

FERC Order No. 901 Summary of Milestone 2

NERC Standards Development Update

July 2024

Overview

This milestone establishes new and revised Standards to address IBR performance during disturbances – commonly referred to as “ride-through”. The currently enforceable ride-through Standard (PRC-024-3) includes capability-based requirements and no performance-based requirements. As a greater magnitude and duration of outage events have been occurring¹, NERC has focused on addressing these issues through a variety of mechanisms². Identified as a response from past NERC event reports, a holistic shift was needed within the current PRC family of Reliability Standards to account for these growing quantity of resources are failing to perform adequately in response to a voltage or frequency excursion on the system. Demonstration of performance using actual monitored data is a key aspect of FERC Order No. 901 and in line with requisite objectives to address poor performance. NERC developed an initial work plan in January 2024 in response to FERC Order No. 901 that includes preliminary planning for developing Reliability Standards solutions to the 901 directives.³ This document provides a high level overview of the current state of the projects associated with Milestone 2 and their interrelationships.

All Milestone 2 projects must be fully implemented by 1/1/2030 to comply with Order No. 901.

Performance Requirements and Post-Event Performance Validation

Demonstration of inverter-based resource (IBR) expected capability, such as through the validation of equipment settings and supporting technical studies, would not be able to demonstrate actual performance of IBR during a grid disturbance. Further, sufficient disturbance monitoring equipment would need to be required in order to measure performance. While performance-based requirements were required to be established, other aspects of Milestone 2 projects were included to assure a holistic approach was pursued. Finally, analytical capability and evaluation obligations from wider-area entities would be established to assure ongoing assessment of performance by planners and operators.

¹ See Event Reports; <https://www.nerc.com/pa/rrm/ea/Pages/Major-Event-Reports.aspx>

² See NERC Quick Reference Guide: Inverter-Based Resource Activities; June 2023;
https://www.nerc.com/pa/Documents/IBR_Quick_Reference_Guide_Activities.pdf

³ INFORMATIONAL FILING OF THE NORTH AMERICAN RELIABILITY CORPORATION REGARDING THE DEVELOPMENT OF RELIABILITY STANDARDS RESPONSIVE TO ORDER NO 901; January 17, 2024

https://www.nerc.com/FilingsOrders/us/NERC%20Filings%20to%20FERC%20DL/NERC%20Compliance%20Filing%20Order%20No%20901%20Work%20Plan_packaged%20-%20public%20label.pdf

