Meeting: CRSP TYP meeting
Date/Time: Thursday, December 6, 2018 10:30AM – 1:30 PM
Subject: Ten Year Planning Projects
Location: CRSP MC SLC Conference Room
Conferencing Line/WebEx

## Agenda

<table>
<thead>
<tr>
<th>No.</th>
<th>Item Description</th>
<th>Duration</th>
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<tr>
<td>1</td>
<td><strong>Welcome notes</strong></td>
<td>Steve 5 min</td>
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<td>2</td>
<td><strong>Introductions / Logistics</strong></td>
<td>Amy 5 min</td>
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<td>3</td>
<td><strong>Audience Comments</strong></td>
<td>All 10 min</td>
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<td>4</td>
<td><strong>CRSP 10-Year Plan Review - RMR Maintenance Office</strong></td>
<td>Jason G. 70 min</td>
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<td>5</td>
<td><strong>Break</strong></td>
<td>15 min</td>
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<td>6</td>
<td><strong>CRSP 10-Year Plan Review - DSW Maintenance Office</strong></td>
<td>Tony/Mike/Jennifer 70 min</td>
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<td>7</td>
<td><strong>Power Marketing Updates</strong></td>
<td>Brent 10 min</td>
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<td>8</td>
<td><strong>Transformer Reserve Program Update</strong></td>
<td>Chris L. 10 min</td>
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<td>9</td>
<td><strong>Review Action Items</strong></td>
<td>Amy/All 10 min</td>
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<td><strong>Adjourn TYP Meeting</strong></td>
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## Decisions

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## Prior Open Action Items:

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Page 1 of 1
Rocky Mountain Region Ten Year Plan Version Control

• R0-version of Ten Year Plan submitted to customers and to headquarters for consolidation of WAPA-wide budget; late October-November
• R1-version of Ten Year Plan with any corrections or changes after customers and senior management review; mid-January
• RFINAL-final version submitted to headquarters for consolidation of WAPA-wide budget submission to the Dept. of Energy; April

FY 19-28 Rocky Mountain Region Ten Year Plan

• FY18 Completed Projects and Equipment Purchase
• Physical Security Projects
• Project Changes
• New Projects & Equipment Purchases
Completed Projects and Equipment Purchases

- 5 projects completed totaling $7.4M
- 5 pieces of heavy equipment purchased for $1.7M

FY 2018 Rocky Mountain Region Completed Projects

- Pleasant View – Ruin Canyon 24.9-kV UG T-line upgrade
  - In-service Date: Q2 FY18
  - Actual Cost: $597k
  - Budget: $670k

- Archer KV2A 230/115-kV Transformer Replacement
  - In-service Date: Q2 FY18
  - Actual Cost: $3.545M
  - Budget: $3.369M

- Rifle 230-kV CB 582 replacement
  - In-service Date: Q2 FY18
  - Actual Cost: $513k
  - Budget: $564k

- Weld 115-kV and 230-kV breaker replacements
  - In-service Date: Q2 FY18
  - Actual Cost: $1.83M
  - Budget: $1.61M
FY 2018 Rocky Mountain Region Completed Projects

• Archer Station Service
  • In-service date: Q4 FY18
  • Actual Cost: $952k
  • Budget: $673k
  • $100k modification to scope to incorporate main-tie-main design
  • Additional cost increase due to underestimation of labor costs for construction inspection and commissioning.

