

June 25, 2021

VIA ELECTRONIC FILING

Michael Law
President and Chief Executive Officer
Alberta Electric System Operator
2500, 330 - 5 Avenue SW
Calgary, Alberta
T2P 0L4

RE: *North American Electric Reliability Corporation*

Dear Mr. Law:

The North American Electric Reliability Corporation (“NERC”) hereby submits Notice of Filing of the North American Electric Reliability Corporation of Proposed Reliability Standards EOP-011-2, IRO-010-4, and TOP-003-5. NERC requests, to the extent necessary, a waiver of any applicable filing requirements with respect to this filing.

NERC understands the AESO may adopt the proposed reliability standards subject to Alberta legislation, principally as established in the *Transmission Regulation* (“the T Reg.”). Briefly, it is NERC’s understanding that the T Reg. requires the following with regard to the adoption in Alberta of a NERC Reliability Standard:

1. The AESO must consult with those market participants that it considers are likely to be directly affected.
2. The AESO must forward the proposed reliability standards to the Alberta Utilities Commission for review, along with the AESO’s recommendation that the Commission approve or reject them.
3. The Commission must follow the recommendation of the AESO that the Commission approve or reject the proposed reliability standards unless an interested person satisfies the Commission that the AESO’s recommendation is “technically deficient” or “not in the public interest.”

Further, NERC has been advised by the AESO that the AESO practice with respect to the adoption of a NERC Reliability Standard includes a review of the NERC Reliability Standard for applicability to Alberta legislation and electric industry practice. NERC has been advised that, while the objective is to adhere as closely as possible to the requirements of the NERC Reliability Standard, each NERC Reliability Standard approved in Alberta (called an “Alberta reliability standard”) generally varies from the similar and related NERC Reliability Standard.

1325 G Street NW Suite 600
Washington, DC 20005
202-400-3000 | www.nerc.com

NERC requests the AESO consider the adoption of Proposed Reliability Standards EOP-011-2, IRO-010-4, and TOP-003-5 as set forth in the filing in Alberta as an “Alberta reliability standard(s),” subject to the required procedures and legislation of Alberta.

Please contact the undersigned if you have any questions concerning this filing.

Sincerely,

/s/ Lauren Perotti

Lauren Perotti
*Senior Counsel for the North American Electric
Reliability Corporation*

**BEFORE THE
ALBERTA ELECTRIC SYSTEM OPERATOR**

**NORTH AMERICAN ELECTRIC)
RELIABILITY CORPORATION)**

**NOTICE OF FILING OF THE
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION OF PROPOSED
RELIABILITY STANDARDS EOP-011-2, IRO-010-4, AND TOP-003-5**

Lauren A. Perotti
Senior Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099 – facsimile
lauren.perotti@nerc.net

*Counsel for the North American Electric
Reliability Corporation*

June 25, 2021

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**BEFORE THE
ALBERTA ELECTRIC SYSTEM OPERATOR**

**NORTH AMERICAN ELECTRIC)
RELIABILITY CORPORATION)**

**NOTICE OF FILING OF THE
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION OF PROPOSED
RELIABILITY STANDARDS EOP-011-2, IRO-010-4, AND TOP-003-5**

The North American Electric Reliability Corporation (“NERC”) hereby submits three proposed Reliability Standards: proposed 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) (collectively, the “Cold Weather Reliability Standards”).

The proposed Cold Weather Reliability Standards mark an important milestone in NERC’s longstanding efforts to reduce the risks posed by cold weather to the reliability of the Bulk-Power System.¹ As discussed more fully herein, the proposed Cold Weather Reliability Standards would advance the reliability of the Bulk-Power System by requiring generators to implement plans for cold weather preparedness. Additionally, the proposed Cold Weather Reliability Standards would enhance the ability of the Balancing Authority, Transmission Operator, and Reliability Coordinator to plan and operate the grid reliably during cold weather conditions by requiring the exchange of information related to the generator’s capability to operate. The proposed standards address recommendations arising from the Federal Energy Regulatory Commission (“FERC”) and

¹ Unless otherwise indicated, all capitalized terms used in this filing shall have the meaning set forth in the *Glossary of Terms used in NERC Reliability Standards* (“NERC Glossary”), https://www.nerc.com/pa/Stand/Glossary%20of%20Terms/Glossary_of_Terms.pdf

NERC Staff's report on the causes of the January 17, 2018 cold weather event affecting the south central United States.²

The proposed Cold Weather Reliability Standards, as shown in **Exhibit A**, are just, reasonable, not unduly discriminatory or preferential, and in the public interest. NERC also provides notice of: (i) the associated Violation Risk Factors (“VRFs”) and Violation Severity Levels (“VSLs”) (**Exhibit E**); (ii) the retirement of currently effective Reliability Standards EOP-011-1, IRO-010-3, and TOP-003-4; and (iii) the proposed implementation plan (**Exhibit B**).

In light of the demonstrated risks to reliability posed by the failure to prepare properly for cold weather, NERC requested in its submission to FERC that FERC consider approving the proposed Cold Weather Reliability Standards and the associated elements on an expedited timeframe.

As This filing presents the technical basis and purpose of the proposed Reliability Standards, a demonstration that the proposed Reliability Standards meet the Reliability Standards criteria (**Exhibit D**), and a summary of the standard development history (**Exhibit F**). The NERC Board of Trustees adopted the proposed Reliability Standards on June 11, 2021.

This filing is organized as follows: Section I provides a summary of the proposed Cold Weather Reliability Standards and the cold weather events that led to their development. Section II of the filing provides the individuals to whom notices and communications related to the filing should be provided. Section III provides relevant background regarding: (i) the January 17, 2018 cold weather event that led to the development of the proposed Cold Weather Reliability Standards; and (ii) information on the development process for the proposed Cold Weather

² See FERC and NERC Staff, *The South Central United States Cold Weather Bulk Electric System Event of January 17, 2018* (Jul. 2019), https://www.nerc.com/pa/rrm/ea/Documents/South_Central_Cold_Weather_Event_FERC-NERC-Report_20190718.pdf [hereinafter FERC/NERC Staff Report].

Reliability Standards. Section IV of the filing provides an overview and justification for the proposed Cold Weather Reliability Standards. Section V of the filing provides a summary of the proposed implementation plan, and Section VI provides a summary of next steps NERC plans to take regarding cold weather reliability risks. Section VII summarizes why NERC requested expedited action by FERC in this proceeding.

