



Proposed Inverter-Based Resource (IBR) Modeling Requirements (PAC-2024-2)

Interconnection Process Working Group (IPWG)

July 22, 2025

Purpose & Key Takeaways



Purpose: Propose Inverter-Based Resource (IBR) modeling requirements and request stakeholder feedback

Key Takeaways:

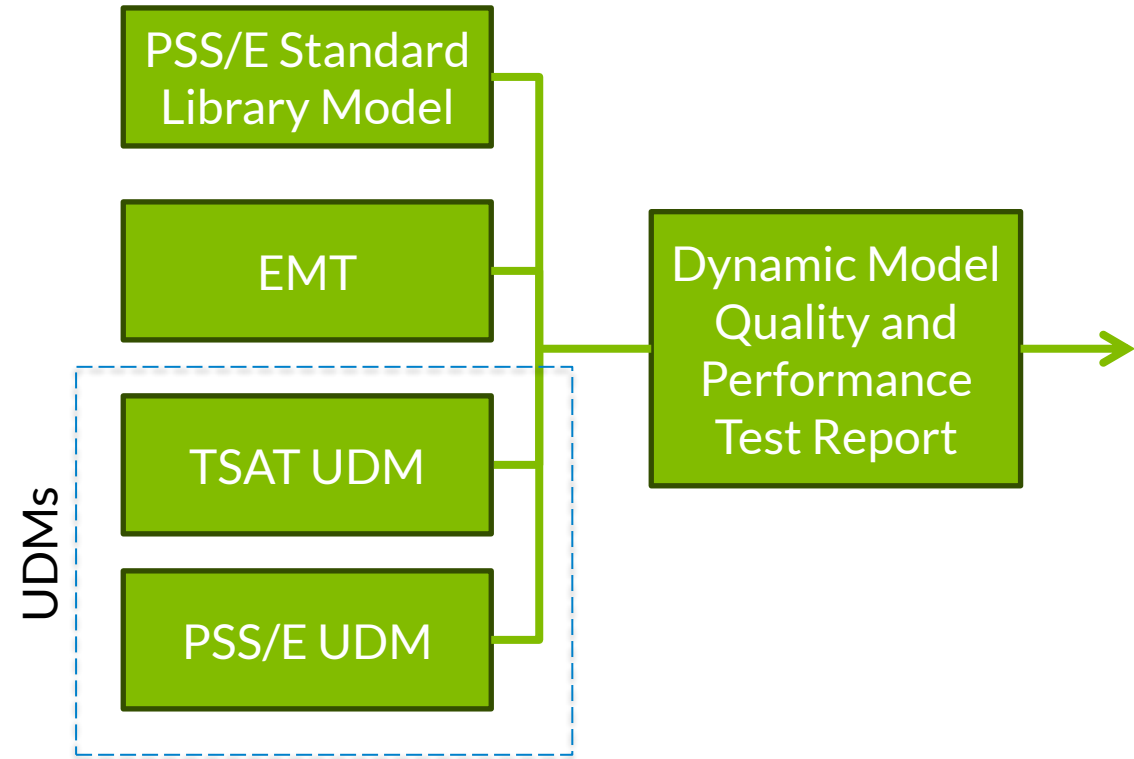
- MISO proposes revised requirements for dynamics models used in the interconnection process (to become a new BPM-015 Appendix) based on stakeholder feedback
- MISO proposes a plan to implement these requirements and process into future DPP Cycles
- Stakeholder feedback is requested on the proposed implementation plan and revised requirements MISO posted with today's meeting materials

MISO is seeking input from stakeholders to define IBR modeling requirements, with the goal of finalizing requirements by November 2025

	Date	Objective
IPWG	June 3	Describe need and proposed requirements [Feedback] (30-45 min)
	July 22	Share revised requirements and proposed implementation plan [Feedback]
	September 3	Slippage (post only or present final proposal to go to PAC)
PAC	October 8	Present requirements and implementation plan [Feedback]
	November 19	Respond to stakeholder feedback

