182 FERC ¶ 61,094
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Willie L. Phillips, Acting Chairman;
James P. Danly, Allison Clements,
and Mark C. Christie.

North American Electric Reliability Corporation Docket No. RD23-1-000

ORDER APPROVING EXTREME COLD WEATHER RELIABILITY STANDARDS EOP-011-3 AND EOP-012-1 AND DIRECTING MODIFICATION OF RELIABILITY STANDARD EOP-012-1

(Issued February 16, 2023)

1. On October 28, 2022, the North American Electric Reliability Corporation (NERC), the Commission-certified Electric Reliability Organization (ERO), submitted a petition seeking approval of proposed Reliability Standards EOP-011-3 (Emergency Operations) and EOP-012-1 (Extreme Cold Weather Preparedness and Operations).[1] As discussed in this order, we approve proposed Reliability Standards EOP-011-3 and EOP-012-1, their associated violation risk factors and violation severity levels, and the newly defined terms Generator Cold Weather Critical Component, Extreme Cold Weather Temperature, and Generator Cold Weather Reliability Event.

2. It is essential to the reliable operation of the Bulk-Power System to "ensure enough generating units will be available during the next cold weather event."[2] As the November 2021 Report found, the Bulk-Power System "cannot operate reliably without adequate generation." When cold weather events such as Winter Storm Uri occur, with "massive numbers of generating units" failing, grid operators could have no other option than to shed firm customer load to prevent uncontrolled load shedding and cascading outages. And as unfortunately illustrated by Winter Storm Uri, "[t]hese firm load shedding events . . . have very real human consequences. Millions went without

[1] The proposed Reliability Standards are not attached to this order. The proposed Reliability Standards are available on the Commission's eLibrary document retrieval system in Docket No. RD23-1-000 and on the NERC website, www.nerc.com.

[2] FERC, NERC, and Regional Entity Staff, *The February 2021 Cold Weather Outages in Texas and the South Central United States*, at 189 (Nov. 16, 2021), https://www.ferc.gov/media/february-2021-cold-weather-outages-texas-and-south-central-united-states-ferc-nerc-and (November 2021 Report).

heat . . . Hundreds died from hypothermia."[3] Accordingly, we approve proposed Reliability Standards EOP-011-3 and EOP-012-1 as just, reasonable, not unduly discriminatory or preferential, and in the public interest.

3. While NERC's proposed Reliability Standards may "provide new protections not currently found in any Reliability Standard,"[4] EOP-012-1, in its current form, includes undefined terms, broad limitations, exceptions and exemptions, and prolonged compliance periods. Thus, we find that Reliability Standard EOP-012-1 requires improvement to address concerns, as discussed further below. Therefore, pursuant to section 215(d)(5) of the Federal Power Act (FPA),[5] we direct NERC to develop and submit modifications to Reliability Standard EOP-012-1 as discussed herein.

4. As an initial matter, we are concerned that use of the terms "continuous run," "commits or is obligated to serve" and "four hours or more," as well as the enumerated exemptions, obfuscates the extent of applicability of Reliability Standard EOP-012-1 to bulk electric system[6] facilities, and may not ensure that compliance is required for all "generating units that are being depended upon to operate in cold weather and on which the reliability of the system depends."[7] We understand that the proposed applicability criteria is meant to avoid "undue burden on those generating units that are not expected to operate in cold weather;"[8] however, we find that excluded generating units should be the exception and not the rule.[9] Therefore, we direct NERC, pursuant to FPA section 215(d)(5), to modify Reliability Standard EOP-012-1 to ensure that it captures all bulk electric system generation resources needed for reliable operation and excludes

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[3] *Id.*

[4] NERC Petition at 7.

[5] 16 U.S.C. § 824o(d)(5).

[6] NERC's Commission-approved bulk electric system definition defines the scope of the Reliability Standards and the entities subject to NERC compliance. *Revisions to Electric Reliability Organization Definition of Bulk Electric System and Rules of Procedure*, Order No. 773, 141 FERC ¶ 61,236 (2012), *order on reh'g*, Order No. 773-A, 143 FERC ¶ 61,053 (2013) *rev'd sub nom. People of the State of New York v. FERC*, 783 F.3d 946 (2d Cir. 2015); NERC Glossary at 5-7.

[7] NERC Petition at 30.

[8] *Id.*

[9] As discussed below, we also find that, even as to the limited set of excluded generating units, the obligation to have a cold weather emergency preparedness plan(s) and training should remain.

only those generation resources not relied upon during freezing conditions.[10] As discussed further below, our directive to NERC is to clarify the language of the applicability section to align with NERC's explanation of the entities that should already be preparing to comply with the Standard, and should not need additional implementation time. Therefore, NERC should ensure the modified applicability section of Reliability Standard EOP-012 is implemented as of the effective date[11] of Reliability Standard EOP-012-1.

5. Further, as Reliability Standard EOP-011-2 requirements to implement and maintain cold weather preparedness plan(s) and associated training applies to all bulk electric system generating units, we defer our decision on whether to approve or modify NERC's proposed implementation date for Reliability Standard EOP-011-3 (and proposed retirement of Reliability Standard EOP-011-2) until NERC submits its revised applicability section for EOP-012. Allowing EOP-011-2 requirements to remain mandatory and enforceable until such time as the revised applicability is effective for EOP-012 will ensure all bulk electric system generating units are required to maintain cold weather preparedness plans.

6. In addition, we direct NERC to develop and submit modifications to Reliability Standard EOP-012-1 Requirements R1 and R7 to address concerns related to the ambiguity of generator-defined declarations of technical, commercial, or operational constraints that exempt a generator owner from implementing the appropriate freeze protection measures. We direct NERC to include in the Standard: objective criteria on permissible technical, commercial, and operational constraints, to identify the appropriate entity that would receive the generator owners' constraint declarations under EOP-012-1 Requirements R1 and R7, to describe how that entity would confirm that the generator owners comply with the objective criteria, and to describe the consequences of providing a constraint declaration. We direct NERC to modify this Standard to ensure that declarations cannot be used to opt out of mandatory compliance with the Standard or obligations set forth in a corrective action plan. We direct NERC to submit a revised Reliability Standard that addresses these concerns no later than 12 months after the date of issuance of this order.

7. Under Requirement R1 of EOP-012-1, generator owners must "[i]mplement freeze

[10] 16 U.S.C. § 824o(d)(5) (stating that the Commission, "upon its own motion or upon complaint, may order the Electric Reliability Organization to submit to the Commission a proposed reliability standard or a modification to a reliability standard that addresses a specific matter if the Commission considers such a new or modified reliability standard appropriate to carry out this section").

[11] This order uses the term "effective date" to mean the mandatory and enforceable date of the Standards, which, according to NERC's implementation plan, is 18 months after regulatory approval. NERC Petition at 50-51.

protection measures that provide capability to operate for a period of not less than twelve (12) continuous hours at the Extreme Cold Weather Temperature" or "[e]xplain in a declaration any technical, commercial, or operational constraints . . . that preclude the ability to implement appropriate freeze protection measures to provide capability of operating at twelve (12) hours at the documented Extreme Cold Weather Temperature."[12] Yet, based on comments and our reading of the plain text of the Standard, we are concerned that the requirement as written is unclear whether new intermittent units will be considered by all generator owners as being capable of operating for at least 12 continuous hours, and thus, must comply with the Requirement. Therefore, we direct NERC to modify the Standard to clarify Reliability Standard EOP-012-1 Requirement R1 to ensure that generators that are technically incapable of operating for 12 continuous hours (e.g., solar facilities during winter months with less than 12 hours of sunlight) are not excluded from complying with the Standard. We direct NERC to submit the revised Reliability Standard no later than 12 months after the date of issuance of this order.

8. Under Requirement R2 of EOP-012-1, each generator owner is required to "ensure its generating unit(s) add new or modify existing freeze protection measures as needed to provide the capability to operate for a period of not less than one (1) hour at the unit(s) Extreme Cold Weather Temperature."[13] We find that the one-hour continuous operations requirement in Reliability Standard EOP-012-1 Requirement R2 is too short of a period to adequately meet the purpose of the Standard to ensure generating units "mitigate the reliability impacts of extreme cold weather."[14] Thus, we direct NERC to modify the one-hour continuous operations requirement of Reliability Standard EOP-012-1 Requirement R2. We direct NERC to submit the revised Reliability Standard no later than 12 months after the date of issuance of this order.

9. In addition, Reliability Standard EOP-012-1 does not require a deadline for, or a maximum duration of, corrective action plan implementation completion. We are concerned that the lack of a time limit for implementation completion of corrective action plans could allow identified issues to remain unresolved for a significant and indefinite period. Therefore, we direct NERC pursuant to FPA section 215(d)(5), to modify Reliability Standard EOP-012-1 Requirements R7 to include deadlines for implementation completion of corrective action plans, as recommended in the

[12] Reliability Standard EOP-012-1, Requirement R1.

[13] Reliability Standard EOP-012-1, Requirement R2.

[14] NERC Petition at 29 (noting that freeze protection measures of the Standard would advance the reliability of the Bulk-Power System by helping to improve generator reliability in cold weather).

November 2021 Report.[15] We direct NERC to submit the revised Reliability Standard no later than 12 months after the date of issuance of this order.

10. Additionally, we are concerned that generator owners will not have to implement freeze protection measures for existing generating units to provide them with the capability to operate for the specified durations at the Extreme Cold Weather Temperature under proposed EOP-012-1 Requirement R2 until 60 months from regulatory approval. Thus, we direct NERC to modify the EOP-012-1 60-month implementation plan for existing generating units. Although we are giving NERC the discretion to determine what the effective date should be shortened to, we also emphasize that industry has been aware of and alerted to the need to prepare their generating units for cold weather since at least 2011.[16] This finding was repeated in the 2019 South Central Event Report[17] and the November 2021 Report.[18] After the 2019 South Central Event Report, it was found that one third of the generator owners and operators surveyed "still had no winterization provisions after multiple recommendations on winter preparedness for generating units."[19] NERC should consider the amount of time that industry has already had to implement freeze protection measures when determining the

[15] *See, e.g.*, November 2021 Report at 187 (discussing Key Recommendation 1d, which, while recommending that the standards drafting team have flexibility to determine the specific timing for the corrective action plan to be developed and implemented after the outage, derate or failure to start, also recommends that the corrective action plan "be developed as quickly as possible, and be completed by no later than the beginning of the next winter season.").

[16] *See, e.g.,* FERC and NERC Staff, *Report on Outages and Curtailments During the Southwest Cold Weather Event of February 1-5, 2011: Causes and Recommendations*, at 208 (Aug. 2011), https://www.ferc.gov/sites/default/files/2020-07/OutagesandCurtailmentsDuringtheSouthwestColdWeatherEventofFebruary1-5-2011.pdf (recommending that each generator owner and operator should take steps to ensure that winterization is in place before the inter season and take preventative action in a timely manner).

[17] FERC and NERC Staff, *The South Central United States Cold Weather Bulk Electric System Event of January 17, 2018*, at 80-81 (July 2019), https://www.ferc.gov/sites/default/files/legal/staff-reports/2019/07-18-19-ferc-nerc-report.pdf (finding that the event was "caused by failure to properly prepare or 'winterize' the generation facilities for cold temperatures").

[18] November 2021 Report at 185 (finding that "generation freezing issues were the number one cause of the Event, and the same frequently-seen frozen components reappear").

