



Memorandum from the Office of the Inspector General

November 19, 2024

David L. Bowling, Jr.
Matthew R. Lovitt

REQUEST FOR FINAL ACTION – EVALUATION 2024-17499 – GAS OPERATIONS
CLEARANCES

Attached is the subject final report for your review and final action. Your written comments, which addressed your management decision and actions planned or taken, have been included in the report. Please notify us when final action is complete. In accordance with the Inspector General Act of 1978, as amended, the Office of the Inspector General is required to report to Congress semiannually regarding evaluations that remain unresolved after 6 months from the date of report issuance.

If you have any questions or wish to discuss our findings, please contact Kristin S. Leach, Senior Auditor, Evaluations – Operations, at (423) 785-4818 or Lindsay J. Denny, Director, Evaluations – Operations, at (865) 633-7349. We appreciate the courtesy and cooperation received from your staff during the evaluation.

A handwritten signature in black ink that reads "David P. Wheeler".

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

KSL:KDS

Attachment

cc (Attachment):

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OIG File No.2024-17499



Office of the Inspector General

Evaluation Report

To the Vice President, Gas,
Hydro and Integration, and
to the Director, Safety

GAS OPERATIONS CLEARANCES

Evaluation Team
Kristin S. Leach
Kenneth H. Sims (Trey)

Evaluation 2024-17499
November 19, 2024

ABBREVIATIONS

AE	Authorized Employee
CPAL	Clearance Personal Accountability Log
eSOMS	Enterprise Shift Operations Management System
LMS	Learning Management System
MOIC	Management Official in Charge
PO	Power Operations
RE	Responsible Employee
SPP	Standard Programs and Processes
TSP	TVA Safety Procedure
TVA	Tennessee Valley Authority

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

BACKGROUND..... 1

OBJECTIVE, SCOPE, AND METHODOLOGY 2

FINDINGS 4

RECOMMENDATIONS 6

APPENDIX

MEMORANDUM DATED NOVEMBER 8, 2024, FROM DAVID L. BOWLING, JR., AND MATTHEW R. LOVITT TO DAVID P. WHEELER



Evaluation 2024-17499 – Gas Operations Clearances

EXECUTIVE SUMMARY

Why the OIG Did This Evaluation

Working in industrial environments is inherently dangerous, and steps must be taken to ensure the safety of personnel performing work on energized equipment. Proper practices and procedures can reduce the number of accidents resulting from an inadvertent release of hazardous energy,ⁱ according to the Occupational Safety and Health Administration. The Tennessee Valley Authority's (TVA) Safety Procedure 18.613, *Clearance Procedure to Safely Control Hazardous Energy Using Group Tagout*, establishes minimum TVA-wide clearance requirements, while Power Operations Standard Programs and Processes 10.015, *Coal and Gas Clearance Procedure*, governs the clearance process at gas sites. These requirements are to be utilized to ensure equipment is isolated from energy sources and rendered nonoperative before performing work where unexpected energizing, start-up, or release of stored energy could occur and cause injury or property damage.

Due to the importance of the clearance procedure in preventing injury and/or property damage while equipment is being serviced, we performed an evaluation of Gas Operations clearances to determine if clearances, required training, and audits were performed in compliance with clearance procedures.

What the OIG Found

We determined clearances, required training, and audits were not always performed in compliance with clearance procedures. Specifically, we identified clearance documentation was not always completed and maintained, some Clearance Personal Accountability Logs were illegible, and some tags were missing or illegible. We also found training had not been completed for some contractors who worked on clearances. Additionally, we determined that audits were not being conducted as required.

What the OIG Recommends

We recommend the Vice President, Gas, Hydro, and Integration, take actions related to identified deficiencies with clearance documentation, training, and audits. Our detailed recommendations are listed in the body of this report.

ⁱ Energy sources include electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other sources in machines and equipment. During the servicing and maintenance of machines and equipment, the unexpected startup or release of stored energy can result in serious injury or death to workers.



Evaluation 2024-17499 – Gas Operations Clearances

EXECUTIVE SUMMARY

TVA Management's Comments

In response to the draft report, TVA management agreed with the recommendations and provided planned actions to address identified deficiencies with clearance documentation, training, and audits. See the Appendix for TVA management's complete response.

Auditor's Response

We agree with TVA management's planned actions to address our recommendations.

