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DEPARTMENT OF ENERGY
FEDERAL ENERGY REGULATORY COMMISSION

18 CFR Part 40

[Docket No. RM13-16-000; Order No. 796]

Generator Verification Reliability Standards

AGENCY: Federal Energy Regulatory Commission.

ACTION: Final rule.

SUMMARY: Pursuant to section 215 of the Federal Power Act, the Federal Energy Regulatory Commission (Commission) approves the following Reliability Standards that were submitted to the Commission for approval by the North American Electric Reliability Corporation, the Commission-certified Electric Reliability Organization: MOD-025-2 (Verification and Data Reporting of Generator Real and Reactive Power Capability and Synchronous Condenser Reactive Power Capability), MOD-026-1 (Verification of Models and Data for Generator Excitation Control System or Plant Volt/Var Control Functions), MOD-027-1(Verification of Models and Data for Turbine/Governor and Load Control or Active Power/Frequency Control Functions), PRC-019-1 (Coordination of Generating Unit or Plant Capabilities, Voltage Regulating Controls, and Protection), and PRC-024-1 (Generator Frequency and Voltage Protective Relay Settings). The generator verification Reliability Standards help ensure that verified data is available for power system planning and operational studies by requiring the

verification of generator equipment and capability needed to support Bulk-Power System reliability and promoting the coordination of important protection system settings.

EFFECTIVE DATE: This rule will become effective **[insert date 60 days after publication in the FEDERAL REGISTER].**

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Before Commissioners: Cheryl A. LaFleur, Acting Chairman;
Philip D. Moeller, John R. Norris,
and Tony Clark.

Generator Verification Reliability Standards Docket No. RM13-16-000

ORDER NO. 796

FINAL RULE

(Issued March 20, 2014)

1. Under section 215 of the Federal Power Act (FPA),[1] the Commission approves five Reliability Standards that were submitted to the Commission for approval by the North American Electric Reliability Corporation (NERC), the Commission-certified Electric Reliability Organization (ERO): MOD-025-2 (Verification and Data Reporting of Generator Real and Reactive Power Capability and Synchronous Condenser Reactive Power Capability), MOD-026-1 (Verification of Models and Data for Generator Excitation Control System or Plant Volt/Var Control Functions), MOD-027-1 (Verification of Models and Data for Turbine/Governor and Load Control or Active Power/Frequency Control Functions), PRC-019-1 (Coordination of Generating Unit or Plant Capabilities, Voltage Regulating Controls, and Protection), and PRC-024-1 (Generator Frequency and Voltage Protective Relay Settings).

2. The Commission approves the associated implementation plan, violation risk factors and, with one modification, the violation severity levels. The Commission also

[1] 16 U.S.C. 824o.

approves the retirement of Reliability Standards MOD-024-1 and MOD-025-1 immediately prior to the effective date of MOD-025-2.

3. The generator verification Reliability Standards will help ensure that generators remain in operation during specified voltage and frequency excursions; properly coordinate protective relays and generator voltage regulator controls; and enhance the ability of generator models to accurately reflect the generator's capabilities and equipment performance. Reliability Standards MOD-026-1, MOD-027-1, PRC-019-1 and PRC-024-1 are new, whereas Reliability Standard MOD-025-2 consolidates two existing Reliability Standards, MOD-024-1 (Verification of Generator Gross and Net Real Power Capability) and MOD-025-1 (Verification of Generator Gross and Net Reactive Power Capability), into one new Reliability Standard. Portions of Reliability Standards MOD-025-2 and PRC-024-1 respond to directives contained in Order No. 693.[2]

4. The generator verification Reliability Standards improve the accuracy of model verifications needed to support reliability and enhance the coordination of generator protection systems and voltage regulating system controls. Such improvements should help reduce the risk of generator trips and provide more accurate models for transmission planners and planning coordinators to develop system models and simulations. We also determine that the generator verification Reliability Standards adequately address the

[2] *See Mandatory Reliability Standards for the Bulk-Power System*, Order No. 693, FERC Stats. & Regs. ¶ 31,242, *order on reh'g*, Order No. 693-A, 120 FERC ¶ 61,053 (2007).

Commission's directives regarding Reliability Standard MOD-025-2 and PRC-024-1. Therefore, pursuant to section 215(d) of the FPA, we approve Reliability Standards MOD-025-2, MOD-026-1, MOD-027-1, PRC-019-1 and PRC-024-1.

I. Background

5. Section 215 of the FPA requires a Commission-certified ERO to develop mandatory and enforceable Reliability Standards, subject to Commission review and approval. Specifically, the Commission may approve, by rule or order, a proposed Reliability Standard or modification to a Reliability Standard if it determines that the Reliability Standard is just, reasonable, not unduly discriminatory or preferential, and in the public interest.[3] Once approved, Reliability Standards may be enforced by the ERO, subject to Commission oversight, or by the Commission independently.[4]

6. Pursuant to section 215 of the FPA, the Commission established a process to select and certify an ERO,[5] and subsequently certified NERC.[6] On March 16, 2007, the Commission issued Order No. 693, approving 83 of the 107 Reliability Standards filed by NERC. Because MOD-024-1 and MOD-025-1, which NERC had included in its filing,

[3] 16 U.S.C. 824o(d)(2).

[4] *Id.* 824o(e)(3).

[5] *Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards*, Order No. 672, FERC Stats. & Regs. ¶ 31,204, *order on reh'g*, Order No. 672-A, FERC Stats. & Regs. ¶ 31,212 (2006).

[6] *North American Electric Reliability Corp.*, 116 FERC ¶ 61,062, *order on reh'g and compliance*, 117 FERC ¶ 61,126 (2006), *aff'd sub nom. Alcoa, Inc. v. FERC*, 564 F.3d 1342 (D.C. Cir. 2009).

involved regional procedures that had not been submitted, the Commission postponed either approving or remanding these standards until NERC submitted additional information. However, the Commission issued three directives in Order No. 693 with respect to MOD-024-1 and MOD-025-1.

7. Reliability Standards MOD-024-1 and MOD-025-1 are "fill-in-the-blank" Reliability Standards that would require regional reliability organizations to develop procedures to verify generator real and reactive power capability, respectively. Regarding MOD-024-1, the Commission directed NERC to clearly define the test conditions and methodologies contained in the Reliability Standard, and also to clarify the time period within which regional reliability organizations must provide generator real power capability verification.[7] For MOD-025-1, the Commission directed NERC to clarify that MVAR capability verifications should be made at multiple points over a generator unit's operating range and also directed NERC to clarify the time period within which reactive power capability verifications are to be provided.[8] These directives are addressed in Reliability Standard MOD-025-2.

8. Order No. 693 contained two directives pertaining to Reliability Standard PRC-024-1. First, the Commission stated that NERC should use the Nuclear Regulatory Commission's (NRC) voltage ride through requirements when implementing Reliability Standards to "assure that there is consistency between the Reliability Standards and the

[7] Order No. 693, FERC Stats. & Regs. ¶ 31,242 at PP 1310-1311.

[8] *Id.* PP 1321-1323.

NRC requirement that the system is accurately modeled."[9] Second, the Commission directed NERC to explicitly require generators to be "capable of riding through the same set of Category B and C contingencies, as required by wind generators in Order No. 661, or that those generators that cannot ride through be simulated as tripping."[10] These directives are addressed in Reliability Standard PRC-024-1.

II. NERC Petition and Proposed Reliability Standards

A. NERC Petition

9. On May 30, 2013, NERC filed its petition seeking approval of Reliability Standards MOD-025-2, MOD-026-1, MOD-027-1, PRC-019-1 and PRC-024-1. NERC states that four of the five Reliability Standards are new, while existing Reliability Standards MOD-024-1 and MOD-025-1 were merged into proposed Reliability Standard MOD-025-2. NERC also seeks approval of the associated implementation plans, violation risk factors and violation severity levels, and retirement of current Reliability Standards MOD-024-1 and MOD-025-1 at midnight of the day immediately prior to the effective date of MOD-025-2. NERC proposes to phase in effective dates in stages over periods ranging from five years (for MOD-025-2, PRC-019-1 and PRC-024-1) to ten years (for MOD-026-1 and MOD-027-1).[11] NERC states that "these five proposed Reliability Standards address generator verifications needed to support Bulk-Power

[9] *Id.* P 1787.

