

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Project 2021-07

Extreme Cold Weather Grid Operations, Preparedness and Coordination

Industry Webinar
June 20, 2023

RELIABILITY | RESILIENCE | SECURITY



Administrative

- Review NERC Antitrust Compliance Guidelines and Public Announcement

Agenda

- Project Background
- Standard Updates
- Implementation Plan
- Posting Update
- Q&A

It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition. It is the responsibility of every NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

Participants are reminded that this meeting is public. Notice of the meeting was widely distributed. Participants should keep in mind that the audience may include members of the press and representatives of various governmental authorities, in addition to the expected participation by industry stakeholders.

Name	Entity
Kenneth Luebbert	Evergy, Inc.
Matthew Harward	Southwest Power Pool, Inc.
Venona Greaff	Oxy
Derek Kassimer	Pine Gate Renewables
Jonathan Davidson	City Utilities of Springfield
David McRee	Duke Energy
Thor Angle	Puget Sound Energy
Keith Smith	Orsted Onshore North American
Chad Wiseman	Newfoundland & Labrador Hydro
Bradley Pabian	Louisville Gas & Electric and Kentucky Utilities
Collin Martin	Oncor Electric Delivery, LLC
Jill Loewer	Utility Services
David Kezell	Electric Reliability Council of Texas, Inc. (ERCOT)
Ryan Salisbury	Oklahoma Gas & Electric
David Deerman	Southern Company Services

- Phase 2 includes the following Recommendations from the Joint Inquiry Report to be included in EOP-012:
 - 1a – GO identification of cold-weather-critical components and systems
 - 1b – GO identification and implementation of freeze protection measures on each of the elements identified per 1a
 - 1c – GO requirement to account for the effects of precipitation and wind

- Phase 2 includes the following directives from the FERC order to be included in EOP-012:
 - **Applicability:** Ensure the applicability section captures all BES generation resources needed for reliable operation and excludes only those generation resources not relied upon during freezing conditions.
 - **Generator Constraints to Implementing Winterization Requirements:** develop modifications related to generator-defined declarations of technical, commercial, or operational constraints that preclude a generator owner from implementing the appropriate freeze protection measures. Specifically, include auditable criteria on permissible constraints and to identify the appropriate entity that would receive the generator owners' constraint declarations.

- Phase 2 includes the following directives from the FERC order to be included in EOP-012:
 - Generator Capability Requirements: modifications to ensure that generators that are technically incapable of operating for 12 continuous hours (e.g., solar facilities during winter months with less than 12 hours of sunlight) are not excluded from complying with the standard. Also, directed modifications to the one-hour continuous operations requirement to better align with the stated purpose of the standard.
 - Corrective Action Plan deadlines: include a deadline or maximum period for the completion of corrective action plan measures for any requirement requiring the development of a corrective action plan to address capability or cold weather performance issues.
 - Implementation Plan: Require a shorter implementation period than five years post approval.

- FERC Order Directives
 - Modify EOP-012-1 to ensure requirements captures all BES resources needed for reliable operation during cold weather
 - Modify EOP-012-1 to exclude only those generation resources not relied upon during “freezing conditions”
 - Additional implementation time is not needed
 - NERC to ensure modified applicability section of EOP-012-1 is implemented as of effective date approved in the order

- SDT proposal to meet FERC directives
 - Functional Entities: Generator Owner and Generator Operator (no change from EOP-012-1)
 - Clarification of Facilities: “Generating Unit” refers to
 - a BES resource identified in the BES definition, Inclusion I2 and I4
 - I2 Generating resource(s) including the generator terminals through the high-side of the stepup transformer(s) connected at a voltage of 100 kV or above with: a) Gross individual nameplate rating greater than 20 MVA. Or, b) Gross plant/facility aggregate nameplate rating greater than 75 MVA
 - I4 Dispersed power producing resources that aggregate to a total capacity greater than 75 MVA (gross nameplate rating), and that are connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage of 100 kV or above
 - Blackstart Resource identified in the BES definition, Inclusion I3
 - Exclusions not prescribed in Applicability section
 - Any exemption moved to individual standard requirements in EOP-012-2

- Phase 2 includes the following Recommendations from the Joint Inquiry Report to be included in EOP-012:
 - 1a – GO identification of cold-weather-critical components and systems
 - 1b – GO identification and implementation of freeze protection measures on each of the elements identified per 1a

- To require Generator Owners to identify cold-weather-critical components and systems for each generating unit.
 - Cold-weather-critical components and systems are those which are susceptible to freezing or otherwise failing due to cold weather, and which could cause the unit to trip, derate, or fail to start.

