EPRI

AT A GLANCE

Distribution Systems

Program 180

Grid modernization and electrification are driving substantial change in how the distribution system is designed, constructed, maintained, and managed. The EPRI Distribution Systems research team performs industry-leading R&D to enable and inform utilities in their design and effective management of the distribution system. The research focuses on distribution assets, such as poles, transformers, reclosers, and cable systems, across their entire life cycle, from specification to removal.

This program produces advanced knowledge, technologies, and tools to inform decisions regarding distribution assets' life cycles. Researchers produce these results by identifying high-value research opportunities, creating and executing robust research projects, and implementing results with utilities. Researchers use various approaches to produce these results, including:

Research Value

- Enhance safety for utility workers and the public
- Improve specifications and designs for new assets
- Develop maintenance practices with a strong technical basis
- Reduce O&M costs and proactively plan capital and maintenance budgets
- Increase system resilience and reliability

- Laboratory testing of new, aged, and failed equipment
- Evaluation of emerging technologies
- Investigations into equipment failure modes and degradation mechanisms
- Collection and assessment of utility practices
- Accelerated aging of components
- Assessment of asset performance

See more about the research at distribution.epri.com.

Member Benefits

- Provide guidance on design and performance of overhead structures
- Access to industry-references on underground distribution and automation
- Insights into leading grounding and arc flash practices
- Evaluate virtual inspection techniques for distribution automation assets
- Exposure and evaluation of new and emerging technologies
- Understand how to apply data science techniques to distribution asset data for wood poles and transformers

EPRI Technical Contact

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Overhead Distribution Assets

- Compiling ten years of resilient overhead structure design research into a compendium
- Testing emerging solid-dielectric distribution transformers
- Evaluating the performance and application of online condition monitoring technologies
- Demonstrating applications for 3D scanning technologies on overhead distribution, such as conductor clearance measurements

Underground Distribution Assets

- Investigating new cable materials such as lead-free EPR and EAM.
- Performing failure analyses on cable accessories to identify opportunities to improve design, material selection, and installation practices
- Examining the heating characteristics of defective medium-voltage cable splices to facilitate improved temperature criteria for triggering maintenance and replacement
- Gathering and sharing industry underground practices for topics such as proactive undergrounding

Distribution Automation Assets

- Assessing the performance of new single-phase switching devices through rigorous laboratory testing
- Investigating causes of recloser cable failure and identifying opportunities to improve per-formance and longevity
- Performing failure analyses of line reclosers to enable improved specifications and design testing methodologies
- Gathering and sharing the latest approaches to distribution automation fleet management and field operation

Safety and Work Practices

- Facilitating industry knowledge sharing of serious injury and fatality (SIF) events to enable utilities to improve safety practices
- Evaluating the effectiveness and accuracy of live downed conductor detection technologies through laboratory testing
- Investigating how arc flash hazards change based on how FR-rated shirts are worn
- Delivering guidance on improved grounding approaches and personnel protection

Asset and Reliability Analytics

- Developing metrics to better assess and evaluate equipment and system performance
- Evaluating the effectiveness of synthetic data to train AI systems
- Investigating the application of emerging data science techniques such as artificial intelligence/machine learning