



DEPARTMENT OF ENERGY
Federal Energy Regulatory Commission

In Reply Refer To:
North American Electric
Reliability Corporation
Docket Nos. RD25-1-000
RD25-2-000
RD25-3-000
(not consolidated)

North American Electric Reliability Corporation
1401 H Street, NW
Suite 410
Washington, DC 20005

Attention: Lauren Perotti
Alain Rigaud
Sarah P. Crawford

Dear Ms. Perotti, Mr. Rigaud, and Ms. Crawford:

1. On November 4, 2024, the North American Electric Reliability Corporation (NERC), the Commission-certified Electric Reliability Organization, submitted three petitions seeking approval of: (1) a proposed definition of an inverter-based resource (IBR) for inclusion in the NERC Glossary of Terms Used in NERC Reliability Standards (NERC Glossary);¹ (2) proposed Reliability Standards PRC-028-1 (Disturbance Monitoring and Reporting Requirements for Inverter-Based Resources) and PRC-002-5 (Disturbance Monitoring and Reporting Requirements);² and (3) proposed Reliability Standard PRC-030-1 (Unexpected Inverter-Based Resource Event Mitigation).³ NERC also requested approval of the associated implementation plans, violation risk factors, and violation severity levels, as well as the retirement of currently effective Reliability Standard PRC-002-4. For the reasons discussed below, pursuant to section 215(d)(2) of the Federal Power Act (FPA),⁴ we grant the requested approvals.

¹ NERC Petition, Docket No. RD25-1-000 (NERC IBR Definition Petition).

² NERC Petition, Docket No. RD25-2-000 (NERC PRC-028-1 Petition).

³ NERC Petition, Docket No. RD25-3-000 (NERC PRC-030-1 Petition).

⁴ 16 U.S.C. § 824o.

2. In Order No. 901, pursuant to section 215(d)(5) of the FPA, the Commission directed NERC to submit new or modified Reliability Standards to, among other things, address disturbance monitoring data sharing, performance requirements, and post-event performance validation for registered IBRs.⁵ The Commission directed NERC to consider the burden on IBR owners to collect and provide data collected by disturbance monitoring equipment while assuring that Bulk-Power System operators and planners have the data they need for accurate disturbance monitoring and analysis.⁶ The Commission also directed NERC to submit new or modified Reliability Standards that “require generator owners to communicate to the relevant planning coordinators, transmission planners, reliability coordinators, transmission operators, and balancing authorities the actual post-disturbance ramp rates.”⁷ The Commission directed NERC to submit new or modified Reliability Standards addressing these directives to the Commission no later than November 4, 2024.⁸

3. In the IBR Definition Petition, NERC proposes to define an IBR as “[a] plant/facility consisting of individual devices that are capable of exporting Real Power through a power electronic interface(s) such as an inverter or converter, and that are operated together as a single resource at a common point of interconnection to the electric system.”⁹ NERC explains that while developing its proposed IBR definition, it considered the Institute of Electrical and Electronics Engineers (IEEE) 2800-2022 IBR definition, as well as other IBR definitions identified in various NERC and Commission documents.¹⁰ According to NERC, the “capable of exporting real power” phrase in the proposed IBR definition clarifies that IBRs are considered generation resources that provide real power to load.¹¹ NERC states that the proposed IBR definition will promote consistency in the application of Reliability Standards, help avoid confusion, and facilitate efficiency for future standards drafting teams when addressing outstanding IBR issues. NERC’s

⁵ *Reliability Standards to Address Inverter-Based Res.*, Order No. 901, 185 FERC ¶ 61,042, at P 229 (2023).

⁶ *Id.* P 86.

⁷ *Id.* P 208.

⁸ *Id.* P 229.

⁹ NERC IBR Definition Petition at 9 (“Examples include, but are not limited to plants/facilities with solar photovoltaic (PV), Type 3 and Type 4 wind, battery energy storage system (BESS), and fuel cell devices.”).

¹⁰ *Id.* at 9-10.