- To require Generator Owners to identify and implement freeze protection measures for the cold-weather-critical components and systems .
 - The Generator Owner should consider previous freeze-related issues experienced by the generating unit, and any corrective or mitigation actions taken in response.

- Generator Owners Identify Cold Weather Critical Components (Recommendation 1a)
 - NERC Glossary Term
 - To address this recommendation, the SDT created the defined term ***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*.
 - R4 – All GO’s must have cold weather preparedness plan(s) to include:
 - R4.3 Documentation identifying the Generator Cold Weather Critical Components
 - *Originally included in EOP-012-1 as R3.2*

- Generator Owners implement freeze protection measures (Recommendation 1b)
 - R4 – All GO's must have cold weather preparedness plan(s) to include:
 - R4.4 Documentation of freeze protection measures implemented on Generator Cold Weather Critical Components.
 - *Originally included in EOP-012-1 as R3.3*

- To revise EOP-011-2, R7.3.2, to require Generator Owners to account for the effects of precipitation and the accelerated cooling effect of wind when providing temperature data.
 - “require GOs to understand how precipitation and the accelerated cooling effect of wind limit their generating unit’s performance.”
 - “The Event demonstrated that ambient temperatures alone do not serve as a basis to predict whether a generating unit can perform during predicted cold weather.”
 - “Preparing a generating unit for all potential effects of a cold weather event, whether induced by cold ambient temperatures alone, or cold ambient temperatures plus wind, and ice, can increase the likelihood that the generator will remain operational throughout the event.”

- EOP-012-2
 - R1.2.2. (proposed modification)
 - Generating unit(s) minimum:
 - Design temperature and **if available, concurrent wind speed and precipitation;**
 - Historical operating temperature at least one hour in duration, and **if available, concurrent wind speed and precipitation; or**
 - Current cold weather performance temperature determined by an engineering analysis, **which includes concurrent wind speed and precipitation.**

- EOP-012-2
 - R4.4 (approved, moved from EOP-012-1 R3.3)
 - 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);**
 - Requirement R4 does not require GOs to install new freeze protection measures to reduce the cooling effects of wind

FERC Directive from Paragraph 66 of Order:

- “[W]e direct NERC...to develop and submit modifications to Reliability Standard EOP-012-1 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.
- Specifically, we direct 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.

The SDT is intentionally leaving room for interpretation as it would be impossible to foresee every potential circumstance that could possibly necessitate a review of potential freeze protection technologies across the breadth of the US and Canada and the breadth of generating unit types and ages that fall under this Standard.

The essence of the constraint should be such that implementing the freeze protection measure is not possible or would be more detrimental than not implementing the freeze protection measure when considering the overall impacts to reliability.

To better clarify the intent of the standard, the SDT created a proposed new NERC Glossary term, Generator Cold Weather Constraint(s) that contains three sub categories

- **Generator Cold Weather Constraint(s)** – A limitation that would prohibit a Generator Owner from implementing freeze protection measures on one or more Generator Cold Weather Components. A constraint must fall under one of the following areas:

- **Technical Constraint** – A technical constraint exists when there is no known technical solution for addressing the issue or implementation of selected freeze protection measure(s) requires application of new technologies or existing technologies in new applications that would facilitate operations outside of the existing equipment specifications. Technical constraints include technologies that have not been demonstrated for a sufficient period of time in like assets in the BES.
 - Examples: No examples provided due to the dynamic nature of technology

- **Commercial Constraint** - A commercial constraint exists when implementation of selected freeze protection measure(s) are uneconomical to the extent that they would result in the generating unit not operating or not being put into service at the time of the evaluation.
 - Examples: Voided warranties, accelerated retirement of the generating unit, cancellation of new projects, etc.

- **Operational Constraint** – An operational constraint exists when implementation of selected freeze protection measure(s) would cause the generating unit to limit its operations in order to protect either the reliability of the BES, the generating unit itself, the surrounding environment, or personnel.
 - Examples: Limited fuel supply, voided warranties, required outage time to implement, reduction in summer capability, etc.

Generator Cold Weather Constraint(s) Process

R 7.4

GO to document in a declaration, with justification, any Generator Cold Weather Constraints that preclude the Generator Owner from implementing actions contained within the Corrective Action Plan.

