

October 14, 2026

**VIA ELECTRONIC FILING**

Ms. Nancy Marconi  
Registrar & Board Secretary  
Ontario Energy Board  
27th Floor 2300 Yonge Street  
Toronto, ON M4P 1E4

Re: *North American Electric Reliability Corporation*

Dear Ms. Marconi:

The North American Electric Reliability Corporation (“NERC”) hereby submits Petition of the North American Electric Reliability Corporation for Approval of Proposed Reliability Standard EOP-012-4. NERC requests, to the extent necessary, a waiver of any applicable filing requirements with respect to this filing.

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

Sincerely,

/s/ Sarah P. Crawford

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**BEFORE THE  
ONTARIO ENERGY BOARD  
OF THE PROVINCE OF ONTARIO**

**North American Electric Reliability        )  
Corporation                                        )**

**PETITION OF THE  
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION  
FOR APPROVAL OF PROPOSED RELIABILITY STANDARD EOP-012-4**

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October 14, 2026

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**North American Electric Reliability Corporation**

Commission (“FERC”), NERC, and Regional Entity Staff Joint Inquiry into the causes of the February 2021 cold weather event affecting Texas and the south-central United States.<sup>2</sup>

NERC developed the most recent version of the EOP-012 standard, Reliability Standard EOP-012-3, in 2025.<sup>3</sup> During the development of Reliability Standard EOP-012-3, several Canadian registered entities identified concerns as it relates to the application of certain EOP-012 requirements in the Canadian provinces. NERC initiated a separate standard development project to address those concerns. Through this project, NERC developed proposed Reliability Standard EOP-012-4. The proposed standard improves upon the prior versions of the EOP-012 standard by including a new Variance for Canadian registered entities. As discussed in further detail in this filing, this Canadian Variance provides an option by which Canadian registered entities may improve cold weather preparedness for the types of extreme cold experienced in Canadian climates, through requirements that would accommodate differences in regulatory frameworks across the Canadian jurisdictions that have adopted mandatory and enforceable Reliability Standards.

The proposed Reliability Standard and related elements are just, reasonable, not unduly discriminatory or preferential, and in the public interest. NERC also submits a proposed implementation plan to govern implementation of the standard (Exhibit B). As described in further detail in Section V of this filing, the proposed implementation plan recognizes that different versions of the EOP-012 standard are in effect or are pending enforcement across the Canadian jurisdictions. The proposed implementation plan is intended to ensure an orderly transition in

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<sup>2</sup> FERC, NERC, Regional Entity Staff Report: *The February 2021 Cold Weather Outages in Texas and the South Central United States* (Nov. 2021), <https://www.ferc.gov/media/february-2021-cold-weather-outages-texas-and-south-central-united-states-ferc-nerc-and> [hereinafter February 2021 Event Joint Inquiry Report]. This cold weather reliability event will be referred to throughout this filing as the “February 2021 Event.”

<sup>3</sup> *Petition of NERC for Approval of Proposed Reliability Standard EOP-012-3* (Apr. 29, 2025) (EOP-012-3 Filing).

standard versions for registered entities in those jurisdictions where the applicable governmental authority has adopted the proposed Canadian Variance for use within the jurisdiction.

This filing presents the technical basis and purpose of the proposed Reliability Standard, a demonstration that the proposed Reliability Standard meets the Reliability Standards criteria (**Exhibit D**), and a summary of the standard development history (**Exhibit F**).

## **I. NOTICES AND COMMUNICATIONS**

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

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## **II. REGULATORY FRAMEWORK**

The proposed Reliability Standard was 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.<sup>4</sup>

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

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<sup>4</sup> The NERC Rules of Procedure are available at <https://www.nerc.com/who-we-are/rules-of-procedure>. The NERC Standard Processes Manual is available at <https://www.nerc.com/globalassets/who-we-are/rules-of-procedure/Appendix-3A.pdf>.

certain 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 Bulk-Power System. NERC considers the comments of all stakeholders, and stakeholders must approve, and the NERC Board of Trustees must adopt, a Reliability Standard before NERC submits the Reliability Standard to the applicable governmental authorities.

NERC endeavors to develop Reliability Standards that may apply on a continent-wide basis; however, in some instances, a regional difference may be necessary to achieve one or more of the reliability objectives of a Reliability Standard. A Variance is a type of regional difference from a continent-wide Reliability Standard. Under NERC's rules, a Variance is defined as follows:

“Variance” means an aspect or element of a Reliability Standard that applies only within a particular Regional Entity or group of Regional Entities, or to a particular entity or class of entities. A Variance allows an alternative approach to meeting the same reliability objective as the Reliability Standard, and is typically necessitated by a physical difference. A Variance is embodied within a Reliability Standard and as such, if adopted by NERC and approved by the Applicable Governmental Authority(ies), shall be enforced within the applicable Regional Entity or Regional Entities pursuant to delegated authorities or to procedures prescribed by the Applicable Governmental Authority.<sup>5</sup>

Under the Reliability Standards criteria, there must be some basis to justify a regional difference from a continent-wide Reliability Standard.

### **III. BACKGROUND**

#### **A. Overview of NERC's Cold Weather Reliability Standards Framework**

The EOP-012 Reliability Standard is an important part of NERC's framework to assure the reliability of the Bulk-Power System during extreme cold conditions. In its summary of the key findings and causes of the February 2021 Event, the joint inquiry team identified that two causes,

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<sup>5</sup> The NERC Rules of Procedure, Appendix 2 Definitions used in the NERC Rules of Procedure, <https://www.nerc.com/AboutNERC/Pages/Rules-of-Procedure.aspx>.

both triggered by cold weather, lead to the Event, and that these two causes form a recurring pattern in cold weather events over the previous ten years. The first cause was that generating units unprepared for cold weather failed in large numbers. The second cause was related to supply issues caused by the decline in natural gas production, exacerbated by the increasing reliance on natural gas fired generation.<sup>6</sup> The joint inquiry team identified that, despite prior recommendations that entities take steps to prepare for winter, a significant number of generating units failed to have any winterization plans.<sup>7</sup> The joint inquiry team further determined that 81% of the freeze-related generating unit outages occurred at temperatures above the unit's stated ambient design temperature.<sup>8</sup>

To address these and other findings, the February 2021 Event Joint Inquiry Report contained recommendations for further action in the areas of cold weather preparedness and operations. Recommendation 1 consisted of ten sub-recommendations for Reliability Standards enhancements. Key Recommendations 1a-1g related to enhanced requirements for generator cold weather preparedness, including implementing freeze protection measures, addressing the causes of freezing issues, providing cold weather plan preparedness plan training on an annual basis, and understanding the generation capacity that is available in cold weather.<sup>9</sup> Key Recommendations 1h-1i recommended requirements to limit the participation of critical natural gas production facilities in load shedding schemes to protect electric system reliability in cold weather.<sup>10</sup> Key Recommendation 1j recommended requirements to minimize the overlap of circuits used in

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<sup>6</sup> February 2021 Event Joint Inquiry Report, *supra* note 2, at 11-12.

<sup>7</sup> *Id.* at 17.

<sup>8</sup> *Id.*

<sup>9</sup> February 2021 Event Joint Inquiry Report at 184-190.

<sup>10</sup> *Id.* at 208-209.

manual and automatic load shed circuits to help maintain system frequency when operators have the best chance of doing so.<sup>11</sup>

Consistent with the recommendations of the February 2021 Event Joint Inquiry Report, NERC developed Reliability Standards responsive to these recommendations in two phases. The EOP-012 Reliability Standard addresses the critical matter of generator cold weather preparedness, as discussed more fully in the following sections of this filing. Other Reliability Standards address other matters necessary for assuring cold weather reliability as identified in the report. These standards are as follows:

*Reliability Standards IRO-010-4 and TOP-003-5:* developed in response to the recommendations of the joint inquiry team examining the January 2018 cold weather event affecting the south central United States,<sup>12</sup> Reliability Standards IRO-010-4 and TOP-003-5 address the inclusion of generator cold weather data and information in Reliability Coordinator, Transmission Operator, and Balancing Authority data specifications, including data and information regarding generator operating limitations in cold weather and the expected operating temperature of the generator.

*Reliability Standard EOP-011-4:* Reliability Standard EOP-011-4 builds upon the improvements in EOP-011-3 to improve how Transmission Operators account for the overlap of manual load shed and automatic load shed in their emergency Operating Plans. This standard requires Balancing Authorities, Transmission Operators, and load shedding entities identified by Transmission Operators to limit the participation of critical natural gas infrastructure loads in the

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<sup>11</sup> *Id.* at 209.