¹¹ *Id.* at 11. In its petition, NERC appears to use the terms “generating resource” and “generation resource” interchangeably. *See id.* at 10-11.

proposed implementation plan states that the proposed IBR definition would become effective on the first day of the first calendar quarter after Commission approval.¹²

4. In the NERC PRC-028-1 Petition, NERC explains that proposed Reliability Standards PRC-028-1 and PRC-002-5 comply in part with the Commission's directives in Order No. 901 regarding disturbance monitoring requirements for IBRs¹³ and would improve reliability by ensuring the availability of data from synchronous generating resources and IBRs necessary to facilitate the analysis of disturbances on the Bulk-Power System.¹⁴ NERC states that although Reliability Standard PRC-002-4 generally serves the purpose of capturing event data to analyze system disturbances, the disturbance monitoring requirements of the existing Standard do not apply to many IBRs, given their technical and operational characteristics.¹⁵ NERC explains that proposed Reliability Standard PRC-028-1 would address this reliability gap by extending disturbance monitoring and reporting requirements to all IBRs that are or will be subject to the Reliability Standards.¹⁶

5. Proposed Reliability Standard PRC-028-1 applies to generator owners that own bulk-electric system IBRs, as well as generator owners that own non-bulk electric system IBRs that NERC will register under NERC's registry criteria for IBR generator owners and generator operators.¹⁷ The proposed Standard would require applicable entities to install disturbance monitoring equipment on their IBRs in order to collect sequence of event recording, fault recording, and dynamic disturbance recording data.¹⁸ NERC explains that data collected under the proposed Standard would be used to evaluate IBR ride-through performance during system disturbances and provide data for IBR model validation to assist operators and planners in better accounting for IBR performance in the future.¹⁹ Additionally, the proposed Standard would require IBR generator owners to address failures of disturbance monitoring recording capabilities by either restoring function

¹² *Id.* at 14.

¹³ NERC states that proposed Reliability Standard PRC-028-1 does not address the Commission's Order No. 901 directive regarding the validation of registered IBR models using disturbance monitoring data, which NERC intends to address during Milestone 3 of its Order No. 901 Work Plan. *See* NERC PRC-028-1 Petition at 35-36.

¹⁴ *Id.* at 19.

¹⁵ *Id.* at 21-22.

¹⁶ *Id.* at 2.

¹⁷ *Id.* at 22; *see also* NERC, *Rules of Procedure*, App. 5B (Statement of Compliance Registry Criteria) (June 27, 2024), <https://www.nerc.com/AboutNERC/Pages/Rules-of-Procedure.aspx>.

¹⁸ NERC PRC-028-1 Petition at 23-31.

¹⁹ *Id.* at 2.

within specified timeframes or submitting corrective action plans indicating how and when recording capabilities would be restored.²⁰

6. Proposed Reliability Standard PRC-002-5 would replace Reliability Standard PRC-002-4 and clarify its applicability to non-IBR bulk electric system elements.²¹ Further, proposed Reliability Standard PRC-002-5 adds data collection and sharing requirements, as well as data formatting requirements, similar to those in proposed Reliability Standard PRC-028-1.²²

7. NERC describes its proposed implementation plan for Reliability Standards PRC-028-1 and PRC-002-5 as “a risk-based, phased-in compliance approach” that would require generator owners to implement disturbance monitoring equipment by no later than 2030.²³ NERC further proposes a process by which generator owners may request an extension to implementation deadlines because of potential constraints outside of a generator owner’s control, such as supply chain delays.²⁴

8. The NERC PRC-030-1 Petition explains that proposed Reliability Standard PRC-030-1 was developed as part of a set of Reliability Standards in response to directives in Order No. 901 to develop requirements that address IBR ride-through settings and performance, data recording, and analysis and mitigation of unexpected IBR performance.²⁵ The purpose of proposed Reliability Standard PRC-030-1 is to “[i]dentify, analyze, and mitigate unexpected [IBR] change of power output.”²⁶ The proposed Reliability Standard covers both bulk electric system IBRs and non-bulk electric system IBRs²⁷ and is applicable to generator owners that own: (1) IBRs that

²⁰ *Id.* at 34-35.