[19] *Id.*

appropriate implementation period. Further, we find that a phased compliance within the implementation time for Reliability Standard EOP-012-1 Requirement R2 will also reduce reliability risks. To address these concerns, we direct NERC to modify the EOP-012-1 implementation plan for Requirement R2 to require a staggered implementation for existing unit(s) in a generator owner's fleet with an effective date of less than 60 months from regulatory approval.[20]

11. We also find it necessary that NERC ensure that Reliability Standard EOP-012-1 adequately addresses the reliability concerns related to generator owner constraint declarations, the adequacy of the Extreme Cold Weather Temperature definition, and determine whether future modification is needed, as discussed in more detail below. We note that, under the proposed implementation plan, it will be five years before certain requirements will be effective and a longer period before experiential data will be available. Notwithstanding our directives to shorten the implementation period for certain Requirements, waiting to collect data until after implementation will not provide timely information on the effectiveness of winterization efforts. However, section 1600 of NERC's Rules of Procedure provides a mechanism for data collections that could be used during the period prior to full implementation. Therefore, we direct NERC, pursuant to section 39.2(d) of the Commission's regulations,[21] to work with Commission staff to submit a plan no later than 12 months after the date of issuance of this order explaining how it will collect and assess data prior to and after the implementation of the following elements of Reliability Standard EOP-012-1: (1) generator owner declared constraints and explanations thereof; and (2) the adequacy of the Extreme Cold Weather Temperature definition.

I. Background

A. Section 215 and Mandatory Reliability Standards

12. Section 215 of the FPA provides that the Commission may certify an ERO, the purpose of which is to develop mandatory and enforceable Reliability Standards, subject to Commission review and approval.[22] Reliability Standards may be enforced by the

[20] *See e.g.*, *Generator Verification Reliability Standards*, Order No. 796, 146 FERC ¶ 61,213, at PP 1-2 (2014) (approving Reliability Standard MOD-025-2 and its associated staggered implementation plan, which required 40% of applicable facilities to be verified in 2 years, 60% in 3 years, 80% in 4 years, and 100% in 5 years).

[21] 18 C.F.R. § 39.2(d) (2021) (the ERO shall provide the Commission such information as is necessary to implement section 215 of the FPA).

[22] 16 U.S.C. § 824o(c).

ERO, subject to Commission oversight, or by the Commission independently.[23] Pursuant to section 215 of the FPA, the Commission established a process to select and certify an ERO,[24] and subsequently certified NERC.[25]

B. The February 2021 Cold Weather Reliability Event

13. On February 16, 2021, the Commission, NERC, and Regional Entity staff initiated a joint inquiry into the circumstances surrounding a February 2021 cold weather reliability event that affected Texas and the South-Central United States that culminated in a report identifying, among other things, recommendations for Reliability Standard improvements.[26] The November 2021 Report found that the February 2021 cold weather reliability event was the largest controlled firm load shed event in U.S. history; over 4.5 million people lost power and at least 210 people lost their lives during the event.[27] The November 2021 Report provided an assessment of the event as well as recommendations including, *inter alia*, Reliability Standard enhancements to improve extreme cold weather operations, preparedness, and coordination.[28]

14. After the February 2021 cold weather reliability event, but before the November 2021 Report was issued, NERC filed a petition for approval of cold weather Reliability Standards addressing recommendations from a 2018 cold weather event report.[29] In August 2021, the Commission approved NERC's modifications to Reliability Standards EOP-011-2 (Emergency Preparedness and Operations), IRO-010-4 (Reliability Coordinator Data Specification and Collection), and TOP-003-5 (Operational Reliability Data).[30] Reliability Standards IRO-010-4 and TOP-003-5 require that reliability

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[23] *Id.* § 824o(e).

[24] *Rules Concerning Certification of the Elec. Reliability Org.; & Procs. for the Establishment, Approval, & Enforcement of Elec. Reliability Standards*, Order No. 672, 114 FERC ¶ 61,104, *order on reh'g*, Order No. 672-A, 114 FERC ¶ 61,328 (2006).

[25] [25] *N. Am. Elec. 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).

[26] *See* November 2021 Report at 9.

[27] *Id.*

[28] *Id.* at 184-212 (sub-recommendations 1a through 1j).

[29] 2019 South Central Event Report at 89.

[30] *See generally Order Approving Cold Weather Reliability Standards*, 176 FERC ¶ 61,119 (2021) (noting that the standards become enforceable on April 1, 2023).

coordinators, transmission operators, and balancing authorities develop, maintain, and share generator cold weather data.[31] EOP-011-2 requires generator owners to have generating unit cold weather preparedness plans and generator owners and generator operators to provide training for implementing the cold weather preparedness plans.[32]

C. NERC's Petition and Proposed Reliability Standards EOP-011-3 and EOP-012-1

15. On October 28, 2022, NERC filed a petition seeking approval on an expedited basis of Reliability Standards EOP-011-3 and EOP-012-1, the Standards' associated violation risk factors and violation severity levels, three newly-defined terms (Extreme Cold Weather Temperature, Generator Cold Weather Critical Component, and Generator Cold Weather Reliability Event), NERC's proposed implementation plan, and the retirement of currently approved EOP-011-2.[33] NERC explains that Reliability Standards EOP-011-3 and EOP-012-1 build upon the 2021-approved cold weather Reliability Standards by further strengthening the reliability of the Bulk-Power System during extreme cold weather conditions.[34] NERC maintains that proposed Reliability Standards EOP-011-3 and EOP-012-1 are consistent with key recommendations for standards' improvement from the November 2021 Report.[35] Specifically, NERC states that the proposed Reliability Standards contain new and revised requirements to advance the reliability of the Bulk-Power System through the implementation of freeze protection measures, enhanced weather preparedness plans, annual training, and the coordination of manual and automatic load shed.[36]

16. NERC states that the purpose of proposed Reliability Standard EOP-011-3 is to ensure that each transmission operator implements plans to mitigate operating emergencies and that such plans are coordinated within the reliability coordinator area. According to NERC, proposed Reliability Standard EOP-011-3 addresses Key Recommendation 1j from the November 2021 Report, which recommends that the

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[31] *Id.*

[32] *Id.*

[33] NERC Petition at 1-2.

[34] *Id.*

[35] *Id.* at 23; *see also* November 2021 Report at 184-92, 208-10 (Key Recommendations 1b, 1d, 1e, 1f, and 1j).

[36] NERC Petition at 23.

circuits used for manual load shed be separated from the circuits used for automatic load shed or for critical loads.[37]

17. NERC proposes to modify approved Reliability Standard EOP-011-2 in multiple ways.[38] First, NERC proposes to remove Requirements R7 and R8 (generator cold weather preparedness plans and associated training) from EOP-011-2 and incorporate them into proposed Reliability Standard EOP-012-1 as Requirements R3 and R5, respectively.[39] Second, the added Requirements R1 and R2 of EOP-011-3 require that transmission operator emergency operating plans include provisions that minimize the overlap of manual load shed circuits, circuits that serve critical loads, and circuits that are used for underfrequency load shedding (UFLS) or undervoltage load shedding (UVLS).[40] Third, Requirement R1 requires the development of provisions that limit manual load shed of UFLS or UVLS circuits to situations warranted by system conditions.[41] Finally, Requirement R2 adds provisions for transmission operators to implement the operator-controlled manual load shed in accordance with Requirement R1. NERC also requests that the currently approved Reliability Standard EOP-011-2, which will go into effect on April 1, 2023, be retired immediately prior to the effective date of Reliability Standard EOP-011-3 and EOP-012-1, i.e., 18 months after regulatory approval.[42]

18. NERC requests approval of a new Reliability Standard, EOP-012-1, which it states is meant to apply to generator owners and operators of generating units that are depended upon to operate during cold weather and Blackstart Resources. The purpose of Reliability Standard EOP-012-1 is to ensure that each generator owner develops and implements plans to alleviate the reliability effects of extreme cold weather on its

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[37] *See id.* at 20 (citing the November 2021 Report at 208-10 (recommending that transmission operators use automatic load shed as a last resort)).

[38] Reliability Standard EOP-011-3, Requirements R3, R4, and R5 are unchanged from the approved version. *See Order Approving Cold Weather Reliability Standards*, 176 FERC ¶ 61,119 (approving EOP-011-2).

[39] *Id.*; NERC Petition at 45-46.

[40] NERC Petition at 46-49.

[41] *Id.* Ex. A-1, at 2-3.

[42] NERC Petition at 50.

generating units.[43] According to NERC, this new Reliability Standard addresses parts of Key Recommendation 1a as well as 1d, 1e, and 1f of the November 2021 Report.[44]

19. Proposed Reliability Standard EOP-012-1 has seven requirements, five of which are new (Requirements R1, R2, R4, R6, and R7) and two of which (Requirements R3 and R5) were moved and revised from approved Reliability Standard EOP-011-2. Reliability Standard EOP-012-1 Requirements R1 and R2 address a generator owner's obligation to implement freeze protection measures on its applicable units to provide them with the capability to operate at the Extreme Cold Weather Temperature for the unit's location.[45] Specifically, Requirement R1 requires either new units to be capable of operating at the Extreme Cold Weather Temperature for a continuous 12-hour period or that the generator owner declares that technical, commercial, or operational constraints prevent successful continuous operation. Requirement R2 requires either that existing units be capable of continuous operation for at least one hour at the Extreme Cold Weather Temperature or the generator owner to develop a corrective action plan to address the unit's inability to continuously operate successfully.[46]

20. Reliability Standard EOP-012-1 Requirements R3 and R5 require generator owners to implement cold weather preparedness plans (Requirement R3) and train their personnel on that plan annually (Requirement R5).[47] Requirement R3 also identifies the generator owner as the entity responsible for identifying the Extreme Cold Weather Temperature and Generator Cold Weather Critical Components for its unit(s); the generator owner must document both in its cold weather preparedness plan(s).

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[43] *Id.* at 29.

[44] *See id.* at 17-18 (citing the November 2021 Report at 184-89).

[45] *Id.* at 33-37.

[46] NERC defines the term "corrective action plan" as a "list of actions and an associated timetable for implementation to remedy a specific problem." NERC, *Glossary of Terms Used in NERC Reliability Standards*, 11 (Dec. 2022) (NERC Glossary), https://www.nerc.com/pa/Stand/Glossary of Terms/Glossary_of_Terms.pdf. *See also* Reliability Standard EOP-012-1, section 4.3.

[47] NERC Petition at 37-41 (stating that Requirements R3 and R5 were taken from Requirements R7 and R8 from Commission approved EOP-011-2 with modifications to ensure that a generator owner's cold weather preparedness plan includes the Extreme Cold Weather Temperature, Generator Cold Weather Critical Components, and freeze protection measures).

21. Reliability Standard EOP-012-1 Requirement R4 requires the generator owner to review its Extreme Cold Weather Temperature calculation, cold weather preparedness plan(s), and freeze protection measures every five years to determine if changes or updates are warranted.[48] Requirement R6 mandates that each generator owner experiencing an outage, failure to start, or derate due to freezing conditions develop a corrective action plan to address the identified causes. Lastly, Requirement R7 requires generator owners to implement corrective action plans developed pursuant to Requirements R2, R4, or R6, or explain in a declaration why they are not implementing corrective actions due to technical, commercial, or operational constraints.[49]

22. NERC requests the Commission approve the violation risk factors and violation severity levels for Reliability Standards EOP-011-3 and EOP-012-1. NERC states that the violation risk factors and violation severity levels for Reliability Standard EOP-011-3 did not change from approved Reliability Standard EOP-011-2. NERC also proposes violation risk factors and violation severity levels for new Reliability Standard EOP-012-1.[50]

23. NERC proposes an 18-month effective date for Reliability Standards EOP-011-3 and EOP-012-1, beginning on the first day of the first calendar quarter following regulatory approval.[51] All the requirements of Reliability Standard EOP-011-3 would be effective on this date.

24. Specific to the requirements of EOP-012-1, as of the effective date, generator owners will be required to update their cold weather preparedness plans to include the Extreme Cold Weather Temperature and Generator Cold Weather Critical Components, and document freeze protection measures for those components as required by EOP-012-1 Requirement R3 as well as provide unit-specific cold weather plan training on an annual basis as required by Requirement R5. Within 150 days of the effective date, generator owners will be required to develop corrective action plans, or declare constraints, as required by proposed EOP-012-1 Requirements R6 and R7. NERC also proposes that generator owners have an additional 42 months from the effective date of proposed Reliability Standard EOP-012-1 (i.e., 60 months from the regulatory approval date) to come into compliance with the new freeze protection measures of EOP-012-1 Requirements R1 and R2 and an additional 60 months from the effective date (i.e.,

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[48] *Id.* at 39-40 (this periodic review may require the generator owner to add or modify existing freeze protection measures to continue reliable operation).

