Title: Empire Corporate Generator Winterization Policy	**Revision:** E 04/07/2026	**Author:** Manager, NERC Compliance ngassthy Thierry Ngassa (Apr 7, 2026 09:49:02 EDT)
Approval Signature(s) and date: **Sr. Director Generation Operations:**		
Applicable NERC Standard(S): EOP-12-3 Extreme Cold Weather Preparedness and Operations		

Revision History

Revision	Date	Changes	Approved By
A	12/13/2022	Original	Berkstresser Mushimba
B	11/13/2023	Reviewed Rev. A	Brian Berkstresser
C	2/18/2024	Reviewed Rev. B	Brian Berkstresser
D	9/26/2024	Transitioned from EOP-011-2	Brian Berkstresser
E	4/6/2026	Transitioned to EOP-012-3 and changed document format to match	Brian Berkstresser

Liberty™

1.0 PURPOSE

The purpose of this policy is to establish the required Company Cold Weather Plan Model that all Empire District Electric (**EDE**) generating plants must use as the governing framework when developing their site-specific cold weather plans. This policy ensures consistent application of corporate standards, alignment with NERC EOP-012-3 requirements, and the incorporation of industry best practices tailored appropriately to each plant's unique configuration, so that all facilities can operate safely and reliably during cold weather conditions.

2.0 SCOPE

This policy applies to all EDE teams involved in developing, reviewing, or implementing Cold Weather Preparedness Plan at each generating plant, including Operations, Maintenance, Engineering, and NERC Compliance. These groups are required to use the Company Cold Weather Plan Model when creating their site-specific plans.

3.0 ASSOCIATED DOCUMENTS

- **Attachment A - R6 CAP Template**
- **Attachment B - ECWT Methodology**

4.0 SPECIAL INSTRUCTIONS

N/A

5.0 PROCEDURES

These procedures below outline the requirements all sites must follow to meet **NERC EOP-012-3** and ensure reliable unit operation during extreme winter conditions. It establishes the process for calculating and updating Extreme Cold Weather Temperature (**ECWT**), documenting cold-weather operating limits, implementing and maintaining freeze protection for critical components, developing site-specific cold weather plans, conducting annual training, and creating Corrective Action Plans (**CAP**) when cold weather events occur. Together, these requirements provide a consistent framework for preparing each facility to operate safely and reliably during extreme cold weather.

R5

5.1 RESPONSIBILITIES

- **Senior Director of Generation** – Establish policy for all Generating Plants to develop procedures to operate during winter weather events safely and reliably.

- **Plant Directors** – Develop plant specific winter weather plans, ensure implementation, assign plan execution responsibilities, develop, and ensure staff training, oversee corrective action plans, and plant plan updates.

5.2 SAFETY

Working safely is the responsibility of everyone. Winter weather conditions can present exposure to potential safety hazards. Ensure daily and pre-job safety briefings

include appropriate winter-related topics. Follow OSHA Cold Stress Guide | Occupational Safety and Health Administration (osha.gov)

5.3 NERC Glossary Terms

- **Extreme Cold Weather Temperature** (**ECWT**)
  According to NERC Technical Rationale, 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 Critical Components** (**GCWCC**)
  According to NERC Glossary Terms, GCWCC is any generating unit component or system, 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. This definition excludes any component or system or associated Fixed Fuel Supply Component located inside a permanent building with a heating source that regularly maintains the space at a temperature above 32 degrees Fahrenheit (0 degrees Celsius).

- **Generator Cold Weather Constraint** (**GCWC**)
  According to NERC Glossary Terms, GCWC is any condition that would preclude a Generator Owner from implementing freeze-protection measures on one or more GCWCCs.