MISO proposed dynamic modeling requirements for IBRs at the June 3 IPWG

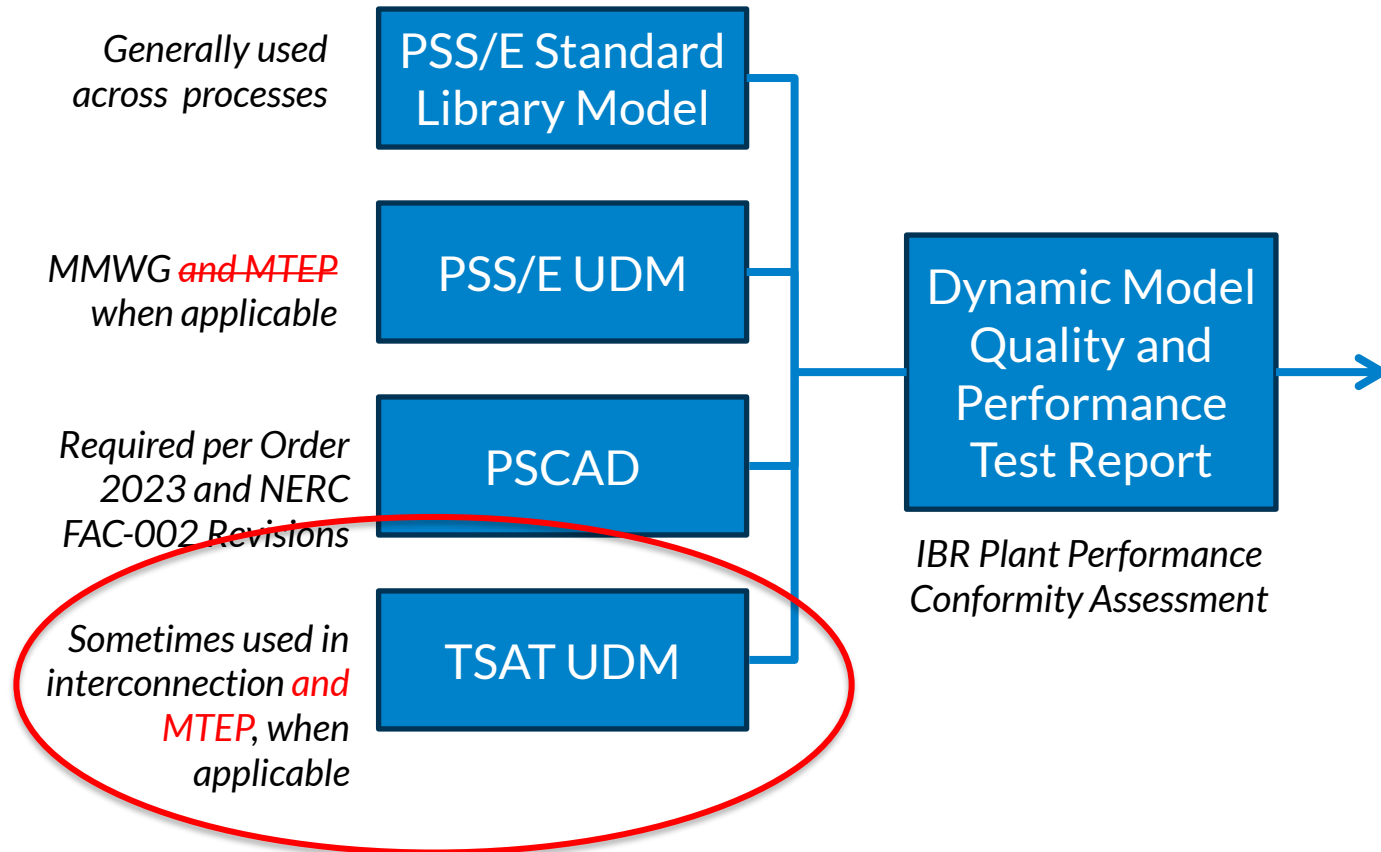
- 3 types of models to meet FERC Order No 2023 and reliability needs
 - User Defined Model (UDM) type model having compatibility across two software programs= 4 total models
- 19 Model Quality Tests and benchmarking
- Report Format Outline



MISO is considering feedback on model submission timing and appreciates the feedback and discussion through the IPWG