[49] *Id.* at 43-45 (noting that the generator owner defines these constraints).

[50] *Id.* Ex. E at 7-20 (explaining NERC's justifications for each violation risk factor and violation severity level associated with Reliability Standard EOP-012-1).

[51] NERC Petition at 50-51.

78 months from the regulatory approval date) to perform the first re-evaluation of the Extreme Cold Weather Temperature for their units and update cold weather preparedness plans and unit freeze protection measures, including developing any corrective action plans, as needed for proposed EOP-012-1 Requirement R4.

25. NERC explains that it considered these implementation timeframes necessary for generator owners to calculate the Extreme Cold Weather Temperature for each generating unit, to identify Generator Cold Weather Critical Components, and to perform the necessary engineering studies and analyses to identify and implement freeze protection measures that would provide for the required performance capability or to explain why such measures are precluded by technical, commercial, or operational constraints. NERC also states that generator owners need additional time to implement the freeze protection measures of EOP-012-1 Requirements R1 and R2 because of the significant engineering, design, analysis, and implementation efforts required to complete such work.[52]

26. NERC explains that it adopted a two-phase standard development project to develop, draft, and revise the extreme cold weather Reliability Standards in accordance with the November 2021 Report due to the extensive scope and demonstrated urgency of new and improved cold weather Reliability Standards.[53] NERC states that its October 28, 2022, petition represents phase one of its standard development project and that the remaining November 2021 Report recommendations will be addressed in the second phase of standards development. In phase two, NERC states that its standard drafting team also plans to consider industry concerns that arose in phase one.

27. Finally, NERC requests the Commission approve the proposed Standards in an expedited manner. NERC explains that, among other things, an expedited approval would provide regulatory certainty to entities seeking to implement the Standards ahead of the mandatory and enforceable dates.[54]

II. Notice of Filing and Responsive Pleadings

28. Notice of NERC's October 28, 2022, Petition was published in the *Federal Register*, 87 Fed. Reg. 67,464 (Nov. 8, 2022), with comments, protests, and motions to intervene due on or before December 1, 2022.

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[52] *Id.* at 52.

[53] *Id.* at 53 (noting that NERC anticipates completing development and filing with the Commission new or revised Reliability Standards by November 1, 2023).

[54] *Id.* at 55.

29. On November 17, 2022, the Electric Power Supply Association (EPSA) filed a motion for an extension of time to submit comments. On November 29, 2022, the Commission extended the comment period seven days to and including December 8, 2022.

30. The Commission received six sets of comments and five reply comments. The LS Power Development, LLC; Calpine Corporation; EPSA; PJM Power Providers Group (PJM Group); Transmission Access Policy Study Group (TAPS); the National Rural Electric Cooperative Association (NRECA); American Public Power Association (APPA); the Independent System Operators and Regional Transmission Organization Council (ISO/RTO Council); Edison Electric Institute (EEI); New England Power Generators Association, Inc. (NEPGA); and Invenergy LLC (Invenergy) filed timely motions to intervene. TAPS, the ISO/RTO Council, NEPGA, Invenergy, EPSA/PJM Group jointly, and the Texas Competitive Power Advocates (TCPA) filed timely comments. NERC filed reply comments out of time. Invenergy filed a motion for leave to reply and reply comments out of time. NEPGA/EPSA/PJM Group filed a joint out of time motion for leave to answer and joint answer to the ISO/RTO Council's comments. APPA/TAPS filed a joint out of time motion for leave to answer along with a joint answer to EPSA's comments. The ISO/RTO Council also filed an out of time motion for leave to answer along with an answer to the NERC's reply comments and NEPGA/EPSA/PJM Group's answer.

31. Commenters either did not address or were generally supportive of NERC's proposed modifications to Reliability Standard EOP-011-3.[55] Commenters raised concerns and requests for clarifications for NERC's proposed Reliability Standard EOP-012-1. The commenters range in their support for Reliability Standard EOP-012-1 from requesting that the Commission approve the Standard as filed with minor clarifications[56] to remanding the Standard to NERC with directives.[57] The comments on specific matters are summarized and addressed in the determinations below.

[55] *E.g.*, EPSA/PJM Group Comments at 3; NEPGA/EPSA/PJM Group Answer at 1; ISO/RTO Council Comments at 1-2, TAPS Comments at 1.

[56] *See* APPA/TAPS Answer at 2-9; ISO/RTO Comments at 1-3; ISO/RTO Answer at 1-2; TAPS Comments at 1.

[57] *See* EPSA/PJM Group Comments at 2-4; Invenergy Comments at 2, 13; NEPGA Comments at 2, 6-8; TCPA Comments at 2, 5-6.

III. Determination

A. Procedural Matters

32. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2021), the timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding.

33. Rule 213(a)(2) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.213(a)(2) (2021), prohibits an answer to a protest or answer unless otherwise ordered by the decisional authority. Pursuant to Rule 214(d) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214(d), we grant NERC and Invenergy's leave to file their late-filed reply comments given their interest in the proceeding and the absence of undue prejudice or delay. We also grant APPA/TAPS, NEPGA/EPSA/PJM Group, and the ISO/RTO Council's motions for leave to file out of time answers and we accept their answers because they have provided information that assisted us in our decision-making process.

B. Substantive Matters

34. Pursuant to section 215(d)(2) of the FPA, we approve Reliability Standards EOP-011-3 and EOP-012-1 as just, reasonable, not unduly discriminatory or preferential and in the public interest. As discussed in this order, we approve proposed Reliability Standards EOP-011-3 and EOP-012-1, their associated violation risk factors and violation severity levels, the newly defined terms Generator Cold Weather Critical Component, Extreme Cold Weather Temperature, and Generator Cold Weather Reliability Event. We defer our decision on whether to approve or modify NERC's proposed implementation date for Reliability Standard EOP-011-3 (and proposed retirement of Reliability Standard EOP-011-2) until NERC submits its revised applicability section for EOP-012, as discussed in more detail below. Absent the reforms adopted in Reliability Standards EOP-011-3 and EOP-012-1, the existing defects and inefficiencies exhibited during extreme cold weather conditions could be exacerbated and negatively affect reliability.

35. We find that Reliability Standard EOP-011-3 is an improvement over the 2021-approved cold weather Reliability Standards and enhances reliability by improving how transmission operators account for the overlap of manual load shed and automatic load shed in their emergency operating plans while also addressing the need to minimize the use of manual load shed that could further exacerbate emergencies and threaten system reliability. Commenters did not express concern with Reliability Standard EOP-011-3. Accordingly, we approve Reliability Standard EOP-011-3.

36. We find that Reliability Standard EOP-012-1 represents an improvement to the Reliability Standards and enhances the reliable operation of the Bulk-Power System by requiring generator owners to implement freeze protection measures, develop enhanced cold weather preparedness plans, implement annual trainings, draft and implement

corrective action plans to address freezing issues, and provide certain cold weather operating parameters to reliability coordinators, transmission operators, and balancing authorities for use in their analyses and planning. We believe that these measures begin to address many of the issues identified as contributing to generating unit failures during extreme cold weather conditions, as noted in the November 2021 Report.[58] We also appreciate that NERC completed the modifications and development of Reliability Standards EOP-011-3 and EOP-012-1 in a timely manner.

37. Several commenters express concern regarding ambiguities in Requirements R1 and R7 of Reliability Standard EOP-012-1 pertaining to the generator owner declarations for "technical, commercial, or operational constraints" and ask the Commission to remand the Standard with direction to NERC for clarifications.[59] As discussed below, we agree that the provisions are ambiguous. However, we are not persuaded that there is sufficient cause to remand Reliability Standard EOP-012-1. Since we find that the Standard enhances the reliable operation of the Bulk-Power System, we conclude that the better course is to approve Reliability Standard EOP-012-1 so that it will take effect in a timely manner. Nevertheless, pursuant to our authority under FPA section 215(d)(5), we also direct NERC to develop modifications to address the concerns regarding Requirements R1 and R7, as well as other concerns we have identified as to other aspects of Reliability Standard EOP-012-1, without delaying the effective date of Reliability Standard EOP-012-1. This approach is consistent with Commission precedent.[60]

38. While we understand that the implementation plan for Reliability Standard EOP-012-1 is designed to accommodate entities that may need time to determine Extreme Cold Weather Temperature values, identify cold weather critical components for applicable generating units, develop corrective action plans for freeze issues, perform various engineering analyses, provide the required training, and develop the necessary capabilities to satisfy revised data specifications, industry has been aware of and alerted to the need to prepare their generating units for cold weather since at least 2011. Therefore, we direct NERC to reduce the implementation time and to include a staggered implementation for Requirement R2 to reduce reliability risks. NERC should consider

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[58] *See* November 2021 Report at 184-210.

[59] *See e.g.*, EPSA/PJM Group Comments at 7-9; ISO/RTO Council Comments at 10; NEPGA Comments at 7-8.

[60] *See e.g.*, *Mandatory Reliability Standards for the Bulk-Power Sys.*, Order No. 693, 118 FERC ¶ 61,218, at P 10 (2007) (noting that "[w]here a Reliability Standard requires significant improvement, but is otherwise enforceable, the Commission approves the Reliability Standard" and "directs the ERO to modify" such Standards to address identified issues or concerns); *Version 5 Critical Infrastructure Prot. Reliability Standards*, Order No. 791, 145 FERC ¶ 61,160, at PP 1-4 (2013), *order on clarification and reh'g*, Order No. 791-A, 146 FERC ¶ 61,188 (2014).

the amount of time that industry has already been alerted to the need to implement freeze protection measures when determining the appropriate implementation period. We also strongly encourage entities that are capable of complying with these Standards earlier than the mandatory and enforceable date to do so.

39. In addition to the directives to modify various aspects of Reliability Standard EOP-012-1, we also have concerns regarding generator owner constraint declarations and the adequacy of the Extreme Cold Weather Temperature definition that may be addressed with additional information. Therefore, pursuant to section 39.2(d) of the Commission's regulations,[61] NERC is hereby directed to work with Commission staff to submit a plan no later than 12 months after the date of issuance of this order on how it will collect and assess, through annual and event-based data submittals, the following elements of Reliability Standard EOP-012-1: (1) generator owner declared constraints and explanations thereof; and (2) the adequacy of the Extreme Cold Weather Temperature definition. NERC is hereby directed to submit periodic reports to the Commission providing the results of the assessments, as discussed in further detail below.

40. Below we address the following elements of Reliability Standard EOP-012-1: (1) jurisdiction; (2) the applicability of Reliability Standard EOP-012-1; (3) generator owner declarations for technical, commercial, or operational constraints; (4) the Extreme Cold Weather Temperature definition; (5) the absence of a deadline by which generator owners must implement new or modified freeze protection measures required by their corrective action plans; (6) cost recovery mechanisms; (7) other technical matters; and (8) annual and event-based data submittals.

1. Jurisdiction

a. Background

41. Section 215(a)(3) of the FPA defines "Reliability Standard" as:

> a requirement, approved by the Commission under this section, to provide for reliable operation of the bulk-power system. The term includes requirements for the operation of existing bulk-power system facilities, including cybersecurity protection, and the design of planned additions or modifications to such facilities to the extent necessary to provide for reliable operation of the bulk-power system, but the term does not include any requirement to enlarge such facilities or to construct new transmission capacity or generation capacity.[62]

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[61] 18 C.F.R. § 39.2(d).

[62] 16 U.S.C. § 824o(a)(3).