I. SUMMARY

Several notable events over the last decade have demonstrated the substantial impacts that extreme cold weather conditions can have on the reliability of the Bulk-Power System. Extreme cold weather was a major factor in Bulk-Power System reliability events in 2011,³ 2014,⁴ and 2018.⁵ Extreme cold weather was likely a major factor in the February 2021 event affecting Texas and the south central United States as well, although this event is still under review and the precise causes still being determined. As NERC has highlighted in its reliability assessments, the grid is rapidly transforming, and it is becoming increasingly reliant on variable energy resources, such as wind and solar, and “just in time” natural gas deliveries. This resource mix is more sensitive to extreme temperature conditions than the generation fleet of prior years. The January 17, 2018 event in particular conclusively demonstrated the need for mandatory Reliability Standards to help support the reliability of the Bulk-Power System during future winter seasons. This need was underscored by the most recent cold weather event in February 2021, which resulted in massive customer load shedding to maintain system stability.

³ See FERC and NERC Staff, *Report on Outages and Curtailments During the Southwest Cold Weather Event of February 1-5, 2011: Causes and Recommendations* (Aug. 2011), <https://www.ferc.gov/sites/default/files/2020-04/08-16-11-report.pdf>.

⁴ See NERC, *Polar Vortex Review* (Sep. 2014), https://www.nerc.com/pa/rrm/January%202014%20Polar%20Vortex%20Review/Polar_Vortex_Review_29_Sept_2014_Final.pdf (reviewing generator outages during the January 2014 polar vortex weather event).

⁵ See FERC/NERC Staff Report, *supra* n. 5.

In assessing the causes of the January 17, 2018 event, FERC and NERC staff concluded that the primary cause was a failure to prepare properly or winterize generation facilities for cold temperatures.⁶ Natural gas supply issues were a major contributing factor.⁷ In their report, NERC and FERC staff recommended a multi-pronged approach, including new or revised Reliability Standards, enhanced outreach to Generator Owners and Generator Operators, and market rules where appropriate, to address reliability needs in cold weather conditions.⁸ NERC developed the proposed Cold Weather Reliability Standards - proposed 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) – to address the standards part of this recommendation.

As discussed more fully in this filing, the proposed Cold Weather Reliability Standards contain new and revised requirements that would require Generator Owners to implement plans to prepare for cold weather and to provide certain generator cold weather operating parameters to the Reliability Coordinator, Transmission Operator, and Balancing Authority for use in their analyses and planning. The proposed Cold Weather Reliability Standards would advance the reliability of the Bulk-Power System in future winter seasons by both improving generator readiness for cold weather conditions and enhancing awareness of factors that could limit generating unit availability by the entities responsible for the reliable operation of the grid.

The proposed Cold Weather Reliability Standards are just, reasonable, not unduly discriminatory or preferential, and in the public interest.

⁶ *Id.* at 80.

⁷ *Id.* at 84.

⁸ *Id.* at 86-87.

II. NOTICES AND COMMUNICATIONS

Notices and communications with respect to this filing may be addressed to the following:

Lauren A. Perotti
Senior Counsel
North American Electric Reliability
Corporation
1325 G Street, N.W.
Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099 – facsimile
lauren.perotti@nerc.net

Howard Gugel
Vice President and Director of Engineering
and Standards
North American Electric Reliability
Corporation
3353 Peachtree Road, N.E.
Suite 600, North Tower
Atlanta, GA 30326
(404) 446-2560
(404) 446-2595 – facsimile
howard.gugel@nerc.net

III. BACKGROUND

A. NERC Reliability Standards Development Procedure

The proposed Cold Weather Reliability Standards were developed in an open and fair manner and in accordance with the Reliability Standard development process. NERC develops Reliability Standards in accordance with Section 300 (Reliability Standards Development) of its Rules of Procedure and the NERC Standard Processes Manual.⁹

NERC's rules provide for reasonable notice and opportunity for public comment, due process, openness, and a balance of interests in developing Reliability Standards, and thus satisfy several of the criteria for approving Reliability Standards. The development process is open to any person or entity with a legitimate interest in the reliability of the BPS. NERC considers the comments of all stakeholders. Stakeholders must approve, and the NERC Board of Trustees must adopt, a new or revised Reliability Standard before NERC submits the Reliability Standard to the applicable governmental authorities.

⁹ The NERC Rules of Procedure, including Appendix 3A, NERC Standard Processes Manual, are available at <http://www.nerc.com/AboutNERC/Pages/Rules-of-Procedure.aspx>.

B. The Need for Reliability Standards to Address Cold Weather Risks

As NERC has highlighted in its reliability assessments, the generation resource mix that powers the North American grid is transforming at a rapid pace. Over time, the resource mix has shifted to be increasingly reliant on variable energy resources, such as wind and solar, and “just in time” natural gas deliveries, resulting in a generation fleet that is more sensitive to extreme temperature conditions than the fleet of prior years.¹⁰ Several notable events over the last decade have demonstrated the substantial impacts that extreme cold weather conditions can have on the reliability of the Bulk-Power System. Extreme cold weather was a major factor in BPS reliability events in 2011,¹¹ 2014,¹² and 2018.¹³ Extreme cold weather was likely a major factor in the February 2021 event affecting Texas and the south central United States as well. A joint inquiry consisting of FERC, NERC, and Regional Entity staff is currently underway to identify the precise causes of this most recent event.¹⁴

Addressing the risks to reliability posed by cold weather has long been a focus area for NERC and the Regional Entities. In its assessments, NERC has highlighted areas where there is potential reliability risk due to extreme weather conditions. Following the 2011 event, NERC published a Reliability Guideline, *Generating Unit Winter Weather Readiness* to aid entities in

¹⁰ In response to these developments, NERC began introducing fuel risks into its seasonal assessments and developed more probabilistic analysis of reliability. NERC’s Winter Reliability Assessment depicts regions in North America where, under peak demand scenarios, there is heightened reliability risk due to potential extreme weather or fuel supply disruptions. See NERC, 2020-2021 Winter Reliability Assessment (Nov. 2020), at 6, 27, https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_WRA_2020_2021.pdf.

¹¹ See FERC and NERC Staff, *Report on Outages and Curtailments During the Southwest Cold Weather Event of February 1-5, 2011: Causes and Recommendations* (Aug. 2011), <https://www.ferc.gov/sites/default/files/2020-04/08-16-11-report.pdf>.