<sup>12</sup> 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](https://www.nerc.com/pa/rrm/ea/Documents/South_Central_Cold_Weather_Event_FERC-NERC-Report_20190718.pdf).

demand response and emergency load shedding programs they oversee, particularly during cold weather conditions when natural gas supply issues for generation have proven to be the most challenging.

*Reliability Standard TOP-002-5:* Reliability Standard TOP-002-5 advances reliability through a new requirement addressing how the Balancing Authority will prepare for operations during extreme cold weather conditions.

More information is available in NERC's 2021-2024 filings regarding those Reliability Standards.

## **B. History of the EOP-012 Reliability Standard**

### **1. Reliability Standard EOP-012-1**

In late 2022, NERC submitted Reliability Standards EOP-011-3 and EOP-012-1, as well as three defined terms for inclusion in the NERC *Glossary*: Extreme Cold Weather Temperature, Generator Cold Weather Critical Component, and Generator Cold Weather Reliability Event.<sup>13</sup> Reliability Standard EOP-012-1 contained new and revised requirements intended to build on the cold weather preparedness plan and training requirements first developed in Reliability Standard EOP-011-2 for enhanced generator cold weather preparedness. Reliability Standard EOP-012-1 included requirements for freeze protection measures for both new and existing generation to provide capability to operate at the Extreme Cold Weather Temperature<sup>14</sup> for the location (Requirements R1 and R2, respectively); the development of enhanced cold weather preparedness plans and annual training on those plans (Requirements R3 and R5, respectively); the periodic

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<sup>13</sup> *Petition of NERC for Approval of Proposed Reliability Standards EOP-011-3 and EOP-012-1 and Request for Expedited Action* (Nov. 14, 2022) (EOP-011-3/EOP-012-1 Filing).

<sup>14</sup> The Extreme Cold Weather Temperature is defined as "The temperature equal to the lowest 0.2 percentile of the hourly temperatures measured in December, January, and February from 1/1/2000 through the date the temperature is calculated."

recalculation of the Extreme Cold Weather Temperature, update of cold weather preparedness plan, and review of freeze protection measures needed to provide operational capability at that temperature (Requirement R4); and the development and implementation of Corrective Action Plans to address freezing issues or insufficiencies in freeze protection measures to operate at the Extreme Cold Weather Temperature (Requirements R6 and R7, respectively).

In February 2023, FERC approved Reliability Standard EOP-012-1 with directives for further modifications.<sup>15</sup> While finding that Reliability Standard EOP-012-1 represented an improvement for reliability, FERC expressed concern with certain aspects of Reliability Standard EOP-012-1 and the proposed implementation plan, and directed NERC to revise the standard and implementation plan as follows:

***Applicability, generally:*** FERC directed NERC to revise the applicability of the standard to ensure that it captures all Bulk Electric System (“BES”) generation resources needed for reliable operation and excludes only those generation resources not relied upon during freezing conditions.<sup>16</sup>

***Applicability of Cold Weather Preparedness Plan and Training Requirements:*** FERC directed NERC to revise Reliability Standard EOP-012-1 to ensure cold weather operating information remains available from all generators.<sup>17</sup>

***Generator Constraints to Implementing Winterization Measures:*** FERC expressed concerns that the proposed technical, commercial, or operational constraint provisions in Requirements R1 and R7 that would allow an entity to explain in a declaration why it could not

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<sup>15</sup> *N. Am. Elec. Reliability Corp.*, 182 FERC ¶ 61,094 (2023) [hereinafter February 2023 Order], *reh’g denied*, 183 FERC ¶ 62,034, *order on reh’g*, 183 FERC ¶ 61,222 (2023).

<sup>16</sup> February 2023 Order at P 58.

<sup>17</sup> *Id.* at P 59.

comply with winterization requirements lacked clear and auditable criteria for compliance.<sup>18</sup> FERC therefore directed NERC to develop modifications to 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 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.”<sup>19</sup> FERC directed 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.”<sup>20</sup>

***Generator Continuous Operations Capability Requirements:*** FERC directed NERC to clarify certain language regarding capability requirements to better align with the stated purpose of the Reliability Standard EOP-012-1.<sup>21</sup>

***Corrective Action Plan deadlines:*** FERC found it appropriate to include a maximum time for implementing corrective actions in a Corrective Action Plan. FERC therefore directed NERC to revise Reliability Standard EOP-012-1 to include a deadline or maximum period for the completion of corrective action plan measures where the development of Corrective Action Plans is required.<sup>22</sup>

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<sup>18</sup> *Id.* at PP 64-65.

<sup>19</sup> *Id.* at P 66.

<sup>20</sup> *Id.*

<sup>21</sup> *Id.* at PP 89-90.

<sup>22</sup> *Id.* at P 79.

**Implementation Plan:** FERC agreed with commenter concerns regarding the length of the proposed implementation period of Reliability Standard EOP-012-1.<sup>23</sup> FERC therefore directed NERC to require a shorter implementation period and staggered implementation for unit(s) across a generator owner’s fleet, stating that such an approach “will reduce reliability risks more quickly.”<sup>24</sup>

In addition to the above-listed directives for standards modifications, FERC directed NERC to work with FERC staff to develop a plan on how it will assess and collect data periodically to monitor the implementation of new requirements for U.S.-based Generator Owners.

### **C. Reliability Standard EOP-012-2**

NERC developed Reliability Standard EOP-012-2 in response to FERC’s directives in the February 2023 Order. As discussed more fully in NERC’s March 2024 filing regarding Reliability Standard EOP-012-2,<sup>25</sup> Reliability Standard EOP-012-2 reflected the following revisions intended to address several of FERC’s directives from the February 2023 Order:

- Clarified the applicability of the standard, so that all Generator Owners would continue to be required to develop cold weather preparedness plans and train on those plans consistent with Reliability Standard EOP-011-2 (Applicability Section A.4.2);
- Clarified the limited exemption for the EOP-012 winterization requirements, so that it would be clear that the only units that would be exempted from applying freeze protection measures are those Bulk Electric System units that do not operate in freezing conditions (except in a limited capacity, during an Emergency) (Requirements R2, R3, R6);
- Clarified that the standard would apply to new intermittent energy resources, and they must provide capability to operate for their maximum operational duration if

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<sup>23</sup> NERC’s proposed implementation plan for Reliability Standard EOP-012-1 and EOP-011-3 provided a five-year implementation period for freeze protection capability requirements, with no specific deadline for the implementation of Corrective Action Plan measures.

<sup>24</sup> February 2023 Order at P 88.

<sup>25</sup> *Petition of NERC for Approval of Proposed Reliability Standard EOP-012-2* (Mar. 8, 2024) (EOP-012-2 Filing).

that is less than 12 hours (e.g., solar farm in area with less than 12 hours of sunlight in winter) (Requirement R2); and

- Removed the requirement for existing generation to run for at least one hour at the Extreme Cold Weather Temperature, as this period was too short to ensure cold weather reliability (Requirement R3).

Relevant to this proceeding, NERC also made the following revisions in Reliability Standard EOP-012-2 to address other directives from the February 2023 Order:

- Abbreviated the overall timeline for implementation of the EOP-012 standard, including fixing October 1, 2027 as the date by which new generation must meet more stringent capability requirements (Implementation Plan, Requirements R2 and R3);
- Added deadlines for completing corrective actions in a Corrective Action Plan (Requirement R7);
- Replaced the phrase “technical, commercial, or operational constraints” with the defined term Generator Cold Weather Constraint,<sup>26</sup> to clarify the limited circumstances under which a Generator Owner could declare constraints precluding them implementing a specific corrective action contained in a Corrective Action Plan to address freeze protection issues (Requirement R7); and
- Clarified the steps Generator Owners would take when they declare a Generator Cold Weather Constraint, including requirements for ongoing reviews and reporting any reliability-related impacts to reliability entities as part of ongoing generating unit cold weather data reporting specifications (Requirement R8).

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<sup>26</sup> NERC proposed to define Generator Cold Weather Constraint as follows:

Any condition that would preclude a Generator Owner from implementing freeze protection measures on one or more Generator Cold Weather Critical Components using the criteria below. Freeze protection measures are not intended to be limited to optimum practices, methods, or technologies, but are also intended to include acceptable practices, methods, or technologies generally implemented by the electric industry in areas that experience similar winter climate conditions.