- Model submission timing and usage was a primary concern for stakeholders
 - MISO considered feedback that UDMs not used in the interconnection process could be submitted later in the process. PSS/E UDMs would not be used in DPP and will instead be requested by GIA. Model quality testing and benchmarking reports submitted at GIA would need to also include this PSS/E UDM.
- MISO acknowledges the concerns about increased workload for testing and reporting
 - MISO would like to explore the development of a testing and reporting tool to assist interconnection customers.
- Retroactive requirements
 - MISO agrees with stakeholder feedback that implementation of these requirements should not be retroactive.
- Some feedback was received on testing parameters and criteria
 - Increases to default Short Circuit Ratio from low SCR conditions (<3) to high SCR conditions (≥ 3)
 - Increased time durations for SCR testing

TSAT Software is the standard for both MTEP and DPP stability analyses

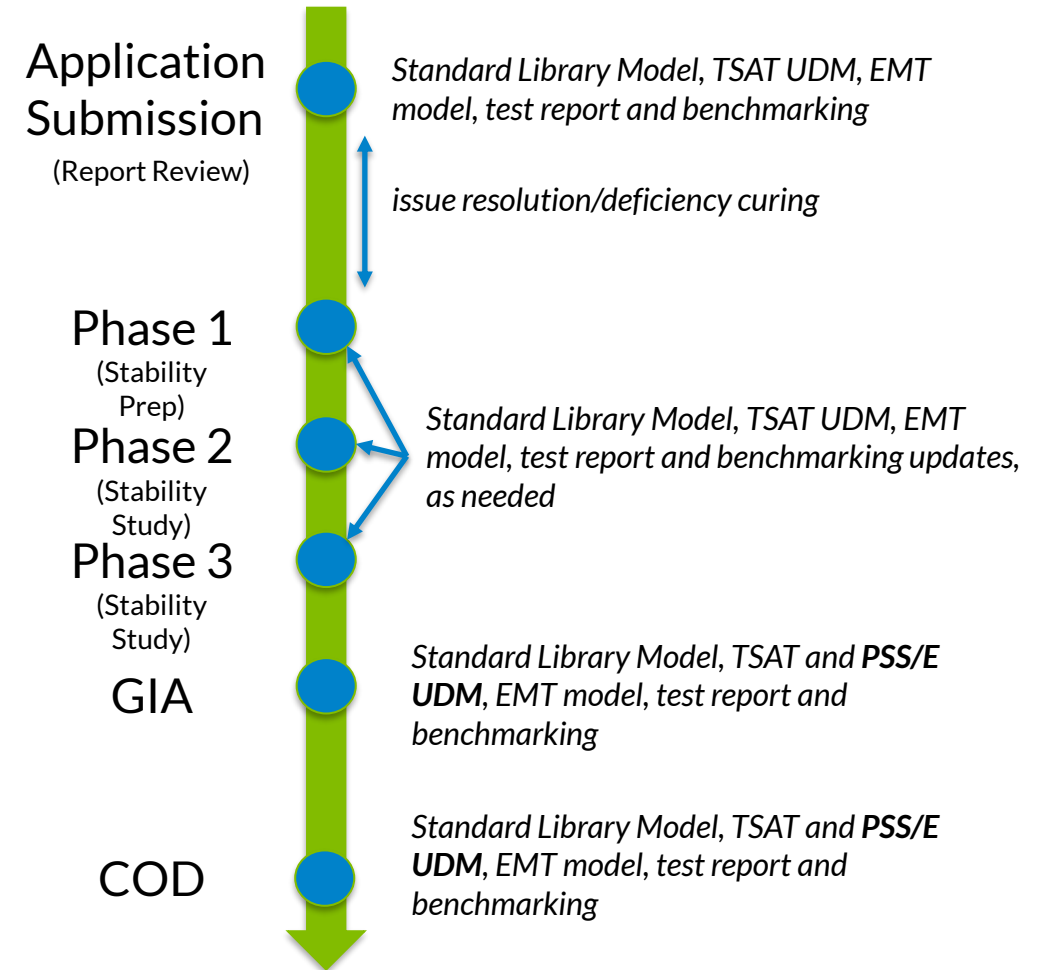


- TSAT UDM models- *today, sometimes* used when vendor guidance indicates significant shortcomings in Standard Library Models
- UDM usage is going to increase due to disturbance report findings
- Any UDM provided needs to be compatible with TSAT for the interconnection process