- **Generator Cold Weather Reliability Event** (**GCWRE**)
  According to NERC Glossary Terms, a GCWRE is defined as an event in which the apparent cause is freezing of equipment or the effects of freezing precipitation (such as snow, sleet, ice, or freezing rain) on equipment under the Generator Owner's control, and the dry-bulb temperature at the time of the event is at or above the unit's Extreme Cold Weather Temperature (ECWT). The event must also meet **one** of the following conditions:

  a) A forced derate of more than 10% of the unit's total capacity, but not less than 20 MW, lasting longer than four hours;
  b) A start-up failure in which the unit fails to synchronize within its specified start-up time; or
  c) A Forced Outage.

R1

5.4 ECWT & PERIODIC REVIEW

At least once every **5 calendar years**, EDE will, for each of its applicable units:

R1.1

5.4.1 ECWT Calculation and Required Follow-Up Actions

- Calculate the ECWT for each applicable unit, including the date, data sources, and any adjustments for missing/invalid temperature data. The ECWT is

calculated using NOAA data per the methodology described in **Attachment B**.

- If the **new ECWT** is **lower**, Empire will update its cold-weather plan(s) within **6 months**, and if **new actions** are needed to meet operational capability requirements, Empire will develop a CAP within **6 calendar months of the recalculation**.

R1.2

5.4.2 Identification of generator cold weather data

Identify generating unit(s) cold weather data, will include:

R1.2.1

5.4.2.1 Generator operating limitations in cold weather data:

a. Capability and availability;
b. Fuel supply and inventory concerns;
c. Startup issues;
d. Fuel switching capabilities; **and**
e. Environmental constraints.

R1.2.2

5.4.2.2 Generating units minimum:

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

R2

5.5 FREEZE PROTECTION for UNITS COD after Oct 1, 2027

For **new** units (commercial operation on or after 10/1/2027) with an ECWT ≤ 32°F and expected to operate at or below 32°F, the plant must either:

- Implement freeze-protection measures to protect **GCWCCs** so to ensure the unit can operate at **its ECWT with 20 mph sustained winds** for:
  - ≥ 12 continuous hours, or
  - Maximum operational duration (if an **intermittent** resource is less than 12 continuous hours)
  -
- **Or** submit a justified **GCWC** (per **R8**).

R3

5.6 FREEZE PROTECTION for UNITS COD prior to Oct 1, 2027

For existing units (commercial operation before 10/1/2027) with an ECWT ≤ 32°F and expected to operate at or below 32°F, the plant must:

- Implement freeze-protection measures to protect **GCWCCs** so to enable operation at the unit's ECWT; or
- Develop a CAP to install or improve freeze protection to meet ECWT capability.

R4

5.7 COLD WEATHER PREPAREDNESS PLANS (CWPP)

Each EDE plant will implement and maintain a cold weather preparedness plan. The plans include, at a minimum:

R4.1

5.7.1 Current calculated ECWT for each unit

R4.2

5.7.2 Generating unit cold weather data per requirement 1.2 in paragraph 5.4.2

R4.3

5.7.3 Documentation identifying GCWCC's

R4.4

5.7.4 Documentation of freeze-protection measures applied to GCWCC's, including actions taken to reduce wind-related heat loss and, when applicable, protections against freezing precipitation such as sleet, snow, ice, and freezing rain.

R4.5

5.7.5 Annual inspection and maintenance of generator freeze protection measures implemented on GCWCCs.

R5

5.8 TRAINING

5.8.1 Plant personnel requiring training is identified in each plant's procedure.

5.8.2 Training is conducted annually to all personnel that are required to have such training. Records of this training and attendance logs are kept for proof of training documentation.

5.8.3 Each plant coordinates and delivers annual winter-readiness training **before October 31 each year**, covering both general winter conditions and plant-specific operational needs.

