

# Technology Innovation Project



Project Brief

## TIP 25: EPRI Program 37 – Substations

### Context

Utilities are faced with a number of issues in managing their assets. They seek to enhance safety, reliability and performance, as well as extend equipment life to defer capital expenditures and control costs. BPA is partnering with the Electric Power Research Institute (EPRI) to accomplish these goals.

This program represents organizational efforts to better coordinate BPA/EPRI research activities. For Program 37 (Substations), 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 participants are selected for their expertise in a particular area as well as the relevance of that subject to BPA 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 effort is more focused, with careful attention to a project's value added.

### Description

BPA participates in EPRI's Power Delivery and Utilization sector of which we fund research in their program 37 *Substations* R&D portfolio. The R&D projects under this program consist of single and multiple year projects that are added or concluded during each program year.

BPA is utilizing EPRI Program 37 for the following functions: Transformer life management; circuit breaker life management; substation maintenance management; SF-6 environmental management; emerging technology for protection and control; and other miscellaneous projects within the program portfolio.

This program offers a complete portfolio of tools and technologies along with resources such as failure databases and aging models to improve transformer and circuit breaker life management along with providing operation and maintenance engineers access to research results for developing strategies in extending equipment life, optimizing maintenance costs and reducing outages.

### Why It Matters

BPA's participation in Program 37 allows the agency to collaborate with other national and international experts. Membership also provides access to a substantial library of written resources and technical reports; networking opportunities EPRI member utilities from around the world; and assures agency development of maintenance and design practices with a broader view of what issues, problems and/or limitations need to be addressed.

### Goals and Objectives

BPA expects Program 37 to accomplish the following objectives:

- 1) Manage program involvement against a detailed annual plan that captures the information obtained from advisor and council meetings, and tracks actions determined out of task force meetings. The plan includes reporting of development activities and application of deliverables, such as diagnostic research, EPRI technical books, maintenance guides, and equipment life extension findings, along with status reports on budget and execution of BPA's EPRI action plan. This plan will also guide developing actions for BPA to leverage better value and applicability of EPRI R&D.
- 2) Continue to add the results of current EPRI R&D projects to BPA maintenance and asset management practices.
- 3) Contribute BPA's expertise to EPRI collaboration model in the following areas: Sulfur hexafluoride (SF6) management, transformer health and life expectancy management, condition-based substation equipment maintenance, switching safety, and protective relaying configuration management.
- 4) Report program status to management and the Collaborative Working Group.
- 5) Retain ability to become involved in future EPRI R&D projects, which is only available to active members.

Continuing attention is being given to more accurately correlate individual project values with BPA needs and to assemble sufficient manpower to complete project goals.

## TIP 25: EPRI Program 37 – Substations

**Project Start Date:** January 1, 2009

**Project End Date:** December 31, 2019

### Funding

BPA FY2019 Membership: \$215,000

### Reports & References

#### Current Project Sets:

- P37.101: Transformer Life Management
- P37.102: Circuit Breaker Life Management
- P37.103: Protection and Control
- P37.104: Substation Ground Grid Research
- P37.105: Disconnect Switches, Arresters and Ratings
- P37.108: GIS (Gas-Insulated Substations) and GIL (Gas-Insulated Lines)
- P37.111: Substation Asset Management Analytics
- P37.113: Effective Maintenance and Monitoring of Transformer Bushings
- P37.114: Physical Security
- P37.115: Performance of Contaminated External Insulation in Substations

### 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>