Criteria used to determine a constraint include practices, methods, or technologies which, given the exercise of reasonable judgment in light of the facts known at the time the decision to declare the constraint was made:

- Were not broadly implemented at generating units for comparable unit types in regions that experience similar winter climate conditions to provide reasonable assurance of efficacy;
- Could not have been expected to accomplish the desired result; or
- Could not have been implemented at a reasonable cost consistent with good business practices, reliability, or safety. A cost may be deemed “unreasonable” when implementation of selected freeze protection measure(s) are uneconomical to the extent that they would require prohibitively expensive modifications or significant expenditures on equipment with minimal remaining life.

In June 2024, FERC approved Reliability Standard EOP-012-2 and the associated implementation plan. FERC also directed further changes which were addressed in Reliability Standard EOP-012-3, discussed in the following section.

#### **D. FERC Directs Development of EOP-012-3**

In its June 2024 Order, FERC found that Reliability Standard EOP-012-2 “improves upon...Reliability Standard EOP-012-1 by clarifying the requirements for generator cold weather preparedness and by making other improvements consistent with the Commission’s directives in its February 2023 Order to help ensure that more generation is available during extreme cold weather.”<sup>27</sup> FERC, however, expressed continuing concerns with certain aspects of Reliability Standard EOP-012-2, and directed NERC to further revise the standard. Specifically, FERC directed NERC to revise the standard as follows:

- To address concerns related to the ambiguity of the Generator Cold Weather Constraint term and criteria, such as by presenting a predefined list of potential constraints or a pre-approval process for declared constraints, and remove references to “reasonable cost” and similar terms in the definition;<sup>28</sup>
- To address concerns regarding the need for a timely review and evaluation of declared Generator Cold Weather Constraints by NERC or the relevant Regional Entity;<sup>29</sup>
- To require a shorter timeline to implement corrective actions for those generating units that experience a Generator Cold Weather Reliability Event;<sup>30</sup>
- To require NERC to pre-approve any extensions of a Corrective Action Plan implementation deadline beyond the maximum 24 and 48-month implementation timeframes provided by the EOP-012 standard;<sup>31</sup>

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<sup>27</sup> *N. Am. Elec. Reliability Corp.*, 187 FERC ¶ 61,204 at P 2 (2024) (June 2024 Order).

<sup>28</sup> *See* June 2024 Order at PP 41-46 (discussion of findings and concerns).

<sup>29</sup> *See id.* at P 52 -54

<sup>30</sup> *Id.* at PP 65-67.

<sup>31</sup> *Id.* at P 69-70.

- To clarify that any corrective action plans for new generating units must be completed prior to the generating unit's commercial operation date;<sup>32</sup>
- To clarify corrective action plan implementation timelines where a Generator Owner has a mix of new and corrections to existing freeze protection measures;<sup>33</sup>
- To require that any declared Generator Cold Weather Constraints be reviewed more frequently than once every five years to ensure the constraint remains valid.<sup>34</sup>

In response to these directives, NERC developed Reliability Standard EOP-012-3.

Reliability Standard EOP-012-3 revised Reliability Standard EOP-012-2 by:

- Providing clear, objective, and sufficiently detailed criteria for determining the limited circumstances under which a Generator Owner could declare constraints that would preclude them implementing a specific corrective action to address freeze protection issues, referred to as Generator Cold Weather Constraints, and revising the definition to describe the concept at a higher level;
- Requiring each Generator Owner declaring a Generator Cold Weather Constraint to submit the declaration to its Compliance Enforcement Authority for validation in a timely manner;
- Requiring that Generator Owners review their validated Generator Cold Weather Constraints at least once every 36 calendar months for continued validity, instead of at least once every five calendar years, to ensure that new technologies are considered and circumstances preventing implementation are reevaluated on a regular basis;
- Providing shorter deadlines for Generator Owners to implement Corrective Action Plans developed in response to Generator Cold Weather Reliability Events, so that known freezing issues are addressed more quickly;
- Requiring that any extension of a Corrective Action Plan implementation deadline beyond the maximum implementation timeframe provided by the standard be pre-approved by the Compliance Enforcement Authority;
- Reinforcing that Generator Owners must update their generating unit cold weather operating limitations while any Corrective Action Plan is pending completion;
- Requiring Generator Owners with new Bulk Electric System ("BES") generating units entering commercial operation on or after October 1, 2027 to have the required cold weather capability upon entering commercial operation, unless a Generator Cold Weather Constraint would apply; and
- Clarifying requirements for Corrective Action Plan timeline applicability, as directed by FERC in the June 2024 Order.

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<sup>32</sup> *Id.* at P 72.

<sup>33</sup> *Id.* at P 76.

<sup>34</sup> *Id.*

During the standard development process for Reliability Standard EOP-012-3, NERC received comments from Canadian registered entity stakeholders regarding their concerns with the standard. Given the limited scope of that project and the time constraints associated with addressing the FERC directives, NERC encouraged those Canadian registered entities to submit a Standard Authorization Request proposing a separate project by which their concerns could be fully considered and addressed.

NERC submitted Reliability Standard EOP-012-3 on April 29, 2025.<sup>35</sup> FERC approved Reliability Standard EOP-012-3 on September 18, 2025 to become effective in the United States on October 1, 2025.<sup>36</sup>

#### **E. Project 2025-01 Revisions to EOP-012-3**

In May 2025, NERC initiated Project 2025-01 Revisions to EOP-012-3. The purpose of this project was to consider standards revisions in accordance with a Standard Authorization Request submitted by Electricity Canada members from Quebec, Ontario, New Brunswick, and Manitoba. The SAR sought, among other things, to develop Canada-specific revisions that would “more appropriately reflect the geographical differences where Canadian peak demand typically occurs during winter months and where Canadian generating units are economically constrained to be suitable for winter operation,” and that would “more appropriately reflect regulatory practices and processes in Canada.” The NERC Standards Committee appointed a team of subject matter experts from Canadian registered entities (see Exhibit G), which developed a proposed Canadian Variance to the EOP-012 standard.

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<sup>35</sup> EOP-012-3 Filing, *supra* note 3.

<sup>36</sup> *N. Am. Elec. Reliability Corp.*, 192 FERC ¶ 61,229 (2025), *order on clarification*, 193 FERC ¶ 61,187 (2025).

In accordance with NERC’s naming convention for Reliability Standards, the standard with the proposed Canadian Variance was assigned version EOP-012-4. As described in Exhibit F, NERC posted proposed Reliability Standard EOP-012-4 for public comment and ballot in accordance with NERC’s standard development process, and it was approved by the ballot pool. The NERC Board of Trustees adopted the proposed standard and its implementation plan on October 8, 2026.

#### **IV. JUSTIFICATION FOR APPROVAL**

In this filing, NERC submits proposed Reliability Standard EOP-012-4 – Extreme Cold Weather Preparedness and Operations, which contains an optional Variance for use within Canadian jurisdictions. NERC also submits four proposed defined terms intended for use within the proposed Canadian Variance. These terms are the same as those used in the continent-wide standard, but with definitions that are appropriate to the Canadian Variance. The terms are denoted with the use of the tag [CV] to distinguish them from the continent-wide defined terms and include the following:

- Generator Cold Weather Reliability Event [CV]
- Fixed Fuel Supply Component [CV]
- Generator Cold Weather Critical Components [CV]
- Generator Cold Weather Constraint [CV]

The purpose of proposed Reliability Standard EOP-012-4 remains the same as prior versions of the EOP-012 standard: “to address the effects of operating in extreme cold weather by ensuring each Generator Owner has developed and implemented plan(s) to mitigate the reliability impacts of extreme cold weather on its applicable generating units.” The proposed Reliability Standard would continue to apply to Generator Owners and Generator Operators that own or

operate BES generating units; however, the proposed standard would exclude from the applicability of the Canadian Variance BES generating units that are subject to the regulation of the Canadian Nuclear Safety Commission.

The proposed Reliability Standard would continue to contain nine continent-wide requirements and one attachment. The continent-wide Requirements R1 through R9 and Attachment 1 are carried forward from Reliability Standard EOP-012-3 unchanged. The proposed Reliability Standard would add a new Section, Section D, containing a Canadian Variance. The proposed Canadian Variance would consist of nine Variance requirements D.A.1 through D.A.8 and one attachment, Attachment 1- CAN. These Variance requirements and attachment are modeled on the structure of the continent-wide requirements, with revisions necessary to accommodate differences in the operational and regulatory frameworks in Canada.

