

Memorandum from the Office of the Inspector General

January 15, 2025

David L. Bowling, Jr. Matthew R. Lovitt

# REQUEST FOR FINAL ACTION – EVALUATION 2024-17513 – HYDRO PLANT OVERTIME

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 Randall C. Clapp, Auditor, at (865) 633-7382, or Lindsay J. Denny, Director, Evaluations – Operations, at (865) 633-7349. We appreciate the courtesy and cooperation received from your staff during the evaluation.

Daid P. White

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

LJD:KDS Attachment cc (Attachment): TVA Board of Directors Janda E. Brown Allen A. Clare Samuel P. Delk Buddy Eller David B. Fountain Jeffrey J. Lyash T. Daniel Lunsford

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Office of the Inspector General

# **Evaluation** Report

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

# HYDRO PLANT OVERTIME

<u>Evaluation Team</u> Randall C. Clapp John Anthony H. Jacosalem Evaluation 2024-17513 January 15, 2025

# **ABBREVIATIONS**

FTE	Full-Time Equivalent
HLE	Hydro Life Extension
OIG	Office of the Inspector General
OSHA	Occupational Safety and Health Administration
SPP	Standard Programs and Processes
TSP	TVA Safety Procedure
TVA	Tennessee Valley Authority

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MEMORANDUM DATED JANUARY 8, 2025, FROM DAVID L. BOWLING, JR., AND MATTHEW R. LOVITT TO DAVID P. WHEELER



### EXECUTIVE SUMMARY

### Why the OIG Did This Evaluation

The Tennessee Valley Authority (TVA) currently operates 29 power-generating hydro plants and one pumped-storage plant. Between June 1, 2022, and May 31, 2024, employees at TVA's hydro plants were paid a total of \$71.7 million. Of this \$71.7 million, \$15.1 million (21 percent) was paid for 187,579 hours of overtime to 243 employees.

To help manage the effects of fatigue, TVA Safety Procedure 18.018, *Fatigue Management*, establishes "... a process to provide reasonable assurance that the effects of fatigue and degraded alertness do not impact an individual's ability to safely and competently perform their duties." Due to the high number of overtime hours worked at some hydro plants, we performed an evaluation to assess TVA's management of overtime at hydro plants.

### What the OIG Found

We determined significant amounts of overtime were worked at some hydro plants. Specifically, we determined 58 percent (108,796 hours) of the 187,579 hours of overtime was worked at 5 of the 30 hydro plants. The overtime worked was the equivalent of 24 full-time employees. We also determined some employees worked significant amounts of overtime. There were 30 instances where employees worked over 1,000 hours of overtime in a single year and 2 employees worked approximately 2,000 hours of overtime in a single year. Additionally, we determined that TVA may not be accurately capturing the effects of fatigue because (1) fatigue evaluations are not being performed and (2) fatigue data is not being trended as required by the *Fatigue Management* procedure.

### What the OIG Recommends

We made recommendations to TVA management to address (1) the amount of overtime being worked and (2) fatigue management. Detailed recommendations are contained in the body of the report.

### **TVA Management's Comments**

In response to the draft report, TVA management provided planned actions to address our recommendations related to overtime and fatigue management. See the Appendix for TVA management's complete response.



Evaluation 2024-17513 – Hydro Plant Overtime

# **EXECUTIVE SUMMARY**

### Auditor's Response

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

# BACKGROUND

The Tennessee Valley Authority (TVA) currently operates 29 hydro plants and one pumped-storage plant. The 29 hydro plants produce about 14.5 million megawatt hours of electricity in a normal year, while the pumped-storage hydro plant has a generating capacity of 1,650 megawatts. TVA needs some employees to work overtime to be able to continually operate the hydro plants. Between June 1, 2022, and May 31, 2024, employees at TVA's hydro plants were paid a total of \$71.7 million. Of this \$71.7 million, \$15.1 million (21 percent) was paid for 187,579 hours of overtime to 243 employees.

In accordance with the Department of Labor's Fair Labor Standards Act, TVA incurs overtime expenses when eligible employees perform work in excess of 40 hours per week.<sup>1</sup> TVA is also obligated to make overtime payments in compliance with requirements outlined in various union agreements. Each hydro site maintains a list that tracks overtime for each employee. The overtime list is utilized to facilitate equitable distribution of overtime among employees in work groups. When a need for overtime is identified, it is initially offered to the employee who has worked the least amount of overtime. That individual has the opportunity to accept or refuse the overtime opportunity. If refused, the overtime will then be offered to the next employee on the list. The process continues until overtime is accepted.

