

# AT A GLANCE



## Distribution Systems

### Program 180

#### Research Value

- Enhance safety, both for utility workers and the public.
- Improve specifications for new assets.
- Develop maintenance practices with a strong technical basis.
- Reduce maintenance costs.
- Proactively plan capital and maintenance budgets.
- Increase distribution system resilience.
- Improve asset and system reliability.

#### 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

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:

- 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](http://distribution.epri.com).

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## Research Highlights



### Overhead Distribution Assets

- Investigating electrical performance of crossarms in salt-contaminated environments and aging of composite materials
- Testing emerging solid-state distribution transformers to better understand overloading capability.
- Evaluating the performance and application of grid monitoring technologies
- Applying short circuit tests to overhead connectors to assess performance.



### Underground Distribution Assets

- Investigating new cable materials
- Performing failure analyses on cable accessories to identify opportunities to improve design, material selection, and installation practices
- Examining the heating characteristics of low and medium voltage accessories, including conductor and metallic shield connections, to understand their impact on accessory performance
- Delivering focused short-course material on UG systems to refresh/expand utility engineer knowledge



### Distribution Automation Assets

- Evaluate integrated voltage sensors in smart grid devices for accuracy and long-term performance.
- Assessing the performance of new single-phase switching devices through rigorous laboratory testing
- Investigating causes of recloser cable failure and identifying opportunities to improve performance and longevity
- 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-rated clothing should be applied based on test results showing underperforming products
- Researching practices and technologies to reduce risks and hazards of contact



### Asset and Reliability Analytics

- Developing metrics to better assess and evaluate equipment and system performance.
- Documenting the application of EPRI research for utility business intelligence (BI) use cases
- Investigating emerging data science techniques for confident data driven decisions related to the asset life cycle



### Wildfire Performance of Distribution Systems

- Investigating the design and performance of covered conductors
- Evaluating the performance and application of grid monitoring technologies
- Developing improved methods to assess material and component flammability
- Facilitating knowledge sharing and implementation of past wildfire research efforts

For more information, contact:

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