[10] *Id.*

[11] NERC Petition, Exhibit B (Implementation Plan for Reliability Standards Submitted for Approval).

System reliability and will ensure that accurate data is verified and made available for planning simulations."[12]

10. NERC explains that Bulk-Power System reliability benefits from "good quality simulation models of power system equipment" and that "model validation ensures the proper performance of the control systems and validates the computer models used for stability analysis."[13] NERC further states that the proposed Reliability Standards will enhance reliability because the tests performed to obtain model data may reveal latent defects that could cause "inappropriate unit response during system disturbances."[14] NERC also states that simulating the response of synchronous machines and related control systems in sufficient detail is essential for effective power system planning and operational studies.[15] For accurate simulations reflecting actual equipment performance covering a range of disturbances, NERC states that models must not only contain adequate information, they must also correspond to actual field values.[16] Finally, NERC asserts that Reliability Standards MOD-025-2 and PRC-024-1 address the directives in Order No. 693 mentioned above.

[12] NERC Petition at 2.

[13] *Id.*

[14] *Id.* at 2-3.

[15] *Id.* at 3.

[16] *Id.*

B. Reliability Standards and NERC Explanation of Provisions

1. Reliability Standard MOD-025-2

11. Reliability Standard MOD-025-2 merges two existing Reliability Standards, MOD-024-1 and MOD-25-1, and has the stated purpose of ensuring the accuracy of generator information related to gross and net real and reactive power capability and synchronous condenser reactive power capability that is available for planning models and bulk electric system reliability assessments.[17] The Reliability Standard applies to generator owners and transmission owners that own synchronous condensers and has three requirements and two Attachments. Attachment 1, incorporated into Requirements R1.1, R2.1 and R3.1, specifies the periodicity for performing real and reactive power capability verification and the verification specifications for applicable facilities. Attachment 2, which generator owners and transmission owners will use to report to their transmission planners the information described in Attachment 1, is incorporated into Requirements R1.2, R2.2 and R3.2.

12. NERC states that Reliability Standard MOD-025-2 addresses the directives in Order No. 693. Specifically, NERC states: (1) Requirement R1, Part 1.2 specifies that a generator owner must submit Attachment 2 or another form containing the same information to its transmission planner within 90 calendar days of either the date the data are recorded for a staged test or the date the data are selected for verification using historical operational data; (2) Requirement R1, Part 1.1 requires a generator owner to

[17] Reliability Standard MOD-025-2, Section A.3 (Purpose).

verify the real power capability of its generating units as set forth in Attachment 1, including the consideration of ambient conditions during the verification period; and (3) Attachment 1, Sections 2.1 through 2.4, requires reactive power capability verification at multiple points across a unit's operating range.[18]

2. Reliability Standard MOD-026-1

13. Reliability Standard MOD-026-1, applicable to generator owners and transmission planners, is a new Reliability Standard and has six requirements and an Attachment describing the periodicity for excitation control system or plant volt/var function model verification. NERC explains that the purpose of MOD-026-1 is to ensure that detailed modeling of generator excitation systems, essential for valid simulations in power system stability studies, will be conducted and that those models accurately represent generator excitation control system or plant volt/var control function behavior for bulk electric system reliability assessments.[19] Requirement R1 requires transmission planners to provide generator owners with specified information within 90 days of a written request, including instructions on how to obtain models, block diagrams and/or data sheets and model data for any of the generator owner's existing applicable unit specific excitation control system or plant volt/var control function contained in the transmission planner's dynamic database from the current (in-use) models. NERC explains that Requirement R1 ensures that the transmission planner provides necessary information to the generator

[18] NERC Petition at 10-12.

[19] *Id.* at 14-16.

owners so that they can provide a useable model in an acceptable format. This procedure further supports generator owner compliance with Requirement R2 by providing relevant information to transmission planners.[20]

14. Requirement R2 requires each generator owner to provide its transmission planner with a verified generator excitation control system or plant volt/var control function model that includes the data and documentation specified in Requirement R2, Part 2.1. The periodicity for this requirement is set forth in Attachment 1. The purpose of Requirement R2 is to verify that the generator excitation control system or plant volt/var control function model and the model parameters used in dynamic simulations performed by the transmission planner accurately represent the generator excitation control system or plant volt/var control function behavior when assessing bulk electric system reliability.[21] Requirement R3 requires generator owners to provide written responses to transmission planner requests within 90 days regarding unusable models, technical concerns and transmission planner determinations that simulated excitation control system or plant volt/var control function model responses do not match a recorded response to a transmission system event. NERC explains that Requirement R3 of Reliability Standard MOD-026-1 "provides response requirements for a Generator Owner when it receives certain requests from the Transmission Planner. This communication ensures that Generator Owners have an obligation to respond in a timely fashion when

[20] *Id.* at 15.

[21] *Id.* at 16.

there are demonstrated problems with a model that was provided by the Generator Owner in accordance with Requirement R2."[22] Under Requirement R4, generator owners are required to determine whether changes to applicable units affect models provided pursuant to Requirement R2 and, when consistent with this determination, to provide the transmission planner with revised model data or plans to perform model verification.

15. Requirement R5 requires a generator owner to respond within 90 days to a "technically justified unit request" from its transmission planner to perform a model review of a unit or plant, including details for model verification or corrected model data. A footnote to Requirement R5 states that "Technical justification is achieved by the Transmission Planner demonstrating that the simulated unit or plant response does not match the measured unit or plant response." Also, Applicability section 4.2.4 in MOD-026-1 states that facilities to which the standard applies include "For all Interconnections: A technically justified unit that meets NERC registry criteria but is not otherwise included in the above Applicability sections 4.2.1, 4.2.2, or 4.2.3 and is requested by the Transmission Planner."

16. NERC explains that Requirement R5 allows transmission planners to request that generator owners who otherwise are not covered by the Applicability section (i.e., whose MVA ratings are lower than the applicability thresholds specified in Section 4 of Reliability Standard MOD-026-1 but meet or exceed the Registry Criteria) provide model

[22] *Id.* at 17.

verifications or correct model data.[23] Requirement R6 requires transmission planners to provide written responses to generator owners within 90 days of receiving a verified excitation control system or plant volt/var control function model information whether the model is usable or not in accordance with Requirement R2. If it determines the model to be unusable, the transmission planner must explain the technical basis for that decision.

3. Reliability Standard MOD-027-1

17. Reliability Standard MOD-027-1is a new Reliability Standard and contains five requirements and an Attachment (Turbine/Governor and Load Control or Active Power Frequency Control Model Periodicity). Its purpose is to verify that the turbine/governor and load control or active power/frequency control model and the model parameters, used in dynamic simulations that assess bulk electric system reliability, accurately represent generator unit real power response to system frequency variations.[24] Requirement R1 requires transmission planners to provide generator owners with guidance that will enable generator owners to provide the information required in Requirements R2 and R4 within 90 days of a written request. Requirement R2 requires generator owners to provide transmission planners with a verified turbine/governor and load control or active power/frequency control model for each applicable unit, including documentation and data in accordance with the periodicity specified in MOD-027-1, Attachment 1.

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[23] *Id.* at 18.

[24] Reliability Standard MOD-027-1, Section A.3 (Purpose).

Attachment 1 also contains a table listing verification conditions and related actions required of generator owners.[25]

18. Requirement R3 establishes communication requirements to ensure that generator owners respond to transmission planner determinations that a generator owner's model is not "usable," or where there is a difference between the model and three or more actual transmission system events.[26] Requirement R3 requires generator owners to provide a written response within 90 days.[27] Requirement R4 requires generator owners to provide transmission planners with updates when changes occur to the turbine/governor and load control or active power/frequency control system that alter equipment response characteristics.[28] Requirement R5 requires transmission planners to inform generator owners within 90 days of receiving model information (in accordance with Requirement R2) whether the model is usable or not. If a model is unusable, the transmission planner shall provide the generator owner with an explanation of the technical basis for that decision. Also, Requirement R3 requires generator owners to provide a written response to this explanation within 90 days.