To help manage the effects of fatigue, TVA Safety Procedure (TSP) 18.018, *Fatigue Management*, establishes "... a process to provide reasonable assurance that the effects of fatigue and degraded alertness do not impact an individual's ability to safely and competently perform their duties." Additionally, the Occupational Safety and Health Administration (OSHA) provides standards that govern employee safety in the workplace. OSHA, as well as other organizations, highlight the adverse effects of excessive work hours, including:

- Personal health risks for employees involved.
- Counter-productive results due to increased absenteeism and turnover.
- Decreased overall productivity due to stress and fatigue.
- Increased overall safety/accident risk.

Due to the high number of overtime hours worked at some of TVA's hydro plants, we performed an evaluation to assess TVA's management of overtime at hydro plants.

<sup>&</sup>lt;sup>1</sup> According to TVA Standard Programs and Processes (SPP) 13.029, *Pay*, paid absences, such as sick leave and annual leave, are counted the same as work time in determining eligibility for overtime pay.

### **OBJECTIVE, SCOPE, AND METHODOLOGY**

The objective of this evaluation was to assess TVA's management of overtime at hydro plants. The scope of the evaluation was overtime hours worked at hydro plants by TVA employees between June 1, 2022, and May 31, 2024. To achieve our objective, we:

- Interviewed TVA personnel and reviewed relevant documentation, regulations, and TVA procedures to gain an understanding of overtime requirements at hydro plants.
- Assessed TVA overtime data for hydro plants to identify (1) plants with significant overtime and (2) individuals who worked significant overtime.
- Assessed data, reviewed documentation, and conducted interviews to identify causes for significant amounts of overtime worked.
- Judgmentally selected<sup>2</sup> four hydro plants (Fort Loudoun Hydro Plant, Raccoon Mountain Pumped-Storage Plant, Wheeler Hydro Plant, and Wilson Hydro Plant) and performed site visits to discuss overtime with plant management to gain a better understanding of overtime management practices.
- Identified seven hydro plant safety related incidents and performed analysis
  of total overtime worked and overtime hours worked prior to the incident for
  the personnel involved, to determine if any correlation existed between the
  incidents and overtime.

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

<sup>&</sup>lt;sup>2</sup> Our judgmental selection was based on the highest total overtime hours worked, considering outages, during the scope of the evaluation.

## **FINDINGS**

We determined significant amounts of overtime were worked at some hydro plants. Specifically, we determined 58 percent (108,796 hours) of the 187,579 hours of overtime was performed at 5 of the 30 hydro plants. The overtime worked was the equivalent of 24 full-time employees. We also determined some employees worked significant amounts of overtime. There were 30 instances where employees worked over 1,000 hours of overtime in a single year and two employees worked approximately 2,000 hours of overtime in a single year. Additionally, we determined that TVA may not be accurately capturing the effects of fatigue because (1) fatigue evaluations are not being performed and (2) fatigue data is not trended with health and safety data as required by the *Fatigue Management* procedure.

# SIGNIFICANT AMOUNTS OF OVERTIME WERE WORKED AT SOME HYDRO PLANTS

We determined significant amounts of overtime were worked at some hydro plants. Specifically, we determined (1) overtime hours worked at five plants was equivalent to 24 full-time employees, and (2) some individual employees worked significant amounts of overtime based on the overtime hours worked on an annual, quarterly, bi-weekly, and daily basis. Potential causes for the significant overtime include (1) Hydro Life Extension (HLE) projects,<sup>3</sup> (2) inadequate staffing levels, (3) Water Orders, and (4) forced and maintenance outages.

# Overtime Worked at Some Plants was Equivalent to 24 Full-Time Employees

Between June 1, 2022, and May 31, 2024, 187,579 hours of overtime were worked at TVA's hydro plants. Fifty-eight percent (108,796) of the 187,579 hours of overtime was performed at 5 of the 30 hydro plants. This was the equivalent of 24 full-time employees. Table 1 below shows the number of overtime hours for the five plants and the annual full-time equivalents (FTE).