The Canadian Variance in proposed Reliability Standard EOP-012-4, including the proposed Canadian Variance defined terms, are discussed more fully below. Additional discussion of the technical basis for the original requirements in the EOP-012 Reliability Standard is available in NERC's filing regarding Reliability Standards EOP-011-3 and EOP-012-1,<sup>37</sup> NERC's filing regarding Reliability Standard EOP-012-2,<sup>38</sup> and NERC's filing regarding Reliability Standard EOP-012-3.<sup>39</sup>

As discussed in **Exhibit D**, and for the reasons stated below, NERC submits that the proposed Reliability Standard EOP-012-4 meets the Reliability Standards criteria and is just, reasonable, not unduly discriminatory or preferential, and in the public interest.

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<sup>37</sup> See EOP-011-3/EOP-012-1 Filing, *supra* note 13.

<sup>38</sup> See EOP-012-2 Filing, *supra* note 25.

<sup>39</sup> EOP-012-3 Filing, *supra* note 3.

## **A. Canadian Variance Definitions**

NERC proposes four defined terms used in the Canadian Variance in proposed Reliability Standard EOP-012-4 for inclusion in the NERC *Glossary*. These terms are:

- Generator Cold Weather Reliability Event [CV]
- Fixed Fuel Supply Component [CV]
- Generator Cold Weather Critical Components [CV]
- Generator Cold Weather Constraint [CV]

In developing the proposed Canadian Variance, the drafting team determined that Canadian-specific definitions of terms are necessary because generating units in Canada are designed and operated under fundamentally different cold-weather conditions than those implicitly assumed in existing continent-wide definitions. Most Canadian generating stations are indoor-type facilities that rely on integrated thermal designs (such as waste heat from operating units) to maintain suitable internal environments, meaning cold-weather performance must be evaluated at a system level rather than through isolated component ratings. In addition, Canadian generators routinely operate at extreme cold temperatures well below  $-40^{\circ}\text{C}$ , where equipment limitations, material properties, lubrication performance, and heat transfer considerations dominate, requiring a holistic engineering approach to ensure reliability. At these temperatures, the air is extremely dry, and icing or freezing precipitation is rare, making the operational challenges significantly different from those encountered near the freezing point, where moisture and ice accumulation are primary concerns. As a result, existing definitions that equate cold weather primarily with freezing-related phenomena can be misleading in the Canadian context, potentially diverting attention from the true drivers of cold-weather risk and underscoring the need for definitions (such as Fixed Fuel Supply Component, Generator Cold Weather Constraint, Generator Cold Weather Critical

Components, and Generator Cold Weather Reliability Event) that better reflect the realities of extreme cold operation in Canadian climates.

To minimize the differences across the continent-wide standard and the proposed Canadian Variance, the drafting team determined to create Variances to the continent-wide defined terms for use within the proposed Canadian Variance. Each of the proposed Canadian Variance defined terms is discussed below.

### **1. Fixed Fuel Supply Component [CV]**

The proposed Canadian Variance definition of Fixed Fuel Supply Component [CV] differs from the continent-wide definition of Fixed Fuel Supply Component as follows:

Fixed Fuel Supply Component [CV]: Non-mobile equipment that supports the reliable delivery of fuel to the generating unit and under the control of the Generator Owner ~~at a plant site~~ in or adjacent to the plant. Gaseous, liquid, or solid fuel handling components that are installed ~~on-site~~ or adjacent to the plant as fixed parts of the fuel delivery system that are under the Generator Owner's control are included. Mobile equipment such as trains, bulldozers, or other equipment that are not fixed in one location are excluded. Water regulating structures are also excluded.

A Canadian Variance definition for Fixed Fuel Supply Component was developed because the continent-wide definition relies on the concept of what is “on site”, which is not sufficiently precise in the Canadian context. Certain large hydroelectric facilities in Canada involve the flooding of large areas or substantial modifications to the watershed upstream of the actual hydroelectric dam. For crown utilities operating on crown land, the notion of a “site” could be interpreted broadly to include watershed modifications and water regulating structures located many kilometers away, which do not directly affect the cold weather operability of the generating units and are often subject to separate management and regulatory oversight. To ensure clarity and consistent application of cold weather operability requirements, the Canadian Variance definition

limits Fixed Fuel Supply Components to equipment located adjacent to the generating facility and explicitly excludes remote water regulating and watershed control structures.

## **2. Generator Cold Weather Constraint [CV]**

The proposed Canadian Variance definition of Generator Cold Weather Constraint [CV] differs from the continent-wide definition as follows:

Generator Cold Weather Constraint [CV]: Any condition that would preclude a Generator Owner from implementing ~~freeze protection~~ cold weather operability measures on one or more Generator Cold Weather Critical Components [CV]. ~~Freeze protection~~ Cold weather operability measures are not intended to be limited to optimum practices, methods, or technologies, but are also intended to include practices, methods, or technologies that would be expected to result in improved generating unit performance during cold temperatures.

A Canadian Variance definition for Generator Cold Weather Constraint was developed because the continent-wide definition is based on the concept of Generator Cold Weather Critical Components. To ensure consistent application of the Canadian Variance definition of Generator Cold Weather Critical Components, a corresponding Canadian Variance definition of Generator Cold Weather Constraint was created to explicitly reference and align with it.

## **3. Generator Cold Weather Critical Components [CV]**

The proposed Canadian Variance definition of Generator Cold Weather Critical Component [CV] differs from the continent-wide definition as follows:

Generator Cold Weather Critical Components [CV]: Any generating unit component or system, or associated Fixed Fuel Supply Component [CV], used during normal operation, that is under the Generator Owner's Control, ~~and is susceptible to freezing issues, the occurrence of which would likely lead to a Generator Cold Weather Reliability Event~~ which, if destroyed, degraded, or modified in a manner inconsistent with original design intent, could result in a reduction in the range of cold weather environmental conditions over which the generating unit can be operated successfully, or a reduction in power output attainable in certain cold weather conditions.

This definition excludes any component or system or associated Fixed Fuel Supply Component [CV]:

(1) Located inside a permanent building with a heating source that regularly maintains the space at a temperature above 32 degrees Fahrenheit (0° degrees Celsius; and

(2) That is continuously submerged in water which remains above 0°C during normal operation.

A Canadian Variance definition for Generator Cold Weather Critical Components was developed because the continent-wide definition is framed in terms of freezing phenomena and the Generator Cold Weather Reliability Event. To better reflect the broader range of cold weather conditions experienced in Canada, a Canadian Variance definition was developed to focus on cold weather operability rather than specific freezing mechanisms, and the reference to Generator Cold Weather Reliability Event was removed. In addition, a targeted exclusion was introduced for certain components of hydroelectric facilities in northern climates that are not susceptible to freezing due to the unique physical properties of water, ensuring the definition more accurately reflects Canadian operating conditions.

#### **4. Generator Cold Weather Reliability Event [CV]**

The proposed Canadian Variance definition of Generator Cold Weather Reliability Event [CV] differs from the continent-wide definition as follows:

**Generator Cold Weather Reliability Event [CV]:** One of the following ~~events for which the apparent cause(s) is due to freezing of equipment or impacts of freezing precipitation (e.g., sleet, snow, ice, and freezing rain) on equipment within the Generator Owner's control, and the dry bulb temperature at the time of the event was at or above the Extreme Cold Weather Temperature:~~ at a generating unit, occurring at or below a temperature of 0°C, unless assessed by a provincially-licensed professional engineer that cold weather performance issues were unlikely to have contributed to the event:

- (1) a forced derate of more than 10% of the total capacity of the unit, but not less than 20 MWs for longer than four hours in duration;
- (2) a start-up failure where the unit fails to synchronize within a specified start-up time; or
- (3) a Forced Outage.

A Canadian Variance definition for Generator Cold Weather Reliability Event [CV] was developed to address several limitations in the continent-wide definition. Specifically, the continent-wide definition excludes events occurring at temperatures colder than the defined Extreme Cold Weather Temperature, even though Canadian balancing areas experience peak demand and highest reliability risk during such extreme cold conditions, when reliance on in-province generation is greatest. Power systems in several Canadian provinces have peak loads much higher than the capacity of the interties connecting them to the rest of the system. While the statistical approach of only expecting generating units to operate down to the Extreme Cold Weather Temperature and planning to import power from other regions during extreme cold events that only occur on average for a few hours per year may make sense in Balancing Authority Areas that have high capacity interconnections with neighbors, many Canadian jurisdictions depend on generators to operate at all temperatures in order to supply customers, and in fact may experience the highest peak loads of any time in the year during such cold weather events. Further, the continent-wide definition emphasizes freezing-related phenomena and precipitation, listing weather conditions that either do not occur in extreme cold or, in the case of sleet, are not recognized in Canada due to differing definitions. However, a broader range of cold weather operational challenges are associated with cold weather in Canadian climates.