[25] NERC Petition at 20.

[26] *Id.* at 21.

[27] *Id.*

[28] *Id.* at 22.

4. Reliability Standard PRC-019-1

19. Reliability Standard PRC-019-1 is a new Reliability Standard and contains two requirements intended to ensure that both generator owners and transmission owners verify coordination of generating unit facility or synchronous condenser voltage regulating controls, limit functions, equipment capabilities and protection system settings.[29] Requirement R1 requires generator owners and transmission owners to coordinate the voltage regulating system controls with the equipment capabilities and settings of the applicable protection system devices and functions.[30] Requirement R2 requires generator owners and transmission owners to perform the coordination described in Requirement R1 to address equipment or setting changes.[31] The coordination required in Reliability Standard PRC-019-1 must be performed at least every five years.

5. Reliability Standard PRC-024-1

20. Reliability Standard PRC-024-1 is a new Reliability Standard and consists of four requirements and two Attachments. The stated purpose of PRC-024-1 is to ensure that generator owners set their generator protective relays such that generating units remain connected during defined frequency and voltage excursions.[32] Requirement R1 requires generator owners having generator frequency protective relaying activated to trip their

[29] Reliability Standard PRC-019-1, Section A.3 (Purpose).

[30] NERC Petition at 23.

[31] *Id.* at 24.

[32] Reliability Standard PRC-024-1, Section A.3 (Purpose).

generating units to set their protective relaying to prevent their generating units from tripping within the "no trip zone" of PRC-024-1 Attachment 1 (unless one of three specified exceptions applies). NERC explains that Attachment 1 contains tables with curve data points for each Interconnection indicating the amount of time a generator needs to remain connected at specific defined frequency excursions.[33] Requirement R2 addresses voltage excursions and requires, subject to four exceptions, generator owners to ensure that their voltage protective relaying settings prevent their generating units from tripping within the "no trip zone" described in PRC-024-1, Attachment 2.

21. NERC states that the standard drafting team believes the voltage profile contained in Attachment 2 includes excursions that would be expected under Category B and C contingencies.[34] Therefore, NERC asserts that by ensuring that generator units remain connected to the grid during voltage excursions, Requirement R2 and Attachment 2 satisfy the directive in Order No. 693 to "explicitly require either that all generators are capable of riding through the same set of Category B and C contingencies, as required by wind generators in Order No. 661, or that those generators that cannot ride through be simulated as tripping."[35]

22. Requirement R3 of Reliability Standard PRC-024-1 requires generator owners to

[33] NERC Petition at 25.

[34] *See* Reliability Standard TPL-002-0b, System Performance Following Loss of a Single Bulk Electric System Element (Category B) and Reliability Standard TPL-003-0b, System Performance Following Loss of Two or More Bulk Electric System Elements (Category C).

[35] *Id.* at 29 (citing Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 1787).

document regulatory or equipment limitations that would prevent them from satisfying the relay setting criteria in Requirements R1 and R2. Generator owners must inform their planning coordinator and transmission planner of any such limitation within 30 calendar days after identifying it. NERC explains that the standard drafting team believes that "regulatory limitations" include NRC requirements and, therefore, Requirement R3 satisfies the Commission's guidance that "NRC requirements should be used when implementing the Reliability Standards."[36]

23. Requirement R4 requires generator owners to provide their planning coordinator or transmission planner with generator protection trip settings associated with Requirements R1 and R2 within 60 days of either a written request or a change to previously requested trip settings.[37]

III. Notice of Proposed Rulemaking

24. On September 19, 2013, the Commission issued a Notice of Proposed Rulemaking (NOPR) proposing to approve Reliability Standards MOD-025-2, MOD-026-1, MOD-027-1, PRC-019-1 and PRC-024-1.[38] The Commission also proposed to approve the associated implementation plans, violation risk factors and violation severity levels, with one modification, and the retirement of existing Reliability Standards MOD-024-1 and MOD-025-1 prior to the effective date of MOD-025-2.

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[36] *Id.* at 27-28 (citing Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 1787).

[37] *Id.* at 31.

[38] *Generator Verification Reliability Standards*, Notice of Proposed Rulemaking, 78 FR 58,492 (September 24, 2013), 144 FERC ¶ 61,205 (2013) (NOPR).

25. While the Commission proposed to approve all five generator verification Reliability Standards, the Commission raised issues regarding certain provisions of Reliability Standards MOD-026-1 and MOD-027-1. In the NOPR, the Commission sought comments on the following issues: (1) whether the higher applicability thresholds for MOD-026-1 and MOD-027-1 could limit their effectiveness, especially in areas with a high concentration of generators falling below the thresholds, or impede transmission planners' ability to address reliability risk; and (2) whether the provision in Reliability Standard MOD-026-1 allowing transmission planners to compel a generator owner below the applicability threshold with a "technically justified" unit to comply with the Reliability Standard's requirements is "sufficiently clear and workable." The Commission also sought comment on whether this provision should be included in Reliability Standard MOD-027-1.

26. In response to the NOPR, the Commission received comments from: NERC, Idaho Power Company (Idaho Power), Electricity Consumers Resource Council (ELCON), ISO New England (ISO-NE), Arizona Public Service Company (APS), International Transmission Company (ITC), Edison Electric Institute (EEI), and G&T Cooperatives.[39]

IV. Discussion

27. Pursuant to section 215(d) of the FPA, the Commission approves Reliability Standards MOD-025-2, MOD-026-1, MOD-027-1, PRC-019-1 and PRC-024-1as just,

[39] G&T Cooperatives consists of Associated Electric Cooperative, Inc., Basin Electric Power Cooperative, and Tri-State Generation and Transmission Association, Inc.

reasonable, not unduly discriminatory or preferential, and in the public interest. The Commission determines that these Reliability Standards will help ensure that verified data is available for power system planning and operational studies by requiring the verification of generator equipment needed to support Bulk-Power System reliability and enhancing the coordination of important protection system settings. Also, Reliability Standards MOD-025-2 and PRC-024-1 satisfy relevant outstanding directives set forth in Order No. 693.[40] Further, we approve the retirement of Reliability Standards MOD-024-1 and MOD-025-1 prior to the effective date of MOD-025-2. We also approve the associated implementation plan and, with one exception, the proposed violation risk factors and violations severity levels.

28. We discuss below the following issues: (A) the Megavolt Amperes (MVA) applicability thresholds for Reliability Standards MOD-026-1 and MOD-027-1; (B) the process for determining when it is "technically justified" for a transmission planner to require a generator owner to provide model reviews under MOD-026-1; (C) why the "technically justified" provision is not also included in MOD-027-1; (D) whether MOD-025-2 should include more flexibility to verify unit reactive power capability; and (E) assignment of violation severity levels.

[40] Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 1787.

A. Higher MVA Applicability Threshold in MOD-026-1 and MOD-027-1

NERC Petition

29. The applicability thresholds in Reliability Standards MOD-026-1 and MOD-027-1 are higher than for Reliability Standards MOD-025-2, PRC-019-1 and PRC-024-1, and could exclude approximately 20 percent of bulk electric system installed MVA from compliance.[41] In contrast to the greater than 20 MVA applicability thresholds set forth in the other three Reliability Standards in NERC's petition,[42] MOD-026-1 and MOD-027-1 would exclude units rated below 100 MVA (Eastern and Quebec Interconnections), 75 MVA (Western Interconnection) and 50 MVA (ERCOT Interconnection).[43]

30. During the standard development process, several industry stakeholders commented that the standard drafting team should ensure that the applicability thresholds of MOD-026-1 and MOD-027-1 be aligned with the other three proposed Reliability Standards. In response, the standard drafting team stated that "verification of excitation system is expensive both from a monetary and human resource viewpoint. Therefore, the

[41] *See* NERC Petition, Exhibit E (Summary of the Reliability Standard Development Proceeding and Complete Record of Development of Proposed Reliability Standard) section entitled "Consideration of Comments on Draft Standard" at 91 (indicating that the threshold in the proposed standard would limit applicability of the standard to 80 percent of installed MVA on an Interconnection basis).

[42] Reliability Standard MOD-025-2, Section 4.2 (Facilities); Reliability Standard PRC-019-1, Section 4.2 (Facilities); and Reliability Standard PRC-024-1, Section 4 (Applicability).