Overtime Hours and Potential FTEs						
Hydro Plant	2 Year Total Overtime Hours	Employees On-Site (as of 5/31/2024)	Potential FTEs That Could be Hired			
Raccoon Mountain	42,815	34	10			
Fort Loudoun	20,291	14	4			
Wilson	18,171	34	4			
Chickamauga	14,375	18	3			
Wheeler	13,144	18	3			
Total	108,796	118	24			

Table 1

In addition, we analyzed the overtime by quarter for each of the five plants with the most overtime to determine if overtime was being consistently utilized or if it was occurring erratically. While there were spikes during various quarters,

<sup>&</sup>lt;sup>3</sup> HLE projects are completed to deliver long term optimal value from the hydro fleet.

Chart 1 below shows there was consistent overtime worked over the two-year period, which could indicate additional staffing is needed.



### **Overtime Hours by Quarter**

### Some Employees Worked Significant Amounts of Overtime

Based on the amounts of overtime worked annually, we determined some employees at hydro plants worked significant amounts of overtime. We identified 30 instances (16 and 14 instances between June 2022 and May 2023 and June 2023 and May 2024, respectively), where employees worked over 1,000 hours of overtime during a single year. In addition, two employees had approximately 2,000 hours of overtime in a single year. Furthermore, our review of overtime data found that the 20 employees who worked the most overtime worked an average of 2,357 hours of overtime and earned about \$193,086 in overtime pay for the two-year period, as shown in Table 2 on the following page.

Overtime Hours Worked and Overtime Earnings				
Employee #	2022-2023 Hours	2023-2024 Hours	2-Year Overtime Hours	2-Year Overtime Earnings
1	1,957	1,999	3,956	\$372,047
2	1,298	1,731	3,029	\$284,399
3	1,308	1,658	2,966	\$278,688
4	1,475	1,399	2,874	\$151,986
5	1,469	1,377	2,846	\$151,571
6	1,747	1,022	2,769	\$253,633
7	1,332	1,370	2,702	\$266,541
8	1,365	1,299	2,664	\$239,636
9	724	1,676	2,400	\$224,096
10	0	2,341	2,341	\$198,911
11	906	1,059	1,965	\$179,814
12	1,026	881	1,907	\$178,726
13	1,004	893	1,897	\$181,851
14	1,194	700	1,894	\$89,478
15	911	951	1,862	\$162,707
16	928	912	1,840	\$175,910
17	749	1,085	1,834	\$86,292
18	1,053	766	1,819	\$150,324
19	754	1,058	1,812	\$151,343
20	1,120	644	<u>1,764</u>	<u>\$83,766</u>
2 Year Average			2,357	\$193,086

Table 2

We also determined some employees worked significant amounts of overtime during a quarterly period, two week pay period, and 24-hour period. For example, there were 36 instances where employees worked over 400 hours or more of overtime during a quarterly period, which equates to about 31 hours of overtime per week. There were approximately 10 instances where employees worked 100 hours or more of overtime in a single pay period, which equates to about 50 hours of overtime per week. Lastly, we found 38 instances in which employees worked over 16 hours within a 24-hour period. According to TVA's Trade and Labor General Agreement,<sup>4</sup> it is best practice to limit the instances where employees work over 16 hours within a 24-hour period.

### **Potential Causes for the Significant Overtime**

The potential causes for the significant overtime include (1) HLE projects, (2) inadequate staffing levels, (3) Water Orders, and (4) forced and maintenance outages.

<sup>&</sup>lt;sup>4</sup> TVA's Trade and Labor General Agreement between TVA and the Trades and Labor Council for Annual Employees of TVA includes procedures managing overtime.

### Hydro Life Extension Projects

According to some management at hydro plants, HLE projects cause significant amounts of overtime. During these projects, contractors are on-site at hydro plants 24/7 to complete the work. While contractors are performing work, qualified hydro personnel are required to be on-site to perform oversight duties. This puts additional stress on those that are qualified to complete the work due to limited personnel trained to this level. Our overtime data also demonstrates the stress HLE projects can put on hydro crews. Of the top 12 employees who worked the most overtime, six worked at hydro plants that had HLE projects during our scope, including the top three overall.

### Inadequate Staffing Levels

According to some management at hydro plants, current staffing levels are also a cause of increased overtime being worked. Additionally, a staffing analysis conducted by hydro management indicated hydro operations has a headcount/megawatt (FTE/MW) ratio that is among the lowest in the generation fleet at .05. Raccoon Mountain, which is the plant with the most overtime during our scope, had a plant FTE/MW ratio of .02. Comparatively, industry peer data indicates a hydro plant FTE/MW median ratio of .22 FTE/MW. Additionally, TVA coal and nuclear plants range from .09-.37. According to hydro management, the current staffing levels cause increased work schedules that could lead to employee fatigue.

