



Memorandum from the Office of the Inspector General

May 20, 2024

David L. Bowling, Jr.

**FINAL REPORT – EVALUATION 2024-17475 – COMPLIANCE WITH NERC
EMERGENCY PREPAREDNESS AND OPERATIONS RELIABILITY STANDARD – GAS**

Attached is the subject final report for your review. Your written comments, which addressed your actions taken, have been included in the report. No further action is needed at this time.

If you have any questions, please contact Samuel L. Ruble, Senior Auditor, Evaluations - Operations, at (865) 633-7384 or Lindsay J. Denny, Director, Evaluations - Operations, at (865) 633-7349. We appreciate the courtesy and cooperation received from your staff during the evaluation.

David P. Wheeler
Assistant Inspector General
(Audits and Evaluations)

SLR:FAJ

Attachment

cc (Attachment):

TVA Board of Directors
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OIG File No. 2024-17475



Office of the Inspector General

Evaluation Report

To the Vice President, Power
Operations, Gas, Hydro, and
Integration

COMPLIANCE WITH NERC EMERGENCY PREPAREDNESS AND OPERATIONS RELIABILITY STANDARD - GAS

Evaluation Team
Samuel L. Ruble
Heather M. Cook

Evaluation 2024-17475
May 20, 2024

ABBREVIATIONS

EOP	Emergency Preparedness and Operations
NERC	North American Electric Reliability Corporation
PM	Preventive Maintenance
PO	Power Operations
SPP	Standard Programs and Processes
TVA	Tennessee Valley Authority
WO	Work Order

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MEMORANDUM DATED MAY 14, 2024, FROM DAVID BOWLING
TO DAVID P. WHEELER



Evaluation 2024-17475 – Compliance With NERC Emergency Preparedness and Operations Reliability Standard – Gas

EXECUTIVE SUMMARY

Why the OIG Did This Evaluation

North American Electric Reliability Corporation (NERC) *Emergency Preparedness and Operations* (EOP) standard 011-2, was approved by the Federal Energy Regulatory Commission on August 24, 2021, with an effective date of April 1, 2023. EOP-011-2 includes a requirement to implement and maintain a cold weather preparedness plan for generating units with 7 required elements. EOP-011-2 also includes a requirement for evidence documenting the plan was implemented and maintained as well as evidence that applicable personnel completed training on the cold weather preparedness plan. Power Operations Standard Programs and Processes 10.020, *Seasonal Readiness Preparation at Coal, Gas, and Hydro Sites*, requires:

- Certification that winter seasonal readiness work is complete by November 15.
- Annual completion of a master winterization preventive maintenance (PM) that references all winterization PMs.

Due to the risk of weather-related generation asset outages, we performed an evaluation of the Tennessee Valley Authority's (TVA) winter readiness at gas plants. The objective of our evaluation was to determine if TVA completed cold-weather plans in accordance with NERC reliability standard for *Emergency Preparedness and Operations*.

What the OIG Found

We determined TVA generally completed cold-weather plans in accordance with NERC reliability standard for EOP-011-2. However, we identified minor discrepancies in certification letters and training.

What the OIG Recommends

We made three recommendations to the Vice President, Power Operations, Gas, Hydro, and Integration, related to taking actions to address (1) certification letters and (2) training. Our detailed recommendations are listed in the body of this report.



Evaluation 2024-17475 – Compliance With NERC Emergency Preparedness and Operations Reliability Standard – Gas

EXECUTIVE SUMMARY

TVA Management’s Comments

In response to our draft report, TVA management agreed with the recommendations and provided actions taken to address the recommendations. See the Appendix for TVA management’s complete response.

Auditor’s Response

We agree with the actions taken to address the recommendations.