42. The term "Reliable Operation" is defined by the statute as "operating the elements of the bulk-power system within equipment and electric system thermal, voltage, and stability limits so that instability, uncontrolled separation, or cascading failures of such system will not occur as a result of a sudden disturbance . . . .or unanticipated failure of system elements."[63]

b. Comments

43. EPSA/PJM Group and Invenergy assert that Requirements R1 and R2 of Reliability Standard EOP-012-1 would impose obligations on generator owners that "fall outside of the scope" of section 215 of the FPA.[64] Both provisions of Reliability Standard EOP-012-1 require generator owners to add new, or modify existing, freeze protection measures, with Requirement R1 pertaining to generating units with an operational date subsequent to the effective date of the Reliability Standard, and Requirement R2 pertaining to existing generating units.

44. EPSA/PJM Group argue that while the definition of Reliable Operation allows NERC to require modifications to address sudden disturbances and unanticipated failures, "the language of the section is very clear that a Reliability Standard may only cover 'the operation' of existing facilities, where such operation shall only be 'within' equipment limits exclusively for the purpose of mitigating 'sudden disturbances' and 'unanticipated failures.'"[65] In other words, according to EPSA/PJM Group, the statute authorizes the modification of existing facilities to reliably operate within their existing equipment limits but does not permit a Reliability Standard that changes a resource's equipment limits.[66] In the same vein, Invenergy asserts that it is unclear whether NERC has the authority under section 215 of the FPA to mandate retrofits on existing generators because the statutory definition of Reliability Standard is limited to requirements "for the operation of existing bulk-power system facilities."[67] According to Invenergy, this language suggests that NERC can only mandate modifications when changes to a facility are already planned.[68]

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[63] *Id.* § 824o(a)(4).

[64] *See* EPSA/PJM Group Comments at 5-7; Invenergy Comments at 13.

[65] *Id.* (footnotes omitted).

[66] *Id.* at 6.

[67] Invenergy Comments at 13.

[68] *Id.*

45. In its reply comments, NERC asserts that the requirements of Reliability Standard EOP-012-1 that generator owners add freeze protection measures is within the scope of its authority and that commenters argue for an overly narrow interpretation of section 215 of the FPA.[69] According to NERC, EOP-012-1 satisfies a three-part framework for analyzing whether a proposed Reliability Standard is within the ERO's authority under the statute, namely that the Standard: (1) applies to users, owners or operators of the Bulk-Power System; (2) provides for the reliable operation of the Bulk-Power System; and (3) may include operational or design requirements, but may not address matters expressly excluded in the statute that were historically left to the jurisdiction of the states. Focusing on the third prong, NERC explains that Reliability Standard EOP-012-1 pertains to the operation of existing facilities and the design of planned additions or modifications to such facilities as needed to provide for the reliable operation of the Bulk-Power System, which is explicitly included in the statutory definition of Reliability Standard. NERC argues that, while the statutory definition of Reliability Standard specifically excludes "any requirement to enlarge [existing] facilities or to construct new transmission capacity or generation capacity," EPSA/PJM Group's narrow reading of the definition would write into the statute a new exclusion that does not exist.

c. Commission Determination

46. We are not persuaded by EPSA/PJM Group and Invenergy's arguments and conclude that Reliability Standard EOP-012-1 Requirements R1 and R2 are within the statutory authority of the ERO and the Commission. We agree with NERC that EPSA/PJM Group and Invenergy narrowly interpret the terms "Reliability Standard" and "Reliable Operation" under section 215 of the FPA to reach an inaccurate conclusion regarding the ERO and the Commission's statutory authority.[70]

47. First, Requirements R1 and R2 of EOP-012-1 comport with the statutory definition of a Reliability Standard, which includes modifications to facilities to the extent that they are necessary to provide for the reliable operation of the Bulk-Power System.[71] Reliability Standard EOP-012-1 Requirement R1 requires generating units with a commercial operation date after the effective date of the Standard to implement freeze protection measures so that the unit is capable of continuous operation for at least 12 hours at the Extreme Cold Weather Temperature or for the generator owner to submit a declaration of a technical, commercial, or operational constraint that preclude its ability to comply with the Standard. Requirement R2 of EOP-012-1 requires existing generating units to either be capable of continuous operation for at least one hour at the Extreme Cold Weather Temperature or to develop a corrective action plan to resolve the issue.

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[69] NERC Reply Comments at 3-11.

[70] *Id.*; *see also* 16 U.S.C. § 824o(a)(3)-(4).

[71] 16 U.S.C. § 824o(a)(3).

Thus, Requirements R1 and R2's freeze protection provisions serve an appropriate purpose, i.e., to provide the "Reliable Operation"[72] of the Bulk-Power System as set forth in the definition of a "Reliability Standard."[73] Further, neither of these requirements mandate the construction of new generation capacity or an expansion of the unit's generating capacity, which are the only relevant exclusions identified in the statutory definition of a "Reliability Standard."[74]

48. Moreover, we reject EPSA/PJM Group's interpretation of the statutory definition of "Reliable Operation" as imposing a limitation or exclusion on an acceptable Reliability Standard. EPSA/PJM Group recognizes that under the definition of "Reliable Operation" NERC may require modifications to mitigate "sudden disturbances" and "unanticipated failures" of facilities to the extent necessary to provide for reliable Bulk-Power System operations.[75] Indeed, the Commission has previously approved Reliability Standards that require the implementation of physical modifications to improve reliability.[76] Rather, EPSA/PJM Group reads a limitation into the statutory definition of Reliable Operation – specifically "within equipment . . . limits" – and argues that the proposed Reliability Standard would constitute an impermissible change to such equipment limits. However, we do not find this argument to be persuasive as the statutory language is not as narrow as EPSA/PJM Group suggests. When read in context, the definition of "Reliable Operation" contemplates that Reliability Standards should be designed so that facility equipment operates within specified limits to mitigate sudden disturbances and prevent unanticipated failures of system elements.[77]

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[72] *Id.* § 824o(a)(4).

[73] *Id.* § 824o(a)(3).

[74] *Id.*

[75] EPSA/PJM Group Comments at 5 (citing to 16 U.S.C. § 824(a)(4)).

[76] *See, e.g.,* Order No. 693, 118 FERC ¶ 61,218 at PP 1547, 1550 (approving Reliability Standard PRC-018-1, which requires the installation of disturbance monitoring equipment); *Mandatory Reliability Standards for Critical Infrastructure Protection*, Order No. 706, 122 FERC ¶ 61,040, at P 86 (2008) (providing entities with a reasonable amount of time to purchase and install new software and equipment for compliance); *PacifiCorp*, 141 FERC ¶ 61,140 P 1 (2014).

[77] 16 U.S.C. § 824o(a)(4).

49. EPSA/PJM Group seizes upon language from the "Reliability Standard" definition stating that the term "includes requirements for the existing bulk-power system facilities . . . ."[78] However, other than EPSA/PJM Group's assertion, there is no logical reason to tie together the language from these two definitions to limit the statutory scope for the requirements of a Reliability Standard. Rather, in context, the "requirements for operation of existing . . . facilities" passage continues ". . . including . . . the design of planned additions or modification to such facilities to the extent necessary to provide for reliable operation of the bulk-power system."[79] This exactly describes the purpose of the freeze protection requirements in EOP-012-1, which are intended to reduce capacity that is forced off-line due to freezing conditions and to help ensure that such capacity is not forced off-line in newer units. Accordingly, we reject the arguments of EPSA/PJM Group that the requirements of EOP-012-1 are beyond our or NERC's authority.

50. For similar reasons, we reject Invenergy's argument that a requirement to "retrofit" existing generators exceeds the statutory definition of a Reliability Standard that is limited to requirements "for the operation of existing bulk-power system facilities."[80] Again, Invenergy would read in an exclusion beyond the one explicit exclusion stated in the definition. Moreover, Invenergy's selected quote ignores the language that follows which includes requirements for "the operation of existing bulk-power system facilities . . . and the design of planned additions or modifications to such facilities to the extent necessary to provide for reliable operation of the bulk-power system."[81] As discussed above, Requirements R1 and R2's freeze protection measures satisfy the latter provision, as the record shows that these modifications are necessary to provide for the reliable operation of the Bulk-Power System.

2. Applicability of Reliability Standard EOP-012-1

51. NERC's Rules of Procedure requires all Reliability Standards to include an applicability section that identifies (1) the registered functional entities required to comply with each Standard and (2) the bulk electric system facilities to which the requirements apply.[82] Reliability Standard EOP-012-1's applicability section applies to

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[78] EPSA/PJM Group Comments at 5.

[79] 16 U.S.C. § 824o(a)(3).

[80] *See* Invenergy Comments at 13. *But see* NERC Petition Ex. A-2, at 3-8 (the term "retrofit" not appearing in proposed Reliability Standard EOP-012-1).

[81] 16 U.S.C. § 824o(a)(3).

[82] *See* NERC, *Rules of Procedure,* App. 3A (Standard Process Manual), 5 (Mar. 2019), [82] *N. Am. Elec. Reliability Corp.*, 116 FERC ¶ 61,062, *order on reh'g and*

registered generator owners and generator operators. Further, the facilities subject to the requirements of the standard include bulk electric system generating units that are Blackstart Resources and any bulk electric system generating unit that:

> commits or is obligated to serve a Balancing Authority load pursuant to a tariff obligation, state requirement as defined by the relevant electric regulatory authority, or other contractual arrangement, rule, or regulation, for a continuous run of four hours or more at or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius)[83]

52. NERC explains that the facilities section inclusions are "carefully tailored to place the responsibility for cold weather preparedness on those generating units that are being depended on to operate in cold weather and on which the reliability of the system depends" and that the facilities section exclusions are meant to avoid "undue burden on those generating units that are not expected to operate in cold weather."[84]

a. Comments

53. Invenergy questions which generator owner and generator operators must comply with Reliability Standard EOP-012-1. Specifically, Invenergy asserts that the applicability section of the Standard is not clear and unambiguous as to which entities must comply. Invenergy argues there are different types of generator owners that vary widely in how they, with their generating units, participate in electric markets, and requests that the Commission direct NERC to modify proposed Reliability Standard EOP-012-1 to provide specific criteria for which entities must comply.[85]

b. Commission Determination

54. We agree with Invenergy that the applicability of Reliability Standard EOP-012-1 is unclear and ambiguous. In its technical rationale and justification, NERC explains that Reliability Standard EOP-012-1 is not meant to require all generating units to provide capacity in extreme cold weather. Instead, the Standard applies to those generating resources that are "obligated to serve Balancing Authority load during periods at or below freezing due to commitments pursuant to tariff obligations, state requirements defined by regulatory authorities, or other contractual arrangements, rules, or regulations

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compliance, 117 FERC ¶ 61,126 (2006), *aff'd sub nom. Alcoa, Inc. v. FERC*, 564 F.3d 1342 (D.C. Cir. 2009).

[83] Reliability Standard EOP-012-1, section 4.2.1.1.

[84] NERC Petition at 30.

[85] Invenergy Comments at 4.

are subject to the winterization requirements."[86] Further, NERC explains that the "[t]he [standard drafting team] chose the four-hour timeframe in consideration of generators that typically do not commit during freezing conditions but are running when conditions drop below freezing for a short period of time . . . "[87] Lastly, NERC states that the language is intended to act as a "blanket inclusion of all [bulk electric system] resources that serve Balancing Authority load for a period of more than four hours in freezing conditions."[88]

55. Despite this additional description regarding the standard drafting team's intent, we are concerned that certain elements of the applicability criteria remain unclear and ambiguous. For example, in light of the multiple different approaches for participating in electricity markets, it may not be clear under what circumstances a generator owner is "obligated to serve a Balancing Authority load."[89] Similarly, while the intent appears to be to exclude units that do not typically run during winter, it is unclear how the qualifier of "for four hours or more" is meant to be measured and applied in practice.

