

A. Introduction

1. **Title:** Extreme Cold Weather Preparedness and Operations
2. **Number:** EOP-012-2
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 applicable generating units.
4. **Applicability:**
 - 4.1. **Functional Entities:**
 - 4.1.1. Generator Owner
 - 4.1.2. Generator Operator
 - 4.2. **Facilities:**
 - 4.2.1. Bulk Electric System (BES) generating units. 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 resource identified in the BES definition, inclusion I2 and I4; or
 - 4.2.1.2. A Blackstart Resource, identified in the BES definition, inclusion I3.
5. **Effective Date:** See Implementation Plan for Project 2021-07 Phase 2.

B. Requirements and Measures

- R1. At least once every five calendar years, each Generator Owner shall, for each of its applicable generating unit(s): [*Violation Risk Factor: Lower*] [*Time Horizon: Long-term Planning*]
 - 1.1. Calculate the Extreme Cold Weather Temperature for each of its applicable unit(s) and identify the calculation date and source of temperature data; and
 - 1.1.1. If the re-calculated Extreme Cold Weather Temperature is lower than the previous Extreme Cold Weather Temperature, the entity shall review and update its cold weather preparedness plan(s) under Requirement R4 within six (6) months of the recalculation. If new corrective actions are needed to provide the required operational capability under Requirement R2 or R3, the entity shall develop a Corrective Action Plan within 6 months of the recalculation.
 - 1.2. Identify generating unit(s) cold weather data, to include:
 - 1.2.1. Generating unit(s) operating limitations in cold weather to include:

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- 1.2.1.1. Capability and availability;
- 1.2.1.2. Fuel supply and inventory concerns;
- 1.2.1.3. Start-up issues;
- 1.2.1.4. Fuel switching capabilities; and
- 1.2.1.5. Environmental constraints.

1.2.2. Generating unit(s) minimum:

- Design temperature, and if available, the concurrent wind speed and precipitation;
- Historical operating temperature at least one hour in duration, and if available, the concurrent wind speed and precipitation; or
- Current cold weather performance temperature determined by an engineering analysis, which includes the concurrent wind speed and precipitation.

M1. Each Generator Owner will have evidence documenting its Extreme Cold Weather Temperature calculation and design information, operating data, or engineering analysis that supports its generating unit minimum temperature.

R2. Applicable to generating units with a commercial operation date on or after October 1, 2027: 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),¹ shall: [*Violation Risk Factor: Medium*] [*Time Horizon: Long-term Planning, Operations Planning*]

- Implement freeze protection measures to protect Generator Cold Weather Critical Components that provide the capability to operate at the unit(s)' Extreme Cold Weather Temperature with sustained concurrent twenty (20) mph 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
- Develop a Corrective Action Plan(s) to add new or modify existing or previously planned freeze protection measures to provide the capability to operate at the unit(s)' Extreme Cold Weather Temperature with a sustained concurrent twenty (20) mph wind speed for (i) a period of not less than

¹ 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.

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twelve (12) continuous hours, or (ii) the maximum operational duration for intermittent energy resources if less than twelve (12) continuous hours.

- 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 Corrective Action Plan for the identified issues. Acceptable evidence may include the following (electronic or hardcopy format): Identification of generating unit(s) minimum temperature under Requirement R1 Part 1.2.2 which is equal to or less than the unit's Extreme Cold Weather Temperature, documentation of freeze protection measures, and Corrective Action Plan(s).
- R3.** Applicable to generating unit(s) in commercial operation prior to October 1, 2027: 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),² shall: *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning, Operations Planning]*
- Implement freeze protection measures to protect Generator Cold Weather Critical Components that provide the capability to operate at the 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 unit(s)' Extreme Cold Weather Temperature.
- M3.** Each Generator Owner will have dated evidence that demonstrates it has freeze protection measures for its unit(s) in accordance with R3, or it has developed a Corrective Action Plan for the identified issues. Acceptable evidence may include, but is not limited to, the following (electronic or hardcopy format): Identification of generating unit(s) minimum temperature per Part 1.2.2 which is equal to or less than the unit's Extreme Cold Weather Temperature, documentation of freeze protection measures, and Corrective Action Plan(s).
- R4.** 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]*

² 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.

