



TIP 351: Network Model Management: Use Cases and Requirements

Context

Currently, Network model data is stored in multiple silos, and formatted specifically for how the data is used for each analysis. The main silos of interest are the Long-term planning bus-branch model, the Short-term and Real-time node breaker model, and the System Protection Aspen model.

All three of these models maintain similar data about the same pieces of equipment and while every database has a different focus and therefore slightly different attributes, the majority of the data is common. Most of the data in the network studies should be the same as the majority of the network components are the same for each study, however a majority of the modeling processes have been developed with a narrow focus and limited tools intended to meet very specific goals.

When viewed from an enterprise perspective, the same time-consuming operations are often repeated, and there is insufficient cross-checking to assure that studies have consistent representations of the grid and are up-to-date with the latest changes in plans. Often, key senior power system engineers spend significant amounts of time designing and executing network data management operations, instead of performing engineering and system analysis studies.

Description

This project will develop Transmission-wide use cases and requirements for a BPA Network Management Model tool (NMM). The NMM will act as an interface between many different existing applications at BPA. The tool will require inputs from Enterprise Data Sources (SED), Real-time applications (SCADA and State Estimator system values), and forecasts (for load, generation, and outages). Some of these systems, such as the Enterprise Data Sources, can be included in the NMM as managed data instead of manually input to the system. The role of the NMM is to maintain a master repository of network model data that is shared by different network model consumers. The NMM provides a location for maintaining a master source of data in a format that enables efficient maintenance, thorough quality control, and validation. The NMM will also be able to manage the development of the base cases needed by the network model consumers.

The project will proceed in five phases:

Phase 1 - Initiation

Define project vision and charter; Access business readiness; Establish collaborative working relationship with AEP and First Energy. Concurrent with the start of this TI project, a low budget IT project will be established to take over once the TI project is finished.

Phase 2 – Feasibility Assessment

Identify how a centralized modeling resource would function in the BPA environment; Meet with other utilities to assess functionality needs; Identify requirements; Develop high-level functionality with AEP and FirstEnergy working group.

Phase 3 – Business Case

Develop Use Cases; Define business case; Solidify requirements; Procure testing lab; Continue development with AEP and FirstEnergy

Phase 4 – Use Cases

Finalize Use Cases; Develop and deploy system testing in lab; Develop and evaluate next steps; finalize collaborative requirements from AEP and FirstEnergy

Phase 5 – Transition

The final phase of this project is focused on a successful handoff to IT to continue into the procurement and implementation processes.

Why It Matters

Utility-to-utility data exchanges are becoming more important to the planning and operation of the power system (FERC Order 1000). Currently most data exchanges are manual and require a large amount of effort and time.

The NMM will allow engineers to create the base cases required for operations, planning and protection analysis by combining the master data sets with the appropriate peripheral data from systems like SCADA and BPA forecasting tools. Though the types of analysis vary from case to case, the underlying network model will be consistent amongst all base cases. In addition to developing cases for analysis, the NMM will have processes in place for regularly communicating the exchange of data in a standard format.

Goals and Objectives

The major objectives pursued by this project are:

- Identify how a centralized modeling resource would function in the BPA environment.
- Develop Use Cases that outline NMM implementation at BPA
- Develop Requirements for the associated Use Cases that identify the needs of existing BPA software and processes.
- Develop Requirements that capture data exchanges with internal and external sources
- Develop a testing station for evaluating potential software solutions
- Evaluate next steps for implementing a NMM software solution

Deliverables

The project will deliver the following products:

- Assessment of business readiness for a Network Model Management tool
- Framework for Network Model Management implementation at BPA
- Requirements for Network Model Management at BPA

- Use Cases for Network Model Management at BPA
 - Including jointly developed Use Cases
- Business Case for Network Model Management at BPA
- Test Plans for evaluating software
- Test Lab for evaluating software
- Next Steps assessment

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Project Start Date: October 1, 2015

Project End Date: September 30, 2016

Reports & References

EPRI, [Network Model Manager Technical Market Requirements: The Transmission Perspective](#)

EPRI, [“Using the Common Information Model for Network Analysis Data Management – A CIM Primer Series Guide”](#)

Links

Participating Organizations

Britton Consulting LLC
AEP
First Energy

Funding

Total Project Cost: \$720,000

BPA FY2016 Budget: \$160,000

For More Information Contact:

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