²¹ *Id.* at 38.

²² *See id.*

²³ *Id.* at 39.

²⁴ *Id.*

²⁵ *See* NERC PRC-030-1 Petition at 1; *see also* Order No. 901, 185 FERC ¶ 61,042 at P 208.

²⁶ NERC PRC-030-1 Petition at 16.

²⁷ Applicable non-bulk electric system IBRs include those non-bulk electric system IBRs 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. *See id.* at 17, 32.

meet the bulk electric system definition criteria, and (2) non-bulk electric system IBRs that NERC will register in accordance with its Rules of Procedure.²⁸

9. Proposed Reliability Standard PRC-030-1 requires applicable entities to implement a documented process for the identification of any “complete facility loss of output or certain changes of real power output” and contains both thresholds²⁹ for identification and exclusions from identification measures.³⁰ Further, the Standard requires applicable entities in certain circumstances to conduct and report, if requested, an analysis of a real power change event.³¹ When identified as necessary by the required analysis, a generator owner must develop and implement a corrective action plan to address performance issues or provide a technical justification³² as to why corrective actions will not be implemented.³³ Proposed PRC-030-1 further requires generator owners to update corrective action plans if corrective actions or schedules change, and notify associated reliability coordinators of completion of or changes to the corrective action plan. According to NERC, proposed PRC-030-1 is responsive to the Commission’s directive in Order No. 901 requiring NERC to develop Reliability Standards that require generator owners to communicate actual post-disturbance ramp rates to relevant planning coordinators, transmission planners, reliability coordinators, transmission operators, and balancing authorities.³⁴

10. NERC’s proposed implementation plan states that proposed Reliability Standard PRC-030-1 will become effective on the later of the first day of the first calendar quarter

²⁸ See *N. Am. Elec. Reliability Corp.*, 183 FERC ¶ 61,116, at P 52 (2023) (citing *Registration of Inverter-based Res.*, 181 FERC ¶ 61,124, at P 33 (2022) (directing NERC to ensure IBR owners and operators are registered and required to comply with applicable Reliability Standards within 36 months of Commission approval of the NERC Registration Work Plan (May 18, 2026))).

²⁹ Proposed Reliability Standard PRC-030-1 establishes a minimum threshold of at least 20 MW and at least 10% of the plant’s gross nameplate rating, occurring within a four second period, that NERC states would make the self-identification of events manageable for both small and large facilities. See NERC PRC-030-1 Petition at 19.

³⁰ *Id.* at 18, 21 (describing those slower changes in Real Power that are excluded from the identification requirements in Requirement R1 because they are anticipated with normal operations or expected responses).

³¹ *Id.* at 22-24.

³² Primary characteristics of an acceptable technical justification for not performing corrective actions include “interconnection requirements on IBR performance extending beyond those in place at the time of interconnection” and corrective actions would require significant material modifications or a qualified change. See *id.* at 26.

³³ *Id.* at 24.

³⁴ See Order No. 901, 185 FERC ¶ 61,042 at P 208.

that is 12 months after the effective date of the Commission's order approving (1) Reliability Standard PRC-030-1 or (2) Reliability Standard PRC-029-1 (Frequency and Voltage Ride-through Requirements for Inverter-Based Generating Resources).³⁵ NERC's proposed implementation plan further provides a phased-in compliance approach where bulk electric system IBRs must comply with all four requirements of Reliability Standard PRC-030-1 no later than the effective date of the Standard. Applicable non-bulk electric system IBRs must comply with all four requirements by the later of January 1, 2027, or the effective date of Reliability Standard PRC-030-1. NERC asserts that this phased-in implementation approach satisfies the Commission's directive in Order No. 901 for all directed Reliability Standards to be effective and enforceable prior to 2030.³⁶

11. Notice of NERC's three November 4, 2024, petitions were published in the *Federal Register*, 89 Fed. Reg. 88993 (Nov. 12, 2024), with interventions and protests due on or before December 4, 2024. Calpine Corporation, North Carolina Electric Membership Corporation, Solar Energy Industries Association, American Clean Power Association, Orsted Wind Power North America LLC, Invenergy Renewables, LLC, Dominion Energy Virginia, Eversource Energy Service Company, and RENEW Northeast, Inc. all filed timely motions to intervene in all or one of the dockets addressed in this order. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 CFR 385.214 (2024), the timely, unopposed motions to intervene serve to make the entities that filed them parties to the proceedings in which they were filed. No comments or protests were submitted in any of the three dockets.