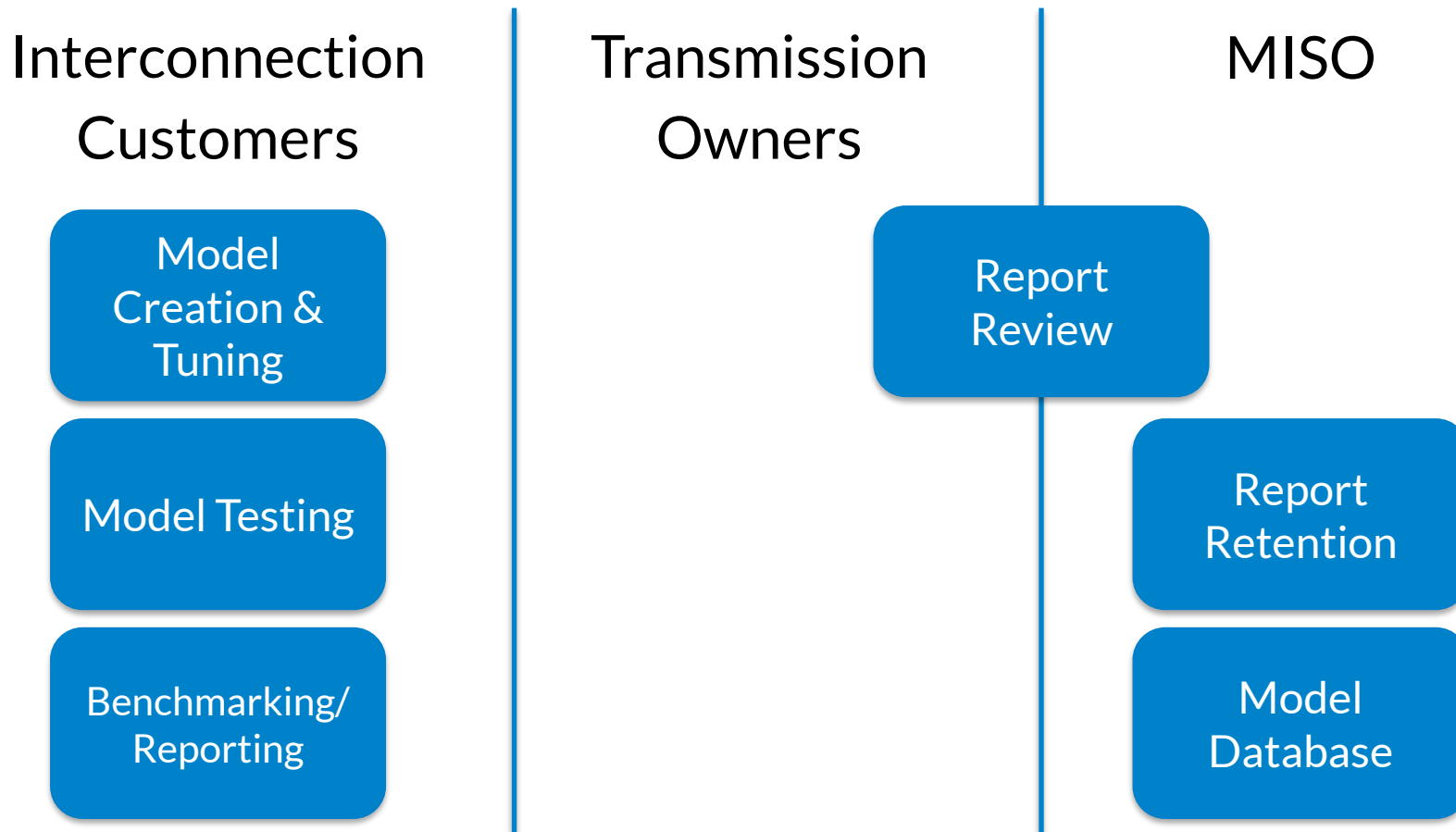
Redlined version of graphic from June 3rd IPWG

MISO believes three models submitted at application will provide the most benefit to the interconnection process

- Removing PSS/E UDM at this stage
- Enables immediate comparison and early identification of potential issues
- Model submissions at application allow for more flexible deficiency resolution
 - Later in the process, on time delivery of these models will be crucial, leaving less flexibility for late projects.
- Stability study prep work can begin sooner
- Collecting EMT models at application submission provides an accurate reference for UDM and Standard Library model performance.
 - Also allows EMT study preparatory time before Phase 2