BACKGROUND

Working in industrial environments is inherently dangerous and steps must be taken to ensure the safety of personnel performing work on energized equipment. Proper practices and procedures can reduce the number of accidents resulting from an inadvertent release of hazardous energy,¹ according to the Occupational Safety and Health Administration.

The Tennessee Valley Authority's (TVA) Safety Procedure (TSP) 18.613, *Clearance Procedure to Safely Control Hazardous Energy Using Group Tagout*, establishes minimum TVA-wide clearance requirements, while Power Operations (PO) Standard Programs and Processes (SPP) 10.015, *Coal and Gas Clearance Procedure*, governs the clearance process at gas sites. The purpose of the *Coal and Gas Clearance Procedure* is to establish standardized requirements that are necessary for group tagout² in accordance with Title 29 Code of Federal Regulations, Section 1910.269, *Electric power generation, transmission, and distribution* (29 CFR § 1910.269). These requirements are to be utilized to ensure equipment is isolated from its energy source and rendered nonoperative before performing work on machines or equipment where the unexpected energizing, start-up, or release of stored energy could occur and cause injury or property damage.

Clearances are prepared, issued, and maintained in TVA's Enterprise Shift Operations Management System (eSOMS).³ Key roles in the clearance process include:

- Management Official in Charge (MOIC) – the plant, facility, production, or site manager serves as the MOIC; is responsible for overseeing the implementation of the clearance procedure; and can designate others to fulfill MOIC responsibilities as appropriate. The MOIC is also responsible for problem resolution when implementing or releasing a clearance, and issues and maintains the official plant clearance list, which identifies the individuals that are trained and qualified to serve in key roles.
- Responsible Employee (RE) – responsible for writing and issuing clearances, which includes reviewing clearance requests, verifying clearance

¹ Energy sources include electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other sources in machines and equipment. During the servicing and maintenance of machines and equipment, the unexpected start-up or release of stored energy can result in serious injury or death to workers.

² The placement of a tagout device on an energy-isolating device indicates the device and the equipment being controlled shall not be operated until the tagout device is removed.

³ eSOMS is a modular software application suite designed to automate and integrate the major processes involved in plant operations management, including clearances.

boundaries,⁴ preparing equipment tags,⁵ and discussing pertinent clearance information with relevant personnel.

- Qualified Employee – participate in pre-job briefings with the REs before hanging or removing equipment tags utilized to establish the clearance boundaries.
- Primary Authorized Employees – hold the clearance and are responsible for the work performed under the clearance, including: (1) performing walkdowns of the clearance boundaries, (2) ensuring energy isolating devices are correctly positioned and tagged, (3) ensuring authorized employees (AEs) understand the boundaries of the clearance and the nature of the work to be performed, and (4) maintaining the clearance personal accountability logs⁶ (CPAL).
- AEs – the personnel performing work on the equipment under clearances. AEs are responsible for signing on the CPAL prior to starting work and signing off the CPAL after work is completed.

Clearance responsibilities are assigned based on an individual's qualifications (i.e., level of clearance training completed). According to PO-SPP-10.015, all personnel, including contractors, are to be trained and examined annually relative to their responsibilities.

PO-SPP-10.015 also sets forth clearance audit requirements. Ten percent of active clearances per month at each site are to be audited by independent personnel qualified at the RE level. These audits are to ensure that employees are knowledgeable of the clearance process, implement it correctly, and utilize it as required when performing service, maintenance, or modification on equipment.

At TVA's 17 gas sites, there were 15 clearances events⁷ from October 1, 2022, through August 26, 2024, while Coal and Hydro had 4 and 1 events, respectively. Due to the importance of the clearance procedure in preventing injury and/or property damage while equipment is being serviced, we scheduled an evaluation of Gas Operations clearances.

⁴ Clearance boundaries are points at energy isolating devices established in accordance with the procedure that allows AEs to safely work on equipment under a clearance.

⁵ Tags are warning devices affixed to equipment that serve as visual markers of clearance boundaries for employees.

⁶ CPALs are paper or electronic rosters that identify all AE working on equipment under a specific clearance.

⁷ A clearance event is exposure or potential exposure to energy in the field.

OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of our evaluation was to determine if clearances, required training, and audits were performed in compliance with clearance procedures. The scope included clearances issued and audits conducted from November 1, 2023, through April 30, 2024, and site visits conducted in June and July 2024. To achieve our objective, we:

- Reviewed applicable regulations and TVA processes and procedures to determine procedural requirements, including:
 - 29 CFR § 1910.269, *Electric power generation, transmission, and distribution*
 - TVA-TSP-18.613, *Clearance Procedure to Safely Control Hazardous Energy*
 - PO-SPP-10.015, *Coal and Gas Clearance Procedure*
- Interviewed pertinent personnel to gain an understanding of the Gas Operations clearance process and requirements.
- Judgmentally selected a sample of 31 active clearances from a population of 109 active clearances at six gas sites⁸ to verify that required tags were in place and that the tags contained the required information. We selected the clearances based on the equipment description, date created, and location.
- Statistically selected a random sample of 66 clearances from a population of 3,258 active and released⁹ clearances issued from November 1, 2023, through April 30, 2024, for all gas sites to determine if clearances were performed in compliance with selected procedural requirements. We selected the sample using rate of occurrence sampling with a 95 percent-confidence level. We tested the following selected elements of the procedure:
 - Clearance request documentation requirements.
 - Clearance preparation and verification requirements in eSOMS, including placement and verification of tags.
 - CPAL requirements.
 - Training records from TVA's Learning Management System¹⁰ (LMS) for the 306¹¹ personnel associated with the selected clearances to determine if training had been completed as required.

⁸ We judgmentally selected Colbert Combustion Turbine, Gallatin Combustion Turbine, John Sevier Combined Cycle, Lagoon Creek Combined Cycle, Lagoon Creek Combined Cycle, and Magnolia Combined Cycle, based on their location in the Gas Operations regions (Eastern, Southern, Western) and their plant type (Combustion Turbine or Combined Cycle).

⁹ According to PO-SPP-10.015, a released clearance is a clearance that has been removed from issued status that is no longer isolating equipment.

¹⁰ TVA's LMS is the official system of record for employee training.

¹¹ There were 314 personnel associated with the selected clearances, but we were unable to test training for 8 of the 314 individuals due to illegible handwritten names on the CPALs.

- Reviewed clearance audits conducted between November 1, 2023, and April 30, 2024, to determine if audits had been performed in accordance with PO-SPP-10.015 and TVA-TSP-18.613.

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 clearances, required training, and audits were not always performed in compliance with clearance procedures. Specifically, we identified clearance documentation was not always completed and maintained, some CPALs were illegible, and some tags were missing or illegible. We also found that training had not been completed for some contractors. Additionally, we determined that audits are not being conducted as required.

MOST CLEARANCES ISSUED WERE NOT IN COMPLIANCE WITH SELECTED PROCEDURE REQUIREMENTS

The majority of the clearances we reviewed were not issued in compliance with the documentation requirements in PO-SPP-10.015. Specifically, we identified clearance requests that were not completed in accordance with procedure and instances where TVA was unable to provide required documentation. Additionally, we found some CPALs were illegible. We also identified 7 of 127 tags were missing or illegible at one site. Clearance documentation that is not properly completed and maintained or illegible clearance tags could result in an increased risk to employee safety.

Clearance Documentation Not Always Completed and Maintained According to Procedure

According to PO-SPP-10.015, (1) each person requesting a clearance must submit a separate clearance request and (2) clearance documentation, including clearance request forms and CPALS, are to be retained for 1 year. Of 66 clearances tested, TVA was unable to provide (1) the required clearance request form for each clearance holder for 18 clearances and (2) CPALS for 6 clearances. Additionally, PO-SPP-10.015 states that TVA Form 17987, Request for Clearance, should be used and that required fields shall be completed by the person requesting the clearance. For 42 of the 66 clearances, required fields were not completed on the clearance request forms. For example, date and time work was to begin and end was missing on some forms.

Some Clearance Personal Accountability Logs Were Illegible

Currently, Gas Operations maintains paper CPALs where individuals sign on and off the clearance. Gas plant personnel were not able to identify eight individuals listed on CPALs because of illegible handwriting. Without being able to identify who is listed on CPALs, TVA cannot determine who is working on clearances and whether they were trained as required.