[43] Reliability Standard MOD-026-1, Section 4.2 (Facilities); Reliability Standard MOD-027-1, Section 4.2 (Facilities).

[standard drafting team] believes that these applicability thresholds will result in substantial accuracy improvements to the excitation models and associated Reliability Standards, while not unduly mandating costly and time-consuming verification efforts."[44]

NOPR

31. In the NOPR, the Commission sought comment on whether the higher applicability thresholds of MOD-026-1 and MOD-027-1, especially in areas with a high concentration of generators falling below the thresholds, would: (a) limit the effectiveness of proposed Reliability Standards MOD-026-1 and MOD-027-1; or (b) adversely impact transmission planners' ability to reduce risk to Bulk-Power System reliability.[45]

Comments

32. NERC maintains that the standard drafting team determined that the applicability thresholds for Reliability Standards MOD-026-1 and MOD-027-1 are appropriate. NERC states that the standard drafting team determined, based on its expertise, that there is little, if any, reliability benefit to requiring every generator to comply with MOD-026-1 and MOD-027-1. NERC explains that "the standard drafting team believes that these applicability thresholds will result in substantial accuracy improvements to the excitation models and associated reliability-based limits determined by dynamic simulations, while

[44] NERC Petition, Exhibit E (Summary of the Reliability Standard Development Proceeding and Complete Record of Development of Proposed Reliability Standard) section entitled "Consideration of Comments on Draft Standard" at 91.

[45] NOPR, 144 FERC ¶ 61,205 at P 27-28.

balancing concerns regarding the resources it [sic] requires to implement verification efforts."[46] NERC notes that the resources required to implement verification efforts can be extensive: "many entities will require the use of consultants to perform the needed tests and model validations due to the expertise required. For example, it was observed in the SERC field trial that using consultants for MOD-026-1 cost roughly $20,000 to $30,000 for one unit."[47] NERC further states that Section 4.2.4 of MOD-026-1, allowing transmission planners to request information from all generators when "technically justified," confirms that the higher applicability threshold "will not limit the effectiveness of" Reliability Standards MOD-026-1 and MOD-027-1.[48]

33. ELCON, EEI, and APS state that excluding approximately 20 percent of MVA from the applicability of MOD-026-1 and MOD-027-1 will not limit the effectiveness of these Reliability Standards. ELCON states that the higher thresholds would not undermine the effectiveness of MOD-026-1 and MOD-027-1 or hamper "transmission planners' ability to reduce risk to the Bulk-Power System."[49] EEI states that it "does not view the higher thresholds utilized in the two proposed standards as inappropriate nor do we believe it will diminish reliability or adversely impact transmission planners' ability

[46] NERC Comments at 4-5.

[47] *Id.* at 5, n.7 (citing SERC Engineering Committee Generation Standards Field Test Report at 3 (June 15, 2007) (included in Exhibit E to the NERC Petition)).

[48] *Id.* at 5.

[49] ELCON Comments at 2.

to reduce risk to the [Bulk- Power System]."[50] Rather, EEI asserts that the thresholds "would be expected to enhance reliability by focusing the limited expertise available for model verification at the units which make the most impact to the dynamic performance of the power system."[51] APS supports the higher thresholds for Reliability Standards MOD-026-1 and MOD-027-1 because there is limited benefit to reliability to require every generator, regardless of size, to comply, and "the owners of the smaller units are still expected to provide correct estimated model data for use in simulation."[52] APS asserts that the cost of performing the required model verification for a generation unit is significant and does not vary considerably based on the size of the unit. "Currently, there are a limited number of individuals with the expertise necessary to perform this model verification, and the costs to hire an expert range between $10,000 and $20,000 for each generator unit tested."[53]

34. Idaho Power and ISO-NE state that excluding approximately 20 percent of MVA from the applicability of MOD-026-1 and MOD-027-1 would limit the effectiveness of the Reliability Standards. Idaho Power maintains that many registered generator owners will not be required to comply with the data verification standards, which will ultimately reduce the overall effectiveness of Reliability Standards MOD-026-1 and MOD-027-1.[54]

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[50] EEI Comments at 5.

[51] *Id.*

[52] APS Comments at 4.

[53] *Id.* at 3-4.

[54] Idaho Power Comments at 2.

Idaho Power bases its comments largely upon its experience with the WECC Modeling and Validation Workgroup (WECC Workgroup), which concluded that the higher thresholds would undermine modeling and simulation accuracy for the WECC region because "[e]xcluding approximately 20 percent of generators based upon different thresholds can lead to very different interpretations of system reliability."[55] Idaho Power notes that the current WECC policy requiring validation at an aggregate unit threshold of 20 MVA has "greatly improved the accuracy of system models for dynamic simulation [and] a safer and more reliable operation of the WECC Interconnection."[56] Further, Idaho Power states that generation resources subject to Reliability Standards MOD-026-1 and MOD-027-1 are not spread evenly throughout the interconnection-wide model of the Western Interconnection, which will result in some areas being represented with a lower percentage of validated generation models.[57] Idaho Power asserts that the higher thresholds limit the overall effectiveness of the Reliability Standards and believes the Commission should adopt a 10 MVA single unit and 20 MVA aggregate thresholds for the Western Interconnection.[58]

35. ISO-NE states that "[t]he 100 MVA threshold is too high [and] would limit the effectiveness of these standards and would adversely impact ISO-NE's ability to reduce risk to Bulk Power System reliability by excluding too many generating units in

[55] *Id.* at 3.

[56] *Id.*

[57] *Id.*

[58] *Id* at 4.

New England."[59] ISO-NE believes the use of the 20 MVA threshold is supported by NERC's registration requirements and the Commission's determination that "generating units with a capacity as low as 20 MVA can have a significant enough impact that they must comply with the Reliability Standards."[60] ISO-NE asserts that inaccurate information for a single generating unit below 100 MVA could impact area studies, and units below 100 MVA may collectively impact system operating limits. Finally, ISO-NE raises a concern that exempting generating units under 100 MVA is inconsistent with the high importance placed by NERC and the Commission on Reliability Standard TPL-001-4 Requirement R1.[61] ISO-NE also maintains that the application of the "capacity factor exemption" in MOD-026-1, Attachment 1 is unclear. ISO-NE states that, "If large units with low capacity factors are also exempted from verification, then overall system reliability will be further reduced."[62]

36. Like Idaho Power and ISO-NE, ITC states that it is concerned about the aggregate effect that excluding generators will have on the accuracy of transmission system stability studies, particularly for areas of the transmission system where excluded generating units

[59] ISO-NE Comments at 2-3.

[60] *Id.* at 3.

[61] *Id.* at 3-4 (citing *Transmission Planning Reliability Standards,* Order No. 786, 145 FERC ¶ 61,051, at P 3 (2013) (directing NERC to change the VRF for Requirement R1 from medium to high)). TPL-001-4, Requirement R1 requires transmission planners and planning coordinators to maintain system models that represent projected system conditions.

[62] *Id.* at 5.

are more highly concentrated.[63] However, ITC maintains that its concern is ameliorated by the provision in MOD-026-1 allowing transmission planners to compel generators deemed to have "technically justified" units below the specified threshold to provide such information in order to more accurately assess system stability.