BACKGROUND

North American Electric Reliability Corporation (NERC) *Emergency Preparedness and Operations* (EOP) standard 011-2, was approved by the Federal Energy Regulatory Commission on August 24, 2021, with an effective date of April 1, 2023. EOP-011-2 includes a requirement to implement and maintain a cold weather preparedness plan for generating units with 7 required elements. The requirements include (1) generating units freeze-protection measures, (2) annual inspection and maintenance of the freeze-protection measures, (3) capability and availability, (4) fuel-switching capabilities, (5) fuel supply and inventory concerns, (6) environmental constraints, and (7) minimum design temperature or historical operating temperature or current cold-weather performance temperature determined by engineering analysis. EOP-011-2 also includes a requirement for evidence documenting the plan was implemented and maintained as well as evidence that applicable personnel completed training of the cold weather preparedness plan.

Power Operations (PO) Standard Programs and Processes (SPP) 10.020, *Seasonal Readiness Preparation at Coal, Gas, and Hydro Sites*, requires:

- Certification that winter seasonal readiness work is complete by November 15.
- Annual completion of a master winterization preventive maintenance (PM) that references all winterization PMs.

The certification letter documents seasonal readiness work is complete. Examples of items included in the certification letters were the completion of seasonal readiness PM work orders (WO), construction of temporary enclosures, repair of assessment findings for heat trace¹ and insulation, and information about site procedures. In addition, sites use emergency-response plans for cold weather to “prepare for and respond to operating emergencies contributed to cold[-]weather events and ensure compliance with NERC EOP[-]011-2.” Tennessee Valley Authority (TVA) gas plants implemented their plans between August 2023 and January 2024.

In December 2022, during Winter Storm Elliott, TVA directed local power companies to reduce power consumption by 5 percent and then by 10 percent due to weather-related production losses. According to TVA, as of January 22, 2024, they have invested \$123 million in winter readiness since Winter Storm Elliott. Due to the risk of weather-related generation asset outages, we performed an evaluation of TVA's winter readiness at gas plants.

¹ Heat trace is used to maintain or raise the temperature of pipes and vessels.

OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of our evaluation was to determine if TVA completed cold-weather plans in accordance with NERC reliability standard for *Emergency Preparedness and Operations*. The scope of our evaluation included cold-weather plans and winter certifications for fiscal year 2024. To achieve our objective, we selected a random sample of 5 of TVA's 17 gas plants, including Allen Combined Cycle Plant, Colbert Combustion Turbine Plant, Gallatin Combustion Turbine Plant, Johnsonville Combustion Turbine Plant, and Southaven Combined Cycle. For each plant we:

- Reviewed site cold-weather plans to determine if required elements were included in compliance with NERC EOP-011-2.
- Verified items from the certification letters were completed.
- Conducted site visits to verify a sample of items identified on certification letters were completed. We randomly selected 4 temporary enclosures and 4 supplemental heat sources at sites where there were at least 4 to review.² Additionally, we judgmentally selected 4 cold-weather material and equipment inventory items that were listed in each site's inventory list for verification.
- Reviewed training records for seasonal readiness coordinators at each site to determine if winter-readiness training was conducted in accordance with NERC EOP-011-2 and PO-SPP-10.020.

This evaluation was conducted in accordance with the Council of the Inspectors General on Integrity and Efficiency's *Quality Standards for Inspection and Evaluation*.

FINDINGS

We determined TVA generally completed cold-weather plans in accordance with the NERC reliability standard for EOP-011-2. However, we identified minor discrepancies in certification letters and training.

ACCURACY OF CERTIFICATION LETTERS

Each site completes a site certification letter that documents seasonal readiness work is complete. Most items listed on each plant's certification letter were completed prior to the certification letter being signed, with the following exception: At Johnsonville Combustion Turbine Plant, some assessment findings were still open when the certification letter was signed, but were not listed as exceptions on the site certification letter.

² In addition, we verified items that had been added to the plan for one site. One site had no temporary enclosures and two sites had no supplemental heat sources to verify.

