Supplemental Project Notice

GRID MODEL VERIFICATION AND VALIDATION FOR OPERATIONAL APPLICATIONS AND PLANNING STUDIES

PROJECT HIGHLIGHTS

- Evaluate grid model quality and remediate issues
- Increase confidence in operational applications and planning studies
- Implement a grid model verification and validation tool (GMVV) to efficiently develop and maintain models
- Develop a roadmap to refine grid modeling processes

Background, Objectives, and New Learnings

In today's environment, the distribution grid is constantly changing. At the same time, engineers require detailed grid models to conduct a wider breadth of studies. These challenges combine to require a significant amount of engineering time and effort developing and validating grid models for accurate representation of the power system. While the analytical workload for engineering studies will continuously increase, the workload to develop adequate grid models should not.

Recognizing these challenges, EPRI's Distribution Operations and Planning and Information Communication Technology programs have been working to improve grid modeling processes so engineers can more efficiently develop and leverage these models in the studies they are performing today. One example is EPRI's Grid Model Verification and Validation (GMVV) tool which helps to automate grid modeling steps that are being done manually today. This tool effectively and efficiently verifies, validates, remediates, and reports on grid model issues to relieve planning engineers of this current burden.

The objective of this project is to provide engineers and grid data specialists with guidance on processes to enhance the development and maintenance of distribution grid models as well as a GMVV tool to enable readily available grid models. Additionally, the project will apply and further refine the GMVV tool in the automation of manual processes. Through utilization of standardized model data exchanges, a single source of truth, and a grid model manager, this project is expected to provide guidance on evolving grid modeling practices. Ultimately, this project will enable the use of grid data like any other distribution asset today.

Benefits

The project is expected to have the following key values:

- Action plan to enhance grid modeling practices.
- Reduce time required to develop and maintain grid models.
- Increase time engineers can focus on studies.
- Improve the integrity of grid models and study results.

Project Approach and Summary

EPRI plans to develop and implement analytical capabilities needed to verify, validate, remediate, and track grid model quality to reduce the effort when producing high-quality models required for advanced power system analytics. By developing these capabilities, project participants will be enabled with a more time- and cost-effective approach to develop models required to assess the evolving distribution system. The tasks required for this project include the following:

- Workshop with utility to identify and understand underlying grid model data repositories, data flows/processes currently in place to develop grid models, grid model issues, and remediations currently in place.
- Gather grid model data from vendor planning tools and measurement data for verification and validation.
- Develop utility-specific grid model data reader for GMVV. This translates the utility grid model data from the vendor tool to the Common Information Model (CIM) for GMVV processing.
- Refine processes to verify grid models/data in GMVV. Error reporting will identify issues and propose solutions.
- Refine processes to validate grid models/data in GMVV. Grid model simulation results will be validated with available measurement data. Error reporting will further identify inaccurate results or convergence issues and provide potential solutions.
- Apply GMVV tool and evaluate/remediate a portion of the member utility system.

EPRI will also collaborate across all participants to develop a generalized action plan with quantifiable metrics to support improved grid modeling practices, including grid model requirements, standardized model data exchanges, utilization of a single source of truth, and resource requirements to support and apply GMVV.

Optional: This optional task applies the "Applied Grid Model Data Management (GMDM) for Distribution" (3002014739) supplemental project to more comprehensively evaluate the existing utility situation, develops a solution vision based on grid model requirements, and proposes an implementation strategy.

Deliverables

The following deliverables will be made available to each participant.

- Workshop to identify known grid model issues and remediations.
- Tool to automatically verify, validate, and remediate grid models.
- Training and support.
- Collaborative report summarizing general action plan for intelligent grid modeling.

The non-proprietary results of this work will be incorporated into EPRI's Distribution Operations and Planning and Information Communication Technology R&D Programs, and made available to the public, for purchase or otherwise.

Price of Project

$125,000

The project qualifies for Self-Directed Funds (SDF). Funding can be distributed across three calendar years.

Project Status and Schedule

This project is intended to span 18 months.

Who Should Join

Utilities requiring regularly updated grid models for analyzing the modern distribution grid. Examples include utilities conducting system-wide studies or transitioning to significant distribution automation.

Contact Information

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

Technical Contact

Matt Rylander at 512.731.9780 (mrylander@epri.com)

Member Support Contacts

Brian Dupin at 650.906.2936 (bdupin@epri.com)
Barry Batson at 704.905.2787 (bbatson@epri.com)
Chuck Wentzel at 618.320.0011 (cwentzel@epri.com)
Anne Haas at 704.595.2980 (ahaas@epri.com)
Warren Frost at 403.390.0735 (wfrost@epri.com)

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EPRI
3420 Hillview Avenue, Palo Alto, California 94304-1338 USA • 800.313.3774 • 650.855.2121 • askepri@epri.com • www.epri.com