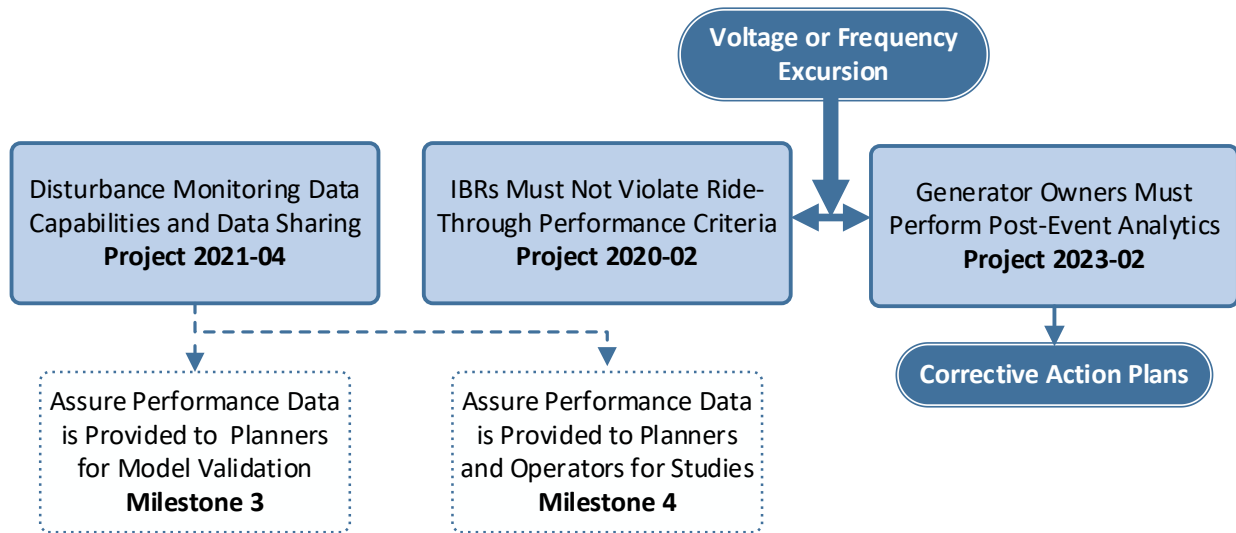


Figure 1: Milestone 2 Project Summary

General High-Level Issues Recently Resolved

IBR Definitions

While the last posted definition for Inverter-Based Resources (IBR) was approved, it included the separate defined term “IBR Unit” which was not approved. In the spring of 2024, drafting teams were advised to remove usage of unapproved terms until a clear path forward with the definitions could be assured. As of July 12, Project 2020-06 has posted an updated definition of Inverter-Based Resources that removes the embedded usage of another defined term. **Stakeholders are encouraged to review and vote on this definition: See [Project 2020-06 Verifications of Models and Data for Generators \(nerc.com\)](https://www.nerc.com/Project-2020-06-Verifications-of-Models-and-Data-for-Generators).** The next drafts of Milestone 2 related projects include this new term as proposed by Project 2020-06. Any additional definitions for parts within an IBR plant/facility will be developed by projects associated with Milestone 3 as determined by those teams.

Sub-BES IBR – Category 2 Generator Owners and Generator Operators

The ERO Enterprise acknowledges that Generator Owners and Generator Operators owning or operating Bulk-Power System connected IBRs that do not meet NERC’s current definition of Bulk Electric System (“BES”) will be registered no later than May 2026 in accordance with the IBR Registration proceeding in FERC Docket No. RR24-2.⁴ To ensure an orderly registration and compliance process for these entities, as well as fairness and consistency in the standard’s application among similar asset types, currently proposed implementation plans provide additional time for both new and existing registered entities to come into compliance with Milestone 2 requirements for their applicable IBRs not meeting the BES definition. As currently proposed, entities owning such assets will not be responsible for complying with any Milestone 2 requirements for those assets before 2027.

⁴ These Generator Owners and Generator Operators are also referred to as “Category 2 GOs/GOPs”.

Project 2021-04 Modifications to PRC-002-2 Disturbance Monitoring⁵

General Overview

- Removes IBR from PRC-002 to retain capability-based requirements. Establishes new PRC-028 to create new capability-based requirements for IBR.
- Other Reliability Standards for Milestone 2, 3, and 4 require this data as actual IBR performance is a core aspect of all of FERC Order No. 901.

Generator Owners

- Will need to assure IBR type plant/facilities follow the new PRC-028 requirements in line with the Implementation Plan. Installation of disturbance monitoring equipment is required and assures actual performance data is made available. Asset owners will need to move quickly to assure new equipment is installed and that any anticipated delays are communicated.
- Generator Owners with applicable plants/facilities are encouraged to discuss their plans to assure every applicable plant/facility will have disturbance monitoring equipment installed according to the 50% and 100% phased-in of the new PRC-028 with their Regional Entity and Compliance Enforcement Authority. Entities will have until 3 years after the effective date to meet requirements for at least 50% of their assets.
- NERC and the drafting team anticipate that facts and circumstances outside an entity's control may prevent an entity from complying per the Implementation Plan. Included within the Implementation Plan is a process for seeking compliance extensions as needed. Asset owners are encouraged to work with their Compliance Enforcement Authority as early as possible on seeking extensions.

Planners and Operators

- Will need to assure communication strategies to their Generator Owners are up to date and implemented.

Project 2020-02 Modifications to PRC-024 (Generator Ride-through)⁶

General Overview

- Removes IBR from PRC-024 to maintain *capability-based requirements* for synchronous generators, synchronous condensers, and asynchronous type 1 and type 2 wind generation. Establishes new PRC-029 to create *capability-based and performance-based requirements* for IBR.

