Training Program:

IEC 61850 & Its Role in Smart Grid-Workshop

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Course Overview

The IEC 61850 suite of standards is changing the way that utilities view automation projects. Now that The National Institute of Standards and Technology (NIST) has identified IEC 61850 in the initial group of interoperability standards which are key to Smart Grid deployment, utilities have even more incentive to evaluate its role in their overall architecture.

With interoperability at the heart of the IEC 61850 standards, they allow utilities to select "best in breed" solutions for the various components required to implement a modern automation system. The benefits of the IEC 61850 standards go beyond just reducing the cost of commissioning, maintaining, and upgrading substation and distribution automation systems and extend well into the utility enterprise. To realize these benefits however, organizations must be prepared to approach these projects in a fundamentally different way than before.

This 3-day technical seminar is focused on a more in depth look at the IEC 61850 standards from both a theoretical and practical point of view. By participating in the seminars, attendees will gain a basic working knowledge of the IEC 61850 standards as well as be better positioned to identify the potential value that they represent for their respective companies.

Who Should Attend

This seminar is suitable for utility professionals including:

- SCADA Engineers
- System Integrators
- Substation Design Engineers
- Operations and Maintenance Engineers
- Substation Protection & Control Engineers
- Commissioning Engineers

Course Outline:

Module 1 - Utility Data Communication Fundamentals (1 day)

This module introduces the various communication technologies utilized within electric utility automation systems. Topics covered include:

- What is a protocol?
- Protocol layers and goals
- Ethernet, serial links, radios, fiber optics
- Internet protocol suite including TCP/IP
- Networking equipment: routers, bridges, hubs, repeaters
- What makes utility networking different?
- History of utility protocols, including Modbus, DNP3, and IEC 61850

Module 2 - IEC 61850 Fundamentals (1 day)

This module introduces the basics of the IEC 61850 standard. Topics covered include:

- Scope and history
- Structure and format
- Application services including reading, controls, reporting and logging
- Object and device information models
- Substation Configuration Language (SCL)
- Peer-to-peer communication
- Testing and conformance
- The big picture: other standards and efforts

Module 3 – Advanced IEC 61850 Concepts (1 day)

This module provides a more in depth look at the various facets of IEC 61850 and how they are applied to the transmission and distribution domains. Topics covered include:

- The Modeling Process
- Naming Conventions
- Modeling a Feeder
- Designing Data Retrieval
- Defining GOOSE
- Modeling a Bus and Transformer
- Modeling a Transmission Line
- Identifying Interoperability Problems
- Reading SCL Files
- Conformance Testing
- Using the Web Sites
- Designing Security