12. Pursuant to section 215(d)(2) of the FPA, we approve the proposed IBR definition for inclusion in the NERC Glossary, as well as proposed Reliability Standards PRC-028-1, PRC-002-5, and PRC-030-1, as just and reasonable and not unduly discriminatory or preferential and in the public interest.³⁷ We also approve the proposed Reliability Standards' associated violation risk factors and violation severity levels, as well as the proposed implementation plans. Finally, we approve the retirement of Reliability Standard PRC-002-4 immediately prior to the effective date of proposed Reliability Standard PRC-002-5.

13. We determine that the proposed IBR definition and proposed Reliability Standards PRC-028-1, PRC-002-5, and PRC-030-1 satisfy many of the Commission's relevant directives from Order No. 901 to establish performance requirements and requirements for sharing disturbance monitoring data and post-disturbance ramp rates for registered IBRs.³⁸ Given the increase in the amount of IBRs connecting to the Bulk-Power System, as well as the importance of the new IBR definition and Reliability Standards PRC-028-1 and PRC-030-1 to maintaining the reliable operation of the Bulk-Power System, we strongly

³⁵ See NERC PRC-030-1 Petition at 32.

³⁶ See Order No. 901, 185 FERC ¶ 61,042 at P 226.

³⁷ 16 U.S.C. 824o(d)(2).

³⁸ See Order No. 901, 185 FERC ¶ 61,042 at PP 1-8.

encourage entities that are capable of complying earlier than the mandatory and enforceable date to do so.

Information Collection Statement

14. The FERC-725G information collection requirements are subject to review by the Office of Management and Budget (OMB) under section 3507(d) of the Paperwork Reduction Act of 1995. OMB’s regulations require approval of certain information collection requirements imposed by agency rules. Upon approval of a collection of information, OMB will assign an OMB control number and expiration date. Respondents subject to the filing requirements will not be penalized for failing to respond to these collections of information unless the collections of information display a valid OMB control number. The Commission solicits comments on the need for this information, whether the information will have practical utility, the accuracy of the burden estimates, ways to enhance the quality, utility, and clarity of the information to be collected or retained, and any suggested methods for minimizing respondents’ burden, including the use of automated information techniques.

15. The Commission bases its paperwork burden estimates on the additional paperwork burden presented by the proposed revisions to Reliability Standard PRC-002-5 and new Reliability Standards PRC-028-1 and PRC-030-1. The new glossary term Inverter-Based Resource (IBR) is not expected to generate any new burden as it is a definition used within the body of Reliability Standards. Reliability Standards are objective-based and allow entities to choose compliance approaches best tailored to their systems. As of November 20, 2024, the NERC Compliance Registry identified 12 reliability coordinators, 325 transmission owners, and 1,238 generator owners as unique U.S. entities that are subject to mandatory compliance with Reliability Standard PRC-002-5. Additionally, these entities will have additional burdens given that the revisions to Reliability Standard PRC-002-5 will focus on synchronous generation and updates to SER, FR, and DDR data being supplied to the reliability coordinator, regional entity, or NERC. Burden estimates for the unique U.S. entities for new PRC-028-1 and PRC-030-1 are taken from numbers supplied by NERC, with 591 registered generator owners that own bulk electric system solar and wind facilities and a median 755 generator owners that own non bulk electric system facilities. Based on these assumptions, we estimate the following reporting burden:

Proposed Changes in Burden PRC-002-5 Docket No. RD25-2					
Reliability Standard	Type and Number of Entity³⁹ (1)	Number of Annual Responses Per Entity (2)	Total Number of Responses (1)*(2)=(3)	Average Number of Burden Hours per Response⁴⁰	Total Burden Hours (3)*(4)=(5)

³⁹ The “Number of Entity” data is compiled from the November 20, 2024, edition of the NERC Compliance Registry.