Archer Station Service

FY 2018 Rocky Mountain Region Equipment Purchases

<table>
<thead>
<tr>
<th>Item</th>
<th>Budget</th>
<th>Actual</th>
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<tbody>
<tr>
<td>Craig Digger Derrick Replacement</td>
<td>$350k</td>
<td>$485k</td>
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<tr>
<td>Craig Med. Duty Utility Truck</td>
<td>$40k</td>
<td>$40k</td>
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<tr>
<td>MOC Tracked Excavator (Found used on GSAXcess)</td>
<td>$250k</td>
<td>$112k</td>
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<tr>
<td>MOC 95’ Bucket Truck</td>
<td>$650k</td>
<td>$485k</td>
</tr>
<tr>
<td>Shiprock 95’ Aerial Manlift – Elbow Bucket Truck</td>
<td>$475k</td>
<td>$575k</td>
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<td>TOTAL</td>
<td>$1,765M</td>
<td>$1,697M</td>
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Physical Security Projects
FY 19-28 Rocky Mountain Region Physical Security Projects Update

- Montrose Operations Center - $265k
  - Completed and in service FY17
- Midway Substation - $283k through October
  - Completed in FY18 and undergoing Factory Acceptance testing Q1 FY19.
- Ault Substation - $351k budget, split with LAP and customers
  - Project awarded and completion anticipated in FY19
- Three more CIP sites - $450k each
  - One project each planned for FY20-22

Changes in Substation Projects
FY 19-28 Rocky Mountain Region Changes in Substation Projects

- Ault Stage 08
  - KU1A Transformer (345/230kV), 2.25MVAR reactors and 6 230-kV breakers
  - In-service Date: Delayed from FY19 to FY20 due to protest of award

- Dolores Transformer
  - ISD delayed from FY19 to FY20
  - Design details completed too late for construction to occur in Oct 2018 water outage

- Flaming Gorge 25-kV circuit breakers
  - ISD moved from FY20 to FY19
  - Breakers purchased in FY18
  - Anticipated budget reduced from $239k to $215k

- Midway KV1A 230/115-kV Transformer and Breakers
  - Budget increased from $2.25M to $2.76M to reflect updated transformer pricing data

- MOC Warehouse Transformer
  - In-service Date: Delayed from FY18 to Q1 FY20 due to late contract award and availability of commissioning resources
  - Budget increase from $355k to $407k

Changes in Communication Projects
**FY 19-28 Rocky Mountain Region Changes in Communication Projects**

- **Magnetic-Fontenelle radio replacements**
  - Completion of project delayed from FY19 to FY20
  - Delay due to allocation of WAPA labor to complete CO Fiber Ring as well as inability to access the sites six month of the year

- **Island Lakes Comm Building**
  - In-service Date: Delayed from FY18 to FY19 due to late award and inability to work in the winter
  - Budget reduced on TYP in FY18 due to low contract award – modifications and under-budgeted construction inspection time have pushed the project estimate back to FY17 figures of approx. $933k
FY 19-28 Rocky Mountain Region New Transmission Line Projects

• Crystal Dam Underground line rebuild
  • Replace a 2 mile long underground 12.5-kV line from the Crystal Dam
  • Serves National Park Service housing, Uncompahgre Valley Water Users Association (UVWUA) housing and UVWUA fish deterrent system
  • $640k in FY21 using WAPA labor forces.
  • Several alternatives evaluated with lower reliability and higher maintenance costs being key factors in the decision not to further explore those options.

FY 19-28 Rocky Mountain Region New Substation Projects

• Fiber between Upper and Lower Molina
  • $250k in FY20
  • Eliminates the need for Upper Molina microwave building which was estimated to cost $450k to replace as well as ongoing building maintenance.

• Flaming Gorge KY1A 138/69-kV Transformer replacement
  • $550k in FY21 and FY22
  • $490k CRSP and $60k Bridger Valley Electric.

• Montrose Auxiliary Storage Building
  • 125’ x 60’ building – acquired from BOR in FY18 at no cost.
  • Building will shelter equipment and materials from the elements.
  • $332k in FY20 for foundation and electric.

