
Transmission Asset Management (TAM) Program

Update

August 2015



TAM Program Basics

- Program is the result of implementation of the Asset Management Improvement Project (2013-2015)
- Program is guided by:
 - ISO 55000, 55001 and 55002
 - Western's Strategic Roadmap 2024
 - Western Order 413.1 – Asset Management
 - Transmission Asset Management Stakeholder Committee (TAMSC) – internal
 - Western Asset Management Manual

TAM Program Basics (cont.)

- Three initial asset classes (long lead time; high dollar) – Power Transformers, Circuit Breakers, Transmission Lines.
- Provides objective, data driven justification of capital funding requests and helps to prioritize projects.
- Determines and raises awareness of major asset risks.
- Documents actions for addressing unacceptable risks.
- Regions continually update asset condition and consequence data.

TAM Program Basics (cont.)

- Annual reports for analysis, trending and as input to the 10-yr plan updates
- Credible and consistent results
- Improves reliability
- Annual review of performance for Program adjustments and to further improvements.

TAM Program Governance

- Program is in the Office of the Chief Operating Officer, Transmission Asset Planning and Management.
- Program guidance is provided by the Transmission Asset Management Stakeholder Committee.
- The TAPM Manager provides day-to-day overall program management.
- The Maintenance Managers provide regional day-to-day management.
- The regional Asset Management Specialist provide local program support and inter-regional coordination.



TAM Program Staffing

Program staffing consists of HQ and regional, dedicated staff, subject matter experts (SME), and contract support.

- Current dedicated staff consists of an asset management specialist in each region and CRSP (5 positions) and the TAPM Manger.
- SMEs from several functional areas such as marketing, maintenance, operations, transmission and finance support TAM Program activities.
- Current contract support consists of two part time positions.
- Temporary details are also utilized for Program activities.

AM Basics – Risk

$$\text{Asset Risk} = \text{Probability of Failure (POF)} \\ \times \\ \text{Consequence of Failure}$$

POF: Probability that that asset will fail in the next year (Uses a Weibull analysis and combines Health Index “HI”, and WAPA historical replacement statistics for that asset class)

Consequence: The impact to Western and others if that asset fails by evaluating nine critical factors such as economic impact and whether the asset provides a critical service.

Transformers

Parameters:

- All oil-filled power transformers, including units with LTC's, and oil-filled reactors
- All phase-shifting transformers (separate asset class)
- Includes units owned by Western (fully or partially)
- Includes units maintained by Western (condition assessment only)
- Excludes pole mounted
- Excludes station service

Owner	Quantity*
DSW	70
RM	103
UGP	222
SN	58
CRSP	67

* Current as of Mar 4, 2015

Breakers

Parameters:

- Power circuit breakers, oil, air, vacuum, and SF-6
- 100-kV and above
- Excludes circuit switchers or other switchgear.
- Includes units owned (fully or partially) by Western
- Includes units maintained by Western (condition assessment only)

Owner	Quantity*
DSW	325
RM	273
UGP	577
SN	243
CRSP	197

* Current as of March 4, 2015

Transmission Lines

Parameters:

- 100-kV and above
- Breaker to breaker
- No underground
- Includes segments owned (fully or partially) by Western (capacity only; ownership does not qualify)
- Includes segments maintained by Western (condition assessment only)

