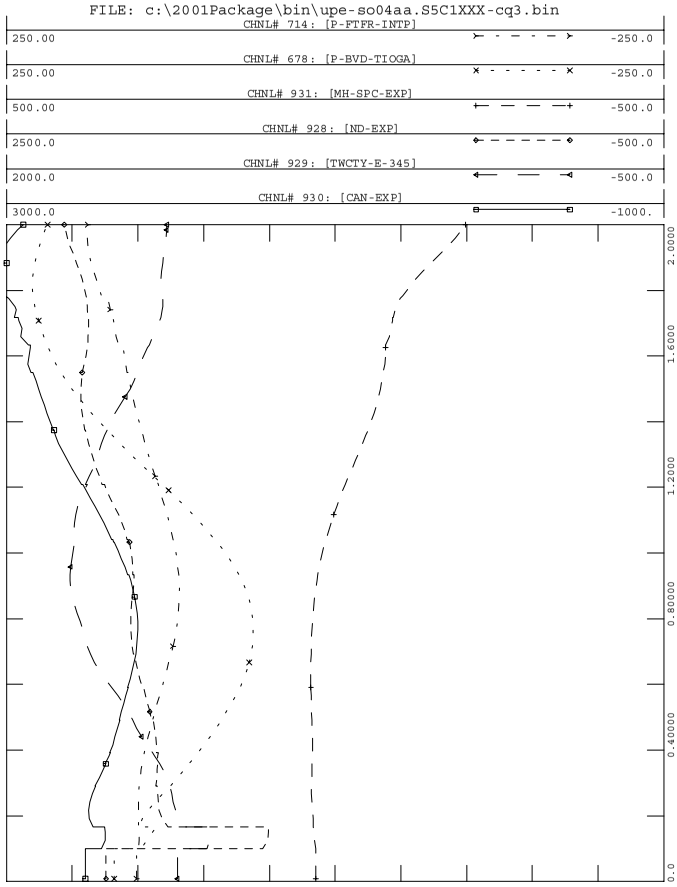
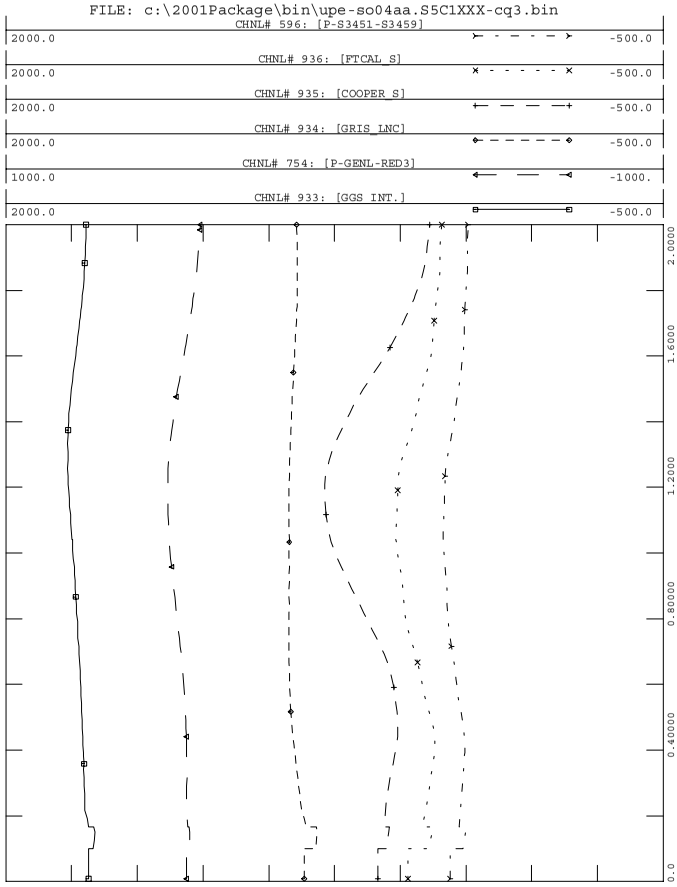
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
POWER FLOW SUMS 1



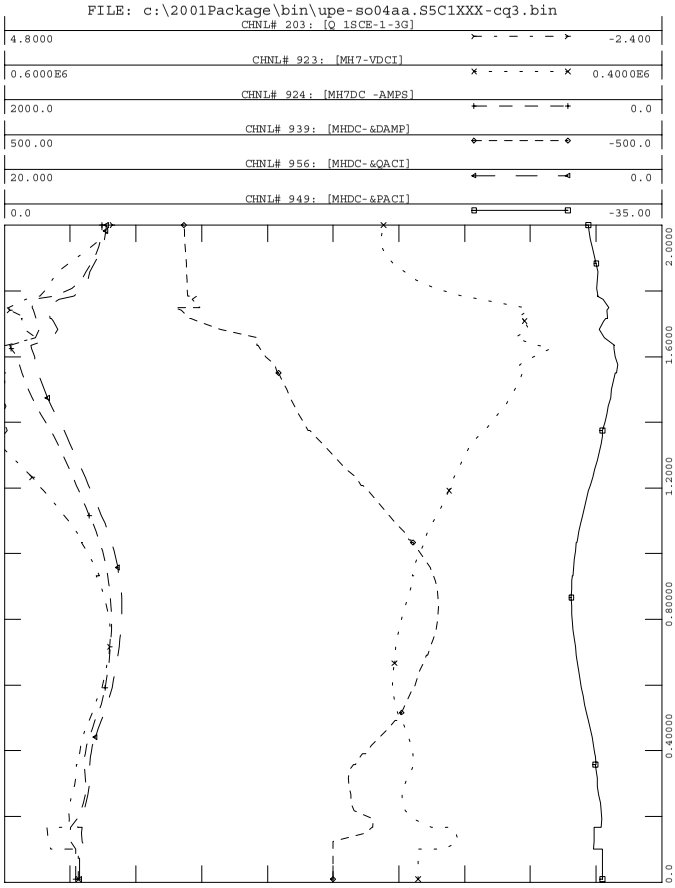
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
POWER FLOW SUM 3



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
MH DC PARAMETERS



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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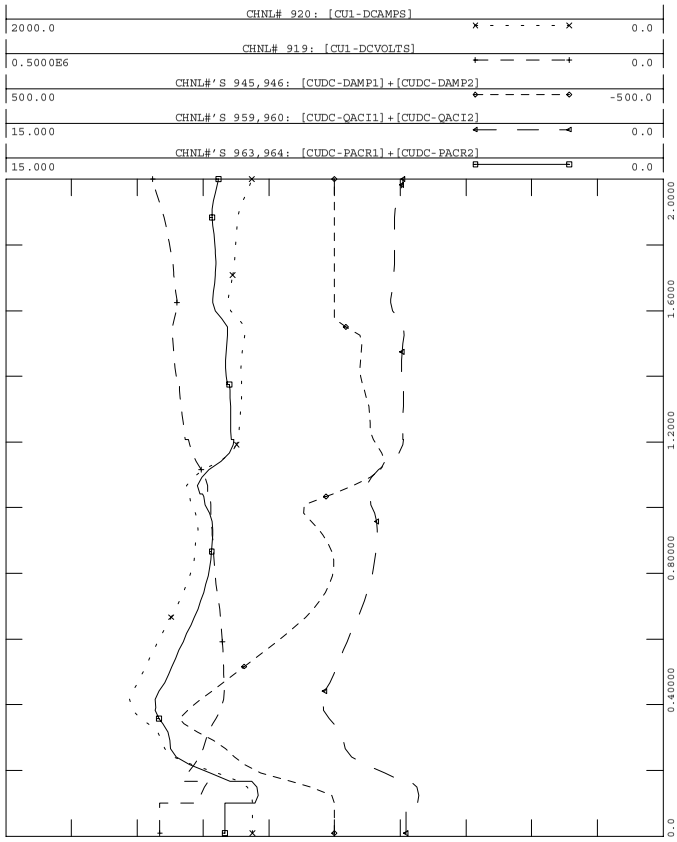
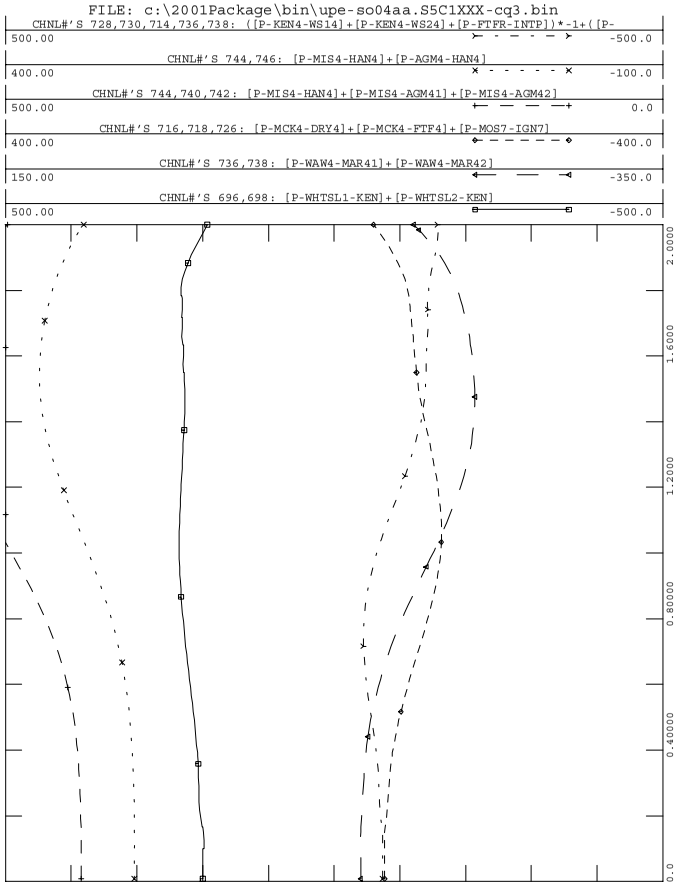
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
CU DC #1



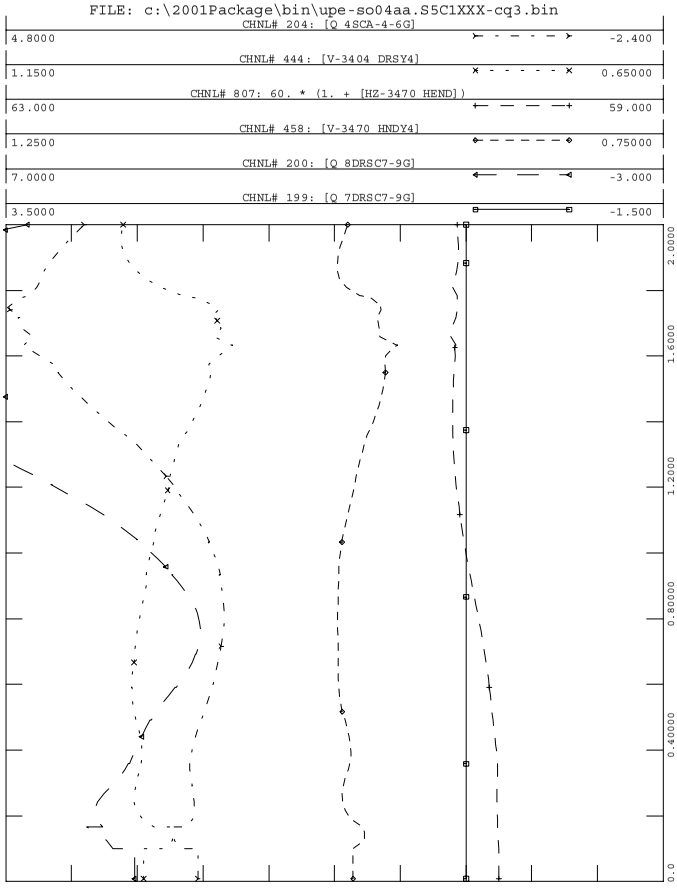
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
OH TIE FLOWS



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42
MH DC PARAMETERS



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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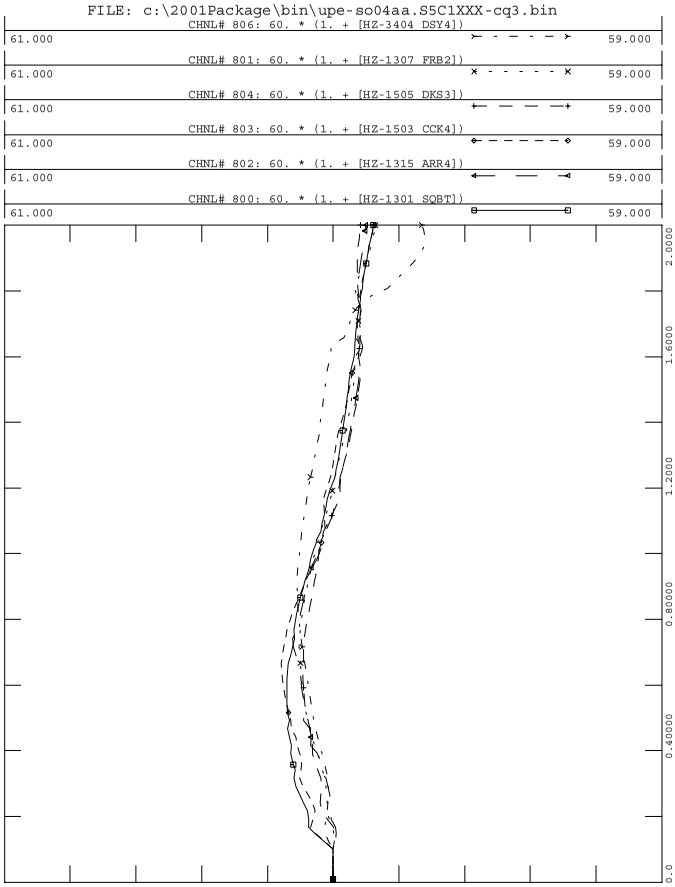
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42

FREQ AT DC TERMINALS



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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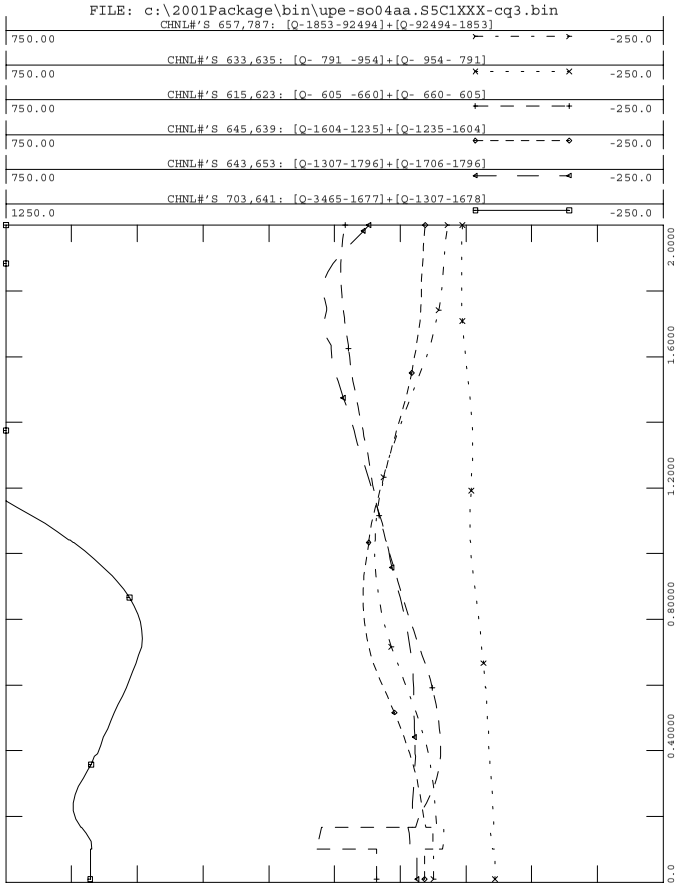
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42

VAR LOSSES



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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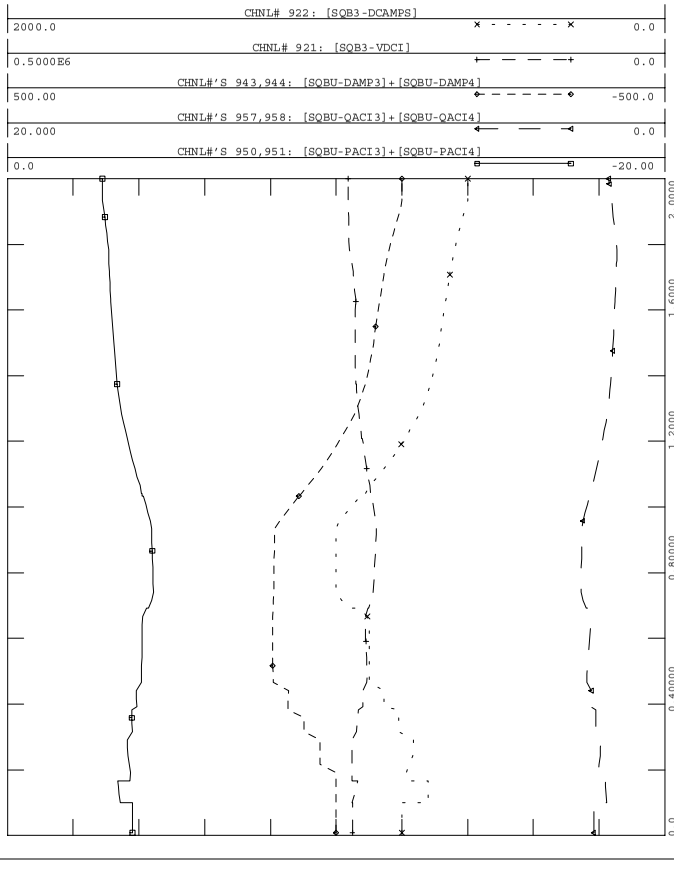
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42

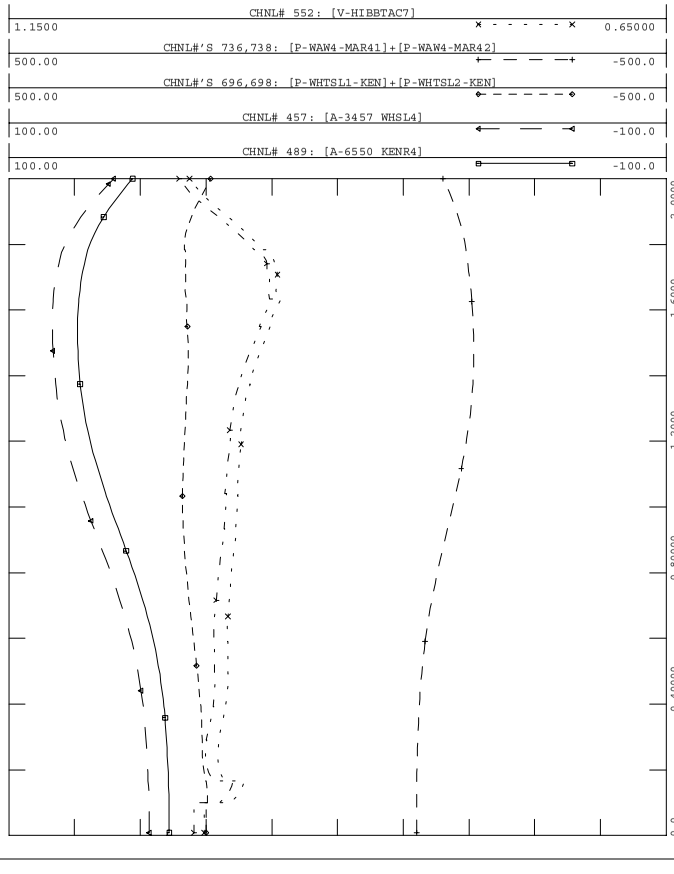
SQB DC #3



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

THU, MAY 02 2002 12:42

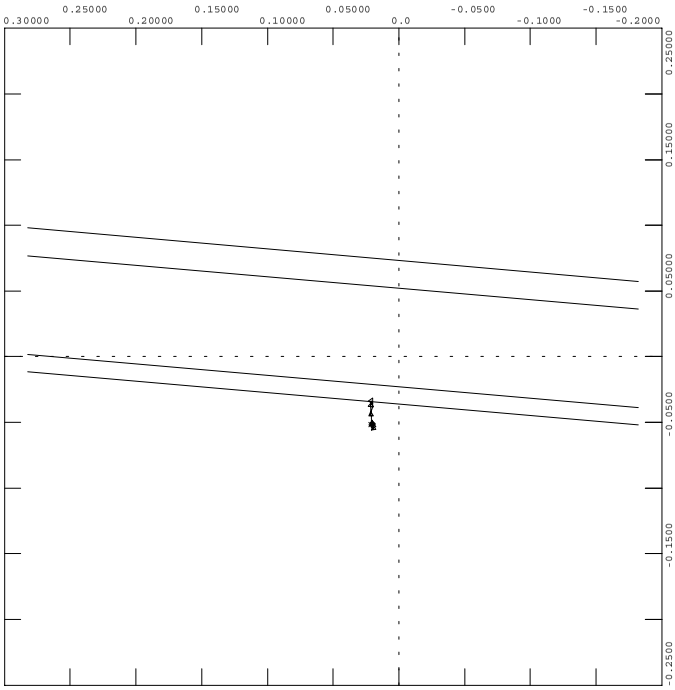
VOLTAGES, ANGLES



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

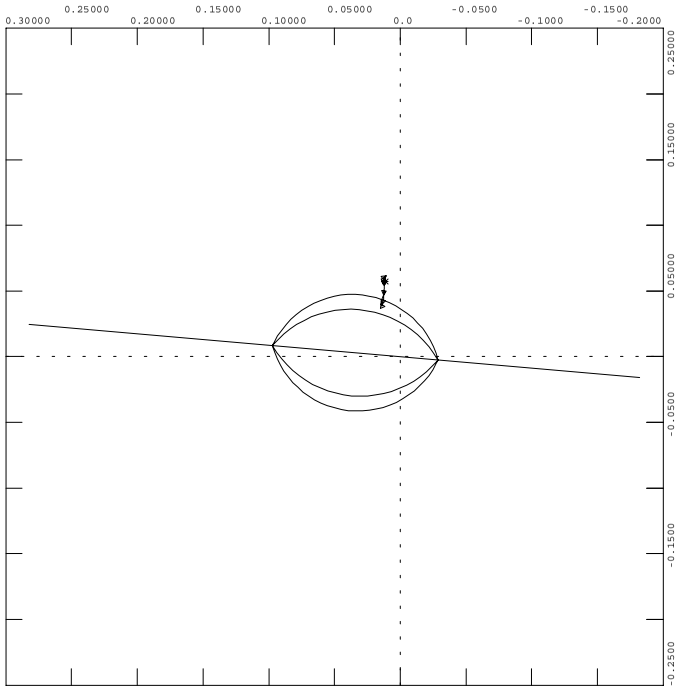


THU, MAY 02 2002 12:42
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

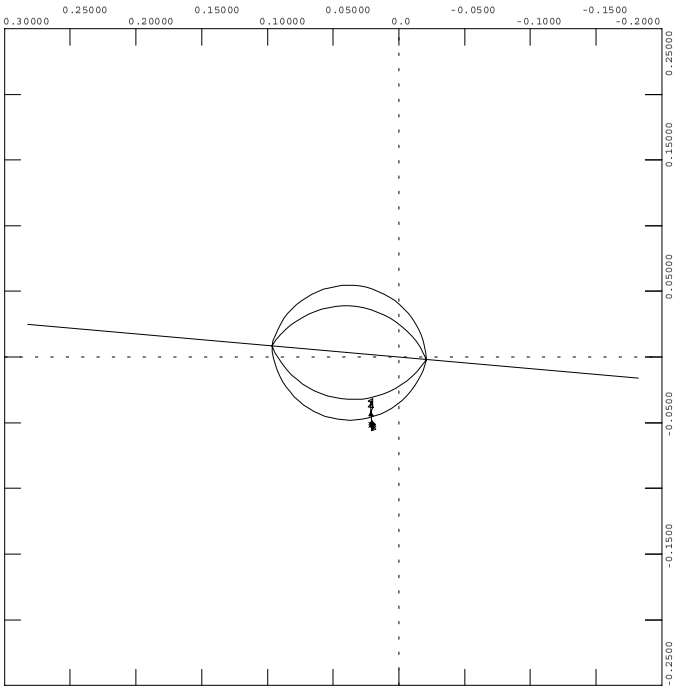


THU, MAY 02 2002 12:42
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

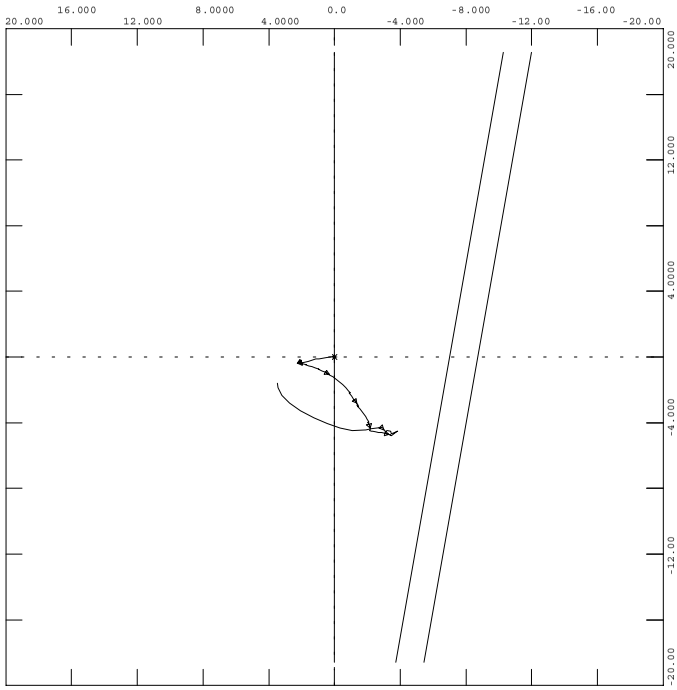


THU, MAY 02 2002 12:42
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

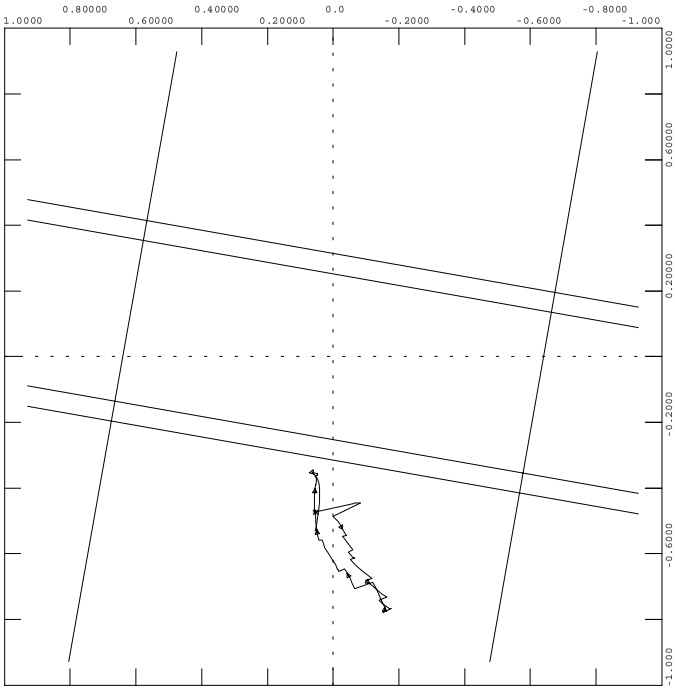


THU, MAY 02 2002 12:42
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

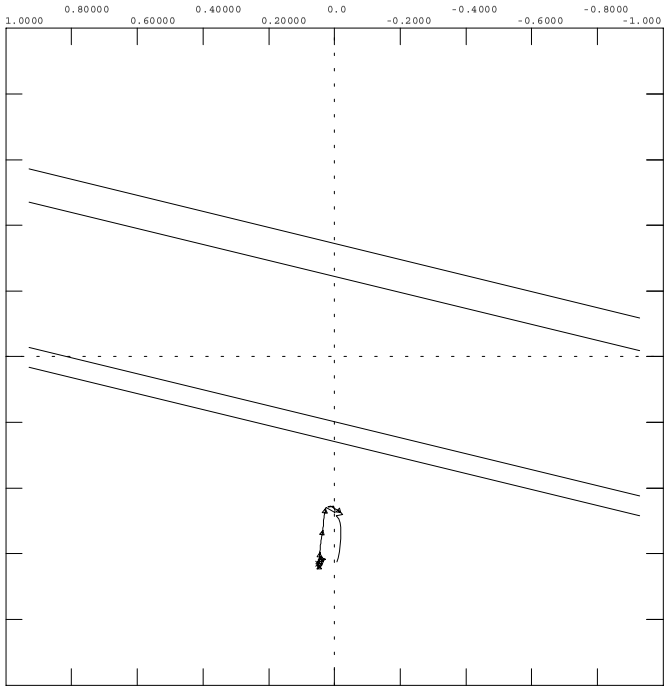


THU, MAY 02 2002 12:42
L20D-DRAYTON-EMRG (776)
CHNL# 815: [R-752 3458 1]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]

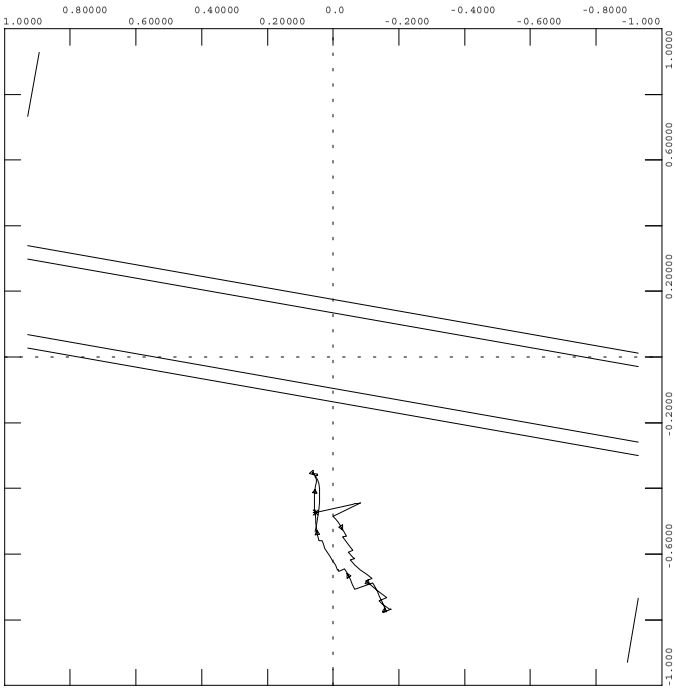


THU, MAY 02 2002 12:42
R50M AT MORANVILLE (520)
CHNL# 821: [R-757 1679 1]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]

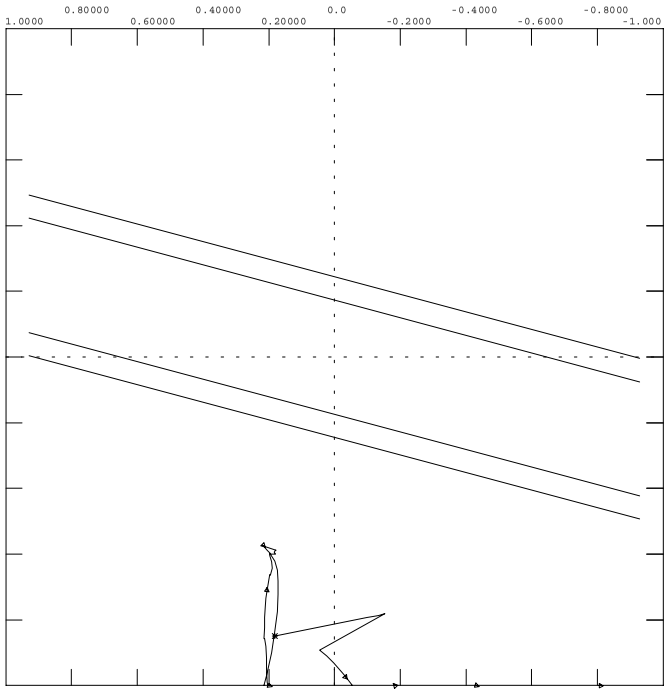


THU, MAY 02 2002 12:42
L20D AT DRAYTON (506)
CHNL# 815: [R-752 3458 1]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]

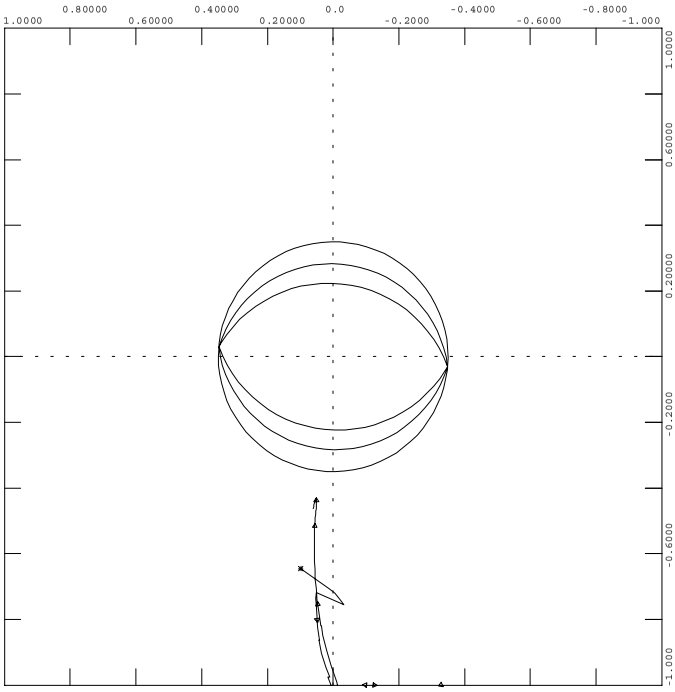


THU, MAY 02 2002 12:42
L20D-PRAIRIE (510)
CHNL# 819: [R-755 752 1]

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

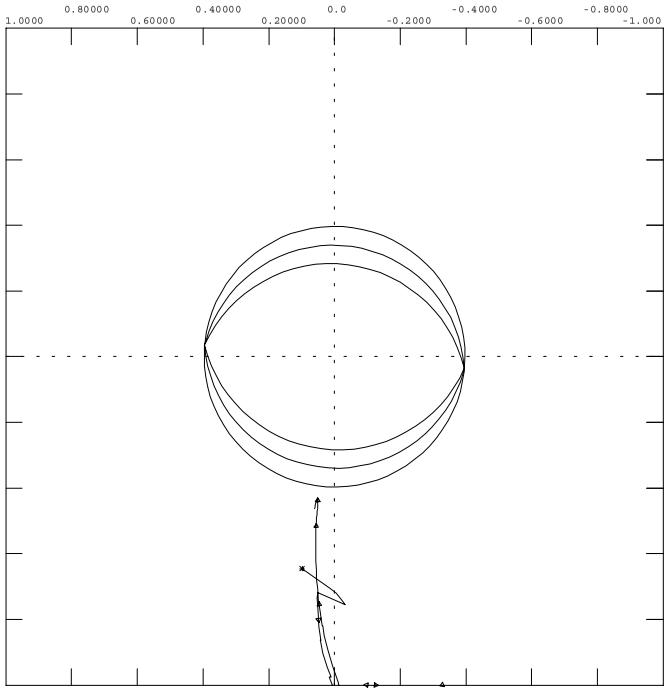
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

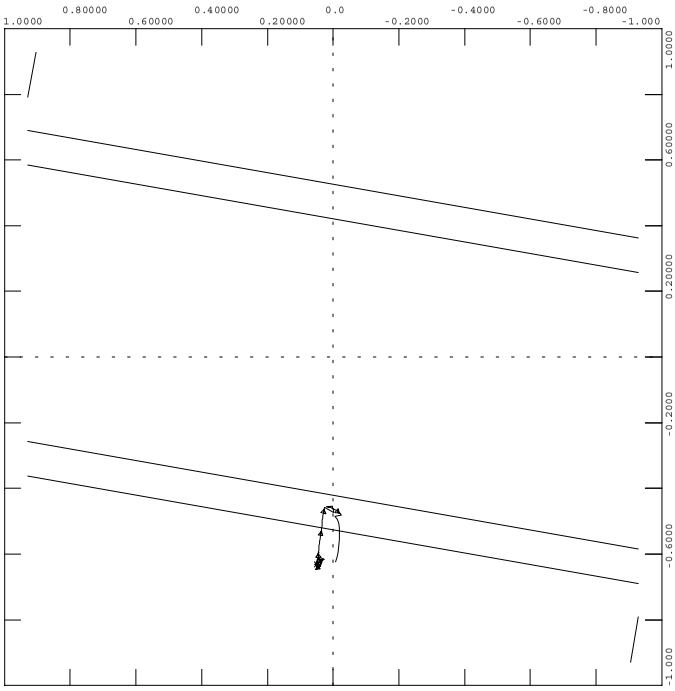
RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

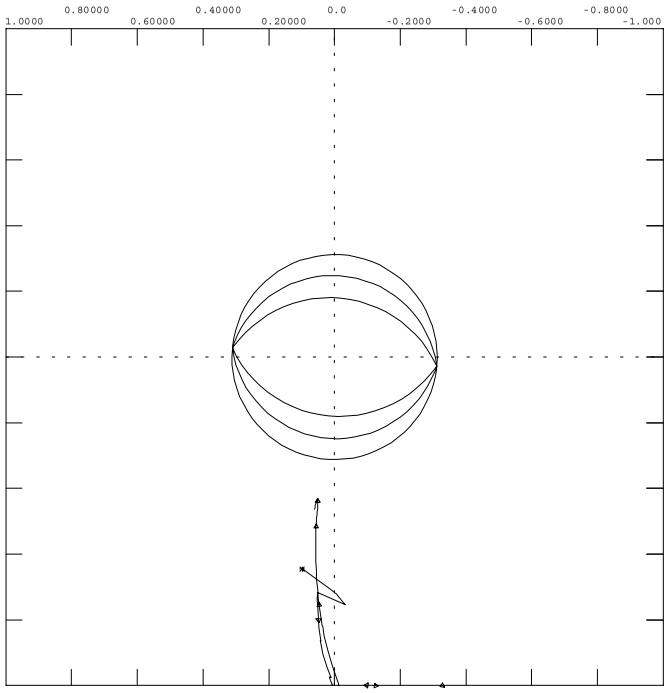
RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



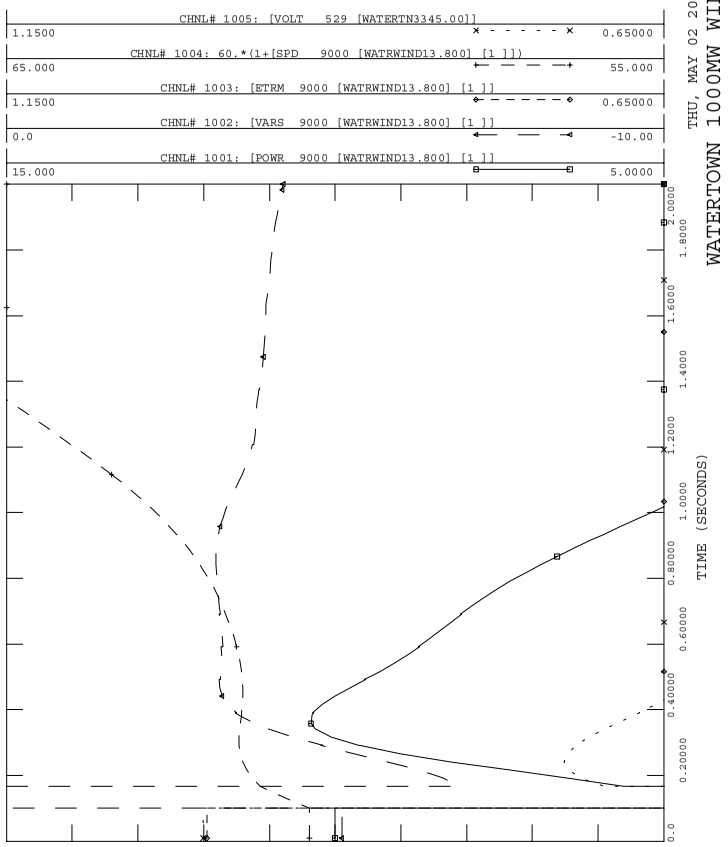
UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

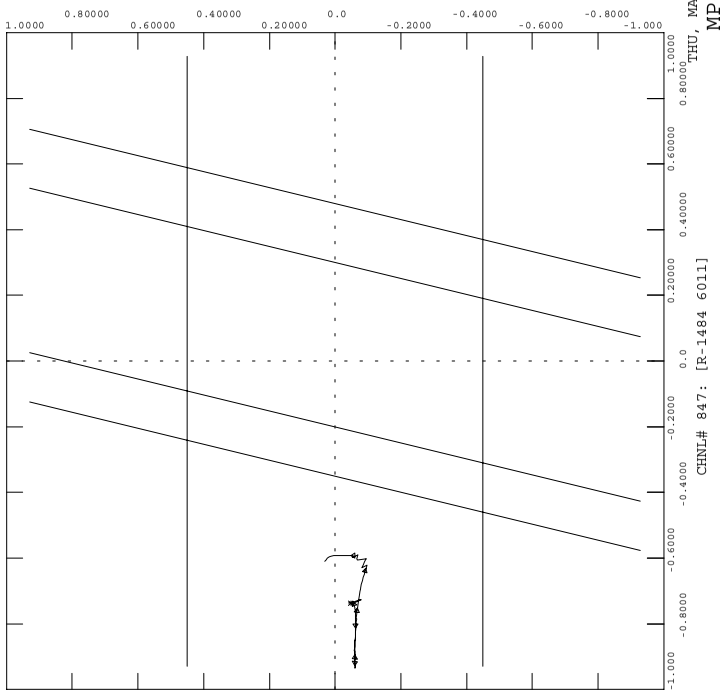


THU, MAY 02 2002 12:42
WATERTOWN 1000MW WIND UNI

UPE-SO04AA.S5C1XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXX-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 2.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



THU, MAY 02 2002 12:42
MP-OH I.FALLS (779)

APPENDIX 31

SCREENING OF MAPP CONTINGENCIES

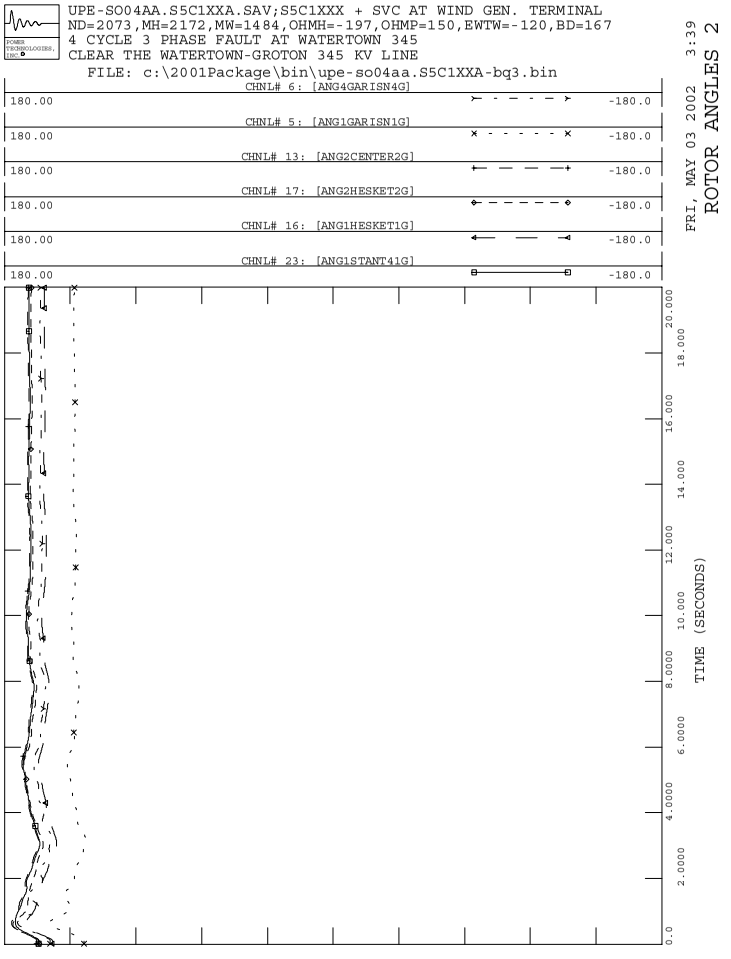
WITH DYNAMIC SIMULATION

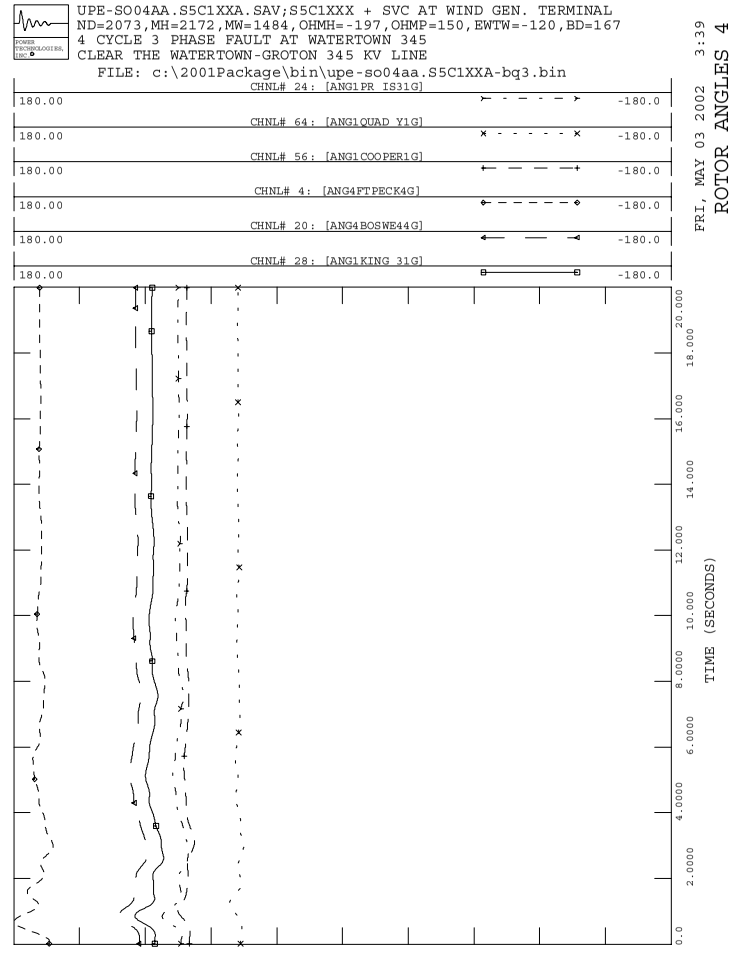
SITE 5 (WATERTOWN)

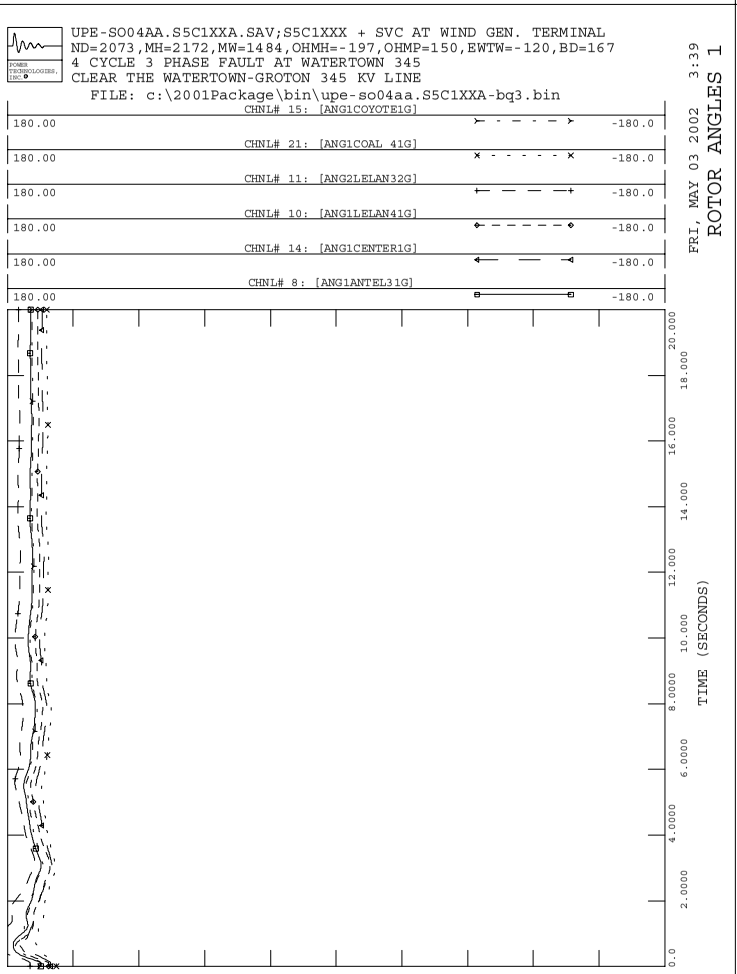
CASE S5C1XXA

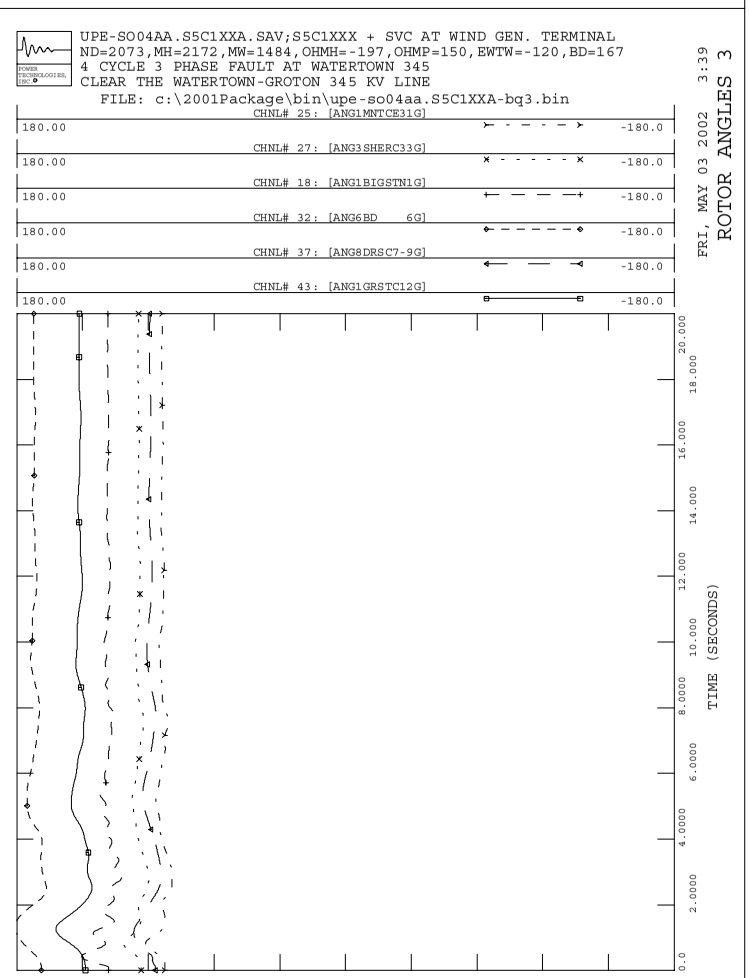
CONTINGENCY BQ3

4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-Groton 345 kV line.


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:39
ROTOR ANGLES 2

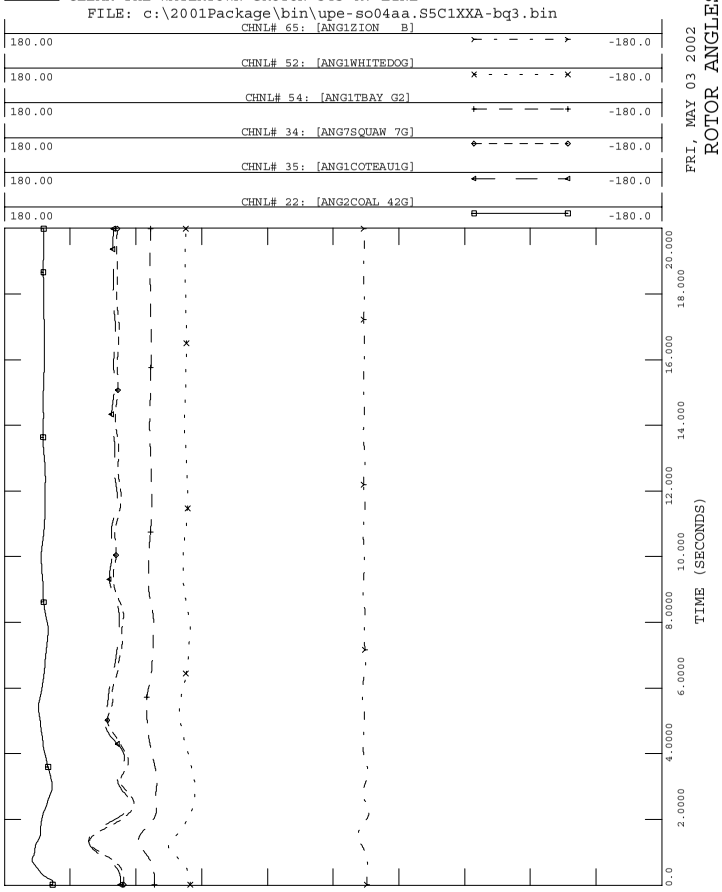

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:39
ROTOR ANGLES 4


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:39
ROTOR ANGLES 1


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:39
ROTOR ANGLES 3

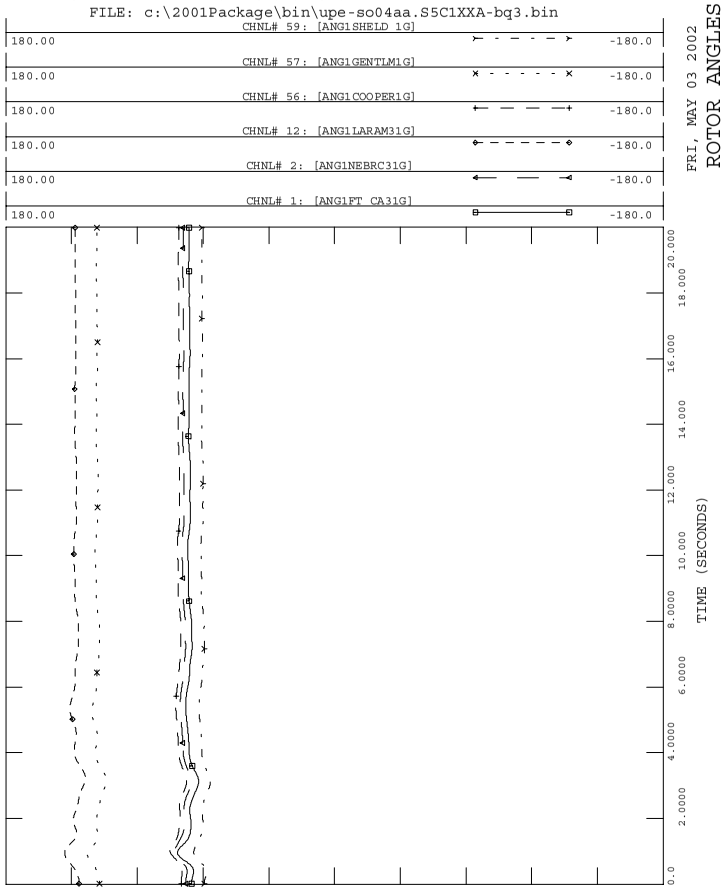
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
ROTOR ANGLES 6



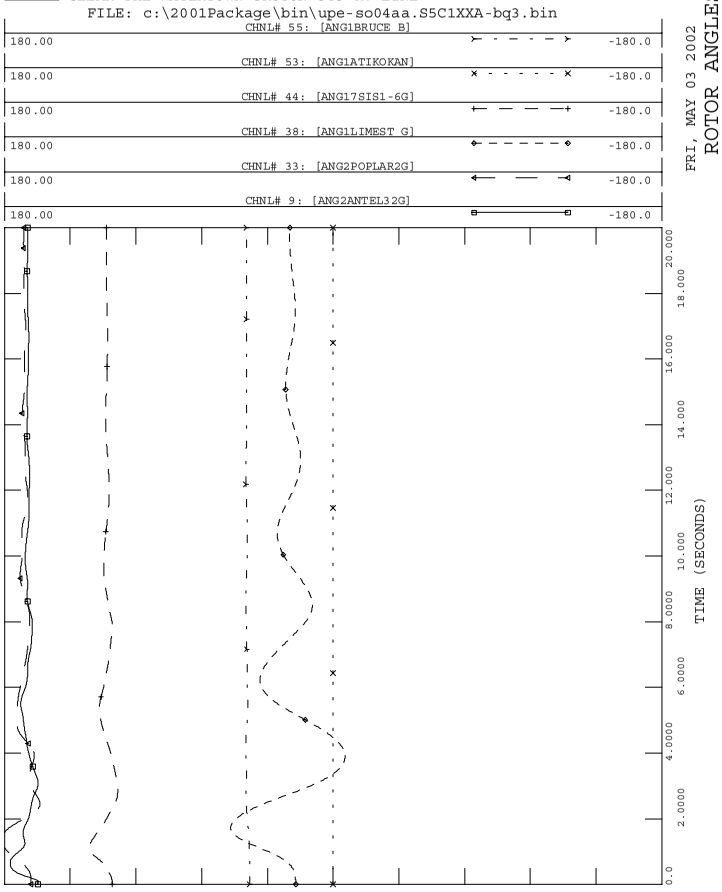
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
ROTOR ANGLES NB



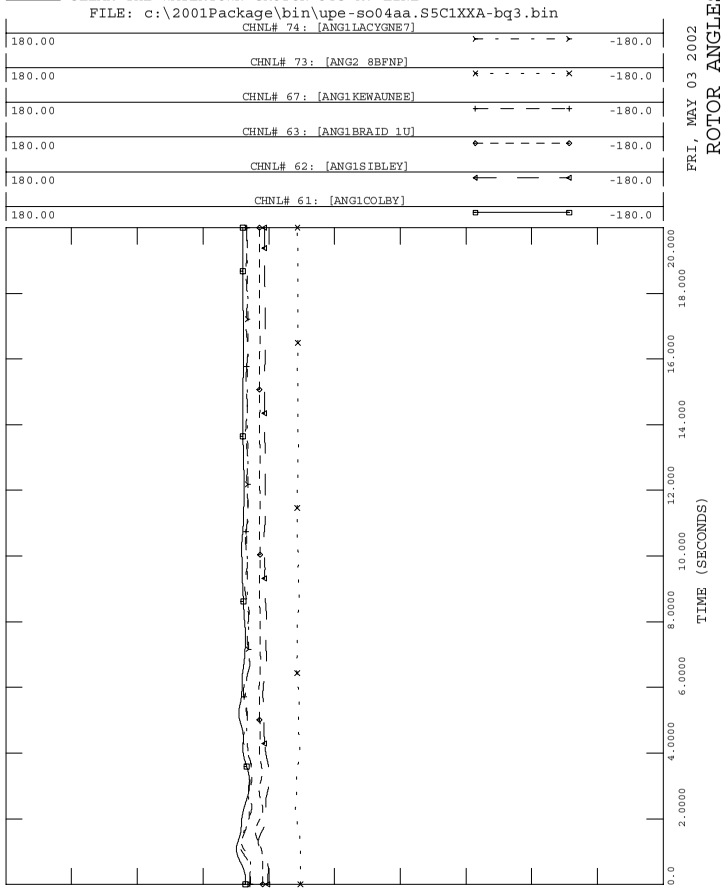
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
ROTOR ANGLES 5



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
ROTOR ANGLES 7



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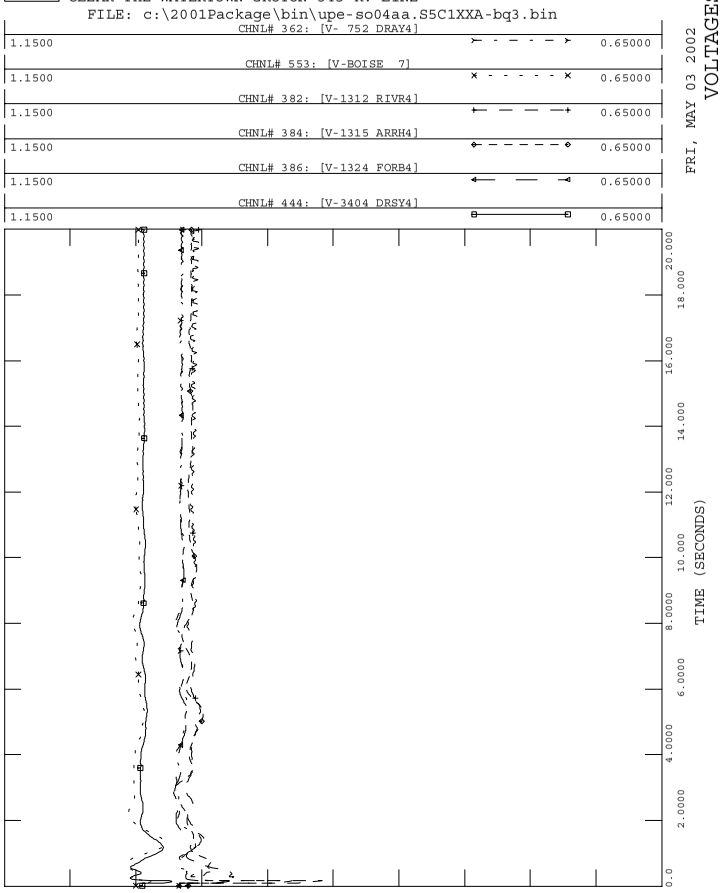
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
VOLTAGES 1



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
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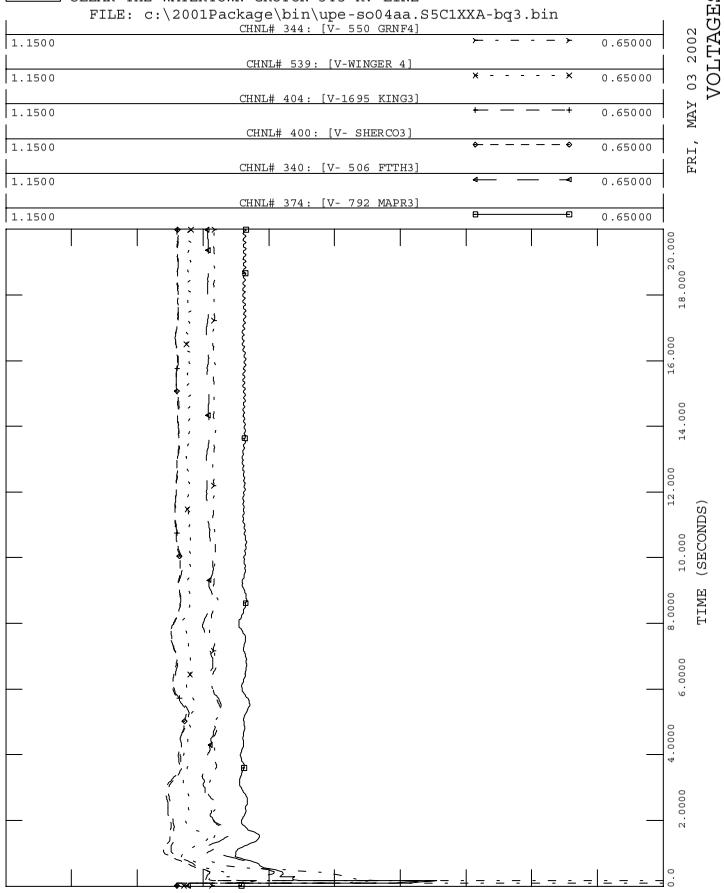
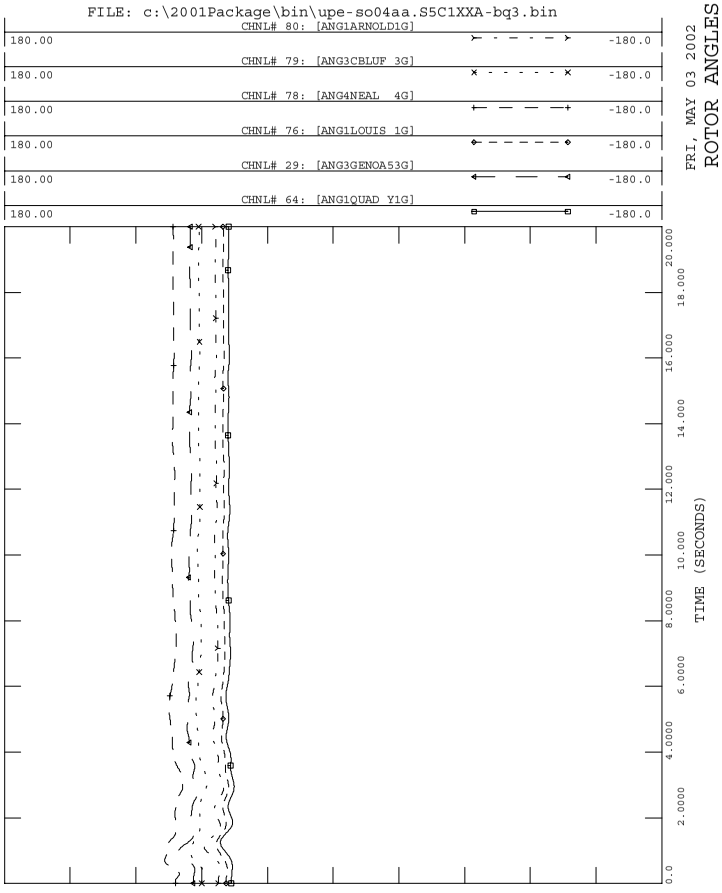
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
VOLTAGES 3



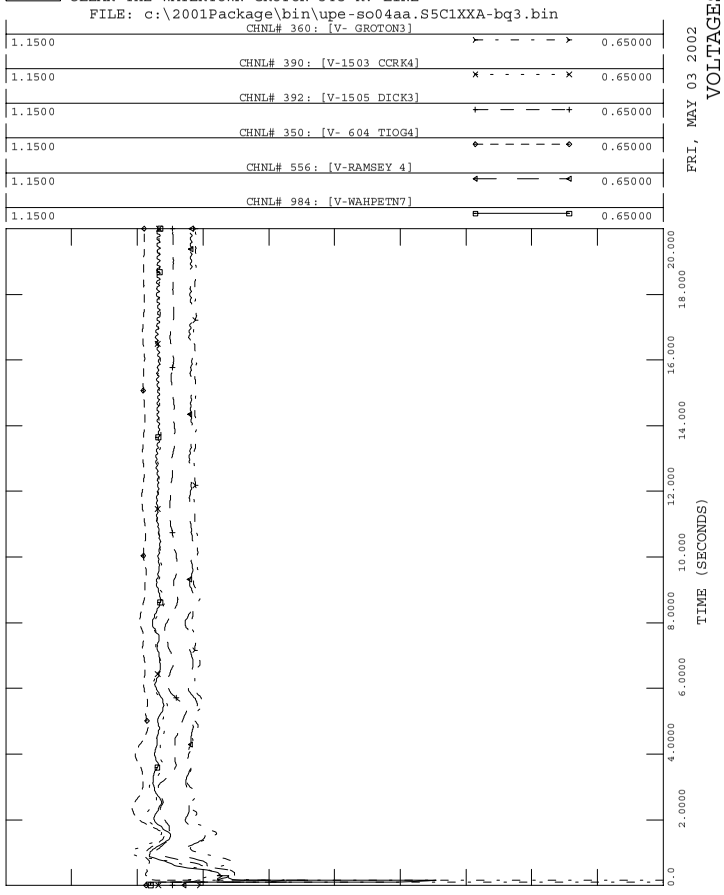
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
ROTOR ANGLES IA



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
VOLTAGES 2



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
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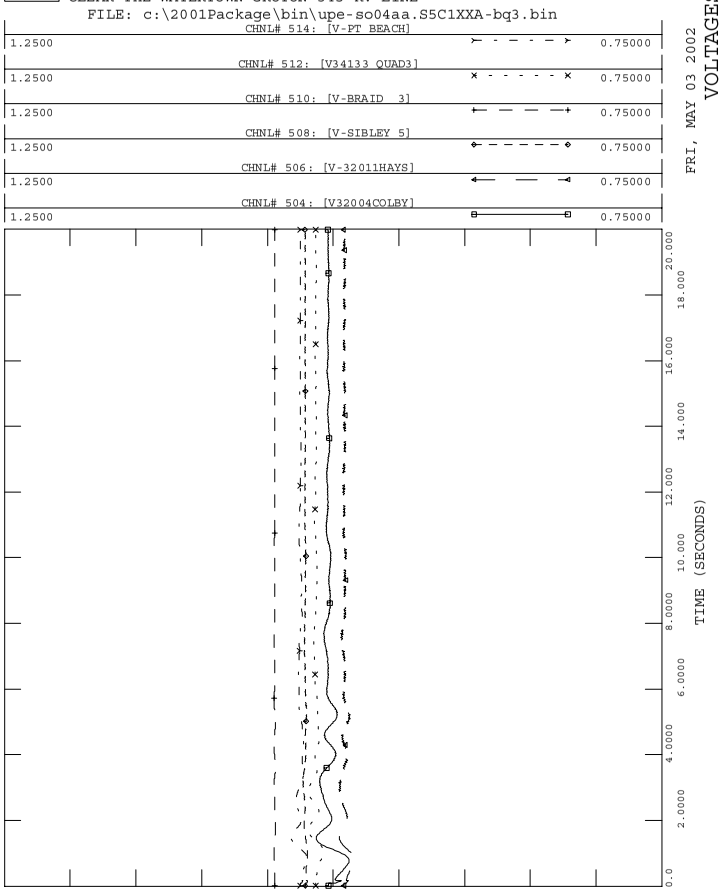
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39

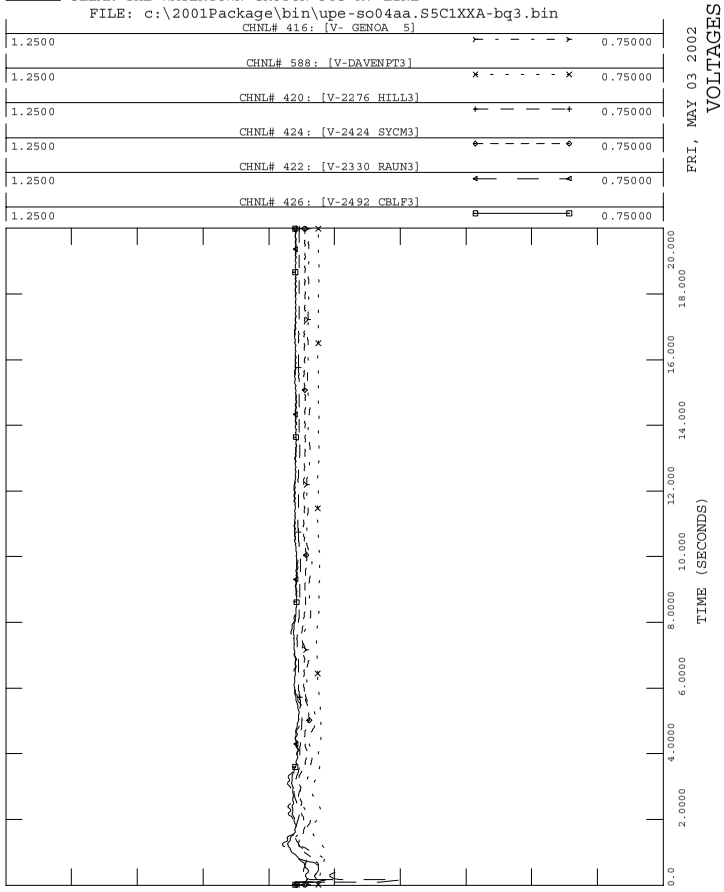
VOLTAGES 5



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39

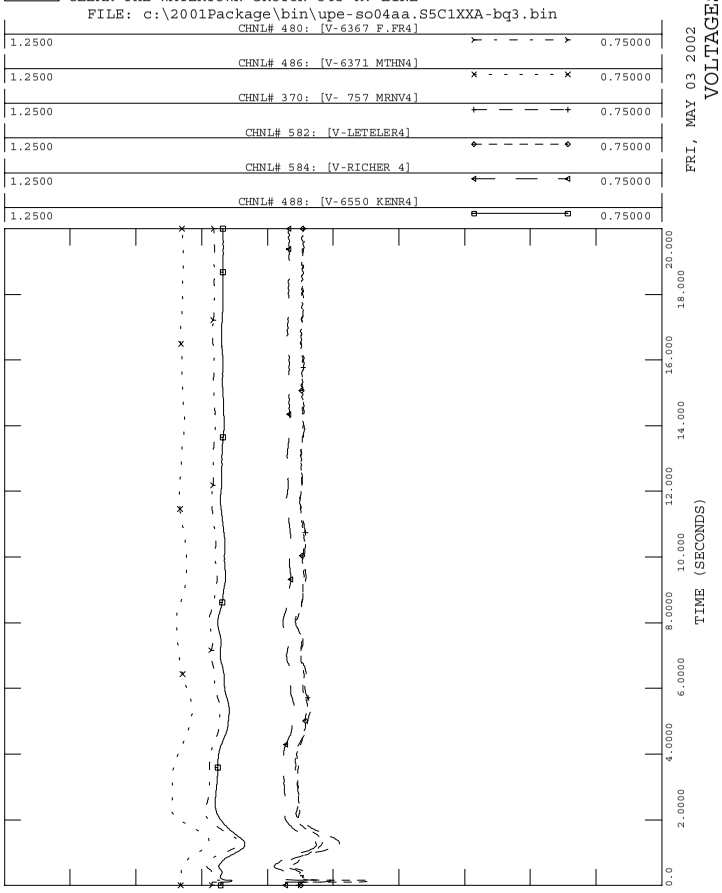
VOLTAGES IA



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39

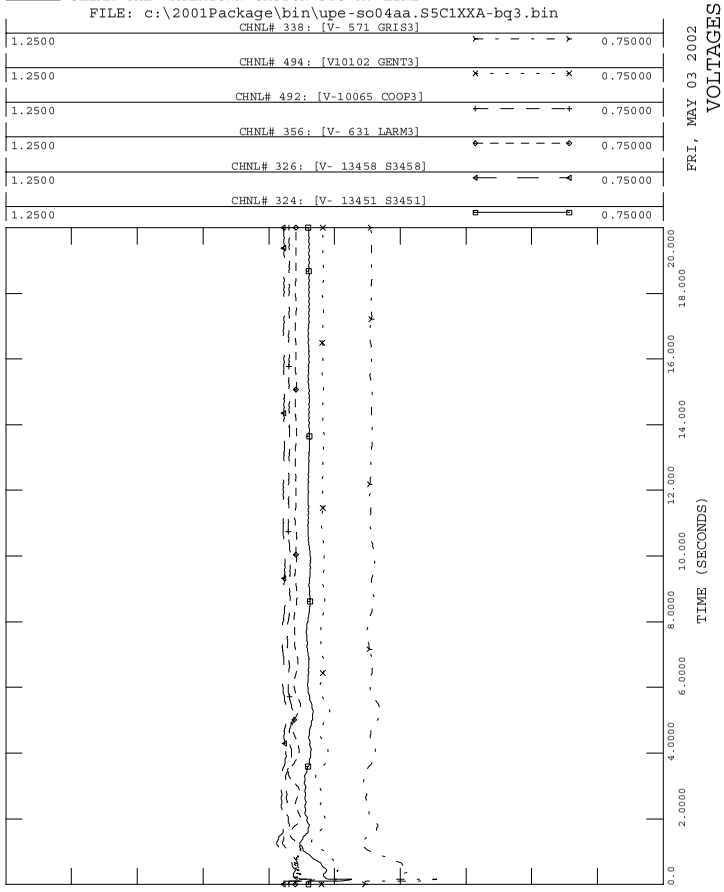
VOLTAGES 4

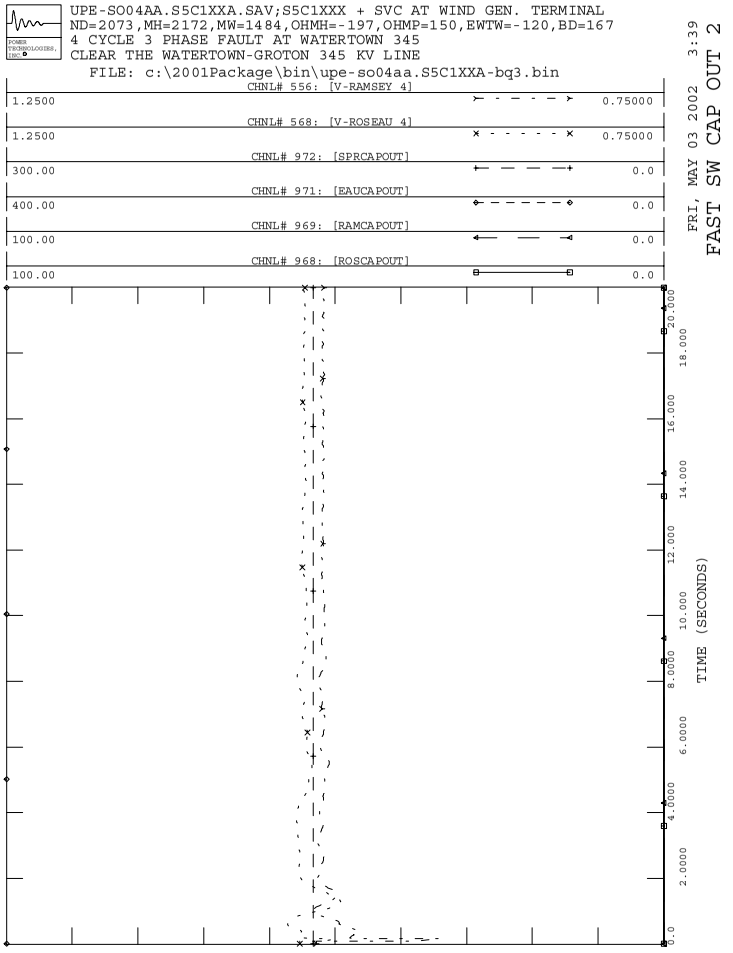


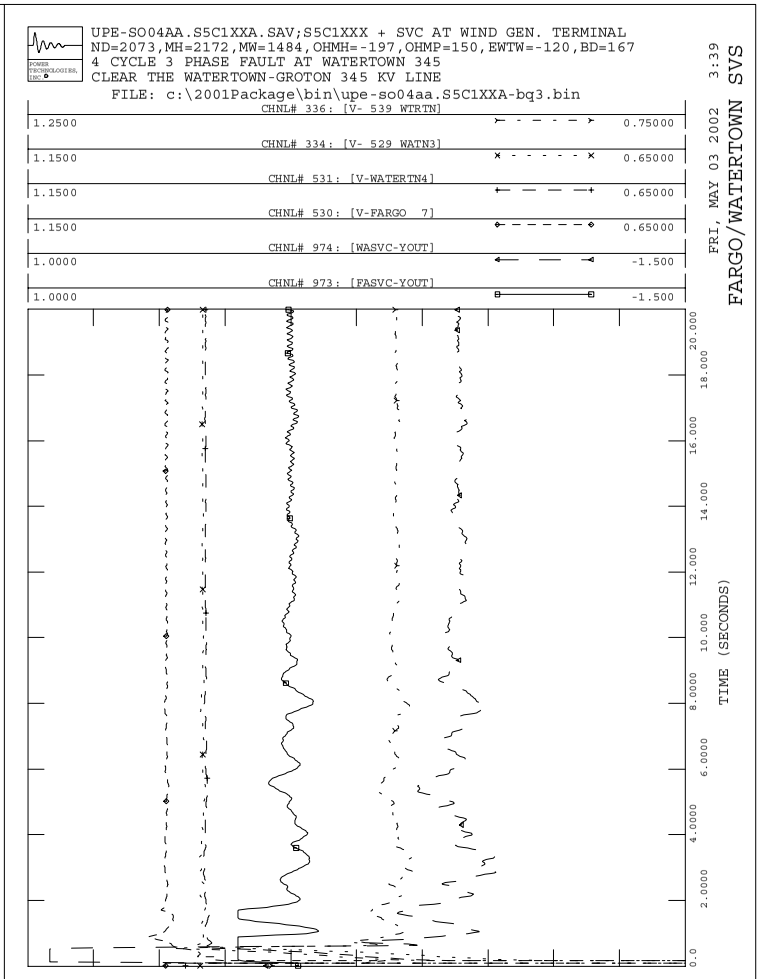
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

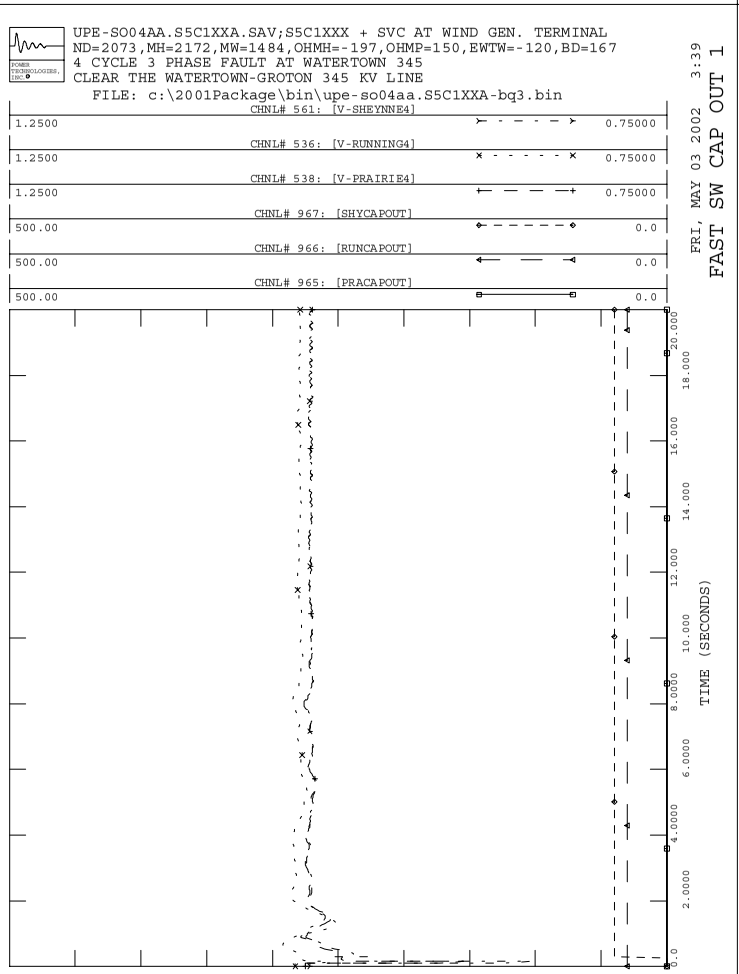
FRI, MAY 03 2002 3:39

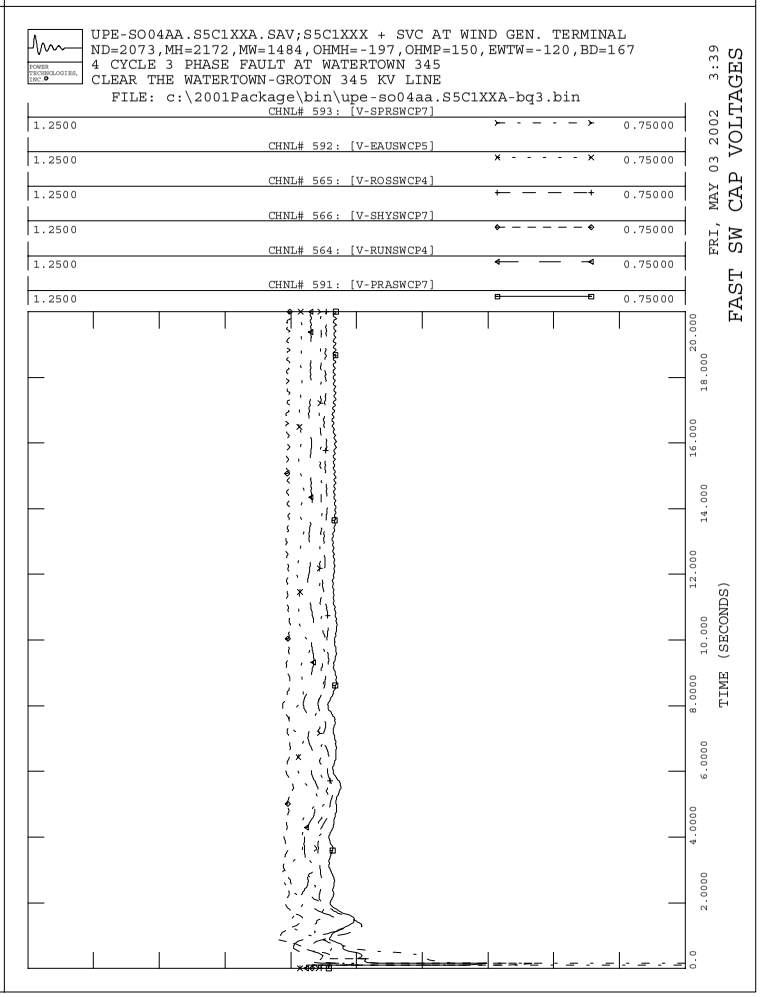
VOLTAGES NB




UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
FRI, MAY 03 2002 3:39
FAST SW CAP OUT 2
TIME (SECONDS)


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
FRI, MAY 03 2002 3:39
FARGO/WATERTOWN SVS
TIME (SECONDS)

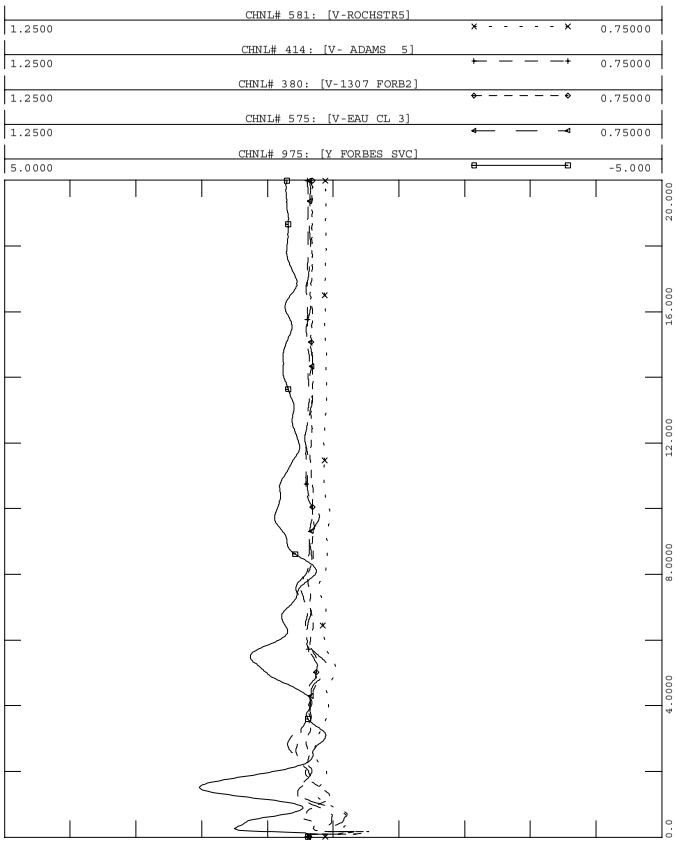

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
FRI, MAY 03 2002 3:39
FAST SW CAP OUT 1
TIME (SECONDS)


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
FRI, MAY 03 2002 3:39
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39

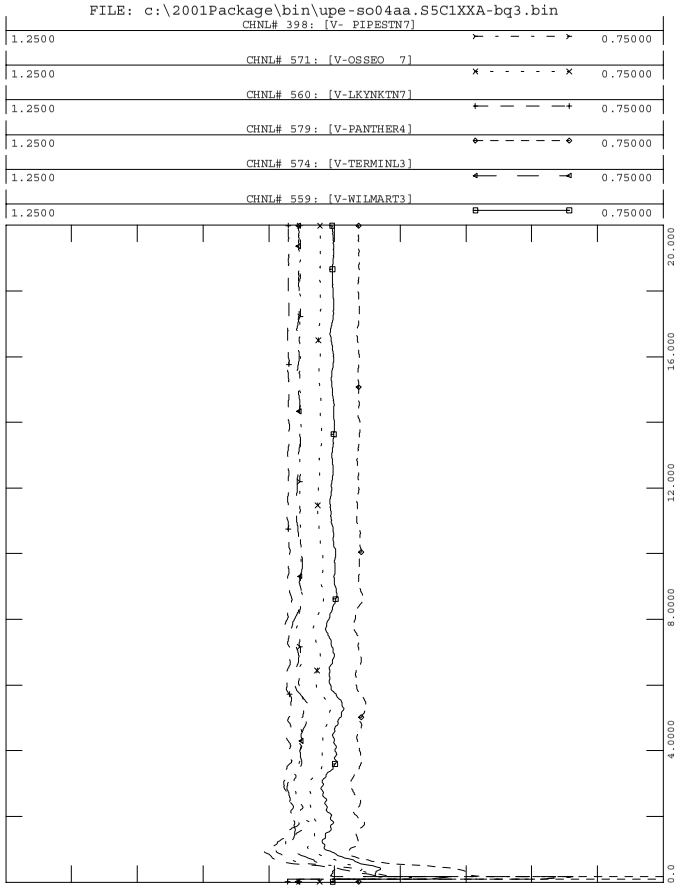
SVC & WISCONSIN VOLT



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39

TC VOLTAGES



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

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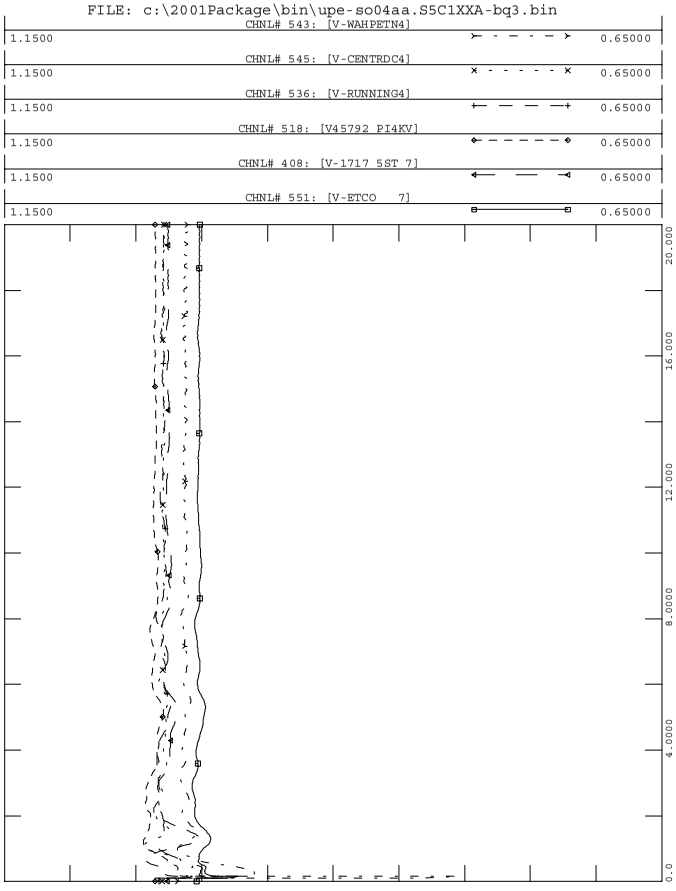
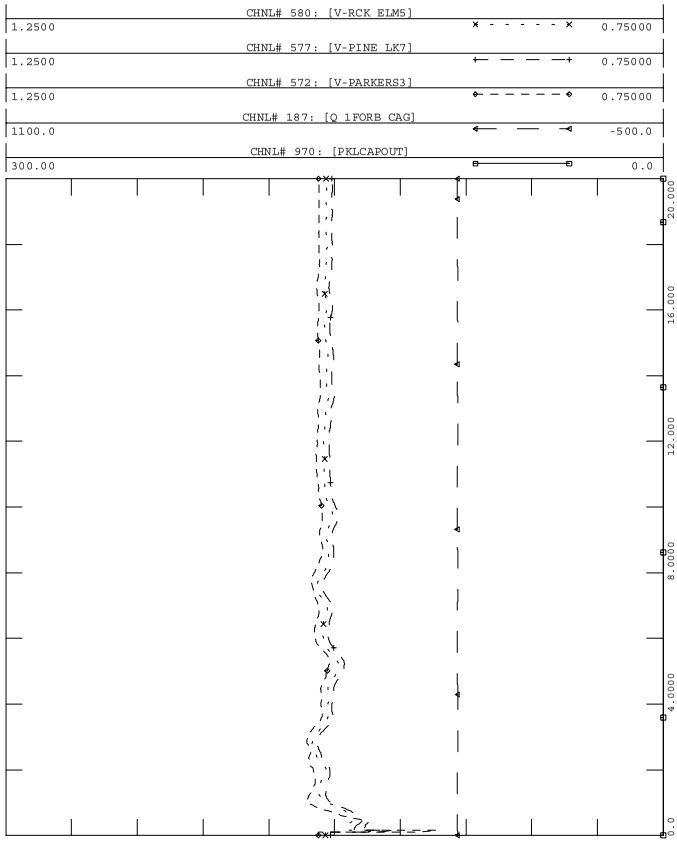
VOLTAGES 6



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39

FORBES SVS OUT & VOLTAGES



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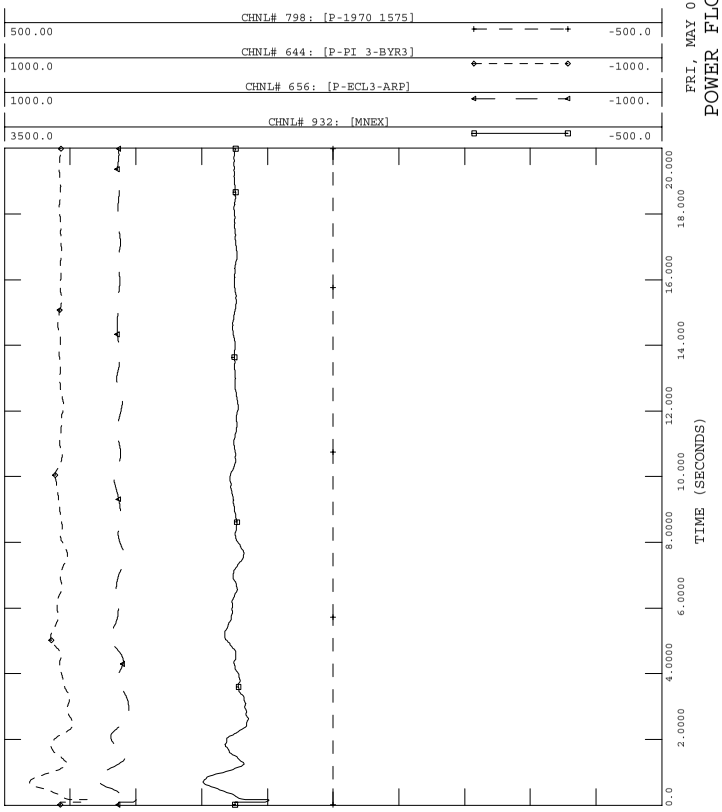
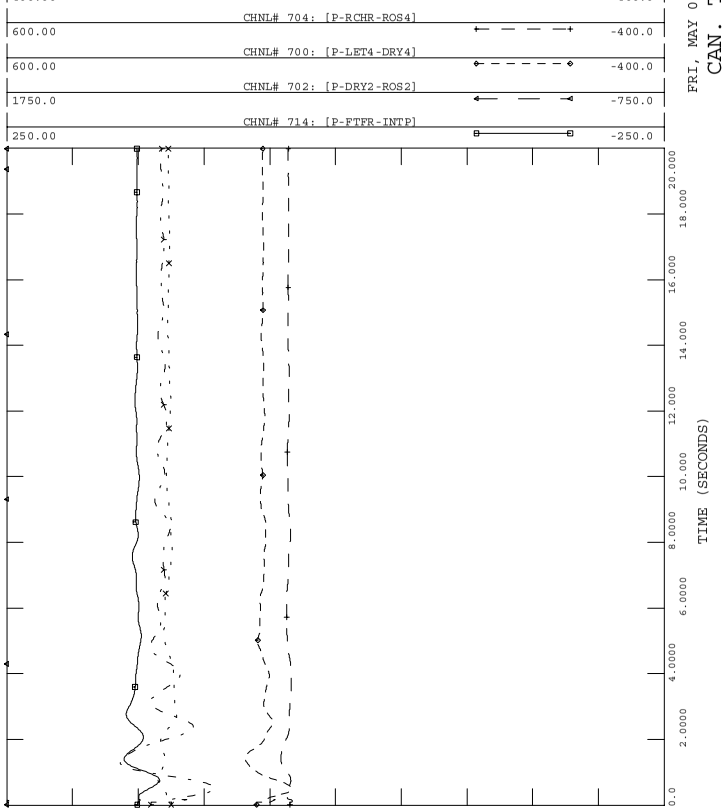
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
POWER FLOW SUMS 2



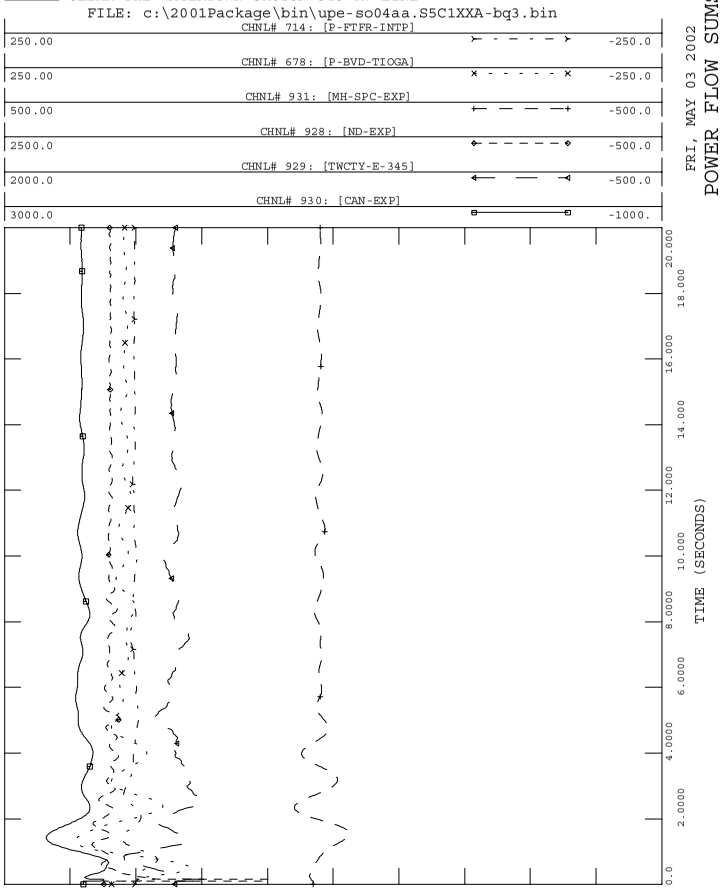
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
CAN. TIE FLOWS



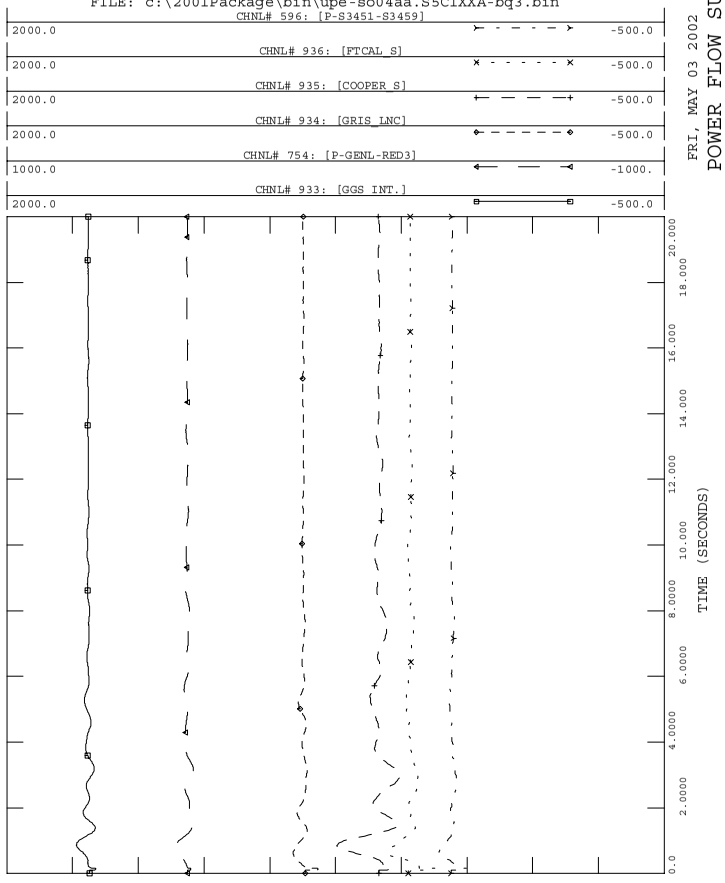
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
POWER FLOW SUMS 1



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
POWER FLOW SUM 3



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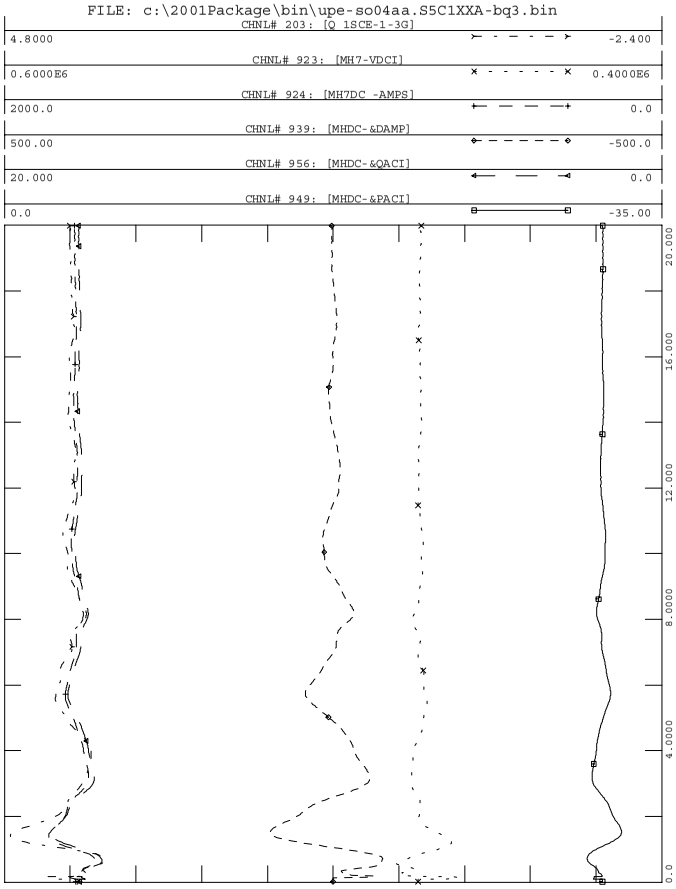
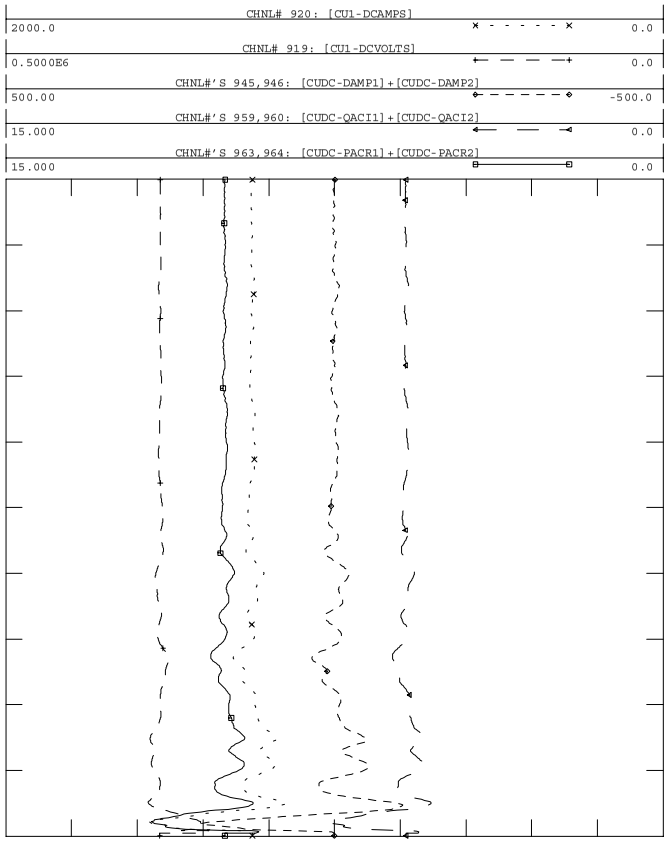
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
MH DC PARAMETERS



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
CU DC #1



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
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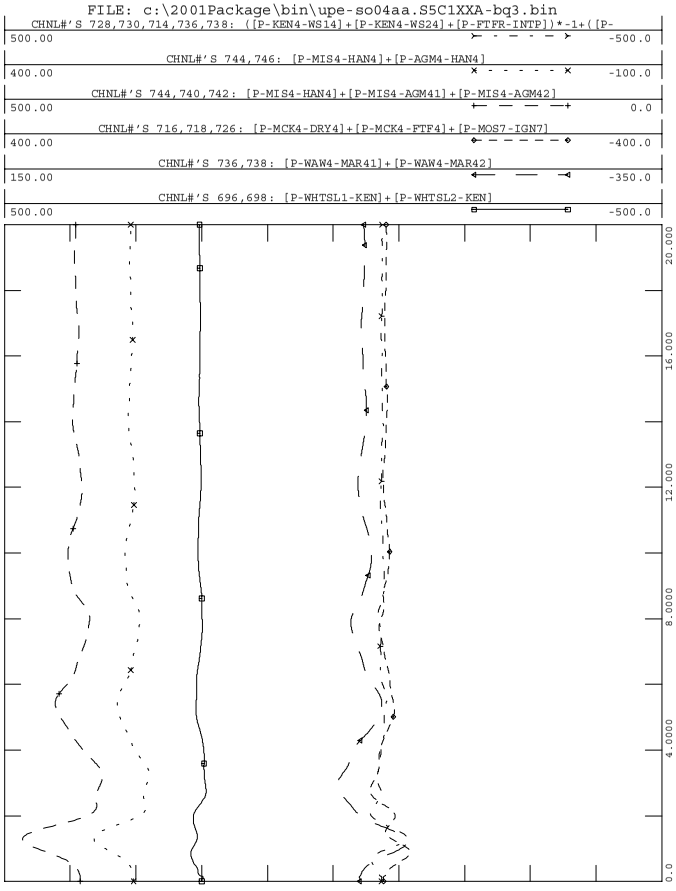
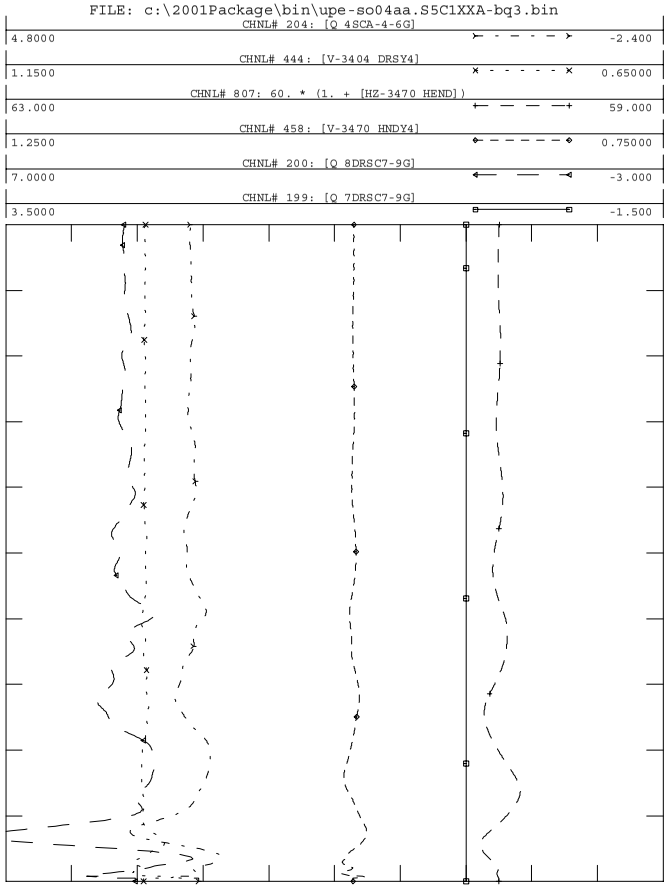
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39
OH TIE FLOWS