Key Topics may include:

- Responding to **freeze-protection panel alarms**
- **Troubleshooting and repairing** freeze-protection circuitry
- Identifying **plant areas most vulnerable** to winter conditions
- Reviewing **special inspections or rounds** used during severe weather
- Performing **fuel-switching procedures**, when applicable

- Understanding the **ambient temperature limits** for which the freeze-protection system was designed
- Reviewing **lessons learned** from past events or **NERC Lessons Learned**
- **Ensuring appropriate NERC GADS coding** for unit derates or trips caused by severe winter weather (e.g**.,** code 9036 – Storms (ice, snow, etc.)**,** or 9040 – Other Catastrophe) to support lessons learned, knowledge retention, and consistency.

5.8.4 New Hire and Transferred Employees:

- New or transferred employees hired after the annual training must receive cold-weather plan and procedure training during orientation.

R6

5.9 CORRECTIVE ACTION PLAN (CAP)

CAP shall be developed when a generator experiences a Generator Cold Weather Reliability Event (**GCWRE**). Plants will use **Attachment A** to give the details of the event.

R6.1

5.9.1 CAP Deadlines:

- For GCWREs in **Jan-Aug**: CAP is due by **Dec. 1** of the **same year**.
- For GCWREs in **Sept-Dec**: CAP is due by **Dec. 1** of the **following year**.

R6.2

5.9.2 CAP Review of Similar Units

- Conduct a review of other generating unit(s) in **EDE** fleet with the same or similar equipment as the affected generating unit to determine susceptibility to identified freezing issues.
- If corrective actions are needed, develop or update a CAP to address the other generating unit(s).
- This review and, if applicable, the CAP development/update, shall be completed **no later than 12 calendar months following the GCWRE**.

R6.3

5.9.3 CAP Content

The CAP shall include at a minimum:

R6.3.1

5.9.3.1 A summary of the identified cause(s) of the GCWRE, where applicable, and any relevant associated data.

R6.3.2

5.9.3.2 A list of actions to add new freeze protection measures or remedy issues with existing freeze protection measures.

R6.3.3

5.9.3.3 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 is completed

R6.3.4

5.9.3.4 A description of the updates to the cold weather preparedness plan required under Requirement R4 to identify updates or additions to the GCWCCs and their freezing protection measures, if required.

R6.3.5

5.9.3.5 A timetable specifying implementation completion

R6.3.5.1

5.9.3.5.1 Affected Unit

- For GCWREs in **Jan-Aug**: CAP is due by **Dec. 1** of the **same year**.
- For GCWREs in **Sept-Dec**: CAP is due by **Dec. 1** of the **following year**.

R6.3.5.2

5.9.3.5.2 Other units

- CAP is due within **24 months** of finishing the **Paragraph 5.9.2 review above,** but **no later than 36 months** after the GCWRE.

R6.4

5.9.4 Extension Requests for CAP Implementation

If unable to complete actions per R6.3.5 timetable due to circumstances beyond control, submit a CAP extension request to the **Compliance Enforcement Authority** (CEA). Empire's CEA is the Midwest Reliability Organization (MRO). The request shall include:

R6.4.1

5.9.4.1 An explanation of the circumstances causing the delay and why those circumstances are beyond the control of the EDE the Generator Owner.

R6.4.2

5.9.4.2 Revisions to the selected actions in Part 6.3.2, if any, including utilization of operating procedures, if applicable.

R6.4.3

5.9.4.3 Updated timetable for implementing the selected actions in Part 6.3.2.

R6.5

5.9.5 Constraint Declaration

Document in a declaration, with justification, if applicable, any Generator Cold Weather Constraint in accordance with Requirement R8.

R7

5.10 CAP REQUIREMENTS & TIMELINES

EDE facilities will define corrective actions with the appropriate 24- or 48-month timelines, implement those actions according to the established schedule, and update both actions and timelines with written justification whenever changes or delays occur.

R7.1

5.10.1 CAP minimum content and timetables

CAP shall include at a minimum the following:

R7.1.1

5.10.1.1 A list of any actions that require **new** freeze protection measures, with a timetable specifying completion within **48** calendar **months** of completing development of the CAP.