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- 4.1. The lowest calculated Extreme Cold Weather Temperature for each unit, as determined in Requirement R1;³
 - 4.2. The generating unit cold weather data, as determined in Requirement R1.2;
 - 4.3. Documentation identifying Generator Cold Weather Critical Components;
 - 4.4. Documentation of freeze protection measures implemented on Generator Cold Weather Critical Components which includes 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); and
 - 4.5. Annual inspection and maintenance of generating unit(s) freeze protection measures.
- M4.** Each Generator Owner will have evidence documenting that its cold weather preparedness plan(s) was implemented and maintained in accordance with Requirement R4. Examples of documentation to demonstrate a cold weather preparedness plan may include existing operating procedures, plans, checklists, or processes. Examples of documentation to demonstrate inspections and maintenance have been completed may include, but are not limited to, completed work order(s) from the Generator Owner's work management system and/or freeze protection checklists identifying the measures inspected and maintained.
- 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 R4. *[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 shall, 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

³ Generator Owners shall include the lowest calculated Extreme Cold Weather Temperature for the unit, even where subsequent periodic re-calculations under Requirement R1 Part 1.1 cause an increase in the Extreme Cold Weather Temperature.

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or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius),⁴ develop a Corrective Action Plan when the generating unit experiences a Generator Cold Weather Reliability Event. The Corrective Action Plan shall be developed within 150 days or by July 1, whichever is earlier, and contain 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 generating units owned by the Generator Owner; and
 - 6.3. An identification of operating limitations or impacts to the cold weather preparedness plan that would apply until execution of the corrective action(s) identified in the Corrective Action Plan.
- M6.** Each Generator Owner will have documented evidence that it developed a Corrective Action Plan following a Cold Weather Reliability Event at an applicable unit in accordance with Requirement R6. Acceptable evidence may include, but is not limited to, the following dated documentation (electronic or hardcopy format): Corrective Action Plan(s) and updated cold weather preparedness plan(s) where indicated as needed by the Corrective Action Plan.
- R7.** Each Generator Owner, for each Corrective Action Plan developed pursuant to Requirements R1, R2, R3, or R6, shall: *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
- 7.1. Include a timetable for implementing the selected corrective action(s) that shall:
 - 7.1.1. List the action(s) which address(es) existing equipment or freeze protection measures, if any, to be completed within 24 calendar months of completing development of the Corrective Action Plan;
 - 7.1.2. List the action(s) which require(s) new equipment or freeze protection measures, if any, to be completed within 48 calendar months of completing development of the Corrective Action Plan; and
 - 7.1.3. List the updates to the cold weather preparedness plan required under Requirement R4 to identify the updates or additions to the Generator Cold Weather Critical Components and their freeze protection measures;
 - 7.2. Implement the Corrective Action Plan in accordance with the specified timetables in Requirement R7 Part 7.1;

⁴ 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.

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- 7.3.** Update the Corrective Action Plan action(s) and timetable(s), with justification, if corrective action(s) change or timetable(s) exceed the timelines in Requirement R7 Part 7.1; and
 - 7.4.** Document in a declaration, with justification, any Generator Cold Weather Constraint that precludes the Generator Owner from implementing selected action(s) contained within the Corrective Action Plan.
- M7.** Each Generator Owner shall have dated evidence that demonstrates it implemented each Corrective Action Plan, including updating actions or timetables, or has explained in a declaration why corrective actions are not being implemented in accordance with Requirement R8. Acceptable evidence may include, but is not limited to, the following dated documentation (electronic or hardcopy format): records that document the implementation of each Corrective Action Plan and the completion of actions for each Corrective Action Plan including revision history of each Corrective Action Plan and, if applicable, justification to support any changes to corrective action(s) identified in the Corrective Action Plan or timetables exceeding the timelines in Requirement R7 Part 7.1. For each Corrective Action Plan applying to multiple generating units, the timetable shall reflect implementation at each unit addressed in the Corrective Action Plan. 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.
- R8.** Each Generator Owner that creates a Generator Cold Weather Constraint declaration shall: *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
 - 8.1.** Review the Generator Cold Weather Constraint declaration at least every five calendar years or as needed when a change of status to the Generator Cold Weather Constraint occurs; and
 - 8.2.** Update the operating limitations associated with capability and availability under Requirement R1 Part R1.2 if applicable.
- M8.** Each Generator Owner shall have dated evidence that demonstrates it performed the review and updated operating limitations as needed. Acceptable evidence may include, but is not limited to the following dated documentation (electronic or hardcopy format): records that document the performance of the review and update to the operating limitations, as needed.