¹² See NERC, *Polar Vortex Review* (Sep. 2014), https://www.nerc.com/pa/rrm/January%202014%20Polar%20Vortex%20Review/Polar_Vortex_Review_29_Sept_2014_Final.pdf (reviewing generator outages during the January 2014 polar vortex weather event).

¹³ See FERC/NERC Staff Report, *supra* n. 5.

¹⁴ FERC Press Release, *FERC, NERC to Open Joint Inquiry into 2021 Cold Weather Grid Operations* (Feb. 16, 2021), <https://www.ferc.gov/news-events/news/ferc-nerc-open-joint-inquiry-2021-cold-weather-grid-operations>.

preparing for cold weather.¹⁵ After the 2011 event and the 2014 polar vortex event, NERC and the Regional Entities also prepared numerous other materials, including training webinars, lessons learned, and other cold weather guidance, to help entities prepare for the winter season. However, the January 17, 2018 cold weather event affecting the south central United States demonstrated the need for NERC to develop mandatory Reliability Standards as an integral part of a broader framework for addressing the risks to reliability posed by cold weather.

The causes of the January 17, 2018 cold weather event are discussed in detail in the FERC and NERC Staff report, *The South Central United States Cold Weather Bulk Electric System Event of January 17, 2018*,¹⁶ which was published in July 2019. As discussed in the FERC/NERC Staff Report, a large area of the south central region of the United States experienced unusually cold weather in mid-January 2018. On January 17, 2018, generator outages, derates, and failures to start led to constrained bulk electric system transmission conditions within the Reliability Coordinator footprints of Midcontinent Independent System Operator (MISO), Southwest Power Pool, Inc. (“SPP”), Tennessee Valley Authority (“TVA”), and the Southeastern Reliability Coordinator (“SeRC”)/Southern Company, and an Energy Emergency was declared in the MISO region.¹⁷ In the days leading up to and immediately following this event, 183 individual generator units within the Reliability Coordinator footprints of SPP, MISO, TVA, and SeRC/Southern Company, spanning all or parts of nine states, either experienced an outage, a derate, or failure to start. When including generation already on planned or unplanned outages or derated before January 15, the

¹⁵ The first version of this Reliability Guideline was developed in 2012. The current version of the Reliability Guideline – Generating Unit Winter Weather Readiness – Current Industry Practices (v.3, 2020) is available on NERC’s website at: https://www.nerc.com/comm/RSTC_Reliability_Guidelines/Reliability_Guideline_Generating_Unit_Winter_Weather_Readiness_v3_Final.pdf.

¹⁶ See FERC/NERC Staff Report, *supra* n. 5.

¹⁷ FERC/NERC Staff Report at 6-7.

four Reliability Coordinators had over 30,000 MW generation unavailable in the south central portions of their footprints by the January 17, 2018 peak morning hour.¹⁸ While the system remained stable during the event, the combination of the Energy Emergency and wide-area constrained transmission conditions meant that had MISO's next single contingency generation outage occurred, operators would have needed to shed firm load promptly to maintain reliable BES operations and prevent further degradation.¹⁹

FERC and NERC staff concluded that the primary cause of the event was a failure to properly prepare or winterize generation facilities for cold temperatures. FERC and NERC staff found that at least 44% of the unplanned outages or derates during the days leading up to and immediately following the event were caused directly by the extreme cold weather (e.g., due to frozen sensing lines, frozen equipment, low temperature limits, and so on), or indirectly attributable to the weather (e.g., due to natural gas curtailments or mechanical problems related to cold weather).²⁰ FERC and NERC staff further found that natural gas supply issues were a major contributing factor to the event, with natural gas supply issues caused by the extreme cold temperatures leading to outages of 38 natural gas fired units totaling approximately 2,200 MW in the days leading up to and immediately following the event.²¹

In Recommendation 1 of the Report, FERC and NERC staff recommended a three-pronged approach, including new or revised Reliability Standards, enhanced outreach to Generator Owners and Generator Operators, and market rules where appropriate, to address reliability needs in cold weather conditions. Specifically, the report recommended addressing the following:

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ FERC/NERC Staff Report at 80-83.

²¹ *Id.* at 84.

- The need for Generator Owners/Generator Operators to perform winterization activities on generating units to prepare for adverse cold weather, in order to maximize generator output and availability for BES reliability during these conditions. These preparations for cold weather should include Generator Owners/Generator Operators:
 - Implementing freeze protection measures and technologies (e.g., installing adequate wind breaks on generating units where necessary).
 - Performing periodic adequate maintenance and inspection of freeze protection elements (e.g., generating units' heat tracing equipment and thermal insulation).
 - If gas-fueled generating units, clearly informing their Reliability Coordinators and Balancing Authorities whether they have firm transportation capacity for natural gas supply
 - Conducting winter-specific and plant-specific operator awareness training.
- The need for Generator Owners/Operators to ensure accuracy of their generating units' ambient temperature design specifications. The accurate ambient temperature design specifications and expected generating unit performance, including for peak winter conditions, should be incorporated into the plans, procedures and training for operating generating units, and shared with Reliability Coordinators and Balancing Authorities.
- The need for Balancing Authorities and Reliability Coordinators to be aware of specific generating units' limitations, such as ambient temperatures beyond which they cannot be expected to perform or lack of firm gas transportation, and take such limitations into account in their operating processes to determine contingency reserves, and in performing operational planning analyses, respectively.²²

As discussed further in Section IV below, NERC developed the proposed Cold Weather Reliability Standards that are the subject of this filing to address these recommendations.

²² FERC/NERC Staff Report at 86-87.

C. Project 2019-06 Cold Weather

Following the issuance of the FERC/NERC Staff Report in July 2019, NERC initiated Project 2019-06 Cold Weather to consider Reliability Standards modifications to address Recommendation 1 from the report. The Project 2019-06 standard drafting team developed revisions to three Reliability Standards, referred to collectively herein as the Cold Weather Reliability Standards: proposed Reliability Standards EOP-011-2, IRO-010-4, and TOP-003-5.