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

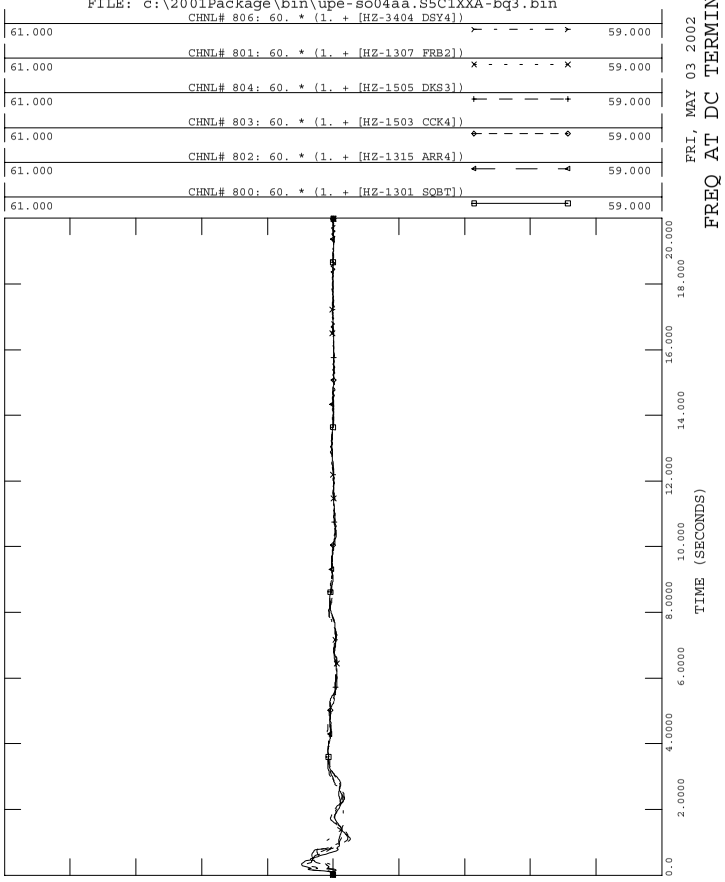
FRI, MAY 03 2002 3:39
MH DC PARAMETERS



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39

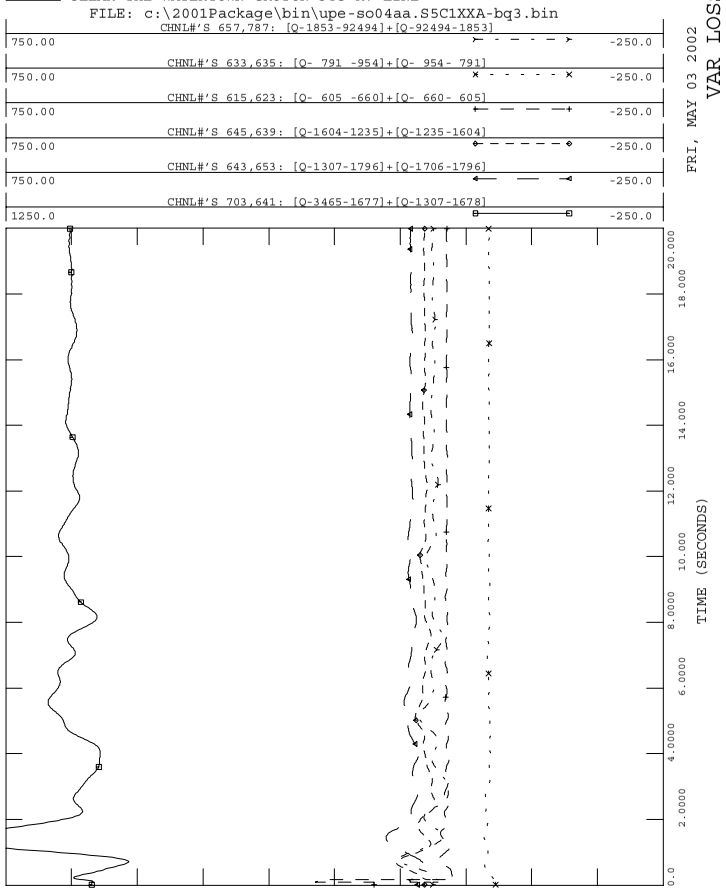
FREQ AT DC TERMINALS



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39

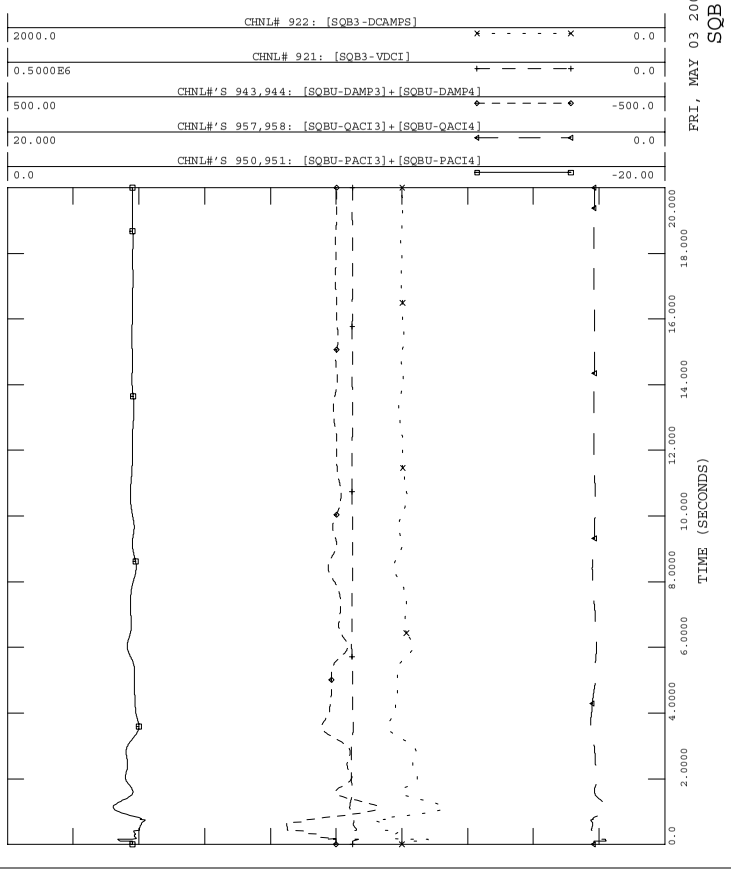
VAR LOSSES



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39

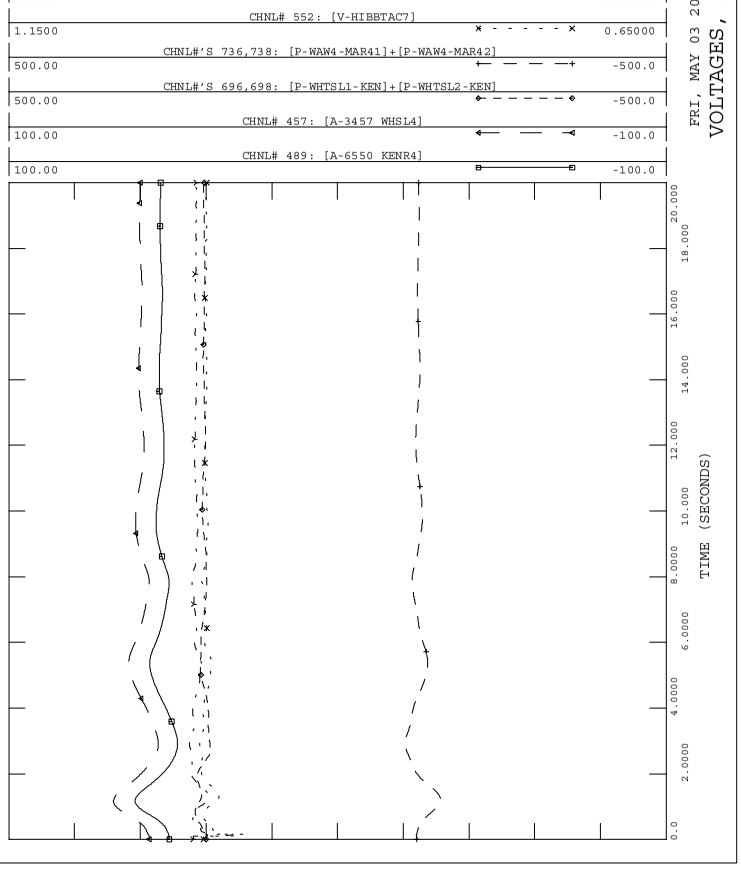
SQB DC #3



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

FRI, MAY 03 2002 3:39

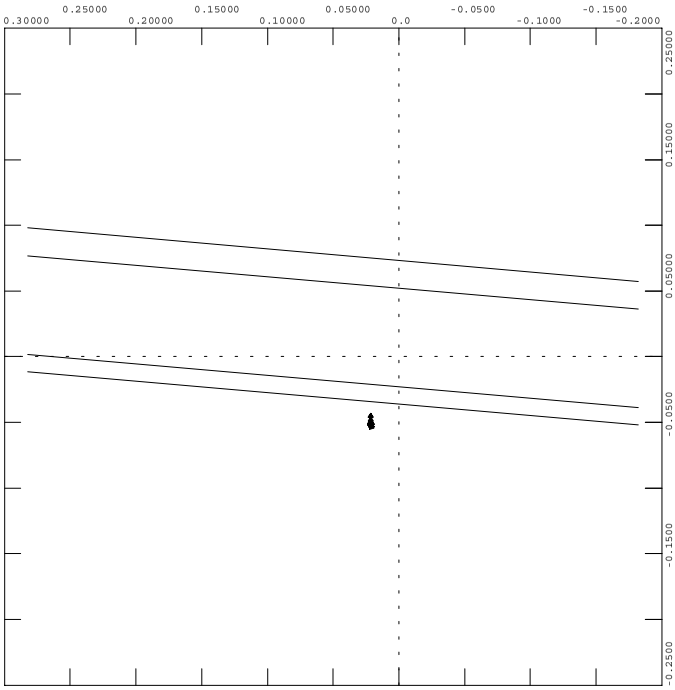
VOLTAGES, ANGLES



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



FRI, MAY 03 2002 3:39
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

RELAY: RELAYG
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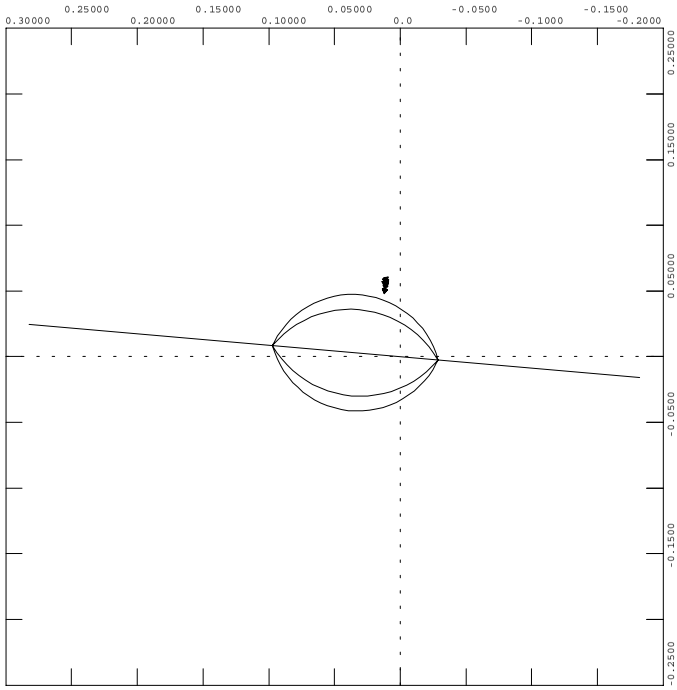
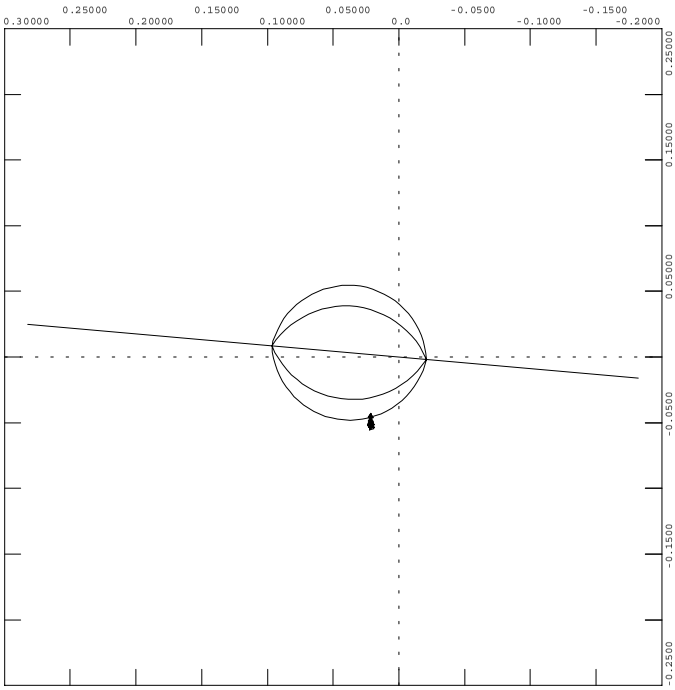


FRI, MAY 03 2002 3:39
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

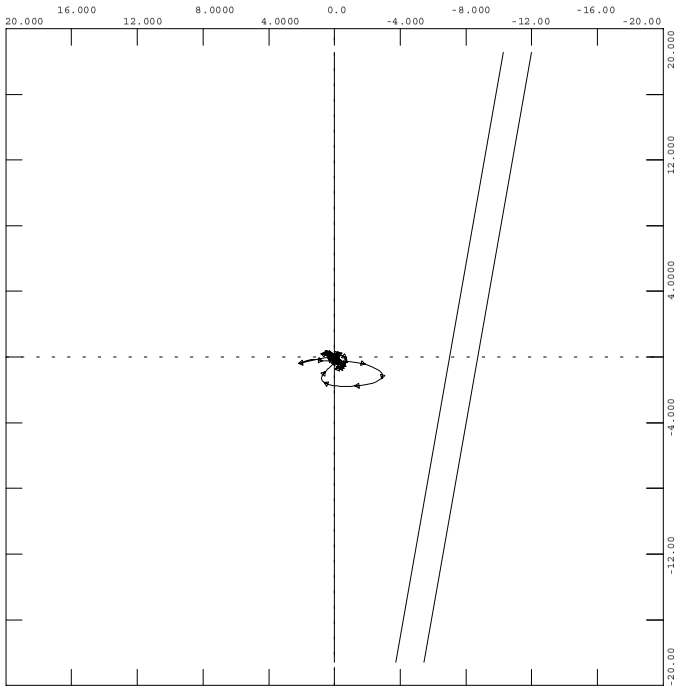


FRI, MAY 03 2002 3:39
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]



FRI, MAY 03 2002 3:39
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

RELAY: SLINOS
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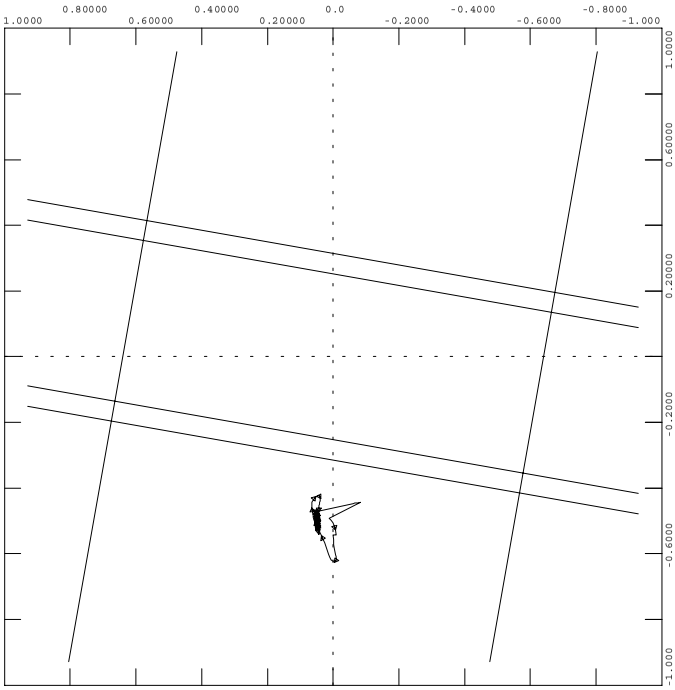
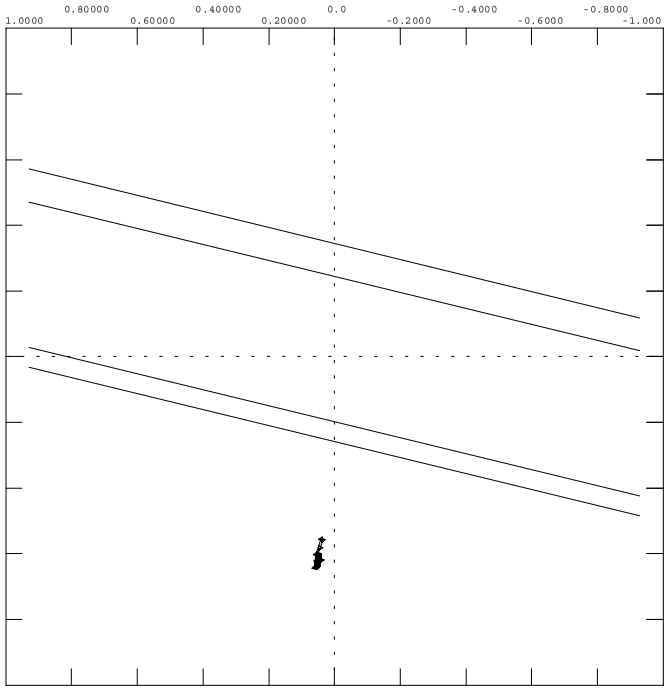
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

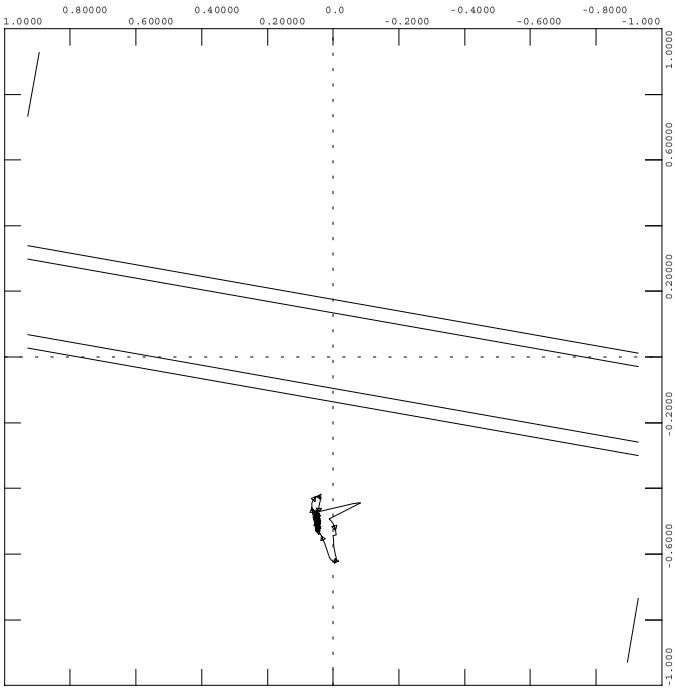
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

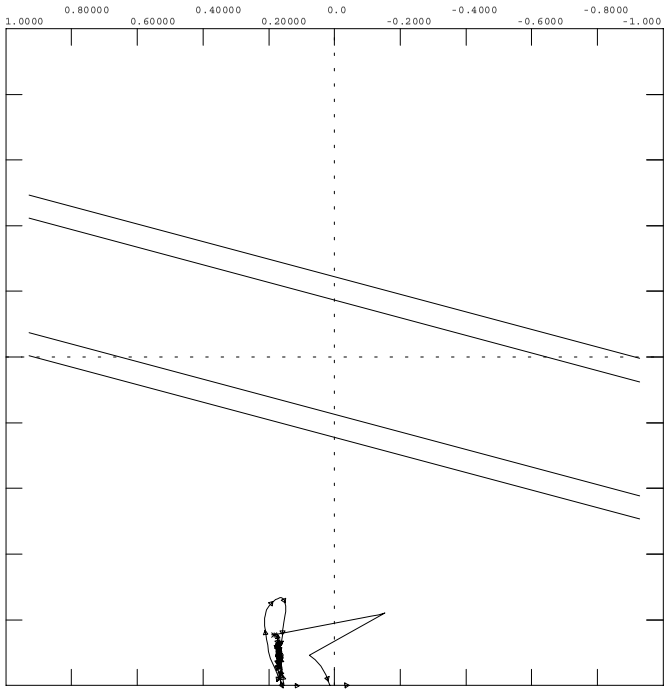
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

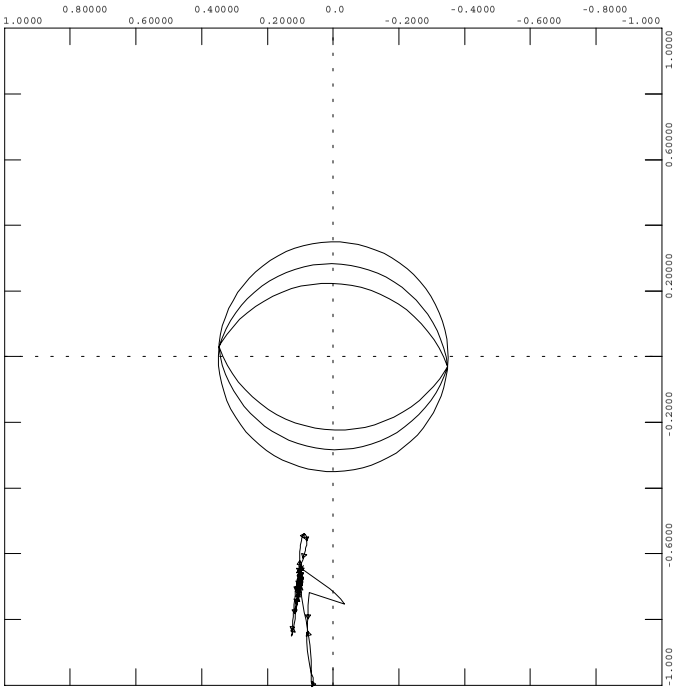
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

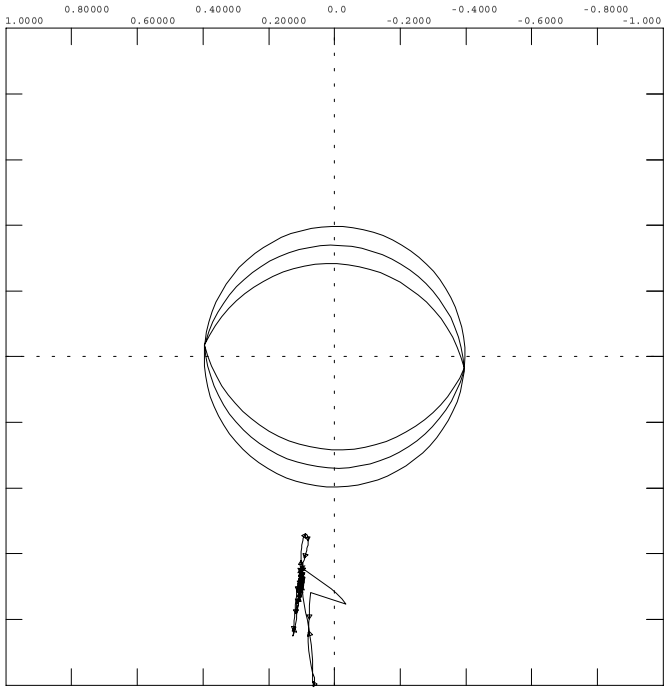
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

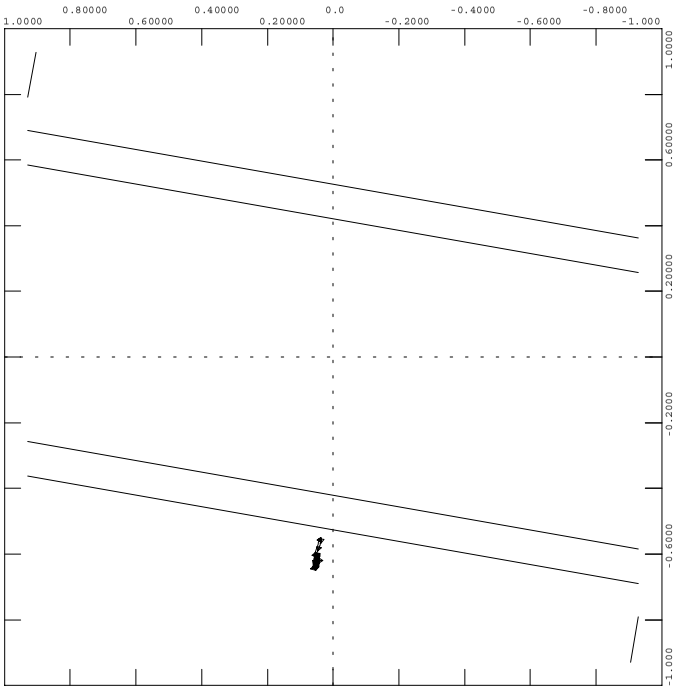
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

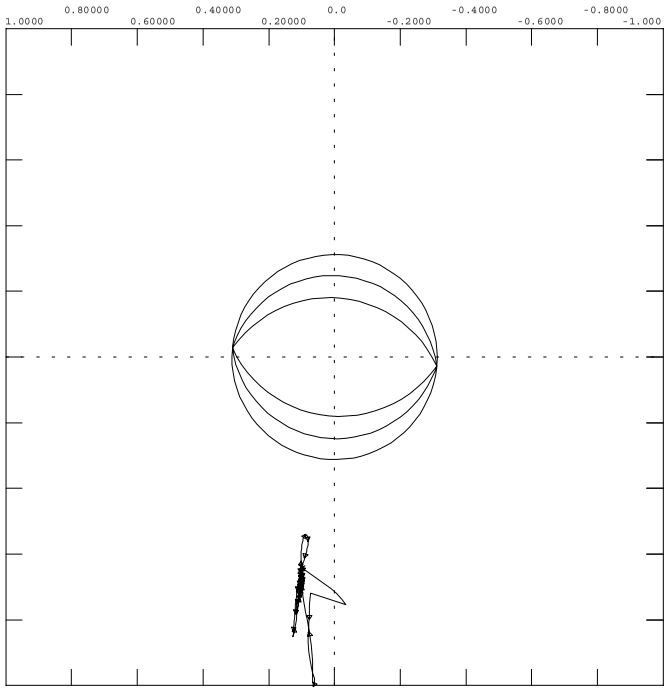
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

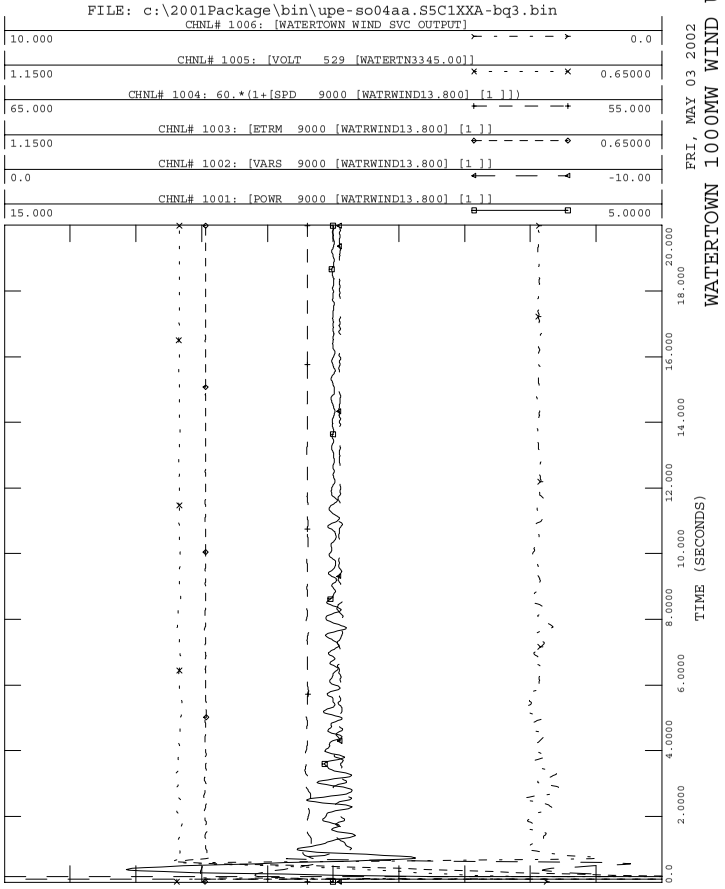
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

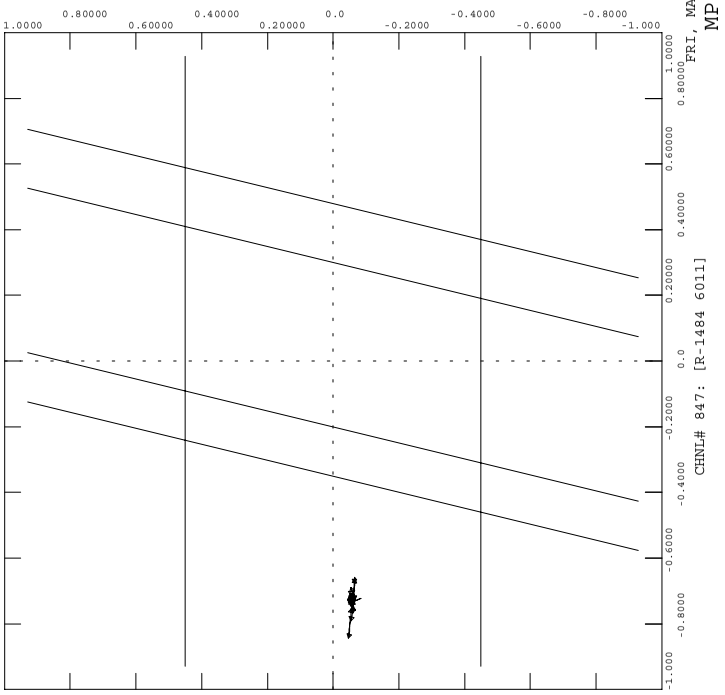


FRI, MAY 03 2002 3:39
WATERTOWN 1000MW WIND UNI

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GROTON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-bq3.bin

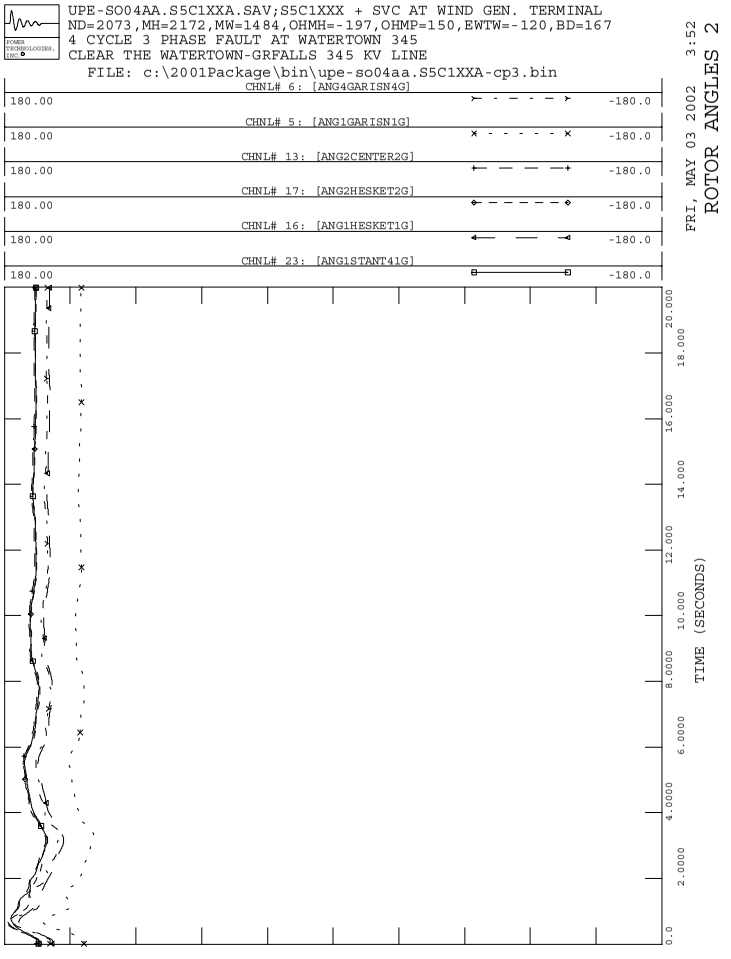
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

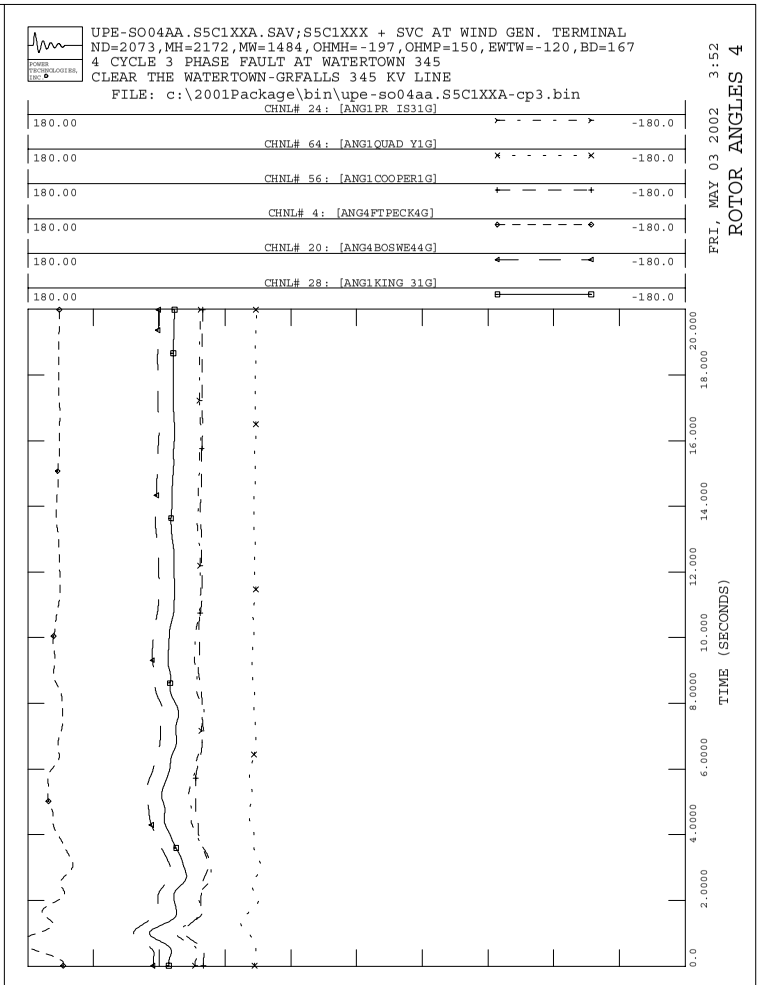


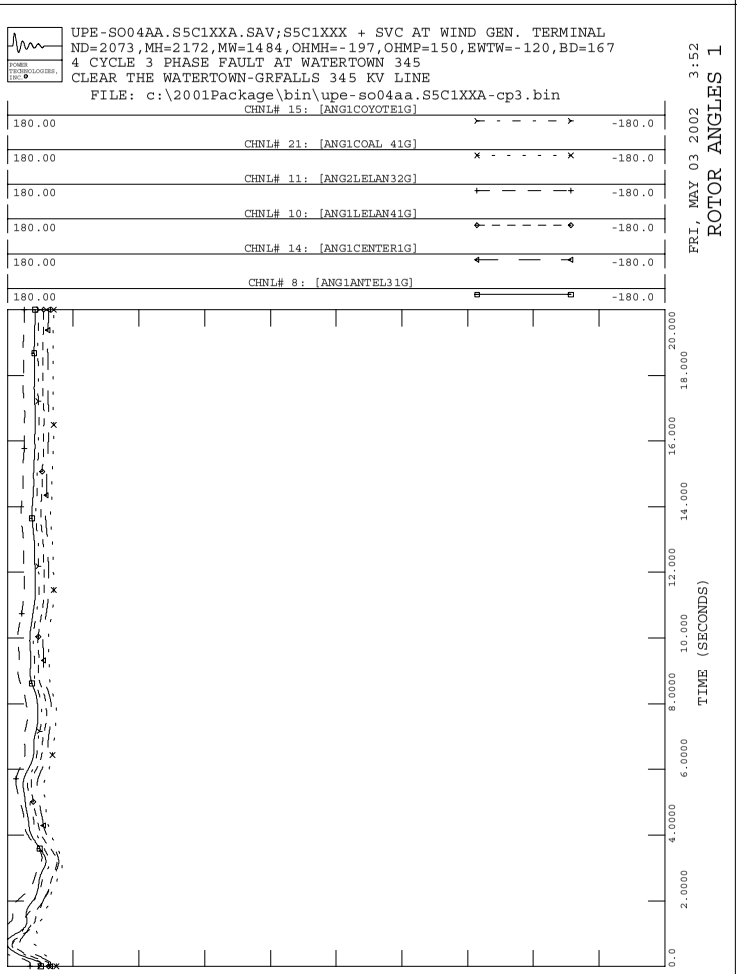
FRI, MAY 03 2002 3:39
MP-OH I.FALLS (779)

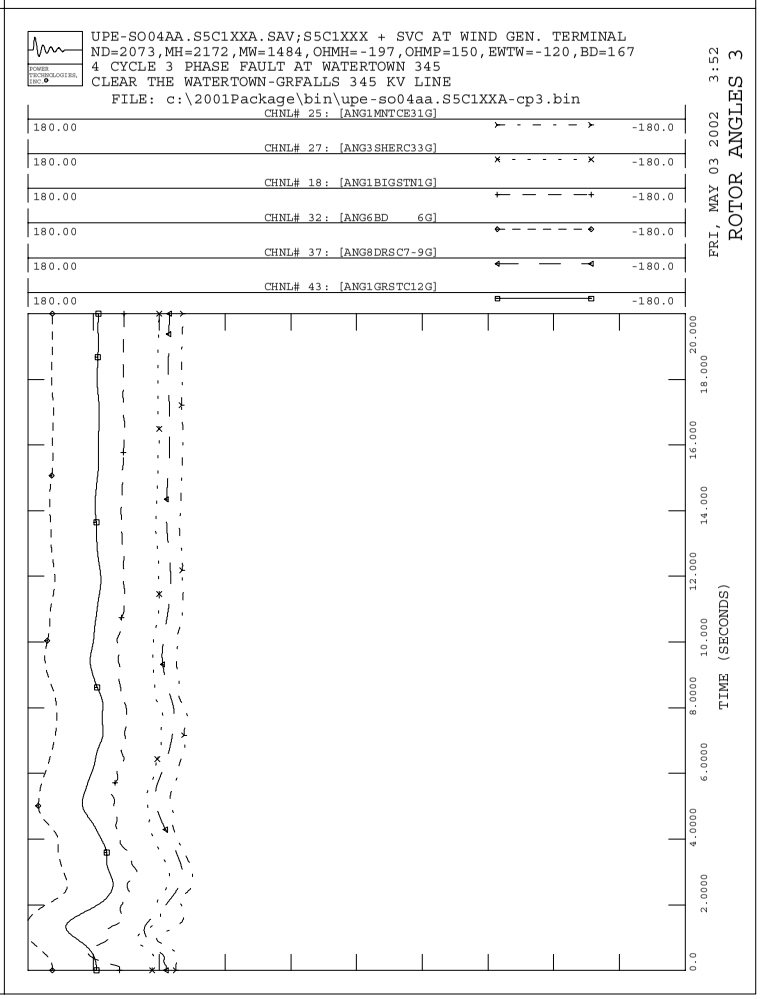
CONTINGENCY CP3

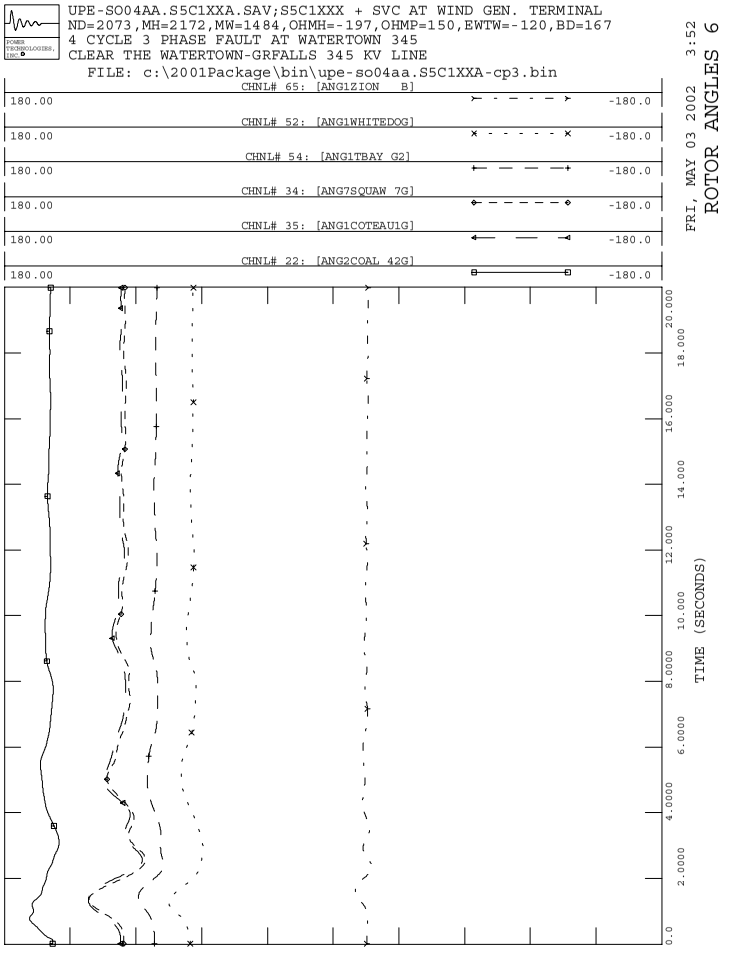
4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-Gr. Falls 345 kV line

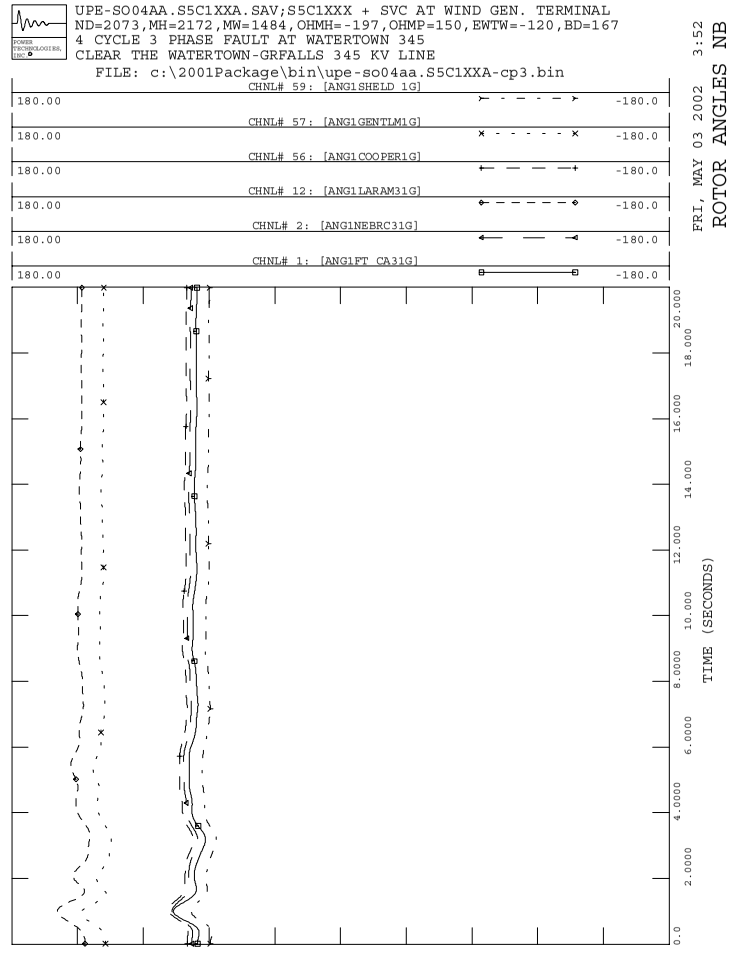

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:52
ROTOR ANGLES 2

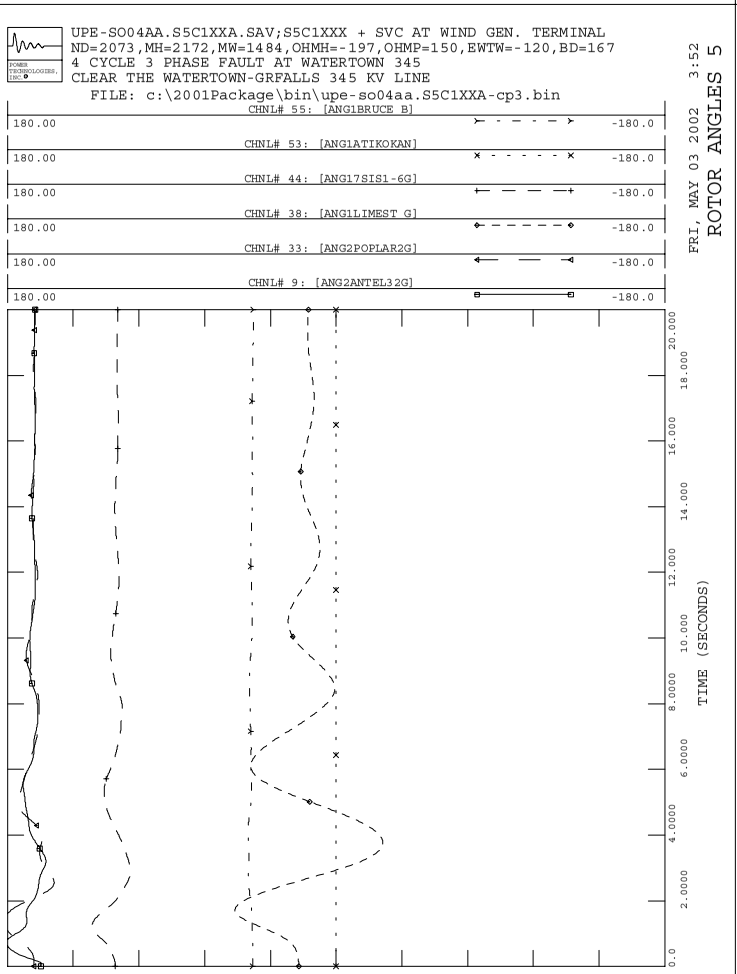

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:52
ROTOR ANGLES 4

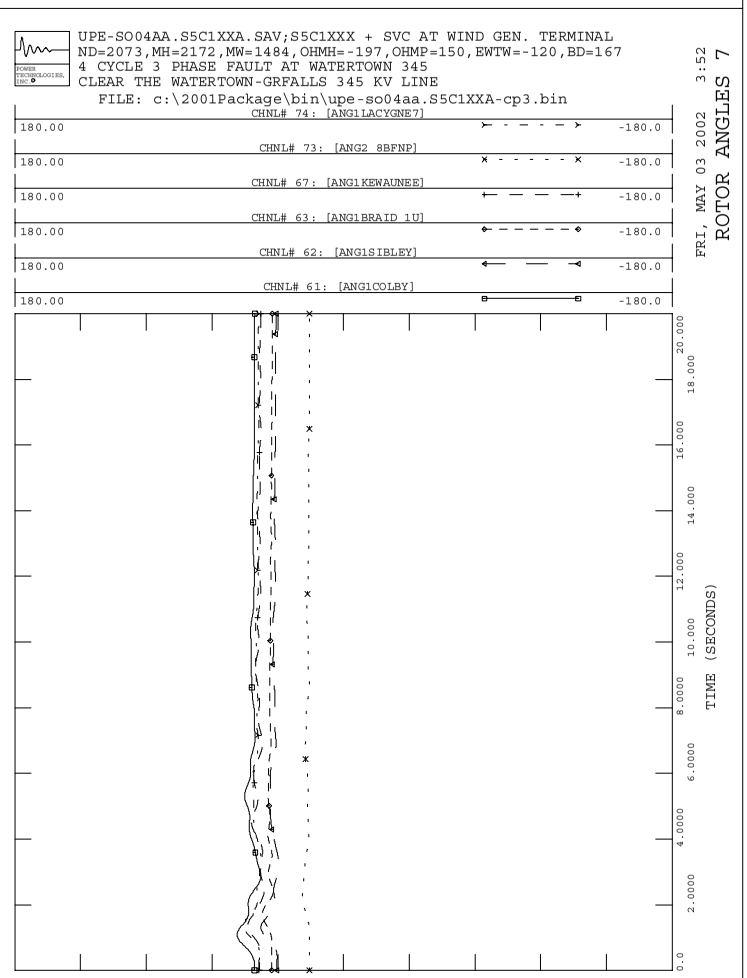

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:52
ROTOR ANGLES 1


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:52
ROTOR ANGLES 3


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:52
ROTOR ANGLES 6


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:52
ROTOR ANGLES NB


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:52
ROTOR ANGLES 5


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
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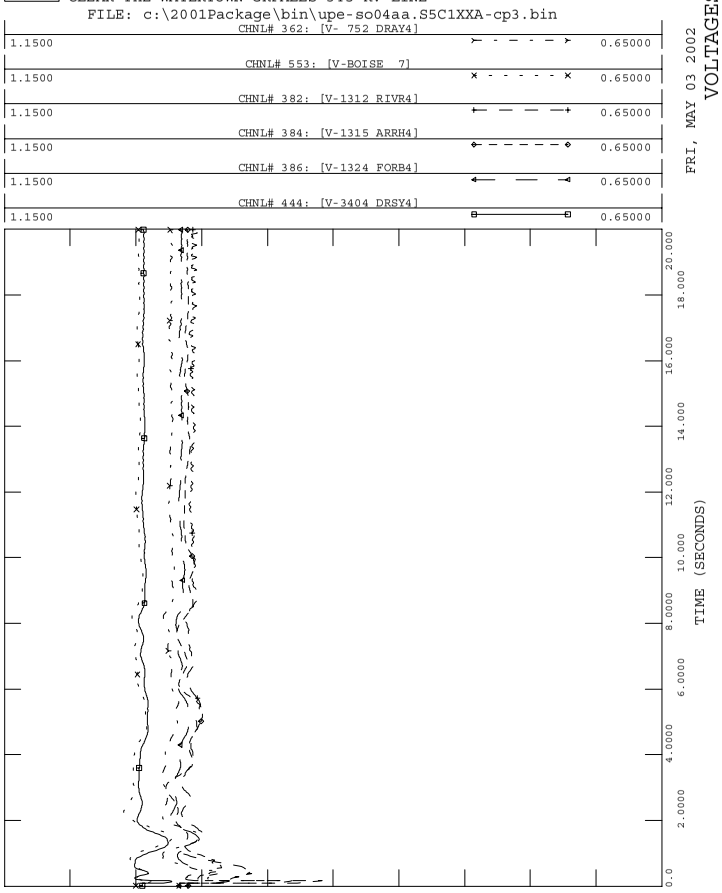
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
FRI, MAY 03 2002 3:52
ROTOR ANGLES 7

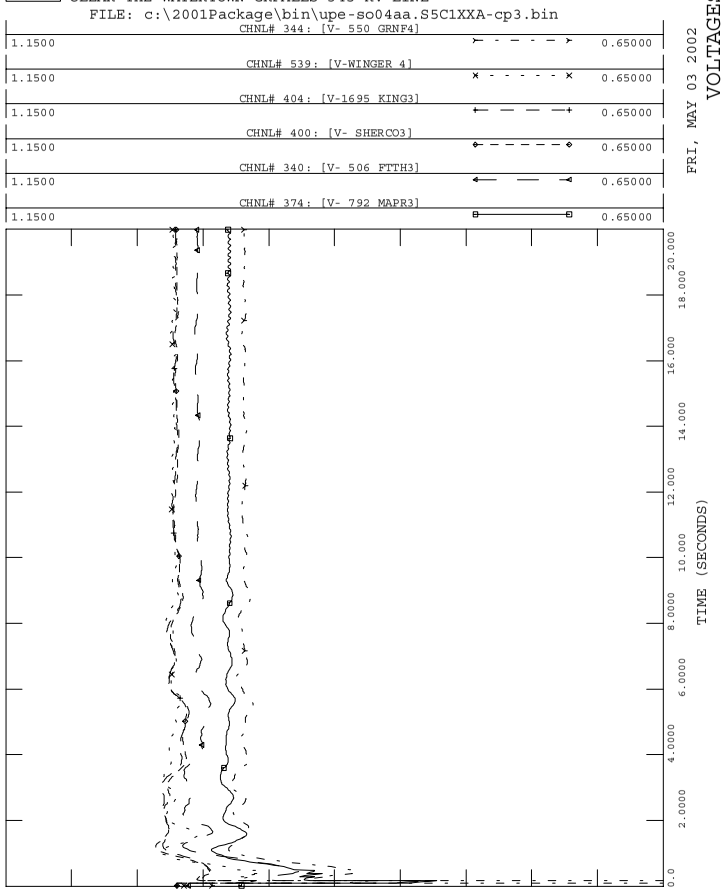
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52
VOLTAGES 1



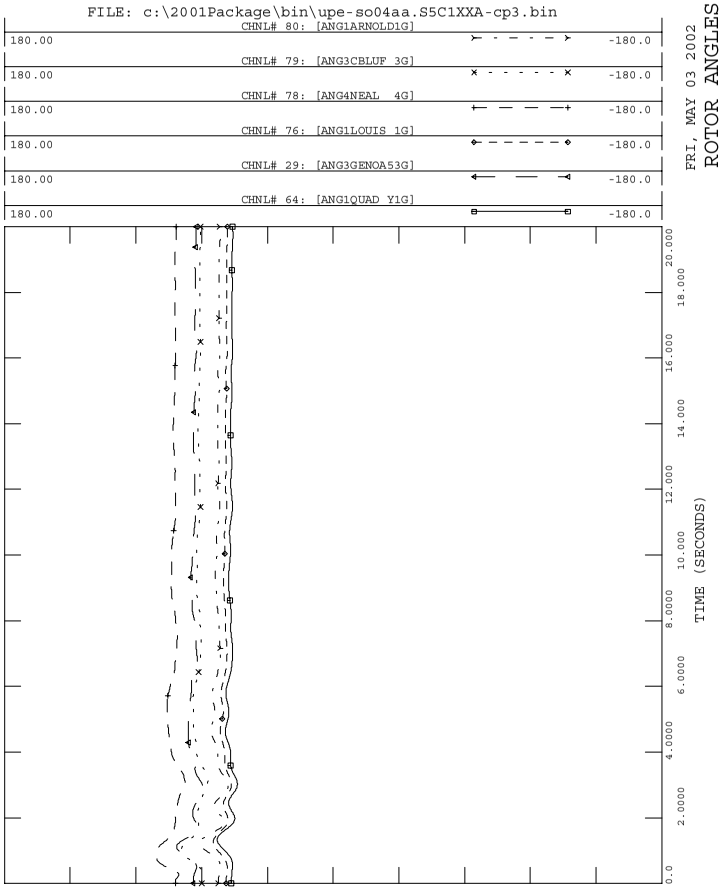
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52
VOLTAGES 3



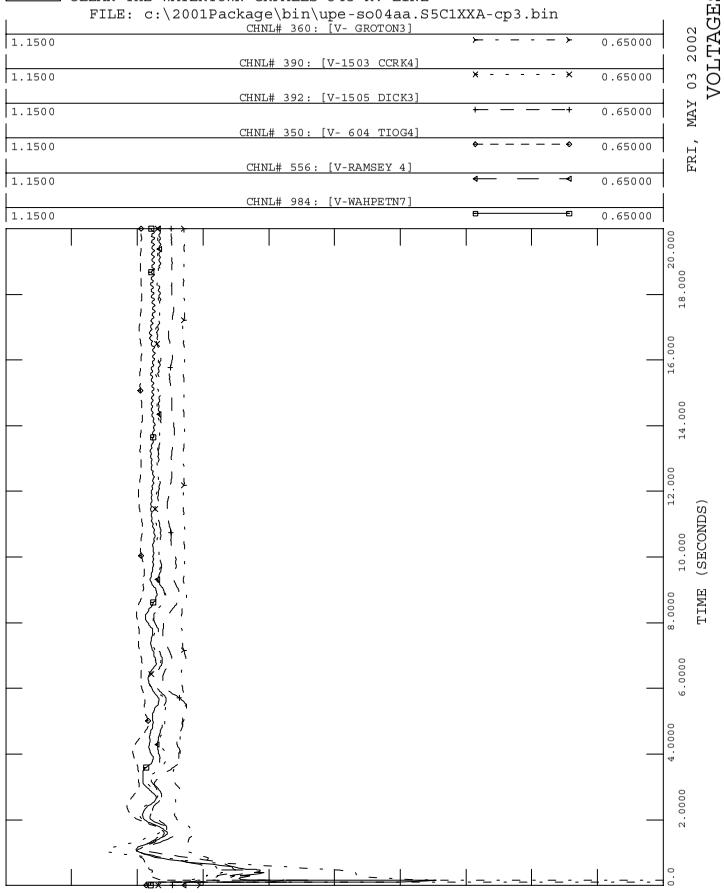
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52
ROTOR ANGLES IA



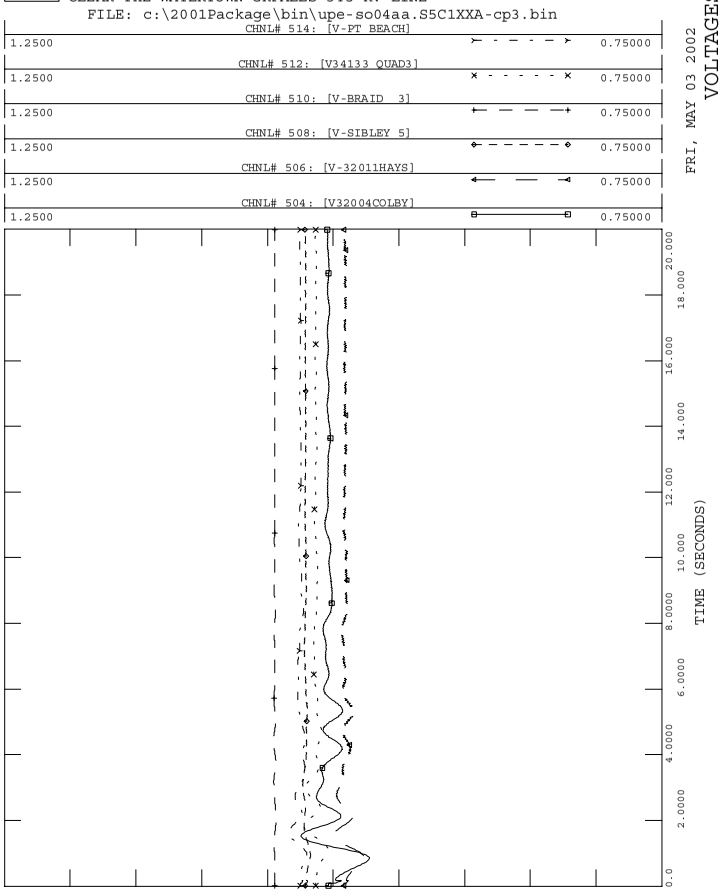
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52
VOLTAGES 2



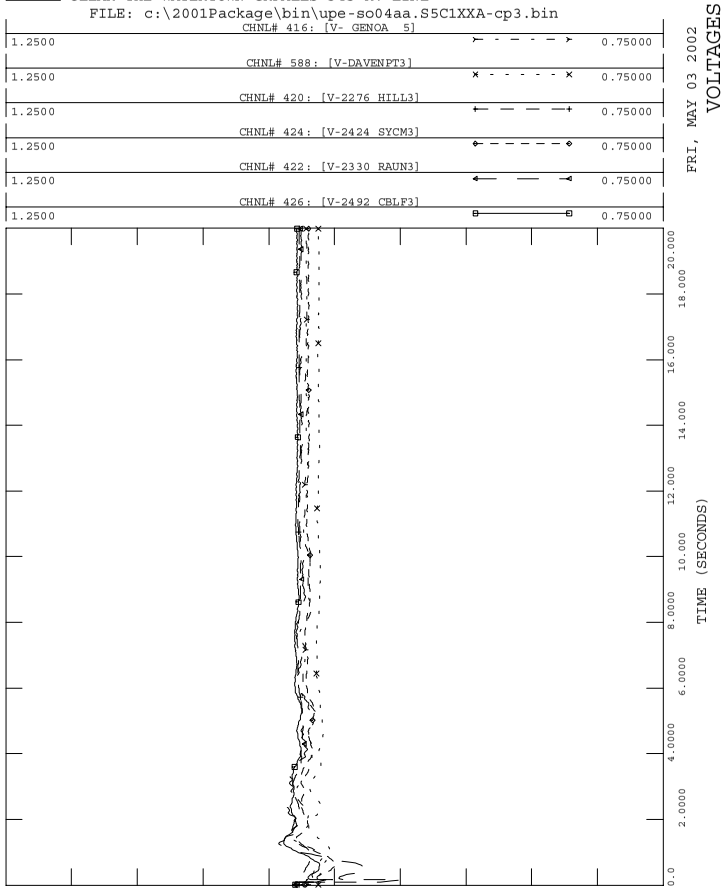
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52
VOLTAGES 5



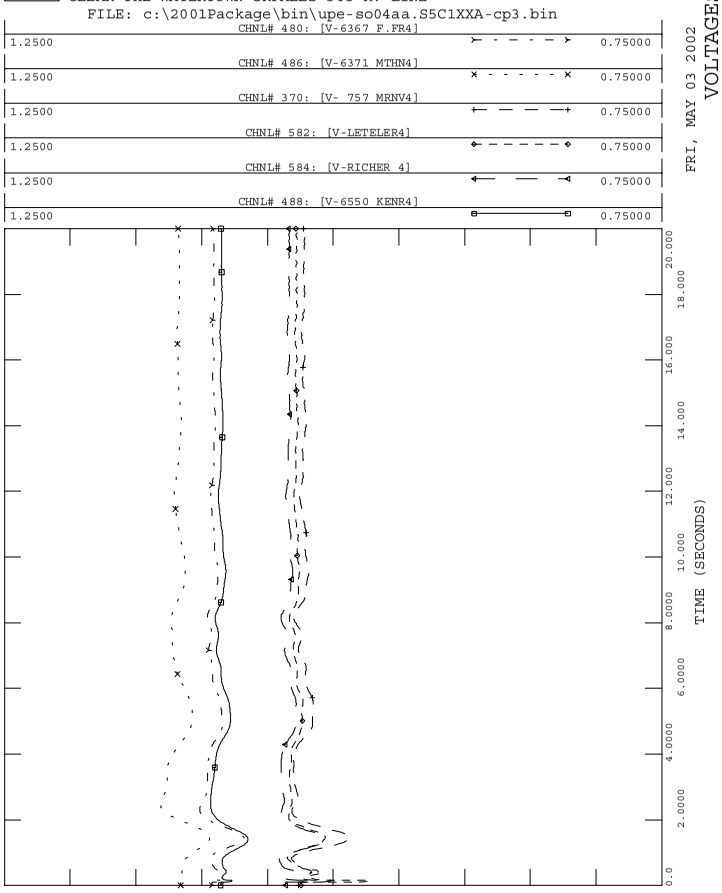
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52
VOLTAGES IA



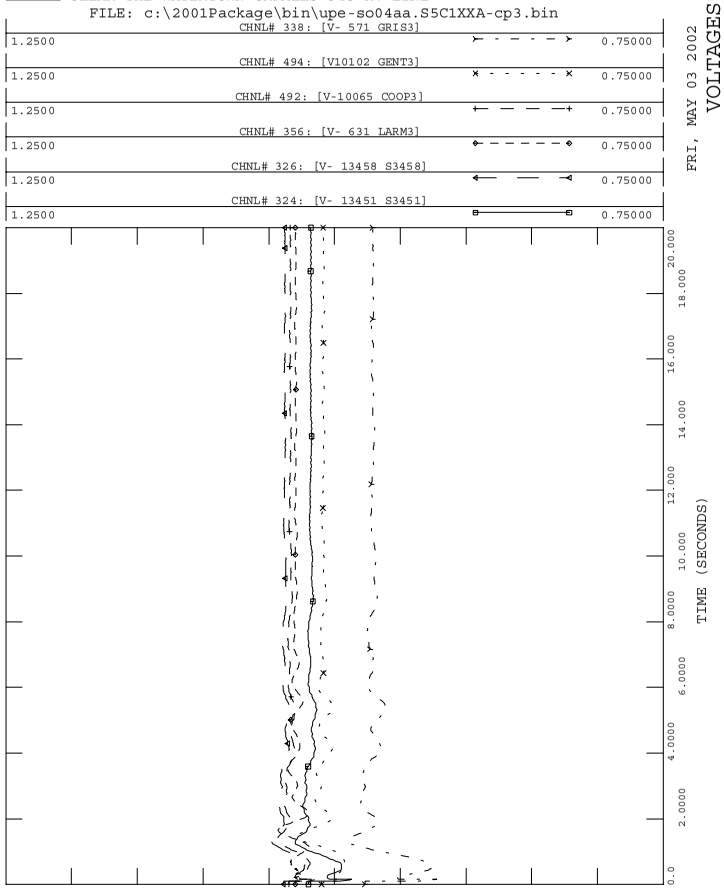
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52
VOLTAGES 4

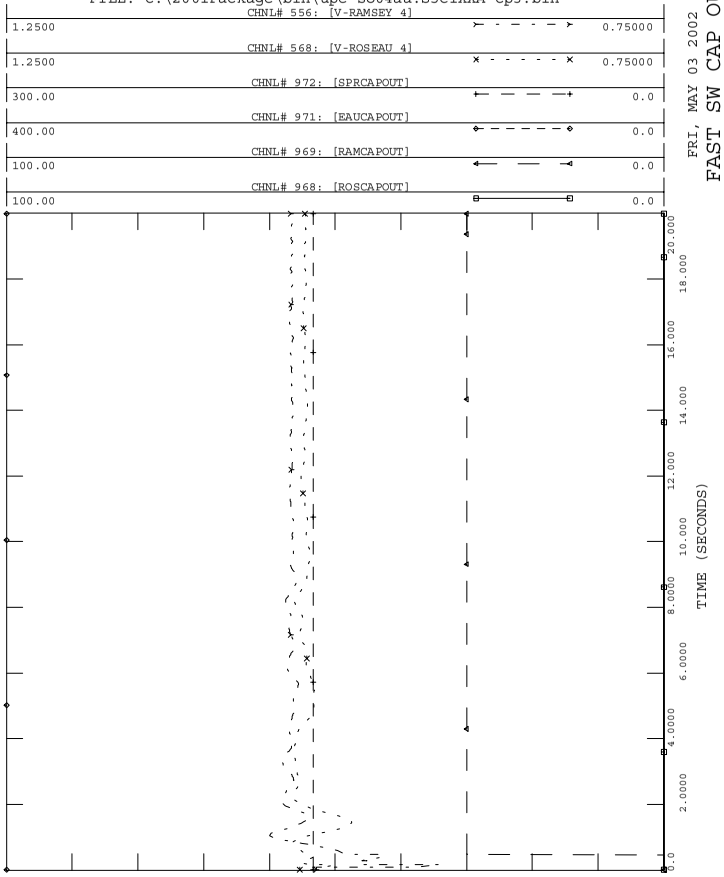


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52
VOLTAGES NB

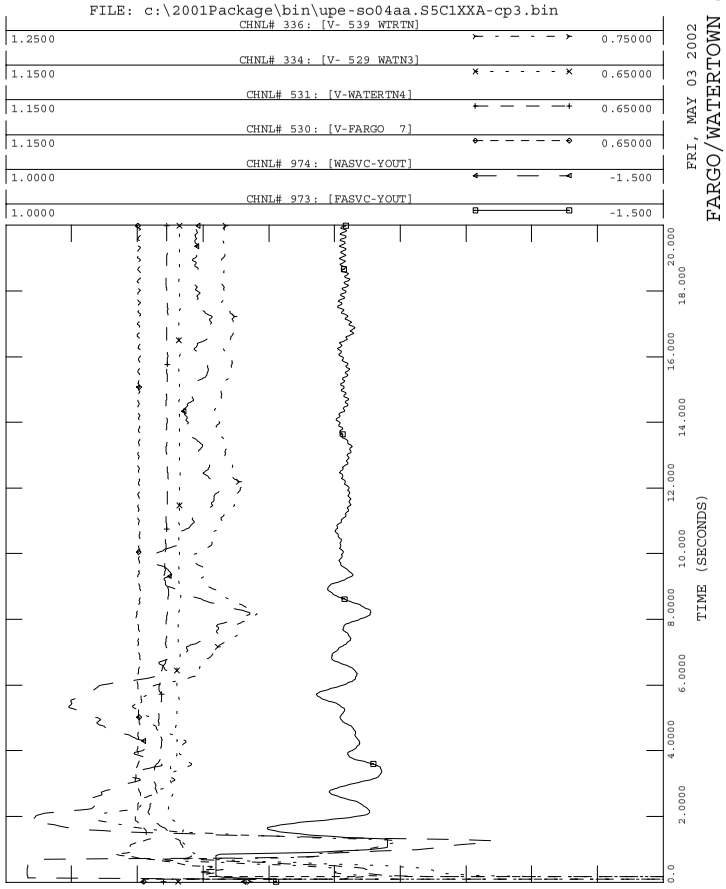


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin



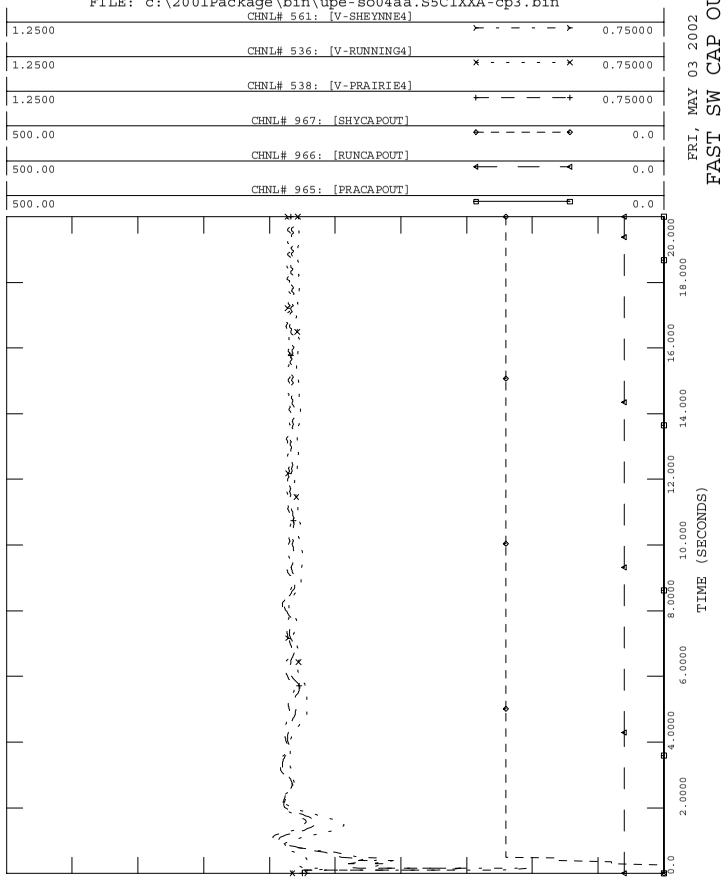
FRI, MAY 03 2002 3:52
FAST SW CAP OUT 2

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin



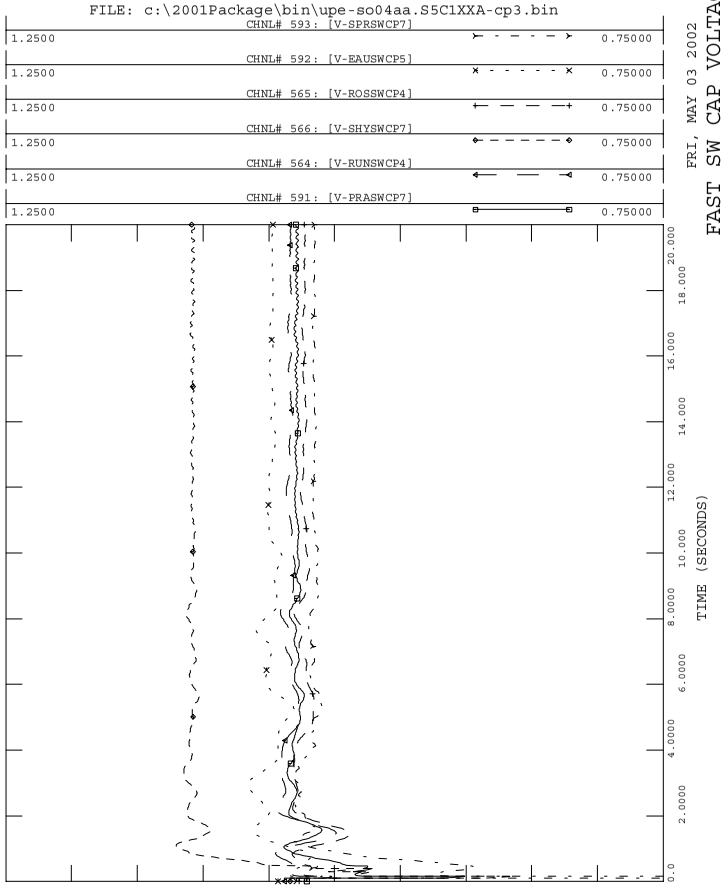
FRI, MAY 03 2002 3:52
FARGO/WATERTOWN SVS

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin



FRI, MAY 03 2002 3:52
FAST SW CAP OUT 1

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

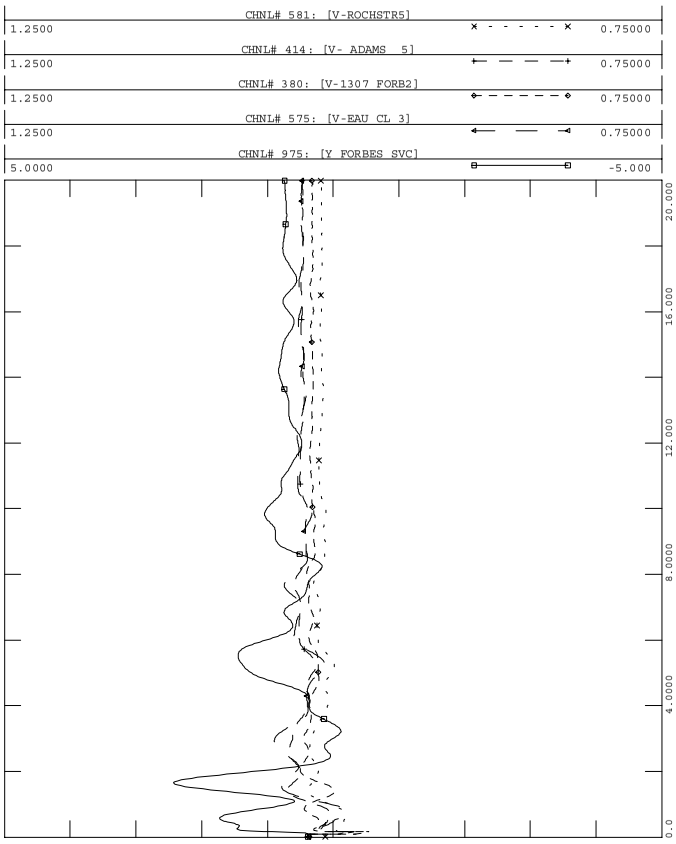


FRI, MAY 03 2002 3:52
FAST SW CAP VOLTAGES

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52

SVC & WISCONSIN VOLT



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

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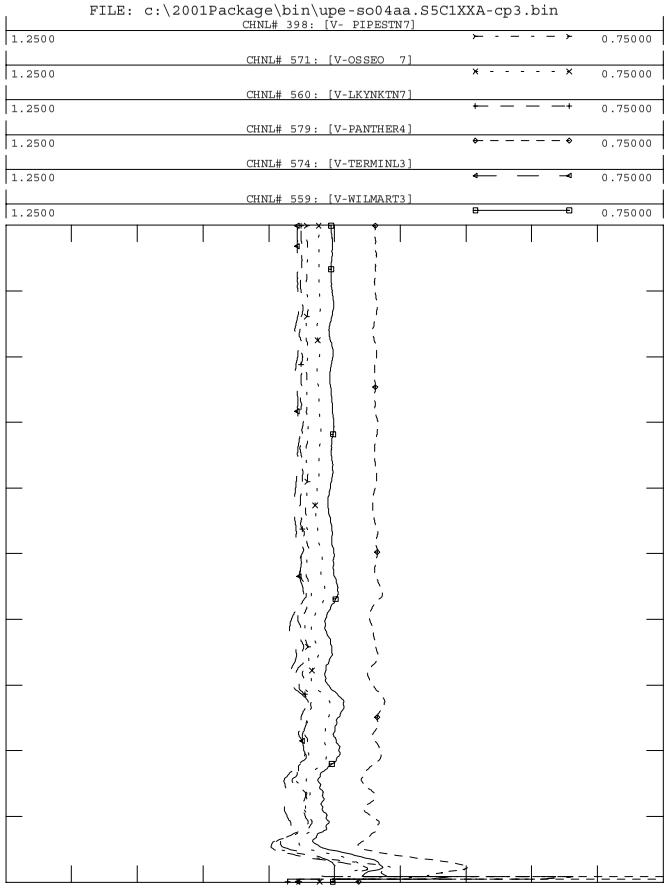
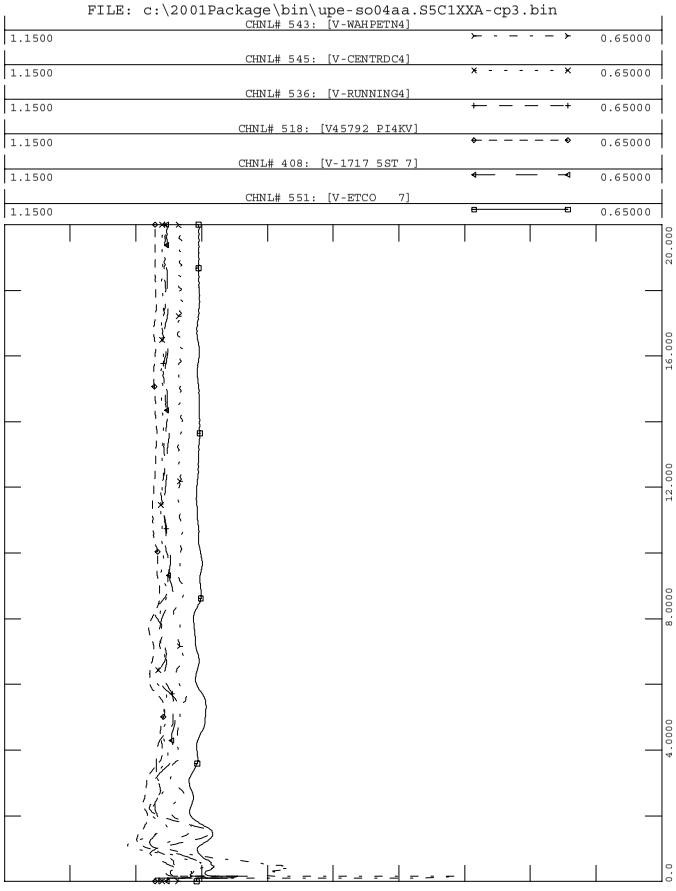
TC VOLTAGES



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52

VOLTAGES 6



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

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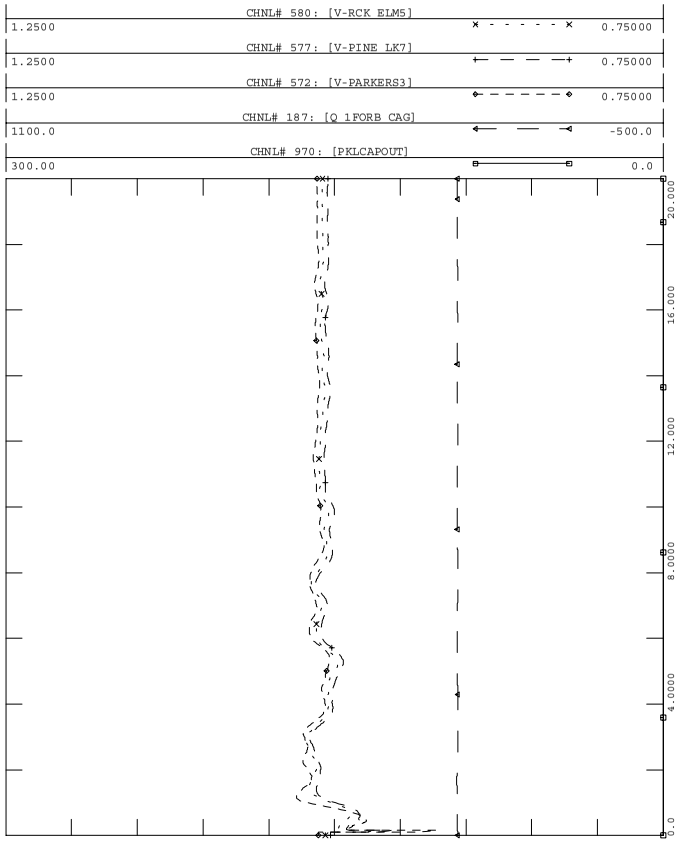
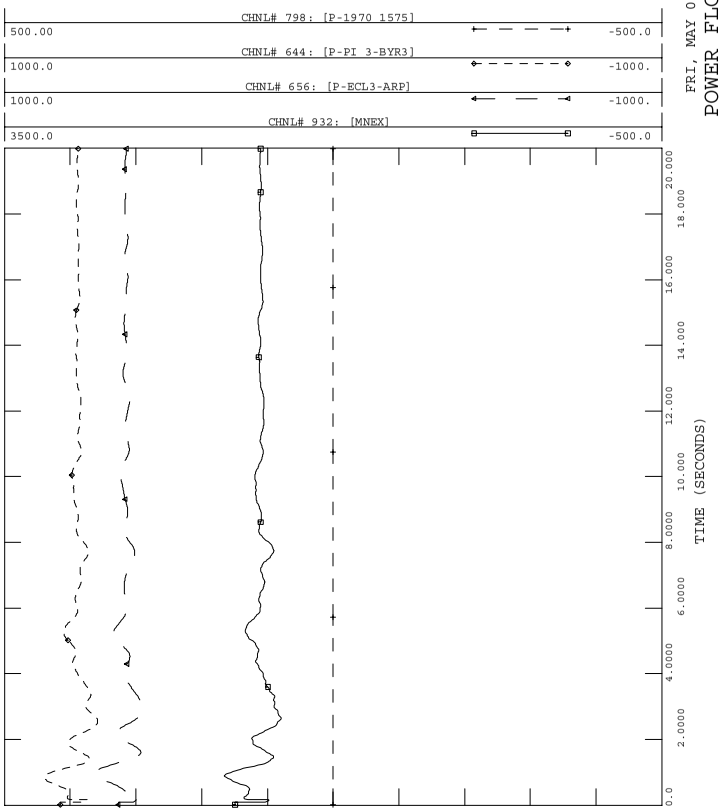
FORBES SVS OUT & VOLTAGES



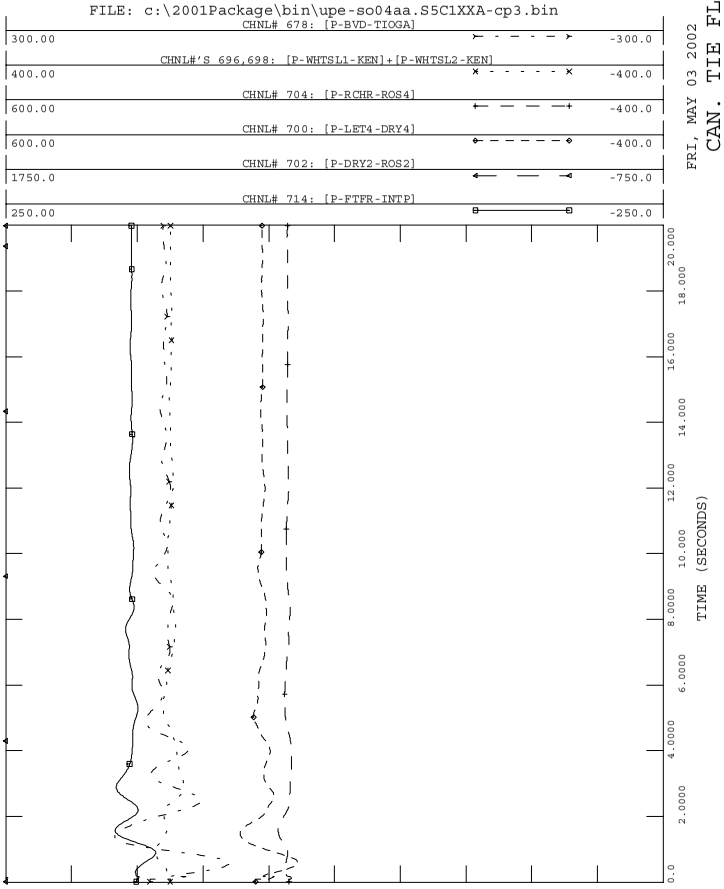
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52
POWER FLOW SUMS 2



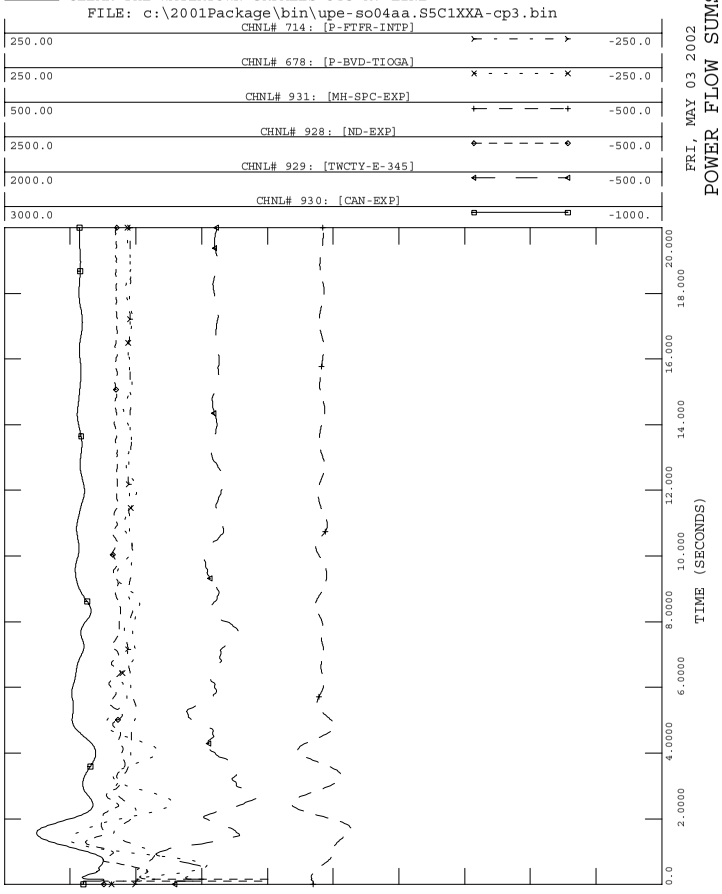
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

FRI, MAY 03 2002 3:52
CAN. TIE FLOWS



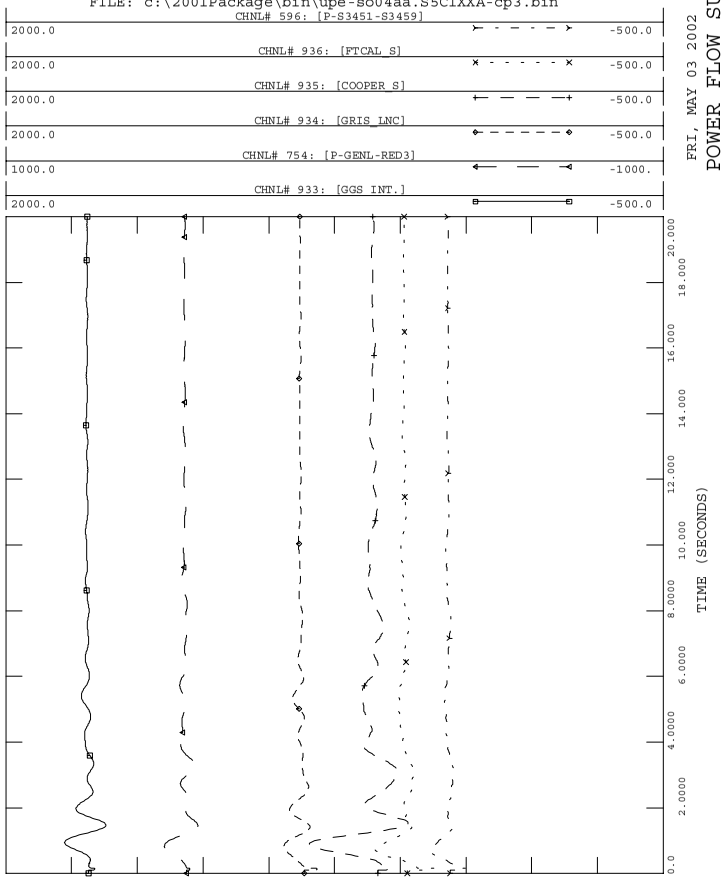
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

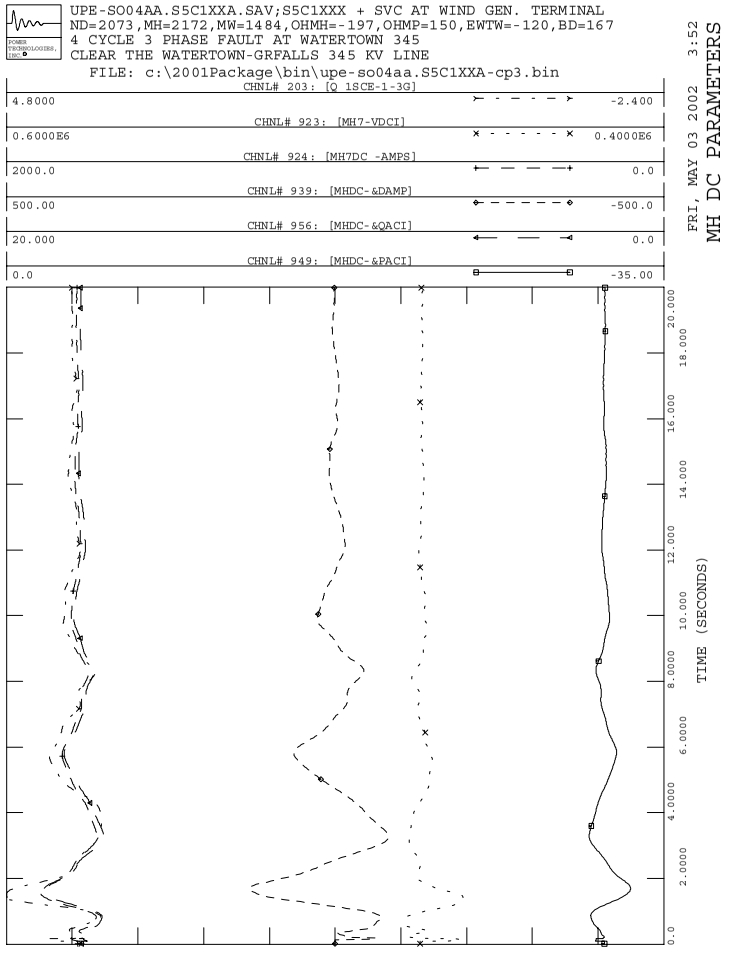
FRI, MAY 03 2002 3:52
POWER FLOW SUMS 1

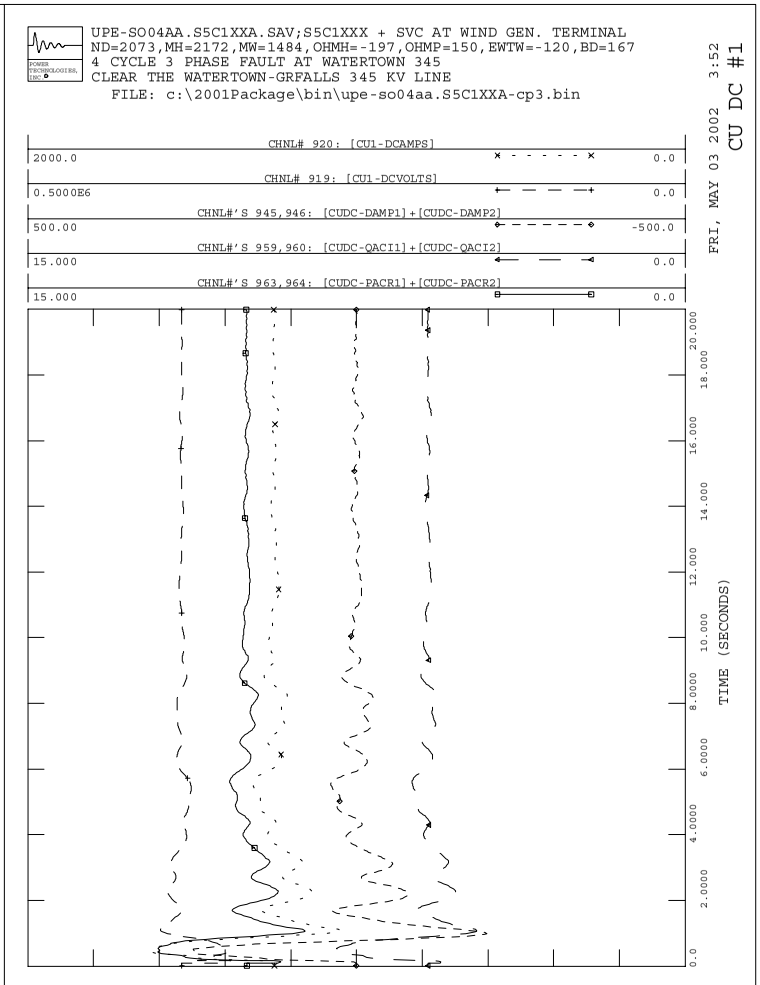


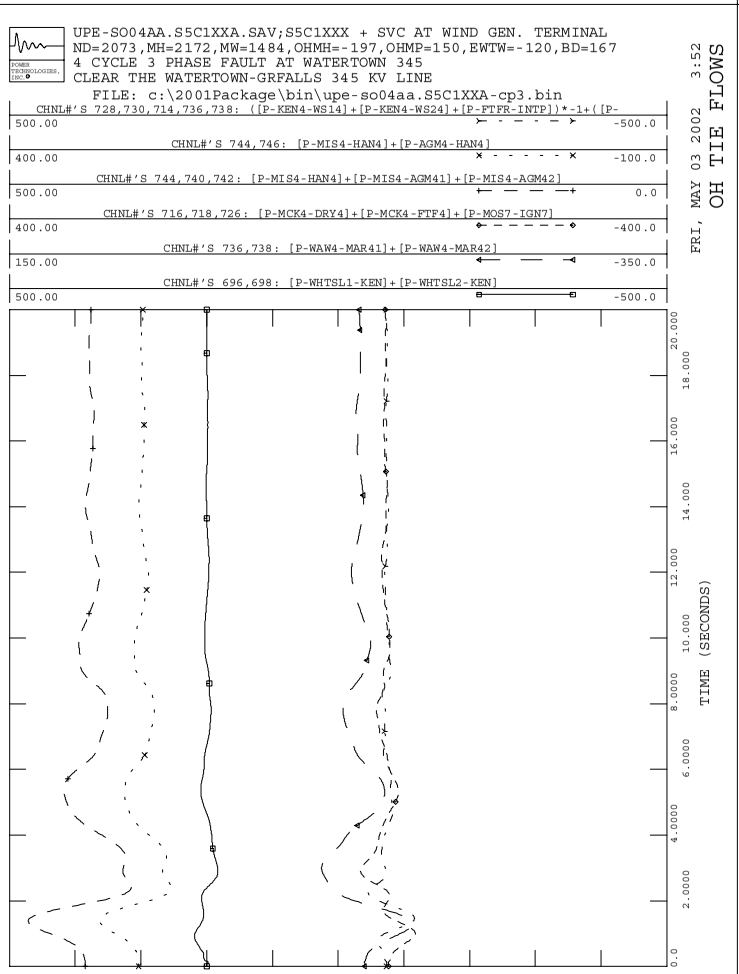
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

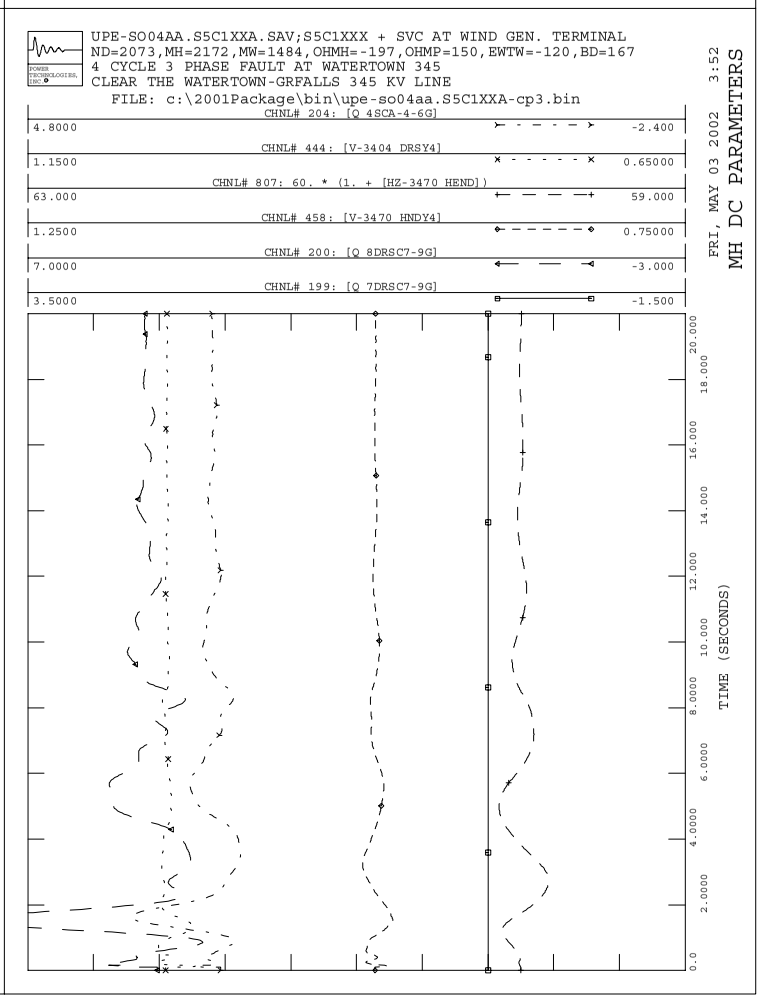
FRI, MAY 03 2002 3:52
POWER FLOW SUM 3

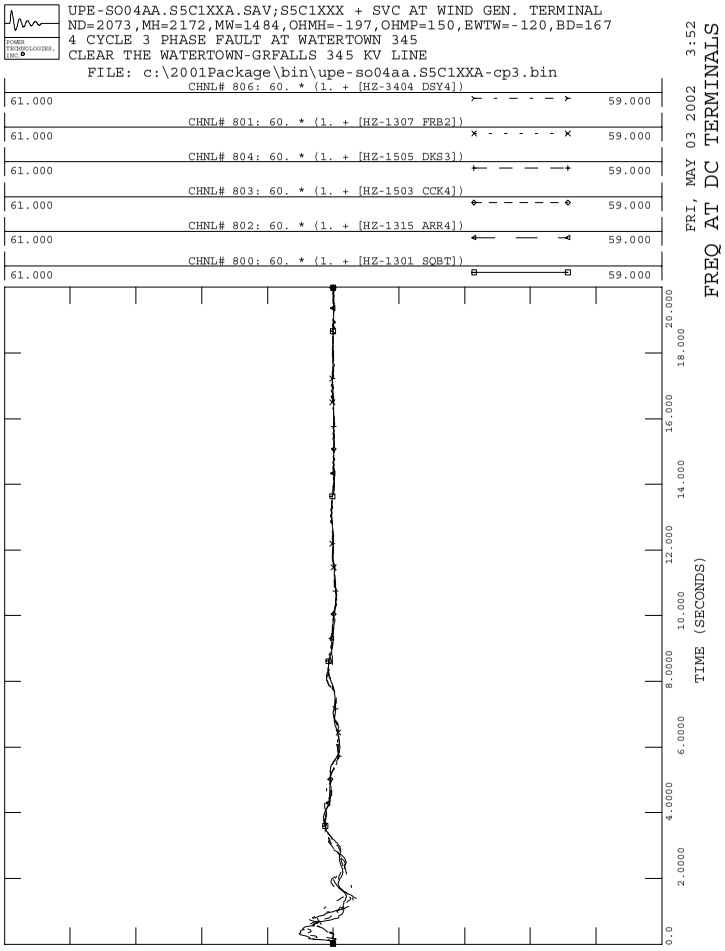


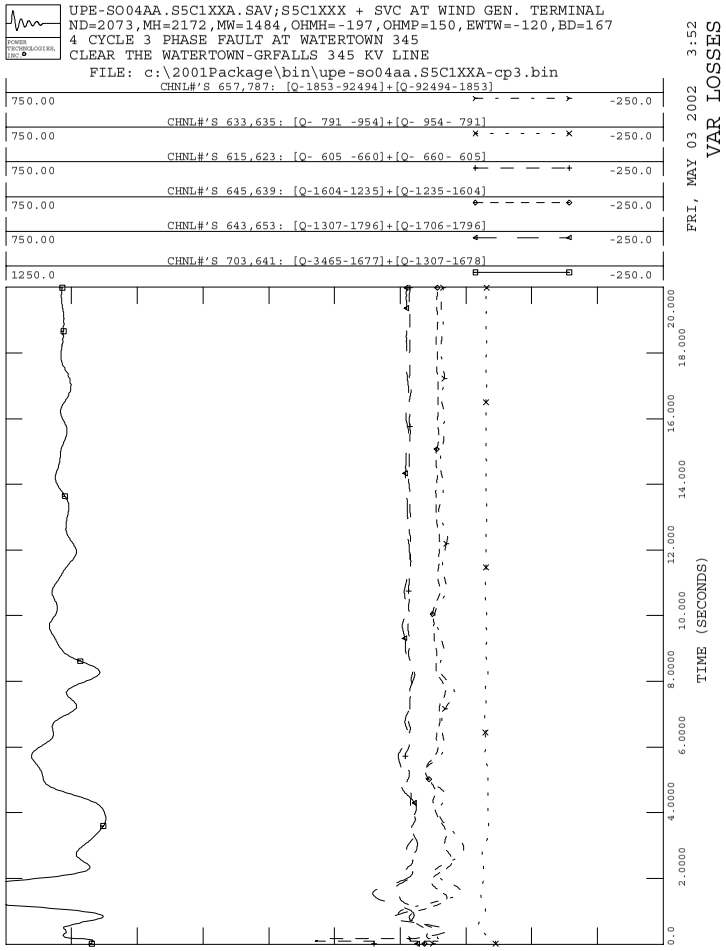

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
FRI, MAY 03 2002 3:52
MH DC PARAMETERS
TIME (SECONDS)

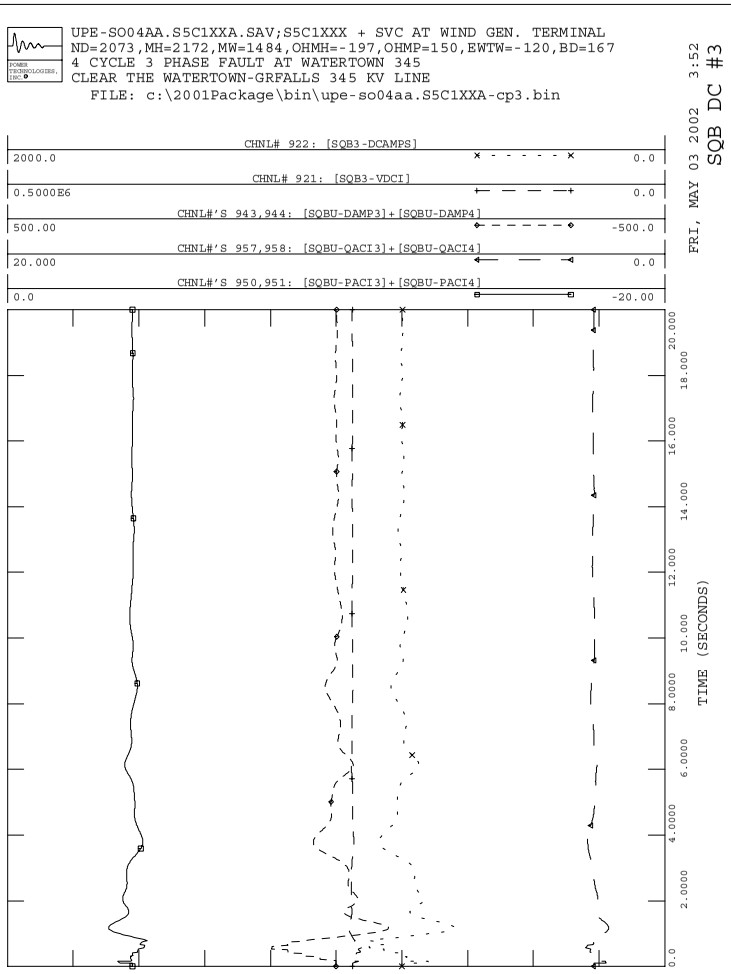

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
FRI, MAY 03 2002 3:52
CU DC #1
TIME (SECONDS)

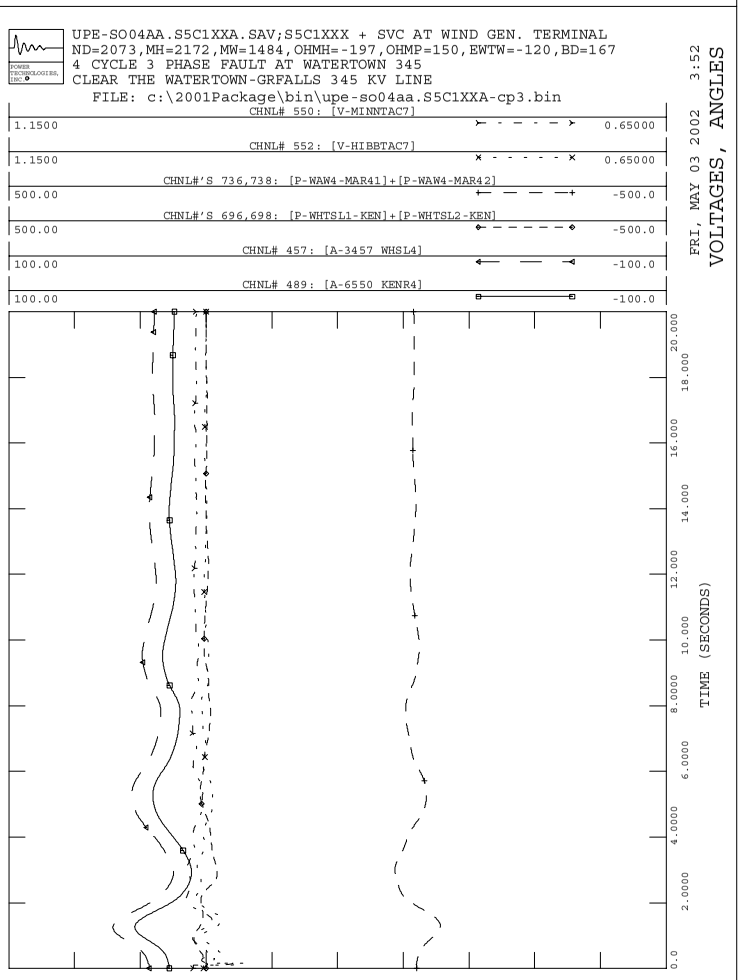

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
FRI, MAY 03 2002 3:52
OH TIE FLOWS
TIME (SECONDS)


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
FRI, MAY 03 2002 3:52
MH DC PARAMETERS
TIME (SECONDS)


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
FRI, MAY 03 2002 3:52
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
FRI, MAY 03 2002 3:52
VAR LOSSES
TIME (SECONDS)

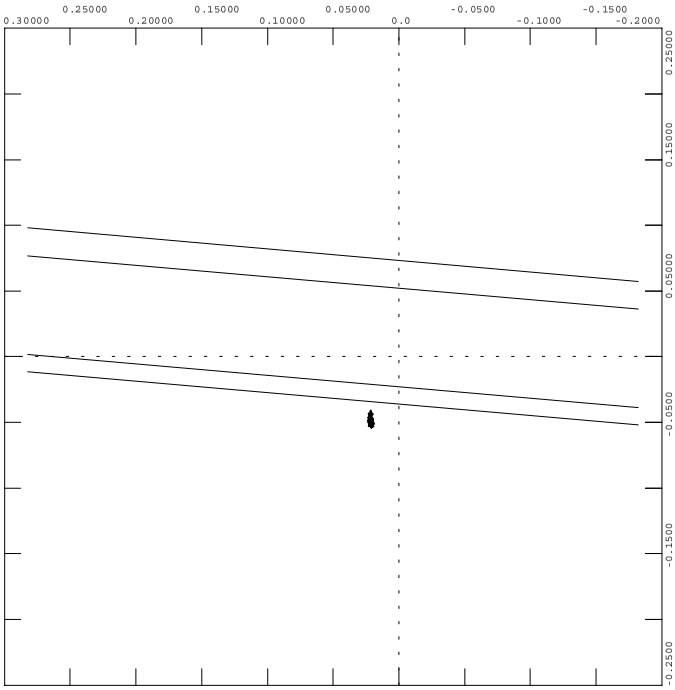

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
FRI, MAY 03 2002 3:52
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
FRI, MAY 03 2002 3:52
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