Commission Determination

37. The Commission is persuaded by the comments submitted by NERC and others that the higher applicability thresholds of Reliability Standards MOD-026-1 and MOD-027-1 are appropriate for a continent-wide standard. Moreover, as NERC and ITC point out, Section 4.2.4 of Reliability Standard MOD-026-1 allows transmission planners to request a model review and related verification information in accordance with Requirement R5 from generators below the applicability threshold when "technically justified" (where the simulated unit or plant response does not match the measured unit or plant response). In addition, as APS observed, the higher applicability threshold does not excuse generator owners with small units from the expectation that estimated model data they provide to transmission planners for use in simulations will be accurate. In response to commenters that expressed concerns, in areas where there is a large concentration of small generators, the Commission notes that Regional Entities could develop more

[63] ITC Comments at 5-6.

stringent requirements, such as a regional standard or regional criteria or process, to assure greater modeling accuracy.[64]

38. We reject ISO-NE's argument that the applicability threshold is somehow inconsistent with the directive to NERC in Order No. 786 to raise the violation severity level from "medium" to "high" for Reliability Standard TPL-001-4, Requirement R1, which requires transmission planners and planning coordinators to maintain system models.[65] We are not persuaded that the violation severity level for Reliability Standard TPL-001-4, Requirement R1 is relevant to the applicability threshold for Reliability Standards MOD-026-1 and MOD-027-1 or how it substantiates ISO-NE's claim that the applicability threshold reduces overall reliability. [66]

B. Process for Identifying "Technically Justified" Generating Units in MOD-026- 1

NERC Petition

39. Reliability Standard MOD-026-1 applies to generating units that are connected to the bulk electric system when "technically justified." Specifically, Applicability

[64] For example, the WECC Modeling and Validation Workgroup concluded that WECC should develop a regional Reliability Standard based upon WECC's existing policy that establishes thresholds of 10 MVA and 20 MVA for single unit and aggregate unit validation respectively.

[65] Transmission Planning Reliability Standards, Order No. 786, 145 FERC ¶ 61,051, at P 3 (2013).

[66] We likewise reject ISO-NE's comments regarding application of the capacity factor exemption in Attachment 1because ISO-NE fails to substantiate the alleged risk of applying the capacity factor exemption to large units.

Section 4.2.4 allows a transmission planner to compel a generator owner to provide model reviews and related information in accordance with Requirement R5 if the transmission planner demonstrates "that the simulated unit or plant response does not match the measured unit or plant response."[67] Under such circumstances, generator owners with one or more "technically justified" units must comply with Reliability Standard MOD-026-1, even though each such unit's MVA rating is below the stated MVA threshold for applicability.

NOPR

40. In the NOPR, the Commission stated that while it agrees with the intent of this section, the way transmission planners would become aware of discrepancies between simulated units and measured units (i.e., the basis for "technically justified" determinations) is unclear. The NOPR stated that the technical justification, or discrepancies between simulated units and measured units, suggests that there should be some benchmark available in the process by which transmission planners identify generator owners for compliance with MOD-026-1. The NOPR observed that the Final Blackout Report on the August 2003 blackout stated that "the regional councils are to establish and begin implementing criteria and procedures for validating data used in power flow models and dynamic simulations by benchmarking model data with actual

[67] Reliability Standard MOD-026-1, Applicability section 4.2.4, n.2 defining "technical justification."

system performance."[68] The Commission sought comment as to whether the means or process for transmission planners to determine whether a generator owner's unit is "technically justified" is sufficiently clear and workable. The Commission also requested comment as to whether additional details regarding how the process will be implemented should be included in an attachment to Reliability Standard MOD-026-1.[69]

Comments

41. NERC maintains that the process for transmission planners to determine whether a generator owner's unit is "technically justified" is clear and workable. NERC states that the "technically justified" provision in Reliability Standard MOD-026-1 expands the applicability of the standard, when necessary, i.e., where the simulated unit or plant response does not match the measured unit or plant response. NERC further states that the "standard drafting team determined that it is readily apparent when measured data does not match simulations and that such situations will be sufficiently clear and workable."[70]

42. ELCON, APS, and EEI believe that the process for transmission planners to determine whether a generator owner's unit is "technically justified" is clear and

[68] U.S.-Canada Power System Outage Task Force (Task Force), Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations (April 2004) (Final Blackout Report), Recommendation 24, *available at* http://www.ferc.gov/industries/electric/indus-act/blackout.asp.

[69] NOPR, 144 FERC ¶ 61,205 at PP 29-30.

[70] NERC Comments at 5.

workable. ELCON maintains that MOD-026-1 is "written with sufficient clarity regarding whether a generator owner's unit is 'technically justified.'"[71] APS supports the "technical justification" provision as written, and believes that the provision "allows transmission planners and planning coordinators the opportunity to address discrepancies between unit simulations and measured unit data," which APS asserts will be "evident and clear."[72] EEI believes that the standard as written is "sufficiently clear and enforceable," because "[a]lthough specific unit performance levels can deviate from a model's predicted response, we do not find this to be problematic; rather, planners need latitude to make judgments based on their knowledge of their regions and what's necessary to assess bulk electric system reliability in their area."[73] EEI states that the standard drafting team "struck a reasonable balance between providing necessary tools for planners without making [an] unnecessary prescriptive determination as to how to ensure those tools would be applied."[74] EEI cautions against adding details that "might unintentionally limit or otherwise undermine the regional knowledge and judgment of transmission planners."[75] Rather, EEI requests that any changes to MOD-026-1 be postponed until industry experience confirms they are needed.

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[71] ELCON Comments at 2.

[72] APS Comments at 5.

[73] EEI Comments at 5.

[74] *Id.* at 6.

[75] *Id.*

43. Idaho Power and ISO-NE state that the process for transmission planners to determine whether a generator owner's unit is "technically justified" is unclear, and both assert that the best fix involves lowering the applicability threshold. Idaho Power states that MOD-026-1 does not clearly define what a "match" is or how to evaluate whether a match exists to satisfy the technically justified definition. Idaho Power believes that the Commission should add a provision in MOD-026-1 to include "technically justified" units that meet the NERC registry requirements. Idaho Power seeks additional guidance on when a match between simulated and measured unit or plant responses occurs and the process a transmission planner should undertake to demonstrate such a match.[76] ISO-NE states that it is concerned that the test described in MOD-026-1, Applicability Section 4.2.4 would require a disturbance to occur before a transmission planner could determine that a generating unit under 100 MVA is "technically justified." ISO-NE asserts that "[i]n order for the Transmission Planner to be able to demonstrate that a plant response does not match measured unit or plant response, an event must first occur."[77] ISO-NE believes that reducing the threshold from 100 MVA to 20 MVA would "eliminate the need for this test, or at least reduce its significance."[78]

[76] Idaho Power Comments at 4.

[77] ISO-NE Comments at 5.

[78] *Id.* at 5.

Commission Determination

44. The Commission is persuaded that the basis and associated process for a transmission planner to demonstrate that it is "technically justified" for a generator owner below the applicability threshold to comply with Requirement R5 of Reliability Standard MOD-026-1 under Section 4.2.4 is sufficiently clear and workable. We agree with EEI that a more prescriptive, "one size fits all" approach could "unintentionally limit or otherwise undermine the regional knowledge and judgment of transmission planners."[79] Further, in the standard drafting team's technical judgment, discrepancies between simulations and measured data will be "readily apparent."[80] APS concurs, stating that such discrepancies will be "evident and clear."[81]

45. Further, the Commission is not persuaded that a change to the applicability thresholds for the Eastern Interconnection, or to the technical justification provision for sub-100 MVA generators, is justified based on ISO-NE's concern that a disturbance would have to occur before a transmission planner could determine that a generating unit is technically justified under Section 4.2.4 of MOD-026-1. ISO-NE is correct that the "demonstration" required by the technical justification provision for sub-100 MVA generators anticipates a system event that would indicate a discrepancy between actual and measured unit response. However, local events that occur in the normal course of

[79] EEI Comments at 6.

[80] NERC Comments at 5.

[81] APS Comments at 5.

operations could provide adequate information for a transmission planner to demonstrate the need to invoke the technically justified provision of Reliability Standard MOD-026-1. While the Commission is satisfied that NERC has proposed a Reliability Standard that improves the reliability of the Bulk-Power System on a continent-wide basis, ISO-NE may seek to develop a more stringent regional approach to address its particular concerns , either through the Northeast Power Coordinating Council's regional Reliability Standards process, an ISO-NE policy, or other means. Considering the strong technical support for Section 4.2.4 as written, we believe the soundest approach is to give the industry time to evaluate the effectiveness of the technically justified provision.