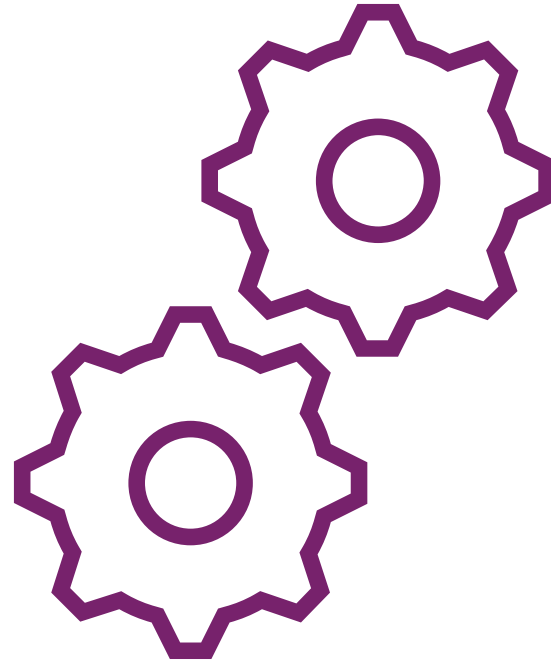


Stakeholder Responsibilities



MISO will explore development or procurement of a tool to automate testing and reporting

- Stakeholders stated concerns about testing workload and cost
- Tooling may address these
- MISO sees benefits that also include testing and reporting consistencies



MISO is expanding details on parameter verification requirements

- Provides mapping of model parameters to field device parameters
- To be submitted:
 - With the signed GIA model submission as initial verification.
 - Within 60 days prior to COD as final verification of as-built settings.
 - Within 30 days of any parameter changes made after COD that affect the electrical output of the IBR plant.



4.6 Requirements for Parameter Verification

The following requirements are applicable to parameter verification for all IBR models:

1. The interconnection customer shall submit a Parameter Verification Report prepared by the OEM that demonstrates the model parameters match the installed (or planned) equipment settings. The report shall include:

a. Equipment make, model, and firmware version information that matches the models used in site-specific interconnection studies.

b. A comprehensive parameter mapping table that correlates model parameters (for both PSS[®]/TSAT[™] and PSCAD[™] models) to field device parameters, including:

- Scaling factors and unit conversions
- Parameter naming correlations between modeling platforms and field devices
- Mathematical relationships for parameters that do not have direct 1:1 correspondence

c. As-built parameter settings exported directly from the commissioned IBR units. PPC.

MISO is targeting mid-2026 implementation of these requirements

- Need to balance reliability risks with feasibility
 - Provide adequate time for TSAT UDM development
 - Address reliability risks as outlined in NERC disturbance reports, Level 3 Alert, and meet requirements of Order No 2023.
- MISO is not proposing retroactive application for any interconnection request pre-DPP 2025

DPP 2025

Expected Q2/Q3 2026

Materials to be submitted
by Phase 2 Kick Off

DPP 2026

Expected Q1 2027

Requirements are fully
applicable at Application
Submission

Next steps

- Exploring tool feasibility
- Seeking feedback on implementation and parameter verification
- Final proposal to be drafted and shared for September IPWG

Stakeholder Feedback Request

- MISO is requesting feedback on the **Proposed IBR Modeling Requirements (PAC-2024-2)** presented today by August 5, 2025
 - Feedback on the Requirements for Parameter Verification addition, section 4.6
 - Feedback on proposed implementation timing
- This is a proposed BPM-015 Appendix
- Feedback requests and responses are managed through the Feedback Tool on the MISO website:
<https://www.misoenergy.org/engage/stakeholder-feedback/>



Questions?

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Appendix

Links to previous IBR-Related presentations:

- [20240130 IPWG Item 04 IBR Performance Requirements](#)
- [20240312 IPWG Item 04c IBR Performance Requirements IEEE 2800 \(PAC-2024-2\)](#)
- [20240502 IPWG Item 04a IBR Performance Requirements IEEE 2800 \(PAC-2024-2\)](#)
- [20250603 IPWG Item 04a IBR Modelling Requirements](#)

