NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Implementation Plan

Project 2023-02 Analysis and Mitigation of BES Inverter-Based Resource Performance Issues
Reliability Standard PRC-030-1

Applicable Standard(s)

- PRC-030-1 Unexpected Inverter-Based Resource Event Mitigation

Requested Retirement(s)

- None

Prerequisite Standard(s)

These standard(s) or definitions must be approved before the Applicable Standard becomes effective:

~~PRC-028-1 Disturbance Monitoring and Reporting Requirements for Inverter-Based Resources~~

- PRC-029-1 Frequency and Voltage Ride Through Requirements for Inverter-Based Generating Resources

Applicable Entities

- Generator Owner (GO)

Background

Multiple NERC disturbance reports,[1] including the Odessa disturbance report,[2] identified the undesired performance of bulk power system (BPS)-connected inverter-based resources (IBRs) during grid faults~~,~~ and have elaborated on the systemic and significant BPS reliability risks that this undesired performance can pose. IBRs may trip for many different reasons, may cease current injection due to inverter controls, or may have unwanted plant-level controller interactions. These types of issues have been extensively documented in the NERC reports. The resulting unexpected and unwarranted loss of generation poses a significant risk to BPS reliability. Project 2023-02 was initiated to address the reliability-related need and benefit by requiring analysis and mitigation of unexpected or unwarranted protection and control operations from inverter-based resources following the identification of such a performance issue.

[1] https://www.nerc.com/pa/rrm/ea/Pages/Major-Event-Reports.aspx
[2] https://www.nerc.com/pa/rrm/ea/Pages/May-June-2021-Odessa-Disturbance.aspx

After Project 2023-02 was initiated, FERC issued Order No. 901,[3] which directs the development of new or modified reliability standards, including new requirements for disturbance monitoring, data sharing, post-event performance validation, and correction of IBR performance. In January 2024, NERC submitted a filing to FERC outlining a comprehensive work plan to address the directives within Order No. 901[4]. Within the work plan, NERC identified three active Standards Development Projects that would need to be filed for regulatory approval with FERC November 4, 2024. These projects include 2020-02 Modifications to PRC-024 (Generation Ride Through),[5] 2021-04 Modifications to PRC-002-2,[6] and 2023-02 Analysis and Mitigation of BES Inverter-Based Resource Performance Issues.[7]

General Considerations

~~The requested implementation timeline allows for ample time for entities to draft and implement their process. The information required for standard compliance is currently available to Generator Owners.~~

This implementation plan recognizes the urgent need for Reliability Standards to address IBR Corrective Action Plans (CAP) to reduce disturbances, as demonstrated by multiple event reports of the last decade, while providing a reasonable period for entities to develop the necessary procedures and change their protection and control settings to meet the new requirements. The ERO Enterprise acknowledges that there are IBRs currently in operation and do not have a standard that addresses CAPs for IBR generation. Consistent with FERC Order No. 901, a limited and documented exemption process for those IBR is appropriate and included within this Implementation Plan. Other NERC Standards Development projects will be pursued to address ongoing identification and mitigation of any potential reliability impacts to the BPS for such exemptions.

This implementation plan provides staggered timeframes by which entities shall first ensure the entity has the necessary PRC Reliability Standards, PRC-029-1, in place (12 months following regulatory approval). Subsequent compliance with the “operation” elements of these requirements shall become due as entities follow Ride-Through criteria on each applicable IBR in accordance with the implementation plan for proposed Reliability Standard PRC-029-1 – Frequency and Voltage Ride-Through Requirements for Inverter-Based Generating Resources.

[3] *Reliability Standards to Address Inverter-Based Resources,* Order No.901, 185 FERC ¶ 61,042 (2023); https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20231019-3157&optimized=false
[4] *See Informational Filing of the N. Am. Elec. Reliability Corp. Regarding the Development of Reliability Standards Responsive to Order No. 901.*, Docket No. RM22-12-000 (January 18, 2024).
[5] *See* NERC Standards Development Project page for Project 2002-02; https://www.nerc.com/pa/Stand/Pages/Project_2020-02_Transmission-connected_Resources.aspx
[6] *See* NERC Standards Development Project page for Project 2021-04; https://www.nerc.com/pa/Stand/Pages/Project-2021-04-Modifications-to-PRC-002-2.aspx
[7] *See* NERC Standards Development Project page for Project 2023-02; https://www.nerc.com/pa/Stand/Pages/Project-2023-02-Performance-of-IBRs.aspx

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. 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, this implementation plan provides additional time for both new and existing registered entities to come into compliance with Reliability Standard PRC-030-1's requirements for their applicable IBRs not meeting the BES definition. In so doing, this implementation plan advances an orderly process for new registrants while allowing existing entities to focus their immediate efforts on their assets posing the highest risk to the reliable operation of the Bulk-Power System.

Effective Date

The effective date for the proposed Reliability Standard is provided below.

Standard PRC-030-1

Where approval by an applicable governmental authority is required, Reliability Standard PRC-030-1 shall become effective on the first day of the first calendar quarter that is ~~six~~12 months after the effective date of the applicable governmental authority's order approving the standard, or as otherwise provided for by the applicable governmental authority.

Where approval by an applicable governmental authority is not required, Reliability Standard PRC-030-1 shall become effective on the first day of the first calendar quarter that is ~~six~~12 months after the date the standard is adopted by the NERC Board of Trustees, or as otherwise provided for in that jurisdiction.

PRC-030-1 Phased-in Compliance Dates

Requirements R1, R2, R3, and R4

Capability-Based Elements

Bulk-Electric System IBRs

Entities shall comply with the portion of Requirements R1, R2, R3 and R4 relating to the **design** of their BES IBRs to meet the requirements by the effective date of the standard.

Applicable Non-BES IBRs[8]

[8] The standard defines such as IBRs as "Non-BES Inverter-Based Resources that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV."

Entities shall not be required to comply with Requirements R1, R2, R3, and R4 relating to the **design of their** applicable non-BES IBRs until the later of: (1) January 1, 2027; or (2) the effective date of the standard.

Performance-Based Elements (all applicable IBRs)

Entities shall not be required to comply with the portion of Requirements R1, R2, R3, and R4 relating to the **operation** of IBRs to meet the requirements until the entity has established the required Ride-through capabilities for those IBRs in accordance with the implementation plan for Reliability Standard PRC-029-1.