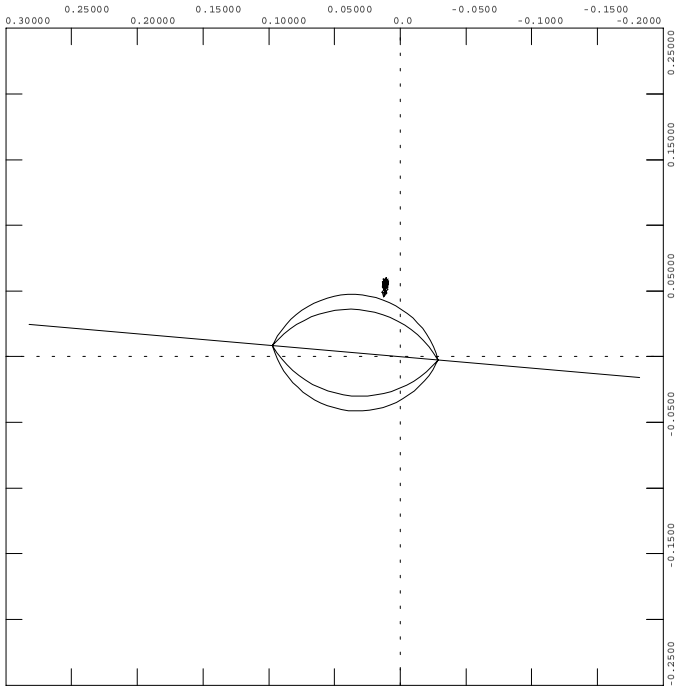


FRI, MAY 03 2002 3:52
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

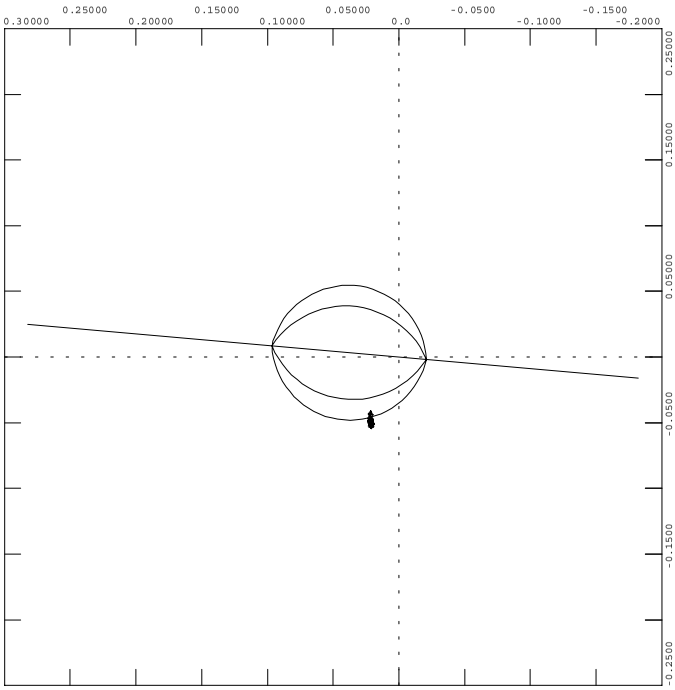


FRI, MAY 03 2002 3:52
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

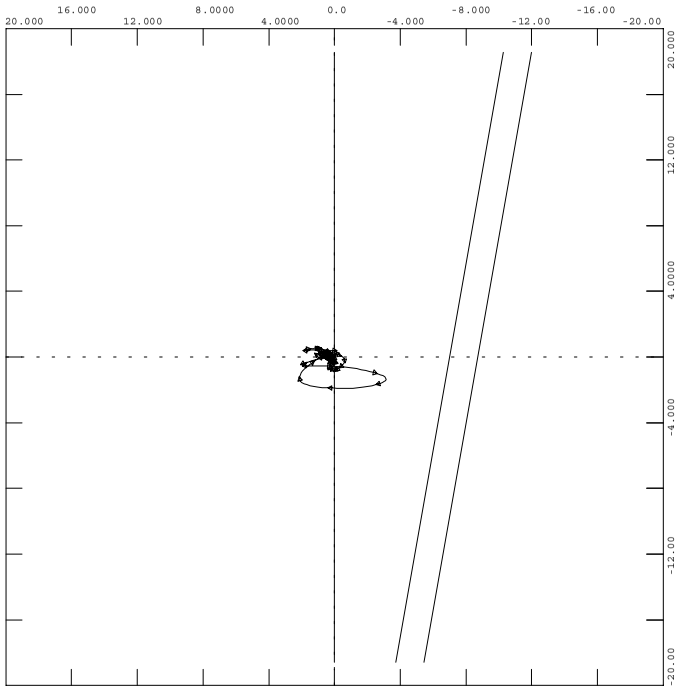


FRI, MAY 03 2002 3:52
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

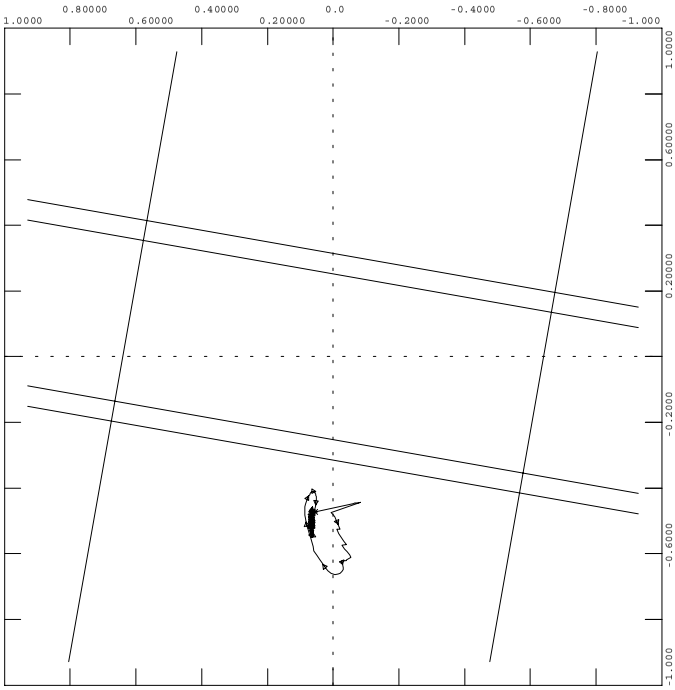


FRI, MAY 03 2002 3:52
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

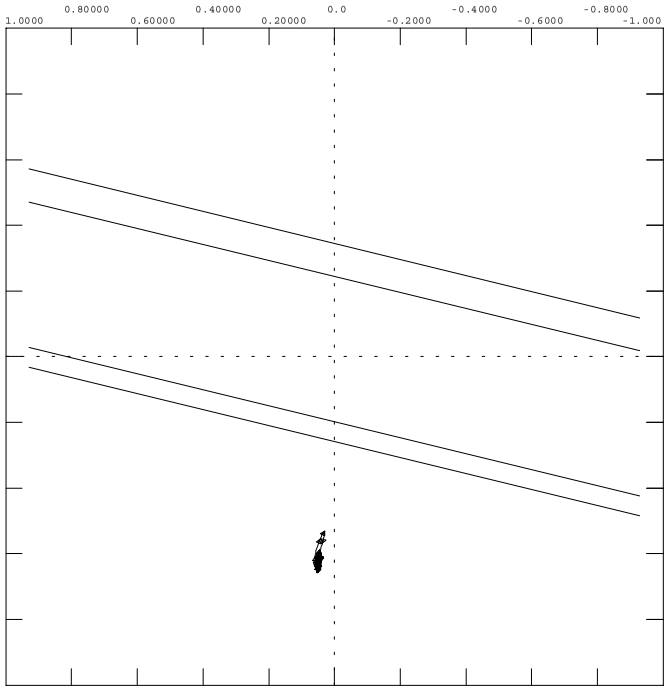
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

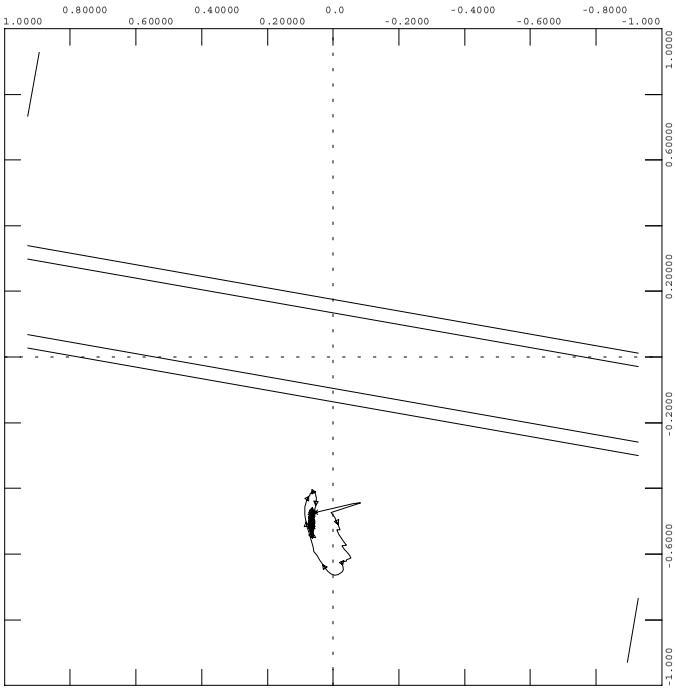
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

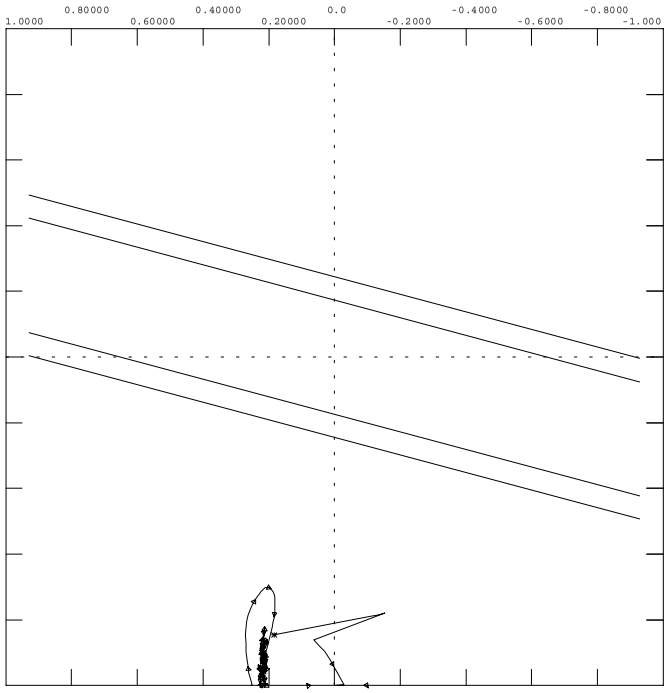
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

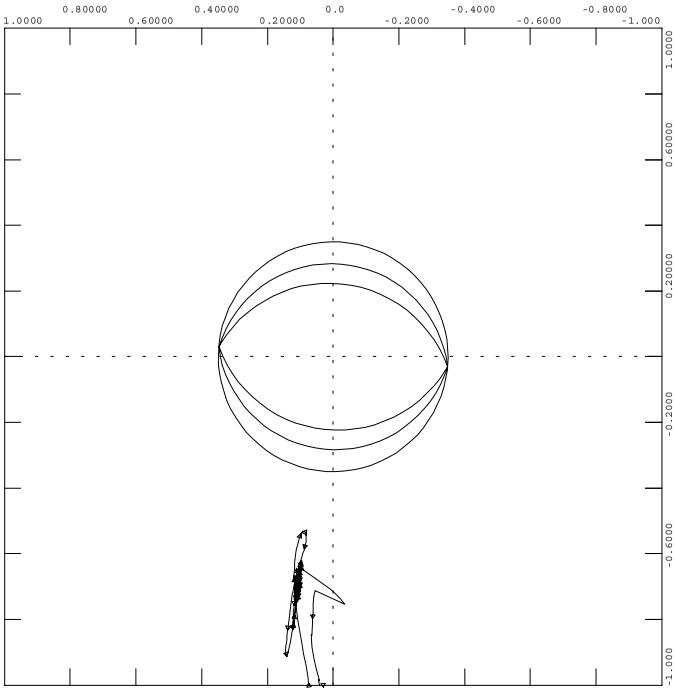
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

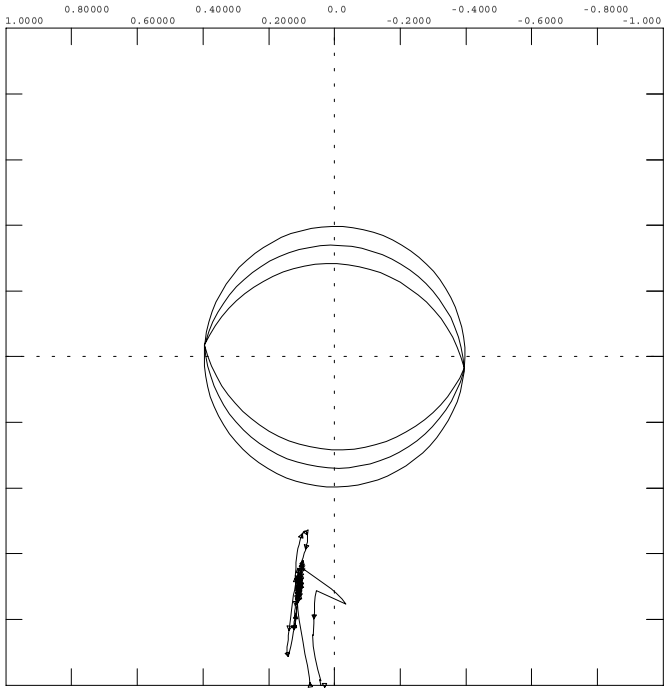
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

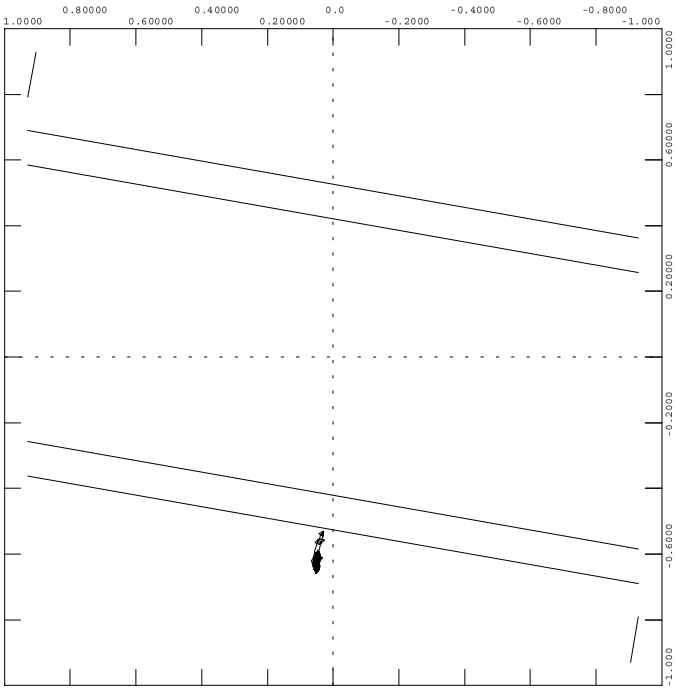
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

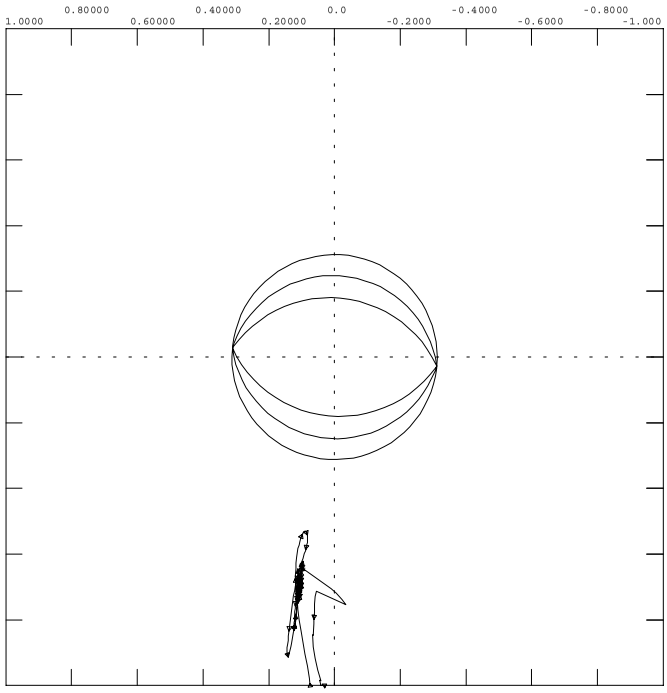
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

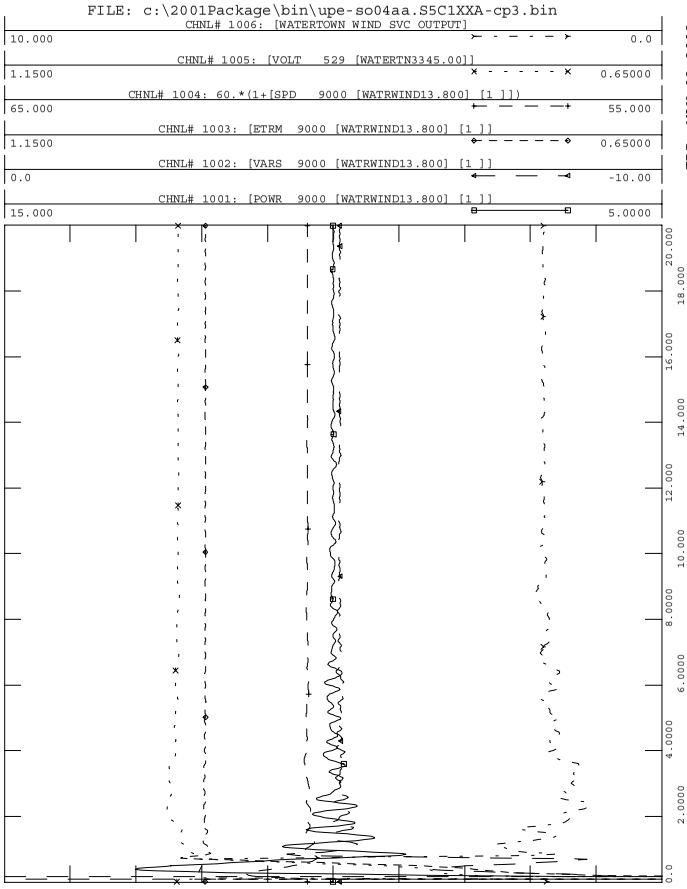
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

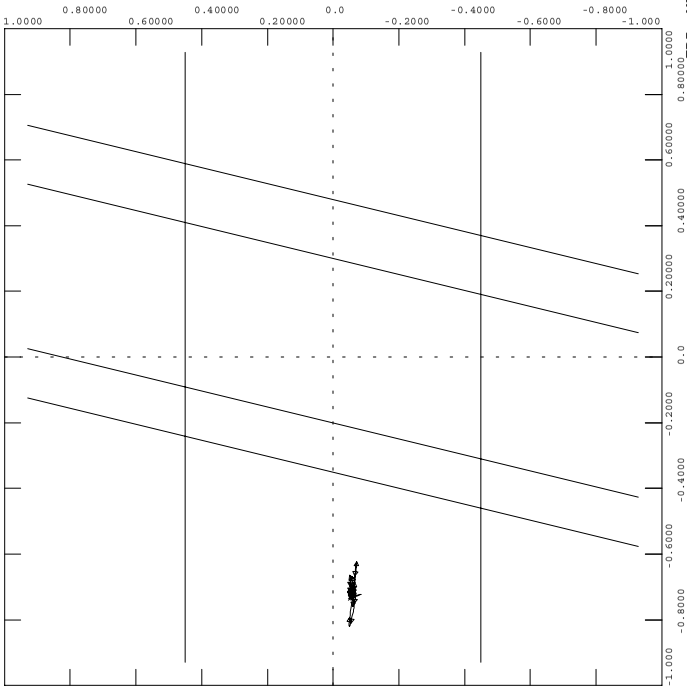


FRI, MAY 03 2002 3:52
WATERTOWN 1000MW WIND UNI

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cp3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

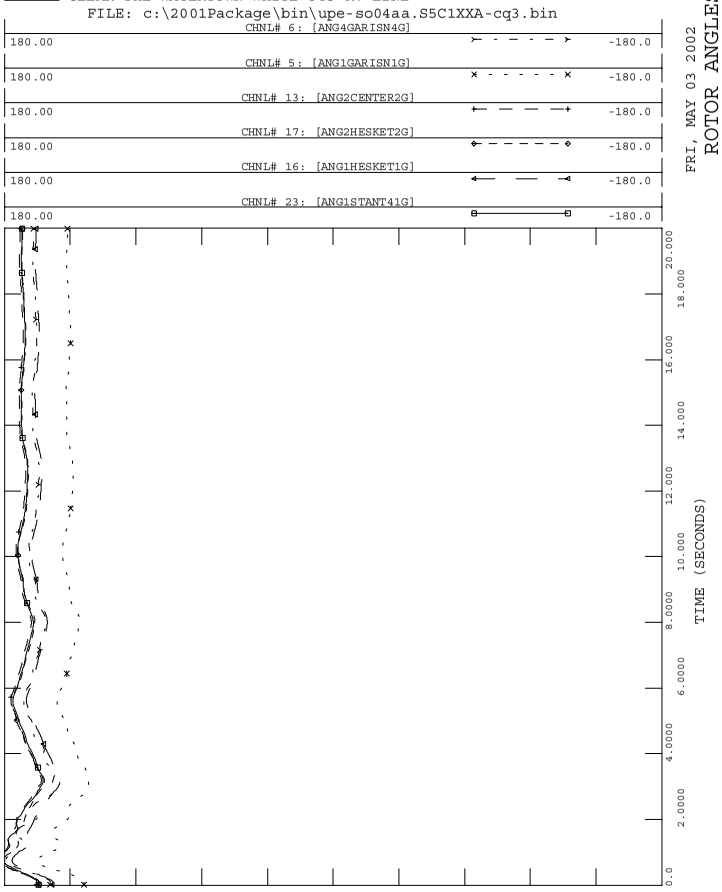


FRI, MAY 03 2002 3:52
MP-OH I.FALLS (779)

CONTINGENCY CQ3

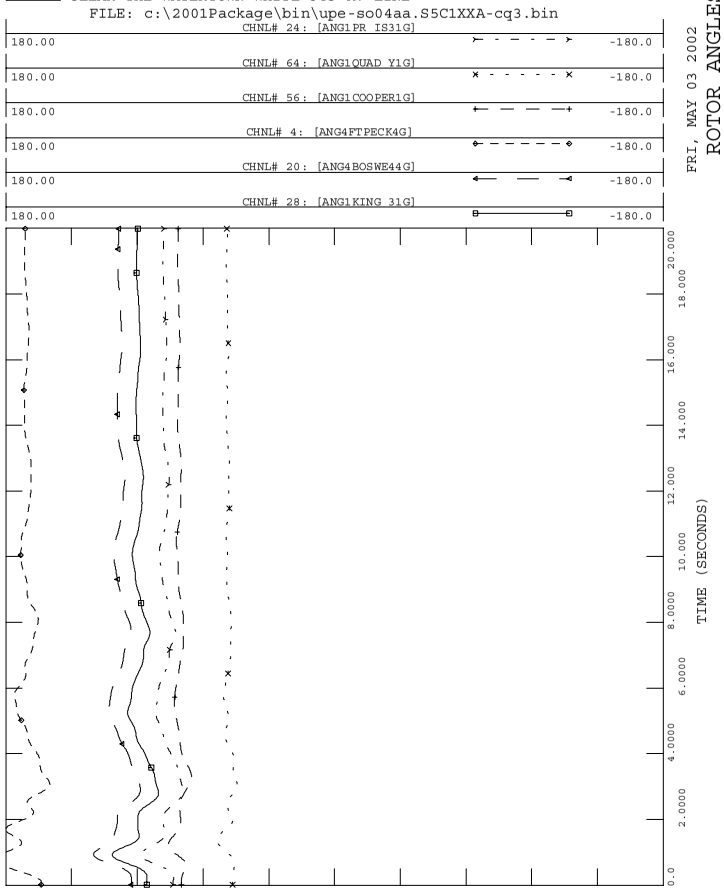
4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-White 345 kV line

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin



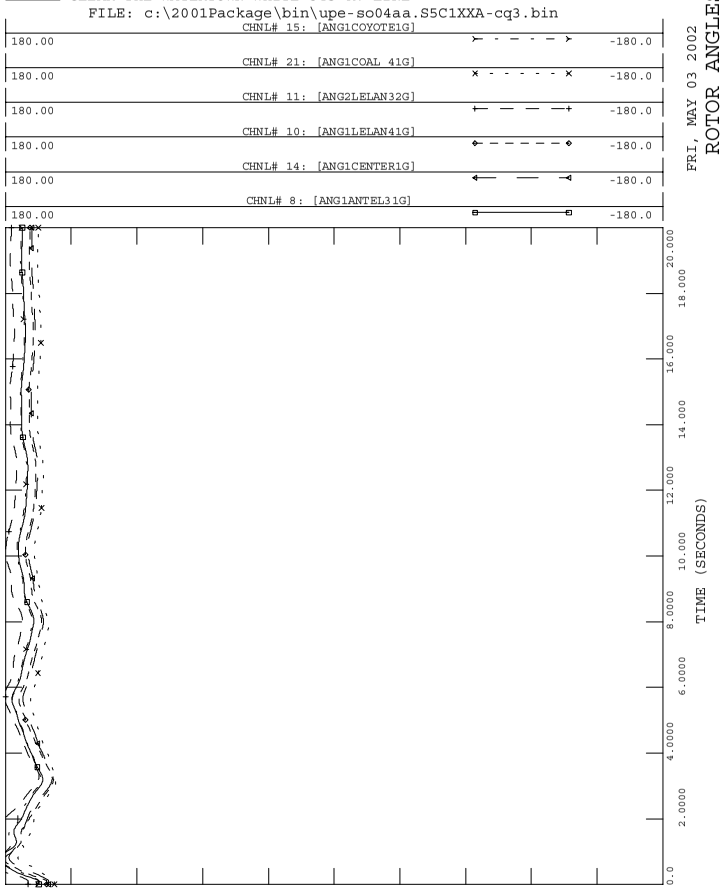
FRI, MAY 03 2002 4:06
ROTOR ANGLES 2

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin



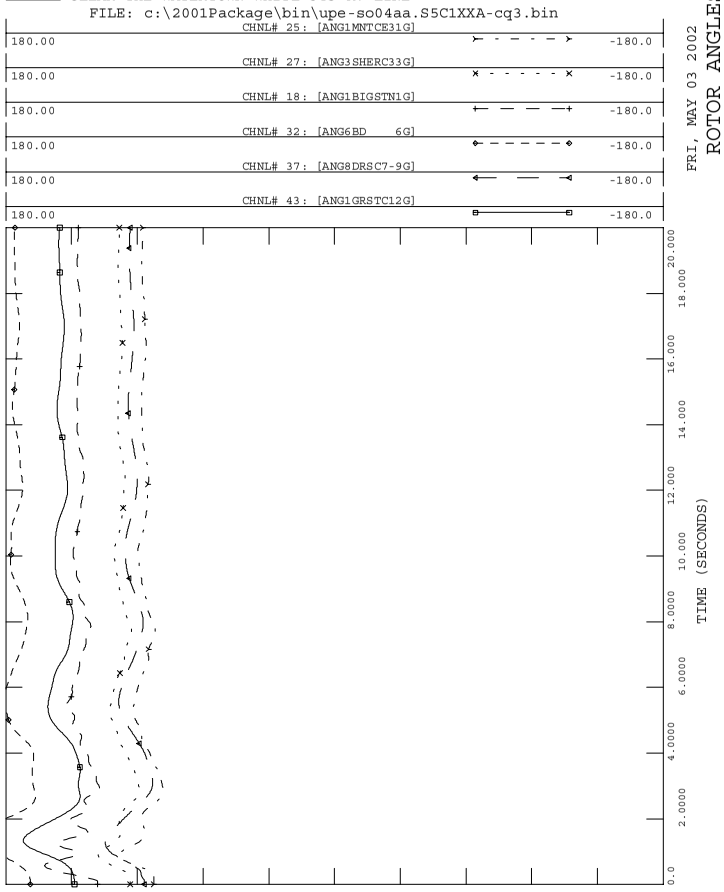
FRI, MAY 03 2002 4:06
ROTOR ANGLES 4

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

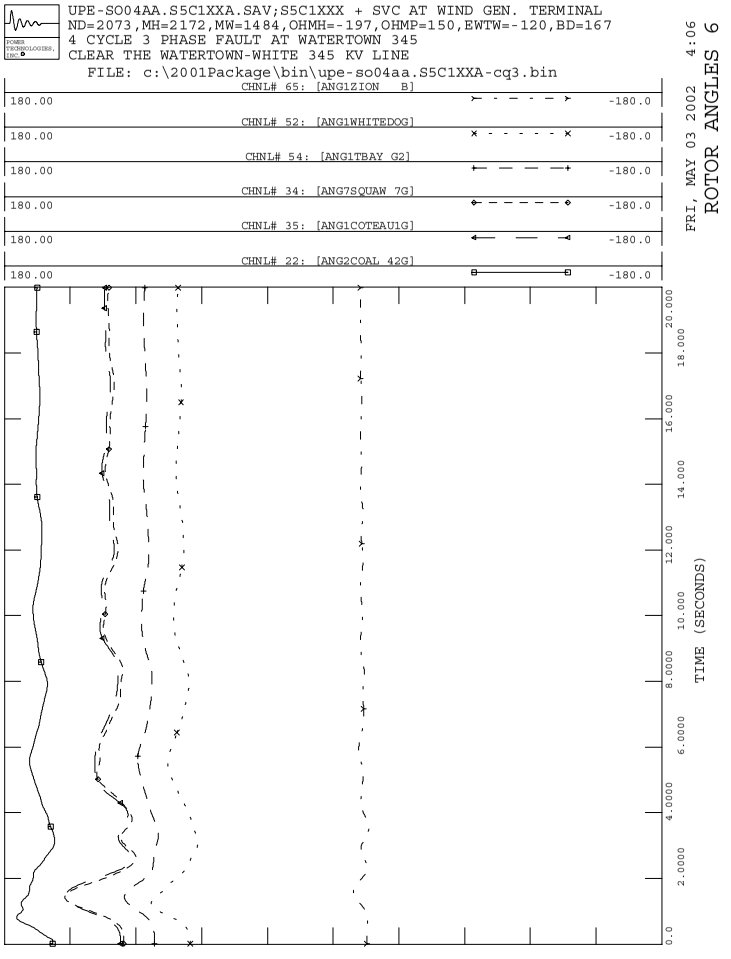


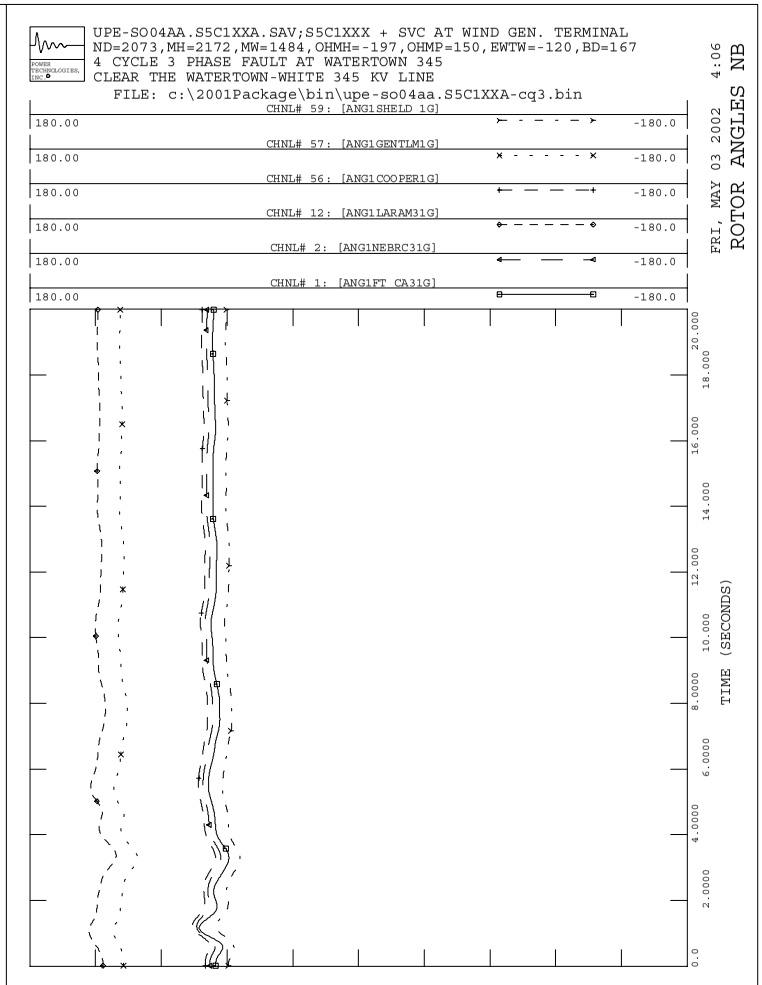
FRI, MAY 03 2002 4:06
ROTOR ANGLES 1

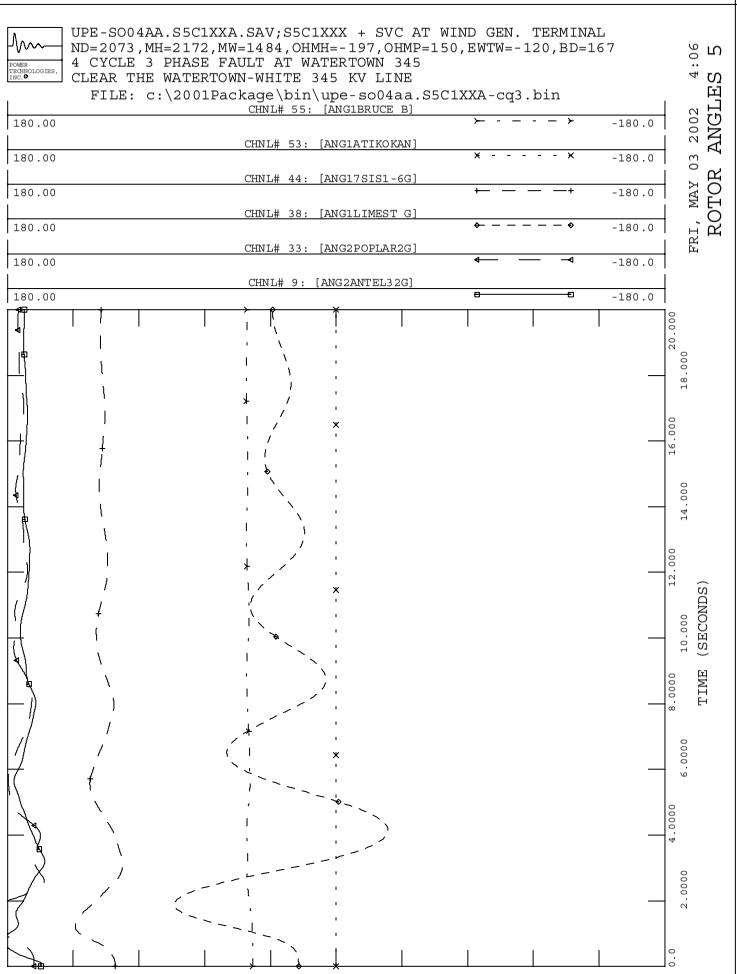
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

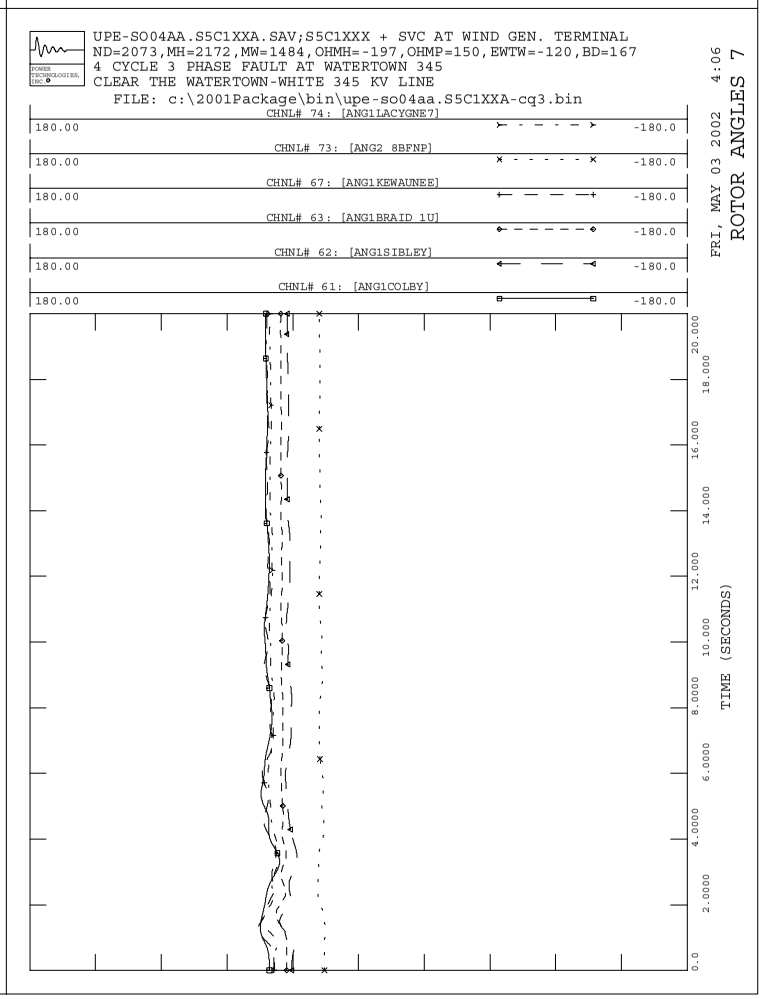


FRI, MAY 03 2002 4:06
ROTOR ANGLES 3


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
FRI, MAY 03 2002 4:06
ROTOR ANGLES 6
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

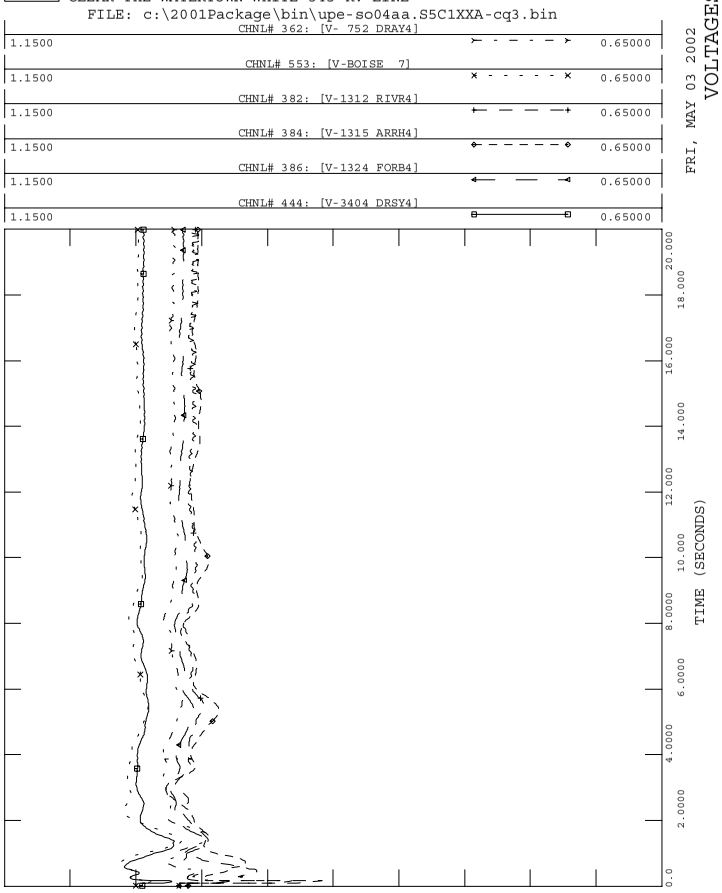

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
FRI, MAY 03 2002 4:06
ROTOR ANGLES NB
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
FRI, MAY 03 2002 4:06
ROTOR ANGLES 5
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
FRI, MAY 03 2002 4:06
ROTOR ANGLES 7
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

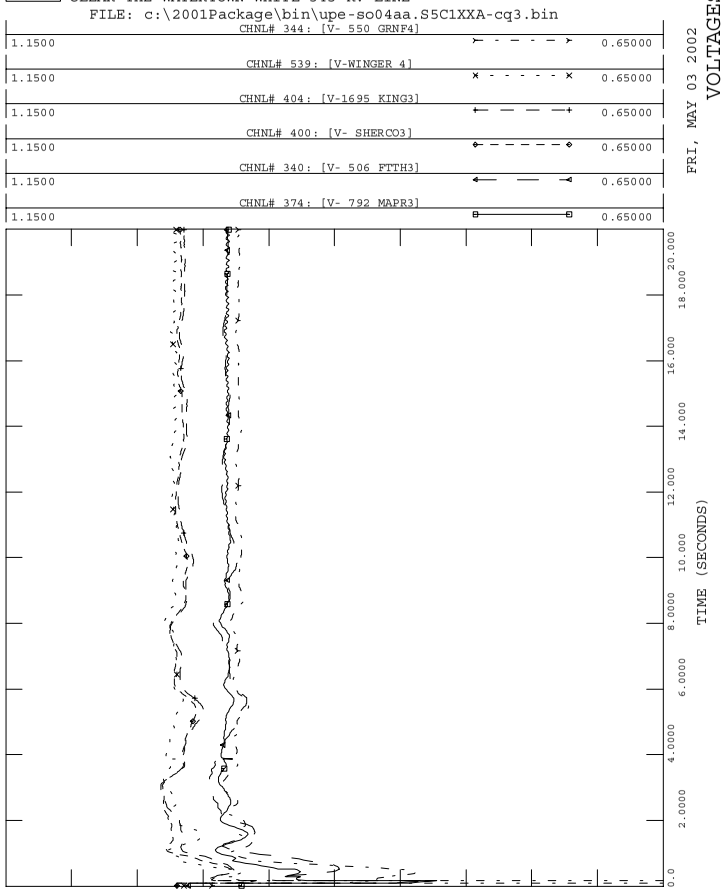
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06
VOLTAGES 1



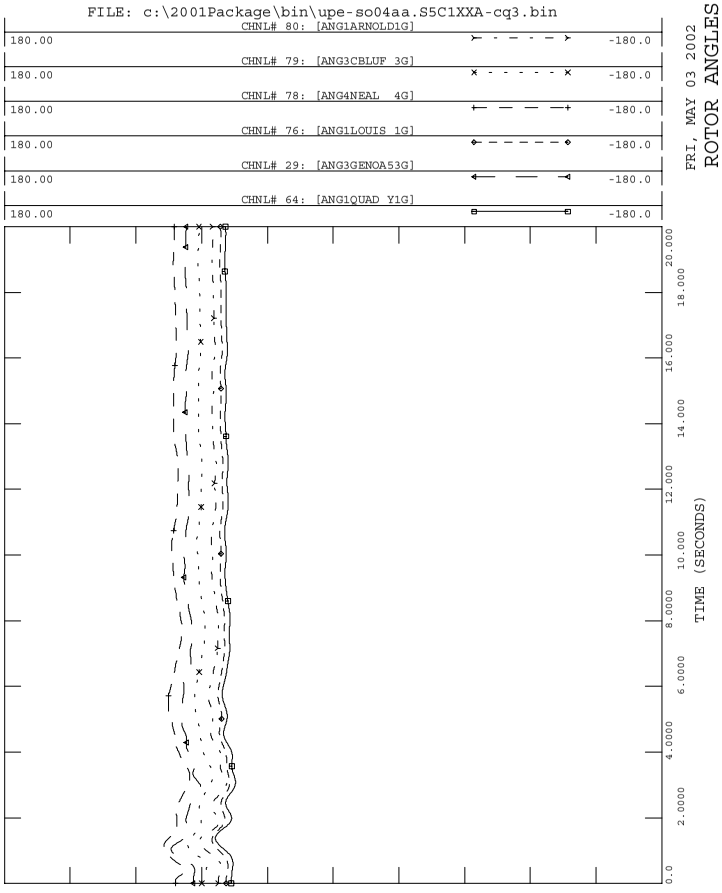
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06
VOLTAGES 3



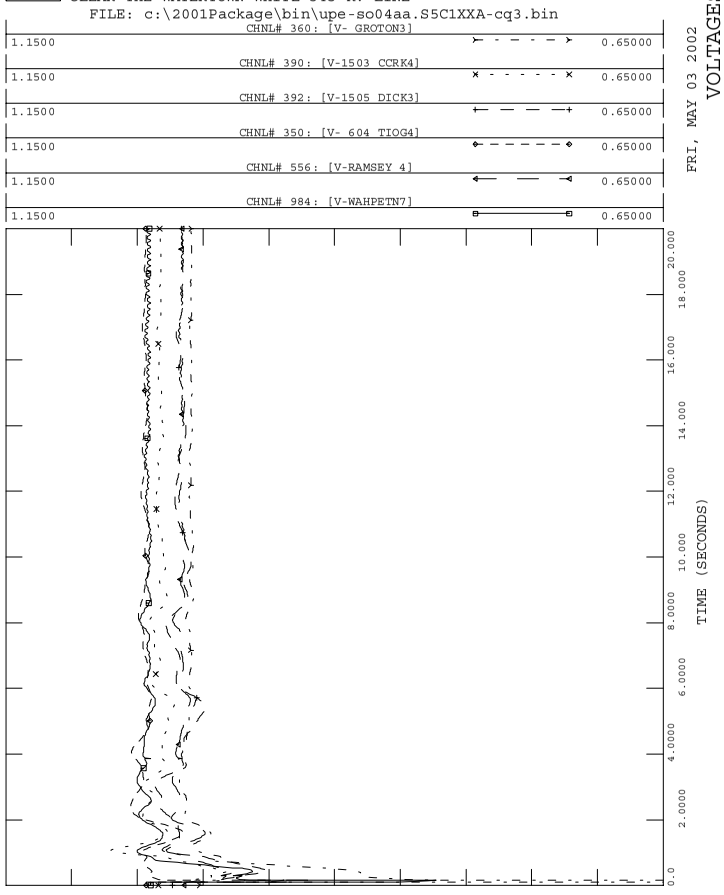
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06
ROTOR ANGLES IA



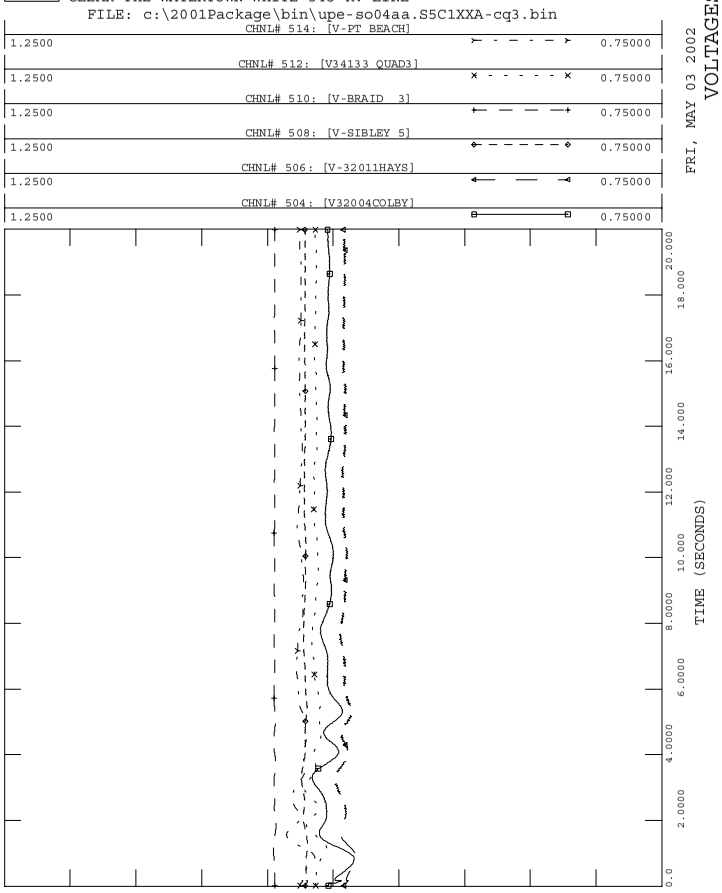
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06
VOLTAGES 2



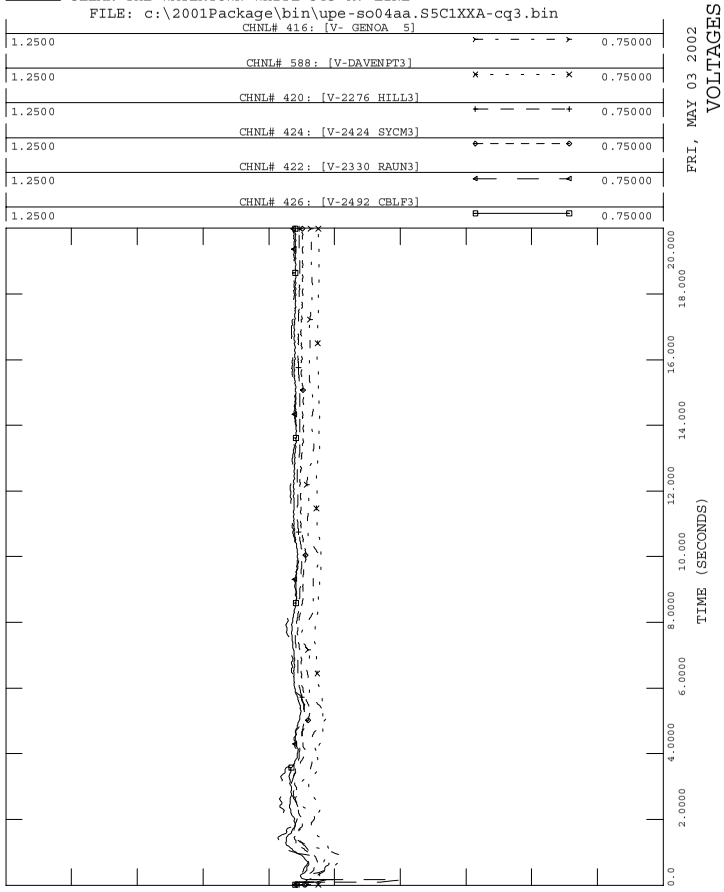
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06
VOLTAGES 5



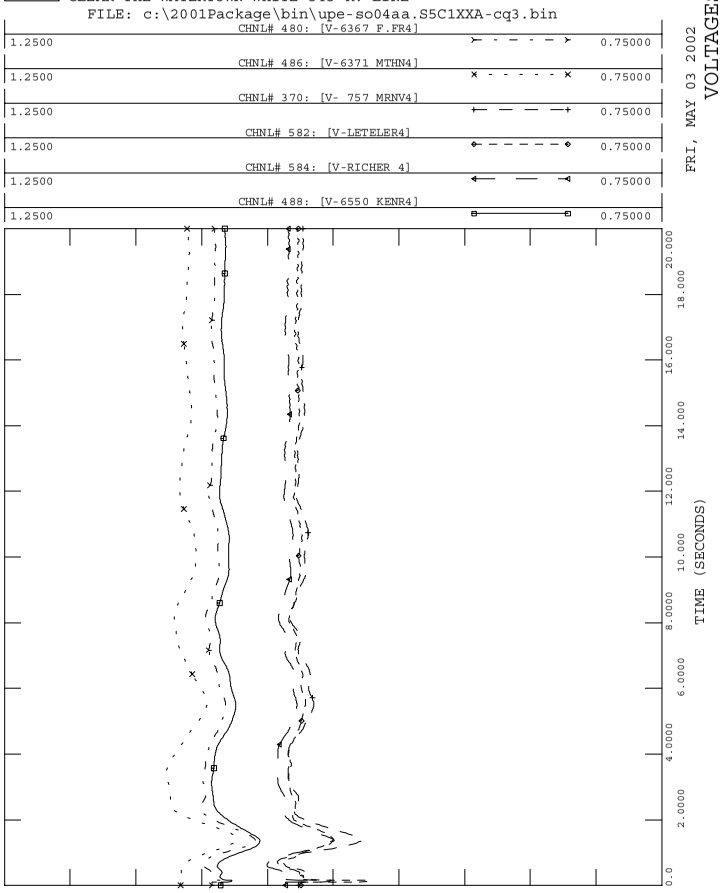
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06
VOLTAGES IA



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06
VOLTAGES 4



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

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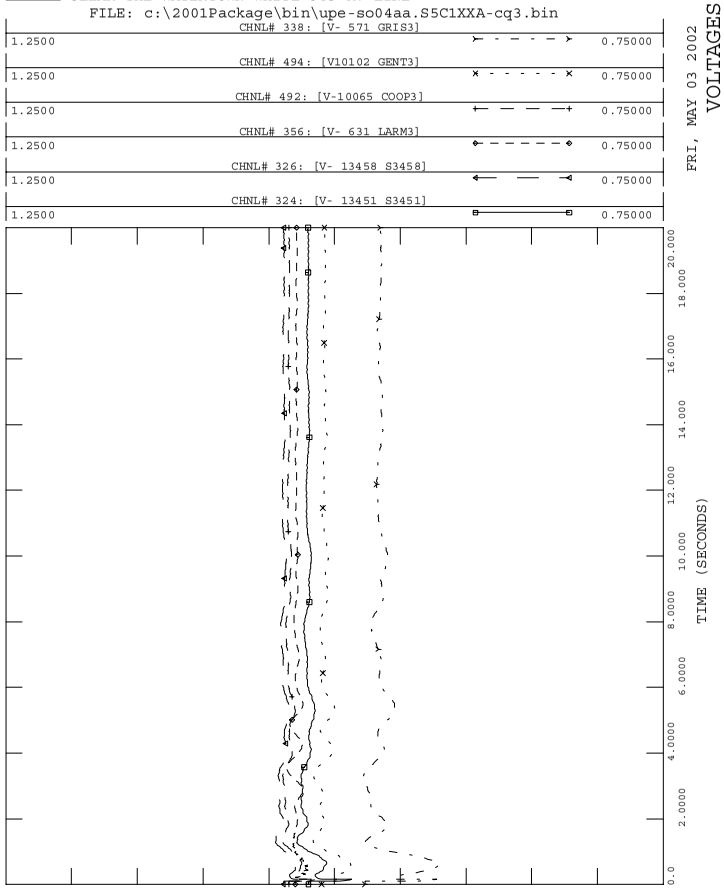
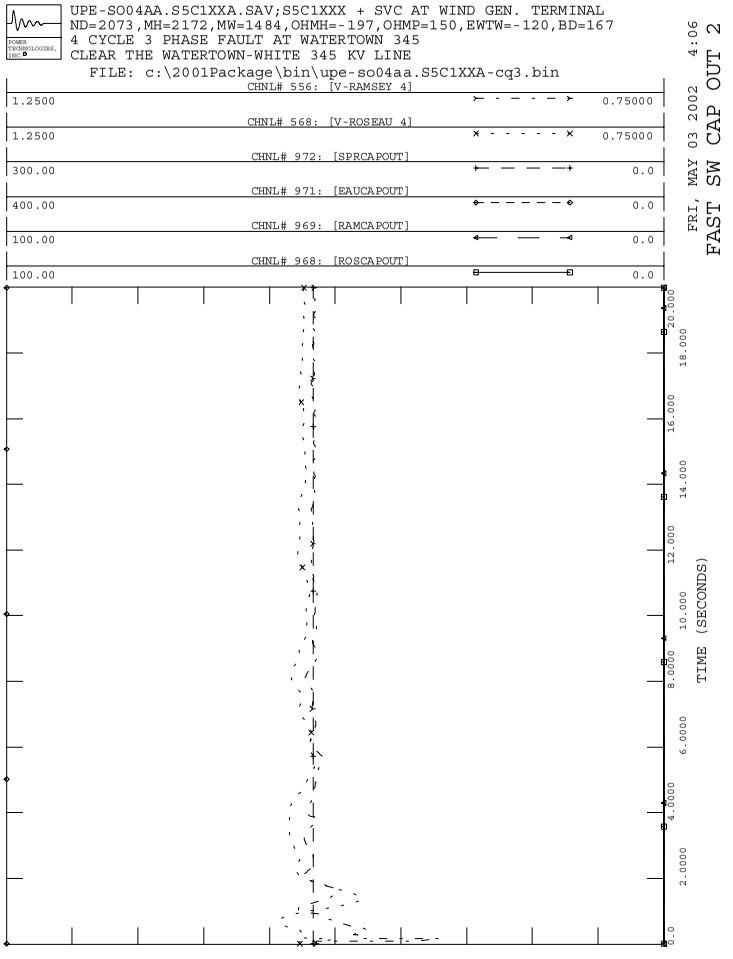
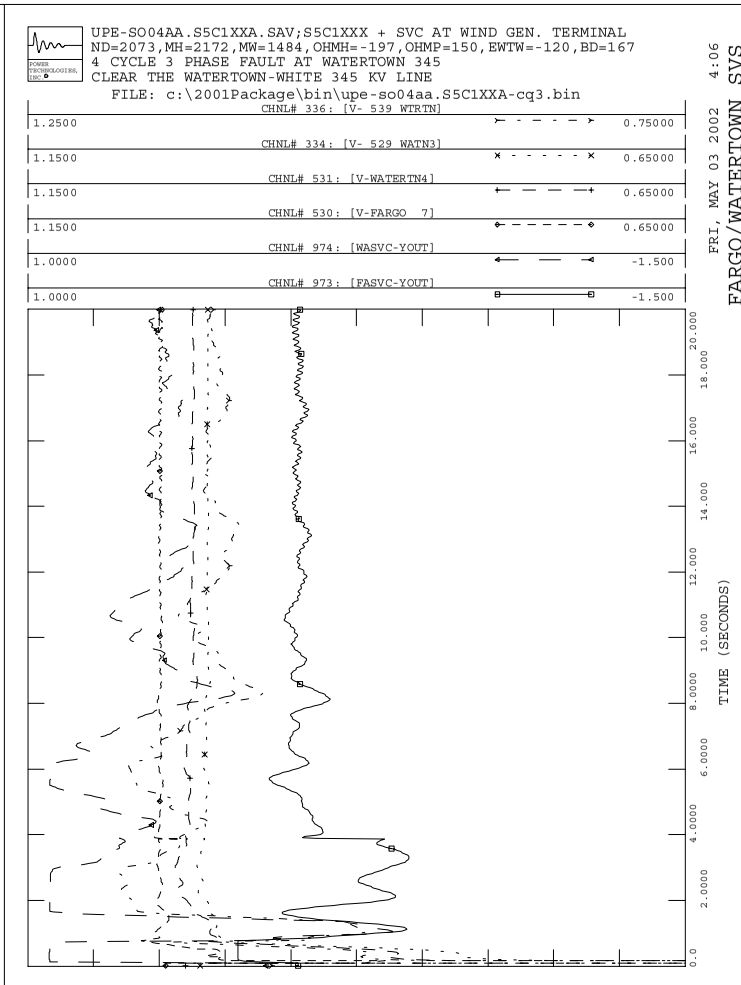
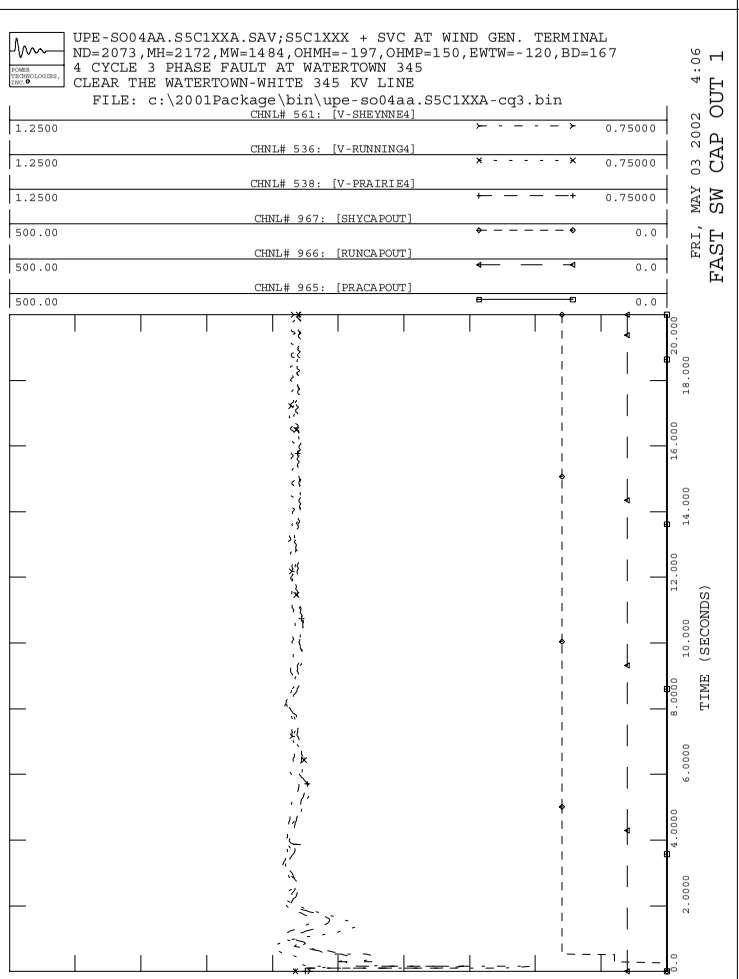
VOLTAGES NB




UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
FRI, MAY 03 2002 4:06
FAST SW CAP OUT 2


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
FRI, MAY 03 2002 4:06
FARGO/WATERTOWN SVS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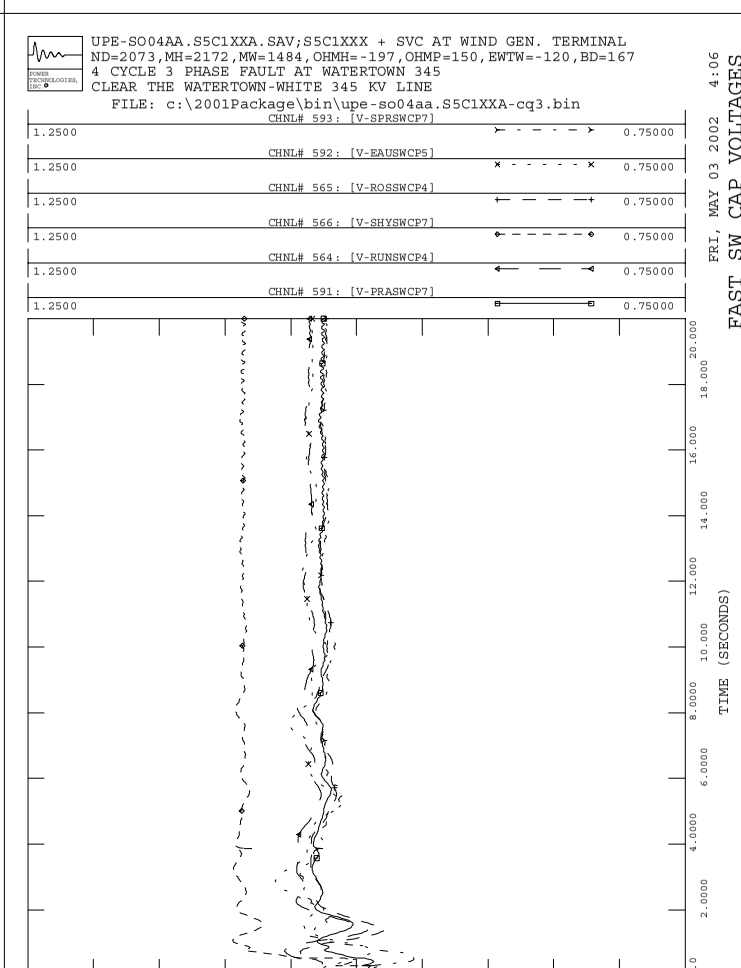
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
FRI, MAY 03 2002 4:06
FAST SW CAP OUT 1


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
FRI, MAY 03 2002 4:06
FAST SW CAP VOLTAGES

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

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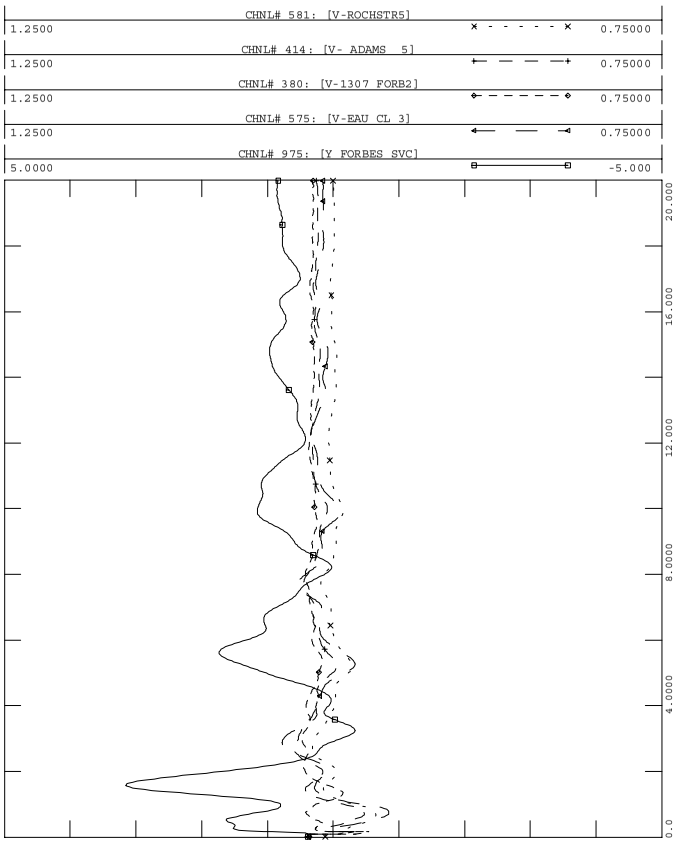
SVC & WISCONSIN VOLT



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4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

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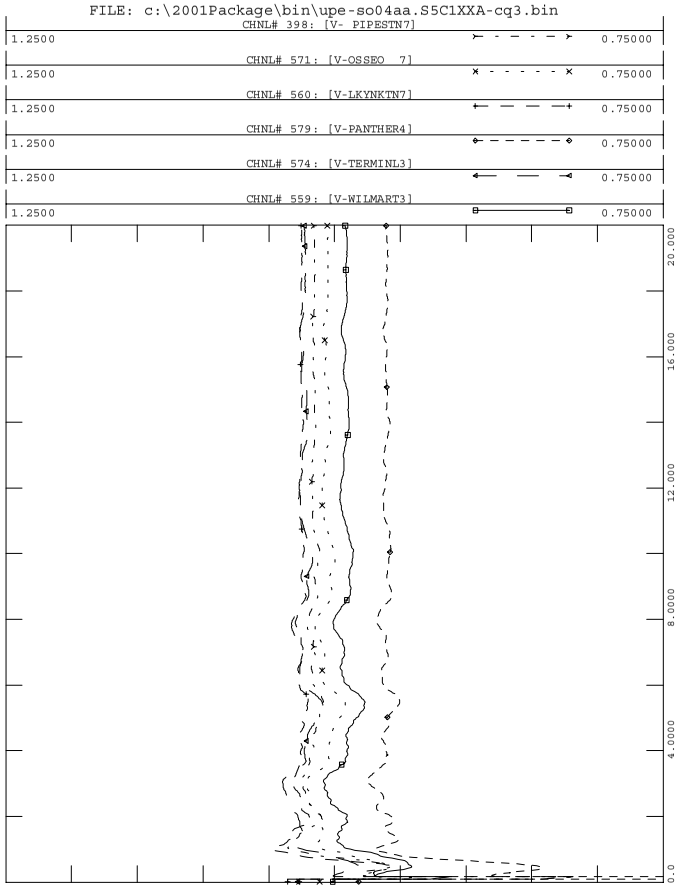
TC VOLTAGES



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
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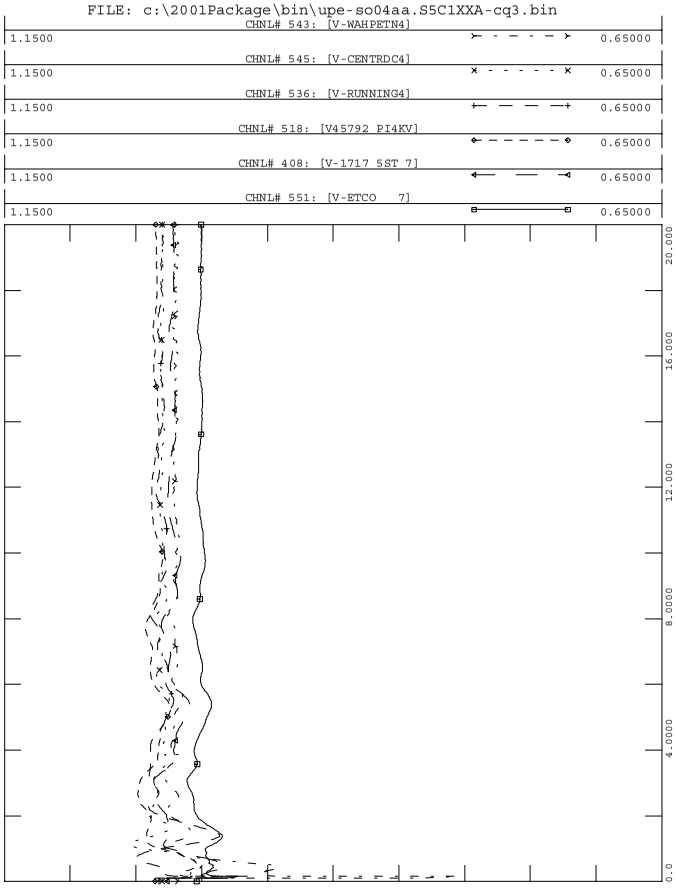
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06

VOLTAGES 6



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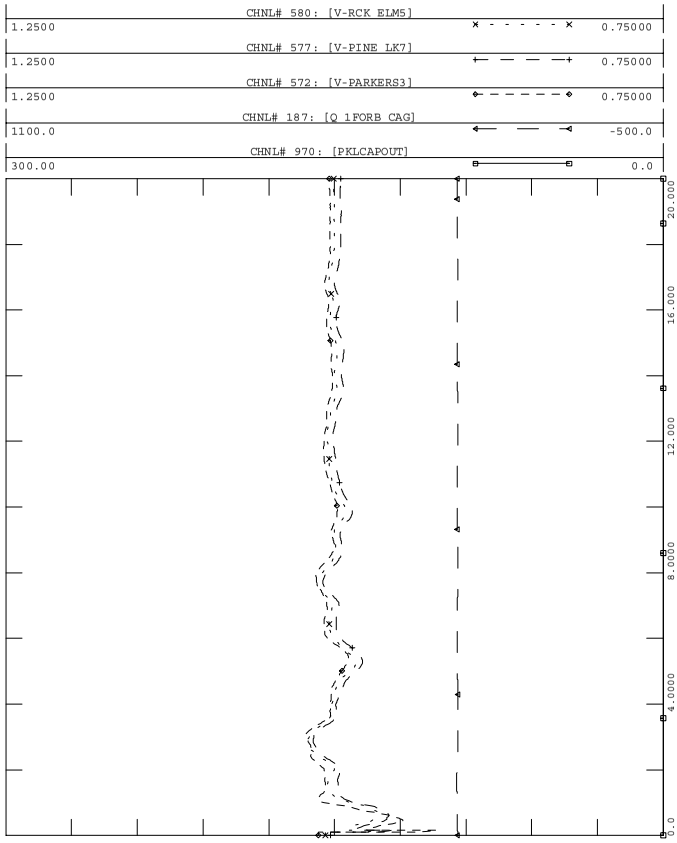
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06

FORBES SVS OUT & VOLTAGES



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
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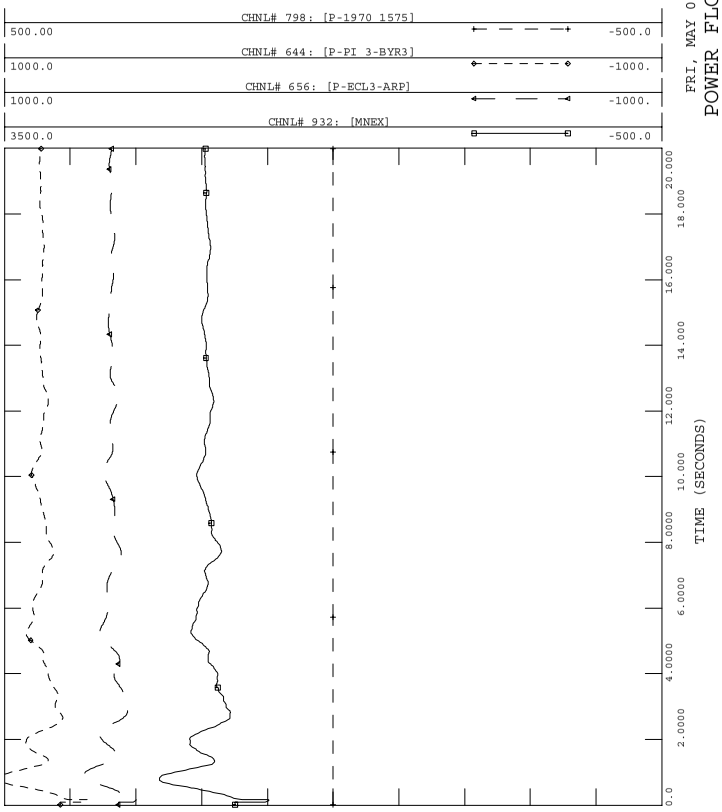
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06
POWER FLOW SUMS 2



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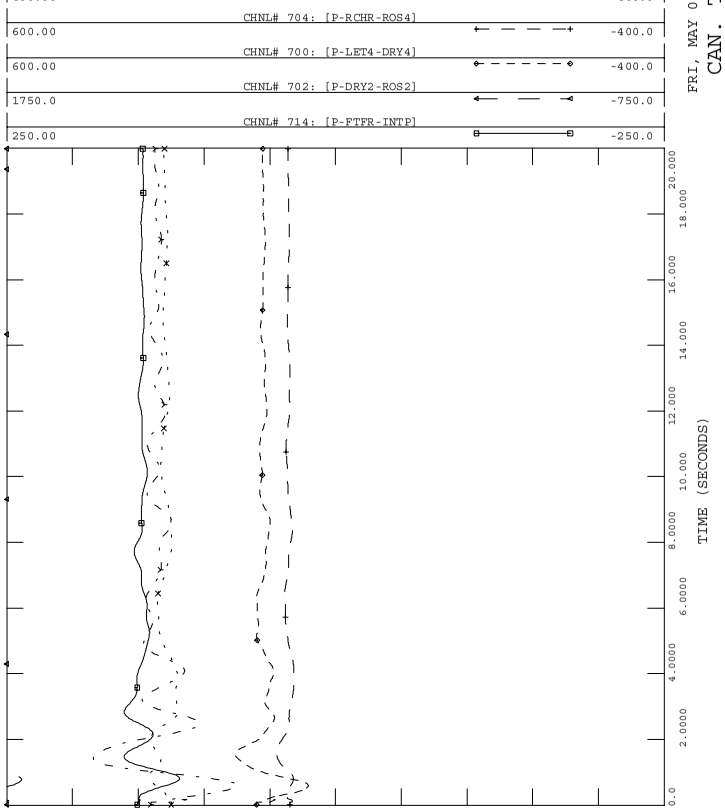
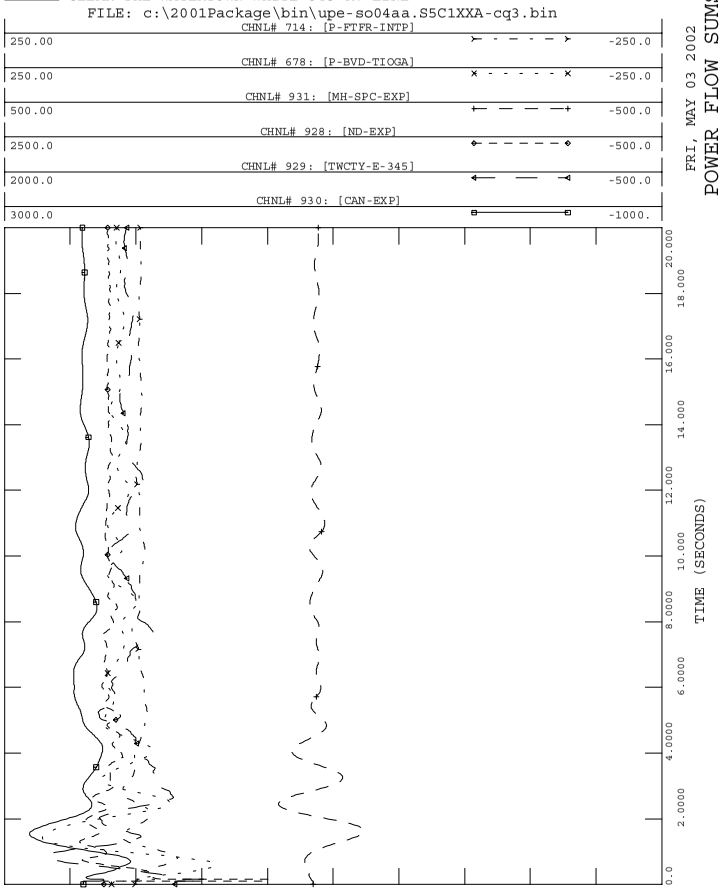
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06
CAN. TIE FLOWS



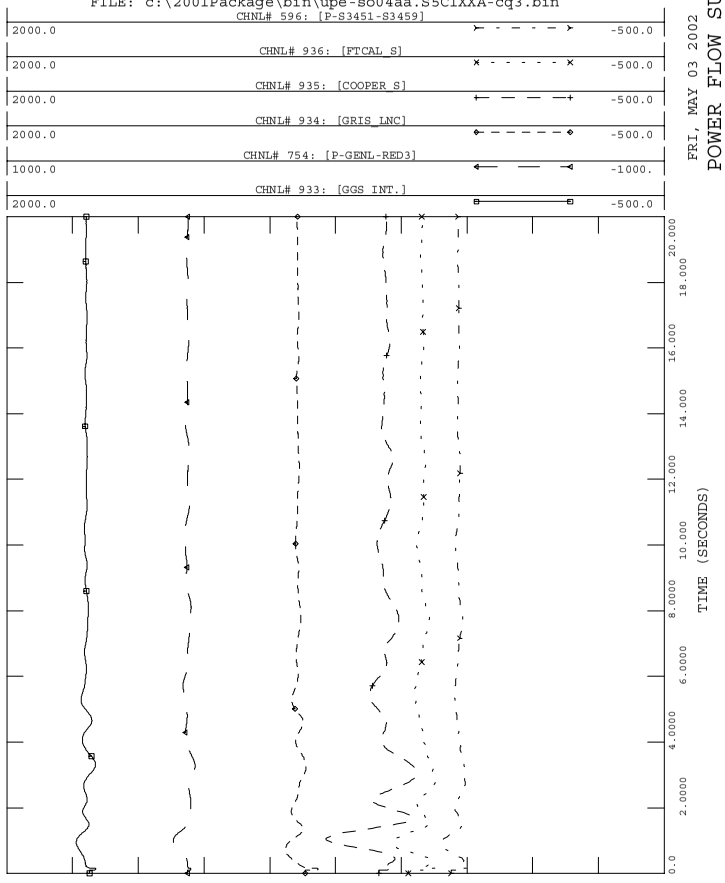
UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06
POWER FLOW SUMS 1



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06
POWER FLOW SUM 3



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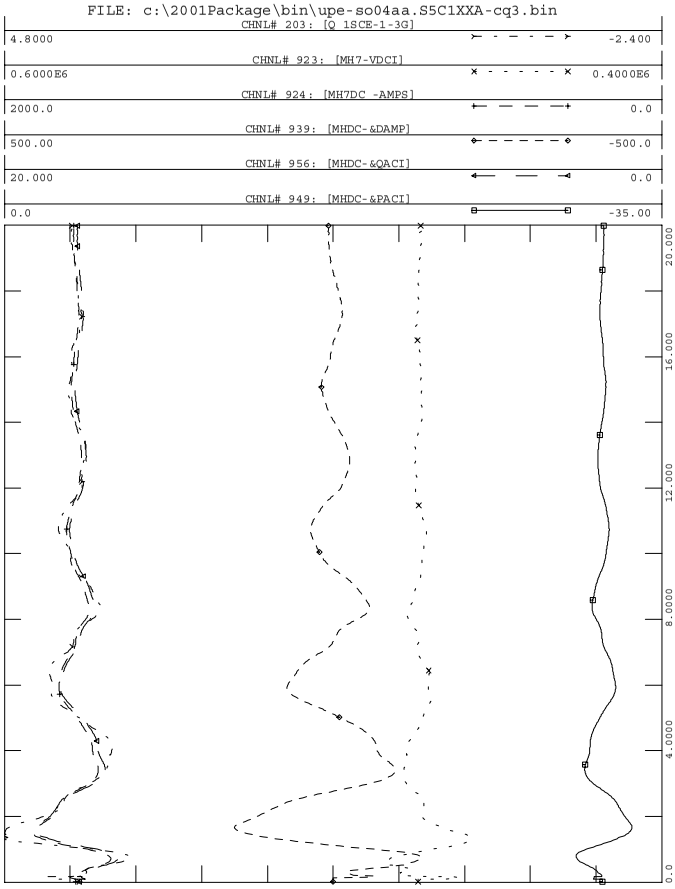
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06

MH DC PARAMETERS



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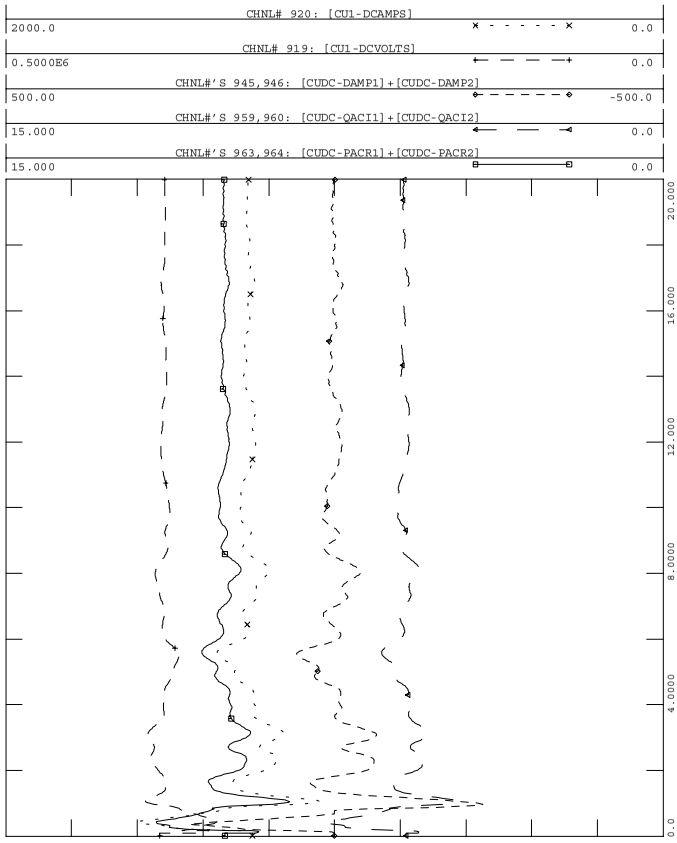
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06

CU DC #1



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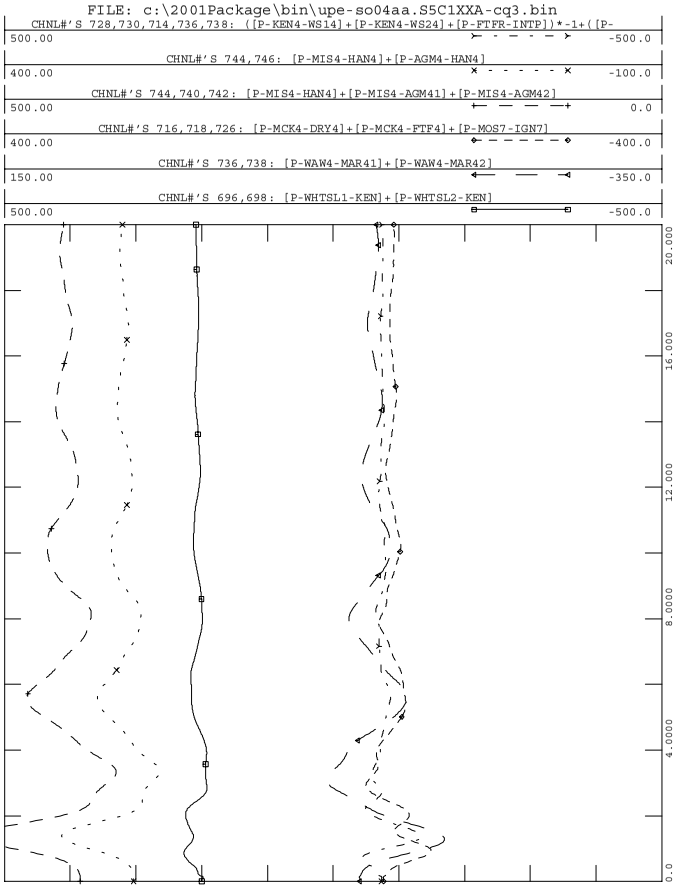
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

FRI, MAY 03 2002 4:06

OH TIE FLOWS



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ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

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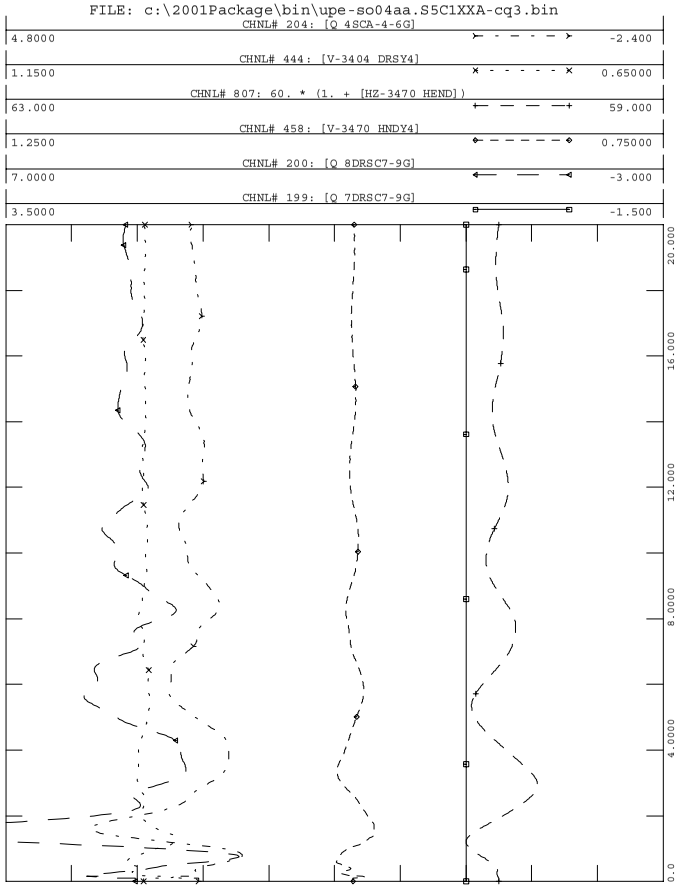
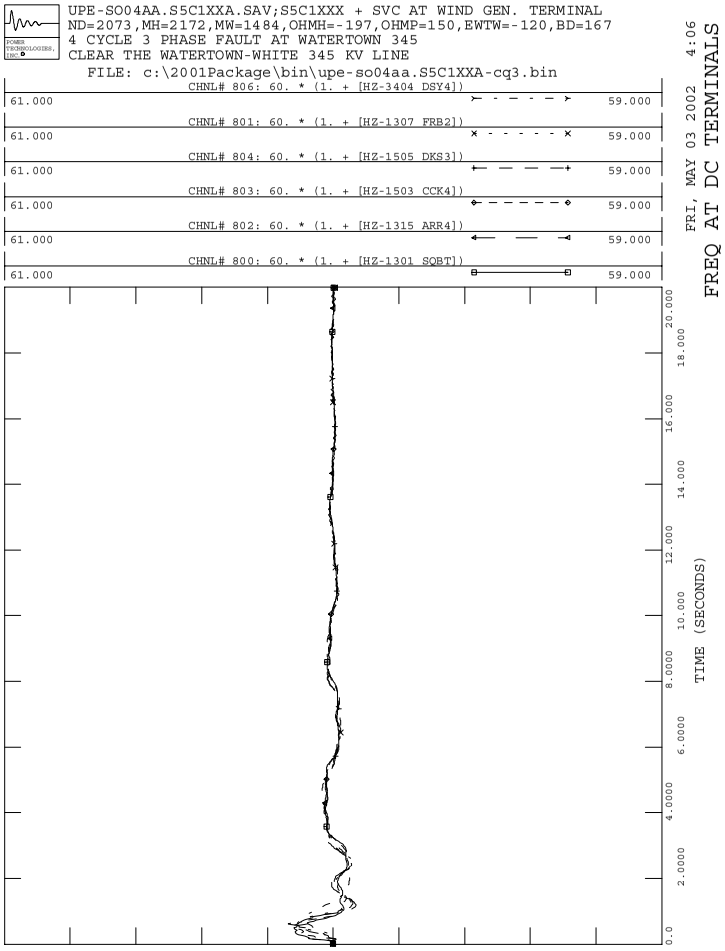
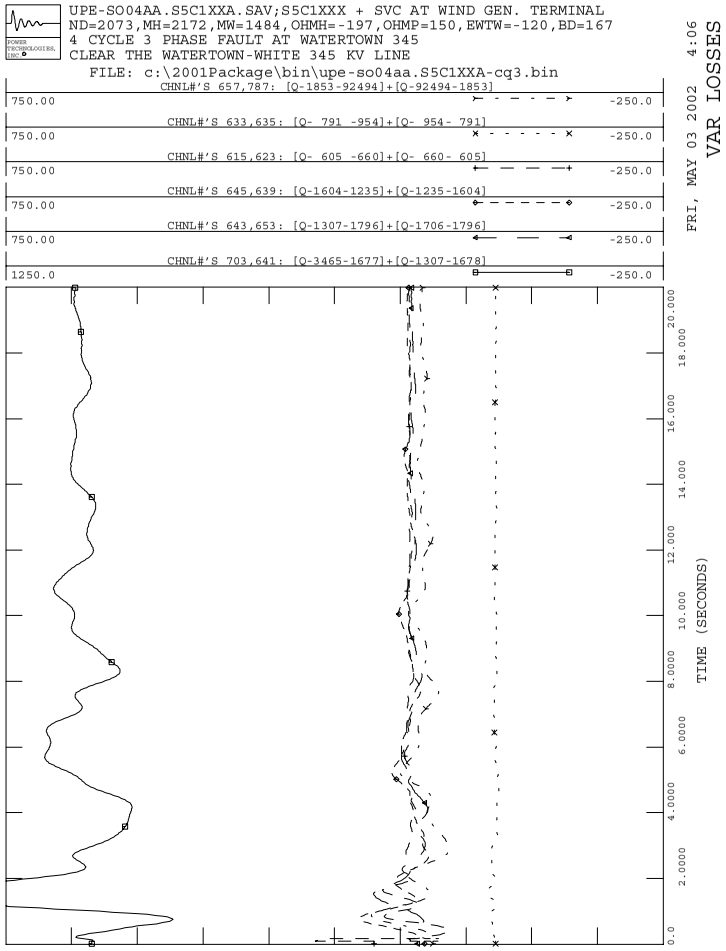
MH DC PARAMETERS




UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
FRI, MAY 03 2002 4:06
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
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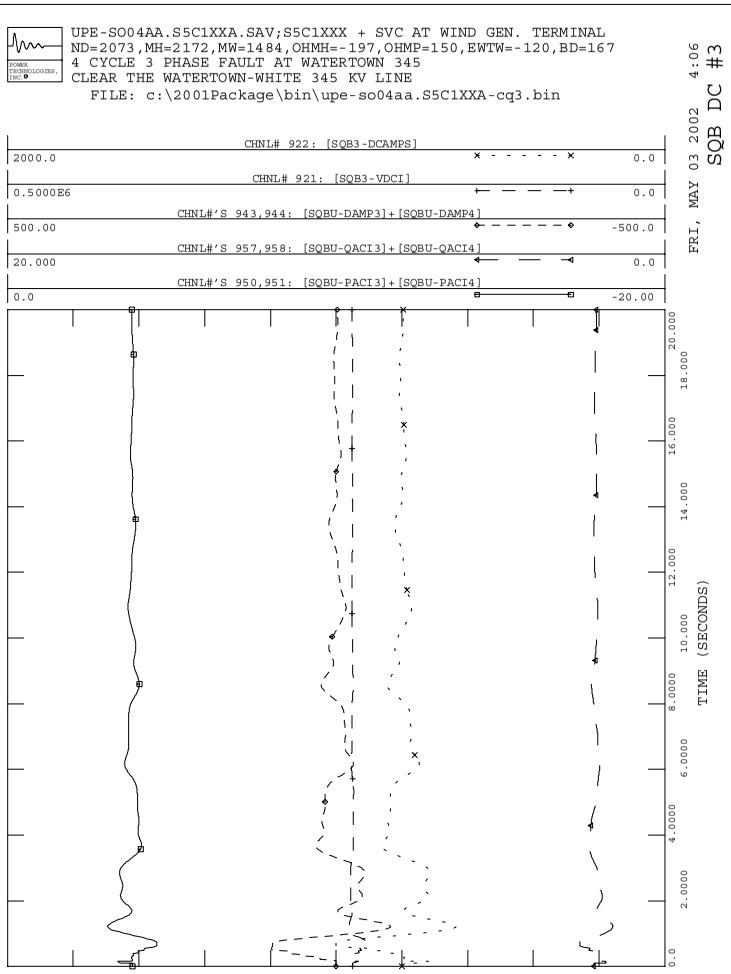
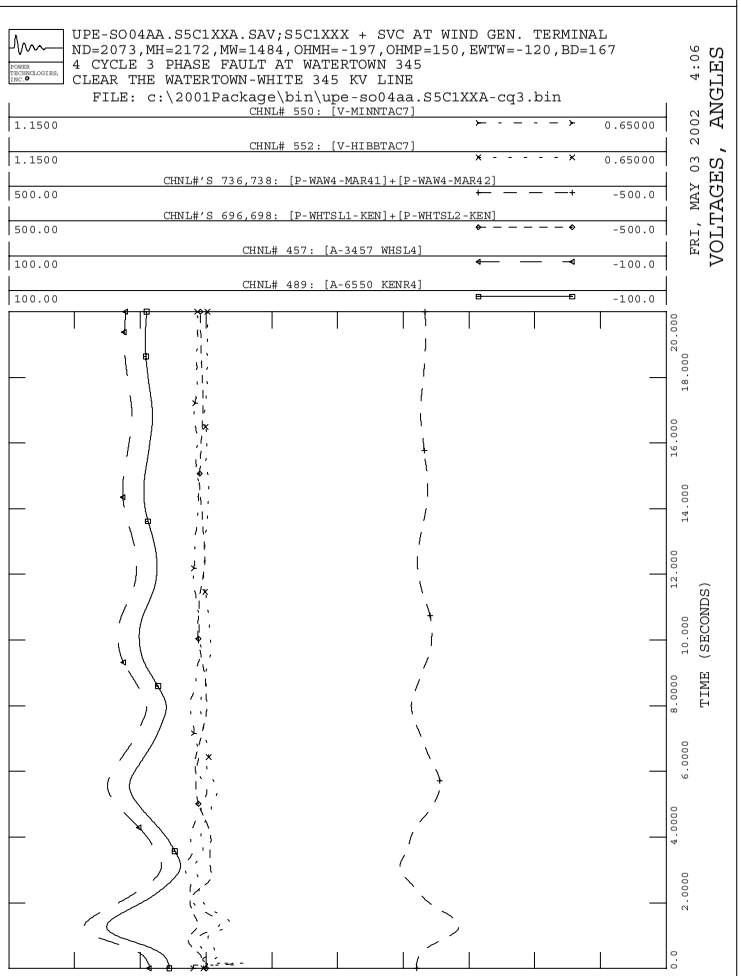
FRI, MAY 03 2002 4:06
VAR LOSSES
TIME (SECONDS)

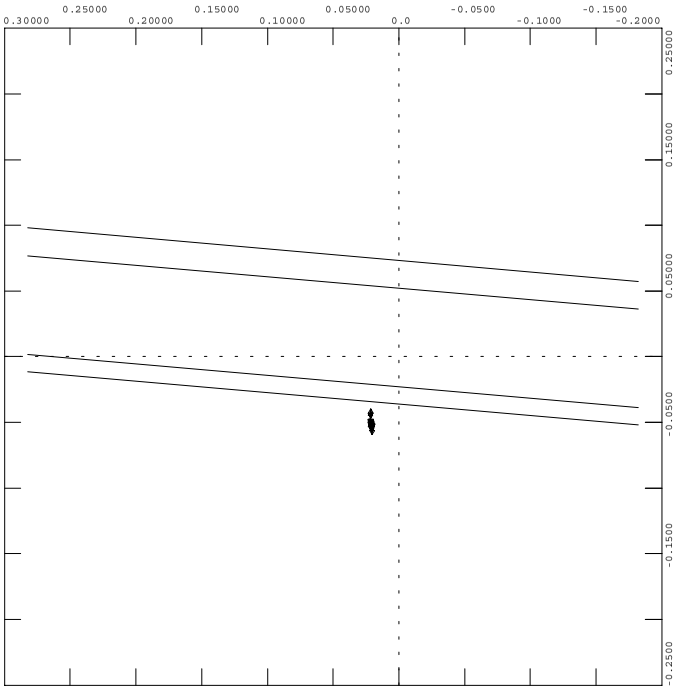

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
FRI, MAY 03 2002 4:06
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
FRI, MAY 03 2002 4:06
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

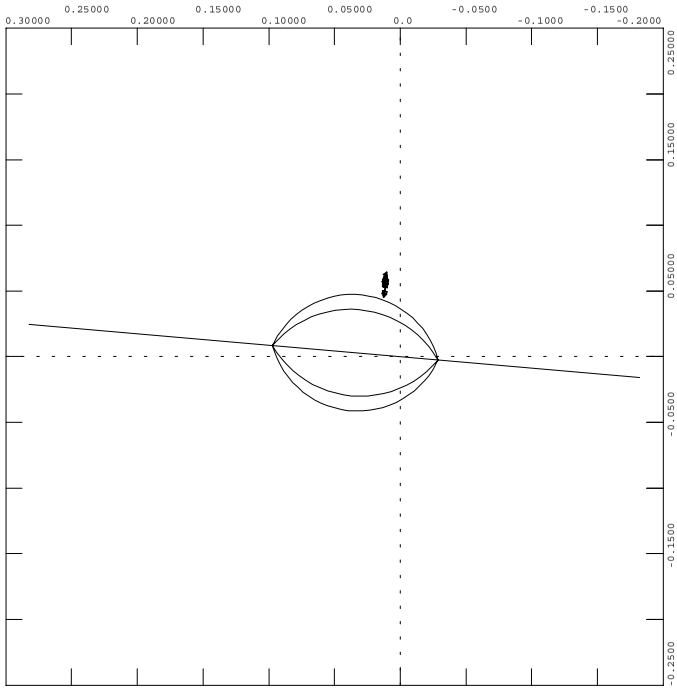


FRI, MAY 03 2002 4:06
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

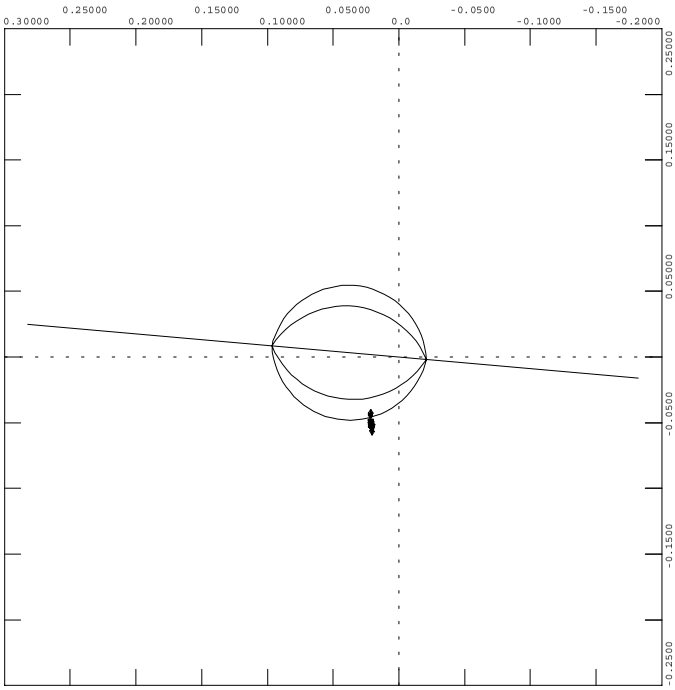


FRI, MAY 03 2002 4:06
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

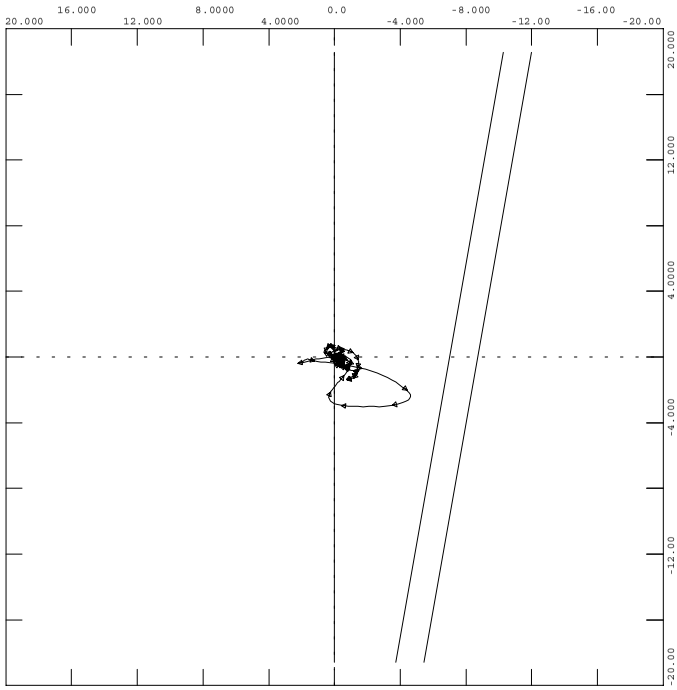


FRI, MAY 03 2002 4:06
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

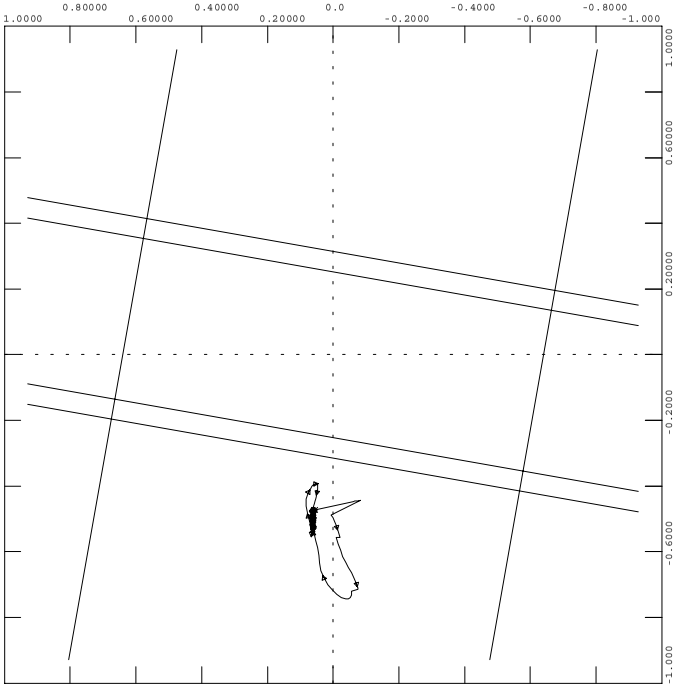


FRI, MAY 03 2002 4:06
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

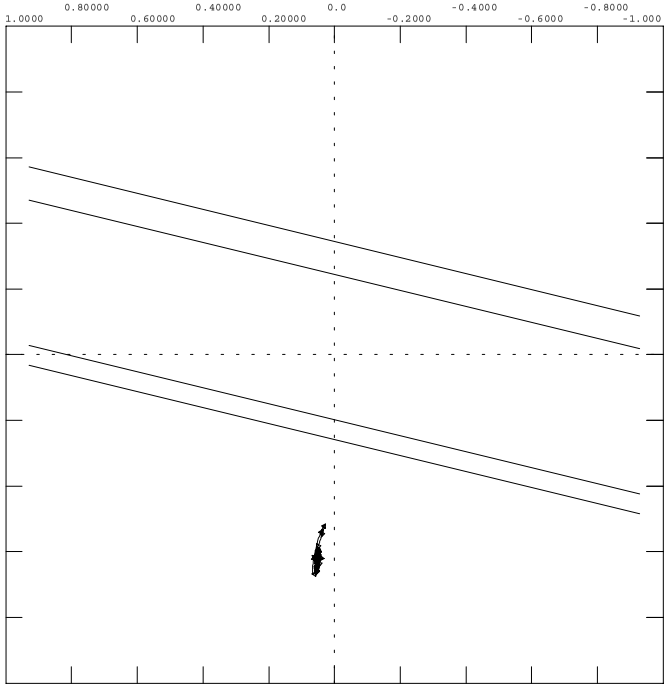
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

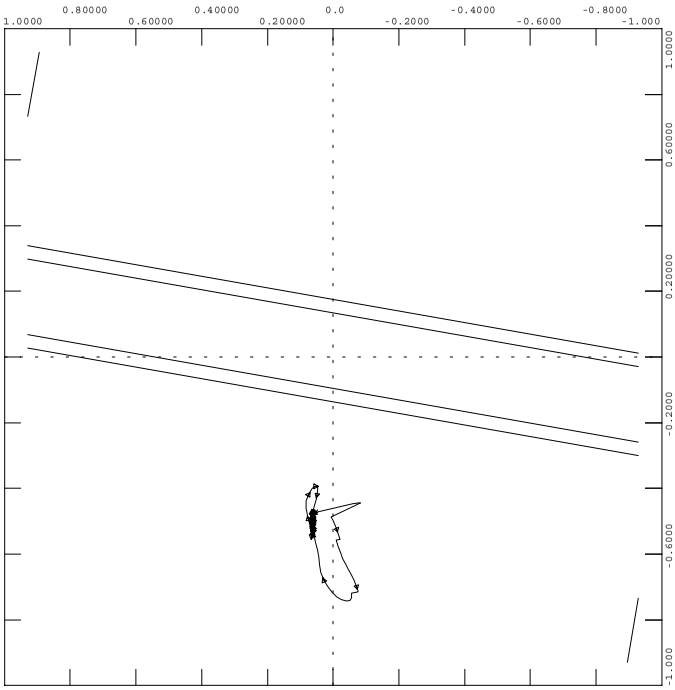
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

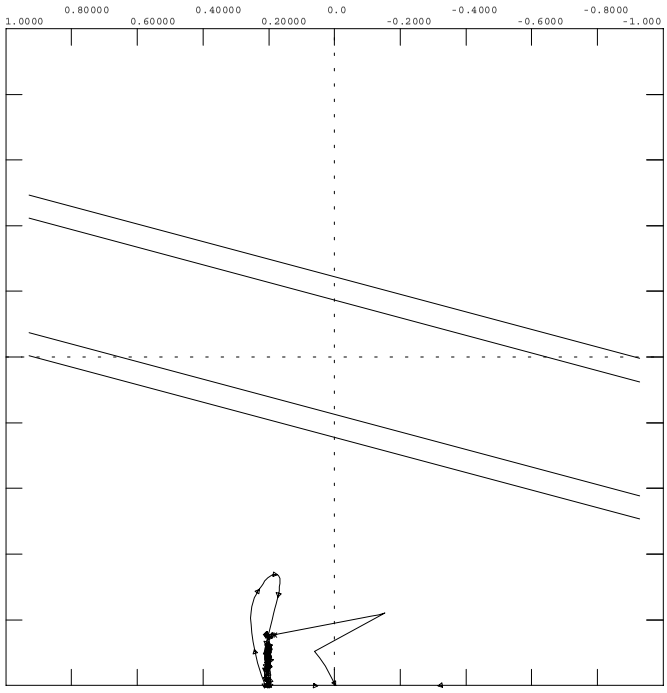
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

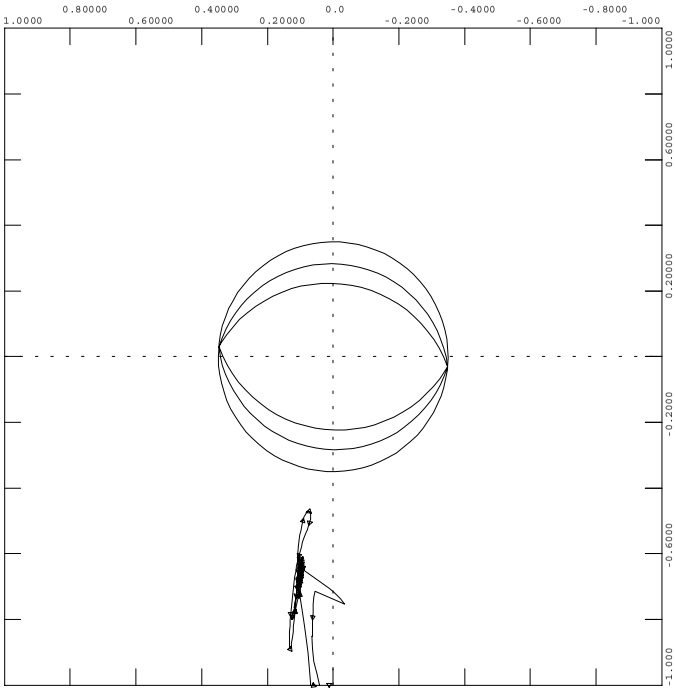
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