The proposed Cold Weather Reliability Standards were posted for two formal comment and ballot periods. The first formal comment period and ballot ran from January 27, 2021 through March 12, 2021. On March 22, 2021, the NERC Board of Trustees, recognizing that “the continued reliability of the Bulk-Power System depends on the prompt development of Reliability Standards to address cold weather preparedness,” directed that development of the proposed Cold Weather Reliability Standards be completed by June 2021.²³ Subsequently, the NERC Standards Committee approved a resolution under Section 16 of the NERC Standard Processes Manual²⁴ to shorten any additional formal comment periods to 25 days. The proposed Cold Weather Reliability Standards were posted for a second formal comment period and ballot from April 2, 2021 through April 26, 2021. The proposed Cold Weather Reliability Standards were posted for final ballot from May 18, 2021 through May 27, 2021 and achieved the following approval percentages:

- Proposed Reliability Standard EOP-011-2: 78.26% approval / 90.65% quorum;
- Proposed Reliability Standard IRO-010-4: 87.30% approval / 89.46% quorum; and

²³ NERC Board of Trustees, March 22, 2021 Action without a Meeting Executed Resolution 2019-06 Cold Weather, <https://www.nerc.com/gov/bot/Pages/Agenda-Highlights-and-Minutes-.aspx>.

²⁴ See NERC, Standard Processes Manual, Appendix 3A to the NERC Rules of Procedure, at Section 16, Waiver; NERC Standards Committee, April 1, 2021 Action without a Meeting, Standard Processes Manual Waiver Request Project 2019-06 Cold Weather, <https://www.nerc.com/comm/SC/Agenda%20Highlights%20and%20Minutes/SC%20Action%20without%20a%20Meeting%20-%20April%201,%202021.pdf>.

- Proposed Reliability Standard TOP-003-5: 87.52% approval / 89.14% quorum.

The NERC Board of Trustees adopted the proposed Cold Weather Reliability Standards on June 11, 2021. A summary of the development history and the complete record of development is attached to this filing as **Exhibit F**.

IV. JUSTIFICATION

In this filing, NERC submits the proposed Cold Weather Reliability Standards: proposed Reliability Standard EOP-011-2 - Emergency Preparedness and Operations, IRO-010-4 - Reliability Coordinator Data Specification and Collection, and TOP-003-5 - Operational Reliability Data. The proposed Cold Weather Reliability Standards mark an important milestone in NERC's longstanding efforts to reduce the risks posed by cold weather to reliability of the BPS. Consistent with Recommendation 1 of the FERC/NERC Staff Report on the 2018 cold weather event, the proposed Cold Weather Reliability Standards contain new and revised requirements that would require generators to implement plans to prepare for cold weather and require the exchange of certain generator cold weather operating parameters that would help enhance situational awareness in the operational planning and Real-time operations timeframes. The new and revised requirements in the proposed Cold Weather Reliability Standards are discussed in detail below.

As discussed in **Exhibit D**, the proposed Reliability Standards meet the Reliability Standards criteria and are just, reasonable, not unduly discriminatory, and in the public interest. The proposed Cold Weather Reliability Standards will become effective in accordance with the proposed implementation plan discussed in Section V.

A. Proposed Reliability Standard EOP-011-2

The currently effective Reliability Standard EOP-011-1 – Emergency Operations, was

submitted on January 8, 2015.²⁵ The standard was initially developed to consolidate requirements from three then-effective EOP Reliability Standards into a single standard that clarified the critical requirements for Emergency Operations while ensuring strong communication and coordination across the functional entities. The stated purpose of the standard is “To address the effects of operating Emergencies by ensuring each Transmission Operator and Balancing Authority has developed Operating Plan(s) to mitigate operating Emergencies, and that those plans are coordinated within a Reliability Coordinator Area.”

Proposed Reliability Standard EOP-011-2 would revise the currently effective standard by adding two new requirements, Requirement R7 and Requirement R8, related to generator cold weather preparedness and training, and revising two requirement parts, Requirement R1.2.6 and 2.2.9, related to the consideration of the reliability impacts of cold weather conditions in Transmission Operator and Balancing Authority emergency Operating Plan(s). To reflect the addition of the new cold weather preparedness requirements, the title of the standard is revised, from “Emergency Operations” to “Emergency Preparedness and Operations.” Additionally, the stated purpose of proposed Reliability Standard EOP-011-2 is revised to reflect the addition of the Generator Owner as an applicable entity.

Proposed Reliability Standard EOP-011-2 addresses in part Recommendation 1 of the FERC/NERC Staff Report on the January 2018 cold weather event. This report recommended that requirements be developed to address: (1) the need for Generator Owners or Generator Operators to prepare for cold weather, including implementing freeze protection measures, performing adequate maintenance and inspection of those measures, identifying fuel supply constraints that could impact their availability (such as natural gas supply considerations), and providing

²⁵ *Notice of Filing of the North American Electric Reliability Corporation of Proposed Reliability Standard EOP-011-1 – Emergency Operations* (2015).

appropriate awareness training; and (ii) the need to ensure accurate generating unit design specifications and operating performance data is included in preparedness plans and training and shared with the appropriate reliability entities. The FERC/NERC Staff Report also recommended that requirements be developed to address the need for Balancing Authorities and Reliability Coordinators to be aware of specific generating unit limitations. The proposed standard addresses this recommendation in part by requiring Generator Owners to identify those limitations. Other proposed Reliability Standards requirements, addressed in the following sections of this filing, would require the exchange of this information with Balancing Authorities, Reliability Coordinators, and Transmission Operators for use in their analyses and monitoring activities. Additionally, the proposed revisions to Requirements R1 and R2 would require consideration of reliability impacts from cold weather specifically in Transmission Operator and Balancing Authority emergency Operating Plans.

The new and revised requirements in proposed Reliability Standard EOP-011-2 are discussed in detail below.

1. New Generator Cold Weather Preparedness Requirements (Requirements R7 and R8)

Proposed Reliability Standard EOP-011-2 contains two new requirements related to generator cold weather preparedness: Requirements R7 and R8.

