Technology Innovation Project *Project Brief*

TIP 334: EPRI: Secure Remote Substation Access Solutions

Context

There is an established need within BPA and the rest of the utility industry for remote substation access solutions that provide cyber security and compliance support for a wide range of relays, meters and other IEDs in power substations and metering installations. These devices include legacy systems, current systems as well as future systems. Remote communications access to substations currently exists into some relays and meters.

Contemporary technology can provide new opportunities for data integration solutions such as fault location, asset optimization, and power quality monitoring. It may also reduce the number of times field personnel are required to visit substations to test relays meters and apparatus. It may also reduce the time to retrieve relay fault or event files for analysis. However, balancing this level of access with cyber security and potential regulatory compliance requirements can be very difficult. This balance can be achieved through proper preparation, procedure implementation, and organizational support.

Description

This project will explore and address a variety of implementation challenges facing secure remote substation access solutions. The focus is on solutions implemented in the electric sector for Transmission and Distribution substations and remote field locations. For each identified challenge, the project team will study implementation options, best practices and capabilities/limitations regarding the challenge.

EPRI will work with BPA and other participants to establish and prioritize solution topics to study. A preliminary list of potential remote access topics includes:

- Security architectures that support NERC CIPv5 compliance
- Identification of specific devices or scenarios that do not easily integrate with Remote Substation Access solutions
- Vendor proprietary relays, meters, DFRs, and other IEDs tools/protocols
- Use of multiple authentication devices/gateways
- Remote Access System Management of IEDs
- Management and tracking of configurations
- Patch management
- Password management

EPRI will research and summarize existing industry solutions with a focus on implementation best practices, technology gaps, and new developments. A workshop for participants will allow a “hands-on” approach to gain system familiarization and increased understanding of the implementation challenges discussed

Why It Matters

The research will benefit the BPA and the public several ways, most notably by enabling wider electric industry adoption of proven and emerging methods to provide secure remote access to substations. This increased access will provide BPA and other utilities with greater flexibility in utilizing operational and maintenance data from sensors and systems. Additionally, an improved understanding of strategies and technology for secure remote substation access will allow utilities to mitigate potential security risks and perform improved forensic analysis.

Goals and Objectives

The objective of this project is to investigate and address implementation challenges for secure remote substation access solutions. New learnings will identify technology gaps and best practices, research and assess specific implementation challenges, and perform lab testing of existing and emerging solutions. This will enable effective application of existing solutions and foster new technology solutions.

Deliverables

- Technical Report: Secure Remote Substation Access: Implementation Challenges and Solutions
- Workshop: Secure Remote Substation Access Security Solutions Workshop at EPRI’s Cyber Security Research Lab in Knoxville, TN.

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Project Start Date: October 1, 2014

Project End Date: September 30, 2015

Reports & References (Optional)

Links (Optional)

Funding

BPA FY2015 Budget: $40,000

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Participating Organizations

Electric Power Research Institute (EPRI)