C. Should Proposed Reliability Standard MOD-027-1 Include the "Technically Justified" Provision

NERC Petition

46. Reliability Standard MOD-027-1 does not contain a provision analogous to Applicability Section 4.2.4 of MOD-026-1, which allows a transmission planner to determine whether technical justification exists to subject a generator owner with units falling below the stated applicability threshold to that Reliability Standard. MOD-027-1 and MOD-026-1 have the same applicability thresholds (100 MVA for the Eastern and Quebec Interconnections, 75 MVA for the Western Interconnection, and 50 and 75 MVA for individual and aggregate nameplate ratings, respectively, in ERCOT). However, these Reliability Standards verify models and data of different functions: MOD-026-1 applies to generator excitation control systems and plant volt/var control functions;

MOD-027-1 applies to turbine/governor and load control or active power/frequency control functions.

NOPR

47. In the NOPR, the Commission sought comment as to whether the technical justification provision should also be included in Reliability Standard MOD-027-1 to provide an opportunity for transmission planners to address discrepancies between unit simulations and generator owners' measured unit data.

Comments

48. NERC states that this issue was considered and rejected by the standard drafting team. NERC states that the standard drafting team determined that, in contrast to MOD-026-1, the data required by Reliability Standard MOD-027-1 are more subjective and difficult to verify because the verification of governor response models is not consistent from one event to another. NERC further states that Reliability Standard MOD-026-1 "addresses the verification of excitation control system dynamic models – whose modeled behavior in the simulation of system events is a large factor in the determination of local stability limits. In contrast, proposed Reliability Standard MOD-027-1 addresses the verification of turbine/governor and load control models – and this equipment rarely, if ever, contributes to a local stability limit."[82]

49. EEI, APS and ELCON believe that it is not necessary to include the technical

[82] NERC Comments at 6.

justification provision in MOD-027-1. EEI states that it is unlikely that turbine/governor controls "will materially contribute to a stability limit, while unit governor response has been shown to be inconsistent from one frequency event to the next thereby making such a provision unworkable and of little value."[83] APS agrees, stating that turbine/governor data verified under MOD-027-1 is not consistent across events, and is more difficult to verify than excitation control system data verified under MOD-026-1. Further, APS states that a discrepancy between a modeled response and a measured response "does not necessarily mean that the model is incorrect. The subjective nature of this determination makes it unsuitable as a standard requirement."[84]

50. Idaho Power and ITC believe that the technical justification provision in MOD-026-1 should be included in Reliability Standard MOD-027-1. Idaho Power asserts that the "[e]xclusion of the technical justification provision in this standard could lead to unverified modeling data. For Idaho Power, this would include entire regions of generation connected to the Bulk Electric System that would have unverified modeling data."[85] Idaho Power notes that transmission planners perform dynamic simulation studies that require accurate turbine/governor models, including blackstart and under-frequency load shedding simulations. Idaho Power states that blackstart generators may fall below the threshold for compliance with Reliability Standard MOD-027-1 but meet

[83] EEI Comments at 6-7.

[84] APS Comments at 5.

[85] Idaho Power Comments at 5.

NERC registry requirements.[86] ITC states that the turbine/governor, load control, and active power/frequency control data required by MOD-027-1 is just as necessary for accurate system modeling as the excitation control system and plant volt/var function data required by MOD-026-1. ITC asserts that to deprive a transmission planner of MOD-027-1 models and data from technically justified units "is just as deleterious to the transmission planner's ability to accurately assess system stability as it would be if the (sic) such problems occurred with respect to MOD-026-1 data."[87] ITC further asserts that failing to equip transmission planners with the technically justified provision, particularly for transmission systems that have high concentrations of generator owners below the applicability threshold, "will significantly degrade the accuracy of system models, and by extension, the overall reliability of the Bulk Electric System."[88]

Commission Determination

51. The Commission is persuaded that the technical justification provision is not workable in MOD-027-1 because there is more subjectivity involved in verifying the data pertaining to turbine/governors, the equipment subject to the modeling verification requirements of MOD-027-1. As NERC explains, the modeling data for excitation control systems under MOD-026-1 is objective and consistent, while turbine/governor response model verification under MOD-027-1 is not consistent from one event to

[86] *Id.* (noting that Reliability Standard EOP-005-2 Requirement R6 requires transmission operators to verify the dynamic performance of blackstart generators).

[87] ITC Comments at 6.

[88] *Id.*

another. The Commission agrees with APS that determining whether the difference between a model response and a measured response reflects a model defect is subjective and, therefore, the technical justification provision is inappropriate for MOD-027-1. While commenters supporting the inclusion of the technical justification provision in MOD-027-1 assert that verified data for both excitation control systems and turbine/governor response are necessary for accurate system modeling, they do not adequately address the implementation issues resulting from the subjective and inconsistent nature of turbine/governor response data. Therefore, we agree with commenters that the difference in the equipment being verified makes including the technical justification provision in Reliability Standard MOD-027-1 inappropriate.

D. Whether Generators Need More Flexibility in Verifying Unit Reactive Capability Under MOD-025-2

NERC Petition

52. Reliability Standard MOD-025-2 consists of three requirements and two Attachments that are incorporated into each of the requirements. Attachment 1 contains time tables for conducting verifications and specifications for applicable facilities. Attachment 2 contains forms intended to be used to report the information identified in Attachment 1. Requirements R1 and R2 require generator owners to verify Real Power capability and Reactive Power capability, respectively, and Requirement R3 requires transmission owners to verify Reactive Power capability in accordance with Attachment 1. For each Requirement, Attachment 2 establishes a 90 calendar day period within which generator owners and transmission owners must submit information of

"either: (i) the date the data is recorded for a staged test; or (ii) the date the data is selected for verification using historical operational data."

Comments

53. While not addressed in the NOPR, G&T Cooperatives, EEI and ELCON express concern about what they believe is a lack of flexibility in the reactive power verification requirements in Reliability Standard MOD-025-2. G&T cooperatives assert that "MOD-025-2 would establish a needlessly prescriptive approach to verifying unit reactive capability." Therefore, while they support the Commission's approval of MOD-025-2, G&T Cooperatives request that the Commission "direct NERC to develop a revised version of MOD-025-2 that permits Generator Owners the flexibility to verify unit reactive capability using the method that best meets the individual needs of that Generator Owner provided it can demonstrate that the method is effective."[89]

54. ELCON views MOD-025-2 as "needlessly prescriptive" and asserts that "at many of the industrial facilities of ELCON members with 'behind the meter' generation, its implementation would raise significant economic and safety concerns and be technically and economically infeasible."[90] While believing that Reliability Standard MOD-025-2 "may inhibit companies from making use of modeling tools," EEI states that "rather than

[89] G&T Cooperatives Comments at 2.

[90] ELCON Comments at 2.

remand the MOD-025-2 standard proposed for approval, EEI envisions that the standard can serve as an initial basis for now."[91]

Commission Determination

55. The Commission is not persuaded that Reliability Standard MOD-025-2 provides insufficient flexibility for generator owners and transmission owners to verify reactive power capability, or that it is overly prescriptive. Therefore, the Commission will not direct modification of the Reliability Standard. The process for verifying reactive capability under MOD-025-2, Requirement 2.2, requires an entity to submit information to its transmission planner (either through Attachment 2 to MOD-025-2 or a form containing the same information) within 90 calendar days of either: (i) the date the data are recorded for a staged test; or (ii) the date the data are selected for verification using historical operational data. This requirement affords a generator owner or transmission owner with the flexibility to perform verification using either staged test or historical operating data. Further, the standard drafting team rejected the G&T Cooperatives' view that new analytical software tools and engineering studies alone can adequately model unit reactive capability.[92]

56. Rather, the Commission agrees with EEI's suggestion that during the implementation of Reliability Standard MOD-025-2, NERC, in consultation with EEI and

[91] EEI Comments at 2.