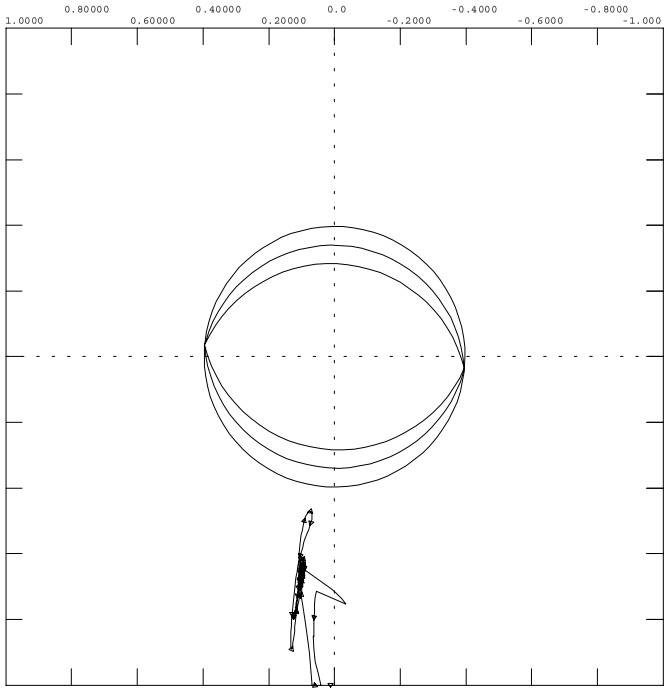
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

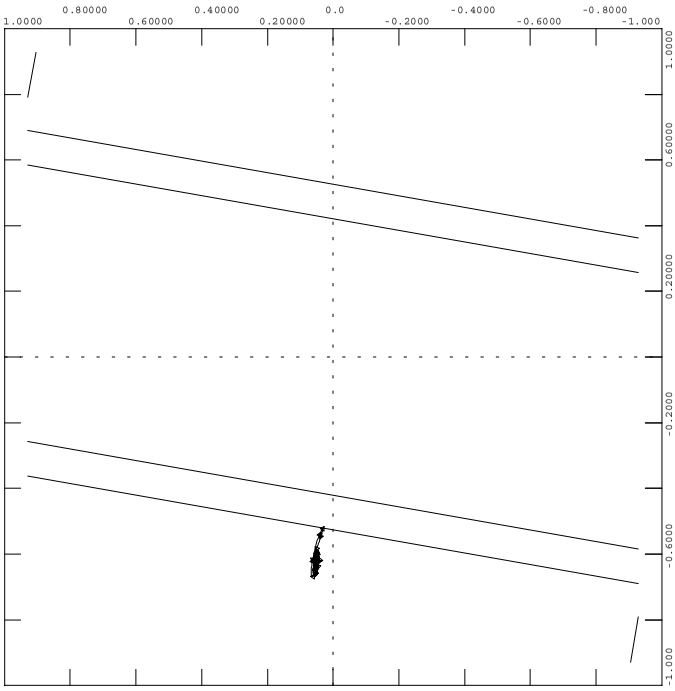
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

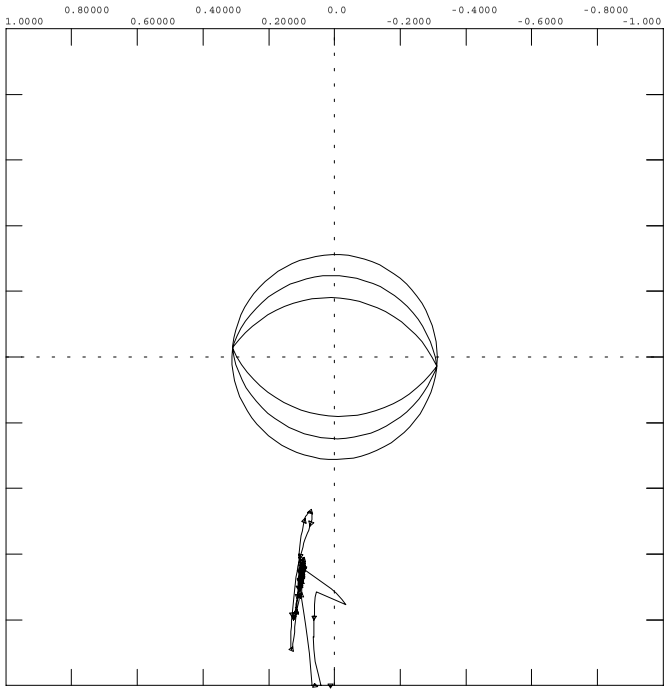
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

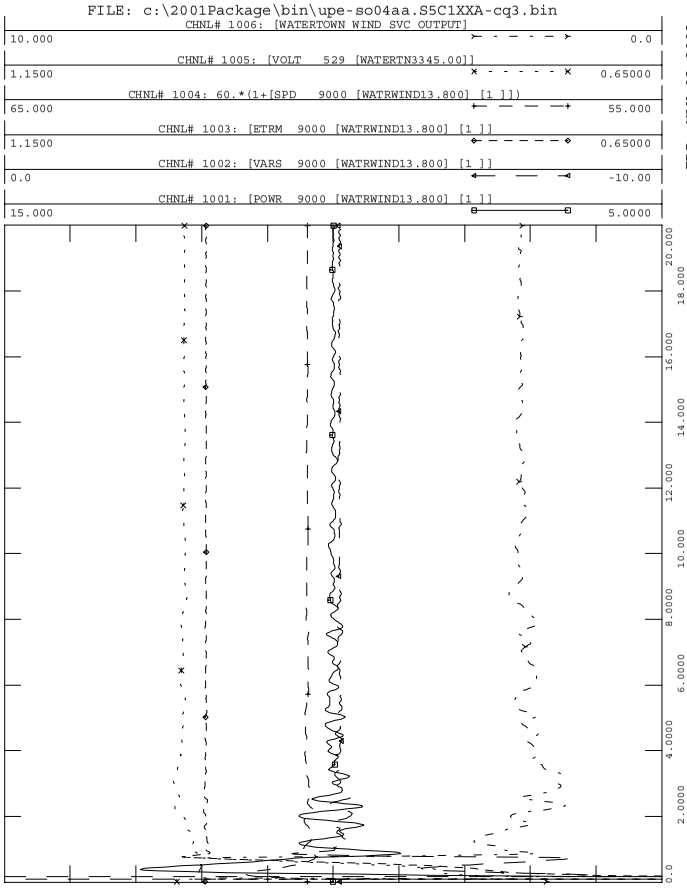
FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

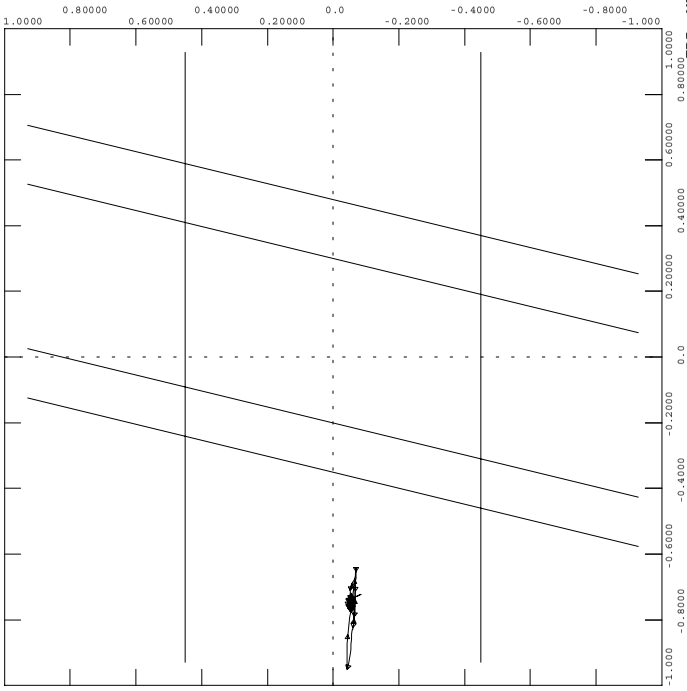


FRI, MAY 03 2002 4:07
WATERTOWN 1000MW WIND UNI

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C1XXA-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



FRI, MAY 03 2002 4:07
MP-OH I.FALLS (779)

APPENDIX 32

SCREENING OF MAPP CONTINGENCIES

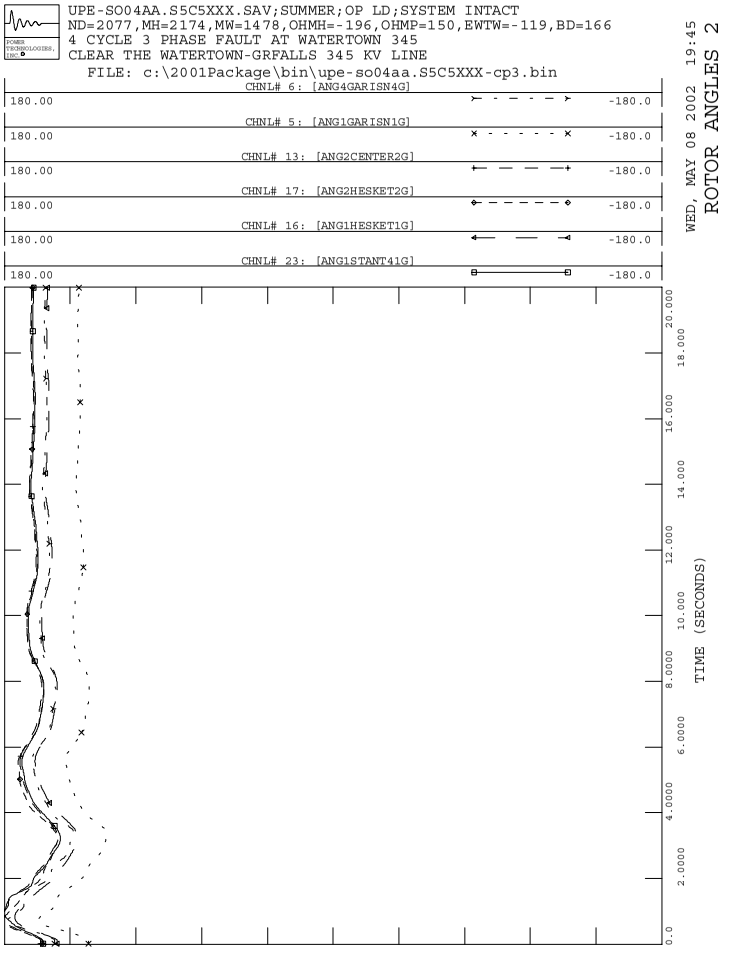
WITH DYNAMIC SIMULATION

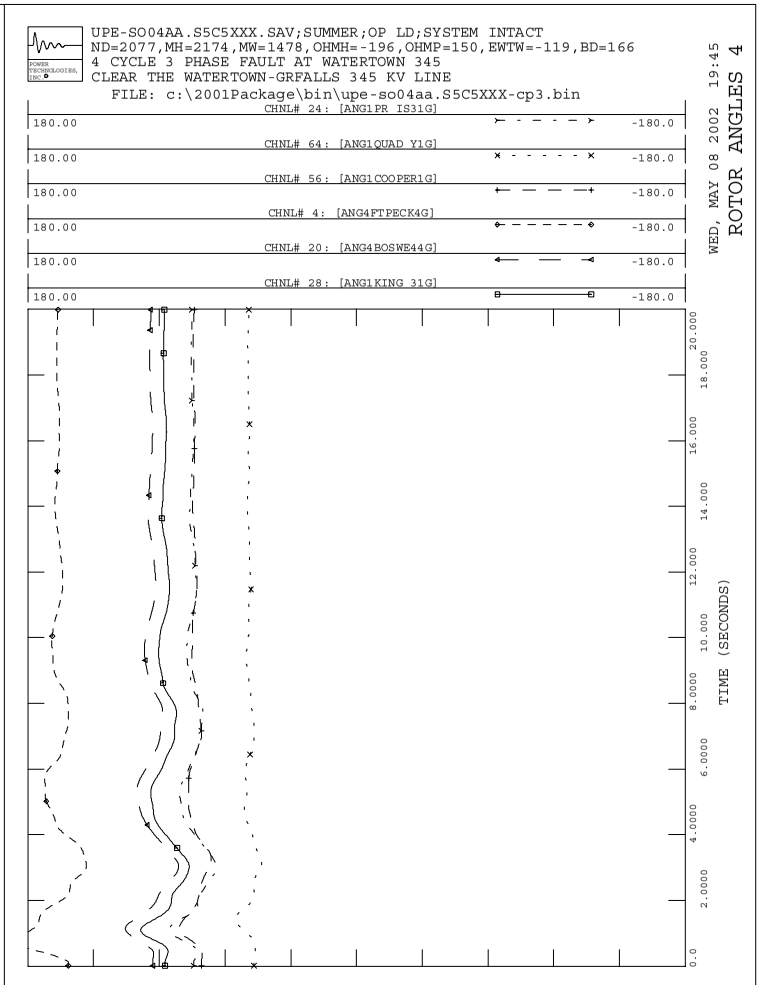
SITE 5 (WATERTOWN)

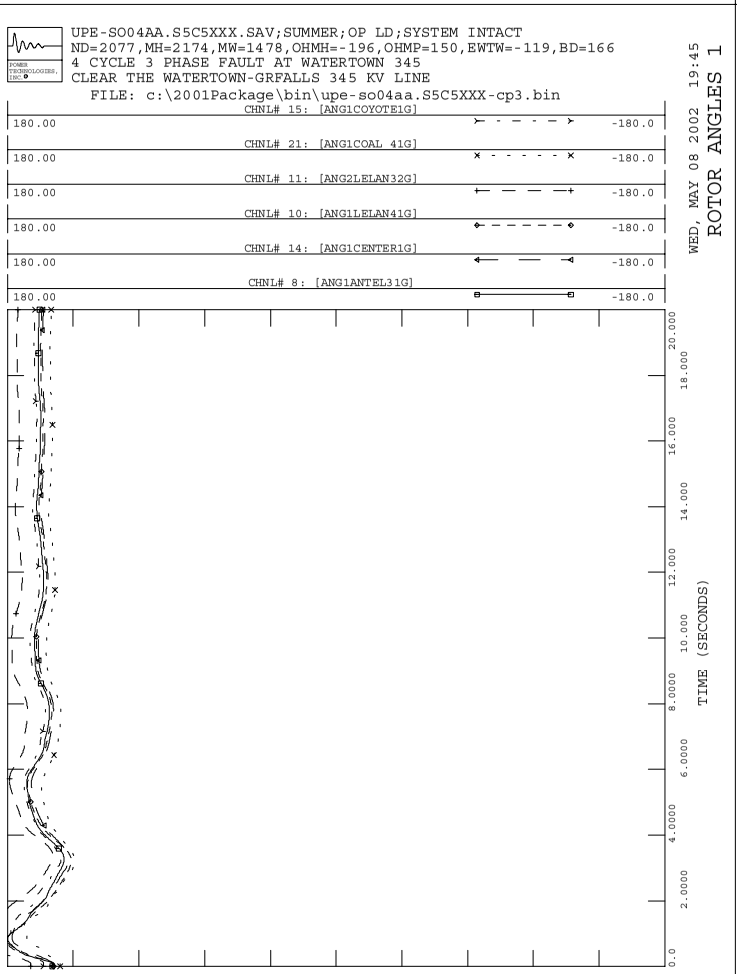
CASE S5C5XXX

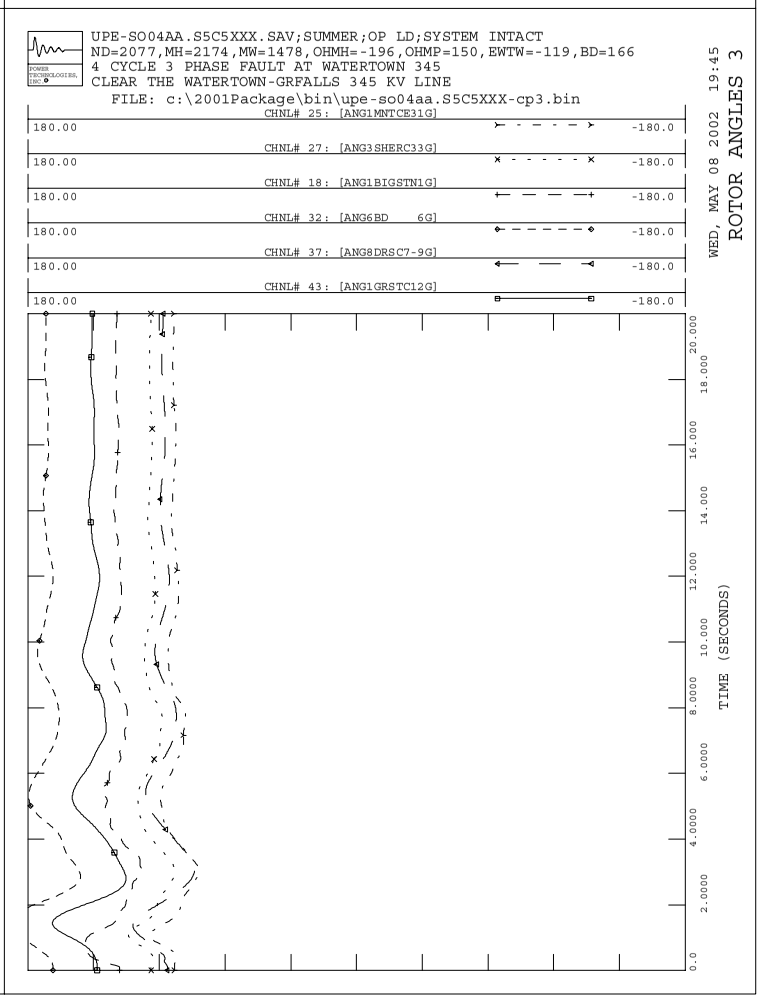
CONTINGENCY CP3

4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-Gr. Falls 345 kV line.


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin
CHNL# 6: [ANG4GARISN4G]
CHNL# 5: [ANG1GARISN1G]
CHNL# 13: [ANG2CENTER2G]
CHNL# 17: [ANG2HESKET2G]
CHNL# 16: [ANG1HESKET1G]
CHNL# 23: [ANG1STANT41G]
180.00
-180.0
TIME (SECONDS)
WED, MAY 08 2002 19:45
ROTOR ANGLES 2

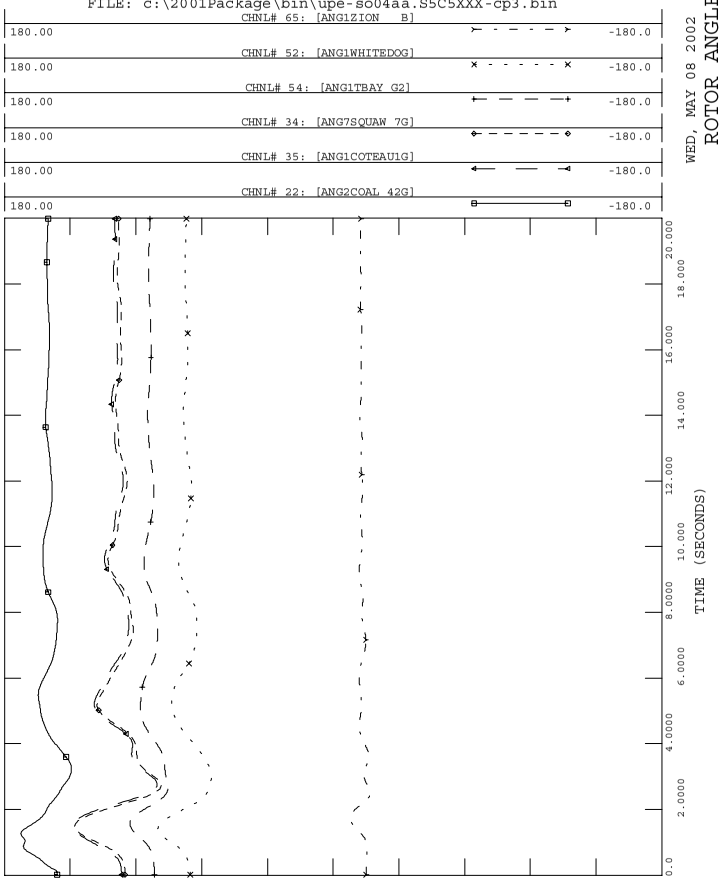

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin
CHNL# 24: [ANG1PR IS31G]
CHNL# 64: [ANG1QUAD Y1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 4: [ANG4FTPECK4G]
CHNL# 20: [ANG4BOSWE44G]
CHNL# 28: [ANG1KING 31G]
180.00
-180.0
TIME (SECONDS)
WED, MAY 08 2002 19:45
ROTOR ANGLES 4


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin
CHNL# 15: [ANG1COYOTE1G]
CHNL# 21: [ANG1COAL 41G]
CHNL# 11: [ANG2LELAN32G]
CHNL# 10: [ANG1LELAN41G]
CHNL# 14: [ANG1CENTER1G]
CHNL# 8: [ANG1ANTEL31G]
180.00
-180.0
TIME (SECONDS)
WED, MAY 08 2002 19:45
ROTOR ANGLES 1


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin
CHNL# 25: [ANG1MNTCE31G]
CHNL# 27: [ANG3SHERC33G]
CHNL# 18: [ANG1BIGSTN1G]
CHNL# 32: [ANG6BD 6G]
CHNL# 37: [ANG8DRSC7-9G]
CHNL# 43: [ANG1GRSTC12G]
180.00
-180.0
TIME (SECONDS)
WED, MAY 08 2002 19:45
ROTOR ANGLES 3

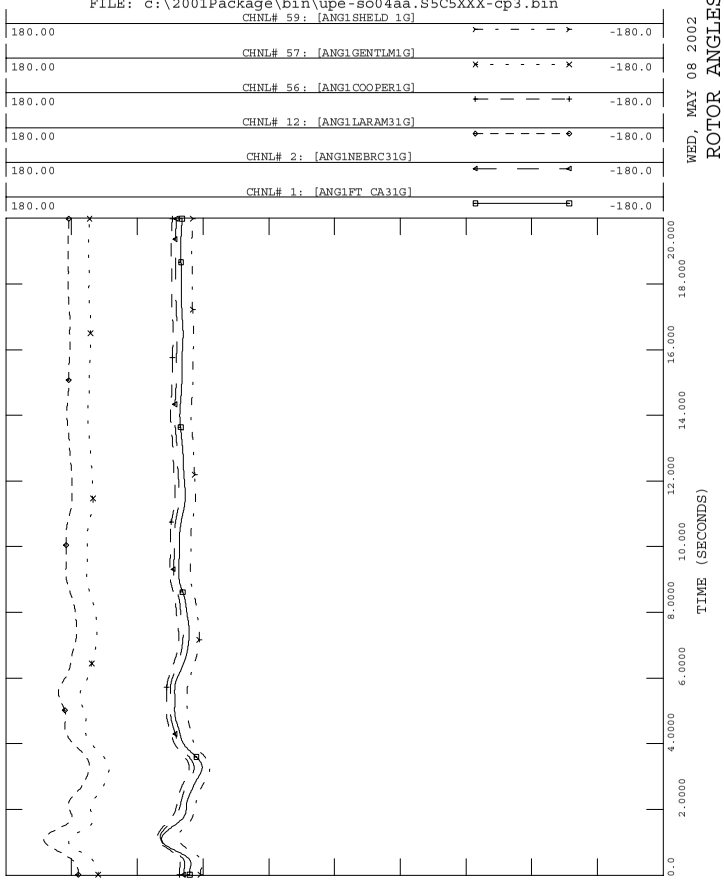
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

WED, MAY 08 2002 19:45
ROTOR ANGLES 6



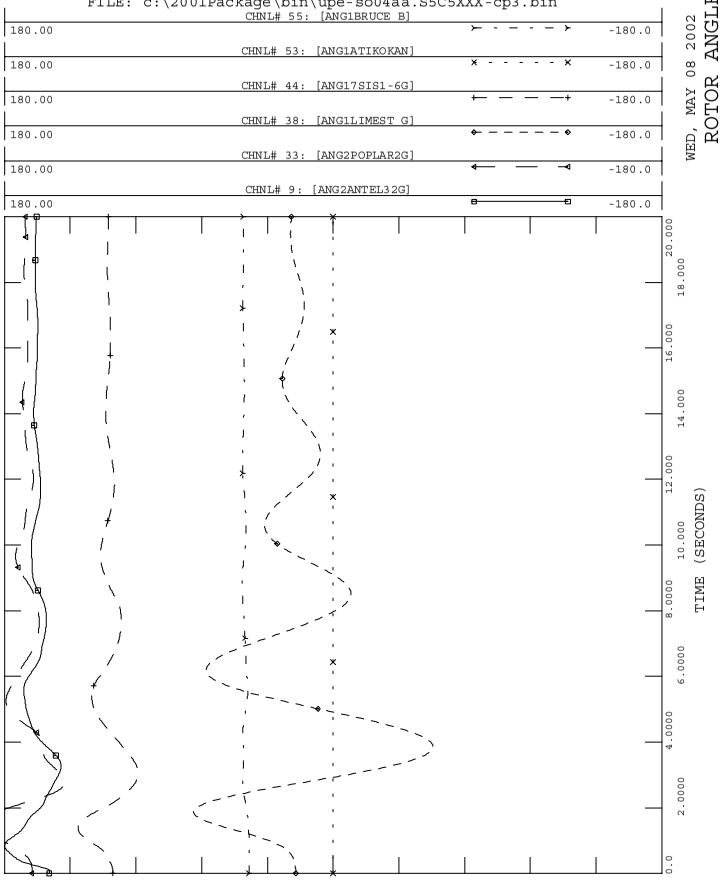
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

WED, MAY 08 2002 19:45
ROTOR ANGLES NB



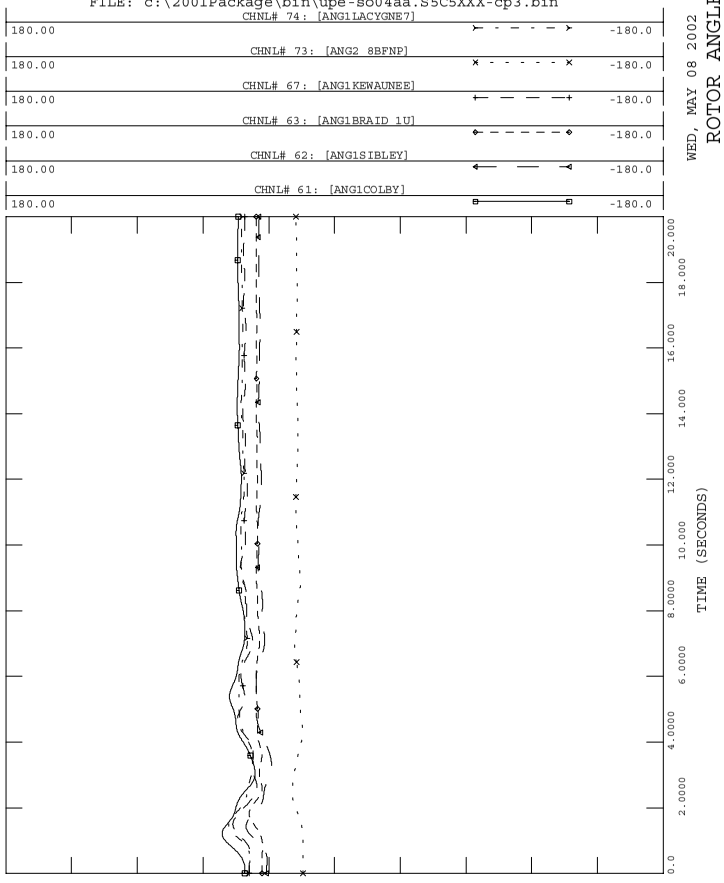
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

WED, MAY 08 2002 19:45
ROTOR ANGLES 5



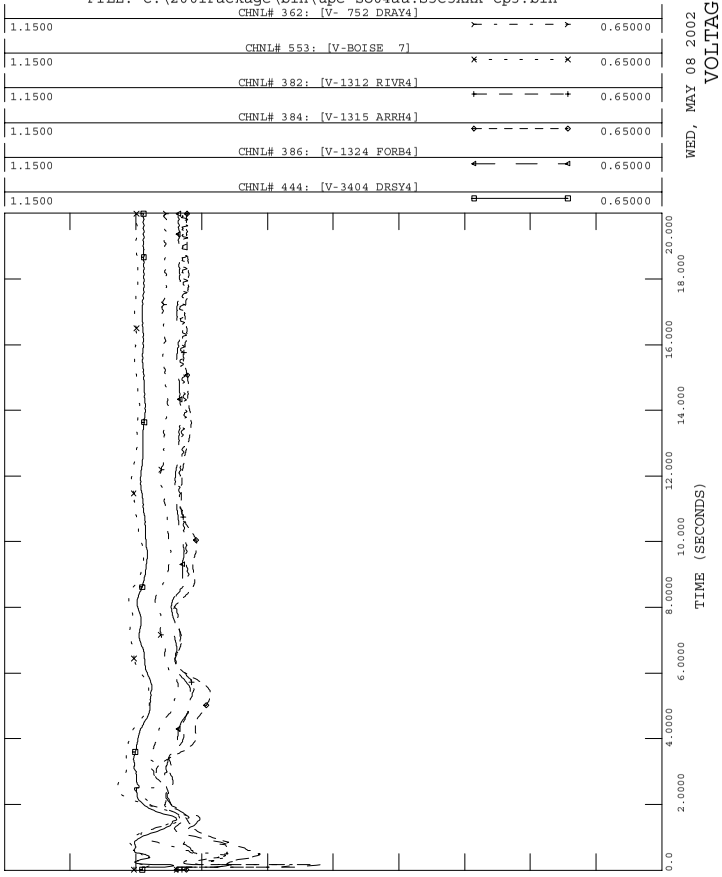
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

WED, MAY 08 2002 19:45
ROTOR ANGLES 7



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

WED, MAY 08 2002 19:45
VOLTAGES 1



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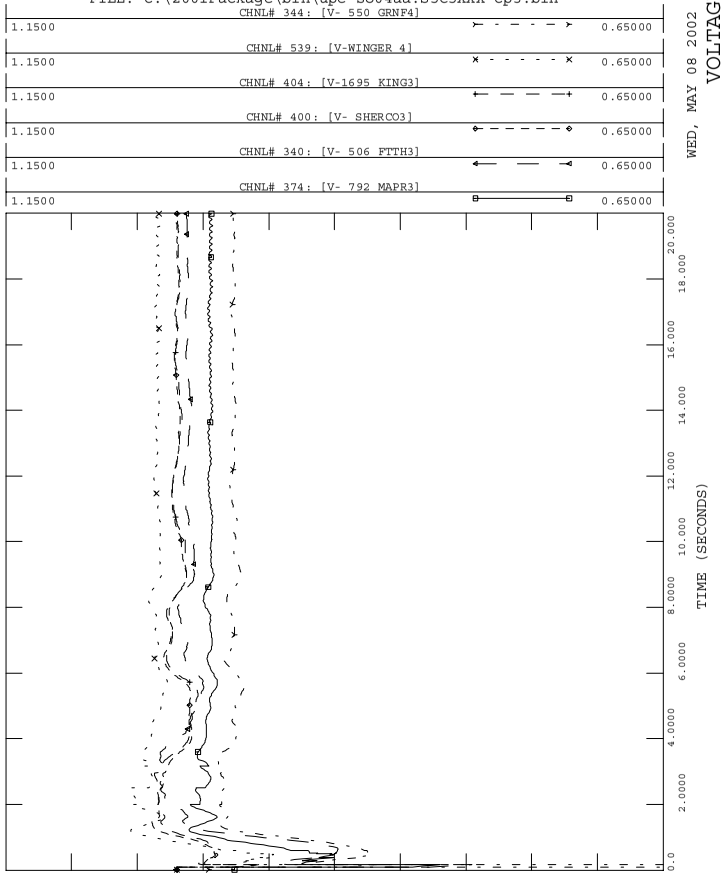
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

WED, MAY 08 2002 19:45
VOLTAGES 3



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CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

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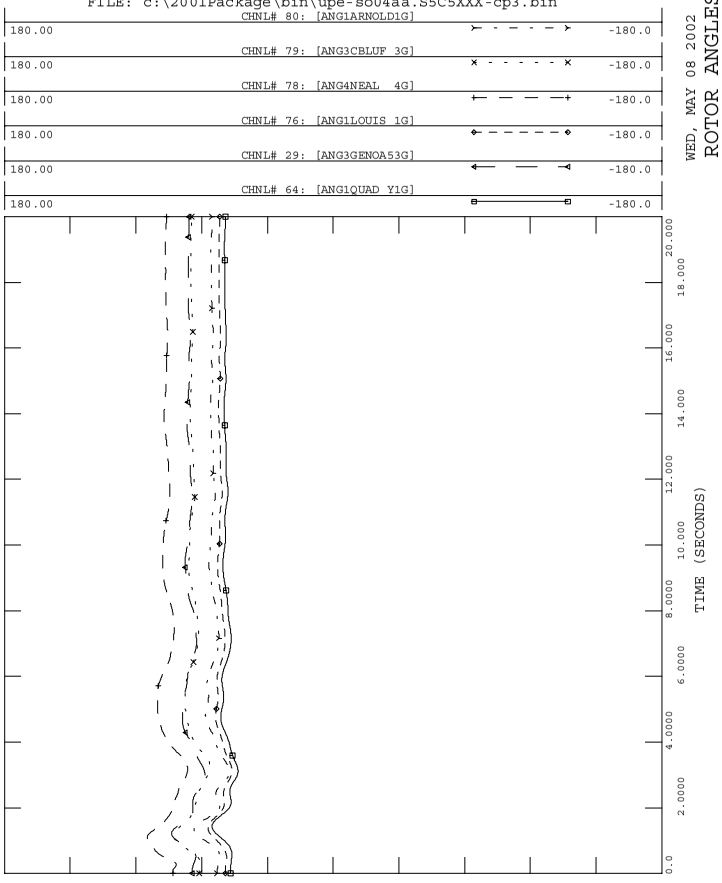
ROTOR ANGLES IA



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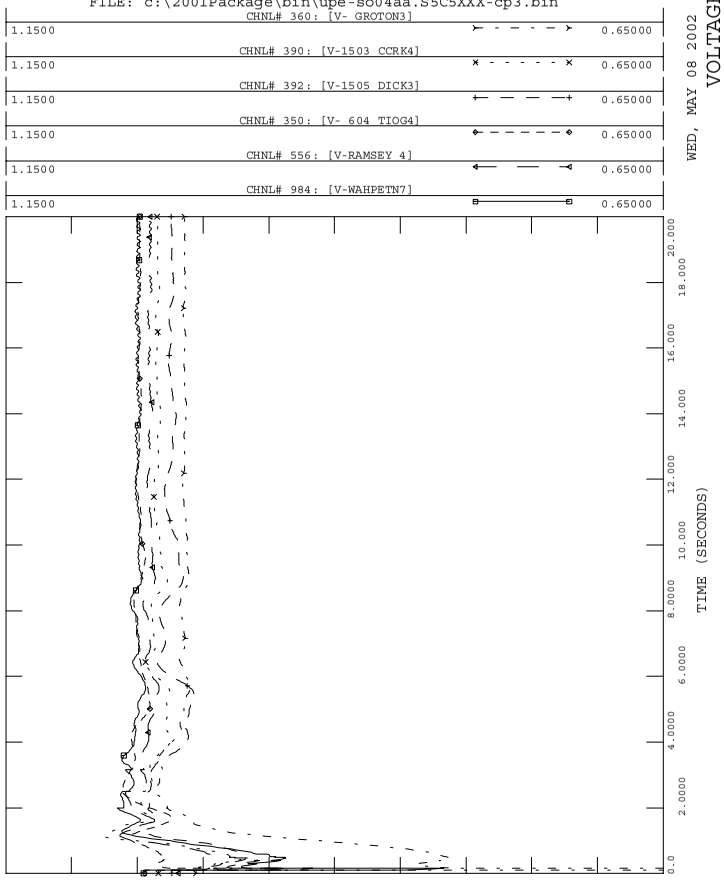
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

WED, MAY 08 2002 19:45
VOLTAGES 2



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4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

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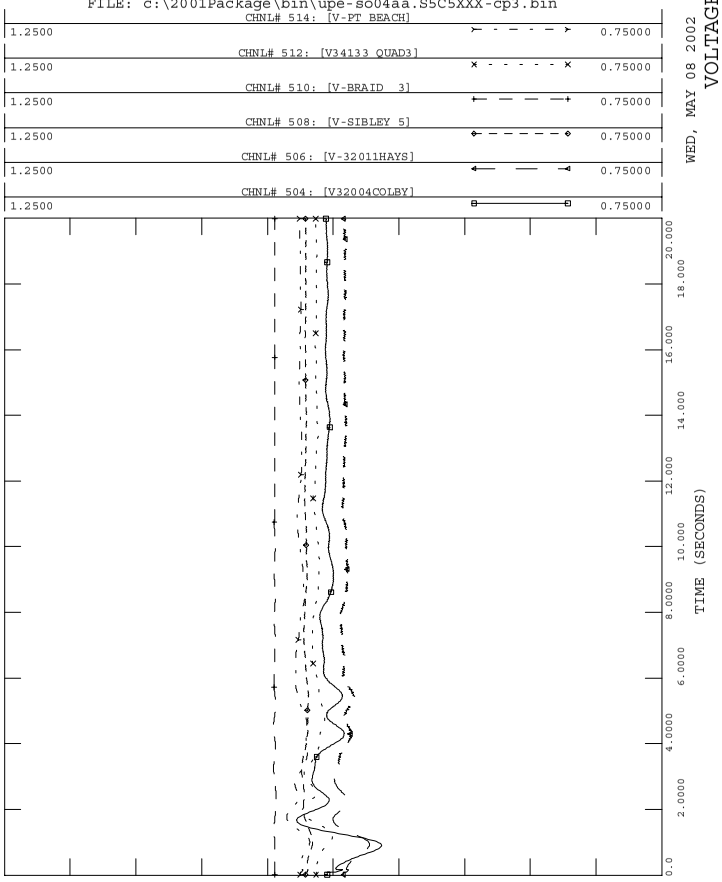
VOLTAGES 5



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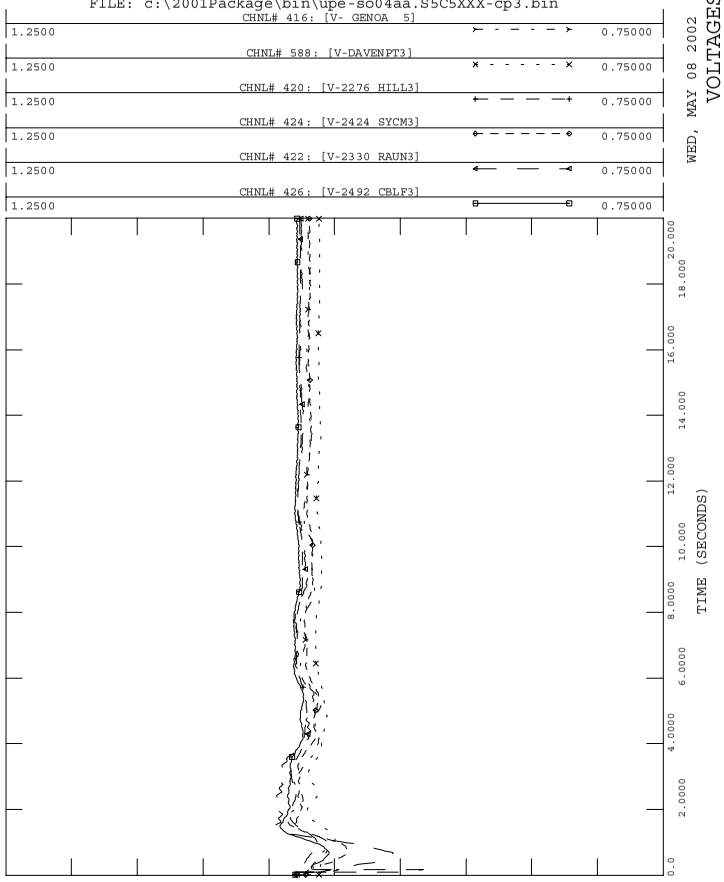
VOLTAGES IA



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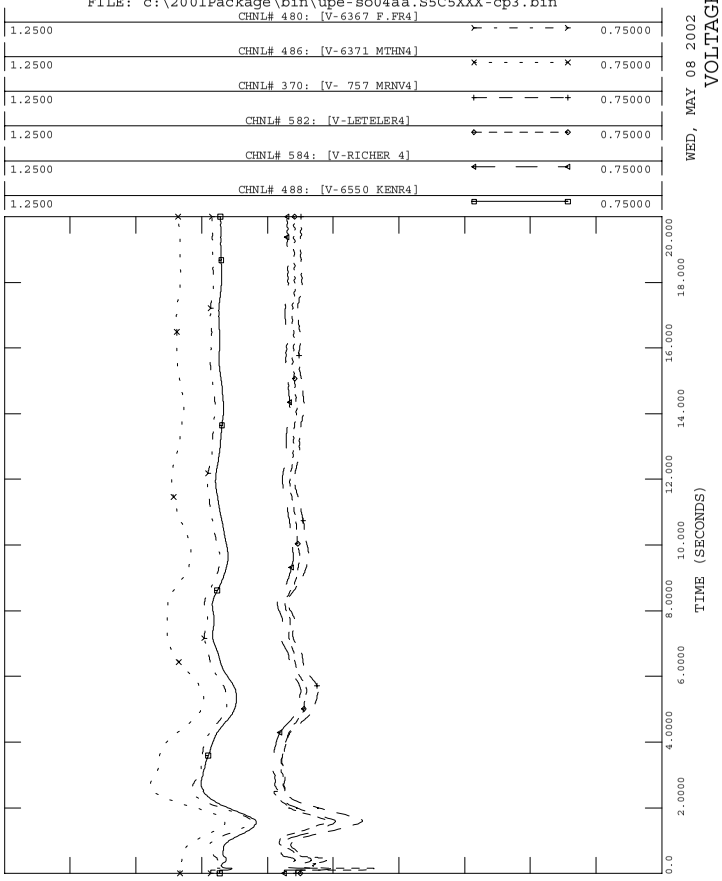
VOLTAGES 4



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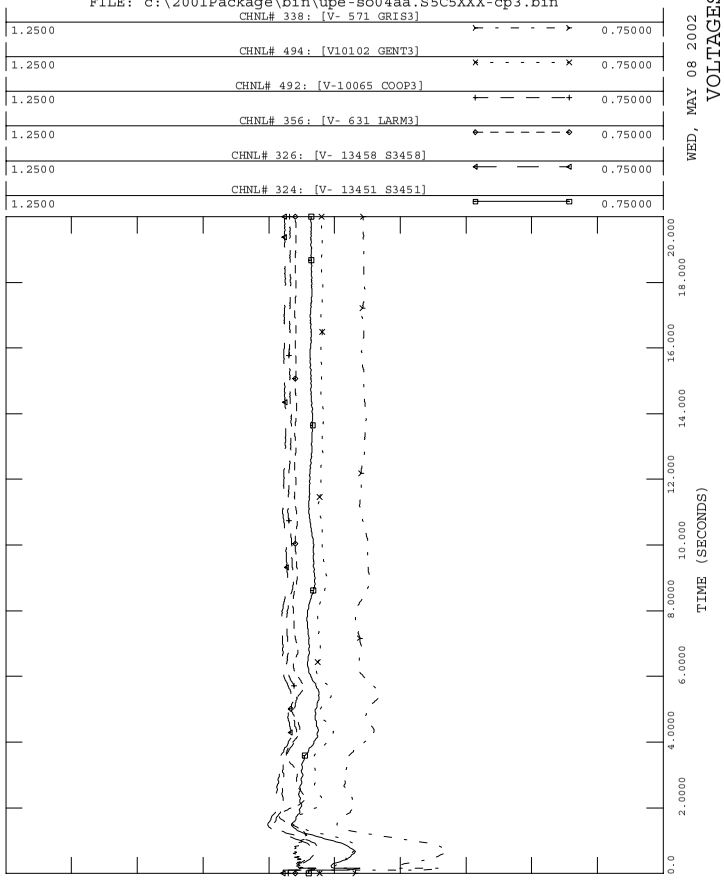
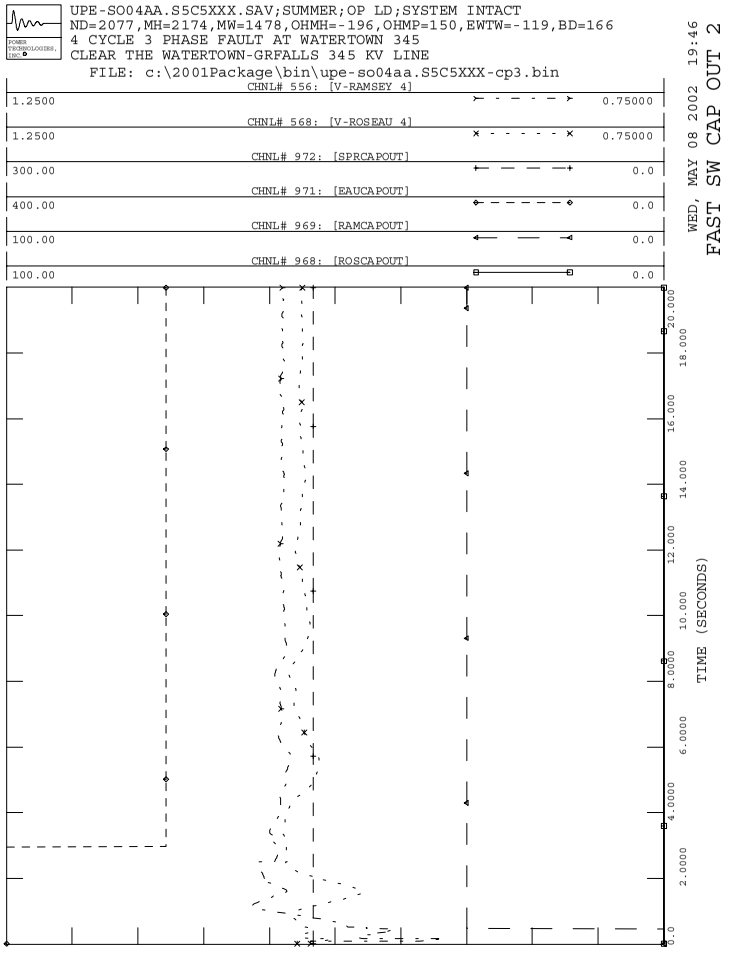
VOLTAGES NB

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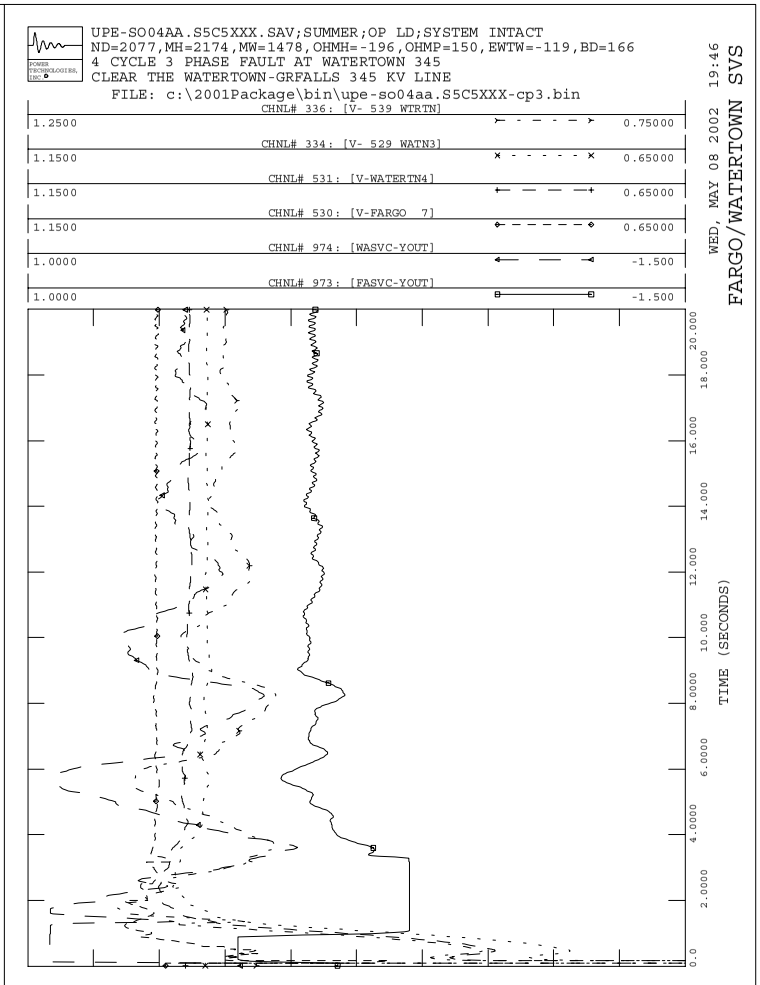
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
WED, MAY 08 2002 19:46
FAST SW CAP OUT 2
TIME (SECONDS)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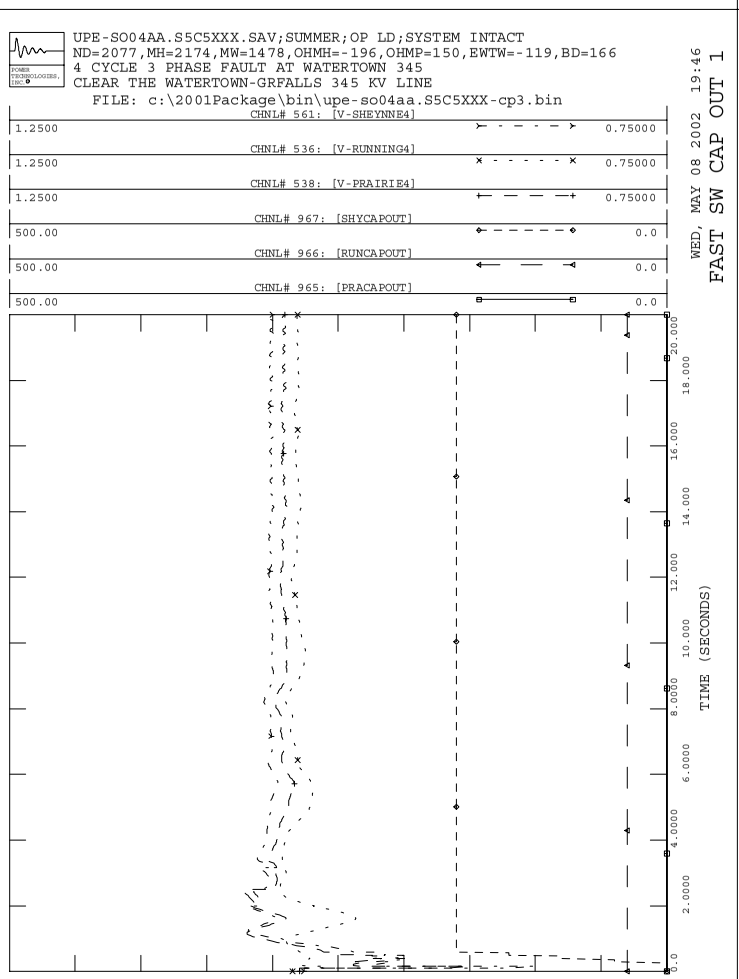
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
WED, MAY 08 2002 19:46
FARGO/WATERTOWN SVS
TIME (SECONDS)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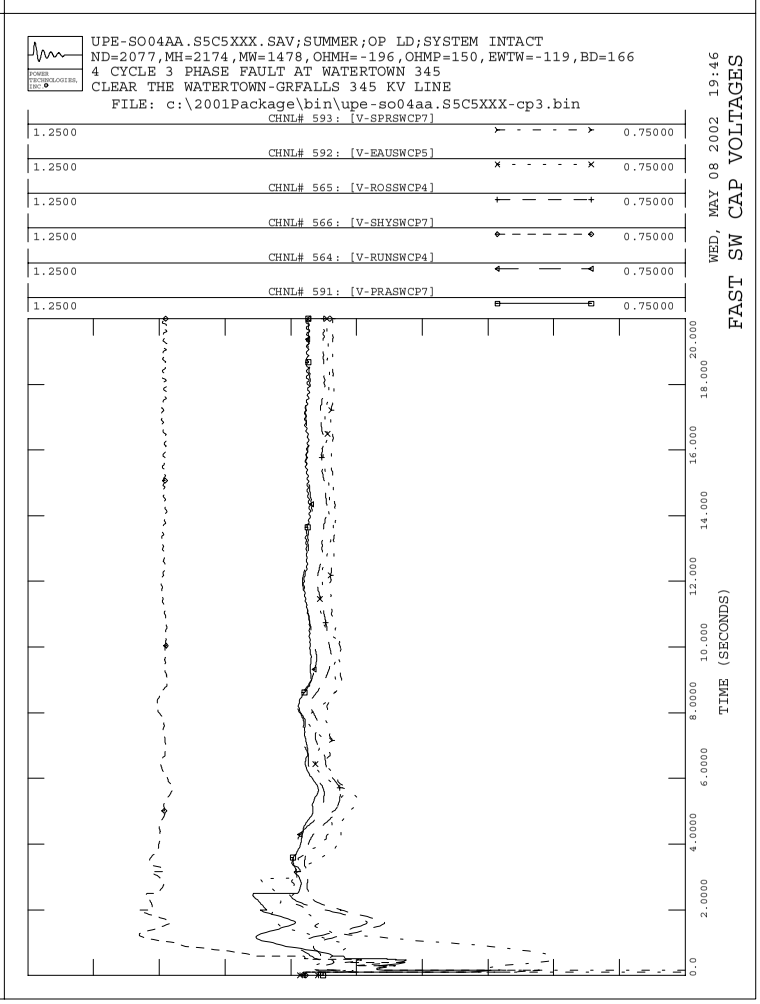
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
WED, MAY 08 2002 19:46
FAST SW CAP OUT 1
TIME (SECONDS)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4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
WED, MAY 08 2002 19:46
FAST SW CAP VOLTAGES
TIME (SECONDS)

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
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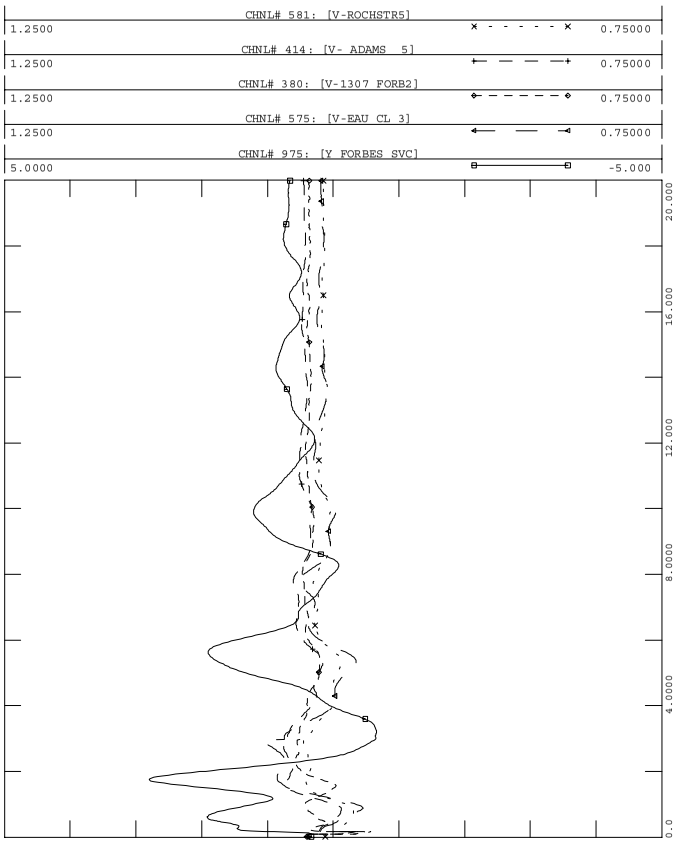
SVC & WISCONSIN VOLT



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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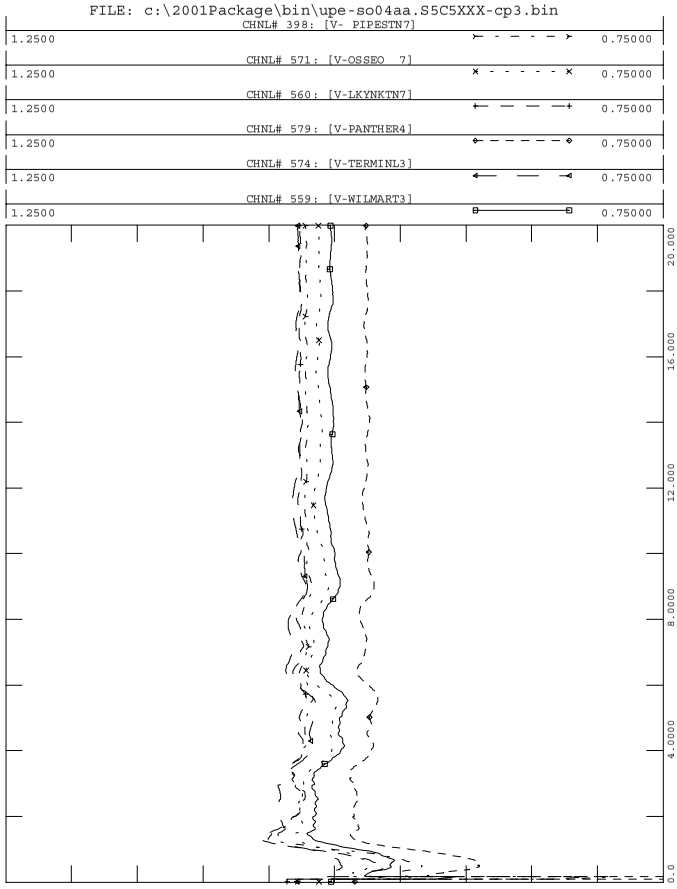
TC VOLTAGES



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4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
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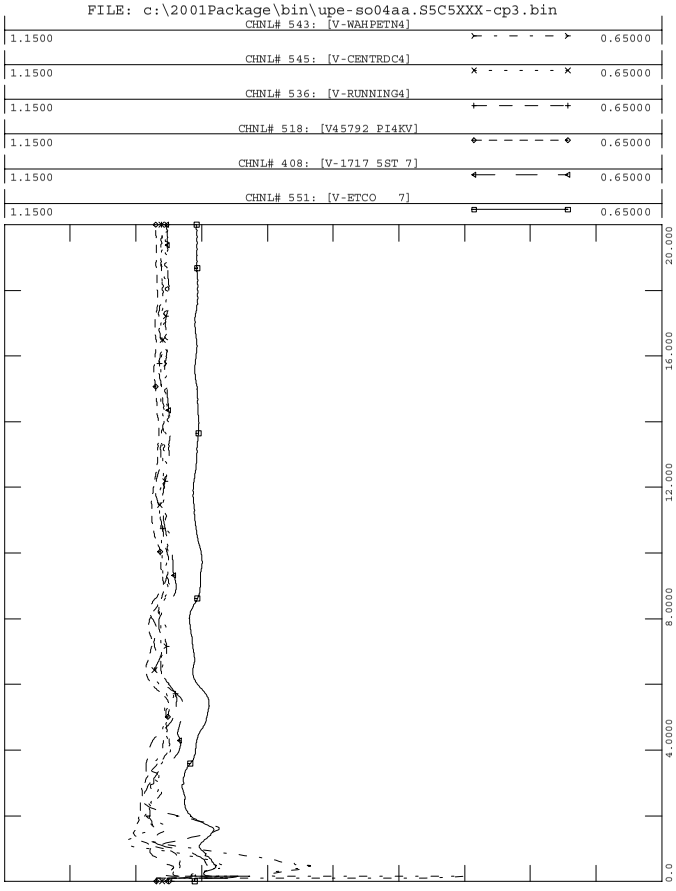
VOLTAGES 6



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CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

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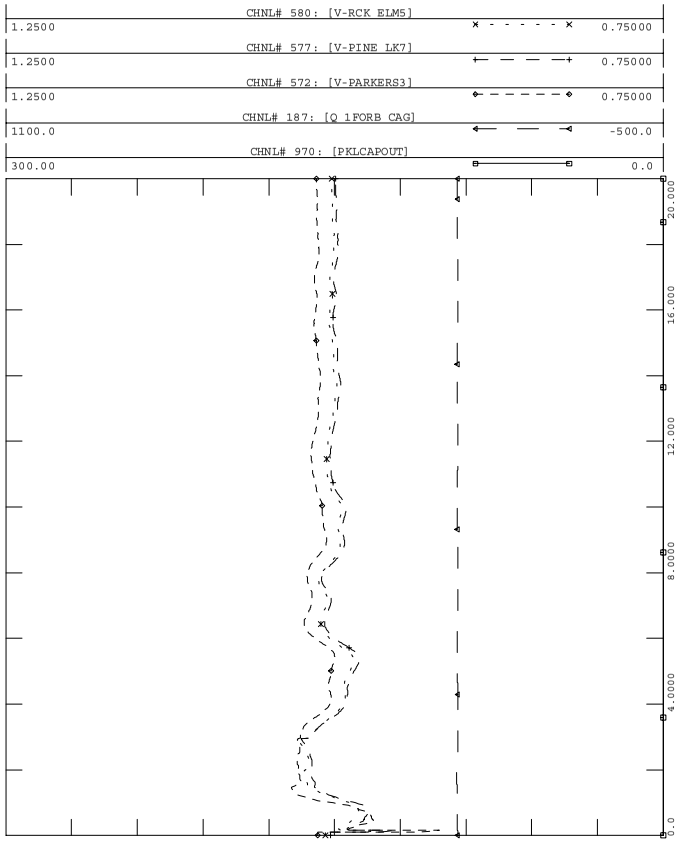
FORBES SVS OUT & VOLTAGES



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CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
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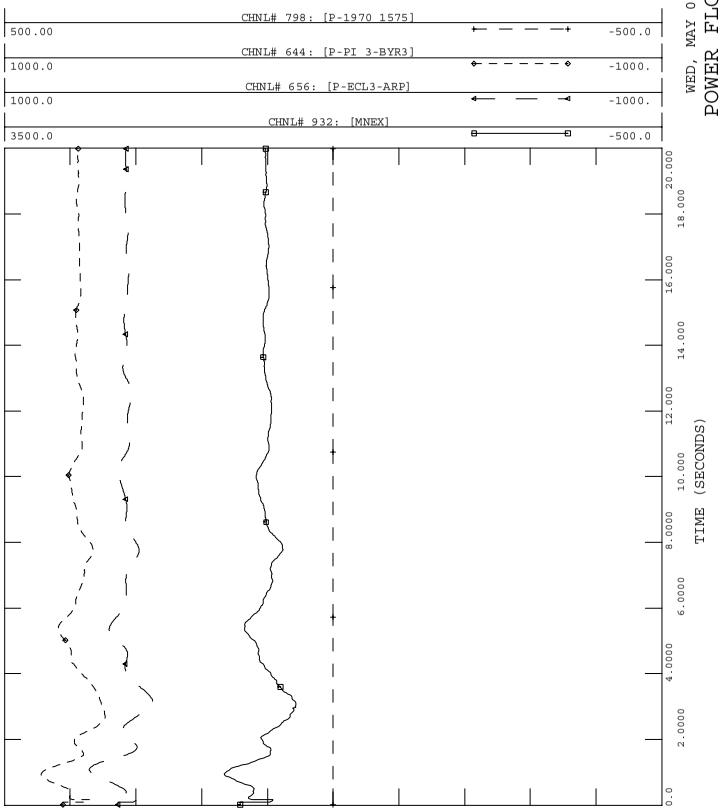
POWER FLOW SUMS 2



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CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
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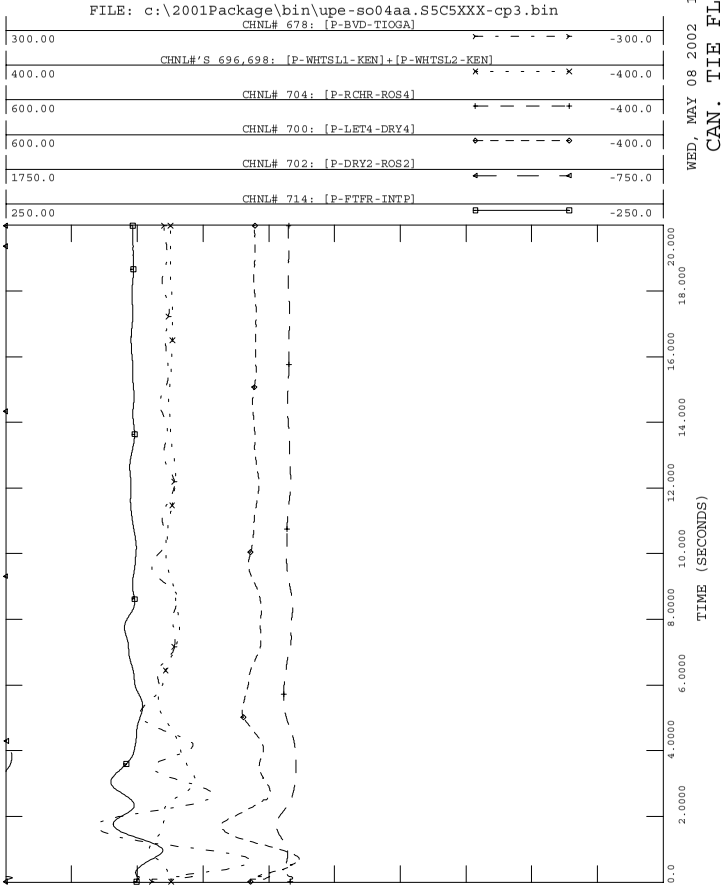
CAN. TIE FLOWS



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CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
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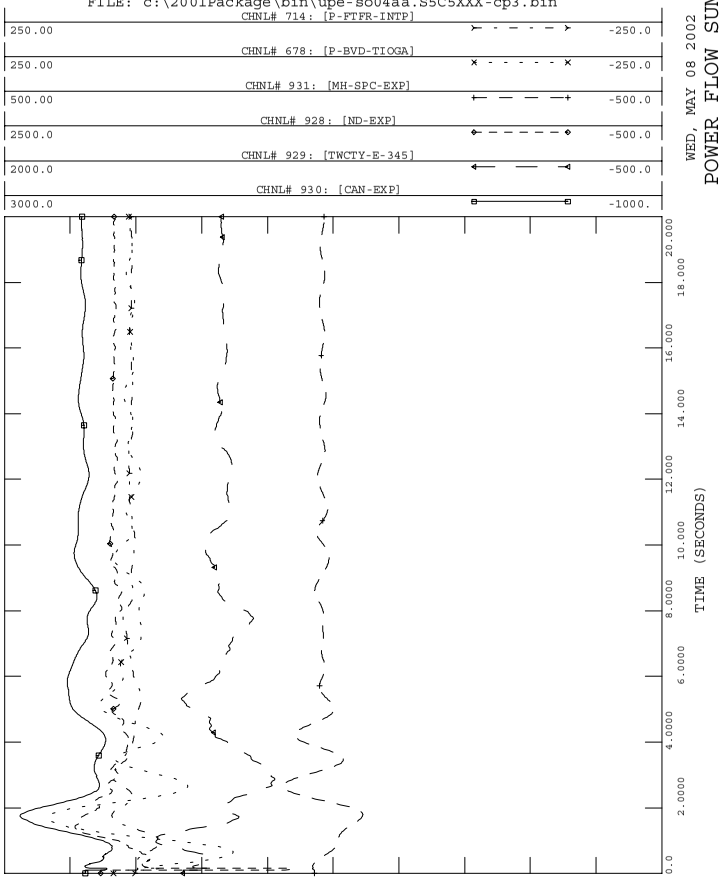

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CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

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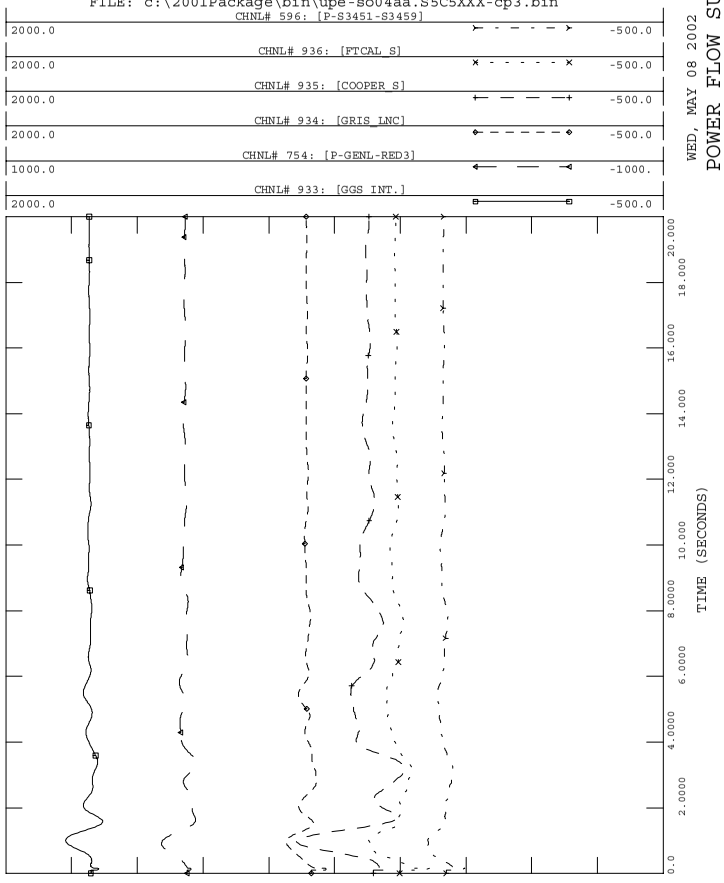
POWER FLOW SUM 3



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CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
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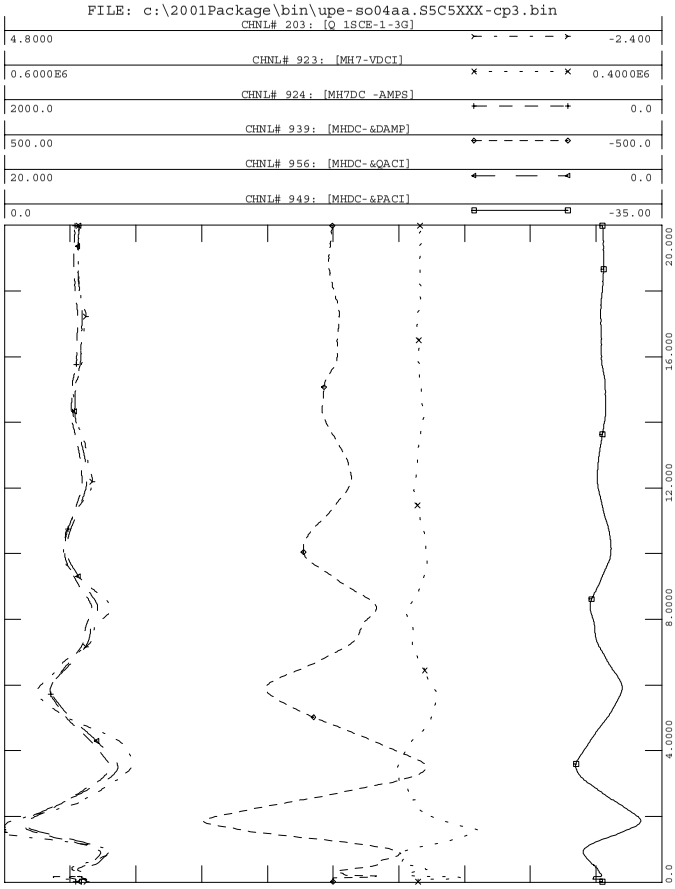
MH DC PARAMETERS



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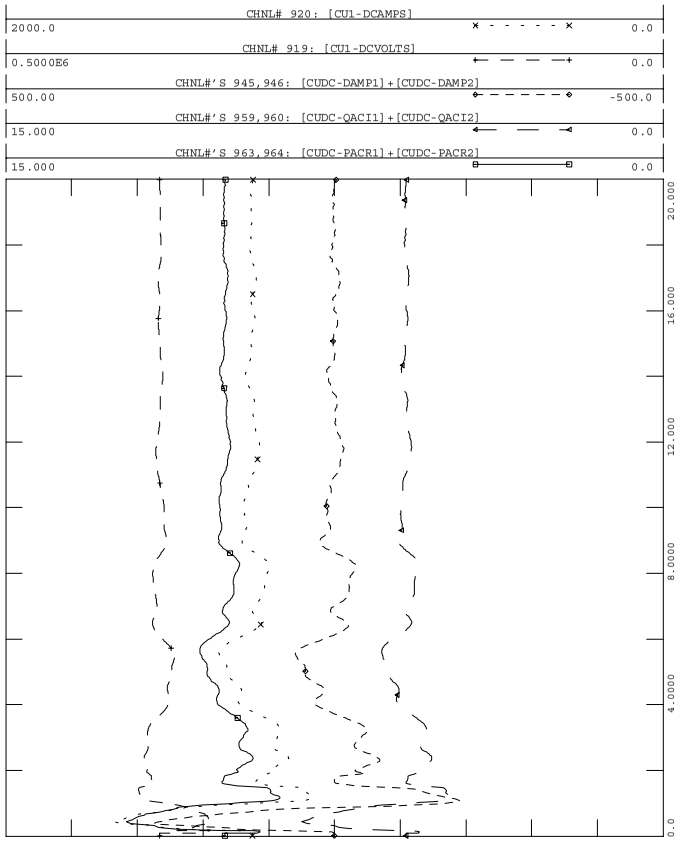
CU DC #1



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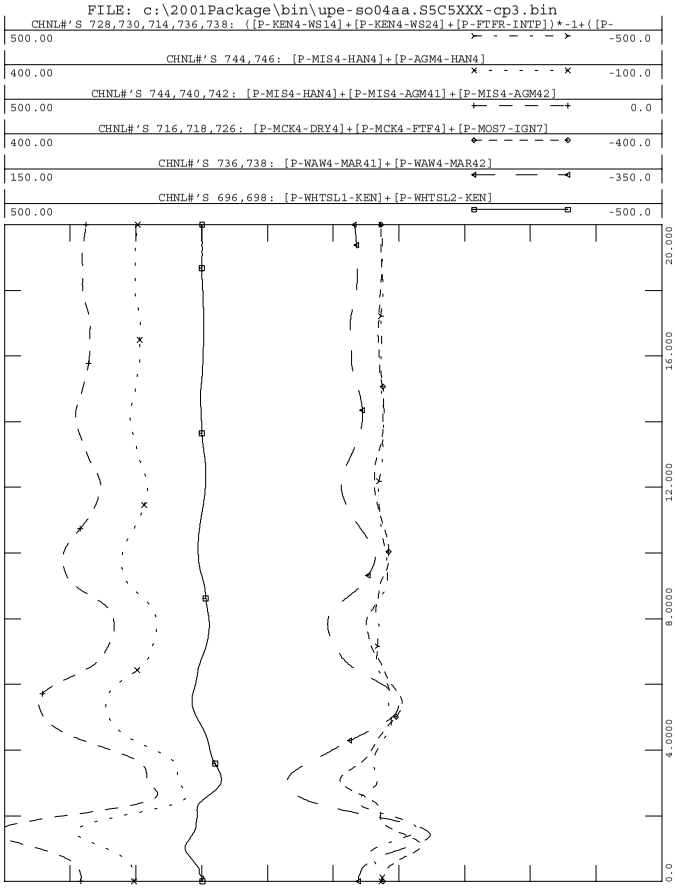
OH TIE FLOWS



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CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
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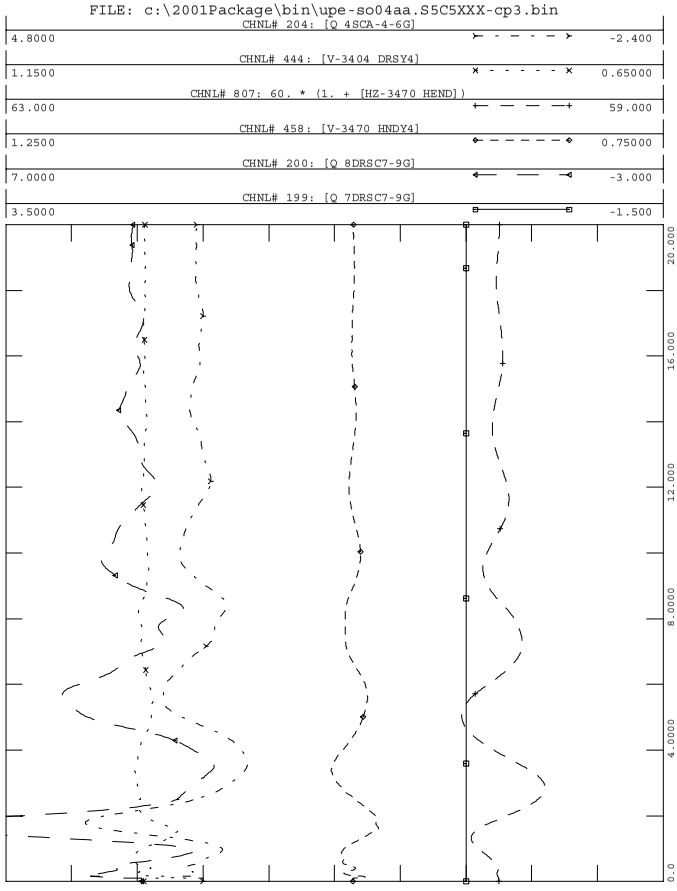
MH DC PARAMETERS



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CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
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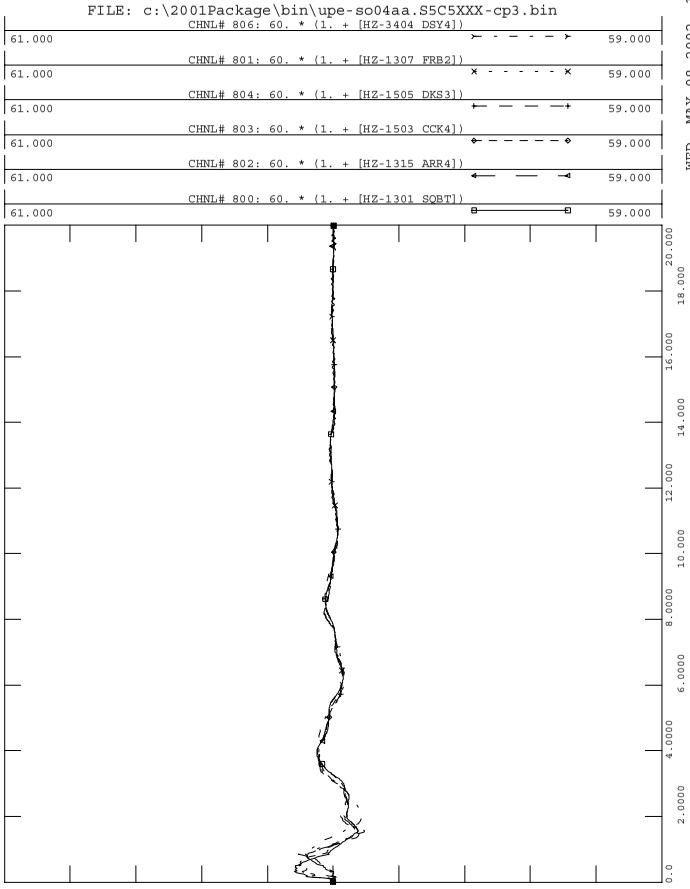
FREQ AT DC TERMINALS



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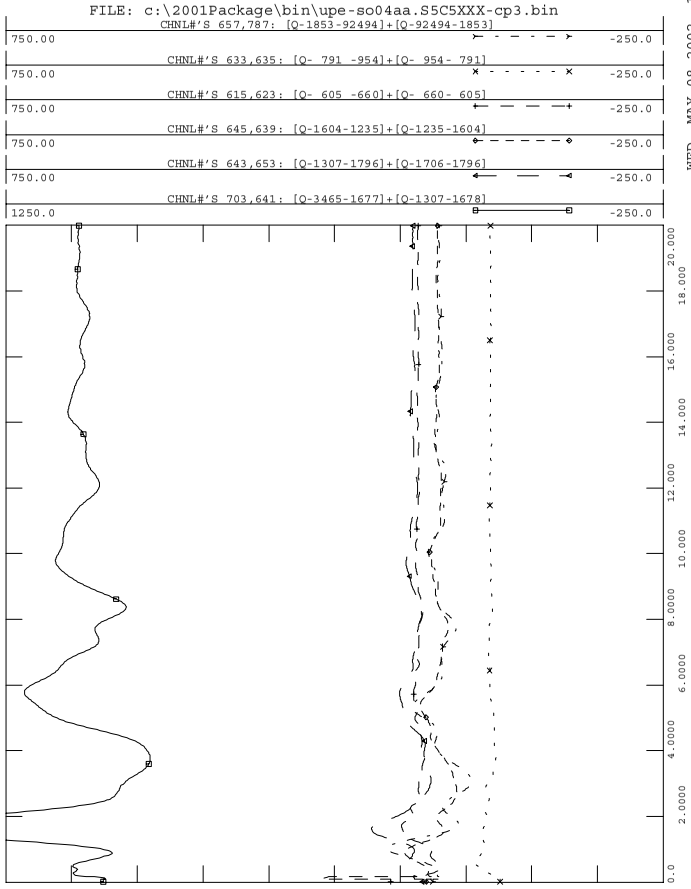
VAR LOSSES



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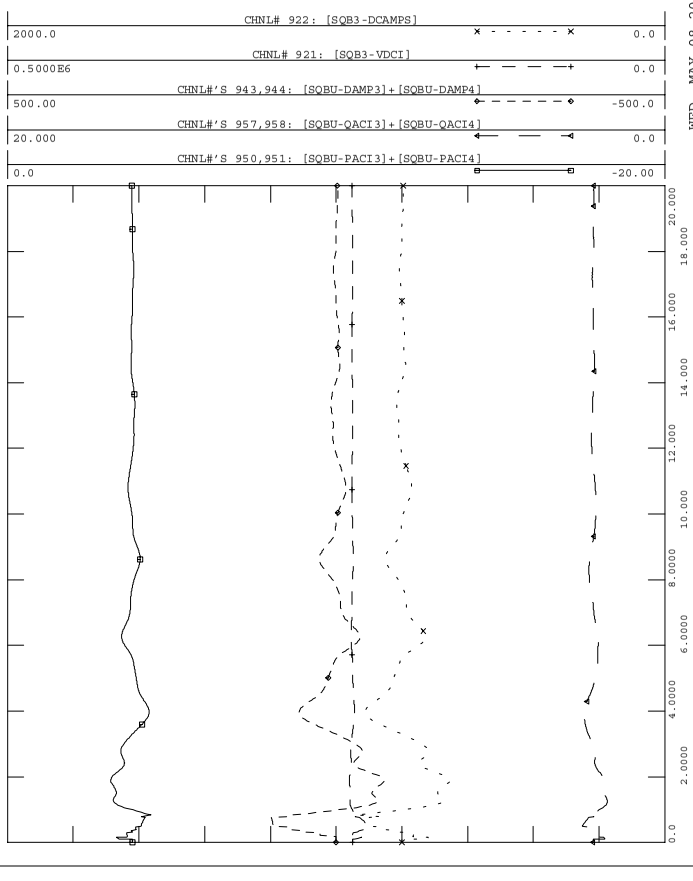
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

WED, MAY 08 2002 19:46

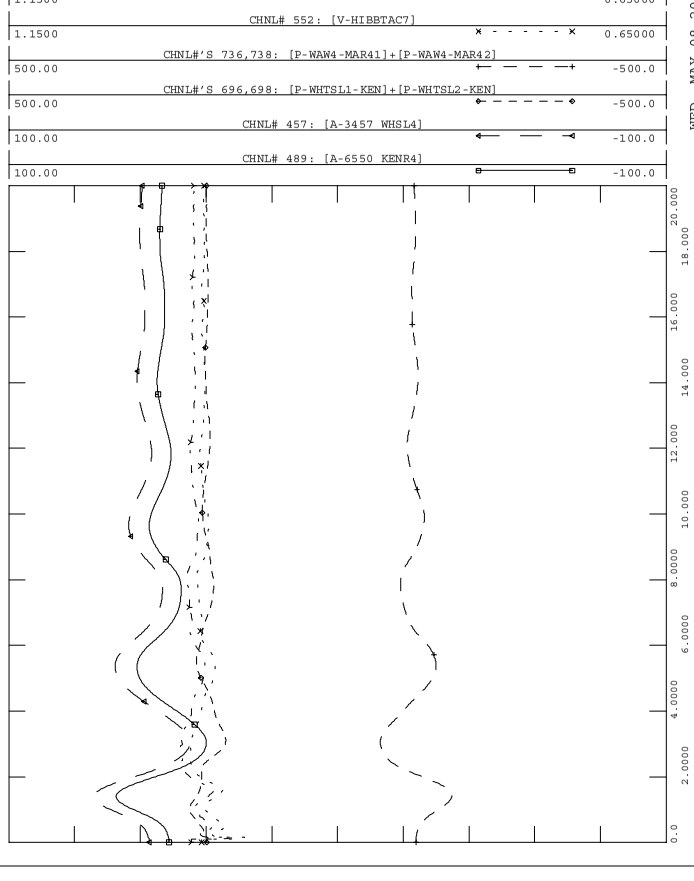
SQB DC #3



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

WED, MAY 08 2002 19:46

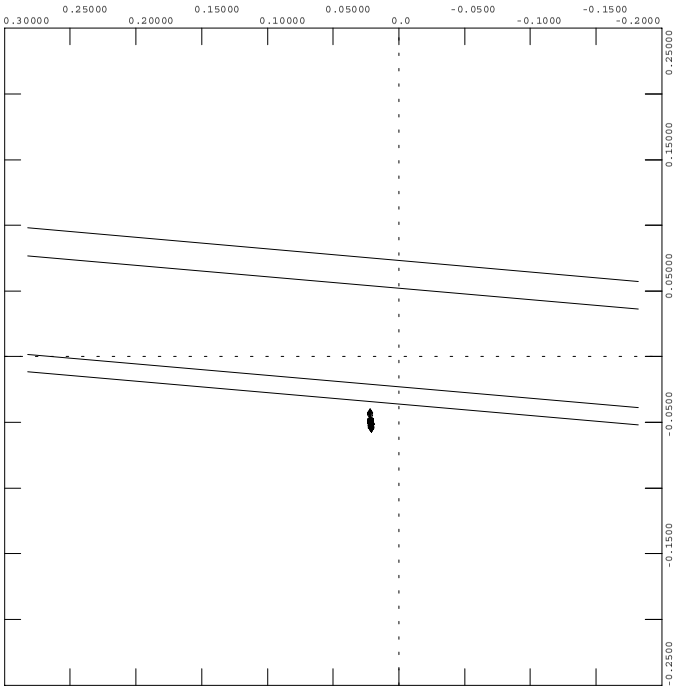
VOLTAGES, ANGLES



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

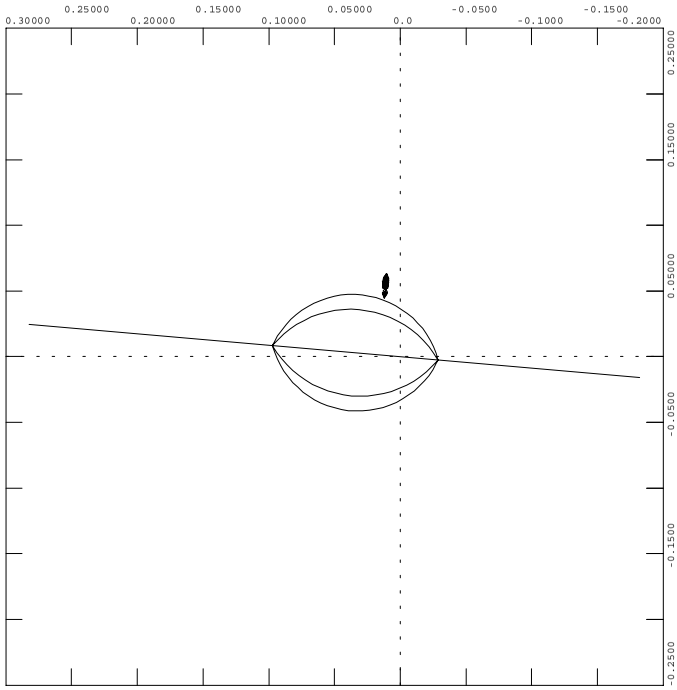


WED, MAY 08 2002 19:46
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

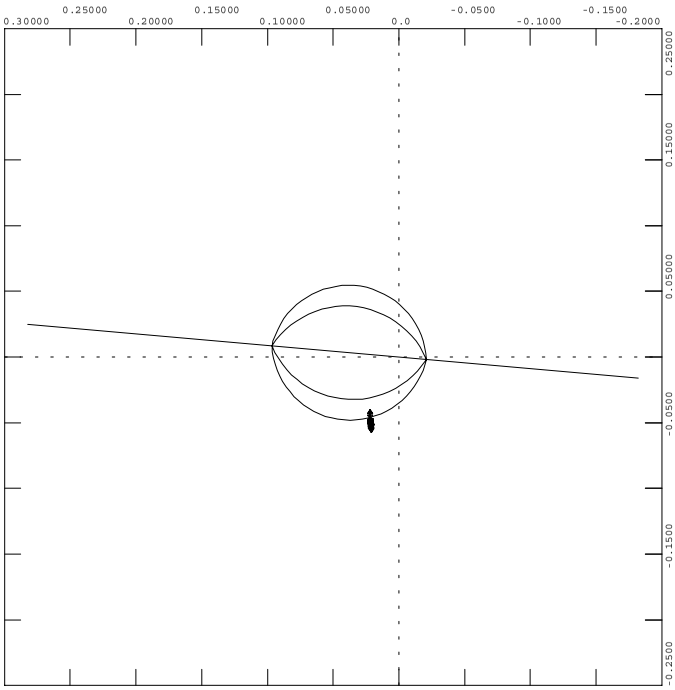


WED, MAY 08 2002 19:46
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

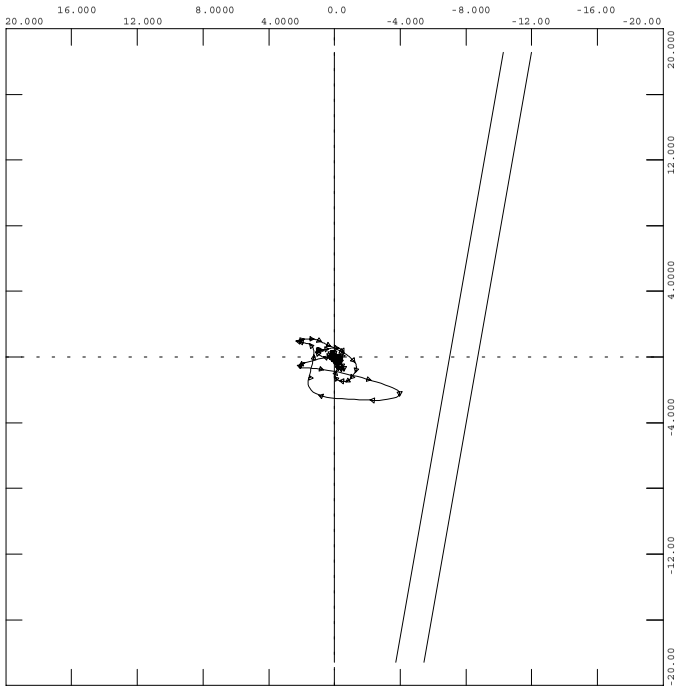


WED, MAY 08 2002 19:46
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

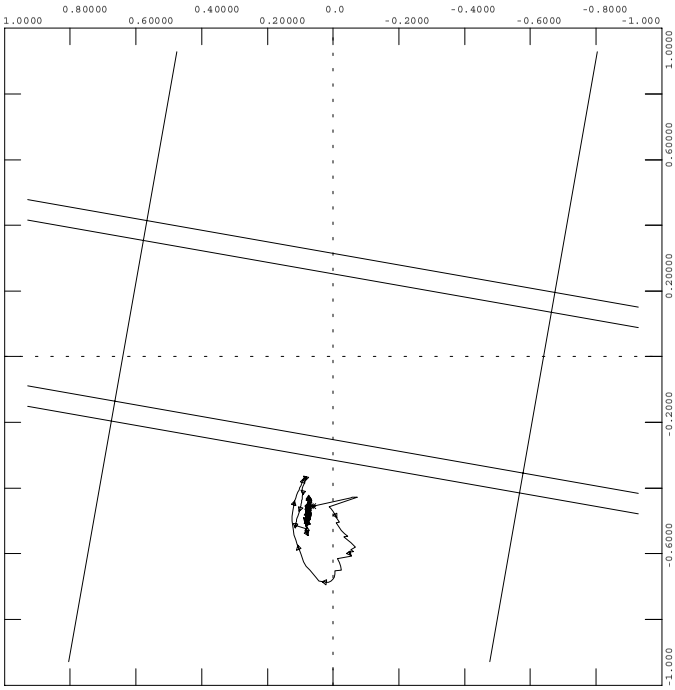


WED, MAY 08 2002 19:46
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

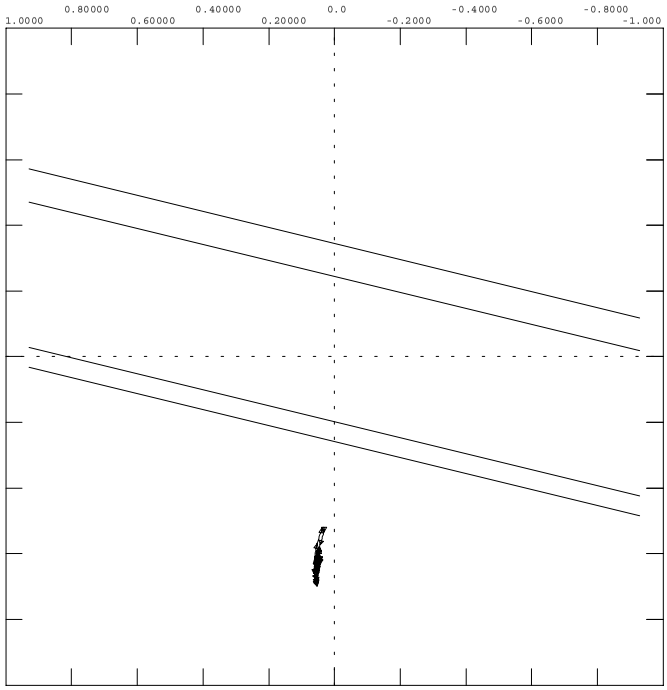
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

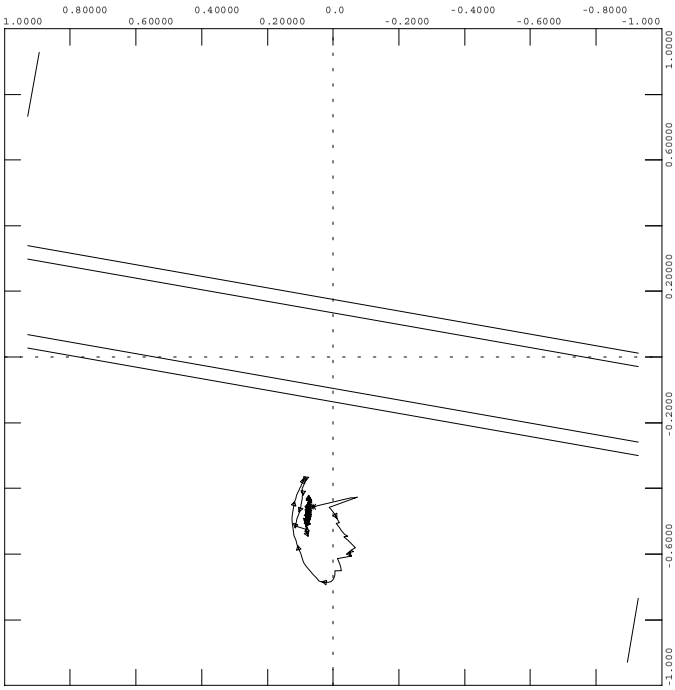
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

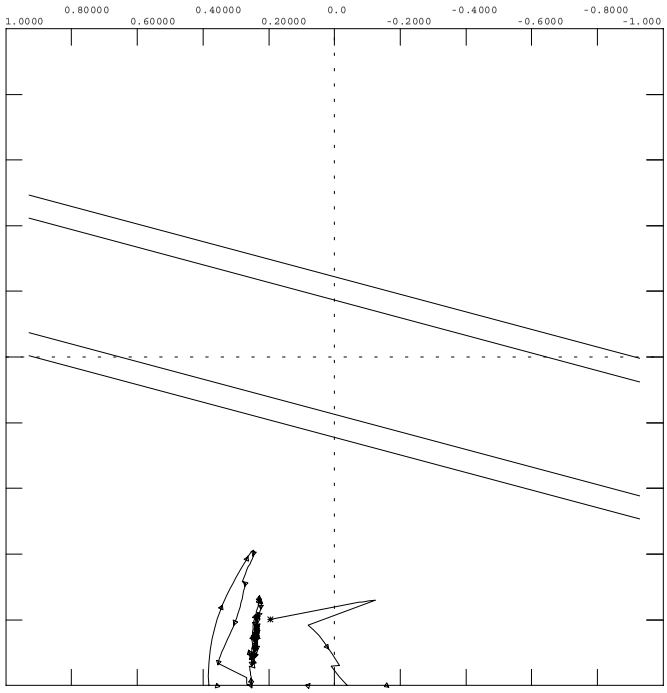
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

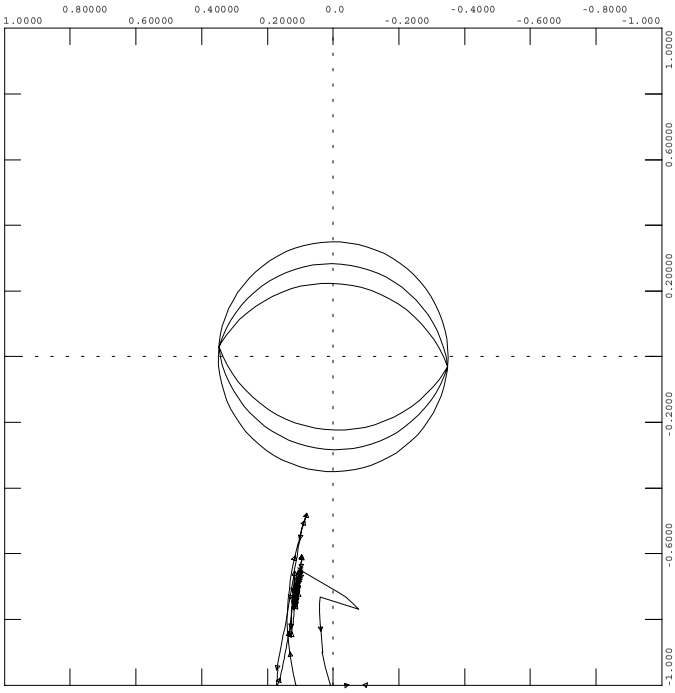
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

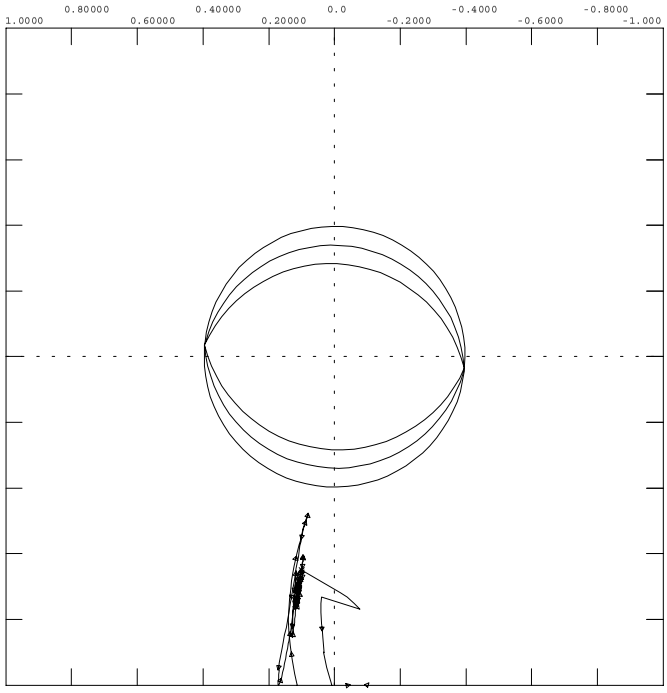
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

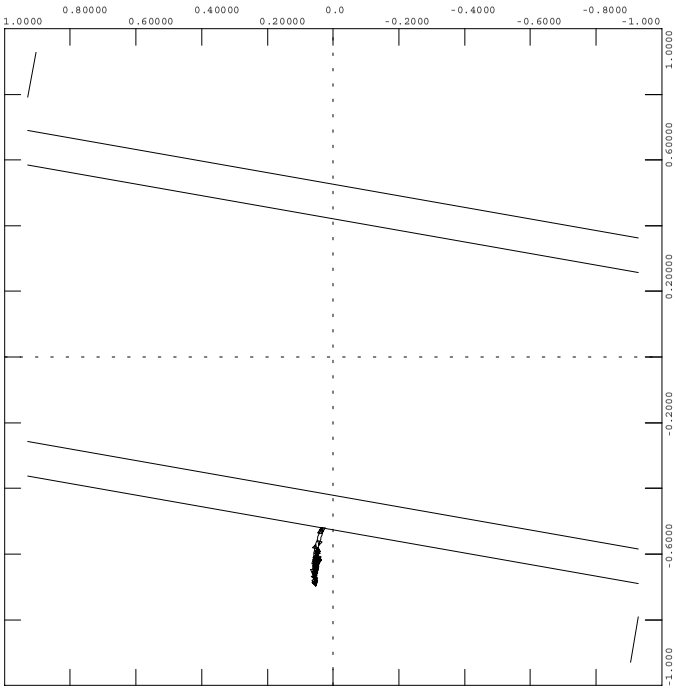
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

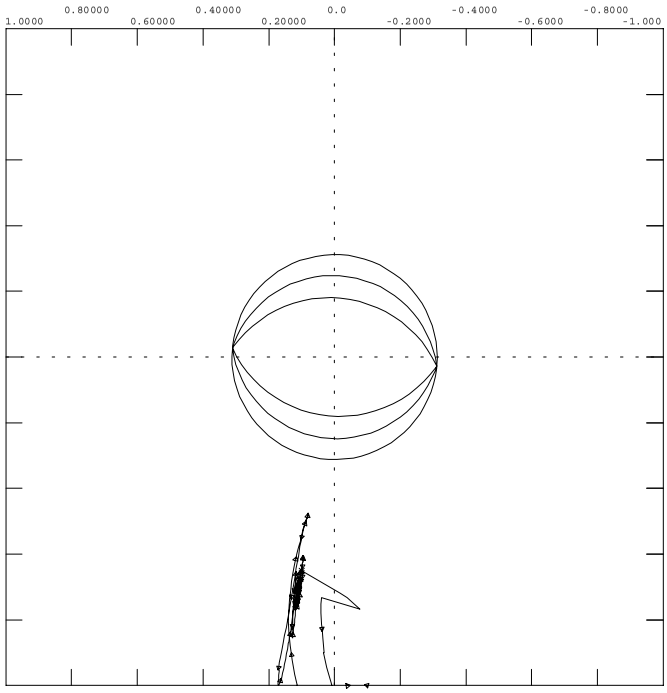
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



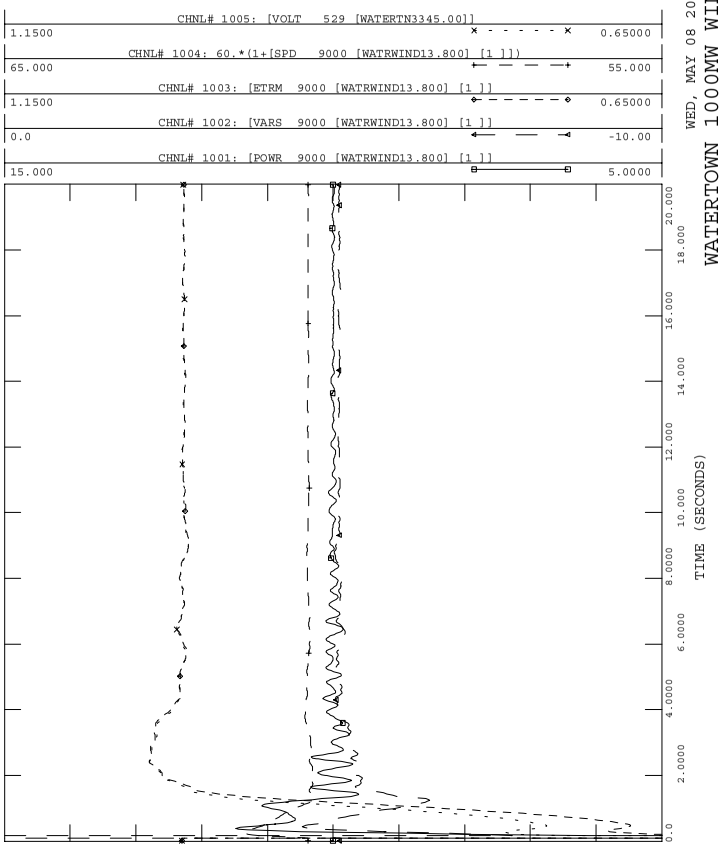
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

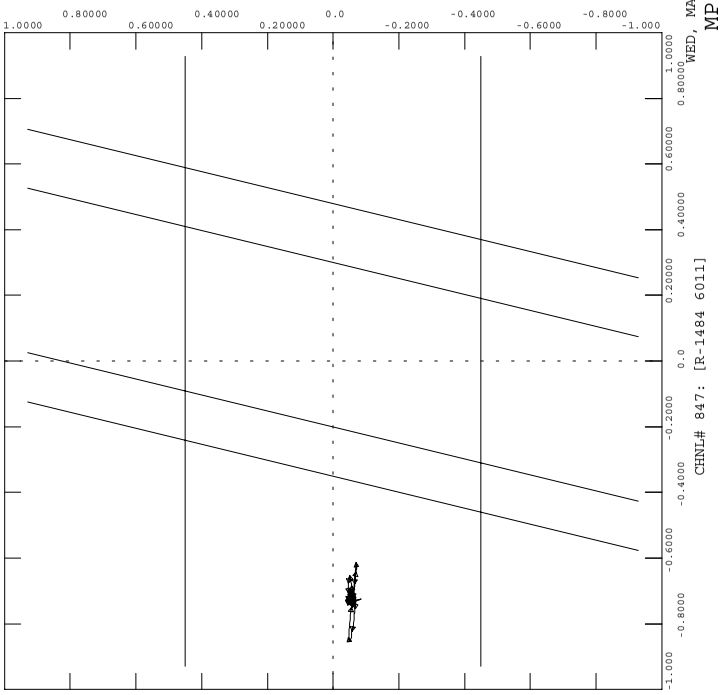


WED, MAY 08 2002 19:46
WATERTOWN 1000MW WIND UNI

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-GRFALLS 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cp3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

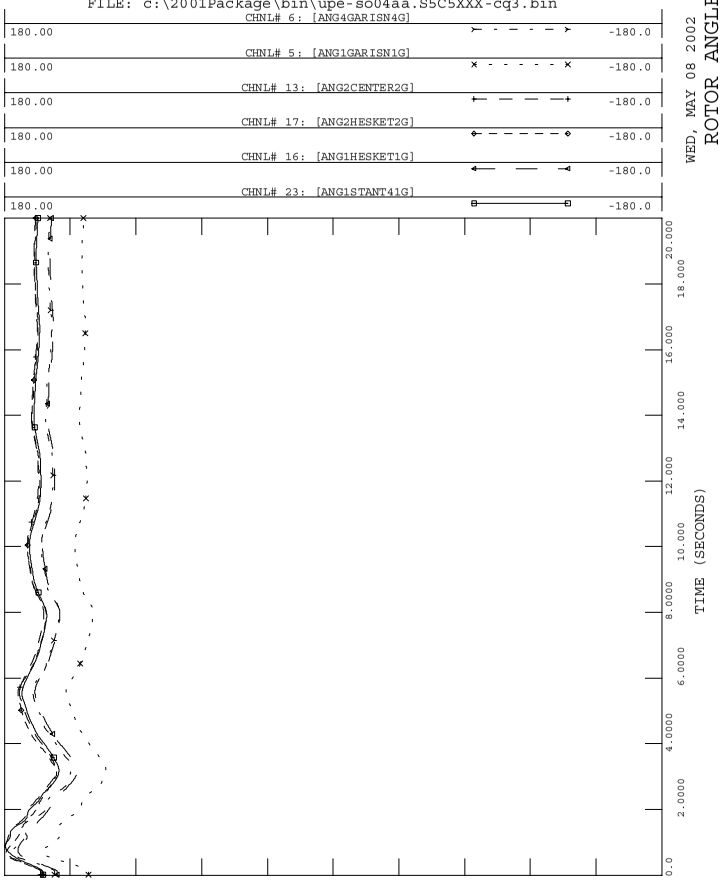


WED, MAY 08 2002 19:46
MP-OH I.FALLS (779)

CONTINGENCY CQ3

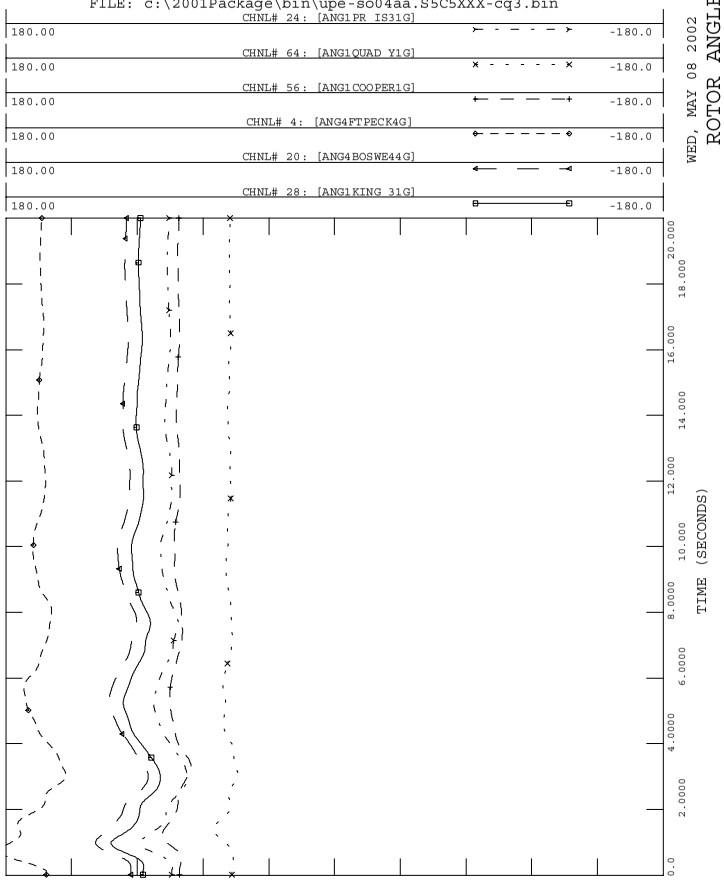
4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-White 345 kV line

