

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

**Reliability Standards for Frequency and)
Voltage Protection Settings and Ride-)
Through for Inverter-Based Resources)**

Docket No. RM25-3-000

COMMENTS OF THE LOUISIANA PUBLIC SERVICE COMMISSION

The Louisiana Public Service Commission ("Louisiana Commission" or "LPSC") is a state regulatory agency with the constitutionally-granted authority to regulate the rates and services of retail utilities operating in Louisiana. The Louisiana Commission appreciates the opportunity to comment on the Notice of Proposed Rulemaking ("NOPR") and offers the following comments in support of enhanced Reliability Standards for inverter-based resources ("IBRs"). The Louisiana Commission generally favors the standards set forth in PRC-024-4 and PRC-029-1. However, the Louisiana Commission requests clarification and provides critique of the proposed compliance measures and exemption in PRC-029-1.

A. The LPSC supports Reliability Standards specific to IBRs.

The Louisiana Commission is tasked to ensure reliable and reasonably priced energy services. The reliability problems caused by IBRs reach across the grid.¹ As recognized by the North American Electric Reliability Commission ("NERC") repeatedly since 2016, "immediate" reform of the performance standards governing IBRs is needed.² Without prompt

¹ See, e.g., N. AM. ELEC. RELIABILITY CORP., *2023 Southwest Utah Disturbance*, 6 (Aug. 2023) https://www.nerc.com/pa/rrm/ea/Documents/NERC_2023_Southwest_UT_Disturbance_Report.pdf [hereinafter "*Southwest Utah Disturbance Report*"] ("The aggregate effects of abnormal performance across multiple inverter-based resources poses [sic] a risk to BPS reliability.").

² See, e.g., N. AM. ELEC. RELIABILITY CORP., *2022 Odessa Disturbance*, v (Dec. 2022) [https://www.nerc.com/comm/RSTC_Reliability_Guidelines/NERC_2022_Odessa_Disturbance_Report%20\(1\).pdf](https://www.nerc.com/comm/RSTC_Reliability_Guidelines/NERC_2022_Odessa_Disturbance_Report%20(1).pdf) [hereinafter "*2022 Odessa Disturbance Report*"] ("As the penetration of solar PV resources [and all inverter-based resources] continues to grow rapidly in the ERCOT footprint and in many areas of North America, it is paramount

action, large-scale, unexpected energy losses caused by IBRs remain a threat to the grid.³ Accordingly, the Louisiana Commission generally supports the new standards in the NOPR designed to address the reliability issues posed by IBRs.

B. Generator owners of IBRs should be required to demonstrate immediate operational compliance with the Ride-through requirements in addition to providing disturbance monitoring data.

However, the Louisiana Commission is concerned that the NOPR's overall timeline for compliance is too slow and that the proposed method for verifying IBR compliance will prove ineffective. PRC-029-1 sets forth two tiers for demonstrating compliance with IBR Ride-through requirements: (1) design and (2) operation.⁴ Generator owners of IBRs may satisfy the design prong by providing "evidence to demonstrate the design of each IBR will adhere to requirements" as specified in R1, R2, and R3, such as "dynamic simulations, studies, plant protection settings, and control settings design evaluation."⁵ The design component is proposed to be implemented

that these inverter-based resource performance issues are proactively and immediately addressed."); *Southwest Utah Disturbance Report* at 6 ("As documented in past disturbance reports, this report further highlights the need for a comprehensive ride-through standard to replace NERC PRC-024-3,"); N. AM. ELEC. RELIABILITY CORP., *Panhandle Wind Disturbance*, v (Aug. 2022) https://www.nerc.com/pa/rrm/ea/Documents/Panhandle_Wind_Disturbance_Report.pdf (reiterating the need for enhanced inverter-based resource ride-through requirements); N. AM. ELEC. RELIABILITY CORP., *Multiple Solar PV Disturbances in CAISO*, vi-vii (Apr. 2022) https://www.nerc.com/pa/rrm/ea/Documents/NERC_2021_California_Solar_PV_Disturbances_Report.pdf (emphasizing the strong need for improved Reliability Standards); N. AM. ELEC. RELIABILITY CORP., *Odessa Disturbance*, vi-vii (Sept. 2021) (same); https://www.nerc.com/pa/rrm/ea/Documents/Odessa_Disturbance_Report.pdf [hereinafter "*Odessa 2021 Disturbance Report*"]; N. AM. ELEC. RELIABILITY CORP., *1,200 MW Fault Induced Solar Photovoltaic Resource Interruption Disturbance Report*, v-vi (June 2017) https://www.nerc.com/pa/rrm/ea/Documents/1200_MW_Fault_Induced_Solar_Photovoltaic_Resource_Interruption_Final.pdf (recommending review of PRC-024-2 in light of 2016 Blue Cut Fire system disturbance); see also N. AM. ELEC. RELIABILITY CORP., *2022 California Battery Energy Storage System Disturbances*, iv-v (Sept. 2023) https://www.nerc.com/comm/RSTC/Documents/NERC_BESS_Disturbance_Report_2023.pdf (noting systemic problems with BESS ride-through performance).