New Substation Projects
FY 19-28 Rocky Mountain Region New Substation Projects

- Weld KV1A 230/115-kV Transformer and Station Service replacement
  - $3.625M in FY21 and FY22
  - Replace aging and failing transformer as well as outdated SS equipment
  - Moves backup SS feed from PSCO transformer to WAPA KV1A

New Mobile and Heavy Equipment

- Craig Knuckleboom Crane Truck (2000) FY21 $200k
- Montrose Road Grader (1995) FY21 $300k

FY 19-28 Rocky Mountain Region New Mobile and Heavy Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>FY 2021</th>
<th>FY 2022</th>
</tr>
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<tbody>
<tr>
<td>Craig Knuckleboom Crane Truck (2000)</td>
<td>$200k</td>
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<tr>
<td>Montrose Road Grader (1995)</td>
<td>$300k</td>
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Questions?
Desert Southwest Region Outline

1. Communication Projects
   • Completed, Active, & New
2. Protection & Control Projects
   • Completed, Active, & New
3. Maintenance & Construction Projects
   • Completed, Active, & New
4. Work Plan Update
   • FY18 Execution, FY19 Plan

Desert Southwest Region Communication Projects
Active Communication Projects

CIPS Engineering Remote Access
- Location(s): Long House Valley
- Driven by compliance requirements
- Provided secure remote access to interrogate devices at the medium and low impact sites to meet CIPv5 requirements
- Total budget: $20,000
- Actual cost to date: $5,077
- ISD: January 31, 2019

Microwave System Upgrades
- Locations: Jack’s Peak (APS) to Glen Canyon and to Preston Mesa
- Project establishes a new communication path and increases reliability
- Work Plan/Out Years – this relates to the Glen Canyon Tower Project
- Government furnished equipment purchased: Q2 FY18
- Total Budget: $314,881
- FY19 Budget: $60,000
- Actual cost to date: $254,881
- Anticipated ISD: Q2 FY19
Active Communication Projects

Microwave System Upgrades
- Paths pending the completion of Glen Canyon Communication Tower Project:
  - Zilner Mesa – Glen Canyon
  - Zilner Mesa – Lolami
  - Jack’s Peak – Glen Canyon
  - Jack’s Peak – Preston Mesa
- Upgrades increases bandwidth and reliability
- Bandwidth requirements in accordance with NERC
- Total Budget: $425,698.46
- FY19 Budget: $70,000
- Actual cost to date: $355,698
- Anticipated ISD: Q2 FY19
**FY19 Communication Projects**

Remote Terminal Replacement (RTU)
- Location(s): Flagstaff
- Existing RTU has reached its capacity for equipment connectivity and processor speed limited
- Installation of bigger RTU equipment with additional ports and increased processor for proper monitoring, remote control, and increased visibility to SCADA
- Total budget: $175,000
- Anticipated ISD: Q4, FY19

**FY19 Communication Projects**

Mingus Mountain Communication Building Replacement
- Building was analyzed by engineering and deemed structurally unsound
- Project moved to FY20 based upon reprioritization of the Glen Canyon Comm Tower replacement
- DSW is repurposing the existing ED5 10’x24’ building for relocation to Mingus Mountain, savings will be realized in the repurposing
- Requesting Project Manager & Construction group support, need estimate for FY20
- FY19 Budget: $70,000 (Design)
- Actual cost to date: $23,785
- Anticipated ISD: Q4 FY20

**New Communication Projects**

“Towers” Mountain Communication Building Replacement
- FY20 $220,000 (Design)
- FY21 $800,000 (Construction)

Communication Battery/Charger System Replacements
- $50,000 per FY in FY20-FY27

Remote Terminal Unit (RTU) Replacements
- $85,000 per FY in FY20-FY27
FY19 Warehouse Project

Glen Canyon Warehouse
- Refurbish old Bureau Warehouse with Reclamation instead of building new building will save both agency $5M+
- Completed design with Reclamation
- Construction to be started in January 2019
- Completion of project by September 2019
- Great team work from DSW staff, CRSP staff, HQ staff, GC Reclamation, TSC Reclamation, and CRSP power office!