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



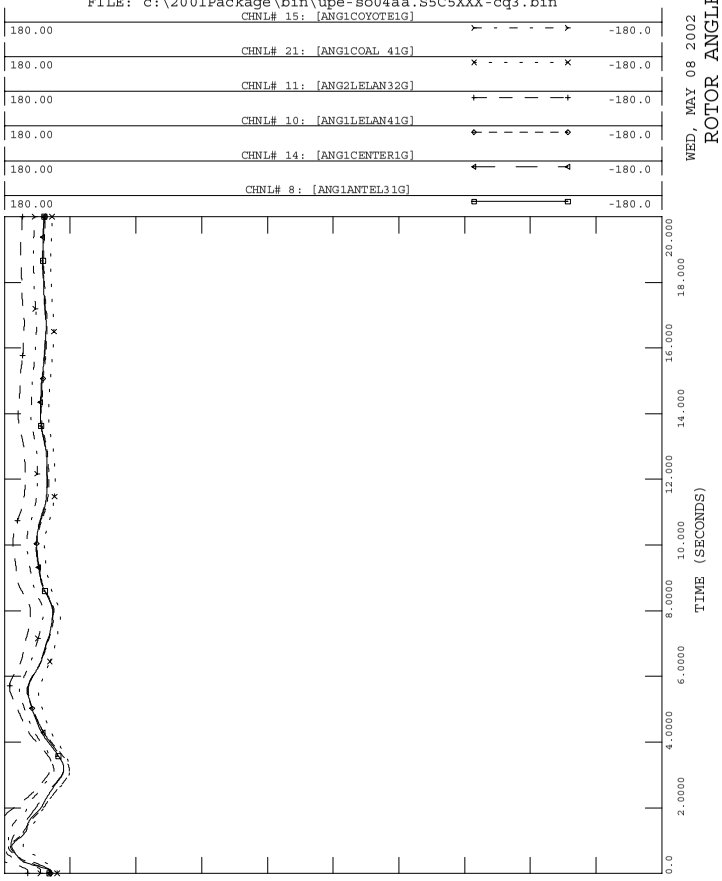
WED, MAY 08 2002 20:00
ROTOR ANGLES 2

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



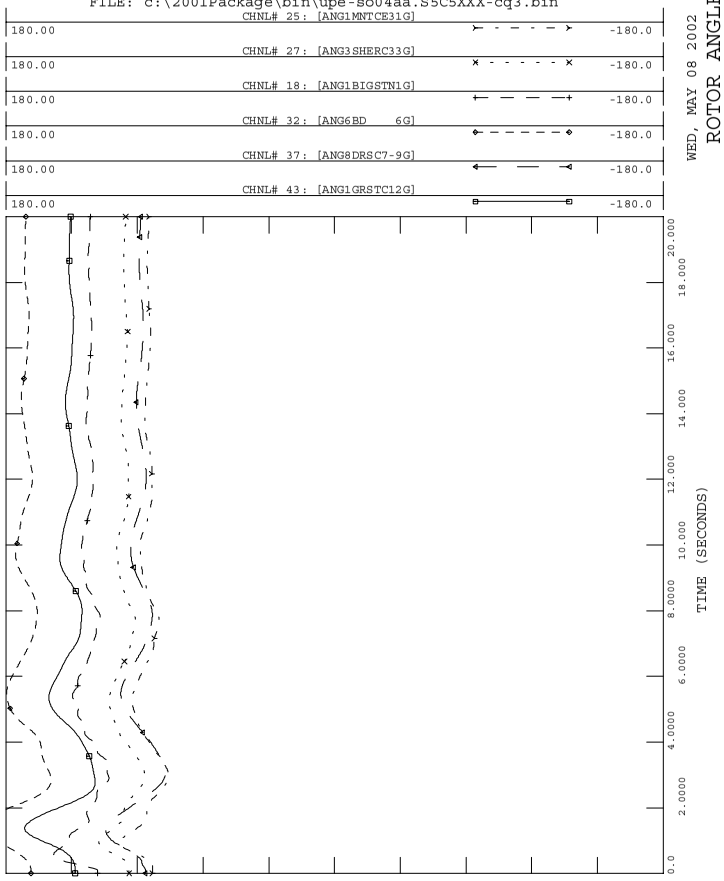
WED, MAY 08 2002 20:00
ROTOR ANGLES 4

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

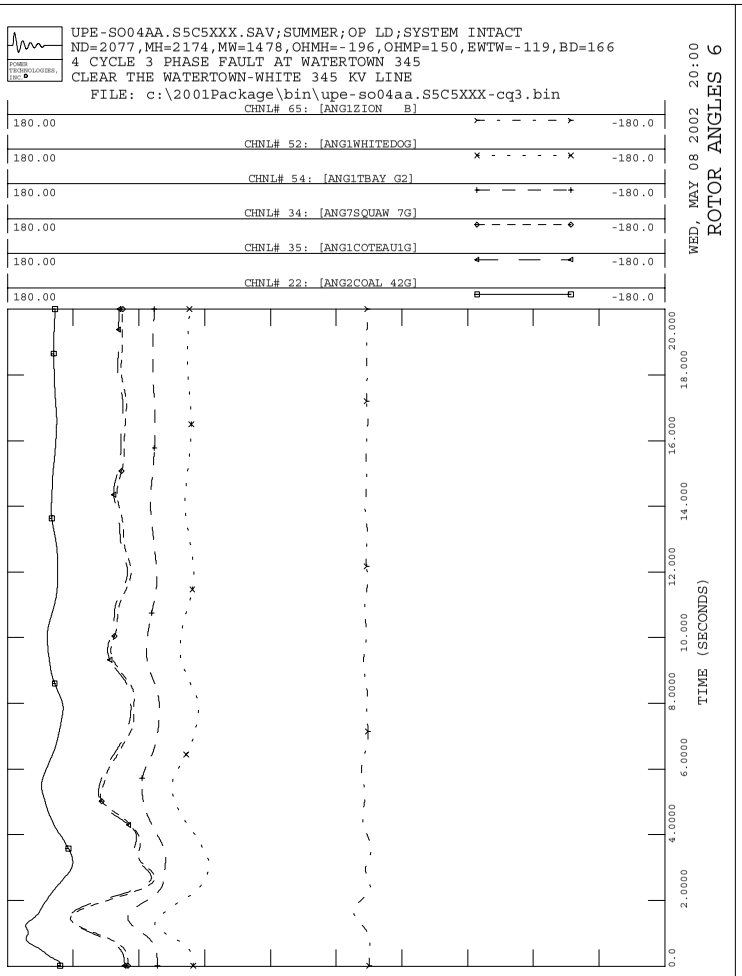


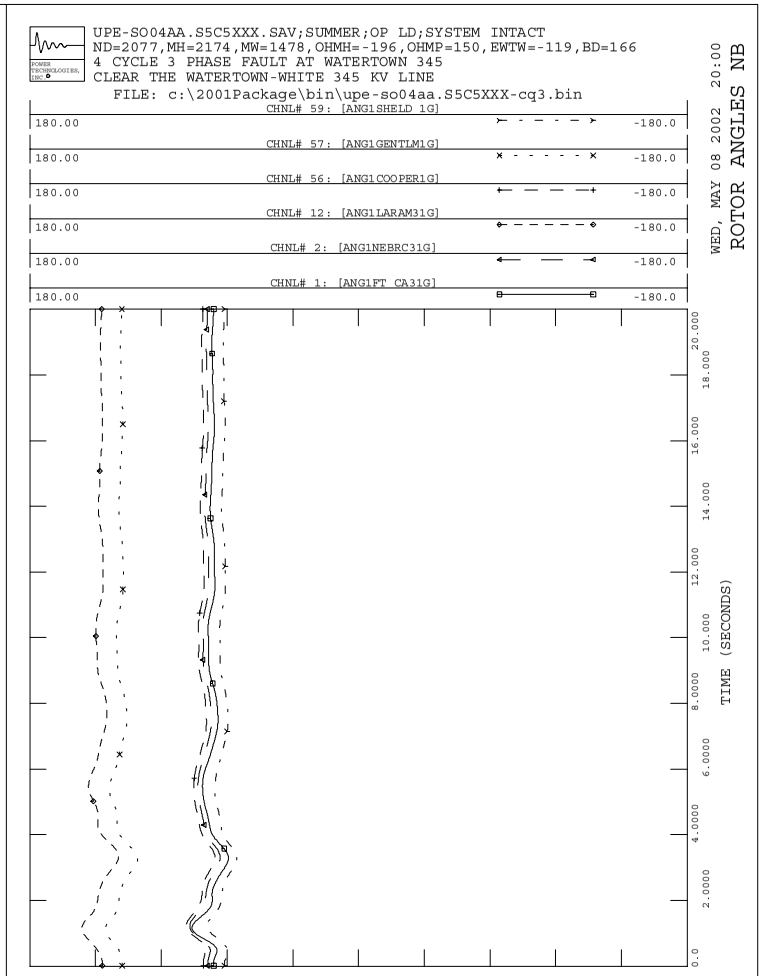
WED, MAY 08 2002 20:00
ROTOR ANGLES 1

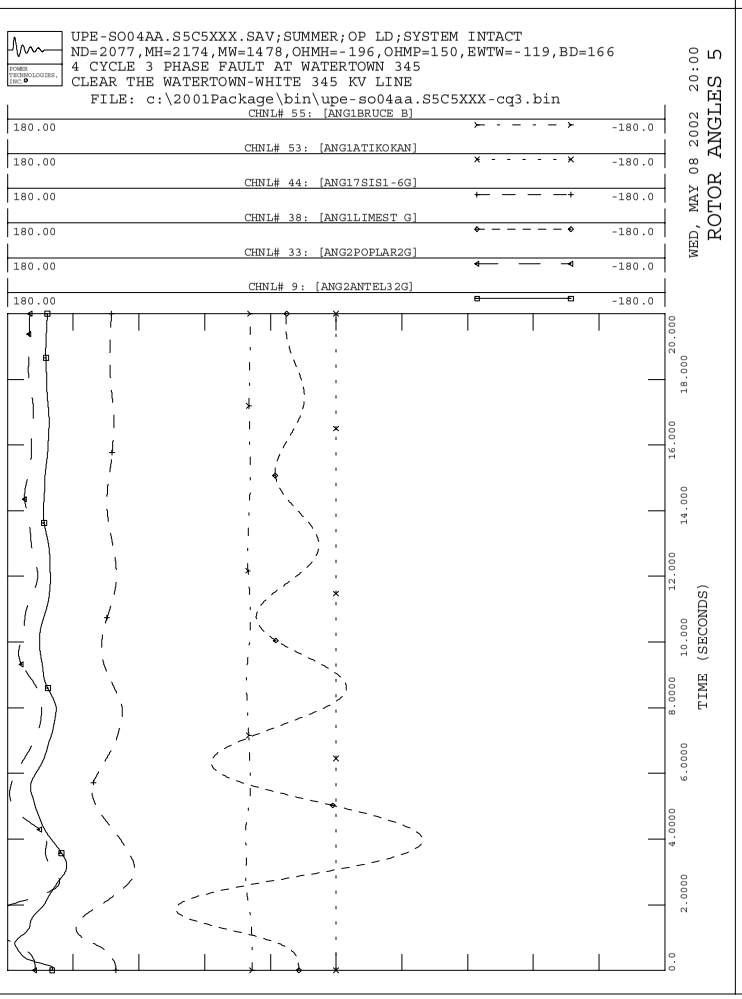
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

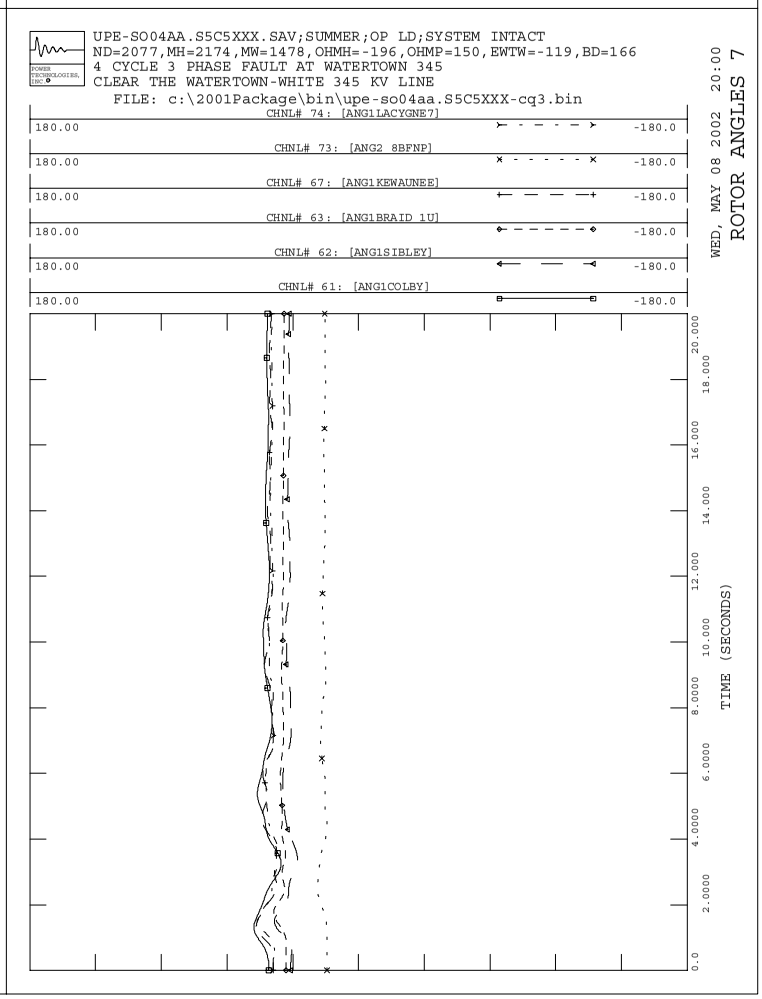


WED, MAY 08 2002 20:00
ROTOR ANGLES 3


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
WED, MAY 08 2002 20:00
ROTOR ANGLES 6
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

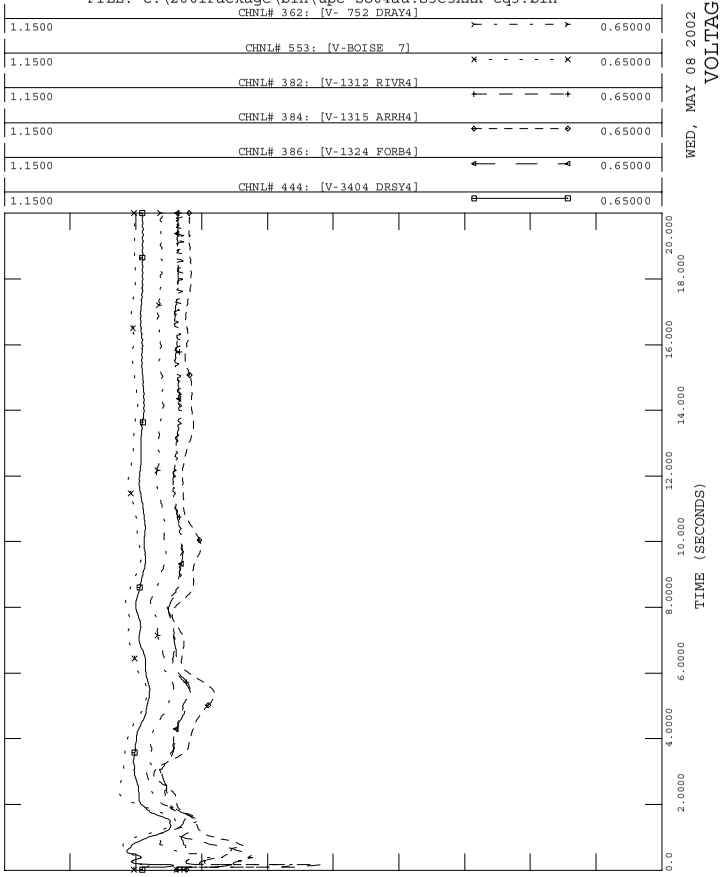

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
WED, MAY 08 2002 20:00
ROTOR ANGLES NB
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
WED, MAY 08 2002 20:00
ROTOR ANGLES 5
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
WED, MAY 08 2002 20:00
ROTOR ANGLES 7
TIME (SECONDS)
0.0
2.0000
4.0000
6.0000
8.0000
10.000
12.000
14.000
16.000
18.000
20.000

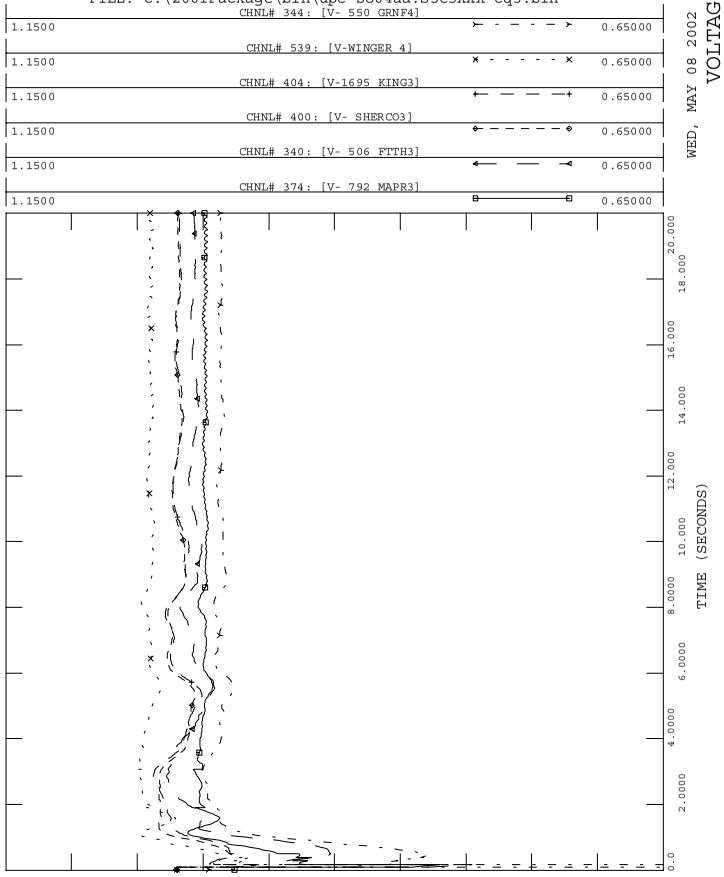
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
VOLTAGES 1



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
VOLTAGES 3



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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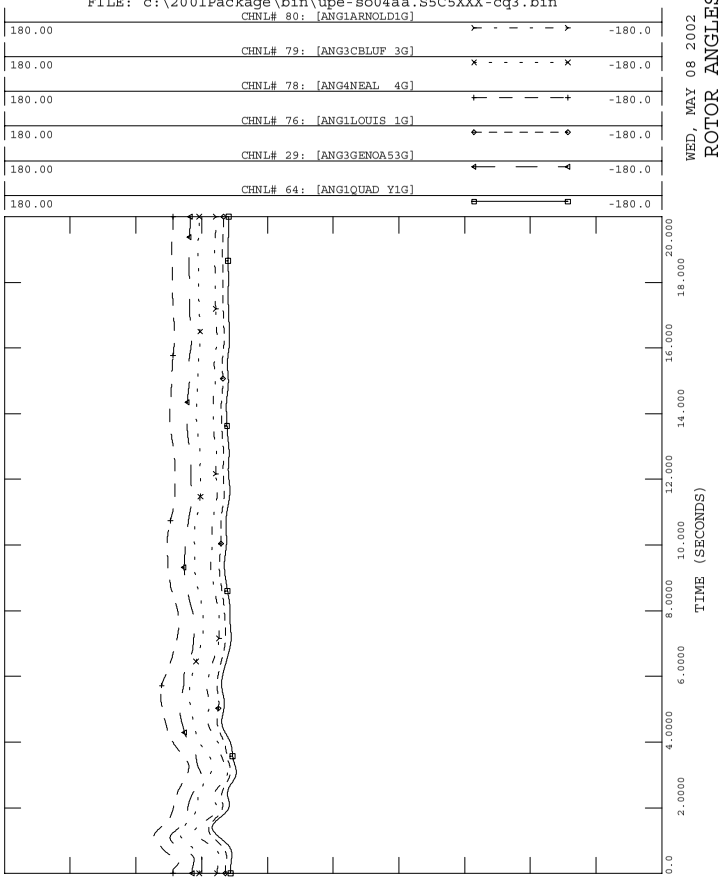
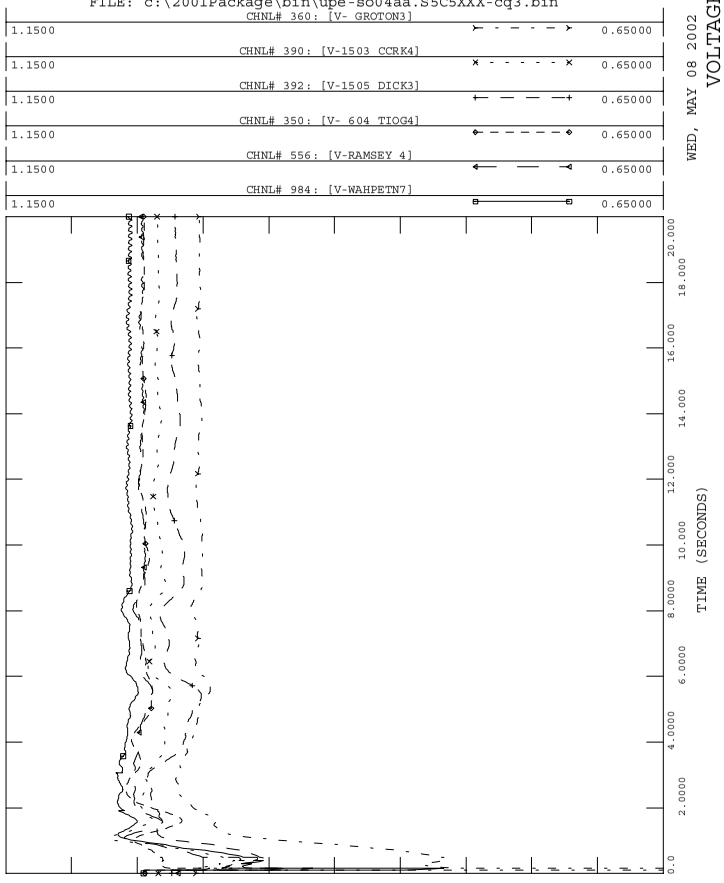
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
ROTOR ANGLES IA



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
VOLTAGES 2



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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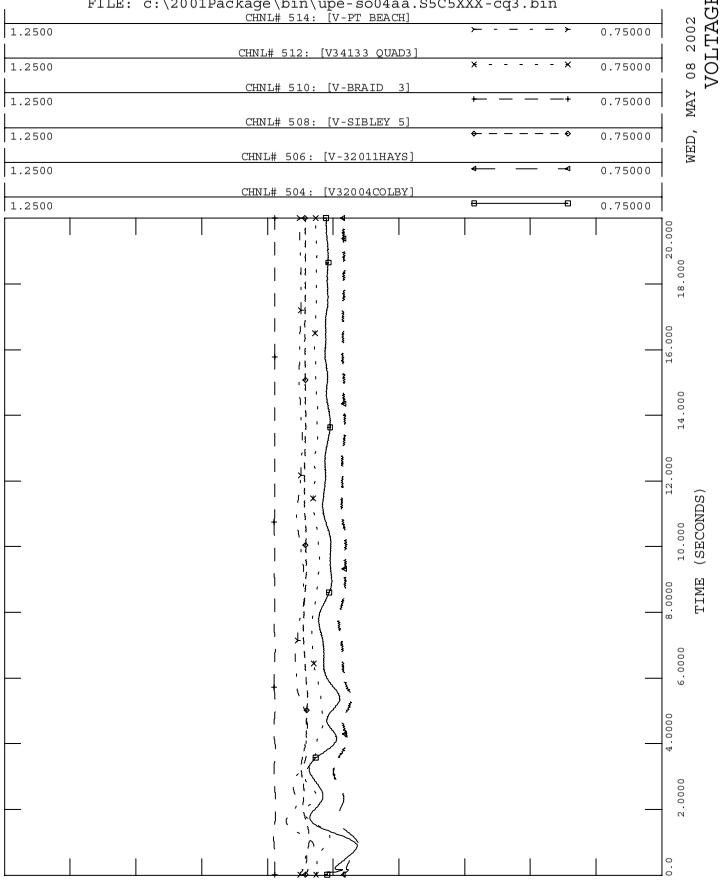
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



WED, MAY 08 2002 20:00
VOLTAGES 5

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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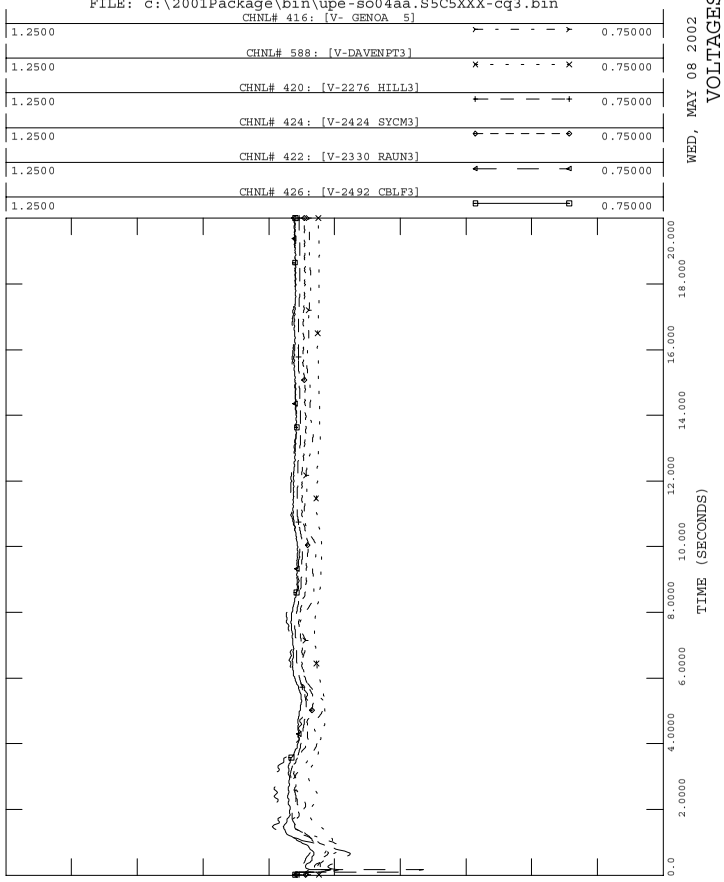
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



WED, MAY 08 2002 20:00
VOLTAGES IA

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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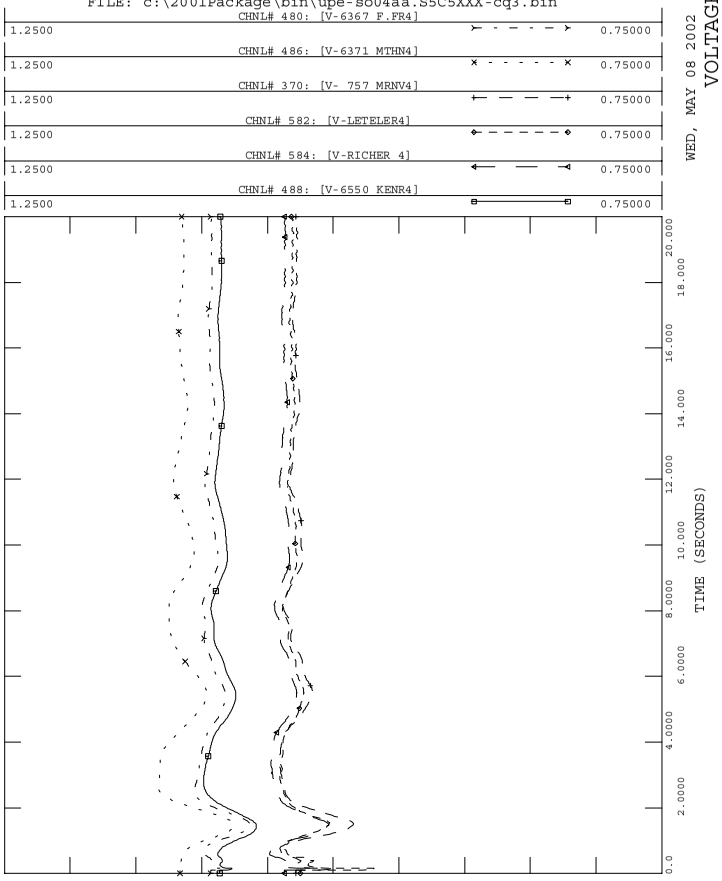
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



WED, MAY 08 2002 20:00
VOLTAGES 4

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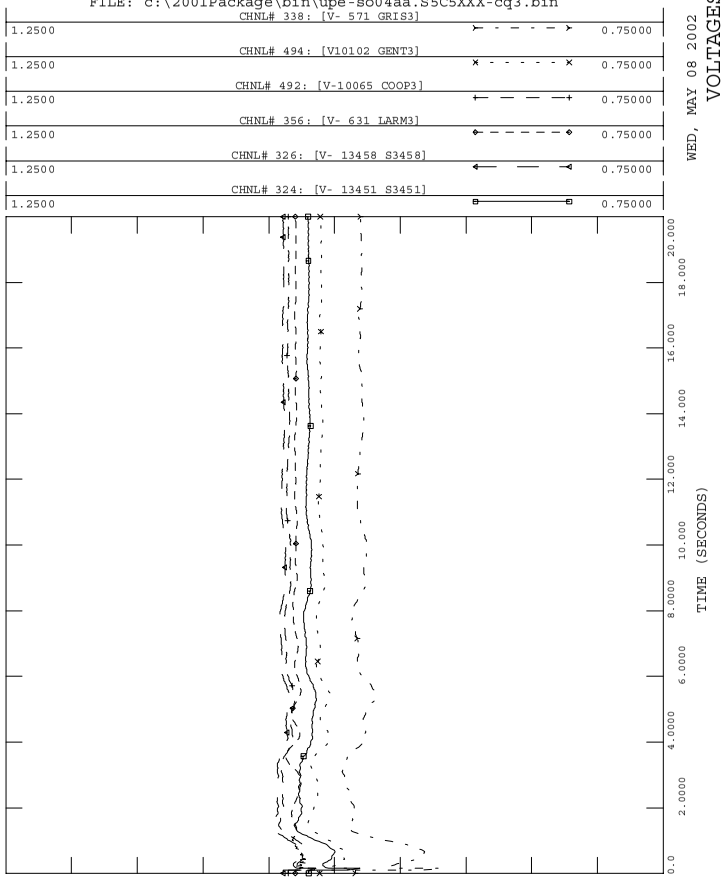
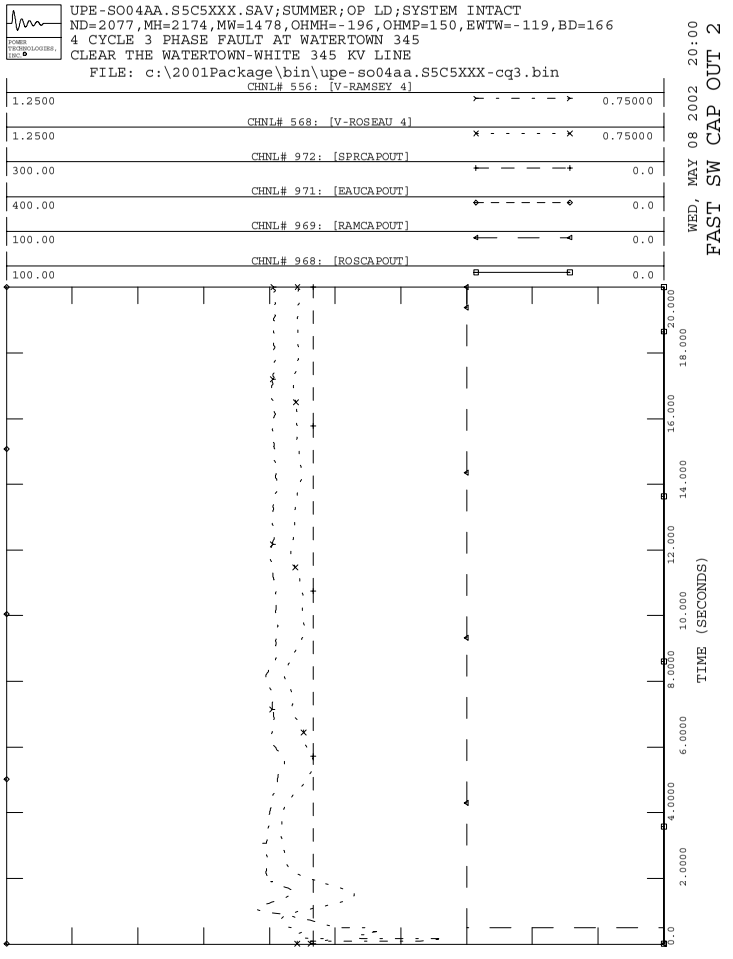
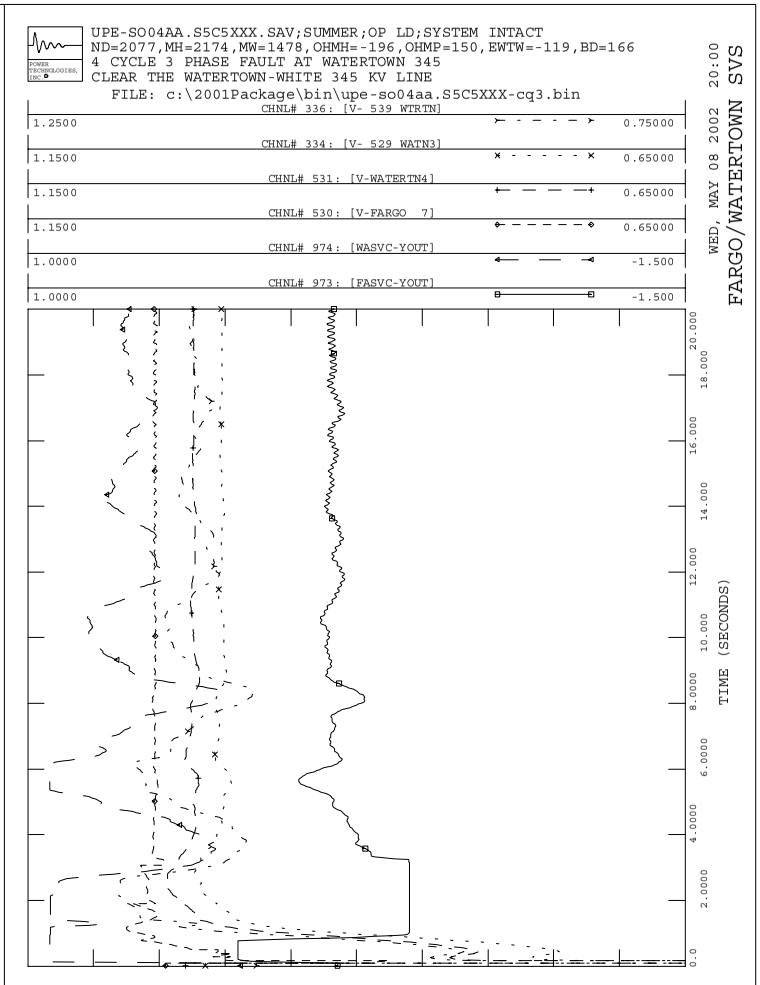
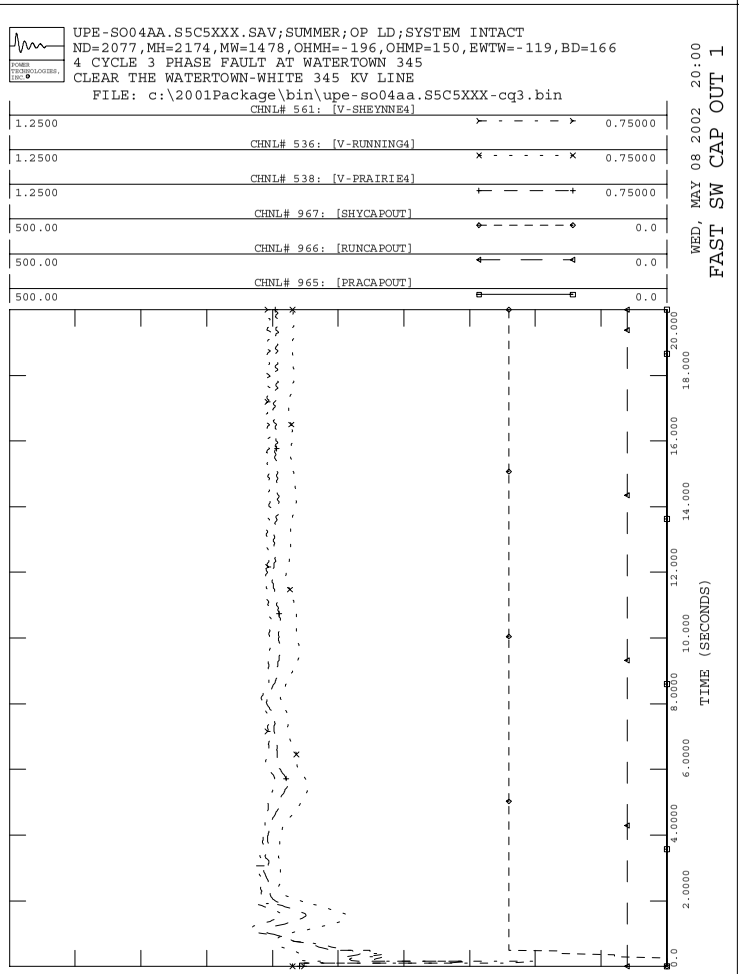
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

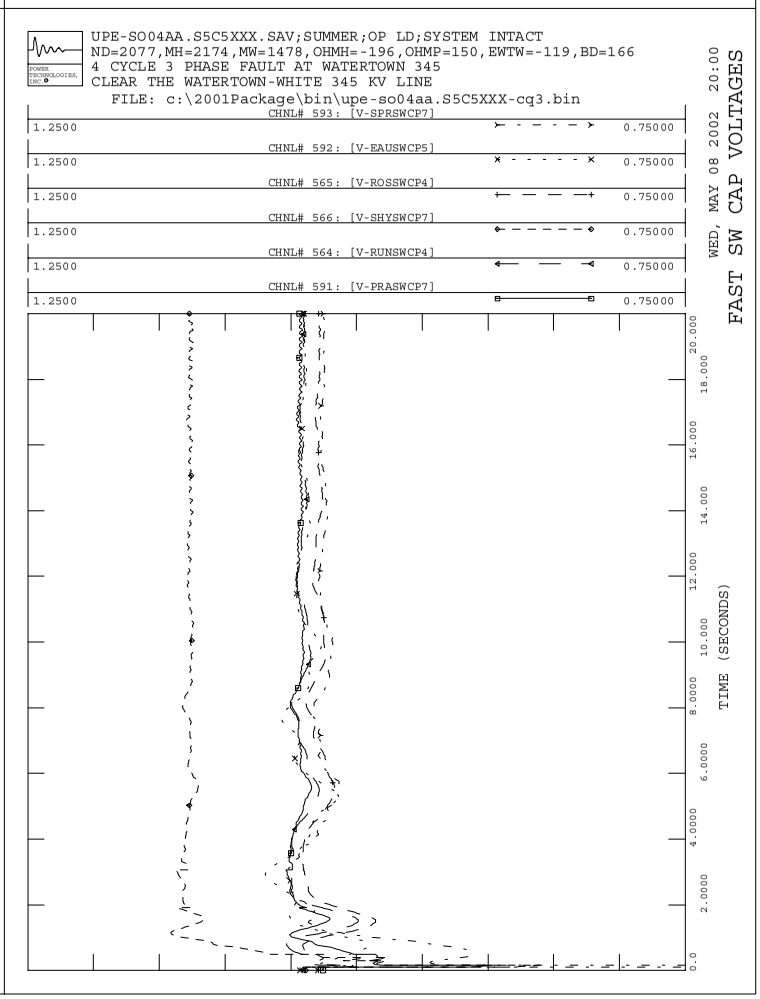


WED, MAY 08 2002 20:00
VOLTAGES NB

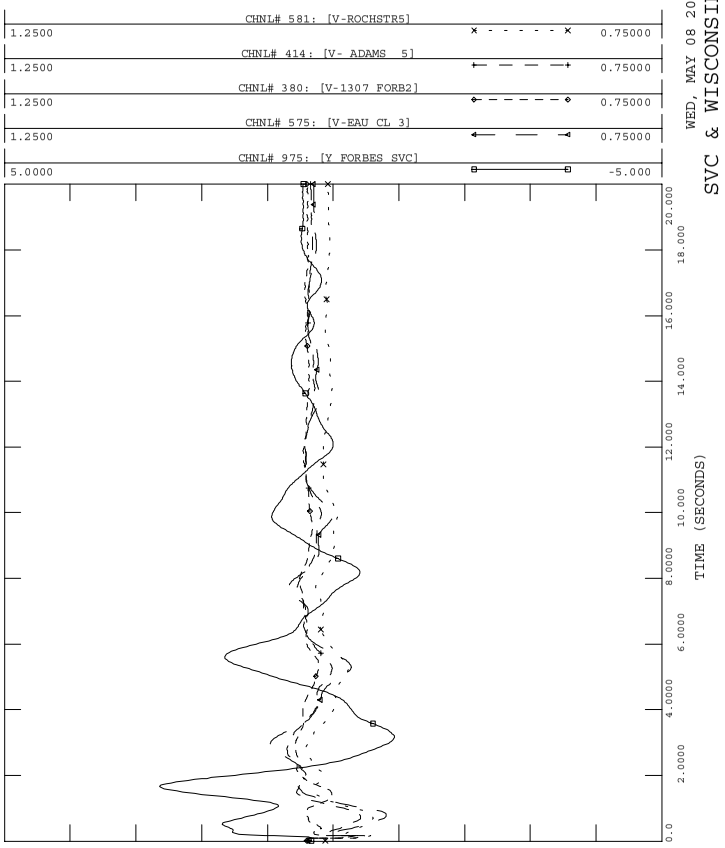

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin
CHNL# 556: [V-RAMSEY 4]
CHNL# 568: [V-ROSEAU 4]
CHNL# 972: [SPRCAPOUT]
CHNL# 971: [EAUCAPOUT]
CHNL# 969: [RAMCAPOUT]
CHNL# 968: [ROSCAPOUT]
TIME (SECONDS)
WED, MAY 08 2002 20:00
FAST SW CAP OUT 2


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin
CHNL# 336: [V- 539 WTRTN]
CHNL# 334: [V- 529 WATN3]
CHNL# 531: [V-WATERTN4]
CHNL# 530: [V-FARGO 7]
CHNL# 974: [WASVC-YOUT]
CHNL# 973: [FASVC-YOUT]
TIME (SECONDS)
WED, MAY 08 2002 20:00
FARGO/WATERTOWN SVS


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin
CHNL# 561: [V-SHEYNNE4]
CHNL# 536: [V-RUNNING4]
CHNL# 538: [V-PRAIRIE4]
CHNL# 967: [SHYCAPOUT]
CHNL# 966: [RUNCAPOUT]
CHNL# 965: [PRACAPOUT]
TIME (SECONDS)
WED, MAY 08 2002 20:00
FAST SW CAP OUT 1

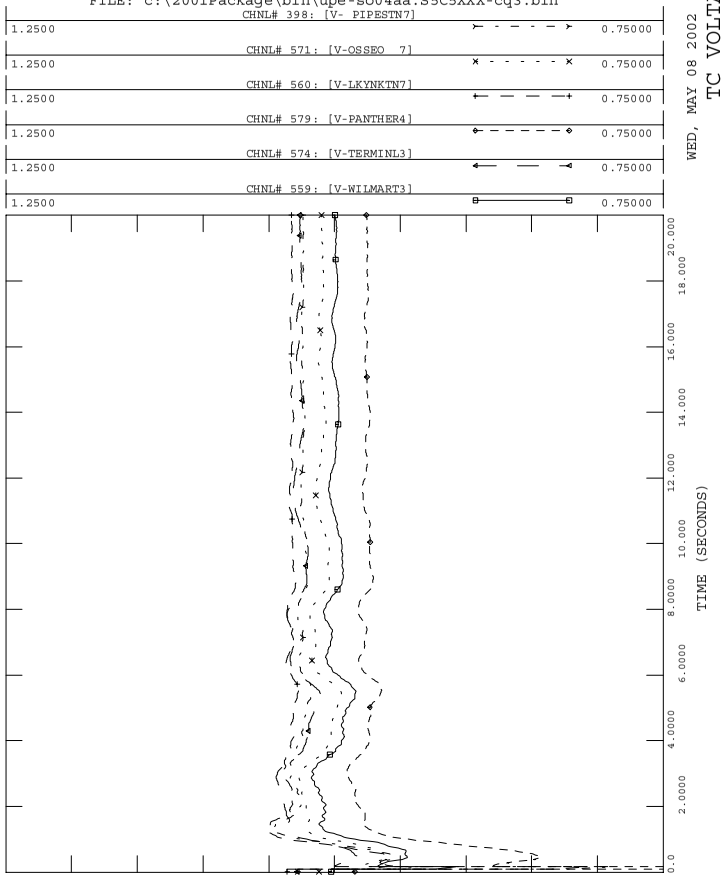

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin
CHNL# 593: [V-SPRSWCP7]
CHNL# 592: [V-EAUSWCP5]
CHNL# 565: [V-ROSSWCP4]
CHNL# 566: [V-SHYSWCP7]
CHNL# 564: [V-RUNSWCP4]
CHNL# 591: [V-PRASWCP7]
TIME (SECONDS)
WED, MAY 08 2002 20:00
FAST SW CAP VOLTAGES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



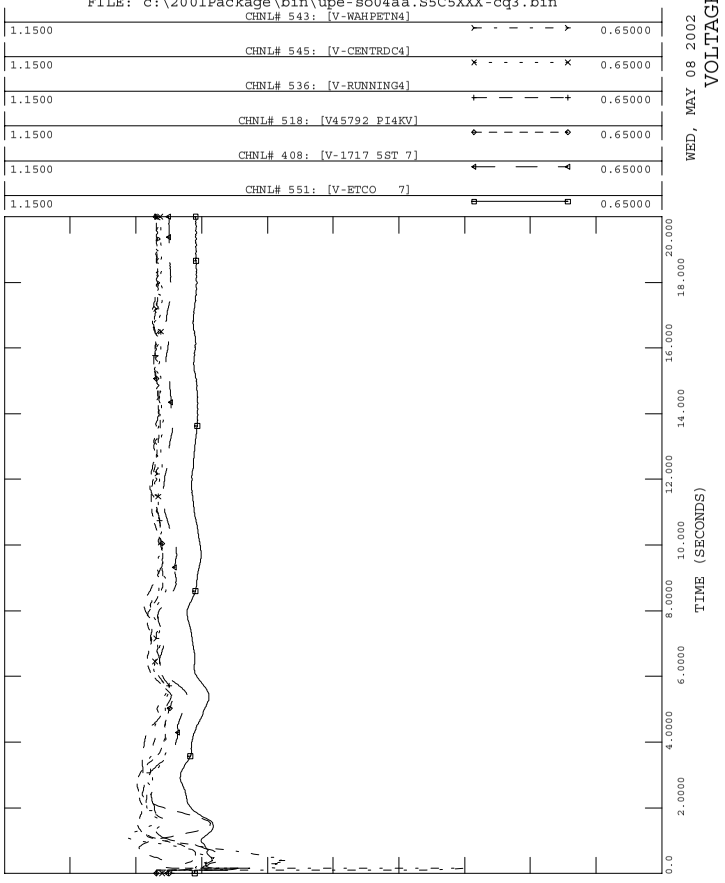
WED, MAY 08 2002 20:00
SVC & WISCONSIN VOLT

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



WED, MAY 08 2002 20:00
TC VOLTAGES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



WED, MAY 08 2002 20:00
VOLTAGES 6

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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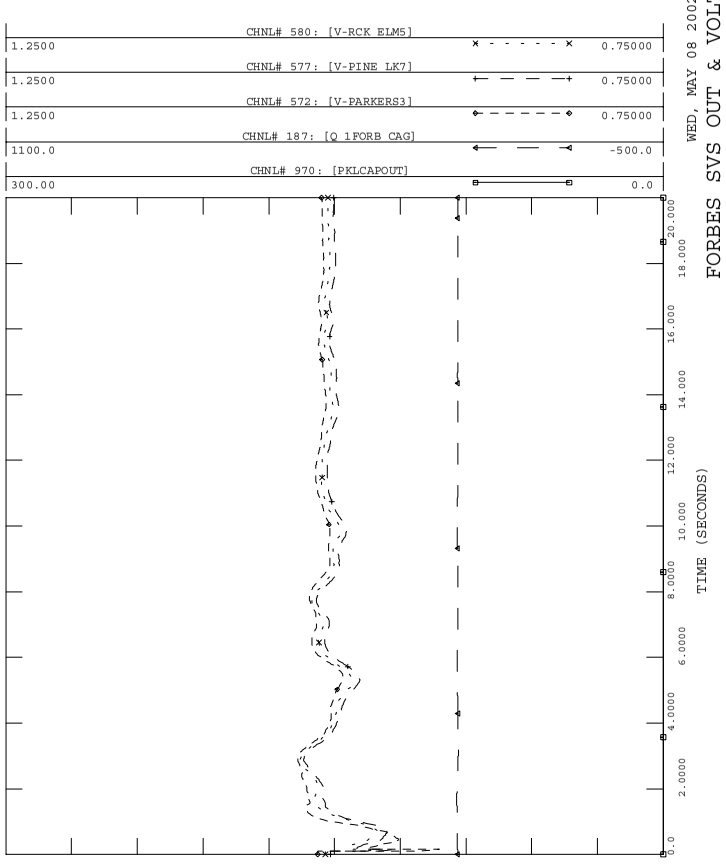
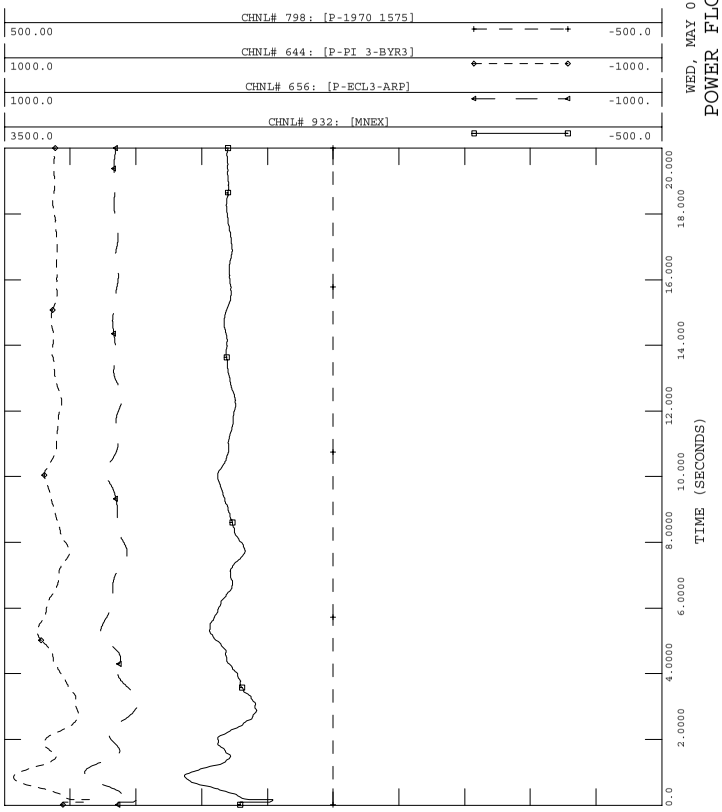
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



WED, MAY 08 2002 20:00
FORBES SVS OUT & VOLTAGES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
POWER FLOW SUMS 2



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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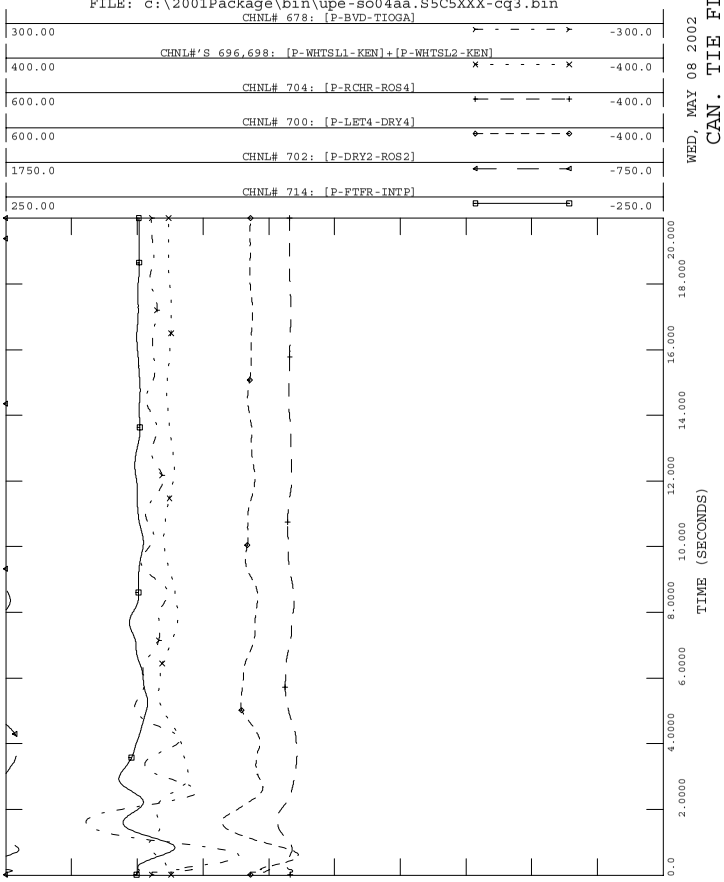
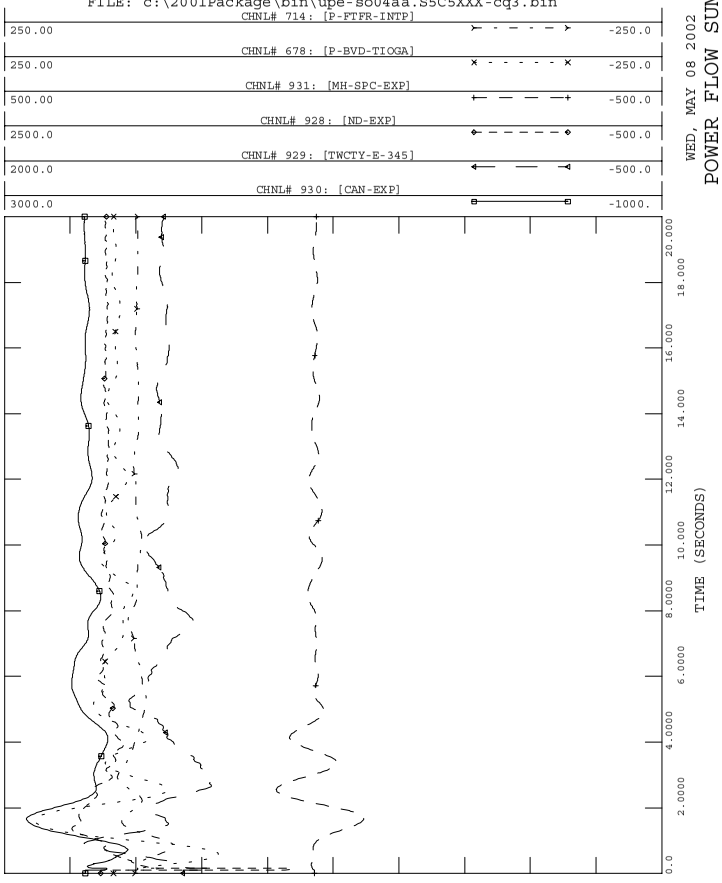
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
CAN. TIE FLOWS



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
POWER FLOW SUMS 1



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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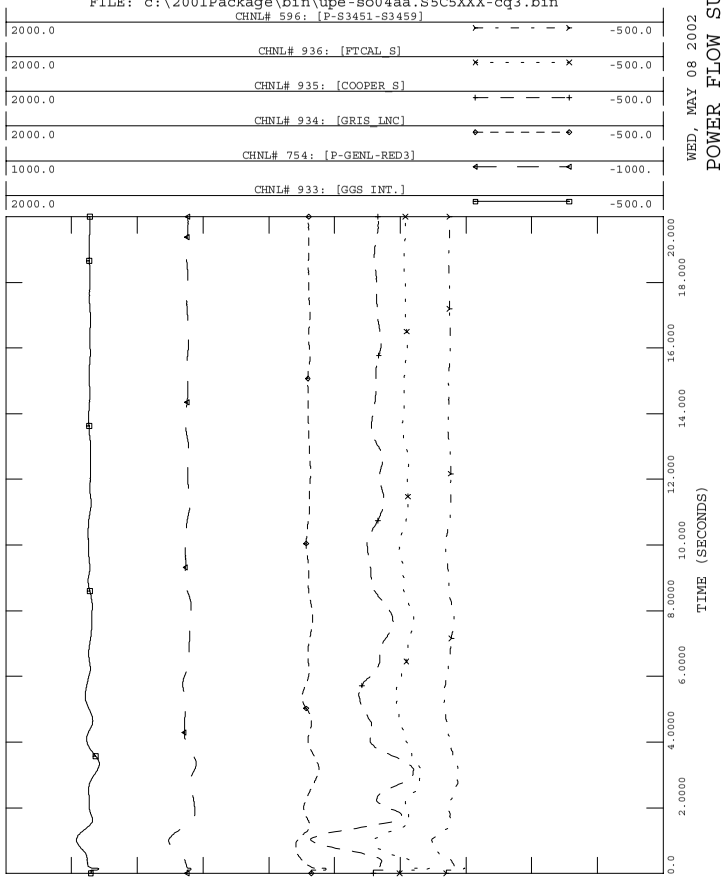
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
POWER FLOW SUM 3



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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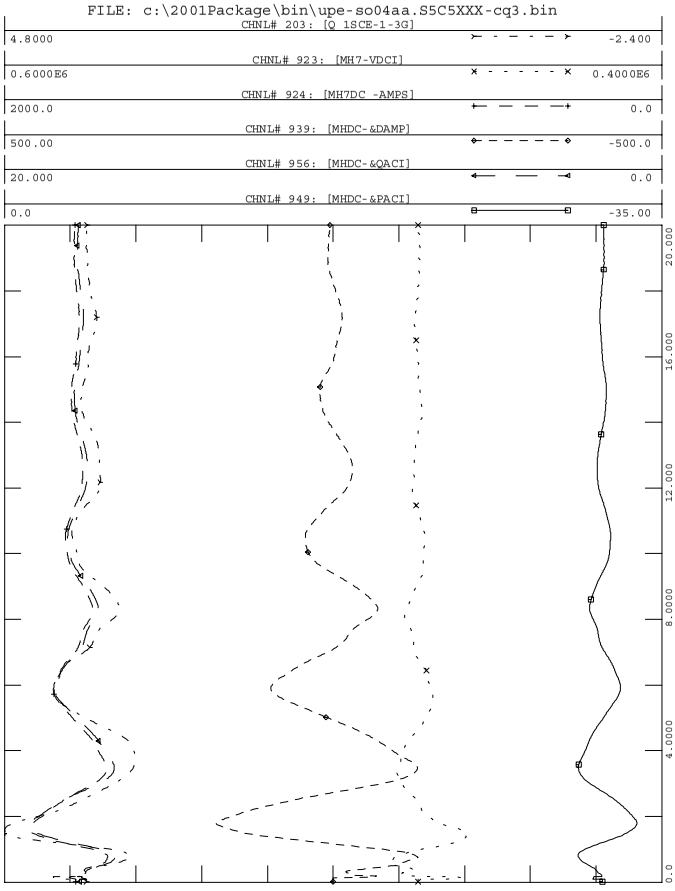
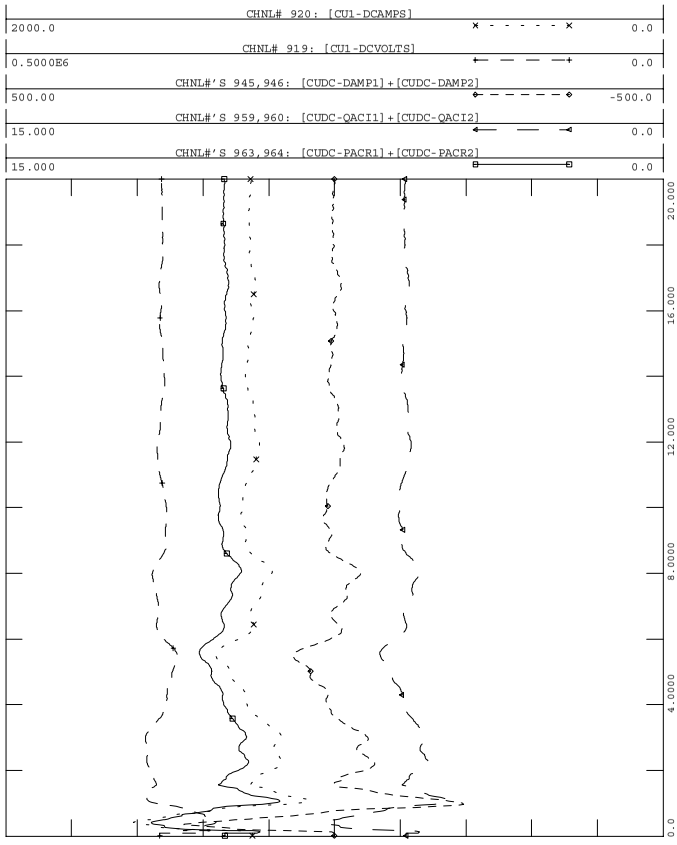
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
MH DC PARAMETERS



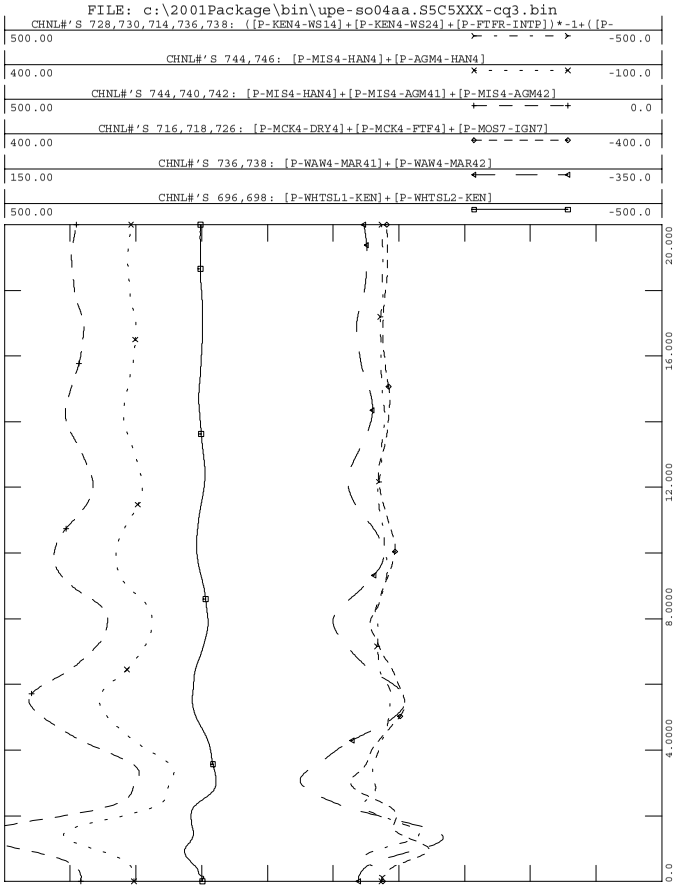
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
CU DC #1



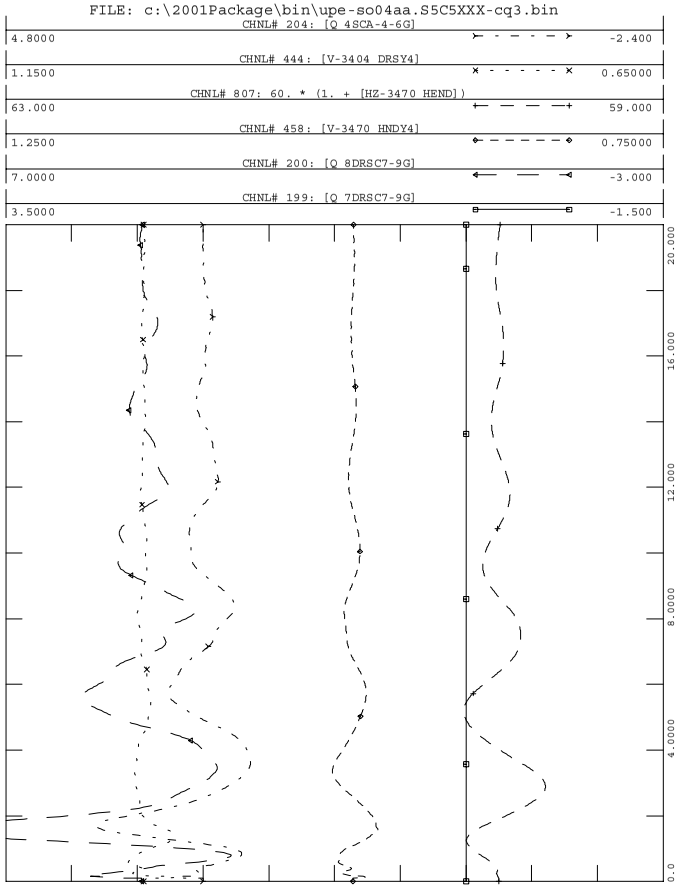
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
OH TIE FLOWS

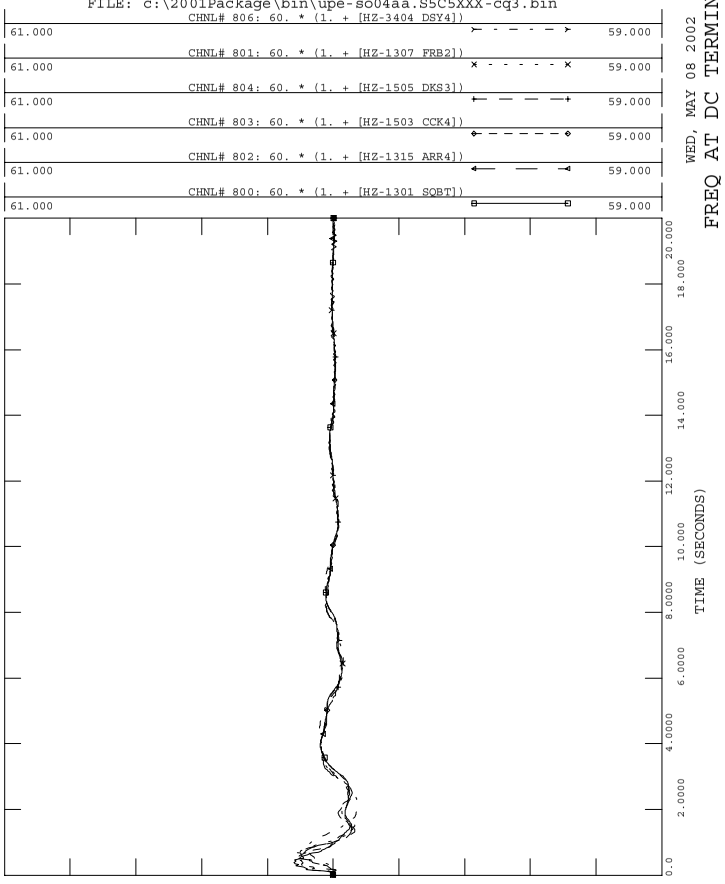


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

WED, MAY 08 2002 20:00
MH DC PARAMETERS

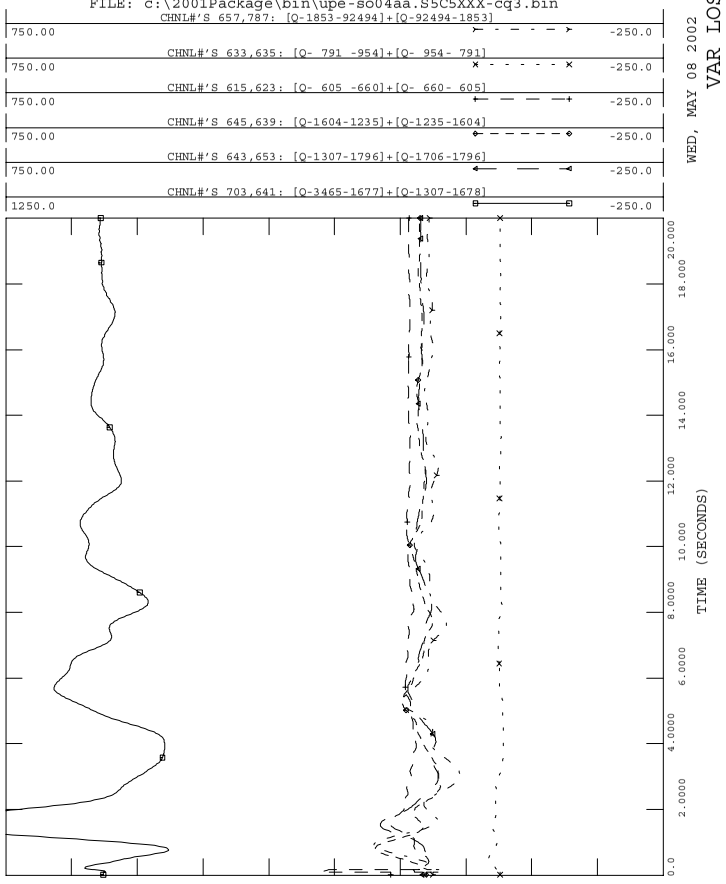


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



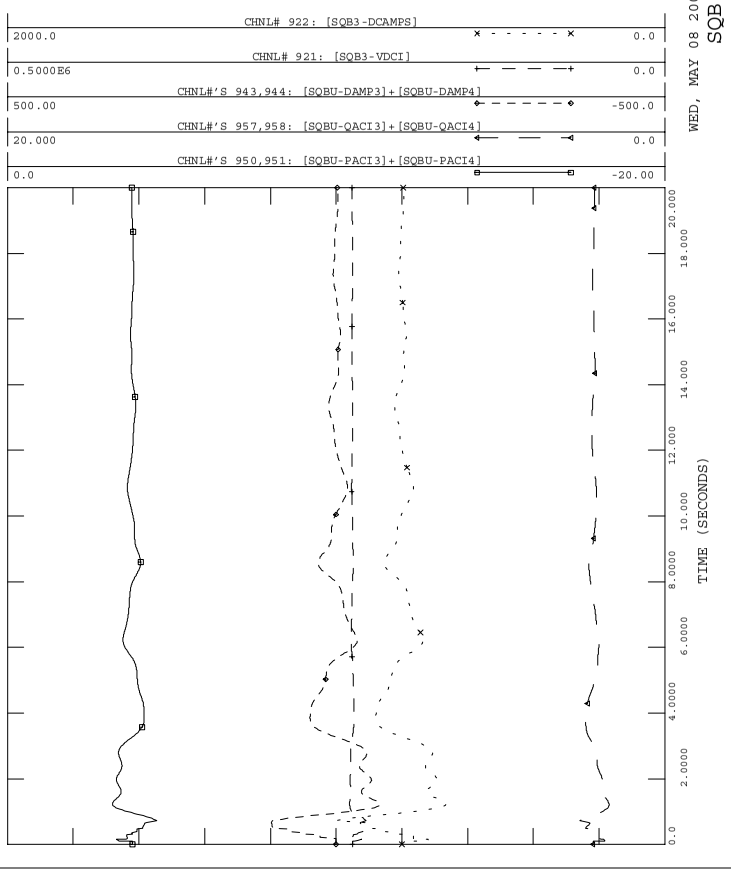
WED, MAY 08 2002 20:00
FREQ AT DC TERMINALS

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



WED, MAY 08 2002 20:00
VAR LOSSES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin



WED, MAY 08 2002 20:00
SQB DC #3

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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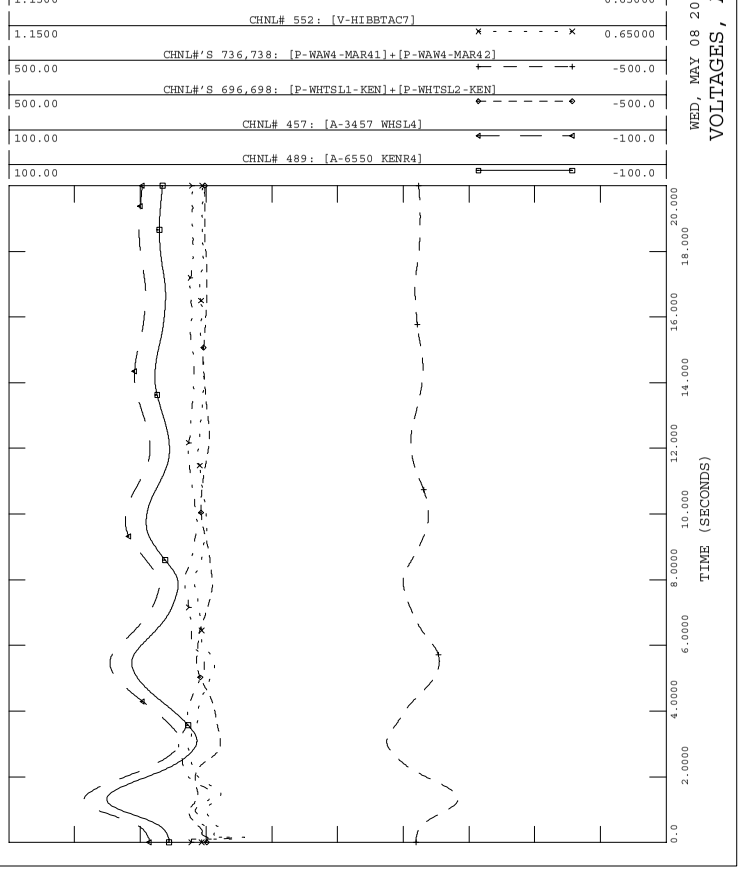
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

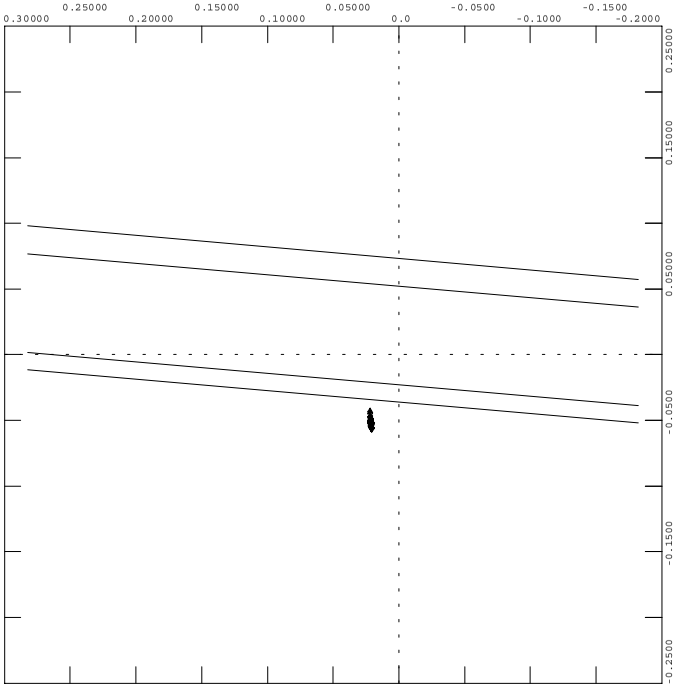


WED, MAY 08 2002 20:00
VOLTAGES, ANGLES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

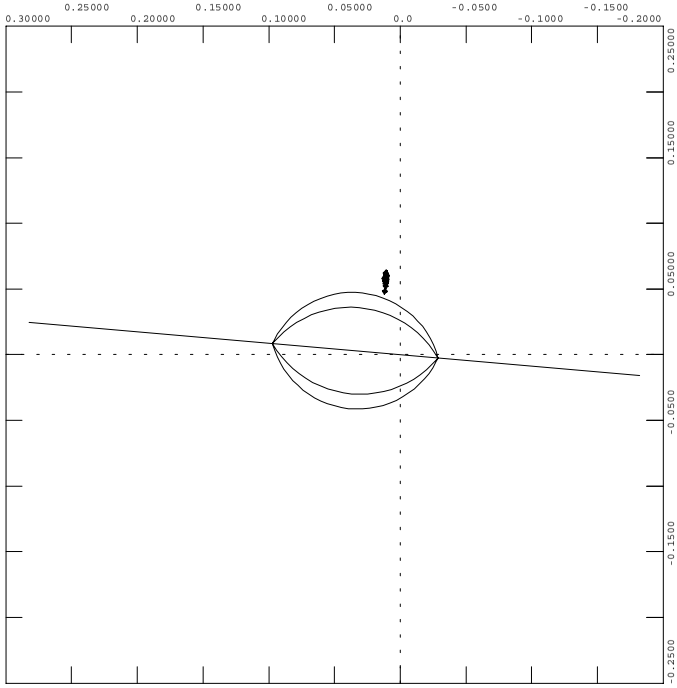


WED, MAY 08 2002 20:00
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

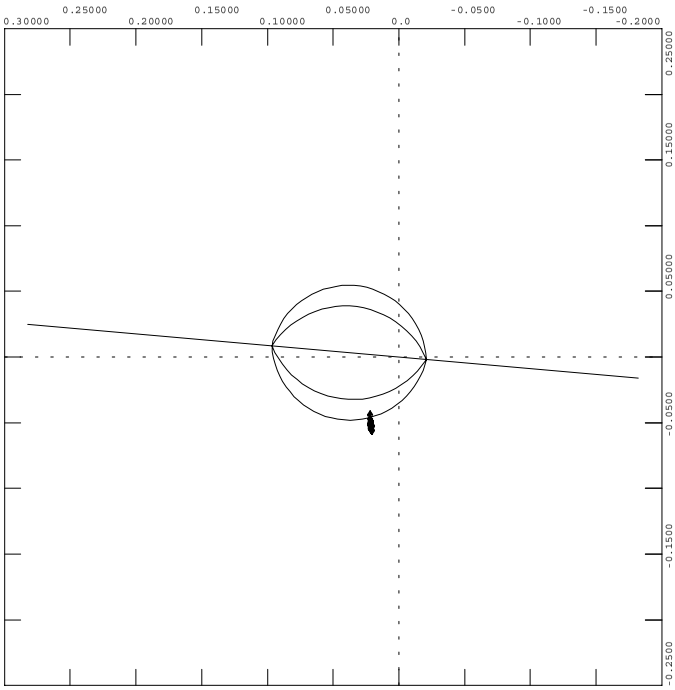


WED, MAY 08 2002 20:00
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

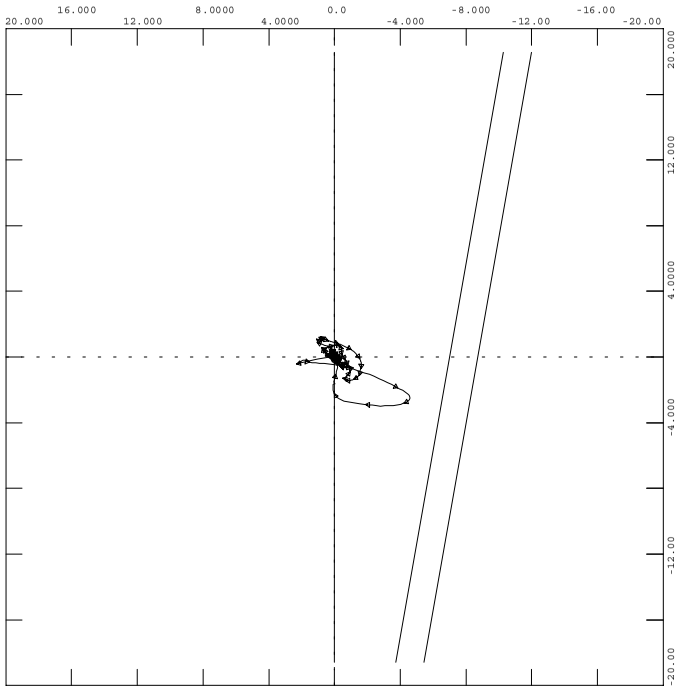


WED, MAY 08 2002 20:00
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

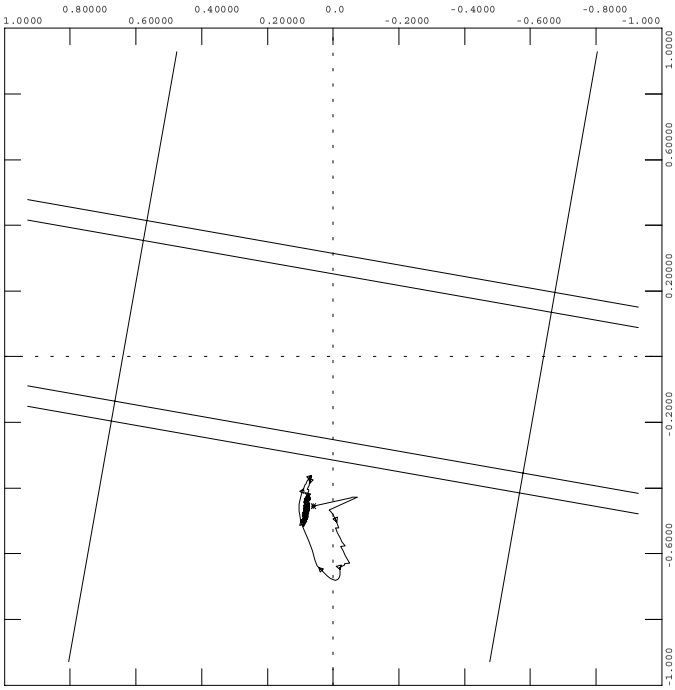


WED, MAY 08 2002 20:00
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

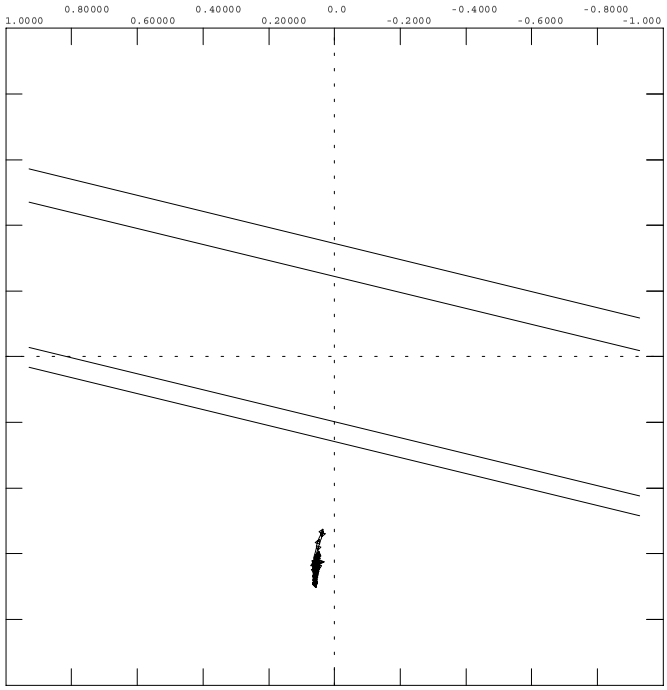
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

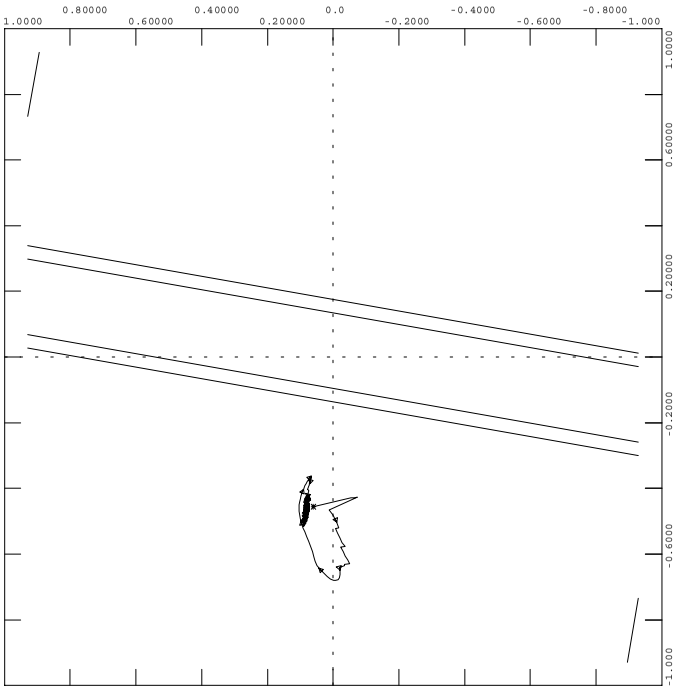
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

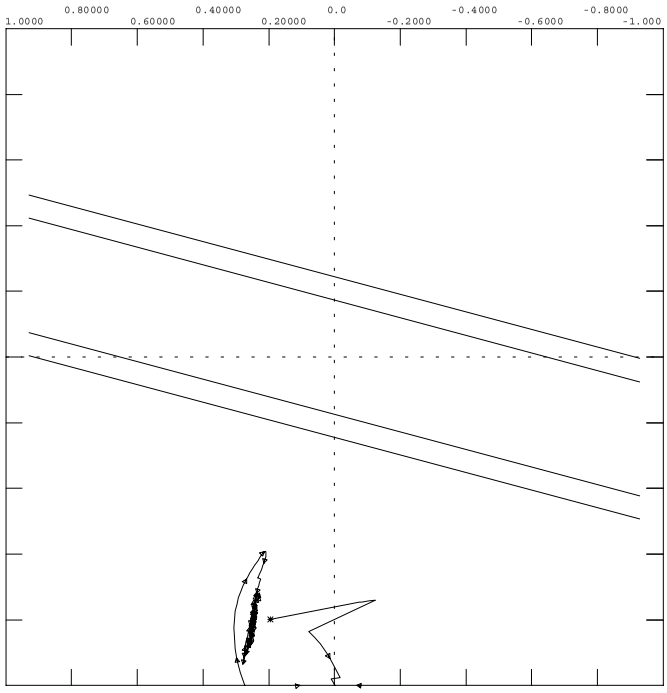
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

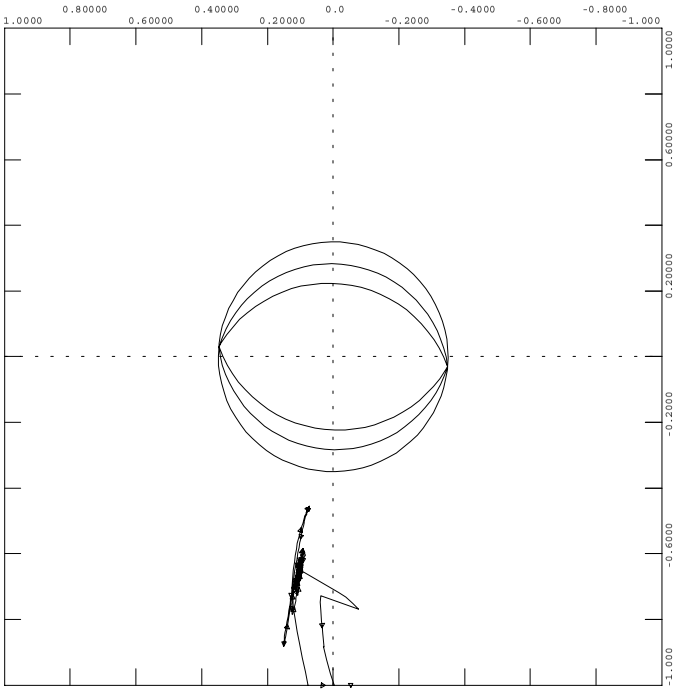
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

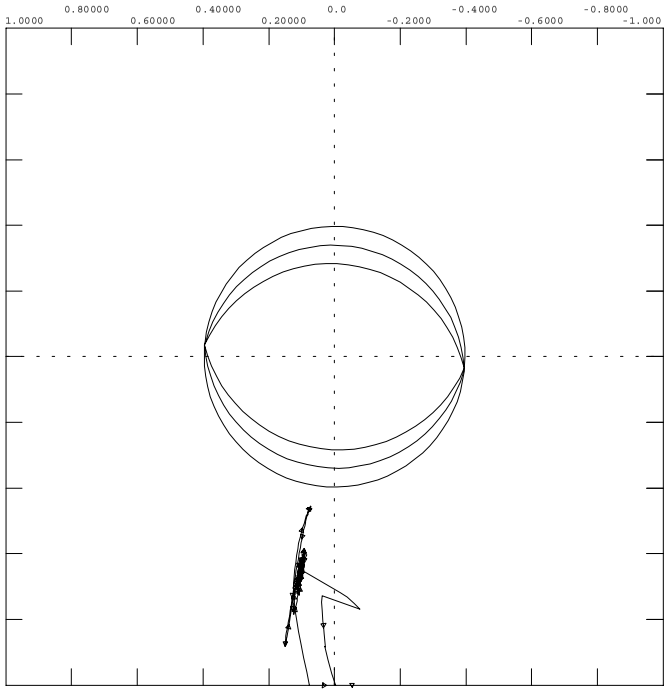
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

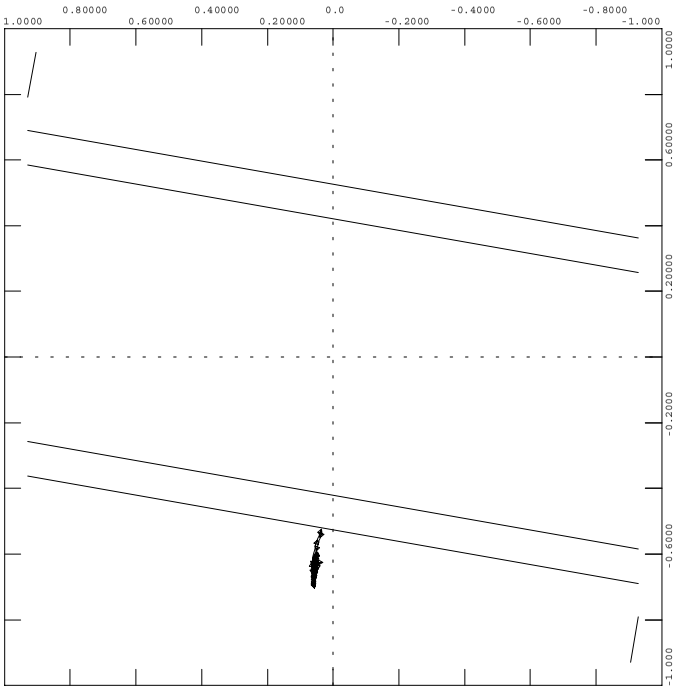
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

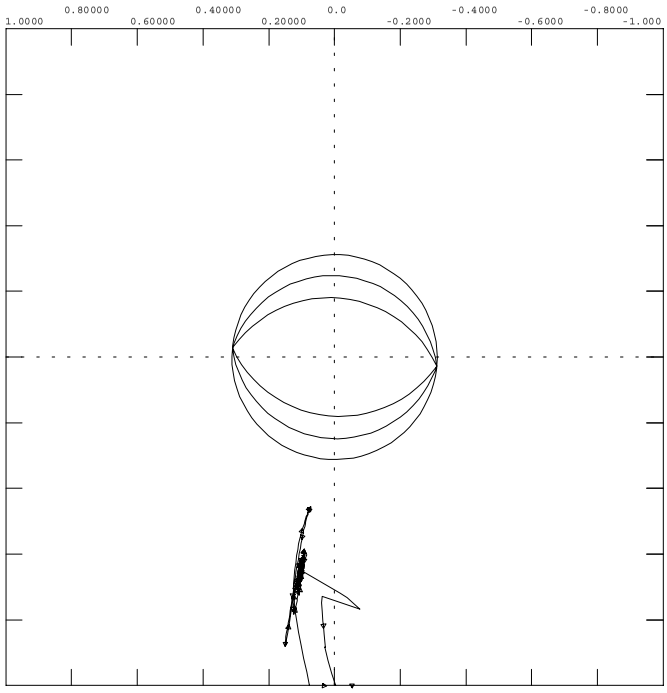
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



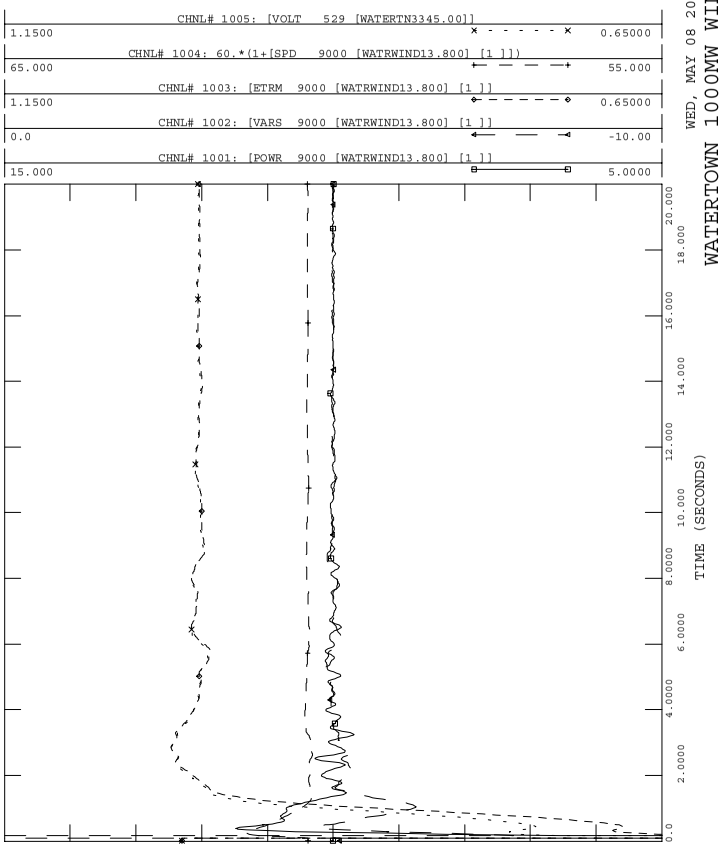
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

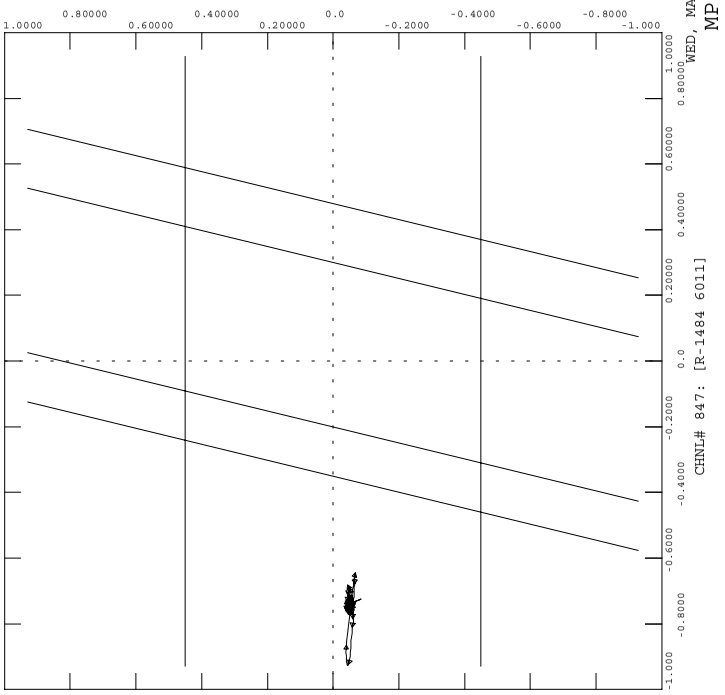


WED, MAY 08 2002 20:00
WATERTOWN 100MW WIND UNI

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-WHITE 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cq3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]

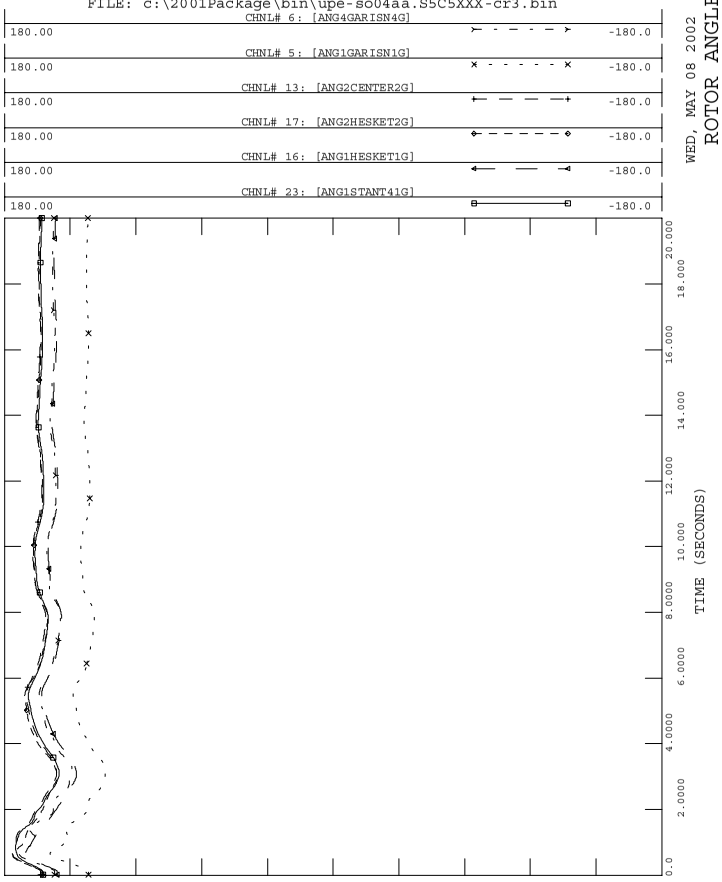


WED, MAY 08 2002 20:00
MP-OH I.FALLS (779)

CONTINGENCY CR3

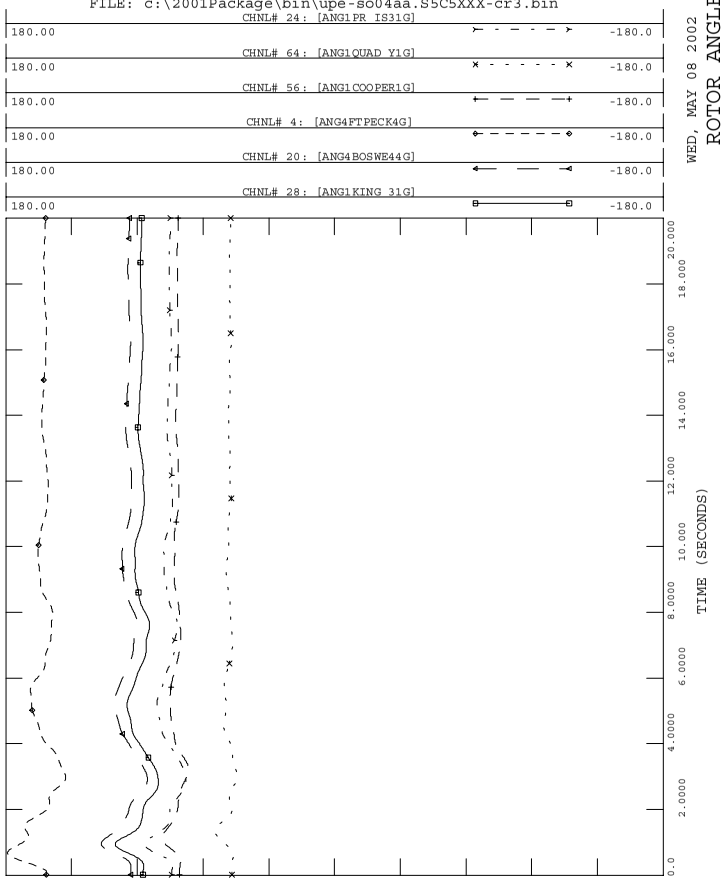
4 cycle 3 phase fault at Watertown 345 kV. Clear the Watertown-Huron 345 kv line

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin



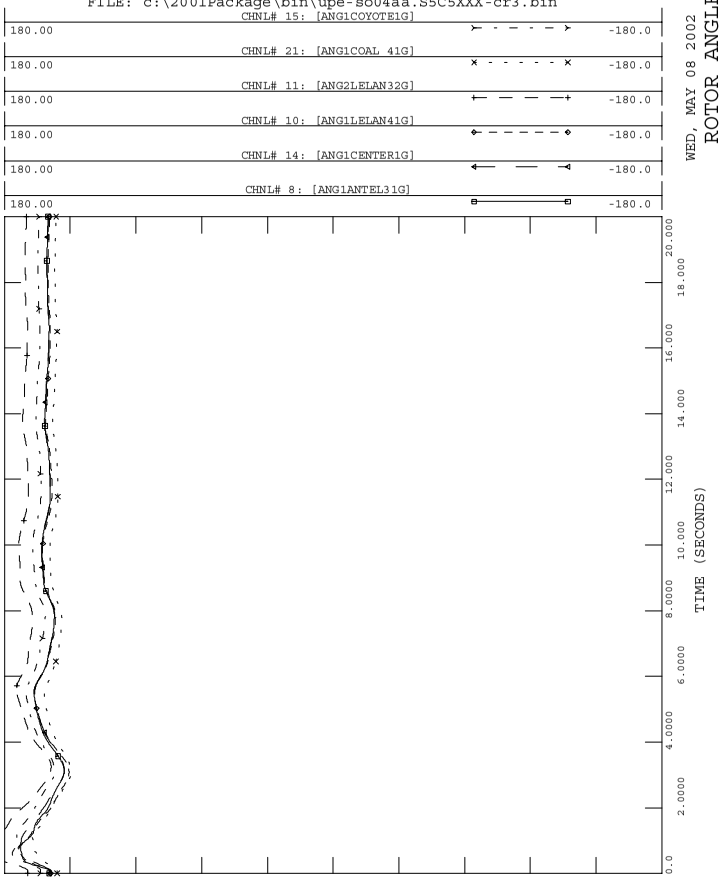
WED, MAY 08 2002 20:14
ROTOR ANGLES 2

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin



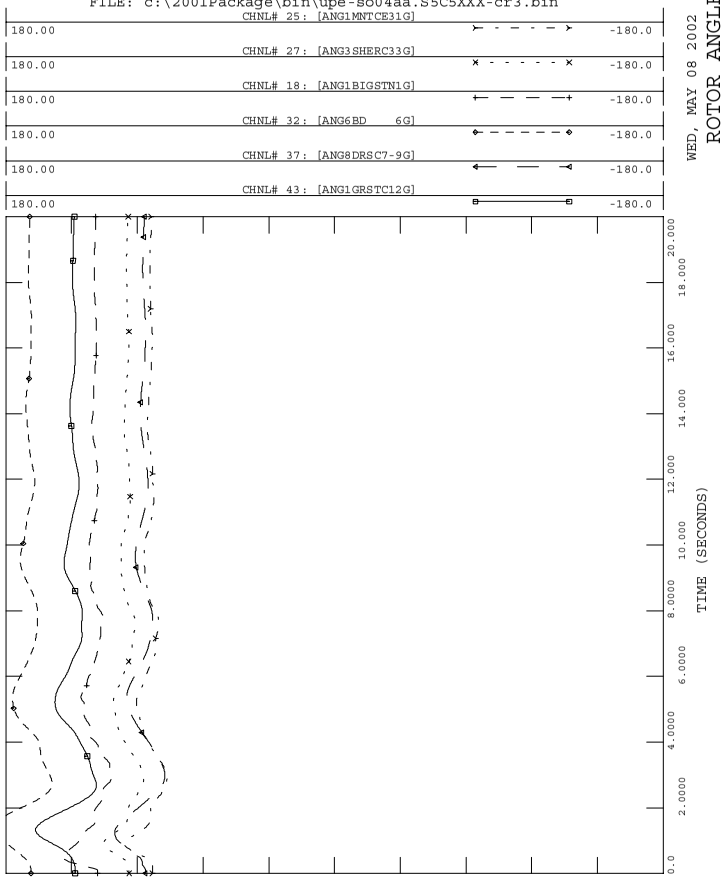
WED, MAY 08 2002 20:14
ROTOR ANGLES 4

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

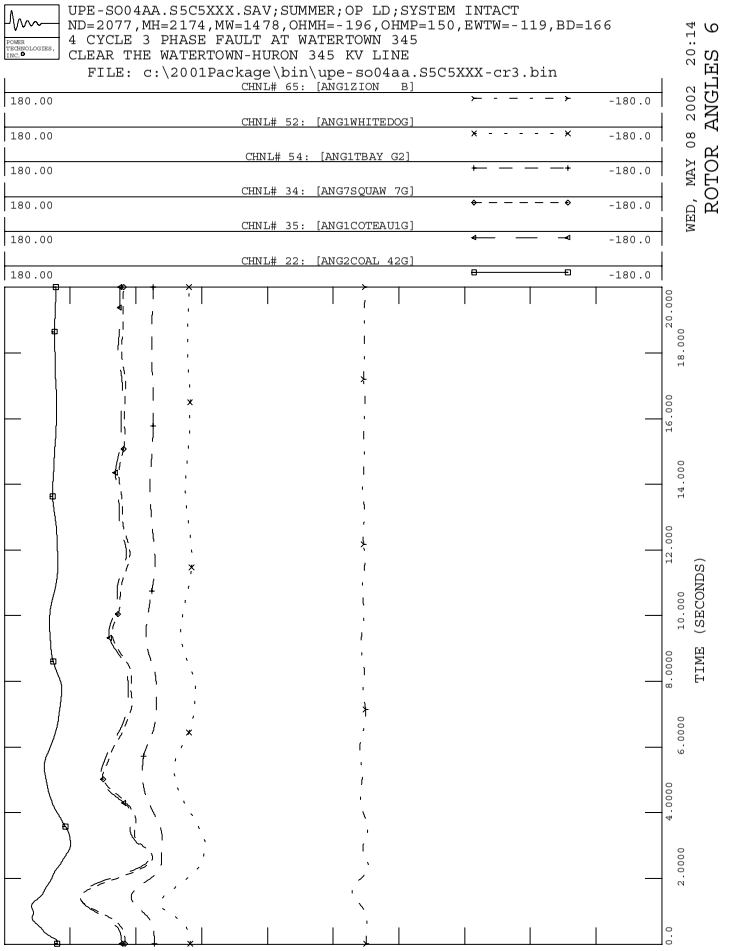


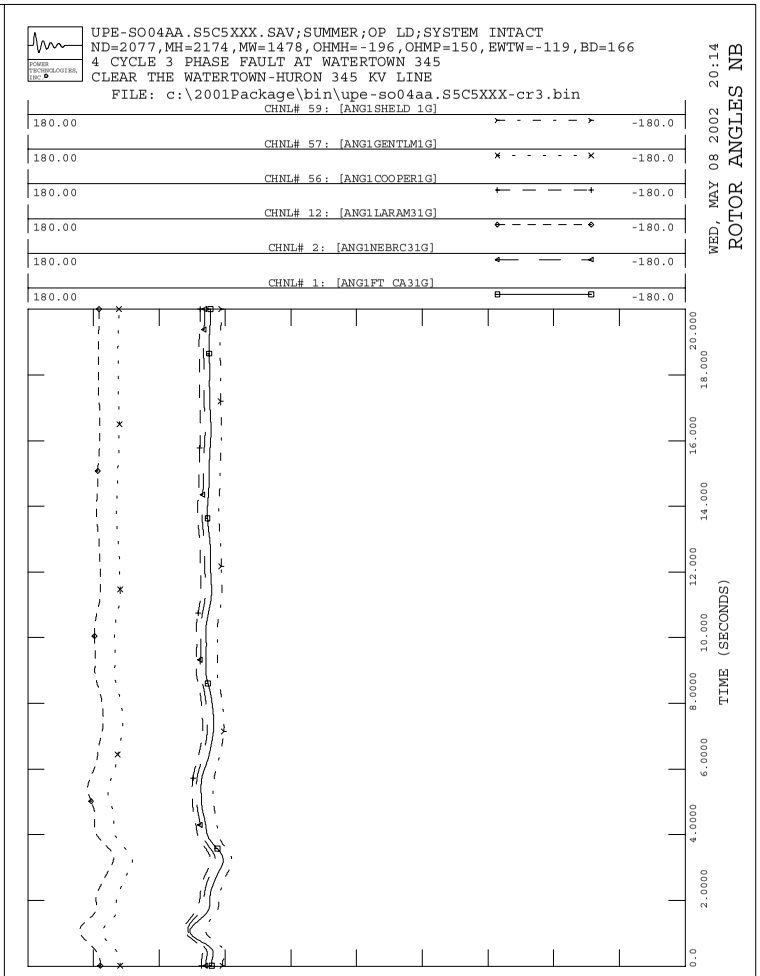
WED, MAY 08 2002 20:13
ROTOR ANGLES 1

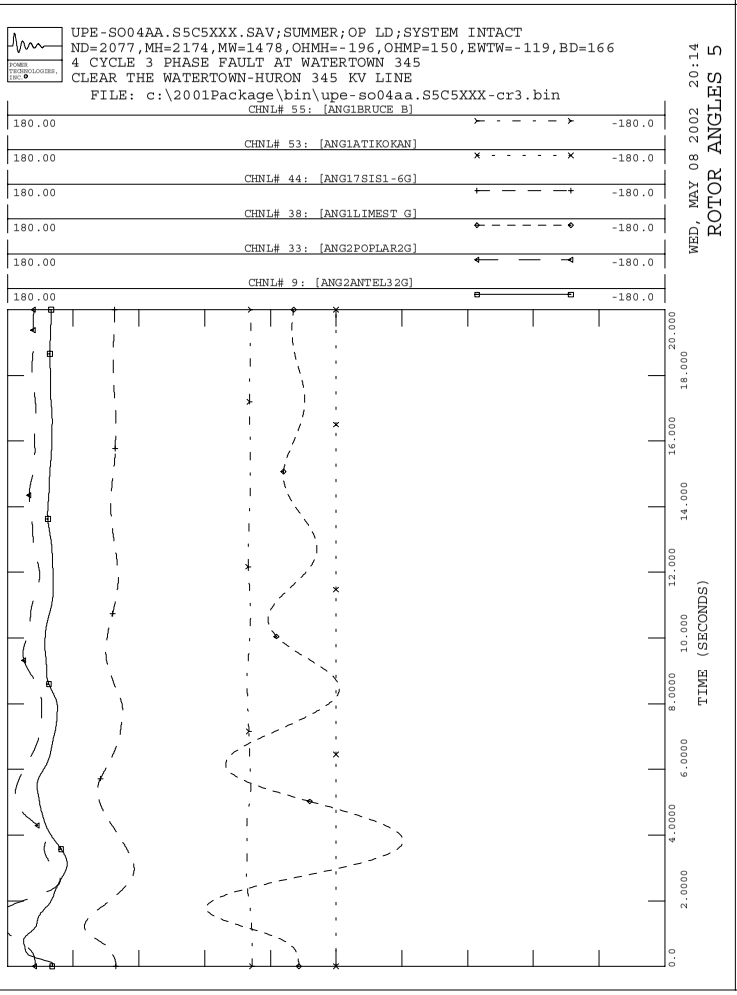
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