Region	Quantity
DSW	167
RM	130
UGP	193
SN	68
CRSP*	60

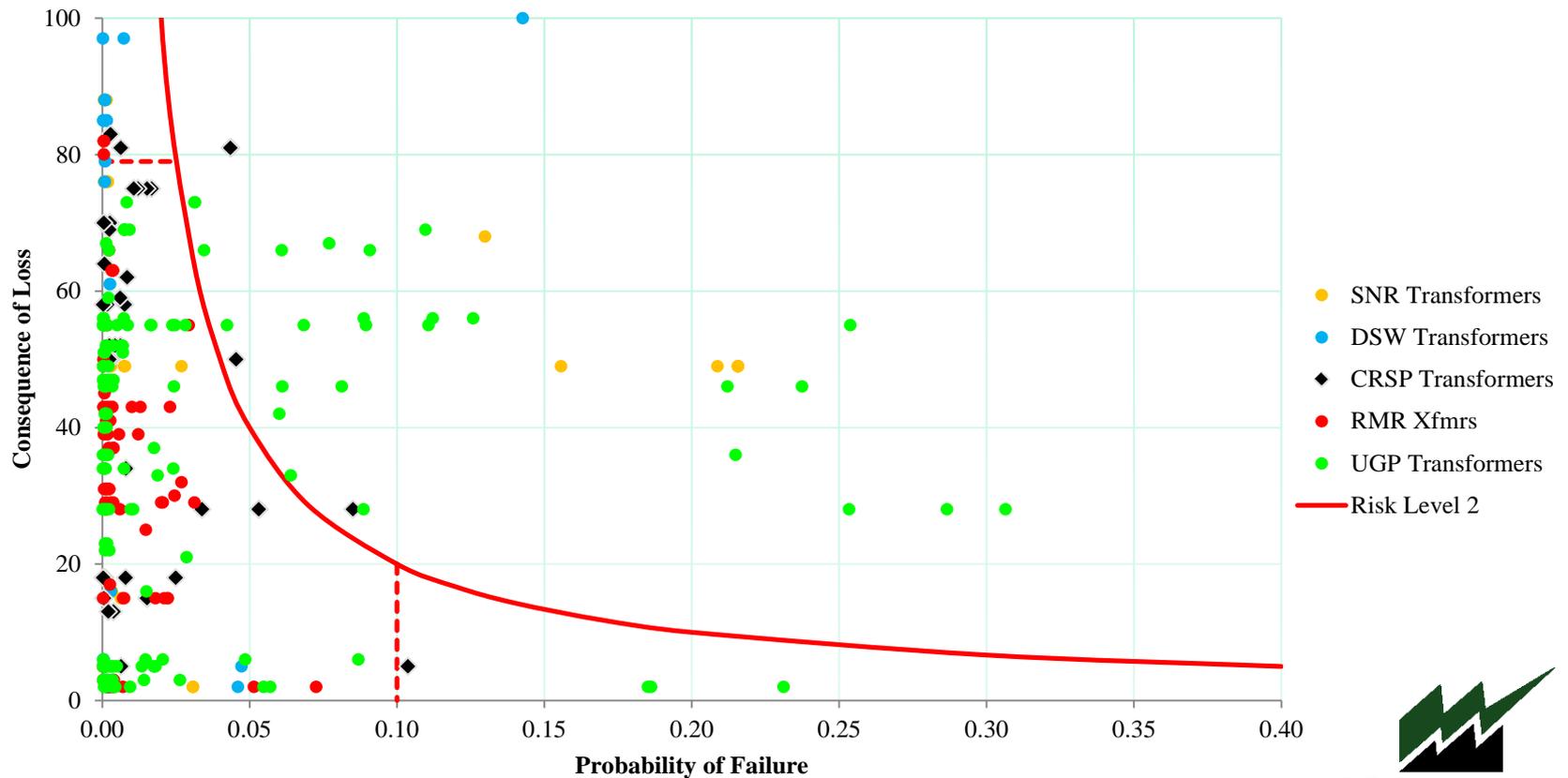
* Contains redundancy between CRSP/DSW and CRSP/RMR assets

TAM Program Results & Data

- Asset condition and consequence raw data is entered into Maximo which calculates POF, consequence scores and the resulting risk.
- POF, consequence scores and risk which exceed Western-wide thresholds (approved by the TAMSC) automatically generate risk register entries in Maximo for tracking resolution of the issue.
- Various reports are available for management of Program data and result.
 - Permission to view reports are controlled due to Standards of Conduct and OOU restrictions.

