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FERC Order 901 Update

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FERC Order 901 Summary

STANDARDS MILESTONES: ORDER 901

1 — COMPLETED JANUARY 2024

Order No. 901 Work Plan submission

2 — COMPLETED NOVEMBER 4, 2024

Standards development and filing to address performance requirements and post-performance validations for Registered IBRs

3 — DUE NOVEMBER 4, 2025

Development and filing of Reliability Standards to address data sharing and model validation for all IBRs

4 — DUE NOVEMBER 4, 2026

Development and filing of Reliability Standards to address use of performance data in Operational and Planning studies

Milestone 3 Summary

Model Verification and Model Validation

MOD-026 updated with requirements for providing Model Verification and Model Validation documentation to planners that include IBRs

Project 2020-06 defined terms “Model Verification” and “Model Validation”

Modeling and analysis data

MOD-032 updated with requirements for ensuring consistent data for Model Validation in accordance with ERO criteria

Perform Model Validation

MOD-033 updated with requirements for Model Validation with dynamic event data

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Main Issues Being Addressed

Uniform Modeling Framework

- MOD-032
  - Criteria for Acceptable Models requirements moved to into the Standard
  - Process for updating requirements now in attachment
  - Clarification there is no overlap of “unregistered IBR” & “DER”
- TOP-003 & IRO-010
  - Minor clarification tying model for validation to the MOD-032 models

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Main Issues Being Addressed

Verification of Models and Data for Generators

- MOD-026
  - Attachment 2 timeline moved into Requirements (R4 & R6)
  - Update to Facilities section to clarify what IBR apply
  - Remove term “verified model” and develop new approach to provide clear objectives.
  - Clarify requirement language for “legacy facilities/equipment” (R3)

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Main Issues Being Addressed

System Model Validation with IBRs

- MOD-033
  - Remove defining term “Distributed Energy Resources” (DER already defined in MOD-032)
  - Move language tying MOD-033 to MOD-032 from a footnote to R1.
  - Clarify expectations when no recent dynamic events are available.

Milestone 3 and 4 Next Steps

Milestone 3

- Project 2021-01 and Project 2022-02 initial ballots complete.
- Project 2020-06 ballot opens on June 6.
- Drafting teams to provide next drafts for ballot around July/August timeframe.
- Milestone 3 Standards to be complete by November 2025.

Milestone 4

- Milestone 4 SARs to be published around August timeframe.
- Call for nominations for Milestone 4 Drafting Teams!
- Looking for individuals from utilities, Regions, and vendors with expertise in planning and operational studies with IBRs.

