

## Standard Development Timeline

This section is maintained by the drafting team during the development of the standard and will be removed when the standard is adopted by the NERC Board of Trustees (Board).

### Description of Current Draft

This is the final draft of the proposed standard for a formal 8-day ballot period.

| Completed Actions   | Date                |
|---|---------------------|
| Standards Committee approved Standard Authorization Request (SAR) for posting | 11/17/2021          |
| SAR posted for comment  | 11/22/21 – 12/21/21 |
| 30-day formal or informal comment period with ballot                          | 5/19/22 – 6/21/22   |
| 30-day formal or informal comment period with additional ballot               | 8/3/22- 9/1/22      |

| Anticipated Actions | Date              |
|---------------------|-------------------|
| 8-day final ballot  | 9/23/22 – 9/30/22 |
| Board adoption      | October 2022      |

## **New or Modified Term(s) Used in NERC Reliability Standards**

This section includes all new or modified terms used in the proposed standard that will be included in the *Glossary of Terms Used in NERC Reliability Standards* upon applicable regulatory approval. Terms used in the proposed standard that are already defined and are not being modified can be found in the *Glossary of Terms Used in NERC Reliability Standards*. The new or revised terms listed below will be presented for approval with the proposed standard. Upon Board adoption, this section will be removed.

### **Term(s):**

**Generator Cold Weather Critical Component** - Any generating unit component or associated fixed fuel supply component, 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.

**Extreme Cold Weather Temperature** – 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.

**Generator Cold Weather Reliability Event** - One of the following events for which the apparent cause(s) is due to freezing of 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:

- (1) a forced derate of more than 10% of the total capacity of the unit and exceeding 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. Introduction

1. **Title:** **Extreme Cold Weather Preparedness and Operations**
2. **Number:** EOP-012-1
3. **Purpose:** 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 generating units.
4. **Applicability:**
  - 4.1. **Functional Entities:**
    - 4.1.1. Generator Owner
    - 4.1.2. Generator Operator
  - 4.2. **Facilities:**
    - 4.2.1 For purposes of this standard, the term “generating unit” subject to these requirements refers to the following Bulk Electric System (BES) resources:
      - 4.2.1.1 A Bulk Electric System generating unit that commits or is obligated to serve a Balancing Authority load pursuant to a tariff obligation, state requirement as defined by the relevant electric regulatory authority, or other contractual arrangement, rule, or regulation, for a continuous run of four hours or more at or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius); or
      - 4.2.1.2 A Blackstart Resource
    - 4.2.2 Exemptions:
      - 4.2.2.1 Any Bulk Electric System generating unit included under Section 4.2.1 above that has a calculated Extreme Cold Weather Temperature exceeding 32 degrees Fahrenheit (zero degrees Celsius) under Requirement R3 Part 3.1 and as part of the required five year review in Requirement R4 Part 4.1 is exempt from further requirements in this standard.
      - 4.2.2.2 A Bulk Electric System generating unit that is not committed or obligated to operate at or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius) for any continuous run of more than four hours, but is called upon to operate for more than four hours 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).
5. **Effective Date:** See Implementation Plan for Project 2021-07.

## B. Requirements and Measures

- R1.** For each generating unit(s) with a commercial operation date subsequent to [Effective Date of this requirement], the Generator Owner shall: [Violation Risk Factor: Medium] [Time Horizon: Long-term Planning, Operations Planning]
- Implement freeze protection measures that provide capability to operate for a period of not less than twelve (12) continuous hours at the Extreme Cold Weather Temperature for the unit(s), assuming a concurrent twenty (20) mph wind speed on any exposed Generator Cold Weather Critical Components; or
  - Explain in a declaration any technical, commercial, or operational constraints, as defined by the Generator Owner, that preclude the ability to implement appropriate freeze protection measures to provide capability of operating for twelve (12) hours at the documented Extreme Cold Weather Temperature.
- M1.** Each Generator Owner will have dated evidence that demonstrates it has the capability to operate in accordance with Requirement R1. Acceptable evidence may include, but is not limited to, the following (electronic or hardcopy format): Documentation of cold weather preparedness plan, documentation of design features, any declaration that contains dated documentation to support constraints identified by the Generator Owner.
- R2.** For each generating unit(s) in commercial operation prior to [Effective Date of this requirement], the Generator Owner shall ensure its generating unit(s) add new or modify existing freeze protection measures as needed to provide the capability to operate for a period of not less than one (1) hour at the unit(s) Extreme Cold Weather Temperature. Generating unit(s) that are not capable of operating for one (1) hour at its Extreme Cold Weather Temperature shall develop a Corrective Action Plan (CAP) for the identified issues, including identification of any needed modifications to the cold weather preparedness plan required under Requirement R3. [Violation Risk Factor: Medium] [Time Horizon: Long-term Planning, Operations Planning]
- M2.** Each Generator Owner will have dated evidence that demonstrates it has freeze protection measures for its unit(s) in accordance with R2, or it has developed a CAP for the identified issues. Acceptable evidence may include the following (electronic or hardcopy format): Identification of generating units minimum temperature per Part 3.5.2 which is equal to or less than the unit's Extreme Cold Weather Temperature, documentation of freeze protection measures, cold weather preparedness plan, and CAP(s).
- R3.** 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: [Violation Risk Factor: High] [Time Horizon: Operations Planning and Real-time Operations]
- 3.1** The Extreme Cold Weather Temperature for their unit(s) including the calculation date and source of temperature data;