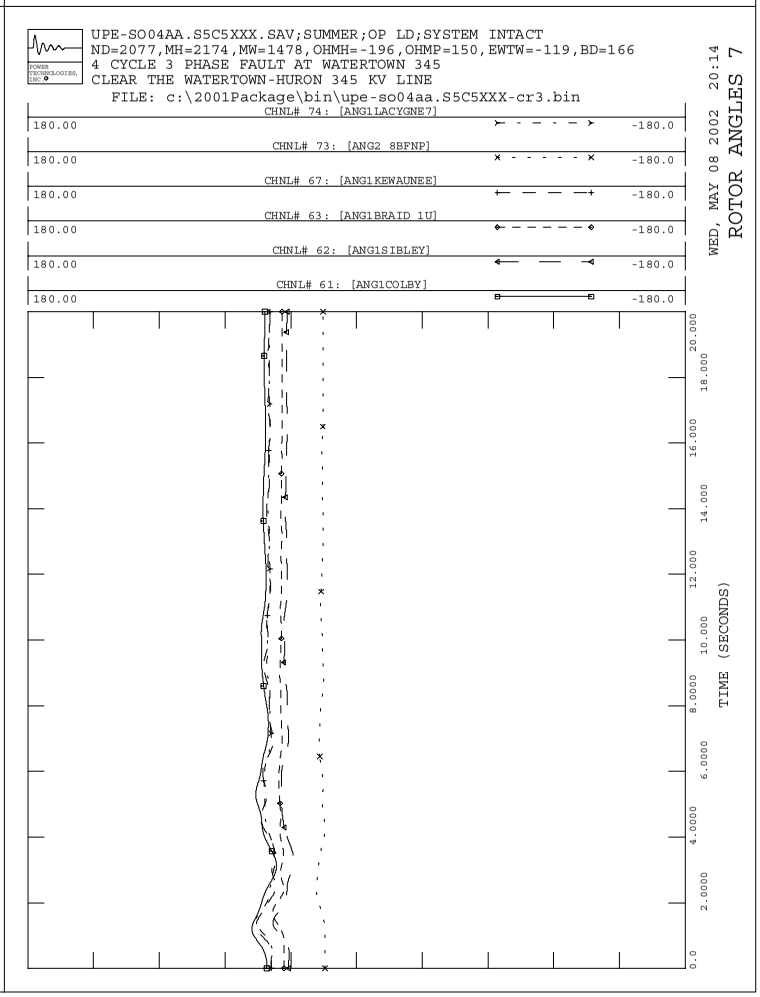


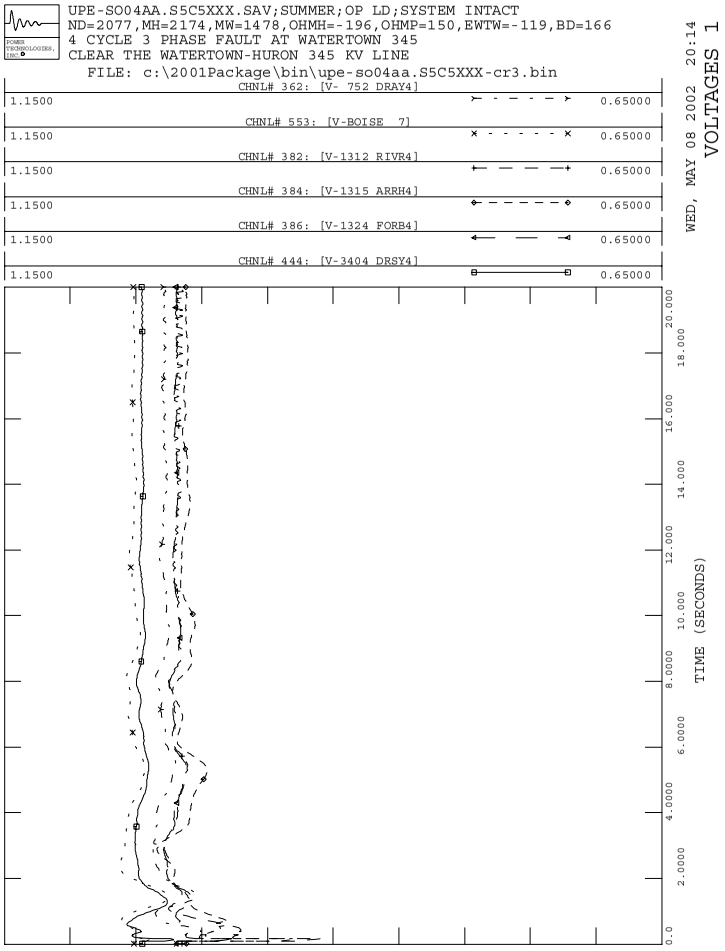
WED, MAY 08 2002 20:14
ROTOR ANGLES 3

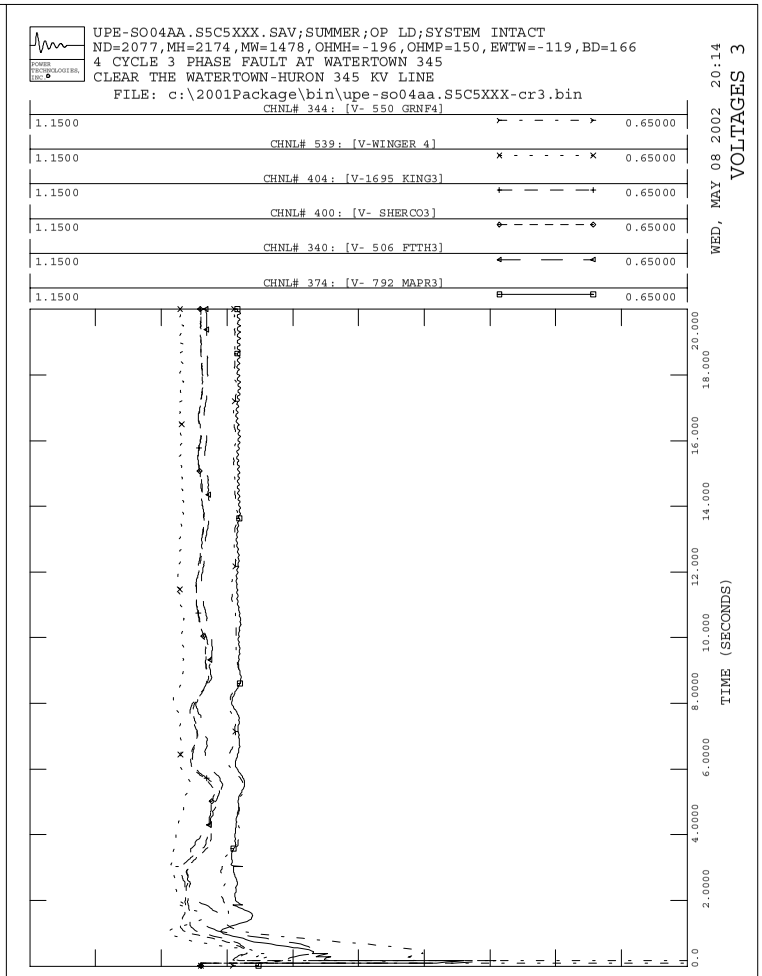

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 65: [ANG1ZION B]
CHNL# 52: [ANG1WHITEDOG]
CHNL# 54: [ANG1TBAY G2]
CHNL# 34: [ANG7SQUAW 7G]
CHNL# 35: [ANG1COTEAU1G]
CHNL# 22: [ANG2COAL 42G]
180.00
-180.0
TIME (SECONDS)
WED, MAY 08 2002 20:14
ROTOR ANGLES 6

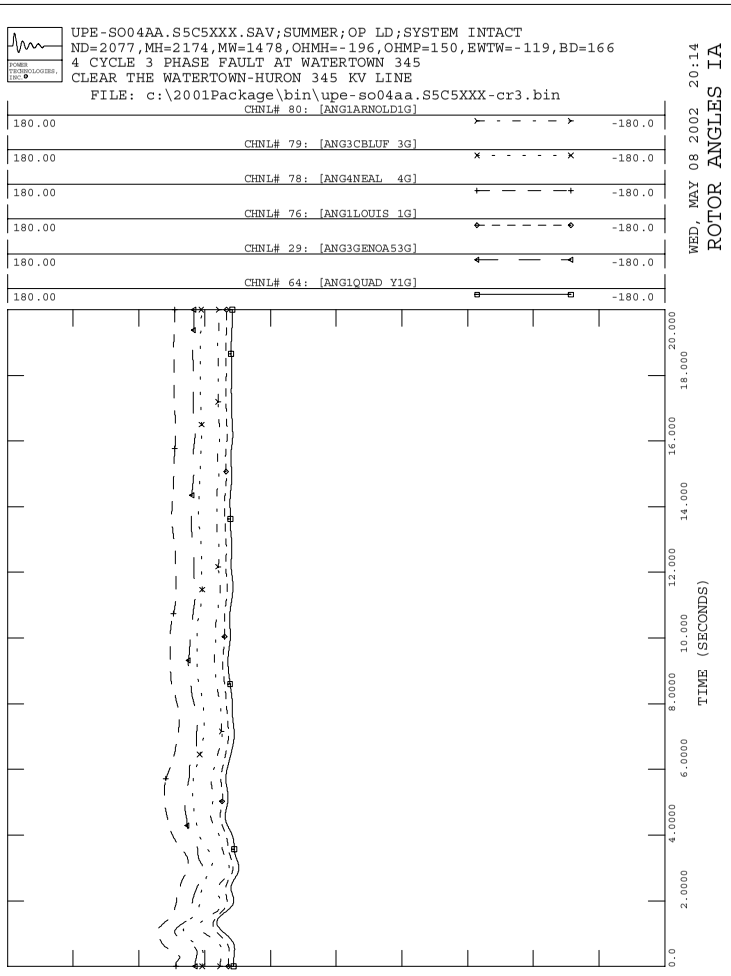

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 59: [ANG1SHELD 1G]
CHNL# 57: [ANG1GENTLM1G]
CHNL# 56: [ANG1COOPER1G]
CHNL# 12: [ANG1LARAM31G]
CHNL# 2: [ANG1NEBRC31G]
CHNL# 1: [ANG1FT CA31G]
180.00
-180.0
TIME (SECONDS)
WED, MAY 08 2002 20:14
ROTOR ANGLES NB

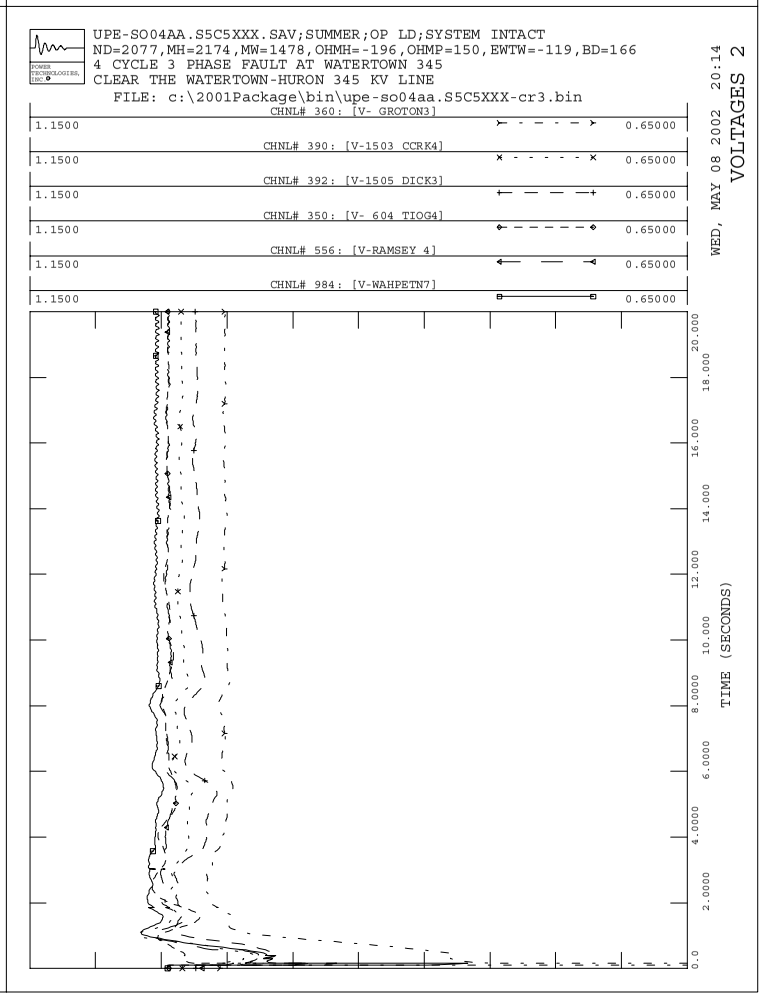

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 55: [ANG1BRUCE B]
CHNL# 53: [ANG1ATIKOKAN]
CHNL# 44: [ANG17SIS1-6G]
CHNL# 38: [ANG1LIMEST G]
CHNL# 33: [ANG2POPLAR2G]
CHNL# 9: [ANG2ANTEL32G]
180.00
-180.0
TIME (SECONDS)
WED, MAY 08 2002 20:14
ROTOR ANGLES 5


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 74: [ANG1LACYGNE7]
CHNL# 73: [ANG2 8BFNP]
CHNL# 67: [ANG1KEWAUNEE]
CHNL# 63: [ANG1BRAID 1U]
CHNL# 62: [ANG1SIBLEY]
CHNL# 61: [ANG1COLBY]
180.00
-180.0
TIME (SECONDS)
WED, MAY 08 2002 20:14
ROTOR ANGLES 7


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 362: [V- 752 DRAY4]
CHNL# 553: [V-BOISE 7]
CHNL# 382: [V-1312 RIVR4]
CHNL# 384: [V-1315 ARRH4]
CHNL# 386: [V-1324 FORB4]
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
WED, MAY 08 2002 20:14
VOLTAGES 1
TIME (SECONDS)

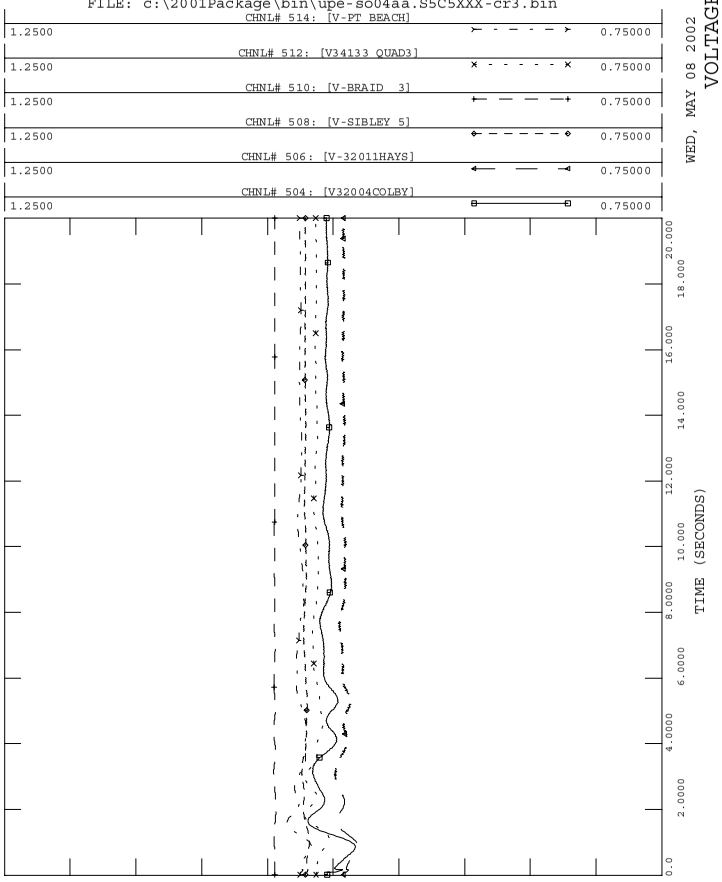

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 344: [V- 550 GRNF4]
CHNL# 539: [V-WINGER 4]
CHNL# 404: [V-1695 KING3]
CHNL# 400: [V- SHERCO3]
CHNL# 340: [V- 506 FTTH3]
CHNL# 374: [V- 792 MAPR3]
1.1500
0.65000
WED, MAY 08 2002 20:14
VOLTAGES 3
TIME (SECONDS)


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 80: [ANG1ARNOLD1G]
CHNL# 79: [ANG3CBLUF 3G]
CHNL# 78: [ANG4NEAL 4G]
CHNL# 76: [ANG1LOUIS 1G]
CHNL# 29: [ANG3GENOA53G]
CHNL# 64: [ANG1QUAD Y1G]
180.00
-180.0
WED, MAY 08 2002 20:14
ROTOR ANGLES IA
TIME (SECONDS)


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 360: [V- GROTON3]
CHNL# 390: [V-1503 CCRK4]
CHNL# 392: [V-1505 DICK3]
CHNL# 350: [V- 604 TIOG4]
CHNL# 556: [V-RAMSEY 4]
CHNL# 984: [V-WAHPETN7]
1.1500
0.65000
WED, MAY 08 2002 20:14
VOLTAGES 2
TIME (SECONDS)

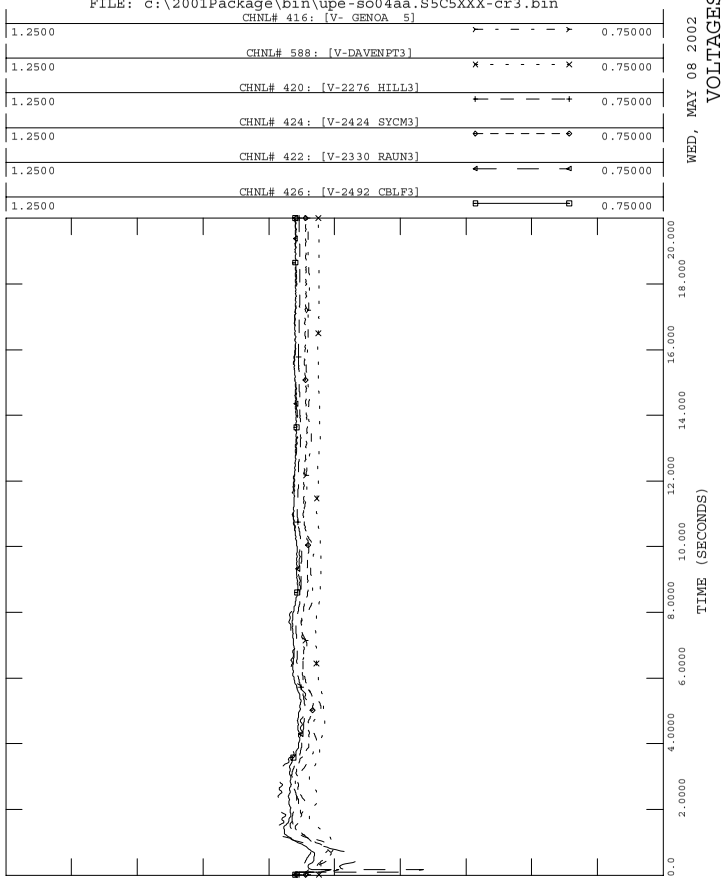
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

WED, MAY 08 2002 20:14
VOLTAGES 5



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

WED, MAY 08 2002 20:14
VOLTAGES IA



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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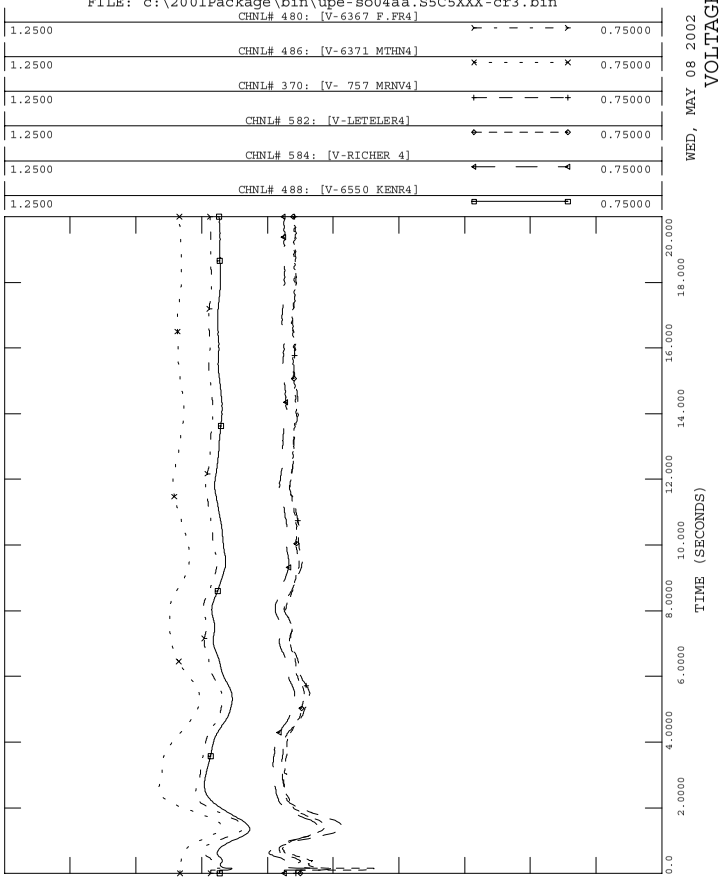
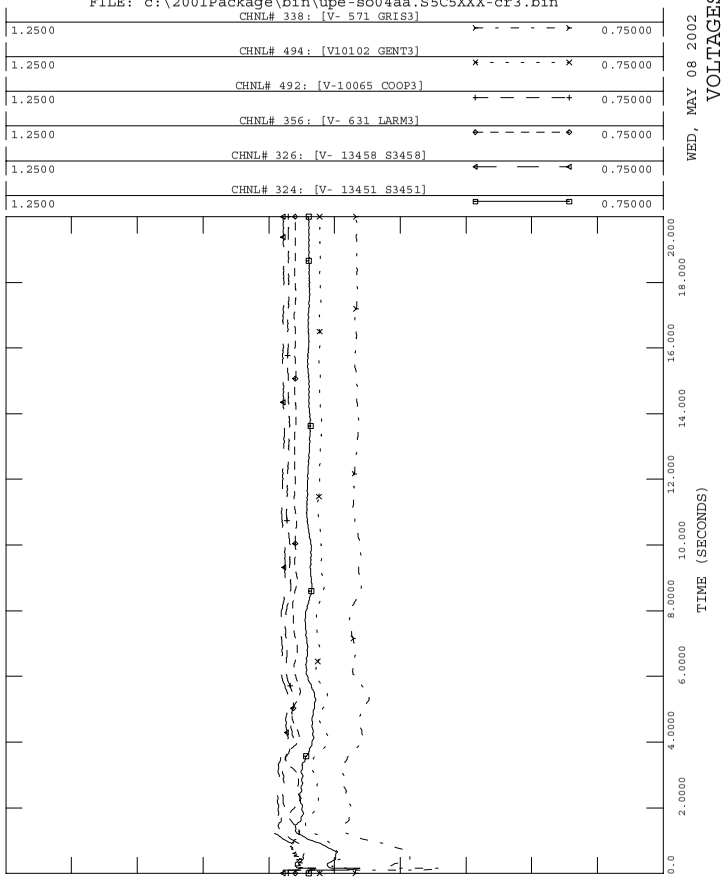
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

WED, MAY 08 2002 20:14
VOLTAGES 4

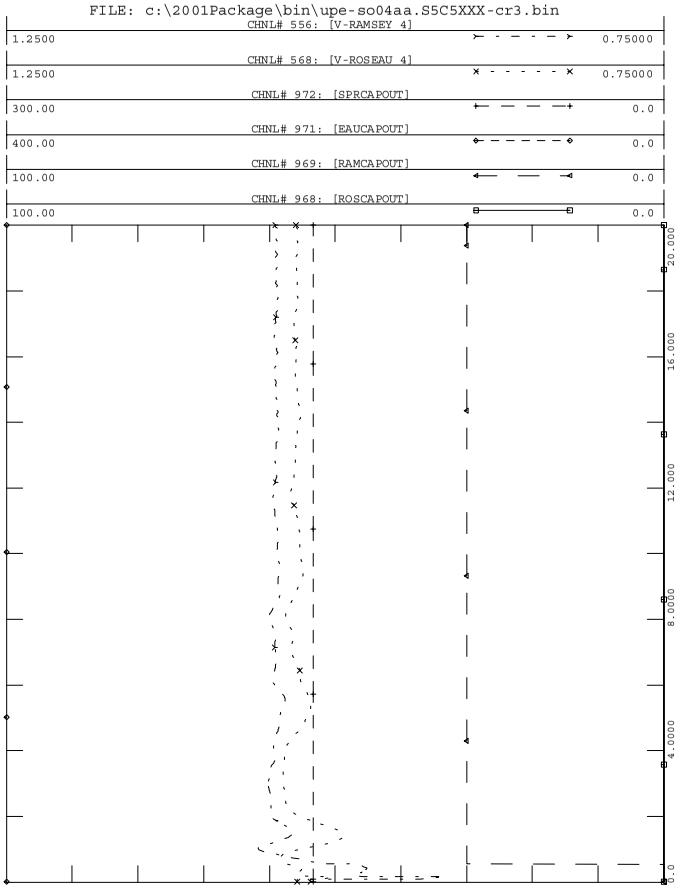


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

WED, MAY 08 2002 20:14
VOLTAGES NB

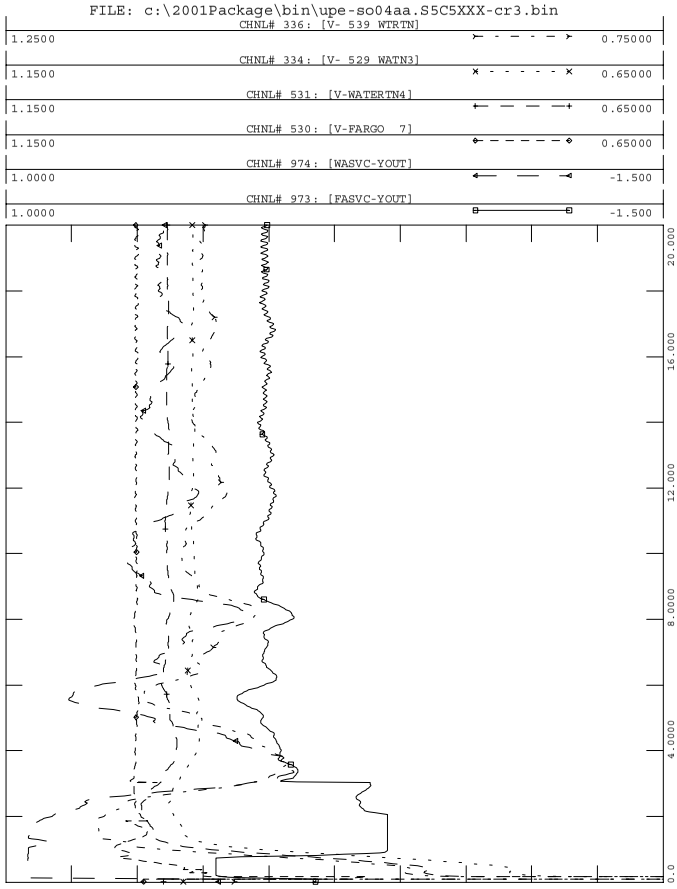


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin



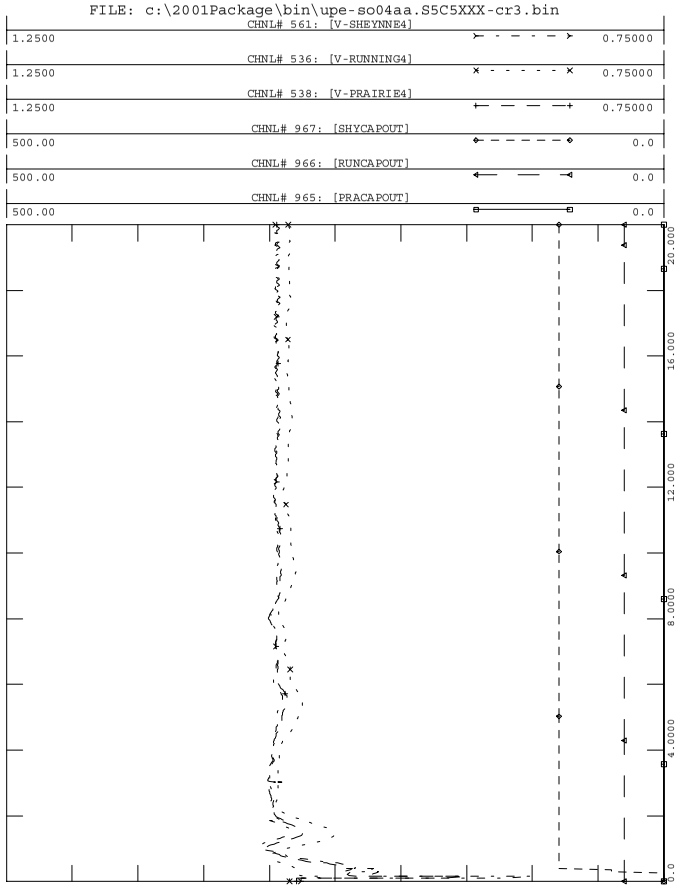
WED, MAY 08 2002 20:14
FAST SW CAP OUT 2

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin



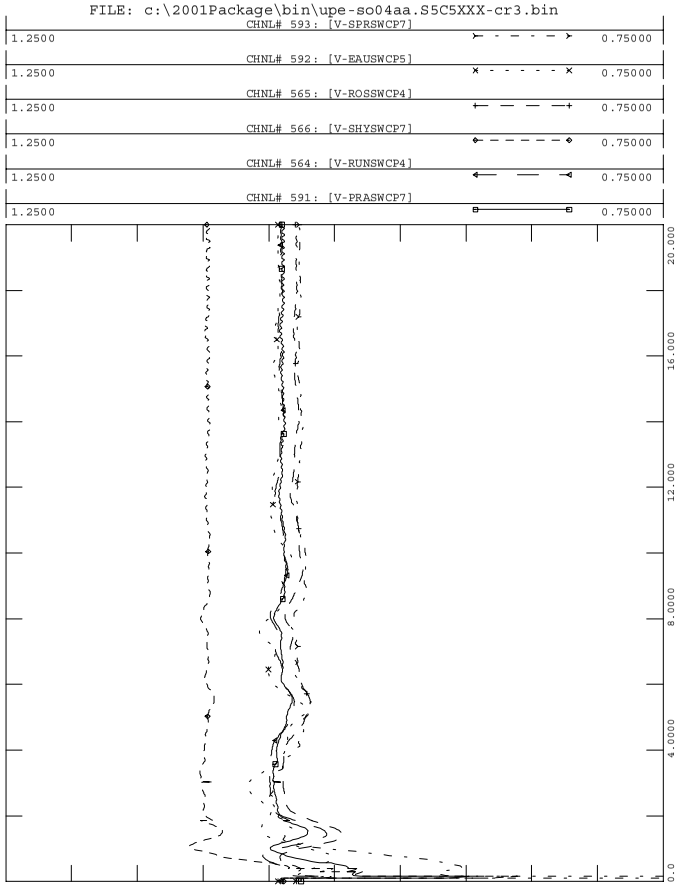
WED, MAY 08 2002 20:14
FARGO/WATERTOWN SVS

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin



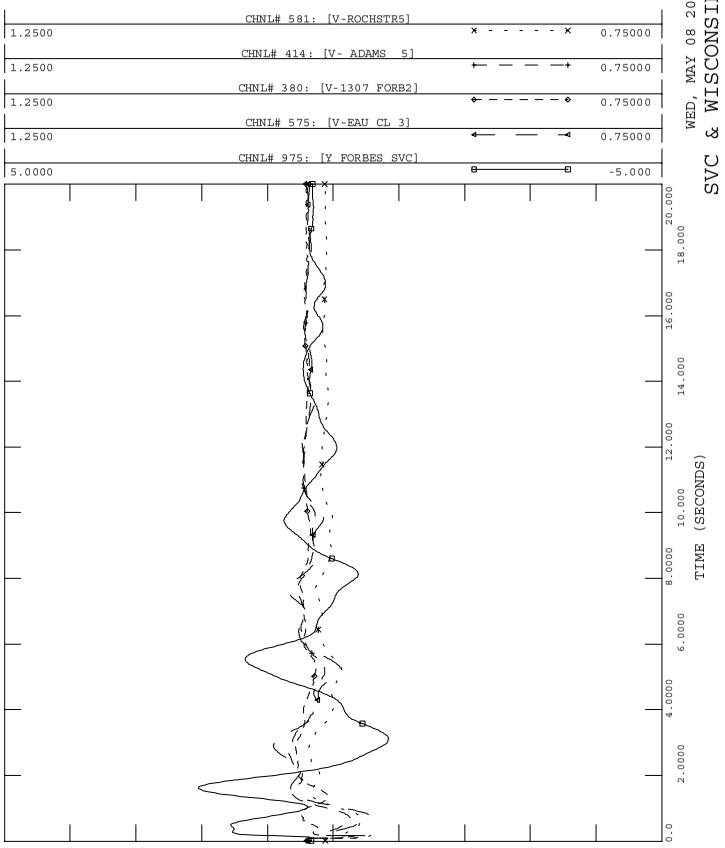
WED, MAY 08 2002 20:14
FAST SW CAP OUT 1

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin



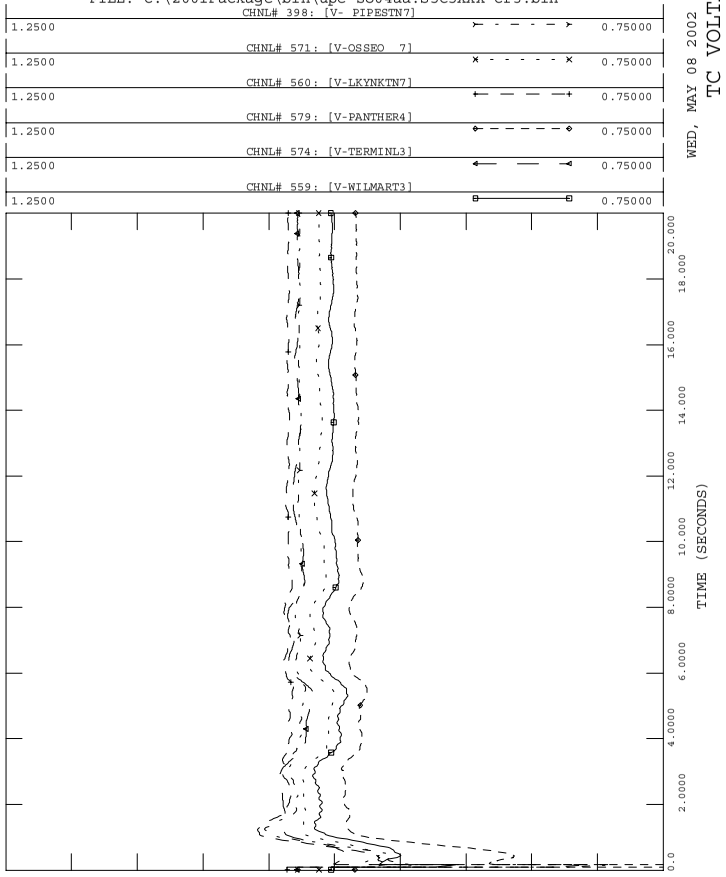
WED, MAY 08 2002 20:14
FAST SW CAP VOLTAGES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin



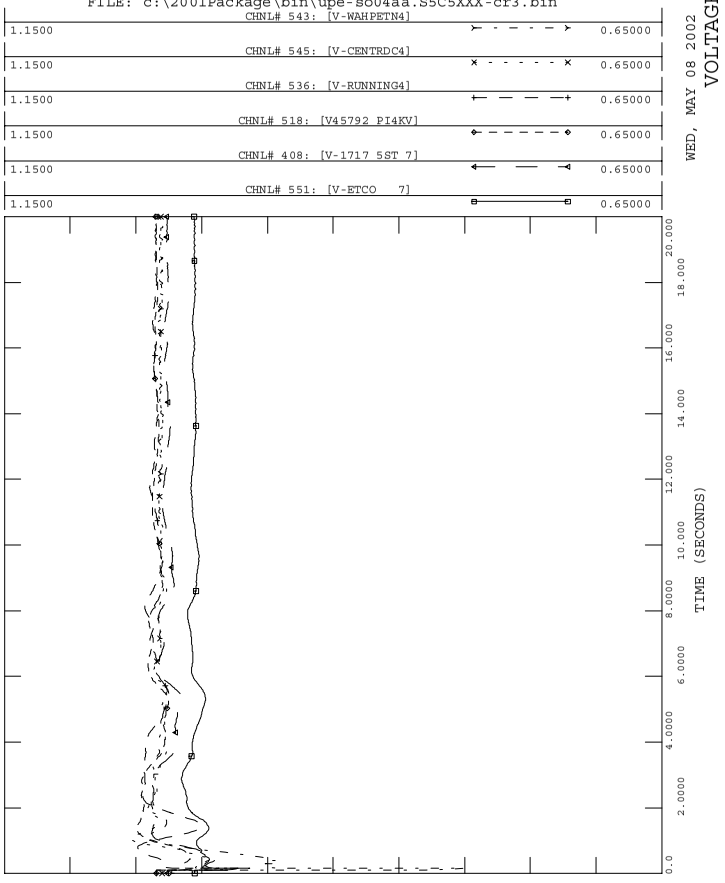
WED, MAY 08 2002 20:14
SVC & WISCONSIN VOLT

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin



WED, MAY 08 2002 20:14
TC VOLTAGES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin



WED, MAY 08 2002 20:14
VOLTAGES 6

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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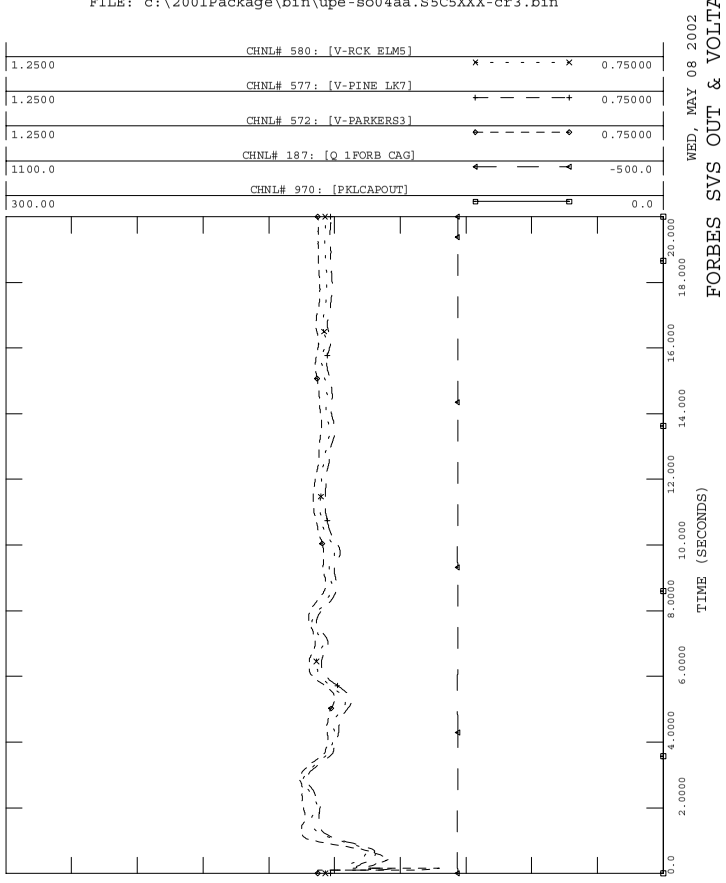
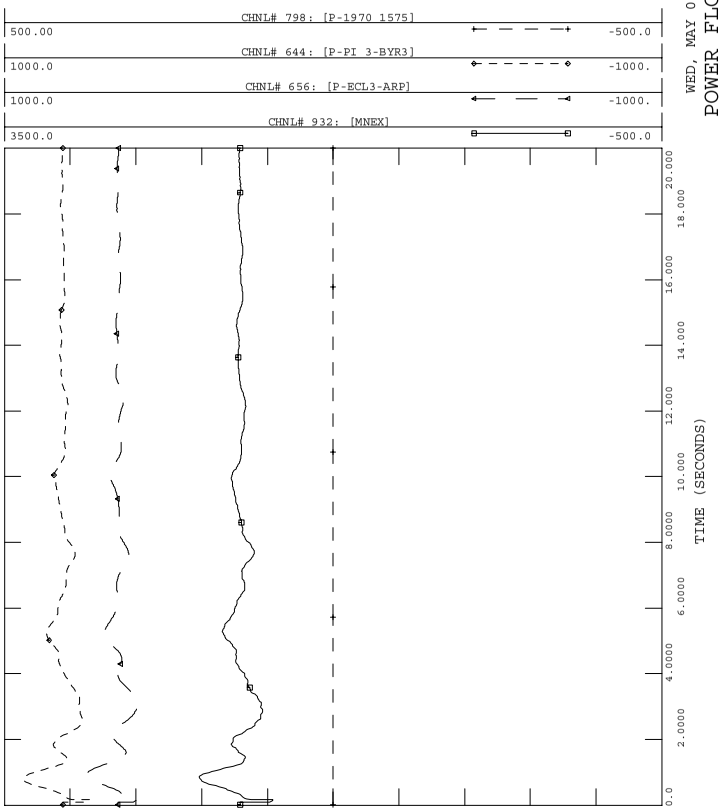
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin



WED, MAY 08 2002 20:14
FORBES SVS OUT & VOLTAGES

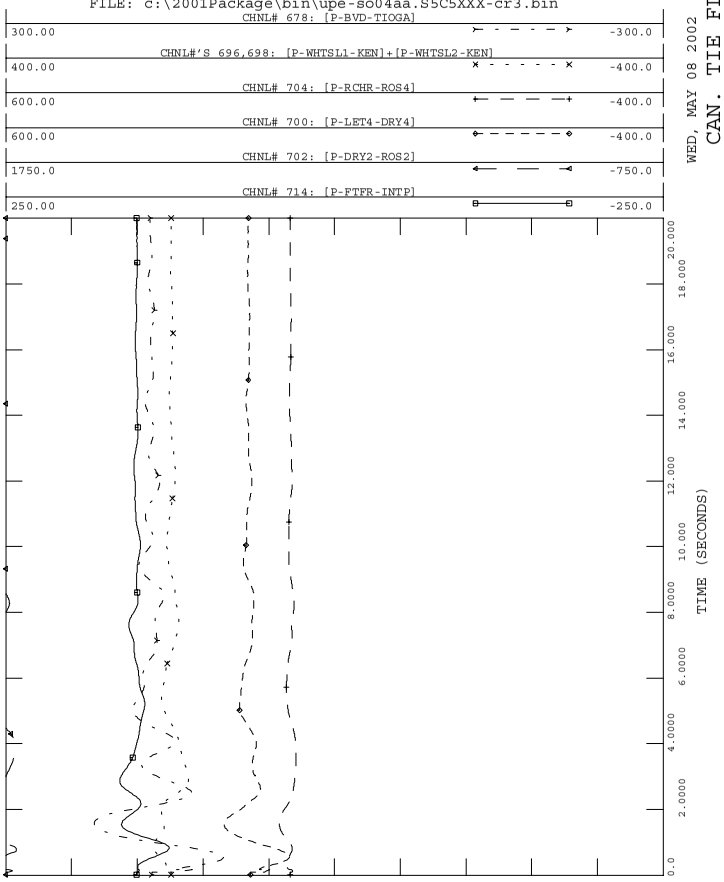
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

WED, MAY 08 2002 20:14
POWER FLOW SUMS 2



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

WED, MAY 08 2002 20:14
CAN. TIE FLOWS



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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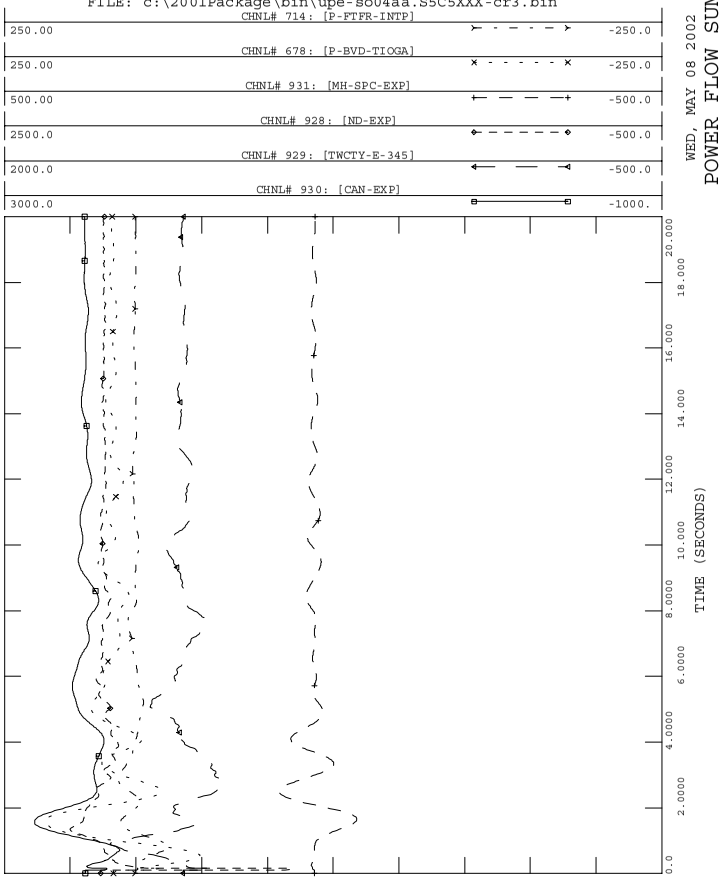
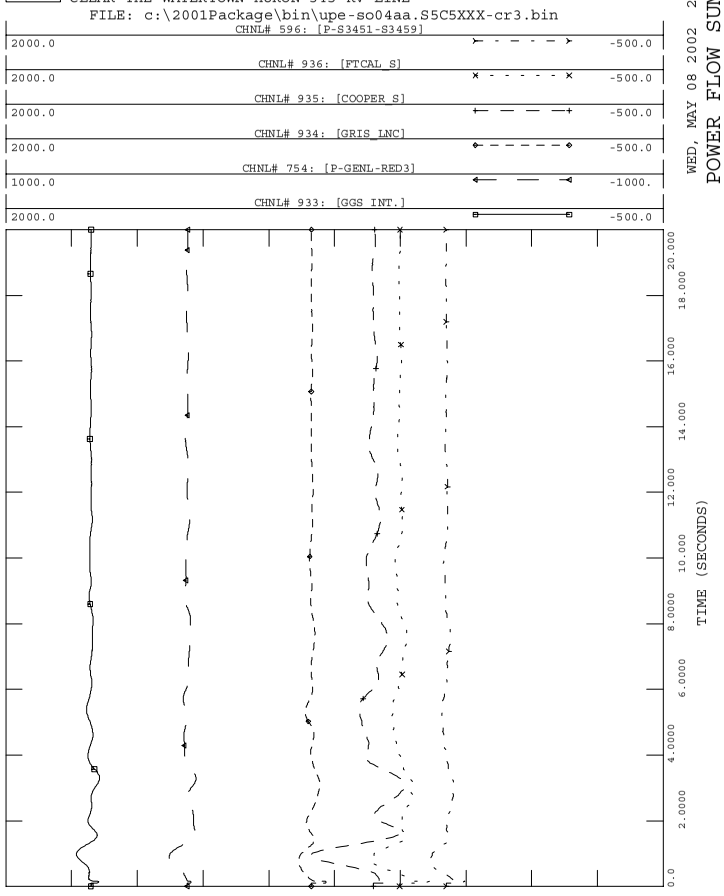
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

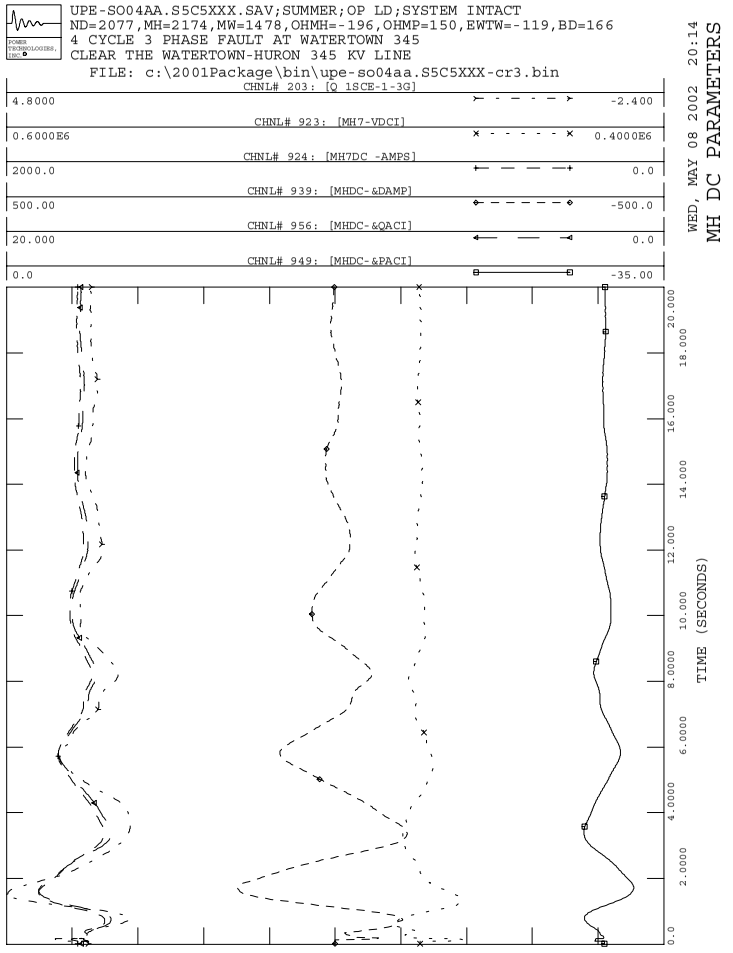
WED, MAY 08 2002 20:14
POWER FLOW SUMS 1

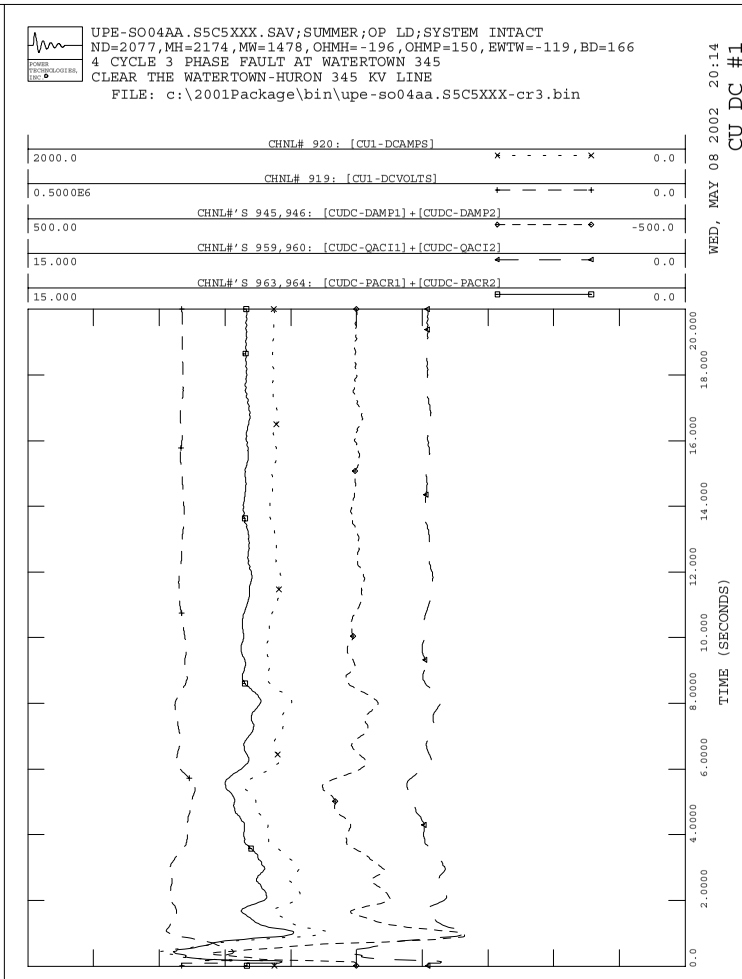


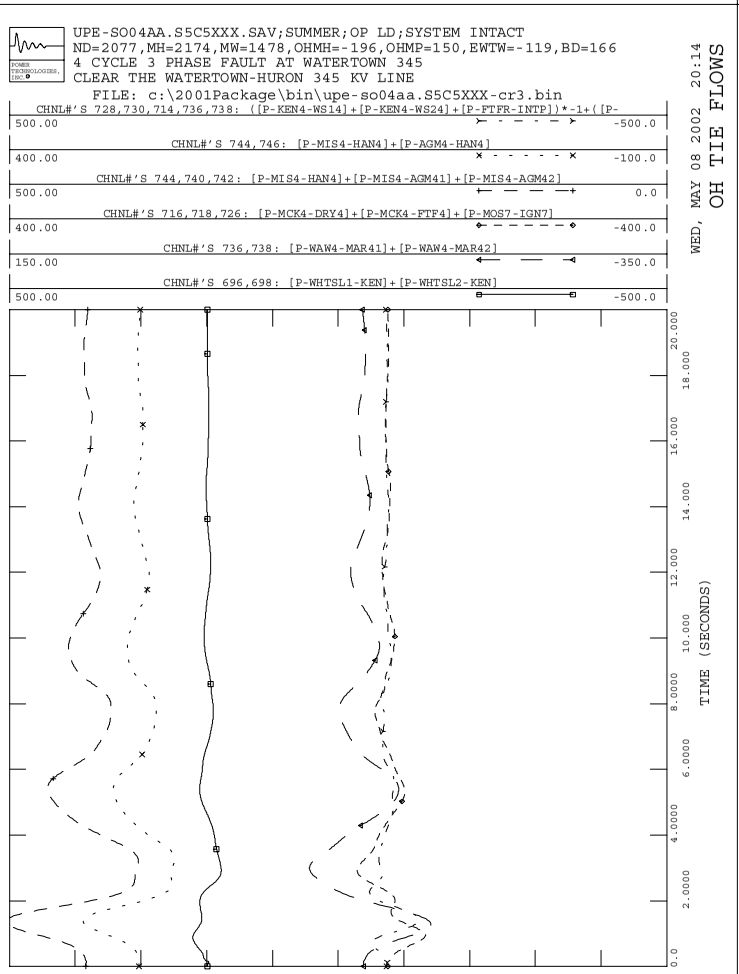
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

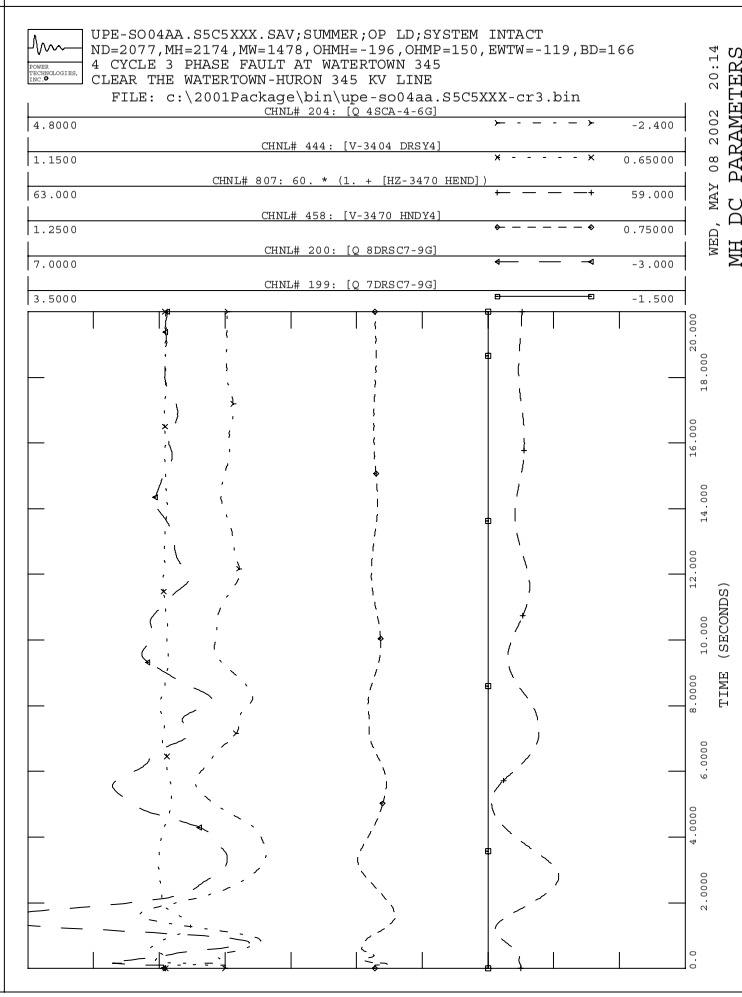
WED, MAY 08 2002 20:14
POWER FLOW SUM 3

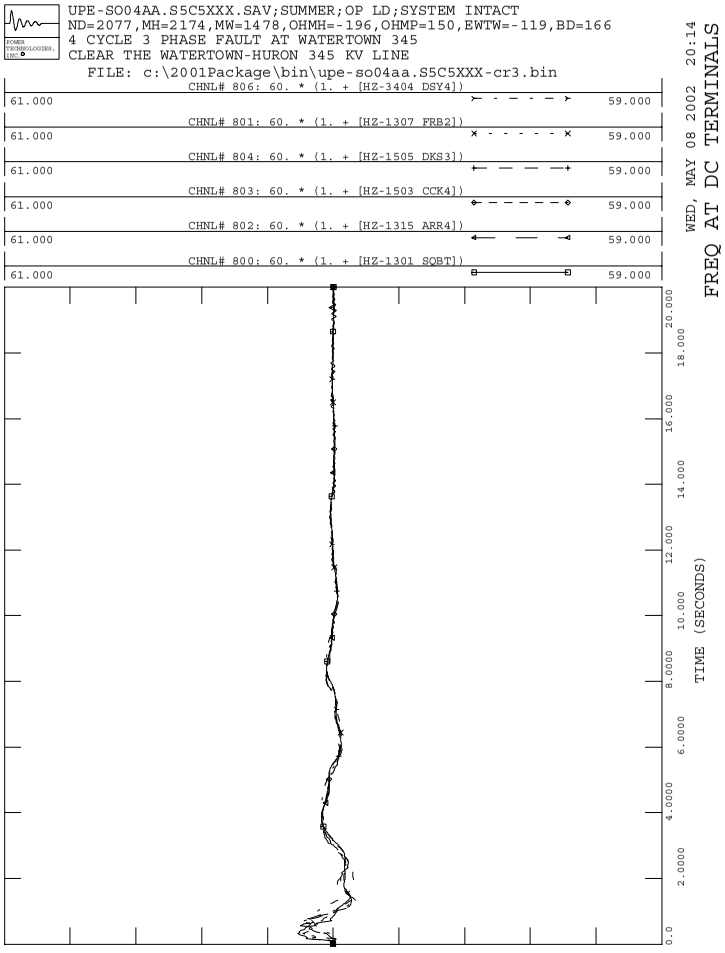


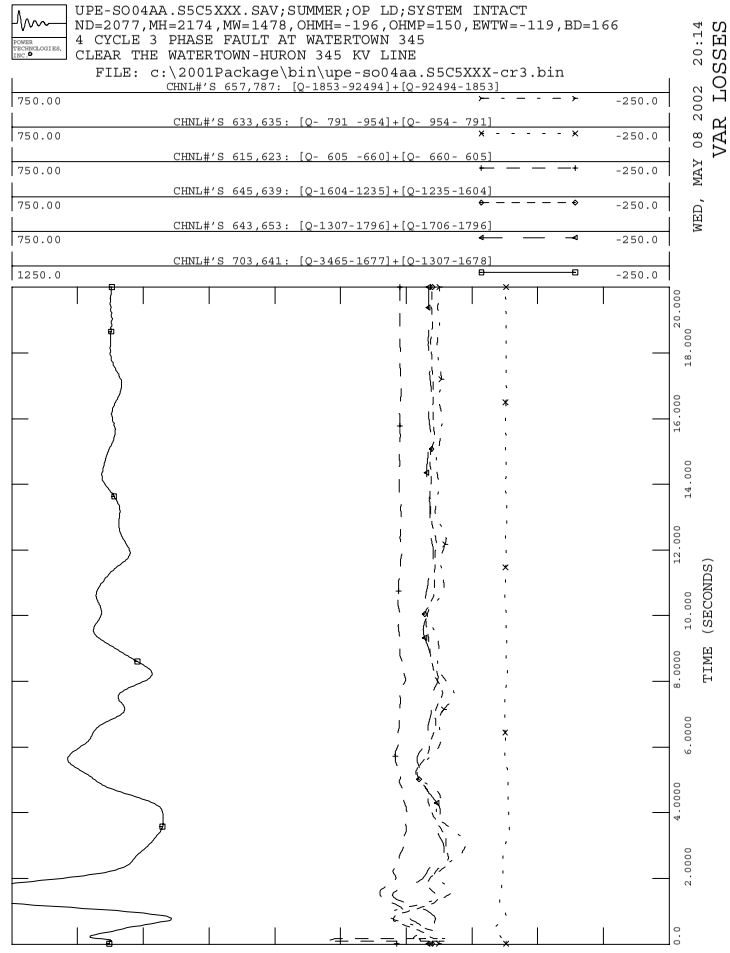

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 203: [Q 1SCE-1-3G]
4.8000
-2.400
CHNL# 923: [MH7-VDCI]
0.6000E6
0.4000E6
CHNL# 924: [MH7DC -AMPS]
2000.0
0.0
CHNL# 939: [MHDC-&DAMP]
500.00
-500.0
CHNL# 956: [MHDC-&QACI]
20.000
0.0
CHNL# 949: [MHDC-&PACI]
0.0
-35.00
TIME (SECONDS)
WED, MAY 08 2002 20:14
MH DC PARAMETERS

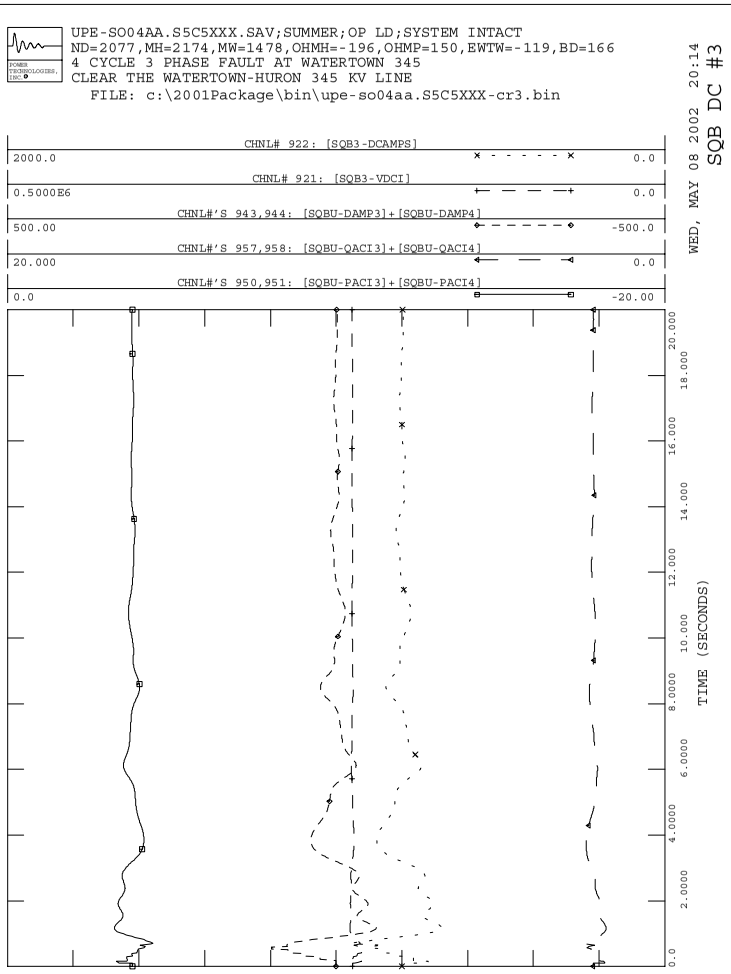

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 920: [CU1-DCAMPS]
2000.0
0.0
CHNL# 919: [CU1-DCVOLTS]
0.5000E6
0.0
CHNL#'S 945,946: [CUDC-DAMP1]+[CUDC-DAMP2]
500.00
-500.0
CHNL#'S 959,960: [CUDC-QACI1]+[CUDC-QACI2]
15.000
0.0
CHNL#'S 963,964: [CUDC-PACR1]+[CUDC-PACR2]
15.000
0.0
TIME (SECONDS)
WED, MAY 08 2002 20:14
CU DC #1

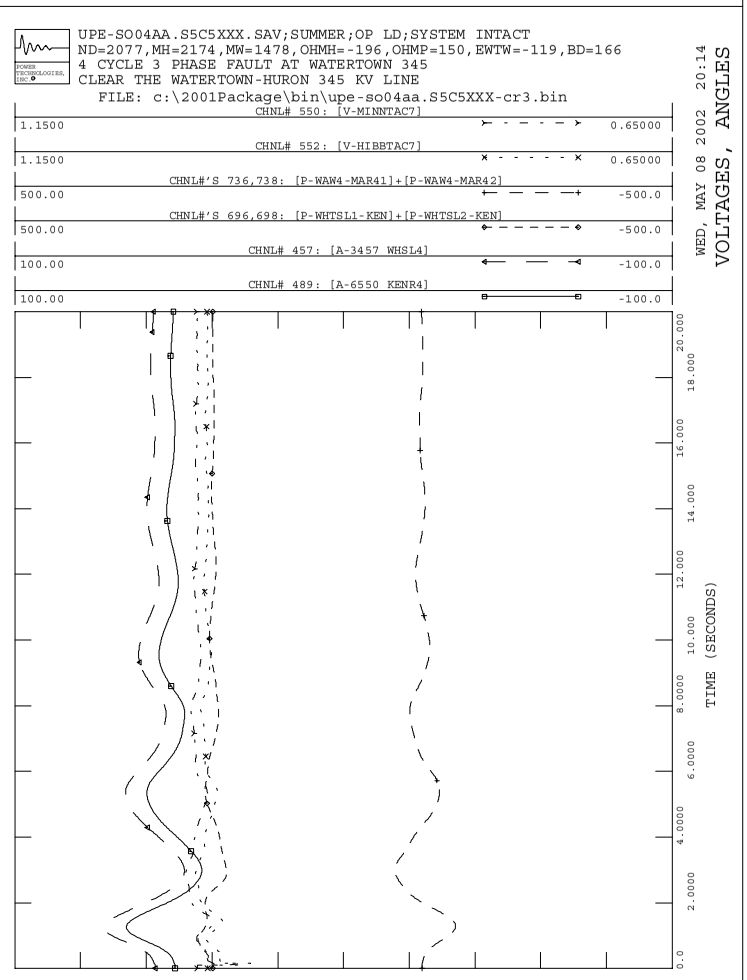

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL#'S 728,730,714,736,738: ([P-KEN4-WS14]+[P-KEN4-WS24]+[P-FTFR-INTP])*-1+([P-
500.00
-500.0
CHNL#'S 744,746: [P-MIS4-HAN4]+[P-AGM4-HAN4]
400.00
-100.0
CHNL#'S 744,740,742: [P-MIS4-HAN4]+[P-MIS4-AGM41]+[P-MIS4-AGM42]
500.00
0.0
CHNL#'S 716,718,726: [P-MCK4-DRY4]+[P-MCK4-FTF4]+[P-MOS7-IGN7]
400.00
-400.0
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
150.00
-350.0
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
500.00
-500.0
TIME (SECONDS)
WED, MAY 08 2002 20:14
OH TIE FLOWS


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 204: [Q 4SCA-4-6G]
4.8000
-2.400
CHNL# 444: [V-3404 DRSY4]
1.1500
0.65000
CHNL# 807: 60. * (1. + [HZ-3470 HEND])
63.000
59.000
CHNL# 458: [V-3470 HNDY4]
1.2500
0.75000
CHNL# 200: [Q 8DRSC7-9G]
7.0000
-3.000
CHNL# 199: [Q 7DRSC7-9G]
3.5000
-1.500
TIME (SECONDS)
WED, MAY 08 2002 20:14
MH DC PARAMETERS


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 806: 60. * (1. + [HZ-3404 DSY4])
CHNL# 801: 60. * (1. + [HZ-1307 FRB2])
CHNL# 804: 60. * (1. + [HZ-1505 DKS3])
CHNL# 803: 60. * (1. + [HZ-1503 CCK4])
CHNL# 802: 60. * (1. + [HZ-1315 ARR4])
CHNL# 800: 60. * (1. + [HZ-1301 SQBT])
61.000
59.000
WED, MAY 08 2002 20:14
FREQ AT DC TERMINALS
TIME (SECONDS)


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL#'S 657,787: [Q-1853-92494]+[Q-92494-1853]
CHNL#'S 633,635: [Q- 791 -954]+[Q- 954- 791]
CHNL#'S 615,623: [Q- 605 -660]+[Q- 660- 605]
CHNL#'S 645,639: [Q-1604-1235]+[Q-1235-1604]
CHNL#'S 643,653: [Q-1307-1796]+[Q-1706-1796]
CHNL#'S 703,641: [Q-3465-1677]+[Q-1307-1678]
750.00
-250.0
1250.0
WED, MAY 08 2002 20:14
VAR LOSSES
TIME (SECONDS)

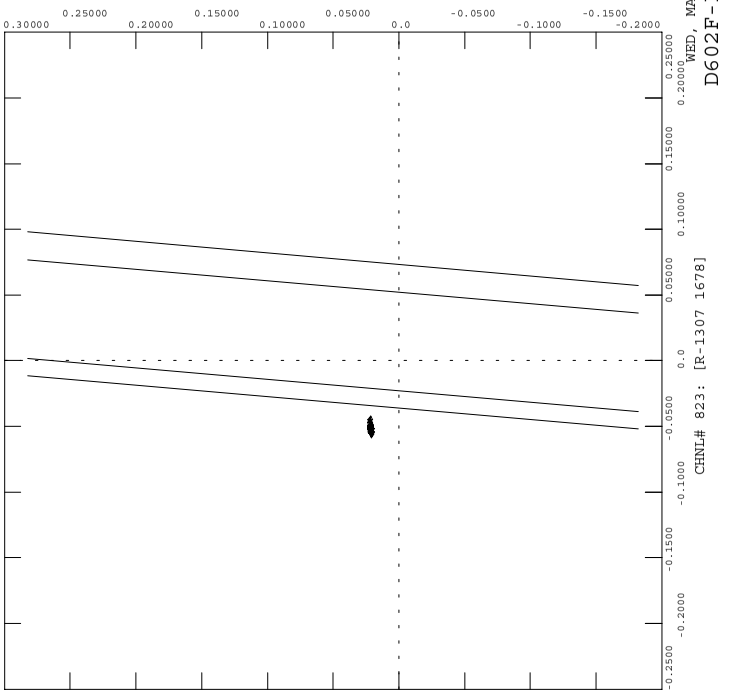

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 922: [SQB3-DCAMPS]
CHNL# 921: [SQB3-VDCI]
CHNL#'S 943,944: [SQBU-DAMP3]+[SQBU-DAMP4]
CHNL#'S 957,958: [SQBU-QACI3]+[SQBU-QACI4]
CHNL#'S 950,951: [SQBU-PACI3]+[SQBU-PACI4]
2000.0
0.0
0.5000E6
500.00
-500.0
20.000
-20.00
WED, MAY 08 2002 20:14
SQB DC #3
TIME (SECONDS)


UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin
CHNL# 550: [V-MINNTAC7]
CHNL# 552: [V-HIBBTAC7]
CHNL#'S 736,738: [P-WAW4-MAR41]+[P-WAW4-MAR42]
CHNL#'S 696,698: [P-WHTSL1-KEN]+[P-WHTSL2-KEN]
CHNL# 457: [A-3457 WHSL4]
CHNL# 489: [A-6550 KENR4]
1.1500
0.65000
500.00
-500.0
100.00
-100.0
WED, MAY 08 2002 20:14
VOLTAGES, ANGLES
TIME (SECONDS)

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

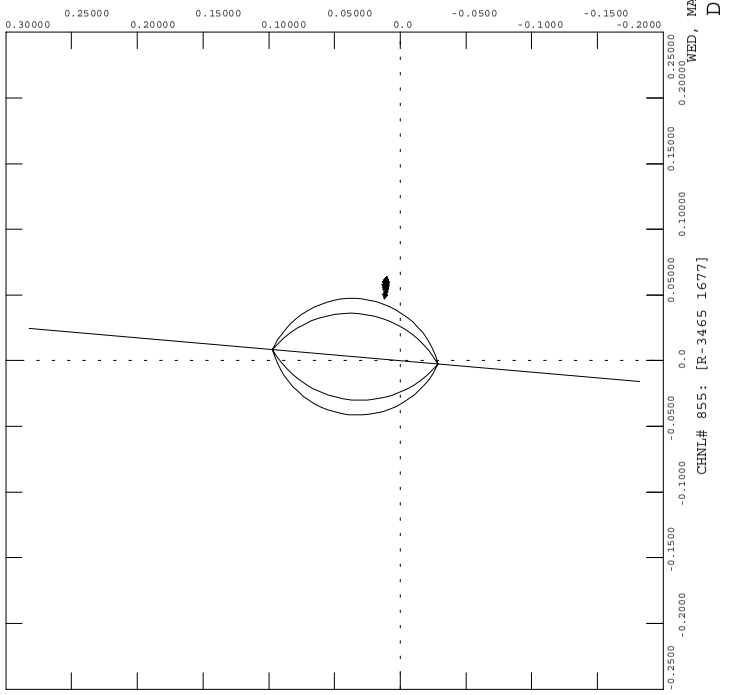
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

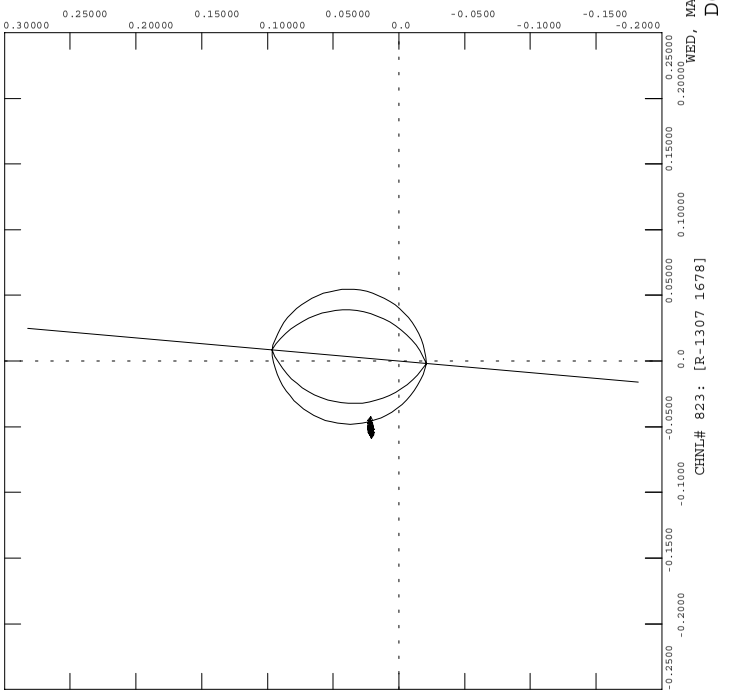
RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

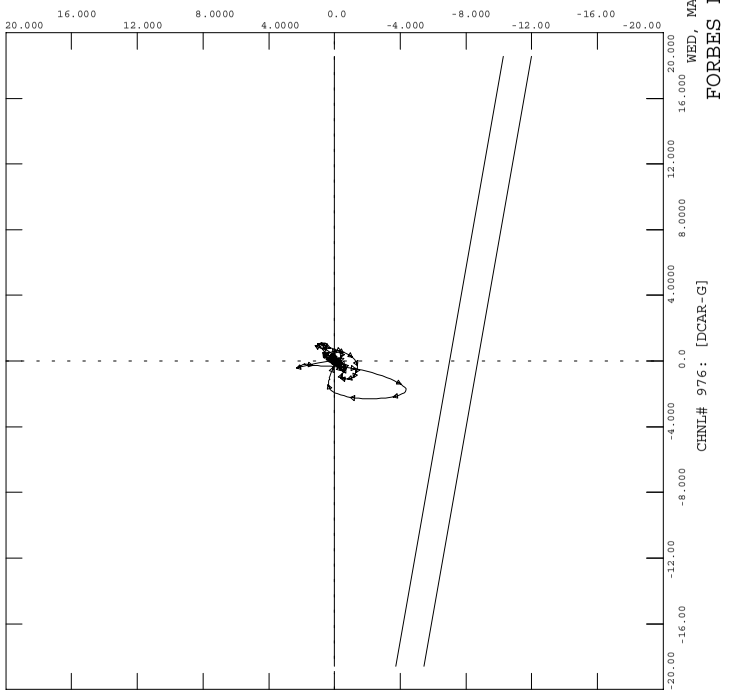
RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

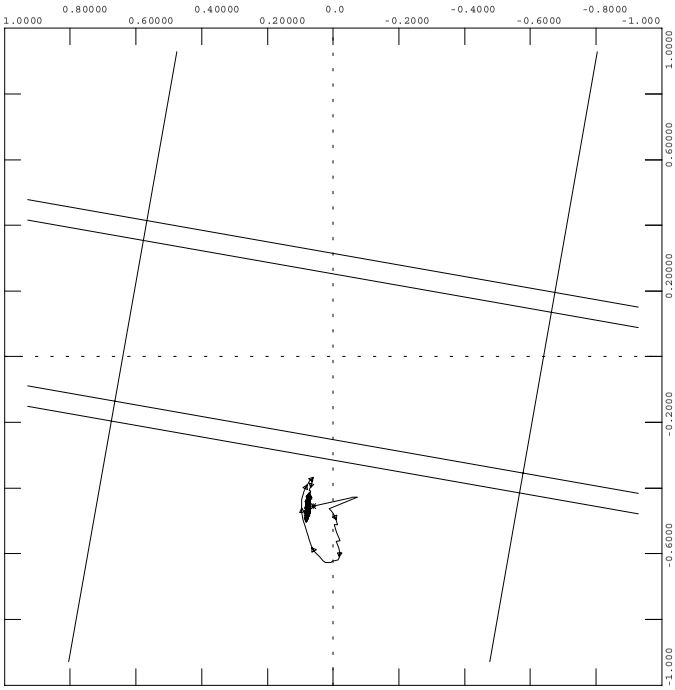
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

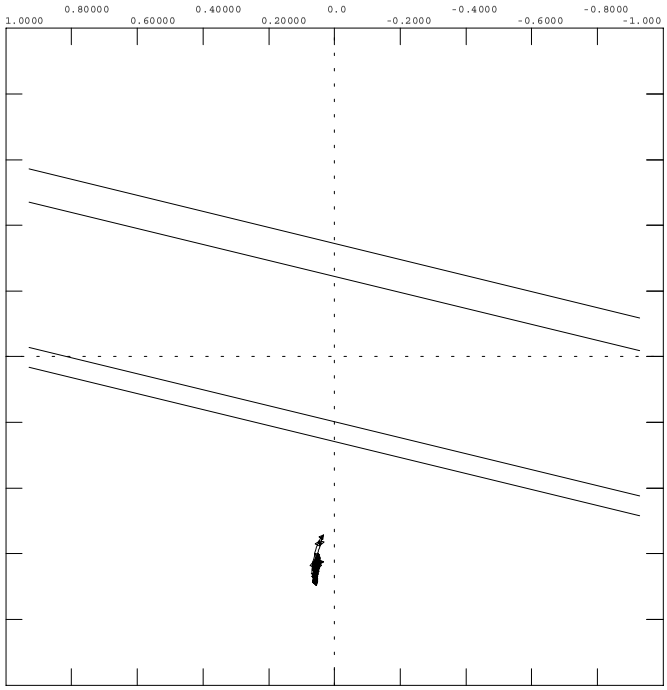
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

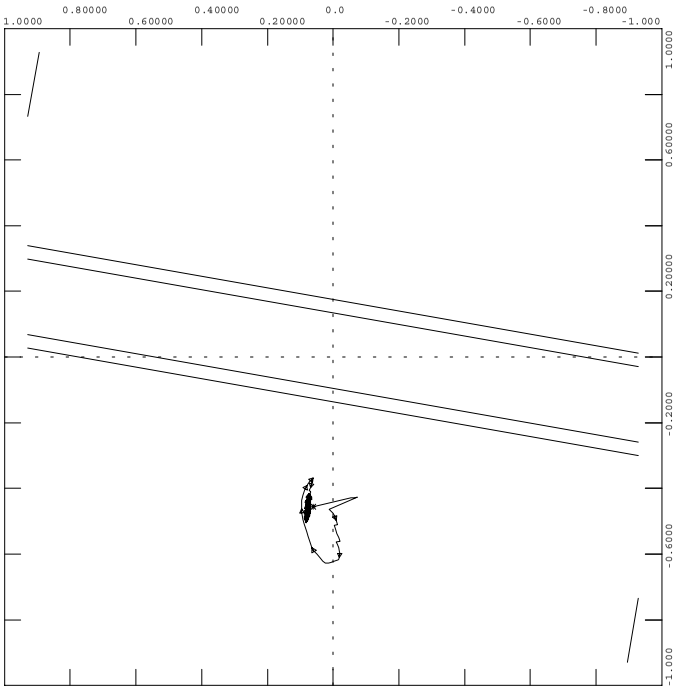
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

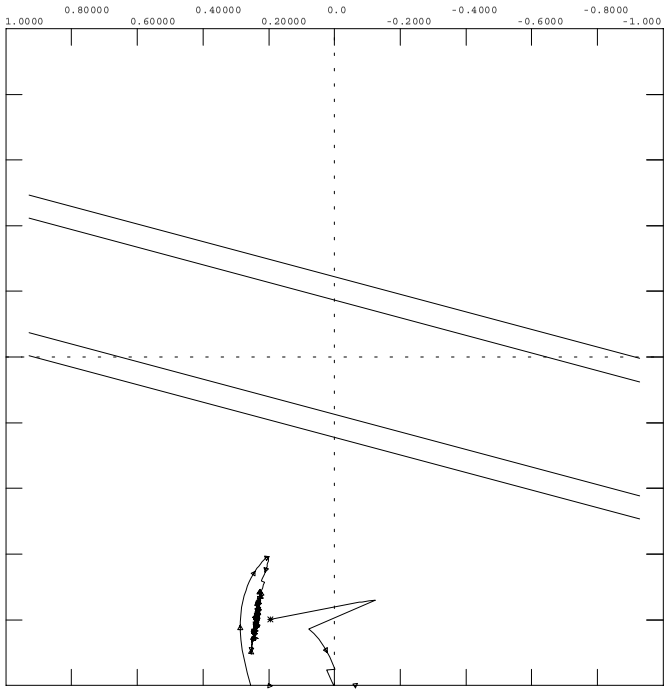
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

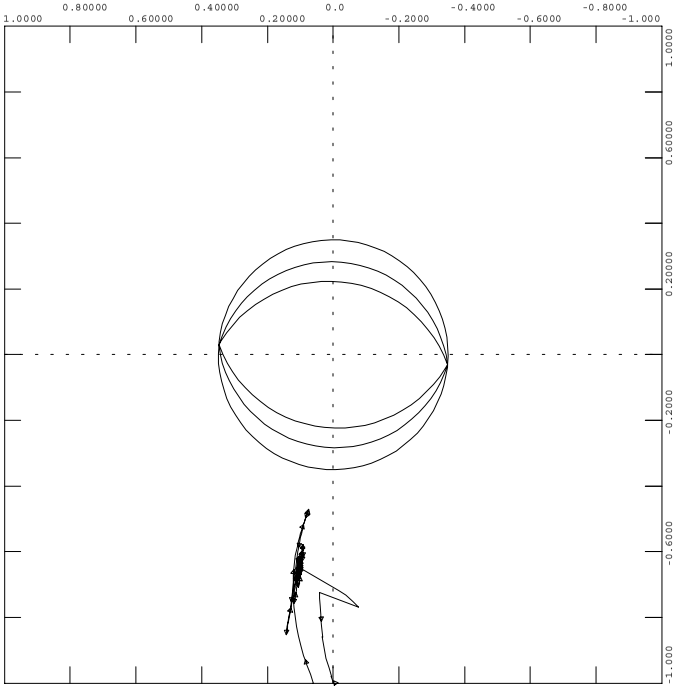
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

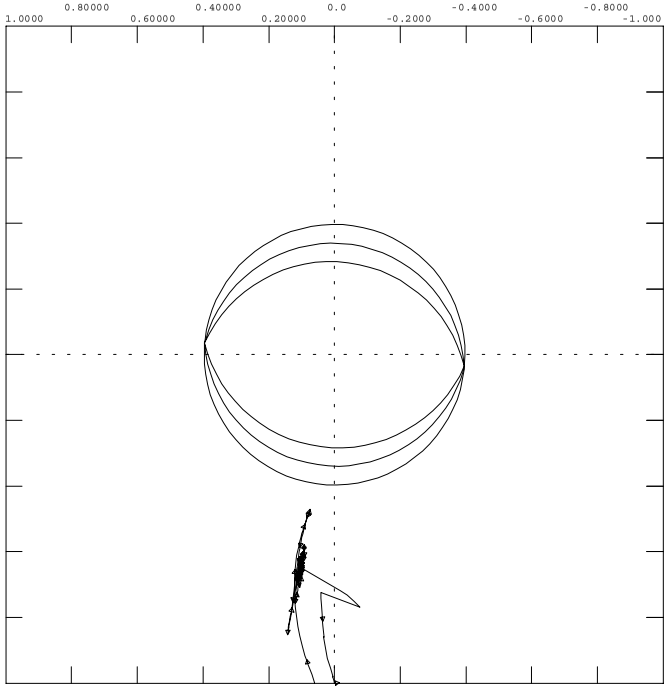
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

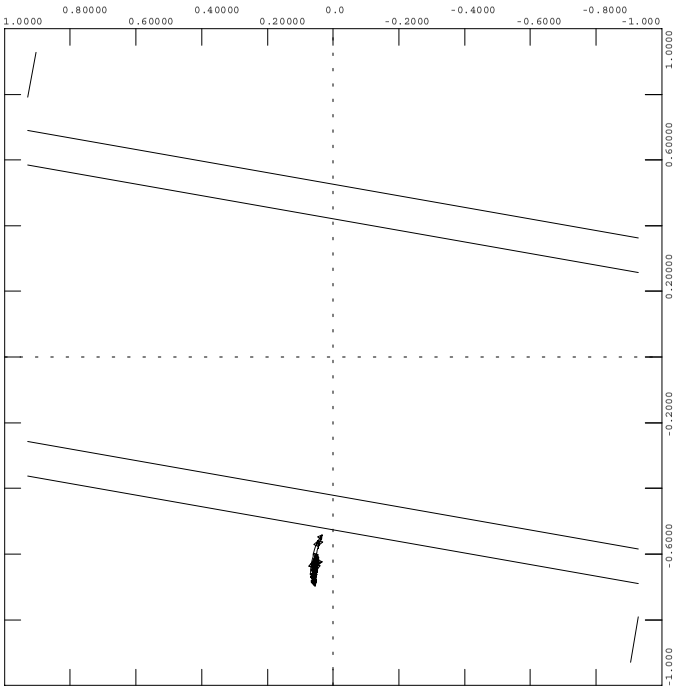
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

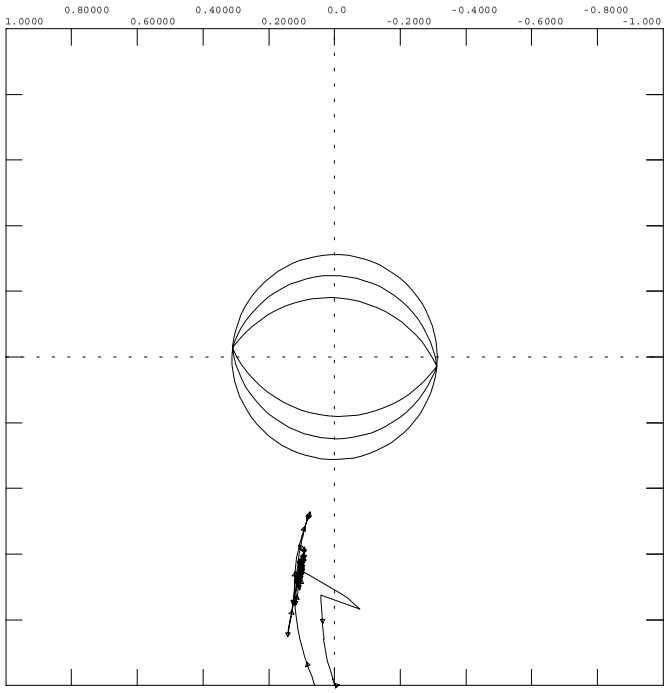
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



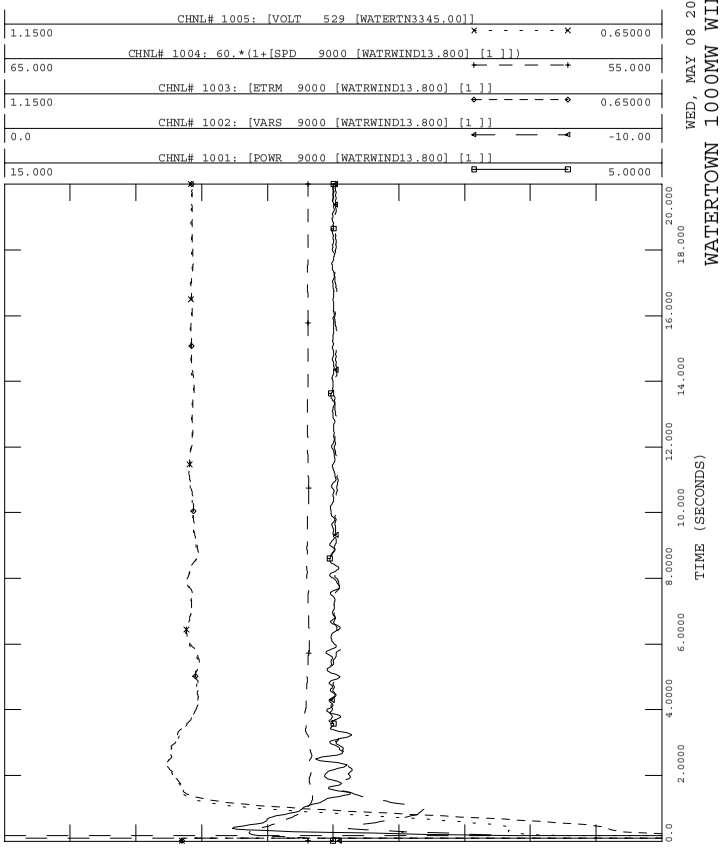
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

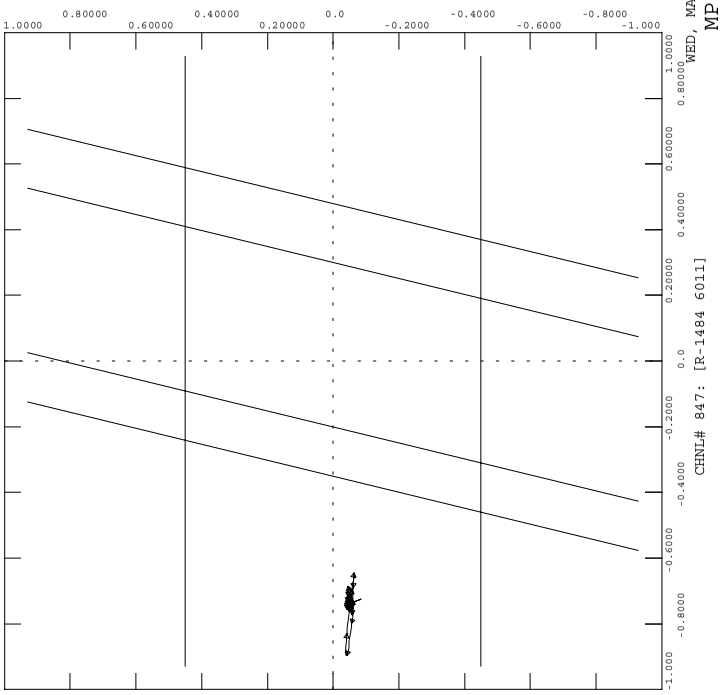


WATERTOWN 1000MW WIND UNI
WED, MAY 08 2002 20:14

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT WATERTOWN 345
CLEAR THE WATERTOWN-HURON 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cr3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



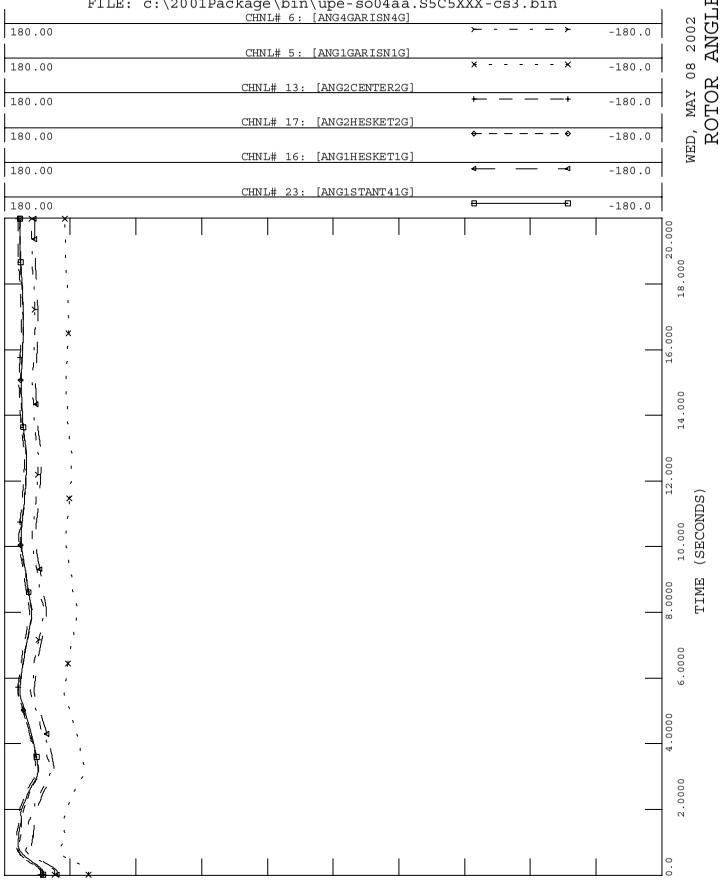
MP-OH I.FALLS (779)
WED, MAY 08 2002 20:14

CONTINGENCY CS3

4 cycle 3 phase fault at Split Rock 345 kV. Clear the Split Rock – Sioux City 345 kv line

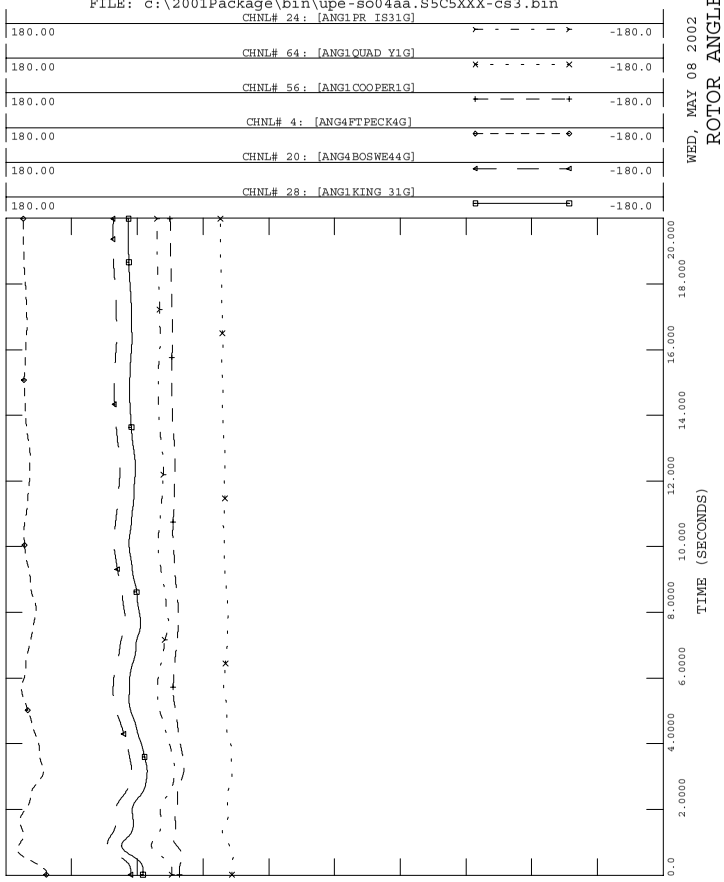
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
ROTOR ANGLES 2



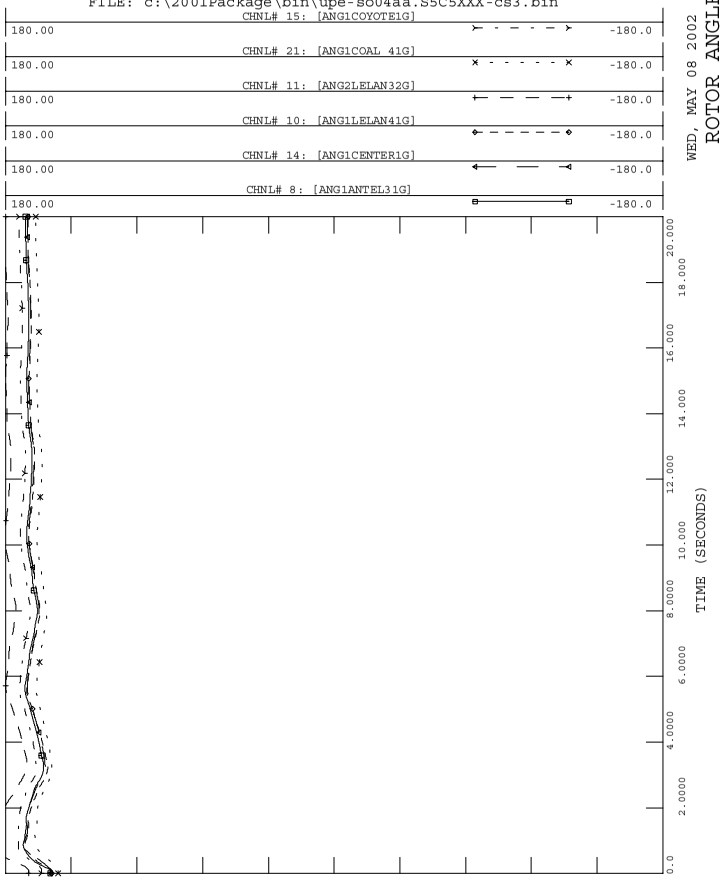
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
ROTOR ANGLES 4



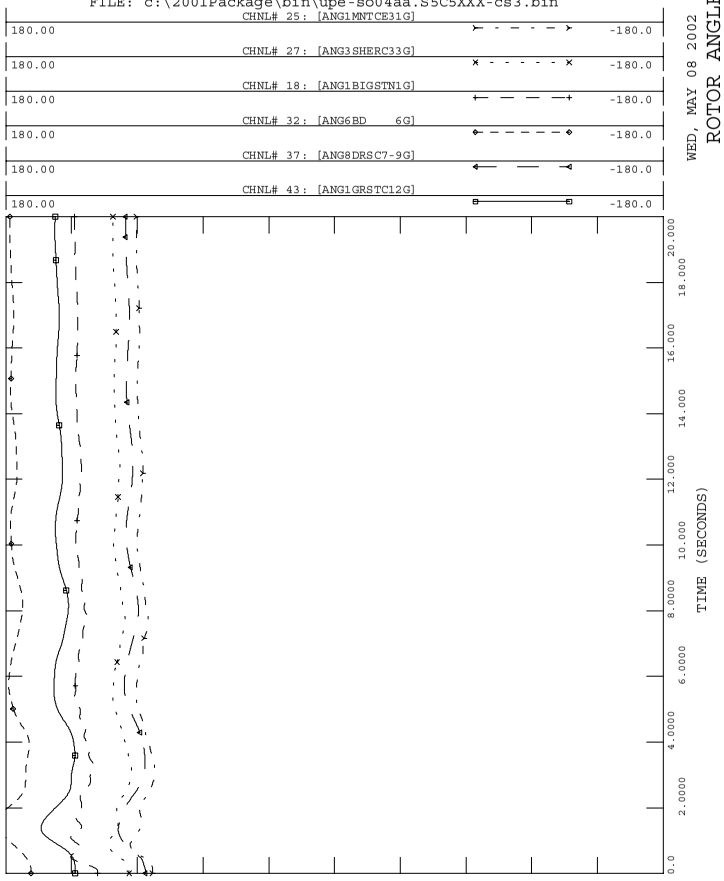
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
ROTOR ANGLES 1



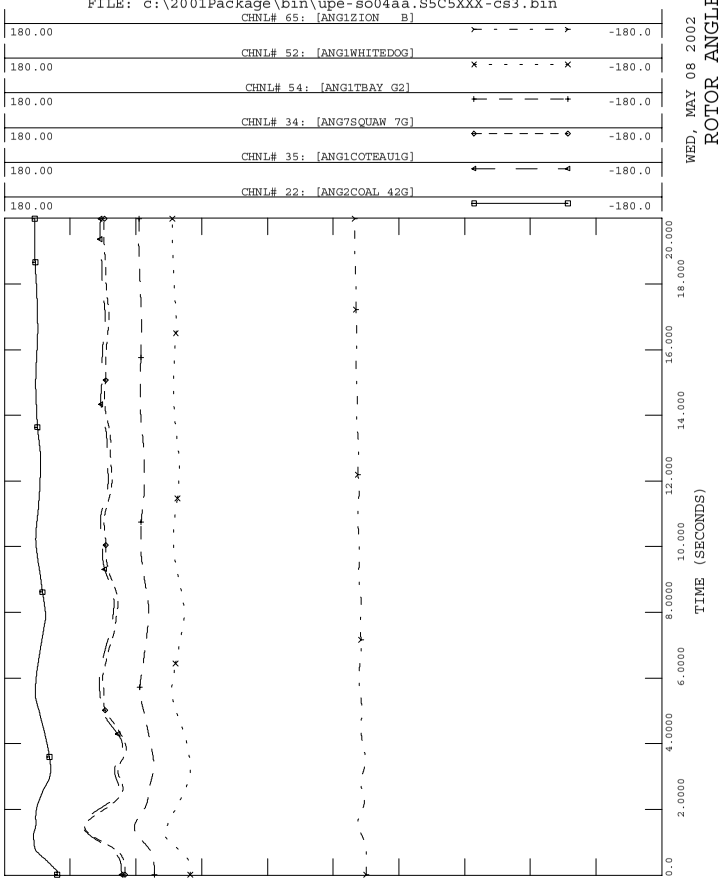
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
ROTOR ANGLES 3



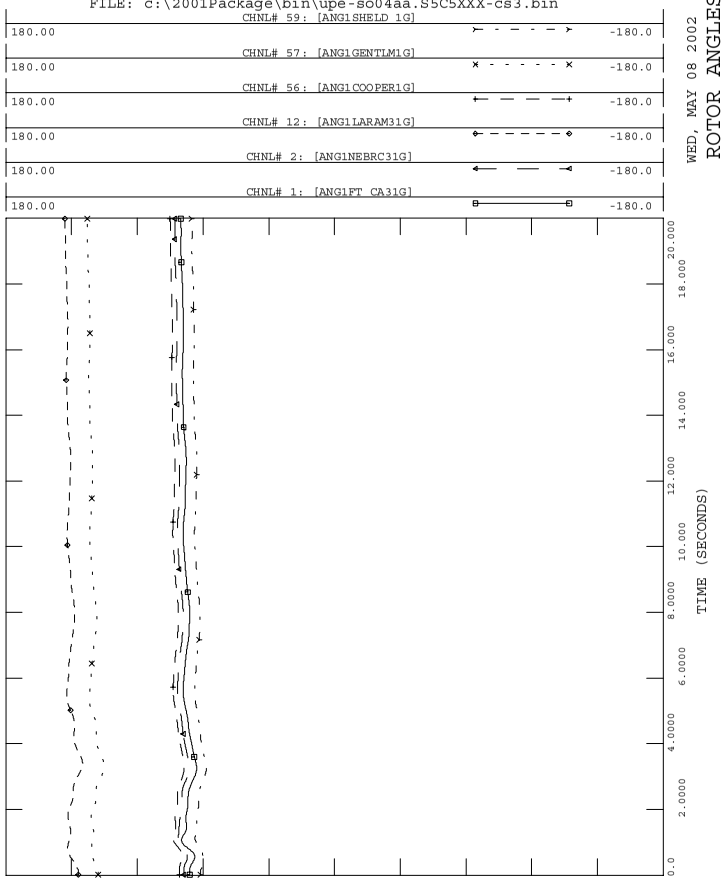
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
ROTOR ANGLES 6



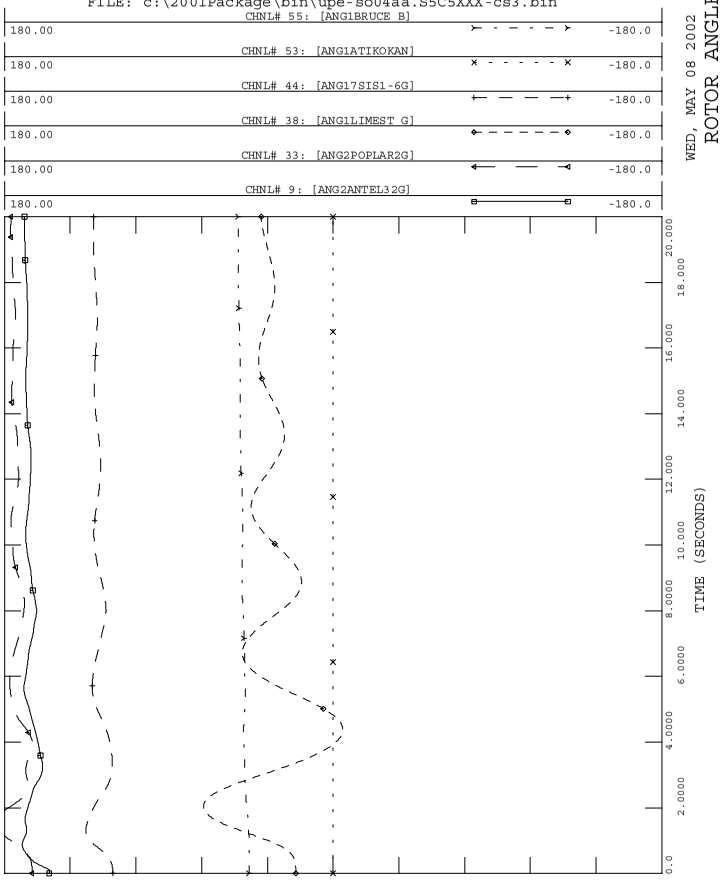
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
ROTOR ANGLES NB