⁴⁰ The estimated hourly cost (salary plus benefits) is a combination of the following categories from the Bureau of Labor Statistics (BLS) website, http://www.bls.gov/oes/current/naics2_22.htm: 75% of the average of an Electrical

(4)					
Annual Collection PRC-002-5 FERC-725G					
Annual review and record retention	12 (RC)	1	12	8 hrs. \$ 70.67/hr	96 hrs. \$ 6,784.32
	325 (TO)	1	325	8 hrs. \$ 70.67/hr	2,600 hrs. \$ 183,742.00
	1,238 (GO)	1	1,238	8 hrs. \$ 70.67/hr	9,904 hrs. \$ 699,915.68
Total for PRC-002-5			1,575		12,600 hrs. \$ 890,442.00

Proposed Burden PRC-028-1 Docket No. RD25-2					
Reliability Standard	Type and Number of Entity⁴¹ (1)	Number of Annual Responses Per Entity (2)	Total Number of Responses (1)*(2)=(3)	Average Number of Burden Hours per Response⁴² (4)	Total Burden Hours (3)*(4)=(5)
Annual Collection PRC-028-1 FERC-725G					
Annual review and record retention	591 (BES IBR GO)	1	591	80 hrs. \$ 70.67/hr	47,280 hrs. \$ 3,341,277.60
	755 (Non-BES IBR GO)	1	755	80 hrs. \$ 70.67/hr	60,400 hrs. \$ 4,268,468.00
Total for PRC-028-1			1,346		107,680 hrs. \$ 7,609,745.60

Proposed Burden PRC-030-1 Docket No. RD25-3
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Engineer (17-2071) \$79.31/hr., $\$79.31 \times 0.75 = \59.4825 (\$59.48/hour); and 25% of an Information and Record Clerk (43-4199) \$44.74/hr., $\$44.74 \times 0.25 = \11.185 (\$11.19/hour); for a total of ($\$59.48 + \$11.19 =$ **\$70.67/hour**).

⁴¹ The “Number of Entity” data is compiled from the November 20, 2024, edition of the NERC Compliance Registry.

⁴² The estimated hourly cost (salary plus benefits) is a combination of the following categories from the Bureau of Labor Statistics (BLS) website, http://www.bls.gov/oes/current/naics2_22.htm: 75% of the average of an Electrical Engineer (17-2071) \$79.31/hr., $\$79.31 \times 0.75 = \59.4825 (\$59.48/hour); and 25% of an Information and Record Clerk (43-4199) \$44.74/hr., $\$44.74 \times 0.25 = \11.185 (\$11.19/hour); for a total of ($\$59.48 + \$11.19 =$ **\$70.67/hour**).

Reliability Standard	Type and Number of Entity ⁴³	Number of Annual Responses Per Entity (2)	Total Number of Responses (1)*(2)=(3)	Average Number of Burden Hours per Response ⁴⁴ (4)	Total Burden Hours (3)*(4)=(5)
Annual Collection PRC-030-1 FERC-725G					
Annual review and record retention	591 (BES IBR GO)	0.5	296	40 hrs. \$ 70.67/hr	11,840 hrs. \$ 836,732.80
	755 (Non-BES IBR GO)	0.5	378	40hrs. \$ 70.67/hr	15,120 hrs. \$ 1,068,530.40
Total for PRC-030-1			674		26,960 hrs. \$ 1,905,263.20

16. The responses and burden hours for Years 1-3 will total respectively as follows:

- Year 1-3 each: for proposed Reliability standard PRC-002-5 will be 1,575 responses; 12,600 hours;
- Year 1-3 each: for proposed Reliability Standard PRC-028-1 will be 1,346 responses; 107,680 hours; and
- Year 1-3 each: for proposed Reliability Standard PRC-030-1 will be 674 responses; 26,960 hours.
- The annual cost burden for each Year 1-3 is \$890,442.00 for proposed Reliability Standard PRC-002-5; \$7,609,745.60 for Proposed Reliability Standard PRC-028-1; and \$1,905,263.20 for proposed Reliability Standard PRC-030-1.