New Requirement R7 would require each Generator Owner to implement and maintain cold weather preparedness plans for their generating units, to include freeze protection measures, annual inspection and maintenance for such measures, and identification of cold weather operating parameters, including fuel considerations and operating temperatures. In determining the applicable entities for Requirement R7, the standard drafting team determined that the Generator Owner should be responsible for implementing and maintaining cold weather preparedness plans

as the “entity that owns and maintains generating Facility(ies).”²⁶ The proposed requirement provides as follows:

- R7.** Each Generator Owner shall implement and maintain one or more cold weather preparedness plan(s) for its generating units. The cold weather preparedness plan(s) shall include the following, at a minimum:
 - 7.1.** Generating unit(s) freeze protection measures based on geographical location and plant configuration;
 - 7.2.** Annual inspection and maintenance of generating unit(s) freeze protection measures;
 - 7.3.** Generating unit(s) cold weather data, to include:
 - 7.3.1.** Generating unit(s) operating limitations in cold weather to include:
 - 7.3.1.1.** capability and availability;
 - 7.3.1.2.** fuel supply and inventory concerns;
 - 7.3.1.3.** fuel switching capabilities; and
 - 7.3.1.4.** environmental constraints.
 - 7.3.2.** Generating unit(s) minimum:
 - 7.3.2.1.** design temperature; or
 - 7.3.2.2.** historical operating temperature; or
 - 7.3.2.3.** current cold weather performance temperature determined by an engineering analysis.

New Requirement R8 in proposed Reliability Standard EOP-011-2 would require each Generator Owner and Generator Operator to provide training to the personnel responsible for implementing the cold weather preparedness plans developed under Requirement R7. The standard drafting team determined that Requirement R8 should apply to both the Generator Owner, defined above, and the Generator Operator, “the entity that operates generating Facility(ies) and performs the functions of supplying energy and Interconnected Operations Service”.²⁷ Under this

²⁶ See Definition of Generator Owner, Appendix 5B to the NERC Rules of Procedure, Statement of Compliance Registry Criteria (rev. 7); see also Definition of Generator Owner, NERC Glossary.

²⁷ See Definition of Generator Operator, Appendix 5B to the NERC Rules of Procedure, Statement of Compliance Registry Criteria (rev. 7); see also Definition of Generator Operator, NERC Glossary.

requirement, the entities would be required to identify who among them will be responsible for providing the training to maintenance and operations personnel based on their respective duties and then that entity shall provide the training.

Proposed Requirement R8 provides as follows:

- R8.** Each Generator Owner in conjunction with its Generator Operator shall identify the entity responsible for providing generating unit-specific training, and that identified entity shall provide the training to its maintenance or operations personnel responsible for implementing cold weather preparedness plan(s) developed pursuant to Requirement R7.

Proposed Requirements R7 and R8 address in part Recommendation 1 of the FERC/NERC Staff Report. Proposed Requirement R7 addresses the fundamental need, identified in the FERC/NERC Staff Report, for Generator Owners to prepare for cold weather. This new requirement is intended to provide Generator Owners with flexibility to develop appropriate cold weather preparedness plans for their generating units, provided that the plans meet the stated minimum requirements. In implementing Requirement R7, Generator Owners would be required to identify those factors that could limit the ability of the generating unit to perform in cold weather. Proposed Reliability Standards IRO-010-4 and TOP-003-5, discussed in Section IV.B below, would require the exchange of this information with the Reliability Coordinator, Transmission Operator, and Balancing Authority for planning and operations. As a continent-wide requirement, proposed Requirement R7 does not provide a uniform definition of “cold weather”. In developing their cold weather preparedness plans, Generator Owners should take into account factors such as geographic location, climate, commonly-available weather maps, or generating unit performance in past seasons.

Under proposed Requirement R7, all cold weather preparedness plans must address, at a minimum, the following three items.

First, as specified in proposed Reliability Standard EOP-011-2 Requirement R7 Part 7.1, the cold weather preparedness plans must identify the freeze protection measures that are, or will be, implemented at the generating unit. Entities have flexibility to determine which, if any, freeze protection measures are appropriate for the unit, taking into account plant configuration and geographic location.

Second, as specified in proposed Reliability Standard EOP-011-2 Requirement R7 Part 7.2, the plans must provide for annual inspection and maintenance of the selected freeze protection measures, to help ensure that the measures are working or otherwise available when needed. The standard does not prescribe the specific timing of such inspections; entities should determine the optimal time for such inspections based on their circumstances. For example, entities may schedule their inspections at a time that would allow for the completion of any needed maintenance in advance of the winter season for that geographic location.

Third, as specified in proposed Reliability Standard EOP-011-2 Requirement R7 Part 7.3, the plans must identify certain generating unit cold weather operating parameters, including information on operating limitations and cold weather design temperature or performance data. This information would be exchanged with the Balancing Authority, Transmission Operator, and Reliability Coordinator under the revised data specification requirements in proposed Reliability Standards IRO-010-4 and TOP-003-5. The types of information that Generator Owners would be required to identify under Requirement R7 are described below.

Proposed Reliability Standard EOP-011-2 Requirement R7 Part 7.3.1 specifies that Generator Owners must identify generating unit operating limitations in cold weather, to include capability and availability, fuel supply and inventory concerns, fuel switching capabilities, and environmental constraints. This proposed requirement mirrors existing language in Reliability

Standard EOP-011-1 Requirement R2 Part 2.2.3; this currently effective requirement specifies that Balancing Authorities shall have Operating Plans to mitigate Capacity Emergencies and Energy Emergencies that include processes to manage generating resources in its Balancing Authority Area accounting for these same four factors. Proposed Reliability Standard EOP-011-2 Requirement R7 Part 7.3.2 specifies that Generator Owners shall identify in their cold weather preparedness plans cold weather operating temperatures, which may be the design temperature, historical operating temperature, or a performance temperature as determined by an engineering analysis. The proposed requirement is intended to provide flexibility to Generator Owners in the method used to develop a reasonably accurate understanding of expected unit performance during cold weather conditions for the geographic area, which was identified as an important reliability need in Recommendation 1 of the FERC/NERC Staff Report.

The data requirements in proposed Reliability Standard EOP-011-2 Requirement R7 reflect a recognition that there are a number of factors that may influence a generating unit's performance in cold weather. Through identification and communication of the relevant data points through the proposed Reliability Standards TOP-003-5 and IRO-010-4 discussed in Section IV.B, the proposed Cold Weather Reliability Standards would help promote a clear and complete understanding among generators and reliability entities alike of the factors that may influence generating unit performance in their areas during cold weather conditions.

Lastly, proposed Reliability Standard EOP-011-2 Requirement R8 would address the need for relevant personnel to understand their obligations and responsibilities under the cold weather preparedness plans by requiring that entities train their personnel. This proposed requirement directly addresses that part of Recommendation 1 from the FERC/NERC Staff Report relating to staff training. The proposed requirement affords entities flexibility to determine the appropriate

periodicity for such training, given their specific needs and circumstances, as well as the appropriate entity to conduct the training, whether that is the Generator Owner or the Generator Operator at the specific unit.