Hydro Operations approved a new headcount of 301 employees for fiscal year 2025 based on work required in the fiscal year 2025 business plan. This is an increase of 39 employees from the headcount of 262 employees as of May 2024.

### Water Orders

Hydro plant management indicated that Water Orders are another requirement that impacts overtime. Water Orders are issued by River Forecasting to open spillway gates to move water along the system and are considered emergent work and are not planned in weekly, monthly, quarterly, or annual plant maintenance. The level of work required to complete a Water Order varies at each plant, but some hydro management indicated that it can take a crew several hours to complete a Water Order. During our scope, 1435 Water Orders were completed throughout the river system.

### Forced and Maintenance Outages

According to management at hydro plants, forced and maintenance outages additionally contributed to increased amounts of overtime worked by personnel. There were 1,112 forced or maintenance outage events at hydro plants during the scope of our evaluation.

# TVA MAY NOT BE ACCURATELY CAPTURING THE EFFECTS OF FATIGUE

TVA-TSP-18.018, *Fatigue Management*, states that its purpose is to establish a process to provide reasonable assurance that the effects of fatigue and degraded alertness do not impact an individual's ability to safely and competently perform their duties. However, we determined that TVA may not be accurately capturing the effects of fatigue because (1) fatigue evaluations are not being performed and (2) fatigue data is not trended with health and safety data.

### **Fatigue Evaluations Are Not Being Performed**

TVA-TSP-18.018, Fatigue Management, requires performance of fatigue evaluations under three different conditions: (1) when an observed condition of impaired alertness creates a reasonable suspicion that an individual is not fit to safely and competently perform their duties, (2) "self-declaration" of fatigue by the employee, and (3) a follow-up of either the preceding conditions described, after a break of less than 10 hours. According to TVA Safety, no fatigue evaluations were performed during the scope of our evaluation. A previous version of the Fatigue Management procedure required fatigue evaluations be performed when an employee worked more than 72 hours in any given week; however, this requirement was removed. We performed analysis to determine the number of instances in which an employee worked more than 32 hours of overtime per week. Based on our analysis of biweekly pay period data, we determined that there were at least 447<sup>5</sup> instances when an employee worked over 32 hours<sup>6</sup> overtime in a week. With the removal of the 72-hour threshold trigger to perform fatigue evaluations, the method of identifying fatigue issues depends on self-declarations of fatigue or someone reporting a suspicion of fatigue.

During the scope of our evaluation, TVA initially used Medgate for tracking medical and safety data. According to TVA Safety, fatigue evaluations could be submitted by employees within Medgate. TVA later transitioned from Medgate to Cority; however, we found that TVA Safety did not implement a way to submit fatigue evaluations in Cority. During our evaluation, TVA Safety corrected the issue by implementing a fatigue evaluation questionnaire in the system.

### Fatigue Data is Not Being Trended

As previously stated, the purpose of the *Fatigue Management* procedure is to establish a process to provide reasonable assurance that the effects of fatigue and degraded alertness do not impact an individual's ability to safely and competently perform their duties. Additionally, TVA-SPP-18.001, *Safety Program*, states that TVA Corporate Safety will monitor metrics, which include safe work performance gaps and trends, injury precursors and severity rates, and risk analysis. The procedure states that results of trending are used to develop corrective action plans where necessary. TVA-TSP-18.018, *Fatigue Management*, indicates that

<sup>&</sup>lt;sup>5</sup> TVA overtime data was provided for biweekly periods. We counted instances if total overtime for the pay period was 64 hours or more.

<sup>&</sup>lt;sup>6</sup> According to TVA-SPP-13.029, *Pay*, paid absences, such as leave and annual leave, are counted the same as work time in determining eligibility for overtime pay.

TVA maintains an Overtime Dashboard for hours worked acutely during short periods of time as well as chronically over long-term durations. However, TVA Safety personnel indicated that (1) fatigue data is not being collected and trended and (2) the Overtime Dashboard is not being used. Properly capturing the effects of fatigue in real time as safety incidents occur as well as identifying projected future risks through trending of fatigue data supports achievement of these goals.