³ See, e.g., *Southwest Utah Disturbance Report* at iv-v.

⁴ Exhibit B to Petition, Implementation Plan, at 3; Petition at 53-54 (referring to "capability-based elements" and "performance-based elements").

⁵ Exhibit A-3 to Petition, Final Draft of PRC-029-1, at 4, 6 (B.M1, M2, M3).

12 months following PRC-029-1's enactment.⁶ Operation according to the requirements is proposed to be shown by "evidence of actual disturbance monitoring (i.e., sequence of event recorded, dynamic disturbance recorder, and fault recorder) data."⁷ Collection of this data requires installing disturbance monitoring equipment in compliance with proposed Reliability Standard PRC-028-1, Disturbance Monitoring and Reporting Requirements for IBRs.⁸ Accordingly, implementation of the "operations" prong of PRC-029-1 is set to track the implementation of PRC-028-1, which is proposed to not take full effect until January 1, 2030.⁹

This draft of PRC-029-1 presents some potential problems. First, it is unclear that generator owners of IBRs meeting the design element have, in fact, set the equipment to meet the Ride-through requirements. NERC disturbance reports indicate that, while IBRs were capable of riding through voltage and frequency disturbances, they were often not programmed to do so.¹⁰ Mere capability is not the issue.

⁶ Exhibit B to Petition, Implementation Plan, at 3; Exhibit C to Petition, Order No. 672 Criteria, at 8.

⁷ Exhibit A-3 to Petition, Final Draft of PRC-029-1, at 4, 6 (B.M1, M2, M3); *see also* Exhibit B to Petition, Implementation Plan, at 3.

⁸ Exhibit B to Petition, Implementation Plan, at 3.

⁹ *Id.* at 3-5; Exhibit C to Petition, Order No. 672 Criteria, at 8-9 n.11.

¹⁰ *See, e.g., Odessa 2021 Disturbance Report* at vi (noting that while PRC-024-3 required voltage and frequency protective relaying to be set outside the "no trip zone" curves, "[v]endors, GOs, and GOPs gather documentation to demonstrate this, but facilities continue to trip for point of interconnection (POI) voltages within the 'no trip zone' in real-time" and that the facilities were effectively "audited on their documentation, not on their performance," leading to "ongoing abnormal and inadequate performance from BPS-connected resources" that "should be addressed comprehensively with standards revisions"); *Southwest Utah Disturbance Report* at 5-6 (noting that while causes of IBR tripping has been known, the "industry is not taking proactive steps to mitigate these performance issues"); *2022 Odessa Disturbance Report* at ix ("Repeated abnormal performance issues across many inverter-based resources is clear evidence that those facilities are not being configured to give the same performance as was studied in the interconnection process. Improvements are needed to ensure that the plant is commissioned to match exactly what was studied during the interconnection process with all gaps or discrepancies clearly documented and analyzed by the TO prior to commercial operation."); *see also* Exhibit H to Petition, Summary of Issues and Alternatives Considered, Proposed Reliability Standard PRC-029-1, 7 (Sept. 24, 2024) (at the Technical Conference, NERC noted that "many IBR were still being designed and installed without setting their protection and controls in accordance with their physical capabilities.").

And while providing data evidencing an IBR's performance during a disturbance event will undoubtedly be critical to eventually resolving reliability issues, that data will come too late for PRC-029-1 to have an immediate, meaningful impact on reliability.¹¹ Such data can only be reviewed after the fact of a disturbance.¹² Moreover, operational compliance with PRC-029-1 is further delayed with the lagging implementation of PRC-028-1, which allows time for the required installation of monitoring equipment.¹³

To address these shortcomings, the Louisiana Commission proposes that PRC-029-1 require documentation from the generator owner that the IBR is not only capable of meeting the Ride-through requirements but also actually programmed or set to meet them.¹⁴ Current PRC-024-3 and proposed PRC-024-4 require such documentation.¹⁵ While NERC intended to move