In addition, the requirement to determine “apparent cause” for events occurring within a specified temperature band (0°C/32°F) disproportionately impacts Canadian entities, which operate in cold conditions for a larger portion of the year. In northern climates, where derates, startup failures, and outages frequently occur for reasons unrelated to cold weather performance, these aspects could hinder efficient event screening and create unnecessary compliance risk.

The Canadian Variance definition of Generator Cold Weather Reliability Event [CV] addresses these limitations by broadening the concept of an event requiring further study and potential mitigation to include any derate, startup-failure, or outage in which cold weather performance issues played a role, regardless of whether the temperature was above or below the Extreme Cold Weather Temperature or whether the issue was related to freezing phenomena or other cold weather operational challenges. To support efficient and practical event screening, the determination would be made by a provincially licensed professional engineer (which will typically be a plant engineer) operating under established regulatory frameworks of a provincial engineering body. To ensure that all events are appropriately evaluated, the definition also provides that unassessed derates, startup failures, and outages are to be treated as Generator Cold Weather Reliability Events [CV] until an engineering determination is completed.

## **B. Applicability**

Proposed Reliability Standard EOP-012-4 would exempt from the Canadian Variance (and by extension, any standard requirements) those Bulk Electric System generating units subject to the regulation of the Canadian Nuclear Safety Commission (“CNSC”). The drafting team considered that generating units regulated by the CNSC are subject to rigorous requirements governing facility design, maintenance, operation, equipment reliability, and operational readiness.<sup>40</sup> The drafting team further considered that, in Canada, nuclear facilities are designed with consideration for the environmental and climatic conditions applicable to their geographical location and are supported by comprehensive maintenance, corrective action, training, and performance monitoring programs. In addition, operators maintain seasonal readiness and winter

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<sup>40</sup> See Exhibit C, Technical Rationale at 6 (citing REGDOC 2.5.2 *Design of Reactor Facilities*, <https://www.cnsccsn.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/regdoc2-5-2-v2/> and CSA N286.12 *Management System Requirements for Nuclear Facilities*, <https://webstore.ansi.org/standards/csa/CSAN28612R2022>).

preparedness processes that include inspections, preventive maintenance, equipment testing, and operational reviews to ensure continued reliable operation during adverse winter conditions. The drafting team determined that the cold weather preparedness, equipment operability, and reliability objectives of the EOP-012 standard are addressed sufficiently through these existing regulatory and operational programs, supporting the exemption.

### **C. Canadian Variance Requirements**

#### **1. Requirement D.A.1: Identifying Generator Cold Weather Data and Information**

Requirement R1 of the EOP-012 Reliability Standard relates to the calculation of the Extreme Cold Weather Temperature (or “ECWT”) for an applicable generating unit. The Extreme Cold Weather Temperature is defined as “The temperature equal to the lowest 0.2 percentile of the hourly temperatures measured in December, January, and February from 01/01/2000 through the date the temperature is calculated.” The Extreme Cold Weather Temperature forms the foundation for much of the required performance under the EOP-012 standard. The proposed Canadian Variance in proposed Reliability Standard EOP-012-4 carries forward the continent-wide requirement substantially unchanged. Carrying forward the continent-wide requirement into the Canadian Variance creates one self-contained set of requirements with associated terms that would allow future drafting teams to revise one or the other, without the need to consider the impacts of shared requirement language between the two.

#### **2. Requirements D.A.2 and D.A.3: Cold Weather Capability for New BES Generating Units and Existing BES Generating Units**

The proposed Canadian Variance in proposed Reliability Standard EOP-012-4 carries forward the framework of the continent-wide standard that imposes more stringent requirements for cold weather preparedness for new BES generating units than for existing generating units. However, there are several key differences between the continent-wide Requirements R2 and R3

and the proposed Canadian Variance Requirements D.A.2 and D.A.3 intended to reflect Canadian regulatory and operational frameworks.

Continent-wide Requirement R2 provides as follows:

- R2.** Applicable to generating units that begin commercial operation<sup>1</sup> on or after October 1, 2027<sup>2</sup>: Each Generator Owner, for each generating unit that has a calculated Extreme Cold Weather Temperature at or below 32 degrees Fahrenheit (zero degrees Celsius) as determined in Requirement R1, and that self-commits or is required to operate at or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius),<sup>3</sup> shall:
- Implement freeze protection measures to protect Generator Cold Weather Critical Components that provide the capability to operate at the generating unit(s)' Extreme Cold Weather Temperature with sustained concurrent twenty (20) mph (32 km/h) wind speed for (i) a period of not less than twelve (12) continuous hours or (ii) the maximum operational duration for intermittent energy resources if less than twelve (12) continuous hours; or
  - Document, in a declaration, with justification, if applicable, a Generator Cold Weather Constraint in accordance with Requirement R8.

**Footnotes:**

- [fn1] Commercial operation means achievement of this designation indicating that the facility has received all approvals necessary for operation after completion of initial start-up testing.
- [fn2] In non-U.S. jurisdictions, this will be the date established by the Applicable Governmental Authority.
- [fn3] Generating unit(s) that do not self-commit or are not required to operate at or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius), but may be called upon to operate in order to assist in the mitigation of BES Emergencies, Capacity Emergencies, or Energy Emergencies during periods at or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius), are exempt from this requirement.

Proposed Canadian Variance Requirement D.A.2 provides as follows:

- D.A.2.** Applicable to generating units that begin commercial operation<sup>11</sup> after the effective date of this Reliability Standard: Each Generator Owner, for each generating unit that self-commits or is required to operate at or below a temperature of 0°C,<sup>12</sup> shall:
- Implement cold weather operability measures such that the generating unit(s) minimum temperature under Requirement D.A.1 Part 1.2.2 is less than or equal to the unit(s)' Extreme Cold Weather Temperature;

- Implement cold weather operability measures such that the generating unit(s) minimum temperature under Requirement D.A.1 Part 1.2.2 is less than or equal to a minimum temperature approved by the applicable regulatory authorities or governing bodies responsible for retail electric service issues; or
- Document in a declaration, with justification, if applicable, a Generator Cold Weather Constraint [CV] in accordance with Requirement D.A.8.

[fn11] Commercial operation means achievement of this designation indicating that the facility has received all approvals necessary for operation after completion of initial start-up testing.

[fn12] Generating unit(s) that do not self-commit or are not required to operate at or below a temperature of 0°C, but may be called upon to operate in order to assist in the mitigation of BES Emergencies, Capacity Emergencies, or Energy Emergencies during periods at or below a temperature of 0°C, are exempt from this requirement.

Continent-wide Requirement R3 provides as follows:

**R3.** Applicable to generating unit(s) in commercial operation prior to October 1, 2027<sup>4</sup>: Each Generator Owner, for each generating unit that has a calculated Extreme Cold Weather Temperature at or below 32 degrees Fahrenheit (zero degrees Celsius) as determined in Requirement R1, and that self-commits or is required to operate at or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius),<sup>5</sup> shall:

- Implement freeze protection measures to protect Generator Cold Weather Critical Components that provide the capability to operate at the generating unit(s)' Extreme Cold Weather Temperature; or
- Develop a Corrective Action Plan to add new or modify existing freeze protection measures to provide the capability to operate at the generating unit(s)' Extreme Cold Weather Temperature.

[fn4] In non-U.S. jurisdictions, this will be the date established by the Applicable Governmental Authority.

[fn5] Generating unit(s) that do not self-commit or are not required to operate at or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius), but may be called upon to operate in order to assist in the mitigation of BES Emergencies, Capacity Emergencies, or Energy Emergencies during periods at or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius), are exempt from this requirement.