- 3.2** Documentation identifying the Generator Cold Weather Critical Components;
  - 3.3** Documentation of freeze protection measures implemented on Generator Cold Weather Critical Components which may include measures used to reduce the cooling effects of wind determined necessary by the Generator Owner to protect against heat loss, and where applicable, the effects of freezing precipitation (e.g., sleet, snow, ice, and freezing rain);
  - 3.4** Annual inspection and maintenance of generating unit(s) freeze protection measures; and
  - 3.5** Generating unit(s) cold weather data, to include:
    - 3.5.1** Generating unit(s) operating limitations in cold weather to include:
      - 3.5.1.1** Capability and availability;
      - 3.5.1.2** Fuel supply and inventory concerns;
      - 3.5.1.3** Fuel switching capabilities; and
      - 3.5.1.4** Environmental constraints.
    - 3.5.2** Generating unit(s) minimum:
      - Design temperature;
      - Historical operating temperature; or
      - Current cold weather performance temperature determined by an engineering analysis.
- M3.** Each Generator Owner will have evidence documenting that its cold weather preparedness plan(s) was implemented and maintained in accordance with Requirement R3.
- R4.** Once every five calendar years, each Generator Owner shall for each generating unit:  
*[Violation Risk Factor: Low] [Time Horizon: Operations Planning, Real-Time Operations]*
- 4.1** Calculate the Extreme Cold Weather Temperature, and update the cold weather preparedness plan if this temperature is now lower than the previous lowest calculation;
  - 4.2** Review its documented generating unit(s) minimum temperature contained within its cold weather preparedness plan(s), pursuant to Part 3.5.2; and
  - 4.3** Review whether its generating units have the freeze protection measures required to operate at the Extreme Cold Weather Temperature pursuant to R1 or R2 as applicable, and if not develop a CAP for the identified issues, including identification of any needed modifications to the cold weather preparedness plan required under Requirement R3.

- M4.** Each Generator Owner will have dated, documented evidence that it reviewed temperature data and updated its cold weather preparedness plan(s) in accordance with Requirement R4.
- R5.** Each Generator Owner in conjunction with its Generator Operator shall identify the entity responsible for providing the generating unit-specific training, and that identified entity shall provide annual training to its maintenance or operations personnel responsible for implementing the cold weather preparedness plan(s) developed pursuant to Requirement R3. *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning, Operations Planning]*
- M5.** Each Generator Operator or Generator Owner will have documented evidence that the applicable personnel completed annual training of the Generator Owner’s cold weather preparedness plan(s). This evidence may include, but is not limited to, documents such as personnel training records, training materials, date of training, agendas or learning objectives, attendance at pre-work briefings, review of work order tasks, tailboards, attendance logs for classroom training, and completion records for computer-based training in fulfillment of Requirement R5.
- R6.** Each Generator Owner that owns a generating unit that experiences a Generator Cold Weather Reliability Event shall develop a CAP, within 150 days or by July 1, whichever is earlier, that contains at a minimum: *[Violation Risk Factor: High] [Time Horizon: Long-term Planning]*
  - 6.1** A summary of the identified cause(s) for the Generator Cold Weather Reliability Event, where applicable, and any relevant associated data;
  - 6.2** A review of applicability to similar equipment at other generating units owned by the Generator Owner;
  - 6.3** An identification of any temporary operating limitations or impacts to the cold weather preparedness plan, that would apply until execution of the corrective action(s) identified in the CAP.
- M6.** Each Generator Owner will have documented evidence that it developed a CAP in accordance with Requirement R6. Acceptable evidence may include, but is not limited to, the following dated documentation (electronic or hardcopy format): CAP(s) and updated cold weather preparedness plan(s) where indicated as needed by the CAP.
- R7.** Each Generator Owner shall: *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
  - 7.1** Implement each CAP developed pursuant to Requirements R2, R4, or R6, or explain in a declaration why corrective actions are not being implemented due to any technical, commercial, or operational constraints as defined by the Generator Owner.
  - 7.2** Update each CAP if actions or timetables change, until completed.