¹¹ See, e.g., Exhibit G to Petition, June 18, 2024 Consideration of Comments, Project 2020-02 Modifications to PRC-024 (Generator Ride-through), at 164 (The Midwest Reliability Organization comments that the events-based approach in the draft of PRC-029-1 did not adequately address Order No. 901 because "many events would not be prevented." The Midwest Reliability Organization further noted that "[t]his is particularly concerning for frequency excursion events . . . as these events are relatively infrequent and yet widespread, potentially resulting in the failure of a multitude of IBRs to meet the performance requirements if frequency trip settings are not evaluated preemptively."), at 227 (The Independent Electricity System Operator – 2 ["IESO"] expressed "concerns with this standard being an event-based standard, in that it does not necessarily provide an assurance of reliability before events occur, such as would be provided by having an engineering analysis, or bench-testing/real-time simulations of controls equipment that indicates successful ride through of prescribed disturbances is expected.").

¹² The same is true of requirements of PRC-030-1, Unexpected Inverter-Based Resource Event Mitigation, which requires a generator owner to document and analyze certain losses of output and corrections that necessarily occur after the fact of a disturbance.

¹³ See Exhibit B to Petition, Implementation Plan, at 4-5; Exhibit C to Petition, Order No. 672 Criteria, at 8-9 n.11.

¹⁴ For instance, B.M1 may be revised to include the additional requirement: "Each Generator Owner shall have evidence to demonstrate that the IBR *is set* to adhere to the Ride-through requirements, as specified in Requirement R1." See also Exhibit G to Petition, June 18, 2024 Consideration of Comments, Project 2020-02 Modifications to PRC-024 (Generator Ride-through), at 164 (Midwest Reliability Organization states that the requirements "should make it clear that facilities are to be configured to meet performance requirements and that the relevant equipment settings should be available as evidence to show compliance.").

¹⁵ See, e.g. PRC-024-3 at B.R1 ("Each Generator Owner shall set its applicable frequency protection . . ."), B.M1 ("Each Generator Owner shall have evidence that the applicable frequency protection has been set in accordance with Requirement R1, such as dated setting sheets, calibration sheets, calculations, or other documentation."); PRC-024-4 at B.R1 ("Each Generator Owner and Transmission Owner shall set applicable frequency protection . . ."), B.M1 ("Each Generator Owner and Transmission Owner shall have evidence that the applicable frequency protection

away from a "protection-settings" approach in drafting PRC-029-1,¹⁶ NERC also intended to remedy concerns that the "event-based" approach failed to address proactive compliance by adding the former design/capability requirements.¹⁷ Nonetheless, the current draft of PRC-029-1 permits delayed *operational* compliance by only relying on the data monitoring process in PRC-028-1 to measure compliance, which is only collected after a disturbance occurs.¹⁸ Verification of current operational compliance could easily be included in PRC-029-1 as a supplement to the design and monitoring requirements. The documentation evidencing the capabilities being programmed should be provided with the design documentation, no later than the effective date of PRC-029-1.¹⁹

has been set in accordance with Requirement R1, such as dated setting sheets, calibration sheets, calculations, or other documentation.").

¹⁶ See Exhibit G to Petition, June 18, 2024 Consideration of Comments, Project 2020-02 Modifications to PRC-024 (Generator Ride-through), at 24-25 (noting NERC's desire to avoid a settings-based approach as impractical and potentially impossible for IBRs due to the variability of OEM designs); Exhibit H to Petition, Summary of Issues and Alternatives Considered, Proposed Reliability Standard PRC-029-1, at 7 (determining that the proposed standard should not align with previous PRC-024-3 criteria "[d]ue to a concern of lowering the bar of performance by requiring that IBR perform less than what the significant majority of IBR are being designed and manufactured to do"); see also *Odessa 2021 Disturbance Report* at vi (criticizing PRC-024-3 for permitting a paper audit rather than performance audit).

¹⁷ See, e.g., Exhibit G to Petition, June 18, 2024 Consideration of Comments, Project 2020-02 Modifications to PRC-024 (Generator Ride-through), at 25 (rejecting a "protection-based" approach in light of variability of OEM designs and explaining that revised "capability-based requirements . . . require a demonstration of verified design/capability to ride-through"), 165 (responding to Midwest Reliability Organization's concern by explaining that PRC-029-1 was revised "to include design capability based requirements as well as the demonstration of performance during disturbances"), 228 (responding to IESO's concern by explaining that PRC-029 was revised "to ensure the design/capability of each IBR can be validated prior to an event—in addition to retaining the event and performance-based requirements"); Exhibit H to Petition, Summary of Issues and Alternatives Considered, Proposed Reliability Standard PRC-029-1, at 7 (because IBRs were "still being designed and installed without setting their protection and controls in accordance with their physical capabilities[,] there was concern that PRC-029-1 should not align with PRC-024-3 criteria to ensure better performance).