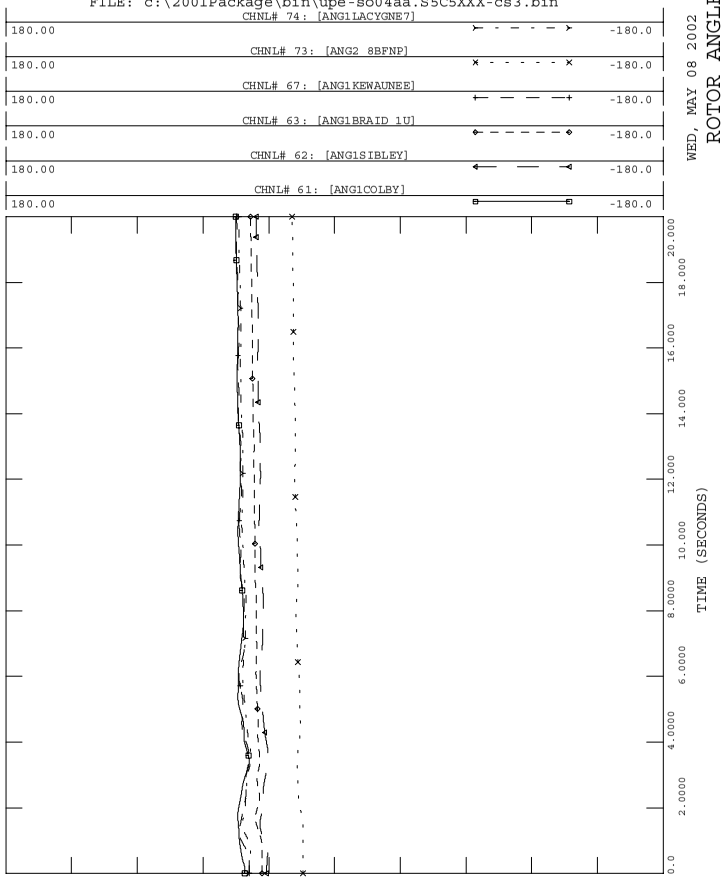
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
ROTOR ANGLES 5



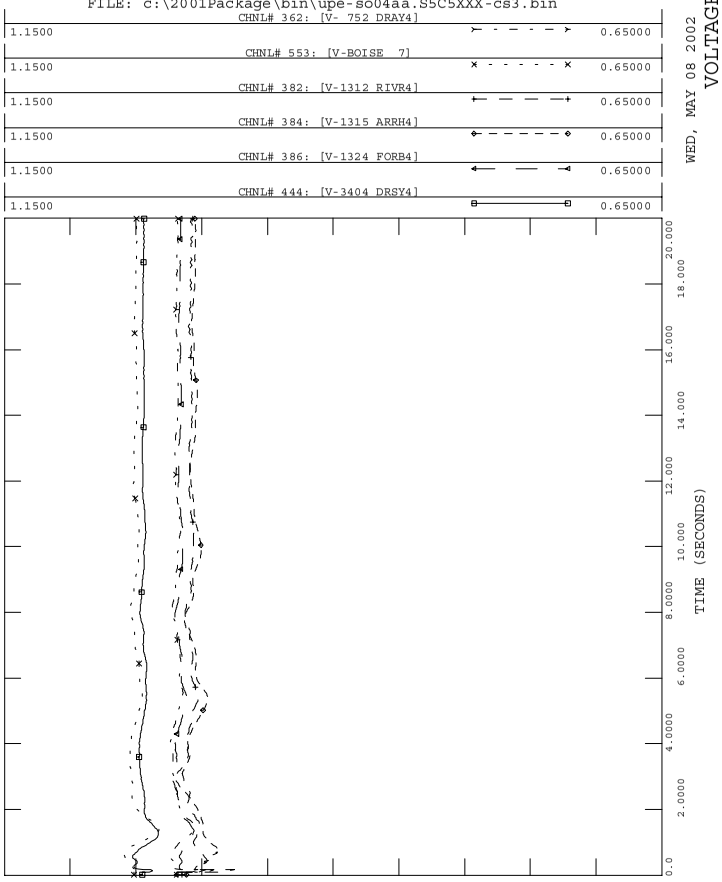
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
ROTOR ANGLES 7



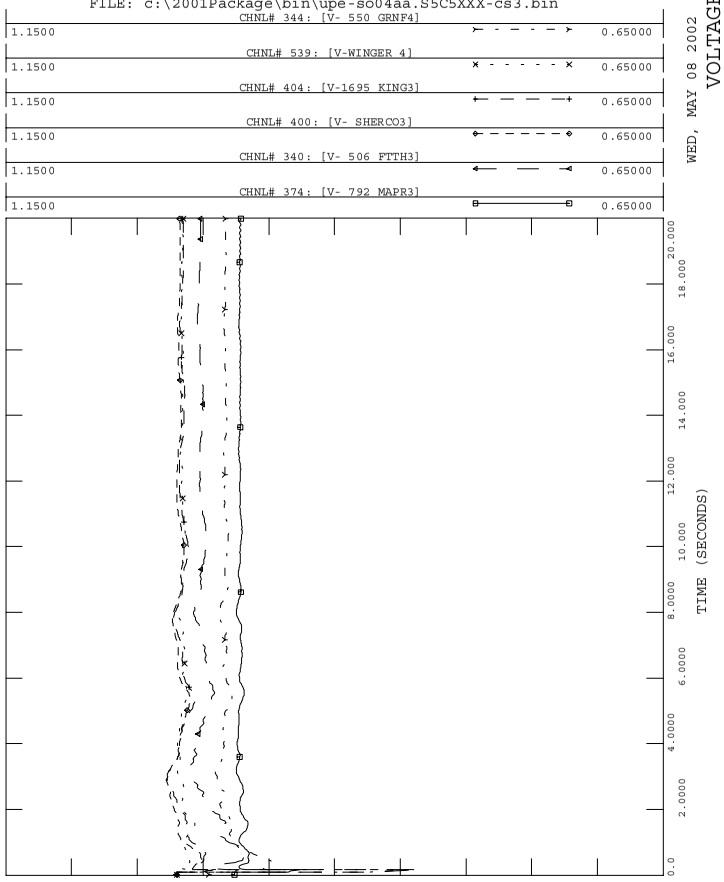
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
VOLTAGES 1



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
VOLTAGES 3



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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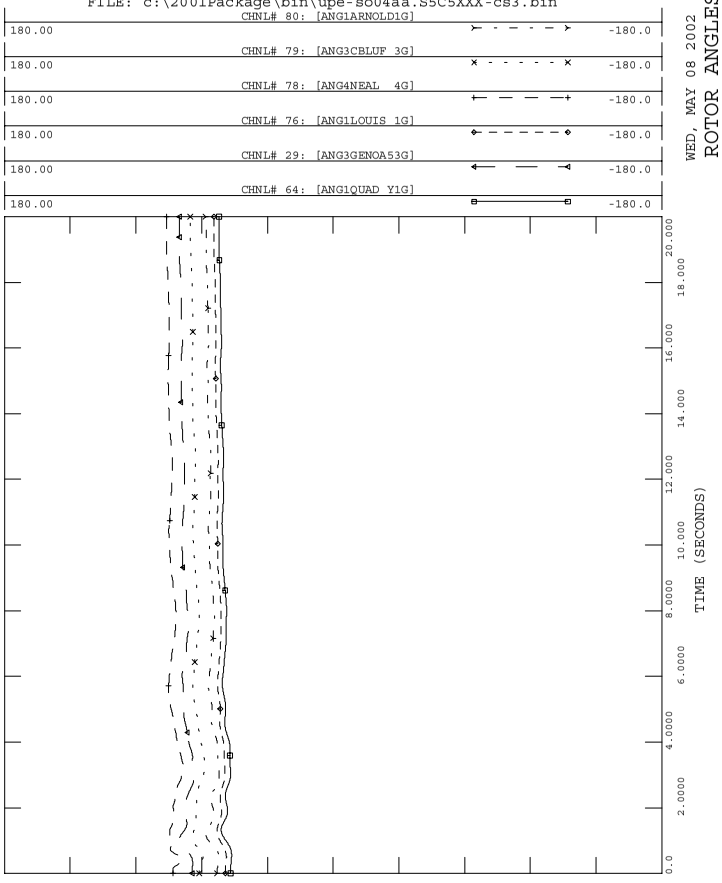
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
ROTOR ANGLES IA



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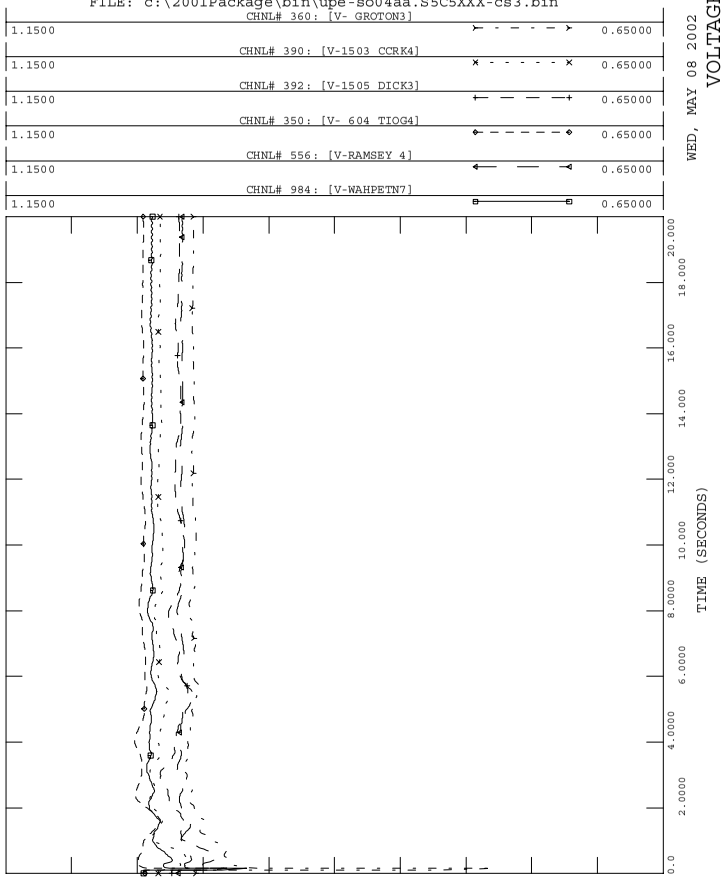
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
VOLTAGES 2



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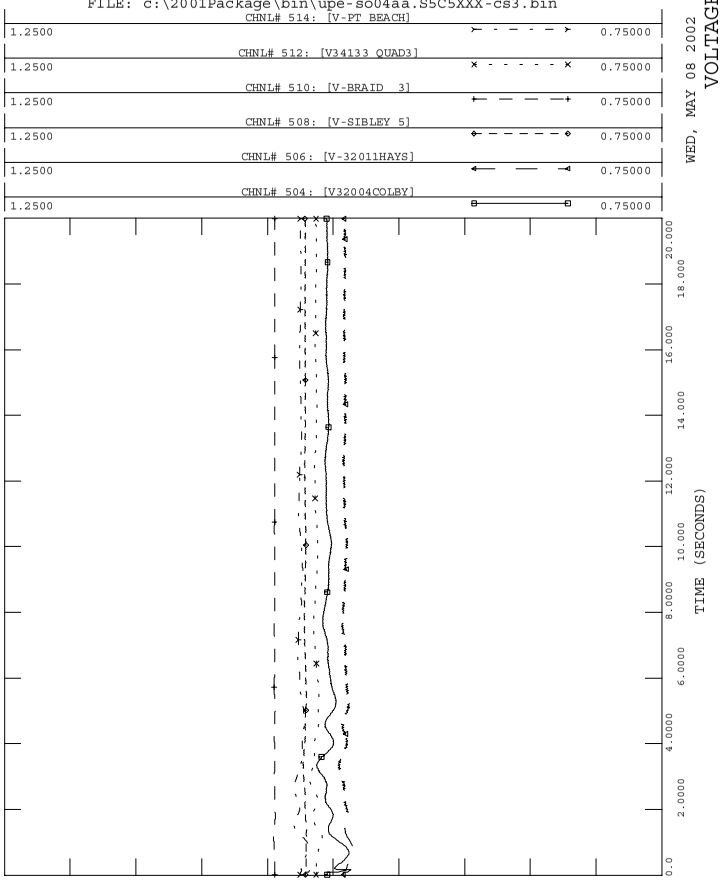
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



WED, MAY 08 2002 20:27
VOLTAGES 5

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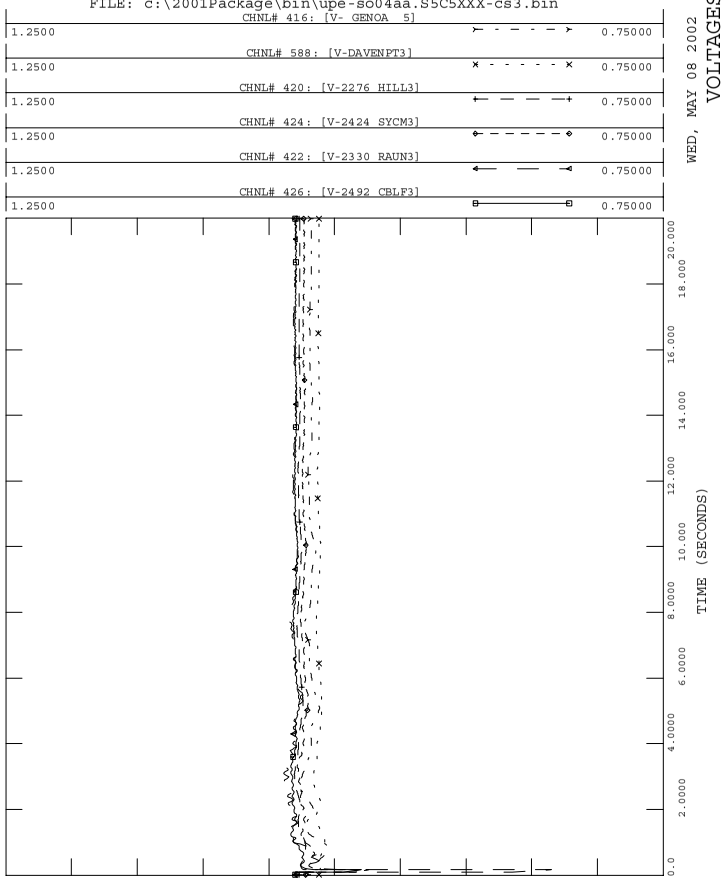
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



WED, MAY 08 2002 20:27
VOLTAGES IA

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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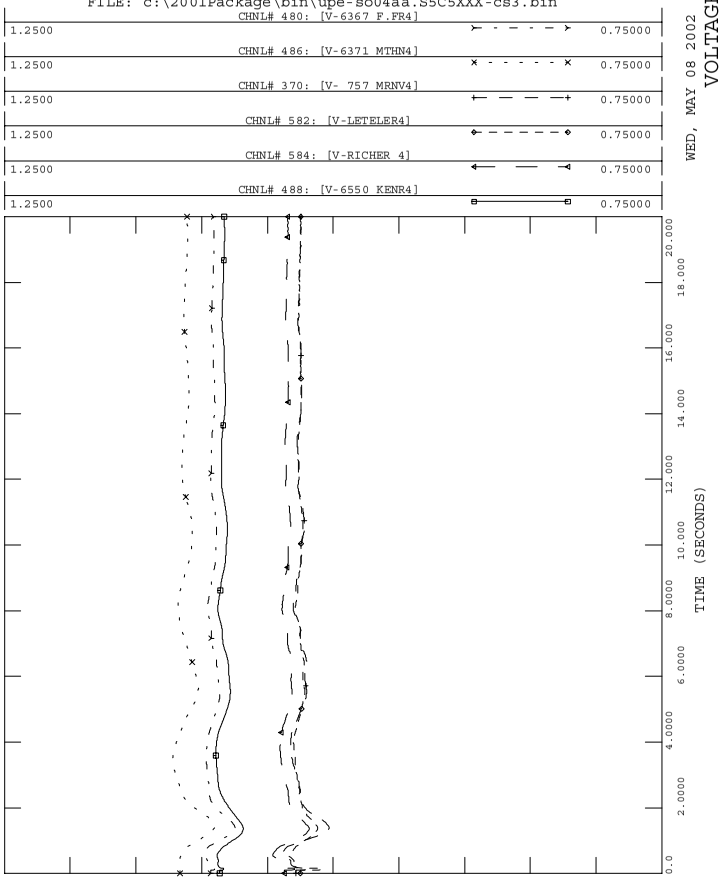
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



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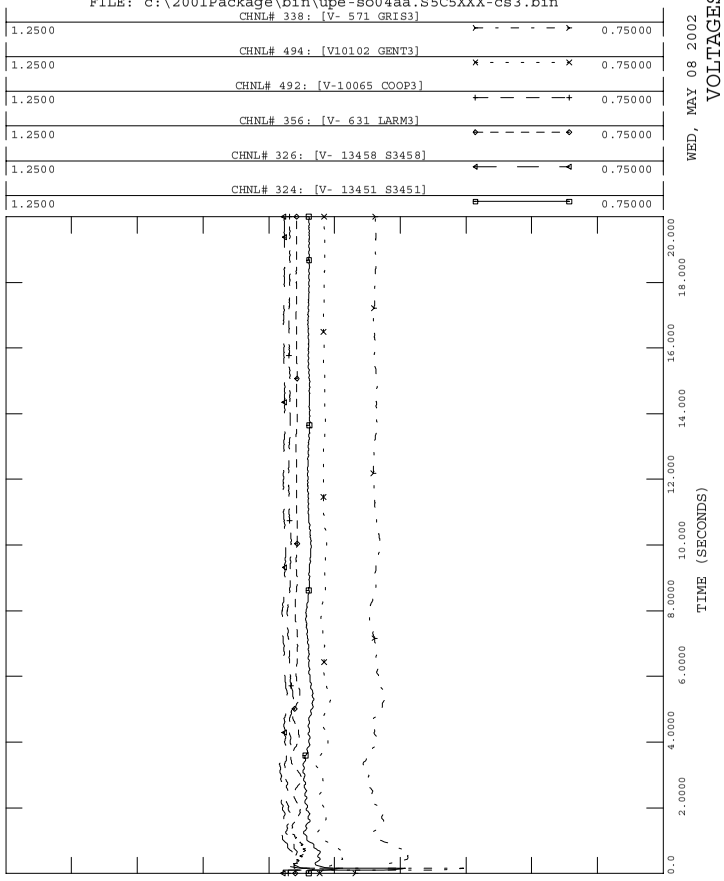
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



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VOLTAGES NB

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
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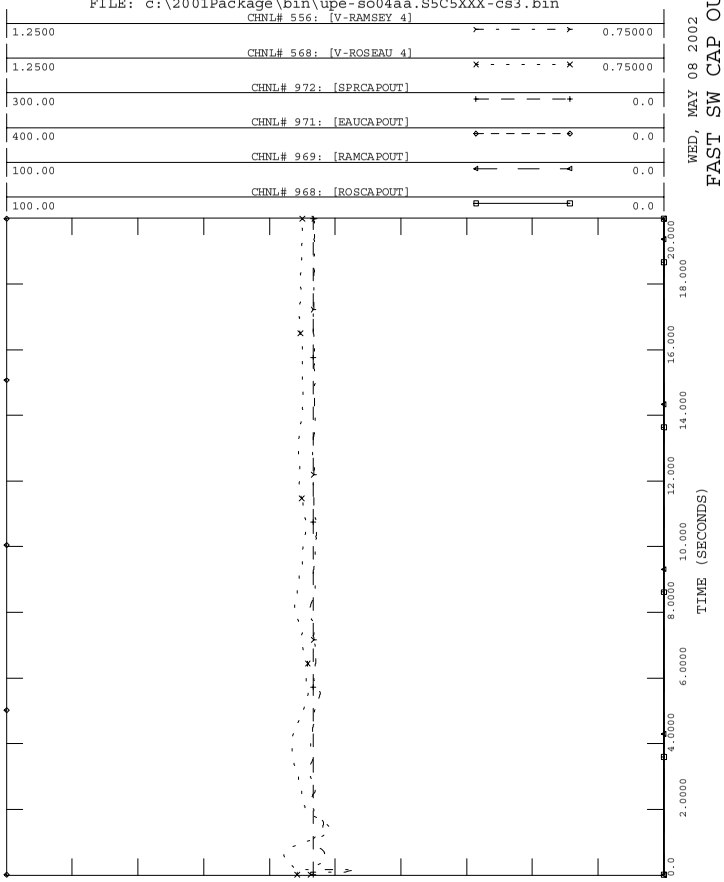

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FAST SW CAP OUT 2

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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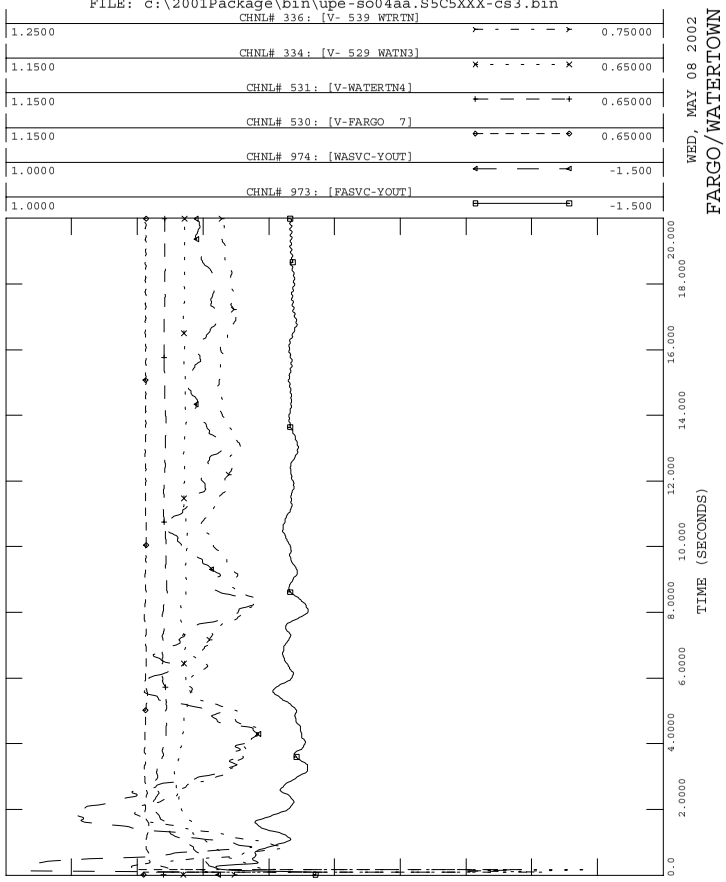
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



WED, MAY 08 2002 20:27
FARGO/WATERTOWN SVS

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
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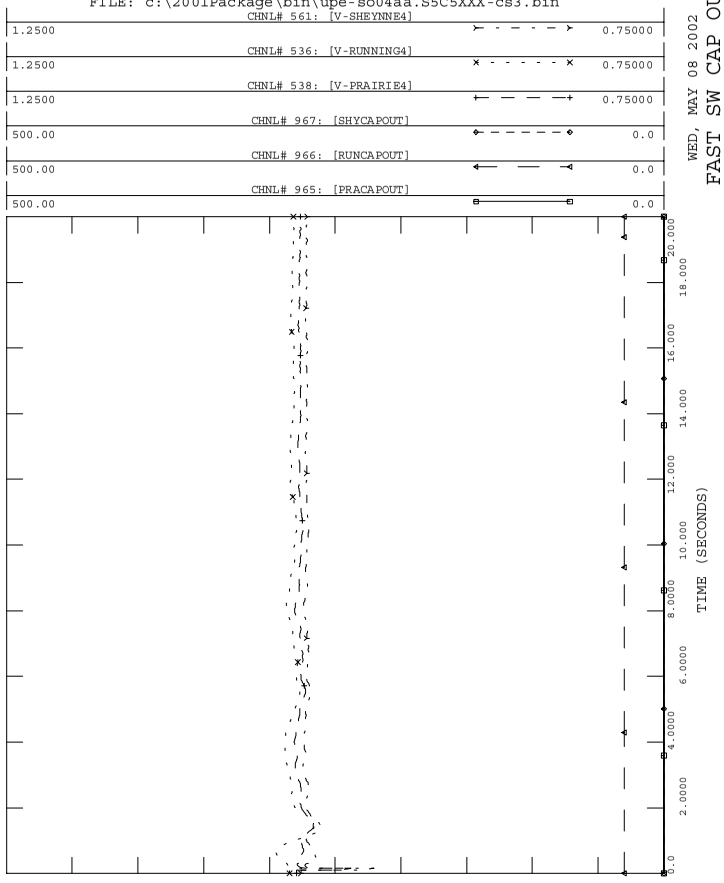
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



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UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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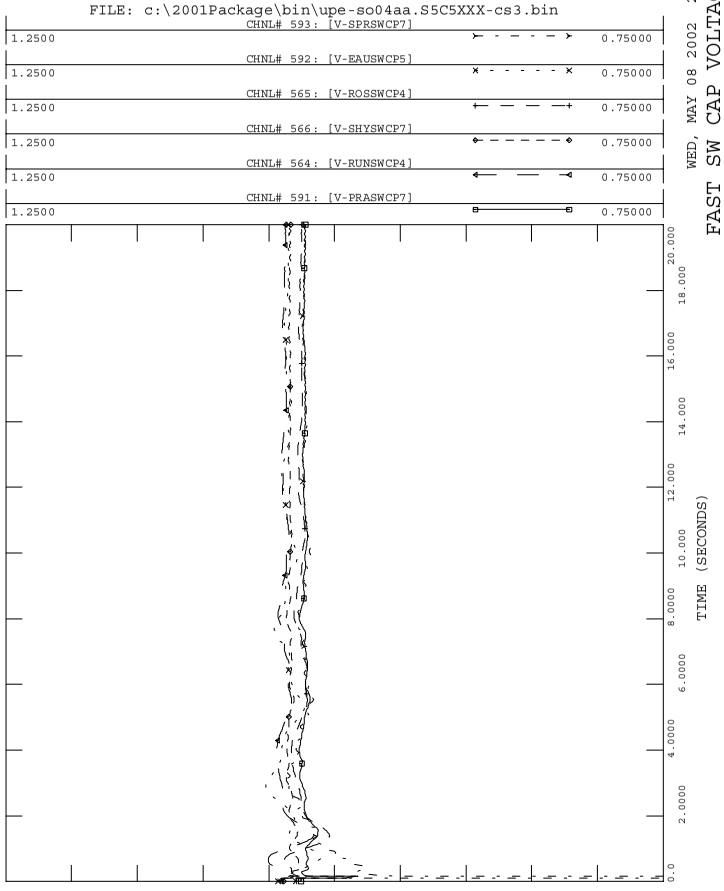
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



WED, MAY 08 2002 20:27
FAST SW CAP VOLTAGES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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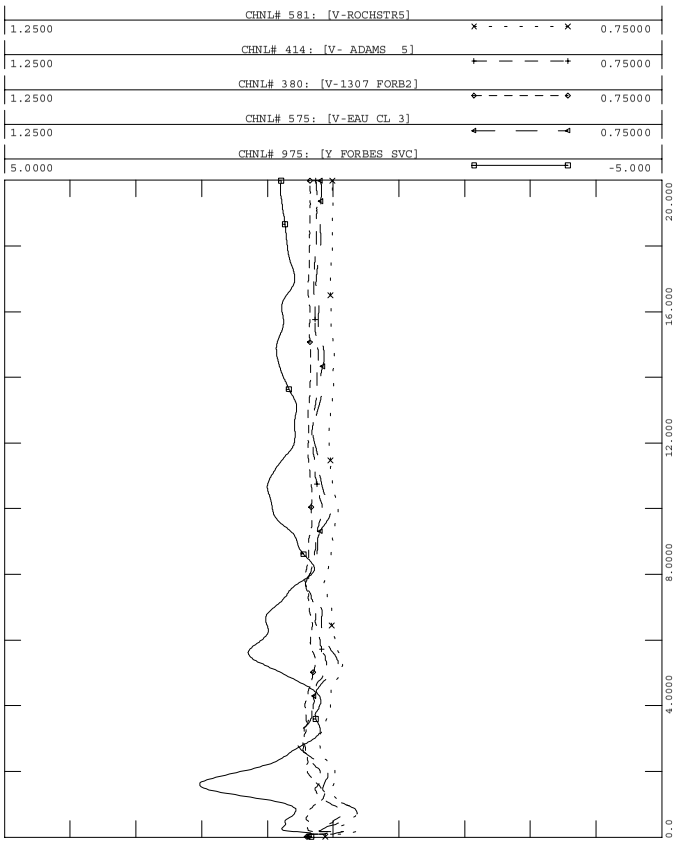
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



WED, MAY 08 2002 20:27

SVC & WISCONSIN VOLT

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
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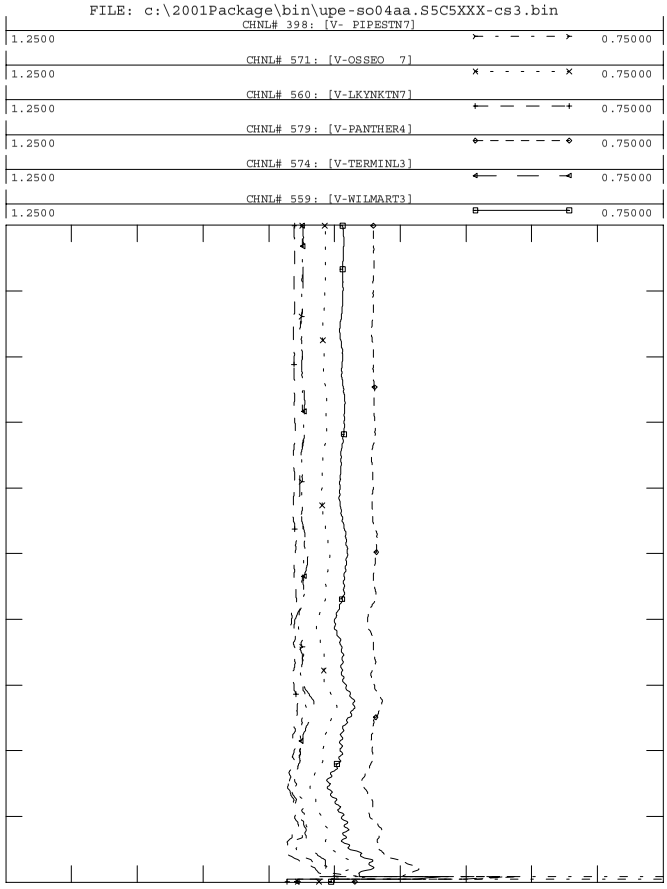

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TC VOLTAGES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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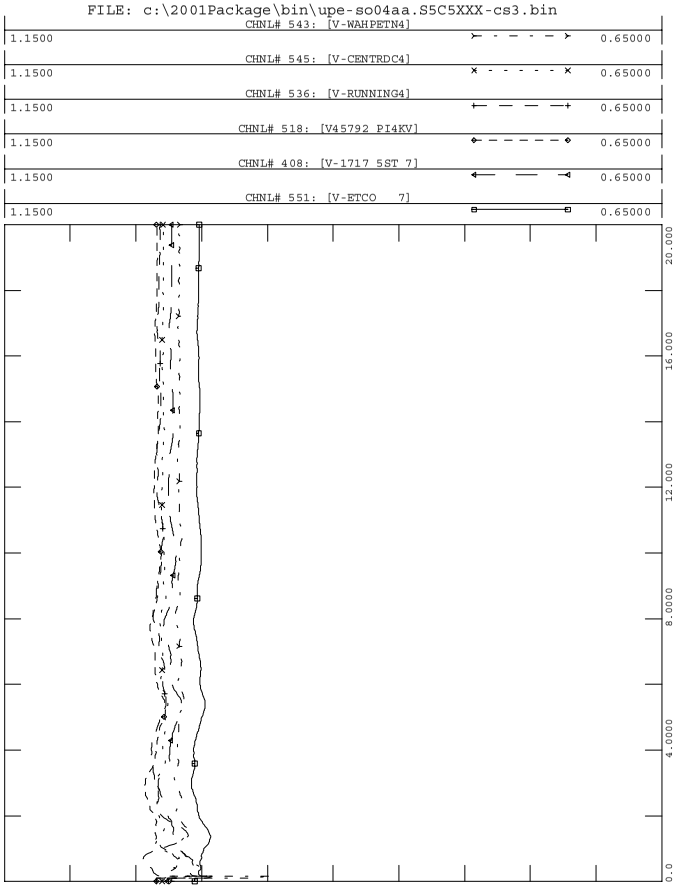
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



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VOLTAGES 6

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
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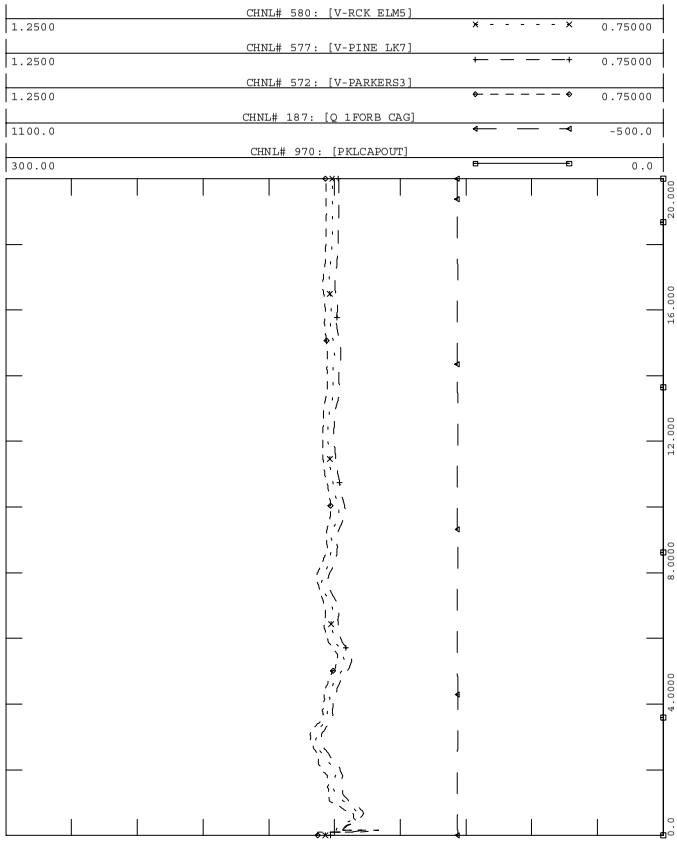

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FORBES SVS OUT & VOLTAGES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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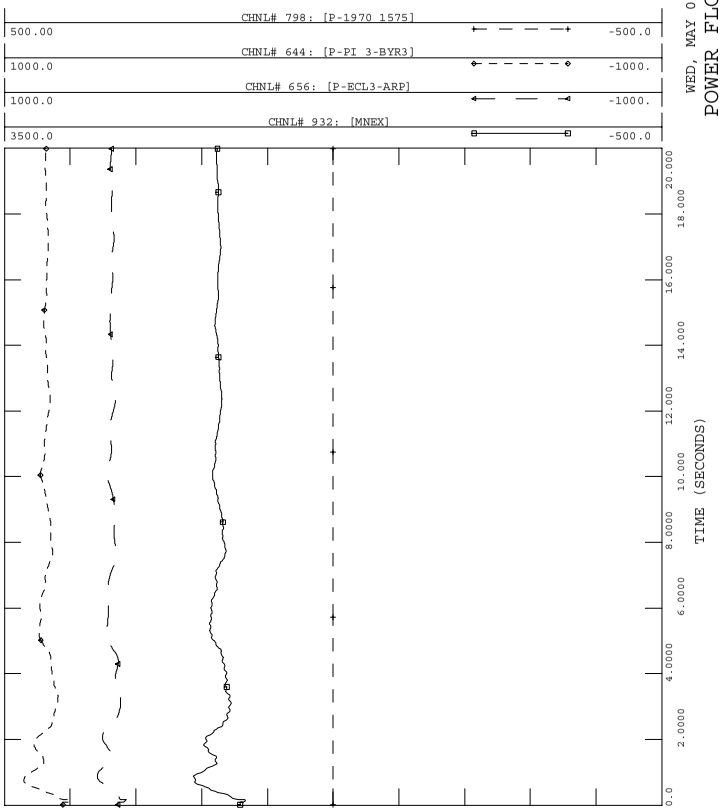
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
POWER FLOW SUMS 2



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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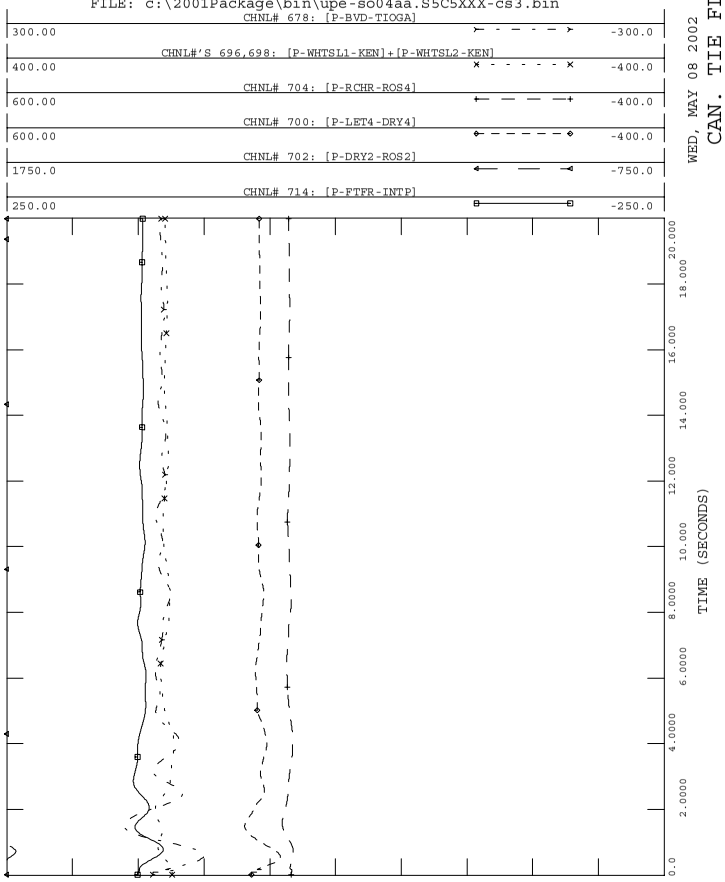
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
CAN. TIE FLOWS



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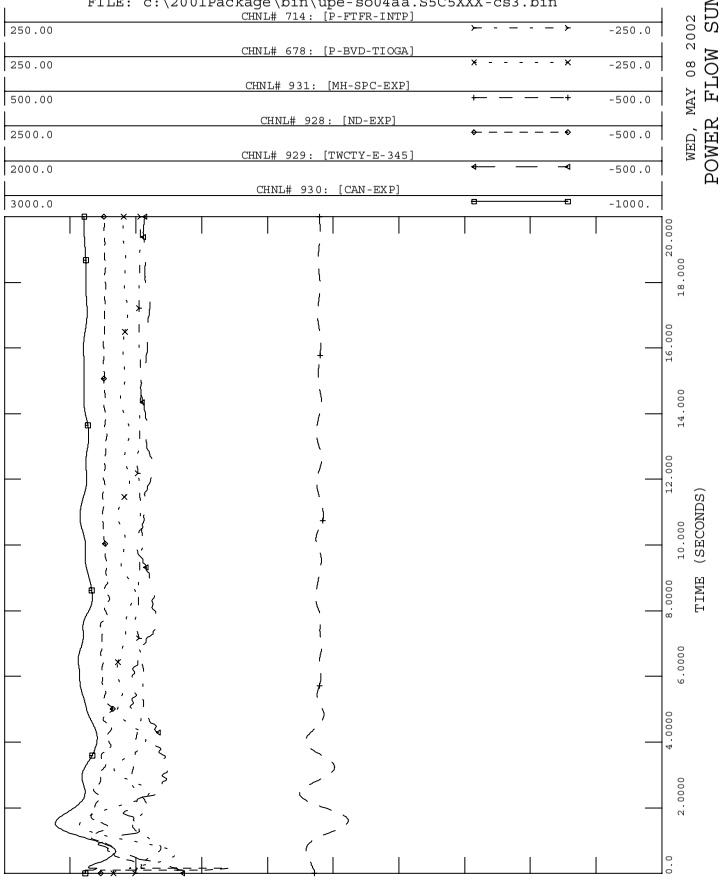
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
POWER FLOW SUMS 1



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4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
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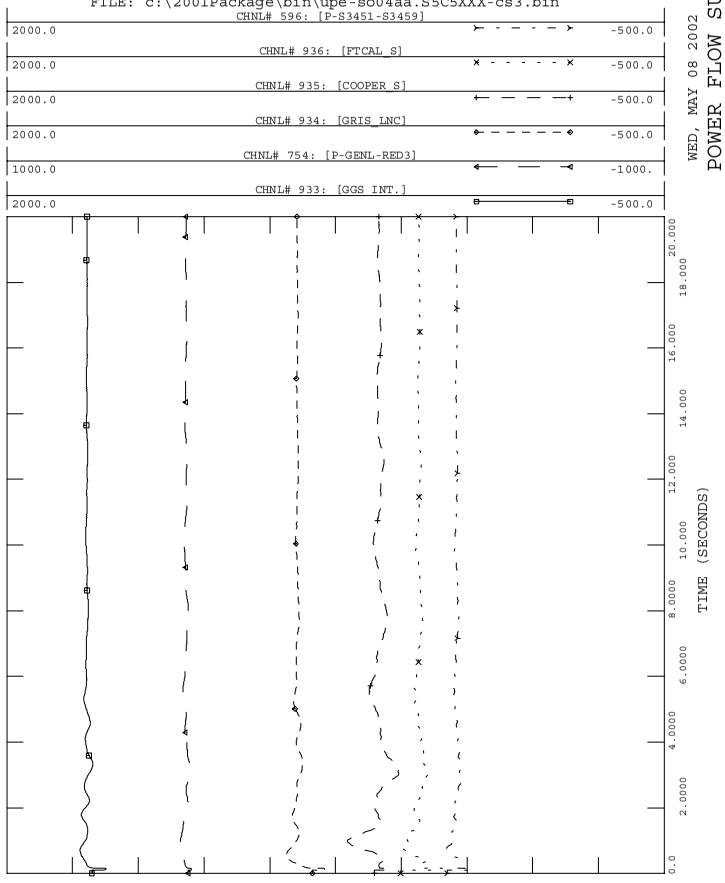
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
POWER FLOW SUM 3



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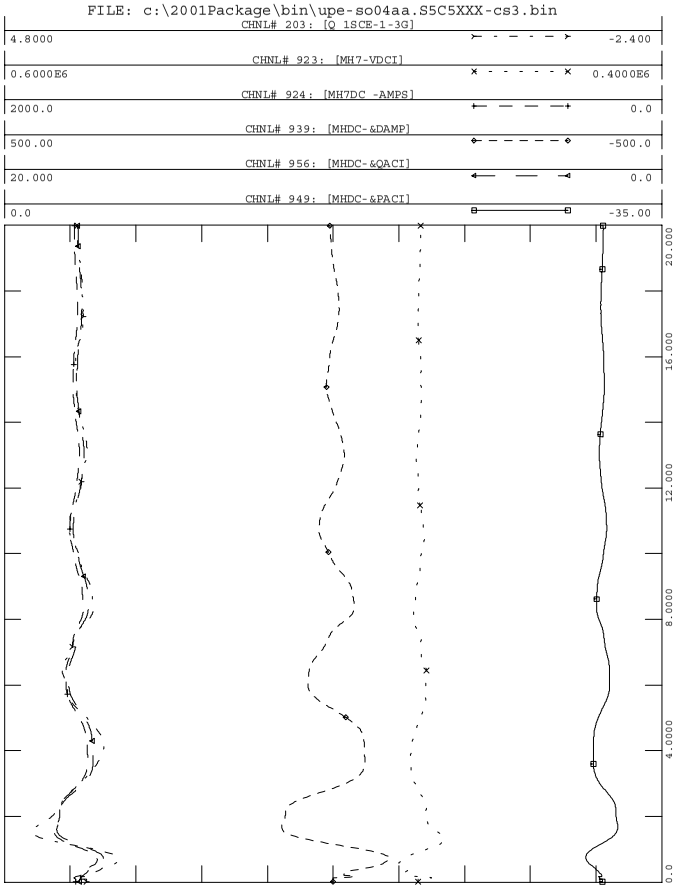
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
MH DC PARAMETERS



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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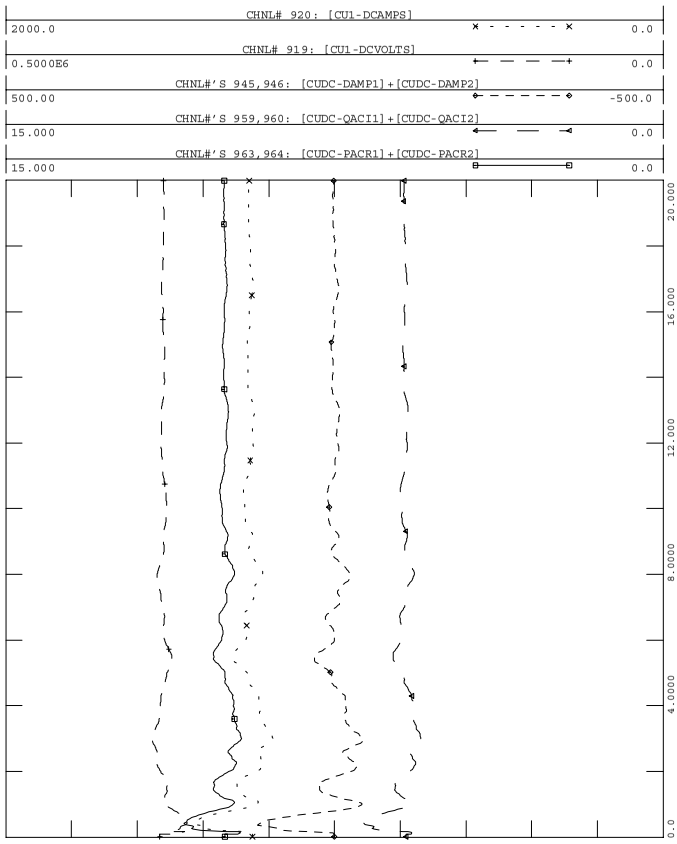
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
CU DC #1



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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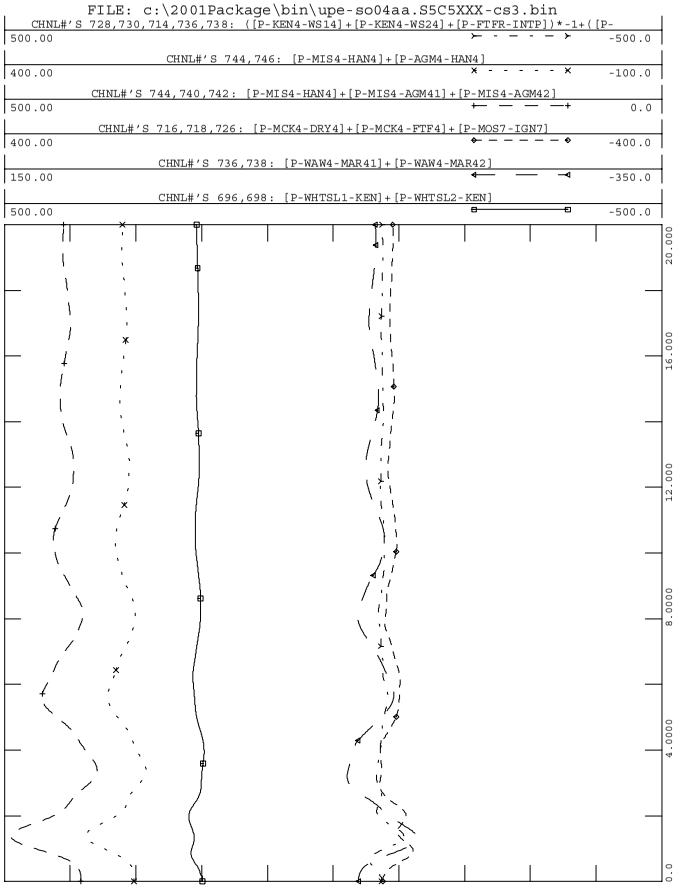
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
OH TIE FLOWS



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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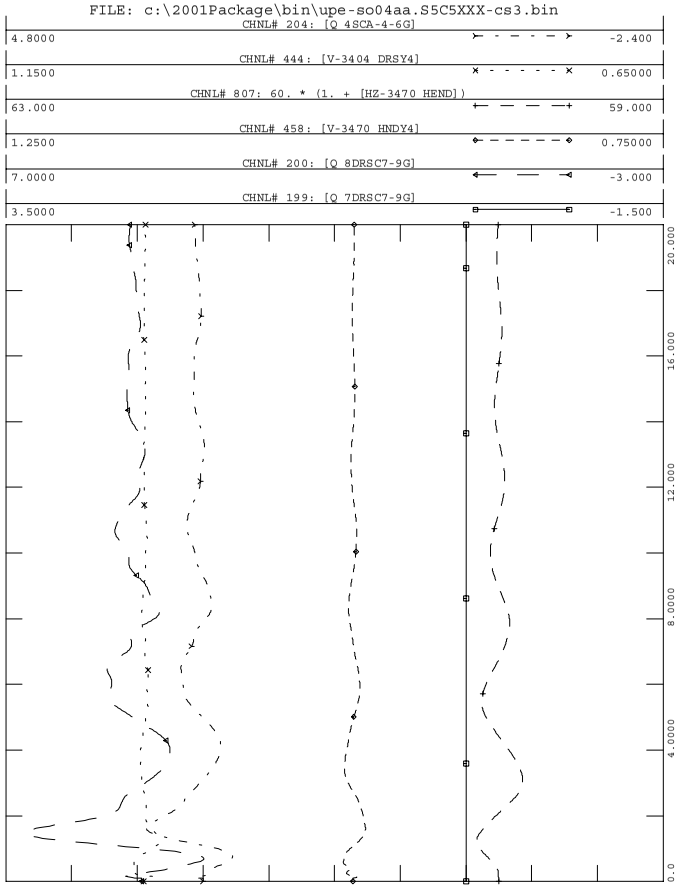
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

WED, MAY 08 2002 20:27
MH DC PARAMETERS



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
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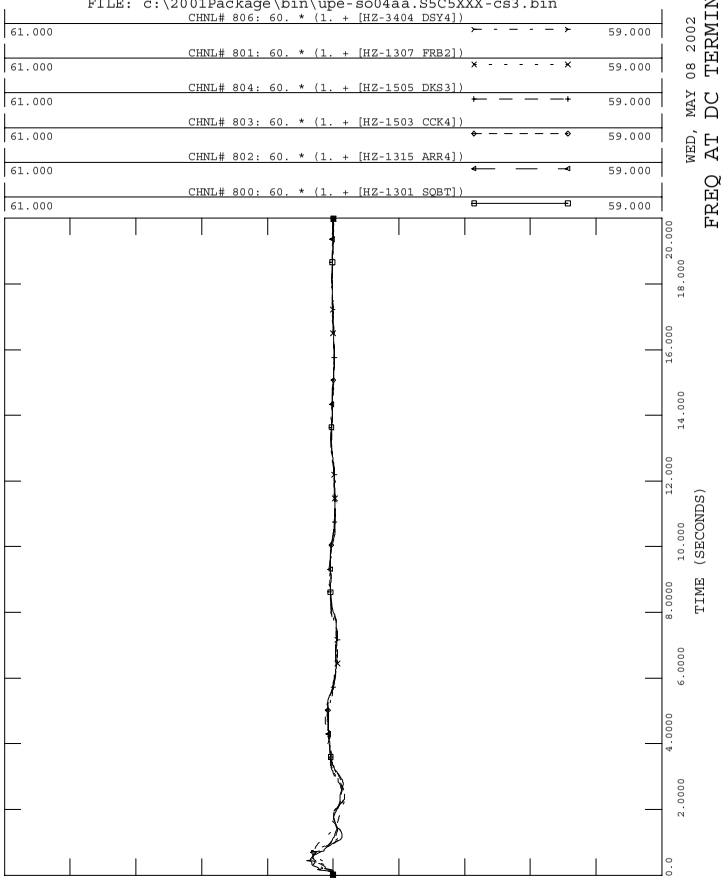
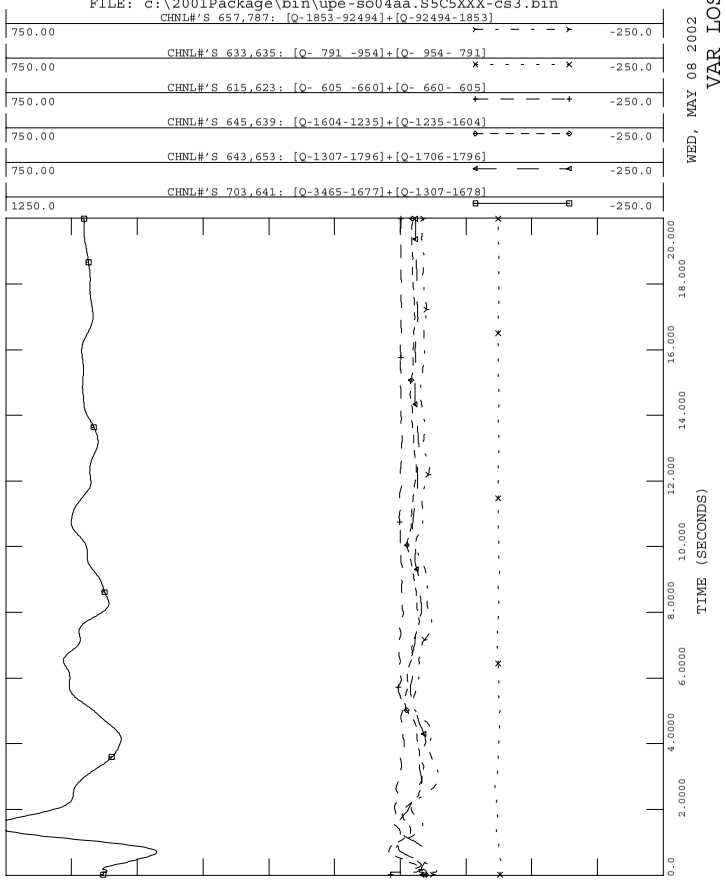
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



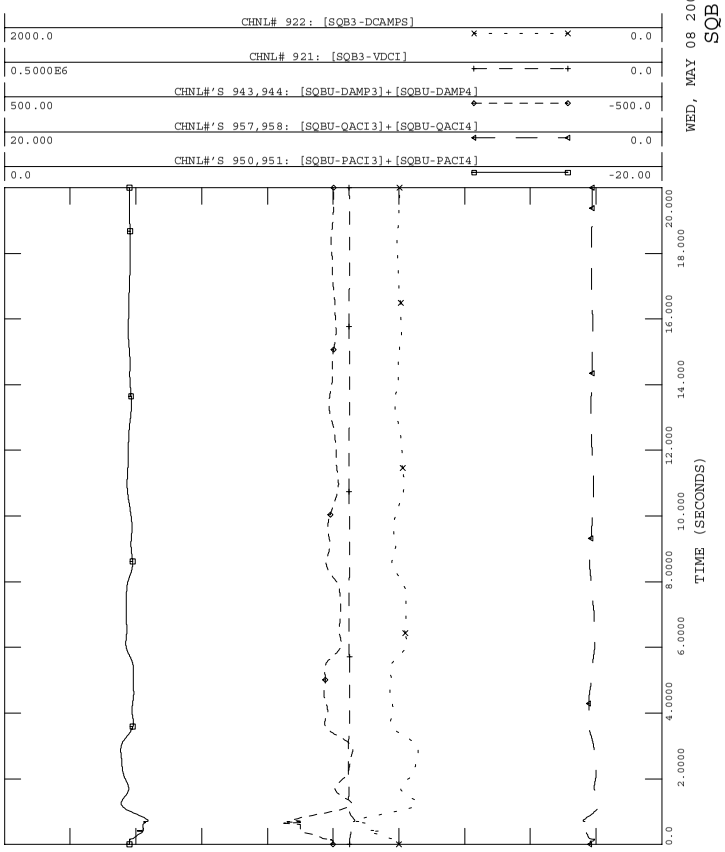
WED, MAY 08 2002 20:27
FREQ AT DC TERMINALS

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



WED, MAY 08 2002 20:27
VAR LOSSES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



WED, MAY 08 2002 20:27
SQB DC #3

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
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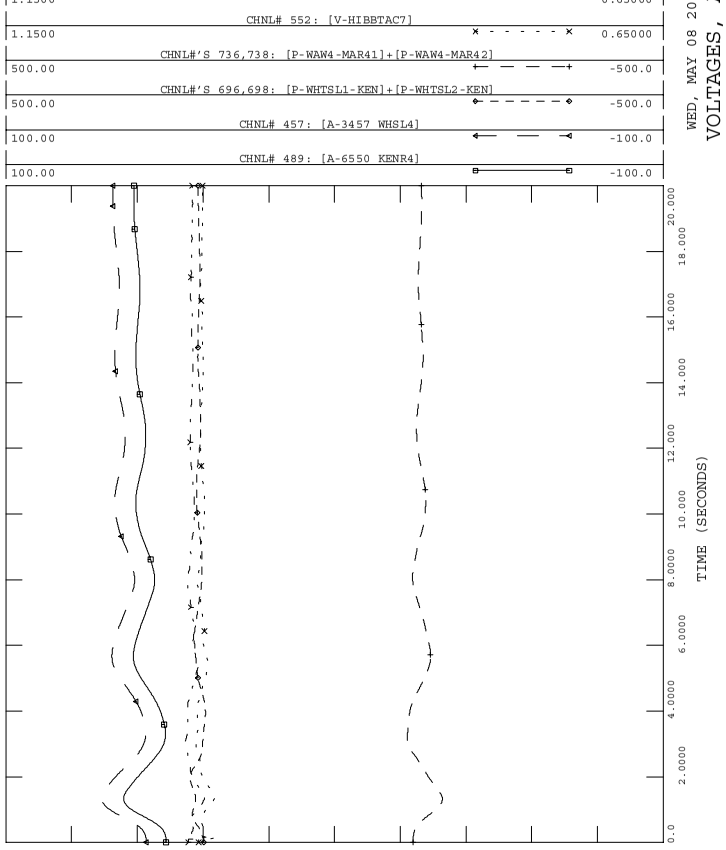
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin



WED, MAY 08 2002 20:27
VOLTAGES, ANGLES

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

RELAY: SLINOS
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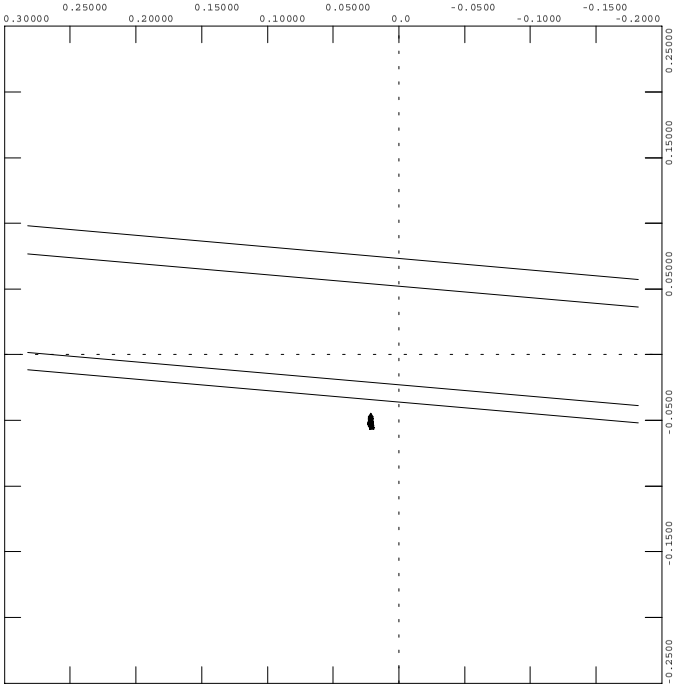
CHNL# 824: [X-FRB2-ROS2]

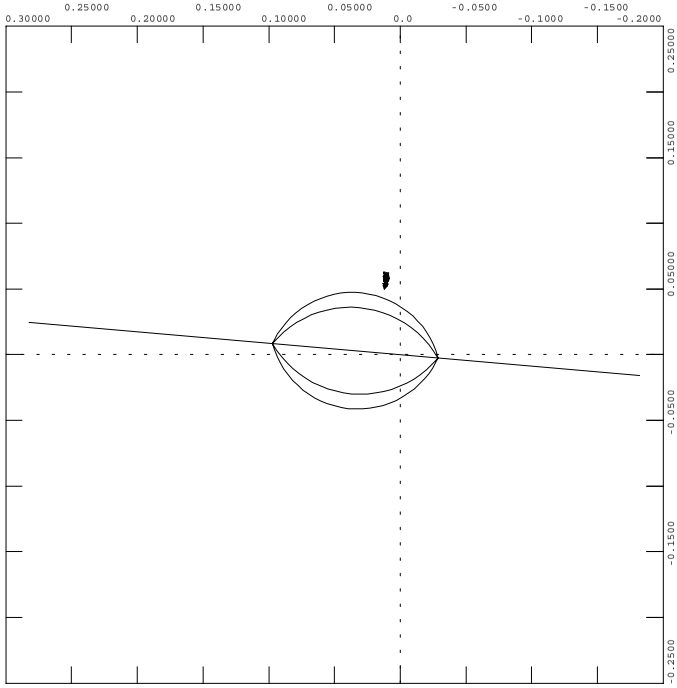


WED, MAY 08 2002 20:27
D602F-FORBES-EMRG (778)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 856: [X-DSY2-ROS2]

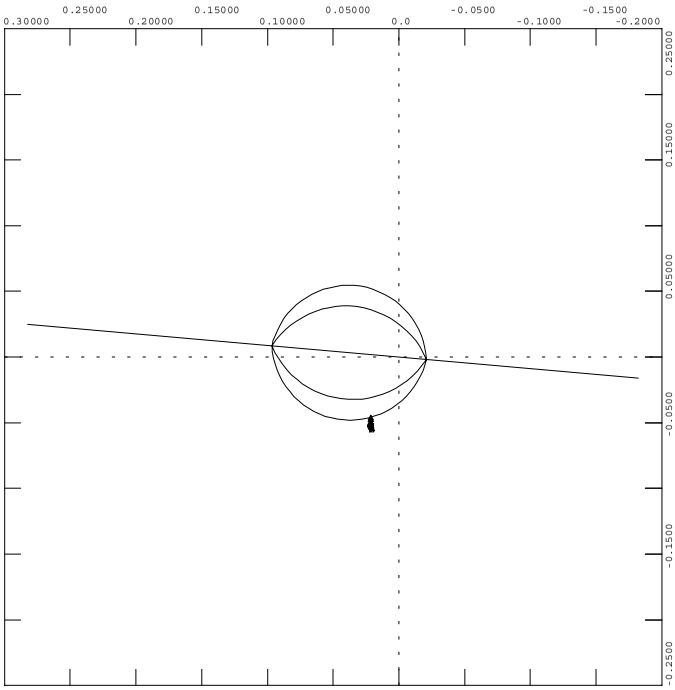


WED, MAY 08 2002 20:27
D602F-DORSEY (606)
CHNL# 855: [R-3465 1677]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

RELAY: RELAYG
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 824: [X-FRB2-ROS2]

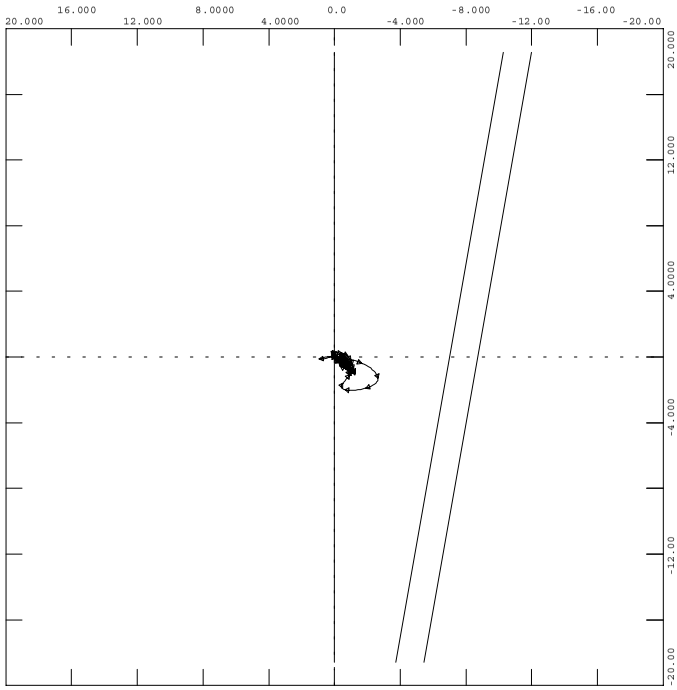


WED, MAY 08 2002 20:27
D602F-FORBES (612)
CHNL# 823: [R-1307 1678]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 977: [DCAR-B]

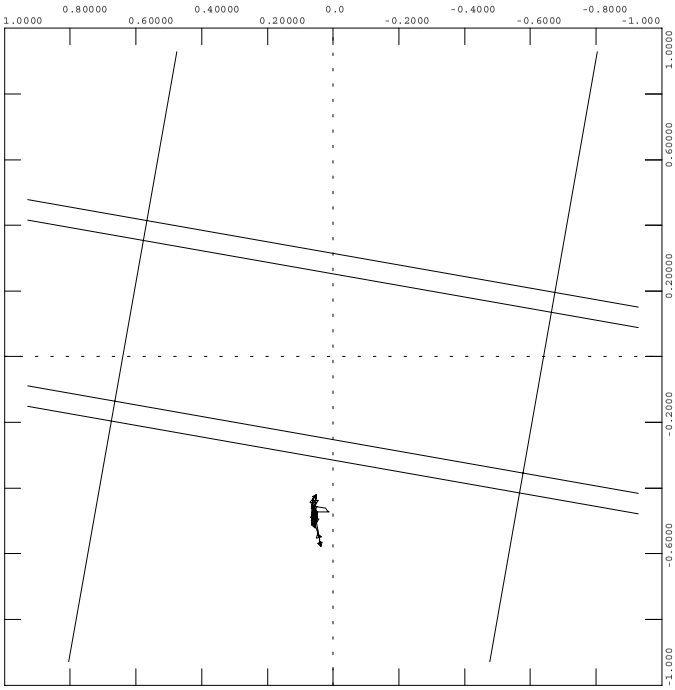


WED, MAY 08 2002 20:27
FORBES DC RED DCAR (679)
CHNL# 976: [DCAR-G]

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

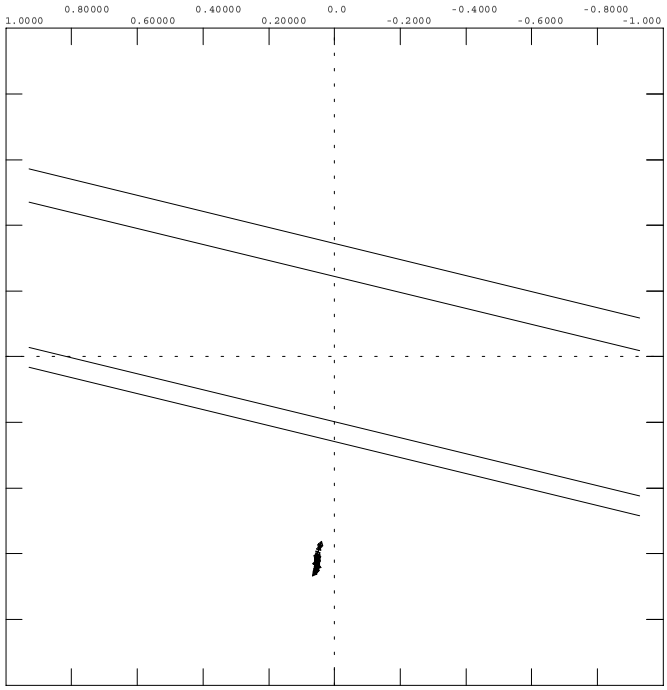
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

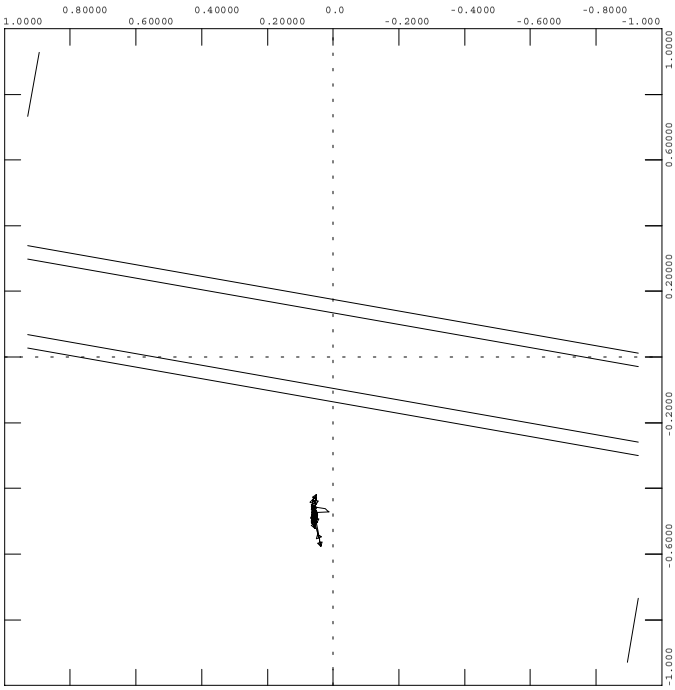
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

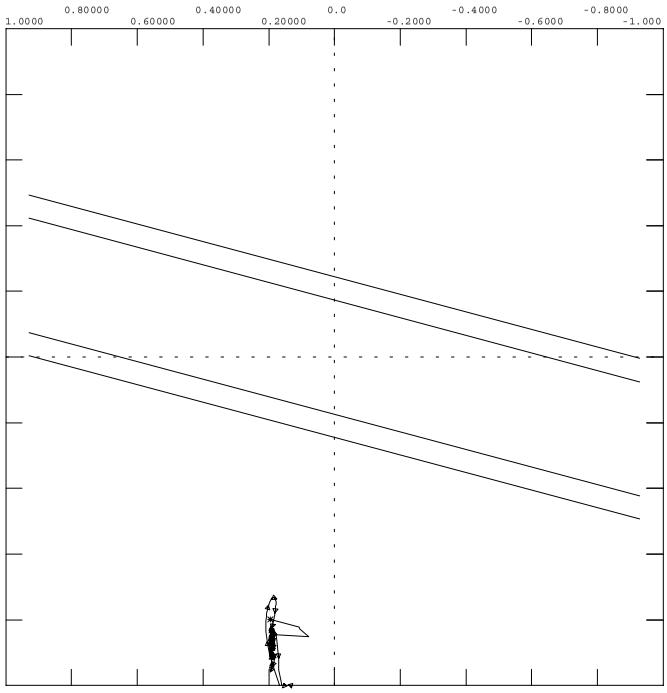
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 816: [X-DRY4-LET4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

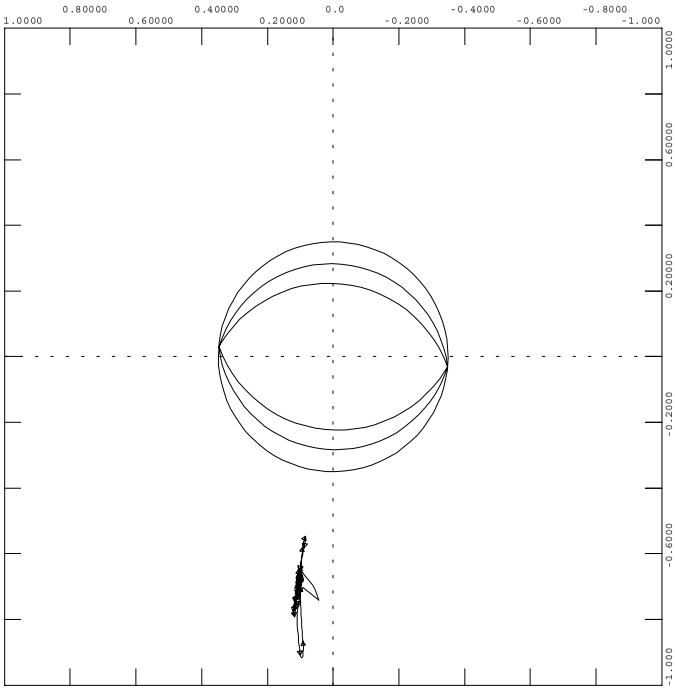
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 820: [X-PRA4-DRY4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

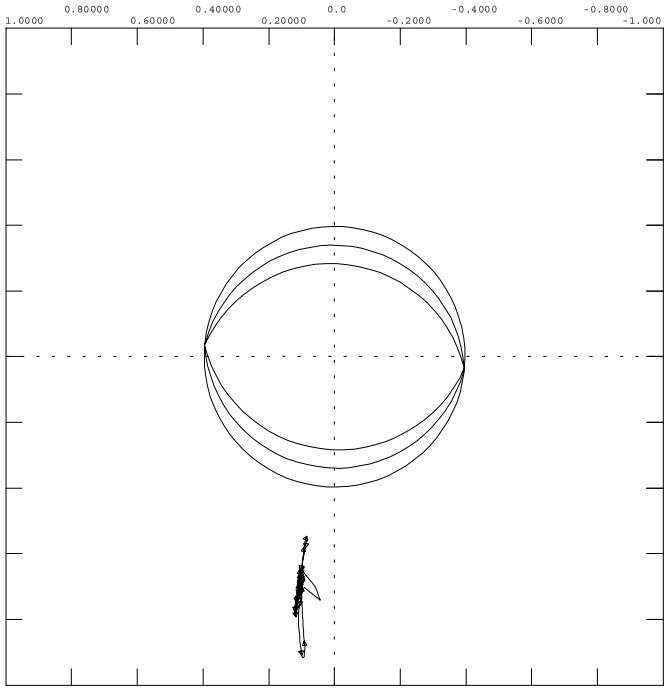
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

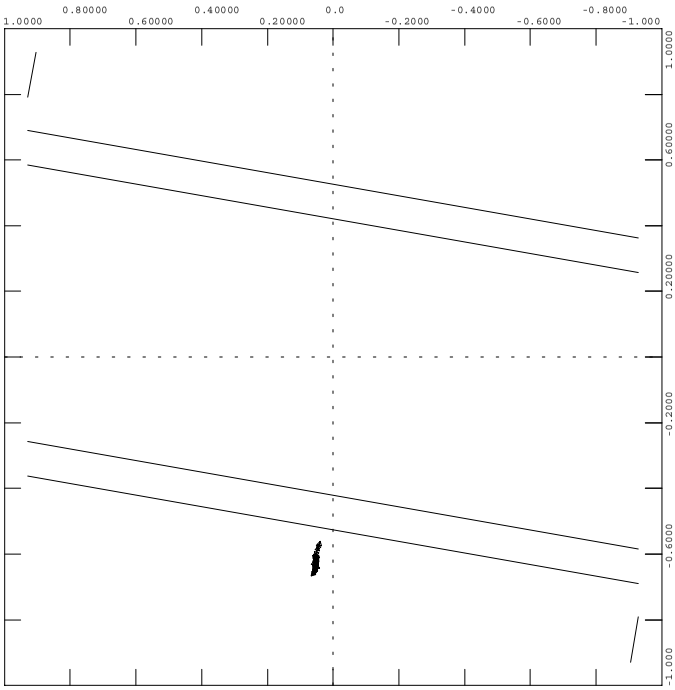
RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

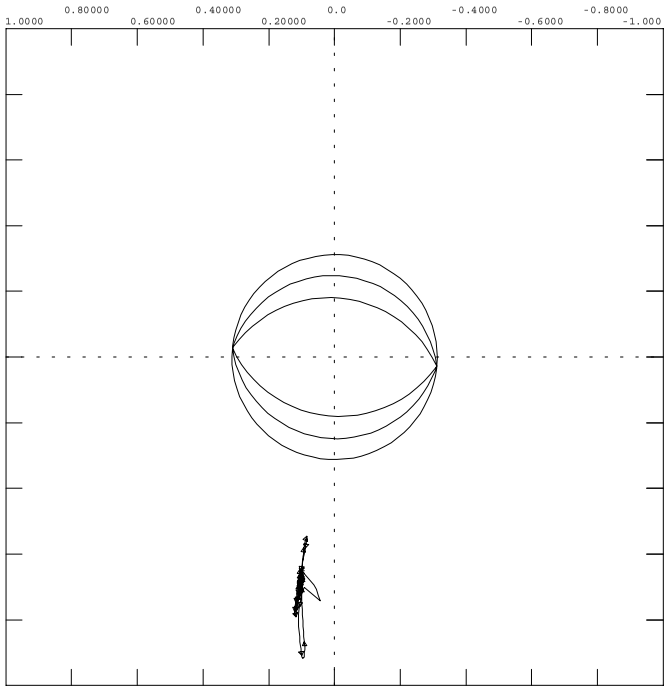
RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 822: [X-MRV4-RCH4]



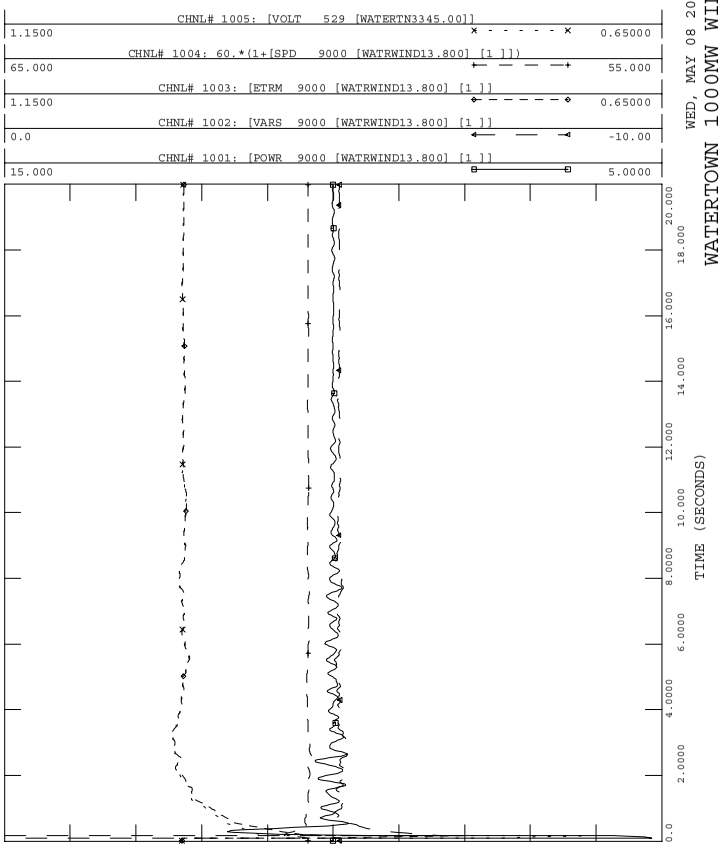
UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

RELAY: SLLP
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 814: [X-TGA4-BD 4]



UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE
FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

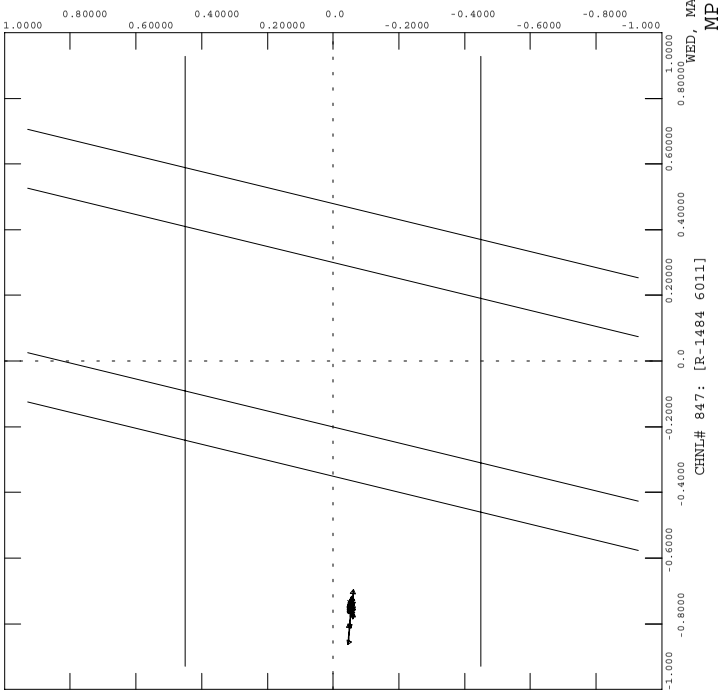


WED, MAY 08 2002 20:27
WATERTOWN 100MW WIND UNI

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166
4 CYCLE 3 PHASE FAULT AT SPLIT ROCK 345
CLEAR THE SPLIT ROCK SIOUX CITY 345 KV LINE

FILE: c:\2001Package\bin\upe-so04aa.S5C5XXX-cs3.bin

RELAY: SLINOS
TSTART: 0.0 TSTOP: 20.0 TIC INCREMENT: 0.25
CHNL# 848: [X-INT.F-FTF]



WED, MAY 08 2002 20:27
MP-OH I.FALLS (779)

APPENDIX 33

Loadflow Attributes Discriminated by Area

For Base Case and Selected Alternatives

ABBBASE Case

(Without Future Coal or Wind Generation)

UPE-SO04AA.ABBBASE.SAV;SUMMER;OP LD;SYSTEM INTACT AREA TOTALS
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	222.7	178.6	162.5
NPPD	469.3	855.6	-767.9	0.0	1354.5	104.2	1631.9	
3	2379.0	2525.4	0.0	0.0	0.0	-179.4	32.9	-91.7
OPPD	758.1	856.9	-70.2	8.4	328.3	-219.9	511.2	
4	0.0	716.0	0.0	0.0	0.0	-728.1	12.1	-727.2
LES	0.0	100.9	-191.2	0.0	58.0	-12.4	160.7	
6	4430.3	2364.1	0.0	0.0	0.0	1784.8	320.4	1576.7
WAPA	726.0	624.1	-498.0	482.4	2889.6	-598.4	3629.2	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	304.7	85.2	-170.5
OTP	224.0	222.6	-216.4	1.0	547.3	93.7	676.4	
15	0.0	0.0	0.0	0.0	0.0	-29.0	1.0	0.0
	0.0	0.0	0.0	0.0	2.9	-3.8	2.2	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	348.2	608.6	-136.4	0.0	1085.2	50.3	910.8	
19	155.5	317.8	0.0	0.0	0.0	-163.0	0.8	-162.8
SMP	34.3	79.5	-25.1	0.0	9.2	-15.0	4.1	
20	4771.0	2095.4	0.0	0.0	0.0	2412.3	269.1	1440.0
MH	2897.9	603.5	-1938.9	118.7	1238.0	243.5	5110.6	
21	1521.2	1539.7	0.0	0.0	0.0	221.1	91.9	53.0
MP	333.2	539.7	-631.2	0.0	357.7	-379.1	1243.9	
22	1415.2	1588.4	0.0	0.0	0.0	-273.6	88.8	-17.7
UPA	434.4	371.1	-1041.3	0.0	268.1	-224.0	1591.6	
23	6568.1	7166.7	0.0	0.0	0.0	-918.7	387.0	-1563.3
NSP	1122.9	1497.8	-2786.2	708.8	2232.8	56.4	3906.3	
26	964.0	797.3	14.9	0.0	0.0	76.7	75.1	158.5
DPC	217.1	227.0	-138.5	0.1	186.6	-73.4	388.5	
30	3881.0	4767.5	0.0	0.0	0.0	-979.5	93.0	-731.4
MEC	1179.2	918.0	-372.9	50.1	1008.8	549.2	1043.6	
31	3465.6	3775.5	0.0	0.0	0.0	-398.2	88.2	-279.9
ALTW	680.6	862.7	-234.0	-57.4	527.3	-202.3	838.8	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.1	64.2	0.0	0.0	6.4	-1.6	17.8	
39	256.7	548.0	0.0	0.0	0.0	-306.9	15.6	-305.0
WEPL	51.7	221.1	-199.7	0.0	123.6	46.7	107.2	
40	16547.3	15930.5	8.9	0.0	0.0	372.7	235.2	440.0
MAIN	3510.3	3608.6	-165.3	53.4	2354.6	-109.3	2477.6	
41	49063.0	45964.3	0.9	0.1	0.0	1944.7	1163.0	1953.4
SPP	9764.8	13647.9	-6544.9	529.3	10576.5	-16.0	12727.0	
42	335171.8	334482.9	-3533.4	5.9	0.0	-1477.6	5693.9	-1028.7
EQIV	69618.6	119849.0	-111226.2	-2394.5	18927.8	-84.7	82402.5	
43	22334.8	21869.1	97.6	31.1	0.0	-53.4	390.3	0.0
OH	4173.9	15245.9	-11788.4	421.1	6447.5	74.2	6668.6	

FROM AREA	TO GENERATION	TO BUS LOAD	TO LINE SHUNT	FROM SHUNT	TO CHARGING	DESIRED NET INT	LOSSES	NET INT
45	5789.5	5333.0	0.0	0.0	0.0	268.7	177.7	282.0
WERE	1337.0	1383.8	-677.8	0.0	1057.9	-168.2	1855.2	
46	1374.4	1466.0	0.0	0.0	0.0	-120.5	28.9	-117.3
MIPU	390.5	488.7	-260.4	0.0	202.4	-26.4	391.0	
48	738.4	943.0	0.0	0.0	0.0	-243.3	38.7	-242.0
EMDE	190.0	209.0	-51.3	0.0	119.5	-81.5	233.3	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	102.2	66.2	0.0	0.0	15.1	36.2	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1080.3	134.0	-992.0
ASEC	416.1	917.4	-397.8	0.0	971.3	-18.3	886.0	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	352.6	192.7	0.0	0.0	68.7	83.5	145.2	
71	18373.2	19174.0	0.0	0.0	0.0	-1255.9	455.1	414.0
CE	8442.3	7475.8	-3958.5	271.9	3863.6	669.5	7847.2	
76	498.8	415.0	0.0	0.0	0.0	63.4	20.4	67.2
SUNF	59.2	136.7	38.3	0.0	378.3	84.8	177.8	
78	3939.5	3475.7	0.0	0.0	0.0	411.8	52.0	417.3
KCPL	800.5	779.4	-270.6	0.0	531.9	-61.1	884.7	
79	198.3	415.0	0.0	0.0	0.0	-221.4	4.7	-221.0
STJO	-63.6	52.0	0.0	0.0	66.6	-91.7	42.7	
83	0.0	0.0	0.0	0.0	0.0	-4.0	4.0	0.0
	0.0	0.0	0.0	0.0	54.2	3.3	50.9	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-167.6	325.0	-115.0
WUMS	3133.8	3908.3	-2941.7	0.0	1597.3	70.4	3694.0	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-296.1	11.9	0.0
	0.0	0.0	-150.8	0.0	74.0	81.3	68.6	
211	0.0	37.5	0.0	0.0	0.0	-52.1	3.5	0.0
	0.0	6.8	-142.9	0.0	28.4	127.4	37.1	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.8	0.0	0.4	-27.9	1.7	
230	548.0	0.0	0.0	0.0	0.0	492.0	0.7	0.0
	-11.9	0.0	-147.0	0.0	1.4	33.0	78.4	
600	517.5	0.0	0.0	0.0	0.0	477.1	1.4	0.0
	154.3	0.0	-24.4	0.1	0.0	86.2	68.8	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507221.6	499999.8	-3411.3	37.8	0.0	0.0	10595.2	5.7
	112026.4	176785.0	-147935.6	193.2	59576.9	0.0	142560.8	

Site 1 (Hettinger)

Case S1C1XXA

UPE-SO04AA.S1C1XXA.SAV;WITH 70 MVAR SVC @ WIND GEN TERMINALS AREA TOTALS
ND=3004,MH=2174,MW=1485,OHMH=-196,OHMP=150,EWTW=-120,BD=165 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	201.0	200.4	162.5
NPPD	640.9	855.6	-774.1	0.0	1316.4	81.4	1794.4	
3	2379.0	2525.4	0.0	0.0	0.0	-180.5	34.0	-91.7
OPPD	784.7	856.9	-69.8	8.3	326.4	-206.4	522.1	
4	0.0	716.0	0.0	0.0	0.0	-728.5	12.5	-727.2
LES	0.0	100.9	-186.5	0.0	56.4	-23.1	165.1	
6	5469.0	2402.8	0.0	0.0	0.0	2637.9	467.3	1576.7
WAPA	1142.4	648.1	-904.1	407.1	3112.4	-1042.8	5170.1	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	289.6	100.4	-170.5
OTP	312.3	222.6	-258.0	1.0	540.4	109.1	784.0	
15	0.0	0.0	0.0	0.0	0.0	-29.3	1.3	0.0
	0.0	0.0	0.0	0.0	2.9	-4.6	2.9	
18	2758.8	2525.1	0.0	0.0	0.0	138.8	94.8	0.0
SPC	352.7	608.6	-136.4	0.0	1085.2	53.1	912.6	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	33.9	79.5	-25.3	0.0	9.3	-15.2	4.2	
20	4769.3	2095.4	0.0	0.0	0.0	2412.6	267.2	1440.0
MH	2938.7	603.5	-1938.8	118.9	1239.1	301.5	5094.3	
21	1521.2	1539.7	0.0	0.0	0.0	218.8	94.2	53.0
MP	346.7	539.7	-705.8	0.0	358.0	-312.9	1266.1	
22	1415.2	1588.4	0.0	0.0	0.0	-278.1	94.1	-17.7
UPA	440.2	371.1	-1041.1	0.0	266.9	-250.8	1623.0	
23	5686.6	6873.1	0.0	0.0	0.0	-1522.8	401.6	-1563.3
NSP	1182.2	1423.1	-2776.6	702.2	2291.5	109.4	4042.4	
26	964.0	797.3	14.9	0.0	0.0	76.0	75.8	158.5
DPC	218.3	227.0	-138.6	0.1	186.6	-75.3	391.8	
30	3881.0	4767.5	0.0	0.0	0.0	-988.6	102.1	-731.4
MEC	1369.6	918.0	-370.8	49.9	1005.2	662.3	1115.4	
31	3465.6	3775.5	0.0	0.0	0.0	-402.2	92.3	-279.9
ALTW	697.0	862.7	-241.0	-57.3	526.5	-195.2	854.3	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.3	64.2	0.0	0.0	6.4	-1.3	17.8	
39	256.7	548.0	0.0	0.0	0.0	-307.5	16.2	-305.0
WEPL	55.0	221.1	-200.1	0.0	123.4	46.6	110.6	
40	16547.3	15991.7	8.9	0.0	0.0	309.8	236.7	440.0
MAIN	3548.5	3622.4	-165.3	53.3	2353.6	-102.0	2493.7	
41	49063.0	45964.6	0.9	0.1	0.0	1941.6	1165.8	1953.4
SPP	9800.6	13647.9	-6544.2	529.2	10574.9	-10.7	12755.2	
42	335147.8	334482.9	-3533.4	5.9	0.0	-1502.5	5694.7	-1028.7
EQIV	69643.5	119849.0	-111225.4	-2394.5	18927.6	-68.0	82409.8	
43	22334.8	21869.1	97.6	31.1	0.0	-53.4	390.4	0.0
OH	4173.1	15245.9	-11788.5	421.1	6448.0	73.3	6669.0	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	265.8	180.7	282.0
WERE	1360.6	1383.8	-677.0	0.0	1056.2	-164.5	1872.5	
46	1374.4	1466.0	0.0	0.0	0.0	-121.2	29.7	-117.3
MIPU	396.3	488.7	-260.1	0.0	202.1	-27.5	397.3	
48	738.4	943.0	0.0	0.0	0.0	-243.6	39.0	-242.0
EMDE	189.6	209.0	-51.2	0.0	119.6	-82.9	234.3	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	105.4	66.2	0.0	0.0	15.1	39.4	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1082.8	136.4	-992.0
ASEC	423.0	917.4	-398.1	0.0	970.2	-26.8	900.9	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	352.9	192.7	0.0	0.0	68.7	83.6	145.2	
71	18373.2	19248.8	0.0	0.0	0.0	-1336.6	461.0	414.0
CE	8573.7	7505.0	-3946.6	272.0	3857.6	666.2	7934.7	
76	498.8	415.0	0.0	0.0	0.0	62.2	21.7	67.2
SUNF	74.8	136.7	37.7	0.0	375.3	86.2	189.5	
78	3939.5	3475.7	0.0	0.0	0.0	410.1	53.7	417.3
KCPL	817.8	779.4	-270.3	0.0	531.4	-50.0	890.0	
79	198.3	415.0	0.0	0.0	0.0	-221.8	5.1	-221.0
STJO	-59.1	52.0	0.0	0.0	66.3	-93.0	48.2	
83	0.0	0.0	0.0	0.0	0.0	-4.2	4.2	0.0
	0.0	0.0	0.0	0.0	53.9	0.8	53.1	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-170.9	328.2	-115.0
WUMS	3167.5	3908.3	-2942.4	0.0	1595.8	78.3	3718.9	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.5	0.0
	0.0	0.0	0.0	0.0	12.1	-4.3	15.0	
210	24.1	0.0	0.0	0.0	0.0	-300.4	16.2	0.0
	0.0	0.0	-152.4	0.0	72.9	58.6	91.7	
211	0.0	37.5	0.0	0.0	0.0	-52.5	3.9	0.0
	0.0	6.8	-142.8	0.0	29.4	125.4	40.0	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.9	0.0	0.4	-27.9	1.7	
230	548.0	0.0	0.0	0.0	0.0	492.9	0.7	0.0
	21.4	0.0	-146.1	0.0	1.4	66.6	77.6	
600	517.5	0.0	0.0	0.0	0.0	476.6	1.8	0.0
	300.2	0.0	-28.4	0.1	0.0	218.1	86.7	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507353.2	499881.1	-3411.3	37.8	0.0	0.0	10845.4	5.7
	113583.4	176777.2	-148445.9	111.3	59788.7	0.0	144928.9	

Site 1 (Hettinger)

Case S1C1XX2

UPE-SO04AA.S1C1XX2.SAV;SUMMER;OP LD;SYSTEM INTACT AREA TOTALS
ND=3037,MH=2174,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=165 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	200.9	200.4	162.5
NPPD	641.4	855.6	-772.3	0.0	1315.4	79.5	1793.9	
3	2379.0	2525.4	0.0	0.0	0.0	-180.6	34.2	-91.7
OPPD	787.5	856.9	-69.8	8.3	326.2	-204.9	523.1	
4	0.0	716.0	0.0	0.0	0.0	-728.6	12.6	-727.2
LES	0.0	100.9	-186.1	0.0	56.3	-24.1	165.5	
6	5469.0	2402.8	0.0	0.0	0.0	2639.4	465.8	1576.7
WAPA	1023.6	648.1	-837.7	408.5	3126.7	-999.5	4954.5	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	293.2	96.8	-170.5
OTP	278.1	222.6	-258.5	1.0	543.6	109.3	753.3	
15	0.0	0.0	0.0	0.0	0.0	-29.3	1.2	0.0
	0.0	0.0	0.0	0.0	2.9	-4.4	2.8	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	351.8	608.6	-136.4	0.0	1085.2	52.6	912.2	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	33.8	79.5	-25.3	0.0	9.3	-15.3	4.2	
20	4770.1	2095.4	0.0	0.0	0.0	2413.0	267.5	1440.0
MH	2924.3	603.5	-1938.8	118.9	1238.5	287.2	5093.6	
21	1521.2	1539.7	0.0	0.0	0.0	219.3	93.7	53.0
MP	335.2	539.7	-707.6	0.0	358.9	-318.7	1263.2	
22	1415.2	1588.4	0.0	0.0	0.0	-276.8	92.8	-17.7
UPA	443.1	371.1	-1041.4	0.0	266.8	-239.3	1614.7	
23	5676.6	6858.8	0.0	0.0	0.0	-1514.9	397.9	-1563.3
NSP	1157.7	1420.1	-2779.9	704.0	2294.5	132.7	4002.1	
26	964.0	797.3	14.9	0.0	0.0	76.0	75.8	158.5
DPC	218.0	227.0	-138.7	0.1	186.7	-75.5	391.7	
30	3881.0	4767.5	0.0	0.0	0.0	-989.7	103.2	-731.4
MEC	1385.4	918.0	-370.6	49.9	1004.8	669.7	1123.2	
31	3465.6	3775.5	0.0	0.0	0.0	-402.6	92.7	-279.9
ALTW	698.8	862.7	-240.9	-57.3	526.4	-194.9	855.6	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.4	64.2	0.0	0.0	6.4	-1.3	17.9	
39	256.7	548.0	0.0	0.0	0.0	-307.6	16.3	-305.0
WEPL	55.1	221.1	-200.1	0.0	123.3	46.6	110.7	
40	16547.3	15995.3	8.9	0.0	0.0	306.2	236.9	440.0
MAIN	3551.4	3623.2	-165.3	53.3	2353.5	-101.4	2495.1	
41	49063.0	45964.6	0.9	0.1	0.0	1941.4	1166.0	1953.4
SPP	9803.6	13647.9	-6544.1	529.2	10574.8	-10.4	12757.7	
42	335142.7	334482.9	-3533.4	5.9	0.0	-1507.8	5694.8	-1028.7
EQIV	69646.2	119849.0	-111225.3	-2394.5	18927.6	-66.4	82410.7	
43	22334.8	21869.1	97.6	31.1	0.0	-53.4	390.4	0.0
OH	4172.2	15245.9	-11788.6	421.1	6448.3	73.1	6669.0	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	265.5	180.9	282.0
WERE	1362.2	1383.8	-677.0	0.0	1056.1	-164.6	1874.1	
46	1374.4	1466.0	0.0	0.0	0.0	-121.3	29.7	-117.3
MIPU	396.8	488.7	-260.0	0.0	202.1	-27.5	397.8	
48	738.4	943.0	0.0	0.0	0.0	-243.6	39.0	-242.0
EMDE	189.6	209.0	-51.2	0.0	119.6	-83.0	234.4	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	105.7	66.2	0.0	0.0	15.1	39.7	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1083.0	136.7	-992.0
ASEC	423.8	917.4	-398.1	0.0	970.1	-28.0	902.6	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	352.9	192.7	0.0	0.0	68.7	83.6	145.3	
71	18373.2	19253.0	0.0	0.0	0.0	-1341.3	461.4	414.0
CE	8582.9	7506.6	-3945.7	272.0	3857.2	665.7	7941.3	
76	498.8	415.0	0.0	0.0	0.0	62.1	21.7	67.2
SUNF	75.2	136.7	37.7	0.0	375.2	86.0	190.0	
78	3939.5	3475.7	0.0	0.0	0.0	409.9	53.9	417.3
KCPL	819.3	779.4	-270.3	0.0	531.3	-49.0	890.5	
79	198.3	415.0	0.0	0.0	0.0	-221.9	5.1	-221.0
STJO	-58.6	52.0	0.0	0.0	66.3	-93.2	48.9	
83	0.0	0.0	0.0	0.0	0.0	-4.2	4.2	0.0
	0.0	0.0	0.0	0.0	54.0	1.2	52.8	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-171.0	328.3	-115.0
WUMS	3166.9	3908.3	-2942.5	0.0	1595.8	77.7	3719.1	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.5	0.0
	0.0	0.0	0.0	0.0	12.1	-4.3	15.0	
210	24.1	0.0	0.0	0.0	0.0	-299.7	15.4	0.0
	0.0	0.0	-153.3	0.0	73.4	64.2	87.6	
211	0.0	37.5	0.0	0.0	0.0	-52.5	3.8	0.0
	0.0	6.8	-142.8	0.0	29.5	126.1	39.5	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.7	0.0	0.4	-27.8	1.7	
230	548.0	0.0	0.0	0.0	0.0	492.9	0.7	0.0
	10.7	0.0	-146.3	0.0	1.4	56.0	77.9	
600	517.5	0.0	0.0	0.0	0.0	476.8	1.7	0.0
	234.8	0.0	-27.8	0.1	0.0	157.6	81.2	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507338.8	499874.6	-3411.3	37.8	0.0	0.0	10837.4	5.7
	113348.6	176776.7	-148382.8	114.5	59807.4	0.0	144647.4	

Site 1 (Hettinger)

Case S1C2XXX

UPE-SO04AA.S1C2XXX.SAV;SUMMER;OP LD;SYSTEM INTACT AREA TOTALS
ND=3011,MH=2174,MW=1484,OHMH=-196,OHMP=150,EWTW=-120,BD=166 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	201.5	199.9	162.5
NPPD	632.0	855.6	-773.8	0.0	1317.2	77.2	1790.2	
3	2379.0	2525.4	0.0	0.0	0.0	-180.5	34.1	-91.7
OPPD	785.2	856.9	-69.8	8.3	326.3	-206.4	522.5	
4	0.0	716.0	0.0	0.0	0.0	-728.5	12.6	-727.2
LES	0.0	100.9	-186.4	0.0	56.4	-23.2	165.1	
6	5469.0	2402.8	0.0	0.0	0.0	2652.6	452.6	1576.7
WAPA	1054.4	648.1	-903.5	409.0	3209.3	-919.5	5053.2	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	290.6	99.3	-170.5
OTP	309.7	222.6	-191.3	1.0	537.3	48.9	771.8	
15	0.0	0.0	0.0	0.0	0.0	-29.3	1.3	0.0
	0.0	0.0	0.0	0.0	2.9	-4.6	2.9	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	351.4	608.6	-136.4	0.0	1085.2	51.8	912.6	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	33.8	79.5	-25.3	0.0	9.3	-15.3	4.2	
20	4769.5	2095.4	0.0	0.0	0.0	2412.7	267.2	1440.0
MH	2938.6	603.5	-1938.8	118.9	1239.0	301.1	5094.4	
21	1521.2	1539.7	0.0	0.0	0.0	218.9	94.1	53.0
MP	347.5	539.7	-705.9	0.0	358.0	-311.3	1265.3	
22	1415.2	1588.4	0.0	0.0	0.0	-277.9	94.0	-17.7
UPA	439.6	371.1	-1041.2	0.0	266.8	-251.1	1622.8	
23	5666.6	6860.5	0.0	0.0	0.0	-1529.0	400.4	-1563.3
NSP	1170.0	1420.4	-2776.9	702.4	2291.8	115.2	4027.3	
26	964.0	797.3	14.9	0.0	0.0	76.0	75.8	158.5
DPC	218.3	227.0	-138.6	0.1	186.6	-75.4	391.8	
30	3881.0	4767.5	0.0	0.0	0.0	-989.3	102.8	-731.4
MEC	1373.6	918.0	-370.7	49.9	1005.0	661.1	1120.3	
31	3465.6	3775.5	0.0	0.0	0.0	-402.5	92.6	-279.9
ALTW	698.1	862.7	-240.9	-57.3	526.4	-195.1	855.1	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.4	64.2	0.0	0.0	6.4	-1.3	17.9	
39	256.7	548.0	0.0	0.0	0.0	-307.5	16.3	-305.0
WEPL	55.0	221.1	-200.1	0.0	123.3	46.6	110.6	
40	16547.3	15994.6	8.9	0.0	0.0	306.8	236.9	440.0
MAIN	3550.7	3623.1	-165.3	53.3	2353.5	-101.6	2494.8	
41	49063.0	45964.6	0.9	0.1	0.0	1941.5	1165.9	1953.4
SPP	9802.2	13647.9	-6544.1	529.2	10574.9	-10.6	12756.5	
42	335145.7	334482.9	-3533.4	5.9	0.0	-1504.7	5694.8	-1028.7
EQIV	69645.4	119849.0	-111225.3	-2394.5	18927.6	-67.0	82410.3	
43	22334.8	21869.1	97.6	31.1	0.0	-53.4	390.4	0.0
OH	4173.0	15245.9	-11788.5	421.1	6448.0	73.3	6669.1	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	265.6	180.8	282.0
WERE	1361.3	1383.8	-677.0	0.0	1056.1	-164.7	1873.4	
46	1374.4	1466.0	0.0	0.0	0.0	-121.3	29.7	-117.3
MIPU	396.6	488.7	-260.1	0.0	202.1	-27.5	397.6	
48	738.4	943.0	0.0	0.0	0.0	-243.6	39.0	-242.0
EMDE	189.6	209.0	-51.2	0.0	119.6	-83.0	234.4	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	105.6	66.2	0.0	0.0	15.1	39.5	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1082.9	136.6	-992.0
ASEC	423.2	917.4	-398.1	0.0	970.2	-27.7	902.0	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	352.9	192.7	0.0	0.0	68.7	83.6	145.3	
71	18373.2	19252.3	0.0	0.0	0.0	-1340.5	461.3	414.0
CE	8580.8	7506.4	-3945.9	272.0	3857.3	665.9	7939.9	
76	498.8	415.0	0.0	0.0	0.0	62.2	21.7	67.2
SUNF	74.7	136.7	37.7	0.0	375.3	86.0	189.6	
78	3939.5	3475.7	0.0	0.0	0.0	410.0	53.8	417.3
KCPL	818.5	779.4	-270.3	0.0	531.4	-49.5	890.3	
79	198.3	415.0	0.0	0.0	0.0	-221.8	5.1	-221.0
STJO	-58.9	52.0	0.0	0.0	66.3	-93.3	48.7	
83	0.0	0.0	0.0	0.0	0.0	-4.2	4.2	0.0
	0.0	0.0	0.0	0.0	53.9	0.9	53.0	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-170.9	328.3	-115.0
WUMS	3168.4	3908.3	-2942.3	0.0	1595.7	78.8	3719.2	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.5	0.0
	0.0	0.0	0.0	0.0	12.1	-4.3	15.0	
210	24.1	0.0	0.0	0.0	0.0	-300.2	16.0	0.0
	0.0	0.0	-151.8	0.0	72.5	58.6	90.7	
211	0.0	37.5	0.0	0.0	0.0	-52.5	3.9	0.0
	0.0	6.8	-142.8	0.0	29.4	125.4	40.0	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.9	0.0	0.4	-27.9	1.7	
230	548.0	0.0	0.0	0.0	0.0	492.9	0.7	0.0
	18.6	0.0	-146.1	0.0	1.4	63.8	77.7	
600	517.5	0.0	0.0	0.0	0.0	476.7	1.8	0.0
	235.2	0.0	-28.1	0.1	0.0	157.1	82.4	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507331.2	499874.9	-3411.3	37.8	0.0	0.0	10829.7	5.7
	113424.1	176776.6	-148377.0	113.5	59882.0	0.0	144792.4	

Site 1 (Hettinger)

Case S1C3XXA

UPE-SO04AA.S1C3XXA.SAV;WITH 70 MVAR SVCS @ WIND GENR TERMS AREA TOTALS
ND=2659,MH=2173,MW=1483,OHMH=-196,OHMP=150,EWTW=-120,BD=163 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	210.7	190.7	162.5
NPPD	544.2	855.6	-780.0	0.0	1333.0	80.2	1721.3	
3	2379.0	2525.4	0.0	0.0	0.0	-179.8	33.4	-91.7
OPPD	770.2	856.9	-70.0	8.4	327.4	-213.0	515.4	
4	0.0	716.0	0.0	0.0	0.0	-728.3	12.3	-727.2
LES	0.0	100.9	-188.9	0.0	57.1	-17.4	162.5	
6	5069.0	2402.8	0.0	0.0	0.0	2322.5	382.8	1576.7
WAPA	769.9	648.1	-867.0	412.5	3167.8	-701.6	4469.4	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	300.0	89.9	-170.5
OTP	251.5	222.6	-194.1	1.0	544.8	65.7	707.1	
15	0.0	0.0	0.0	0.0	0.0	-29.1	1.0	0.0
	0.0	0.0	0.0	0.0	2.9	-4.0	2.4	
18	2758.8	2525.1	0.0	0.0	0.0	138.8	94.8	0.0
SPC	359.5	608.6	-136.4	0.0	1085.2	61.6	910.9	
19	155.5	317.8	0.0	0.0	0.0	-163.0	0.8	-162.8
SMP	33.6	79.5	-25.3	0.0	9.3	-15.5	4.1	
20	4768.4	2095.4	0.0	0.0	0.0	2410.8	268.0	1440.0
MH	2883.9	603.5	-1938.7	118.8	1238.3	250.7	5089.3	
21	1521.2	1539.7	0.0	0.0	0.0	220.6	92.4	53.0
MP	303.7	539.7	-713.3	0.0	361.5	-324.1	1245.2	
22	1415.2	1588.4	0.0	0.0	0.0	-274.2	90.0	-17.7
UPA	437.7	371.1	-1040.7	0.0	267.5	-228.4	1598.4	
23	5953.6	6958.5	0.0	0.0	0.0	-1334.5	395.4	-1563.3
NSP	1156.9	1441.1	-2786.0	708.5	2301.1	89.9	4031.4	
26	964.0	797.3	14.9	0.0	0.0	76.6	75.2	158.5
DPC	213.8	227.0	-138.8	0.1	186.8	-77.1	389.3	
30	3881.0	4767.5	0.0	0.0	0.0	-984.0	97.5	-731.4
MEC	1258.7	918.0	-372.0	50.0	1007.3	590.7	1079.3	
31	3465.6	3775.5	0.0	0.0	0.0	-399.9	90.0	-279.9
ALTW	686.0	862.7	-241.2	-57.4	527.1	-196.5	845.5	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.2	64.2	0.0	0.0	6.4	-1.4	17.8	
39	256.7	548.0	0.0	0.0	0.0	-307.2	15.9	-305.0
WEPL	52.7	221.1	-200.4	0.0	123.6	46.6	108.9	
40	16547.3	15971.2	8.9	0.0	0.0	331.0	236.1	440.0
MAIN	3533.5	3617.8	-165.3	53.3	2354.0	-105.8	2487.6	
41	49063.0	45964.5	0.9	0.1	0.0	1943.2	1164.3	1953.4
SPP	9780.5	13647.9	-6544.8	529.2	10575.8	-13.8	12739.6	
42	335180.9	334482.9	-3533.4	5.9	0.0	-1469.0	5694.3	-1028.7
EQIV	69630.9	119849.0	-111225.8	-2394.5	18927.7	-76.4	82405.6	
43	22334.8	21869.1	97.6	31.1	0.0	-53.4	390.4	0.0
OH	4172.2	15245.9	-11788.5	421.1	6448.9	73.4	6669.0	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	267.2	179.3	282.0
WERE	1350.6	1383.8	-677.5	0.0	1056.9	-164.8	1864.1	
46	1374.4	1466.0	0.0	0.0	0.0	-120.9	29.3	-117.3
MIPU	393.4	488.7	-260.2	0.0	202.3	-27.2	394.4	
48	738.4	943.0	0.0	0.0	0.0	-243.4	38.8	-242.0
EMDE	189.4	209.0	-51.3	0.0	119.7	-82.2	233.6	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	103.9	66.2	0.0	0.0	15.1	37.8	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1081.4	135.1	-992.0
ASEC	418.7	917.4	-398.3	0.0	970.9	-22.1	892.6	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	352.5	192.7	0.0	0.0	68.7	83.6	145.0	
71	18373.2	19223.7	0.0	0.0	0.0	-1309.2	458.7	414.0
CE	8525.7	7495.2	-3950.9	271.9	3859.8	667.4	7901.9	
76	498.8	415.0	0.0	0.0	0.0	62.8	21.1	67.2
SUNF	67.7	136.7	37.9	0.0	376.7	85.8	183.9	
78	3939.5	3475.7	0.0	0.0	0.0	410.9	52.8	417.3
KCPL	809.7	779.4	-270.4	0.0	531.6	-55.0	887.3	
79	198.3	415.0	0.0	0.0	0.0	-221.6	4.9	-221.0
STJO	-61.3	52.0	0.0	0.0	66.5	-92.3	45.4	
83	0.0	0.0	0.0	0.0	0.0	-4.1	4.1	0.0
	0.0	0.0	0.0	0.0	54.3	2.3	52.0	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-169.2	326.4	-115.0
WUMS	3140.8	3908.3	-2944.2	0.0	1596.9	69.1	3704.4	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.5	0.0
	0.0	0.0	0.0	0.0	12.1	-4.3	15.0	
210	24.1	0.0	0.0	0.0	0.0	-297.2	13.0	0.0
	0.0	0.0	-154.8	0.0	74.1	79.6	74.4	
211	0.0	37.5	0.0	0.0	0.0	-52.3	3.7	0.0
	0.0	6.8	-142.9	0.0	29.7	127.6	38.2	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.8	0.0	0.4	-27.9	1.8	
230	548.0	0.0	0.0	0.0	0.0	492.6	0.6	0.0
	1.4	0.0	-147.0	0.0	1.4	47.0	78.1	
600	517.5	0.0	0.0	0.0	0.0	477.1	1.4	0.0
	134.3	0.0	-24.4	0.1	0.0	66.6	68.3	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507252.3	499920.8	-3411.3	37.8	0.0	0.0	10704.8	5.7
	112445.0	176780.8	-148379.3	123.1	59893.8	0.0	143813.2	