2. Revisions to Transmission Operator and Balancing Authority Requirements (R1 and R2)

Proposed Reliability Standard EOP-011-2 Requirements R1 and R2 provide that the Transmission Operator and Balancing Authority, respectively, shall develop, maintain, and implement one or more Operating Plans to mitigate operating Emergencies in their respective areas that address specified topics.

In proposed Reliability Standard EOP-011-2, NERC revises Requirement R1 Part 1.2.6 as follows:

- R1.** Each Transmission Operator shall develop, maintain, and implement one or more Reliability Coordinator-reviewed Operating Plan(s) to mitigate operating Emergencies in its Transmission Operator Area. The Operating Plan(s) shall include the following, as applicable:

1.2.6. Reliability Provisions to determine reliability impacts of:

1.2.6.1 cold weather conditions; and

1.2.6.2. extreme weather conditions.

Similar revisions are proposed to Requirement R2 Part 2.2.9, relating to the Balancing Authority's obligations:

- R2.** Each Balancing Authority shall develop, maintain, and implement one or more Reliability Coordinator-reviewed Operating Plan(s) to mitigate Capacity Emergencies and Energy Emergencies within its Balancing Authority Area. The Operating Plan(s) shall include the following, as applicable:

2.2.9 Reliability Provisions to determine reliability impacts of:

2.2.9.1. cold weather conditions; and

2.2.9.2. extreme weather conditions.

The proposed revisions would enhance reliability by requiring the Transmission Operator and Balancing Authority to consider cold weather impacts specifically, in addition to the impacts of extreme weather conditions, when developing and implementing Operating Plans to mitigate emergencies in their respective areas.

B. Proposed Reliability Standards IRO-010-4 and TOP-003-5

The IRO-010 and TOP-003 Reliability Standards are data specification standards. The currently effective versions of the Reliability Standards IRO-010-3 – Reliability Coordinator Data Specification and Collection and TOP-003-4 – Operational Reliability Data were submitted on February 27, 2020.²⁸ The IRO-010 Reliability Standard contains requirements for Reliability Coordinator data specifications, while the TOP-003 Reliability Standard contains requirements for Balancing Authority and Transmission Operator data specifications. The purpose of the IRO-010 Reliability Standard, which is unchanged in proposed Reliability Standard IRO-010-4, is “to prevent instability, uncontrolled separation, or Cascading outages that adversely impact reliability, by ensuring the Reliability Coordinator has the data it needs to monitor and assess the operation of its Reliability Coordinator Area.” The purpose of the TOP-003 Reliability Standard, which is similarly unchanged in proposed Reliability Standard TOP-003-5, “to ensure the Transmission Operator and Balancing Authority have data needed to fulfill their operational and planning responsibilities.”

Proposed Reliability Standards IRO-010-4 and TOP-003-5 maintain the general framework of the currently effective standards, which consists of three sets of requirements. First,

²⁸ *Notice of Filing of the North American Electric Reliability Corporation of Reliability Standards Developed Under the Standards Alignment with Registration Project* (2020).

the Reliability Coordinator and Transmission Operator shall maintain documented data specifications for the data needed for their Operational Planning Analyses, Real-time monitoring, and Real-time Assessments; the Balancing Authority shall maintain documented data specifications for the data needed for its analysis functions and Real-time monitoring.²⁹ Second, the Reliability Coordinator, Transmission Operator, and Balancing Authority shall distribute the data specifications to the entities that have the required data.³⁰ Third, each entity receiving a data specification shall satisfy it using a mutually agreeable process.³¹ In the proposed Reliability Standards, NERC proposes to revise the first set of requirements, related to the documented data specifications, to provide specifically for the inclusion of the cold weather data that would be developed by the Generator Owner under proposed Reliability Standard EOP-011-2 Requirement R7.

In proposed Reliability Standard IRO-010-4, NERC proposes to revise Requirement R1 to add a new Part 1.3, as follows:

- R1.** The Reliability Coordinator shall maintain a documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and Real-time Assessments. The data specification shall include but not be limited to:

1.3. Provisions for notification of BES generating unit(s) during local forecasted cold weather to include:

1.3.1 Operating limitations based on:

1.3.1.1. capability and availability;

²⁹ See proposed Reliability Standards IRO-010-4 Requirement R1 (Reliability Coordinator), TOP-003-5 Requirement R1 (Transmission Operator), and TOP-003-5 Requirement R2 (Balancing Authority).

³⁰ See proposed Reliability Standards IRO-010-4 Requirement R2 (Reliability Coordinator), TOP-003-5 Requirement R3 (Transmission Operator), and TOP-003-5 Requirement R4 (Balancing Authority).

³¹ See proposed Reliability Standards IRO-010-4 Requirement R3 (requirement to satisfy Reliability Coordinator data specifications) and TOP-003-5 Requirement R5 (requirement to satisfy Transmission Operator and Balancing Authority data specifications).

1.3.1.2. fuel supply and inventory concerns;

1.3.1.3. fuel switching capabilities; and

1.3.1.4. environmental constraints

1.3.2. Generating unit(s) minimum:

1.3.2.1. design temperature; or

1.3.2.2. historical operating temperature; or

1.3.2.3. current cold weather performance temperature determined by an engineering analysis.

NERC proposes to add an identical Requirement Part in proposed Reliability Standard TOP-003-5 Requirements R1 and R2, relating to Transmission Operator and Balancing Authority data specifications, respectively. (All changes are shown in **Exhibit A**.) A Generator Owner receiving a data specification from the Reliability Coordinator, Balancing Authority, or Transmission Operator would be required under the standards to satisfy the data specification according to a mutually agreeable process.

The proposed revisions address that part of Recommendation 1 of the FERC/NERC Staff Report relating to Balancing Authority and Reliability Coordinator awareness of limitations of specific generating units, including temperature limitations and fuel constraints, so they can be taken into account in operational planning analyses and in determining contingency reserves. In developing the requirements, the standard drafting team determined that the Transmission Operator should also receive such information.

In addition to above-listed revisions, the term “Special Protection System” is replaced with the term “Remedial Action Scheme (“RAS”)” throughout proposed Reliability Standards IRO-

010-4 and TOP-003-5, consistent with previous revisions to the definitions of those terms and similar changes made in other standards.³² These revisions are shown in **Exhibit A**.