Additionally, we analyzed safety incident data which indicates a potential correlation between safety incidents and overtime hours worked. We identified five<sup>7</sup> safety incidents involving employees that worked overtime at hydro plants. All five safety incidents involved employees that worked more overtime than average. Specifically, these employees worked (1) an average of 30 overtime hours within the preceding two pay periods and/or (2) an average of at least 772 overtime hours during the scope of our evaluation. For these safety incidents, Table 3 below shows how many overtime hours each employee worked (1) during the two-year period and (2) the preceding two pay periods prior to the safety incident.

Overtime Hours Worked				
Incident #	Overtime Hours for Two-Year Period	Overtime Hours for Prior Two Pay Periods		
1	1,130	80		
2	778	32		
3	778	33		
4	2,846	0		
5	1,106	29		
Average	1,327	35		
		<b>-</b>		

Table 3

While we were unable to determine if fatigue was, or was not, a causal factor for any of the safety incidents due to fatigue evaluations not being performed, the significant overtime hours worked indicate that fatigue could have been a contributing factor in the safety incidents.

## **RECOMMENDATIONS**

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

• Continue efforts to reach approved Hydro Operations headcount.

**TVA Management's Comments** – Hydro Operations management intends to initiate new technician level 1 and 2 training classes in FY 2025 in an effort to reach approved headcount totals. See the Appendix for TVA management's complete response.

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

<sup>&</sup>lt;sup>7</sup> There were seven total incidents. We excluded two that were classified as hearing loss or no physical injury.

• Evaluate opportunities to mitigate overtime at Hydro Life Extension projects.

**TVA Management's Comments** – TVA management stated a joint effort between the HLE team and Hydro Operations management is under way to evaluate HLE schedules and workload amongst plant technicians and staff. A specific staffing strategy will be developed for each project to ensure adequate outage support while avoiding any unplanned overtime. See the Appendix for TVA management's complete response.

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

We recommend the Director, Safety:

• Evaluate TVA-TSP-18.018, *Fatigue Management*, and TVA-SPP-18.001, *Safety Program*, to determine if fatigue is being effectively identified and mitigated at hydro facilities.

**TVA Management's Comments** – TVA management stated they would coordinate an effort to evaluate TVA-TSP-18.018, *Fatigue Management*, and TVA-SPP-18.001, *Safety Program*, for any enhancements and to ensure they can comply with the procedure requirements. See the Appendix for TVA management's complete response.

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

January 08, 2025

David P. Wheeler, WT 2C-K

#### REQUEST FOR COMMENTS - DRAFT EVALUATION 2024-17513 - HYDRO PLANT OVERTIME

Hydro Operations would like to thank Anthony H. Jacosalem and Lindsay J. Denny for their diligence and support to evaluate and assess TVA's management of overtime at hydro plants.

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

#### Recommendations

We recommend the Vice President, Power Operations (PO), Gas, Hydro, and Integration:

1. Continue efforts to reach approved Hydro Operations headcount.

Response

Hydro Operations management intends to initiate new technician level 1 and 2 training classes in FY25 in an effort to reach approved headcount totals. Technician training classes are multi-year programs intended to train personnel for plant environments and multi-skilled work tasks; the additional FY25 training classes will train entry-level technicians to progress to more senior-level positions.

2. Evaluate opportunities to mitigate overtime at Hydro Life Extension projects.

#### Response

A joint effort between Hydro Life Extension (HLE) project team and Hydro Operations management is under way to evaluate HLE schedules and workload amongst plant technicians and staff that supports these long duration projects. Moving forward, a specific staffing strategy will be developed for each project between the HLE Team and Hydro Operations. This will ensure adequate outage support, while avoiding any unplanned overtime from the hydro staff.

We recommend the Director, Safety:

 Evaluate TVA-TSP-18.018, Fatigue Management, and TVA-SPP-18.001, Safety Program, to determine if fatigue is being affectively identified and mitigated at hydro facilities. David P. Wheeler, WT 2C-K Page 2 January 08, 2025

Response

Central Safety will coordinate an effort with the Safety Peer Team Procedure Subcommittee to evaluate TVA-TSP-18.018, *Fatigue Management*, and TVA-SPP-18.001, *Safety Program*, for any enhancements and to ensure we can comply with the procedure requirements.

Thank you for allowing us to provide these comments. Please contact us if you have any questions.

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

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