CRSP Portion:
- FY19 Budget: $175,000
- FY20 Budget: $15,000
- Actual cost to date: $439,444.58
- Anticipated ISD: Q4 FY20

FY19 Communication Project

Glen Canyon Warehouse Communications
- The Glen Canyon Warehouse building is being re-designed to accommodate office space, storage room and training room
- Jointly occupied by BOR and WAPA
- Project to provide the Communications for WAPA Personnel (VOIP, wireless, networking)
- Total FY19 Budget: $117,700
- Anticipated ISD: Q4 FY19

Desert Southwest Region
Protection & Control Projects
**Protection & Control Projects**

### Western Area Power Administration

#### Pinnacle Peak Transformer Relay Replacements
- **FY17:** Design and Procurement
- **FY18:** Complete installation & Commissioning
- **FY19:** Budget: $15,000 for CAD Completion / Project Close-out Phase
- **Total budget:** $345,716
- **Cost to date:** $336,233
- **ISD:** Q4 FY18
- **Cost drivers:** Increased cost due to FY18 labor rate increase & installation and commissioning constraint discovered during design phase.

#### Pinnacle Peak Relay Replacements

**Transfer Breaker & Bus Differential**
- **Scope:** Upgrade transfer line protection along with breaker failure protection.
- **Replace north & south 230 kV bus old electromechanical relay differential protection.**
- **FY18:** 50% Design and Procurement
- **FY19:** $210,000 Design, Installation and Commissioning
- **Total budget:** $297,051
- **Cost to date:** $74,018
- **ISD:** Q4 FY2019

### Glen Canyon Substation Relay Replacements

- **69/24 kV Protection panel upgrade**
- **Replace electromechanical relays - line, breaker, and bus protection on the 69-kV and 24-kV elements.**
- **FY18:** 30% Design and Procurement
- **FY19:** $300,000 Design, Installation and Commissioning
- **Total budget:** $410,000
- **Actual Cost to date:** $105,221.64
- **Anticipated ISD:** Q4 FY19

### Kayenta Line Relay Replacements
- **FY20:** $320,000

### Pinnacle Peak Transformer Relay Replacements – Tertiary Shunt Reactors
- **FY20:** $200,000
- **FY21:** $200,000

### Glen Canyon, Flagstaff, & Pinnacle Peak Remedial Action Scheme (RAS)
- **Completion of the RAS scheme for Path A/B being contingent upon integration of Bureau of Reclamation portion of the scheme.**
- **FY14 Design and Communications**
- **FY15 WEC Approved Design**
- **FY16 Procurement**
- **FY18 Completed B&M Equipment installation**
- **FY19 $150,000 Complete Installation**
- **Total budget:** $341,907
- **Actual cost to date:** $101,774
- **Anticipated ISD:** Q3 FY2019
Protection & Control Projects

Pinnacle Peak Disturbance Monitoring Equipment (DME) Upgrades
- Driven by compliance requirements (NERC Reliability Standard PRC-002-2); both 230-kV & 345-kV to be monitored.
- FY18: Design and Procurement
- FY19 Budget: $90,000 Design, Installation and Commissioning
- Actual cost to date: $181,547.32
- Total Budget: $281,246
- Anticipated ISD: Q3 FY19

Glen Canyon Digital Monitoring Equipment (DME) Upgrade
- Existing equipment is over 20 years old and nonfunctional
- Equipment is non-supported and discontinued
- The equipment upgrade could be required in the near future due to compliance requirements (NERC Reliability Standard PRC-002-2).
- FY20: $200,000
- FY21: $200,000

Protection & Control Projects

Meter Replacement - Revenue & Panel
- FY20: $50,000 - Glen Canyon Substation
- FY21: $225,000 - Pinnacle Peak
  - Replacement of numerous analog transducers, analog panel indication meters, and revenue meters that are at their end-of-life.
- FY22: $50,000 - Kayenta

Desert Southwest Region
Construction Projects
Completed Construction Projects

• **Pinnacle Peak Breaker 2982 - Emergency Replacement**
  • In-service Date: Q2 FY18
  • Actual cost: $265,109
  • Budget: $350,000