V. EFFECTIVE DATE

The implementation plan is attached to this filing as **Exhibit B**. The proposed implementation plan provides that, where approval by an applicable governmental authority is required, the the proposed Cold Weather Reliability Standards shall become effective on the first day of the first calendar quarter that is eighteen (18) months after the effective date of the applicable governmental authority's order approving the Reliability Standard, or as otherwise provided for by the applicable governmental authority. Where approval by an applicable governmental authority is not required, the proposed Cold Weather Reliability Standards shall become effective on the first day of the first calendar quarter that is eighteen (18) months after the date the standard is adopted by the NERC Board of Trustees, or as otherwise provided for in that jurisdiction. The currently effective versions of the standards would be retired immediately prior to the effective date of the revised Reliability Standards. This implementation timeline reflects consideration that Generator Owners entities may need time to develop and implement cold weather preparedness plans for their generating units under proposed Reliability Standard EOP-011-2 Requirement R7, which may include performing engineering analysis to determine cold weather operating temperatures and to identify appropriate freeze protection measures for the climate, and to provide the required training under Requirement R8. The implementation plan also reflects consideration that Reliability Coordinators, Balancing Authorities, and Transmission Operators may need time to develop revised data specifications to include cold weather parameters

³² See *Notice of Filing of the North American Electric Reliability Corporation of Revisions to the Definition of "Remedial Action Scheme" and Proposed Reliability Standards* (2015).

and to distribute to affected entities, and for the receiving entities to develop the necessary capabilities in order to satisfy the revised data specifications.

While NERC maintains that its proposed implementation period is reasonable in light of the above considerations, NERC strongly encourages entities to prioritize implementation of the proposed Cold Weather Reliability Standards and to comply with them, in whole or in part, as soon as circumstances allow. Such voluntary action would provide needed support to the reliability of the Bulk-Power System during those winter weather seasons that elapse before the standards become mandatory and enforceable. In addition, NERC is planning a number of risk mitigating measures to take place during the implementation period, described below.

VI. NEXT STEPS

Presently, NERC and the Regional Entities are considering a comprehensive suite of measures to help support the reliability of the Bulk-Power System during the upcoming winter season and any future winter seasons that elapse before the Cold Weather Reliability Standards are approved and enforceable. These measures may include winter weather readiness outreach and training, including site visits and webinars; the use of the NERC Alert System, such as to issue recommended actions to entities;³³ and compliance practice guides. NERC may also use its Winter Reliability Assessment to help assess and document the industry's preparedness based on the input from the aforementioned activities and scenario analysis. This will include reviewing preparations being made to prepare for the winter season and assessing changes made to operational planning

³³ The NERC Alert system is described in Section 810 of the NERC Rules of Procedure and includes three levels: Level 1 (Advisories), Level 2 (Recommendations) and Level 3 (Essential Actions). Level 2 and Level 3 Alerts require responsive action and reporting by the receiving entities. Before issuing an Alert, NERC must provide FERC with at least five business days' notice. Following the issuance of a Level 2 or Level 3 Alert, NERC is responsible for filing a report to FERC summarizing the actions taken and the success of such actions in correcting any vulnerability or deficiency that was the subject of the notification. *See* NERC Rules of Procedure Section 810, Information Exchange and Issuance of NERC Advisories, Recommendations and Essential Actions. The NERC Rules of Procedure are available at <https://www.nerc.com/AboutNERC/Pages/Rules-of-Procedure.aspx>.

practices and generator preparedness, particularly in areas that experienced significant generator outages during the cold snap experienced in February 2021. NERC will discuss its cold weather approach in detail at the NERC Board of Trustees meeting on August 12, 2021. NERC will keep FERC staff apprised of this discussion and the subsequent cold weather preparation efforts of the ERO Enterprise.

As noted above, a joint inquiry consisting of FERC, NERC, and Regional Entity staff is currently underway to identify the precise causes of the February 2021 event affecting Texas and the south central United States. The proposed Cold Weather Reliability Standards discussed in this filing address recommendations arising from the 2018 cold weather event, which is, as of this filing, the latest for which analysis has been completed and recommendations have been developed. To the extent that the February 2021 event joint inquiry team recommends further Reliability Standards modifications, NERC is prepared to address those recommendations promptly through its standard development process. The proposed Cold Weather Reliability Standards addressed in this filing are an important step forward in protecting the reliability of the Bulk-Power System during cold weather conditions.

VII. REQUEST FOR FERC EXPEDITED ACTION

In its filing to FERC, NERC requested that FERC approve the proposed Cold Weather Reliability Standards and associated elements in an expedited manner. As noted prior in this filing, the failure to properly prepare or winterize generation facilities for cold temperatures was the primary cause of the January 17, 2018 cold weather event.³⁴ The need for these standards is so great that in March 2021, the NERC Board of Trustees took the unprecedented step of directing that development be completed by June 2021. NERC and its stakeholders recognized the urgency

³⁴ FERC/NERC Staff Report at 80.

of this issue and successfully met the Board's goal, resulting in NERC being able to file these standards much earlier than projected.

As discussed in Section V, NERC's proposed implementation plan provides for an 18-month implementation timeframe, which appropriately balances the urgency in the need to implement the standards against the time allowed for those who must comply to develop necessary procedures and other relevant capabilities. An expedited approval of the proposed Cold Weather Reliability Standards would advance the public interest by having the vital cold weather reliability protections these standards would provide in place as soon as is reasonably possible. Further, an expedited approval would provide regulatory certainty to those entities that would seek to implement the proposed standards on their own expedited timeframes. For these reasons, NERC requested that FERC consider expedited action on NERC's proposals.

Respectfully submitted,

/s/ Lauren A. Perotti

Lauren A. Perotti
Senior Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099 – facsimile
lauren.perotti@nerc.net

*Counsel for the North American Electric
Reliability Corporation*

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EXHIBITS A - C and E - G

EXHIBIT D

Reliability Standards Criteria

The discussion below explains how the proposed Reliability Standards have met or exceeded the Reliability Standards criteria.

1. Proposed Reliability Standards must be designed to achieve a specified reliability goal and must contain a technically sound means to achieve that goal.