- M7.** Each Generator Owner shall have dated evidence that demonstrates it implemented each CAP, including updating actions or timetables, or has explained in a declaration why corrective actions are not being implemented in accordance with Requirement R7. Acceptable evidence may include, but is not limited to the following dated documentation (electronic or hardcopy format): records that document the implementation of each CAP and the completion of actions for each CAP including revision history of each CAP. Evidence may also include work management program records, work orders, and maintenance records. Any declaration shall contain dated documentation to support constraints identified by the Generator Owner.

## C. Compliance

### 1. Compliance Monitoring Process

- 1.1. Compliance Enforcement Authority:** “Compliance Enforcement Authority” (CEA) means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.
- 1.2. Evidence Retention:** The following evidence retention period(s) identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the CEA may ask an entity to provide other evidence to show that it was compliant for the full-time period since the last audit.

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its CEA to retain specific evidence for a longer period of time as part of an investigation.

- The Generator Owner shall keep data or evidence to show compliance for three years for Requirement R1, R3, and R5 and Measure M1, M3, and M5.
- The Generator Owner shall keep data or evidence to show compliance for three years, or until any Corrective Action Plan under Requirement R2 is complete, whichever timeframe is greater, for Requirement R2 and Measure M2.
- The Generator Owner shall retain the current cold weather preparedness plan(s), as evidence of review or revision history, plus each version issued since the last audit and evidence of compliance since the last audit for Requirement R4 and Measure M4. The Generator Owner shall retain any Corrective Action Plans under Requirement R4 Part 4.3 for three years or until the Corrective Action Plan is complete, whichever timeframe is greater.

- The Generator Owner shall keep data or evidence to show compliance for three years, or until any Corrective Action Plan under Requirement R6 is complete, whichever timeframe is greater, for Requirement R6 and Measure M6.
  - The Generator Owner shall keep data or evidence to show compliance for three years, or until any Corrective Action Plan is complete, whichever timeframe is greater, for Requirement R7 and Measure M7.
- 1.3. Compliance Monitoring and Enforcement Program:** As defined in the NERC Rules of Procedure, “Compliance Monitoring and Enforcement Program” refers to the identification of the processes that will be used to evaluate data or information for the purpose of assessing performance or outcomes with the associated Reliability Standard.



## Violation Severity Levels

| R #        | Violation Severity Levels   |   |   |   |
|------------|---|---|---|---|
|            | Lower VSL   | Moderate VSL  | High VSL  | Severe VSL  |
| <b>R1.</b> | <p>The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R1 for 5% or less of its units.</p> <p>OR</p> <p>The Generator Owner did not explain in a declaration any technical, commercial, or operational constraints that preclude the ability to implement appropriate freeze protection measures for 5% or less of its units.</p> | <p>The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R1 for more than 5%, but less than or equal to 10% of its units.</p> <p>OR</p> <p>The Generator Owner did not explain in a declaration any technical, commercial, or operational constraints that preclude the ability to implement appropriate freeze protection measures for more than 5%, but less than or equal to 10% of its units.</p> | <p>The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R1 for more than 10%, but less than or equal to 20% of its units.</p> <p>OR</p> <p>The Generator Owner did not explain in a declaration any technical, commercial, or operational constraints that preclude the ability to implement appropriate freeze protection measures for more than 10%, but less than or equal to 20% of its units.</p> | <p>The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R1 for more than 20% of its units.</p> <p>OR</p> <p>The Generator Owner did not explain in a declaration any technical, commercial, or operational constraints that preclude the ability to implement appropriate freeze protection measures for more than 20% of its units.</p> |
| <b>R2.</b> | <p>The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R2 for 5% or less of its units.</p> <p>OR</p> <p>The Generator Owner did not develop a CAP as required by</p>  | <p>The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R2 for more than 5%, but less than or equal to 10% of its units.</p> <p>OR</p> <p>The Generator Owner did not develop a CAP as required by Requirement R2 for more than</p>  | <p>The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R2 for more than 10%, but less than or equal to 20% of its units.</p> <p>OR</p> <p>The Generator Owner did not develop a CAP as required by Requirement R2 for more than</p>   | <p>The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R2 for more than 20% of its units.</p> <p>OR</p> <p>The Generator Owner did not develop a CAP as required by</p>   |