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Questions and Answers

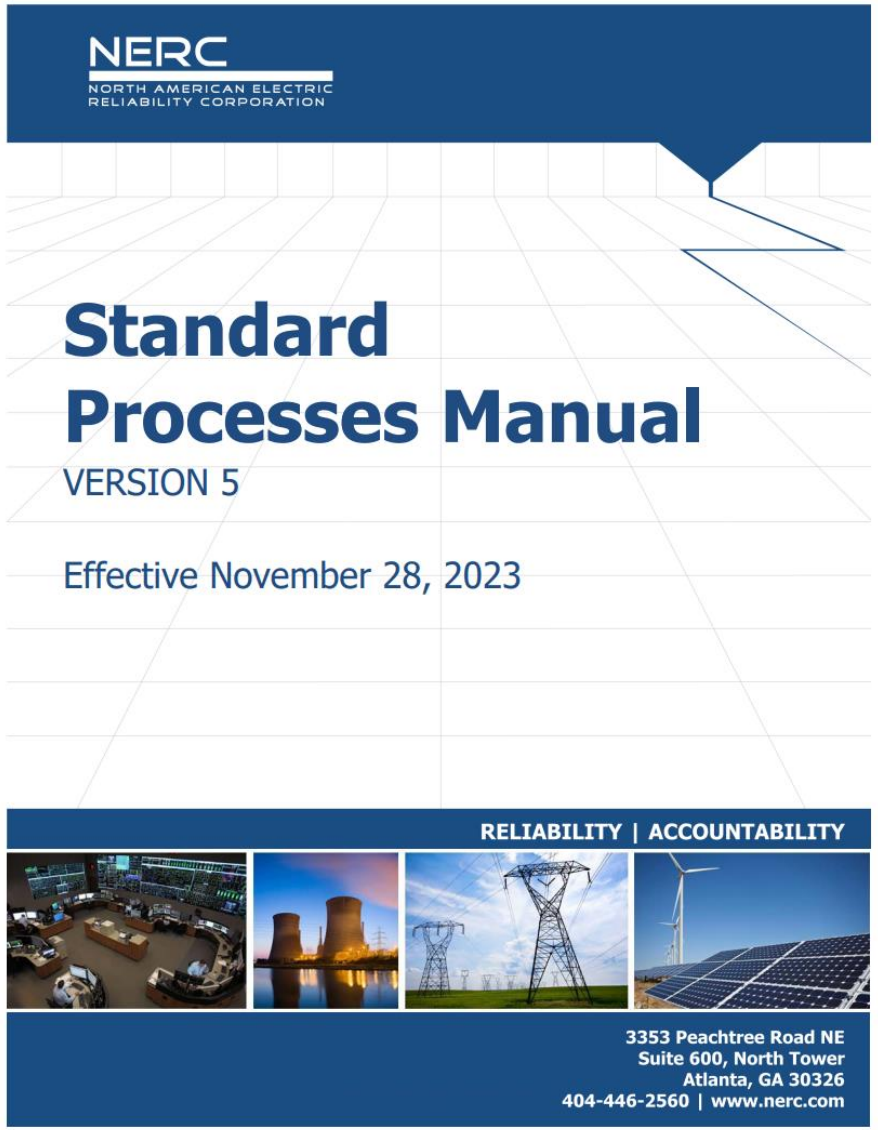
Standards Development

NERC facilitates Standards Development Process

Drafting Team develops specifics

A strong reliability standard:

- Identifies responsible entities – WHO
- Specifies objectives – WHAT
- Specifies periodicity – WHEN
- Does not specify HOW



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Milestone 2 Summary

Disturbance monitoring and data sharing

- PRC-002 updated with IBR definition and applicability
- PRC-028 created for IBR disturbance monitoring

Use this data for Model Validation (Milestone 3 requirements)

IBR ride-through criteria

- PRC-024 updated to include Type 1 and Type 2 Wind
- PRC-029 created for IBR ride-through

Perform post-event analytics

- PRC-030 created to analyze unexpected IBR excursions

Operational Studies Potential Updates:

- Revise definitions (Real-time Assessment, Operational Planning Analysis, Balancing Contingency Event) to include IBR performance and sudden IBR output reduction.

- TOP Standards:
  - Require entities to utilize IBR performance as captured via updated modeling standards. IBR performance to inform generation-load-interchanges as well as Operating Plans.

- IRO, FAC, PRC Standards:
  - Require Reliability Coordinators to utilize IBR performance information to identify Operating Limit exceedances as well as Transmission and Generation outages.
  - Require Reliability Coordinators to utilize IBR performance information to determine stability limits, Contingency events, and responses to Remedial Action Schemes

Planning Studies Potential Updates:

- Revise TPL-001 Standard or create new Standard to update Planning Models. These updated Planning Models will include IBRs as required in updated Standards from Milestone 3.
- Ensure grid stress performance conditions are updated where necessary.
- Planning assessments to capture IBR performance under these conditions, and to include ride-through performance.

Table 1 – Steady State & Stability Performance Planning Events

Steady State & Stability:

a. The System shall remain stable. Cascading and uncontrolled islanding shall not occur.

b. Consequential Load Loss as well as generation loss is acceptable as a consequence of any event excluding P0.

c. Simulate the removal of all elements that Protection Systems and other controls are expected to automatically disconnect for each event.

d. Simulate Normal Clearing unless otherwise specified.

e. Planned System adjustments such as Transmission configuration changes and re-dispatch of generation are allowed if such adjustments are executable within the time duration applicable to the Facility Ratings.

Category	Initial Condition	Event [1]	Fault Type [2]	BES Level [3]	Interruption of Firm Transmission Service Allowed [4]	Non-Consequential Load Loss Allowed
P0 No Contingency	Normal System	None	N/A	EHV, HV	No	No
cy	Normal System	Loss of one of the following: 1. Generator 2. Transmission Circuit 3. Transformer[5] 4. Shunt Device[6]	3Ø	EHV, HV	No[9]	No[12]
		5. Single Pole of a DC line	SLG			
cy	Normal System	1. Opening of a line section w/o a fault [7]	N/A	EHV, HV	No[9]	No[12]
		2. Bus Section Fault	SLG	EHV	No[9]	No
				HV	Yes	Yes
		3. Internal Breaker Fault[8] (non-Bus-tie Breaker)	SLG	EHV	No[9]	No
				HV	Yes	Yes
		4. Internal Breaker Fault (Bus-tie Breaker)[8]	SLG	EHV, HV	Yes	Yes