56. We find that NERC has not sufficiently supported the applicability criteria of EOP-012-1. Reliability Standard EOP-012-1 applies only to "[a] Blackstart Resource" or "[a] Bulk Electric System generating unit that commits or is obligated to serve . . . pursuant to a tariff obligation, state requirement . . . , or other contractual arrangement, rule, or regulation, for a continuous run of four hours or more at or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius) . . . ."[90] This applicability is further limited by enumerated exemptions set forth in section 4.2.2. NERC explains in its Petition that the Facilities section 4.2 of the Reliability Standard, that limits applicability to an unidentified subset of generating units, is meant to "place the responsibility for cold weather preparedness on those generating units that are being depended on to operate in cold weather and on which the reliability of the system depends, while avoiding undue burden on those generating units that are not expected to operate in cold weather."[91] But based on commenter concerns and our reading of the plain text of the Reliability

[86] NERC Petition, Ex. C-2, Technical Rationale and Justification for EOP-012-1 at 1.

[87] *Id.*

[88] *Id.* at 2.

[89] *Id.* at 1.

[90] Reliability Standard, EOP-012-1, section 4.2.

[91] NERC Petition at 30.

Standard, the extent of Reliability Standard EOP-012-1's applicability to bulk electric system facilities is unclear.

57. For example, it is unclear how the term "continuous run" would apply to intermittent resources, which by their nature are variable and, therefore, do not always run continuously. Ensuring clear applicability to intermittent generators is critical to ensuring that enough generating units are available during cold temperatures.

58. Moreover, to the extent it is NERC's intent to exclude units that do not typically run during winter from every requirement in the Standard, we have concerns that this is not clearly articulated in Reliability Standard EOP-012-1. In short, we are concerned that use of the terms "continuous run," "commits or is obligated to serve" and "four hours or more," as well as the enumerated exemptions, obfuscates the extent of applicability of Reliability Standard EOP-012-1 and may not ensure that compliance is required for all "generating units that are being depended on to operate in cold weather and on which the reliability of the system depends."[92] Therefore, we direct NERC, pursuant to FPA section 215(d)(5), to modify Reliability Standard EOP-012-1 to ensure that it captures all bulk electric system generation resources needed for reliable operation and excludes only those generation resources not relied upon during freezing conditions.[93] As the directive is to clarify the language of the applicability section to align with NERC's explanation of the entities that should comply, there should be no need for additional implementation time. Therefore, NERC should ensure the modified applicability is implemented as of the effective date of Reliability Standard EOP-012-1.

59. Given the lack of clarity in the proposed applicability criteria for EOP-012-1, we are concerned that the standard could apply to significantly fewer generators than the existing Reliability Standard EOP-011-2 Requirements R7 and R8. Thus, as Reliability Standard EOP-011-2 requirements to implement and maintain cold weather preparedness plan(s) and associated training applies to all bulk electric system generating units, we defer our decision on whether to approve or modify NERC's proposed implementation date for Reliability Standard EOP-011-3 (and proposed retirement of Reliability Standard EOP-011-2) until NERC submits its revised applicability section for EOP-012. Allowing these requirements to remain mandatory and enforceable will ensure all bulk electric system generating units are required to maintain cold weather preparedness plans until such time as the revised applicability criteria are effective for EOP-012.

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[92] *Id.* at 30.

[93] 16 U.S.C. § 824o(d)(5) (stating that the Commission, "upon its own motion or upon complaint, may order the Electric Reliability Organization to submit to the Commission a proposed reliability standard or a modification to a reliability standard that addresses a specific matter if the Commission considers such a new or modified reliability standard appropriate to carry out this section").

60. Furthermore, we are concerned that the proposed applicability criteria for EOP-012-1 and retirement of EOP-011-2 Requirements R7 and R8 will eliminate valuable information on cold weather preparedness of generating units that typically do not operate during the winter. Under EOP-011-2, all bulk electric system generating units must identify in cold weather preparedness plan(s) "[g]enerating unit(s) cold weather data" including "[g]enerating unit(s) operating limitations in cold weather" and "[g]enerating unit(s) minimum . . . design temperature . . . historical operating temperature . . . or current cold weather performance temperature determined by an engineering analysis." This data is to be exchanged with the reliability coordinator, transmission operator, and balancing authority for planning and operations. The November 2021 Report stated that "[t]he intent behind requiring [generator owners] to identify and share with the [balancing authorities] and [transmission operators] the expected limitations of their generating units 'during local forecasted cold weather,' is to prevent grid operators from being surprised when large numbers of generating units that had committed to run are unable to do so during cold weather events."[94] Once EOP-012-1 goes into effect, and EOP-011-2 Requirements R7 and R8 are retired, we are concerned that generating units that do not typically operate during the winter will no longer provide this information to reliability coordinators, transmission operators, and balancing authorities. The loss of this information concerns us as the proposed applicability of EOP-012-1 recognizes that units that do not typically run during the winter may be called upon during emergencies. We therefore direct NERC to modify EOP-012-1 to ensure that this information remains available.

3. The allowance of exceptions for generator owner-defined technical, commercial, or operational constraints

a. NERC Petition

61. Requirement R1 of EOP-012-1 requires a generator owner to either implement freeze protection measures on its existing units that provide capability to operate for a period of not less than 12 continuous hours at the Extreme Cold Weather Temperature for the unit or "[e]xplain in a declaration any technical, commercial, or operational constraints that preclude the ability" to comply with the requirement.[95] Similarly, Requirement R7 mandates that a generator owner implement each corrective action plan developed pursuant to Requirements R2, R4, or R6 "or explain in a declaration why corrective actions are not being implemented due to any technical, commercial, or operational constraint as defined by the Generator Owner."[96]

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[94] November 2021 Report at 190-91.

[95] NERC Petition Ex A-2, at 4.

[96] *Id.* at 4-6.

b. Comments

62. Several commenters assert that the Requirements R1 and R7 in Reliability Standard EOP-012-1 could benefit from increased clarity. EPSA/PJM Group, NEPGA, and the ISO/RTO Council assert that the generator owner declaration of constraints outlined in Requirement R1 and Requirement R7 are overly broad and that there is no explanation of what technical, commercial, or operational constraints would be permissible for generator owners to avoid both the implementation of freeze protection measures and a corrective action plan.[97] Specifically, EPSA/PJM Group contend that the broad discretion towards generator owners to identify constraints in Requirements R1 and R7 may lead to generator owners avoiding the implementation of freeze protection measures (to lower their costs), thereby negatively interfering with competition.[98] The ISO/RTO Council states that this generator owner discretion to determine what constraints are valid without oversight could make enforcement difficult.[99] Similarly, Invenergy argues that this discretion could lead to uneven implementation and enforcement.[100] TCPA also requests that the Commission clarify that a lack of cost recovery is a commercial constraint to implementing Requirement R1 and R7.[101] Finally, commenters point out that there is no indication in the Standard of which entity should receive the declaration of constraints from the generator owner, if any.[102]

63. NERC, in its reply comments, states that provisions criticized by commenters including the "constraints" provision represents a balancing of competing opinions raised in the standards development process. NERC opines that the petition provides a sound technical basis for approving the Standards as filed, and reiterates that during the second phase project, "NERC may propose further changes to enhance the clarity or effectiveness of the EOP-012 standard."[103]

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[97] EPSA/PJM Group Comments at 7-9; ISO/RTO Council Comments at 10; NEPGA Comments at 7-8.

[98] EPSA/PJM Group Comments at 7-9.

[99] ISO/RTO Council Comments at 10-11.

[100] Invenergy Comments at 8.

[101] TCPA Comments at 2-3, 7-8.

[102] *E.g.*, ISO/RTO Council Comments at 10.

[103] NERC Reply Comments at 13.

c. Commission Determination

64. We share commenters' concerns regarding the uncertainty created by the proposed technical, commercial, or operational constraint provisions in Requirements R1 and R7, and that without criteria to guide the generator owners, or guardrails on what constitutes a legitimate technical, commercial, or operational constraint, entities may either benefit financially by avoiding the purpose of the Standard altogether or have declarations without auditable elements.[104] Indeed, instead of implementing freeze protection measures, Requirement R1 allows an entity to explain in a declaration the constraints that preclude the ability to comply. Requirement R7 allows an entity to explain in a declaration any technical, commercial, or operational constraints as defined by the generator owner that prevent its implementation of corrective actions set forth in a corrective action plan pursuant to Requirements R2, R4 and R6. We are also concerned that a generator owner may make the determination without informing planning and operational entities (i.e., the reliability coordinator or balancing authority) that are expecting the reliable operation of the generating unit to its Extreme Cold Weather Temperature.

65. The Commission has previously encountered similar concerns regarding the vagueness and enforceability of Reliability Standards language. For example, in Order No. 693 the Commission approved Reliability Standards while also expressing concern that the term "sabotage" was too ambiguous.[105] Similarly, in Order No. 791 (approving Version 5 of the CIP Standards), the Commission raised concerns with vague language that required entities to "identify, assess, and correct" deficiencies. The Commission determined that the ambiguities resulted in an "unacceptable amount of uncertainty" and directed NERC to remove the ambiguous language and develop modifications within one year.[106] In both Order No. 693 and Order No. 791, the Commission approved NERC's proposed Reliability Standards as an improvement to reliability, while directing NERC to submit modifications to the Standards addressing the Commission's concern regarding vagueness of particular language. We conclude that a similar approach is appropriate in the immediate proceeding, given the improvements offered by Reliability Standard EOP-012-1 in addressing Bulk-Power System reliability during extreme cold weather events.

66. Accordingly, we direct NERC, pursuant to section 215(d) of the FPA, to develop and submit modifications to Reliability Standard EOP-012-1 Requirements R1 and R7 to address concerns related to the ambiguity of generator-defined declarations of technical, commercial, or operational constraints that preclude a generator owner from

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[104] *See, e.g.,* ISO/RTO Comments at 10 (cautioning that the "broad undefined 'commercial' exemption could lead to the exception swallowing the rule").

[105] Order No. 693, 118 FERC ¶ 61,218 at PP 1, 461.

[106] *See* Order No. 791, 145 FERC ¶ 61,160 at PP 49-53, 67, 69.

implementing the appropriate freeze protection measures and to ensure that the constraint declarations may not be used to opt-out of compliance with the Standard or obligations set forth in a corrective action plan. Specifically, we direct NERC to include auditable criteria on permissible constraints and to identify the appropriate entity that would receive the generator owners' constraint declarations under EOP-012-1 Requirements R1 and R7. We direct NERC to submit the revised Reliability Standard no later than 12 months after the date of issuance of this order.

67. TCPA requests that the Commission clarify that a "lack of cost recovery" is a commercial constraint to implementing Requirement R1 and R7.[107] TCPA argues that the ability of transmission service providers and others to receive regulated rates of return creates an uneven playing field for independent generation.[108] We decline to grant TCPA's proposed clarification. Granting TCPA's requested clarification would be tantamount to a blanket waiver for all generators that do not currently recover their costs through cost-of-service rates.[109] We believe it would be inappropriate to allow entities participating in competitive wholesale electric markets to simply opt-out of reliability improvements offered by NERC's proposal because they lack a dedicated cost recovery mechanism.

68. Additionally, to provide the Commission with an ongoing assessment of the risk to the Bulk-Power System, we direct that NERC assess the implementation of the declarations through annual informational data submittals filed with the Commission, discussed in more detail in section 8.

4. The calculation of the Extreme Cold Weather Temperature at which a generating unit must be capable of performing

a. NERC Petition

69. NERC proposes to define the term Extreme Cold Weather Temperature as equal to the lowest 0.2 percentile of the hourly temperatures measured in December, January, and February from January 1, 2000, through the date the temperature is calculated.[110] According to NERC, a statistical approach using modern weather data would advance

[107] TCPA Comments at 2-3, 7-8 (recommending that commercial constraints be expanded to include economic issues).

[108] *Id.* at 2.

[109] This order discusses cost recovery mechanisms in more detail in section 5.