Generator Cold Weather Constraint(s) Process

R8

- 8.1 Perform an annual review and update the Generator Cold Weather Constraint declaration as needed;
- 8.2 Update the operating limitations associated with capability and availability per Part 1.2 if applicable; and
- 8.3 Provide the Generator Cold Weather Constraint declaration to the Balancing Authority in the format and at the interval specified by the Balancing Authority.

- CAPs may be required by R1, R2, R3, or R6 to provide new or corrected freeze protection measures
 - R1: Any new measures associated with 5-year review of ECWT
 - R2: New generation cold weather capability
 - R3: Existing generation cold weather capability
 - R6: Correction of any generation following Generator Cold Weather Reliability Event
- FERC directive to establish requirements for duration of CAP timelines
 - Reference to TPL-007 CAP timelines
- Establishing requirements for implementation timelines reduces overall BES cold weather risk by ensuring improvements are made in a timely fashion

Implementation of Corrective Action Plans

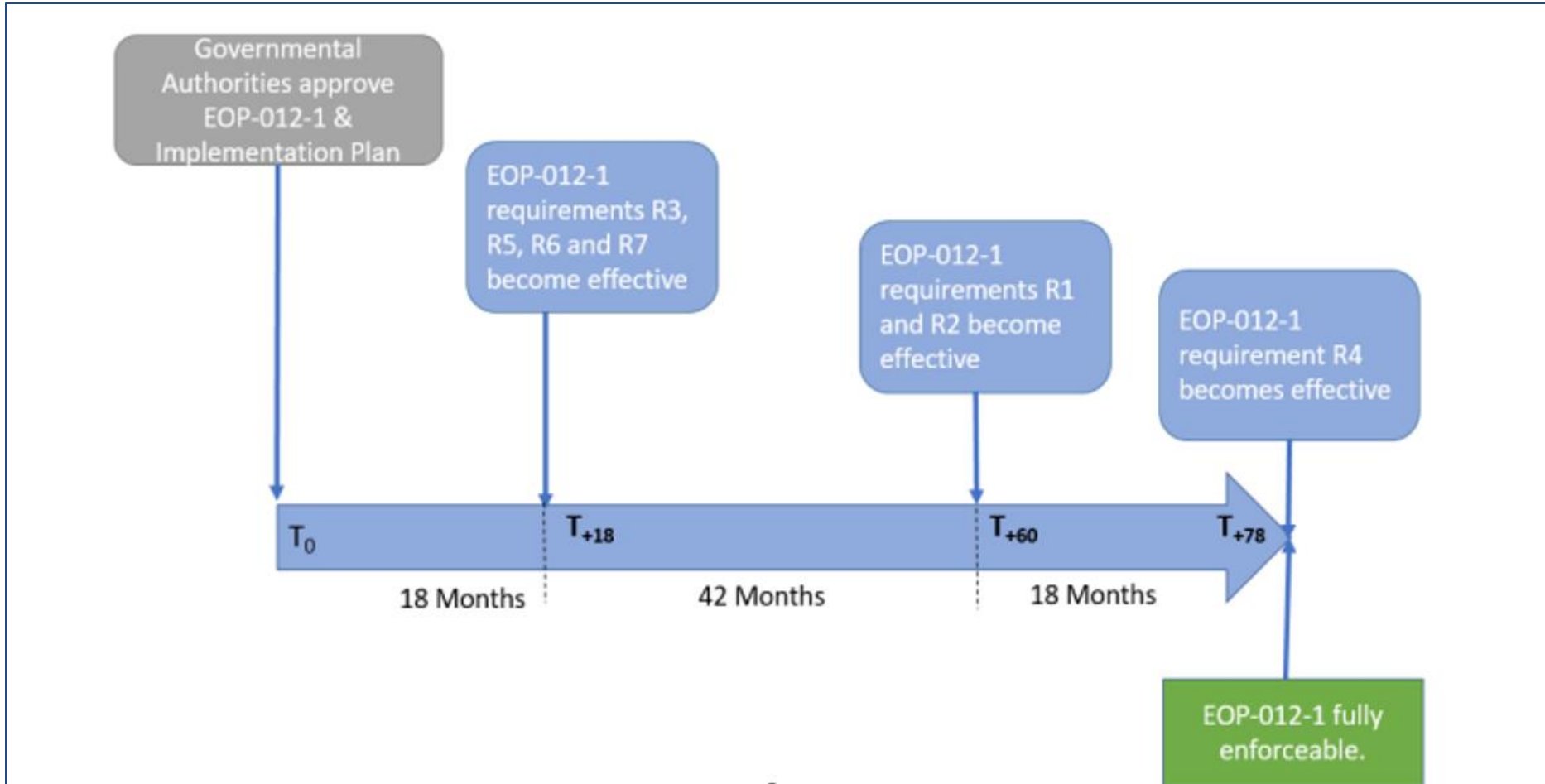
- Requires CAP to have a timetable for execution.
 - Actions that address existing equipment or freeze protection measures must be completed within 24 months of development of the CAP.
 - Actions that require new equipment or freeze protection measures must be completed within 48 months of development of the CAP.
- Generator Owners may declare a Generator Cold Weather Constraint (see definition) if unable to implement actions in the CAP

