Supplemental Project Notice

EUROPEAN MODELING AND MODEL VALIDATION INTEREST GROUP: 2025 – 2027 CYCLE

PROJECT HIGHLIGHTS

- Coordination, support, and information sharing of leading modelling practices for renewable energy resources, loads, distributed generation, FACTS, HVDC, and a variety of other power system asset classes.
- Implementation and refinement of generic planning models in commercial software tools.
- Access to mature tools to support parameter derivation and estimation for asset model validation using fault recorder or phasor measurement unit data.

Background, Objectives, and New Learnings

Power system model development and validation are foundational tasks for accurate power system analysis and decision making. As Europe and Asia move toward ambitious renewable energy targets, the modelling needs of utilities are becoming more wide ranging. Emerging challenges for power system planners include modelling inverter-based generation, high voltage DC (HVDC), and other system elements for which the behavior is highly dependent on control design.

The third cycle of the European Modelling and Model Validation Interest Group (EMMVIG) will continue efforts to further develop generic models for power system elements and refine tools for periodic model validation and benchmarking by emphasizing experience sharing and interaction between European and Asian members. It is critical to ensure that models can reasonably replicate the performance of the actual power system to avoid planning and operational decisions arising from model errors.

EPRI has been performing R&D related to modelling, model development, and model validation and worked with European utilities to share knowledge on these topics. The objective of this Interest Group is to continue this engagement by providing a forum to share knowledge among participating members, and to provide continued support on the following:

- **Modeling guidance for power system dynamic studies**: EPRI has contributed to the development of **generic planning models** for a range of resources such as conventional generators, wind, solar photovoltaic (PV), battery storage, aggregated loads with distributed energy resources, flexible AC transmission systems (FACTS), and HVDC. EPRI plans to provide guidance on the development, benchmarking, and testing of these models for adoption into planning studies.
- **Guidance on emerging topics in inverter-based resource (IBR) modeling**: EPRI plans to provide guidance on parameterization of IBR models, determination of appropriate models for specific assessments, and model quality tests for OEM supplied blackbox models.

Interest Group participation also provides access to the following software tools:

- The **Power Plant Parameter Derivation (PPPD)** tool, which provides a semi-automated platform for deriving and validating power plant models using staged field data or recorded, online disturbance data. Using online disturbance data can achieve model validation in a fraction of the time and cost compared to traditional methods.
- The **Load Component Export Tool (LCET)** which pulls information from various public resources and data provided on load demographics by a utility to create composite load model records used in planning.

Benefits

Expected benefits of this Interest Group include:

- A unique environment for utility engineers to learn about the technical aspects of modelling and model validation for different asset types based on experience and expertise from utilities in regions facing similar challenges.
- Automated algorithms to assist planning engineers in constructing reliable and accurate power system models, significantly reducing engineering time.
- Model validation tools that provide proven methods for using readily available fault information for model revalidation on a routine basis without the need for invasive testing.

Project Approach and Summary

Interest Group interaction will be facilitated through periodic webcasts and in-person meetings. Events are intended to focus on disseminating information relating to generic planning models and updating model validation tools and methods. Topics for these events are expected to include:

- Technical discussion and mutual learning about modelling and model validation in planning.
- Recent developments and trends and impending modelling requirements in the European context.
- User support and updates for EPRI model validation tools as part of the annual interest group meeting.
- Coordinated engagement with commercial software vendors to promote application and transfer of new and updated models.

Deliverables

The following deliverables are expected to be issued from the project:

- Access to updated versions of PPPD and LCET, including any new releases that occur during each funding year.
- 2 in-person meetings (in the 3-year cycle) and periodic topical webcasts providing forums for learning, demonstrating tools and approaches for model validation, discussing modelling issues, sharing experiences with these models from case studies with participants, discussing advanced transmission planning challenges (e.g., grid forming) and identifying emerging modelling needs.

Price of Project

The price to participate is $15,000 per year. A three-year commitment is required for a total of $45,000. There is no prorating for those who join late in the three-year Interest Group cycle. The project qualifies for Self-Directed Funding (SDF).

Commercial use of the software is presently not offered, and thus the members should use the tools only for work on their own assets.

Project Status and Schedule

The interest group in its second cycle and will run for three years from January 2025 to December 2027.

Who Should Join

Intended for transmission system operators, regional service centers, and transmission owners and operators in Europe and Asia.

Contact Information

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