[110] *Id.* at 24.

the reliability of the Bulk-Power System while also avoiding being overly burdensome for those responsible for compliance.[111]

b. Comments

70. Some commenters express concern with the Extreme Cold Weather Temperature definition.[112] The ISO/RTO Council argues that only examining historical data from the year 2000 forward risks unnecessarily limiting the range of possible cold weather scenarios that the Standard is intended to address, and proposes an alternate calculation method.[113] NEPGA/EPSA/PJM Group counters that the ISO/RTO Council's proposed revisions materially change Reliability Standard EOP-012-1, and should the Commission adopt the ISO/RTO proposal, then efforts to comply with EOP-012-1 "as drafted" could be potentially futile.[114] Invenergy asserts that the Extreme Cold Weather Temperature definition is arbitrary because NERC did not measure the definition against any objective standard to ensure reliable operation.[115] Invenergy adds that the Extreme Cold Weather Temperature should be calculated by NERC and its Regional Entities to prevent uneven implementation and enforcement.[116] Invenergy also argues that it is unreasonable that the proposed Extreme Cold Weather Temperature "will be heavily influenced by the colder nighttime temperatures, when there is no solar generation."[117]

c. Commission Determination

71. As noted above, the Extreme Cold Weather Temperature is equal to the lowest 0.2 percentile of the hourly temperatures measured in December, January, and February from January 1, 2000, through the date the temperature is calculated.[118] This method of determining the Extreme Cold Weather Temperature is a statistical approach, using the

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[111] *Id.* at 25-27 (relying on the Modernization and Associated Restructuring from the National Weather Service, which has higher quality, more granular temperature data in more locations).

[112] NEPGA/EPSA/PJM Group Answer at 3-4; ISO/RTO Comments at 6.

[113] ISO/RTO Council Comments at 7-9.

[114] NEPGA/EPSA/PJM Group Answer at 3-8 (requesting that the Commission *not* adopt the ISO/RTO Council's alternative Extreme Cold Weather Temperature proposal).

[115] Invenergy Comments at 7-8.

[116] *Id.* at 8.

[117] *Id.* at 7-8.

[118] NERC Petition at 24.

cumulative distribution of historical temperatures to determine the 0.2 percentile historical temperature. NERC's petition explains it relied on the Modernization and Associated Restructuring from the National Weather Service, which has higher quality and more granular temperature data in more locations, being completed in the year 2000 to justify the elimination of all pre-2000 historical weather data from consideration.[119]

72. We find that NERC's Extreme Cold Weather Temperature definition represents a reasonable starting point for reducing the level of risk. The use of the Extreme Cold Weather Temperature to establish a specific level of required freeze protection for resources is also a significant improvement over the current cold weather Reliability Standards, which contain no minimum temperature operating requirements.[120] With respect to the 0.2 threshold, we believe that NERC reasonably balanced a number of competing factors in setting the Extreme Cold Weather Temperature.[121] Similarly, while we agree with the ISO/RTO Council that additional data sources may be available, we find that NERC's consideration of data availability and its determination to rely on meteorological data starting in the year 2000 is reasonable. Similarly, as the Extreme Cold Weather Temperature definition is meant to apply uniformly regardless of generation type, we do not find it unreasonable that solar generators would need to meet an Extreme Cold Weather Temperature based on 24-hour-temperature data.[122]

73. Although we agree that NERC could have adopted other, potentially more robust approaches to defining the Extreme Cold Weather Temperature, we believe that other factors such as application, inspection, and maintenance of the freeze protection measures and the associated training of generator owners or generator operators that perform these actions (all of which are requirements in the proposed Standard) should reasonably improve reliable operation of the Bulk-Power System. Further, recognizing that extreme cold weather temperatures could drop below the Extreme Cold Weather Temperature during future events, the need for periodic Extreme Cold Weather Temperature review[123]

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[119] *Id.* at 25-27.

[120] *See Order Approving Cold Weather Reliability Standards*, 176 FERC ¶ 61,119, at P 1.

[121] NERC Petition at 130 (relying on this approach to ensure that the Extreme Cold Weather Temperature does not result in an overly conservative design or preclude the generator owner from using historical operating data to show compliance).

[122] *See* Invenergy Comments at 7-8.

[123] Reliability Standard EOP-012-1 already mandates a five-year Extreme Cold Weather Temperature re-calculation and updates to corrective actions where warranted.

and updates[124] based on the new cold weather temperatures will help mitigate freezing issues over time, which could lessen the risk of freeze-related outages not being subject to corrective action plans.

74. Accordingly, we are not persuaded by commenters that modification to NERC's Extreme Cold Weather Temperature definition is warranted at this time. Nevertheless, based on the concerns expressed above, we direct that NERC assess the implementation of the definition through event-based informational data submittals filed with the Commission, discussed in more detail in section 8. Based on the results of NERC's informational data submittals to the Commission, the Commission will determine whether future modification to the Extreme Cold Weather Temperature definition is warranted.

5. The absence of a deadline by which generator owners must implement the new or modified freeze protection measures required by their corrective action plans

a. NERC Petition

75. Requirement R7 of EOP-012-1 mandates that a generator owner implement each corrective action plan developed pursuant to Requirements R2, R4, or R6, or "explain in a declaration why corrective actions are not being implemented due to any technical, commercial, or operational constraint as defined by the Generator Owner."[125] Requirement R7 also requires that the generator owner update each corrective action plan if the actions or timetables change, until the corrective action plan implementation is completed. But Reliability Standard EOP-012-1 does not include a deadline for the implementation completion of such plans.

b. Comments

76. Some commenters express concern with Requirement R7 and the implementation timeline for generator owner-developed corrective action plans.[126] Specifically, the ISO/RTO Council requests modification because Requirement R7 does not explain when the implementation of the developed corrective action plans should occur.[127] The ISO/RTO Council also argues that it is unclear to which entity or entities the generator

[124] The proposed Standard requires updates regardless of the Extreme Cold Weather Temperature methodology used.

[125] NERC Petition at 43.

[126] *See, e.g.*, ISO/RTO Council Comments at 10-11; TCPA Comments at 4, 6.

[127] ISO/RTO Council Comments at 11.

owner is supposed to provide its corrective action plan.[128] TCPA asserts that it is unclear from EOP-012-1 when the corrective actions outlined in the developed corrective action plans should be completed.[129]

c. Commission Determination

77. The NERC Glossary defines a "corrective action plan" as used in EOP-012-1 as a "list of actions and an associated timetable for implementation to remedy a specific problem."[130] As such, the "corrective action plan[s]" in EOP-012-1 are required to contain a timetable for implementation completion and entities are required to implement actions consistent with the timelines defined in the corrective action plan under Requirement R7. While entities are required to adhere to the timelines as defined in their corrective action plans, some Reliability Standards establish a maximum time for completion while others do not. For example, the Commission directed NERC to add specific timelines for the completion of corrective action plans to mitigate geomagnetic disturbances in Reliability Standard TPL-007-1 (Transmission System Planned Performance for Geomagnetic Disturbance Events).[131] In contrast, the Commission has approved other Reliability Standards requiring a corrective action plan that do not require a specific deadline for the completion of the corrective action plan.[132]

78. In this instance, despite the lack of a deadline for completion, we find it appropriate to approve the Standard while also directing modification. We are persuaded that modifying the Standard to include a maximum time for implementation completion is reasonable for several reasons. First, having a requirement to implement a corrective action plan by a date certain will provide a significant level of risk reduction compared to

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[128] *Id.* at 10.

[129] TCPA Comments at 6.

[130] NERC Petition at 1013.

[131] *Reliability Standard for Transmission Sys. Planned Performance for Geomagnetic Disturbance Events*, Order No. 830, 156 FERC ¶ 61,215, at PP 101-04 (2016), *reh'g denied,* Order No. 830-A, 158 FERC ¶ 61,041 (2017) (directing NERC to modify TPL-007-1 to include a two-year deadline after the development of a CAP to complete the implementation of non-hardware mitigation and a four-year deadline to complete hardware mitigation).

[132] *See, e.g.*, PRC-004-6 (Protection System Misoperation Identification and Correction), Requirement R5 (requiring each transmission owner, generator owner, and distribution owner that owns a protection system component that caused misoperation to develop a corrective action plan or explain in declaration why corrective actions are beyond the entity's control).

the status quo. Second, the requirement to implement a corrective action plan and to identify any temporary operating limitations or effects to the cold weather preparedness plan that would apply to entities until the execution of the corrective actions by a date certain is an improvement to the Reliability Standards.[133] Finally, we do not find persuasive NERC's explanation that competition for expert resources and supply chain challenges may make setting a specific, uniform corrective action plan timeline for all generating units difficult. The November 2021 Report recommends that NERC's standard drafting team establish a maximum date that corrective action plans must be completed.[134] Otherwise, without a maximum time for implementation, we are concerned that the time it takes to complete the corrective action plans could allow identified issues to remain unresolved for a significant period.

79. Accordingly, we direct NERC pursuant to FPA section 215(d)(5) to modify Reliability Standard EOP-012-1 to address concerns related to the lack of an implementation timeframe for corrective action plans. Specifically, we direct NERC to include in the Standard a deadline or maximum period for the implementation completion of corrective action plans under the Standard. We direct NERC to submit the revised Reliability Standard no later than 12 months after the date of issuance of this order.

6. Cost Recovery Mechanisms

a. NERC Petition

80. Reliability Standard EOP-012-1 does not address cost recovery mechanisms. However, NERC's petition recognizes that generator owners can recover costs through markets or cost recovery mechanisms approved by the state public utility commissions.[135]

b. Comments

81. Some commenters assert that Reliability Standard EOP-012-1 should address cost recovery.[136] TCPA asserts that the lack of a cost recovery for competitive generators is a commercial constraint to compliance with EOP-012-1 and requests that the Commission say so in its order.[137] The ISO/RTO Council asks the Commission to remove the

[133] *Id.* Ex. A-2 at 6-7.

[134] November 2021 Report at 187 (Key Recommendation 1d).

[135] NERC Petition at 44 (citing to November 2021 Report at 191-92).

[136] *See, e.g.*, EPSA/PJM Group Comments at 10-13.

[137] TCPA Comments at 2.

commercial constraint option from EOP-012-1 altogether.[138] Invenergy argues that the November 2021 Report recognized that generators should be compensated for retrofits and that, while the NERC Reliability Standards process may not be the appropriate forum to address cost recovery, it is now incumbent on the Commission to address cost recovery for generators required to comply with EOP-012-1.[139] NEPGA contends that a market change or other cost recovery mechanism must be in place by the effective date of Reliability Standard EOP-012-1 and asks the Commission to recognize the FPA's cost recovery allowances.[140] EPSA/PJM Group ask that the Commission begin a proceeding under section 206 to address cost recovery for compliance with Reliability Standards.[141]

82. NERC and APPA/TAPS assert that cost recovery is outside the scope of what Reliability Standards can address.[142] Specifically, APPA/TAPS contend that the Commission should not act in this proceeding to provide competitive generators with a mechanism to recover cold weather Standard compliance costs because the FPA does not mandate special cost recovery mechanisms for competitive generators' section 215 compliance costs.[143] APPA/TAPS state that adopting a separate cost recovery mechanism for competitive generators' reliability compliance costs would be inconsistent with the Commission's market-based framework and could risk undercutting competitive markets.[144]

c. Commission Determination

83. We find that the question of whether existing market mechanisms provide an opportunity to recover the prudently incurred costs of compliance with the proposed Standard and the request to initiate a proceeding under FPA 206 are outside the scope of the instant proceeding.

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[138] ISO/RTO Council Comments at 10.

[139] Invenergy Comments at 11-13.

[140] NEPGA Comments at 2, 4-6.

[141] EPSA/PJM Group Comments at 11, 13 (proffering that the Commission could issue a show cause order pursuant to FPA section 206 to ensure that each ISO and RTO have cost recovery mechanisms in place).

[142] NERC Reply Comments at 10; APPA/TAPS Answer at 2-9.

[143] APPA/TAPS Answer at 2-8.

[144] *Id.* at 8-9.

