

Standard Development Timeline

This section is maintained by the drafting team during the development of the standard and will be removed when the standard is adopted by the NERC Board of Trustees (Board).

Description of Current Draft

This is the initial draft of the proposed standard for a formal 35-day comment period.

Completed Actions	Date
Standards Committee approved Standard Authorization Request (SAR) for posting	May 15, 2024
SAR posted for comment	May 23 – June 28, 2024

Anticipated Actions	Date
35-day formal comment period with 10-day ballot	April 17 – May 21, 2025
20-day formal or informal comment period with additional ballot	July – August, 2025
10-day final ballot	September 2025
Board adoption	October 2025

New or Modified Term(s) Used in NERC Reliability Standards

This section includes all new or modified terms used in the proposed standard that will be included in the *Glossary of Terms Used in NERC Reliability Standards* upon applicable regulatory approval. Terms used in the proposed standard that are already defined and are not being modified can be found in the *Glossary of Terms Used in NERC Reliability Standards*. The new or revised terms listed below will be presented for approval with the proposed standard. Upon Board adoption, this section will be removed.

Term(s):

The terms Model Validation and Distributed Energy Resources refer to proposed definitions being developed by Project 2020-06 Verifications of Models and Data for Generators and Project 2022-02 Uniform Framework for IBR, respectively. As of this posting, the proposed definitions of Model Validation and Distributed Energy Resources are:

Model Validation: The process of comparing measurements with simulation results to assess how closely a model's behavior matches the measured behavior.

Distributed Energy Resources: Generators and energy storage technologies connected to a distribution system that are capable of providing Real Power in non-isolated parallel operation with the Bulk-Power System, including those connected behind the meter of an end-use customer that is supplied from a distribution system.

A. Introduction

1. **Title:** Steady-State and Dynamic System Model Validation
2. **Number:** MOD-033-3
3. **Purpose:** To establish a comprehensive process for system model validation to facilitate achieving and maintaining adequate model accuracy.
4. **Applicability:**
 - 4.1. **Functional Entities:**
 - 4.1.1. Planning Coordinator
 - 4.1.2. Reliability Coordinator
 - 4.1.3. Transmission Operator

Effective Date: See Implementation Plan for MOD-033-3.

B. Requirements and Measures

- R1.** Each Planning Coordinator shall implement a documented Model Validation process for its portion of the existing system that includes the following attributes: *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
- 1.1.** Comparison of the power flow simulation performance of the steady state System model¹ to actual System behavior, represented by state estimator case(s) or other Real-time data sources, at least once every 24 calendar months;
 - 1.2.** Comparison of the dynamic local event simulation performance of the dynamic System model to actual System behavior, represented by Real-time data sources such as Disturbance data recording(s), at least once every 24 calendar months (using a dynamic local event that occurs within 24 calendar months of the last dynamic local event used in comparison²) and completing each comparison within 24 calendar months of the dynamic local event.
 - 1.3.** Guidelines to determine unacceptable differences in performance under Parts 1.1 and 1.2; and
 - 1.4.** Guidelines to resolve the unacceptable differences in performance identified under Part 1.3.
- M1.** Acceptable evidence may include, but is not limited to, a copy of the documented Model Validation process and documentation that demonstrates its implementation in accordance with Requirement R1.
- R2.** Each Reliability Coordinator and Transmission Operator shall, within 30 calendar days of a written request, provide actual System behavior data (or a written response that it does not have the requested data) to any Planning Coordinator performing Model Validation under Requirement R1. *[Violation Risk Factor: Lower] [Time Horizon: Long-term Planning]*
- M2.** Acceptable evidence may include, but is not limited to, a copy of the dated communication(s) in accordance with Requirement R2

¹ System models include unregistered Inverter-Based Resources (IBRs) and aggregate Distributed Energy Resources (DERs) when present. The phrase “unregistered IBR” refers to a Bulk-Power System connected IBR that does not meet the criteria that would require the owner to register with NERC for mandatory Reliability Standards compliance purposes.

² If no dynamic local event occurs within this 24 calendar months period, use the next dynamic local event that occurs.