17. Title: Mandatory Reliability Standards, Revised Protection and Control Reliability Standards

18. Action: Revision to FERC-725G information collection.

⁴³ The “Number of Entity” data is compiled from the November 20, 2024, edition of the NERC Compliance Registry.

⁴⁴ The estimated hourly cost (salary plus benefits) is a combination of the following categories from the Bureau of Labor Statistics (BLS) website, http://www.bls.gov/oes/current/naics2_22.htm: 75% of the average of an Electrical Engineer (17-2071) \$79.31/hr., $79.31 \times 0.75 = 59.4825$ (\$59.48/hour); and 25% of an Information and Record Clerk (43-4199) \$44.74/hr., $44.74 \times 0.25 = 11.185$ (\$11.19/hour); for a total of $(\$59.48 + \$11.19 = \mathbf{\$70.67/hour})$.

19. OMB Control No.: 1902-0252.
20. Respondents: Businesses or other for-profit institutions; not-for-profit institutions.
21. Frequency of Responses: On Occasion.
22. Necessity of the Information: This order approves the Reliability Standards pertaining to disturbance monitoring and reporting requirements for IBRs and unexpected IBR event mitigation as well as the IBR definition. As discussed above, the Commission approves the proposed IBR definition and Reliability Standards PRC-028-1, PRC-002-5, and PRC-030-1 pursuant to section 215(d)(2) of the FPA because the definition and the Standards help ensure the availability of data from synchronous generating resources and IBRs; the Standards also create requirements for a documented process to identify unexpected IBR events and to develop corrective action plans, as needed.
23. Internal Review: The Commission has reviewed the proposed Reliability Standards and made a determination that its action is necessary to implement section 215 of the FPA.
24. Interested persons may obtain information on the reporting requirements by contacting the following: Federal Energy Regulatory Commission, 888 First Street, NE Washington, DC 20426 [Attention: Kayla Williams, Office of the Executive Director, email: DataClearance@ferc.gov, phone: (202) 502-8663, fax: (202) 273-0873].
25. For submitting comments concerning the collection(s) of information and the associated burden estimate(s), please send your comments to the Commission, and to the Office of Management and Budget, Office of Information and Regulatory Affairs, Washington, DC 20503 [Attention: Desk Officer for the Federal Energy Regulatory Commission, phone: (202) 395-4638, fax: (202) 395-7285]. For security reasons, comments to OMB should be submitted by e-mail to: oira_submission@omb.eop.gov. Comments submitted to OMB should include Docket Number RM25-3-000 and OMB Control Number 1902-0252.
26. In addition to publishing the full text of this document in the *Federal Register*, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the Internet through the Commission's Home Page (<http://www.ferc.gov>).
27. From the Commission's Home Page on the Internet, this information is available on eLibrary. The full text of this document is available on eLibrary in PDF and Microsoft Word format for viewing, printing, and/or downloading. To access this document in eLibrary, type the docket number excluding the last three digits of this document in the docket number field.
28. User assistance is available for eLibrary and the Commission's website during normal business hours from the Commission's Online Support at (202) 502-6652 (toll free at 1-866-208-3676) or email at ferconlinesupport@ferc.gov, or the Public Reference Room at (202) 502-8371, or (202) 502-8659 for TTY. E-mail the Public Reference Room at public.referenceroom@ferc.gov.

29. All submissions must be formatted and filed in accordance with submission guidelines at: <http://www.ferc.gov/help/submission-guide.asp>. For user assistance, contact FERC Online Support by e-mail at ferconlinesupport@ferc.gov, or by phone at: (866) 208-3676 (toll-free), or (202) 502-8659 for TTY.

By direction of the Commission.

Dated: February 20, 2025

Debbie-Anne A. Reese,
Secretary.

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