7. Other Technical Matters

a. Comments

84. Commenters raise other technical concerns touching on a variety of elements of the Standard. For example, the ISO/RTO Council argues that NERC's implementation plan may "discourage earlier compliance" and that the Commission should enact a shorter implementation plan along with an exception process for generator owners that may "legitimately need more time."[145] The ISO/RTO Council recommends revising the "Generator Cold Weather Reliability Event" definition to account for generating units rated at or below 200 MW.[146] The ISO/RTO Council also expresses concern that corrective action plans under the Standard only apply when the unit is unable to operate at or above the Extreme Cold Weather Temperature.[147] Additionally, the ISO/RTO Council questions how EOP-012-1 interacts with tariff requirements.[148]

85. EPSA/PJM Group requests that Requirements R1 and R2 be removed from EOP-012-1 and be replaced with a requirement that balancing authorities instead ensure weather-resilient generation.[149] For Reliability Standard EOP-012-1 Requirement R1, TAPS requests that compliance with the phrase "provide the capability to operate" be based on sound engineering judgment, meaning subsequent failures during cold weather not automatically lead to a violation since cold weather events cannot be simulated ahead of time.[150]

86. TCPA requests clarification of when the five-year clock in Requirement R4 begins and explanation how Requirement R7 requirement for corrective action plans could be effective 18 months after government approval when the standards for which the corrective action plans would address (i.e., Requirements R2 and R4) are not effective until 60 and 78 months after government approval.[151] TCPA suggests that generator owners only be required to provide annual compliance progress reports.[152] TCPA also

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[145] ISO/RTO Council Comments at 15-16.

[146] *Id.* at 16-17.

[147] *Id.* at 11-12.

[148] *Id.* at 13-15.

[149] EPSA/PJM Comments at 2.

[150] TAPS Comments at 5-6.

[151] TCPA Comments at 6.

[152] *Id.*

raises issue with EOP-012-1's violation severity level's lack of differentiation between single and multiple facilities.[153] Invenergy suggests revising NERC's "Generator Cold Weather Reliability Event" definition to align better with the bulk electric system definition to ensure that corrective action plans are only required when an actual Cold Weather Reliability Event occurs.[154] Invenergy and TCPA recommend eliminating the term "continuous" from EOP-012-1 Requirement R1 to reflect variable generation and that solar and wind plants are unable to operate continuously.[155]

87. NERC asserts that it is presently in phase two of its standard development process and that its standard drafting team is presently considering many of the issues raised in connection with this proceeding.[156] NERC encourages commenters in this proceeding to continue participating in NERC's standard development process so that their issues and concerns can be addressed.

b. Commission Determination

88. We share concerns with commenters regarding the implementation period of Reliability Standard EOP-012-1, although we acknowledge NERC's assertion that the time is necessary for generator owners to calculate the Extreme Cold Weather Temperature for each generating unit, to identify Generator Cold Weather Critical Components, and to perform the necessary engineering studies and analyses to identify and implement freeze protection measures that would provide for the required performance capability or to explain why such measures are precluded by technical, commercial, or operational constraints. To address these concerns, we direct NERC to revise EOP-012 to require a shorter implementation period and staggered implementation for unit(s) in a generator owner's fleet.[157] Such an approach will reduce reliability risks more quickly. Although we are giving NERC the discretion to determine what the effective date should be shortened to, we also emphasize that industry has been aware of and alerted to the need to prepare their generating units for cold weather since at least 2011. NERC should consider the amount of time that industry has already had to implement freeze protection measures when determining the appropriate shorter implementation period. We direct NERC to submit the revised implementation to

[153] *Id.* at 7.

[154] Invenergy Comments at 2, 5-6.

[155] *Id.* at 2, 9-10; TCPA Comments at 5.

[156] NERC Reply Comments at 13.

[157] *See, e.g.*, 146 FERC ¶ 61,213 at PP 1-2 (approving Reliability Standard MOD-025-2 and its associated staggered implementation plan).

Reliability Standard EOP-012-1 no later than 12 months after the date of issuance of this order.

89. For comments related to the "continuous" operation requirements of EOP-012-1, the Reliability Standard is clear that it requires generating units to be "capable" of operating continuously for 12 hours, and not that the units must actually operate when they would otherwise not be expected to operate. NERC states in its petition that the 12-hour requirement is a minimum.[158] However, we find the phrase "continuous operation" to be confusing and subject to conflicting interpretations. We also note that it creates confusion as to whether certain generating units can ever be capable of compliance. As Invenergy states, "solar generators are not capable of operating in a 12-hour period that extends beyond daylight hours, and, typically when there are freezing temperatures, the sun does not even shine for 12 hours."[159] And while Invenergy states that the "Standard Drafting Team indicated that the freeze protection measures must provide the level of protection that would allow for 12 continuous hours if the sun were to shine or the wind were to blow for the period,"[160] the Reliability Standard Requirements in EOP-012-1 do not specify that.[161] Thus, we direct NERC to modify the Standard to clarify Reliability Standard EOP-012-1 Requirement R1 to ensure that generators that are technically incapable of operating for 12 continuous hours (e.g., solar facilities during winter months with less than 12 hours of sunlight) are not excluded from complying with the Standard. We direct NERC to submit the revised Reliability Standard no later than 12 months after the date of issuance of this order.

90. We also find that the one-hour continuous operations requirement in Reliability Standard EOP-012-1 Requirement R2 is too short of a period to adequately meet the purpose of the Standard to ensure generating units "mitigate the reliability impacts of

[158] Reliability Standard EOP-012-1 does not restrict longer duration commitments of generating units, whether based on tariff commitments, emergencies, or other conditions. *See* NERC Petition Ex. C-2 at 5 (explaining that the intent of Requirement R1 is to implement freeze protection measures such that facilities are capable of continuous operation *for not less than* 12 hours) (emphasis added).

[159] Invenergy Comments at 9.

[160] *Id.*

[161] Order No. 693, 118 FERC ¶ 61,218 at P 253 ("The most critical element of a Reliability Standard is the Requirements. As NERC explains, 'the Requirements within a standard define what an entity must do to be compliant . . . [and] binds an entity to certain obligations of performance under section 215 of the FPA.'").

extreme cold weather"[162] Thus, we direct NERC to modify the one-hour continuous operations requirement of Reliability Standard EOP-012-1 Requirement R2 to better align with the stated purpose of the Reliability Standard EOP-012-1. We direct NERC to submit the revised Reliability Standard no later than 12 months after the date of issuance of this order.

91. We find that it is premature to address TCPA's recommendation that generator owners only submit annual progress reports on compliance.[163] Nothing in proposed Reliability Standard EOP-012-1 mandates the submission of compliance reports and we are already directing NERC to address periodic data submittals in this order.

92. Finally, for suggested revisions to NERC's "Generator Cold Weather Reliability Event" definition to align better with the bulk electric system definition, and requests that Requirements R1 and R2 be removed from EOP-012-1 and be replaced with a requirement that balancing authorities instead ensure weather-resilient generation,[164] we decline to direct such modifications at this time.

8. Annual and Event-based Data Submittals

93. NERC states that it plans to address data submittal requirements in phase two of its standard development process.[165] We find that such data submittals are essential to assess the performance of the Standards towards assuring the reliability of the Bulk-Power System. Specifically, we find that additional data and analysis is necessary to address the uncertainty created by the proposed technical, commercial, or operational constraint provisions, as discussed above in section 3. This data and analysis are essential to assess how the generating units' freeze protection measures (implemented to provide capability to operate at the Extreme Cold Weather Temperature) perform in future extreme cold weather events, as discussed above in section 4.

94. Accordingly, we direct that NERC, pursuant to section 39.2(d) of the Commission's regulations, work with Commission staff to develop and submit a plan within 12 months of the issuance of this order explaining how it will gather data and submit an analysis that will allow the Commission to understand the efficacy of, and monitor the ongoing risk posed by: (1) proposed technical, commercial, or operational

[162] NERC Petition at 29 (noting that freeze protection measures of the Standard would advance the reliability of the Bulk-Power System by helping to improve generator reliability in cold weather).

[163] TCPA Comments at 5.

[164] EPSA/PJM Comments at 2.

[165] NERC Petition at 54-55.

constraint provisions in EOP-012-1, Requirements R1, R6, and R7; and (2) actual performance of freeze protection measures during future extreme cold weather events.

95. Regarding the proposed technical, commercial, or operational constraint provisions in EOP-012-1, Requirements R1, R6, and R7, NERC should work with Commission staff on the details of timing and what to include in its plan, which, at a minimum, should include collection of the following data: (1) the generating units that have declared constraints under EOP-012-1 and the megawatts of generation that they represent, organized by fuel type; (2) the megawatts of generation for which declarations have been made for each type of constraint (technical, commercial, or operational), organized by fuel type; (3) the rationale(s) for each declaration; (4) the megawatts of generation within the generation owner/operator's fleet currently capable of operating at each unit's Extreme Cold Weather Temperature; (5) the projected megawatts for which the generator owner/operator expects to complete corrective action plans for each year; (6) the projected megawatts for which the generator owner/operator expects to implement corrective action plans for each year; and (7) the megawatts of generating units identified as "similar equipment"[166] to which the generator owner has determined that the cause(s) for the Generator Cold Weather Reliability Event are also applicable, under R6.2, while also identifying any similar equipment that will receive a declaration. To provide the Commission with an ongoing assessment of the risk to the Bulk-Power System, NERC's plan should include an annual informational filing to the Commission beginning 12 months after the mandatory and enforceable date of the Standard. The informational filing should include data on the seven foregoing categories aggregated at an appropriate level (e.g., Regional Entity, balancing authority, etc.), and an analysis of the efficacy of the requirements of the Standard based on the data. Depending on the results of NERC's data collection and analysis, the Commission will determine whether further modifications are needed to the Standard.

96. NERC's plan should also include how it will analyze the performance of generating units' freeze protection measures (implemented to provide capability to operate at the Extreme Cold Weather Temperature) in future extreme cold weather events. Depending on the results of NERC's data collection and analysis, the Commission will determine whether further modifications are needed to the definitions or the Standard.

IV. Information Collection Statement

97. The information collection requirements contained in this 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.[167] OMB's regulations require approval of certain

[166] For example, wind or solar equipment.

[167] 44 U.S.C. § 3507(d).

information collection requirements imposed by agency rules.[168] Upon approval of a collection of information, OMB will assign an OMB control number and expiration date. Comments on the collection of information are due within 60 days of the date this order is published in the *Federal Register*. Respondents subject to the filing 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. The Commission solicits comments on the Commission's need for this information, whether the information will have practical utility, the accuracy of the burden estimates, ways to enhance the quality, utility, and clarity of the information to be collected or retained, and any suggested methods for minimizing respondents' burden, including the use of automated information techniques.

98. The EOP Standards are currently located in the FERC-725S (OMB Control No. 1902-0270) collection. The collection is currently approved by OMB and contains Reliability Standards EOP-010-1, EOP-011-1, EOP-004-4, EOP 005-3, EOP-006-3, EOP-008-2 (Table 1). In Docket No. RD23-1-000, the Commission proposes to replace the current OMB approved Reliability Standard EOP-011-1[169] with Reliability Standard EOP-011-3 (Table 2) and add a new information collection line item for Reliability Standard EOP-012-1 (Table 3).

99. The number of respondents below is based on an estimate of the NERC compliance registry for balancing authorities, transmission operators, generator operators, generator owners, and reliability coordinators. Reliability Standards EOP-011-3 and EOP-012-1 apply to balancing authorities, transmission operators, generator operators, and reliability coordinators. The Commission based its paperwork burden estimates on the NERC compliance registry as of November 4, 2022. According to the registry, there are 98 balancing authorities, 168 transmission operators, 981 generator operators, 1,107 generator owners, and 12 reliability coordinators. The estimates in the tables below are based on the change in burden from the current EOP Reliability Standards to the Reliability Standards approved in this order. The Commission based the burden estimates in the tables below on staff experience, knowledge, and expertise.

