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.

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.
TIP 23: EPRI P35: Overhead Transmission

**Project Start Date:** January 1, 2014  
**Project End Date:** December 31, 2014

**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

**Funding**

BPA FY2014 Membership: $387,262

**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:  

**Participating Organizations**

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