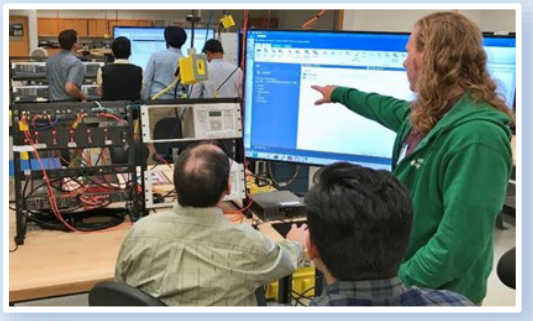
Supplemental Project Notice

IEC 61850 DIGITAL SUBSTATION DEVELOPMENT AND TECHNOLOGY TRANSFER: (PHASE 2)



PROJECT HIGHLIGHTS

- Overcome the steep learning curve of IEC 61850 standard through EPRI technology transfer
- Gain hands-on knowledge of state-of-the-art digital IEC 61850 substation technologies at EPRI P&C lab
- Collaboratively address technical barriers and accelerate field deployment

Background, Objectives, and New Learnings

Industrial communication technologies and standard-based interoperability enable utilities to advance digital substations and develop new protection, automation, and control systems. The International Electrotechnical Commission (IEC) 61850 standard is a foundational standard specifying communication networks and systems for power utility automation. Worldwide, utilities show growing interests to apply the IEC 61850 standard and embrace new digital substation technologies that promise to improve safety and reliability, reduce costs, enable condition-based maintenance, strengthen storm hardening and grid resiliency.

While the transition to IEC 61850 digital substation may provide significant advantages, utilities are often facing the challenges such as:

- Knowledge preparation for staff to overcome the steep learning curve of IEC 61850 standard and technologies.
- Technical barriers in developing new approaches for protection system testing and maintenance in digital substation environment for meeting reliability and regulatory requirements.
- Develop new workflows and methods for effective management of device settings, streamline IEC 61850 system engineering process, and apply necessary change controls on configuration and documentation in a highly-integrated IEC 61850 system.

For decades, EPRI have been collaborating with utilities and industry stakeholders in R&D projects for accelerating IEC 61850 standard development and field deployment. This project builds on EPRI's previous research and accomplishments:

- A wealth of research results from the deliverables of completed projects, addressing different needs in IEC 61850 project development and field implementation.
- The purpose-built testbed systems at EPRI P&C lab consist of state-of-the-art IEC 61850 products or prototypes for research, development, and hands-on technology transfer.
- Success of industry-wide collaborations with utilities, manufacturers, testing service providers, standard working groups, and IEC 61850 subject matter experts (SMEs).

The goal of the project is to assist utilities in accelerating IEC 61850 digital substation development by providing technical support in knowledge preparation, engineering design, field deployment, testing and maintenance.

The EPRI technology transfer and proposed research may provide utilities with significant new learnings in specification, engineering, testing and maintenance of new protection and automation systems in IEC 61850 digital substation. The project will coordinate with relevant research programs at EPRI, including Substations, Information, Communication and Cyber Security. The non-proprietary results in this project will be incorporated into the EPRI Substations Program (P37) and made available to the public.

Benefits

- Simplify the learning of IEC 61850 standard and utility implementation through EPRI technology transfer
- Gain hands-on knowledge and skillset of the state-of-the-art digital substation technologies at EPRI P&C lab
- Address practical challenges and overcome technical barriers through collaborative R&D
- Share success stories and good practices

Project Approach and Summary

The project takes a phased approach to address members' R&D needs. In the current phase, the project aims to work with participating members to identify specific research tasks, develop technical solutions, and support members applying R&D results.

The proposed research approaches include:

- Work with participating utilities to identify specific business needs, challenges, technical barriers, and R&D tasks.
- Transfer the research results from completed EPRI IEC 61850 projects that can be readily applied by utilities.
- Build EPRI testbed systems, in collaboration with utilities, equipment manufacturers and SMEs, to address R&D tasks.
- Develop and demonstrate new technologies, methods or tools using the EPRI testbed systems. For instance:
  - New monitoring and diagnosis capabilities in IEC 61850 digital substation that enable condition-based protection system maintenance programs.
  - New testing and simulation functions in the latest development of IEC 61850 standard for facilitating relay isolation and protection system maintenance testing.
- Perform technology transfer through EPRI hosted webcasts, conference calls, or workshops.

Deliverables

- Webex-based IEC 61850 training and EPRI technology transfer.
- A testbed system at EPRI's P&C lab for research, development, and demonstration.
- Hands-on technology transfer at EPRI P&C lab in Charlotte, North Carolina.
- Quarterly webcasts with the project funders.

Price of Project

The cost to participate current phase of the project is $80k per participant. This project qualifies for self-directed fund (SDF) or co-funding.

Project Status and Schedule

The scheduled duration of this project is 24 months.

Who Should Join

Utilities interested to advance digital substations and develop new protection and control designs using the IEC 61850 standard and associated technologies.

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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