[92] *See*, *e.g.*, NERC Petition, Exhibit E (Summary of the Reliability Standard Development Proceeding and Complete Record of Development of Proposed Reliability Standard) section entitled "Consideration of Comments on Draft Standard" at 75.

other industry representatives, should consider potential modifications to MOD-025-2 "that would better reflect rapidly evolving modeling technology, as well as successful methods and processes already in use by some companies."[93]

E. Assignment of Violation Severity Levels

1. Violation Severity Level for MOD-026-1, Requirement R6 and MOD-027-1, Requirement R5

NOPR

57. In the NOPR, the Commission expressed concern regarding the proposed violation severity level for Requirement R6 of MOD-026-1 and Requirement R5 of MOD-027-1. For those requirements, NERC proposed a "severe" violation severity level when a transmission planner's written response that a generation owner's verified model is useable "omitted confirmation for all specified model criteria" in the requirement. NERC did not propose any violation severity level for a violation of the last sentence of these requirements: "If the model is not useable, the [transmission planner] shall provide a technical description of why the model is not useable." The Commission noted that compliance with this obligation is no less important than compliance with the other obligations of these requirements. The Commission further stated that the lack of a violation severity level for this type of violation is inconsistent with the Commission's Violation Severity Level Guideline 3, because the proposed violation severity level does not address all of the obligations in these requirements. Therefore, the Commission

[93] EEI Comments at 3.

proposed to direct NERC to submit a violation severity level that addresses a violation of the last sentence of Requirement R6 of MOD-026-1 and Requirement R5 of MOD-027-1.

Commission Determination

58. No entity submitted comments on this matter. Accordingly, as proposed in the NOPR, we direct NERC to submit a violation severity level that addresses a transmission planner's obligation to provide a technical description of why a model submitted by a generation owner is not usable for Requirement R6 of MOD-026-1 and Requirement R5 of MOD-027-1.

2. Violation Severity Level for PRC-024-1, Requirements R1 and R2

NOPR

59. In the NOPR, the Commission addressed NERC's proposal to assign a "severe" violation severity level for a violation of Requirements R1 and R2 of PRC-024-1 when a generator owner fails to set its generator frequency or voltage protective relays so that they do not trip within the criteria listed within Requirements R1 and R2 unless there is a documented and communicated regulatory or equipment limitation under Requirement R3. We observed that Requirements R1 and R2 of PRC-024-1 include three and four bulleted exceptions, respectively, to the requirement that the generator frequency or voltage protective relays not trip applicable generating unit(s) within the "no-trip zone" of Attachment 1or 2 to that standard. For Requirements R1 and R2, only the third and fourth exception, respectively, relate to a regulatory or equipment limitation in

accordance with Requirement R3. Therefore, the Commission noted that the wording of the violation severity level for Requirements R1 and R2 could be read to mean that a generator owner that set generator frequency or voltage protective relaying to trip within the "no-trip zone" based on either the first or second exception in Requirement R1 and either the first, second or third exception in R2, violated that Requirement with a severe violation severity level. To avoid such an interpretation, the Commission asked NERC to confirm in its comments that a generator owner will not violate Requirement R1 or R2 if it sets generator frequency or voltage protective relaying to trip within the "no-trip zone" based upon the exceptions for Requirements R1 and R2.

Commission Determination

60. In its comments, NERC responded to the Commission's request by stating that "[c]onsistent with the NOPR, NERC confirms this statement."[94] Accordingly, with that clarification, the Commission approves the violation severity level for Requirements R1 and R2 of PRC-024-1.

V. Information Collection Statement

61. The following collections of information contained in the Final Rule are subject to review by the Office of Management and Budget (OMB) under section 3507(d) of the Paperwork Reduction Act of 1995 (PRA).[95] OMB's regulations require that OMB approve certain reporting and recordkeeping requirements (collections of information)

[94] NERC Comments at 7.

[95] 44 U.S.C. 3507(d) (2006).

imposed by an agency.[96] Upon approval of a collection of information, OMB will assign an OMB control number and expiration date. Respondents subject to the filing or recordkeeping requirements of this rule will not be penalized for failing to respond to these collections of information unless the collections of information display a valid OMB control number.

62. The Commission will submit these reporting and recordkeeping requirements to OMB for its review and approval under section 3507(d) of the PRA. The Commission received comments on specific requirements in the Reliability Standards approved in this Final Rule. However, the Commission received no comments on the Commission's need for this information, whether the information will have practical utility, the accuracy of the provided burden estimate, ways to enhance the quality, utility, and clarity of the information to be collected, and any suggested methods for minimizing the respondents' burden, including the use of automated information techniques.

63. This Final Rule approves five Reliability Standards: MOD-025-2, MOD-026-1, MOD-027-1, PRC-019-1 and PRC-024-1. Reliability Standard MOD-025-2 would replace Reliability Standards MOD-024-1 and MOD-025-1. In Order No. 693, the Commission did not approve or remand MOD-024-1 and MOD-025-1, as they were identified as "fill-in-the-blank" Reliability Standards for which NERC had not submitted regional procedures.

[96] 5 CFR 1320.11 (2013).

64. Public Reporting Burden: The burden and cost estimates below are based on the increase in the reporting and recordkeeping burden imposed by the approved Reliability Standards. Our estimate of the number of respondents affected is based on the NERC Compliance Registry as of July 30, 2013.[97] According to the Compliance Registry, NERC has registered 901 generator owners and 187 transmission planners within the United States. Currently, synchronous condensers are not included in the NERC Compliance Registry, and the standard drafting team stated that the number of transmission owners who own synchronous condensers is extremely low.

65. The burden estimates reflect the standards and the number of affected entities (e.g., the generator owner's one-time burden to develop testing procedures, verification process, and process for collection of data).

[97] NERC Compliance Registry (July 30, 2013), *available at* http://www.nerc.com/pa/comp/Registration%20and%20Certification%20DL/NERC_Compliance_Registry_Matrix_Summary20130730.pdf.

PRC-019-1 (Coordination of Generating Unit or Plant Capabilities, Voltage Regulating Controls, and Protection)					
FERC-725G	**Number of Respondents[98] (1)**	**Number of Responses per Respondent (2)**	**Average Burden Hours Per Response (3)**	**Total Annual Burden Hours (1)x(2)x(3)**	**Total Annual Cost[99]**
Develop coordination and relay settings procedures	738 GO	1	8	5,904 one-time	$307,008 one-time ($52/hr)
Relay Settings	738 GO	1	8	5,904	$413,280 ($70/hr)
Evidence Retention	738 GO	1	1	738	$20,664 ($28/hr)
TOTAL				12,546	$740,952

[98] GO = Generator Owner, TP = Transmission Planner.

Assuming 10 generators per generator owner, using EIA-860 2012 generator data (http://www.eia.gov/electricity/data/eia860/) total number of units > 20 MW are 7,379, which results in 738 generator owners. Note that the number of generator owner respondents used to calculate the public reporting burden for MOD-026-1 and MOD-027-1 is 356, due to the higher applicability threshold for those Reliability Standards.

[99] The estimates for cost per hour are derived as follows:

$52/hour, the average of the salary plus benefits for an engineer, from Bureau of Labor and Statistics at http://bls.gov/oes/current/naics3_221000.htm and http://www.bls.gov/news.release/ecec.nr0.htm

$70/hour, the average of the salary plus benefits for a manager and an engineer, from Bureau of Labor and Statistics at http://bls.gov/oes/current/naics3_221000.htm and http://www.bls.gov/news.release/ecec.nr0.htm

$28/hour, based on a Commission staff study of record retention burden cost.

PRC-024-1 (Generator Frequency and Voltage Protective Relay Settings)					
FERC-725G	**Number of Respondents[98] (1)**	**Number of Responses per Respondent (2)**	**Average Burden Hours Per Response (3)**	**Total Annual Burden Hours (1)x(2)x(3)**	**Total Annual Cost[99]**
Develop coordination and relay settings procedures	738 GO	1	8	5,904 one-time	$307,008 one-time ($52/hr)
Relay Settings	738 GO	1	8	5,904	$413,280 ($70/hr)
Evidence Retention	738 GO	1	1	738	$20,664 ($28/hr)
TOTAL				12,546	$740,952

MOD-025-2 (Verification and Data Reporting of Generator Real and Reactive Power Capability and Synchronous Condenser Reactive Power Capability)					
FERC-725L	**Number of Respondents[98] (1)**	**Number of Responses per Respondent (2)**	**Average Burden Hours Per Response (3)**	**Total Annual Burden Hours (1)x(2)x(3)**	**Total Annual Cost[99]**
Develop testing procedures, verification process, and process for collection of data	738 GO	1	8	5,904 one-time	$307,008 one-time ($52/hr)

Attachment 2	738 GO	1	6	4,428	$309,960 ($70/hr)
Evidence Retention	738 GO	1	1	738	$20,664 ($28/hr)
TOTAL				11,070	$637,632