Site 1 (Hettinger)

Case S1C4XXX

UPE-SO04AA.S1C4XXX.SAV;WITH 150 MVA SYNCH.COND. @ M.CITY AREA TOTALS
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	213.6	187.7	162.5
NPPD	534.0	855.6	-773.7	0.0	1338.5	93.0	1697.6	
3	2379.0	2525.4	0.0	0.0	0.0	-179.7	33.2	-91.7
OPPD	767.3	856.9	-70.1	8.4	327.6	-214.3	514.0	
4	0.0	716.0	0.0	0.0	0.0	-728.3	12.3	-727.2
LES	0.0	100.9	-189.3	0.0	57.3	-16.7	162.4	
6	4719.0	2402.8	0.0	0.0	0.0	1993.3	361.9	1576.7
WAPA	761.0	648.1	-1040.4	412.6	3101.2	-668.8	4534.3	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	301.1	88.8	-170.5
OTP	249.7	222.6	-220.3	1.0	544.0	96.6	699.8	
15	0.0	0.0	0.0	0.0	0.0	-29.1	1.0	0.0
	0.0	0.0	0.0	0.0	2.9	-4.1	2.4	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	359.4	608.6	-136.4	0.0	1085.2	61.5	910.9	
19	155.5	317.8	0.0	0.0	0.0	-163.0	0.8	-162.8
SMP	33.5	79.5	-25.1	0.0	9.3	-15.6	4.1	
20	4768.9	2095.4	0.0	0.0	0.0	2411.2	268.1	1440.0
MH	2900.5	603.5	-1938.6	118.8	1238.4	250.9	5105.9	
21	1521.2	1539.7	0.0	0.0	0.0	220.7	92.3	53.0
MP	314.2	539.7	-711.3	0.0	360.9	-323.8	1252.9	
22	1415.2	1588.4	0.0	0.0	0.0	-275.0	90.6	-17.7
UPA	438.7	371.1	-1040.7	0.0	267.5	-231.3	1602.2	
23	6282.5	7008.2	0.0	0.0	0.0	-1051.3	391.6	-1563.3
NSP	1142.0	1455.8	-2785.1	708.0	2231.7	71.9	3950.1	
26	964.0	797.3	14.9	0.0	0.0	77.2	74.6	158.5
DPC	213.8	227.0	-132.2	0.1	186.7	-81.1	386.8	
30	3881.0	4767.5	0.0	0.0	0.0	-983.4	96.9	-731.4
MEC	1238.0	918.0	-372.2	50.2	1007.8	576.0	1073.7	
31	3465.6	3775.5	0.0	0.0	0.0	-399.2	89.2	-279.9
ALTW	684.8	862.7	-241.1	-57.4	527.0	-192.8	840.4	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.2	64.2	0.0	0.0	6.4	-1.5	17.9	
39	256.7	548.0	0.0	0.0	0.0	-307.1	15.8	-305.0
WEPL	52.1	221.1	-200.3	0.0	123.6	46.4	108.4	
40	16547.3	15964.6	8.9	0.0	0.0	337.7	236.0	440.0
MAIN	3528.9	3616.3	-165.3	53.3	2354.1	-107.2	2485.9	
41	49063.0	45964.5	0.9	0.1	0.0	1943.8	1163.8	1953.4
SPP	9773.7	13647.9	-6544.9	529.3	10576.1	-14.2	12733.8	
42	335202.1	334482.9	-3533.4	5.9	0.0	-1447.7	5694.2	-1028.7
EQIV	69625.3	119849.0	-111226.0	-2394.5	18927.7	-79.9	82404.2	
43	22334.8	21869.1	97.6	31.1	0.0	-53.8	390.8	0.0
OH	4177.4	15245.9	-11788.1	421.0	6446.9	73.5	6671.9	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	267.6	178.8	282.0
WERE	1347.7	1383.8	-677.6	0.0	1057.1	-164.6	1861.3	
46	1374.4	1466.0	0.0	0.0	0.0	-120.8	29.2	-117.3
MIPU	392.8	488.7	-260.3	0.0	202.3	-26.9	393.6	
48	738.4	943.0	0.0	0.0	0.0	-243.4	38.8	-242.0
EMDE	189.4	209.0	-51.3	0.0	119.6	-82.2	233.5	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	103.3	66.2	0.0	0.0	15.1	37.3	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1081.0	134.7	-992.0
ASEC	416.8	917.4	-398.1	0.0	971.0	-21.1	889.8	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	352.5	192.7	0.0	0.0	68.7	83.6	145.0	
71	18373.2	19215.7	0.0	0.0	0.0	-1300.4	457.9	414.0
CE	8510.3	7492.1	-3952.1	271.9	3860.3	667.1	7891.6	
76	498.8	415.0	0.0	0.0	0.0	62.9	20.9	67.2
SUNF	65.5	136.7	38.0	0.0	377.1	85.7	182.2	
78	3939.5	3475.7	0.0	0.0	0.0	411.2	52.6	417.3
KCPL	806.6	779.4	-270.5	0.0	531.7	-56.9	886.4	
79	198.3	415.0	0.0	0.0	0.0	-221.5	4.8	-221.0
STJO	-62.1	52.0	0.0	0.0	66.5	-92.1	44.6	
83	0.0	0.0	0.0	0.0	0.0	-4.1	4.1	0.0
	0.0	0.0	0.0	0.0	54.3	2.9	51.5	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	15.9	14.5	
100	11030.9	10873.2	-0.4	0.8	0.0	-167.6	325.0	-115.0
WUMS	3127.6	3908.3	-2945.6	0.0	1597.5	69.8	3692.5	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.5	0.0
	0.0	0.0	0.0	0.0	12.1	-4.3	15.0	
210	24.1	0.0	0.0	0.0	0.0	-297.5	13.2	0.0
	0.0	0.0	-144.7	0.0	73.3	67.1	76.1	
211	0.0	37.5	0.0	0.0	0.0	-52.3	3.7	0.0
	0.0	6.8	-142.9	0.0	29.8	127.6	38.2	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.7	0.0	0.4	-27.8	1.8	
230	548.0	0.0	0.0	0.0	0.0	492.5	0.7	0.0
	-4.8	0.0	-146.9	0.0	1.4	40.5	78.3	
600	517.5	0.0	0.0	0.0	0.0	477.1	1.4	0.0
	118.2	0.0	-24.4	0.1	0.0	50.6	68.1	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507252.9	499955.9	-3411.3	37.8	0.0	0.0	10670.4	5.7
	112337.3	176790.9	-148555.6	122.8	59762.7	0.0	143741.8	

Site 1 (Hettinger)

Case S1C5XX1

UPE-SO04AA.S1C5XX1.SAV;SUMMER;OP LD;SYSTEM INTACT AREA TOTALS
ND=2934,MH=2169,MW=1484,OHMH=-198,OHMP=149,EWTW=-122,BD=167 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	220.4	180.9	162.5
NPPD	486.0	855.6	-767.6	0.0	1352.0	100.0	1650.0	
3	2379.0	2525.4	0.0	0.0	0.0	-179.4	33.0	-91.7
OPPD	759.8	856.9	-70.2	8.4	328.2	-218.8	511.7	
4	0.0	716.0	0.0	0.0	0.0	-728.1	12.1	-727.2
LES	0.0	100.9	-191.0	0.0	57.9	-13.3	161.2	
6	5469.0	2402.8	0.0	0.0	0.0	2758.7	346.5	1576.7
WAPA	412.7	648.1	-756.4	486.9	3522.2	-597.1	4177.1	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	305.2	84.7	-170.5
OTP	255.3	222.6	-217.0	1.0	696.3	190.7	760.2	
15	0.0	0.0	0.0	0.0	0.0	-29.0	1.0	0.0
	0.0	0.0	0.0	0.0	2.9	-3.8	2.2	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	349.9	608.6	-136.4	0.0	1085.2	52.0	910.8	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	32.0	79.5	-25.3	0.0	9.3	-17.1	4.2	
20	4771.0	2095.4	0.0	0.0	0.0	2412.1	269.3	1440.0
MH	2883.5	603.5	-1938.9	118.7	1237.9	229.1	5110.5	
21	1521.2	1539.7	0.0	0.0	0.0	222.4	90.5	53.0
MP	300.0	539.7	-681.9	0.0	362.2	-353.4	1240.3	
22	1415.2	1588.4	0.0	0.0	0.0	-273.3	88.6	-17.7
UPA	434.9	371.1	-1043.4	0.0	268.9	-220.8	1591.9	
23	5581.6	7130.3	0.0	0.0	0.0	-1866.7	384.8	-1563.3
NSP	931.0	1477.3	-2917.3	711.6	2542.1	166.7	4061.9	
26	964.0	797.3	14.9	0.0	0.0	77.3	74.6	158.5
DPC	176.4	227.0	-139.2	0.1	187.9	-110.4	386.8	
30	3881.0	4767.5	0.0	0.0	0.0	-980.6	94.1	-731.4
MEC	1189.2	918.0	-372.6	50.1	1008.3	550.0	1051.9	
31	3465.6	3775.5	0.0	0.0	0.0	-398.6	88.7	-279.9
ALTW	683.5	862.7	-233.6	-57.5	526.9	-203.4	842.2	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.2	64.2	0.0	0.0	6.4	-1.5	17.8	
39	256.7	548.0	0.0	0.0	0.0	-307.0	15.7	-305.0
WEPL	51.9	221.1	-199.8	0.0	123.6	46.5	107.6	
40	16547.3	15932.6	8.9	0.0	0.0	370.4	235.4	440.0
MAIN	3513.5	3609.1	-165.3	53.3	2354.5	-108.4	2479.3	
41	49063.0	45964.3	0.9	0.1	0.0	1944.1	1163.5	1953.4
SPP	9770.6	13647.9	-6545.1	529.2	10576.3	-16.2	12732.9	
42	335154.2	334482.9	-3533.4	5.9	0.0	-1495.5	5694.1	-1028.7
EQIV	69624.0	119849.0	-111226.0	-2394.5	18927.7	-82.0	82404.7	
43	22334.8	21869.1	97.6	31.1	0.0	-54.1	391.1	0.0
OH	4178.9	15245.9	-11788.2	421.0	6447.4	73.7	6673.6	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	268.2	178.3	282.0
WERE	1342.5	1383.8	-677.7	0.0	1057.6	-166.8	1858.9	
46	1374.4	1466.0	0.0	0.0	0.0	-120.6	29.1	-117.3
MIPU	391.2	488.7	-260.3	0.0	202.4	-26.9	392.2	
48	738.4	943.0	0.0	0.0	0.0	-243.3	38.7	-242.0
EMDE	189.4	209.0	-51.2	0.0	119.7	-81.9	233.2	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	102.6	66.2	0.0	0.0	15.1	36.6	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1080.7	134.4	-992.0
ASEC	417.5	917.4	-398.4	0.0	971.3	-18.8	888.7	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	352.4	192.7	0.0	0.0	68.8	83.5	145.0	
71	18373.2	19176.6	0.0	0.0	0.0	-1259.1	455.7	414.0
CE	8452.6	7476.8	-3957.9	271.9	3863.2	669.4	7855.6	
76	498.8	415.0	0.0	0.0	0.0	63.2	20.6	67.2
SUNF	61.6	136.7	38.2	0.0	377.8	85.0	179.5	
78	3939.5	3475.7	0.0	0.0	0.0	411.5	52.3	417.3
KCPL	803.4	779.4	-270.5	0.0	531.9	-59.0	885.3	
79	198.3	415.0	0.0	0.0	0.0	-221.5	4.8	-221.0
STJO	-63.2	52.0	0.0	0.0	66.6	-92.4	43.8	
83	0.0	0.0	0.0	0.0	0.0	-3.9	3.9	0.0
	0.0	0.0	0.0	0.0	54.9	5.6	49.3	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-166.2	323.6	-115.0
WUMS	3074.6	3908.3	-2953.5	0.0	1601.1	42.7	3678.2	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-295.8	11.6	0.0
	0.0	0.0	-151.4	0.0	74.3	84.2	66.6	
211	0.0	37.5	0.0	0.0	0.0	-52.1	3.4	0.0
	0.0	6.8	-142.9	0.0	28.5	127.8	36.8	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.8	0.0	0.4	-27.9	1.7	
230	548.0	0.0	0.0	0.0	0.0	492.1	0.7	0.0
	-66.5	0.0	-147.6	0.0	1.4	-23.7	81.1	
600	517.5	0.0	0.0	0.0	0.0	477.2	1.3	0.0
	46.1	0.0	-22.0	0.1	0.0	-21.2	65.4	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507256.2	500006.8	-3411.4	37.8	0.0	0.0	10622.8	5.7
	111316.3	176790.0	-148388.5	200.3	60674.3	0.0	143388.0	

Site 1 (Hettinger)

Case S1C5XXA

UPE-SO04AA.S1C5XXA.SAV;SAME AS S1C5XXX W/70 MVR SVCS@WIND G AREA TOTALS
ND=2080,MH=2173,MW=1486,OHMH=-196,OHMP=150,EWTW=-120,BD=166 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	222.1	179.3	162.5
NPPD	469.2	855.6	-770.2	0.0	1354.9	100.8	1637.9	
3	2379.0	2525.4	0.0	0.0	0.0	-179.3	32.9	-91.7
OPPD	757.6	856.9	-70.2	8.4	328.3	-219.9	510.8	
4	0.0	716.0	0.0	0.0	0.0	-728.1	12.1	-727.2
LES	0.0	100.9	-191.3	0.0	58.0	-12.1	160.6	
6	5469.0	2402.8	0.0	0.0	0.0	2754.6	350.6	1576.7
WAPA	583.8	648.1	-769.5	485.1	3365.4	-629.5	4238.7	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	302.7	87.2	-170.5
OTP	294.0	222.6	-216.1	1.0	692.0	198.7	785.7	
15	0.0	0.0	0.0	0.0	0.0	-29.0	1.0	0.0
	0.0	0.0	0.0	0.0	2.9	-3.9	2.3	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	350.7	608.6	-136.4	0.0	1085.2	52.5	911.2	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	31.9	79.5	-25.3	0.0	9.3	-17.2	4.2	
20	4770.9	2095.4	0.0	0.0	0.0	2412.4	269.0	1440.0
MH	2894.7	603.5	-1938.9	118.7	1237.9	240.7	5109.9	
21	1521.2	1539.7	0.0	0.0	0.0	222.2	90.8	53.0
MP	307.7	539.7	-681.2	0.0	361.9	-347.6	1241.1	
22	1415.2	1588.4	0.0	0.0	0.0	-274.1	89.3	-17.7
UPA	438.3	371.1	-1042.6	0.0	268.4	-223.2	1596.4	
23	5581.6	7169.9	0.0	0.0	0.0	-1908.7	387.6	-1563.3
NSP	965.8	1485.7	-2914.8	710.4	2537.3	147.0	4102.2	
26	964.0	797.3	14.8	0.0	0.0	77.7	74.2	158.5
DPC	174.5	227.0	-139.3	0.1	188.0	-110.9	385.4	
30	3881.0	4767.5	0.0	0.0	0.0	-979.2	92.7	-731.4
MEC	1165.3	918.0	-372.9	50.1	1008.8	537.9	1041.1	
31	3465.6	3775.5	0.0	0.0	0.0	-397.9	88.0	-279.9
ALTW	680.1	862.7	-233.6	-57.5	527.1	-203.7	839.1	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.1	64.2	0.0	0.0	6.4	-1.5	17.8	
39	256.7	548.0	0.0	0.0	0.0	-306.9	15.6	-305.0
WEPL	51.3	221.1	-199.9	0.0	123.6	46.6	107.1	
40	16547.3	15923.8	8.9	0.0	0.0	379.4	235.1	440.0
MAIN	3507.4	3607.1	-165.3	53.3	2354.6	-110.1	2477.0	
41	49063.0	45964.3	0.9	0.1	0.0	1944.4	1163.3	1953.4
SPP	9802.4	13647.9	-6510.6	529.2	10573.4	-17.2	12728.7	
42	335174.9	334482.9	-3533.4	5.9	0.0	-1474.6	5693.9	-1028.7
EQIV	69617.8	119849.0	-111226.2	-2394.5	18927.8	-86.1	82403.1	
43	22334.8	21869.1	97.6	31.1	0.0	-53.5	390.5	0.0
OH	4174.5	15245.9	-11788.6	421.1	6448.0	74.0	6670.1	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	268.8	177.7	282.0
WERE	1339.0	1383.8	-677.9	0.0	1057.8	-166.4	1855.3	
46	1374.4	1466.0	0.0	0.0	0.0	-120.5	28.9	-117.3
MIPU	390.1	488.7	-260.4	0.0	202.4	-26.8	391.0	
48	738.4	943.0	0.0	0.0	0.0	-243.3	38.7	-242.0
EMDE	189.3	209.0	-51.2	0.0	119.7	-81.6	232.9	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	102.1	66.2	0.0	0.0	15.1	36.1	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1080.1	133.9	-992.0
ASEC	415.6	917.4	-398.4	0.0	971.5	-16.7	884.9	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.6	-119.0
SPRM	352.3	192.7	0.0	0.0	68.8	83.5	144.9	
71	18373.2	19165.8	0.0	0.0	0.0	-1247.4	454.7	414.0
CE	8432.2	7472.6	-3959.8	271.9	3864.1	669.8	7841.8	
76	498.8	415.0	0.0	0.0	0.0	63.4	20.4	67.2
SUNF	59.8	136.7	38.2	0.0	378.2	85.3	177.8	
78	3939.5	3475.7	0.0	0.0	0.0	411.8	51.9	417.3
KCPL	800.6	779.4	-270.6	0.0	531.9	-60.8	884.4	
79	198.3	415.0	0.0	0.0	0.0	-221.4	4.7	-221.0
STJO	-63.7	52.0	0.0	0.0	66.6	-91.6	42.5	
83	0.0	0.0	0.0	0.0	0.0	-3.9	3.9	0.0
	0.0	0.0	0.0	0.0	54.9	5.8	49.0	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-165.2	322.5	-115.0
WUMS	3062.8	3908.3	-2955.0	0.0	1601.7	41.7	3669.3	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-296.2	12.0	0.0
	0.0	0.0	-150.8	0.0	74.0	81.0	68.8	
211	0.0	37.5	0.0	0.0	0.0	-52.1	3.5	0.0
	0.0	6.8	-142.9	0.0	28.5	127.4	37.1	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.7	0.0	0.4	-27.8	1.7	
230	548.0	0.0	0.0	0.0	0.0	491.9	0.7	0.0
	-57.6	0.0	-147.4	0.0	1.4	-14.5	80.6	
600	517.5	0.0	0.0	0.0	0.0	477.2	1.3	0.0
	86.2	0.0	-22.7	0.1	0.0	19.4	65.7	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507276.9	500026.7	-3411.4	37.8	0.0	0.0	10623.7	5.7
	111554.4	176792.1	-148369.8	197.3	60511.8	0.0	143446.0	

Site 2 (Jamestown)

Case S2C3XX2

UPE-SO04AA.S2C3XX2.SAV;SUMMER;OP LD;SYSTEM INTACT AREA TOTALS
ND=3080,MH=2174,MW=1482,OHMH=-197,OHMP=150,EWTW=-120,BD=166 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	229.9	171.4	162.5
NPPD	404.6	855.6	-775.4	0.0	1362.1	100.5	1586.0	
3	2379.0	2525.4	0.0	0.0	0.0	-181.9	35.5	-91.7
OPPD	757.7	856.9	-70.2	8.4	328.3	-242.6	533.5	
4	0.0	716.0	0.0	0.0	0.0	-727.6	11.6	-727.2
LES	0.0	100.9	-192.0	0.0	58.2	-7.6	156.9	
6	5030.3	2364.1	0.0	0.0	0.0	2405.7	299.5	1576.7
WAPA	544.3	624.1	-718.7	305.5	2850.7	-66.8	3274.6	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1733.0	975.3	0.0	0.0	0.0	685.2	104.7	-170.5
OTP	28.5	222.6	-380.9	1.0	552.9	21.5	723.1	
15	0.0	0.0	0.0	0.0	0.0	-29.2	1.1	0.0
	0.0	0.0	0.0	0.0	2.9	-4.2	2.6	
18	2758.8	2525.1	0.0	0.0	0.0	139.0	94.7	0.0
SPC	344.5	608.6	-136.4	0.0	1085.2	49.1	908.4	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	35.0	79.5	-25.3	0.0	9.3	-14.4	4.4	
20	4770.4	2095.4	0.0	0.0	0.0	2414.5	266.4	1440.0
MH	2945.0	603.5	-1939.1	118.9	1240.0	299.8	5103.5	
21	1521.2	1539.7	0.0	0.0	0.0	219.0	94.0	53.0
MP	301.9	539.7	-757.8	0.0	361.9	-300.2	1264.3	
22	1415.2	1588.4	0.0	0.0	0.0	-267.7	83.4	-17.7
UPA	420.2	371.1	-1042.4	0.0	269.7	-209.9	1566.2	
23	5593.4	6986.4	0.0	0.0	0.0	-1739.7	412.7	-1563.3
NSP	1095.3	1447.0	-2781.9	1427.8	3117.6	-309.1	4456.2	
26	964.0	797.3	14.9	0.0	0.0	75.4	76.4	158.5
DPC	220.9	227.0	-138.6	0.1	186.7	-75.1	394.1	
30	3881.0	4767.5	0.0	0.0	0.0	-985.4	98.9	-731.4
MEC	1218.9	918.0	-371.9	50.6	1007.6	543.9	1085.8	
31	3465.6	3775.5	0.0	0.0	0.0	-409.5	99.6	-279.9
ALTW	693.5	862.7	-241.5	-57.2	592.5	-236.4	958.5	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.3	64.2	0.0	0.0	6.4	-1.3	17.8	
39	256.7	548.0	0.0	0.0	0.0	-306.8	15.6	-305.0
WEPL	51.1	221.1	-199.8	0.0	123.6	46.5	106.9	
40	16547.3	15969.9	8.9	0.0	0.0	332.2	236.2	440.0
MAIN	3536.7	3617.5	-165.3	53.3	2353.9	-103.3	2488.5	
41	49063.0	45964.5	0.9	0.1	0.0	1943.2	1164.4	1953.4
SPP	9784.1	13647.9	-6544.7	529.2	10575.7	-15.2	12744.7	
42	335106.4	334482.9	-3533.4	5.9	0.0	-1543.6	5694.4	-1028.7
EQIV	69640.6	119849.0	-111225.6	-2394.5	18927.6	-69.6	82408.7	
43	22334.8	21869.1	97.6	31.1	0.0	-53.4	390.4	0.0
OH	4173.8	15245.9	-11788.5	421.0	6447.5	73.9	6668.9	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	267.4	179.1	282.0
WERE	1347.8	1383.8	-677.7	0.0	1057.5	-169.9	1867.1	
46	1374.4	1466.0	0.0	0.0	0.0	-120.9	29.4	-117.3
MIPU	393.4	488.7	-260.2	0.0	202.2	-27.5	394.7	
48	738.4	943.0	0.0	0.0	0.0	-243.5	38.9	-242.0
EMDE	189.6	209.0	-51.3	0.0	119.6	-82.5	233.9	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	103.6	66.2	0.0	0.0	15.1	37.6	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1082.4	136.1	-992.0
ASEC	423.2	917.4	-397.9	0.0	970.8	-24.4	898.9	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	352.8	192.7	0.0	0.0	68.7	83.6	145.3	
71	18373.2	19222.1	0.0	0.0	0.0	-1308.6	459.6	414.0
CE	8535.1	7494.6	-3950.7	272.0	3859.6	668.8	7910.2	
76	498.8	415.0	0.0	0.0	0.0	63.4	20.5	67.2
SUNF	58.7	136.7	38.3	0.0	378.4	83.7	178.4	
78	3939.5	3475.7	0.0	0.0	0.0	410.4	53.3	417.3
KCPL	808.2	779.4	-270.4	0.0	531.8	-56.9	887.7	
79	198.3	415.0	0.0	0.0	0.0	-221.6	4.9	-221.0
STJO	-63.4	52.0	0.0	0.0	66.6	-95.8	47.0	
83	0.0	0.0	0.0	0.0	0.0	-4.2	4.2	0.0
	0.0	0.0	0.0	0.0	54.3	1.2	53.1	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-171.8	329.2	-115.0
WUMS	3160.9	3908.3	-2943.5	0.0	1596.0	67.2	3724.8	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-298.1	13.9	0.0
	0.0	0.0	-149.2	0.0	73.3	69.2	78.4	
211	0.0	37.5	0.0	0.0	0.0	-52.6	3.9	0.0
	0.0	6.8	-142.9	0.0	29.5	125.4	40.2	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	22.6	0.0	0.4	-28.6	1.7	
230	548.0	0.0	0.0	0.0	0.0	492.6	0.7	0.0
	-4.4	0.0	-146.6	0.0	1.4	40.6	78.2	
600	517.5	0.0	0.0	0.0	0.0	476.9	1.6	0.0
	-16.7	0.0	-25.4	0.1	0.0	-92.3	77.1	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507181.0	499907.1	-3411.3	37.8	0.0	0.0	10647.1	5.7
	111664.3	176761.8	-148450.8	736.0	60500.9	0.0	143118.2	

Site 2 (Jamestown)

Case S2C4XX1

UPE-SO04AA.S2C4XX1.SAV;SUMMER;OP LD;SYSTEM INTACT AREA TOTALS
ND=3039,MH=2172,MW=1487,OHMH=-197,OHMP=150,EWTW=-121,BD=168 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	224.6	176.7	162.5
NPPD	444.2	855.6	-773.2	0.0	1356.7	100.2	1618.4	
3	2379.0	2525.4	0.0	0.0	0.0	-179.4	32.9	-91.7
OPPD	756.8	856.9	-70.2	8.4	328.4	-220.8	510.9	
4	0.0	716.0	0.0	0.0	0.0	-728.0	12.0	-727.2
LES	0.0	100.9	-191.6	0.0	58.1	-11.3	160.0	
6	5030.3	2364.1	0.0	0.0	0.0	2350.9	354.4	1576.7
WAPA	379.5	624.1	-883.3	416.4	3136.2	-459.8	3842.0	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1733.0	975.3	0.0	0.0	0.0	675.7	114.2	-170.5
OTP	35.1	222.6	-464.6	1.0	552.2	6.0	828.3	
15	0.0	0.0	0.0	0.0	0.0	-29.0	0.9	0.0
	0.0	0.0	0.0	0.0	2.9	-3.7	2.1	
18	2758.8	2525.1	0.0	0.0	0.0	139.0	94.7	0.0
SPC	345.8	608.6	-136.4	0.0	1085.2	49.4	909.4	
19	155.5	317.8	0.0	0.0	0.0	-163.0	0.8	-162.8
SMP	33.9	79.5	-25.3	0.0	9.3	-15.2	4.1	
20	4770.9	2095.4	0.0	0.0	0.0	2414.9	266.5	1440.0
MH	2952.9	603.5	-1939.0	118.9	1239.6	305.1	5105.7	
21	1521.2	1539.7	0.0	0.0	0.0	219.4	93.6	53.0
MP	296.3	539.7	-758.4	0.0	362.5	-300.5	1260.4	
22	1415.2	1588.4	0.0	0.0	0.0	-269.6	84.9	-17.7
UPA	425.2	371.1	-1039.6	0.0	269.0	-219.5	1577.3	
23	5623.4	7144.1	0.0	0.0	0.0	-1874.1	420.4	-1563.3
NSP	1158.4	1480.2	-2781.4	707.4	2421.8	7.6	4193.7	
26	964.0	797.3	14.9	0.0	0.0	76.9	75.0	158.5
DPC	212.4	227.0	-138.8	0.1	186.9	-77.5	388.4	
30	3881.0	4767.5	0.0	0.0	0.0	-978.5	92.0	-731.4
MEC	1160.4	918.0	-373.0	50.0	1008.9	538.1	1036.1	
31	3465.6	3775.5	0.0	0.0	0.0	-398.0	88.1	-279.9
ALTW	680.0	862.7	-233.8	-57.4	527.1	-203.9	839.6	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.1	64.2	0.0	0.0	6.4	-1.5	17.8	
39	256.7	548.0	0.0	0.0	0.0	-306.8	15.5	-305.0
WEPL	50.7	221.1	-199.9	0.0	123.7	46.4	106.8	
40	16547.3	15930.1	8.9	0.0	0.0	373.0	235.2	440.0
MAIN	3509.4	3608.6	-165.3	53.4	2354.6	-110.0	2477.6	
41	49063.0	45964.3	0.9	0.1	0.0	1945.0	1162.7	1953.4
SPP	9761.2	13647.9	-6545.0	529.3	10576.6	-16.4	12723.8	
42	335179.5	334482.9	-3533.4	5.9	0.0	-1469.8	5693.7	-1028.7
EQIV	69616.0	119849.0	-111226.2	-2394.5	18927.8	-86.0	82401.1	
43	22334.8	21869.1	97.6	31.1	0.0	-53.6	390.7	0.0
OH	4174.8	15245.9	-11788.4	421.0	6447.7	72.9	6671.0	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	269.0	177.5	282.0
WERE	1336.0	1383.8	-677.9	0.0	1058.0	-167.6	1853.8	
46	1374.4	1466.0	0.0	0.0	0.0	-120.4	28.9	-117.3
MIPU	390.1	488.7	-260.4	0.0	202.4	-26.4	390.6	
48	738.4	943.0	0.0	0.0	0.0	-243.3	38.7	-242.0
EMDE	190.0	209.0	-51.3	0.0	119.5	-81.4	233.1	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	102.0	66.2	0.0	0.0	15.1	36.0	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1080.1	133.8	-992.0
ASEC	415.4	917.4	-398.0	0.0	971.4	-17.1	884.7	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	352.5	192.7	0.0	0.0	68.8	83.5	145.1	
71	18373.2	19173.6	0.0	0.0	0.0	-1255.2	454.8	414.0
CE	8439.3	7475.7	-3958.9	271.9	3863.7	671.4	7843.0	
76	498.8	415.0	0.0	0.0	0.0	63.5	20.3	67.2
SUNF	57.7	136.7	38.3	0.0	378.6	84.6	176.7	
78	3939.5	3475.7	0.0	0.0	0.0	411.9	51.9	417.3
KCPL	799.5	779.4	-270.6	0.0	531.9	-61.8	884.3	
79	198.3	415.0	0.0	0.0	0.0	-221.4	4.6	-221.0
STJO	-63.9	52.0	0.0	0.0	66.6	-91.4	42.2	
83	0.0	0.0	0.0	0.0	0.0	-4.1	4.1	0.0
	0.0	0.0	0.0	0.0	54.4	2.0	52.4	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-167.5	324.9	-115.0
WUMS	3117.8	3908.3	-2946.4	0.0	1597.8	61.3	3692.3	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-295.4	11.1	0.0
	0.0	0.0	-151.2	0.0	74.4	86.7	64.0	
211	0.0	37.5	0.0	0.0	0.0	-52.6	3.9	0.0
	0.0	6.8	-142.9	0.0	29.4	125.4	40.1	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	22.2	0.0	0.4	-28.3	1.8	
230	548.0	0.0	0.0	0.0	0.0	492.1	0.6	0.0
	21.8	0.0	-146.4	0.0	1.4	67.2	77.4	
600	517.5	0.0	0.0	0.0	0.0	477.2	1.3	0.0
	2.7	0.0	-22.4	0.1	0.0	-64.9	66.2	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507284.6	499976.2	-3411.3	37.8	0.0	0.0	10681.7	5.7
	111332.9	176767.1	-148699.0	125.8	60031.1	0.0	143169.8	

Site 2 (Jamestown)

Case S2C4XX3

UPE-SO04AA.S2C4XX3.SAV; LET PHASE SHIFTER AND PRAIRIE SVC AREA TOTALS
ND=3038,MH=2173,MW=1479,OHMH=-198,OHMP=150,EWTW=-121,BD=168 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	220.3	181.0	162.5
NPPD	486.5	855.6	-769.1	0.0	1351.2	101.1	1650.1	
3	2379.0	2525.4	0.0	0.0	0.0	-179.6	33.1	-91.7
OPPD	759.9	856.9	-70.2	8.4	328.2	-220.1	513.1	
4	0.0	716.0	0.0	0.0	0.0	-728.1	12.1	-727.2
LES	0.0	100.9	-191.0	0.0	57.9	-12.7	160.7	
6	5030.3	2364.1	0.0	0.0	0.0	2331.3	373.9	1576.7
WAPA	518.5	624.1	-932.5	414.9	3118.0	-541.9	4095.6	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1733.0	975.3	0.0	0.0	0.0	654.5	135.4	-170.5
OTP	59.5	222.6	-606.9	1.0	544.3	20.2	972.8	
15	0.0	0.0	0.0	0.0	0.0	-29.4	1.4	0.0
	0.0	0.0	0.0	0.0	2.8	-4.8	3.1	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	349.3	608.6	-136.4	0.0	1085.1	50.7	911.4	
19	155.5	317.8	0.0	0.0	0.0	-163.0	0.8	-162.8
SMP	33.3	79.5	-25.3	0.0	9.3	-15.7	4.1	
20	4770.8	2095.4	0.0	0.0	0.0	2407.5	273.7	1440.0
MH	2905.6	603.5	-1939.3	118.6	1235.8	198.7	5161.3	
21	1521.2	1539.7	0.0	0.0	0.0	221.3	91.7	53.0
MP	274.8	539.7	-762.5	0.0	364.0	-300.3	1244.3	
22	1415.2	1588.4	0.0	0.0	0.0	-268.4	83.8	-17.7
UPA	416.6	371.1	-1040.5	0.0	269.6	-213.8	1564.4	
23	5623.4	7076.1	0.0	0.0	0.0	-1786.4	400.2	-1563.3
NSP	1115.6	1465.9	-2792.6	715.5	2432.6	143.4	4043.3	
26	964.0	797.3	14.9	0.0	0.0	77.4	74.4	158.5
DPC	208.1	227.0	-139.0	0.1	187.1	-79.2	386.2	
30	3881.0	4767.5	0.0	0.0	0.0	-981.5	95.0	-731.4
MEC	1210.4	918.0	-372.4	50.0	1008.0	563.7	1059.0	
31	3465.6	3775.5	0.0	0.0	0.0	-398.7	88.8	-279.9
ALTW	682.1	862.7	-233.7	-57.4	527.0	-202.5	840.0	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.2	64.2	0.0	0.0	6.4	-1.5	17.8	
39	256.7	548.0	0.0	0.0	0.0	-306.9	15.7	-305.0
WEPL	51.7	221.1	-199.8	0.0	123.6	46.4	107.6	
40	16547.3	15945.3	8.9	0.0	0.0	357.5	235.6	440.0
MAIN	3518.8	3612.0	-165.3	53.3	2354.4	-108.3	2481.6	
41	49063.0	45964.4	0.9	0.1	0.0	1944.3	1163.3	1953.4
SPP	9768.8	13647.9	-6544.8	529.3	10576.3	-14.9	12729.5	
42	335186.6	334482.9	-3533.4	5.9	0.0	-1463.0	5694.0	-1028.7
EQIV	69621.5	119849.0	-111226.1	-2394.5	18927.8	-82.7	82403.4	
43	22334.8	21869.1	97.6	31.1	0.0	-53.3	390.3	0.0
OH	4170.4	15245.9	-11788.8	421.1	6448.8	72.7	6668.2	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	268.3	178.1	282.0
WERE	1340.2	1383.8	-677.7	0.0	1057.7	-167.6	1857.5	
46	1374.4	1466.0	0.0	0.0	0.0	-120.6	29.1	-117.3
MIPU	391.5	488.7	-260.3	0.0	202.3	-26.7	392.2	
48	738.4	943.0	0.0	0.0	0.0	-243.4	38.8	-242.0
EMDE	190.1	209.0	-51.2	0.0	119.5	-81.8	233.5	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	102.7	66.2	0.0	0.0	15.1	36.7	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1080.7	134.4	-992.0
ASEC	416.6	917.4	-397.9	0.0	971.2	-19.7	888.1	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	352.7	192.7	0.0	0.0	68.7	83.6	145.2	
71	18373.2	19192.1	0.0	0.0	0.0	-1275.3	456.3	414.0
CE	8472.8	7482.9	-3955.7	271.9	3862.2	669.0	7866.9	
76	498.8	415.0	0.0	0.0	0.0	63.3	20.6	67.2
SUNF	60.6	136.7	38.2	0.0	378.0	84.6	179.2	
78	3939.5	3475.7	0.0	0.0	0.0	411.5	52.3	417.3
KCPL	803.0	779.4	-270.5	0.0	531.8	-59.7	885.6	
79	198.3	415.0	0.0	0.0	0.0	-221.5	4.7	-221.0
STJO	-63.1	52.0	0.0	0.0	66.6	-92.1	43.6	
83	0.0	0.0	0.0	0.0	0.0	-4.1	4.1	0.0
	0.0	0.0	0.0	0.0	54.6	2.7	51.9	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-167.0	324.3	-115.0
WUMS	3110.8	3908.3	-2947.3	0.0	1598.3	61.6	3686.4	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.5	0.0
	0.0	0.0	0.0	0.0	12.1	-4.3	15.0	
210	24.1	0.0	0.0	0.0	0.0	-299.6	15.4	0.0
	0.0	0.0	-143.3	0.0	72.7	54.1	86.9	
211	0.0	37.5	0.0	0.0	0.0	-52.1	3.5	0.0
	0.0	6.8	-142.9	0.0	30.0	129.5	36.6	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	22.9	0.0	0.4	-29.0	1.8	
230	548.0	0.0	0.0	0.0	0.0	492.3	0.6	0.0
	-20.2	0.0	-147.5	0.0	1.4	25.0	78.8	
600	517.5	0.0	0.0	0.0	0.0	477.1	1.4	0.0
	78.0	0.0	-24.5	0.1	0.0	10.4	68.2	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507291.6	499942.0	-3411.3	37.8	0.0	0.0	10722.9	5.7
	111565.9	176763.4	-148893.8	132.3	60003.8	0.0	143567.5	

Site 3 (Minot)

Case S3C2X1A

UPE-SO04AA.S3C2X1A.SAV; S3C2XX1 + SVC AT WIND TERMINAL AREA TOTALS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	217.2	184.1	162.5
NPPD	513.3	855.6	-777.7	0.0	1345.9	108.7	1672.6	
3	2379.0	2525.4	0.0	0.0	0.0	-179.7	33.3	-91.7
OPPD	762.6	856.9	-70.1	8.4	328.0	-219.1	514.5	
4	0.0	716.0	0.0	0.0	0.0	-728.1	12.1	-727.2
LES	0.0	100.9	-190.6	0.0	57.7	-13.6	161.0	
6	4430.3	2364.1	0.0	0.0	0.0	1718.7	386.5	1576.7
WAPA	991.3	624.1	-652.6	412.6	3006.8	-664.6	4302.4	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	258.4	131.5	-170.5
OTP	281.6	222.6	-320.3	1.0	717.6	-136.0	1237.8	
15	0.0	0.0	0.0	0.0	0.0	-29.2	1.1	0.0
	0.0	0.0	0.0	0.0	2.9	-4.2	2.5	
18	2758.8	2525.1	0.0	0.0	0.0	138.8	94.8	0.0
SPC	356.6	608.6	-136.4	0.0	1085.2	56.9	912.6	
19	155.5	317.8	0.0	0.0	0.0	-163.0	0.8	-162.8
SMP	33.5	79.5	-25.1	0.0	9.3	-15.7	4.1	
20	4771.0	2095.4	0.0	0.0	0.0	2414.0	267.4	1440.0
MH	2965.4	603.5	-1939.3	118.7	1238.4	308.5	5113.8	
21	1521.2	1539.7	0.0	0.0	0.0	219.0	94.0	53.0
MP	328.8	539.7	-707.8	0.0	359.1	-327.3	1265.6	
22	2415.2	1588.4	0.0	0.0	0.0	720.4	95.1	-17.7
UPA	-38.0	371.1	-1666.2	0.0	266.8	-222.9	1741.8	
23	5716.6	7086.5	0.0	0.0	0.0	-1720.6	417.3	-1563.3
NSP	1226.4	1468.1	-2776.2	706.0	2418.2	10.7	4263.3	
26	964.0	797.3	14.9	0.0	0.0	76.6	75.2	158.5
DPC	217.2	227.0	-138.6	0.1	186.7	-74.2	389.4	
30	3881.0	4767.5	0.0	0.0	0.0	-982.4	95.9	-731.4
MEC	1226.6	918.0	-372.3	50.0	1007.8	572.6	1066.0	
31	3465.6	3775.5	0.0	0.0	0.0	-399.5	89.6	-279.9
ALTW	685.2	862.7	-233.7	-57.4	527.0	-203.4	844.1	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.2	64.2	0.0	0.0	6.4	-1.5	17.8	
39	256.7	548.0	0.0	0.0	0.0	-307.1	15.8	-305.0
WEPL	52.6	221.1	-199.7	0.0	123.5	46.5	108.1	
40	16547.3	15942.4	8.9	0.0	0.0	360.3	235.6	440.0
MAIN	3520.0	3611.3	-165.3	53.3	2354.3	-106.6	2481.7	
41	49063.0	45964.4	0.9	0.1	0.0	1943.5	1164.1	1953.4
SPP	9780.0	13647.9	-6544.4	529.2	10575.8	-13.8	12738.8	
42	335139.1	334482.9	-3533.4	5.9	0.0	-1510.7	5694.2	-1028.7
EQIV	69629.3	119849.0	-111225.8	-2394.5	18927.7	-78.4	82406.4	
43	22334.8	21869.1	97.6	31.1	0.0	-53.2	390.2	0.0
OH	4170.7	15245.9	-11788.8	421.1	6448.3	73.4	6667.3	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	267.7	178.7	282.0
WERE	1344.5	1383.8	-677.5	0.0	1057.4	-168.0	1861.6	
46	1374.4	1466.0	0.0	0.0	0.0	-120.7	29.2	-117.3
MIPU	392.5	488.7	-260.2	0.0	202.3	-26.9	393.3	
48	738.4	943.0	0.0	0.0	0.0	-243.4	38.8	-242.0
EMDE	190.1	209.0	-51.2	0.0	119.4	-82.1	233.8	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	103.3	66.2	0.0	0.0	15.1	37.3	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1081.4	135.0	-992.0
ASEC	419.7	917.4	-397.8	0.0	970.9	-21.5	892.5	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	352.9	192.7	0.0	0.0	68.7	83.6	145.4	
71	18373.2	19188.6	0.0	0.0	0.0	-1271.9	456.5	414.0
CE	8472.8	7481.5	-3956.1	272.0	3862.3	670.4	7867.3	
76	498.8	415.0	0.0	0.0	0.0	63.1	20.8	67.2
SUNF	63.7	136.7	38.1	0.0	377.4	85.3	181.1	
78	3939.5	3475.7	0.0	0.0	0.0	411.2	52.6	417.3
KCPL	805.8	779.4	-270.5	0.0	531.7	-57.8	886.4	
79	198.3	415.0	0.0	0.0	0.0	-221.5	4.8	-221.0
STJO	-62.7	52.0	0.0	0.0	66.6	-92.9	44.7	
83	0.0	0.0	0.0	0.0	0.0	-4.2	4.2	0.0
	0.0	0.0	0.0	0.0	54.0	1.3	52.8	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-168.7	326.1	-115.0
WUMS	3164.3	3908.3	-2921.1	0.0	1596.7	70.4	3703.3	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-297.1	12.8	0.0
	0.0	0.0	-159.6	0.0	74.1	85.3	73.5	
211	0.0	37.5	0.0	0.0	0.0	-52.5	3.9	0.0
	0.0	6.8	-142.9	0.0	29.4	125.5	40.0	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.1	0.0
	0.0	0.0	7.9	0.0	0.4	-14.0	1.8	
230	548.0	0.0	0.0	0.0	0.0	492.2	0.6	0.0
	42.4	0.0	-146.1	0.0	1.4	87.9	77.1	
600	517.5	0.0	0.0	0.0	0.0	476.9	1.6	0.0
	275.4	0.0	-25.9	0.1	0.0	199.4	78.0	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507337.4	499946.0	-3411.3	37.8	0.0	0.0	10764.8	5.7
	112446.9	176763.6	-148893.7	120.6	60036.6	0.0	144492.2	

Site 3 (Minot)

Case S3C3X2A

UPE-SO04AA.S3C3X2A.SAV;SUMMER;OP LD;SYSTEM INTACT AREA TOTALS
ND=2667,MH=2174,MW=1477,OHMH=-197,OHMP=149,EWTW=-121,BD=165 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	215.9	185.5	162.5
NPPD	525.7	855.6	-775.7	0.0	1343.6	106.7	1682.8	
3	2379.0	2525.4	0.0	0.0	0.0	-180.1	33.6	-91.7
OPPD	764.6	856.9	-70.1	8.4	327.8	-220.2	517.5	
4	0.0	716.0	0.0	0.0	0.0	-728.1	12.1	-727.2
LES	0.0	100.9	-190.2	0.0	57.6	-14.2	161.1	
6	4430.3	2364.1	0.0	0.0	0.0	1725.3	379.9	1576.7
WAPA	990.2	624.1	-576.3	412.3	2910.9	-735.3	4200.0	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	265.6	124.3	-170.5
OTP	275.5	222.6	-318.2	1.0	713.2	-99.9	1189.1	
15	0.0	0.0	0.0	0.0	0.0	-29.0	1.0	0.0
	0.0	0.0	0.0	0.0	2.9	-3.9	2.3	
18	2758.8	2525.1	0.0	0.0	0.0	138.8	94.8	0.0
SPC	357.2	608.6	-136.4	0.0	1085.1	57.6	912.6	
19	155.5	317.8	0.0	0.0	0.0	-163.0	0.8	-162.8
SMP	34.2	79.5	-25.1	0.0	9.2	-15.0	4.0	
20	4770.9	2095.4	0.0	0.0	0.0	2413.2	268.2	1440.0
MH	2940.5	603.5	-1939.3	118.6	1237.2	282.9	5113.5	
21	1521.2	1539.7	0.0	0.0	0.0	209.5	103.4	53.0
MP	297.9	539.7	-712.0	0.0	522.8	-367.0	1442.3	
22	2415.2	1588.4	0.0	0.0	0.0	716.4	99.4	-17.7
UPA	-24.8	371.1	-1689.3	0.0	265.4	-211.5	1765.5	
23	5716.6	6963.3	0.0	0.0	0.0	-1603.7	422.9	-1563.3
NSP	1233.7	1442.1	-2847.8	709.5	2355.8	54.0	4258.6	
26	964.0	797.3	14.9	0.0	0.0	75.7	76.1	158.5
DPC	218.9	227.0	-138.6	0.1	186.6	-74.7	391.5	
30	3881.0	4767.5	0.0	0.0	0.0	-983.7	97.2	-731.4
MEC	1253.4	918.0	-371.9	49.9	1007.3	589.0	1075.7	
31	3465.6	3775.5	0.0	0.0	0.0	-400.8	90.9	-279.9
ALTW	691.9	862.7	-233.7	-57.3	526.7	-204.3	851.2	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.2	64.2	0.0	0.0	6.4	-1.3	17.7	
39	256.7	548.0	0.0	0.0	0.0	-307.1	15.9	-305.0
WEPL	53.2	221.1	-199.6	0.0	123.5	46.5	108.6	
40	16547.3	15969.9	8.9	0.0	0.0	332.5	236.0	440.0
MAIN	3533.5	3617.5	-165.3	53.3	2354.1	-104.7	2486.8	
41	49063.0	45964.5	0.9	0.1	0.0	1942.7	1164.9	1953.4
SPP	9790.5	13647.9	-6544.1	529.2	10575.3	-12.5	12747.3	
42	335102.4	334482.9	-3533.4	5.9	0.0	-1547.2	5694.0	-1028.7
EQIV	69635.2	119849.0	-111225.7	-2394.5	18927.7	-70.9	82404.6	
43	22334.8	21869.1	97.6	31.1	0.0	-53.5	390.7	0.0
OH	4176.1	15245.9	-11788.2	421.0	6447.1	74.0	6670.6	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	267.1	179.4	282.0
WERE	1348.6	1383.8	-677.4	0.0	1057.1	-168.7	1866.0	
46	1374.4	1466.0	0.0	0.0	0.0	-120.9	29.3	-117.3
MIPU	393.8	488.7	-260.2	0.0	202.2	-27.0	394.6	
48	738.4	943.0	0.0	0.0	0.0	-243.5	38.9	-242.0
EMDE	190.2	209.0	-51.2	0.0	119.4	-82.4	234.2	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	103.9	66.2	0.0	0.0	15.1	37.9	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1082.1	135.8	-992.0
ASEC	422.6	917.4	-397.6	0.0	970.6	-23.8	897.4	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	353.1	192.7	0.0	0.0	68.7	83.6	145.5	
71	18373.2	19222.1	0.0	0.0	0.0	-1306.6	457.7	414.0
CE	8512.4	7494.6	-3951.8	272.0	3860.4	675.0	7883.1	
76	498.8	415.0	0.0	0.0	0.0	62.9	20.9	67.2
SUNF	65.5	136.7	38.1	0.0	377.1	85.1	182.7	
78	3939.5	3475.7	0.0	0.0	0.0	410.7	53.1	417.3
KCPL	809.0	779.4	-270.4	0.0	531.7	-55.9	887.7	
79	198.3	415.0	0.0	0.0	0.0	-221.6	4.9	-221.0
STJO	-62.2	52.0	0.0	0.0	66.5	-93.9	46.2	
83	0.0	0.0	0.0	0.0	0.0	-6.2	6.2	0.0
	0.0	0.0	-31.6	0.0	52.3	6.5	77.4	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-176.2	333.6	-115.0
WUMS	3253.8	3908.3	-2916.2	0.0	1591.9	89.8	3763.7	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-296.9	12.7	0.0
	0.0	0.0	-159.7	0.0	74.2	88.5	70.5	
211	0.0	37.5	0.0	0.0	0.0	-52.2	3.6	0.0
	0.0	6.8	-142.9	0.0	29.9	128.5	37.5	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	7.9	0.0	0.4	-14.0	1.7	
230	548.0	0.0	0.0	0.0	0.0	492.6	0.6	0.0
	26.5	0.0	-146.7	0.0	1.4	72.5	77.4	
600	517.5	0.0	0.0	0.0	0.0	476.9	1.6	0.0
	278.4	0.0	-26.0	0.1	0.0	202.1	78.4	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507300.7	499883.9	-3411.3	37.8	0.0	0.0	10790.3	5.7
	112622.0	176756.9	-148933.1	123.5	60020.6	0.0	144695.0	

Site 3 (Minot)

Case S3C3X3A

UPE-SO04AA.S3C3X3A.SAV; S3C3X2A + S.COMP MINOT-HARVEY-PRARIE AREA TOTALS
ND=2704,MH=2175,MW=1477,OHMH=-197,OHMP=150,EWTW=-120,BD=164 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	217.1	184.2	162.5
NPPD	513.2	855.6	-777.7	0.0	1346.0	107.9	1673.4	
3	2379.0	2525.4	0.0	0.0	0.0	-180.0	33.6	-91.7
OPPD	763.0	856.9	-70.1	8.4	328.0	-221.0	516.8	
4	0.0	716.0	0.0	0.0	0.0	-728.1	12.1	-727.2
LES	0.0	100.9	-190.6	0.0	57.7	-13.3	160.7	
6	4430.3	2364.1	0.0	0.0	0.0	1741.7	363.5	1576.7
WAPA	899.5	624.1	-607.6	413.1	2922.2	-618.5	4034.2	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	253.3	136.6	-170.5
OTP	247.8	222.6	-319.2	1.0	716.2	-107.7	1173.3	
15	0.0	0.0	0.0	0.0	0.0	-29.1	1.0	0.0
	0.0	0.0	0.0	0.0	2.9	-4.0	2.4	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	356.9	608.6	-136.4	0.0	1085.2	57.8	912.1	
19	155.5	317.8	0.0	0.0	0.0	-163.0	0.7	-162.8
SMP	34.3	79.5	-25.1	0.0	9.2	-14.9	4.0	
20	4771.0	2095.4	0.0	0.0	0.0	2413.6	267.8	1440.0
MH	2935.0	603.5	-1939.3	118.7	1237.8	281.4	5110.0	
21	1521.2	1539.7	0.0	0.0	0.0	207.7	105.2	53.0
MP	297.6	539.7	-711.7	0.0	523.5	-392.1	1467.4	
22	2415.2	1588.4	0.0	0.0	0.0	719.7	96.0	-17.7
UPA	-34.3	371.1	-1677.3	0.0	266.5	-209.6	1743.1	
23	5716.6	6972.3	0.0	0.0	0.0	-1613.8	423.9	-1563.3
NSP	1220.4	1444.0	-2849.2	709.1	2356.5	28.1	4271.9	
26	964.0	797.3	14.9	0.0	0.0	75.8	76.0	158.5
DPC	217.8	227.0	-138.5	0.1	186.7	-75.5	391.3	
30	3881.0	4767.5	0.0	0.0	0.0	-983.0	96.5	-731.4
MEC	1236.6	918.0	-372.1	49.9	1007.5	578.1	1070.2	
31	3465.6	3775.5	0.0	0.0	0.0	-400.6	90.7	-279.9
ALTW	690.9	862.7	-233.7	-57.3	526.7	-204.8	850.8	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.2	64.2	0.0	0.0	6.4	-1.3	17.7	
39	256.7	548.0	0.0	0.0	0.0	-307.1	15.8	-305.0
WEPL	52.9	221.1	-199.6	0.0	123.5	46.5	108.4	
40	16547.3	15967.9	8.9	0.0	0.0	334.6	235.9	440.0
MAIN	3531.9	3617.1	-165.3	53.3	2354.1	-105.0	2486.0	
41	49063.0	45964.5	0.9	0.1	0.0	1942.8	1164.7	1953.4
SPP	9789.0	13647.9	-6544.2	529.2	10575.4	-12.9	12746.2	
42	335098.8	334482.9	-3533.4	5.9	0.0	-1550.7	5693.9	-1028.7
EQIV	69634.2	119849.0	-111225.8	-2394.5	18927.7	-71.3	82404.2	
43	22334.8	21869.1	97.6	31.1	0.0	-53.6	390.5	0.0
OH	4175.0	15245.9	-11788.3	421.0	6447.2	74.0	6669.6	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	267.2	179.2	282.0
WERE	1347.6	1383.8	-677.4	0.0	1057.2	-168.8	1865.3	
46	1374.4	1466.0	0.0	0.0	0.0	-120.9	29.3	-117.3
MIPU	393.5	488.7	-260.2	0.0	202.2	-27.0	394.2	
48	738.4	943.0	0.0	0.0	0.0	-243.5	38.9	-242.0
EMDE	190.2	209.0	-51.2	0.0	119.4	-82.3	234.1	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	103.7	66.2	0.0	0.0	15.1	37.7	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1082.0	135.7	-992.0
ASEC	422.3	917.4	-397.7	0.0	970.7	-23.3	896.8	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	353.0	192.7	0.0	0.0	68.7	83.6	145.5	
71	18373.2	19219.6	0.0	0.0	0.0	-1303.8	457.3	414.0
CE	8505.1	7493.6	-3952.4	272.0	3860.7	675.7	7876.9	
76	498.8	415.0	0.0	0.0	0.0	63.0	20.9	67.2
SUNF	64.6	136.7	38.1	0.0	377.3	85.0	182.1	
78	3939.5	3475.7	0.0	0.0	0.0	410.8	53.0	417.3
KCPL	808.1	779.4	-270.4	0.0	531.7	-56.5	887.3	
79	198.3	415.0	0.0	0.0	0.0	-221.6	4.9	-221.0
STJO	-62.5	52.0	0.0	0.0	66.6	-93.9	46.0	
83	0.0	0.0	0.0	0.0	0.0	-6.2	6.2	0.0
	0.0	0.0	-62.9	0.0	53.2	37.3	78.7	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-176.4	333.8	-115.0
WUMS	3238.4	3908.3	-2918.9	0.0	1593.2	77.4	3764.7	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-297.1	12.9	0.0
	0.0	0.0	-159.9	0.0	74.3	87.7	71.6	
211	0.0	37.5	0.0	0.0	0.0	-52.2	3.6	0.0
	0.0	6.8	-142.9	0.0	29.9	128.5	37.4	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	8.0	0.0	0.4	-14.0	1.7	
230	548.0	0.0	0.0	0.0	0.0	492.6	0.6	0.0
	26.4	0.0	-146.7	0.0	1.4	72.3	77.4	
600	517.5	0.0	0.0	0.0	0.0	477.0	1.4	0.0
	208.6	0.0	-24.7	0.1	0.0	137.8	71.8	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507297.1	499888.5	-3411.3	37.8	0.0	0.0	10781.9	5.7
	112339.9	176757.4	-148990.9	124.1	60043.9	0.0	144492.9	

Site 3 (Minot)

Case S3C3X4A

UPE-SO04AA.S3C3X4A.SAV;SUMMER;OP LD;SYSTEM INTACT AREA TOTALS
ND=2666,MH=2172,MW=1476,OHMH=-197,OHMP=149,EWTW=-121,BD=167 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	216.4	184.9	162.5
NPPD	520.5	855.6	-776.6	0.0	1344.6	107.3	1678.9	
3	2379.0	2525.4	0.0	0.0	0.0	-180.1	33.6	-91.7
OPPD	763.9	856.9	-70.1	8.4	327.9	-220.5	517.1	
4	0.0	716.0	0.0	0.0	0.0	-728.1	12.1	-727.2
LES	0.0	100.9	-190.4	0.0	57.7	-13.8	160.9	
6	4430.3	2364.1	0.0	0.0	0.0	1728.2	377.1	1576.7
WAPA	952.0	624.1	-609.4	412.7	2969.7	-656.4	4174.3	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	266.1	123.8	-170.5
OTP	260.5	222.6	-319.4	1.0	716.6	-99.4	1178.1	
15	0.0	0.0	0.0	0.0	0.0	-29.1	1.0	0.0
	0.0	0.0	0.0	0.0	2.9	-3.9	2.3	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	356.7	608.6	-136.4	0.0	1085.2	57.0	912.7	
19	155.5	317.8	0.0	0.0	0.0	-163.0	0.7	-162.8
SMP	34.2	79.5	-25.1	0.0	9.2	-15.0	4.0	
20	4771.0	2095.4	0.0	0.0	0.0	2413.3	268.1	1440.0
MH	2941.5	603.5	-1939.3	118.7	1237.7	283.8	5113.9	
21	1521.2	1539.7	0.0	0.0	0.0	208.9	104.1	53.0
MP	293.9	539.7	-713.1	0.0	525.8	-376.9	1452.3	
22	2415.2	1588.4	0.0	0.0	0.0	717.1	98.6	-17.7
UPA	-39.8	371.1	-1673.4	0.0	266.4	-235.8	1759.8	
23	5716.6	6968.0	0.0	0.0	0.0	-1608.5	423.0	-1563.3
NSP	1214.1	1443.1	-2849.9	709.2	2356.8	33.3	4262.2	
26	964.0	797.3	14.9	0.0	0.0	75.9	75.9	158.5
DPC	216.6	227.0	-138.6	0.1	186.7	-76.1	390.9	
30	3881.0	4767.5	0.0	0.0	0.0	-983.3	96.8	-731.4
MEC	1245.4	918.0	-372.0	49.9	1007.4	583.9	1072.9	
31	3465.6	3775.5	0.0	0.0	0.0	-400.7	90.7	-279.9
ALTW	691.0	862.7	-233.7	-57.3	526.7	-204.5	850.6	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.2	64.2	0.0	0.0	6.4	-1.3	17.7	
39	256.7	548.0	0.0	0.0	0.0	-307.1	15.8	-305.0
WEPL	53.0	221.1	-199.6	0.0	123.5	46.5	108.5	
40	16547.3	15968.8	8.9	0.0	0.0	333.6	235.9	440.0
MAIN	3532.6	3617.3	-165.3	53.3	2354.1	-104.9	2486.3	
41	49063.0	45964.5	0.9	0.1	0.0	1942.7	1164.8	1953.4
SPP	9789.9	13647.9	-6544.2	529.2	10575.3	-12.7	12746.8	
42	335099.5	334482.9	-3533.4	5.9	0.0	-1550.0	5694.0	-1028.7
EQIV	69634.7	119849.0	-111225.7	-2394.5	18927.7	-71.1	82404.3	
43	22334.8	21869.1	97.6	31.1	0.0	-53.7	390.7	0.0
OH	4176.8	15245.9	-11788.2	421.0	6447.0	74.0	6671.0	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	267.2	179.3	282.0
WERE	1348.2	1383.8	-677.4	0.0	1057.1	-168.8	1865.7	
46	1374.4	1466.0	0.0	0.0	0.0	-120.9	29.3	-117.3
MIPU	393.7	488.7	-260.2	0.0	202.2	-27.0	394.4	
48	738.4	943.0	0.0	0.0	0.0	-243.5	38.9	-242.0
EMDE	190.2	209.0	-51.2	0.0	119.4	-82.4	234.1	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	103.8	66.2	0.0	0.0	15.1	37.8	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1082.1	135.8	-992.0
ASEC	422.6	917.4	-397.7	0.0	970.7	-23.6	897.1	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	353.1	192.7	0.0	0.0	68.7	83.6	145.5	
71	18373.2	19220.8	0.0	0.0	0.0	-1305.1	457.4	414.0
CE	8507.7	7494.1	-3952.1	272.0	3860.6	675.3	7879.1	
76	498.8	415.0	0.0	0.0	0.0	62.9	20.9	67.2
SUNF	65.1	136.7	38.1	0.0	377.2	85.1	182.4	
78	3939.5	3475.7	0.0	0.0	0.0	410.7	53.0	417.3
KCPL	808.7	779.4	-270.4	0.0	531.7	-56.2	887.5	
79	198.3	415.0	0.0	0.0	0.0	-221.6	4.9	-221.0
STJO	-62.3	52.0	0.0	0.0	66.5	-93.9	46.1	
83	0.0	0.0	0.0	0.0	0.0	-6.1	6.1	0.0
	0.0	0.0	-63.1	0.0	53.4	38.5	78.0	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-176.1	333.5	-115.0
WUMS	3231.7	3908.3	-2919.6	0.0	1593.5	74.5	3761.8	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-296.9	12.7	0.0
	0.0	0.0	-160.0	0.0	74.4	88.9	70.6	
211	0.0	37.5	0.0	0.0	0.0	-52.2	3.6	0.0
	0.0	6.8	-142.9	0.0	29.9	128.3	37.6	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	8.0	0.0	0.4	-14.0	1.7	
230	548.0	0.0	0.0	0.0	0.0	492.6	0.6	0.0
	22.6	0.0	-146.7	0.0	1.4	68.5	77.5	
600	517.5	0.0	0.0	0.0	0.0	477.0	1.5	0.0
	244.2	0.0	-25.1	0.1	0.0	170.9	74.6	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507297.8	499886.3	-3411.3	37.8	0.0	0.0	10784.7	5.7
	112445.7	176757.2	-148990.5	123.7	60092.6	0.0	144647.0	

Site 3 (Minot)

Case S3C4X1A

UPE-SO04AA.S3C4X1A.SAV; S3C1X1A + AVAL-SROCK500+SR-LFIELD AREA TOTALS
ND=2976,MH=2178,MW=1473,OHMH=-196,OHMP=150,EWTW=-119,BD=164 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	224.9	176.4	162.5
NPPD	444.0	855.6	-782.9	0.0	1355.9	104.1	1623.1	
3	2379.0	2525.4	0.0	0.0	0.0	-182.6	36.2	-91.7
OPPD	762.4	856.9	-70.1	8.4	328.0	-244.1	539.3	
4	0.0	716.0	0.0	0.0	0.0	-727.7	11.7	-727.2
LES	0.0	100.9	-191.4	0.0	58.0	-8.6	157.1	
6	4430.3	2364.1	0.0	0.0	0.0	1808.5	296.7	1576.7
WAPA	938.6	624.1	-527.0	303.7	2654.5	-176.1	3392.2	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	280.1	109.8	-170.5
OTP	224.9	222.6	-262.4	1.0	730.3	5.0	994.9	
15	0.0	0.0	0.0	0.0	0.0	-29.1	1.1	0.0
	0.0	0.0	0.0	0.0	3.0	-4.1	2.5	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	355.5	608.6	-136.4	0.0	1085.2	56.8	911.7	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	35.2	79.5	-25.1	0.0	9.2	-14.3	4.3	
20	4770.9	2095.4	0.0	0.0	0.0	2413.9	267.5	1440.0
MH	2928.0	603.5	-1939.3	118.8	1239.0	277.1	5108.5	
21	1521.2	1539.7	0.0	0.0	0.0	218.9	94.0	53.0
MP	317.0	539.7	-708.4	0.0	358.9	-341.7	1268.6	
22	2415.2	1588.4	0.0	0.0	0.0	724.2	91.5	-17.7
UPA	-55.0	371.1	-1646.3	0.0	268.6	-232.2	1716.0	
23	5716.6	6978.8	0.0	0.0	0.0	-1632.8	436.6	-1563.3
NSP	1215.3	1445.4	-2869.4	1407.0	3145.6	-463.3	4868.4	
26	964.0	797.3	14.9	0.0	0.0	74.9	76.8	158.5
DPC	226.3	227.0	-138.4	0.1	186.4	-71.7	395.6	
30	3881.0	4767.5	0.0	0.0	0.0	-989.5	103.0	-731.4
MEC	1314.1	918.0	-370.6	49.9	1005.0	603.7	1118.1	
31	3465.6	3775.5	0.0	0.0	0.0	-412.4	102.5	-279.9
ALTW	708.2	862.7	-233.6	-57.2	590.3	-257.1	983.6	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.4	64.2	0.0	0.0	6.4	-1.2	17.7	
39	256.7	548.0	0.0	0.0	0.0	-307.1	15.8	-305.0
WEPL	52.7	221.1	-199.6	0.0	123.5	46.6	108.1	
40	16547.3	15966.4	8.9	0.0	0.0	335.4	236.5	440.0
MAIN	3541.6	3616.7	-165.3	53.2	2353.8	-99.9	2490.6	
41	49063.0	45964.5	0.9	0.1	0.0	1941.4	1166.1	1953.4
SPP	9807.4	13647.9	-6544.0	529.1	10574.7	-13.0	12763.9	
42	335024.9	334482.9	-3533.4	5.9	0.0	-1625.8	5695.1	-1028.7
EQIV	69658.1	119849.0	-111224.8	-2394.6	18927.5	-61.4	82416.8	
43	22334.8	21869.1	97.6	31.1	0.0	-53.5	390.5	0.0
OH	4173.1	15245.9	-11788.6	421.0	6447.9	73.2	6669.5	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	266.1	180.4	282.0
WERE	1356.8	1383.8	-677.3	0.0	1056.8	-171.0	1876.1	
46	1374.4	1466.0	0.0	0.0	0.0	-121.2	29.7	-117.3
MIPU	396.0	488.7	-260.1	0.0	202.1	-27.7	397.2	
48	738.4	943.0	0.0	0.0	0.0	-243.7	39.1	-242.0
EMDE	189.8	209.0	-51.1	0.0	119.5	-83.2	234.5	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	105.0	66.2	0.0	0.0	15.1	38.9	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1083.9	137.6	-992.0
ASEC	429.3	917.4	-397.7	0.0	970.2	-28.9	908.9	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	353.2	192.7	0.0	0.0	68.6	83.6	145.6	
71	18373.2	19217.9	0.0	0.0	0.0	-1304.9	460.2	414.0
CE	8541.3	7492.9	-3950.7	272.0	3859.5	670.7	7915.9	
76	498.8	415.0	0.0	0.0	0.0	62.9	20.9	67.2
SUNF	63.9	136.7	38.1	0.0	377.4	84.1	182.4	
78	3939.5	3475.7	0.0	0.0	0.0	409.6	54.2	417.3
KCPL	815.0	779.4	-270.3	0.0	531.6	-52.8	890.2	
79	198.3	415.0	0.0	0.0	0.0	-221.9	5.2	-221.0
STJO	-61.8	52.0	0.0	0.0	66.6	-97.4	50.1	
83	0.0	0.0	0.0	0.0	0.0	-4.3	4.3	0.0
	0.0	0.0	0.0	0.0	53.8	-0.3	54.0	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-173.8	331.1	-115.0
WUMS	3212.6	3908.3	-2917.3	0.0	1594.5	73.4	3742.6	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	14.9	
210	24.1	0.0	0.0	0.0	0.0	-296.7	12.5	0.0
	0.0	0.0	-160.5	0.0	74.6	88.1	72.1	
211	0.0	37.5	0.0	0.0	0.0	-52.4	3.8	0.0
	0.0	6.8	-142.9	0.0	29.6	126.7	39.0	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.1	0.0
	0.0	0.0	8.0	0.0	0.4	-14.1	1.8	
230	548.0	0.0	0.0	0.0	0.0	492.6	0.6	0.0
	28.6	0.0	-146.5	0.0	1.4	74.4	77.4	
600	517.5	0.0	0.0	0.0	0.0	477.1	1.4	0.0
	208.9	0.0	-23.0	0.1	0.0	136.6	71.5	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507223.2	499891.8	-3411.3	37.8	0.0	0.0	10704.8	5.7
	112465.3	176757.8	-148775.0	712.5	60488.4	0.0	144257.8	

Site 4 (Ft. Thompson)

Case S4C1XXA

UPE-SO04AA.S4C1XXA.SAV; S4C1XXX + WIND UNIT SVC AREA TOTALS
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	200.4	200.9	162.5
NPPD	628.6	855.6	-766.4	0.0	1313.6	57.0	1796.0	
3	2379.0	2525.4	0.0	0.0	0.0	-180.8	34.3	-91.7
OPPD	790.4	856.9	-69.7	8.3	326.0	-203.7	524.5	
4	0.0	716.0	0.0	0.0	0.0	-728.7	12.7	-727.2
LES	0.0	100.9	-185.7	0.0	56.2	-25.1	166.0	
6	4430.3	2364.1	0.0	0.0	0.0	1710.8	394.4	1576.7
WAPA	848.4	624.1	-704.3	413.9	2977.3	-836.9	4352.5	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	295.1	94.9	-170.5
OTP	263.9	222.6	-235.2	1.0	541.8	91.6	731.6	
15	0.0	0.0	0.0	0.0	0.0	-29.2	1.2	0.0
	0.0	0.0	0.0	0.0	2.9	-4.4	2.7	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	349.2	608.6	-136.4	0.0	1085.2	50.3	911.9	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	33.6	79.5	-25.3	0.0	9.3	-15.5	4.2	
20	4771.0	2095.4	0.0	0.0	0.0	2413.6	267.8	1440.0
MH	2935.1	603.5	-1939.2	118.7	1238.4	281.1	5110.9	
21	1521.2	1539.7	0.0	0.0	0.0	219.6	93.4	53.0
MP	336.0	539.7	-707.8	0.0	358.9	-315.1	1260.5	
22	2415.2	1588.4	0.0	0.0	0.0	720.9	94.9	-17.7
UPA	-62.2	371.1	-1621.4	0.0	266.9	-289.5	1739.6	
23	5626.6	6853.3	0.0	0.0	0.0	-1559.7	398.7	-1563.3
NSP	1196.0	1438.7	-2778.4	704.1	2293.7	129.8	4022.2	
26	964.0	797.3	14.9	0.0	0.0	76.4	75.4	158.5
DPC	216.2	227.0	-138.7	0.1	186.7	-75.9	390.3	
30	3881.0	4767.5	0.0	0.0	0.0	-991.7	105.2	-731.4
MEC	1402.9	918.0	-370.2	49.8	1004.1	671.8	1137.7	
31	3465.6	3775.5	0.0	0.0	0.0	-403.1	93.2	-279.9
ALTW	700.5	862.7	-241.0	-57.3	526.4	-194.0	856.4	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.4	64.2	0.0	0.0	6.4	-1.3	17.9	
39	256.7	548.0	0.0	0.0	0.0	-307.6	16.3	-305.0
WEPL	55.6	221.1	-199.9	0.0	123.3	46.6	111.1	
40	16547.3	15972.5	8.9	0.0	0.0	329.1	236.7	440.0
MAIN	3544.7	3618.1	-165.3	53.2	2353.7	-99.8	2492.2	
41	49063.0	45964.5	0.9	0.1	0.0	1940.5	1167.1	1953.4
SPP	9818.1	13647.9	-6543.7	529.2	10574.2	-9.1	12769.8	
42	335069.6	334482.9	-3533.4	5.9	0.0	-1581.3	5695.2	-1028.7
EQIV	69656.1	119849.0	-111224.9	-2394.5	18927.5	-63.4	82417.2	
43	22334.8	21869.1	97.6	31.1	0.0	-53.3	390.2	0.0
OH	4171.1	15245.9	-11788.8	421.1	6448.3	73.3	6667.7	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	264.8	181.6	282.0
WERE	1366.8	1383.8	-676.8	0.0	1055.8	-165.5	1879.2	
46	1374.4	1466.0	0.0	0.0	0.0	-121.4	29.8	-117.3
MIPU	398.0	488.7	-260.0	0.0	202.1	-27.4	398.8	
48	738.4	943.0	0.0	0.0	0.0	-243.7	39.1	-242.0
EMDE	189.9	209.0	-51.2	0.0	119.4	-83.6	235.0	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	106.4	66.2	0.0	0.0	15.1	40.3	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1084.0	137.6	-992.0
ASEC	428.4	917.4	-397.6	0.0	969.7	-30.4	908.8	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	353.2	192.7	0.0	0.0	68.6	83.6	145.6	
71	18373.2	19225.3	0.0	0.0	0.0	-1312.4	460.3	414.0
CE	8548.4	7495.8	-3949.9	272.0	3859.1	668.3	7921.4	
76	498.8	415.0	0.0	0.0	0.0	62.0	21.9	67.2
SUNF	76.6	136.7	37.7	0.0	375.0	85.7	191.5	
78	3939.5	3475.7	0.0	0.0	0.0	409.5	54.3	417.3
KCPL	822.6	779.4	-270.2	0.0	531.2	-46.9	891.5	
79	198.3	415.0	0.0	0.0	0.0	-222.0	5.3	-221.0
STJO	-57.9	52.0	0.0	0.0	66.3	-94.2	50.6	
83	0.0	0.0	0.0	0.0	0.0	-4.1	4.1	0.0
	0.0	0.0	0.0	0.0	54.1	1.7	52.4	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-170.3	327.6	-115.0
WUMS	3156.8	3908.3	-2942.9	0.0	1596.3	74.9	3712.8	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-299.3	15.0	0.0
	0.0	0.0	-148.7	0.0	72.9	60.8	85.8	
211	0.0	37.5	0.0	0.0	0.0	-52.4	3.8	0.0
	0.0	6.8	-142.9	0.0	29.5	126.3	39.3	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.4	0.0	0.4	-27.5	1.8	
230	548.0	0.0	0.0	0.0	0.0	492.6	0.7	0.0
	16.2	0.0	-146.3	0.0	1.4	61.5	77.7	
600	517.5	0.0	0.0	0.0	0.0	476.9	1.6	0.0
	155.8	0.0	-26.7	0.1	0.0	83.6	75.0	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507177.9	499779.8	-3411.3	37.8	0.0	0.0	10771.3	5.7
	112624.5	176755.3	-148796.1	119.7	59652.7	0.0	144197.8	

Site 4 (Ft. Thompson)

Case S4C2X1A

UPE-SO04AA.S4C2X1A.SAV; S4C2XX1 WITH WIND UNIT SVC AREA TOTALS
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	207.1	194.3	162.5
NPPD	586.2	855.6	-775.7	0.0	1325.6	77.4	1754.4	
3	2379.0	2525.4	0.0	0.0	0.0	-183.5	37.1	-91.7
OPPD	787.8	856.9	-69.8	8.3	326.2	-229.5	548.1	
4	0.0	716.0	0.0	0.0	0.0	-728.2	12.2	-727.2
LES	0.0	100.9	-187.4	0.0	56.7	-18.6	161.7	
6	4430.3	2364.1	0.0	0.0	0.0	1751.8	353.5	1576.7
WAPA	868.6	624.1	-675.2	481.0	2894.5	-573.8	3930.6	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	298.9	91.0	-170.5
OTP	246.1	222.6	-214.4	1.0	541.7	72.5	712.0	
15	0.0	0.0	0.0	0.0	0.0	-29.2	1.1	0.0
	0.0	0.0	0.0	0.0	2.9	-4.2	2.6	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.7	0.0
SPC	350.3	608.6	-136.4	0.0	1085.2	51.1	912.2	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	35.2	79.5	-25.1	0.0	9.3	-14.4	4.4	
20	4771.0	2095.4	0.0	0.0	0.0	2413.5	267.9	1440.0
MH	2924.2	603.5	-1939.2	118.7	1238.3	270.8	5110.1	
21	1521.2	1539.7	0.0	0.0	0.0	219.3	93.6	53.0
MP	331.8	539.7	-707.4	0.0	358.4	-324.8	1265.1	
22	2415.2	1588.4	0.0	0.0	0.0	722.0	94.4	-17.7
UPA	-66.4	371.1	-1621.0	0.0	267.4	-287.4	1733.5	
23	5666.6	6722.8	0.0	0.0	0.0	-1387.5	395.7	-1563.3
NSP	1059.7	1391.4	-2782.5	705.5	2332.7	6.2	4098.1	
26	964.0	797.3	15.0	0.0	0.0	74.4	77.3	158.5
DPC	228.5	227.0	-138.4	0.1	186.4	-71.7	397.8	
30	3881.0	4767.5	0.0	0.0	0.0	-998.6	112.1	-731.4
MEC	1424.5	918.0	-368.7	50.6	1002.0	642.0	1184.6	
31	3465.6	3775.5	0.0	0.0	0.0	-417.1	107.2	-279.9
ALTW	724.6	862.7	-240.9	-57.1	591.4	-263.0	1014.4	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.7	64.2	0.0	0.0	6.4	-1.0	17.8	
39	256.7	548.0	0.0	0.0	0.0	-307.7	16.4	-305.0
WEPL	56.0	221.1	-199.8	0.0	123.2	46.6	111.4	
40	16547.3	16023.5	8.9	0.0	0.0	276.5	238.3	440.0
MAIN	3580.7	3629.6	-165.3	53.1	2352.7	-91.9	2507.8	
41	49063.0	45964.7	0.9	0.1	0.0	1938.3	1169.0	1953.4
SPP	9845.1	13647.9	-6542.9	529.1	10572.9	-6.6	12792.4	
42	335007.1	334482.9	-3533.4	5.9	0.0	-1644.5	5696.0	-1028.7
EQIV	69682.8	119849.0	-111224.1	-2394.5	18927.3	-45.0	82424.0	
43	22334.8	21869.1	97.6	31.1	0.0	-54.1	391.0	0.0
OH	4179.0	15245.9	-11787.9	420.9	6446.8	73.7	6673.2	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	263.1	183.4	282.0
WERE	1378.2	1383.8	-676.4	0.0	1055.2	-169.3	1893.4	
46	1374.4	1466.0	0.0	0.0	0.0	-122.0	30.5	-117.3
MIPU	402.3	488.7	-260.0	0.0	201.9	-28.3	403.8	
48	738.4	943.0	0.0	0.0	0.0	-244.0	39.4	-242.0
EMDE	190.1	209.0	-51.1	0.0	119.3	-84.6	236.0	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	108.4	66.2	0.0	0.0	15.1	42.3	15.0	
61	2495.6	3441.9	0.0	0.0	0.0	-1086.8	140.5	-992.0
ASEC	435.5	917.4	-397.8	0.0	969.0	-40.9	926.1	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	353.8	192.7	0.0	0.0	68.5	83.8	145.9	
71	18373.2	19287.6	0.0	0.0	0.0	-1380.6	466.2	414.0
CE	8670.1	7520.1	-3937.6	272.0	3853.1	663.0	8005.7	
76	498.8	415.0	0.0	0.0	0.0	61.7	22.1	67.2
SUNF	77.5	136.7	37.7	0.0	374.8	84.2	193.8	
78	3939.5	3475.7	0.0	0.0	0.0	407.6	56.2	417.3
KCPL	832.6	779.4	-270.1	0.0	531.0	-42.8	897.1	
79	198.3	415.0	0.0	0.0	0.0	-222.4	5.7	-221.0
STJO	-56.9	52.0	0.0	0.0	66.3	-99.6	56.9	
83	0.0	0.0	0.0	0.0	0.0	-4.3	4.3	0.0
	0.0	0.0	0.0	0.0	53.8	-0.1	53.9	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-175.9	333.2	-115.0
WUMS	3220.5	3908.3	-2939.4	0.0	1593.6	87.1	3758.0	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-298.6	14.4	0.0
	0.0	0.0	-148.9	0.0	72.9	64.2	82.7	
211	0.0	37.5	0.0	0.0	0.0	-52.4	3.8	0.0
	0.0	6.8	-142.9	0.0	29.6	126.8	38.9	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.4	0.0	0.4	-27.5	1.7	
230	548.0	0.0	0.0	0.0	0.0	493.4	0.7	0.0
	-3.4	0.0	-146.6	0.0	1.4	41.8	78.4	
600	517.5	0.0	0.0	0.0	0.0	477.1	1.4	0.0
	139.4	0.0	-25.4	0.1	0.0	70.4	70.7	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507155.4	499762.8	-3411.3	37.8	0.0	0.0	10765.9	5.7
	112772.1	176743.8	-148739.2	188.7	59669.2	0.0	144247.0	

Site 4 (Ft. Thompson)

Case S4C4XXA

UPE-SO04AA.S4C4XXA.SAV; S4C2X1A + FTTHOMPSON - SPLIT ROCK AREA TOTALS
ND=2070,MH=2171,MW=1474,OHMH=-198,OHMP=148,EWTW=-123,BD=167 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	212.4	188.9	162.5
NPPD	534.0	855.6	-781.0	0.0	1336.1	80.5	1715.0	
3	2379.0	2525.4	0.0	0.0	0.0	-184.4	37.9	-91.7
OPPD	779.3	856.9	-69.9	8.3	326.9	-244.4	555.2	
4	0.0	716.0	0.0	0.0	0.0	-727.9	11.9	-727.2
LES	0.0	100.9	-189.1	0.0	57.2	-13.2	158.6	
6	4430.3	2364.1	0.0	0.0	0.0	1783.2	322.0	1576.7
WAPA	778.1	624.1	-678.6	482.6	2869.0	-379.7	3622.3	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	300.9	89.0	-170.5
OTP	230.5	222.6	-215.4	1.0	544.2	75.4	697.1	
15	0.0	0.0	0.0	0.0	0.0	-29.1	1.1	0.0
	0.0	0.0	0.0	0.0	2.9	-4.1	2.5	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	348.4	608.6	-136.4	0.0	1085.2	50.0	911.3	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	35.8	79.5	-25.1	0.0	9.3	-13.9	4.5	
20	4770.9	2095.4	0.0	0.0	0.0	2413.3	268.1	1440.0
MH	2912.4	603.5	-1939.2	118.7	1238.4	260.2	5109.0	
21	1521.2	1539.7	0.0	0.0	0.0	219.1	93.8	53.0
MP	325.5	539.7	-708.1	0.0	358.6	-332.7	1267.5	
22	2415.2	1588.4	0.0	0.0	0.0	722.8	93.6	-17.7
UPA	-70.3	371.1	-1582.6	0.0	267.9	-322.9	1727.3	
23	5666.6	6722.8	0.0	0.0	0.0	-1399.3	407.5	-1563.3
NSP	1027.1	1391.4	-2784.0	706.8	2450.6	-26.5	4216.5	
26	964.0	797.3	15.0	0.0	0.0	73.9	77.8	158.5
DPC	231.5	227.0	-138.3	0.1	186.3	-70.9	399.8	
30	3881.0	4767.5	0.0	0.0	0.0	-1000.0	113.5	-731.4
MEC	1408.2	918.0	-368.6	50.4	1001.8	614.3	1195.9	
31	3465.6	3775.5	0.0	0.0	0.0	-420.3	110.3	-279.9
ALTW	729.6	862.7	-240.9	-57.1	591.1	-292.9	1049.0	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.7	64.2	0.0	0.0	6.4	-0.9	17.8	
39	256.7	548.0	0.0	0.0	0.0	-307.6	16.3	-305.0
WEPL	55.1	221.1	-200.0	0.0	123.3	46.6	110.7	
40	16547.3	16023.5	8.9	0.0	0.0	276.4	238.4	440.0
MAIN	3582.3	3629.6	-165.3	53.1	2352.6	-91.1	2508.6	
41	49063.0	45964.7	0.9	0.1	0.0	1938.2	1169.1	1953.4
SPP	9846.4	13647.9	-6542.9	529.1	10572.9	-7.2	12794.2	
42	334985.8	334482.9	-3533.4	5.9	0.0	-1665.9	5696.1	-1028.7
EQIV	69687.1	119849.0	-111223.9	-2394.5	18927.3	-42.9	82426.4	
43	22334.8	21869.1	97.6	31.1	0.0	-53.2	390.1	0.0
OH	4171.2	15245.9	-11788.7	421.1	6448.0	73.9	6666.9	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	263.1	183.4	282.0
WERE	1377.6	1383.8	-676.5	0.0	1055.4	-171.0	1894.6	
46	1374.4	1466.0	0.0	0.0	0.0	-122.0	30.5	-117.3
MIPU	402.3	488.7	-260.0	0.0	201.9	-28.4	404.0	
48	738.4	943.0	0.0	0.0	0.0	-244.0	39.4	-242.0
EMDE	190.1	209.0	-51.1	0.0	119.3	-84.7	236.1	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	108.3	66.2	0.0	0.0	15.1	42.2	15.0	
61	2495.6	3441.9	0.0	0.0	0.0	-1087.1	140.8	-992.0
ASEC	437.1	917.4	-397.8	0.0	969.0	-41.6	928.2	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	353.9	192.7	0.0	0.0	68.5	83.8	145.9	
71	18373.2	19287.6	0.0	0.0	0.0	-1380.9	466.5	414.0
CE	8673.1	7520.1	-3937.5	272.0	3853.0	663.8	8007.8	
76	498.8	415.0	0.0	0.0	0.0	62.0	21.9	67.2
SUNF	74.7	136.7	37.7	0.0	375.4	83.8	191.9	
78	3939.5	3475.7	0.0	0.0	0.0	407.3	56.4	417.3
KCPL	832.0	779.4	-270.1	0.0	531.0	-43.7	897.5	
79	198.3	415.0	0.0	0.0	0.0	-222.4	5.7	-221.0
STJO	-57.8	52.0	0.0	0.0	66.3	-100.9	57.5	
83	0.0	0.0	0.0	0.0	0.0	-4.3	4.3	0.0
	0.0	0.0	0.0	0.0	53.7	-0.5	54.2	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-177.2	334.5	-115.0
WUMS	3231.4	3908.3	-2938.7	0.0	1593.0	86.5	3768.4	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-298.1	13.9	0.0
	0.0	0.0	-149.6	0.0	73.3	68.1	79.8	
211	0.0	37.5	0.0	0.0	0.0	-52.4	3.7	0.0
	0.0	6.8	-142.9	0.0	29.6	127.1	38.6	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.5	0.0	0.4	-27.6	1.7	
230	548.0	0.0	0.0	0.0	0.0	493.4	0.7	0.0
	-6.0	0.0	-146.8	0.0	1.4	39.4	78.5	
600	517.5	0.0	0.0	0.0	0.0	477.2	1.3	0.0
	91.6	0.0	-23.5	0.1	0.0	24.9	66.2	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507134.2	499762.8	-3411.3	37.8	0.0	0.0	10744.6	5.7
	112500.1	176743.8	-148713.3	191.7	59777.9	0.0	144054.9	

Site 4 (Ft. Thompson)

Case S4C5XXA

UPE-SO04AA.S4C5XXA.SAV; S4C1XXA + FTTH-SROCK-LFIELD AREA TOTALS
ND=2065,MH=2172,MW=1475,OHMH=-197,OHMP=149,EWTW=-121,BD=167 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	213.0	188.3	162.5
NPPD	527.7	855.6	-774.5	0.0	1333.4	72.6	1707.5	
3	2379.0	2525.4	0.0	0.0	0.0	-182.0	35.5	-91.7
OPPD	773.1	856.9	-70.0	8.4	327.2	-229.4	534.5	
4	0.0	716.0	0.0	0.0	0.0	-728.1	12.1	-727.2
LES	0.0	100.9	-188.9	0.0	57.1	-15.4	160.4	
6	4430.3	2364.1	0.0	0.0	0.0	1768.0	337.3	1576.7
WAPA	761.1	624.1	-646.7	415.1	2960.4	-436.0	3788.6	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	300.8	89.0	-170.5
OTP	230.8	222.6	-238.1	1.0	547.4	102.2	696.4	
15	0.0	0.0	0.0	0.0	0.0	-29.1	1.0	0.0
	0.0	0.0	0.0	0.0	2.9	-4.0	2.4	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	348.2	608.6	-136.4	0.0	1085.2	50.0	911.2	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	35.0	79.5	-25.3	0.0	9.3	-14.4	4.4	
20	4771.0	2095.4	0.0	0.0	0.0	2412.9	268.5	1440.0
MH	2894.8	603.5	-1939.1	118.7	1238.5	243.1	5108.7	
21	1521.2	1539.7	0.0	0.0	0.0	220.1	92.9	53.0
MP	312.5	539.7	-710.6	0.0	360.1	-334.4	1260.4	
22	2415.2	1588.4	0.0	0.0	0.0	723.4	92.5	-17.7
UPA	-71.8	371.1	-1589.6	0.0	268.2	-313.9	1723.9	
23	5626.6	6853.3	0.0	0.0	0.0	-1568.2	407.2	-1563.3
NSP	1096.1	1438.7	-2785.6	708.5	2418.0	-10.8	4190.3	
26	964.0	797.3	15.0	0.0	0.0	74.9	76.9	158.5
DPC	224.2	227.0	-138.6	0.1	186.6	-73.9	396.2	
30	3881.0	4767.5	0.0	0.0	0.0	-989.8	103.3	-731.4
MEC	1300.4	918.0	-370.8	50.9	1005.9	588.3	1119.9	
31	3465.6	3775.5	0.0	0.0	0.0	-411.0	101.0	-279.9
ALTW	703.5	862.7	-241.3	-57.2	592.9	-234.5	966.6	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.4	64.2	0.0	0.0	6.4	-1.2	17.8	
39	256.7	548.0	0.0	0.0	0.0	-307.4	16.1	-305.0
WEPL	53.8	221.1	-200.1	0.0	123.4	46.6	109.6	
40	16547.3	15972.5	8.9	0.0	0.0	329.1	236.8	440.0
MAIN	3547.2	3618.1	-165.3	53.2	2353.6	-98.2	2493.1	
41	49063.0	45964.5	0.9	0.1	0.0	1940.3	1167.2	1953.4
SPP	9820.9	13647.9	-6543.6	529.1	10574.0	-10.6	12774.1	
42	335010.5	334482.9	-3533.4	5.9	0.0	-1640.5	5695.4	-1028.7
EQIV	69665.0	119849.0	-111224.5	-2394.6	18927.5	-57.9	82420.0	
43	22334.8	21869.1	97.6	31.1	0.0	-53.0	390.0	0.0
OH	4169.3	15245.9	-11788.9	421.1	6448.4	73.9	6665.5	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	265.0	181.5	282.0
WERE	1365.3	1383.8	-677.0	0.0	1056.1	-168.7	1881.3	
46	1374.4	1466.0	0.0	0.0	0.0	-121.4	29.9	-117.3
MIPU	397.8	488.7	-260.0	0.0	202.1	-27.7	398.8	
48	738.4	943.0	0.0	0.0	0.0	-243.8	39.2	-242.0
EMDE	189.9	209.0	-51.1	0.0	119.4	-83.6	235.0	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	106.0	66.2	0.0	0.0	15.1	40.0	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1084.5	138.2	-992.0
ASEC	431.3	917.4	-397.8	0.0	969.8	-31.2	912.7	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	353.4	192.7	0.0	0.0	68.6	83.6	145.7	
71	18373.2	19225.3	0.0	0.0	0.0	-1313.2	461.1	414.0
CE	8558.2	7495.8	-3949.4	272.0	3858.9	669.7	7929.0	
76	498.8	415.0	0.0	0.0	0.0	62.4	21.5	67.2
SUNF	71.1	136.7	37.8	0.0	376.0	84.9	187.7	
78	3939.5	3475.7	0.0	0.0	0.0	409.2	54.6	417.3
KCPL	820.7	779.4	-270.3	0.0	531.4	-48.9	891.7	
79	198.3	415.0	0.0	0.0	0.0	-222.0	5.3	-221.0
STJO	-59.8	52.0	0.0	0.0	66.4	-96.9	51.5	
83	0.0	0.0	0.0	0.0	0.0	-4.2	4.2	0.0
	0.0	0.0	0.0	0.0	54.0	1.0	52.9	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-173.7	331.0	-115.0
WUMS	3184.8	3908.3	-2940.9	0.0	1595.0	72.0	3740.2	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	14.9	
210	24.1	0.0	0.0	0.0	0.0	-297.3	13.1	0.0
	0.0	0.0	-150.7	0.0	74.0	74.5	75.3	
211	0.0	37.5	0.0	0.0	0.0	-52.3	3.7	0.0
	0.0	6.8	-142.9	0.0	29.7	127.7	38.2	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.6	0.0	0.4	-27.7	1.7	
230	548.0	0.0	0.0	0.0	0.0	492.7	0.7	0.0
	-5.3	0.0	-147.0	0.0	1.4	40.1	78.3	
600	517.5	0.0	0.0	0.0	0.0	477.2	1.3	0.0
	94.7	0.0	-23.8	0.1	0.0	27.9	66.8	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507118.8	499779.8	-3411.3	37.8	0.0	0.0	10712.2	5.7
	112078.9	176755.3	-148729.5	126.5	59860.0	0.0	143786.3	

Site 5 (Watertown)

Case S5C1XXA

UPE-SO04AA.S5C1XXA.SAV;S5C1XXX + SVC AT WIND GEN. TERMINAL AREA TOTALS
ND=2073,MH=2172,MW=1484,OHMH=-197,OHMP=150,EWTW=-120,BD=167 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	212.9	188.4	162.5
NPPD	530.9	855.6	-772.0	0.0	1337.9	81.2	1704.0	
3	2379.0	2525.4	0.0	0.0	0.0	-181.1	34.6	-91.7
OPPD	768.6	856.9	-70.1	8.4	327.6	-224.8	525.8	
4	0.0	716.0	0.0	0.0	0.0	-728.1	12.1	-727.2
LES	0.0	100.9	-189.8	0.0	57.4	-14.3	160.5	
6	4430.3	2364.1	0.0	0.0	0.0	1750.7	354.5	1576.7
WAPA	775.9	624.1	-681.5	481.6	2917.7	-665.9	3959.1	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	296.0	93.9	-170.5
OTP	253.5	222.6	-236.1	1.0	544.5	103.7	712.8	
15	0.0	0.0	0.0	0.0	0.0	-29.2	1.1	0.0
	0.0	0.0	0.0	0.0	2.9	-4.3	2.6	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	349.5	608.6	-136.4	0.0	1085.2	50.5	912.1	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	33.2	79.5	-25.3	0.0	9.3	-15.9	4.2	
20	4771.0	2095.4	0.0	0.0	0.0	2413.8	267.6	1440.0
MH	2929.7	603.5	-1939.3	118.7	1238.8	277.4	5109.5	
21	1521.2	1539.7	0.0	0.0	0.0	219.8	93.2	53.0
MP	321.4	539.7	-710.0	0.0	360.2	-325.9	1260.1	
22	2415.2	1588.4	0.0	0.0	0.0	720.2	95.4	-17.7
UPA	-63.5	371.1	-1581.9	0.0	267.3	-331.0	1740.7	
23	5716.6	7018.8	0.0	0.0	0.0	-1643.3	407.3	-1563.3
NSP	1100.8	1453.8	-2994.8	709.4	2301.3	171.4	4089.3	
26	964.0	797.3	14.9	0.0	0.0	76.2	75.6	158.5
DPC	183.5	227.0	-139.1	0.1	187.7	-107.5	390.6	
30	3881.0	4767.5	0.0	0.0	0.0	-989.7	103.2	-731.4
MEC	1335.2	918.0	-371.2	49.5	1005.3	622.1	1122.1	
31	3465.6	3775.5	0.0	0.0	0.0	-403.6	93.7	-279.9
ALTW	695.5	862.7	-241.2	-57.4	526.7	-202.3	860.3	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.4	64.2	0.0	0.0	6.4	-1.3	17.8	
39	256.7	548.0	0.0	0.0	0.0	-307.3	16.0	-305.0
WEPL	53.6	221.1	-200.1	0.0	123.4	46.8	109.2	
40	16547.3	15957.5	8.9	0.0	0.0	344.6	236.3	440.0
MAIN	3535.3	3614.7	-165.3	53.3	2353.9	-101.6	2488.1	
41	49063.0	45964.4	0.9	0.1	0.0	1941.5	1166.0	1953.4
SPP	9804.9	13647.9	-6544.1	529.2	10574.8	-12.3	12760.9	
42	335058.9	334482.9	-3533.4	5.9	0.0	-1591.7	5694.9	-1028.7
EQIV	69650.7	119849.0	-111225.1	-2394.5	18927.6	-66.3	82414.8	
43	22334.8	21869.1	97.6	31.1	0.0	-53.5	390.5	0.0
OH	4173.5	15245.9	-11788.5	421.0	6447.6	73.6	6669.1	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	266.0	180.5	282.0
WERE	1357.9	1383.8	-677.2	0.0	1056.5	-168.2	1874.0	
46	1374.4	1466.0	0.0	0.0	0.0	-121.2	29.6	-117.3
MIPU	395.7	488.7	-260.1	0.0	202.2	-27.5	396.8	
48	738.4	943.0	0.0	0.0	0.0	-243.6	39.0	-242.0
EMDE	189.7	209.0	-51.2	0.0	119.5	-83.0	234.4	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	104.9	66.2	0.0	0.0	15.1	38.9	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1083.3	137.0	-992.0
ASEC	425.9	917.4	-398.1	0.0	970.4	-27.7	904.7	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	353.1	192.7	0.0	0.0	68.7	83.6	145.5	
71	18373.2	19207.0	0.0	0.0	0.0	-1292.6	458.8	414.0
CE	8514.2	7488.7	-3953.0	272.0	3860.7	669.4	7898.2	
76	498.8	415.0	0.0	0.0	0.0	62.6	21.2	67.2
SUNF	68.9	136.7	37.9	0.0	376.4	85.2	185.5	
78	3939.5	3475.7	0.0	0.0	0.0	409.9	53.9	417.3
KCPL	815.1	779.4	-270.3	0.0	531.5	-52.1	889.6	
79	198.3	415.0	0.0	0.0	0.0	-221.8	5.1	-221.0
STJO	-60.9	52.0	0.0	0.0	66.5	-95.4	48.9	
83	0.0	0.0	0.0	0.0	0.0	-4.1	4.1	0.0
	0.0	0.0	0.0	0.0	54.2	1.8	52.5	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-170.4	327.7	-115.0
WUMS	3083.5	3908.3	-2990.3	0.0	1599.7	54.3	3710.8	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	15.0	
210	24.1	0.0	0.0	0.0	0.0	-299.6	15.3	0.0
	0.0	0.0	-157.8	0.0	73.2	68.5	87.6	
211	0.0	37.5	0.0	0.0	0.0	-52.4	3.7	0.0
	0.0	6.8	-142.9	0.0	29.6	127.0	38.7	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.6	0.0	0.4	-27.6	1.8	
230	548.0	0.0	0.0	0.0	0.0	492.4	0.7	0.0
	-13.2	0.0	-146.7	0.0	1.4	31.5	78.6	
600	517.5	0.0	0.0	0.0	0.0	477.2	1.3	0.0
	114.0	0.0	-23.6	0.1	0.0	47.0	66.7	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507257.2	499911.9	-3411.4	37.8	0.0	0.0	10718.5	5.7
	111959.9	176759.9	-149023.5	192.2	59644.6	0.0	143675.3	

Site 5 (Watertown)

Case S5C5XXX

UPE-SO04AA.S5C5XXX.SAV;SUMMER;OP LD;SYSTEM INTACT AREA TOTALS
ND=2077,MH=2174,MW=1478,OHMH=-196,OHMP=150,EWTW=-119,BD=166 IN MW/MVAR

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
1	-30.0	0.0	0.0	0.0	0.0	-30.0	0.0	0.0
	-9.8	0.0	0.0	0.0	0.0	-11.6	1.8	
2	3164.6	2763.3	0.0	0.0	0.0	218.5	182.8	162.5
NPPD	484.6	855.6	-772.7	0.0	1347.0	85.4	1663.3	
3	2379.0	2525.4	0.0	0.0	0.0	-182.3	35.9	-91.7
OPPD	766.4	856.9	-70.1	8.4	327.7	-237.4	536.4	
4	0.0	716.0	0.0	0.0	0.0	-727.8	11.8	-727.2
LES	0.0	100.9	-190.6	0.0	57.7	-10.7	158.1	
6	4430.3	2364.1	0.0	0.0	0.0	1778.1	327.1	1576.7
WAPA	729.6	624.1	-679.7	483.5	2974.5	-410.7	3710.7	
12	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	1333.0	975.3	0.0	0.0	0.0	300.2	89.8	-170.5
OTP	226.1	222.6	-238.3	1.0	548.8	109.5	686.0	
15	0.0	0.0	0.0	0.0	0.0	-29.1	1.1	0.0
	0.0	0.0	0.0	0.0	2.9	-4.1	2.4	
18	2758.8	2525.1	0.0	0.0	0.0	138.9	94.8	0.0
SPC	348.1	608.6	-136.4	0.0	1085.2	49.8	911.3	
19	155.5	317.8	0.0	0.0	0.0	-163.1	0.8	-162.8
SMP	33.3	79.5	-25.3	0.0	9.3	-15.8	4.2	
20	4770.9	2095.4	0.0	0.0	0.0	2413.3	268.1	1440.0
MH	2905.7	603.5	-1939.2	118.7	1238.9	254.8	5108.3	
21	1521.2	1539.7	0.0	0.0	0.0	220.5	92.5	53.0
MP	304.8	539.7	-712.0	0.0	361.2	-335.1	1255.9	
22	2415.2	1588.4	0.0	0.0	0.0	721.8	93.8	-17.7
UPA	-68.6	371.1	-1421.2	0.0	268.1	-483.4	1728.2	
23	5716.6	7010.2	0.0	0.0	0.0	-1632.2	404.7	-1563.3
NSP	1011.6	1452.0	-2999.3	711.7	2411.2	150.8	4134.5	
26	964.0	797.3	14.9	0.0	0.0	76.3	75.5	158.5
DPC	183.1	227.0	-139.1	0.1	187.6	-107.8	390.4	
30	3881.0	4767.5	0.0	0.0	0.0	-994.2	107.7	-731.4
MEC	1349.8	918.0	-370.6	49.6	1004.4	601.7	1155.5	
31	3465.6	3775.5	0.0	0.0	0.0	-406.8	96.9	-279.9
ALTW	703.7	862.7	-240.6	-57.3	526.0	-206.0	871.0	
36	200.7	184.3	0.0	0.0	0.0	15.7	0.7	-5.4
MPW	74.4	64.2	0.0	0.0	6.4	-1.2	17.8	
39	256.7	548.0	0.0	0.0	0.0	-307.2	15.9	-305.0
WEPL	53.1	221.1	-200.2	0.0	123.5	46.8	108.8	
40	16547.3	15959.4	8.9	0.0	0.0	342.4	236.5	440.0
MAIN	3539.9	3615.2	-165.3	53.2	2353.7	-99.5	2490.1	
41	49063.0	45964.4	0.9	0.1	0.0	1941.1	1166.6	1953.4
SPP	9812.5	13647.9	-6543.9	529.1	10574.4	-12.1	12767.8	
42	335024.2	334482.9	-3533.4	5.9	0.0	-1626.7	5695.3	-1028.7
EQIV	69659.9	119849.0	-111224.7	-2394.6	18927.5	-61.9	82419.1	
43	22334.8	21869.1	97.6	31.1	0.0	-53.2	390.2	0.0
OH	4170.6	15245.9	-11788.8	421.1	6448.2	73.6	6667.0	

AREA	FROM GENERATION	TO LOAD	TO BUS SHUNT	TO LINE SHUNT	FROM CHARGING	TO NET INT	LOSSES	DESIRED NET INT
45	5789.5	5333.0	0.0	0.0	0.0	265.6	180.9	282.0
WERE	1360.5	1383.8	-677.2	0.0	1056.5	-170.0	1878.2	
46	1374.4	1466.0	0.0	0.0	0.0	-121.3	29.8	-117.3
MIPU	396.8	488.7	-260.0	0.0	202.1	-27.8	398.0	
48	738.4	943.0	0.0	0.0	0.0	-243.7	39.1	-242.0
EMDE	189.8	209.0	-51.2	0.0	119.4	-83.4	234.8	
60	526.6	504.0	0.0	0.0	0.0	20.0	2.6	20.0
KACY	105.4	66.2	0.0	0.0	15.1	39.4	14.9	
61	2495.6	3441.9	0.0	0.0	0.0	-1084.1	137.8	-992.0
ASEC	429.0	917.4	-398.0	0.0	970.2	-30.3	910.0	
69	588.2	699.7	0.0	0.0	0.0	-119.2	7.7	-119.0
SPRM	353.2	192.7	0.0	0.0	68.6	83.6	145.6	
71	18373.2	19209.3	0.0	0.0	0.0	-1295.8	459.7	414.0
CE	8527.4	7489.6	-3952.2	272.0	3860.2	669.1	7909.2	
76	498.8	415.0	0.0	0.0	0.0	62.7	21.1	67.2
SUNF	67.4	136.7	38.0	0.0	376.7	84.6	184.9	
78	3939.5	3475.7	0.0	0.0	0.0	409.4	54.4	417.3
KCPL	817.4	779.4	-270.3	0.0	531.5	-51.2	890.9	
79	198.3	415.0	0.0	0.0	0.0	-221.9	5.2	-221.0
STJO	-60.9	52.0	0.0	0.0	66.5	-97.1	50.7	
83	0.0	0.0	0.0	0.0	0.0	-4.1	4.1	0.0
	0.0	0.0	0.0	0.0	54.3	2.2	52.1	
94	0.0	-1.0	0.0	0.0	0.0	1.0	0.0	1.0
ERCOT	0.0	76.0	0.0	0.0	0.0	-77.7	1.7	
95	227.2	315.0	0.0	0.0	0.0	-89.7	1.9	-90.0
INDN	114.5	87.3	0.0	0.0	3.2	16.0	14.4	
100	11030.9	10873.2	-0.4	0.8	0.0	-170.7	328.0	-115.0
WUMS	3085.7	3908.3	-2989.5	0.0	1599.6	53.7	3712.7	
140	0.0	0.0	0.0	0.0	0.0	-4.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	
200	0.0	0.0	0.0	0.0	0.0	-12.3	6.4	0.0
	0.0	0.0	0.0	0.0	12.2	-4.2	14.9	
210	24.1	0.0	0.0	0.0	0.0	-298.4	14.2	0.0
	0.0	0.0	-159.2	0.0	74.0	76.7	81.5	
211	0.0	37.5	0.0	0.0	0.0	-52.3	3.7	0.0
	0.0	6.8	-142.9	0.0	29.8	127.8	38.1	
220	0.0	0.0	0.0	0.0	0.0	-24.3	1.0	0.0
	0.0	0.0	21.8	0.0	0.4	-27.8	1.8	
230	548.0	0.0	0.0	0.0	0.0	492.4	0.7	0.0
	-28.1	0.0	-147.1	0.0	1.4	16.3	79.2	
600	517.5	0.0	0.0	0.0	0.0	477.1	1.4	0.0
	93.2	0.0	-24.1	0.1	0.0	26.2	67.3	
652	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTALS	507222.5	499907.5	-3411.4	37.8	0.0	0.0	10688.4	5.7
	111730.1	176759.5	-148870.0	196.7	59826.1	0.0	143469.5	