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 retain data or evidence to support its current Extreme Cold Weather Temperature calculation and generating unit cold weather data, plus each calculation or revision since the last audit, for Requirement R1 and Measure M1.
- The Generator Owner shall keep data or evidence to show compliance for three years, or until any Corrective Action Plan under Requirement R2 or R3 is complete, whichever timeframe is greater, for Requirements R2 and R3 and Measures M2 and M3.
- 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 or Generator Operator shall keep data or evidence to show compliance for three years for Requirement R5 and Measure M5.
- 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 time frame is greater, for Requirement R7 and Measure M7.

- The Generator Owner shall maintain data or evidence to support its current Generator Cold Weather Constraint declaration, plus each revision since the last audit, for Requirement R8 and Measure M8.

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
R1.	The Generator Owner did not calculate the Extreme Cold Weather Temperature and identify generating unit(s) cold weather data in accordance with Requirement R1 for 5% or less of its applicable units.	The Generator Owner did not calculate the Extreme Cold Weather Temperature and identify generating unit(s) cold weather data in accordance with Requirement R1 for more than 5%, but less than or equal to 10% of its applicable units.	The Generator Owner did not calculate the Extreme Cold Weather Temperature and identify generating unit(s) cold weather data in accordance with Requirement R1 for more than 10%, but less than or equal to 20% of its applicable units.	The Generator Owner did not calculate the Extreme Cold Weather Temperature and identify generating unit(s) cold weather data in accordance with Requirement R1 for more than 20% of its applicable units.
R2.	<p>The Generator Owner did not have freeze protection measure(s) for its applicable unit(s) meeting the criteria in Requirement R2 for 5% or less of its applicable units.</p> <p>OR</p> <p>The Generator Owner did not develop a Corrective Action Plan to implement appropriate freeze protection measures for 5% or less of its applicable units.</p>	<p>The Generator Owner did not have freeze protection measure(s) for its applicable unit(s) meeting the criteria in Requirement R2 for more than 5%, but less than or equal to 10% of its applicable units.</p> <p>OR</p> <p>The Generator Owner did not develop a Corrective Action Plan for more than 5%, but less than or equal to 10% of its applicable units.</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 applicable units.</p> <p>OR</p> <p>The Generator Owner did not develop a Corrective Action Plan for more than 10%, but less than or equal to 20% of its applicable units.</p>	<p>The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R2 for more than 20% of its applicable units.</p> <p>OR</p> <p>The Generator Owner did not develop a Corrective Action Plan for more than 20% of its applicable units.</p>
R3.	The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R3 for	The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R3 for	The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R3 for	The Generator Owner did not have freeze protection measure(s) meeting the criteria in Requirement R3 for