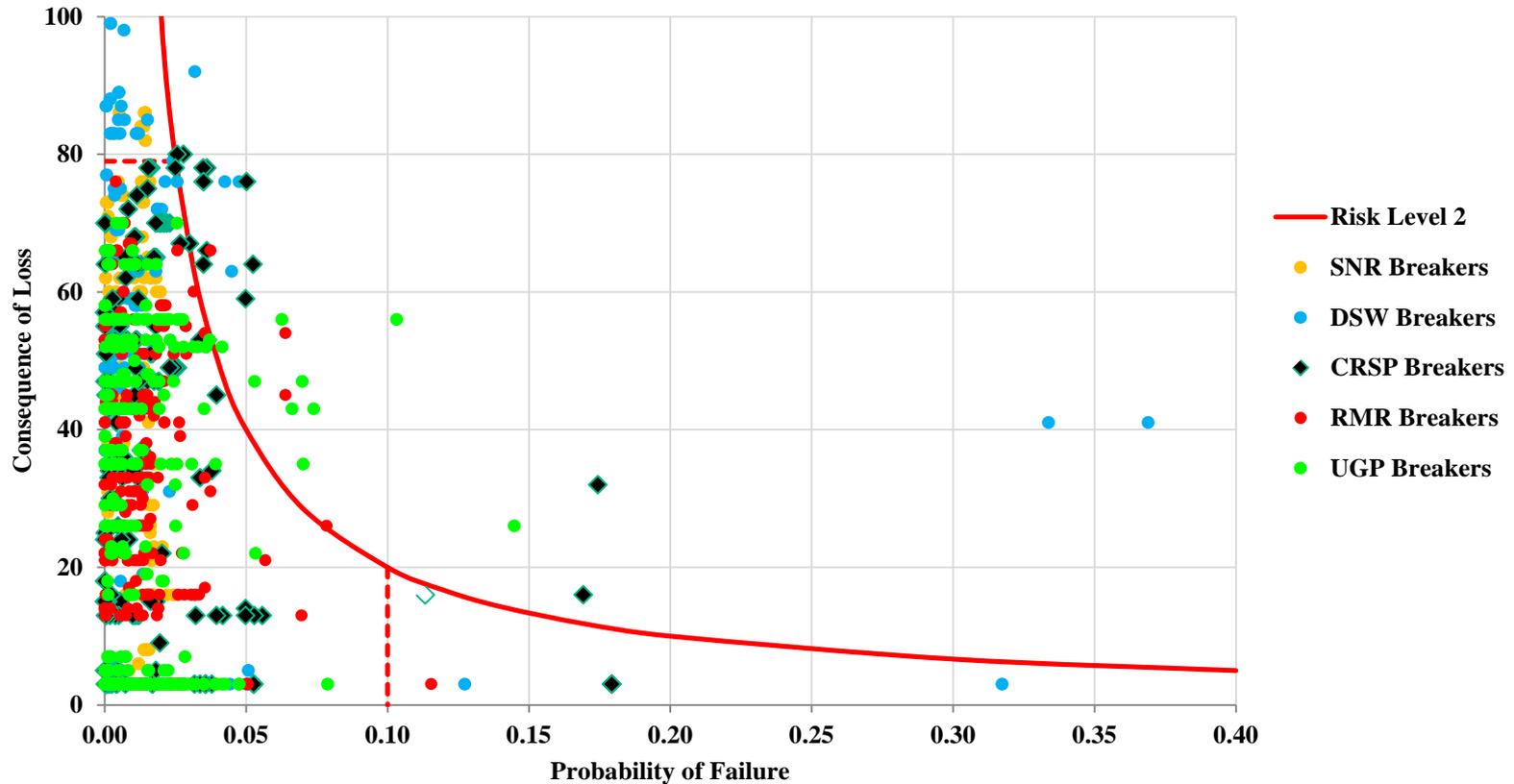
Western Transformer Risk Example

WAPA 2015 Transformer Risk



Western Breaker Risk Example

WAPA 2015 Breaker Risk



Next Steps

- Develop Strategic Asset Management Plan (SAMP). This plan will provide guidance to the TAM Program for other asset classes.
- Develop metrics and build analytics for t-line structures and conductors condition assessment.
- Initiate project for adding Life Cycle Asset Management.
- Evaluate and prioritize additional asset classes to be incorporated into the Program.

Next Steps (cont.)

- Consider adding asset adequacy risks to the Program. This issue would address asset risk due to inadequate capabilities such as capacity or voltage rating in addition to risk of failure.
- Implement the AM Technology Roadmap and work to improve data architecture, collection, governance and stewardship, and in addition:
 - Expand and automate substation equipment Condition Data Acquisition (DGA, Doble, bus fault duty, loading data).
 - Assure long-term sustainability of consequence data and processes.
 - Assure long-term sustainability of TAM Program data, document management and administration.
 - Develop dashboard reporting feature.

Additional Information

For more information about Western's TAM Program contact:

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