MOD-026-1 (Verification of Models and Data for Generator Excitation Control System or Plant Volt/Var Control Functions)					
FERC-725L	**Number of Respondents[98] (1)**	**Number of Responses per Respondent (2)**	**Average Burden Hours Per Response (3)**	**Total Annual Burden Hours (1)x(2)x(3)**	**Total Annual Cost[99]**
Develop testing procedures, verification process, and process for collection of data	356 GO	1	8	2,848 one-time	$148,096 one-time ($52/hr)
Instructions for obtaining excitation control system or plant voltage/variance control function model	187 TP	1	8	1,496 one-time	$104,720 one-time ($70/hr)
Documentation on generator verification	356 GO	1	8	2,848	$199,360 ($70/hr)
Evidence Retention	543 GO and TP	1	1	543	$15,204 ($28/hr)
TOTAL				7,735	$467,380

MOD-027-1 (Verification of Models and Data for Turbine/Governor and Load Control or Active Power/Frequency Control Functions)					
FERC-725L	**Number of Respondents[98] (1)**	**Number of Responses per Respondent (2)**	**Average Burden Hours Per Response (3)**	**Total Annual Burden Hours (1)x(2)x(3)**	**Total Annual Cost[99]**
Develop testing procedures, verification process, and process for collection of data	356 GO	1	8	2,848 one-time	$148,096 one-time ($52/hr)
Instructions for obtaining turbine/governor and load control or active power/frequency control model	187 TP	1	8	1,496 one-time	$104,720 one-time ($70/hr)
Documentation on generator verification	356 GO	1	8	2,848	$199,360 ($70/hr)
Evidence Retention	543 GO and TP	1	1	543	$15,204 ($28/hr)
TOTAL				7,735	$467,380
TOTAL for RM13-16					$3,054,296 ($1,627,640 without one-time costs)

Title: Mandatory Reliability Standards for the Bulk-Power System

Action: Revisions to FERC-725G and FERC-725L.

OMB Control Nos: 1902-0252 and 1902-0261

Respondents: Businesses or other for-profit institutions; not-for-profit institutions.

Frequency of Responses: One-time, every five years, and every ten years.

Necessity of the Information: The proposed approval of the five Reliability Standards noted above implements the Congressional mandate of the Energy Policy Act of 2005 to develop mandatory and enforceable Reliability Standards to better ensure the reliability of the nation's Bulk-Power System.

Internal Review: The Commission has reviewed the proposed approval to the Reliability Standards and made a determination that its action is necessary to implement section 215 of the FPA. The Commission has assured itself, by means of its internal review, that there is specific, objective support for the burden estimate associated with the information requirements.

66. 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: Ellen Brown, Office of the Executive Director, e-mail: DataClearance@ferc.gov, phone: (202) 502-8663, fax: (202) 273-0873].

67. For submitting comments concerning the collection of information and the associated burden estimates, 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 RM13-16-000 and OMB Control Number 1902-0252 and 1902-0261.

VI. Regulatory Flexibility Act Certification

68. The Regulatory Flexibility Act of 1980 (RFA)[100] generally requires a description and analysis of proposed rules that will have significant economic impact on a substantial number of small entities. The RFA mandates consideration of regulatory alternatives that accomplish the stated objectives of a proposed rule and that minimize any significant economic impact on a substantial number of small entities. The Small Business Administration's (SBA's) Office of Size Standards develops the numerical definition of a small business.[101] Since the issuance of the Proposed Rule, the SBA has revised its size standard for electric utilities from an output based standard (megawatt hours) to number of employees (including affiliates). Under SBA's new size standards, Generator Owners and Transmission Planners likely come under one of four categories and associated size thresholds: [102]

- Hydroelectric power generation at 500 employees
- Fossil fuel electric power generation at 750 employees
- Other electric power generation (e.g. solar, wind, geothermal, and others) at 250

[100] 5 U.S.C. 601-612 (2006).

[101] 13 CFR 121.101 (2013).

[102] 13 CFR 121.201, Sector 22, Utilities.

employees

- Electric bulk power transmission and control at 500 employees

69. According to US economic census data,[103] over half of the firms in the categories above are small. However, currently FERC does not have information on how the economic census data compares with entities registered with NERC and is unable to estimate the number of small generator owners and transmission planners based on the new SBA definition. Regardless, FERC recognizes that the rule will impact small GOs and TPs and estimates the economic impact on each type of entity below.

70. Proposed Reliability Standards MOD-025-2, MOD-026-1, MOD-027-1, PRC-019-1 and PRC-024-1, MOD-025-2 help ensure that generators remain in operation during specified voltage and frequency excursions, properly coordinate protective relays and generator voltage regulator controls, and ensure that generator models accurately reflect the generator's capabilities and equipment performance. The Commission estimates that the small entities to which Reliability Standards PRC-019-1, PRC-024-1 and MOD-025-1 applies will incur compliance[104] and paperwork/record keeping costs[105] totaling $655,228 ($13,372 per generator owner). For Reliability Standards MOD-026-1

[103] Data and further information is available from SBA at http://www.sba.gov/advocacy/849/12162.

[104] Assuming 50 hours per generator owner per reliability standard for relay settings/testing and other non-paperwork based on $70/hour. These are non-paperwork related costs, not associated with the burden described in the information collection section above.

[105] This cost came from the above PRC-019-1, PRC-024-1, and MOD-025-2 tables in the information collection section.

and MOD-027-1, the Commission estimates that a subset of the small generator owner entities will incur compliance and paperwork/record keeping costs of $198,176 ($9,008 per generator owner).[106] This will result in a per entity compliance and paperwork/record-keeping cost for the subset of generator owners complying with MOD-026-1 and MOD-027-1 of $22,380[107] and the remaining small generator owners who only have to comply with PRC-019-1, PRC-024-1 and MOD-025-1 incurring a $13,372 cost per entity, as previously described. Additionally, small transmission planner entities will incur compliance and paperwork/record keeping costs[108] totaling $49,392 ($1,176 per transmission planner)[109] to comply with MOD-026-1 and MOD-027-1.

71. The Commission does not consider the estimated costs per small entity to have a significant economic impact on a substantial number of small entities. Accordingly, the Commission certifies that this Final Rule will not have a significant economic impact on a substantial number of small entities.

VII. Environmental Analysis

72. The Commission is required to prepare an Environmental Assessment or an Environmental Impact Statement for any action that may have a significant adverse effect

[106] These two figures were not calculated correctly in the NOPR and have been corrected here.

[107] This figure was not calculated correctly in the NOPR and has been corrected here.

[108] This cost came from the above MOD-026-1 and MOD-027-1 tables in the information collection section.

[109] These two figures were not calculated correctly in the NOPR and have been corrected here.

on the human environment.[110] The Commission has categorically excluded certain actions from this requirement as not having a significant effect on the human environment. Included in the exclusion are rules that are clarifying, corrective, or procedural or that do not substantially change the effect of the regulations being amended.[111] The actions proposed here fall within this categorical exclusion in the Commission's regulations.

VIII. Document Availability

73. 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) and in the Commission's Public Reference Room during normal business hours (8:30 a.m. to 5:00 p.m. Eastern time) at 888 First Street, NE, Room 2A, Washington DC 20426.

74. 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.

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[110] *Regulations Implementing the National Environmental Policy Act of 1969*, Order No. 486, FERC Stats. & Regs., Regulations Preambles 1986-1990 ¶ 30,783 (1987).

[111] 18 CFR 380.4(a)(2)(ii).

75. User assistance is available for eLibrary and the Commission's web site 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, TTY (202) 502-8659. E-mail the Public Reference Room at public.referenceroom@ferc.gov.

IX. Effective Date and Congressional Notification

76. These regulations are effective **[Insert Date 60 days after publication in the FEDERAL REGISTER].** The Commission has determined, with the concurrence of the Administrator of the Office of Information and Regulatory Affairs of OMB, that this rule is not a "major rule" as defined in section 351 of the Small Business Regulatory Enforcement Fairness Act of 1996.

By the Commission.

Nathaniel J. Davis, Sr.,
Deputy Secretary.

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