Active Construction Projects

**Glen Canyon Erosion and Waterline Project – Phase II**

• Scope:
  • Drainage capacity study completion
  • Additional Channel and Drainage improvements required
  • Remaining waterline replacement
  • Driveway Resurfacing

• Total Budget: $1,304,000
  • FY19 Budget: $1,360,000
  • Actual cost to date: $72,303
  • Anticipated ISD: Q4 FY19

Active Construction Projects

**Glen Canyon Erosion & Waterline Project Phase II**

• Phase I – Emergency repairs, completed Q2 FY17
Active Construction Projects

Glen Canyon Erosion & Waterline Project Phase II

Active Construction Projects

Glen Canyon Erosion Aerial

Active Construction Projects

Shiprock – Glen Canyon Reactor Project

- System voltage study showed voltage disturbances resulting in operational issues and station equipment risks
- Scope:
  - Addition of 60 MVar of shunt reactance installed to reduce post disturbance voltages
- Total Budget: $7,496,051
  - FY19 Budget: $3,100,000
  - FY20 Budget: $1,183,000
  - Actual cost to date: $3,199,003
  - Anticipated In-Service Date: Q3 FY2020
Active Construction Projects

Shiprock – Glen Canyon Reactor Project

Scope includes installing one 30MVAr Variable Shunt Reactor (VSR) at Kayenta and one 30MVAr VSR at Long House.

Active Construction Projects

Shiprock – Glen Canyon Reactor Project

Glen Canyon Communication Tower Replacement

- Scope:
  - Requirement for dual redundant routes to Glen Canyon
  - Bigger antennas to increase capacity adds additional loading to the tower
- Total Estimated Budget: $1,064,718
  - FY19 Budget: $709,000
  - FY20 Budget: $40,000
- Actual cost to date: $91,655
- Anticipated In-Service Date: Q4 FY19
Active Construction Projects

Glen Canyon KV2D 24/4-kV Station Service Transformer Replacement
- Driven by age and condition. Oil is contaminated and showing signs of internal degradation
- Scope:
  - Replace KV2D 24/4-kV Station Service Transformer.
- Total Budget: $454,000
  - FY19 Budget: $290,000
  - FY20 Budget: $129,000
- Actual cost to date: $16,747.77
- Anticipated In-Service Date: Q2 FY20

Active Construction Projects

Physical Security – Flagstaff, Glen Canyon and Pinnacle Peak Substations
- Upgrade physical security to Federal Information Processing Standard (FIPS) 201 compliance
- Scope – Security Assessments, Install Cameras and Install Card Readers

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<tr>
<th>Substation</th>
<th>FY18 Budget</th>
<th>FY19 Budget</th>
<th>FY20 Budget</th>
<th>Cost to Date</th>
<th>Const. Complete</th>
<th>In Service Date</th>
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<tr>
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<td>$495,000</td>
<td>$25,000</td>
<td>$387,702</td>
<td>Done</td>
<td>12/20/2018</td>
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<tr>
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<td>$125,000</td>
<td>$436,248</td>
<td>1/15/2019</td>
<td>2/15/2019</td>
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<tr>
<td>Pinnacle Peak</td>
<td>$520,000</td>
<td>$395,000</td>
<td>$125,000</td>
<td>$364,811</td>
<td>3/15/2019</td>
<td>4/19/2019</td>
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Note: Kayenta and Long House Valley physical security will be assessed and planned in FY19

FY19 New Start Construction Projects

Pinnacle Peak Shunt Capacitor Banks
- Due to Cap Bank Failure in FY17, Breaker was lost to damage
- Existing Equipment in degraded condition due to age causing reliability limitations
- Scope:
  - Removal of the existing capacitor banks and installation of new replacement units.
- Total Budget: $5,765,000
  - FY19 Budget: $1,480,000
  - FY20 Budget: $3,476,000
  - FY21 Budget: $429,000
  - FY22 Budget: $380,000
- Actual cost to date: $77,000
- Anticipated In-Service Date: Q2 FY21
FY19 New Start Construction Projects