The proposed Reliability Standards (proposed Reliability Standards EOP-011-2, IRO-010-4, and TOP-003-5) would advance the reliability of the Bulk-Power System by: (i) requiring generators to implement plans for cold weather preparedness; and (ii) enhancing the ability of the Balancing Authority, Transmission Operator, and Reliability Coordinator to plan and operate the grid reliably through the exchange of information related to the generator's ability to operate during cold weather conditions. NERC developed the proposed standards to address recommendations from FERC and NERC Staff's report regarding the January 17, 2018 cold weather event affecting the south central United States.¹ The proposed Cold Weather Reliability Standards are designed to achieve a specific reliability goal and contain a technically sound means to achieve that goal.

2. Proposed Reliability Standards must be applicable only to users, owners, and operators of the bulk power system, and must be clear and unambiguous as to what is required and who is required to comply.

The proposed Reliability Standards are clear and unambiguous as to what is required and who is required to comply. The new requirements in proposed Reliability Standard EOP-011-2 would apply to Generator Owners (R7 and R8) and Generator Operators (R8). The applicability

¹ See FERC and NERC Staff, *The South Central United States Cold Weather Bulk Electric System Event of January 17, 2018* (Jul. 2019), https://www.nerc.com/pa/rmm/ea/Documents/South_Central_Cold_Weather_Event_FERC-NERC-Report_20190718.pdf [hereinafter "FERC/NERC Staff Report"].

of the revised requirements in proposed Reliability Standards IRO-010-4 and TOP-003-5 would remain unchanged. The proposed Reliability Standards clearly articulate the actions that applicable entities must take to comply with the standards.

3. A proposed Reliability Standard must include clear and understandable consequences and a range of penalties (monetary and/or non-monetary) for a violation.

The Violation Risk Factors (“VRFs”) and Violation Severity Levels (“VSLs”) for the proposed Reliability Standards comport with NERC and FERC guidelines related to their assignment, as discussed further in Exhibit E. The assignment of the severity level for each VSL is consistent with the corresponding requirement, and the VSLs should ensure uniformity and consistency in the determination of penalties. The VSLs do not use any ambiguous terminology, thereby supporting uniformity and consistency in the determination of similar penalties for similar violations. For these reasons, the proposed Reliability Standards include clear and understandable consequences.

4. A proposed Reliability Standard must identify clear and objective criteria or measures for compliance, so that it can be enforced in a consistent and non-preferential manner.

The proposed Reliability Standards contain measures that support each requirement by clearly identifying what is required and how the requirement will be enforced. These measures help provide clarity regarding how the requirements would be enforced and help ensure that the requirements would be enforced in a clear, consistent, and non-preferential manner and without prejudice to any party.

5. **Proposed Reliability Standards should achieve a reliability goal effectively and efficiently, but do not necessarily have to reflect “best practices” without regard to implementation cost or historical regional infrastructure design.**

The proposed Reliability Standards achieve their reliability goals effectively and efficiently. The proposed Reliability Standards would achieve the reliability goal of improving preparedness for cold weather while allowing for flexibility in the development and implementation of generator cold weather preparedness plans.

6. **Proposed Reliability Standards cannot be “lowest common denominator,” i.e., cannot reflect a compromise that does not adequately protect Bulk-Power System reliability. Proposed Reliability Standards can consider costs to implement for smaller entities, but not at consequences of less than excellence in operating system reliability.**

The proposed Reliability Standards do not reflect a “lowest common denominator” approach. The proposed Reliability Standards would enhance reliability in cold weather conditions by requiring Generator Owners to implement cold weather preparedness plans and by requiring Reliability Coordinators, Transmission Operators, and Balancing Authorities to include in their documented data specifications information relating to the generator’s ability to operate in cold weather.

7. **Proposed Reliability Standards must be designed to apply throughout North America to the maximum extent achievable with a single Reliability Standard while not favoring one geographic area or regional model. It should take into account regional variations in the organization and corporate structures of transmission owners and operators, variations in generation fuel type and ownership patterns, and regional variations in market design if these affect the proposed Reliability Standard.**

The proposed Reliability Standards would continue to apply consistently throughout North America and do not favor one geographic area or regional model. The proposed Reliability Standards would provide sufficient flexibility to accommodate regional/geographic variations, including climate, generation type, market issues, state rules, and other considerations.

8. Proposed Reliability Standards should cause no undue negative effect on competition or restriction of the grid beyond any restriction necessary for reliability.

The proposed Reliability Standards would have no undue negative effect on competition and would not unreasonably restrict the available transmission capacity or limit the use of the BPS in a preferential manner. The proposed standards would require the same performance by each of the applicable entities.

9. The implementation time for the proposed Reliability Standard is reasonable.

The proposed effective date for the proposed Reliability Standards is just and reasonable and appropriately balances the urgency in the need to implement the standards against the reasonableness of the time allowed for those who must comply to develop necessary procedures or other relevant capability. The proposed implementation plan provides that the proposed Reliability Standards would become effective on the first day of the first calendar quarter that is eighteen (18) months after applicable regulatory approval. The currently effective versions of the standards would be retired immediately prior to the effective date of the revised Reliability Standards. This implementation timeline reflects consideration that entities may need time to develop, implement, and maintain cold weather preparedness plans for generating sites, to include information on cold weather operating temperatures that may need to be developed through engineering analysis. The implementation timeline also reflects consideration that entities will need time to develop and distribute revised data specifications to affected entities, and for receiving entities to develop the necessary capabilities in order to comply with the revised data specifications. The proposed implementation plan is attached as **Exhibit B** to this filing.

10. The Reliability Standard was developed in an open and fair manner and in accordance with the Reliability Standard development process.

The proposed Reliability Standards were developed in accordance with NERC's ANSI-accredited processes for developing and approving Reliability Standards. **Exhibit F** includes a summary of the Reliability Standard development proceedings, and details the processes followed to develop the proposed Reliability Standards. These processes included, among other things, comment periods, pre-ballot review periods, and balloting periods. Additionally, all meetings of the standard drafting team were properly noticed and open to the public.

11. NERC must explain any balancing of vital public interests in the development of proposed Reliability Standards.

NERC has identified no competing public interests regarding the request for approval of this proposed Reliability Standards. No comments were received that indicated that one or more of the proposed Reliability Standards conflicts with other vital public interests.

12. Proposed Reliability Standards must consider any other appropriate factors.

No other negative factors relevant to whether the proposed Reliability Standards are just and reasonable were identified.