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	<p>5% or less of its applicable units.</p> <p>OR</p> <p>The Generator Owner did not develop a Corrective Action Plan as required by Requirement R3 for 5% or less of its applicable units.</p>	<p>more than 5%, but less than or equal to 10% of its applicable units.</p> <p>OR</p> <p>The Generator Owner did not develop a Corrective Action Plan as required by Requirement R3 for more than 5%, but less than or equal to 10% of its applicable units.</p>	<p>more than 10%, but less than or equal to 20% of its applicable units.</p> <p>OR</p> <p>The Generator Owner did not develop a Corrective Action Plan as required by Requirement R3 for more than 10%, but less than or equal to 20% of its applicable units.</p>	<p>more than 20% of its applicable units.</p> <p>OR</p> <p>The Generator Owner did not develop a Corrective Action Plan as required by Requirement R3 for more than 20% of its applicable units.</p>
R4.	<p>The Generator Owner implemented a cold weather preparedness plan(s) but failed to maintain it.</p>	<p>The Generator Owner's cold weather preparedness plan failed to include one of the applicable Parts within Requirement R4.</p>	<p>The Generator Owner had and maintained a cold weather preparedness plan(s) but failed to implement it.</p> <p>OR</p> <p>The Generator Owner's cold weather preparedness plan failed to include two of the applicable requirement parts within Requirement R4.</p>	<p>The Generator Owner does not have a cold weather preparedness plan(s).</p> <p>OR</p> <p>The Generator Owner's cold weather preparedness plan failed to include three or more of the applicable requirement parts within Requirement R4.</p>
R5.	<p>The Generator Owner or Generator Operator failed to provide annual generating unit-specific training as described in Requirement R5 to the greater of:</p> <ul style="list-style-type: none"> one applicable personnel at a single generating unit; or 	<p>The Generator Owner or Generator Operator failed to provide annual generating unit-specific training as described in Requirement R5 to the greater of:</p> <ul style="list-style-type: none"> two applicable personnel at a single generating unit; or 	<p>The Generator Owner or Generator Operator failed to provide annual generating unit-specific training as described in Requirement R5 to the greater of:</p> <ul style="list-style-type: none"> three applicable personnel at a single generating unit; or 	<p>The Generator Owner or Generator Operator failed to provide annual generating unit-specific training as described in Requirement R5 to the greater of:</p> <ul style="list-style-type: none"> four or more applicable personnel at a single generating unit; or

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	<ul style="list-style-type: none"> 5% or less of its total applicable personnel. 	<ul style="list-style-type: none"> more than 5%, but less than or equal to 10% of its total applicable personnel. 	<ul style="list-style-type: none"> more than 10%, but less than or equal to 15% of its total applicable personnel. 	<ul style="list-style-type: none"> more than 15% of its total applicable personnel.
R6.	The Generator Owner developed a Corrective Action Plan, but not within 150 days or by July 1 as required in Requirement R6.	The Generator Owner's Corrective Action Plan failed to comply with one of the elements in Requirement R6, Parts 6.1 through 6.3.	The Generator Owner's Corrective Action Plan failed to comply with two of the elements in Requirement R6, Parts 6.1 through 6.3.	<p>The Generator Owner's Corrective Action Plan 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 Corrective Action Plan, as required by Requirement R6.</p>
R7.	The Generator Owner implemented a Corrective Action Plan, but failed to update the Corrective Action Plan when corrective action(s) changed in accordance with Requirement R7.	The Generator Owner implemented a Corrective Action Plan, but failed to include a timetable for implementing the selected corrective actions meeting the criteria of Requirement R7 Part 7.1.	The Generator Owner implemented a Corrective Action Plan, but failed to implement the Corrective Action Plan within the specified timetable or failed to update the Corrective Action Plan, with justification, when timetable(s) exceeded the timelines in Requirement R7 Part 7.1.	The Generator Owner failed to implement a Corrective Action Plan or failed to document in a declaration why corrective actions are not being implemented in accordance with Requirement R7.
R8.	N/A	N/A	The Generator Owner failed to comply with one of the elements in Requirement R8, Parts 8.1 through 8.2.	The Generator Owner failed to comply with all of the elements in Requirement R8, Parts 8.1 through 8.2.

D. Regional Variances

None.

E. Associated Documents

Implementation Plan

Version History

Version	Date	Action	Change Tracking
1	October 1, 2024	Drafted by Project 2021-07	New
2	February 16, 2023	Revisions drafted by Project 2021-07 due to FERC Order and inquiry Recommendations.	Revisions
2	February 15,2024	Board Adopted	