

AT A GLANCE



Transmission Asset Management Analytics

Program 34

Research Value

- A sound technical basis for decision-making.
- Effective use of existing infrastructure and data.
- Early identification of type issues.
- Asset useful life estimates.
- Maintenance and inspection requirements.

Member Benefits

- Guidelines on what equipment-specific data utilities should collect.
- Provide algorithms to:
 - Assess the condition of in-service assets.
 - Identify assets at risk.
 - Set triggers and alarms for automated maintenance actions.
 - Assist with repair versus replace decisions.
- Provide metrics based on industry-wide data to inform decisions.
 - Capital planning.
 - Spare strategies.
 - Maintenance program development; task and timing selection.
 - Specification and selection of new assets.
 - Benchmarking.
- Reduced reliance on time-based maintenance.

Transmission companies face many issues such as aging infrastructure, stringent operating requirements, financial constraints, and retiring expertise. These issues make asset management challenging. In response, many electric utilities are adopting analysis-based decision processes to improve maintenance and reliability and to minimize equipment life-cycle costs and risks. However, the data, analytical tools, and models required are not well established. The Transmission Asset Management program develops asset knowledge enablers, such as failure rates and asset health assessment algorithms, to help utilities make better life-cycle management decisions. Research results are transferred to members through scientific reports, easy-to-use software tools, reference guides, webcasts, and workshops.



Research Highlights

Asset Management Principles & Practices (34.001)

- Deliver asset management guidelines.
- Evaluate the application of Generative Artificial Intelligence, Large Language Models, and Computer Vision in transmission asset management.
- Provides training on analytics to improve transmission asset management and maintenance.

Substations Asset Data Analytics (34.002)

- Offer guidelines on the substation equipment data to collect and why.
- Apply advanced analytical techniques to better understand substation equipment performance.
- Deliver computer-assisted analytics for work order categorization and information retrieval.
- Deliver algorithms to analyze data from online monitors, digital relays, fault recorders, SCADA, and system operation historians.
- Deliver new metrics based on analysis of industry-wide data for power transformers, circuit breakers, disconnect switches, capacitor banks, substation batteries, and protective relays.
- Deliver new versions of asset health algorithms for power transformers and circuit breakers.

Overhead Transmission Asset Data Analytics (34.003)

- Deliver analytics and new metrics based on industry wide data for wood poles, lattice structures, conductors, shield wire, and insulators.
- Apply Natural Language Processing and Computer Vision for overhead transmission fleet management.
- Investigate how spatial information and remote sensing can enhance asset analytics.
- Deliver an overhead transmission line risk ranking framework.

Underground Transmission Asset Data Analytics (34.004)

- Deliver an underground transmission line risk ranking framework.
- Deliver computer assisted analytics for defect classification and information retrieval.

Supplemental Projects and Application Opportunities

- Applying Transmission Asset Analytics Tools and Methodologies
- Asset Management Maturity Assessment
- Power Transformer Through fault Risk Assessment: Algorithm Development & Validation – Phase 2
- Power Transformer Spare Strategy Evaluation Model Development & Application
- “Near Real Time” Load Tap Changer Analytics
- Conductor and Shield Wire Performance Modeling
- Overhead Transmission Line Risk Ranking: Application & Demonstration
- 1-on-1 Utility Specific Wood Pole & Steel Structure Fleet Management Analytics

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