Proposed Canadian Variance Requirement D.A.3 provides as follows:

**D.A.3.** Applicable to generating unit(s) in commercial operation<sup>13</sup> prior to the effective date of this Reliability Standard: Each Generator Owner, for each generating unit that self-commits or is required to operate at or below a temperature of 0°C,<sup>14</sup> shall:

- Implement cold weather operability measures such that the generating unit(s) minimum temperature under Requirement D.A.1 Part 1.2.2 is less than or equal to the unit(s)' Extreme Cold Weather Temperature;
- Implement cold weather operability measures such that the generating unit(s) minimum temperature under Requirement D.A.1 Part 1.2.2 is less than or equal to a minimum temperature approved by the applicable regulatory authorities or governing bodies responsible for retail electric service issues; or
- Develop a Corrective Action Plan to add new or modify existing cold weather operability measures to provide the capability to operate at the generating unit(s)' Extreme Cold Weather Temperature.

[fn13] Commercial operation means achievement of this designation indicating that the facility has received all approvals necessary for operation after completion of initial start-up testing.

[fn14] Generating unit(s) that do not self-commit or are not required to operate at or below a temperature of 0°C, but may be called upon to operate in order to assist in the mitigation of BES Emergencies, Capacity Emergencies, or Energy Emergencies during periods at or below a temperature of 0°C, are exempt from this requirement.

The proposed Canadian Variance Requirements D.A.2 and D.A.3 differ from the continent-wide requirements in several key respects. First, the proposed Canadian Variance requirements modify the requirement language so that the date that determines which requirement applies is based on the effective date of the standard, ensuring that requirements intended for new units are not applied retroactively to existing units. Canadian provinces vary in their mechanisms and timeframes for adopting Reliability Standards, implementation plans, and NERC Glossary definitions, and for identifying jurisdiction-specific dates. The proposed language would accommodate these differences and create clear expectations for applicability.

The proposed Requirements D.A.2 and D.A.3 simplify the requirements for winterization by establishing thermal performance criteria based on the Extreme Cold Weather Temperature and the generating unit(s) minimum operating temperature. The performance criteria replaces consideration of Generator Cold Weather Critical Components and wind speed in the continent-wide requirements. Although wind speed affects the rate of heat transfer by convection, and in principle can impact the cold weather operability of a generating unit, the required thermal

resistance to avoid freezing is usually much larger than the effects of convection in the extreme cold weather in which Canadian units operate. Therefore, it is practical to disregard the thermal impact of convection. In any case, the Canadian Variance definition of “Generator Cold Weather Reliability Event [CV]” includes events below the Extreme Cold Weather Temperature, so issues related to marginal winter preparedness will be identified and corrected.

Proposed Canadian Variance Requirements D.A.2 and D.A.3 would require the Generator Owner to implement cold weather operability measures on its units that will enable it to run in the very cold conditions it is reasonably likely to encounter. For existing units, Generator Owners may develop Corrective Action Plans to provide the required capability, if not already present. Such Corrective Action Plans may be implemented over time. For new units, Generator Owners must either deploy the necessary cold weather operability measures upon beginning commercial operation or declare a Generator Cold Weather Constraint [CV] that would preclude the implementation of such measures.

Canadian-specific requirements D.A.2 and D.A.3 provide three mechanisms to accommodate situations in which having generator units operate at generating unit minimum temperatures at, or colder than the Extreme Cold Weather Temperature, are not attainable:

- Generating units that are not required or do not self-commit to operate in cold weather (outside of being called upon to assist in Emergency conditions) are exempted from compliance with D.A.2, D.A.3, and D.A.6; this is consistent with exemptions from corresponding requirements in the continent-wide standard.
- The processes of Corrective Action Plans and Generator Cold Weather Constraints [CV] may be engaged to provide technical solutions or justifications for non-solutions. These processes, described in Requirements D.A.7 and D.A.8, are based on, and are comparably stringent to, the continent-wide standard, but accommodate differences in Canadian regulatory frameworks.
- A third, Canadian-specific, option is provided in which an alternative temperature criterion is approved by the “applicable regulatory authorities or governing bodies responsible for retail electric service issues”. It is expected that this mechanism will be used rarely, but may be useful in some contexts. For example, a provincial utilities board may wish to

approve a project that could not feasibly attain a generator minimum temperature of colder than the Extreme Cold Weather Temperature due to commercial unavailability of the generating unit technology with sufficiently cold environmental ratings, but which is desired to support public policy objectives such as decarbonization.

The proposed cold weather operability framework thus accommodates differences in operation in Canadian climates and regulatory frameworks while advancing the reliability goal of the EOP-012 standard to improve generator reliability in extreme cold temperatures.

### **3. Requirement D.A.4: Implementing and Maintaining Cold Weather Preparedness Plans**

Proposed Reliability Standard EOP-012-4 Canadian Variance Requirement D.A.4 largely carries forward Requirement R4 from the continent-wide standard, with updates to reflect Canadian Variance definitions and requirement numbers. Language regarding “freeze protection measures” is replaced with “cold weather operability measures,” consistent with the overall Canadian Variance approach to winterization requirements. The proposed requirement would provide as follows:

**D.A.4.** 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:

**D.A.4.1.** The lowest calculated Extreme Cold Weather Temperature for each generating unit, as determined in Requirement D.A.1<sup>15</sup>;

**D.A.4.2.** The generating unit cold weather data, as determined in Requirement D.A.1, Part 1.2;

**D.A.4.3.** Documentation identifying Generator Cold Weather Critical Components [CV];

**D.A.4.4** Documentation of cold weather operability measures implemented on Generator Cold Weather Critical Components [CV];

**D.A.4.5.** Annual inspection and maintenance of generating unit(s) cold weather operability measures implemented on Generator Cold Weather Critical Components [CV].

[fn15] Generator Owners shall include the lowest calculated Extreme Cold Weather Temperature for the unit, even where subsequent periodic re-

calculations under Requirement D.A.1 Part D.A.1.1. cause an increase in the Extreme Cold Weather Temperature.

The proposed Canadian Variance Requirement D.A.4. would thus carry forward requirements for cold weather preparedness plans, documentation of components vulnerable to cold weather that may create operational impacts for the unit, and ongoing proactive inspection and maintenance of measures intended to ensure those components remain functional in cold weather.

#### **4. Requirement D.A.5: Providing Annual Training on Cold Weather Preparedness Plans**

Proposed Reliability Standard EOP-012-4 Canadian Variance Requirement D.A.5 carries forward Requirement R5 from the continent-wide standard substantively unchanged, with minor revisions identified below:

**D.A.5.** Each Generator Owner, in conjunction with its Generator Operator, shall identify the entity responsible for providing generating unit-specific training for each of its applicable generating units, and that identified entity shall provide annual training to the maintenance and operations personnel, as applicable, responsible for implementing the cold weather preparedness plan(s) developed pursuant to Requirement D.A.4.

The differences in the Canadian Variance requirement are modest in nature and intended to improve readability and reflect the numbering of the corresponding Canadian Variance requirements.

#### **5. Requirement D.A.6: Developing and Implementing Corrective Action Plans to Address Generator Cold Weather Reliability Events**

Proposed Reliability Standard EOP-012-4 Canadian Variance Requirement D.A.6 carries forward the continent-wide requirement that each Generator Owner experiencing a Generator Cold Weather Reliability Event develop a Corrective Action Plan to address the identified causes. Proposed Reliability Standard EOP-012-4 Requirement D.A.6 differs from the continent-wide requirement in several respects, demonstrated in blackline below:

**D.A.6.** Each Generator Owner shall, after experiencing a Generator Cold Weather Reliability Event [CV] at a generating unit that ~~has a calculated Extreme Cold Weather Temperature at or below 32 degrees Fahrenheit (zero degrees Celsius) as determined in Requirement R1 and that~~ self-commits or is required to operate at or below a temperature of ~~32 degrees Fahrenheit (zero degrees Celsius)~~ 0°, <sup>16</sup> develop and implement<sup>17</sup> a Corrective Action Plan(s) to address identified ~~freezing issues~~ cold weather performance issues as follows:

**D.A.6.1.** The Generator Owner shall develop a Corrective Action Plan for the generating unit that experienced a Generator Cold Weather Reliability Event [CV] no later than prior to the first day of the first December following the Generator Cold Weather Reliability Event [CV].<sup>18</sup>

**D.A.6.2.** The Generator Owner shall conduct a review of other generating unit(s) in its fleet with the same or similar equipment as the affected generating unit to determine if any of those generating unit(s) are susceptible to the identified freezing issues. If corrective actions are needed, the Generator Owner shall develop or update a Corrective Action Plan to address the other generating unit(s). This review and, if applicable, the development or update of any Corrective Action Plan(s), shall be completed no later than 12 calendar months following the Generator Cold Weather Reliability Event [CV].