- FERC directed NERC to modify EOP-012-1 Requirement R1 to ensure that generators that are technically incapable of operating for 12 continuous hours (e.g., solar facilities during winter months with less than 12 hours of sunlight) are not excluded from complying with the standard.
- The Commission also directed NERC to modify the one-hour continuous operations requirement to better align with the stated purpose of the Reliability Standard EOP-012-1.

- In Requirement R1, the SDT addressed this directive by:
- Removing the following statement from R1:
 - 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.
- By removing the statement above, along with the revised Applicability section, the standard more clearly includes generators who are incapable of operating for 12 continuous hours.

- In Requirement R2, the SDT addressed this directive by:
- Removing the statement:
 - “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. “
- The SDT adjusted the requirement to have freeze protection so that:
 - The unit operates for no less than 12 hours or
 - Maximum operational duration for intermittent energy resources
- If unable to operate as above, will develop a Corrective Action Plan

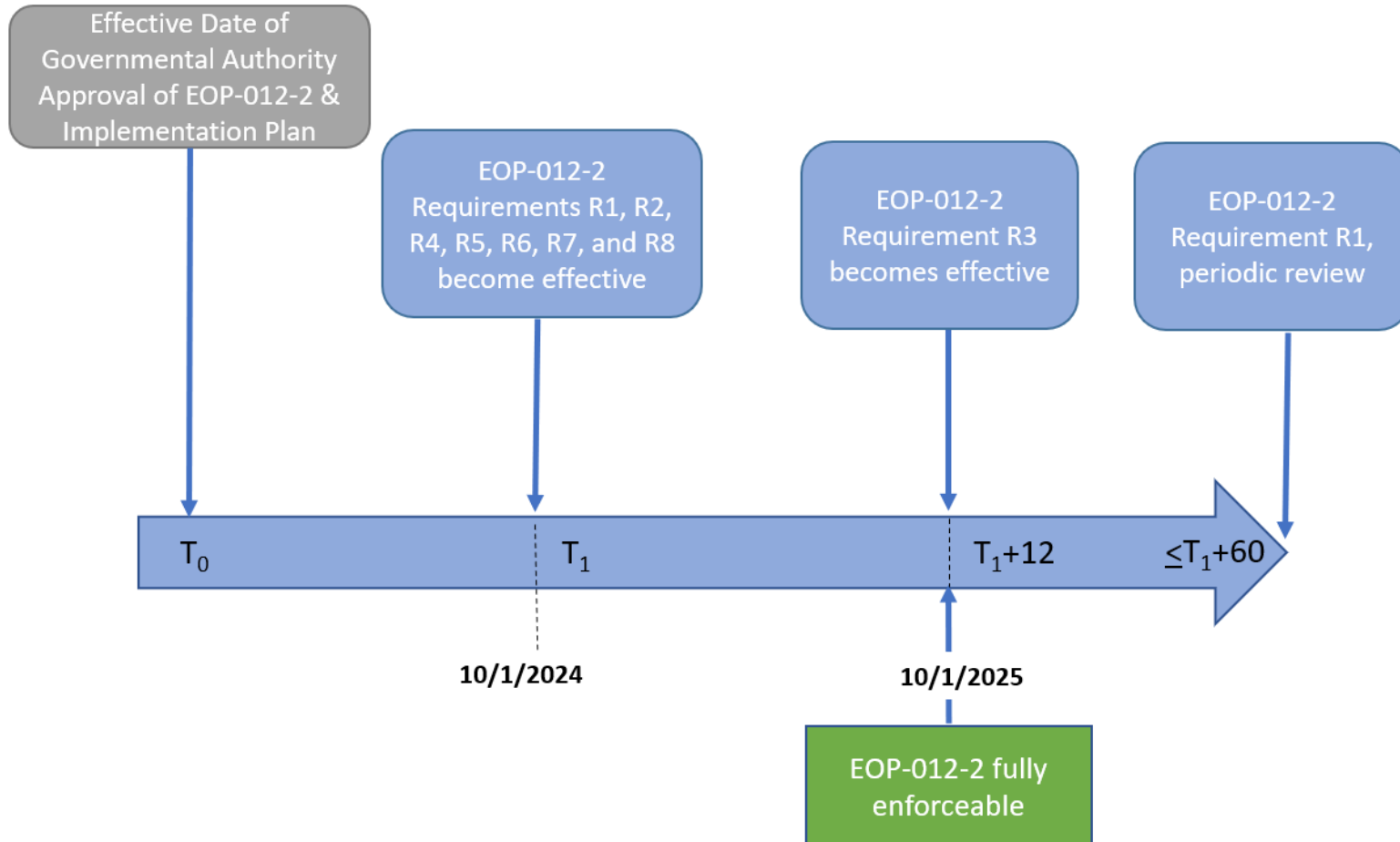
EOP-012-1 Implementation Plan



- We direct NERC to revise EOP-012 to require a **shorter** implementation period and **staggered** implementation for unit(s) in a generator owner's fleet
 - Such an approach will reduce reliability risks more quickly. Although we are giving NERC the discretion to determine what the effective date should be shortened to, we also emphasize that industry has been aware of and alerted to the need to prepare their generating units for cold weather since at least 2011
 - NERC should consider the amount of time that industry has already had to implement freeze protection measures when determining the appropriate shorter implementation period

- **Effective 10/1/2024**
 - **R1** - ECWT and unit cold weather information
 - **R2** - Applicable to generating units with a commercial operation date **on or after October 1, 2027**
 - **R4** - Cold Weather Preparedness Plan (CWPP)
 - **R5** - Annual training on CWPP
 - **R6** - If a Generator Cold Weather Reliability Event (GCWRE) occurs, develop a CAP **w/ 150 days or July 1**, whichever is earlier
 - **R7** – Timelines for the completion of Corrective Action Plans
 - **R8** – Generator Cold Weather Constraint declarations

- **Effective 10/1/2025**
 - **R3** - Applicable to generating unit(s) in commercial operation **prior to October 1, 2027**