Clearance Tags Missing

According to PO-SPP-10.015, a tag is installed on all energy-isolating devices and is used to isolate equipment from all sources of energy to permit work to be safely performed on the equipment. Of the 131¹² tags associated with our sample of 6 clearances selected, we found 7 missing or illegible tags. These tags were all located at one site. Subsequent to our site visit, the missing and illegible tags were replaced.

REQUIRED TRAINING NOT COMPLETED

PO-SPP-10.015 requires all personnel are trained and examined annually relative to their clearance responsibilities. During our review of training records for the 306 employees and contractors associated with the clearances in our sample, we identified 7 contractors who worked on clearances without the required training for their role. For those seven, two did not have the correct training for their clearance role, and one did not have until after the clearance work was performed. For the remaining four, we were unable to find their training in LMS and/or the gas sites were unable to provide any documentation of training. Lack of training could result in an increased risk to employee safety.

CLEARANCE AUDITS WERE NOT IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

PO-SPP-10.015 requires gas sites to conduct monthly audits of no less than 10 percent of active clearances. However, we were informed by a PO program manager that Gas Operations conducts audits based on the total number of clearances written each month rather than active clearances. Additionally, not all sites conducted audits during our scope. Specifically, 14 of 17 gas sites did not perform monthly audits consistently, with one site performing no audits during our scope. In total, we determined no audits were performed for 39 of the 102 months reviewed. Monthly, each gas site self-reports the number of clearance audits performed. In 39 of the 102 months, sites self-reported more audits completed than were performed. Performing audits consistently could increase the effectiveness of audits.

¹² We observed 127 of 131 tags. The remaining four tags were inaccessible.

RECOMMENDATIONS

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

- Reinforce procedure guidelines regarding clearance documentation.

TVA Management's Comments – TVA management agreed with the recommendation and stated they will reinforce procedure guidelines regarding clearance documentation during annual clearance training. See the Appendix for TVA management's complete response.

Auditor's Response – We concur with TVA's planned action.

- Implement a periodic review of active clearances to verify tags are in place.

TVA Management's Comments – TVA management agreed with the recommendation and will implement work controls to perform a review of active clearances to verify tags are in place. See the Appendix for TVA management's complete response.

Auditor's Response – We concur with TVA's planned action.

- Take actions to ensure required training is completed for contractors.

TVA Management's Comments – TVA management agreed with the recommendation and plans to take actions to ensure required training is completed for contractors. See the Appendix for TVA management's complete response.

Auditor's Response – We concur with TVA's planned action.

- Perform monthly audits in accordance with PO-SPP-10.015 requirements.

TVA Management's Comments – TVA management agreed with the recommendation and will implement work controls to perform monthly audits in accordance with PO-SPP-10.015 requirements. See the Appendix for TVA management's complete response.

Auditor's Response – We concur with TVA's planned action.

November 8, 2024

David P. Wheeler, WT 2C-K

REQUEST FOR COMMENTS – DRAFT AUDIT 2024-17499 – GAS OPERATIONS
CLEARANCES

Gas Operations would like to thank Kristen Leach and Lindsay Denny for their diligence, support, and recommendations for improvement as we are continuously improving our performance with the clearance process within the gas operations fleet.

In response to the recommendations provided in your draft report dated October 16, 2024, we provide the following comments and responses.

Recommendations:

1. Reinforce procedure guidelines regarding clearance documentation.

Response

Gas Operations agrees with this recommendation. To address this recommendation, Gas Operations will reinforce procedure guidelines regarding clearance documentation during annual clearance training.

2. Implement a periodic review of active clearances to verify tags are in place.

Response

Gas Operations agrees with this recommendation. To address this recommendation, Gas Operations will implement work controls utilizing Maximo to perform a period review of active clearances to verify tags are in place.

3. Take actions to ensure required training is completed for contractors.

Response

Gas Operations agrees with this recommendation. To address this recommendation, Gas Operations will take actions to ensure required training is completed for contractors.

David P. Wheeler, WT 2C-K
Page 2
November 8, 2024

4. Perform monthly audits in accordance with PO-SPP-10.015 requirements.

Response

Gas Operations agrees with this recommendation. To address this recommendation, Gas Operations will implement work controls utilizing Maximo to perform monthly audits in accordance with PO-SPP-10.015 requirements.

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



David L. Bowling, Jr.
Vice President
Gas, Hydro, and Plant Integration



Matthew R. Lovitt
Director
Safety

ERG:TDL

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