Generator Owners

- Evaluation of ride-through capability should be documented as a priority.
- Criteria in this Standard will be used to evaluate if IBR “rode-through” a voltage or frequency excursion.

⁵ <https://www.nerc.com/pa/Stand/Pages/Project-2021-04-Modifications-to-PRC-002-2.aspx>

⁶ https://www.nerc.com/pa/Stand/Pages/Project_2020-02_Transmission-connected_Resources.aspx

- As an asset owner would not be the functional entity responsible to monitor and evaluate System conditions, requirements within PRC-030 (see below) will be the trigger to identify when a voltage or frequency excursion has occurred and for which an asset owner would need to demonstrate ride-through performance and preserve evidence appropriately.
- PRC-029 currently proposes a phased-in Implementation Plan to separate out design-based and performance-based compliance expectations. Entities can expect to align the implementation for demonstration of performance (within PRC-029) with their strategy for installing new disturbance monitoring equipment (within PRC-028).

Planners and Operators

- Other modifications in this work plan will validate capability using performance data for model quality (Milestone 3) and evaluations of risks inclusive of performance data during operational and planning studies (Milestone 4).
- Future revisions to FAC-001 and FAC-002 will establish ride-through capability during the interconnection process. Those will be announced at a later date and are not associated with an Order No. 901 Milestone.

Project 2023-02 Analysis and Mitigation of BES Inverter-Based Resource Performance Issues⁷

General Overview

- Removes IBR from PRC-002 to maintain *risk-based requirements* for synchronous generation. Establishes new PRC-030 to create new *risk-based requirements* for IBR.

Generator Owners

- Will be required to preserve and provide evidence of disturbance monitoring data on request of identified planners and operators.
- Corrective action plans to improve upon performance and determining those thresholds in the Reliability Standard.

Planners and Operators

- Wider area entities will have *capability-based* and *risk-based requirements* to assure that additional analytical reviews of IBR performance can be conducted or triggered by identified Reliability Coordinators, Balancing Authorities, and Transmission Operators.

⁷ <https://www.nerc.com/pa/Stand/Pages/Project-2023-02-Performance-of-IBRs.aspx>

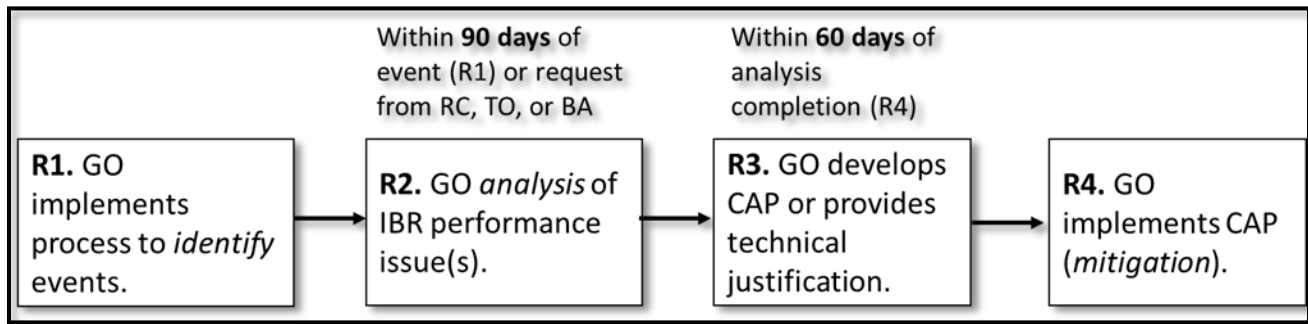


Figure 2: PRC-030-1 Requirement Summary

Integration with Later Projects

- Other Reliability Standards for Milestone 3 will address data sharing of protection settings, communication of changes, and validation of those settings as part of capability- and performance-based requirements.
- Other Reliability Standards for Milestone 4 will address risk-based requirements of both planner and operator studies to include performance data. Those study inputs will be modified to assure that performance data is evaluated.