As part of our testing to determine if PM WOs were completed prior to the certification letter date, we identified 1 inactive PM³ of 63 PMs listed on the master winterization PM that should be removed. Additionally, we identified 11 PMs that were coded as winterization that should have been included in the master winterization PM, but were not. We also identified 6 PMs on the master winterization PM that were not coded as winterization, which should have been. If the PM list is not updated and complete, it could increase the risk that all winterization PM WOs are not completed as needed.

TIMELINESS OF TRAINING

EOP-011-2 includes a requirement for evidence that applicable personnel completed training of the cold weather preparedness plan. PO-SPP-10.020 states that annual training must be completed prior to the start of the winter preparation period.⁴ We determined that seasonal readiness coordinators for all five sites received training in March 2023. However, seasonal readiness coordinators at Gallatin Combustion Turbine Plant and Southaven Combined Cycle Plant were replaced in September and November 2023, respectively, but did not receive training until February 2024 and March 2024.

RECOMMENDATIONS

We recommend the Vice President, PO, Gas, Hydro, and Integration:

- Reinforce the expectation that certification letters include all exceptions.
TVA Management's Comments – TVA management agreed with the recommendation and have implemented work controls to perform an annual review of WO status to ensure exceptions are listed on the certification letter. See the Appendix for TVA management's complete response.
Auditor's Response – We agree with TVA management's action taken.
- Update the master winterization PM and implement a periodic review for accuracy.
TVA Management's Comments – TVA management agreed with the recommendation and have implemented work controls to perform an annual review of the master winterization PM prior to WO generation. See the Appendix for TVA management's complete response.
Auditor's Response – We agree with TVA management's action taken.

³ Inactive PMs no longer need to be completed.

⁴ The SPP does not state the date the winter preparation period starts.

- Take steps to ensure all seasonal readiness coordinators receive training in a timely manner.

TVA Management's Comments – TVA management agreed with the recommendation and have implemented work controls to ensure accurate designations of seasonal readiness coordinators prior to the seasonal readiness preparation period and utilize the learning management system to ensure training is complete. See the Appendix for TVA management's complete response.

Auditor's Response – We agree with TVA management's action taken.

May 14, 2024

David P. Wheeler, WT 2C-K

REQUEST FOR COMMENTS – DRAFT AUDIT 2024-17475 – COMPLIANCE WITH NERC
EMERGENCY PREPAREDNESS AND OPERATIONS RELIABILITY STANDARD - GAS

Gas Operations would like to thank Sam Ruble for his diligence, support, and recommendations for improvement as we are continuously improving our performance in relation to compliance with NERC emergency preparedness and operations reliability standard.

In response to the recommendations provided in your draft report dated April 24, 2024, we provide the following comments and responses.

Recommendations:

1. Reinforce the expectation that certification letters include all exceptions.

Response

Power Operations agrees with this recommendation. To address this recommendation, Power Operations has implemented work controls utilizing Maximo to perform an annual review of all work order status prior to certification to ensure all exceptions are listed on the certification letter.

2. Update the master winterization Preventative Maintenance (PM) and implement a periodic review for accuracy.

Response

Power Operations agrees with this recommendation. To address this recommendation, Power Operations has implemented work controls utilizing Maximo to perform an annual review of master winterization PM prior to work order generation.

3. Take steps to ensure all seasonal readiness coordinators receive training in a timely manner.

David P. Wheeler, WT 2C-K
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Response

Power Operations agrees with this recommendation. To address this recommendation, Power Operations has implemented work controls utilizing Maximo to ensure accurate designations of seasonal readiness coordinators prior to seasonal readiness preparation period and utilize the learning management system to ensure required training is complete

Thank you for the time to allow us to review and provide feedback on the draft audit.

A handwritten signature in black ink that reads "David Bowling". The signature is written in a cursive, flowing style.

David Bowling
Vice President
Gas, Hydro, and Plant Integration

SDD:WHR
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