The SDT defined the Extreme Cold Weather Temperature (ECWT):

- **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.*
- **Proposed Requirement R1 Part 1.1** - Calculate the Extreme Cold Weather Temperature for each of its applicable generating unit(s) and **identify the calculation date and source of temperature data** and(emphasis added)

- If data is not available from a single source, GO will use its judgement to determine where data representative of the location can be found.
 - Multiple public sources are available, including NOAA, ASOS, NWS, FAA, Environment and Climate Change Canada.
- Document source of the data and date calculation made. This meets the proposed requirement.
- If multiple locations are combined, ensure source location is clear (i.e. plant data from 2013 forward, weather station prior to this date).
- Recommend GO records why this data was chosen, (closest location, best available, etc.) but not specifically required.

- Documents Included
 - EOP-012-2
 - Implementation Plan
 - Technical Rationale for EOP-012-2
 - Mapping Document
- Posting Date: June 5 – July 20, 2023
- Ballot Pool: June 5 – July 5, 2023
- [Project Page](#)

- TOP-002 and EOP-011 Respond to Comments
 - Team Meetings in Summer 2023
 - Second Posting in late Summer 2023
 - NERC Board Deadline September 30, 2023
- Point of Contact
 - Alison Oswald, Manager of Standards Development
 - Alison.oswald@nerc.net or call 404-275-9410
- Webinar Slides and Recording Posting
 - Within 48-72 hours of Webinar completion
 - Will be available in the Standards, Compliance, and Enforcement Bulletin

- Informal Discussion
 - Via the Questions and Answers Objectives feature
 - Chat only goes to the host, not panelists
 - Respond to stakeholder questions
- Other
 - Some questions may require future team consideration
 - Please reference slide number, standard section, etc., if applicable
 - Team will address as many questions as possible
 - Webinar and chat comments are not a part of the official project record
 - Questions regarding compliance with existing Reliability Standards should be directed to ERO Enterprise compliance staff, not the SDT



Questions and Answers

A stylized map of North America is centered on the slide. The map is divided into three horizontal color bands: a light purple band at the top covering Canada, a dark blue band in the middle covering the United States, and a light grey band at the bottom covering Mexico. The text "Webinar has ended – Thank You" is overlaid on the dark blue band.

Webinar has ended – Thank You