¹⁸ See Exhibit B to Petition, Implementation Plan, at 4-5.

¹⁹ See *id.*

C. The exemption impermissibly favors legacy IBR owners at the expense of Bulk-Power System reliability.

The exemption as written threatens to undermine the purpose of the proposed Reliability Standards: to strengthen the grid. It is virtually impossible to determine the effect of the exemption at the present time.²⁰ The Federal Energy Regulatory Commission ("FERC") implicitly recognizes this in ordering NERC to submit informational filings 12 and 24 months following the close of the exemption period.²¹ Under the proposed timeline, FERC would not be able to assess the effects of the exemption until approximately 2028 and 2029.²² Subsequent corrective action would take even longer, potentially beyond FERC's goal of ensuring IBR compliance by 2030.²³ This protracted timeline should be corrected by shortening the periods to qualify for the exemption (*i.e.*, 6 months following the implementation of PRC-029-1, instead of 12 months) and to submit informational filings (*i.e.*, 6 and 12 months following the expiration of the exemption period, instead of 12 and 24 months).

Furthermore, NERC proposes to mitigate the effect of the exemption by primarily relying on existing Reliability Standards governing Transmission Planners, Planning Coordinators, Reliability Coordinators, and Transmission Operators.²⁴ Although NERC states that

²⁰ See Exhibit G to Petition, Transcript of NERC Standards Committee and NERC Ride-through Technical Conference, Sept. 5, 2024, at 86:12-22 (acknowledging that "[w]e don't know if [the exemption] poses risk to the system or does not, yet to be determined.").

²¹ *Reliability Standards for Frequency and Voltage Protection Settings and Ride-Through for Inverter-Based Resources*, Docket No. RM25-3-000, 189 FERC ¶ 61,212, at PP 5, 35 (2024).

²² See Exhibit B to Petition, Implementation Plan, at 4-5 (providing that PRC-029-1 will become effective on the first day of the first calendar quarter that is twelve months after the date of FERC's order approving the standard, or as otherwise provided for by FERC; and further requiring compliance with Requirement R4 by the effective date of the standard for BES IBRs, on the one hand, and by the later of January 1, 2027, or the effective date of the standard for non-BES IBRs, on the other hand).

²³ See *Reliability Standards to Address Inverter-Based Resources*, Order No. 901, 185 FERC ¶ 61,042, at P 8 (2023).

²⁴ See Petition at 46.

future Reliability Standards under Milestone 4 of the Order No. 901 Work Plan will also mitigate the effects of the exemption, delayed implementation of these standards is concerning.²⁵ In the interim, there remains concern that transmission owners and operators are expected to mitigate an event consisting of an unknown number of IBRs disconnecting at any time in the future, in an unanticipated manner.²⁶ This favoring of legacy IBR owners over other players in the energy market seems to be a compromise that threatens the reliability of the Bulk-Power System, which is prohibited by Order No. 672.²⁷

D. Conclusion

The Louisiana Commission urges the expeditious approval and enforcement of Reliability Standards governing IBRs with meaningful compliance criteria. The Louisiana Commission requests the Commission to ensure that IBR generator owners will immediately comply with PRC-029-1 by providing documentation showing not only equipment capability but also that the equipment is programmed in accordance with the Ride-through requirements. The Louisiana Commission further questions the exemption's potential to undermine reliability and suggests shortening the qualification and informational filing periods and considering what mitigation measures will adequately protect the Bulk-Power System.

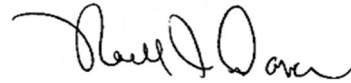
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²⁵ See *id.* at 15 ("Milestone 4: Development and Filing of Reliability Standards to Address Planning and Operational Studies Requirements for all IBRs [completion: November 4, 2026]"), 46; Order No. 901, 185 FERC ¶ 61,042, at P 56.

²⁶ Order No. 901, 185 FERC ¶ 61,042, at P 196-99.

²⁷ See *Rules Concerning Certification of the Electric Reliability Organization and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards*, Order No. 672, 114 FERC ¶ 61,104, at PP 329-30, *order on reh'g*, Order No. 672-A, 114 FERC ¶ 61,328 (2006).

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CERTIFICATE OF SERVICE

I hereby certify that the foregoing "Comments of the Louisiana Public Service Commission" have been served on the official service list compiled by the Secretary in this proceeding by e-mail this 24th day of March, 2025.