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|            | Requirement R2 for 5% or less of its units.  | 5%, but less than or equal to 10% of its units.  | 10%, but less than or equal to 20% of its units.   | Requirement R2 for more than 20% of its units.  |
|------------|--|--|--|---|
| <b>R3.</b> | The Generator Owner implemented a cold weather preparedness plan(s), but failed to maintain it.  | The Generator Owner’s cold weather preparedness plan failed to include one of the applicable Parts within Requirement R3.  | The Generator Owner had and maintained a cold weather preparedness plan(s), but failed to implement it.<br><br>OR<br>The Generator Owner’s cold weather preparedness plan failed to include two of the applicable requirement parts within Requirement R3. | The Generator Owner does not have cold weather preparedness plan(s).<br><br>OR<br>The Generator Owner’s cold weather preparedness plan failed to include three or more of the applicable requirement parts within Requirement R3. |
| <b>R4.</b> | The Generator Owner completed the actions required in Requirement R4, but was late by 30 calendar days or less.  | The Generator Owner completed the actions required in Requirement R4, but was late by greater than 30 calendar days, but less than or equal to 60 calendar days. | The Generator Owner failed to complete one of the applicable requirement parts in Requirement R4 Parts 4.1 through 4.3;<br><br>OR<br>The Generator Owner completed the actions required in Requirement R4, but was late by greater than 60 calendar days.  | The Generator Owner failed to complete two or more of the applicable requirement parts in Requirement R4 Parts 4.1 through 4.3.   |
| <b>R5.</b> | The Generator Owner or Generator Operator failed to provide annual generating unit-specific training as described in Requirement R5 to the greater of: | The Generator Owner or Generator Operator failed to provide annual generating unit-specific training as described in Requirement R5 to the greater of:           | The Generator Owner or Generator Operator failed to provide annual generating unit-specific training as described in Requirement R5 to the greater of:   | The Generator Owner or Generator Operator failed to provide annual generating unit-specific training as described in Requirement R5 to the greater of:  |

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|            |   |  |   |  |
|------------|---|--|---|--|
|            | <ul style="list-style-type: none"> <li>one applicable personnel at a single generating unit; or</li> <li>5% or less of its total applicable personnel.</li> </ul>   | <ul style="list-style-type: none"> <li>two applicable personnel at a single generating unit; or</li> <li>more than 5%, but less than or equal to 10% of its total applicable personnel.</li> </ul> | <ul style="list-style-type: none"> <li>three applicable personnel at a single generating unit; or</li> <li>more than 10%, but less than or equal to 15% of its total applicable personnel.</li> </ul> | <ul style="list-style-type: none"> <li>four applicable personnel at a single generating unit; or</li> <li>more than 15% of its total applicable personnel.</li> </ul>  |
| <b>R6.</b> | The Generator Owner developed a CAP, but not within 150 days or by July 1 as required in Requirement R6.  | The Generator Owner's CAP failed to comply with one of the elements in Requirement R6, Parts 6.1 through 6.3.  | The Generator Owner's CAP failed to comply with two of the elements in Requirement R6, Parts 6.1 through 6.3.   | <p>The Generator Owner's CAP failed to comply with three of the elements in Requirement R6, Parts 6.1 through 6.3.</p> <p>OR</p> <p>The Generator Owner did not develop a CAP as required by Requirement R6.</p> |
| <b>R7.</b> | The Generator Owner implemented a CAP or explained in a declaration why corrective actions are not being implemented, but failed to update the CAP when actions or timetables changed, in accordance with Requirement R7. |  |   | The Generator Owner failed to implement a CAP or explain in a declaration why corrective actions are not being implemented in accordance with Requirement R7.  |

### D. Regional Variances

None.

### E. Associated Documents

Implementation Plan

## Version History

| Version | Date | Action                     | Change Tracking |
|---------|------|----------------------------|-----------------|
| 1       | TBD  | Drafted by Project 2021-07 | New             |