Pinnacle Peak – Flagstaff Series Cap Bank Breaker Replacements
- Parallel Projects to Replace Series Cap Bank Maintenance and Protection Breakers (4) at Pinnacle Peak and (4) at Flagstaff
- Parallel Design and Procurement
- Installation of mated pairs – thus eliminating additional 345kV line outages

• Project #1
  - Pinnacle Peak: 345kV Breakers 2292 & 2299
  - Total Budget: $2,310,000
  - FY19 Budget: $1,210,000
  - FY20 Budget: $1,050,000
  - FY21 Budget: $50,000

• Project #2
  - Pinnacle Peak: 345kV Breakers 2292 & 2299
  - Total Budget: $2,171,000
  - FY19 Budget: $150,000
  - FY20 Budget: $0
  - FY21 Budget: $2,021,000

New Construction & Maintenance Projects

- Pinnacle Peak 345kV Breaker 1196 & 1692
  - FY21 Budget: $1,150,000
  - Total Project Cost: $2,750,000

- Kayenta 230kV Bypass Breakers 1086 and 1386
  - FY21 Budget: $1,346,000
  - Total Project Cost: $2,846,000

- Glen Canyon 345kV Breaker 1092, 1196, 3292
  - FY22 Budget: $1,600,000
  - FY23 Budget: $2,575,000

- Glen Canyon 230kV Breakers 7482, 7282, 8082
  - FY25 Budget: $800,000
  - Total Project Cost: $2,580,000

- Glen Canyon 230kV Breakers 7682 and 7982
  - FY27 Budget: $2,380,000
  - Total Project Cost: $2,380,000
Work Plan Update

FY18 Summary
• Work Plan $2.405M
• Revalidated Plan $9.405M
• Executed $4.849M

FY19 Summary
• Work Plan $6.62M
• Revalidated Plan $10.0M

Questions for Desert Southwest Region Office?

Thank you
CRSP Power Marketing Updates

SLCA/IP Firm Electric Service Contracts

- 135 Customers
- 57 Signed Contracts – 72% of SLCA/IP Resource Under Contract for 2025 Period

Numerous small customers still need to sign

- Special Effort for Tribal Customers
  - 55 Tribal customers
  - 10 Tribes/Tribal Utilities have signed already
  - Education and Outreach Efforts – WAPA’s name becoming more familiar
  - Benefit Crediting Contracts need to be renegotiated for 2025

Western Area Power Administration

SLCA/IP Firm Electric Service Rate – SLIP F10 Expires September 30, 2020

- In effect since October 1, 2015
- Official Rate Process begins October 2019 with announcements in Federal Register, Public Information and Comment Forums

Work this coming year:

- We will have some proposals at the May customer meeting
- Working hard this winter to resolve various issues, discussions with customers, information on website

Please be aware of SPAM/Phishing Attempts. All billing will come from: RMRBilling@wapa.gov
Asset Management Program Update

Chris Lyles
Asset Management

Topics for Discussion Today

- T-Line Structures as Assets
- Transformer Acquisition Process
- Transformer Strategy for High-Impact Low Frequency (HILF) events

Transmission Line Assets

- Asset Management formally launched in 2015
- 581 transmission line segments considered assets
- Age was used for determining health
- 178,000 individual structures are now assets
- Individual structure condition determines health
Reformed Transformer Acquisition Process

- Goal: Reduce lead-time from 24 months to 9-12 months
- 9 months for 115-230kV. 12 months for 345kV and above
- Team interviewed 3 transformer vendors
- Long-term contract with standard specifications
- Improved process for typical capital replacements and emergency needs
- Timeframe for implementation

Transformer Strategy for HILF events

- Scope and methodology for strategy
- WAPA-wide mitigation vs. regional
- Anticipated path forward
- Anticipated outcome: Purchase and Store
  Partner with other utilities
  Rely on new acquisition strategy

Feedback and Questions

Chris Lyles
Asset Management
lyles@wapa.gov
720-962-7249