C. Compliance

1. Compliance Monitoring Process

- 1.1. **Compliance Enforcement Authority:** “Compliance Enforcement Authority” means NERC or the Regional Entity in their respective roles of monitoring and enforcing compliance with the NERC Reliability Standards.
- 1.2. **Evidence Retention:** The following evidence retention period(s) identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full-time period since the last audit.

The applicable entity shall keep data or evidence to show compliance with Requirements R1 and R2, since the last audit, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- 1.3. **Compliance Monitoring and Enforcement Program:** “Compliance Monitoring Enforcement Program” or “CMEP” means, depending on the context (1) the NERC Compliance Monitoring and Enforcement Program (Appendix 4C to the NERC Rules of Procedure) or the Commission-approved program of a Regional Entity, as applicable, or (2) the program, department or organization within NERC or a Regional Entity that is responsible for performing compliance monitoring and enforcement activities with respect to Registered Entities’ compliance with Reliability Standards.

Violation Severity Levels

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
R1.	The Planning Coordinator implemented a documented Model Validation process but failed to address one of the four attributes stipulated in Requirement R1, Parts 1.1 through 1.4. OR The Planning Coordinator performed the comparison as stipulated in Parts 1.1 or 1.2 but was late by less than or equal to 4 calendar months.	The Planning Coordinator implemented a documented Model Validation process but failed to address two of the four attributes stipulated in Requirement R1, Parts 1.1 through 1.4. OR The Planning Coordinator performed the comparison as stipulated in Parts 1.1 or 1.2 but was late by more than 4 calendar months but less than or equal to 8 calendar months.	The Planning Coordinator implemented a documented Model Validation process but failed to address three of the four attributes stipulated in Requirement R1, Parts 1.1 through 1.4. OR The Planning Coordinator performed the comparison as stipulated in Parts 1.1 or 1.2 but was late by more than 8 calendar months but less than or equal to 12 calendar months.	The Planning Coordinator failed to have a documented Model Validation process in accordance with Requirement R1. OR The Planning Coordinator failed to implement its documented Model Validation process in accordance with Requirement R1. OR The Planning Coordinator performed the comparison as stipulated in Parts 1.1 or 1.2 but was late by more than 12 calendar months.
R2.	The Reliability Coordinator or Transmission Operator provided the requested System behavior data or written response that it does not have the requested data to a requesting Planning Coordinator in accordance with Requirement R2 but	The Reliability Coordinator or Transmission Operator provided the requested System behavior data or written response that it does not have the requested data to a requesting Planning Coordinator in accordance with Requirement R2 but was late by more than 15	The Reliability Coordinator or Transmission Operator provided the requested System behavior data or written response that it does not have the requested data to a requesting Planning Coordinator in accordance with Requirement R2 but was late by more than 30 calendar	The Reliability Coordinator or Transmission Operator provided the requested System behavior data or written response that it does not have the requested data to a requesting Planning Coordinator but was late by more than 45 calendar days. OR The Reliability Coordinator or Transmission Operator failed to provide the requested System

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
	was late by less than or equal to 15 calendar days.	calendar days but less than or equal to 30 calendar days.	days but less than or equal to 45 calendar days.	behavior data or written response that it does not have the requested data to a requesting Planning Coordinator.

D. Regional Variances

None.

E. Associated Documents

- MOD-033-3 Implementation Plan
- MOD-033-3 Technical Rationale

Version History

Version	Date	Action	Change Tracking
1	February 6, 2014	Adopted by the NERC Board of Trustees	Developed as a new standard for system validation to address outstanding directives from FERC Order No. 693 and recommendations from several other sources.
1	May 1, 2014	FERC Order issued approving MOD-033-1.	
2	February 6, 2020	Adopted by the NERC Board of Trustees.	Revisions under Project 2017-07
2	October 30, 2020	FERC Order approving MOD- 033-2. Docket No. RD20-4-000	
2	April 1, 2021	Effective Date	
3	TBD	Adopted by the NERC Board of Trustees.	FERC Order No. 901 Revisions by Project 2021-01