**D.A.6.3.** For each Corrective Action Plan, the Generator Owner shall include at a minimum:

**6.3.1.** A summary of the identified cause(s) of the Generator Cold Weather Reliability Event [CV], where applicable, and any relevant associated data;

**6.3.2.** A list of actions to add new ~~freeze protection~~ cold weather operability measures or remedy issues with existing ~~freeze protection~~ cold weather operability measures;

**6.3.3** An identification of any operating limitations on the generating unit(s), or impacts to the cold weather preparedness plan, if any, that would apply until implementation of the corrective action(s) identified in the Corrective Action Plan is completed;

**6.3.4.** A description of the updates to the cold weather preparedness plan required under Requirement D.A.4 to identify updates or additions to the Generator Cold Weather Critical Components [CV] and their ~~freeze protection~~ cold weather operability measures, if required; and

**6.3.5.** A timetable specifying that implementation of the Corrective Action Plan(s) shall be completed as follows:

**6.3.5.1.** For the generating unit experiencing the Generator Cold Weather Reliability Event [CV]: prior to the first day of the first December following the Generator Cold Weather Reliability Event [CV],<sup>19</sup> or within twelve (12) calendar months following the receipt of any required regulatory approvals, whichever is later.

**6.3.5.2.** For other generating unit(s) owned by the Generator Owner: within 24 calendar months of completing the review required in Part 6.2, or no later than 36 calendar months following the Generator Cold Weather Reliability Event [CV], or within 36 calendar months following the receipt of any required regulatory approvals, whichever is later.

**D.A.6.4** If a Generator Owner determines it will be unable to complete one or more of the actions in a Corrective Action Plan in accordance with the timetables specified in Requirement D.A.6 Part 6.3.5 due to circumstances beyond its control, the Generator Owner shall ~~submit a Corrective Action Plan extension request to the Compliance Enforcement Authority (CEA) for approval. The submitted Corrective Action Plan extension request shall include the following update its Corrective Action Plan with the following information:~~

- 6.4.1.** An explanation of the circumstances causing the delay and why those circumstances are beyond the control of the Generator Owner;
- 6.4.2.** Revisions to the selected actions in Part 6.3.2, if any, including utilization of operating procedures, if applicable; and
- 6.4.3.** Updated timetable for implementing the selected actions in Part 6.3.2.

**D.A.6.5** The Generator Owner shall document in a declaration, with justification, if applicable, any Generator Cold Weather Constraint [CV] in accordance with Requirement D.A.8, ~~as applicable.~~

[fn16] Generating unit(s) that do not self-commit or are not required to operate at or below a temperature of ~~32 degrees Fahrenheit~~  $\pm 0^{\circ}\text{C}$  (~~zero degrees Celsius~~), but may be called upon to operate in order to assist in the mitigation of ~~BES~~ Bulk Electric System Emergencies, Capacity Emergencies, or Energy Emergencies during periods at or below a temperature of ~~32 degrees Fahrenheit~~ (~~zero degrees Celsius~~)  $0^{\circ}\text{C}$ , are exempt from this requirement.

[fn17] If a Generator Owner has previously experienced a Generator Cold Weather Reliability Event [CV] and developed a Corrective Action Plan for

the generating unit or units under Requirement D.A.6 Parts 6.1 or 6.2, the Generator Owner may review and update its existing plan(s) in lieu of developing a new plan.

[fn18/19] For events that occur in September, October, or November, the timetable shall specify completion prior to December 1 of the following calendar year.

The proposed Canadian Variance Requirement D.A.6 carries forward the approach first proposed in Reliability Standard EOP-012-3 that Generator Owners mitigate winterization issues on the units that experienced actual performance issues first, while allowing additional time to complete an extent of condition review across the fleet and develop Corrective Action Plans to mitigate issues at other generating units in the fleet that are likely to be similarly impacted. This helps to ensure that known issues that have caused actual reliability impacts are identified and addressed in a timely manner, while helping to prevent these issues from causing similar issues at other generating units in the fleet in the future.

The proposed Canadian Variance requirements for Corrective Action Plans differ in several respects from the continent-wide requirements. In addition to replacing freezing-related language with cold weather performance-based language and incorporating Canadian Variance defined terms, proposed Canadian Variance Requirements D.A.6 and D.A.7, discussed in the following section, adopt the approach used in Reliability Standard EOP-012-2 for extending Corrective Action Plan timelines. This replaces the process in Reliability Standard EOP-012-3 Requirements R6 and R7, which requires that the Compliance Enforcement Authority pre-approve any extension to Corrective Action Plan timelines. NERC developed the continent-wide requirements requiring Compliance Enforcement Authority pre-approval of timeline extensions to address the FERC directives. These differences in the Canadian Variance are needed to provide flexibility to accommodate regulatory differences in certain Canadian jurisdictions. Canadian jurisdictions differ in how they assign responsibility for adopting, monitoring, and enforcing Reliability

Standards. Canadian entity stakeholders identified that requirements for prior approval of Corrective Action Plan extensions and Generator Cold Weather Constraints could place participants in roles not intended by those frameworks or could present other issues. The drafting team also considered that some Canadian provinces do not allow entities to proceed with new capital expenditures pursuant to a Corrective Action Plan without prior review by the provincial utilities board. The time limits established for Corrective Action Plan completion in the continent-wide standard may not allow time for the completion of the required regulatory processes.

The proposed Canadian Variance in Reliability Standard EOP-012-4 addresses these issues as follows: first, by replacing prior Compliance Enforcement Authority approval of timeline extensions with an approach where Corrective Action Plans can be revised and shared with impacted parties, including the Compliance Enforcement Authority, which can review the revisions for reasonableness in the context of its compliance monitoring and enforcement activities; and second, by pausing the requirement for timely Corrective Action Plan completion until the receipt of any required regulatory approvals. These differences in the Canadian Variance from the continent-wide requirement are similar to the differences adopted to address similar issues in the Reliability Standard TPL-007-3 Canadian Variance.

**6. Requirement D.A.7: Developing and Implementing Corrective Action Plans to Address Cold Weather Operations Capability**

Proposed Reliability Standard EOP-012-4 Canadian Variance Requirement D.A.7 would address the development of Corrective Action Plans to implement cold weather operability measures as needed to ensure reliable cold weather operations, or as needed to provide such capability after a periodic review of the Extreme Cold Weather Temperature (Requirement D.A.1) or upon determining that a previously declared Generator Cold Weather Constraint [CV] is no longer valid (Requirement D.A.9). As noted above, proposed Requirement D.A.6 would address

Corrective Action Plans to address Generator Cold Weather Reliability Events. Proposed Requirement D.A.7 differs from the continent-wide requirement in several respects to address specific Canadian concerns, as demonstrated in blackline below:

**D.A.7.** Each Generator Owner that is required to develop a Corrective Action Plan under Requirements D.A.1, D.A.3, or D.A.9 shall develop and implement the Corrective Action Plan in accordance with the following:

**D.A.7.1** For each Corrective Action Plan, the Generator Owner shall include at a minimum the following:

- 7.1.1.** A list of any actions that require new ~~freeze protection~~ cold weather operability measures, with a timetable specifying completion of such measures within 48 calendar months of completing development of the Corrective Action Plan, or the receipt of any necessary regulatory approvals, whichever is later;
- 7.1.2.** A list of any actions that remedy issues with existing ~~freeze protection~~ cold weather operability measures with a timetable specifying completion of such measures within 24 calendar months of completing development of the Corrective Action Plan (regardless of any longer timelines in the Corrective Action Plan associated with ~~new freeze protection~~ cold weather operability measures), or the receipt of any necessary regulatory approvals, whichever is later;
- 7.1.3.** A description of updates to the cold weather preparedness plan required under Requirement D.A.4 to identify the updates or additions to the Generator Cold Weather Critical Components [CV] and their ~~freeze protection~~ cold weather operability measures; and
- 7.1.4.** An identification of operating limitations on the generating unit(s), or impacts to the cold weather preparedness plan, if any, that would apply until implementation of the corrective action(s) identified in the Corrective Action Plan is completed.

**D.A.7.2.** If a Generator Owner determines it will be unable to complete one or more of the actions in a Corrective Action Plan in accordance with the timetables specified in Requirement D.A.7 Part 7.1 due to circumstances beyond its control, the Generator Owner shall ~~submit~~ update its a-Corrective Action Plan extension request to the CEA for approval. The submitted Corrective Action Plan extension request shall include with the following information:

- 7.2.1. An explanation of the circumstances causing the delay and how those circumstances are beyond the control of the Generator Owner;
- 7.2.2. Revisions to the selected actions in Parts 7.1, if any, including utilization of operating procedures, if applicable; and
- 7.2.3. Updated timetable for implementing the selected actions in Part 7.1.

