

# Technology Innovation Project



Project Brief

## TIP 23: EPRI P35: Overhead Transmission

### Context

Transmission companies are focused on improving safety and reliability, while looking for ways to reduce operations and maintenance costs. Increasing transmission capacity without making large capital investments and reducing capital expenditures for new/refurbished equipment are major priorities. BPA is partnering with the Electric Power Research Institute (EPRI) to address these needs.

This project is an organizational effort to better coordinate BPA/EPRI research activities for increased efficiency and productivity. Membership association with EPRI allows BPA to go far beyond what BPA's own facilities could provide in terms of duration and extremity of testing and subject matter considered. For Program 35 (Overhead Transmission) the strategy for EPRI involvement is to promote R&D through EPRI program projects and supplemental projects that are directly applicable to BPA's business lines and agency obligations. Pure knowledge from data gathered is, of course, gained through this affiliation; but the primary focus is on finding and promoting EPRI projects that directly apply to bulk power transmission owners like BPA. BPA project managers are selected based on their expertise in a particular area as well as the relevance of that subject to BPA's needs, and are expected to facilitate the involvement of other Subject Matter Experts (SMEs) in projects that can produce a demonstrable return on BPA investment.

This is a programmatic effort to formalize BPA's collaboration with EPRI so that the engagement is less arbitrary and more focused, with careful attention to a project's value added.

### Description

The Electric Power Research Institute's Program 35, *Overhead Transmission*, addresses research needs of transmission asset owners. It includes projects focused on specific components (e.g., insulators, compression connectors and cross arms) as well as projects focused on transmission-related issues (e.g., lightning and grounding, live working and transmission capacity). It delivers a blend of short-term tools such as software, reference books and field guides, together with longer-term research, such as component aging tests and the development of sensors for monitoring line components and performance. The program consists of multiple projects that are added or concluded during each program year.

This program also performs long-term laboratory experiments aimed at better understanding the aging and failure mechanisms of structures and line components. Corrosion laboratories create environments to better understand the impact of corrosion above and below ground; insulators are tested for aging and degradation to learn more about their long-term performance characteristics.

### Why It Matters

Overhead transmission is a major area of responsibility for meeting BPA's strategic objectives. This program encompasses and addresses the technology needs described in the Transmission Technology Roadmap. BPA's continued participation assures the agency's representation in this program's governing body. Collaboration with other EPRI member utilities affords opportunities to leverage agency interest, share information and, in particular, avoid the very high costs associated with independently conducting this research. BPA's membership in this program includes access to EPRI's laboratories and testing facilities.

### Goals and Objectives

BPA's participation will add the results of current EPRI R&D projects to Transmission Engineering design and analyses practices and provide BPA's contribution to EPRI member utilities in the following areas:

- Foundation analysis and design practices at BPA
- Conductor compression fittings and other advanced conductor work at BPA
- BPA's subgrade corrosion management practices
- BPA practices and techniques for live working
- BPA's work with polymer insulators and other composite components
- Lightning performance and analyses on BPA transmission lines and structures

The BPA project manager reports program status to management and the Collaborative Working Group. Continuing attention is being given to accurately correlate individual project values with BPA needs.

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**Project Start Date:** January 1, 2014

**Project End Date:** December 31, 2014

### Funding

BPA FY2014 Membership: \$387,262

### Reports & References

#### Current Project Sets:

- P35.001 Inspection Assessment and Management of Overhead Transmission Lines
- P35.002 Conductor Shield Wire and Hardware Corrosion Management
- P35.003 Structure and Foundation Corrosion Management
- P35.004 Compression Connector Management
- P35.005 Crossarm and Composite Pole Management
- P35.006 Lightning Performance and Grounding of Transmission Lines
- P35.007 Transmission Line Design Tools
- P35.008 Overhead Line Design and Research
- P35.010 Live Working: Research Techniques and Procedures
- P35.011 Polymer and Composite Overhead Transmission Line Components
- P35.012 Porcelain / Glass Insulator Integrity Assessment
- P35.013 Ratings for Overhead Lines
- P35.014 High Temperature Operation of Overhead Lines
- P35.015 Performance and Maintenance of High-Temperature Conductors
- P35.016 New and Emerging Inspection and Sensing Technologies
- P35.017 Design and Construction - Approach and Practices

### For More Information Contact:

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### Links

EPRI reports are available to BPA employees here:  
<http://internal.bpa.gov/Services/Library/Pages/Databases.aspx>

Further information on EPRI Program 35:  
[http://mydocs.epri.com/docs/Portfolio/PDF/2010\\_P035.pdf](http://mydocs.epri.com/docs/Portfolio/PDF/2010_P035.pdf)

### Participating Organizations

Ameren Services Co.	Georgia Transmission Corp.	Pinnacle West Capital Corporation
American Electric Power Service Corp.	Great Plains Energy Services, Inc.	PNM Resources, Inc.
American Transmission Co.	Great River Energy	PowerLink Queensland
Arkansas Electric Cooperative Corp.	Hawaiian Electric Co., Inc	PowerSouth Energy Cooperative
BC Hydro	Hetch Hetchy Water & Power	PPL Corporation
Bonneville Power Administration	Hoosier Energy Rural Electric Coop, Inc.	Salt River Project
CenterPoint Energy	Hydro One Networks, Inc.	San Diego Gas & Electric Co.
Houston Electric, LLC	Korea Electric Power Corp.	Sarawak Energy Berhad
Central Hudson Gas & Electric Corp.	Lincoln Electric System	South Carolina Electric & Gas Co.
Consolidated Edison, Inc.	Long Island Power Authority	Southern Company
CPS Energy	Los Angeles Dept. of Water & Power	Tennessee Valley Authority (TVA)
Dominion Resources, Inc.	Manitoba Hydro	The United Illuminating Company
Duke Energy Corp.	National Grid UK, Ltd.	Tri-State Generation & Transmission
Entergy Services, Inc.	Nebraska Public Power District	Assoc. Inc.
ESKOM	New York Power Authority	Unisource Energy Corporation
Exelon Corporation	Northeast Utilities	Western Area Power Administration
FirstEnergy Corp.	NorthWestern Corp.	Xcel Energy Services, Inc.

