

Technology Innovation Project



Project Brief

TIP 411: EPRI Modeling and Model Validation Tools User Group 2019-2021

Context

In March 2014, the U.S. Federal Energy Regulatory Commission (FERC) approved standards developed by the North American Electric Reliability Corporation (NERC) that require all generating facilities in North America to perform model validation. In May 2014, FERC approved the future application of two NERC standards for modeling and model validation for the steady-state and dynamic computer simulation models of the entire power system.

Inherent in this latter requirement is the need to perform model validation for all other major active power system components, such as static VAR compensators (SVCs). Also, transmission planning standard TPL-001-4, revised by NERC and approved by FERC in November 2014, requires that transmission authorities and system operators model the dynamic behavior of loads in their planning studies.

For many years, EPRI has been performing R&D related to each of these aspects of modeling, model development and model validation. In 2009, after several years of R&D, EPRI developed the Power Plant Parameter Derivation software tool (PPPD). The PPPD provides a semi-automated platform for deriving and validating power plant models using either staged field test data or recorded on-line disturbance data. The PPPD has been supported since 2010 by an active user group comprised of more than twenty power authorities including utilities, independent system operators, and independent power producers. Many of these user group members have successfully applied the PPPD and methodology to collectively validate the models of over one hundred generating units. When applied using disturbance monitoring, this approach can help achieve model validation for a fraction of the time and expense of other traditional methods.

Description

The user group format allows members to share experiences applying these tools in a wide variety of systems, and develop new learnings that are expected to yield public benefits.

This project focuses on holding webcasts and one annual face-to-face meeting. These forums are an ideal setting for:

1. Discussion and feedback from the users to guide maintenance of the described software tools and release of their future versions with updated features, bug-fixes, etc.
2. Sharing various users' experiences with the tool(s).

3. Providing training sessions for users (by EPRI as part of the annual meeting).
4. A forum for discussion and mutual learning among group members on modeling and model validation.

Why It Matters

This project will provide a forum to help utilities with application of the tools through workshops, user group meetings, webcasts, and software support.

The described tools provide an automated algorithm to assist the engineer in the model validation process, significantly reducing engineering time.

The tools/methods and group interactions provide a unique environment for utility engineers to learn about the technical aspects of meeting the NERC MOD-26, MOD-27, MOD-32, MOD-33 and TPL-001-4 standards.

The model validation tools provide proven methods for using on-line recorded data for model revalidation on a routine basis.

Goals and Objectives

The new learnings in this project are expected to yield public benefits, as it has the potential to help improve the system-wide models used by generator owners, transmission planners and planning coordinators; thereby helping these entities to improve system reliability.

Deliverables

User group members will gain access to each of the software tools described above-PPPD, LMDPPD and LCDT. Some of the tools may be updated yearly with new releases. Group members will also have access to EPRI staff for support.

The annual face-to-face meeting and several webcasts also provide forums for learning for the user group members.

The non-proprietary results and high-level learning of this work will be incorporated into EPRI R&D Programs 40 and 173, and made available to the public, for purchase or otherwise, through the publication of reports, technical updates or other forms of publications (e. g., journal articles).

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Project Start Date: January, 2019

Project End Date: December, 2021

Participating Organizations

Electric Power Research Institute (EPRI)

Reports & References

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