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[168] 5 C.F.R. § 1320 (2021).

[169] The currently OMB approved FERC-725S includes the burden related to Reliability Standard EOP-011-1. Reliability Standard EOP-011-1 was superseded by Reliability Standard EOP-011-2, which was approved by the Commission in Docket No. RD21-5-000 (issued August 24, 2021). Reliability Standard EOP-011-3, as noted in Docket No. RD23-1-000, will supersede Reliability Standard EOP-011-2; thus, the burdens resulting from Reliability Standard EOP-011-3 will be reflected in the FERC-725S information collection.

100. The estimates in the tables below are based, in combination, on one-time (years 1 and 2) and ongoing execution (year 3) obligations to follow the revised EOP Reliability Standards.

101. The Reliability Standard EOP-011-3 modifications transfer Requirements R7 and R8 to Reliability Standard EOP-012-1, as described below. For Reliability Standard EOP-011-3, transmission operators and to a much lesser extent, balancing authorities, still have a one-time cost to modify existing operating plans based on revisions to Reliability Standard EOP-011-3 (Requirements R1 and R2) and to mitigate operating emergencies related to cold weather conditions. Additionally, reliability coordinators will need to review the modified operating plans of the transmission operators. In year three and ongoing, the transmission operator and reliability coordinator estimates are lower to reflect lower paperwork burden for upkeep and review of the operating plans for emergencies based on the modified Reliability Standard EOP-011-3 to ensure that the new requirements are in place and that applicable entities are following those plans.

102. The new Reliability Standard EOP-012-1, which is applicable to 1,107 generator owners and 981 generator operators, contains several new requirements and two requirements from Reliability Standard EOP-011-2 that have been moved to Reliability Standard EOP-012-1. In year three and ongoing, the estimates are lower to reflect that the implementation plan(s) to mitigate the reliability effects of extreme cold weather conditions on generating units are in place and that entities are familiar with the EOP-012-1 requirements.

103. Burden Estimates: The Commission estimates the changes in the annual public reporting burden and cost as indicated in the tables below:

Table 1: Current costs and burden related to FERC-725S (1902-0270)

Reliability Standard and Associated Requirement	Number of Respondents (1)	Annual Number of Responses per Respondent (2)	Total Number of Responses (1)*(2)=(3)	Average Burden & Cost Per Response (4)	Total Annual Burden & Total Annual Cost (3)*(4)=(5)	Cost per Respondent ($) (5)÷(1)
EOP-010-1						
	181	1	181	20 hrs.; $1,660	3,620 hrs.; $300,460	$1,660
EOP-011-1						

	12	1	12	1,500 hrs.; $124,500	18,000 hrs.; $1,494,000	$124,500
EOP-004-4, EOP-005-3, EOP-006-3, EOP-008-2						
	280	1	280	250.58170 hrs.; $20,798	70,162.4 hrs.; $5,234,440	$20,798
Total EOP	**473**				**91,782 hrs.; $7,028,900**	

Table 2: Proposed Changes Due to Final Rule in Docket No. RD23-1-000					
Reliability Standard & Requirement	**Type[171] and Number of Entity** (1)	**Number of Annual Responses Per Entity** (2)	**Total Number of Responses** **(1)*(2)=(3)**	**Average Number of Burden Hours per Response[172]** **(4)**	**Total Burden Hours** **(3)*(4)=(5)**

[170] Burden hours per response may also include any methods for improvement not limited to trainings, drills, simulations, testing, etc.

[171] TOP=Transmission Operator, BA=Balancing Authority, GO=Generator Owner, GOP=Generator Operator and RC=Reliability Coordinator.

[172] The estimated hourly cost (salary plus benefits) is a combination based on the Bureau of Labor Statistics (BLS), as of 2022, for 75% of the average of an Electrical Engineer (17-2071) - $77.02, mechanical engineers (17-2141) - $67.79. $77.02 + $67.79/2 = 72.405 x .75 = 54.303 ($**54.30**-rounded) **($54.30/hour)** and 25% of an Information and Record Clerk (43-4199) $42.35 x .25% = 10.5875 **($10.59** rounded) ($10.59/hour), for a total ($54.30+$10.59 = $**64.89/hour**).

FERC-725S – Proposed estimates due to RD23-1 for EOP-011-3					
One Time Estimate - Years 1 and 2 EOP-011-3					
EOP-011-3	168 (TOP)	1	168	60 hrs. $3,893.40	10,080 hrs. $654,091.2
EOP-011-3[173]	98 (BA)	1	98	6 hrs. $389.34	588 hrs. $38,155.32
EOP-011-3[174]	12 (RC)	1	12	28 hrs. $1,816.92	336 hrs. $21,803.04
Sub-total of EOP-011-3 (One time)			278		**11,004 hrs. $714,049.56**
Ongoing Estimate – Year 3 ongoing EOP-011-3					
EOP-011-3[175]	168 (TOP)	1	168	10 hrs. $648.90	1,680 hrs. $109,015.20
EOP-011-3[176]	98 (BA)	1	98	10 hrs. $648.90	980 hrs. $63,592.20

[173] Reduce the estimate for balancing authorities from EOP-011-2 down from previous 60 hours to 6 hours for EOP-011-3.

[174] Reduce the estimate for reliability coordinators from EOP-011-2 down from previous 40 hours to 28 hours for EOP-011-3.

[175] Reduce the estimate for transmission operators from EOP-011-2 down from previous 50 hours to 10 hours for EOP-011-3.

[176] Reduce the estimate for balancing authorities from EOP-011-2 down from previous 50 hours to 10 hours for EOP-011-3.

EOP-011-3[177]	12 (RC)	1	12	14 hrs. $908.46	168 hrs. $10,901.52
Sub-Total of EOP-011-3 (ongoing)			278		2,828 $183,508.92
Sub-Total of ongoing burden averaged over three years			92.67 (rounded)		942.67 hrs. (rounded) $61,169.64
Proposed Total Burden Estimate of EOP-011-3			**370.67**		**11,946.67 hrs.** **$775,219.42** (rounded)

Table 3: Proposed Changes Due to Final Rule in Docket No. RD23-1-000 for EOP-012-1					
Reliability Standard & Requirement	**Type and Number of Entity**	**Number of Annual Responses Per Entity**	**Total Number of Responses** **(1)*(2)=(3)**	**Average Number of Burden Hours per Response[178]**	**Total Burden Hours** **(3)*(4)=(5)**

[177] Reduce the estimate for reliability coordinators from EOP-011-2 down from previous 20 hours to 14 hours for EOP-011-3.

[178] The estimated hourly cost (salary plus benefits) is a combination based on the Bureau of Labor Statistics (BLS), as of 2022, for 75% of the average of an Electrical Engineer (17-2071) - $77.02, mechanical engineers (17-2141) - $67.79. $77.02 + $67.79/2 = 72.405 x .75 = 54.303 ($**54.30**-rounded) **($54.30/hour)** and 25% percent of an Information and Record Clerk (43-4199) $42.35 x .25% = 10.5875 **($10.59** rounded) ($10.59/hour), for a total ($54.30+$10.59 = $**64.89/hour**).

	(1)	(2)		(4)	
FERC-725S					
One Time Estimate - Years 1 and 2 EOP-012-1					
EOP-012-1[179]	1,107 (GO)	1	1,107	150 hrs. $9,733.50	166,050 hrs. $10,774,984.50
EOP-012-1	981 (GOP)	1	981	10 hrs. $648.90	9,810 hrs. $636,570.90
Sub-Total for EOP-012-1 (one-time)			2,088	160 hrs. $10,382.40	175,860 hrs. $11,411,555.40
Ongoing Estimate – Year 3 ongoing EOP-012-1					
EOP-012-1	1,107 (GO)	1	1,107	40 hrs. $ 2,595.60	40,680 hrs. $ 2,639,725.20
EOP-012-1	981 (GOP)	1	981	10 hrs. $648.90	9,810 hrs. $ 636,570.90
Sub-Total for EOP-012-1 (ongoing)			2,088	50 hrs. $ 3,244.50	50,490 hrs. $ 3,276,296.10
Sub-Total of ongoing burden averaged over three years			696		16,830 hrs. $1,092,098.70
Proposed Total			**2,784**		**192,690 hrs. $12,503,654.10**

[179] The estimates for the generator owner and generator operator are being moved from the current EOP-011-2 to the new EOP-012-1.

Burden Estimate of EOP-012-1					
Changes to FERC 725S by RD23-1-000					
FERC-725S Modification	**Current Inventory (hours)**	**Current Inventory (responses)**	**Total Change Due to RD23-1-000**		
Removal of EOP-011-1	18,000 hrs.	12	-18,000 hrs. -12 responses		
Updates to EOP-011-3	-	-	+11,946.67 hrs. +370.67 responses		
Addition of EOP-012-1	-	-	+**192,690** hrs. +2,784 responses		

Titles: FERC-725S, Mandatory Reliability Standards for the Bulk-Power System; EOP Reliability Standards.

Action: Modifications to Existing Collections of Information in FERC-725S.

OMB Control Nos: 1902-0270 (FERC-725S).

Respondents: Business or other for profit, and not for profit institutions.

Frequency of Responses: On occasion (and proposed for deletion).

Necessity of the Information: Reliability Standards EOP-011-3 (Emergency Operations), and EOP-012-1 (Extreme Cold Weather Preparedness and Operations) are part of the implementation of 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. Specifically, the revised and new Reliability Standards ensure that generating resources are prepared for local cold weather events and that entities will effectively communicate the information needed for operating the Bulk-Power System.

Internal review: The Commission has reviewed NERC's proposal and determined that its action is necessary to implement section 215 of the FPA.

104. Interested persons may obtain information on the reporting requirements by contacting the Federal Energy Regulatory Commission, Office of the Executive Director, 888 First Street, NE, Washington, DC 20426 [Attention: Ellen Brown, e-mail: DataClearance@ferc.gov, phone: (202) 502-8663, fax: (202) 273-0873].

105. Comments concerning the information collections and requirements approved for retirement in this Final Rule and the associated burden estimates, should be sent to the Commission in this docket and may also be sent to the Office of Management and Budget, Office of Information and Regulatory Affairs [Attention: Desk Officer for the Federal Energy Regulatory Commission]. For security reasons, comments should be sent by e-mail to OMB at the following e-mail address: oira_submission@omb.eop.gov.

V. Document Availability

106. 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.

107. 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.

108. User assistance is available for eLibrary and the Commission's website during normal business hours from the Commission's Online Support at (202) 502-6652 (toll free at 1-866-208-3676) or email at ferconlinesupport@ferc.gov, or the Public Reference Room at (202) 502-8371, TTY (202) 502-8659. E-mail the Public Reference Room at public.referenceroom@ferc.gov.

The Commission orders:

(A) Reliability Standards EOP-011-3 and EOP-012-1, the associated violation risk factors and violation severity levels, and the newly defined terms Generator Cold Weather Critical Component, Extreme Cold Weather Temperature, and Generator Cold Weather Reliability Event, are hereby approved, as discussed in the body of this order.

(B) NERC is hereby directed to develop and submit, within 12 months of the date of issuance of this order, modifications to Reliability Standard EOP-012-1 as discussed in the body of this order.

(C) NERC is hereby directed to work with Commission staff to submit a plan no later than 12 months after the date of issuance of this order on how it will collect and assess data prior to and on the implementation of the following elements of Reliability Standard EOP-012-1: (1) generator owner declared constraints and explanations thereof; and (2) the adequacy of the Extreme Cold Weather Temperature definition, as discussed in the body of this order.

(D) NERC is hereby directed to assess annual and event-based data submittals to address the following elements of Reliability Standard EOP-012-1: (1) generator owner declared constraints and explanations thereof; and (2) the adequacy of the Extreme Cold Weather Temperature definition, and to submit periodic reports to the Commission providing the results of the assessments, as discussed in the body of this order.

By the Commission.

(S E A L)

Kimberly D. Bose,
Secretary.