R7.1.2

5.10.1.2 A list of any actions that **remedy** issues with **existing** freeze protection measures, with a timetable specifying completion within **24** calendar **months** of completing development of the CAP.

R7.1.3

5.10.1.3 A description of updates to the cold weather preparedness plan required under Requirement R4 to identify the updates or additions to the GCCs and their freeze protection measures

R7.1.4

5.10.1.4 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 is completed.

R7.2

5.10.2 Submit CAP extension request if delayed

If unable to complete actions per R7.1 timetables due to circumstances beyond control, EDE plant will submit a CAP extension request to the MRO. The request will include:

R7.2.1

5.10.2.1 An explanation of the circumstances causing the delay and how those circumstances are beyond the control of the EDE Generator Owner.

R7.2.2

5.10.2.2 Revisions to the selected actions in Paragraph 5.10.1 R7.1, if any, including utilization of operating procedures, if applicable.

R7.2.3

5.10.2.3 Updated timetable for implementing the selected actions in Paragraph 5.10.1 R7.1.

R7.3

5.10.3 Document Generator Cold Weather Constraint

Document in a declaration, with justification, if applicable, any Generator Cold Weather Constraint (GCWC) in accordance with Requirement R8.

R8

5.11 GENERATOR COLD WEATHER CONSTRAINT DECLARATION

Each EDE plant that declares a GCWC in accordance with **Attachment 1** (of EOP-012-3) will:

R8.1

5.11.1 Submission deadlines

Submit declaration(s) to the MRO as follows:

- For R2 constraints upon commercial operation: Submit within 15 calendar days after commercial operation.
- For all other Generator Cold Weather Constraints: Submit within 45 calendar days of determining that the Generator Cold Weather Constraint is applicable.

R8.2

5.11.2 Update operating limitations

Update the operating limitations under Requirement R1 Part R1.2 Paragraphs 5.4 and 5.4.2 respectively if applicable.

R8.3

5.11.3 Invalid constraint resolution

If the MRO determines the declared GCWC is invalid, the plant shall:

- 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 MRO.
- **Or** Implement freeze-protection measures to provide the necessary capability in accordance with Requirement R2.

R8.4

5.11.4 Repeat CWRE notification

Document and provide notice to the MRO, when a GCWRE occurs with the same cause of a previous GCWRE at the same or a similar unit, and one or more corrective actions to address the cause is addressed by an existing validated GCWC for the same or a similar unit.

R9

5.12 CONSTRAINT REVIEW & VALIDATION

Review each GCWC declaration validated by the MRO at least once every **36 calendar months** to determine if it remains valid in accordance with Attachment 1 of EOP-012-3.

R9.1

5.12.1 CAP after invalid constraint

If a GCWC is determined to be no longer valid: Develop or update a Corrective Action Plan pursuant to Requirement R7 within **six (6) calendar months** of such determination.

Attachment B

ECWT Methodology

What is ECWT?

The extreme cold weather temperature (ECWT) 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.[1]"

Calculating ECWT

Hourly temperature records are sourced from the Global Historical Climatology Network-hourly (GHCNh), Version 1[2], maintained by the National Centers for Environmental Information (NCEI) under the National Oceanic and Atmospheric Administration (NOAA). Data is collected from the nearest weather station to the generation site that reports FM-15 (METAR) data. If sub-hourly records are available, only one record per hour is used.

If a temperature record is missing for a specific hour, dating back to midnight on January 1, 2000, data from the next closest weather station with an available record for that hour is used. This process is repeated until all historical gaps are filled.

To ensure accuracy, only weather stations within 200 miles and ±500 feet of elevation from the generation site are considered.

Once a complete history of temperature records is established, the 0.2 percentile of recorded temperatures is calculated to determine the Extreme Cold Weather Temperature (ECWT) of the site.

[1] https://www.nerc.com/globalassets/standards/approved-standards/eop/eop-012-3.pdf

[2] https://www.ncei.noaa.gov/access/search/data-search/global-historical-climatology-network-hourly