**D.A.7.3** The Generator Owner shall document in a declaration, with justification, if applicable, any Generator Cold Weather Constraint [CV] in accordance with Requirement D.A.8.

Proposed Canadian Variance Requirement D.A.7 would carry forward the improvements reflected in continent-wide Requirement R7 in Reliability Standard EOP-012-3 to ensure the timely mitigation of issues that could prevent a generating unit from operating reliably in cold weather. As noted in the discussion of proposed Canadian Variance Requirement D.A.6, certain modifications are necessary to address concerns regarding the completion of Corrective Action Plan measures as well as reflect the Canadian Variance approach to implementing cold weather operability measures to ensure cold weather reliability, rather than strictly freeze protection measures.

## **7. Requirement D.A.8: Declaring Generator Cold Weather Constraints [CV] and Attachment 1 - CAN**

Proposed Reliability Standard EOP-012-4 Canadian Variance Requirement D.A.8 carries forward the continent-wide Requirement R8 which addresses the declaration of Generator Cold Weather Constraints [CV]. Since its inception, the EOP-012 standard has recognized that certain circumstances may make the implementation of one or more winterization measures impractical or even impossible. To avoid premature retirement or discontinuation of planned generation resources due to the inability to implement winterization measures to operate in extreme cold temperatures, a consequence which could present its own reliability challenges, the EOP-012

standard has excused Generator Owners from implementing one or more corrective actions where these circumstances would apply. Revisions to the EOP-012 standard since its initial development have been designed to provide further clarity and oversight of the process for identifying these circumstances. In Reliability Standard EOP-012-3, NERC referred to these circumstances as “Generator Cold Weather Constraints” and established a list of circumstances which would always constitute such constraints (“known” constraints), and a list of circumstances which could constitute such constraints depending on the specific facts and circumstances (“case-by-case” constraints). This list is included in Attachment 1 to the standard. Reliability Standard EOP-012-3 also strengthened provisions for oversight and review to ensure these constraints are validly declared.

In developing the proposed Canadian Variance in Reliability Standard EOP-012-4, the drafting team carried forward the EOP-012-3 framework for the declaration and review of Generator Cold Weather Constraints, with revisions as needed to defined terms and to address concerns in the context of the Canadian regulatory frameworks.

Proposed Canadian Variance Requirement D.A.8 would modify the continent-wide Requirement R8 in several respects, demonstrated in the blackline below:

**D.A.8.** Each Generator Owner that declares a Generator Cold Weather Constraint [CV] ~~in accordance with Attachment 1~~ shall:

**D.A.8.1.** ~~Identify which of the circumstance(s) in Attachment 1-CAN applies, and explain the reasons why those circumstance(s) preclude the implementation of one or more actions in a Corrective Action Plan; Submit its Generator Cold Weather Constraint declaration(s) to the CEA as follows:~~

- ~~• For Generator Cold Weather Constraints determined in accordance with Requirement R2 for generating unit(s) upon beginning commercial operation, submit within 15 calendar days after commercial operation; or~~

- ~~For all other Generator Cold Weather Constraints, submit within 45 calendar days of determining that the Generator Cold Weather Constraint is applicable.~~

**D.A.8.2.** Update the operating limitations under Requirement D.A.1 Part R1.2 if applicable; and

~~**8.3.** If the CEA determines the declared Generator Cold Weather Constraint is invalid, update its Corrective Action Plan(s) to require corrective actions be completed in accordance with Requirement R6 or Requirement R7, as applicable, subject to any extensions approved by the CEA, or implement freeze protection measures to provide the necessary capability in accordance with Requirement R2; and~~

**D.A.8.34.** ~~Document and provide notice to the CEA, Identify and document when a generating unit experiences a Generator Cold Weather Reliability Event [CV] with the same cause of a previous Generator Cold Weather Reliability Event [CV] at the same or a similar unit, and one or more corrective actions to address the cause is addressed by an existing, validated Generator Cold Weather Constraint [CV] for the same or a similar unit.~~

As with other Canadian Variance requirements, this requirement is modified to use the Canadian Variance [CV] definitions. Similarly to proposed Canadian Variance Requirements D.A.6 and D.A.7, the Generator Cold Weather Constraint [CV] process is based on the process described in Reliability Standard EOP-012-2, in which constraints are declared and reviewed during compliance monitoring activities, rather than the process developed to address FERC directives in Reliability Standard EOP-012-3, which require Compliance Enforcement Authority pre-approval. These differences are to accommodate regulatory differences in certain Canadian jurisdictions where such pre-approval could present concerns.

Proposed Attachment 1-CAN would address the identification of Generator Cold Weather Constraints. This attachment expressly defines the types of circumstances that would qualify as Generator Cold Weather Constraints. Attachment 1-CAN is based on Attachment 1 in the continent-wide standard, but contains language updates as previously discussed. It also identifies the process of approving case-by-case Generator Cold Weather Constraints [CV] as overlapping

an area typically considered to be the practice of engineering by the engineering legislation in Canadian provinces. The determination of case-by-case Generator Cold Weather Constraints [CV] would therefore be performed by a provincially licensed professional engineer and supported with appropriate justification.

For further discussion of the technical basis supporting the circumstances identified as “known” Generator Cold Weather Constraints and “case-by-case” Generator Cold Weather Constraints in Attachment 1 (and as carried forward in the proposed Canadian Variance as Attachment 1-CAN), please refer to NERC’s filing regarding Reliability Standard EOP-012-3.<sup>41</sup>

#### **8. Requirement D.A.9: Ongoing Obligations for Generator Owners with Generator Cold Weather Constraints**

Proposed Reliability Standard EOP-012-4 Canadian Variance Requirement D.A.9 addresses the periodic review of Generator Cold Weather Constraint [CV] declarations. Proposed Requirement D.A.9 modifies the continent-wide requirement in several respects, identified in the blackline below:

**D.A.9.** The Generator Owner shall review each Generator Cold Weather Constraint [CV] declaration ~~validated by the CEA~~ at least once every 36 calendar months to determine if it remains valid in accordance with Attachment 1-CAN.

**D.A.9.1.** If a Generator Cold Weather Constraint [CV] declaration is determined to be no longer valid, then within six (6) calendar months of such determination, the Generator Owner shall develop or update a Corrective Action Plan pursuant to Requirement D.A.7.

Proposed Canadian Variance Requirement D.A.9 carries forward the continent-wide requirement that requires Generator Owners to review all Generator Cold Weather Constraints previously determined to be valid at least once every 36 calendar months to ensure the constraint remains valid. The rationale for this requirement is that changed circumstances, such as

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<sup>41</sup> See EOP-012-3 Filing, *supra* note 3.

technological developments, may remove barriers to implementation and therefore obviate the need for a previously declared constraint. Revisions are made to accommodate the alternative Canadian Variance process for declaring Generator Cold Weather Constraints [CV] discussed previously and Canadian Variance specific definitions.

## **V. EFFECTIVE DATE OF THE PROPOSED RELIABILITY STANDARD**

NERC respectfully submits the proposed implementation plan attached to this petition as **Exhibit B**. The proposed implementation plan considers that different versions of the EOP-012 standard are in effect or in the approval stages across the Canadian provinces. Applicable governmental authorities in Canada may approve the Canadian Variance for use within their specific provinces, or they may approve or continue to use the continent-wide requirements for application within their provinces.

The proposed implementation timelines are based on which version of the continent-wide EOP-012 standard has been approved or is in effect in the Canadian provinces. Generally, the intent is that Reliability Standard EOP-012-4 will supersede prior EOP-012 versions not yet approved or in effect. Where a province has adopted an alternative process for approving implementation timeframes, it is NERC's intent that that this process be followed for proposed Reliability Standard EOP-012-4.

## **VI. CONCLUSION**

For the reasons set forth above, NERC respectfully requests approval of:

- proposed Reliability Standard EOP-012-4 and associated elements included in Exhibit A, effective as proposed herein;
- the proposed Implementation Plan included in Exhibit B; and
- the retirement of Reliability Standard EOP-012-3, or the current version of the EOP-012 standard in effect or scheduled to be in effect in this jurisdiction.

Respectfully submitted,

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## Exhibits